Gigabit Network Management Card

SNMP G2 Monitoring for Uniti Power UPS Systems
User Guide - English

15/07/2025

1 Table of Contents

2 Installing the Network Management Module

2.1 Overview

The UPS Network Module enables you to monitor, manage, and control power environments for multiple devices over the network connection.

The UPS Network Module can send email notifications to configured recipients and alert traps to specified SNMP management programs or used as a stand-alone management system.

2.2 Unpacking the Network module

The Network Management Card G2 for UPS will include the following accessories:

Packing materials must be disposed of in compliance with all local regulations concerning waste.
Recycling symbols are printed on the packing materials to facilitate sorting.

2.3 Mounting the Network Module

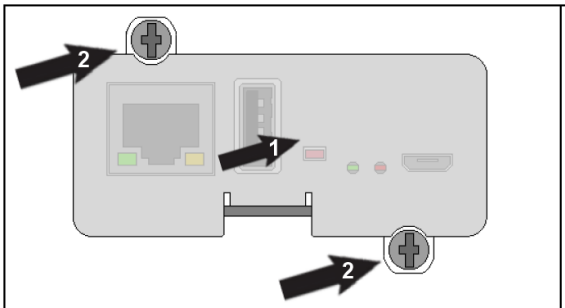
It is not necessary to power down the Device before installing the Network Module. Required tools:

No. 2 Phillips screwdriver.

The Network Module is hot-swappable. Inserting and/or extracting the Network Module from the communication slot of the product has no effect on the output.

Remove the two screws securing the option slot cover plate and store the plate for possible future use.

1. Install the Network Module along the alignment channels in the option slot.
2. Secure the Network Module using the two screws.



If the product is powered up, you can verify that the Network Module is seated properly and communicating with the product by checking that the Status ON LED flashes green after 2 minutes.

2.4 Accessing the Network Module

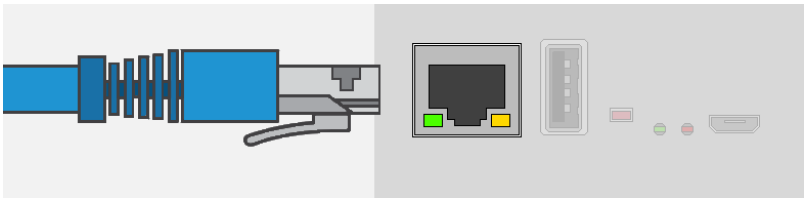
2.4.1 Accessing the web interface through Network

2.4.1.1 Connecting the network cable

Security settings in the Network Module may be in their default states.

For maximum security, configure through a USB connection before connecting the network cable.

Connect a standard *gigabit compatible shielded ethernet cable (F/UTP or F/FTP)* between the network connector on the Network Module and a network jack.



2.4.1.2 Accessing the web interface

It is highly recommended that browser access to the Network Module is isolated from outside access using a firewall or isolated network.

STEP 1 – On a network computer, launch a supported web browser. The browser window appears.

STEP 2 – In the Address/Location field, enter https://***[IP address]*** with the IP address of the Network Module.

STEP 3 – The login screen appears.

STEP 4 – Enter the user name in the User Name field. The default user name is **admin**.

STEP 5 – Enter the password in the Password field. The default password is **admin**.

STEP 6 – The password must be changed at first login.

STEP 7 – Click **Login**. The Network Module web interface appears.

At first login:

STEP 8 - Accept License Agreement. The Network Module web interface appears.

2.4.2 Finding and setting the IP address

2.4.2.1 Your network is equipped with a BOOTP/DHCP server (default)

2.4.2.1.1 Read from the device LCD

Note: some device may not be able to display the IP address even if they have an LCD.

If your device has an LCD, from the LCD's menu, navigate to Identification>>>"COM card IPv4".

- Note the IP address of the card.
- Go to the section: Accessing the web interface through Network.

2.4.2.1.2 Read from the Utility tool

Download the Utility tool from the website and then install to the computer. The Utility tool could list the Network Modules within a network after scan.

- Note the IP address of the card by corresponding MAC address on the Network Module's front panel.
- Go to the section: Accessing the web interface through Network.

2.4.2.1.3 With web browser through the configuration port

For example, if your device does not have an LCD, the IP address can be discovered by accessing the web interface through RNDIS and browsing to Settings>Network.

To access the web interface through RNDIS, see the Accessing the web interface through RNDIS section.

- Navigate to Contextual help>>>Settings>>>TCP/IP>>>IPV4.
- Read the IPv4 settings.

2.4.2.2 Your network is not equipped with a BOOTP/DHCP server

2.4.2.2.1 Define from the configuration port

The IP address can be defined by accessing the web interface through RNDIS.

To access web interface through RNDIS, see the Accessing the web interface through RNDIS section.

Define the IP settings:

- Navigate to Contextual help>>>Settings>>>TCP/IP>>>IPV4.
- Select Manual (Static IP).
- Input the following information: Address, Subnet Mask, Default Gateway
- Save the changes.

2.4.3 Accessing the web interface through RNDIS

This connection is used to access and configure the Network Module network settings locally through a RNDIS (Ethernet over USB interface).

2.4.3.1 Connecting the configuration cable

1. Connect a Micro-B to USB cable to a USB connector on the host computer.
2. Connect the cable to the Settings connector on the Network Module.

2.4.3.2 Web interface access through RNDIS

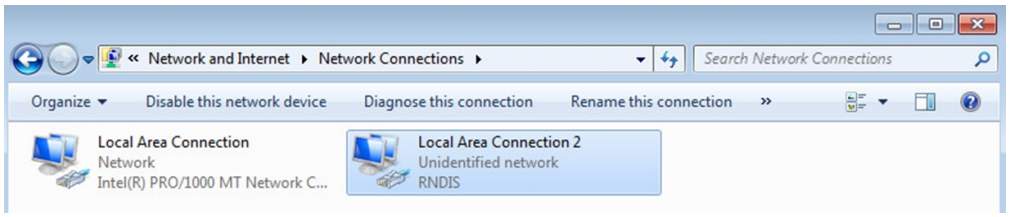
2.4.3.2.1 Configuring the RNDIS

a Automatic configuration

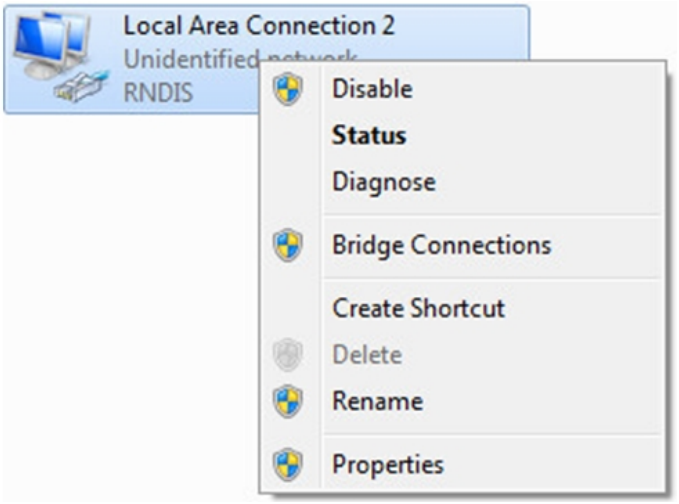
RNDIS driver is used to emulate a network connection from USB.
After the card is connected to the PC, **Windows®** OS will automatically search for the RNDIS driver.
On some computers, the OS can find the RNDIS driver then configuration is completed, and you can go to Accessing the web interface.
On some others it may fail then proceed to manual configuration.

b Manual configuration

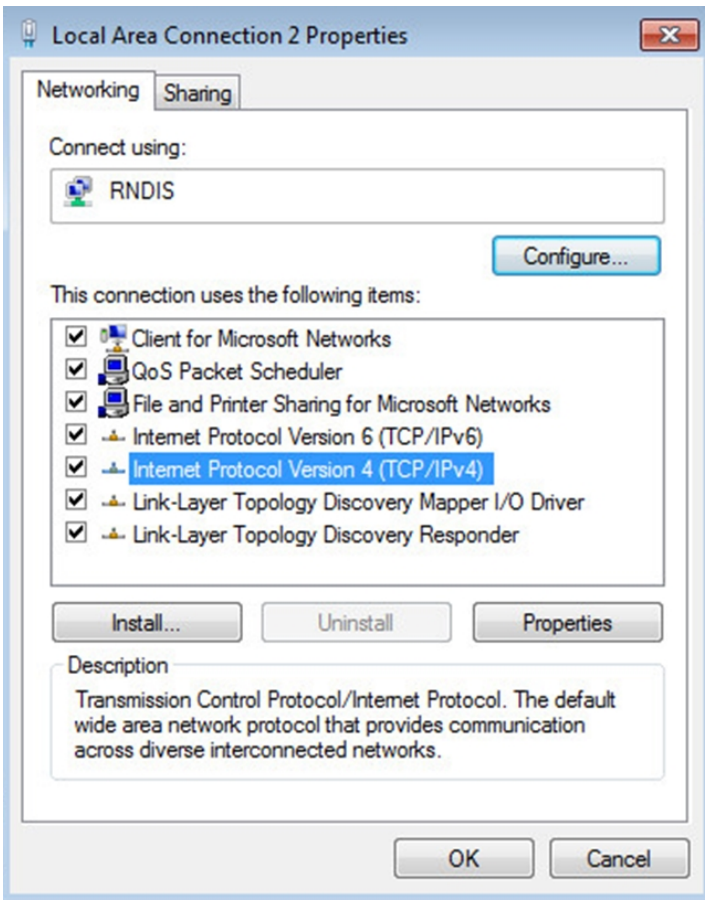
STEP 1 – In case **Windows®** OS fails to find driver automatically, go to the Windows control panel>Network and sharing center>Local area connection



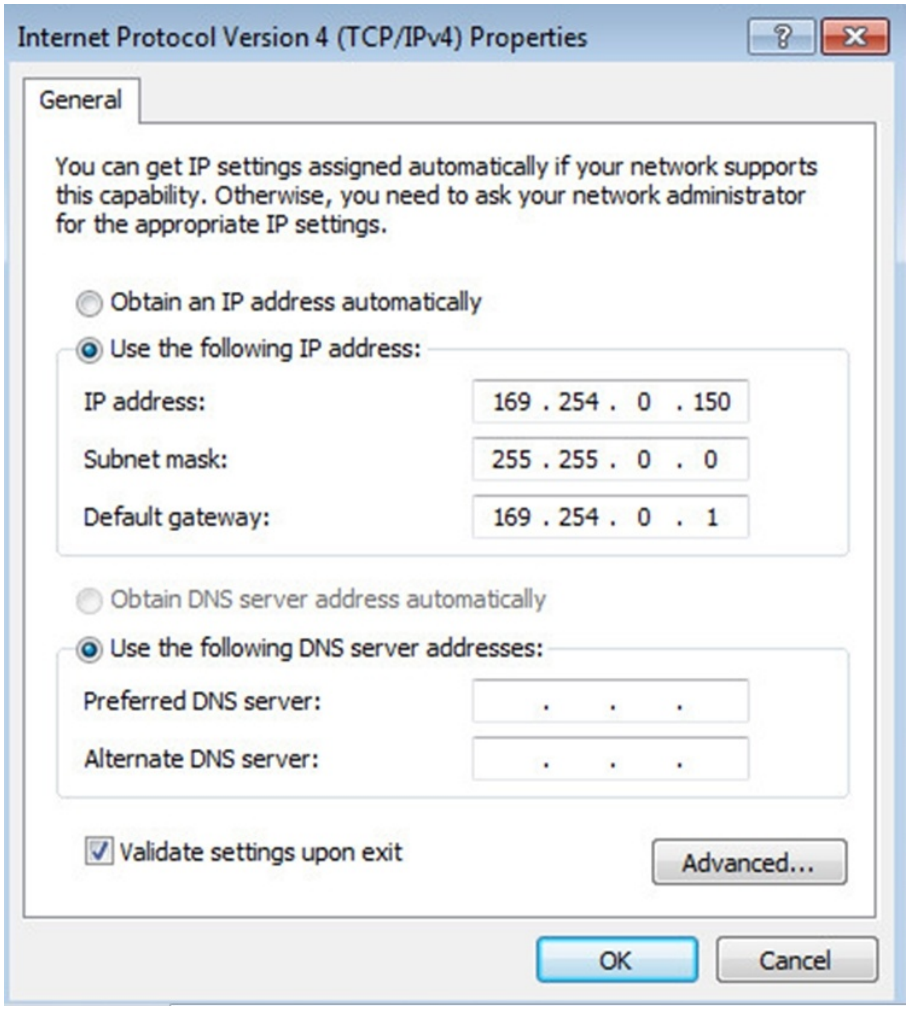
STEP 2 – Right click on the RNDIS local area connection and select Properties.



STEP 3 – Select Internet Protocol Version 4 (TCP/IPv4)" and press the Properties button



STEP 4 – Then enter the configuration as below and validate (IP = 169.254.0.150 and mask = 255.255.0.0), click OK, then click on Close.



2.4.3.2.2 Accessing the web interface

STEP 1 – Be sure that the Device is powered on.

STEP 2 – On the host computer, download the rndis.7z file from the website and extract it. For more information, navigate to section in the full documentation.

STEP 3 – Launch setProxy.bat to add 169.254.* in proxy's exceptions list, if needed. For manual configuration, navigate to Modifying the Proxy exception list section in the full documentation.

STEP 4 – Launch a supported browser, the browser window appears.

STEP 5 – In the Address/Location field, enter: **https://169.254.0.1**, the static IP address of the Network Module for RNDIS. The log in screen appears.

STEP 6 – Enter the user name in the User Name field. The default user name is **admin**.

STEP 7 – Enter the password in the Password field. The default password is **admin**.

STEP 8 – Click **Login**. The Network Module local web interface appears.

2.4.4 Accessing the card through serial terminal emulation

This connection is used to access and configure the Network Module network settings locally through Serial (Serial over USB interface).

2.4.4.1 Connecting the configuration cable

STEP 1 – Connect the Micro-B to USB cable to a USB connector on the host computer.

STEP 2 – Connect the cable to the Settings connector on the Network Module.

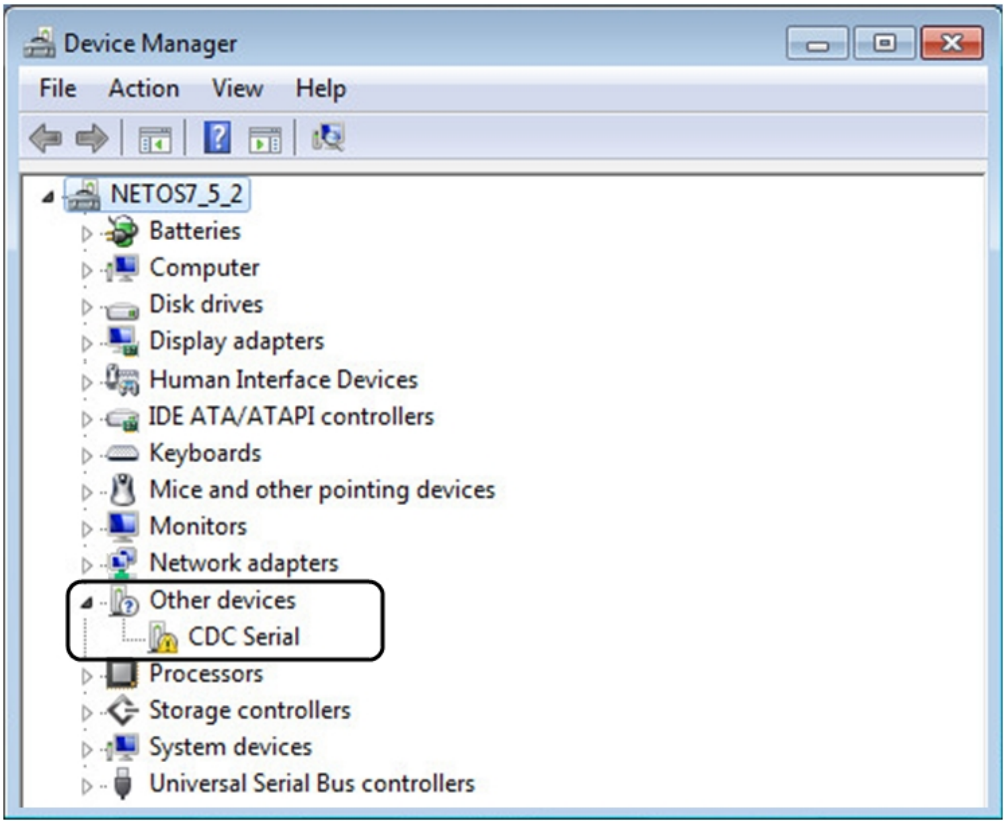
2.4.4.2 Manual configuration of the serial connection

Serial driver is used to emulate a serial connection from USB.
After the card is connected to the PC, manual configuration of the driver is needed for Windows® OS to discover the serial connection.

STEP 1 – On the host computer, download Serial driver available from Microsoft®.

STEP 2 – Plug the USB cable and go to Windows® Device Manager.

STEP 3 – Check the CDC Serial in the list, if it is with a yellow exclamation mark implying that driver has not been installed follow the steps 4-5-6-7 otherwise configuration is OK.

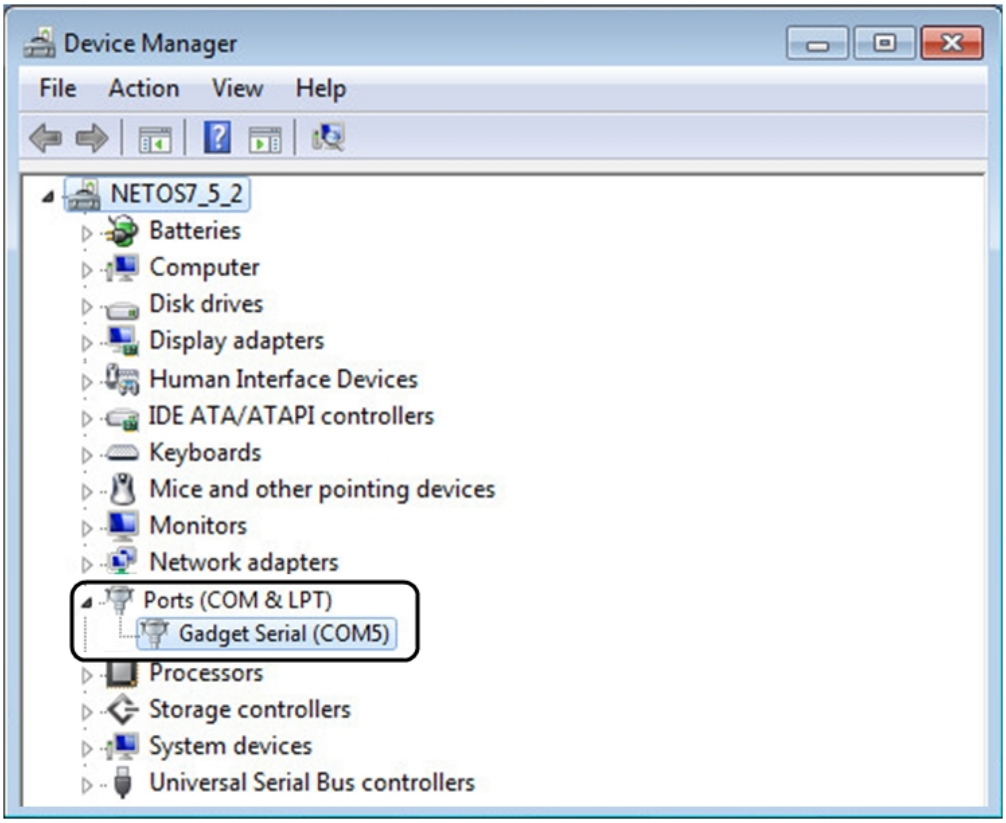


STEP 4 – Right click on it and select Update Driver Software. When prompted to choose how to search for device driver software, choose Browse my computer for driver software. Select Let me pick from a list of device drivers on my computer.

STEP 5 – Select the folder where you have previously downloaded the driver file Click on Next.

STEP 6 – A warning window will come up because the driver is not signed. Select Install this driver software anyway

STEP 7 – The installation is successful when the COM port number is displayed for the Gadget Serial device in the Windows® Device Manager.



2.4.4.3 Accessing the card through Serial

It is intended mainly for automated configuration of the network and time settings of the network card. It can also be used for troubleshooting and remote reboot/reset of the network interface in case the web user interface is not accessible.

CLI can be accessed through:

- SSH
- Serial terminal emulation.

⚠	Changing network parameters may cause the card to become unavailable remotely. If this happens it can only be reconfigured locally through USB.

ℹ	You can see this list of available commands by typing in the CLI: *?* You can see the help by typing in the CLI: *help*

For more details, refer to Information>>>CLI section

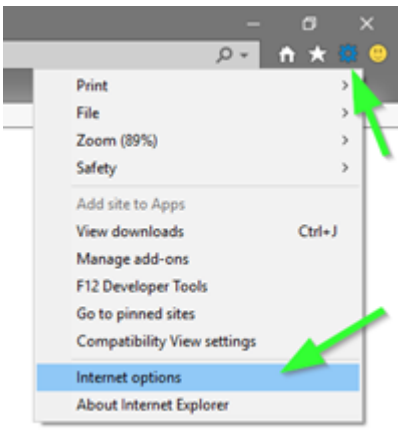
2.4.5 Modifying the Proxy exception list

To connect to the Network Module via a USB cable and your system uses a Proxy server to connect to the internet, the proxy settings can reject the IP address 169.254.0.1.

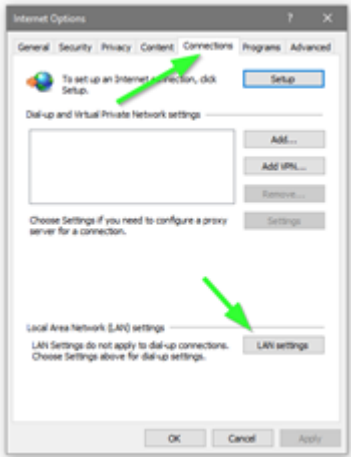
The 169.254. * Sequence is used to set up communication with devices via a physical connection.

To activate this connection, exceptions will have to be made in the proxy settings.

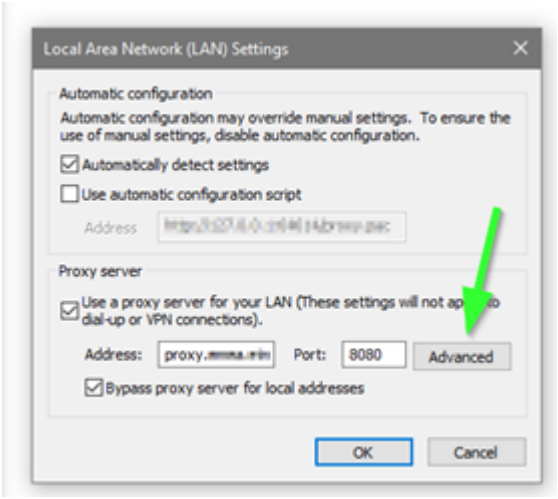
- Open Internet Explorer
- Navigate to settings, Internet options;



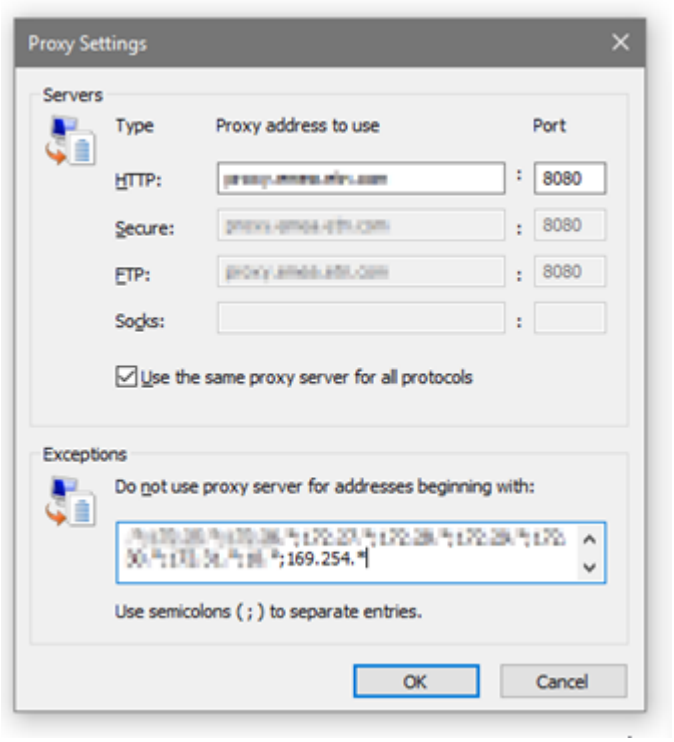
- Select the Connections tab
- Press LAN Settings



- Press ADVANCED



- Add the address 169.254. *



- Press OK.
- Close Internet Explorer and re-open it.
- Now you can access the address 169.254.0.1 with Internet Explorer and any other browser.

2.5 Configuring the Network Module settings

Use the web interface to configure the Network Module. The main web interface menus are described below:

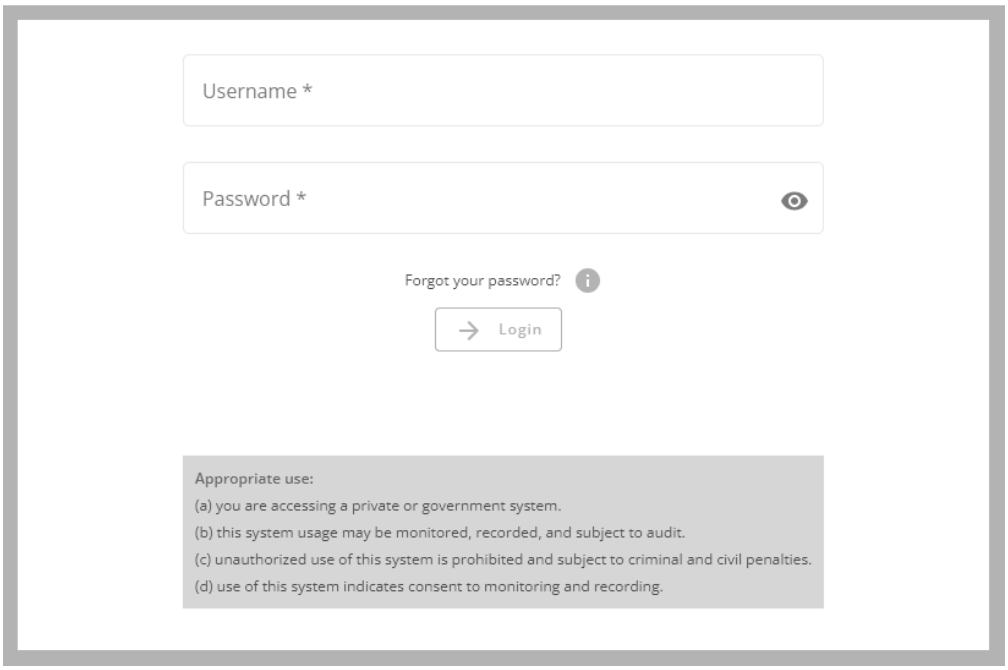
2.5.1 Menu structure

☰	Extend menu display.
	**Home:** Overview and status of the Device (Active alarms, Outlet status, ...).
	**Meters:** Power quality meters and logs.
	**Controls:** Device and outlets control.
	**Protection:** Agents list, Agents shutdown sequencing, Shutdown on power outage.
	**Environment:** Commissioning/Status, Alarm configuration, Information.

	**Settings:** Network Module settings.
	**UPS settings:** General information, Settings.
	**Maintenance:** Firmware, Services, Resources, System logs.
FW	Display Network module firmware version.
Time	Display Network Module local time (not the UTC time).

3 Contextual help of the web interface

3.1 Login page



The page language is set to English by default but can be switched to browser language when it is managed.

After navigating to the assigned IP address, accept the untrusted certificate on the browser.

3.1.1 Logging in for the first time

3.1.1.1 1. Enter default password

As you are logging into the Network Module for the first time you must enter the factory set default username and password.

- Username = admin
- Password = admin

3.1.1.2 2. Change default password

Changing the default password is mandatory and requested in a dedicated window.

Enter your current password first, and then enter the new password twice.

Follow the password format recommendations on the tooltip in order to define a secure password.

3.1.1.3 3. Accept license agreement

On the next step, License Agreement is displayed.

Read and accept the agreement to continue.

Accounts with identical names

When an user attempt to log with a user name that exist both locally & remotely, then only the local account can successfully be logged in by default.

Two options for the remote user to successfully log in

1. You can use a prefix to access the remote account. For example ldap\johndoe or radius\johndoe depending on the remote configuration you set in the card.
2. Change the user name of the local account

3.1.2 Troubleshooting

How do I log in if I forgot my password?

Action

- Ask your administrator for password initialization.
- If you are the main administrator, your password can be reset manually by following steps described in the Servicing the Network Management Module>>>Recovering main administrator password.

Web user interface is not up to date after a FW upgrade

Symptom

After an upgrade:

- The Web interface is not up to date
- New features of the new FW are not displayed
- An infinite spinner is displayed on a tile

Possible causes

The browser is displaying the Web interface through the cache that contains previous FW data.

Action

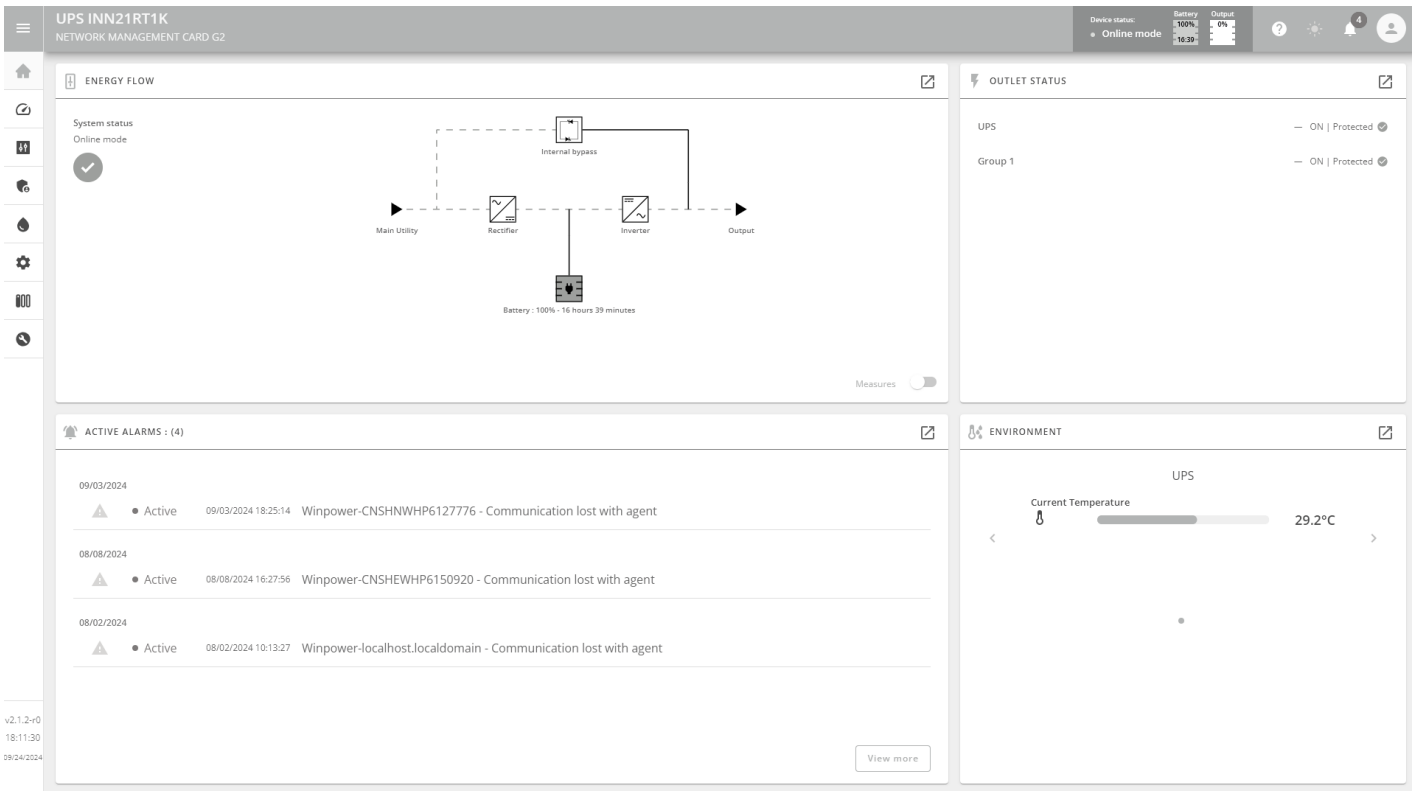
Empty the cache of your browser using F5 or CTRL+F5.

3.1.2.1 For other issues

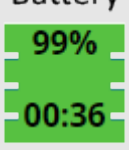
For details on other issues, see the Troubleshooting section.

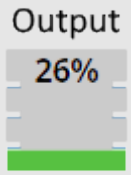
3.2 Home

The Home screen provides status information for the device including key measures and active alarms.



3.2.1 Header structure

Name	Displays the Network module name.
Device name	Displays by default the Device model or the system name if filled in the section Contextual help>>>Maintenance>>>System information .
	Shortcut to the Device details: • Name • Location • Model • P/N • S/N • FW version
Device status	Displays if the Device is Online, On bypass, On battery...
	Displays the battery level (in %) and the remaining backup time.

	Output load level
	**Help:** Opens full documentation in a separate browser page.
	**Profile:** Displays user profile, password change, account information, logout and legal information.
	**Alarms:** Open alarm page and displays the number of active alarms.

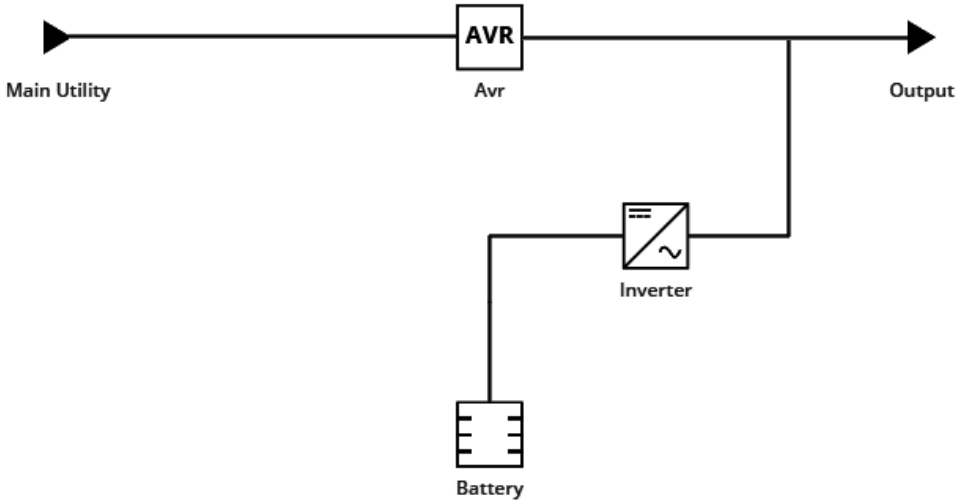
3.2.2 Menu structure

	Extend menu display.
	**Home:** Overview and status of the Device (Active alarms, Outlet status, ...).
	**Meters:** Power quality meters and logs.
	**Controls:** Device and outlets control.
	**Protection:** Agents list, Agents shutdown sequencing, Shutdown on power outage.
	**Environment:** Commissioning/Status, Alarm configuration, Information.
	**Settings:** Network Module settings.
	**UPS settings:** General information, Settings.
	**Maintenance:** Firmware, Services, Resources, System logs.
FW	Display Network module firmware version.

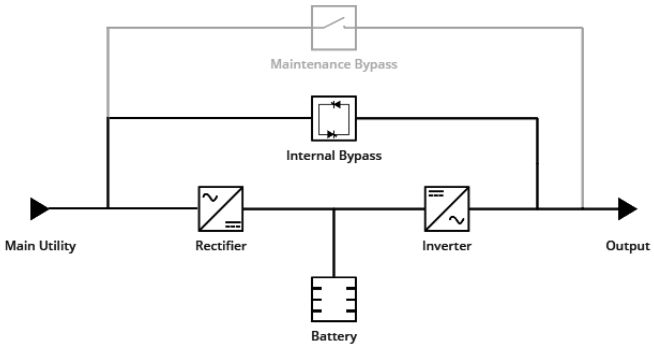
Time	Display Network Module local time (not the UTC time).

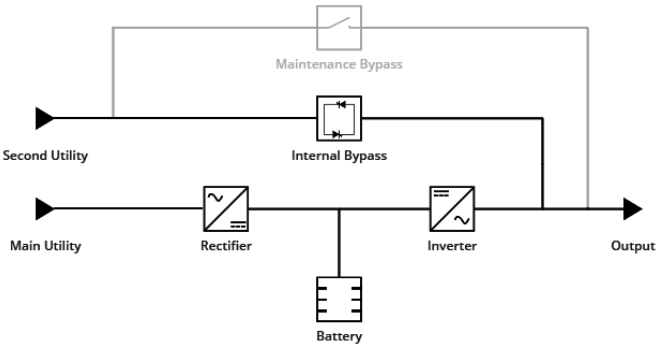
3.2.3 Energy flow diagram

3.2.3.1 Line interactive UPS



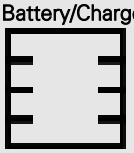
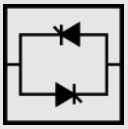
3.2.3.2 Online UPS





3.2.3.3 Diagram elements description

Description and symbols	Description	Possible states below the symbol		
		Good	Warning	Fault
Input	Main utility input.	In range	Out of nominal range	
Output	Output of the UPS.	Protected Powered	In overload Not protected	In short circuit

AVR device 	The equipment is protected and powered through an AVR device.	Normal mode Buck mode Boost mode	In overload	
Rectifier 	Rectifier: convert AC power to DC power.	Normal HE mode (ready) / ESS mode (ready)	In overload	In short circuit In fault
Battery/Charger 	Battery and internal battery charger.	Battery: OK Charger: Charging Floating Resting Off	Battery: End of life	Battery: In fault Charger: In fault Not present
Inverter 	Inverter: convert DC power to AC power.	Normal	In overload	In short circuit In fault
Internal bypass 	Automatic bypass.	Powered (standby, auto bypass, forced bypass, HE mode, ESS mode)	In overload	In fault
Maintenance bypass (optional) 	Maintenance bypass closed.	Maintenance		

Description and symbols	**Description**	**Possible states**		
		Green 	**Orange** 	**Black**
Wiring 	Electrical connection between blocks.	Energy flow	In overload Out of nominal range	No energy Unknown

3.2.3.4 Details

To access the device details, press the icon: 

This view provides a summary of device identification information and nominal values:

- Name
- Model
- P/N
- S/N
- Location
- Firmware version
- Input Voltage
- Input Frequency
- Output Voltage
- Output Frequency

The **COPY TO CLIPBOARD** button will copy the information to your clipboard.

For example, you can copy and paste information into an email.

3.2.3.5 Show measures

Provides input and output measures on the synoptic.

3.2.3.5.1 Example #1

Single input source with 1 phase in and 1 phase out:

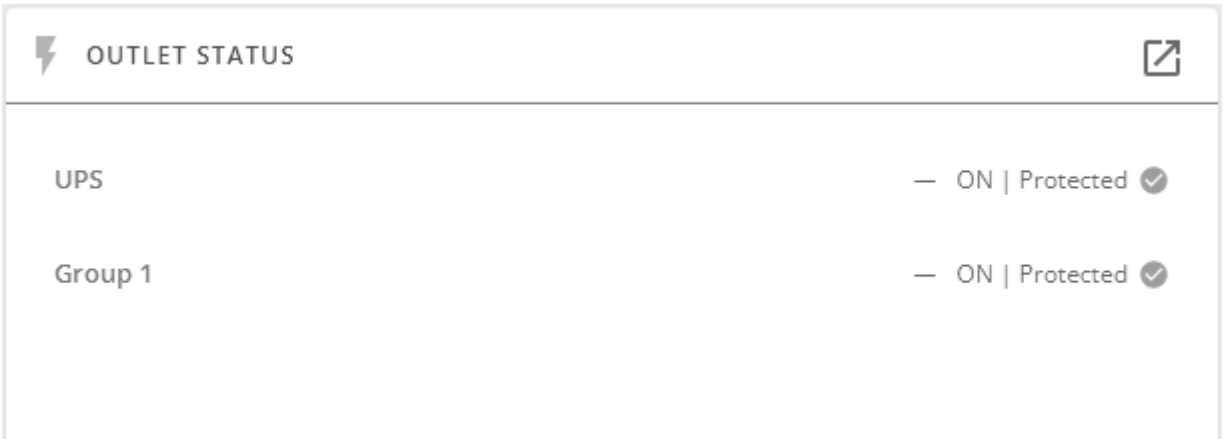
Input measures	Output measures
Voltage (V) Current (A) Frequency (Hz)	Voltage (V) Current (A) Frequency (Hz)

3.2.3.5.2 Example #2

Dual input sources with 3 phases in and 3 phases out

Input measures (main and secondary)			Output measures		
Phase #1 Voltage (V) Current (A)	Phase #2 Voltage (V) Current (A)	Phase #3 Voltage (V) Current (A)	Phase #1 Voltage (V) Current (A)	Phase #2 Voltage (V) Current (A)	Phase #3 Voltage (V) Current (A) Load (W) Load (%)
Frequency (Hz)			Frequency (Hz)		

3.2.4 Outlet status



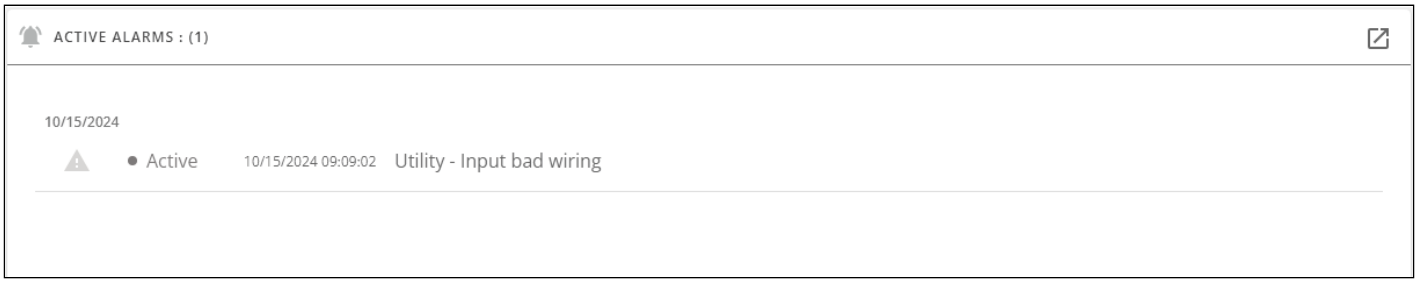
Provides the status of the UPS outlets (ON/OFF) by load segmentation:

- Status (ON/OFF— Protected/Not protected/Not powered)
- Load level (W) – availability depending on the UPS model

Note: Load segmentations allow non-priority equipment to automatically power down during an extended power outage to keep battery runtime on essential equipment.
This feature is also used to remote reboot and sequential start servers to restrict inrush currents.

Note: To access Controls menu, press the icon:

3.2.5 Active Alarms

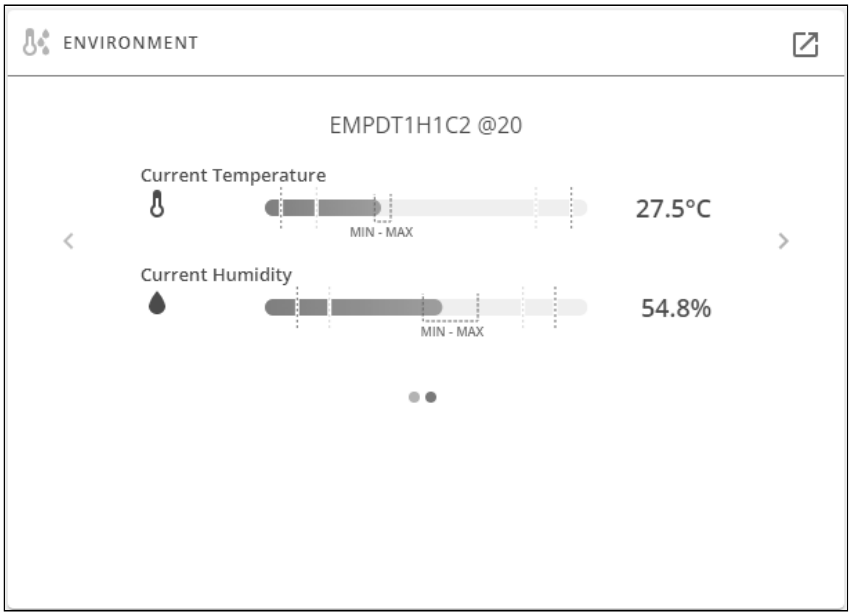


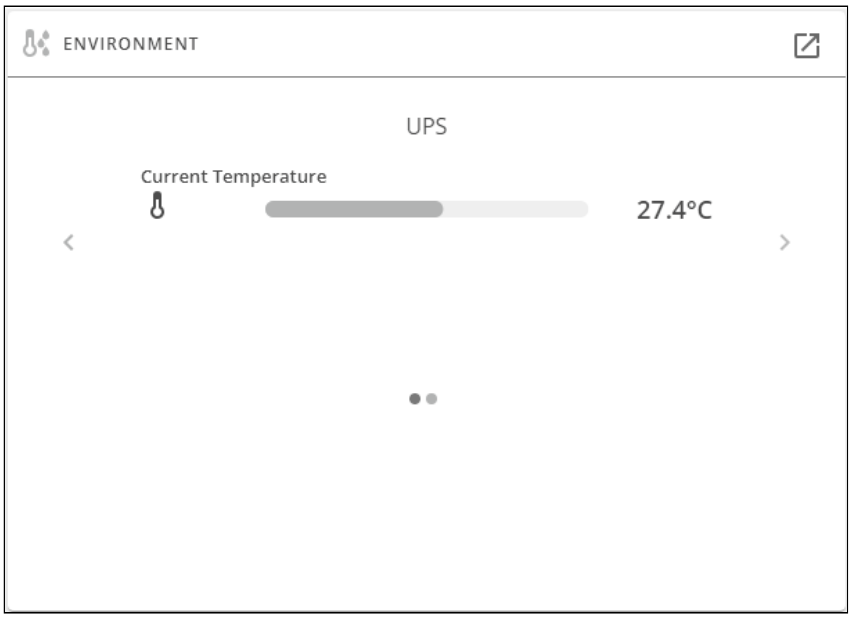
Only active alarms are displayed, the Alarms icon will also display the number of active alarms.

Alarms are sorted by date, alert level, time, and description.

Note: To see the alarm history, press the icon:

3.2.6 Environment





UPS ambient temperature is displayed if available.

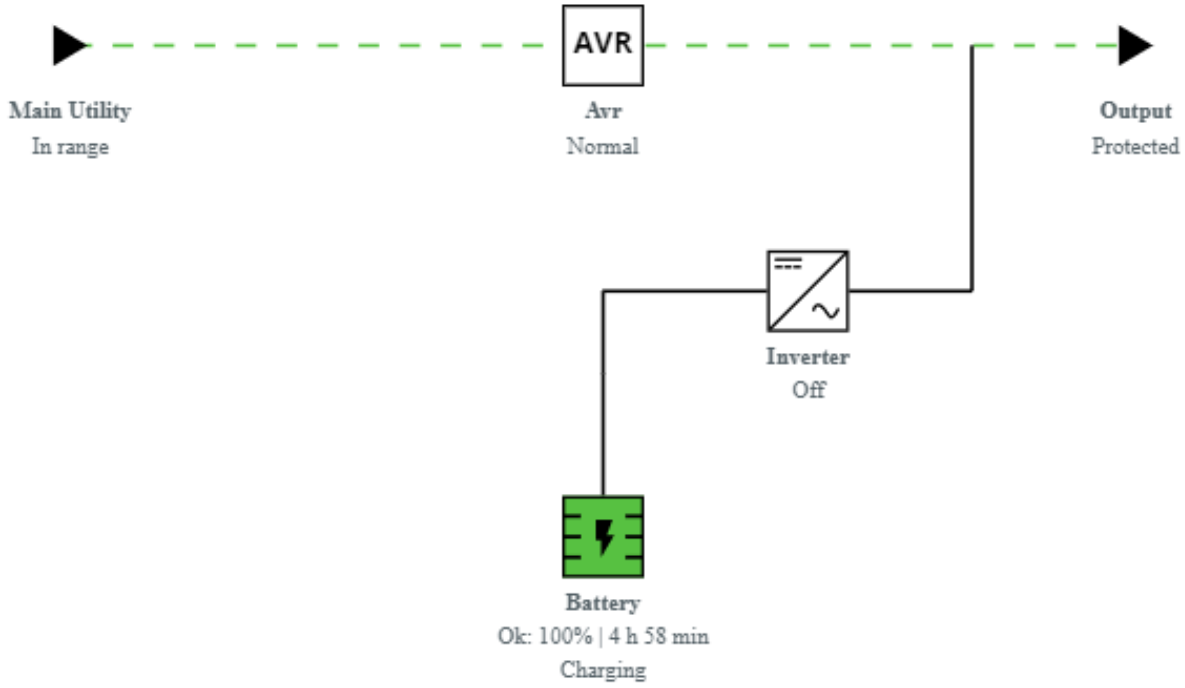
Sensor status and data are displayed if available, MIN-MAX shows the minimal and maximal temperature or humidity measured by the sensor.

Note: To see detailed sensor data, press the icon:

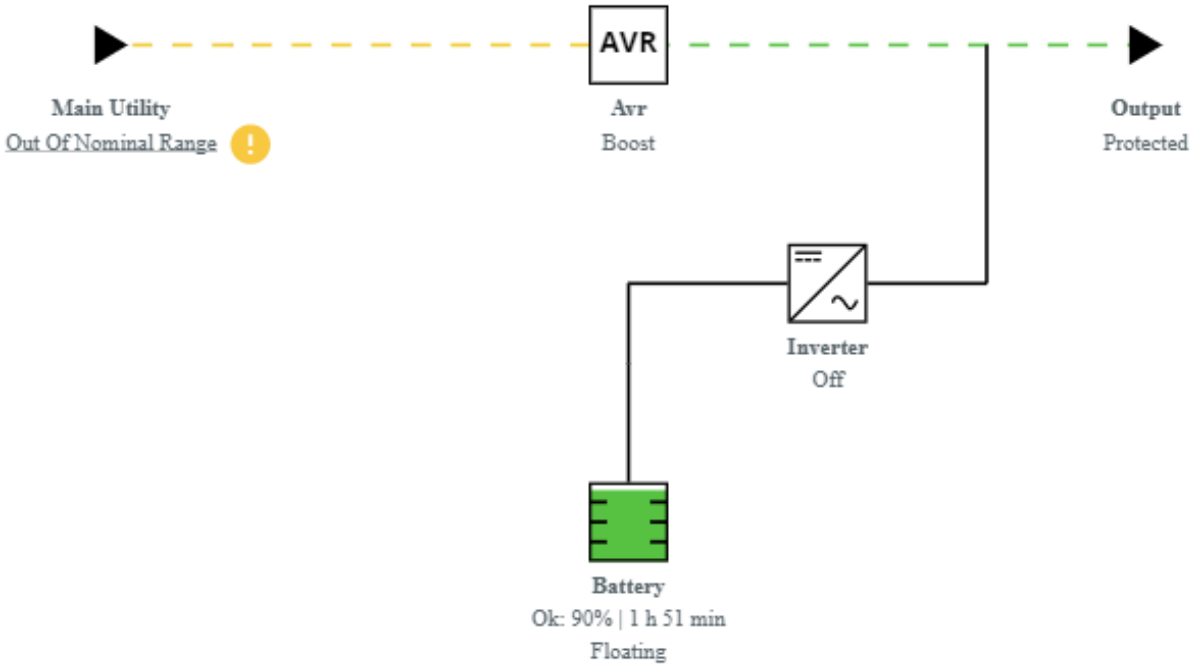
3.2.7 Energy flow diagram examples

3.2.7.1 Line interactive UPS

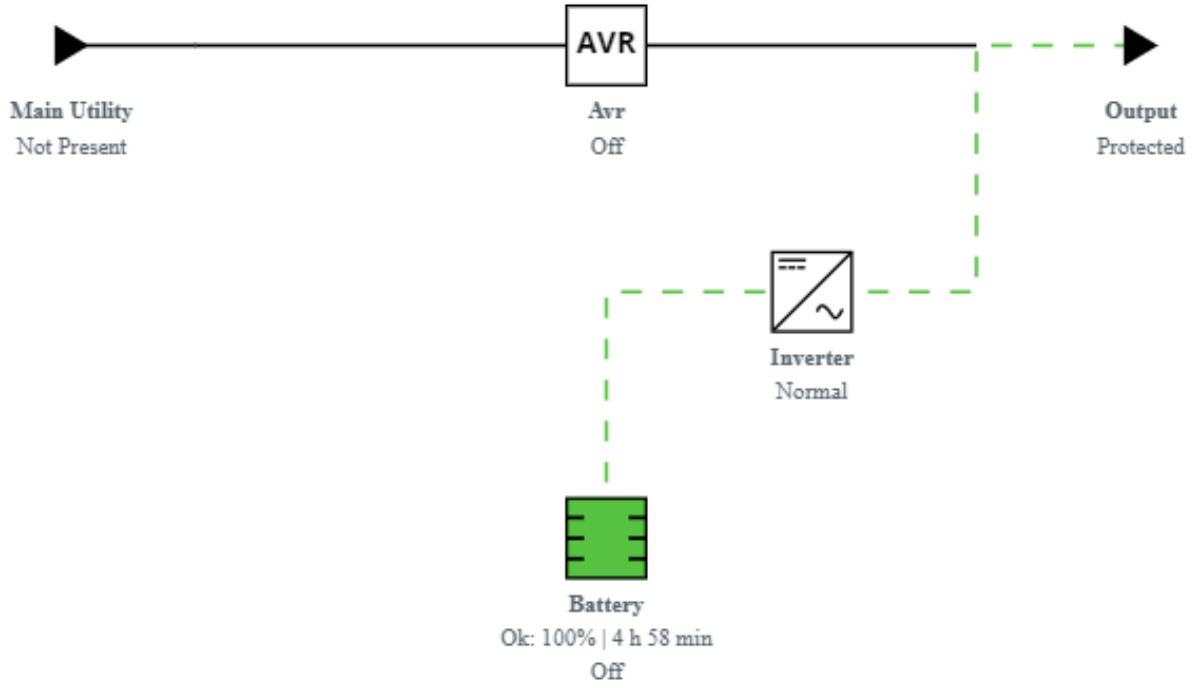
3.2.7.1.1 Normal mode



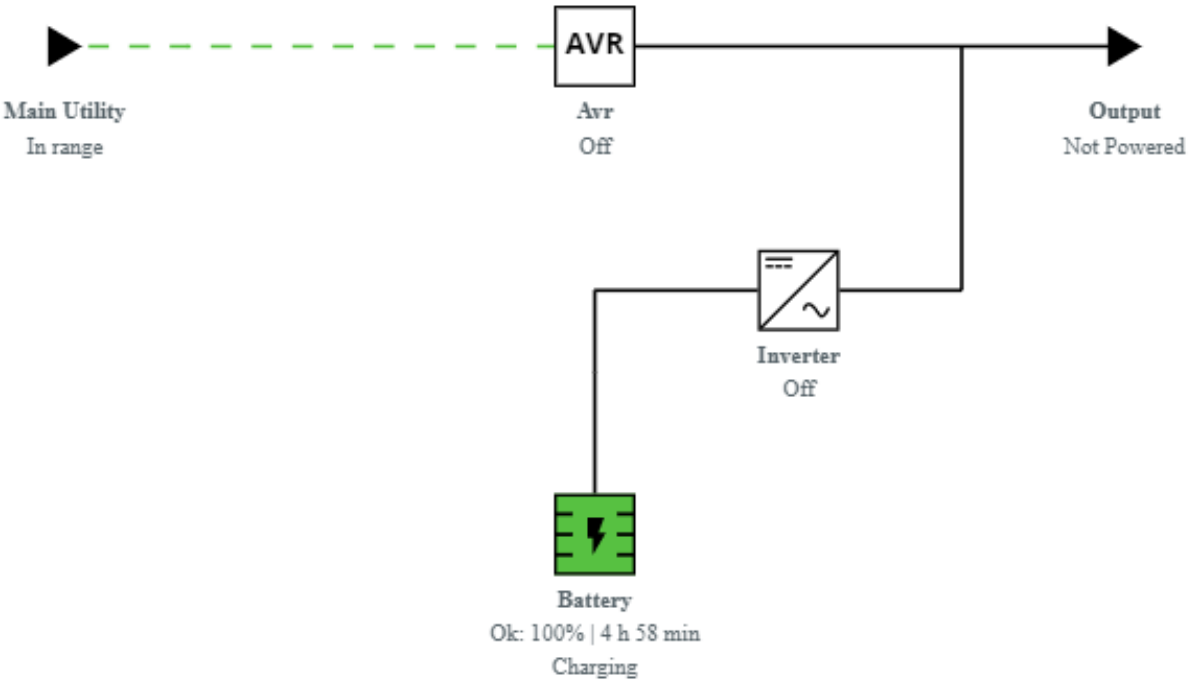
3.2.7.1.2 Buck/Boost mode



3.2.7.1.3 Battery mode

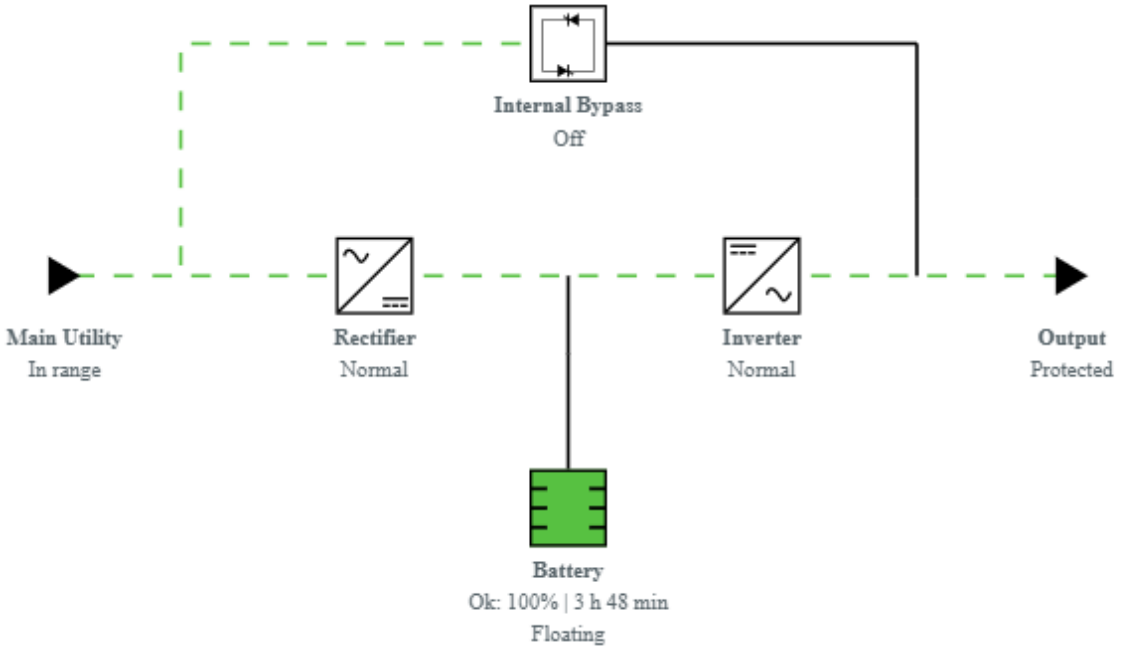


3.2.7.1.4 Off mode

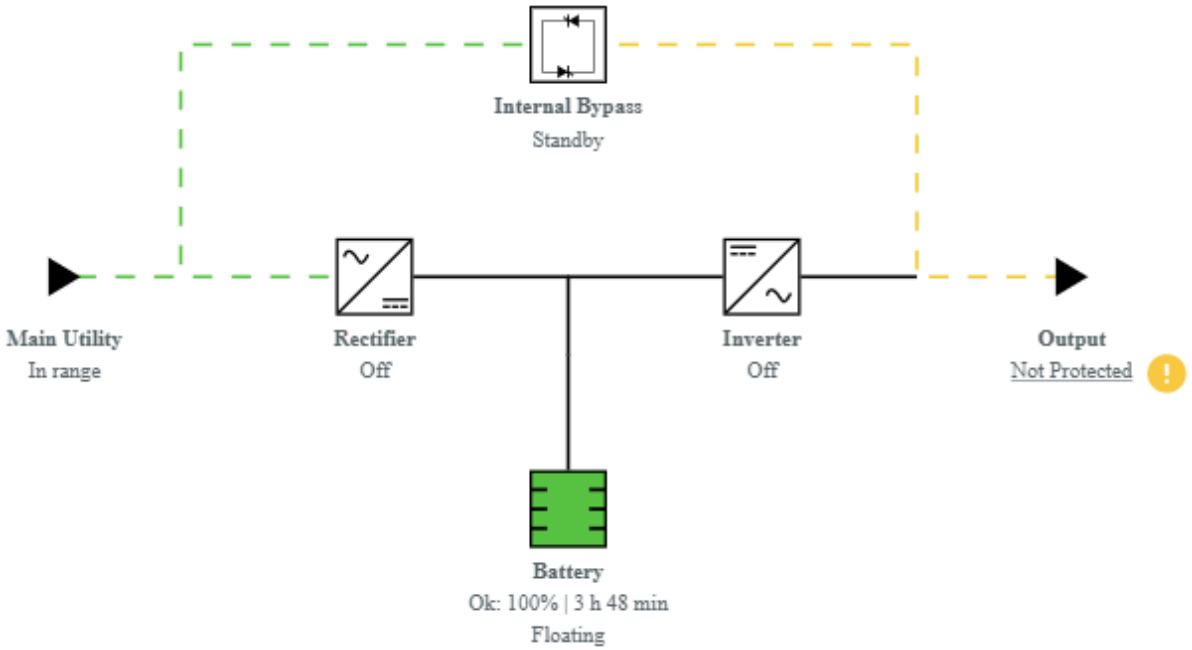


3.2.7.2 Online UPS with single input source

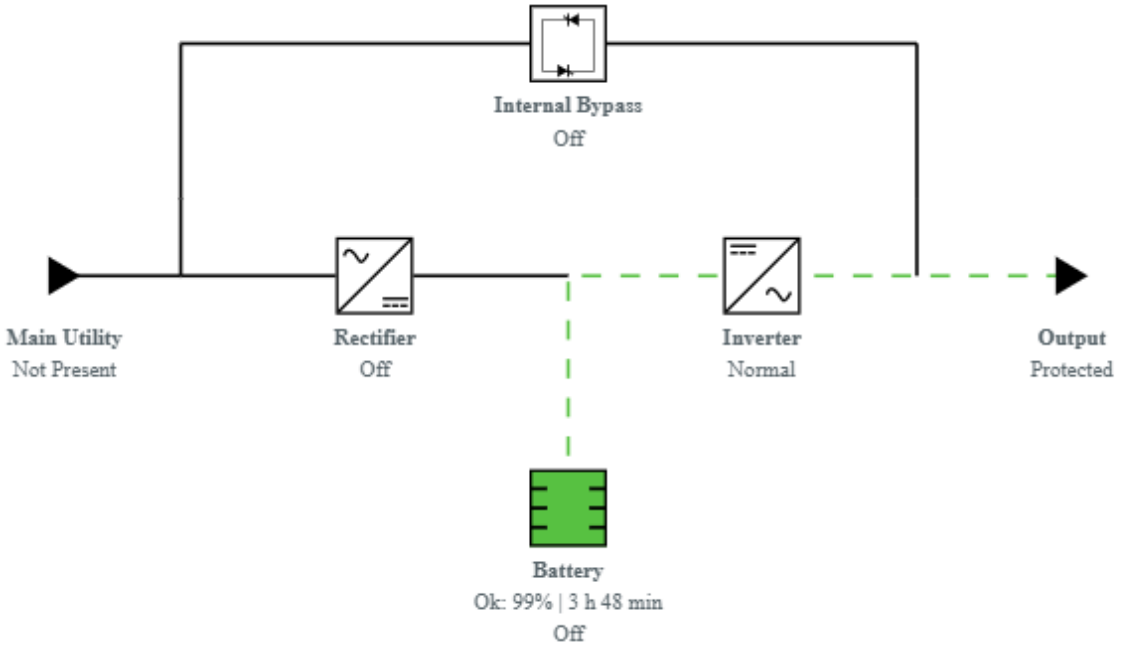
3.2.7.2.1 Online mode



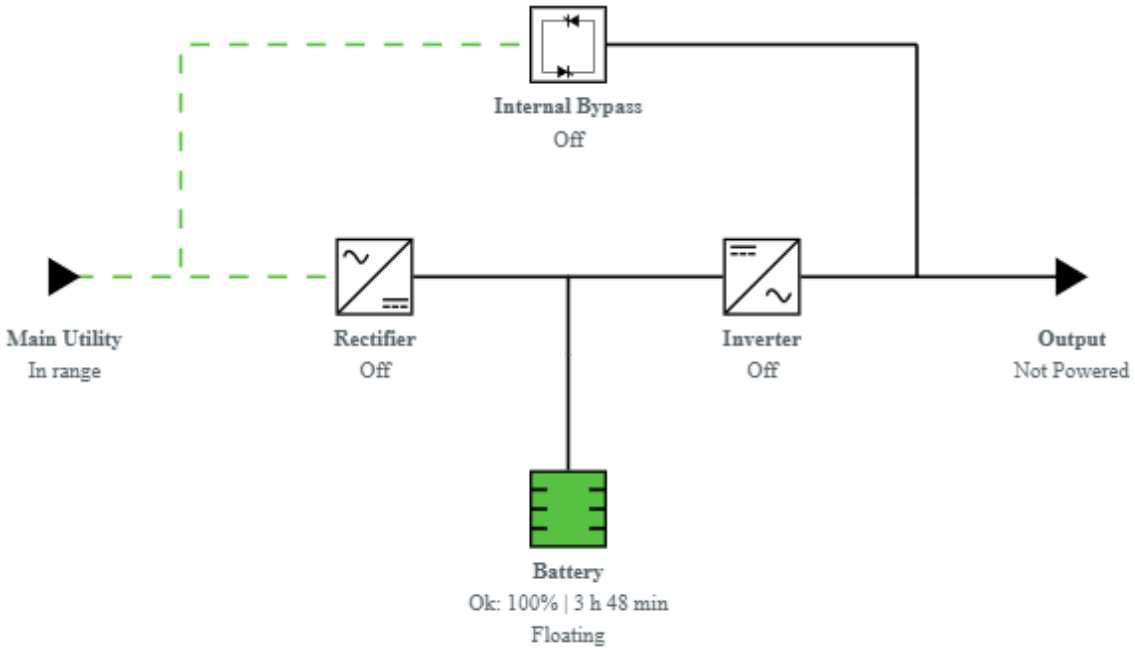
3.2.7.2.2 Bypass mode



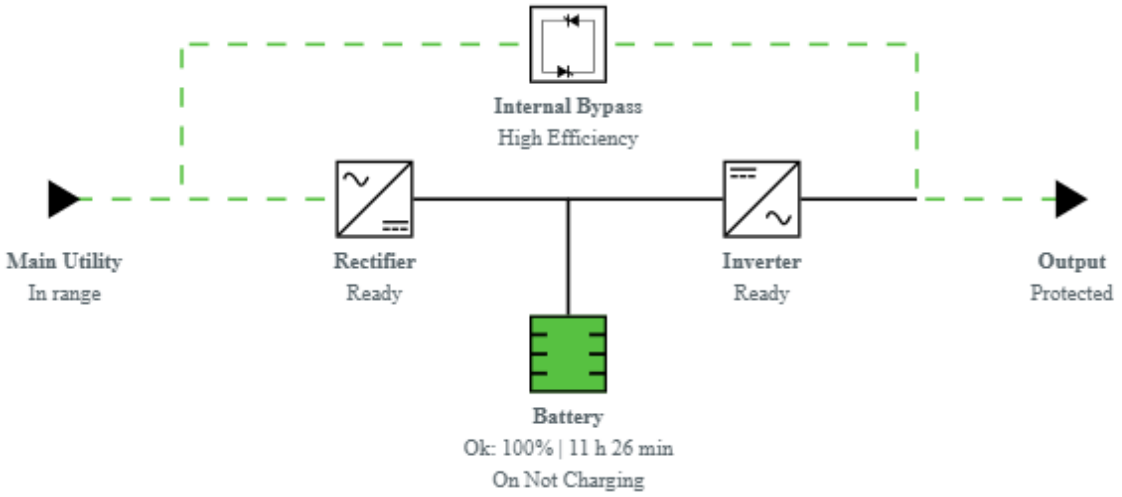
3.2.7.2.3 Battery mode



3.2.7.2.4 Off mode

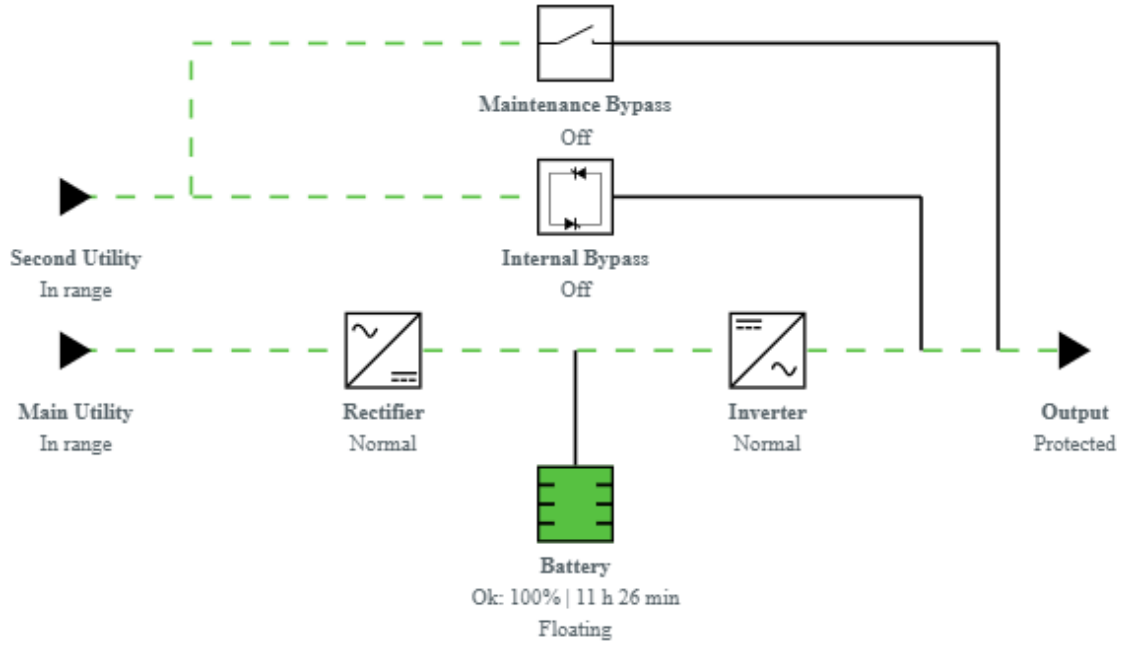


3.2.7.2.5 HE mode / ESS mode

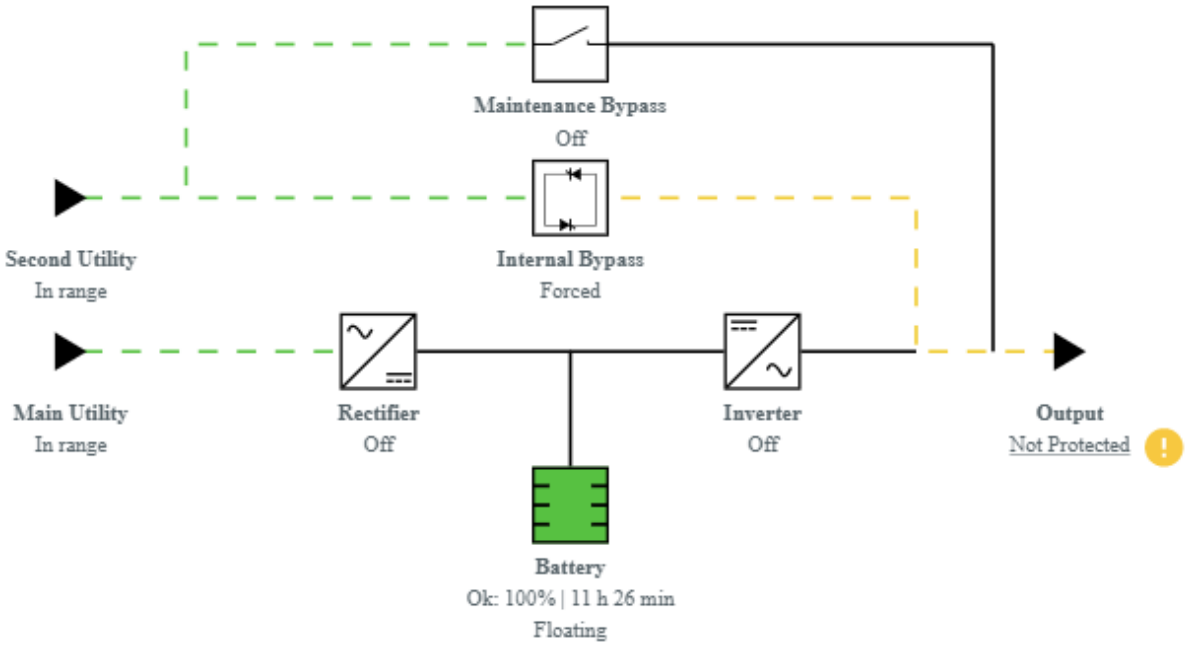


3.2.7.3 Online UPS with dual inputs sources and Maintenance bypass

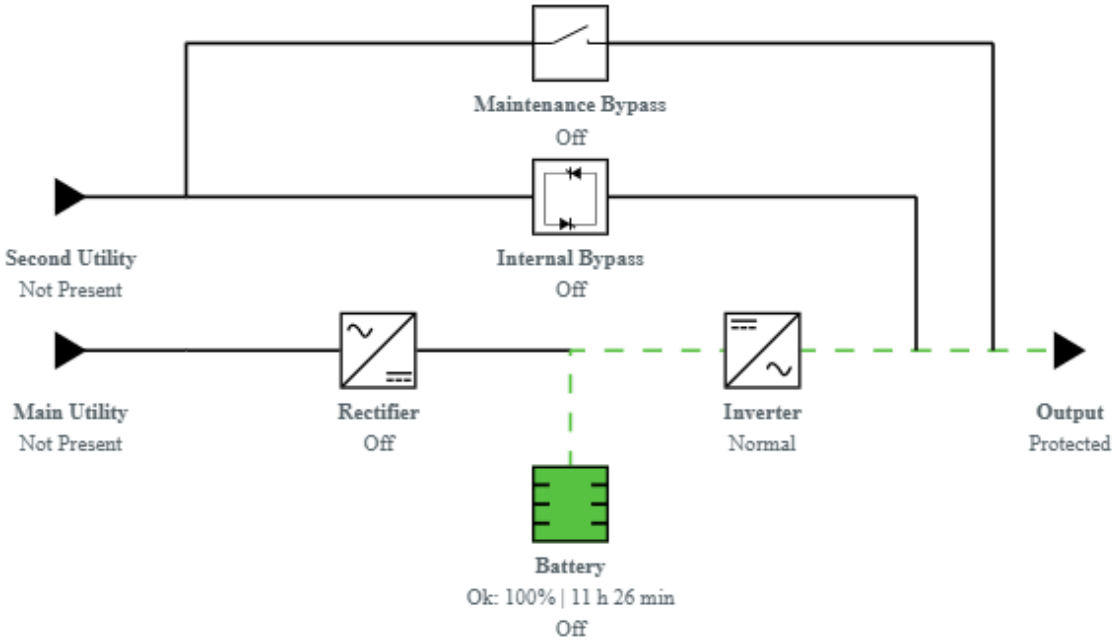
3.2.7.3.1 Online mode



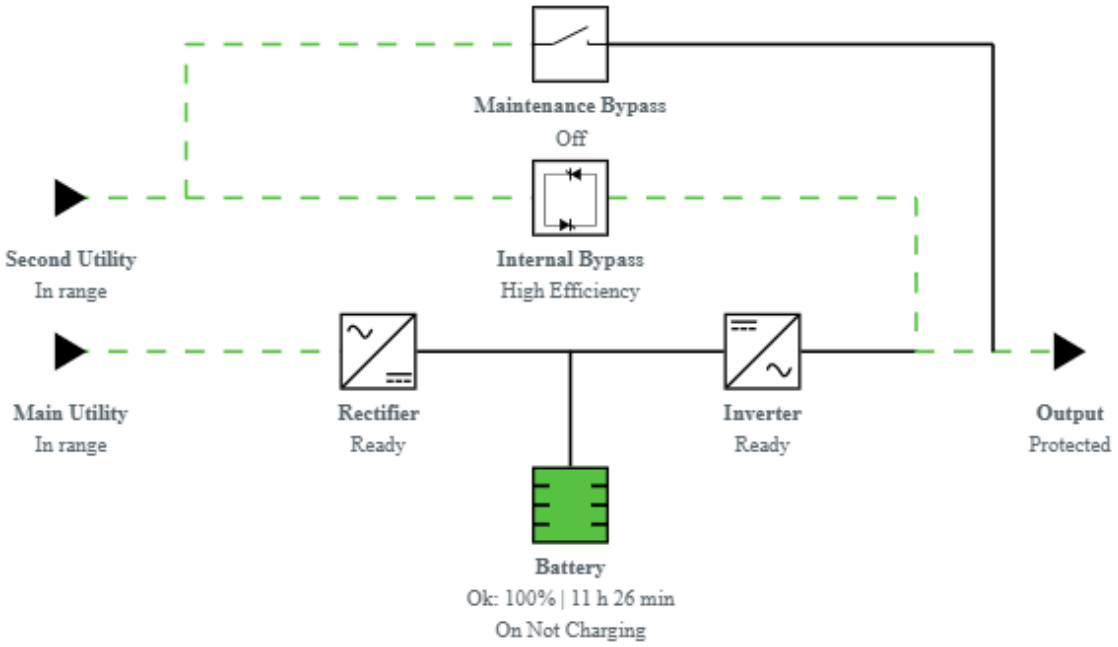
3.2.7.3.2 Bypass mode



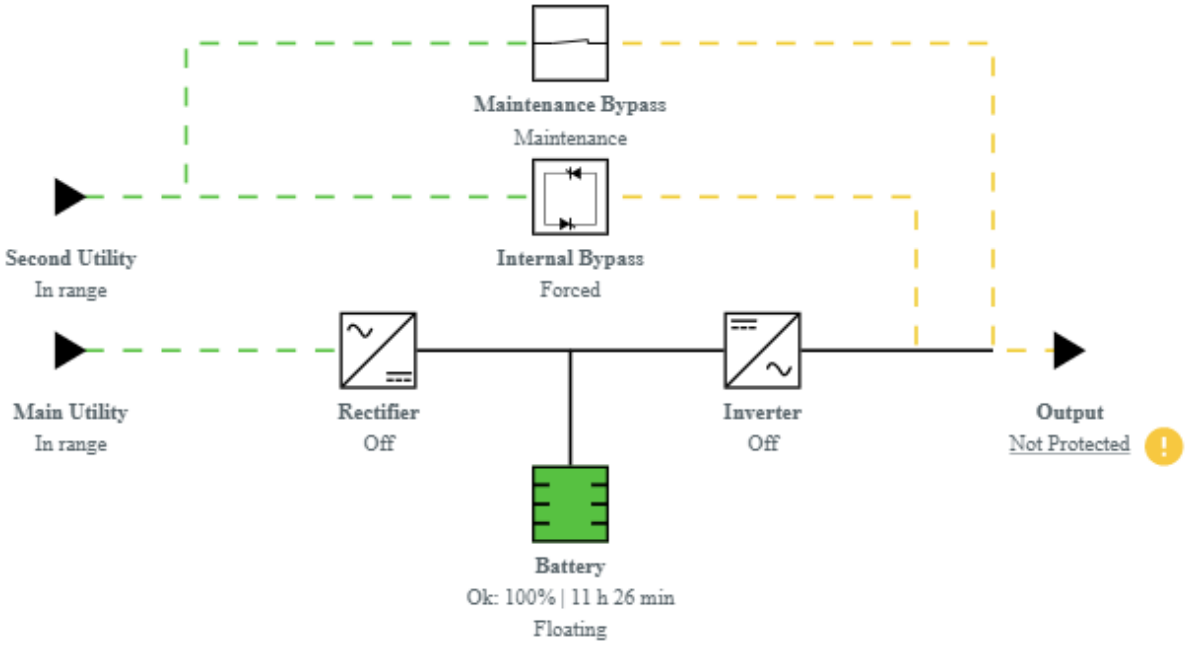
3.2.7.3.3 Battery mode



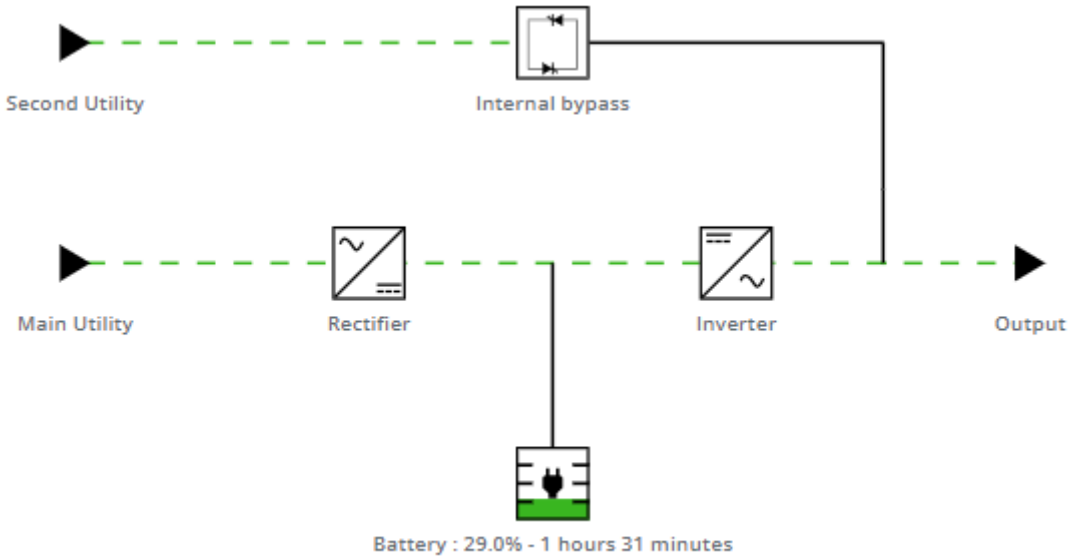
3.2.7.3.4 HE mode / ESS mode



3.2.7.3.5 Maintenance bypass mode



When the network management card communicates with different types of UPS, there might be no Maintenance Bypass in the energy flow as shown in the following figure.



3.2.8 Access rights per profiles

	Administrator	Operator	Viewer
Home	✓	✓	✓

3.2.8.1 For other access rights

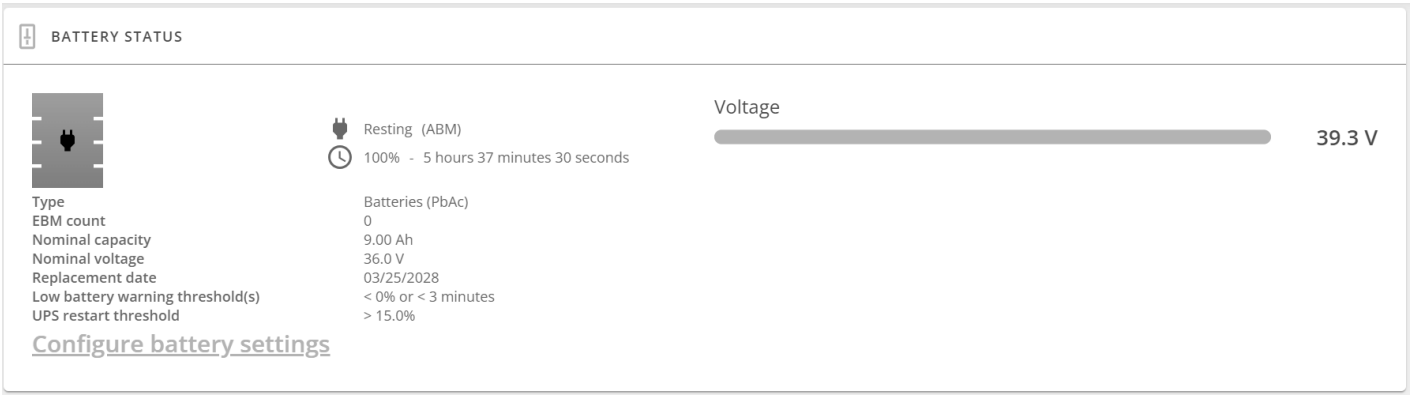
For other access rights, see the Information>>>Access rights per profiles section.

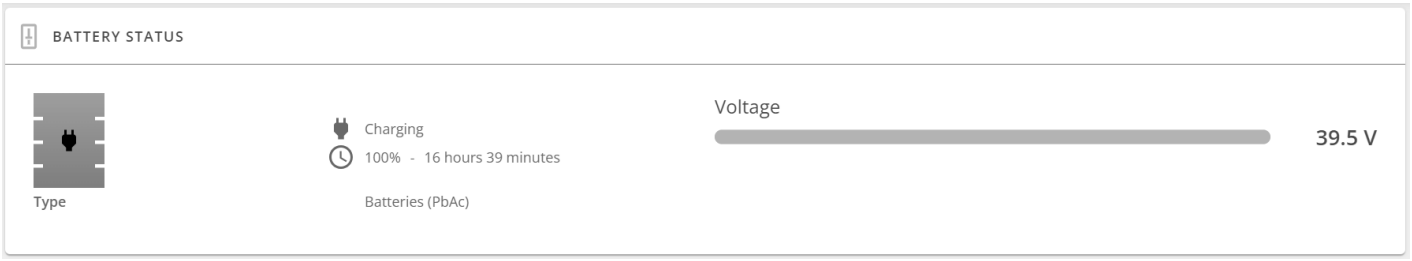
3.3 Meters

3.3.1 Battery

3.3.1.1 Battery status

With different types of UPS, the battery status can be one of below.





Battery status section is an overview of the battery information.

The information displayed depends on the device.

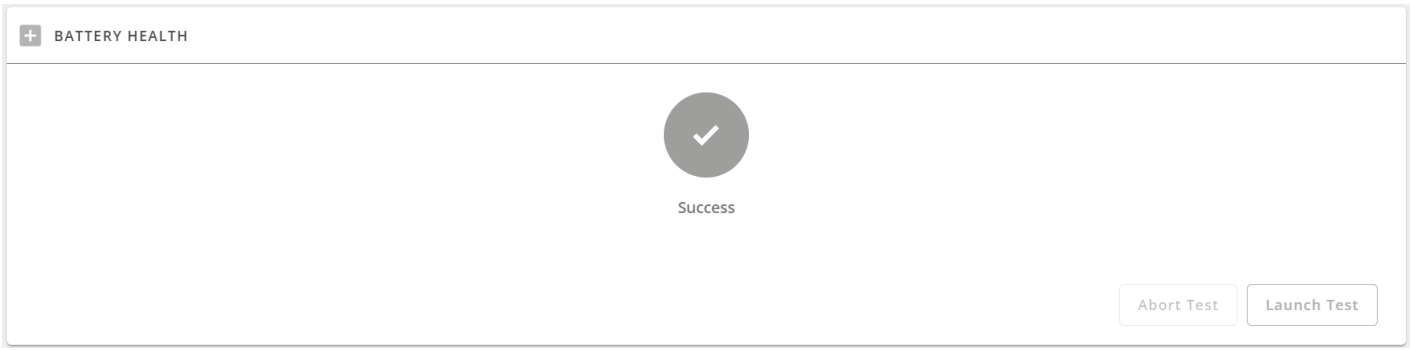
3.3.1.1.1 Overview/Environment

- Type
- EBM count
- Nominal capacity
- Nominal voltage
- Capacity remaining
- Runtime
- State
- Recommended replacement date
- State of health
- Voltage
- Current
- Temperature
- Min cell voltage
- Max cell voltage
- Number of cycles
- Min temperature
- Max temperature
- BMS state
- Low battery warning threshold(s)
- UPS Restart threshold

3.3.1.1.2 Configurable parameters

- Battery replacement notification
  - Enable / Disable
- Low battery warning threshold(s)
  - % of battery remaining to enter low battery mode
  - seconds of battery remaining to enter low battery mode
- UPS Restart threshold
  - % of battery needed to restart safely the UPS

3.3.1.2 Battery health



Battery health section provides status of the battery and allow to launch a battery test.

The status reflects the last completed battery test result, as well as its critical status (color) and completion time.

- Pass
- Warning
- Fail
- Unknown

3.3.1.2.1 Commands

Launch test button is disabled if a battery test is already in progress or scheduled.

The ***Abort test*** button is enabled only when a test is in progress or scheduled.

3.3.1.2.2 Pending action

The pending action reflects the battery test status.

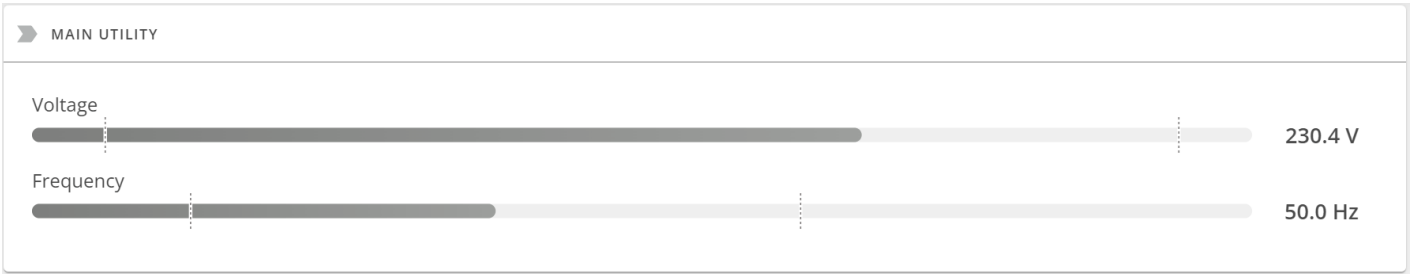
- None
- Scheduled
- In progress
- Aborted
- Done

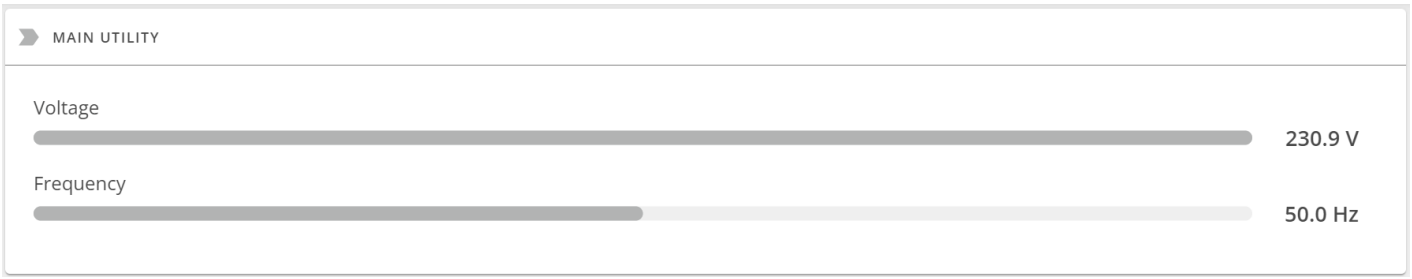
3.3.2 Measures

Gauge color code:
- Green: Value inside thresholds.
- Orange/Red: Value outside thresholds.
- Blue: No thresholds provided by the device.

3.3.2.1 Main utility input

While network management card communicates with different types of UPS, the main utility of meters might appear differently.

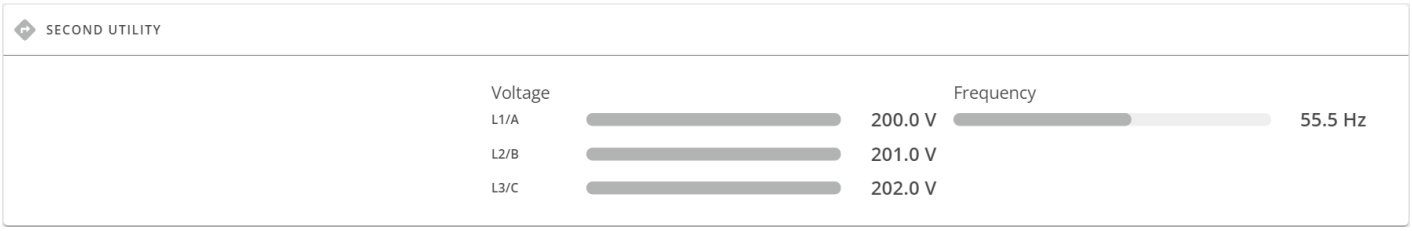




Displays the product main utility measures.

- Current (A)
- Voltage (V)
- Frequency (Hz)

3.3.2.2 Second utility input (if available)

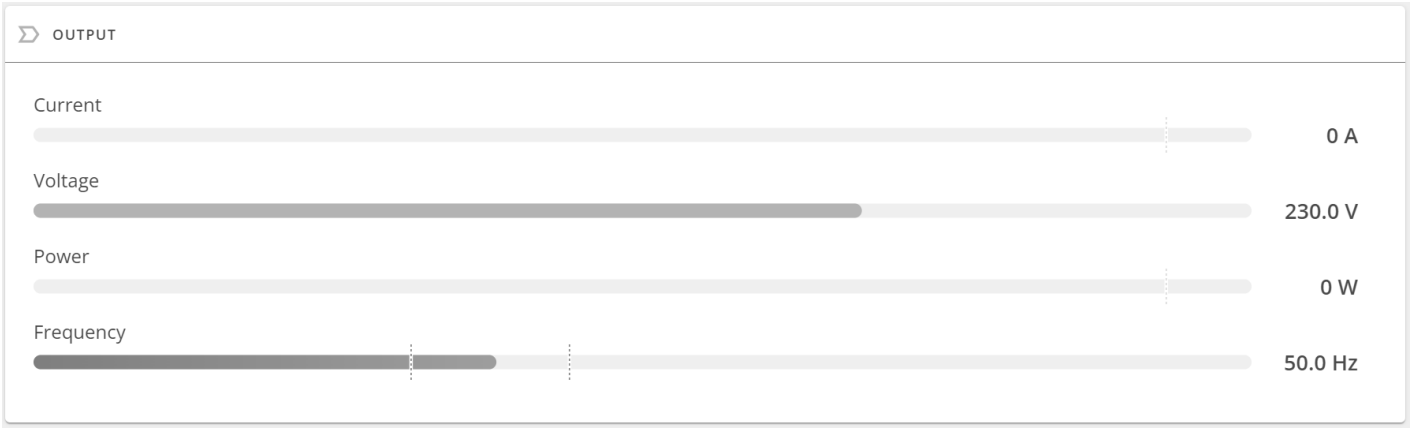


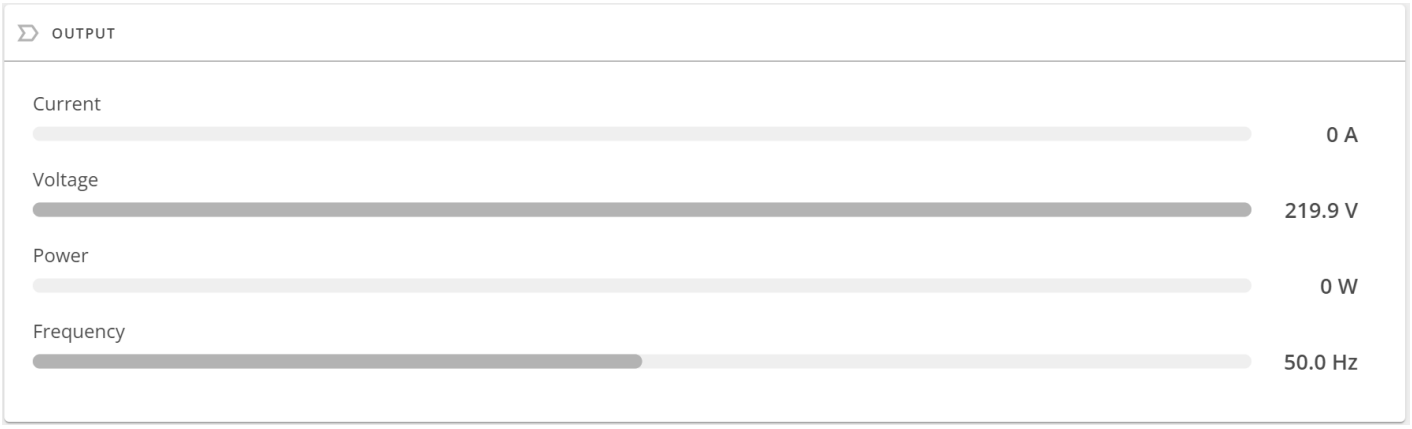
If presents, displays the product second utility measures.

- Current (A)
- Voltage (V)
- Frequency (Hz)

3.3.2.3 Output

While network management card communicates with different types of UPS, the meters output might appear differently.





- Voltage (V)
- Power (W)
- Current (A)
- Frequency (Hz)

3.3.3 Device logs

3.3.3.1 Logs

This web page allows to set configuration and browse measures log of the device measures only.

The sensors measures logs are accessible in Environment menu.

3.3.3.1.1 Log browse

- Browse logs in time range by setting start time and end time
- Go to next page
- Go to previous page
- Go to first page
- Go to last page
- Page jump: Input page number and click **Go** to jump to specified page.
- Item per page: Set how many logs displayed per page, valid value is 10/25/50/100

3.3.3.1.2 Download

Press the Download button on the top right to download the Device log file.

If available, possible measures are listed below:

- Input Voltage (V)
- Input Frequency (Hz)
- Bypass Voltage (V)
- Bypass Frequency (Hz)
- Output Voltage (V)
- Output Frequency (Hz)
- Output Current (A)
- Output Apparent Power (VA)
- Output Active Power (W)
- Output Power Factor
- Output Percent Load (%)
- Battery Voltage (V)
- Battery Capacity (%)
- Battery Remaining Time (s)

3.3.3.1.3 Settings

Press the **settings** button on the top right to define the log acquisition frequency of the Device measures.

3.3.4 Default settings and possible parameters - Meters

	Default setting	Possible parameters
Meters/Logs	Log measures every — 60s	Log measures every — 3600s maximum

3.3.4.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.3.5 Access rights per profiles

	Administrator	Operator	Viewer
Meters	✓	✓	✓
Battery health: Launch test/Abort	✓	✓	✗
Logs configuration	✓	✓	✗

3.3.5.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.3.6 Save and Restore

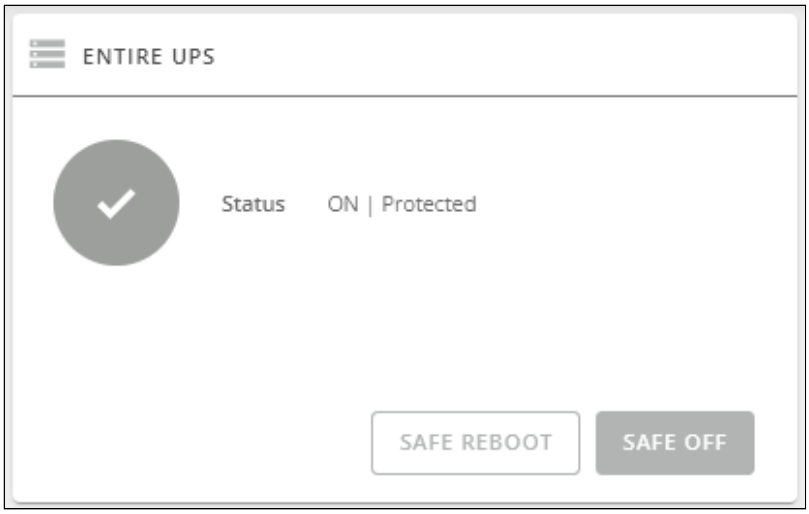
	SRR section	Settings	Possible values
Logs	measure	periodicity	[time in seconds]

3.3.6.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.4 Controls

3.4.1 Entire UPS



Controls are displayed for the entire UPS, and not for specific outlet options.

The table in this section displays UPS status, the associated commands (on/off), and the pending action.

3.4.1.1 Status

Reflects the current mode of the UPS. The following is a list of potential table values that are displayed based on the UPS topology.

- On — Protected/Not protected
- Off — Not powered/Not protected

3.4.1.2 Commands

A set of commands are available and activated when one of the following buttons is pressed. A confirmation window appears.

- Safe OFF

  This will shut off the load. Protected applications will be safely powered down.

This control is available only if the status is not OFF and if there are no active commands running.

- Safe reboot

  This will shut off and then switch ON the load. Protected applications will be safely powered down.

  This control is available only if the status is not OFF and if there are no active commands running.

- Switch ON

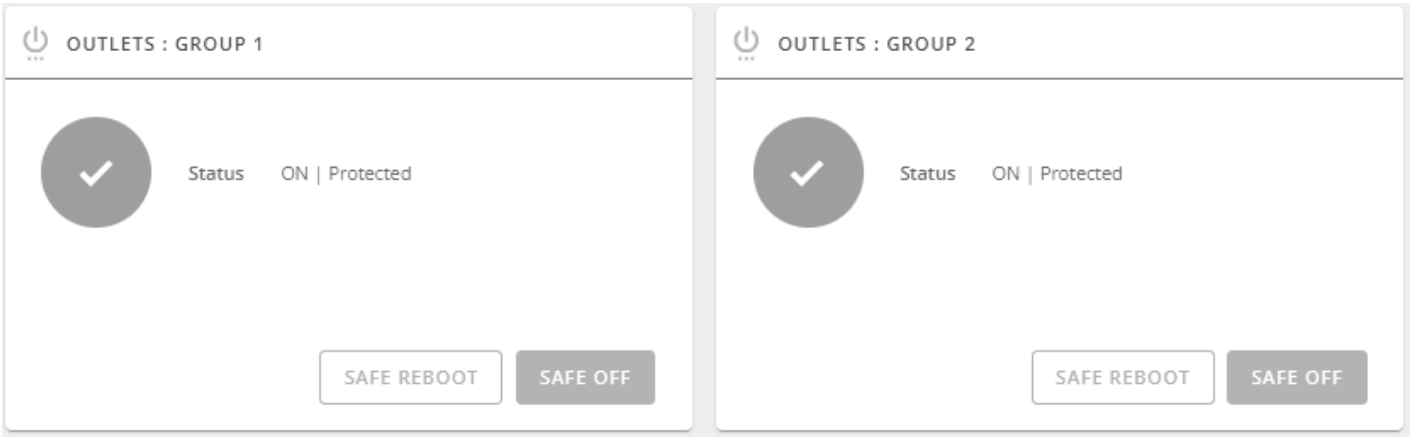
  This will switch ON the load or turn ON the online UPS.

  This control is available when the status is OFF, if there are no active commands running and if the Online UPS is on bypass.

3.4.1.3 Pending action

Displays the delay before shutdown and delays before startup.

3.4.2 Outlets - Group 1/ Group 2



Load segmentations allow, battery runtime to remain on essential equipment and automatically power down non-priority equipment during an extended power outage.

This feature is also used for remote reboot and the sequential start of servers to restrict inrush currents.

3.4.2.1 Status

It reflects the current outlet status.

- On — Protected/Not protected
- Off — Not powered

3.4.2.2 Commands

A set of commands are available and activated when one of the following buttons is pressed. A confirmation window appears.

- Safe OFF

  This will shut off the load connected to the associated load segment. Protected applications are safely powered down.

  This control is available only if the status is not OFF and if there are no active commands running.

- Safe reboot

  This will power down and then switch ON the load connected to the associated load segment. Protected applications are safely powered down.

  This control is available only if the status is not OFF and if there are no active commands running.

- Switch ON

  This will switch ON the load connected to the associated load segment.

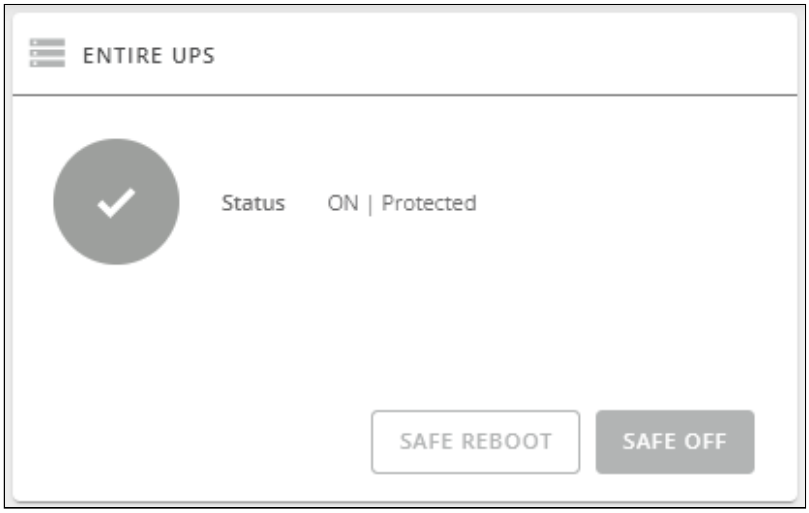
  This control is available when status is OFF and if there are no active commands running.

3.4.2.3 Pending action

Displays the delay before shutdown and delay before startup.

3.4.3 Group

3.4.3.1 Entire UPS



Controls are displayed for the entire UPS, and not for specific outlet options.

The table in this section displays UPS status, the associated commands (on/off), and the pending action.

3.4.3.1.1 Status

Reflects the current mode of the UPS. The following is a list of potential table values that are displayed based on the UPS topology.

- On — Protected/Not protected
- Off — Not powered/Not protected

3.4.3.1.2 Commands

A set of commands are available and activated when one of the following buttons is pressed. A confirmation window appears.

- Safe OFF

  This will shut off the load. Protected applications will be safely powered down.

  This control is available only if the status is not OFF and if there are no active commands running.

- Safe reboot

  This will shut off and then switch ON the load. Protected applications will be safely powered down.

  This control is available only if the status is not OFF and if there are no active commands running.

- Switch ON

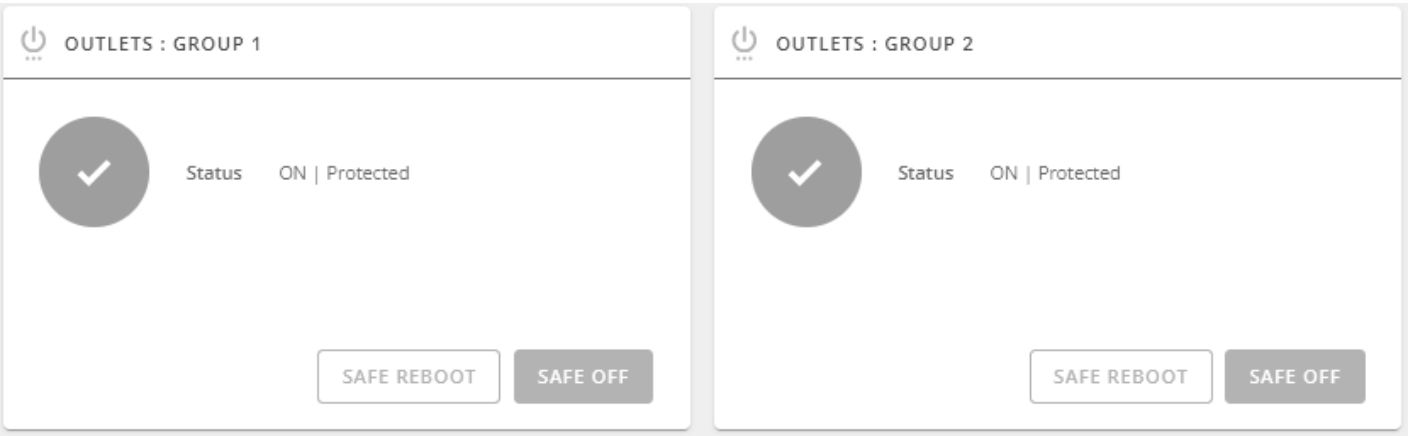
  This will switch ON the load or turn ON the online UPS.

  This control is available when the status is OFF, if there are no active commands running and if the Online UPS is on bypass.

3.4.3.1.3 Pending action

Displays the delay before shutdown and delays before startup.

3.4.3.2 Outlets - Group 1/ Group 2



Load segmentations allow, battery runtime to remain on essential equipment and automatically power down non-priority equipment during an extended power outage.

This feature is also used for remote reboot and the sequential start of servers to restrict inrush currents.

3.4.3.2.1 Status

It reflects the current outlet status.

- On — Protected/Not protected
- Off — Not powered

3.4.3.2.2 Commands

A set of commands are available and activated when one of the following buttons is pressed. A confirmation window appears.

- Safe OFF

  This will shut off the load connected to the associated load segment. Protected applications are safely powered down.

  This control is available only if the status is not OFF and if there are no active commands running.

- Safe reboot

  This will power down and then switch ON the load connected to the associated load segment. Protected applications are safely powered down.

  This control is available only if the status is not OFF and if there are no active commands running.

- Switch ON

  This will switch ON the load connected to the associated load segment.

  This control is available when status is OFF and if there are no active commands running.

3.4.3.2.3 Pending action

Displays the delay before shutdown and delay before startup.

3.4.3.3 Access rights per profiles

	Administrator	Operator	Viewer
Control	✓	✓	✗

3.4.3.3.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.4.3.4 Troubleshooting

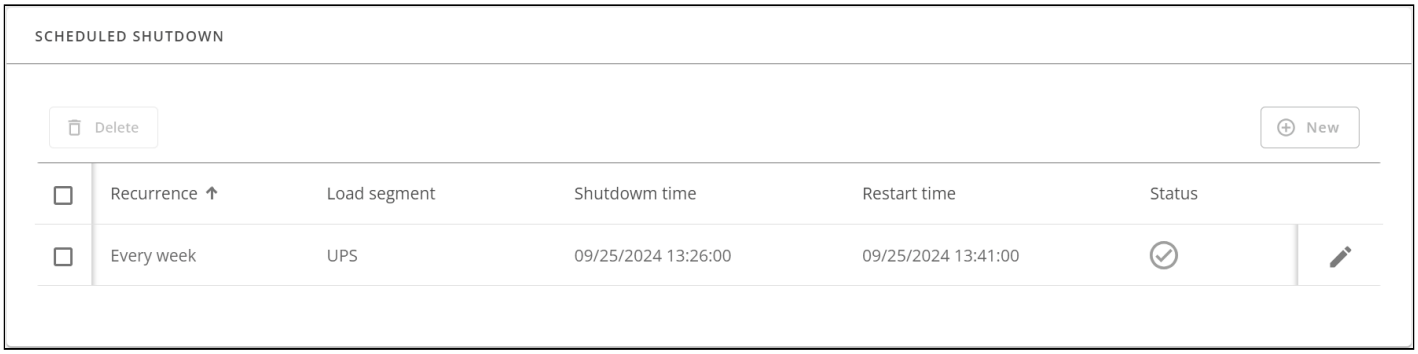
3.4.4 Schedule

Use Scheduled shutdowns to turn off either the UPS or individual load segments at a specific day and time.

This feature is used for saving energy by turning off equipment outside of office hours or to enhance cybersecurity by powering down network equipment.

If server shutdown scenarios are defined for any of the connected servers or appliances, they will be triggered before the corresponding outlets are turned off as configured in shutdown settings.

3.4.4.1 Scheduled shutdown table



The table displays the scheduled shutdowns and includes the following details:

- **Recurrence –** Once/Every day/Every week
- **Load segment –** Primary/Group 1/Group 2
- **Shutdown time –** Date/Time
- **Restart time –** Date/Time
- **Status –** Active/Inactive

3.4.4.2 Actions

3.4.4.2.1 New

Press the **New** button to create a scheduled shutdown.

3.4.4.2.2 Delete

Select a schedule shutdown and press the **Delete** button to delete the scheduled shutdown.

3.4.4.2.3 Edit

Press the pen icon to edit schedule shutdown and to access the settings:

3.4.4.3 Specifics

3.4.4.4 Access rights per profiles

	Administrator	Operator	Viewer
Protection/Scheduled shutdowns	✓	✓	✗

3.4.4.4.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.4.4.5 Save and Restore

	SRR section	Settings	Possible values
Scheduled shutdown	schedule	enabled	true/false
		scheduler	1: Primary 2: Group 1 3: Group 2
		recurrence	0: once 1: every day 2: every week
		shutdownTimeStamp	[timestamp (unix)]
		restartTimeStamp	[timestamp (unix)]

3.4.4.5.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.4.4.6 Troubleshooting

Action not allowed in Control/Schedule/Power outage policy

Symptom

Below message is displayed when you access the Control, Schedule or Power outage policy page.

This action is not allowed by the UPS.

To enable it, please refer to the user manual of the UPS and its instructions on how to configure the UPS settings and allow remote commands.

Possible Cause

1- Remote commands are not allowed due to the UPS configuration (see the action below)

2- The UPS does not support remote commands.

Action

Refer to the UPS user manual and its instruction on how to configure the UPS settings and allow remote commands.

Example: UPS menu Settings>>>ON/OFF settings>>>Remote command>>>Enable.

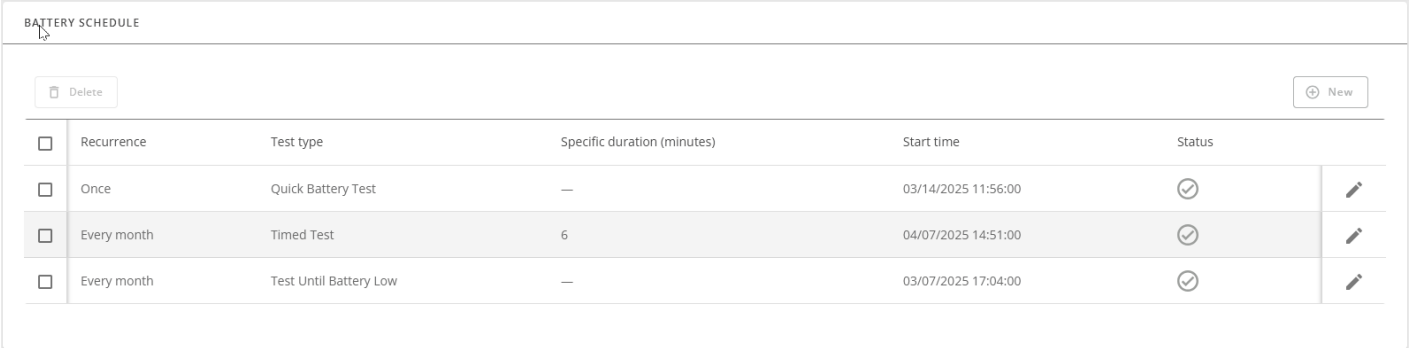
3.4.4.6.1 For other issues

For details on other issues, see the Troubleshooting section.

3.4.5 Battery schedule

Use Battery schedule to initiate battery test at a specific day and time.

3.4.5.1 Battery schedule table



There are three types of test you can schedule:

1. **Quick Test:** Performs a rapid check.
2. **Timed Test:** Runs the test for a specified duration. User can configure the **duration** based on their requirement.
3. **Test until battery low:** This test continues until the battery reaches a low charge level.

Battery test types might appear differently based on different types of UPS.

User can schedule these tests to recur at different intervals:

- **Once**: The test will run a single time at the scheduled date and time.
- **Every Week**: The test will run weekly on the specified day and time.
- **Every Month**: The test will run monthly on the specified date and time.

By scheduling regular tests, user can periodically monitor the health of UPS battery and ensure it is ready to provide backup power when needed.

3.4.5.2 Actions

3.4.5.2.1 New

Press the **New** button to create a scheduled shutdown.

3.4.5.2.2 Delete

Select a schedule shutdown and press the **Delete** button to delete the scheduled shutdown.

3.4.5.2.3 Edit

Press the pen icon to edit schedule shutdown and to access the settings:

3.4.5.3 Specifics

3.4.5.4 Access rights per profile - Battery schedule

	Administrator	Operator	Viewer
Battery schedule	✅	✅	❌

3.4.5.4.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.4.5.5 Save and Restore - Battery schedule

	SRR section	Settings	Possible values
Battery schedule	schedule	Enabled	true/false
		Recurrence	0: Once 1: Every week 2: Every month
		Test Type	0: Quick Battery Test 1: Test Until Battery Low 2: Timed Test
		Duration	Specific duration for Timed test: [1-99] minutes
		Start Time	[timestamp (Unix)]

3.4.5.5.1 Additional information

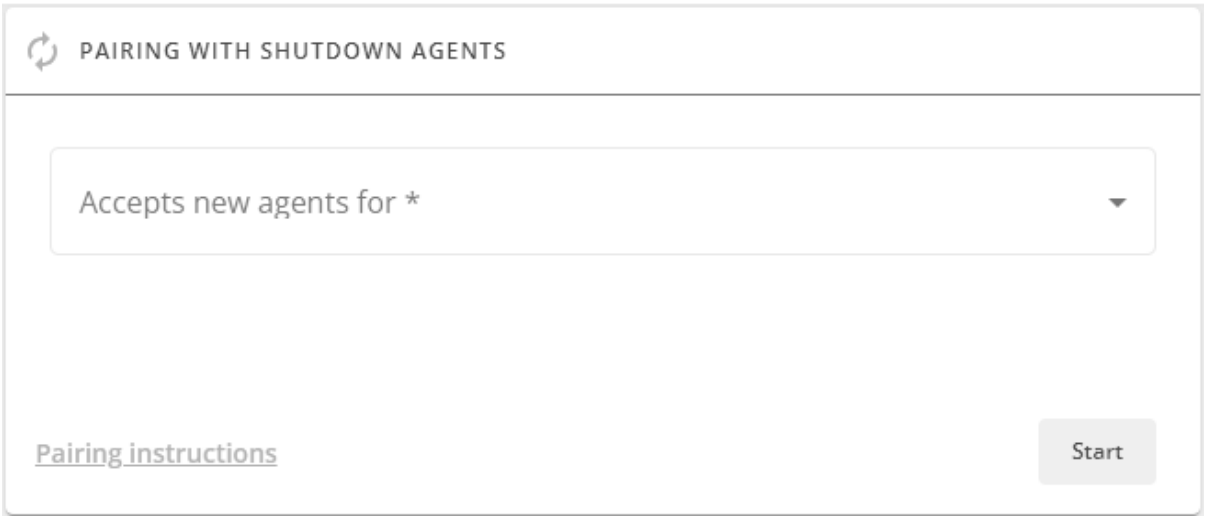
For details on Save and Restore, see the Save and Restore section.

3.5 Protection

3.5.1 Agents list

3.5.1.1 Pairing with shutdown agents

For details on pairing instructions, follow the link **pairing instructions** in the tile or see the Servicing the Network Management Module*>>>Pairing agent to the Network Module* section.



Authentication and encryption of connections between the UPS network module and shutdown agents is based on matching certificates. Automated pairing of shutdown agents and UPS network modules is recommended in case the installation is done manually in a secure and trusted network, and when certificates cannot be created in other ways.

During the selected timeframe, new agent connections to the Network Module are automatically trusted and accepted.

After automatic acceptance, make sure that all listed agents belong to your infrastructure. If not, access may be revoked using the **Delete** button.

For maximum security, our company recommend following one of the two methods on the **certificate settings** page:

- Import client certificates manually.
- Generate trusted certificate for both clients and Network Module using your own PKI.

3.5.1.1.1 Actions

a Start

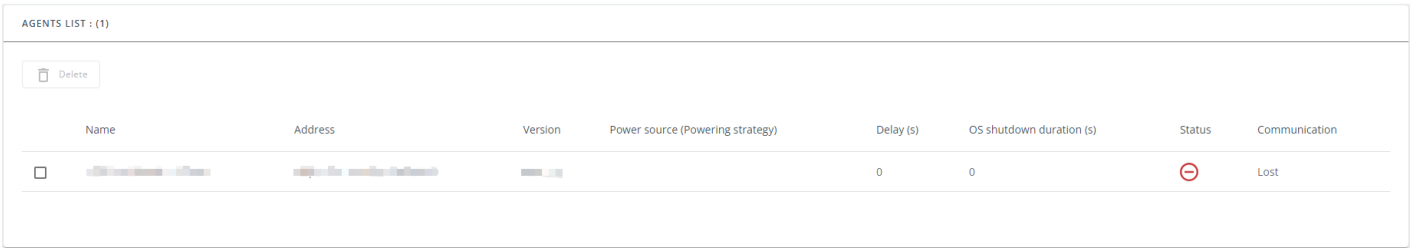
Starts the pairing window for the selected timeframe or until it is stopped.

Time countdown is displayed.

b Stop

Stops the pairing window.

3.5.1.2 Agents list table



The table displays the SPS G2/Winpower G2 agent list that is connected to the Network Module and includes the following details:

- Name
- Address
- Version of the Agent
- Power source (Powering strategy)
- Delay (in seconds)
- OS shutdown duration (in seconds)
- Status
  - In service | Protected
  - In service | Not protected
  - Stopping | Protected
  - Stopped | Protected
- Communication
  - Connected | yyyy/mm/dd hh:mm:ss
  - Lost | yyyy/mm/dd hh:mm:ss

3.5.1.3 Actions

3.5.1.3.1 Delete

When the agent is connected, the Delete function may not work correctly because the agent will keep on trying to re-connect.
So connect to the software, remove the Network module from the Software nodes list (in the nodes list, right click on the Network module and click **remove nodes**).

When communication with the agent is lost, agent can be deleted by using the **Delete** button.

Select an agent and press the **Delete** button to delete the agent.

3.5.1.4 Specifics

3.5.1.5 Access rights per profiles

	Administrator	Operator	Viewer
Protection/Agent list	✓	✓	✗

3.5.1.5.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.5.1.6 Troubleshooting

Software is not able to communicate with the Network module

Symptoms

- In the Network Module, in Contextual help>>>Protection>>>Agent list>>>Agent list table, agent is showing "**Lost**" as a status.
- In the Network Module, in Contextual help>>>Settings>>>Certificate>>>Trusted remote certificates, the status of the Protected applications (MQTT) is showing **"Not valid yet"**.
- SPS G2/Winpower G2 shows "System time setting error" or "Add failed devices".

Possible cause

The SPS G2/Winpower G2 certificate is not yet valid for the Network Module.

Certificates of SPS G2/Winpower G2 and the Network Module are not matching so that authentication and encryption of connections between the Network Module and the shutdown agents is not working.

Setup

SPS G2/Winpower G2 is started.

Network module is connected to the UPS and to the network.

Action #1

Check if the SPS G2/Winpower G2 certificate validity for the Network Module.

STEP 1: Connect to the Network Module

- On a network computer, launch a supported web browser. The browser window appears.
- In the Address/Location field, enter: https://xxx.xxx.xxx.xxx/ where xxx.xxx.xxx.xxx is the static IP address of the Network Module.
- The log in screen appears.
- Enter the user name in the User Name field.
- Enter the password in the Password field.
- Click **Login**. The Network Module web interface appears.

STEP 2: Navigate to **Settings/Certificates** page

STEP 3: In the **Trusted remote certificates** section, check the status of the **Protected applications (MQTT)**.

If it is "**Valid"** go to Action#2 STEP 2, if it is "**Not yet valid"**, time of the need to be synchronized with SPS G2/Winpower G2.

STEP 4: Synchronize the time of the Network Module with SPS G2/Winpower G2 and check that the status of the **Protected applications (MQTT)** is now valid.

Communication will then recover, if not go to Action#2 STEP 2.

Action #2

Pair agent to the Network Module with automatic acceptance (recommended in case the installation is done in a secure and trusted network).

For manual pairing (maximum security), go to Servicing the Network Management Module*>>>Pairing agent to the Network Module* section and then go to STEP 2, item 1.

STEP 1: Connect to the Network Module.

- On a network computer, launch a supported web browser. The browser window appears.
- In the Address/Location field, enter: https://xxx.xxx.xxx.xxx/ where xxx.xxx.xxx.xxx is the static IP address of the Network Module.
- The log in screen appears.
- Enter the user name in the User Name field.
- Enter the password in the Password field.
- Click **Login**. The Network Module web interface appears.

STEP 2: Navigate to **Protection/Agents list** page.

STEP 3: In the **Pairing with shutdown agents** section, select the time to accept new agents and press the **Start** button and **Continue**. During the selected timeframe, new agent connections to the Network Module are automatically trusted and accepted.

STEP 4: Action on the agent (SPS G2/Winpower G2) while the time to accepts new agents is running on the Network Module

Try to search the Network Module and connect it.

Client server is not restarting

Symptom

Utility power has been restored, the UPS and its load segments are powered on, but the Client server does not restart.

Possible Cause

The “Automatic Power ON” server setup setting might be disabled.

Action

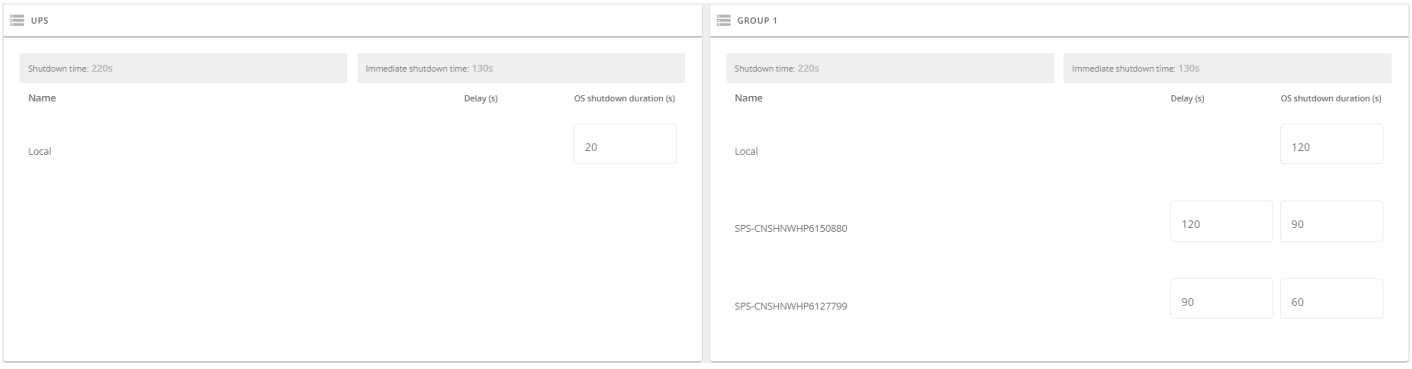
In the server system BIOS, change the setting for Automatic Power ON to "Enabled".

3.5.1.6.1 For other issues

For details on other issues, see the Troubleshooting section.

3.5.2 Agent shutdown sequencing

3.5.2.1 Agent shutdown sequence timing



All agents that are connected to the Network Module are displayed in tables by power sources.

- Primary
- Group 1
- Group 2

The 'local agent' setting is used for setting for example a minimum shutdown duration, or a power down delay for a load segment that has no registered shutdown agents.

One use case would be a load segment that powers network equipment that needs to stay on while servers and storage perform their orderly shutdown.

A shutdown time summary is calculated and displayed on the top of the table:
- Shutdown time: maximum time (Delay + OS shutdown duration + 10s) calculated among all the agents.
- Immediate shutdown time (OS shutdown duration + 10s) calculated among all the agents.

The tables include the following details:

- Name
- Delay (in seconds)
- OS shutdown duration (in seconds)

3.5.2.2 Actions

3.5.2.2.1 Set Delay

Select and directly change the setting in the table and then **Save**.

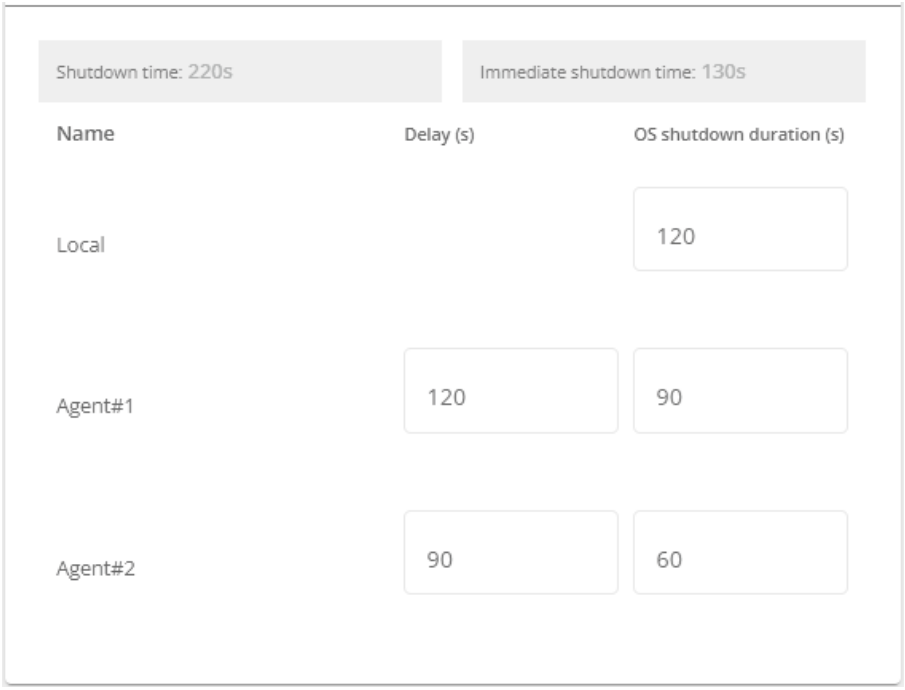
3.5.2.2.2 Set OS shutdown duration

Select and directly change the setting in the table and then **Save**.

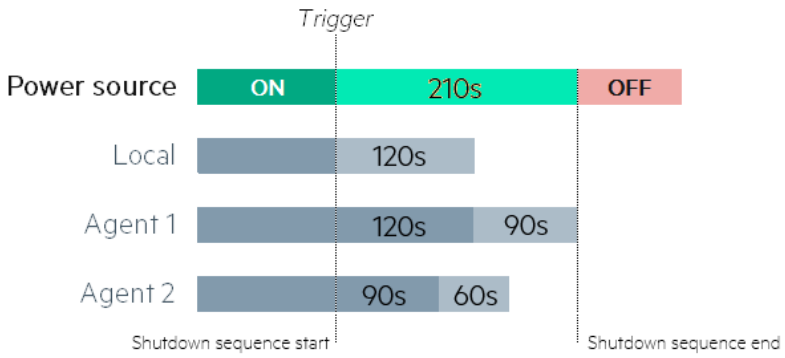
3.5.2.3 Examples

Examples below show the impact of agent settings on the shutdown sequence for a shutdown or an immediate shutdown.

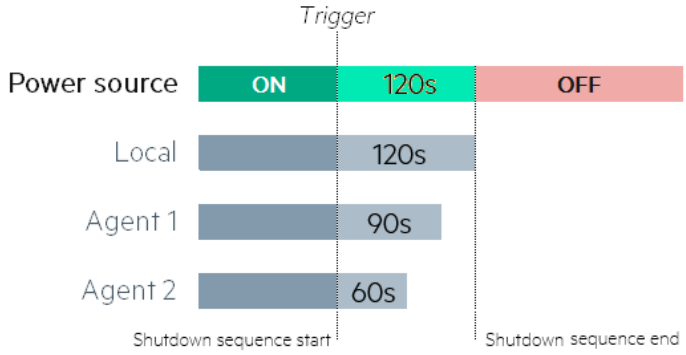
3.5.2.3.1 Example #1



→ Shutdown time: 210s + 10s = 220s

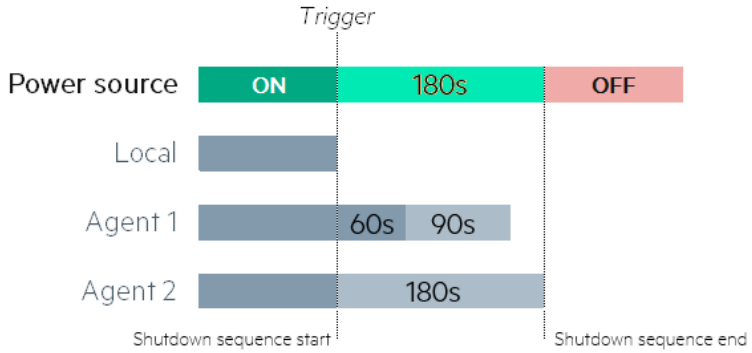


→ Immediate shutdown time: 120s + 10s = 130s

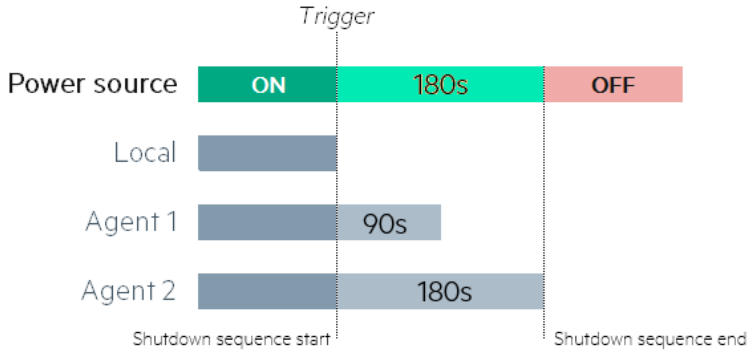


3.5.2.3.2 Example #2

→ Shutdown time: 180s + 10s = 190s



→ Immediate shutdown time: 180s +10s = 190s



The trigger in the diagram is the moment when the shutdown sequence starts, and it is defined in the Contextual help>>>Protection>>>Scheduled shutdown or the Contextual help>>>Protection>>>Shutdown on power outage sections for each power source.

3.5.2.4 Access rights per profiles

	Administrator	Operator	Viewer
Protection/Agent settings	✓	✓	✗

3.5.2.4.1 For other access rights

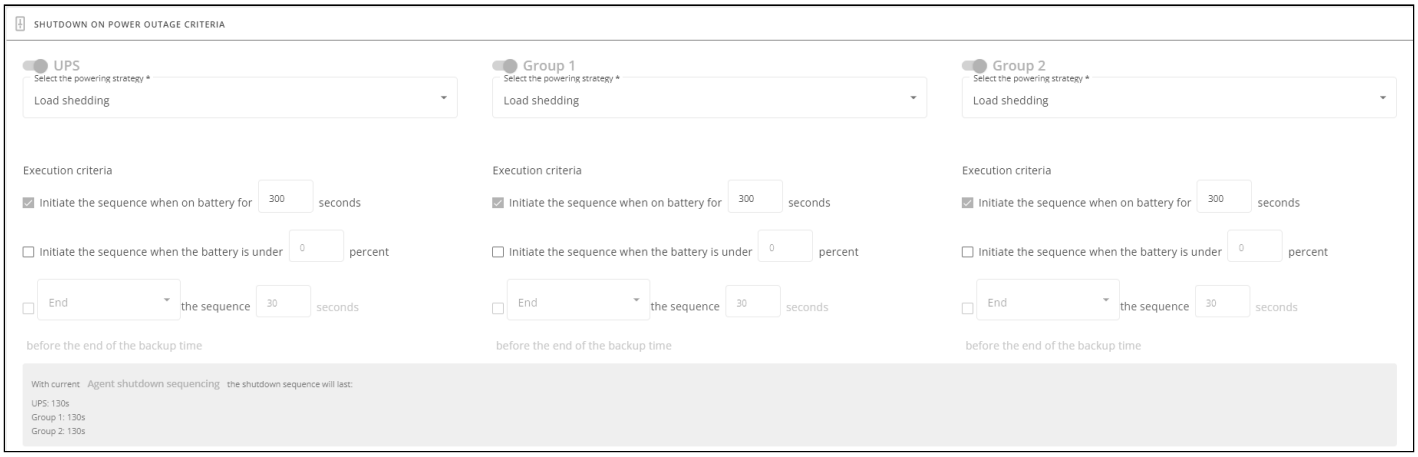
For other access rights, see the Information>>>Access rights per profiles section.

3.5.3 Shutdown on power outage

These setting are in conjunction with the shutdown agents and control how the network module directs the shutdown of protected servers and appliances. It gives the possibility to prioritize and schedule shutdown actions so that the IT system is powered down in the correct order. For example, applications first, database servers next, and storage last. It is also possible to turn off some outlets to reduce power consumption and get longer battery runtime for the most important devices.

For examples on Powering down applications see the Servicing the Network Management Module>>>Powering down/up applications examples section.

3.5.3.1 Shutdown on power outage criteria



Shutdown criteria are set per power source (outlet groups) if they are present in the UPS.

By default, shutdown criterias are set to Maximize availability.

3.5.3.1.1 Shutdown criteria selection

The available criteria for shutdown are listed below:

a Maximize availability (default)

To end the shutdown sequence 30s before the end of backup time.

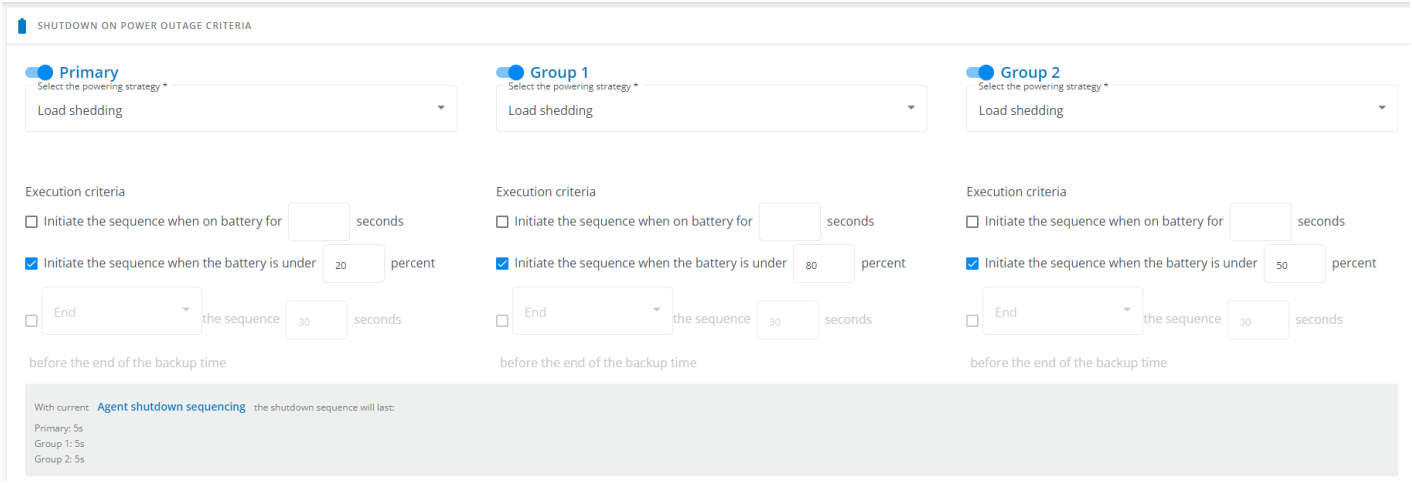
b Immediate OFF

To initiate the shutdown sequence when on battery for 10 seconds.

Load Shedding

To initiate the shutdown sequentially group by group.
This deliberate step by step shutdown will prevent a failure of the entire system. This reduces the load on the UPS system and increases the runtime for the remaining loads.

Example



c Custom

Several conditions can be set to define shutdown criteria:

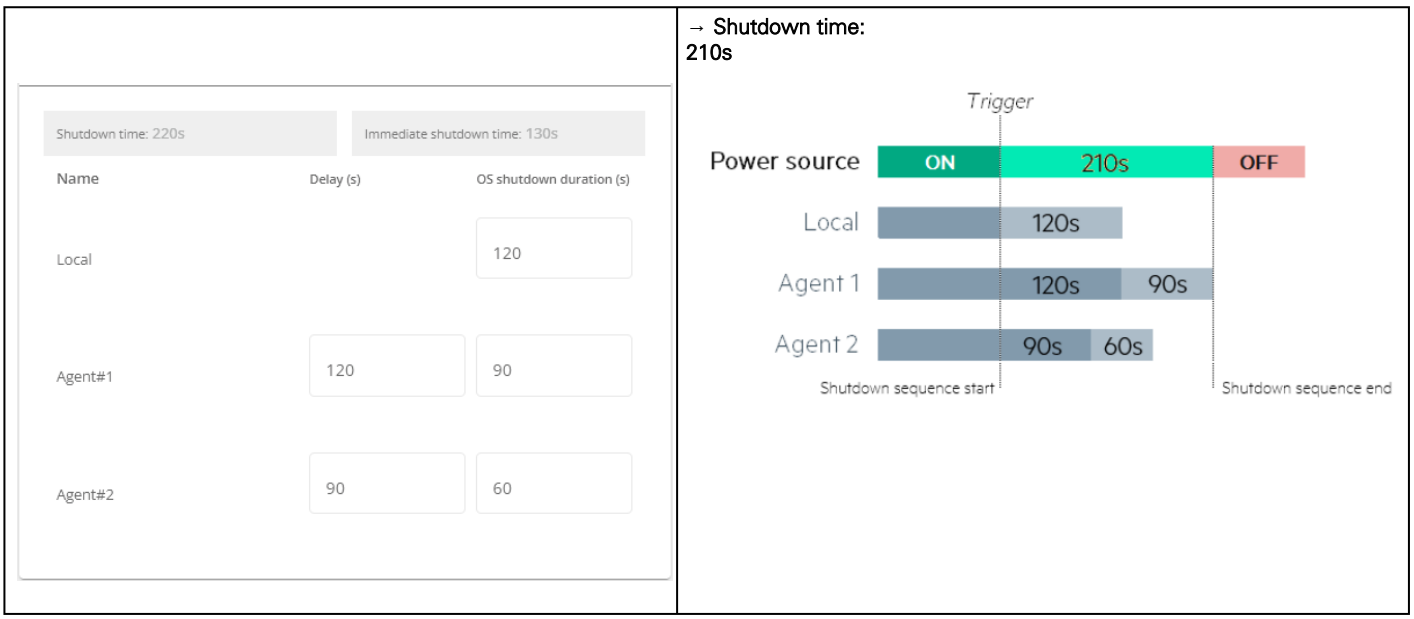
- To initiate the shutdown sequence when on battery for 10 seconds.
- To initiate the sequence when the battery reaches the set capacity in (%)
- To initiate or end the shutdown sequence after the set time in (s) before the end of backup time.

When there are several conditions to start the shutdown sequence, the shutdown sequence will start as soon as one of the condition is reached.

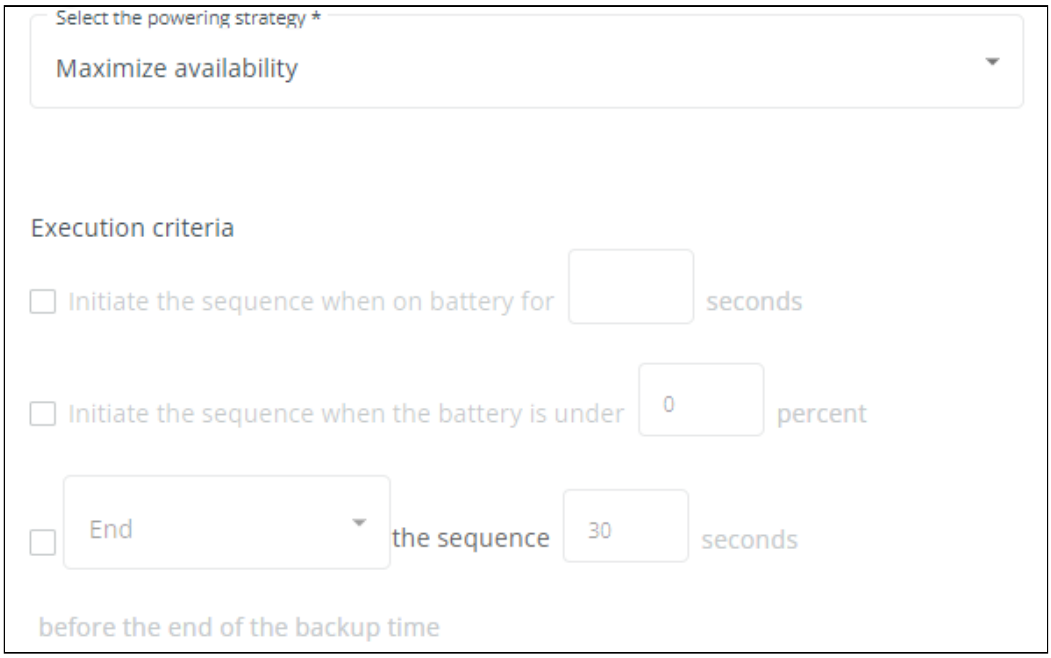
When primary shuts OFF, both group1 and group 2 shut OFF immediately.
So if Primary is set to Immediate OFF, groups policies should be restricted to Immediate OFF.

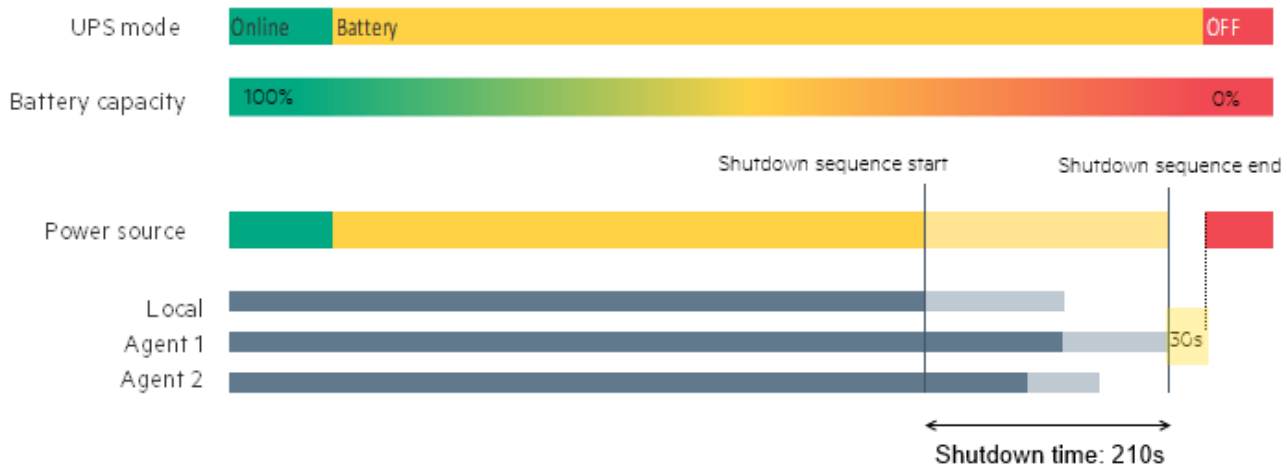
d Settings examples

All the following examples are using below agent's settings.

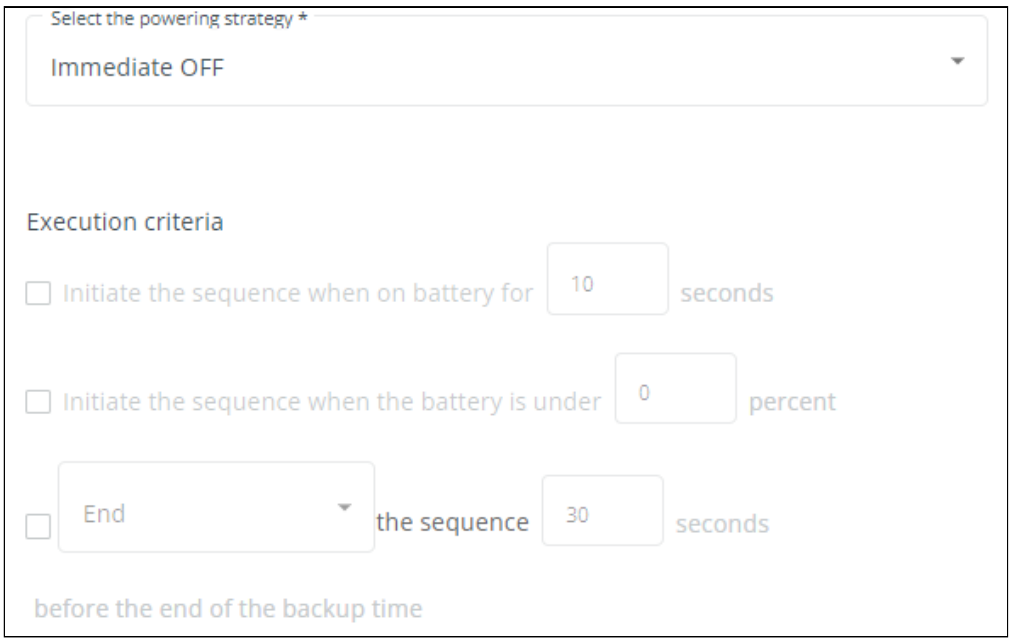


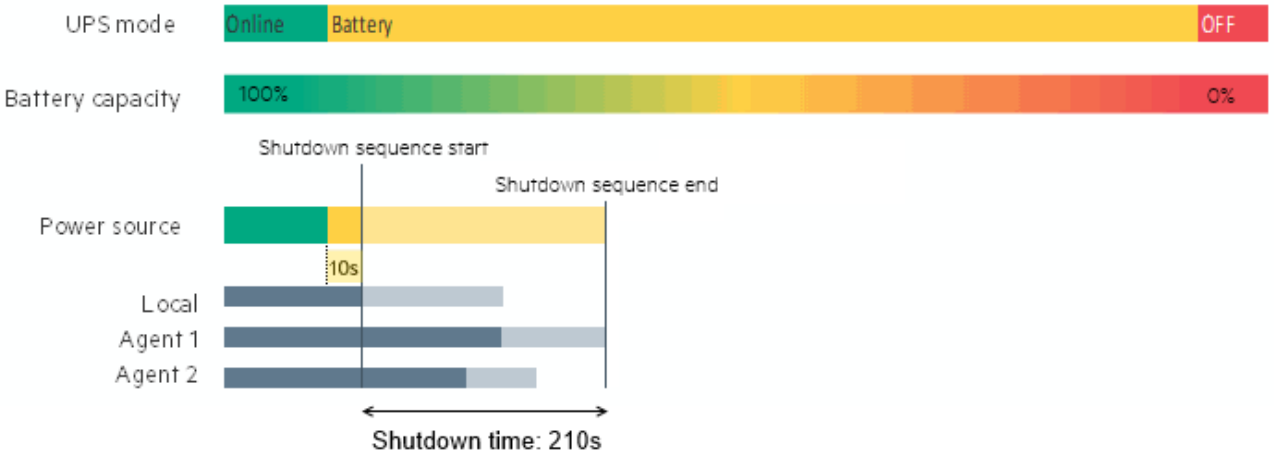
Example 1: Maximize availability





Example 2: Immediate OFF





Example 4: Custom

Settings #1	

Select the powering strategy *

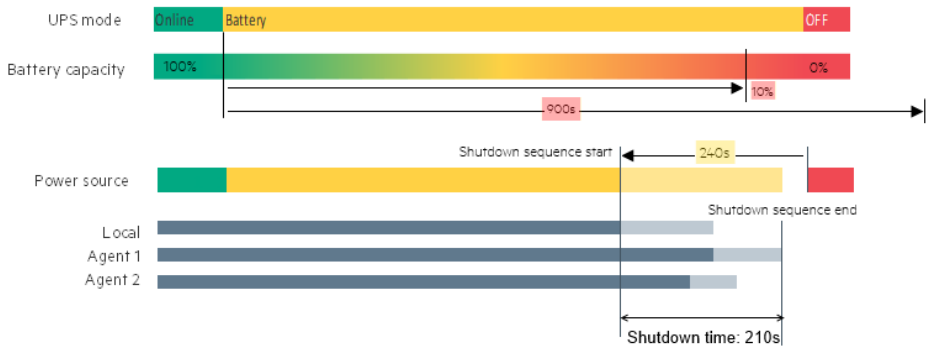
Custom

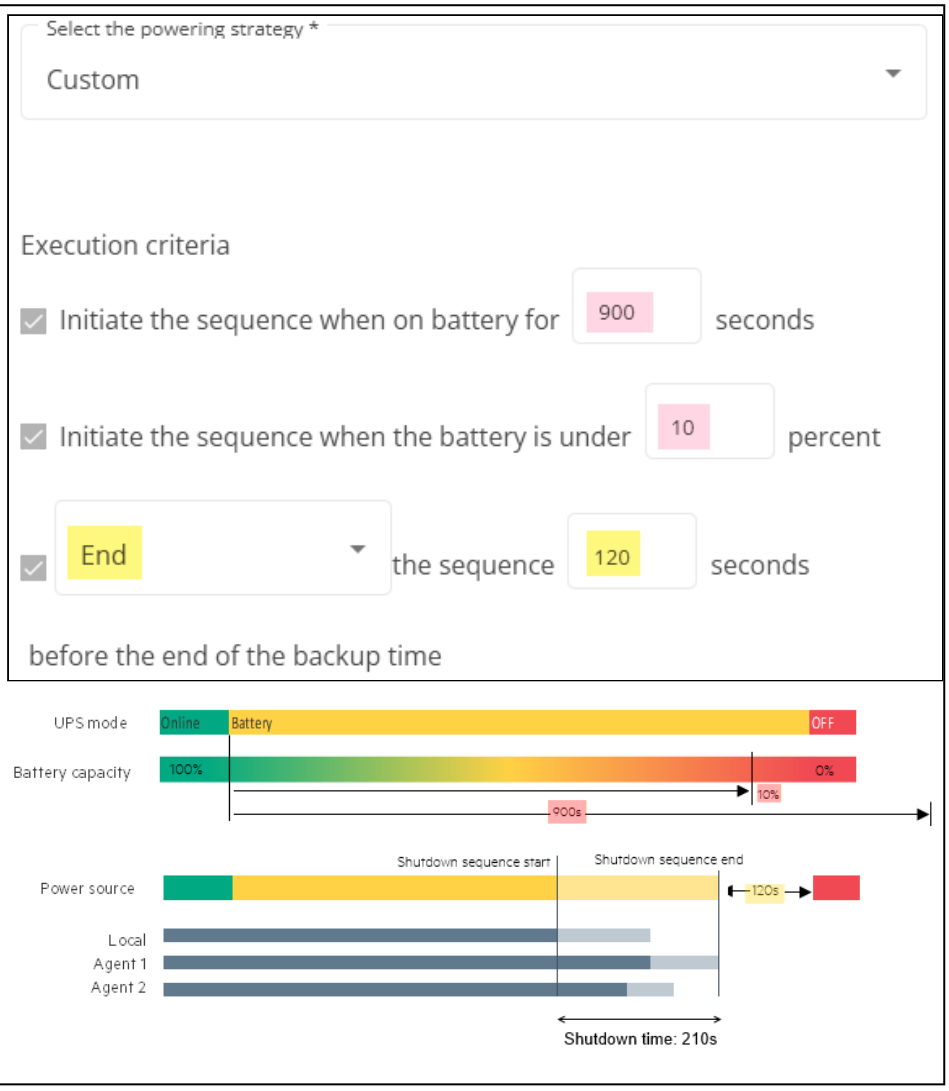
Execution criteria

Initiate the sequence when on battery for 900 seconds

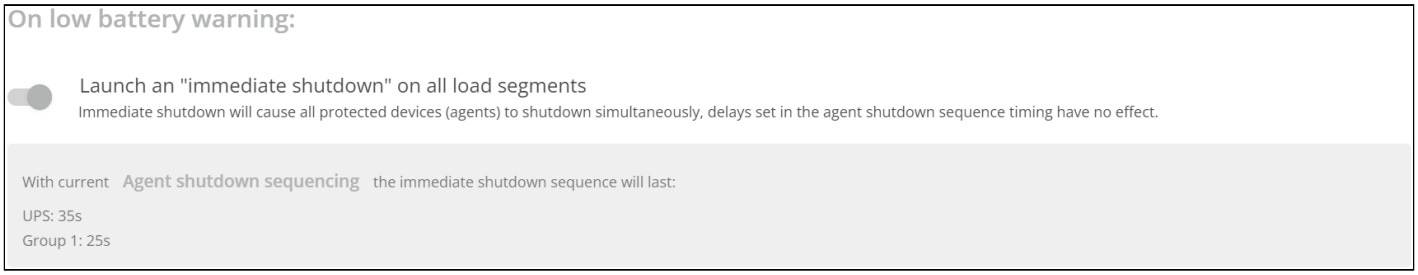
Initiate the sequence when the battery is under 10 percent

Initiate the sequence 240 seconds before the end of the backup time



Settings #2	

3.5.3.1.2 On low battery warning

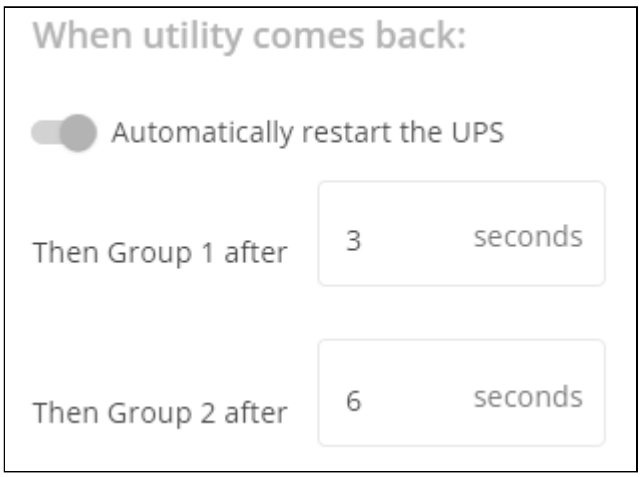


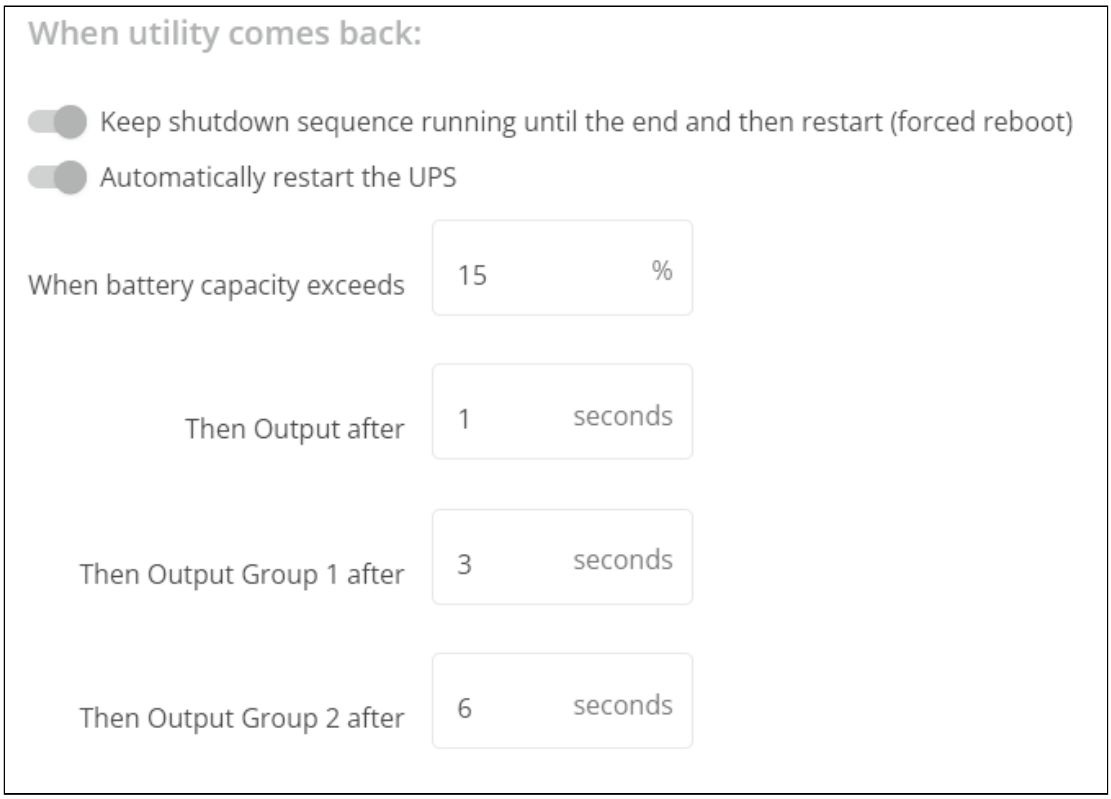
In some cases, like a renewed power failure or failed battery, the capacity is much lower than anticipated. The UPS gives a Low battery warning when there is 2 - 3 minutes of estimated runtime left, depending on the UPS and its settings. This time is typically enough for shutting down a server but does not allow sophisticated sequential shutdown schemes.

The Low battery policy is intended for these cases.

3.5.3.1.3 When utility comes back

Based on different types of UPS, the options of "When utility comes back" function will be different as below.





Note: When utility comes back settings cannot be altered for three phase UPS units and will remain at their defaults.

These settings define the restart sequence when utility comes back. For example, this allows sequential startup of the IT system so that network and storage devices are connected to 'Primary' and start up immediately. After a delay database servers in Group1 are powered up, and then application and web servers in Group 2 are powered up. This startup would ensure that necessary services would be available for each layer when needed. A sequential startup will also help avoid a peak power draw in the beginning.

a Options

Keep shutdown sequence running until the end, and then restart (forced reboot).

Wait until UPS battery capacity exceeds a set percentage value in (%), and then automatically restart the UPS.

- Then restart Group 1 after a set time in (s).
- Then restart Group 2 after a set time in (s).

b Enable/Disable

Each option listed above can be enabled or disabled with check-boxes.

When disabled, the option will be greyed out.

3.5.3.2 Access rights per profiles

	Administrator	Operator	Viewer
Protection/Sequence	✓	✓	✗

3.5.3.2.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.5.3.3 Save and Restore

	SRR section	SRR sub section	Settings	Possible values
Shutdown on power outage	powerOutagePolicy/Settings	panicShutdownTriggers	onLowStateOfCharge	true/false
		restart	enabled	true/false
	powerOutagePolicy/ suppliersSettings		id	1: Primary 2: Group 1 3: Group 2
		settings	localShutdownDuration	[time in seconds]
		shutdownTriggers/ powerOutage	enabled	true/false
			capacityLessThan	[percentage]
			afterBackupTime	[time in seconds]
			startShutdownBeforeEndOfBackup	[time in seconds]
			endShutdownBeforeEndOfBackup	[time in seconds]

3.5.3.3.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.5.3.4 Troubleshooting

Action not allowed in Control/Schedule/Power outage policy

Symptom

Below message is displayed when you access the Control, Schedule or Power outage policy page.

This action is not allowed by the UPS.

To enable it, please refer to the user manual of the UPS and its instructions on how to configure the UPS settings and allow remote commands.

Possible Cause

1- Remote commands are not allowed due to the UPS configuration (see the action below)

2- The UPS does not support remote commands.

Action

Refer to the UPS user manual and its instruction on how to configure the UPS settings and allow remote commands.

Example: UPS menu Settings>>>ON/OFF settings>>>Remote command>>>Enable.

Client server is not restarting

Symptom

Utility power has been restored, the UPS and its load segments are powered on, but the Client server does not restart.

Possible Cause

The “Automatic Power ON” server setup setting might be disabled.

Action

In the server system BIOS, change the setting for Automatic Power ON to "Enabled".

3.5.3.4.1 For other issues

For details on other issues, see the Troubleshooting section.

3.6 Environment

3.6.1 Commissioning/Status

3.6.1.1 Sensors commissioning/Status table

The table displays the sensors commissioning information and includes the following details.

- **Name**
- **Location –** location-position-elevation
- **Temperature**
- **Humidity**
- **Dry contact #1 –** Status and name
- **Dry contact #2 –** Status and name
- **Communication –** Connected/Lost with dates

3.6.1.2 Actions

3.6.1.2.1 Download sensors measures

Press the **Download sensors measures** button to download the sensors log file: 

If available, possible measures are listed below:

- Temperature of <sensor_1> (in K, 1 decimal digit)
- Humidity of <sensor_1> (in %, 1 decimal digit)
- Temperature of <sensor_2>> (in K, 1 decimal digit)
- Humidity of <sensor_2> (in %, 1 decimal digit)
- Temperature of <sensor_3> (in K, 1 decimal digit)
- Humidity of <sensor_3> (in %RH, 1 decimal digit)

°C = K - 273.15
°F = K x 9/5 -459.67

3.6.1.2.2 Discover

At first the table is empty, press the **Discover** button to launch the sensor discovery process.

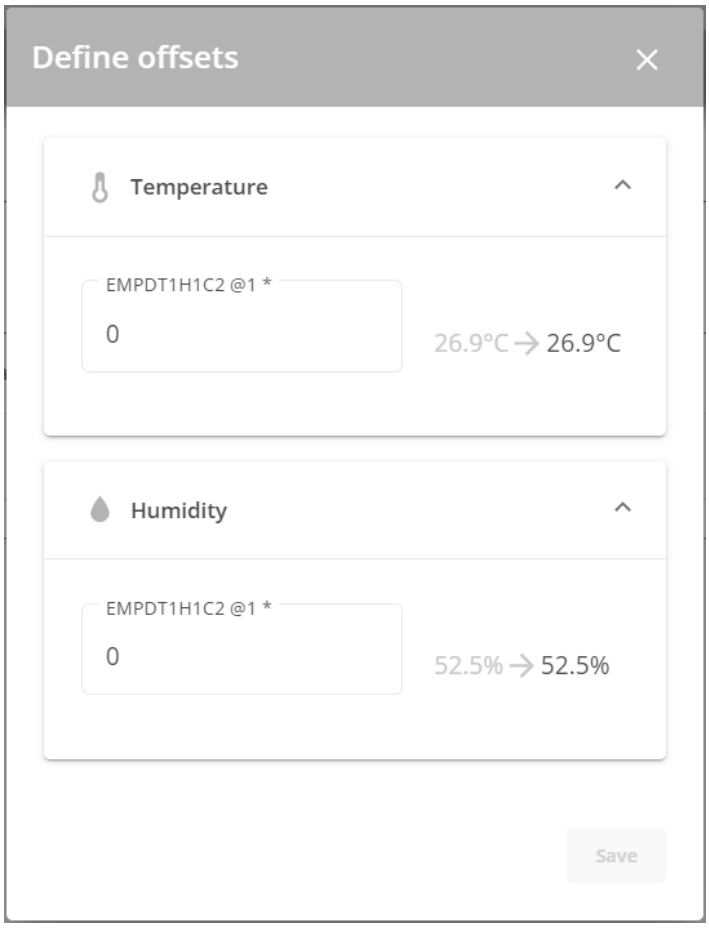
If sensors are discovered, the table is populated accordingly

3.6.1.2.3 Delete

Select a sensor and press the **Delete** button to delete the sensor.

When a sensor is deleted, all the commissioning information are deleted.

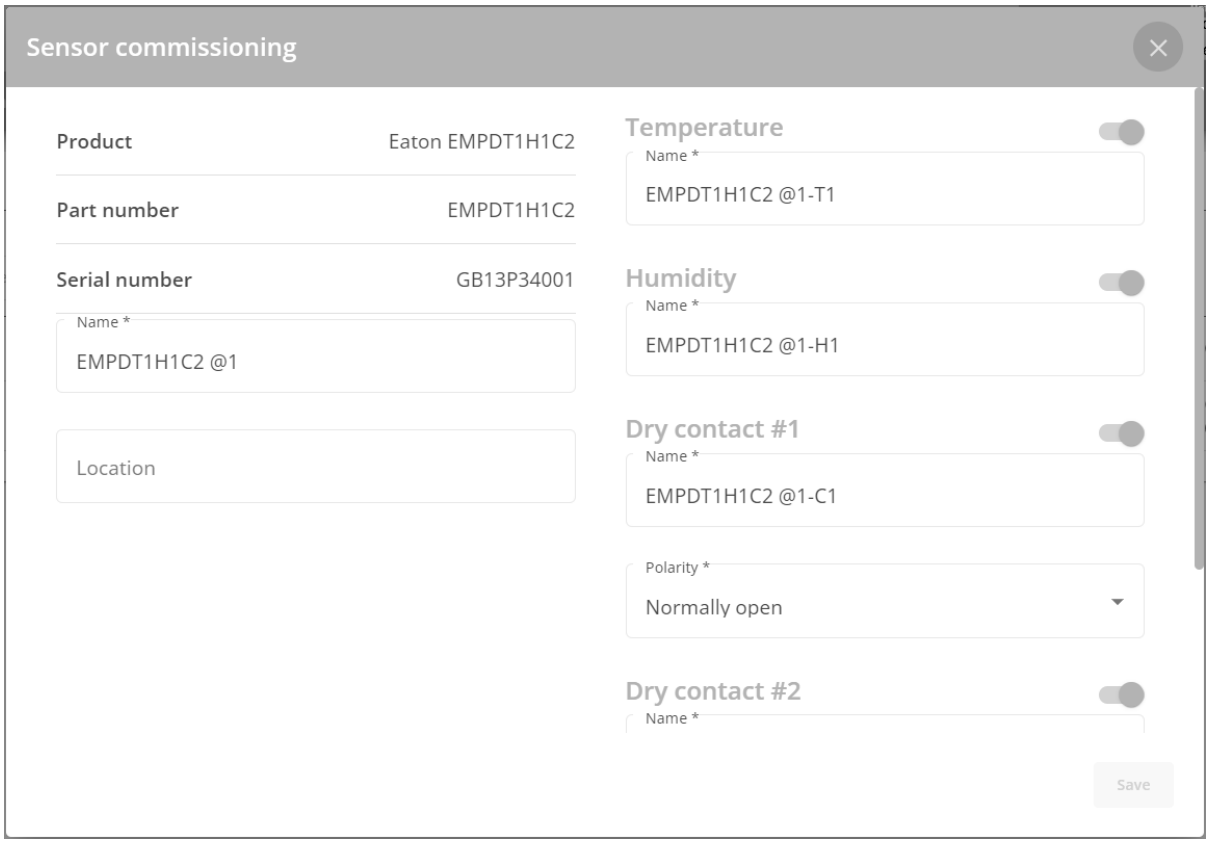
3.6.1.2.4 Define offsets



1. Select the sensors.
2. Press the **Define offset** button to adjust the temperature and humidity offsets of the selected sensors.
3. Extend the temperature or humidity section.
4. Set the offsets in the cell, temperatures and humidity will be updated accordingly.
5. Press the **Save** button when done.

Deactivated humidity or temperatures are not displayed and replaced by this icon:

3.6.1.2.5 Edit



Press the pen logo to edit sensor communication information:

You will get access to the following information and settings:

- Product reference
- Part number
- Serial number
- Name
- Location
- Temperature and humidity – Active (Yes, No)
- Dry contacts – Active (Yes, No)/Name/Polarity (Normally open, Normally closed)

	The dry contact is close and this is normal because it is configured as normally close.
	The dry contact is open and this is normal because it is configured as normally open.
	The dry contact is open and this is not normal because it is configured as normally close.
	The dry contact is close and this is not normal because it is configured as normally open.

Press **Save** after modifications.

Deactivated dry contacts are not displayed and replaced by this icon:

3.6.1.3 Access rights per profiles

	Administrator	Operator	Viewer
Environment/Commissioning	✓	✓	✗
Environment/Status	✓	✓	✓

3.6.1.3.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.6.1.4 Troubleshooting

EMP communication status shows "Lost"

In the Network Module, in Contextual help>>>Environment>>>Commissioning/Status , EMPs are missing in the Sensor commissioning table.

Symptom #1

The connection status of the sensor is "Lost"

Possible causes

The EMPs are not powered by the Network module.

Action #1-1

Launch again the discovery, if it is still not ok, go to Action #1-2.

Action #1-2

1- Check the EMPs connection and cables.

Refer to the sections Servicing the EMP>>>Installing the EMP>>>Cabling the first EMP to the device and Servicing the EMP>>>Installing the EMP>>>Daisy chaining 3 EMPs .

2- Disconnect and reconnect the USB to RS485 cable.

3- Launch the discovery, if it is still not ok, go to Action #1-3.

Action #1-3

1- Reboot the Network module.

2- Launch the discovery.

EMP detection fails at discovery stage

In the Network Module, in Contextual help>>>Environment>>>Commissioning/Status, EMPs are missing in the Sensor commissioning table.

Symptom #1

The EMPs green RJ45 LED (FROM DEVICE) is not ON.

Possible causes

The EMPs are not powered by the Network module.

Action #1-1

Launch again the discovery, if it is still not ok, go to Action #1-2.

Action #1-2

1- Check the EMPs connection and cables.

Refer to the sections Servicing the EMP>>>Installing the EMP>>>Cabling the first EMP to the device and Servicing the EMP>>>Installing the EMP>>>Daisy chaining 3 EMPs.

2- Disconnect and reconnect the USB to RS485 cable.

3- Launch the discovery, if it is still not ok, go to Action #1-3.

Action #1-3

1- Reboot the Network module.

2- Launch the discovery.

Symptom #2

The EMPs orange RJ45 LEDs are not blinking.

Possible causes

C#1: the EMP address switches are all set to 0.

C#2: the EMPs are daisy chained, the Modbus address is the same on the missing EMPs.

Action #2-1

1- Change the address of the EMPs to have different address and avoid all switches to 0.

Refer to the section Servicing the EMP>>>Defining EMPs address and termination>>>Manual addressing.

2- Disconnect and reconnect the USB to RS485 cable. The address change is only taken into account after an EMP power-up.

3- Launch the discovery, if it is still not ok, go to Action #2-2.

Action #2-2

1- Reboot the Network module.

Refer to the section Contextual help>>>Maintenance>>>Services>>>Reboot.

2- Launch the discovery.

3.6.1.4.1 For other issues

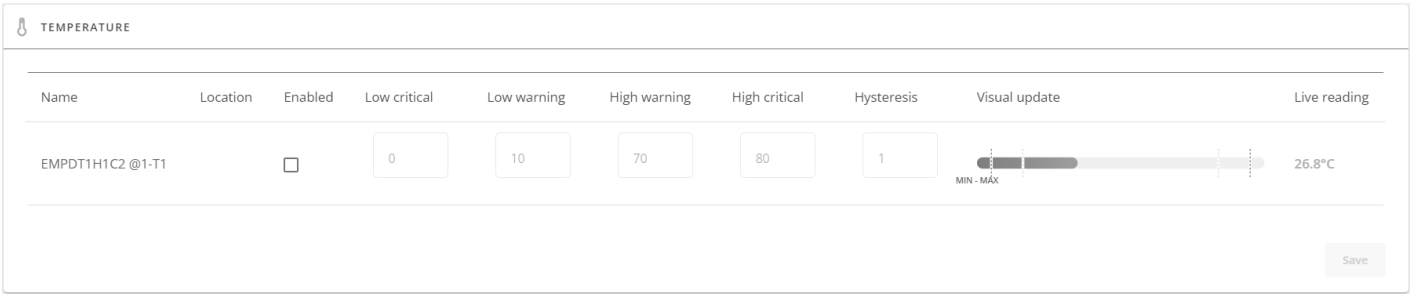
For details on other issues, see the Troubleshooting section.

3.6.2 Alarm configuration

Humidity, temperatures or dry contacts deactivated during commissioning are not displayed.
Gauge color code:

- Green: Value inside thresholds.
- Orange/Red: Value outside thresholds.
- Grey: No thresholds provided by the device.

3.6.2.1 Temperature



The table shows the following information and settings for each sensor:

- Name
- Location
- Enabled – yes/no
- Low critical threshold – xx°C or xx°F
- Low warning threshold – xx°C or xx°F
- High warning threshold – xx°C or xx°F
- High critical threshold – xx°C or xx°F
- Hysteresis – x°C or x°F
- Visual update
- Live reading (MIN-MAX shows the minimal and maximal temperature measured by the sensor)

3.6.2.1.1 Actions

a Set Enabled

Select and directly change the setting in the table and then **Save**.

When disabled, no alarm will be sent.

b Set alarm threshold

Enable the alarm first and then change the setting in the table and then **Save**.

When a warning threshold is reached, an alarm will be sent with a warning level.

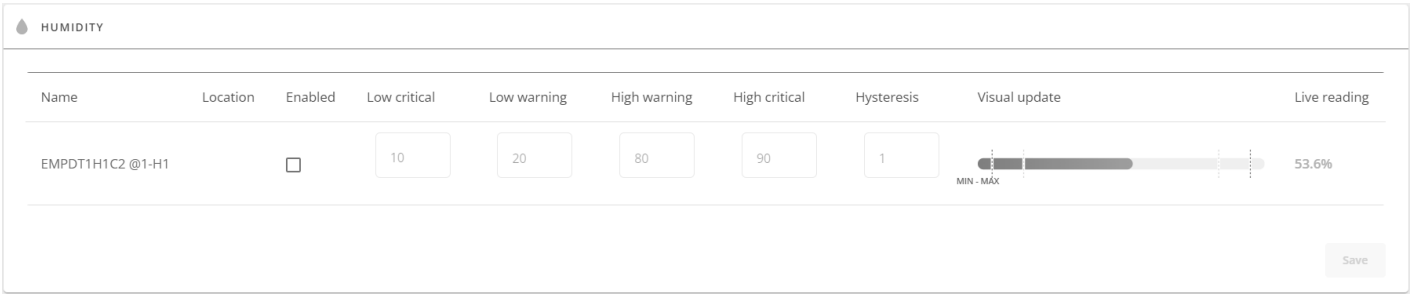
When a critical threshold is reached, an alarm will be sent with a critical level.

c Set Hysteresis

Enable the alarm first and change the setting in the table and then **Save**.

The hysteresis is the difference between the value where the alarm turns ON from turning OFF and the value where it turns OFF from turning ON.

3.6.2.2 Humidity



The table shows the following information and settings for each sensor:

- Name
- Location
- Enabled – yes/no
- Low critical threshold – xx%
- Low warning threshold – xx%
- High warning threshold – xx%
- High critical threshold – xx%
- Hysteresis – x%
- Visual update
- Live reading (MIN-MAX shows the minimal and maximal humidity measured by the sensor)

3.6.2.2.1 Actions

a Set Enabled

Select and directly change the setting in the table and then **Save**.

When disabled, no alarm will be sent.

b Set alarm threshold

Enable the alarm first and then change the setting in the table and then **Save**.

When a warning threshold is reached, an alarm will be sent with a warning level.

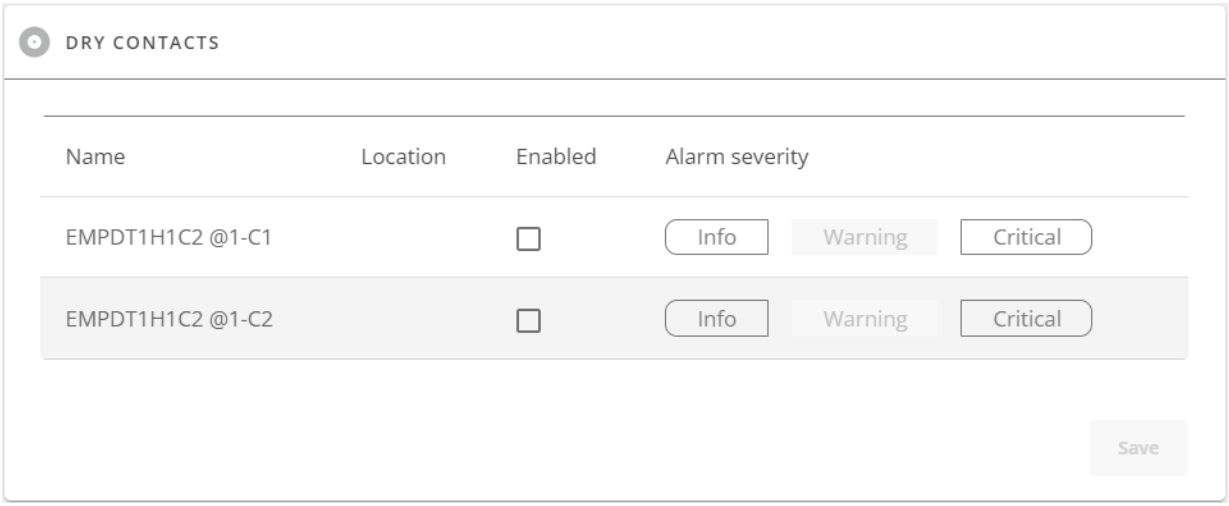
When a critical threshold is reached, an alarm will be sent with a critical level.

c Set Hysteresis

Enable the alarm first and then change the setting in the table and then **Save**.

The hysteresis is the difference between the value where the alarm turns ON from turning OFF and the value where it turns OFF from turning ON.

3.6.2.3 Dry contacts



The table shows the following settings for each dry contact:

- Name
- Location
- Enabled – yes/no
- Alarm severity – Info/Warning/Critical

3.6.2.3.1 Actions

a Set Enabled

Enable the alarm first and then change the setting in the table and then **Save**.

When disabled, no alarm will be sent.

b Set alarm severity

Enable the alarm first and then change the setting in the table and then **Save**.

When the dry contacts is not in a normal position, an alarm will be sent at the selected level.

	The dry contact is open and this is not normal because it is configured as normally close.
	The dry contact is close and this is not normal because it is configured as normally open.

3.6.2.4 Default settings and possible parameters - Environment Alarm configuration

	Default setting	Possible parameters
Temperature	Enabled — No Low critical – 0°C/32°F Low warning – 10°C/50°F High warning – 70°C/158°F High critical – 80°C/176°F	Enabled — No/Yes low critical<low warning<high warning<high critical

Humidity	Enabled — No Low critical – 10% Low warning – 20% High warning – 80% High critical – 90%	Enabled — No/Yes 0%<low critical<low warning<high warning<high critical<100%
Dry contacts	Enabled — No Alarm severity – Warning	Enabled — No/Yes Alarm severity – Info/Warning/Critical

3.6.2.4.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.6.2.5 Access rights per profiles

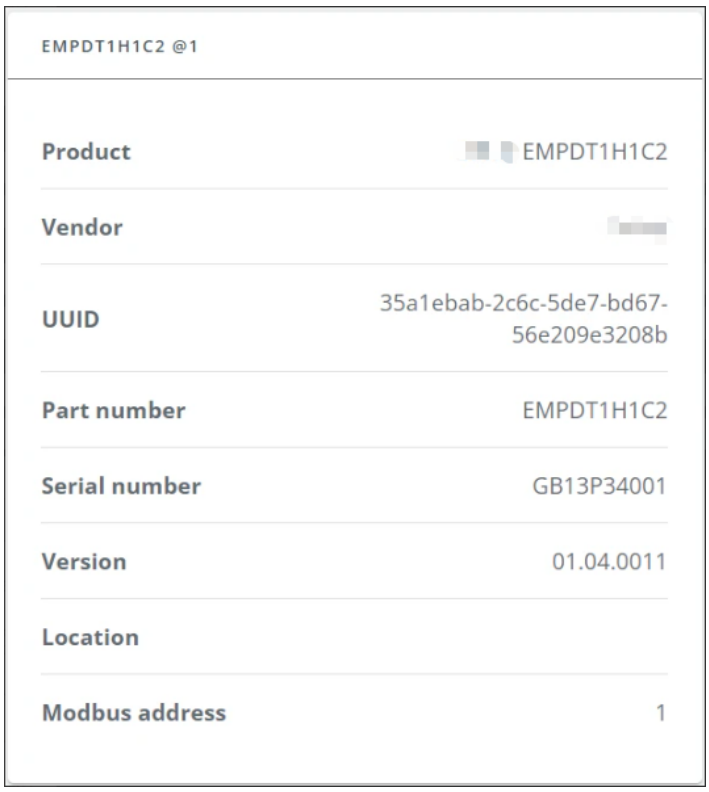
	Administrator	Operator	Viewer
Environment/Alarm configuration	✓	✓	✗

3.6.2.5.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.6.3 Information

Sensor information is an overview of all the sensors information connected to the Network Module.



- Physical name
- Vendor
- Part number
- Firmware version
- UUID
- Serial number
- Location

3.6.3.1 Access rights per profiles

	Administrator	Operator	Viewer
Environment/Information	✓	✓	✓

3.6.3.1.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.6.4 Sensor Logs

This web page allows to set configuration and browse measures log of the sensors measures only.

3.6.4.1 Logs browse

- Browse logs in time range by setting start time and end time
- Go to next page
- Go to previous page
- Go to first page
- Go to last page
- Page jump: Input page number and click **go** to jump to specified page.
- Item per page: Set how many logs displayed per page, valid value is 10/25/50/100

3.6.4.2 Download

Press the **Download** button to download the sensors log file:

If available, possible measures are listed below:

- Temperature of <sensor_1> (in K, 1 decimal digit)
- Humidity of <sensor_1> (in %, 1 decimal digit)
- Temperature of <sensor_2>> (in K, 1 decimal digit)
- Humidity of <sensor_2> (in %, 1 decimal digit)
- Temperature of <sensor_3> (in K, 1 decimal digit)
- Humidity of <sensor_3> (in %RH, 1 decimal digit)

°C = K - 273.15
°F = K x 9/5 -459.67
User interface is updated based on the account preferences

3.6.4.3 Settings

Press the **Settings** button on the top right to define the log acquisition frequency of the Sensors measures.

3.6.4.4 Specifics

3.6.4.5 Access rights per profiles - Sensor

	Administrator	Operator	Viewer
Environment/Sensor Logs	✓	✓	✓
Environment/Sensor Logs/Settings	✓	✓	✗

3.6.4.5.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.6.4.6 Default settings and possible parameters - Sensors

	Default Setting	Possible parameters
Sensors/Logs	Log measures every — 60s	Log measures every — 3600s maximum

3.6.4.6.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.7 Settings

3.7.1 General

3.7.1.1 System details

3.7.1.1.1 Location

Text field that is used to provide the card location information.

Card system information is updated to show the defined location.

3.7.1.1.2 Contact

Text field that is used to provide the contact name information.

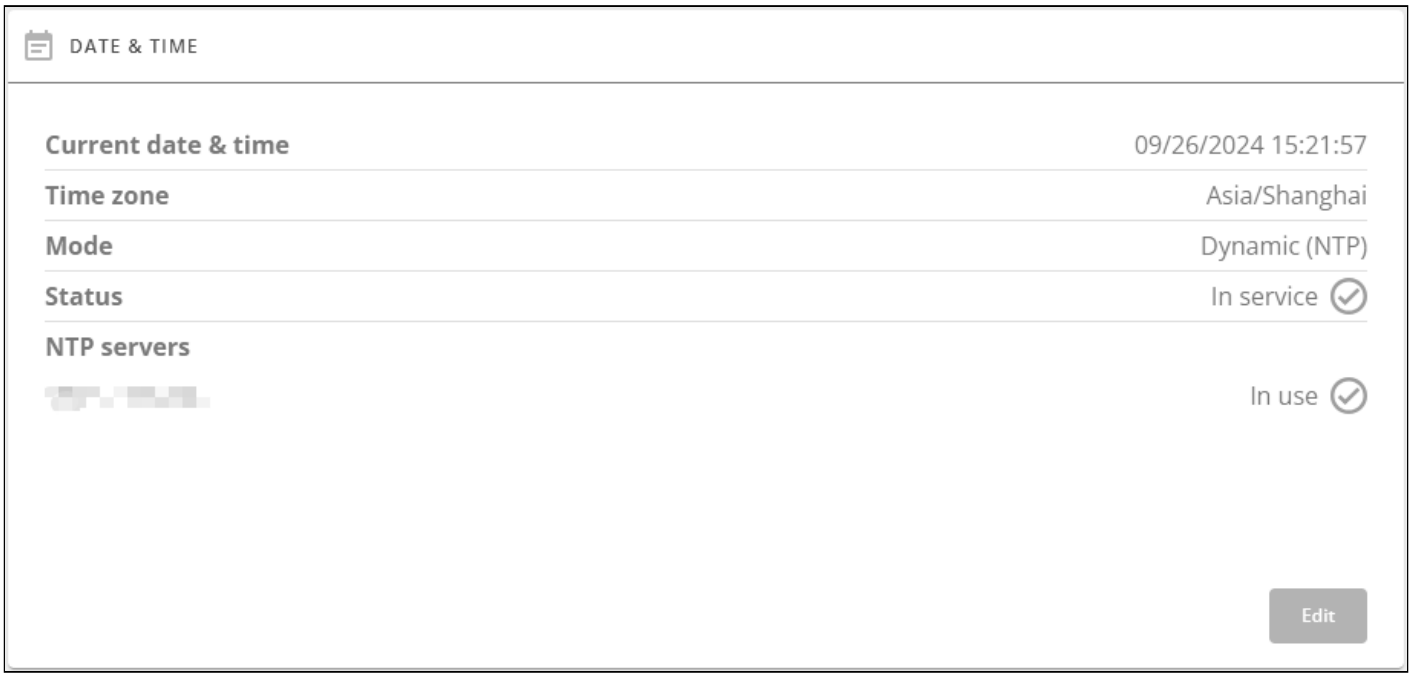
Card system information is updated to show the contact name.

3.7.1.1.3 System name

Text field that is used to provide the system name information.

Card system information is updated to show the system name.

3.7.1.2 Date & Time



The current date and time appears at the top of the screen.

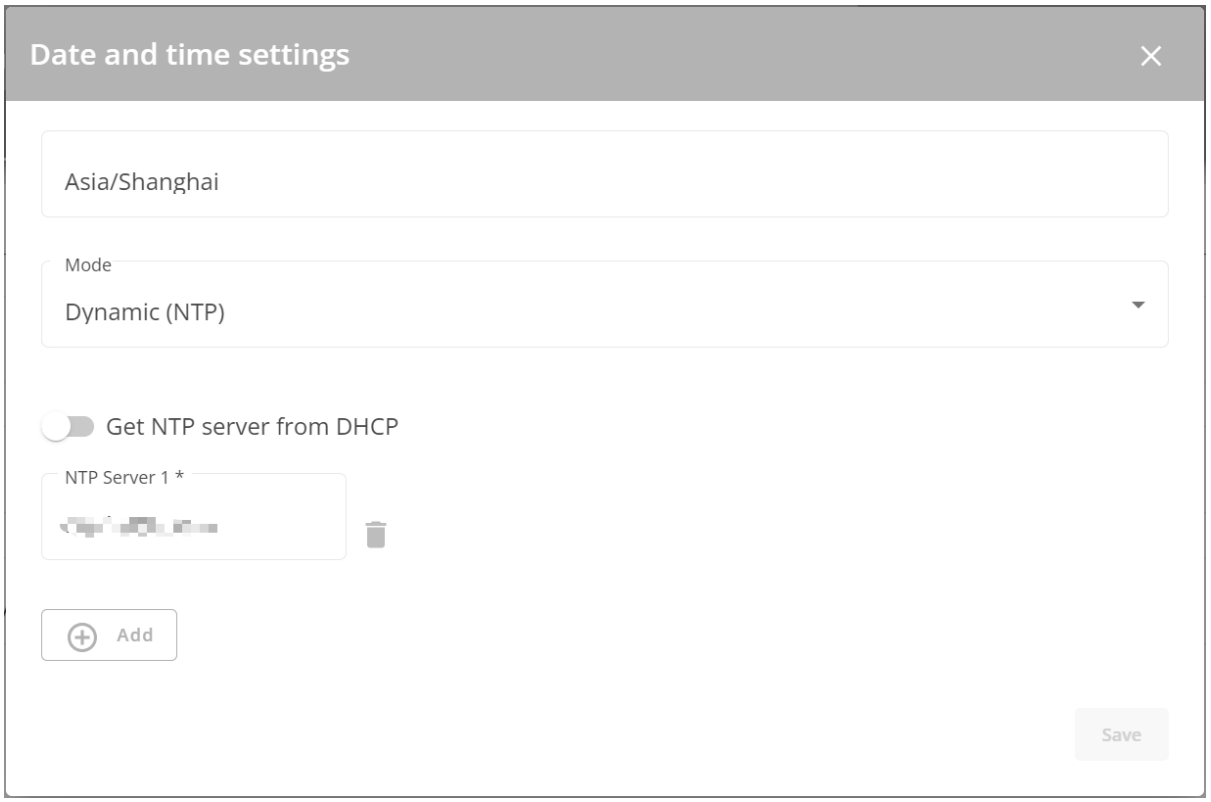
You can set the time either manually or automatically.

3.7.1.2.1 Manual mode: Manually entering the date and time

1. Select the time zone for your geographic area.

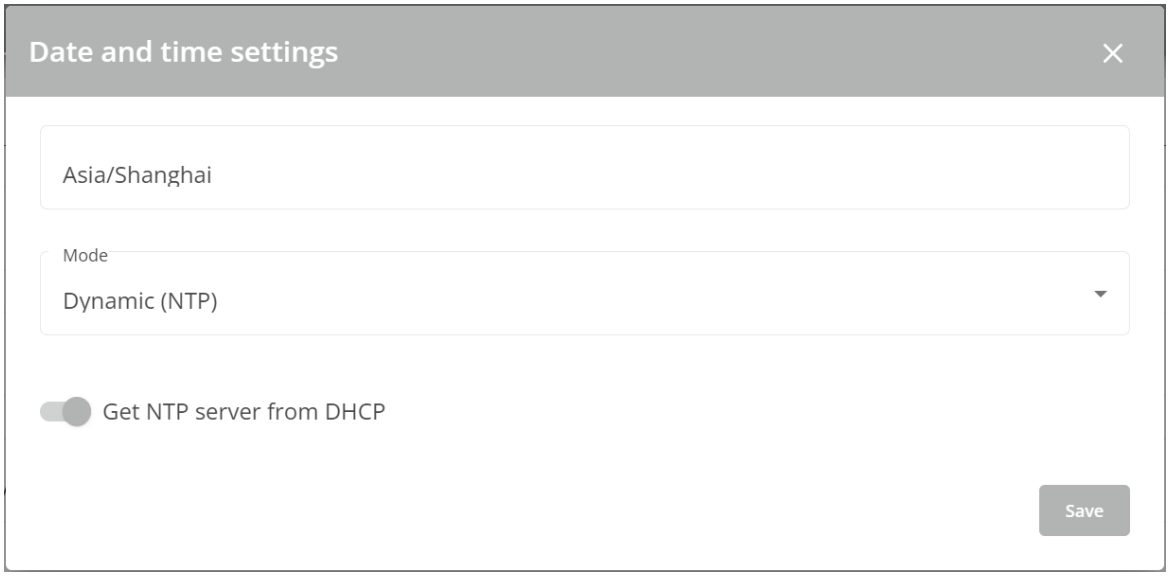
2. Select the date and time.
3. Save the changes.

3.7.1.2.2 Dynamic (NTP): Synchronizing the date and time with an NTP server



1. Select the time zone for your geographic area.
2. Enter the IP address or host name of the NTP servers in the NTP server fields (up to 5 servers).
3. Save the changes.

3.7.1.2.3 Dynamic (NTP): Synchronizing the date and time from the DHCP server



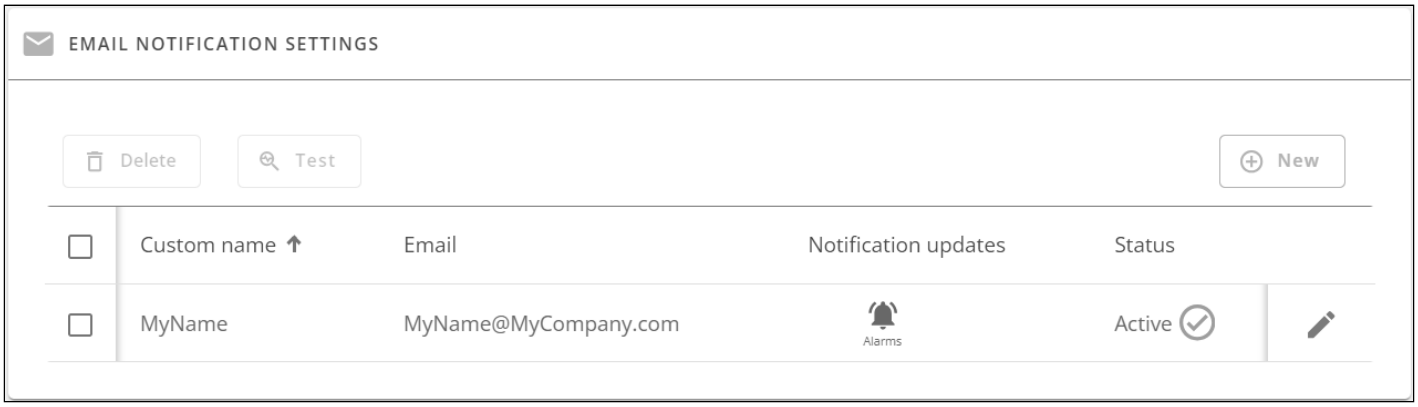
1. Select the time zone for your geographic area.
2. Select Get NTP server from DHCP

3. Save the changes.

DST is managed based on the time zone.

3.7.1.3 Email notification settings

For examples on email sending configuration see the Servicing the Network Management Module>>>Subscribing to a set of alarms for email notification section.



3.7.1.3.1 Email sending configuration table

The table shows all the email sending configuration and includes the following details:

- **Configuration name**
- **Email address**
- **Notification updates –** Displays Events notification/Periodic report icons when active.
- **Status** – Active/Inactive/In delegation

3.7.1.3.2 Actions

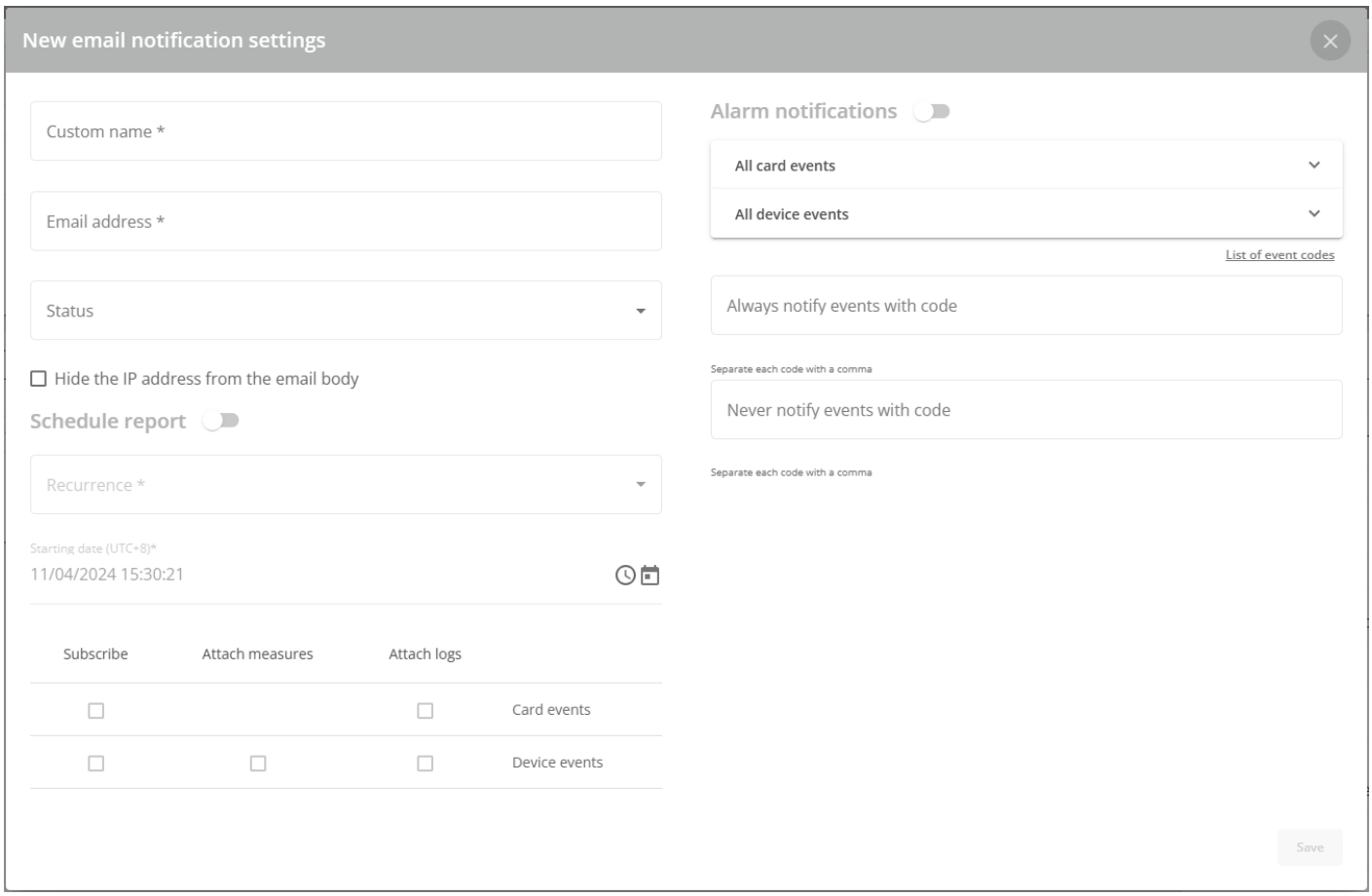
a Add

Press the **New** button to create a new email sending configuration.

b Remove

Select an email sending configuration and press the **Delete** button to remove it.

c Edit



Press the pen icon to edit email sending configuration:

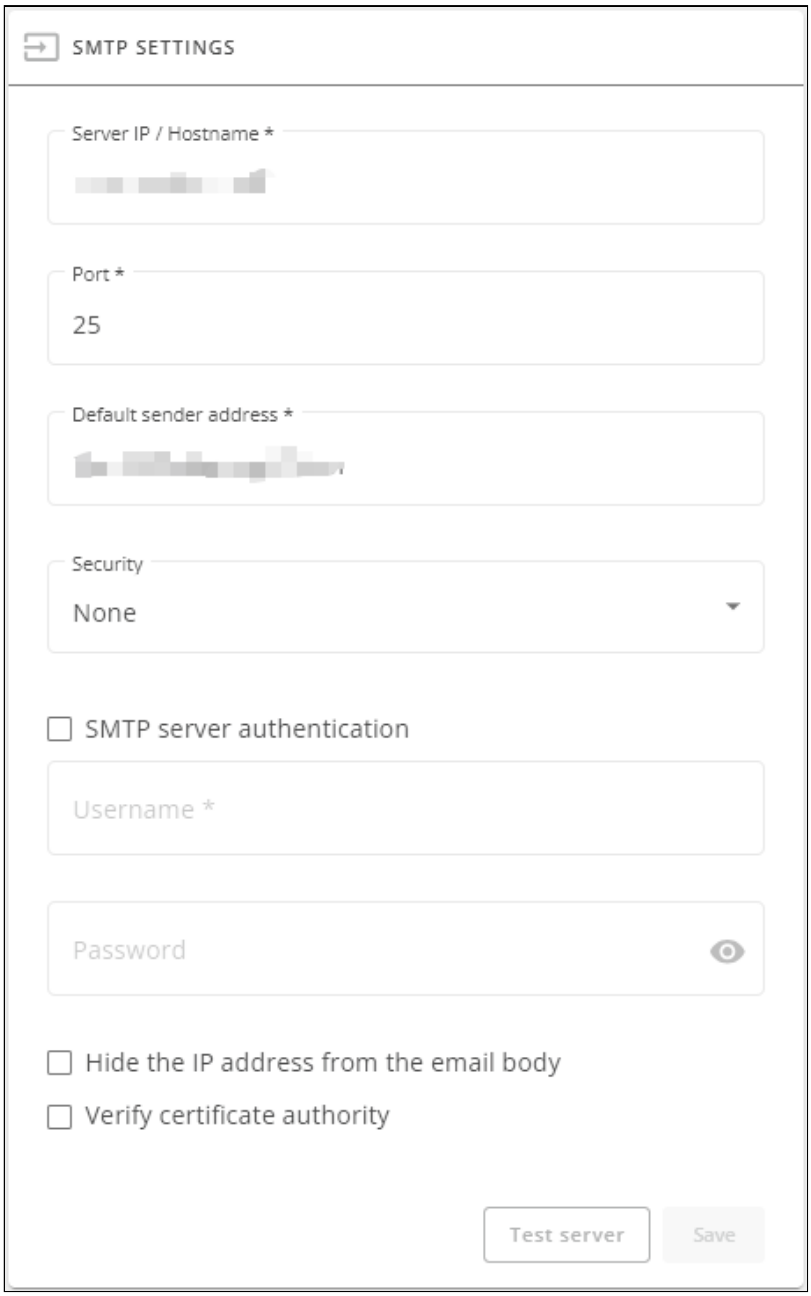
You will get access to the following settings:

- **Custom name**
- **Email address**
- **Status –** Active/Inactive
- **Hide the IP address from the email body –** Disabled/Enabled
  This setting will be forced to Enabled if Enabled in the SMTP settings.
- **Schedule report –** Active/Recurrence/Starting/Topic selection – Card/Devices

  Attachment will contains only logs that have occurred during the recurrence.

- **Alarm notifications** – Severity level/Attach logs/Exceptions on events notification

3.7.1.4 SMTP settings



SMTP is an internet standard for electronic email transmission.

The following SMTP settings are configurable:

- **Server IP/Hostname –** Enter the host name or IP address of the SMTP server used to transfer email messages in the SMTP Server field.
- **Port**
- **Default sender address**
- **Hide the IP address from the email body –** Disabled/Enabled
  If Enabled, it will force this setting to Enabled in the Email notification settings.
- **Secure SMTP connection –** Verify certificate authority
- **SMTP server authentication –** Username/Password (Read below note for Gmail Configuration regarding the password)

Select the SMTP server authentication checkbox to require a user name and a password for SNMP authentication, enter the Username and the Password.

Gmail Users

Google no more allow the card to send email using your Gmail account password, but requires you to use a dedicated "App passwords" instead.

To proceed, you need first to enable a 2-Step Verification on your Google account.
Then you need to follow these steps to generate an "App password" that you'll be required to configure SMTP server authentication in the card (instead of your google account usual password):

1. Go to https://security.google.com/settings/security/apppasswords and sign in to your account.
2. Choose **Mail** from the list of available apps.
3. Choose **Other** from the device list.
4. Enter your **Custom Name**. You can put any name such as "my-card" in it.
5. Click the **Generate** button.
6. Copy the password and put in the password field. (The same password can be reused across multiple cards)
   Be careful, this password cannot be recovered after clicking the "Done" button. If lost, you'll have to regenerate a new password & reapply it in the settings.
7. Click the **Done** button, and that's it.

- Save and test server configuration

3.7.1.5 Default settings and possible parameters - General

	Default setting	Possible parameters
System details	Location — empty	Location — 31 characters maximum
	Contact — empty	Contact — 255 characters maximum
	System name — empty	System name — 255 characters maximum
	Time & date settings — Dynamic(NTP)(Time zone: Asia/Shanghai)	Time & date settings — Manual (Time zone: selection on map/Date) / Dynamic (NTP)

Email notification settings	No email	5 configurations maximum Custom name — 128 characters maximum Email address — 128 characters maximum Hide IP address from the email body — enable/disabled Status — Active/Inactive • Alarm notifications Active — No/Yes All card events – Subscribe/Attach logs Critical alarm – Subscribe/Attach logs Warning alarm – Subscribe/Attach logs Info alarm – Subscribe/Attach logs All device events – Subscribe/Attach measures/Attach logs Critical alarm – Subscribe/Attach measures/Attach logs Warning alarm – Subscribe/Attach measures/Attach logs Info alarm – Subscribe/Attach measures/Attach logs Always notify events with code Never notify events with code • Schedule report Active — No/Yes Recurrence – Every day/Every week/Every month Starting – Date and time Card events – Subscribe/Attach logs Device events – Subscribe/Attach measures/Attach logs
SMTP settings	Server IP/Hostname — blank SMTP server authentication — disabled Port — 25 Default sender address — *NMCG2@example.com* Hide IP address from the email body — disabled Security — enabled Verify certificate authority — disabled SMTP server authentication — disabled	Server IP/Hostname — 128 characters maximum SMTP server authentication — disable/enable (Username/Password — 128 characters maximum) Port — x-xxx Sender address — 128 characters maximum Hide IP address from the email body — enable/disabled Secure SMTP connection — enable/disable Verify certificate authority — disable/enable

3.7.1.5.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.7.1.6 Access rights per profiles

	Administrator	Operator	Viewer
General	✓	✗	✗

3.7.1.6.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.7.1.7 CLI commands

email-test

Description

mail-test sends test email to troubleshoot SMTP issues.

Help

```
        Usage: email-test <command> ...
Test SMTP configuration.

Commands:
  email-test -h, --help, Display help page

  email-test -r, --recipient <recipient_address>
  Send test email to the
    <recipient_address>      Email address of the recipient
```

time

Description

Command used to display or change time and date.

Help

For Viewer and Operator profiles:

```
time -h
 Usage: time [OPTION]...
 Display time and date.

   -h, --help      display help page
   -p, --print     display date and time in YYYYMMDDhhmmss format
```

For Administrator profile:

```
time -h
 Usage: time [OPTION]...
Display time and date, change time and date.
  -h, --help      display help page
```

```
  -p, --print     display date and time in YYYYMMDDhhmmss format
  -s, --set <mode>
      Mode values:
      - set date and time (format YYYYMMDDhhmmss)
          manual <date and time>
      - set preferred and alternate NTP servers
          ntpmanual <preferred server> <alternate server>
      - automatically set date and time
          ntpauto
Examples of usage:
-> Set date 2017-11-08 and time 22:00
     time --set manual 201711082200
-> Set preferred and alternate NTP servers
     time --set ntpmanual fr.pool.ntp.org de.pool.ntp.org
```

Examples of usage

```
 -> Set date 2017-11-08 and time 22:00
      time --set manual 201711082200
 -> Set preferred and alternate NTP servers
      time --set ntpmanual fr.pool.ntp.org de.pool.ntp.org
```

3.7.1.7.1 For other CLI commands

See the CLI commands in the Information>>>CLI section.

3.7.1.8 Save and Restore

	SRR section	SRR sub section	Settings	Sub Setttings	Possible values
System details	card	**identification**	name		String: refer to default settings and possible parameters for constraints.
			contact		String: refer to default settings and possible parameters for constraints.
			location		String: refer to default settings and possible parameters for constraints.
Time and Date settings	date	**ntp**	enabled		true/false
			getServersFromDhcp		true/false
			servers	preferredServer	*
				alternateServer	*

			timeZone		Examples: Europe/Paris Africa/Johannesburg America/New_York Asia/Shanghai
Email	email	**notifyOnEvents**	enabled		true/false
			cardEvents	**critical**	
				subscribe	true/false
				attachEventsLog	true/false
				warning	
				subscribe	true/false
				attachEventsLog	true/false
				info	
				subscribe	true/false
				attachEventsLog	true/false
			devicesEvents	**critical**	
				subscribe	true/false
				attachEventsLog	true/false
				attachMeasuresLog	true/false
				warning	
				subscribe	true/false
				attachEventsLog	true/false
				attachMeasuresLog	true/false
				info	
				subscribe	true/false
				attachEventsLog	true/false
				attachMeasuresLog	true/false
			exceptions	notifiedEvents	evenst codes separated by coma
				noneNotifiedEvents	evenst codes separated by coma
		periodicReport	enabled		true/false
			periodicity		Every day/week/month
			startTime		Unix timestamp
			card	subscribe	true/false
				attachEventsLog	true/false
			devices	subscribe	true/false
				attachEventsLog	true/false
				attachMeasuresLog	true/false
		message	sender		String: refer to default settings and possible parameters for constraints.

			subject		String: refer to default settings and possible parameters for constraints.
			hideIpAddress		true/false
SMTP	smtp	**certificateData**	ca		Certificate Authority of SMTP server
			port		Number: refer to default settings and possible parameters for constraints.
			enabled		true/false
			server		IP address or hostname of SMTP server
			requireAuth		true/false
			user		Username for server authentication
			password	plaintext cyphered	String: refer to default settings and possible parameters for constraints. -
			fromAddress		email address format
			ssl		1: None 2: STARTTLS 3: SSL
			verifyTlsCert		true/false

3.7.1.8.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.7.2 Users

3.7.2.1 Local users

The table shows all the supported local user accounts and includes the following details:

- **Username**
- **Email**
- **Profile**
- **Status –** Status could take following values – Inactive/Locked/Password expired/Active

For the list of access rights per profile refer to the section Full documentation>>>Information>>>Access rights per profiles.

3.7.2.1.1 Actions

a Add

Press the **New** button to add new local users.

You can add up to 20 local users. Kindly note that above 10 users connected simultaneously, it is likely to consume a lot of CPU resources resulting in slower card performance.

b Remove

Select a user and press the **Delete** button to remove it.

c Edit

Press the pen logo to edit user information:

You will get access to the following settings:

- Active
- Profile
- Username
- Full name
- Email
- Phone
- Organization – Notify by email about account modification/Password
- Reset password
- Generate randomly
- Enter manually
- Force password to be changed on next login

d Global settings

Press **Save** after modifications.

Password settings

To set the password strength rules, apply the following restrictions:

- Minimum length
- Minimum upper case
- Minimum lower case
- Minimum digit
- Special character

Password expiration

To set the password expiration rules, apply the following restrictions:

- Number of days until password expires
- Main administrator password never expire

Main administrator password never expires

1. If this feature is disabled, the administrator account can be locked after the password expiration.
2. If Enabled, the administrator password never expires, make sure it is changed regularly.

Lock account

- Lock account after a number of invalid tries
- Main administrator account will never block

Main administrator account will never block

1. If this feature is disabled, the administrator account can be locked after the number of failed connections defined.
2. If Enabled, the security level of the administrator account is reduced because unlimited password entry attempts are allowed.

3.7.2.2 Remote users

3.7.2.3 LDAP

The table shows all the supported severs and includes the following details:

- Name
- Address
- Port
- Security
- Certificate
- Status – Status could take following values – Unreachable/Active

3.7.2.3.1 Actions

a Configure

1. Enable LDAP to be able to configure settings
2. Press **Configure** to access the following LDAP settings:

- Connectivity
  - Security
    SSL – None/Start TLS/SSL
    Verify server certificate
  - Primary server – Name/Hostname/Port
  - Secondary server – Name/Hostname/Port
  - Credentials – Anonymous search bind/Search user DN/Password
  - User base DN
  - User name attribute
  - Group base DN
  - Group name attribute

3. Click **Save**.

b Profile mapping

For the list of access rights per profile refer to the section Full documentation>>>Information>>>Access rights per profiles.

1. Press **Profile mapping** to map remote groups to local profiles.
2. Click **Save**.

c Users preferences

All users preferences will apply to all remote users (LDAP, RADIUS).

1. Press **Users preferences** to define preferences that will apply to all newly logged in LDAP users

- Language
- Temperature

- Date format
- Time format

2. Click **Save**.

d LDAP Test

1. At the end of each LDAP primary or secondary configuration row you'll be able to launch a LDAP test by clicking on the button.
2. The LDAP test will give you a status (ok / ko) on below parameters to make it easier to troubleshoot

- Primary
- Bind
- User domain dn
- User name attribute
- Group domain dn
- Group name attribute
- Mapped profile
- Credentials

3. Click **Test** to check your configuration.

3.7.2.4 RADIUS

Radius is not a secured protocol, for a maximum security, it is recommended to use LDAP over TLS.

The table shows all the supported severs and includes the following details:

- Name - descriptive name for the RADIUS server
- Address - hostname or IP address for the RADIUS server
- Port - connection port of the RADIUS Server

3.7.2.4.1 Actions

a Configure

1. Enable Radius to be able to configure settings
2. Press **Configure** to access the following RADIUS settings:

- Primary server
  - Name - descriptive name for the RADIUS server
  - Secret - a shared secret between the client and the RADIUS server
  - Address - hostname or IP address for the RADIUS server
  - UDP port - the UDP port for the RADIUS server (1812 by default)
  - Time out (s) - length of time the client waits for a response from the RADIUS server
  - Retry count - the number of time a connection is retried
- Secondary server
  - Name - descriptive name for the RADIUS server
  - Secret - a shared secret between the client and the RADIUS server
  - Address - hostname or IP address for the RADIUS server
  - UDP port - the UDP port for the RADIUS server (1812 by default)
  - Time out (s) - length of time the client waits for a response from the RADIUS server
  - Retry count - the number of time a connection is retried
- NAS
  - Identifier - descriptive identifier for the radius server to identify the device
  - IP - IP address of the card or a domain name (FQDN)

Note: The radius protocol supported by the card is PAP

3. Click **Save**.

b Profile mapping

For the list of access rights per profile refer to the section Full documentation>>>Information>>>Access rights per profiles.

1. Press **Profile mapping** to map RADIUS profile to local profiles.

Default Profile
You can enable & define a default profile for all Radius that are not subject to any specific rules (see below).

Specific Rules
Fill the usual triplet of information as per your radius configuration:

- Attribute - The attribute value - Mandatory
- Vendor - The vendor value associated to the attribute - Mandatory (0 as default value)
- Value - The value of the attribute needed for this mapping - Mandatory

Fill the profile you want your specific radius configuration to be mapped with

- Profile - the local profile you want users to be mapped

Please refer to your RADIUS protocol provider documentation for further information.

2. Click **Save**.

c Users preferences

1. Press **Users preferences** to define preferences that will apply to all RADIUS users

- Language
- Temperature
- Date format
- Time format

2. Click **Save**.

3.7.2.5 Sessions

- Monitors the information for the connected sessions
- End any session as an admin with a re-authentication

3.7.2.5.1 Information

a Username

This can be either a default profile name or a custom name

b Profile

Displays if the session belongs to an administrator, operator or viewer profile

c Service

Displays on which service the session is going on (Web, SSH, Serial , etc...)

d IP Address

Displays the IP address of the active session.

e Interface

Displays the type of connection (Web, LAN, etc...)

f Connected since

Displays the last opened session time

3.7.2.5.2 Settings

a Account timeout

To set the session expiration rules, apply the following restrictions:

- No activity timeout (in minutes).

  If there is no activity, session expires after the specified amount of time.

- Session lease time (in minutes).

  If there is activity, session still expires after the specified amount of time.

Main administrator password never expires

When new settings are set, parameters will be taken into account on their next connection to the card.

3.7.2.6 Default settings and possible parameters for Users

	Default setting	Possible parameters
Password settings	Minimum length — enabled (8) Minimum upper case — enabled (1) Minimum lower case — enabled (1) Minimum digit — enabled (1) Special character — enabled (1)	Minimum length — enable (6-32)/disable Minimum upper case — enable (0-32)/disable Minimum lower case — enable (0-32)/disable Minimum digit — enable (0-32)/disable Special character — enable (0-32)/disable
Password expiration	Number of days until password expires — disabled	Number of days until password expires — disable/ enable (1-99999)
Lock account	Lock account after xx invalid tries — enabled (10) Lock account for xx minutes — 30	Lock account after xx invalid tries — enable (1-4294967295)/disable Lock account for xx minutes — enable(1-71582788)/ disable
Account timeout	No activity timeout — 60 minutes Session lease time — 120 minutes	No activity timeout — 1-60 minutes Session lease time — 60-720 minutes
Local users	1 user only: • Active — Yes • Profile — Administrator • Username — admin • Full Name — blank • Email — blank • Phone — blank • Organization — blank	20 users maximum: • Active — Yes/No • Profile — Administrator/Operator/Viewer • Username — 255 characters maximum • Full Name — 128 characters maximum • Email — 128 characters maximum • Phone — 64 characters maximum • Organization — 128 characters maximum

	Default setting	Possible parameters

LDAP	Configure • Active – No • Security SSL – SSL Verify server certificate – enabled • Primary server Name – Primary Hostname – blank Port – 636 • Secondary server Name – blank Hostname – blank Port – blank • Credentials Anonymous search bind – disabled Search user DN – blank Password – blank • Search base Search base DN – dc=example,dc=com • Request parameters User base DN – ou=people,dc=example,dc=com User name attribute – uid UID attribute – uidNumber Group base DN – ou=group,dc=example,dc=com Group name attribute – gid GID attribute – gidNumber Profile mapping – no mapping Users preferences • Language – English • Temperature unit – °C (Celsius) • Date format – mm/dd/yyyy • Time format – hh:mm:ss (24h)	Configure • Active – No/yes • Security SSL – None/Start TLS/SSL Verify server certificate – disabled/enabled • Primary server Name – 128 characters maximum Hostname – 128 characters maximum Port – x-xxx • Secondary server Name – 128 characters maximum Hostname – 128 characters maximum Port – x-xxx • Credentials Anonymous search bind – disabled/enabled Search user DN – 1024 characters maximum Password – 128 characters maximum • Search base Search base DN – 1024 characters maximum • Request parameters User base DN – 1024 characters maximum User name attribute – 1024 characters maximum UID attribute – 1024 characters maximum Group base DN – 1024 characters maximum Group name attribute – 1024 characters maximum GID attribute – 1024 characters maximum Profile mapping – up to 5 remote groups mapped to local profiles Users preferences • Language – English, French, German, Italian, Polish, Russian, Simplified Chinese, Spanish, Traditional Chinese, Turkish • Temperature unit – °C (Celsius)/°F (Fahrenheit) • Date format – dd/mm/yyyy / yyyy/mm/dd / mm/dd/yyyy • Time format – hh:mm:ss (24h) / hh:mm:ss (12h)

RADIUS	Configure • Active – No • Retry number – 0 • Primary server Name – blank Secret – blank Address – blank UDP port – 1812 Time out – 3 • Secondary server Name – blank Secret – blank Address – blank UDP port – 1812 Time out – 3 Users preferences • Language – English • Temperature unit – °C (Celsius) • Date format – mm/dd/yyyy • Time format – hh:mm:ss (24h)	Configure • Active – Yes/No • Retry number – 0 to 128 • Primary server Name – 128 characters maximum Address – 128 characters maximum Secret – 128 characters maximum UDP port – 1 to 65535 Time out – 3 to 60 • Secondary server Name – 128 characters maximum Address – 128 characters maximum Secret – 128 characters maximum UDP port – 1 to 65535 Time out – 3 to 60 Users preferences • Language – English, French, German, Italian, Polish, Russian, Simplified Chinese, Spanish, Traditional Chinese, Turkish • Temperature unit – °C (Celsius) • Date format – dd/mm/yyyy / yyyy/mm/dd / mm/dd/yyyy • Time format – hh:mm:ss (24h)

3.7.2.6.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.7.2.7 Access rights per profiles - Users

	Administrator	Operator	Viewer
Local users	✓	✗	✗
Remote users	✓	✗	✗

3.7.2.7.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.7.2.8 CLI commands - Users

ldap-test

Description

Ldap-test help to troubleshoot LDAP configuration issues or working issues.

Help

```
     Usage: ldap-test <command> [OPTION]...
Test LDAP configuration.

Commands:
  ldap-test -h, --help, Display help page

  ldap-test --checkusername <username> [--primary|--secondary] [-v]
  Check if the user can be retrieve from the LDAP server
    <username>      Remote username to test
    --primary       Force the test to use primary server (optional)
    --secondary     Force the test to use secondary server (optional)
    -v,--verbose    Print the exchanges with LDAP server (optional)

  ldap-test --checkauth <username> [--primary|--secondary] [-v]
  Check if remote user can login to the card
    <username>      Remote username to test
    -p,--primary       Force the test to use primary server (optional)
    -s,--secondary     Force the test to use secondary server (optional)
    -v,--verbose    Print the exchanges with LDAP server (optional)

  ldap-test --checkmappedgroups [--primary|--secondary] [-v]
  Check LDAP mapping
    -p,--primary       Force the test to use primary server (optional)
    -s,--secondary     Force the test to use secondary server (optional)
    -v,--verbose    Print the exchanges with LDAP server (optional)

Quick guide for testing:

In case of issue with LDAP configuration, we recommend to verify the
configuration using the commands in the following order:

  1. Check user can be retrieve on the LDAP server
    ldap-test --checkusername <username>

  2. Check that your remote group are mapped to the good profile
    ldap-test --checkmappedgroups

  3. Check that the user can connect to the card
    ldap-test --checkauth <username>
```

logout

Description

Logout the current user.

Help

```
logout
  <cr> logout the user
```

whoami

Description

whoami displays current user information:

- Username
- Profile
- Realm

3.7.2.8.1 For other CLI commands

See the CLI commands in the Information>>>CLI section.

3.7.2.9 Troubleshooting - Users

How do I log in if I forgot my password?

Action

- Ask your administrator for password initialization.
- If you are the main administrator, your password can be reset manually by following steps described in the Servicing the Network Management Module>>>Recovering main administrator password.

LDAP configuration/commissioning is not working

Refer to the section Servicing the Network Management Module>>>Commissioning/Testing LDAP.

3.7.2.9.1 For other issues

For details on other issues, see the Troubleshooting section.

3.7.2.10 Save and Restore - Users

	SRR section	SRR sub section	Settings	Possible values

Password settings	accountService	passwordRules	**strength** minLengthminUpperCase minLowerCase minDigit minSpecialCharacter	Numbers: refer to default settings an possible parameters for constraints.
Password expiration			**expiration** expiration enabled afterDays defaultAccountNeverExpires	true/false Number: refer to default settings an possible parameters for constraints. true/false
Lock account		lockoutRules	**lockoutRules** enabled threshold defaultAccountNeverBlocks	true/false Number: refer to default settings an possible parameters for constraints. true
Account timeout		sessionsService	sessionTimeout sessionLeaseTime	Numbers: refer to default settings an possible parameters for constraints.
Local users		PredefinedAccounts	**credentials** enabled username passwordExpired locked profile **password** plaintext cyphered	true/false String: refer to default settings an possible parameters for constraints. true/false true/false administrators/operators/viewers String: refer to default settings an possible parameters for constraints. -

	SRR section	Sub section	Sub section	Sub section	Sub section	Settings	Sub settings	Possible values

LDAP	ldap	1.0	**settings**	**enabled**				true/false
				connectivity	**primaryServer**	name		String: refer to default settings an possible parameters for constraints.
						uri		String: refer to default settings an possible parameters for constraints.
						port		Unsigned number
					secondaryServer	name		String: refer to default settings an possible parameters for constraints.
						uri		String: refer to default settings an possible parameters for constraints.
						port		Unsigned number
					userDomain	nameAttribute		String: refer to default settings an possible parameters for constraints.
						dn		String: refer to default settings an possible parameters for constraints.
					groupDomain	nameAttribute		String: refer to default settings an possible parameters for constraints.
						dn		String: refer to default settings an possible parameters for constraints.
					bind	dn		String: refer to default settings an possible parameters for constraints.
						password	plaintext	String: refer to default settings an possible parameters for constraints.
							ciphered	String: refer to default settings an possible parameters for constraints.
					security	type		1: ssl 2: starttls 3: none
						verifyCertificate		true/false

				mappings	remoteGroup	String: refer to default settings an possible parameters for constraints.
					profileName	• administrators • viewers • operators
				preferences	language	String: refer to default settings an possible parameters for constraints.
					dateFormat	String: refer to default settings an possible parameters for constraints.
					timeFormat	String: refer to default settings an possible parameters for constraints.
					temperatureUnit	String: refer to default settings an possible parameters for constraints.
					licenceAgreement	String: refer to default settings an possible parameters for constraints.

	SRR section	Sub section	Sub section	Sub section	Sub section	Settings	Sub settings	Possible values
RADIUS	radius	1.0	**settings**	**enabled**				true/false
				connectivity		protocol		▪ pap ▪ chap
					primaryServer	name		String: refer to default settings an possible parameters for constraints.
						secret		String: refer to default settings an possible parameters for constraints.
						uri		String: refer to default settings an possible parameters for constraints.
						port		Unsigned number
						timeout		Unsigned number
						retryCount		Unsigned number

					secondaryServer	name	String: refer to default settings an possible parameters for constraints.
						secret	String: refer to default settings an possible parameters for constraints.
						uri	String: refer to default settings an possible parameters for constraints.
						port	Unsigned number
						timeout	Unsigned number
						retryCount	Unsigned number
					nas	identifier	String: refer to default settings an possible parameters for constraints.
						ip	String: refer to default settings an possible parameters for constraints.
				mappings		profile	String: refer to default settings an possible parameters for constraints.
						attribute	Number
						value	Number
						vendor	Number
				preferences		language	String: refer to default settings an possible parameters for constraints.
						dateFormat	String: refer to default settings an possible parameters for constraints.
						timeFormat	String: refer to default settings an possible parameters for constraints.
						temperatureUnit	String: refer to default settings an possible parameters for constraints.
						licenceAgreement	String: refer to default settings an possible parameters for constraints.

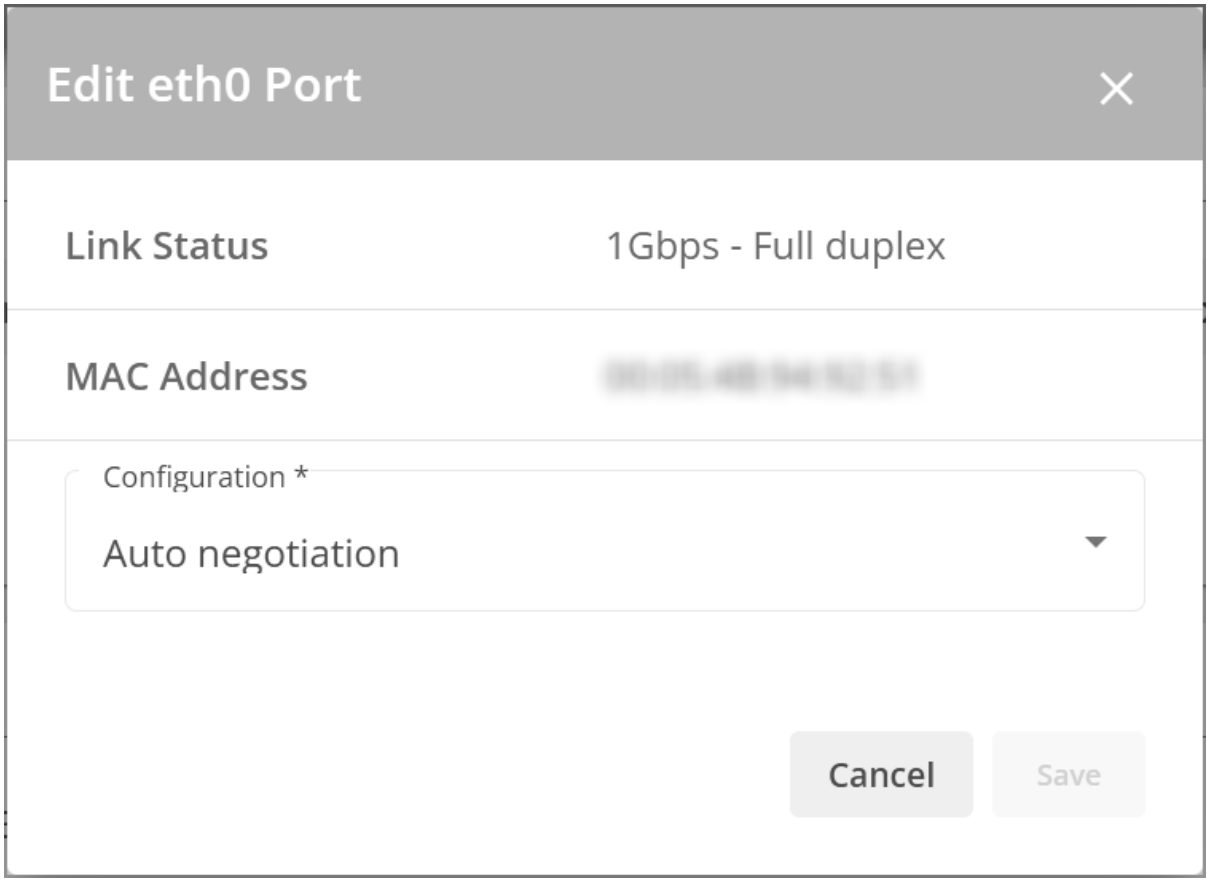
3.7.2.10.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.7.3 Ports

3.7.3.1 Ethernet port and interface settings

3.7.3.1.1 Edit port



Allows to edit the link configuration of the selected port through The different options are listed below.

- Auto negotiation
- 10 Mbps - Half duplex
- 10 Mbps - Full duplex
- 100Mbps - Half duplex
- 100Mbps - Full duplex
- 1.0Gbps - Full duplex

3.7.3.2 802.1x

If your network environment supports the 802.1x authentication mechanism, you can authenticate the card by toggling the button. The card supports two authentication methods: **TLS (default)** and **PEAP**.

Steps to ensure proper authentication:

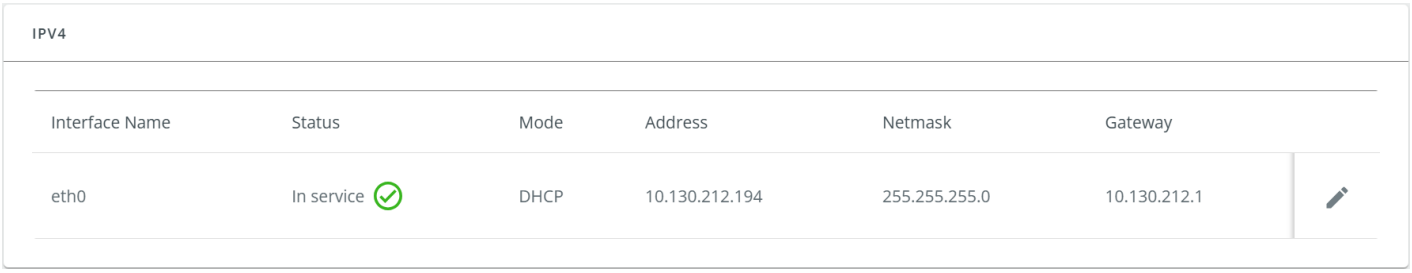
1. **Import the appropriate 802.1x certificate** on the card to perform the certificate exchange correctly.
2. **Debugging**: You can download 802.1x logs to help with troubleshooting.
3. **Additional Security**: Verify the server for enhanced security.

3.7.4 TCP/IP

3.7.4.1 Hostname

Text field to Enter the Network Module **Hostname**.

3.7.4.2 IPV4



Any modifications are applied after the Network Module reboots.

The table shows includes the following details:

- **Interface name**
- **Status**
- **Mode**
- **Address**
- **Netmask**
- **Gateway**

3.7.4.2.1 IPV4 configuration

After a mouse over on the table, click the edit icon to access settings and configure the network settings for a dedicated interface.

Select either the Manual or DHCP settings option.

a Manual

Select Manual, and then enter the network settings if the network is not configured with a BootP or DHCP server.

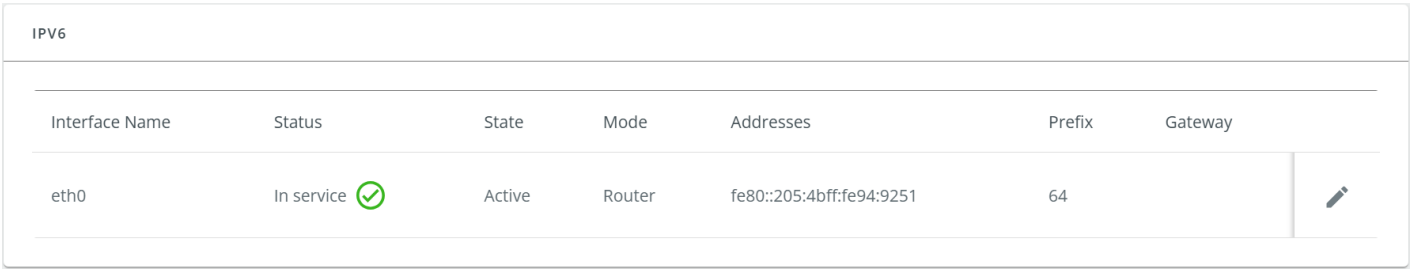
- Enter the IP Address.
  The Network Module must have a unique IP address for use on a TCP/IP network.
- Enter the netmask.
  The netmask identifies the class of the sub-network the Network Module is connected to.
- Enter the gateway address.
  The gateway address allows connections to devices or hosts attached to different network segments.

b DHCP

Select dynamic DHCP to configure network parameters by a BootP or DHCP server.

If a response is not received from the server, the Network Module boots with the last saved parameters from the most recent power up. After each power up, the Network Module makes five attempts to recover the network parameters.

3.7.4.3 IPV6



The table shows includes the following details:

- Interface name
- Status
- Mode
- Addresses
- Prefix
- Gateway

3.7.4.3.1 IPV6 configuration

After a mouse over on the table, click the edit icon to access settings and configure the network settings for a dedicated interface.

Select either the Manual or Router settings option.

a Manual

Select Manual and enter below settings:

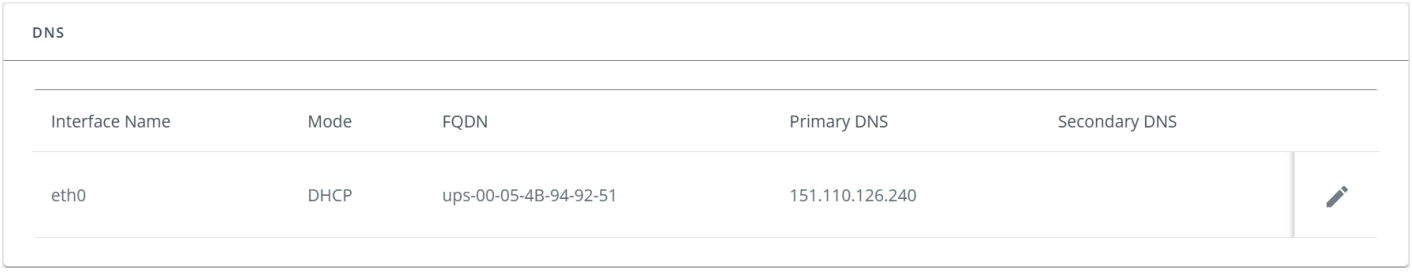
- Address
- Prefix
- Gateway

Enable the configuration and **Save** it.

b Router

Select Router, **Enable** the configuration and **Save** it.

3.7.4.4 DNS



The table shows includes the following details:

- **Interface name**
- **Mode**
- **FQDN**
- **Primary DNS**
- **Secondary DNS**

After a mouse over on the table, click the edit icon to access settings and configure the DNS settings for a dedicated interface.

Select either the Manual or DHCP settings option.

3.7.4.4.1 Manual

Select Manual and enter below settings:

- Domain name
- Primary DNS
- Secondary DNS

Save the configuration.

3.7.4.4.2 DHCP

Select DHCP and **Save** the configuration.

3.7.4.5 Default settings and possible parameters - TCP/IP

	Default setting	Possible parameters
Protocol - Hostname	*device*-[MAC address]	Hostname — 128 characters maximum
Protocol - IPV4	Enable — checked Mode — DHCP	Enabled — Active/Inactive Mode — DHCP/Manual (Address/Prefix/Gateway)
Protocol - IPV6	Enable — checked Mode — Router	Enabled — Active/Inactive Mode — Router/Manual (Address/Prefix/Gateway)
Protocol - DNS	Mode — DHCP	Mode :DHCP/Manual (Domain name/Primary DNS/ Secondary DNS)

3.7.4.5.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.7.4.6 Access rights per profiles

	Administrator	Operator	Viewer
TCP/IP	✓	✗	✗

3.7.4.6.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.7.4.7 CLI commands

netconf

Description

Tools to display or change the network configuration of the card.

Help

For Viewer and Operator profiles:

```
netconf -h
 Usage: netconf [OPTION]...
 Display network information and change configuration.

   -h, --help      display help page
   -l, --lan       display Link status and MAC address
   -4, --ipv4      display IPv4 Mode, Address, Netmask and Gateway
   -6, --ipv6      display IPv6 Mode, Addresses and Gateway
   -d, --domain    display Domain mode, FQDN, Primary and Secondary DNS
```

For Administrator profile:

```
netconf -h
 Usage: netconf [OPTION]...
 Display network information and change configuration.
  -h, --help      display help page
  -l, --lan       display Link status and MAC address
  -d, --domain    display Domain mode, FQDN, Primary and Secondary DNS
  -4, --ipv4      display IPv4 Mode, Address, Netmask and Gateway
  -6, --ipv6      display IPv6 Mode, Addresses and Gateway
    Set commands are used to modify the settings.
  -s, --set-lan <link speed>
      Link speed values:
      auto       Auto negotiation
      10hf       10 Mbps - Half duplex
      10ff       10 Mbps - Full duplex
      100hf      100 Mbps - Half duplex
      100ff      100 Mbps - Full duplex
      1000ff     1.0 Gbps - Full duplex
  -f, --set-domain hostname <hostname>    set custom hostname
  -f, --set-domain <mode>
          Mode values:
          - set custom Network address, Netmask and Gateway:
              manual <domain name> <primary DNS> <secondary DNS>
          - automatically set Domain name, Primary and Secondary DNS
              dhcp
  -i, --set-ipv4 <mode>
          Mode values:
          - set custom Network address, Netmask and Gateway
              manual <network> <mask> <gateway>
          - automatically set Network address, Netmask and Gateway
              dhcp
  -x, --set-ipv6 <status>
          Status values:
          - enable IPv6
              enable
```

```
          - disable IPv6
              disable
  -x, --set-ipv6 <mode>
          Mode values:
          - set custom Network address, Prefix and Gateway
              manual <network> <prefix> <gateway>
          - automatically set Network address, Prefix and Gateway
              router
Examples of usage:
-> Display Link status and MAC address
     netconf -l
-> Set Auto negotiation to Link
     netconf --set-lan auto
-> Set custom hostname
     netconf --set-domain hostname ups-00-00-00-00-00-00
-> Set Adress, Netmask and Gateway
     netconf --set-ipv4 manual 192.168.0.1 255.255.255.0 192.168.0.2
-> Disable IPv6
```

Examples of usage

```
 -> Display Link status and MAC address
      netconf -l
 -> Set Auto negotiation to Link
      netconf -s auto
 -> Set custom hostname
      netconf -f hostname ups-00-00-00-00-00-00
 -> Set Adress, Netmask and Gateway
      netconf -i manual 192.168.0.1 255.255.255.0 192.168.0.2
 -> Disable IPv6
      netconf -6 disable
```

ping and ping6

Description

Ping and ping6 utilities are used to test network connection.

Help

```
ping
  The ping utility uses the ICMP protocol's mandatory ECHO_REQUEST datagram
  to elicit an ICMP ECHO_RESPONSE from a host or gateway.  ECHO_REQUEST
  datagrams (``pings'') have an IP and ICMP header, followed by a ``struct
  timeval'' and then an arbitrary number of ``pad'' bytes used to fill out
  the packet.

  -c               Specify the number of echo requests to be sent
  -h               Specify maximum number of hops
  <Hostname or IP>  Host name or IP address
```

```
ping6
```

```
  The ping6 utility uses the ICMP protocol's mandatory ECHO_REQUEST datagram
  to elicit an ICMP ECHO_RESPONSE from a host or gateway.  ECHO_REQUEST
  datagrams (``pings'') have an IP and ICMP header, followed by a ``struct
  timeval'' and then an arbitrary number of ``pad'' bytes used to fill out
  the packet.

  -c                Specify the number of echo requests to be sent
  <IPv6 address>    IPv6 address
```

traceroute and traceroute6

Description

Traceroute and traceroute6 utilities are for checking the configuration of the network.

Help

```
traceroute
  -h                Specify maximum number of hops
  <Hostname or IP>  Remote system to trace
```

```
traceroute6
  -h                Specify maximum number of hops
  <IPv6 address>    IPv6 address
```

3.7.4.7.1 For other CLI commands

See the CLI commands in the Information>>>CLI section.

3.7.4.8 Save and Restore

	SRR section	SRR sub section	Settings	Sub settings	Possible values
Ethernet	network Interfaces	link	config		0
DNS/ DHCP		domain	mode		1
			manual	domain Name	String: refer to default settings an possible parameters for constraints.
			dns	preferredServer alternateServer	xx.xxx.xx.xx xx.xxx.xx.xx

IPv4	ipv4	enabled		true/false
		dhcpEnabled		true/false
		manual	address	xx.xxx.xx.xx
			subnet Mask	xxx.xxx.xxx.x
			gateway	xx.xxx.xx.x
IPv6	ipv6	enabled		true/false
		addressing		*
		mode		*
		manual	address	*
			prefixLength	*
			gateway	*
Hostname	Hostname			String: refer to default settings an possible parameters for constraints.

3.7.4.8.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.7.5 Firewall

This page allows to set the firewall settings to filter incoming network packets by defining a set of rules based on network, IP addresses and ports combinations.

Below settings can be done for each protocols:

- Communication through ETH0, ETH1 can be activated or not.
- Port can be set for ETH0 and ETH1.
- An IP whitelists can be defined for ETH0 and ETH1.

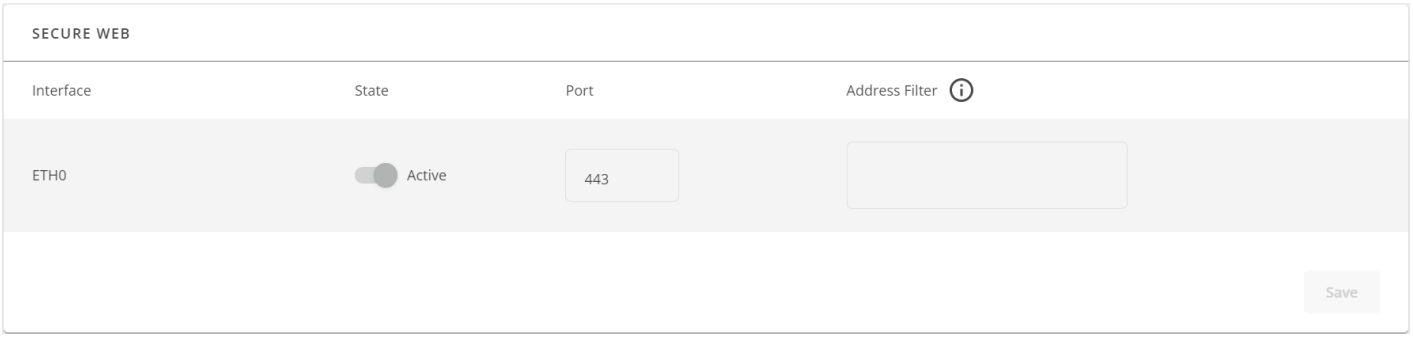
By default the firewall comes with a **predefined set of network services**

- Web UI (service always enabled at first boot, otherwise no configuration of the firewall is possible by the user)
- SSH
- SNMP
- MQTT
- Ping capabilities
- MODBUS

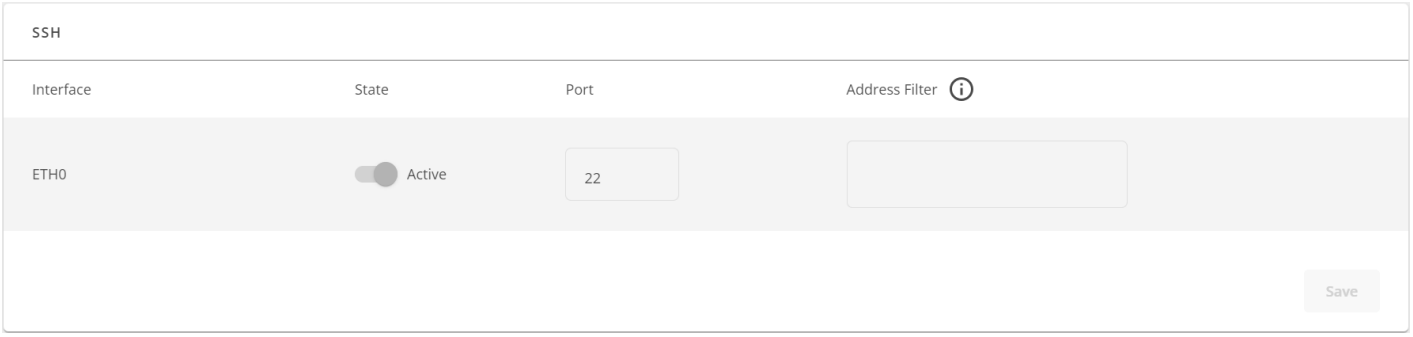
All other network services are disabled by default for remote access and can be configured afterwards.

3.7.5.1 HTTP redirect to HTTPS

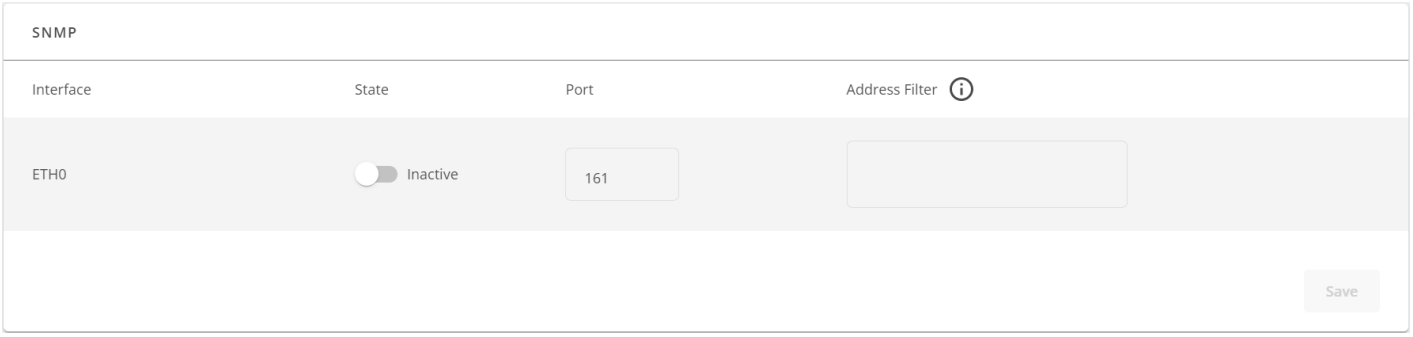
3.7.5.2 Secure web (HTTPS)



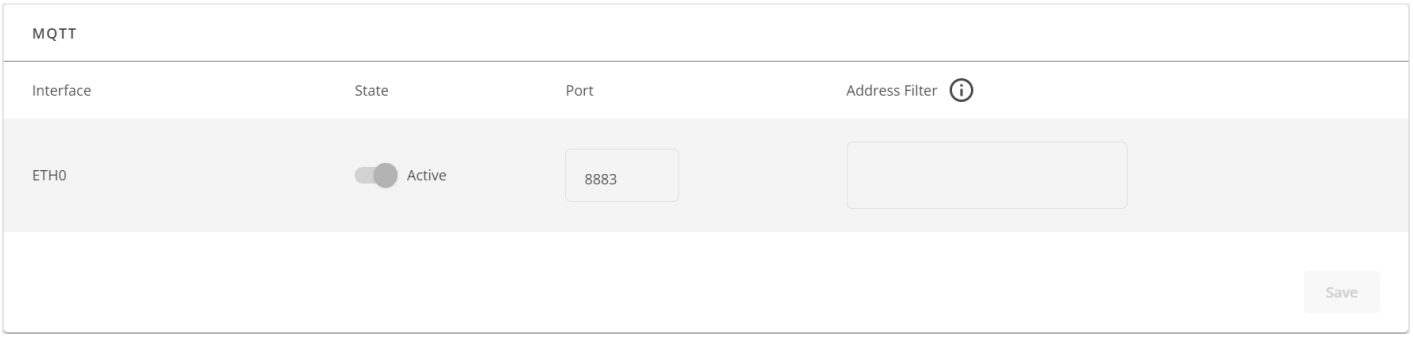
3.7.5.3 SSH



3.7.5.4 SNMP



3.7.5.5 MQTT



3.7.5.6 MODBUS

3.7.5.7 ICMP V4

3.7.5.8 ICMP V6

3.7.5.9 Default settings and possible parameters - Firewall

	Default setting	Possible parameters

Firewall - WEB	State : Active Port : 80 Address Filter : Empty	Active / Inactive Integer IP address
Firewall - Secure WEB	State : Active Port : 443 Address Filter : Empty	Active / Inactive Integer IP address
Firewall - SSH	State : Active Port : 22 Address Filter : Empty	Active / Inactive Integer IP address
Firewall - SNMP	State : Inactive Port : 161 Address Filter : Empty	Active / Inactive Integer IP address
Firewall - MQTT	State : Active Port : 8883 Address Filter : Empty	Active / Inactive Integer IP address
Firewall - MODBUS	State : Inactive Port : 502 Address Filter : Empty	Active / Inactive Integer IP address
Firewall - ICMP V4	State : Active	Active / Inactive
Firewall - ICMP V6	State : Active	Active / Inactive

3.7.5.9.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.7.5.10 Access rights per profiles

	Administrator	Operator	Viewer
Firewall	✓	✗	✗

3.7.5.10.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.7.5.11 Save and Restore

	SRR section	Interface	SRR sub section	Settings	Sub settings	Possible values
ICMP	Firewall	ETH*x*	ICMP	V4	Enabled	true/false
				V6	Enabled	true/false

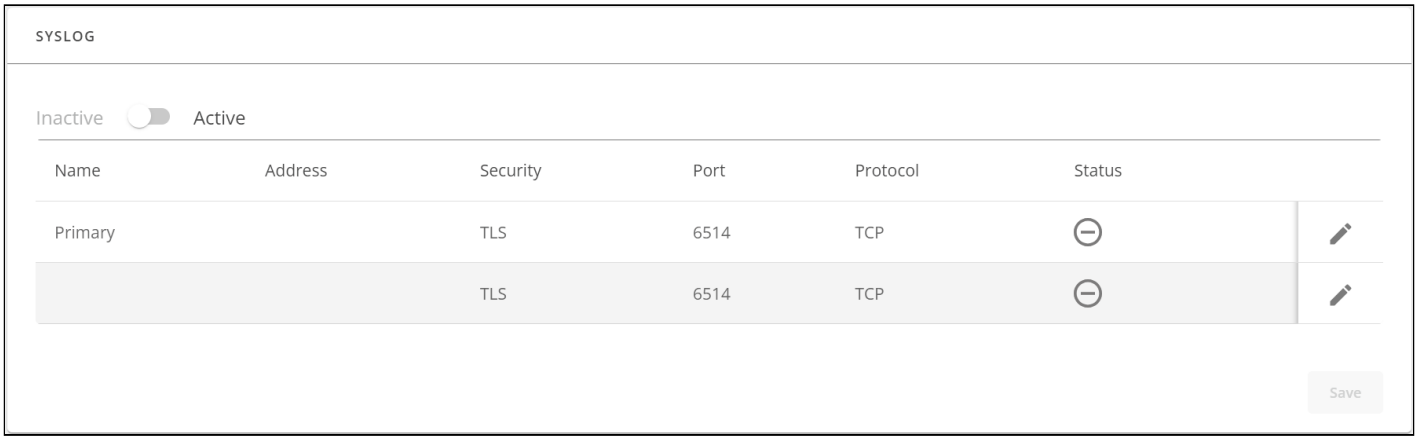
HTTP_REDIRECT			HTTP_REDIRECT	Enabled	true/false
				port	Number : refer to default settings an possible parameters for constraints.
				address (White list)	xx.xxx.xx.xx
SECURE_WEB			SECURE_WEB	Enabled	true/false
				port	Number : refer to default settings an possible parameters for constraints.
				address (White list)	xx.xxx.xx.xx
SSH			SSH	Enabled	true/false
				port	Number : refer to default settings an possible parameters for constraints.
				address (White list)	xx.xxx.xx.xx
SNMP			SNMP	Enabled	true/false
				port	Number : refer to default settings an possible parameters for constraints.
				address (White list)	xx.xxx.xx.xx
MQTT			MQTT	Enabled	true/false
				port	Number : refer to default settings an possible parameters for constraints.
				address (White list)	xx.xxx.xx.xx
MODBUS			MODBUS	Enabled	true/false
				port	Number : refer to default settings an possible parameters for constraints.
				address (White list)	xx.xxx.xx.xx

3.7.5.11.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.7.6 Protocols

3.7.6.1 Syslog



3.7.6.1.1 Settings

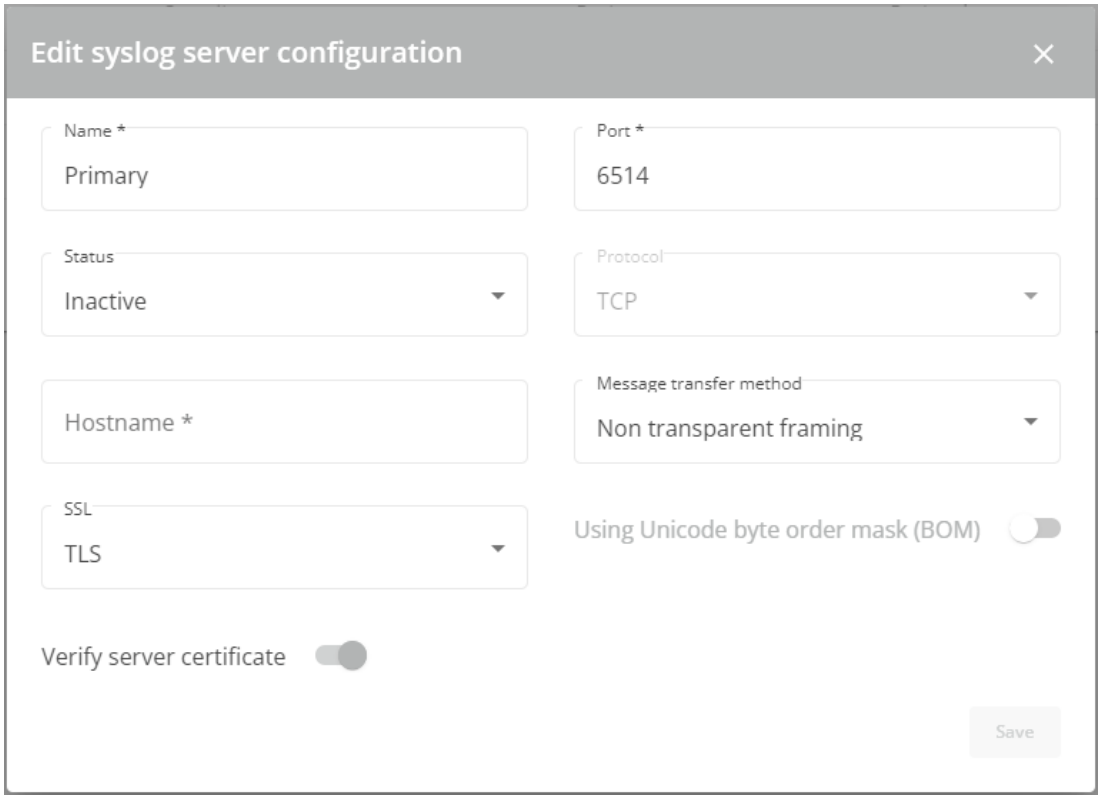
This screen allows an administrator to configure up to two syslog servers.

To configure the syslog server settings:

1- **Enable** syslog.

Press **Save** after modifications.

2- **Configure** the syslog server:



- Click the edit icon to access settings.
- Enter or change the server name.
- Select **Yes** in the Active drop-down list to activate the server.

- Enter the Hostname and Port.
- Select the Protocol – UDP/TCP.
- In TCP, select the message transfer method – Octet counting/Non-transparent framing.
- Select the option Using Unicode BOM if needed.
- Press **Save** after modifications.

3.7.6.2 Default settings and possible parameters - Protocols

	Default setting	Possible parameters
Syslog	Inactive • Server#1 Name – Primary Status – Disabled Hostname – empty Port – 6514 Protocol – TCP Message transfer method – Non transparent framing Using unicode byte order mask (BOM) – disabled • Server#2 Name – empty Status – Disabled Hostname – empty Port – 6514 Protocol – TCP Message transfer method – Non transparent framing Using unicode byte order mask (BOM) – disabled	Inactive/Active • Server#1 Name – 128 characters maximum Status – Disabled/Enabled Hostname – 128 characters maximum Port – x-xxx Protocol – UDP/TCP Message transfer method(in TCP) – Non transparent framing/Octet counting Using unicode byte order mask (BOM) – disable/enable • Server#2 Name – 128 characters maximum Status – Disabled/Enabled Hostname – 128 characters maximum Port – x-xxx Protocol – UDP/TCP Message transfer method (in TCP) – Non transparent framing/Octet counting Using unicode byte order mask (BOM) – disable/enable

3.7.6.2.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.7.6.3 Access rights per profiles

	Administrator	Operator	Viewer
Protocols	✓	✗	✗

3.7.6.3.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.7.6.4 Save and Restore

	SRR section	SRR sub section	Settings	Sub settings	Possible values
Syslog	rsyslog	**certificates**	ca trustedClient		*
		Settings	enabled		true/false
		servers	name		String: refer to default settings an possible parameters for constraints.
			enabled		true/false
			hostname		String: refer to default settings an possible parameters for constraints.
			protocol		1: UDP 2: TCP
			port		Number: refer to default settings an possible parameters for constraints.
			tcpFraming		1: TRADITIONAL 2: OCTET_COUNTING
			usingByteOrderMask		true/false
			security	ssl	*
				verifyTlsCert	true/false

3.7.6.4.1 Additional information

For details on Save and Restore, see the Save and Restore section.

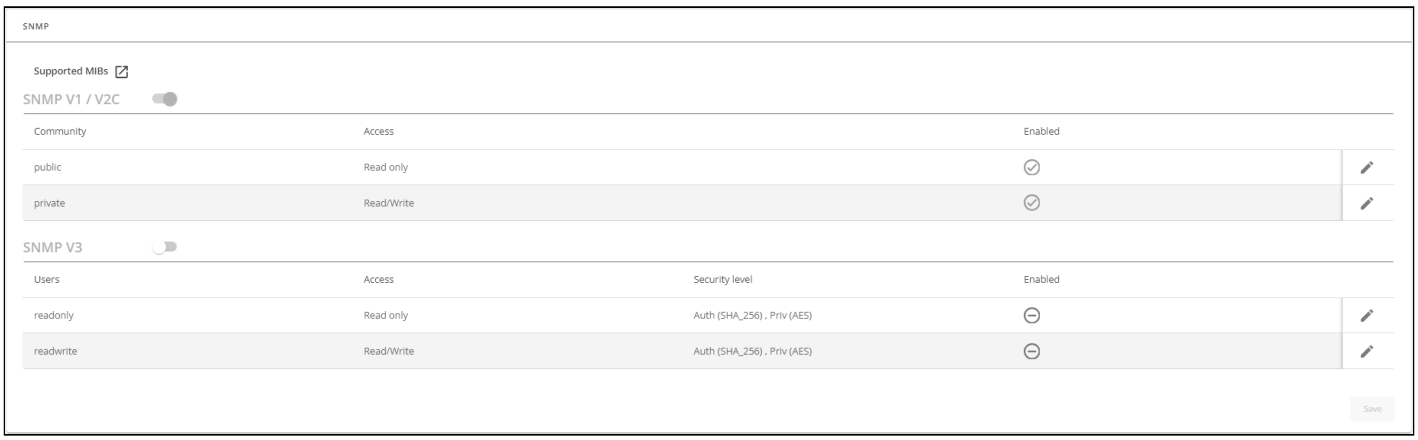
3.7.7 SNMP

This tab contains settings for SNMP protocols used for network management systems.

Changes to authentication settings need to be confirmed by entering a valid password for the active user account.

3.7.7.1 SNMP tables

The default port for SNMP is 161 and normally this should not be changed. Some organizations prefer to use non-standard ports due to cybersecurity, and this field allows that.



SNMP monitoring Battery status, power status, events, and traps are monitored using third-party SNMP managers.

To query SNMP data, you do not need to add SNMP Managers to the Notified Application page.

To set-up SNMP managers:

- Configure the IP address.
- Select SNMP v1/v2 or v3.
- Compile the MIB you selected to be monitored by the SNMP manager.

List of supported MIBs: *Standard IETF UPS MIB (RFC 1628) | EPPC*

Press the **Supported MIBs** button to download the MIBs.

3.7.7.1.1 Settings

This screen allows an administrator to configure SNMP settings for computers that use the MIB to request information from the Network Module.

Default ports for SNMP are 161 (SNMP v1 and v3, set/get) and 162 (traps). These ports can be changed on the settings screen for additional security.

To configure the SNMP settings:

a Enable the SNMP agent

In addition to this, v1/V2C and/or v3 must be enabled, along with appropriate communities and activated user accounts to allow SNMP communication.

Press **Save** after modifications.

b Configure the SNMP V1/V2C settings:

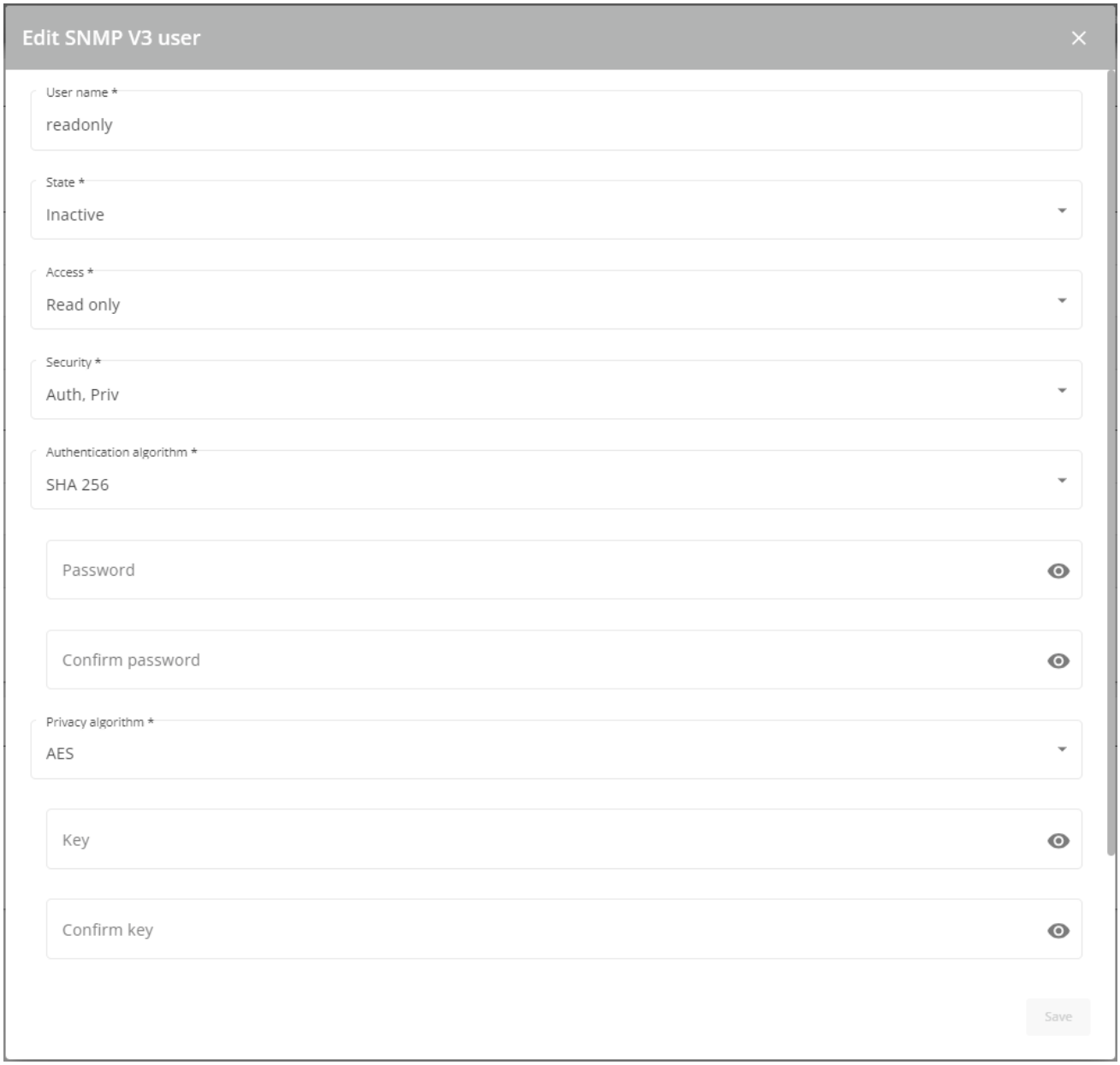
1. Click the edit icon on either Read Only or Read/Write account to access settings:

2. Enter the SNMP Community Read-Only string. The Network Module and the clients must share the same community name to communicate.

3. Select **Active** in the Enabled drop-down list to activate the account.

4. Access level is set to display information only.

c Configure the SNMP V3 settings:



1. Click the edit icon on either Read Only or Read/Write account to access settings:
2. Edit the user name.
3. Select **Active** in the Enabled drop-down list to activate the account.
4. Select access level.
   - **Read only**—The user does not use authentication and privacy to access SNMP variables.
   - **Read/Write**—The user must use authentication, but not privacy, to access SNMP variables.
5. Select the communication security mechanism.
   - **Auth, Priv**—Communication with authentication and privacy.
   - **Auth, No Priv**—Communication with authentication and without privacy.
   - **No Auth, No Priv**—Communication without authentication and privacy.
6. If Auth is selected on the communication security mechanism, select the Authentication algorithms.

It is recommended to set SHA256/SHA384/SHA512 with the AES192/AES256 Privacy algorithms.

- SHA— SHA1 is not recommended as it is not secured.
- SHA256—fill in password and privacy keys. The password can be between 8 and 24 characters and use a combination of alphanumeric and the following special characters <>&@#%_=:;,./?|$*.
- SHA384—fill in password and privacy keys. The password can be between 8 and 24 characters and use a combination of alphanumeric and the following special characters <>&@#%_=:;,./?|$*.
- SHA512—fill in password and privacy keys. The password can be between 8 and 24 characters and use a combination of alphanumeric and the following special characters <>&@#%_=:;,./?|$*.
- AES / AES192 / AES256

7. If Priv is selected on the communication security mechanism, select the Privacy algorithms.

It is recommended to set AES192/AES256 with the SHA256/SHA384/SHA512 Authentication algorithms.

- AES— fill in password and privacy keys. The password can be between 8 and 24 characters and use a combination of alphanumeric and the following special characters <>&@#%_=:;,./?|$*.
- AES192—fill in password and privacy keys. The password can be between 8 and 24 characters and use a combination of alphanumeric and the following special characters <>&@#%_=:;,./?|$*.
- AES256—fill in password and privacy keys. The password can be between 8 and 24 characters and use a combination of alphanumeric and the following special characters <>&@#%_=:;,./?|$*.

8. Enter your own login password and click **Save**.

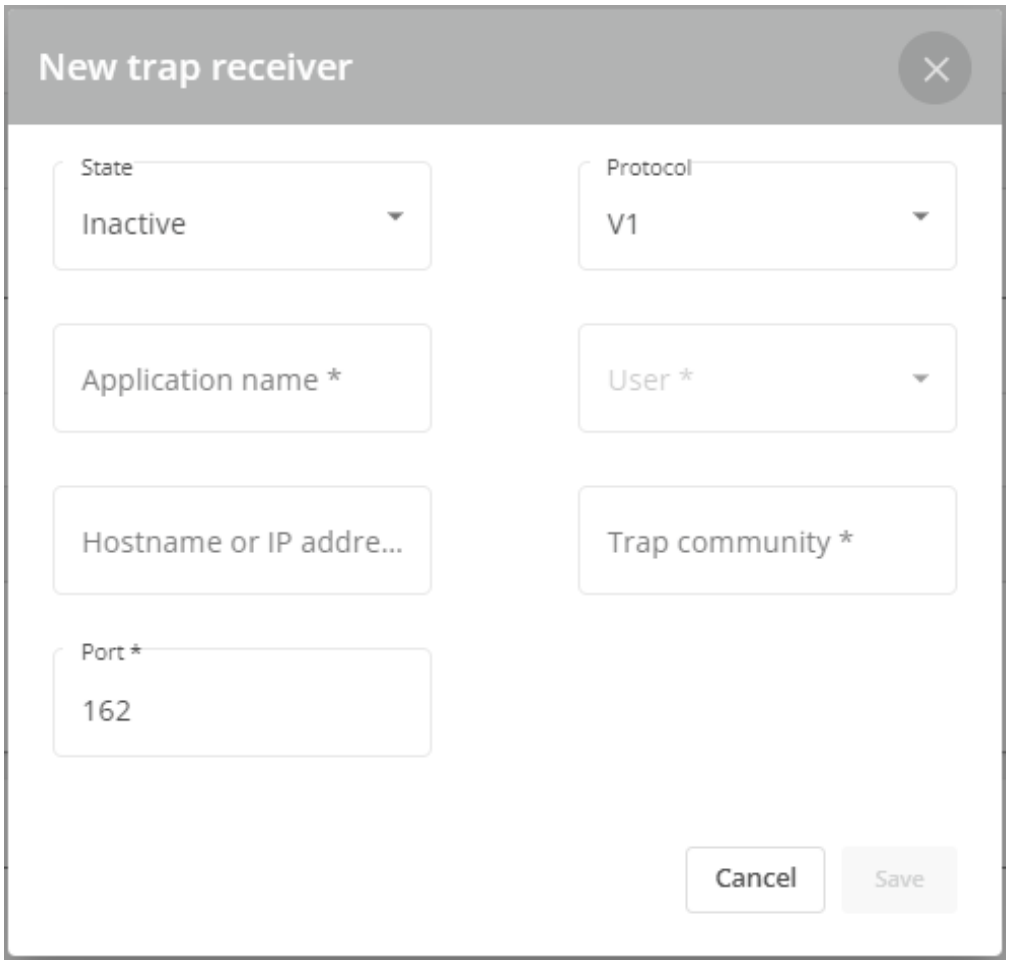
3.7.7.2 Trap receivers

The table shows all the trap receivers and includes the following details:

- Application name
- Host
- Protocol
- Port
- **Status:** Active/Inactive/Error(configuration error)

3.7.7.2.1 Actions

a Add



1. Press the **New** button to create new trap receivers.
2. Set following settings:
   - Enabled – Yes/No
   - Application name
   - Hostname or IP address
   - Port
   - Protocol – V1/V2C/V3
   - Trap community (V1/V2C) / User (V3)
3. Press the **SAVE** button.

b Remove

Select a trap receiver and press the **Delete** button to remove it.

c Edit

Press the pen icon to edit trap receiver information and access to its settings:

d Test trap

Press the **Test trap** button to send the trap test to all trap receivers.

Separate window provides the test status with following values:

- In progress
- Request successfully sent
- invalid type

For details on SNMP trap codes, see the Information>>>SNMP traps section.

e MIB Configuration

Press the MIB configuration button to filter the MIBs on which the traps will be applied. This way you may avoid duplicate information if several MIBs are available on your product.

3.7.7.3 Specifics

3.7.7.4 Link to SNMP traps

3.7.7.5 Default settings and possible parameters - SNMP

	Default setting	Possible parameters

SNMP	Activate SNMP — disabled Port — 161 SNMP V1/V2 — disabled • Community #1 — public Enabled — Inactive Access — Read only • Community #2 — private Enabled — Inactive Access — Read/Write SNMP V3 — disabled • User #1 — Read only Enabled — Inactive Access — Read only Authentication — Auth (SHA_256) Password — empty Confirm password — empty Privacy — Secured - AES Key — empty Confirm key — empty • User#2 — Read/Write Enabled — Inactive Access — Read/Write Authentication — Auth (SHA_256) Password — empty Confirm password — empty Privacy — Secured - AES Key — empty Confirm key — empty	Activate SNMP — disable/enable Port — x-xxx SNMP V1/V2 — disable/enable • Community #1 — 128 characters maximum Enabled — Inactive/Active Access — Read only • Community #2 — 128 characters maximum Enabled — Inactive/Active Access — Read/Write SNMP V3 — disable/enable • User #1 — 32 characters maximum Enabled — Inactive/Active Access — Read only/Read-Write Authentication — Auth (SHA/SHA_256/SHA_384/SHA_512)/None Password — 128 characters maximum Confirm password — 128 characters maximum Privacy — Secured - AES/AES_192/AES_256/None Key — 128 characters maximum Confirm key — 128 characters maximum • User#2 — 32 characters maximum Enabled — Inactive/Active Access — Read only/Read-Write Authentication — Auth (SHA/SHA_256/SHA_384/SHA_512)/None Password — 128 characters maximum Confirm password — 128 characters maximum Privacy — Secured - AES/AES_192/AES_256/None Key — 128 characters maximum Confirm key — 128 characters maximum
Trap receivers	No trap	Enabled — No/Yes Application name — 128 characters maximum Hostname or IP address — 128 characters maximum Port — x-xxx Protocol — V1/V2C/V3 Trap community — 128 characters maximum

3.7.7.5.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.7.7.6 Access rights per profiles

	Administrator	Operator	Viewer
SNMP	✓	✗	✗

3.7.7.6.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.7.7.7 Troubleshooting

3.7.7.7.1 For other issues

For details on other issues, see the Troubleshooting section.

3.7.7.8 Save and Restore

	SRR section	SRR sub section	Settings	Sub settings	Example
SNMP	snmp		enabled		true
			port		Number: refer to default settings an possible parameters for constraints.
		v1	enabled		true
			communities	readOnly	
				Name	String: refer to default settings an possible parameters for constraints.
				Enabled	
				readWrite	
				Name	String: refer to default settings an possible parameters for constraints.
				Enabled	true/false
		v3	enabled		true
			users	name	String: refer to default settings an possible parameters for constraints.
				allowWrite	true/false
				enabled	true/false
				auth	
				enabled	true/false
				algorithm	*
				password	

				plaintext	String: refer to default settings an possible parameters for constraints.
				cyphered	-
				priv	
				enabled	true/false
				algorithm	*
				password	
				plaintext	String: refer to default settings an possible parameters for constraints.
				cyphered	-
				name	String: refer to default settings an possible parameters for constraints.
				allowWrite	true/false
				enabled	true/false
				auth	
				enabled	true/false
				algorithm	*
				password	
				plaintext	String: refer to default settings an possible parameters for constraints.
				cyphered	-
				priv	
				enabled	true/false
				algorithm	*
				password	
				plaintext	String: refer to default settings an possible parameters for constraints.
				cyphered	-
		traps	receivers	name	String: refer to default settings an possible parameters for constraints.
				host	*

				port	Number: refer to default settings an possible parameters for constraints.
				community	*
				protocol	1 : V1 2 : V2C 3 : V3
				user	*
				enabled	true/false

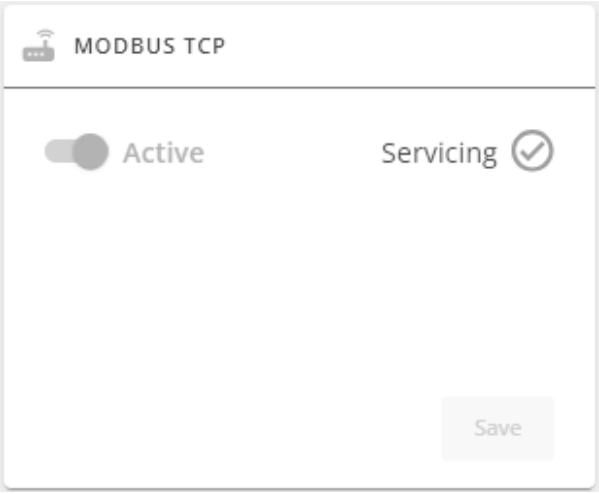
3.7.7.8.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.7.8 Industrial protocols

3.7.8.1 Configuration

3.7.8.1.1 Modbus TCP

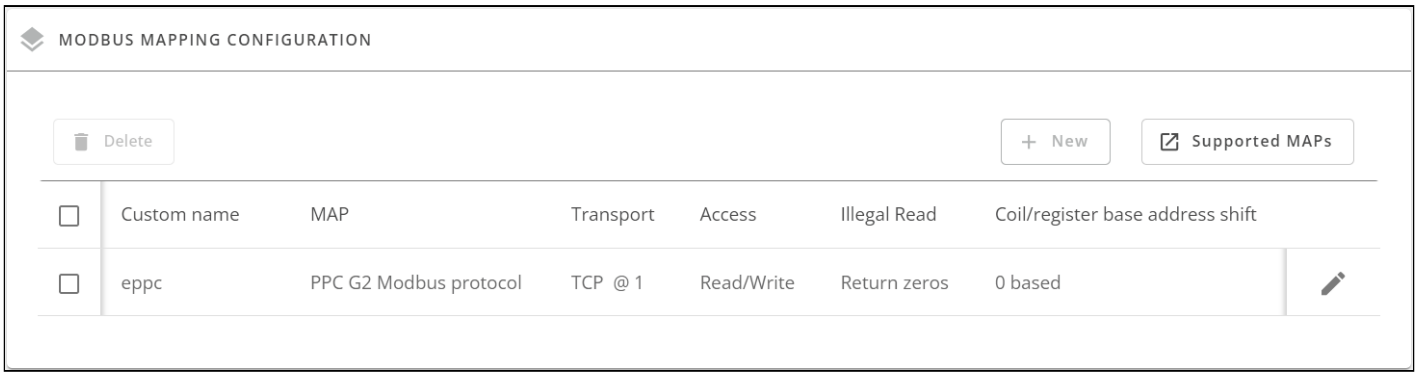


Modbus TCP session idle timeout : 300s

The following Modbus TCP settings are configurable:

- **Enable / Disable**

3.7.8.2 Mapping configuration



3.7.8.2.1 Mapping configuration table

The table shows all the mapping configuration and includes the following details:

- Custom name
- MAP
- Transport
- Access
- Illegal read
- Coil/register base address shift

3.7.8.2.2 Actions

a Add

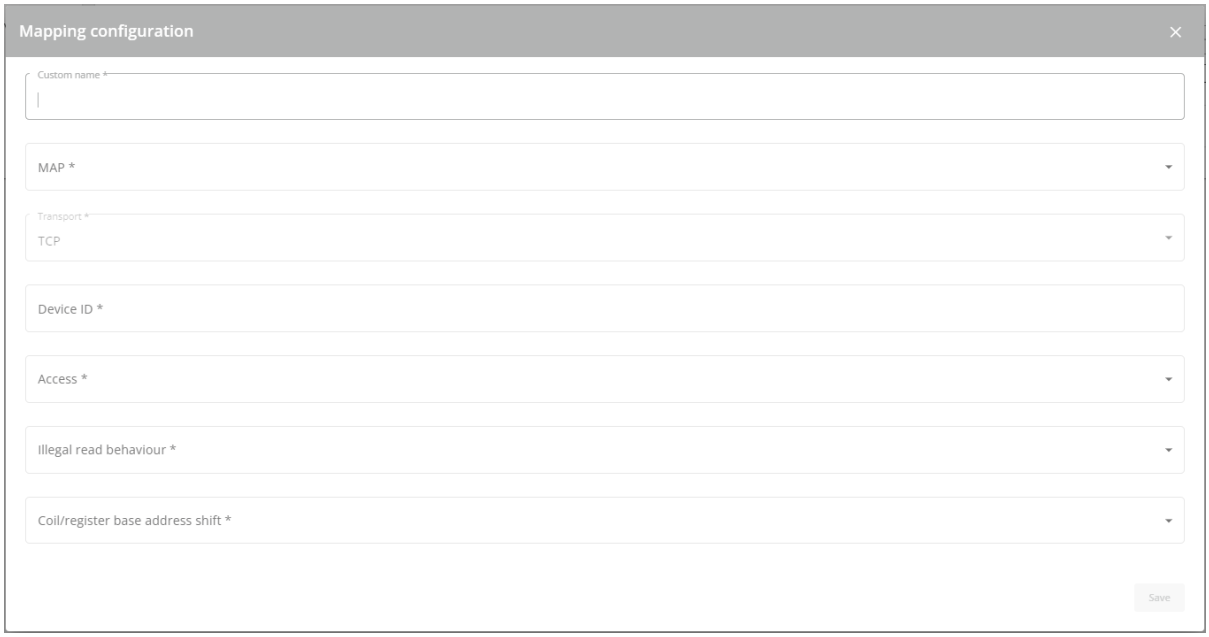
Press the **New** button to create new mapping configuration.

b Remove

Select a mapping configuration and press the **Delete** button to remove it.

c Edit

Press the pen logo to edit mapping configuration:



You will get access to the following settings:

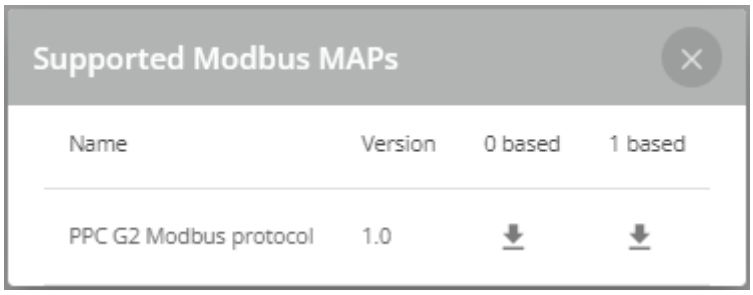
- Custom name
- MAP
- Transport
- Device ID & conventional alternative ids you may choose

MAP	Conventional IDs
Uid-0	0, 1 , 247, 255
Uid 244	244
Uid 245	245, 253
Uid 140	144

- Illegal read behaviour
- Coil/register base address shift

d Supported MAPs

Press the **Supported MAPs** button to download the MAPs.



File is generated in real time and will take into account the Device capabilities and values at the time of the generation.
Table in the downloaded file will show all possible registers, only the one showing Available equal to True will be supported by your system.

Mapping file content:

- Address (hex, 0/1-based): register address in hexadecimal
- Address (dec, 0/1 based): register address in decimal
- Type: Register/Discrete
- Size in bytes
- Number of Modbus registers
- Writable: True/False
- Representation: Int16/Uint16/String/Boolean/...
- Name
- Description
- Unit
- Status to 0: status when the register equal 0
- Status to 1: status when the register equal 1
- Available: True/False - Shows if the register is available on current Device
- Value: Shows current value of the register on current Device

3.7.8.3 Specifics

3.7.8.4 Default settings and possible parameters - Industrial protocols

	Default setting	Possible parameters
Modbus TCP	Modbus TCP — Inactive Port — 502	Modbus TCP — Inactive/Active Port — x-xxx

	Default setting	Possible parameters
Mapping configuration	No mapping	Custom name – 128 characters maximum Map – PPC G2 Modbus protocol Transport – TCP Access – None/Read only/Read/Write Illegal read behaviour – Return exception/Return zeros Coil/register base address shift – No shift/Shift by 1 (JBUS)

3.7.8.4.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.7.8.5 Access rights per profiles

	Administrator	Operator	Viewer
Industrial protocols/Modbus*	✓	✗	✗

3.7.8.5.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.7.8.6 Troubleshooting

Modbus communication doesn't work

Symptoms

- Communication doesn't work

Refer to the section Servicing the Network Management Module>>>Configuring Modbus to get configuration and testing information.

Possible cause

- Incorrect communication parameters.

Verify that the communication parameters are set to the desired settings.

Contextual help>>>Settings>>>Modbus>>>Modbus TCP

For Modbus TCP configuration refer to the section .

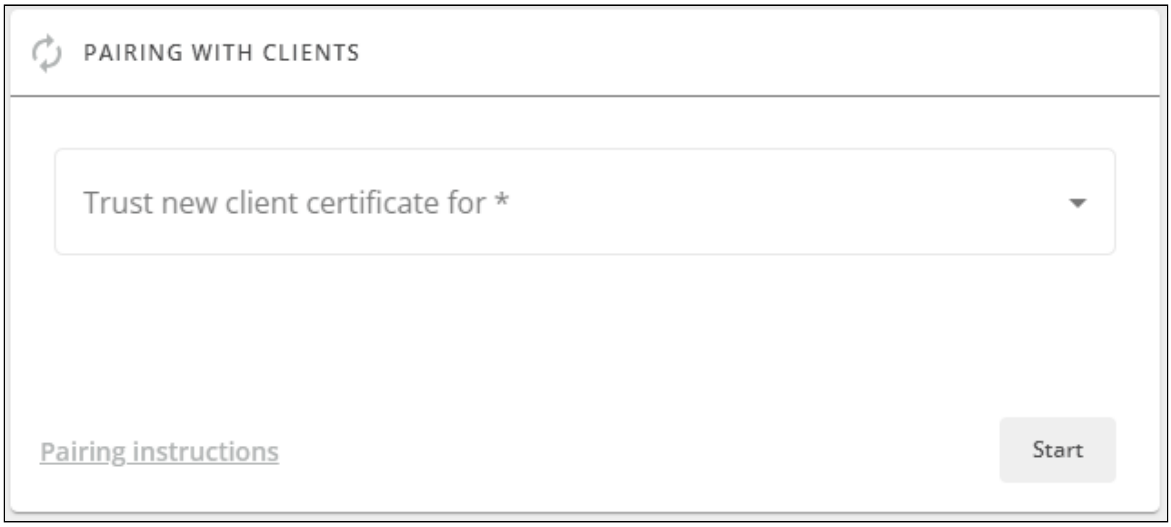
3.7.8.6.1 For other issues

For details on other issues, see the Troubleshooting section.

3.7.9 Certificate

3.7.9.1 Pairing with clients

For details on pairing instructions, follow the link **pairing instructions** in the tile or see the Servicing the Network Management Module*>>>Pairing agent to the Network Module* section.



During the selected timeframe, new connections to the Network Module are automatically trusted and accepted.

After automatic acceptance, make sure that all listed clients belong to your infrastructure. If not, access may be revoked using the Delete button.

The use of this automatic acceptance should be restricted to a secured and trusted network.

For maximum security, we recommend following one of the two methods on the certificate settings page:

- Import agent's certificates manually.
- Generate trusted certificate for both agents and Network Module using your own PKI.

3.7.9.1.1 Actions

a Start

Starts the pairing window during the selected timeframe or until it is stopped.

Time countdown is displayed.

b Stop

Stops the pairing window.

3.7.9.2 Local certificates

Manage local certificates by :

- Generating CSR and import certificates signed by the CA.
- Generating new self-signed certificates.

3.7.9.2.1 Local certificates table

The table shows the following information for each local certificate.

- Used for
- Issued by
- CSR pending
- Valid from
- Expiration
- Status — valid, expires soon, or expired

3.7.9.2.2 Actions

a Revoke

This action will take the selected certificate out of use.

Select the certificate to revoke, and then press the **Revoke** button.

A confirmation window appears, press **Continue** to proceed, this operation cannot be recovered.

Revoke will replace current certificate by a new self-signed certificate.
This may disconnect connected applications:
- Web browsers
- Shutdown application
- Monitoring application
The certificate that is taken out of use with the revoke action cannot be recovered.

b Export

Exports the selected certificate on your OS browser window.

c Configure issuer

Press the **Configure issuer** button.

A configuration window appears to edit issuer data.

- Common name (CN)
- Country (C)
- State or Province (ST)
- City or Locality (L)
- Organization name (O)
- Organization unit (OU)
- Contact email address

Press **Save** button.

Issuer configuration will be applied only after the revoke of the certificate.

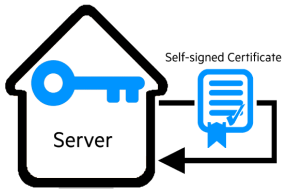
d Edit

Press the pen logo:

You will get access to the following:

- Certificate summary
- Actions
  - Generate a new self-signed certificate
  - Generate a certificate signing request (CSR)
  - Generate a certificate signing request excluding IP addresses (CA / CB compliance)
  - Import certificate (only available when CSR is generated).
- Details

e Generate a new self-signed certificate



To replace a selected certificate with a new self-signed certificate.

This may disconnect applications such as a Web browser, shutdown application, or monitoring application.

This operation cannot be recovered.

f Create new certificates:

g CSR

Press **Generate Signing Request** button in the in the certificate edition.

The CSR is automatically downloaded.

CSR must be signed with the CA, which is managed outside the card.

h Import certificate

When the CSR is signed by the CA, it can be imported into the Network Module.

When the import is complete, the new local certificate information is displayed in the table.

Regarding the automating renewal:
- In case of expiration, a signed certificate will not renew itself and will be marked invalid / expired.
- In case of network configuration changes (hostname, static IP, etc...), even a signed certificate might be replaced by a self signed if it becomes invalid

3.7.9.3 Certificate authorities (CA)

Manages CAs.

3.7.9.3.1 CA table

The table displays certificate authorities with the following details:

- Used for
- Issued by
- Issued to
- Valid from
- Expiration
- Status — valid, expires soon, or expired

3.7.9.3.2 Actions

a Import

When importing the CA, you must select the associated service, and then upload process can begin through the OS browser window.

b Revoke

Select the certificate to revoke, and then press the **Revoke** button.

A confirmation window appears, press **Continue** to proceed, this operation cannot be recovered.

Export
Exports the selected certificate on your OS browser window.

c Edit

Press the pen logo to access to the certificate summary:

3.7.9.4 Trusted remote certificates

The table shows the following information for each trusted remote certificate.

- Used for
- Issued by
- Issued to
- Valid from
- Expiration
  In case a certificate expires, the connection with the client will be lost. If this happens, the user will have to recreate the connection and associated certificates.
- Status — valid, expires soon, or expired

3.7.9.4.1 Actions

a Import

When importing the client certificate, you must select the associated service, and then upload process can begin through the OS browser window.

b Revoke

Select the certificate to revoke, and then press the **Revoke** button.

A confirmation window appears, press **Continue** to proceed, this operation cannot be recovered.

c Edit

Press the pen logo to the certificate summary: 

3.7.9.5 Specifics

3.7.9.6 Default settings and possible parameters - Certificate

	Default setting	Possible parameters
Local certificates	Common name — Service + Hostname + selfsigned Country — CN - China State or Province — Guangdong City or Locality — Shenzhen Organization name — blank Organization unit — blank Contact email address — blank	Common name — 64 characters maximum Country — Country code State or Province — 64 characters maximum City or Locality — 64 characters maximum Organization name — 64 characters maximum Organization unit — 64 characters maximum Contact email address — 64 characters maximum

3.7.9.6.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.7.9.7 Access rights per profiles

	Administrator	Operator	Viewer
Certificate	✓	✗	✗

3.7.9.7.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.7.9.8 CLI commands

Certificate

3.7.9.8.1 For other CLI commands

See the CLI commands in the Information>>>CLI section.

3.7.9.9 Troubleshooting

Software is not able to communicate with the Network module

Symptoms

- In the Network Module, in Contextual help>>>Protection>>>Agent list>>>Agent list table, agent is showing "**Lost**" as a status.
- In the Network Module, in Contextual help>>>Settings>>>Certificate>>>Trusted remote certificates, the status of the Protected applications (MQTT) is showing **"Not valid yet"**.
- SPS G2/Winpower G2 shows "System time setting error" or "Add failed devices".

Possible cause

The SPS G2/Winpower G2 certificate is not yet valid for the Network Module.

Certificates of SPS G2/Winpower G2 and the Network Module are not matching so that authentication and encryption of connections between the Network Module and the shutdown agents is not working.

Setup

SPS G2/Winpower G2 is started.

Network module is connected to the UPS and to the network.

Action #1

Check if the SPS G2/Winpower G2 certificate validity for the Network Module.

STEP 1: Connect to the Network Module

- On a network computer, launch a supported web browser. The browser window appears.
- In the Address/Location field, enter: https://xxx.xxx.xxx.xxx/ where xxx.xxx.xxx.xxx is the static IP address of the Network Module.
- The log in screen appears.
- Enter the user name in the User Name field.
- Enter the password in the Password field.
- Click **Login**. The Network Module web interface appears.

STEP 2: Navigate to **Settings/Certificates** page

STEP 3: In the **Trusted remote certificates** section, check the status of the **Protected applications (MQTT)**.

If it is "**Valid"** go to Action#2 STEP 2, if it is "**Not yet valid"**, time of the need to be synchronized with SPS G2/Winpower G2.

STEP 4: Synchronize the time of the Network Module with SPS G2/Winpower G2 and check that the status of the **Protected applications (MQTT)** is now valid.

Communication will then recover, if not go to Action#2 STEP 2.

Action #2

Pair agent to the Network Module with automatic acceptance (recommended in case the installation is done in a secure and trusted network).

For manual pairing (maximum security), go to Servicing the Network Management Module*>>>Pairing agent to the Network Module* section and then go to STEP 2, item 1.

STEP 1: Connect to the Network Module.

- On a network computer, launch a supported web browser. The browser window appears.
- In the Address/Location field, enter: https://xxx.xxx.xxx.xxx/ where xxx.xxx.xxx.xxx is the static IP address of the Network Module.
- The log in screen appears.
- Enter the user name in the User Name field.
- Enter the password in the Password field.
- Click **Login**. The Network Module web interface appears.

STEP 2: Navigate to **Protection/Agents list** page.

STEP 3: In the **Pairing with shutdown agents** section, select the time to accept new agents and press the **Start** button and **Continue**. During the selected timeframe, new agent connections to the Network Module are automatically trusted and accepted.

STEP 4: Action on the agent (SPS G2/Winpower G2) while the time to accepts new agents is running on the Network Module

Try to search the Network Module and connect it.

Card wrong timestamp leads to "Full acquisition has failed" error message on Software

Symptoms:

SPS G2/Winpower G2 shows the error message "The full data acquisition has failed" even if the credentials are correct.

Possible cause:

The Network module timestamp is not correct.
Probably the MQTT certificate is not valid at Network module date.

Action:

Set the right date, time and timezone. If possible, use a NTP server, refer to Contextual help>>>Settings>>>General>>>System details>>>Time & date settings section.

3.7.9.9.1 For other issues

For details on other issues, see the Troubleshooting section.

3.7.9.10 Save and Restore

	SRR section	Settings	Example
Certificate issuer configuration	certificateSettings	country	String: refer to default settings an possible parameters for constraints.

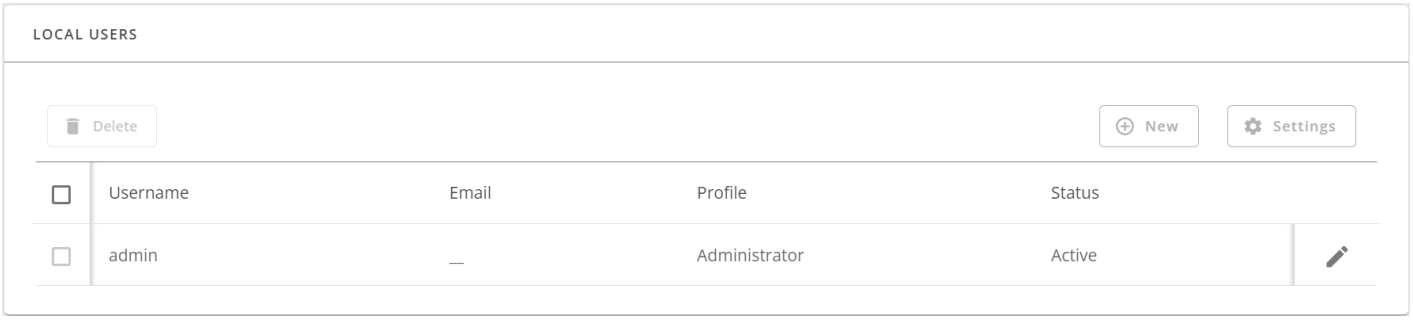
		state	String: refer to default settings an possible parameters for constraints.
		location	String: refer to default settings an possible parameters for constraints.
		organizationName	String: refer to default settings an possible parameters for constraints.
		organizationUnit	String: refer to default settings an possible parameters for constraints.
		contact	String: refer to default settings an possible parameters for constraints.
Local certificate (mqtt)	mqtt	**certificateData**	
		ca	*
		trustedClient	*

3.7.9.10.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.7.10 Local users

3.7.10.1 Local users table



The table shows all the supported local user accounts and includes the following details:

- **Username**
- **Email**
- **Profile**
- **Status –** Status could take following values – Inactive/Locked/Password expired/Active

For the list of access rights per profile refer to the section Full documentation>>>Information>>>Access rights per profiles.

3.7.10.1.1 Actions

a Add

Press the **New** button to add new local users.

You can add up to 20 local users. Kindly note that above 10 users connected simultaneously, it is likely to consume a lot of CPU resources resulting in slower card performance.

b Remove

Select a user and press the **Delete** button to remove it.

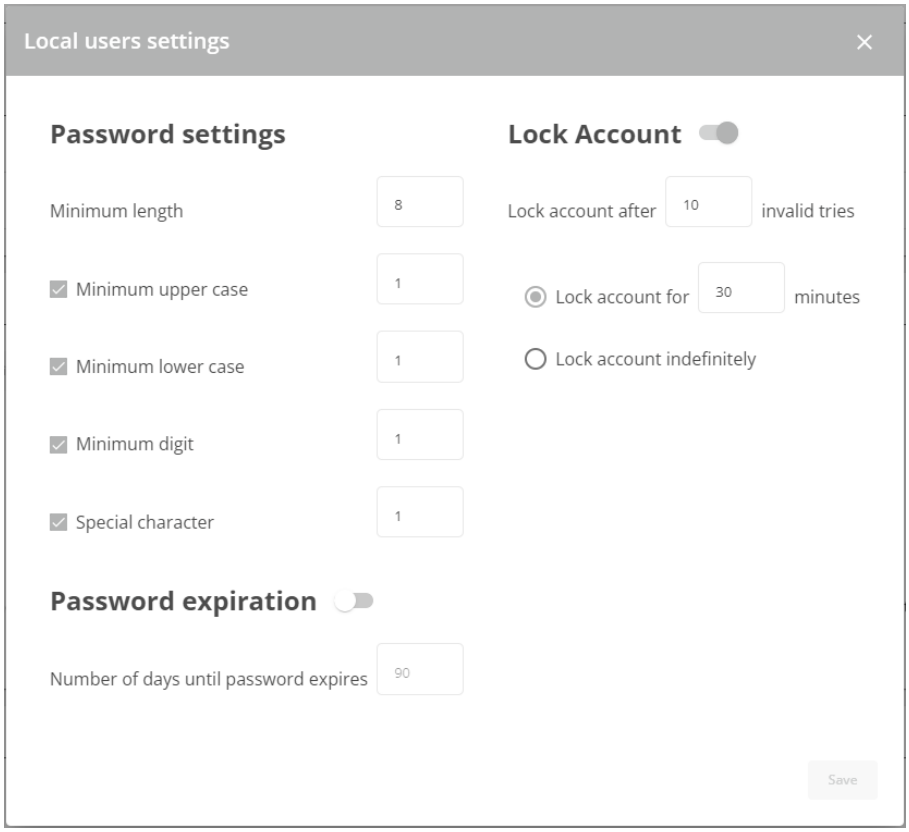
c Edit

Press the pen logo to edit user information:

You will get access to the following settings:

- Active
- Profile
- Username
- Full name
- Email
- Phone
- Organization – Notify by email about account modification/Password
- Reset password
- Generate randomly
- Enter manually
- Force password to be changed on next login

d Global settings



Press **Save** after modifications.

Password settings

To set the password strength rules, apply the following restrictions:

- Minimum length
- Minimum upper case
- Minimum lower case
- Minimum digit
- Special character

Password expiration

To set the password expiration rules, apply the following restrictions:

- Number of days until password expires
- Main administrator password never expire

> **Main administrator password never expires**
>
> 1. If this feature is disabled, the administrator account can be locked after the password expiration.
> 2. If Enabled, the administrator password never expires, make sure it is changed regularly.

Lock account

- Lock account after a number of invalid tries
- Main administrator account will never block

Main administrator account will never block

1. If this feature is disabled, the administrator account can be locked after the number of failed connections defined.
2. If Enabled, the security level of the administrator account is reduced because unlimited password entry attempts are allowed.

Account timeout

To set the session expiration rules, apply the following restrictions:

- No activity timeout (in minutes).

  If there is no activity, session expires after the specified amount of time.

- Session lease time (in minutes).

  If there is activity, session still expires after the specified amount of time.

Main administrator password never expires

When new settings are set, parameters will be taken into account on their next connection to the card.

3.7.10.2 Default settings and possible parameters - Global user settings and Local users

	Default setting	Possible parameters
Password settings	Minimum length — enabled (8) Minimum upper case — enabled (1) Minimum lower case — enabled (1) Minimum digit — enabled (1) Special character — enabled (1)	Minimum length — enable (6-32)/disable Minimum upper case — enable (0-32)/disable Minimum lower case — enable (0-32)/disable Minimum digit — enable (0-32)/disable Special character — enable (0-32)/disable
Password expiration	Number of days until password expires — disabled	Number of days until password expires — disable/ enable (1-99999)
Lock account	Lock account after xx invalid tries — enabled (10) Lock account for xx minutes — 30	Lock account after xx invalid tries — enable (1-4294967295)/disable Lock account for xx minutes — enable(1-71582788)/ disable
Account timeout	No activity timeout — 60 minutes Session lease time — 120 minutes	No activity timeout — 1-60 minutes Session lease time — 60-720 minutes
Local users	1 user only: • Active — Yes • Profile — Administrator • Username — admin • Full Name — blank • Email — blank • Phone — blank • Organization — blank	20 users maximum: • Active — Yes/No • Profile — Administrator/Operator/Viewer • Username — 255 characters maximum • Full Name — 128 characters maximum • Email — 128 characters maximum • Phone — 64 characters maximum • Organization — 128 characters maximum

3.7.10.2.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.7.10.3 Access rights per profiles

	Administrator	Operator	Viewer
Local users	✓	✗	✗

3.7.10.3.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.7.10.4 CLI commands

whoami

Description

whoami displays current user information:

- Username
- Profile
- Realm

logout

Description

Logout the current user.

Help

```
logout
  <cr> logout the user
```

3.7.10.4.1 For other CLI commands

See the CLI commands in the Information>>>CLI section.

3.7.10.5 Troubleshooting

How do I log in if I forgot my password?

Action

- Ask your administrator for password initialization.
- If you are the main administrator, your password can be reset manually by following steps described in the Servicing the Network Management Module>>>Recovering main administrator password.

3.7.10.5.1 For other issues

For details on other issues, see the Troubleshooting section.

3.7.10.6 Save and Restore

	SRR section	SRR sub section	Settings	Possible values
Password settings	accountService	passwordRules	**strength** minLengthminUpperCase minLowerCase minDigit minSpecialCharacter	Numbers: refer to default settings an possible parameters for constraints.
Password expiration			**expiration** expiration enabled afterDays defaultAccountNeverExpires	true/false Number: refer to default settings an possible parameters for constraints. true/false
Lock account		lockoutRules	**lockoutRules** enabled threshold defaultAccountNeverBlocks	true/false Number: refer to default settings an possible parameters for constraints. true
Account timeout		sessionsService	sessionTimeout sessionLeaseTime	Numbers: refer to default settings an possible parameters for constraints.

Local users		PredefinedAccounts	**credentials** enabled username passwordExpired locked profile **password** plaintext cyphered	 true/false String: refer to default settings an possible parameters for constraints. true/false true/false administrators/operators/viewers String: refer to default settings an possible parameters for constraints. -

3.7.10.6.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.7.11 Remote users

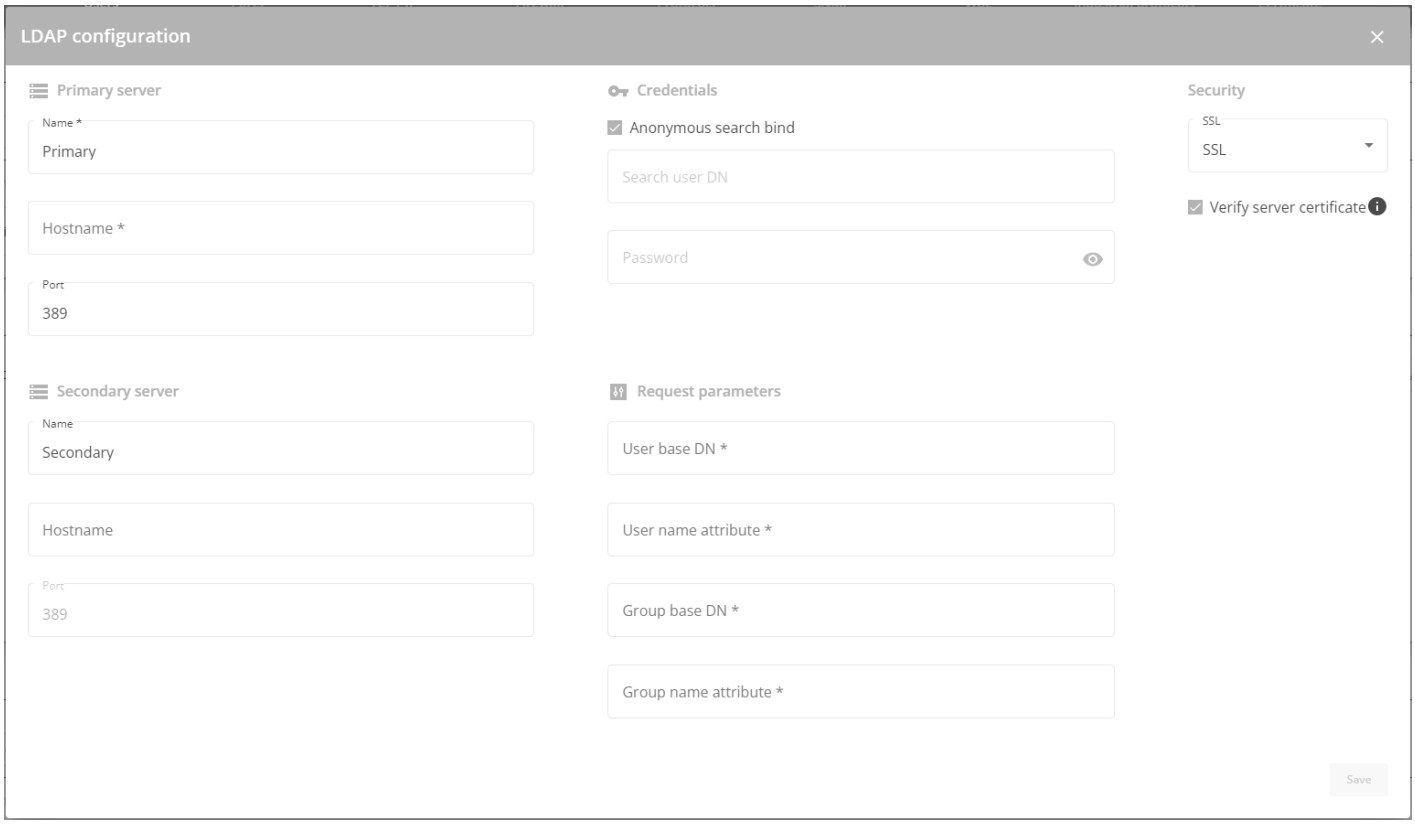
3.7.11.1 LDAP

The table shows all the supported severs and includes the following details:

- Name
- Address
- Port
- Security
- Certificate
- Status – Status could take following values – Unreachable/Active

3.7.11.1.1 Actions

a Configure



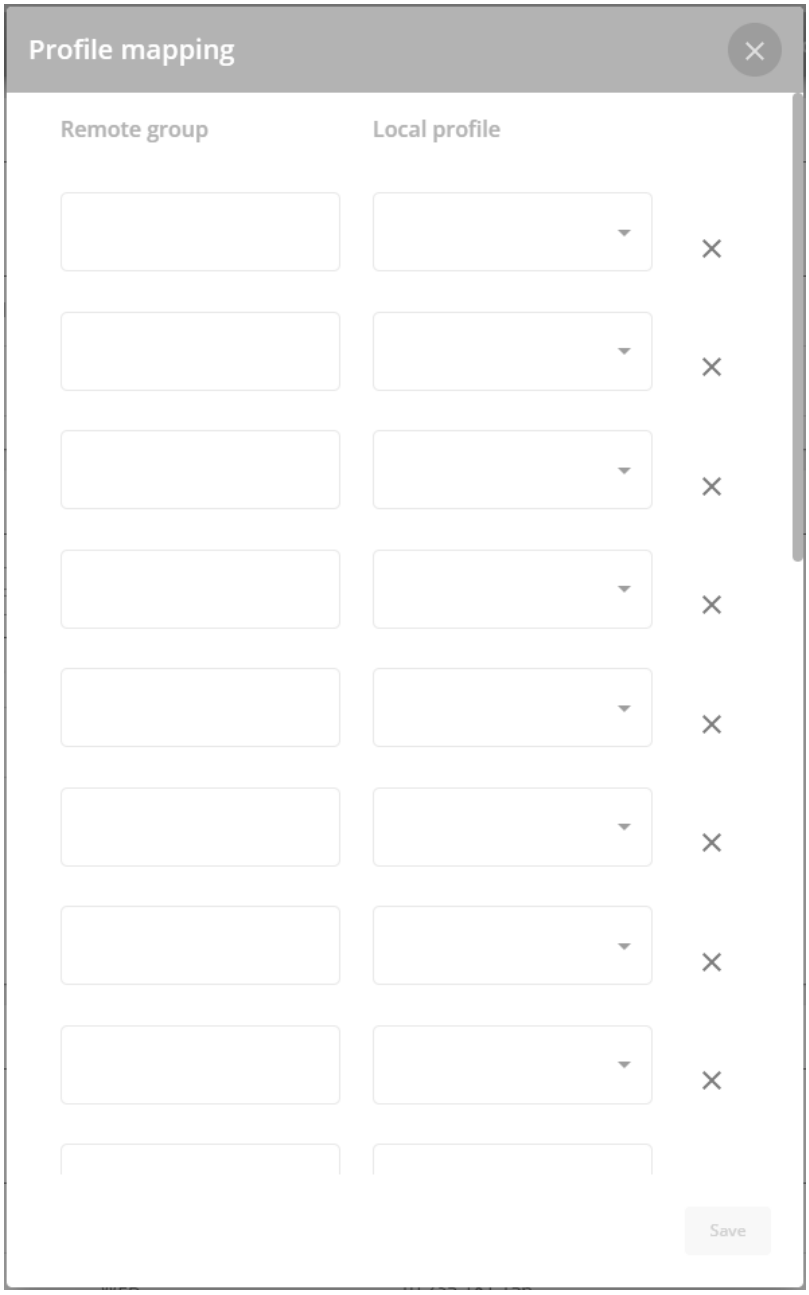
1.Enable LDAP to be able to configure settings

2. Press **Configure** to access the following LDAP settings:

- Connectivity
  - Security
    SSL – None/Start TLS/SSL
    Verify server certificate
  - Primary server – Name/Hostname/Port
  - Secondary server – Name/Hostname/Port
  - Credentials – Anonymous search bind/Search user DN/Password
  - User base DN
  - User name attribute
  - Group base DN
  - Group name attribute

2. Click **Save**.

b Profile mapping

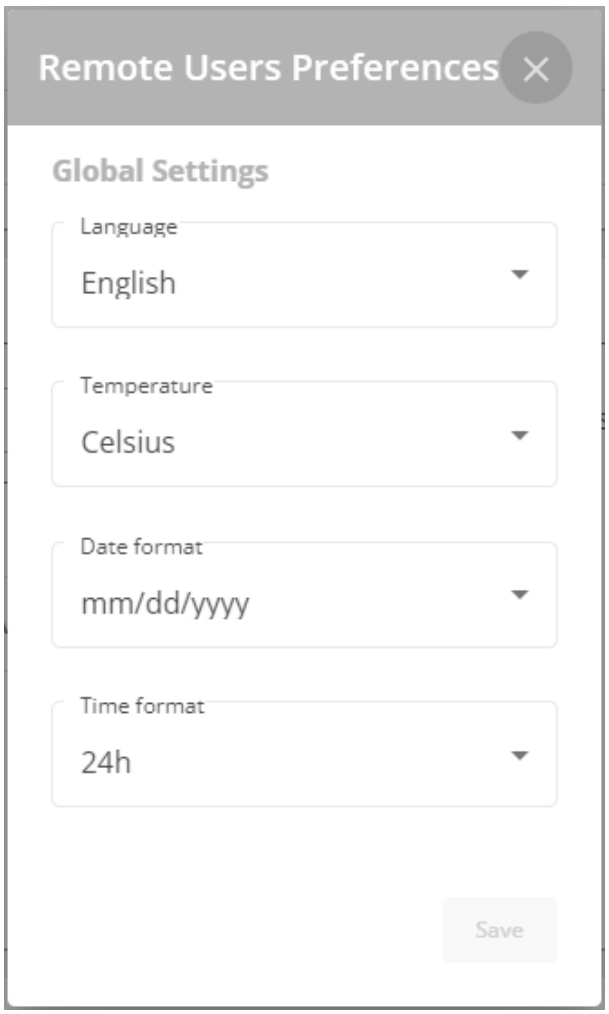


For the list of access rights per profile refer to the section Full documentation>>>Information>>>Access rights per profiles.

1. Press **Profile mapping** to map remote groups to local profiles.
2. Click **Save**.

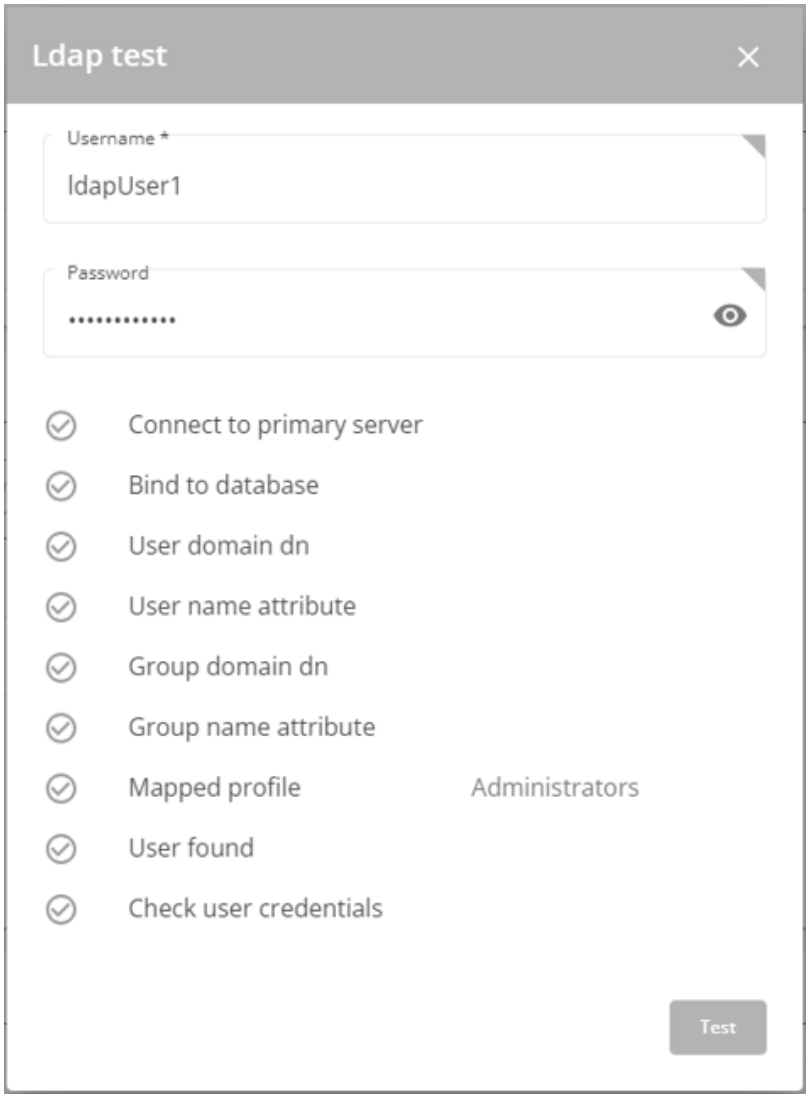
c Users preferences

All users preferences will apply to all remote users (LDAP, RADIUS).



1. Press Users preferences to define preferences that will apply to all newly logged in LDAP users
   - Language
   - Temperature
   - Date format
   - Time format
2. Click Save.

d LDAP Test



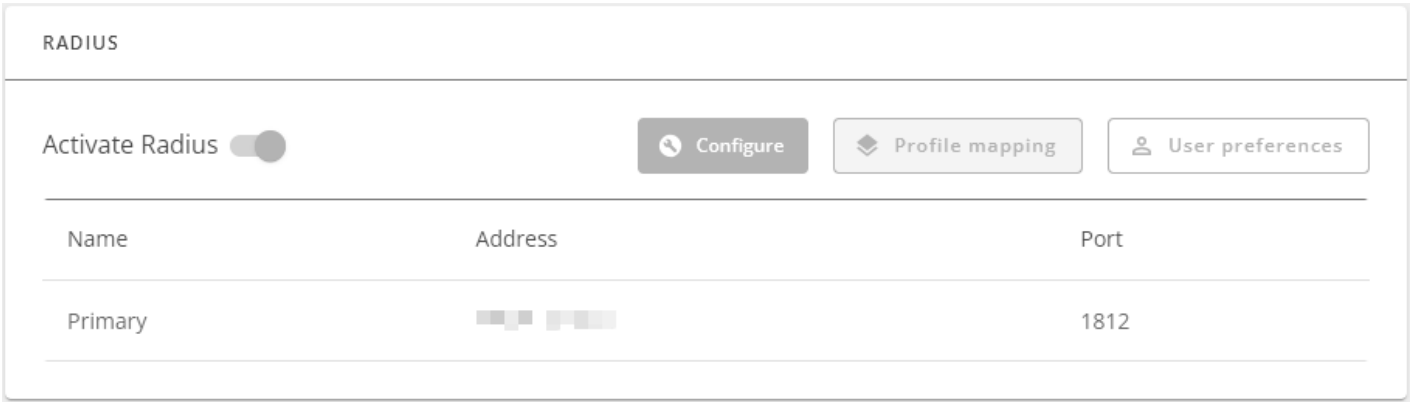
1. At the end of each LDAP primary or secondary configuration row you'll be able to launch a LDAP test by clicking on the button.
2. The LDAP test will give you a status (ok / ko) on below parameters to make it easier to troubleshoot

- Primary
- Bind
- User domain dn
- User name attribute
- Group domain dn
- Group name attribute
- Mapped profile
- Credentials

3. Click **Test** to check your configuration.

3.7.11.2 RADIUS

Radius is not a secured protocol, for a maximum security, it is recomended to use LDAP over TLS.

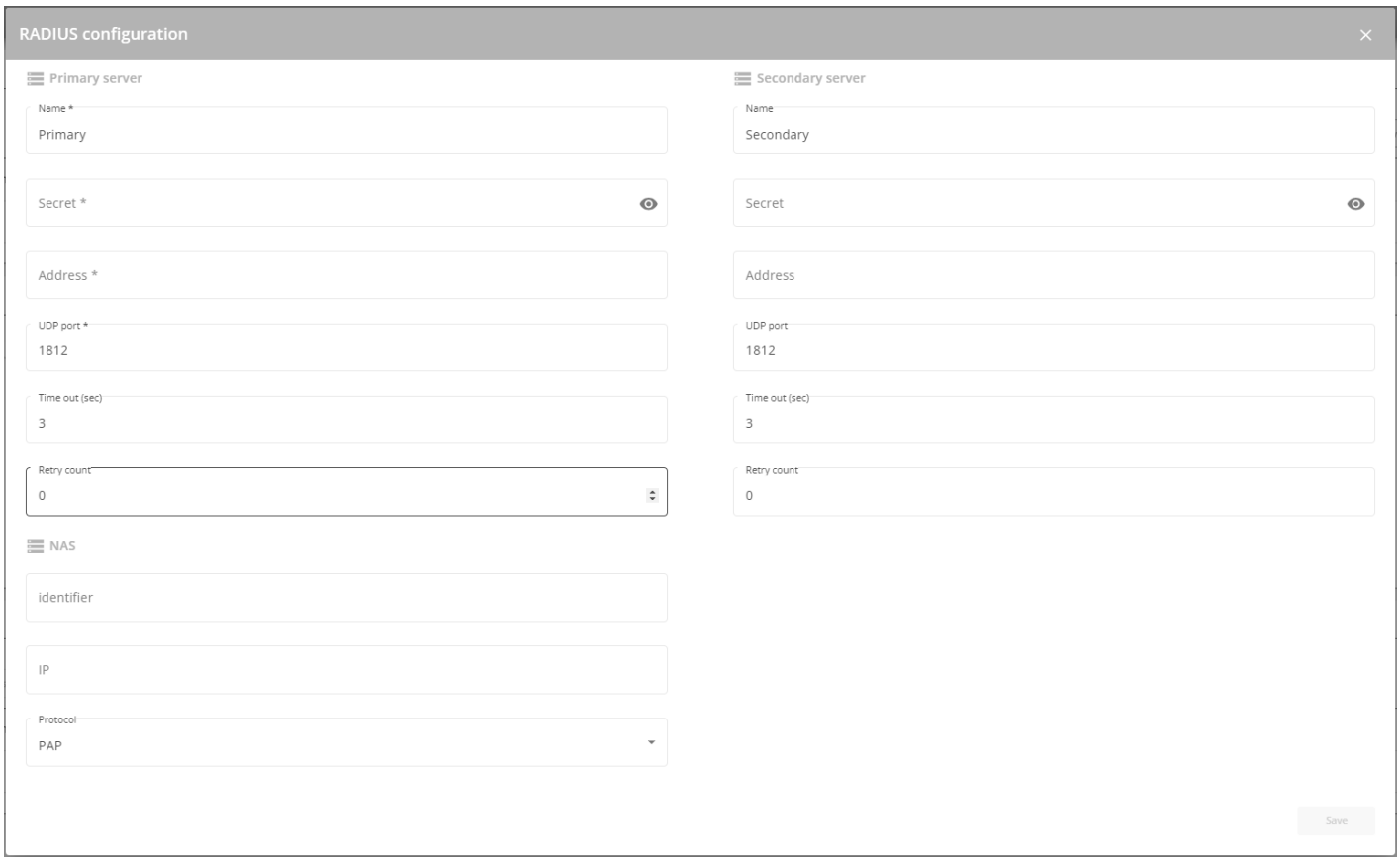


The table shows all the supported severs and includes the following details:

- Name - descriptive name for the RADIUS server
- Address - hostname or IP address for the RADIUS server
- Port - connection port of the RADIUS Server

3.7.11.2.1 Actions

a Configure



1. Enable Radius to be able to configure settings
2. Press **Configure** to access the following RADIUS settings:

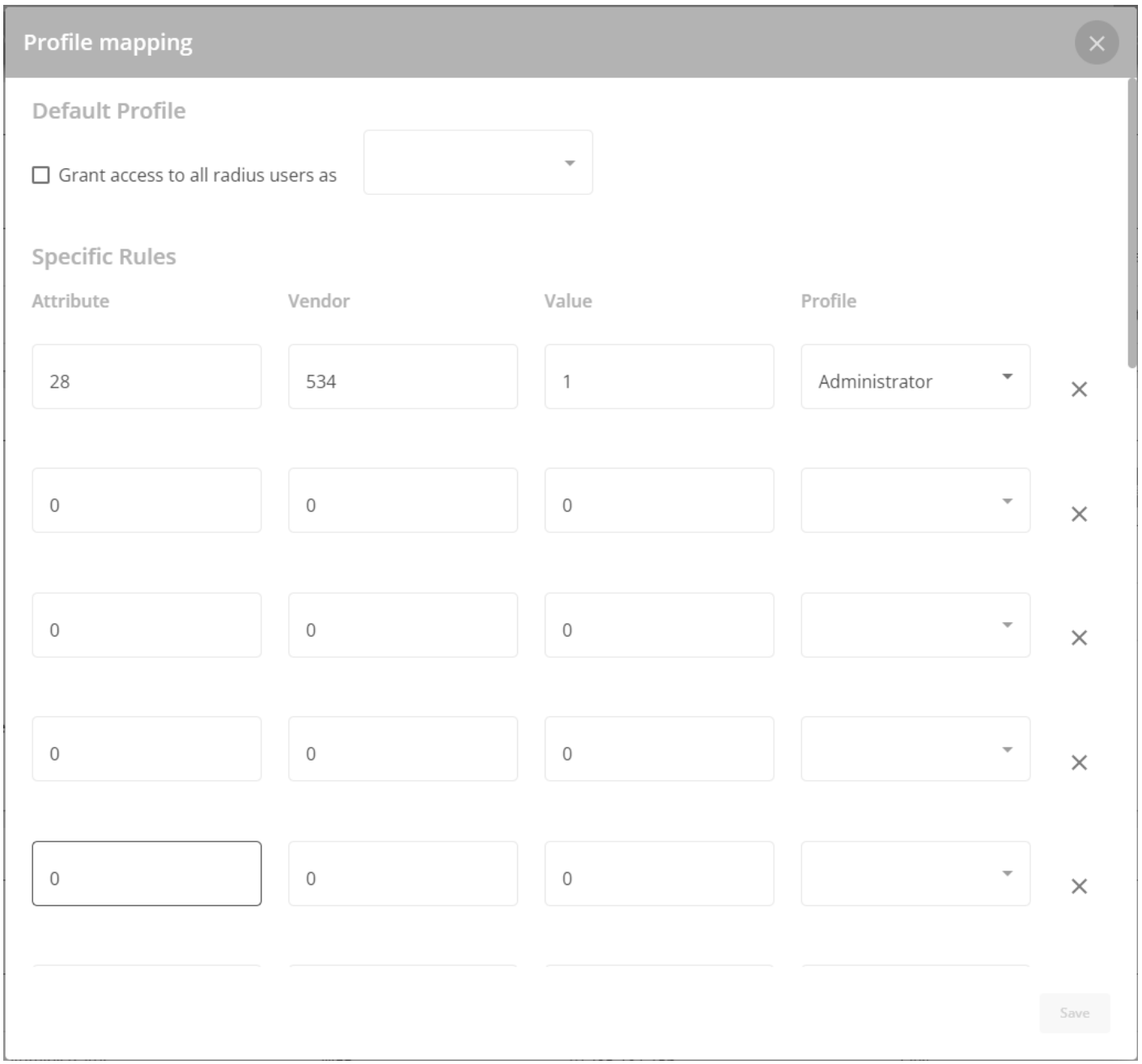
- Primary server
  - Name - descriptive name for the RADIUS server
  - Secret - a shared secret between the client and the RADIUS server
  - Address - hostname or IP address for the RADIUS server
  - UDP port - the UDP port for the RADIUS server (1812 by default)
  - Time out (s) - length of time the client waits for a response from the RADIUS server

    - Retry count - the number of time a connection is retried
- Secondary server
    - Name - descriptive name for the RADIUS server
    - Secret - a shared secret between the client and the RADIUS server
    - Address - hostname or IP address for the RADIUS server
    - UDP port - the UDP port for the RADIUS server (1812 by default)
    - Time out (s) - length of time the client waits for a response from the RADIUS server
    - Retry count - the number of time a connection is retried
- NAS
    - Identifier - descriptive identifier for the radius server to identify the device
    - IP - IP address of the card or a domain name (FQDN)

Note: The radius protocol supported by the card is PAP

2. Click **Save**.

b Profile mapping



For the list of access rights per profile refer to the section Full documentation>>>Information>>>Access rights per profiles.

1. Press **Profile mapping** to map RADIUS profile to local profiles.

Default Profile
You can enable & define a default profile for all Radius that are not subject to any specific rules (see below).

Specific Rules
Fill the usual triplet of information as per your radius configuration:

- Attribute - The attribute value - Mandatory
- Vendor - The vendor value associated to the attribute - Mandatory (0 as default value)
- Value - The value of the attribute needed for this mapping - Mandatory

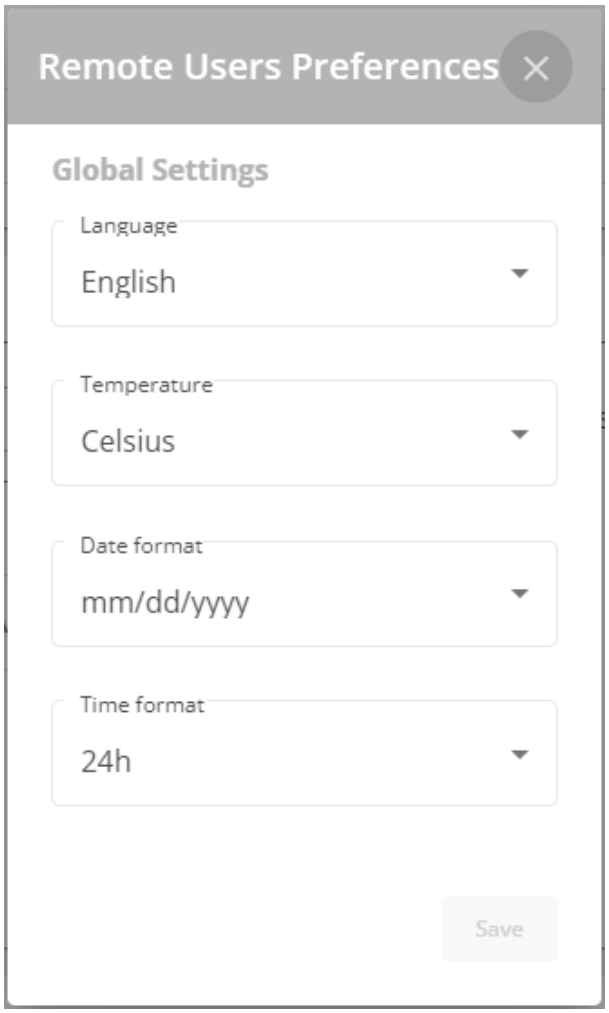
Fill the profile you want your specific radius configuration to be mapped with

- Profile - the local profile you want users to be mapped

Please refer to your RADIUS protocol provider documentation for further information.

2. Click Save.

c Users preferences



1. Press Users preferences to define preferences that will apply to all RADIUS users

- Language
- Temperature
- Date format
- Time format

2. Click Save.

3.7.11.3 Specifics

3.7.11.4 Default settings and possible parameters - Remote users

	Default setting	Possible parameters

LDAP	Configure • Active – No • Security SSL – SSL Verify server certificate – enabled • Primary server Name – Primary Hostname – blank Port – 636 • Secondary server Name – blank Hostname – blank Port – blank • Credentials Anonymous search bind – disabled Search user DN – blank Password – blank • Search base Search base DN – dc=example,dc=com • Request parameters User base DN – ou=people,dc=example,dc=com User name attribute – uid UID attribute – uidNumber Group base DN – ou=group,dc=example,dc=com Group name attribute – gid GID attribute – gidNumber Profile mapping – no mapping Users preferences • Language – English • Temperature unit – °C (Celsius) • Date format – mm/dd/yyyy • Time format – hh:mm:ss (24h)	Configure • Active – No/yes • Security SSL – None/Start TLS/SSL Verify server certificate – disabled/enabled • Primary server Name – 128 characters maximum Hostname – 128 characters maximum Port – x-xxx • Secondary server Name – 128 characters maximum Hostname – 128 characters maximum Port – x-xxx • Credentials Anonymous search bind – disabled/enabled Search user DN – 1024 characters maximum Password – 128 characters maximum • Search base Search base DN – 1024 characters maximum • Request parameters User base DN – 1024 characters maximum User name attribute – 1024 characters maximum UID attribute – 1024 characters maximum Group base DN – 1024 characters maximum Group name attribute – 1024 characters maximum GID attribute – 1024 characters maximum Profile mapping – up to 5 remote groups mapped to local profiles Users preferences • Language – English, French, German, Italian, Polish, Russian, Simplified Chinese, Spanish, Traditional Chinese, Turkish • Temperature unit – °C (Celsius)/°F (Fahrenheit) • Date format – dd/mm/yyyy / yyyy/mm/dd / mm/dd/yyyy • Time format – hh:mm:ss (24h) / hh:mm:ss (12h)

RADIUS	Configure • Active – No • Retry number – 0 • Primary server Name – blank Secret – blank Address – blank UDP port – 1812 Time out – 3 • Secondary server Name – blank Secret – blank Address – blank UDP port – 1812 Time out – 3 Users preferences • Language – English • Temperature unit – °C (Celsius) • Date format – m/d/Y • Time format – hh:mm:ss (24h)	Configure • Active – Yes/No • Retry number – 0 to 128 • Primary server Name – 128 characters maximum Address – 128 characters maximum Secret – 128 characters maximum UDP port – 1 to 65535 Time out – 3 to 60 • Secondary server Name – 128 characters maximum Address – 128 characters maximum Secret – 128 characters maximum UDP port – 1 to 65535 Time out – 3 to 60 Users preferences • Language – English, French, German, Italian, Polish, Russian, Simplified Chinese, Spanish, Traditional Chinese, Turkish • Temperature unit – °C (Celsius)/°F (Fahrenheit) • Date format – dd/mm/yyyy / yyyy/mm/dd / mm/dd/yyyy • Time format – hh:mm:ss (24h) / hh:mm:ss (12h)

3.7.11.4.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.7.11.5 Access rights per profiles

	Administrator	Operator	Viewer
Remote users	✓	✗	✗

3.7.11.5.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.7.11.6 CLI commands

ldap-test

Description

Ldap-test help to troubleshoot LDAP configuration issues or working issues.

Help

```
     Usage: ldap-test <command> [OPTION]...
Test LDAP configuration.

Commands:
  ldap-test -h, --help, Display help page

  ldap-test --checkusername <username> [--primary|--secondary] [-v]
  Check if the user can be retrieve from the LDAP server
    <username>      Remote username to test
    --primary       Force the test to use primary server (optional)
    --secondary     Force the test to use secondary server (optional)
    -v,--verbose    Print the exchanges with LDAP server (optional)

  ldap-test --checkauth <username> [--primary|--secondary] [-v]
  Check if remote user can login to the card
    <username>      Remote username to test
    -p,--primary       Force the test to use primary server (optional)
    -s,--secondary     Force the test to use secondary server (optional)
    -v,--verbose    Print the exchanges with LDAP server (optional)

  ldap-test --checkmappedgroups [--primary|--secondary] [-v]
  Check LDAP mapping
    -p,--primary       Force the test to use primary server (optional)
    -s,--secondary     Force the test to use secondary server (optional)
    -v,--verbose    Print the exchanges with LDAP server (optional)

Quick guide for testing:

In case of issue with LDAP configuration, we recommend to verify the
configuration using the commands in the following order:

  1. Check user can be retrieve on the LDAP server
    ldap-test --checkusername <username>

  2. Check that your remote group are mapped to the good profile
    ldap-test --checkmappedgroups

  3. Check that the user can connect to the card
    ldap-test --checkauth <username>
```

logout

Description

Logout the current user.

Help

```
logout
  <cr> logout the user
```

whoami

Description

whoami displays current user information:

- Username
- Profile
- Realm

3.7.11.6.1 For other CLI commands

See the CLI commands in the Information>>>CLI section.

3.7.11.7 Troubleshooting

How do I log in if I forgot my password?

Action

- Ask your administrator for password initialization.
- If you are the main administrator, your password can be reset manually by following steps described in the Servicing the Network Management Module>>>Recovering main administrator password.

LDAP configuration/commissioning is not working

Refer to the section Servicing the Network Management Module>>>Commissioning/Testing LDAP.

3.7.11.7.1 For other issues

For details on other issues, see the Troubleshooting section.

3.7.11.8 Save and Restore

	SRR section	Sub section	Sub section	Sub section	Sub section	Settings	Sub settings	Possible values
LDAP	ldap	1.0	settings	enabled				true/false
				connectivity	primaryServer	name		String: refer to default settings an possible parameters for constraints.
						uri		String: refer to default settings an possible parameters for constraints.
						port		Unsigned number
					secondaryServer	name		String: refer to default settings an possible parameters for constraints.
						uri		String: refer to default settings an possible parameters for constraints.
						port		Unsigned number
					userDomain	nameAttribute		String: refer to default settings an possible parameters for constraints.
						dn		String: refer to default settings an possible parameters for constraints.
					groupDomain	nameAttribute		String: refer to default settings an possible parameters for constraints.
						dn		String: refer to default settings an possible parameters for constraints.
					bind	dn		String: refer to default settings an possible parameters for constraints.
						password	plaintext	String: refer to default settings an possible parameters for constraints.
							ciphered	String: refer to default settings an possible parameters for constraints.

					security	type		1: ssl 2: starttls 3: none
						verifyCertificate		true/false
				mappings		remoteGroup		String: refer to default settings an possible parameters for constraints.
						profileName		• administrators • viewers • operators
				preferences		language		String: refer to default settings an possible parameters for constraints.
						dateFormat		String: refer to default settings an possible parameters for constraints.
						timeFormat		String: refer to default settings an possible parameters for constraints.
						temperatureUnit		String: refer to default settings an possible parameters for constraints.
						licenceAgreement		String: refer to default settings an possible parameters for constraints.

	SRR section	Sub section	Sub section	Sub section	Sub section	Settings	Sub settings	Possible values
RADIUS	radius	1.0	**settings**	**enabled**				true/false
				connectivity		protocol		▪ pap ▪ chap
					primaryServer	name		String: refer to default settings an possible parameters for constraints.
						secret		String: refer to default settings an possible parameters for constraints.
						uri		String: refer to default settings an possible parameters for constraints.
						port		Unsigned number

						timeout	Unsigned number
						retryCount	Unsigned number
					secondaryServer	name	String: refer to default settings an possible parameters for constraints.
						secret	String: refer to default settings an possible parameters for constraints.
						uri	String: refer to default settings an possible parameters for constraints.
						port	Unsigned number
						timeout	Unsigned number
						retryCount	Unsigned number
					nas	identifier	String: refer to default settings an possible parameters for constraints.
						ip	String: refer to default settings an possible parameters for constraints.
				mappings		profile	String: refer to default settings an possible parameters for constraints.
						attribute	Number
						value	Number
						vendor	Number
				preferences		language	String: refer to default settings an possible parameters for constraints.
						dateFormat	String: refer to default settings an possible parameters for constraints.
						timeFormat	String: refer to default settings an possible parameters for constraints.
						temperatureUnit	String: refer to default settings an possible parameters for constraints.

					licenceAgreement	String: refer to default settings an possible parameters for constraints.

3.7.11.8.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.7.12 Wake on LAN

This feature allows you to wake up devices reachable on the network

3.7.12.1 Examples of WoL

What happens	Action
The network card reboot	wake devices
The network card power on	wake devices
UPS turns from OFF to ON	wake devices
LoadSegment turns from OFF to ON	wake devices
When the devices(SPS G2/Winpower G2 installed) is actively shut down by the shutdown protection service due to a UPS event (such as AC fail), the WoL service will actively wake up the devices after receiving the AC restore event.	wake devices
When the devices(SPS G2/Winpower G2 installed) is shut down manually, the WoL service will actively wake up the devices after receiving the AC restore event.	wake devices
If the UPS is connected to multiple devices (SPS G2/Winpower G2 installed) and any one of them is shut down or communication is lost, it will wake up after receiving the AC restore event.	wake devices
AC restore event is received, but no device(SPS G2/Winpower G2 installed) is closed at this time, and the network wake-up command will not be sent.	Do not wake the device

3.7.12.2 Settings

This screen allows an administrator to configure WoL settings for device that support to be wakeup through ethernet cable. By default the device list is empty.

To configure the WoL settings:

3.7.12.2.1 Add new device

Click the **+New** button to add a device; In the pop-up box, you need to enter the following information :

1. Select enable/disable this device;
2. Enter the device MAC address in the format xx:xx:xx:xx:xx:xx;

3. Description information is used to record device information such as: location information, device type, device name, and other information.

3.7.12.2.2 Enable device

If you want the wake-up function to take effect on this device, you need to choose to enable it.

3.7.12.2.3 Disable device

If you do not need to wake the device temporarily, you can disable it.

3.7.12.2.4 Delete device

Check the checkbox and click the Delete button in the upper left corner to permanently delete this device from the list.

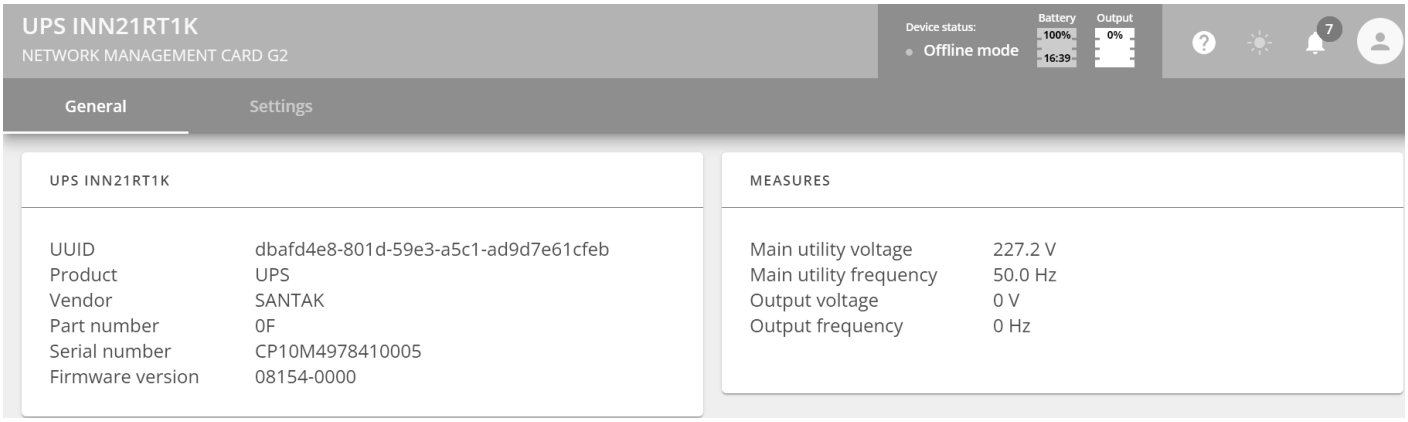
3.7.12.3 Device Test

Click the **Test** button in the upper right corner to immediately send a network wake-up command to the devices in the list. This feature is used to verify that the MAC address is configured correctly.

3.8 Device details

3.8.1 General

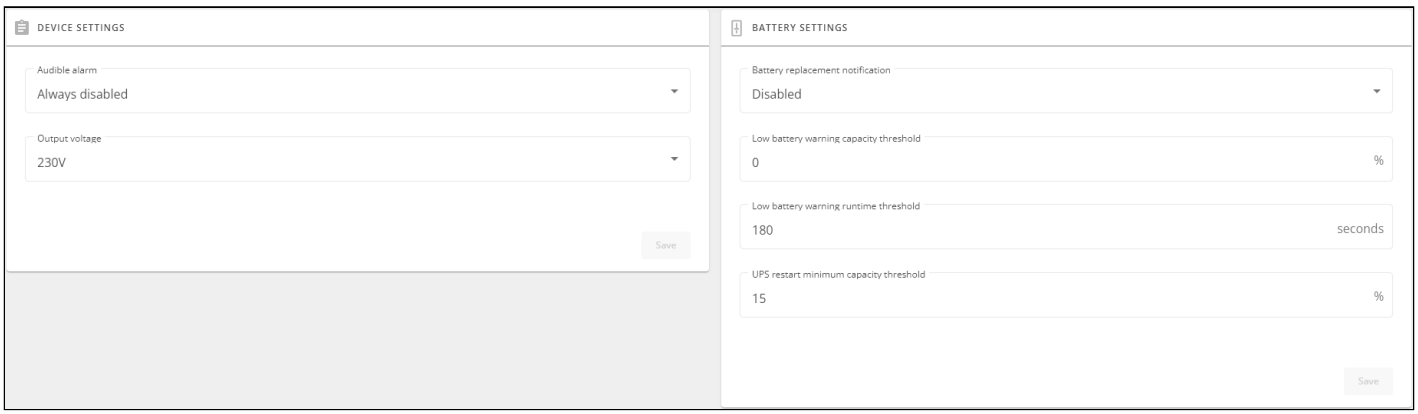
On this tab, you can see a list of the device characteristics.

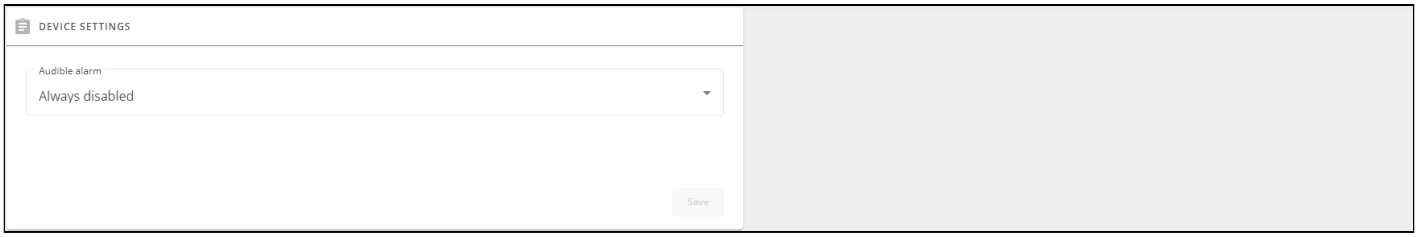


Some UPS may support the download of their system logs. This may prove useful in case the support team needs it for debugging purposes.
Its content is for Service use only and not intended to be exported into the UI or the PDF

3.8.2 Settings - UPS

UPS settings might appear differently based on different types of UPS.





This section is only for the UPS device and contains all its settings.

- **Audible Alarms** - To enable / disable the sound emitted by the UPS when an alarm is triggered (Battery replacement alarm for instance or UPS technical fault)
- **Battery replacement notification -** To enable / disable the battery replacement notification when the battery is getting close to its estimated end of life
- **Output voltage -** To select the output voltage that fits best your need

Device unique attributes

Some options proposed may not apply to your device. Please refer to the device User Manual Guide.

3.8.2.1 Specifics

3.8.2.2 Access rights per profiles

	Administrator	Operator	Viewer
UPS	✓	✓	✗

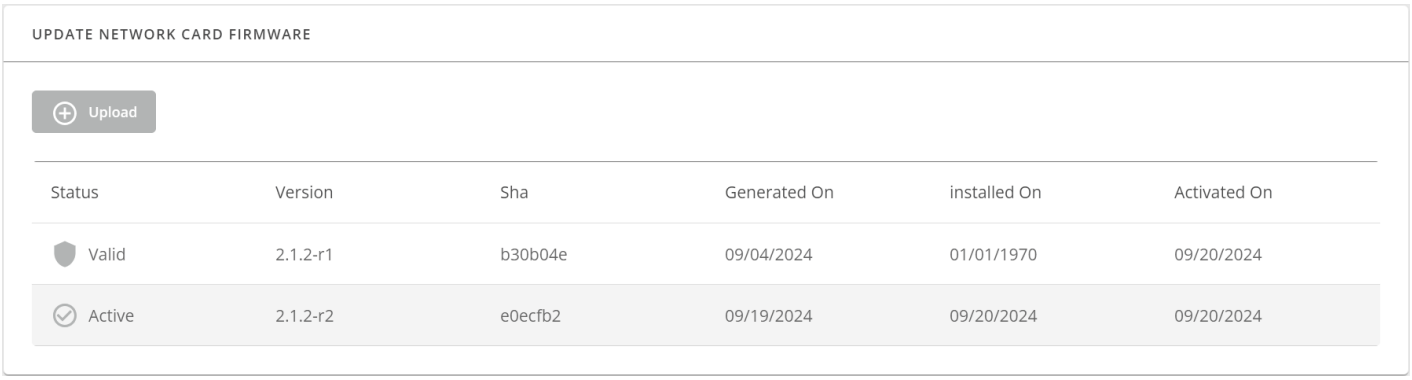
3.8.2.2.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.9 Maintenance

3.9.1 Firmware

3.9.1.1 Update Network Card Firmware



- Monitors the information for the two-embedded firmware.
- Upgrade the Network Module firmware.

3.9.1.1.1 Card Firmware information

a Status

- Uploading
- Invalid
- Valid
- Pending reboot
- Active

b Version/Sha

Displays the associated firmware version and associated Sha.

c Generated on

Displays the release date of the firmware.

For better performance, security, and optimized features, our company recommends to upgrade the Network Module regularly.

d Installation on

Displays when the firmware was installed in the Network Module.

e Activated on

Displays when the firmware was activated in the Network Module.

3.9.1.1.2 Upgrade the Network Module firmware

During the upgrade process, the Network Module does not monitor the Device status.

To upgrade the firmware:

1. Download the latest firmware version from the website. For more information, see the Servicing the Network Management Module>>>Accessing to the latest Network Module firmware/driver section.

2. Click **+Upload**.

3. Click **Choose file** and select the firmware package by navigating to the folder where you saved the downloaded firmware.

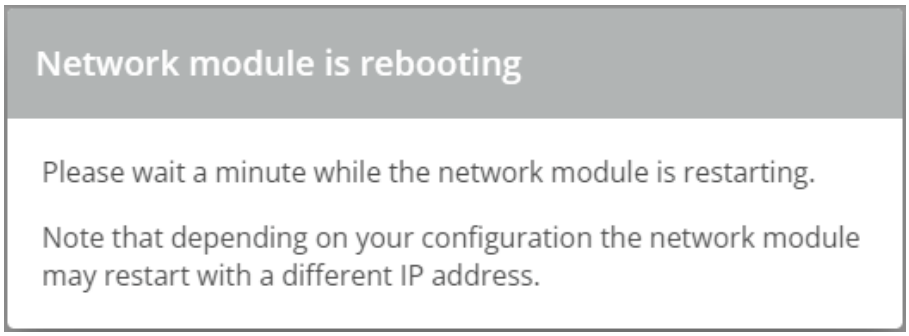
4. Click **Upload**. The upload can take up to 5 minutes.

The firmware that was inactive will be erased by this operation.

When an upgrade is in progress, the upload button is disabled, and the progress elements appear below the table with the following steps:

Transferring > Verifying package > Flashing > Configuring system > Rebooting

A confirmation message displays when the firmware upload is successful, and the Network Module automatically restarts.



Do not close the web browser or interrupt the operation.
Depending on your network configuration, the Network Module may restart with a different IP address.
Refresh the browser after the Network module reboot time to get access to the login page.
Press F5 or CTRL+F5 to empty the browser to get all the new features displayed on the Web user interface.
Communication Lost and Communication recovered may appear in the Contextual help>>>Alarms section.

3.9.1.2 Update Device Firmware

- Upgrade Device Firmware linked to the card.

3.9.1.2.1 Device Firmware information

a Status

- Uploading
- Invalid
- Valid
- Pending reboot
- Active

b Version

Displays the associated firmware version

3.9.1.2.2 Upgrade the Device firmware

To upgrade the device firmware:

1. Download the latest firmware version from the website. For more information, see the Servicing the Network Management Module>>>Accessing to the latest Network Module firmware/driver section.

2. Click on **Upload & Activate button**.

3. **Select a file** and pick the firmware package by navigating to the folder where you saved the downloaded firmware.

4. Click **Upload**. The upload can take up to 5 minutes.

The firmware that was inactive will be erased by this operation.

When an upgrade is in progress, the upload button is disabled, and the progress elements appear below the table with the following steps:

Erasing Memory > Programming in progress > Restarting to application mode

A confirmation message displays when the firmware upload is successful.

a Upgrade statuses

Status	Description
Aborted	the upgrade was aborted in some way. It should not happen in normal circumstances
Package Integrity Error	the file provided for the firmware does not exist, is not syntactically compliant, has a wrong signature or a binary block inside has a wrong hash
Invalid Signature	package was signed but verification of the signature failed
Device not Ready for Upgrade	the device could not be put to upgrade mode
Flashing Error	an error has occurred during the flashing
Device Boot Error	the device could not be rebooted to normal mode
Incompatible Device	the firmware provided is incompatible with the device
Communication Lost	communication between the communication module and the device was lost during the upgrade

3.9.1.3 Specifics

3.9.1.4 Access rights per profiles

	Administrator	Operator	Viewer
Card firmware upgrade	✓	✗	✗
Device firmware upgrade	✓	✓	✗

3.9.1.4.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.9.1.5 CLI commands

get release info

Description

Displays certain basic information related to the firmware release.

Help

```
get_release_info
```

```
-d  Get current release date
-s  Get current release sha1
-t  Get current release time
-v  Get current release version number
```

3.9.1.5.1 For other CLI commands

See the CLI commands in the Information>>>CLI section.

3.9.1.6 Troubleshooting

The Network Module fails to boot after upgrading the firmware

Possible Cause

1- The IP address has changed.

2- The Network module LED shows solid red after the upgrade.

3- The first boot after the upgrade takes a longer time.

Note: If the application is corrupt, due to an interruption while flashing the firmware for example, the boot will be done on previous firmware.

Action

1- Recover the IP address and connect to the card.

2- Reset the Network module by using the Restart button on the front panel.

3- Wait until the Network module LED shows flashing green.

Refer to Installing the Network Management Module>>>Accessing the Network Module>>>Finding and setting the IP address section.

Web user interface is not up to date after a FW upgrade

Symptom

After an upgrade:

- The Web interface is not up to date
- New features of the new FW are not displayed
- An infinite spinner is displayed on a tile

Possible causes

The browser is displaying the Web interface through the cache that contains previous FW data.

Action

Empty the cache of your browser using F5 or CTRL+F5.

3.9.1.6.1 For other issues

For details on other issues, see the Troubleshooting section.

3.9.2 Services

3.9.2.1 Service options

3.9.2.1.1 Sanitization

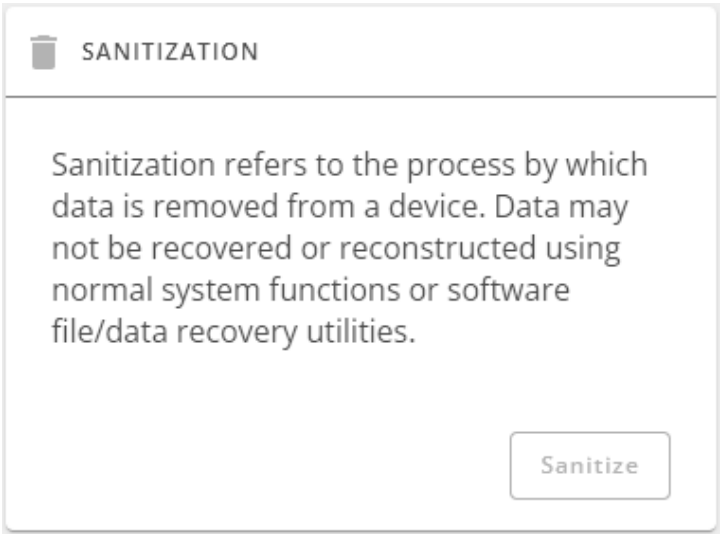
Sanitization removes all the data; the Network Module will come back to factory default settings.

For details on default settings, see the Information>>>Default settings parameters section.

To sanitize the Network Module:

1. Click **Sanitize**.

A confirmation message displays, click **Sanitize** to confirm.



Depending on your network configuration, the Network Module may restart with a different IP address.
Only main administrator user will remain with default login and password.
Refresh the browser after the Network module reboot time to get access to the login page.

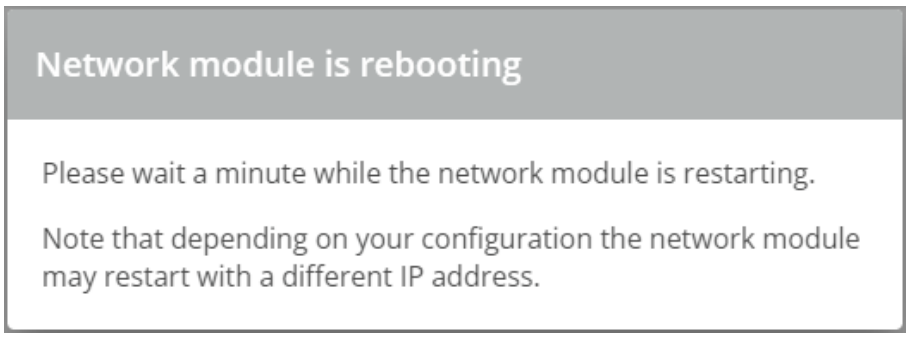
3.9.2.1.2 Reboot

Reboot means restarting the network module operating system.

To reboot the Network Module:

Click **Reboot**.

A confirmation message displays, click **Reboot** to confirm, the reboot time will take approximately less than 2min.

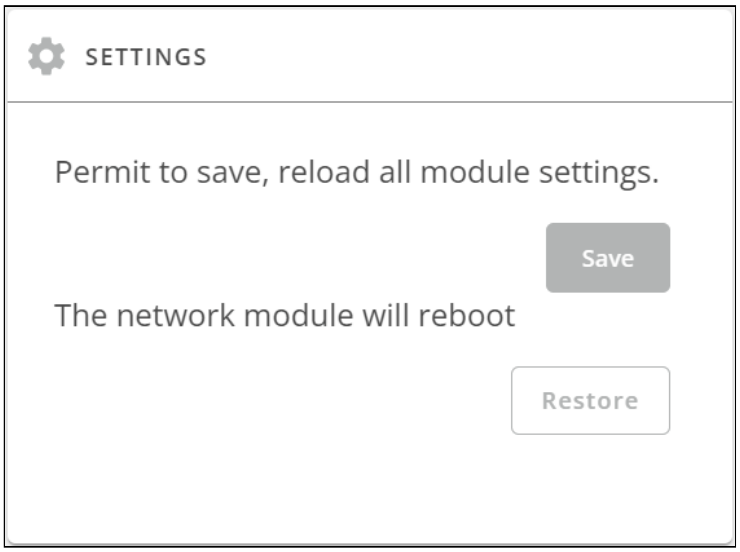


Depending on your network configuration, the Network Module may restart with a different IP address.
Refresh the browser after the Network module reboot time to get access to the login page.
Communication Lost and Communication recovered may appear in the Alarm section.

3.9.2.1.3 Settings

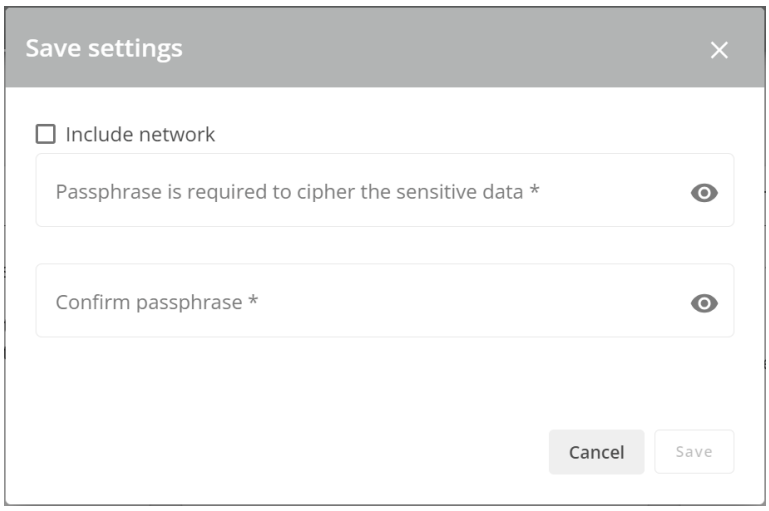
Allow to save and restore the Network module settings.

For more details, navigate to Servicing the Network Management Module>>>Saving/Restoring/Duplicating section.



3.9.2.1.4 Save

Below settings are not saved:



To save the Network module settings:

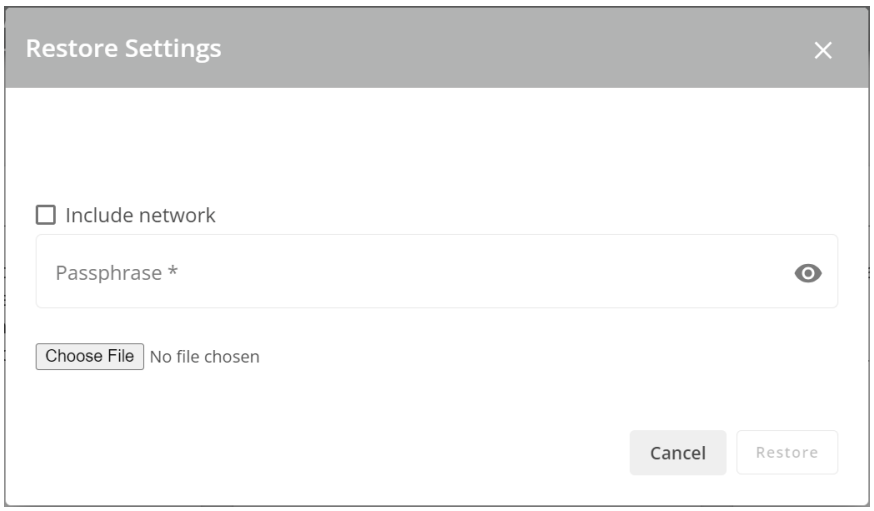
1. Click on **Save**
2. Select to include the Network settings if needed.

A passphrase need to be entered twice to cypher the sensitive data.

3. Click on **Save**

3.9.2.1.5 Restore

Restoring settings may result in the Network module reboot.



To restore the Network module settings:

1. Click on **Restore**
2. Select to include the Network settings if needed.
3. Enter the passphrase used when the file was saved.
4. Click on **Choose file** and select the JSON file
5. Click on **Restore** to confirm
6. For safety reason, **re-enter your own password** to confirm your identity

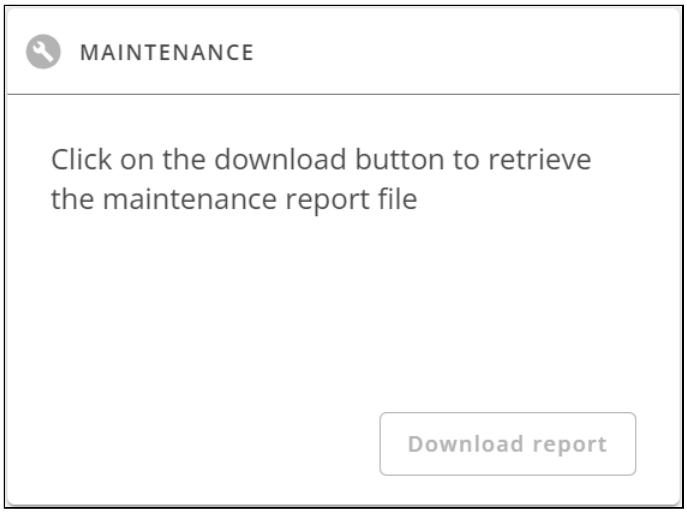
3.9.2.1.6 Maintenance

The maintenance report is for the service representative use to diagnose problems with the network module. It is not intended for the user, which is why the file is protected by a password.

To download the maintenance report file:

Click **Download report**.

A confirmation message displays, Maintenance report file successfully downloaded.



3.9.2.1.7 Zero Touch Provisioning (ZTP)

By enabling this service, the module will rely on DHCP options to **automatically download & apply a configuration file.**

3.9.2.1.8 Activation/desactivation behavior

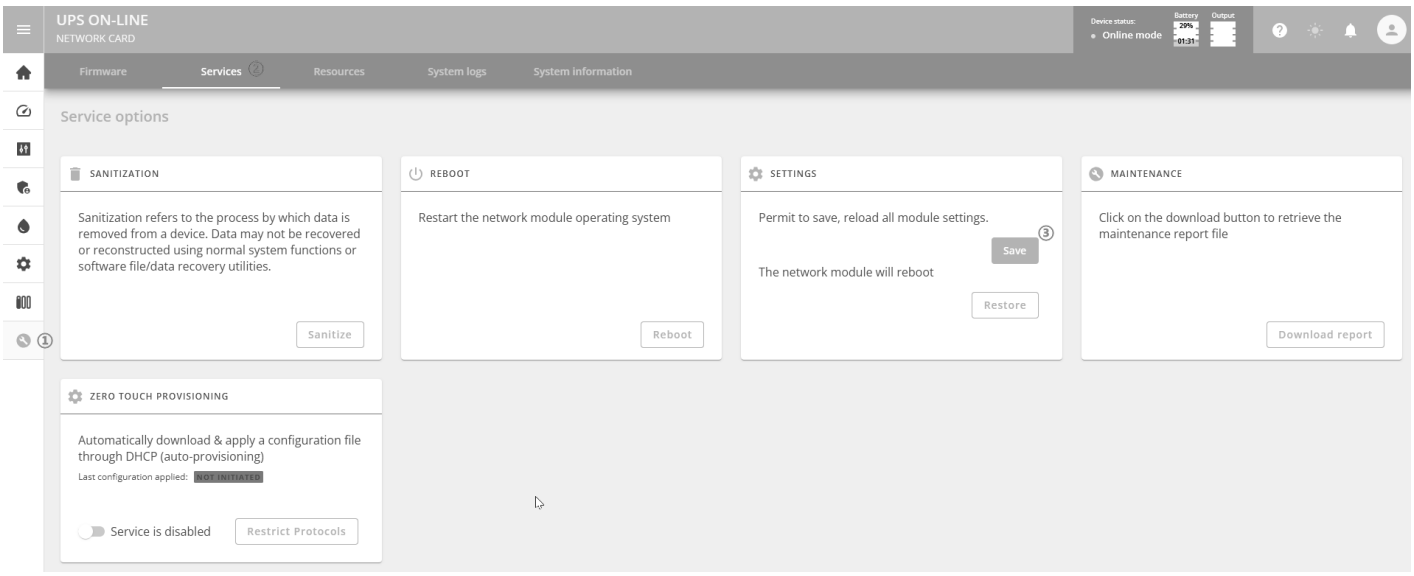
- Automatic behavior:
  - Enabled by default out of factory
  - Enabled after a sanitization
  - Disabled after the first loaded configuration
  - Disabled after first login
  - Disabled when card is running for more than 48 hours
- Manual behavior (overrides automatic behavior)
  - User can manually enable/disable it on the web UI
  - This setting can be included in the configuration file

3.9.2.1.9 ZTP setup workflow

a Part 1 : Getting the config file from Save and Restore ready for ZTP usage.

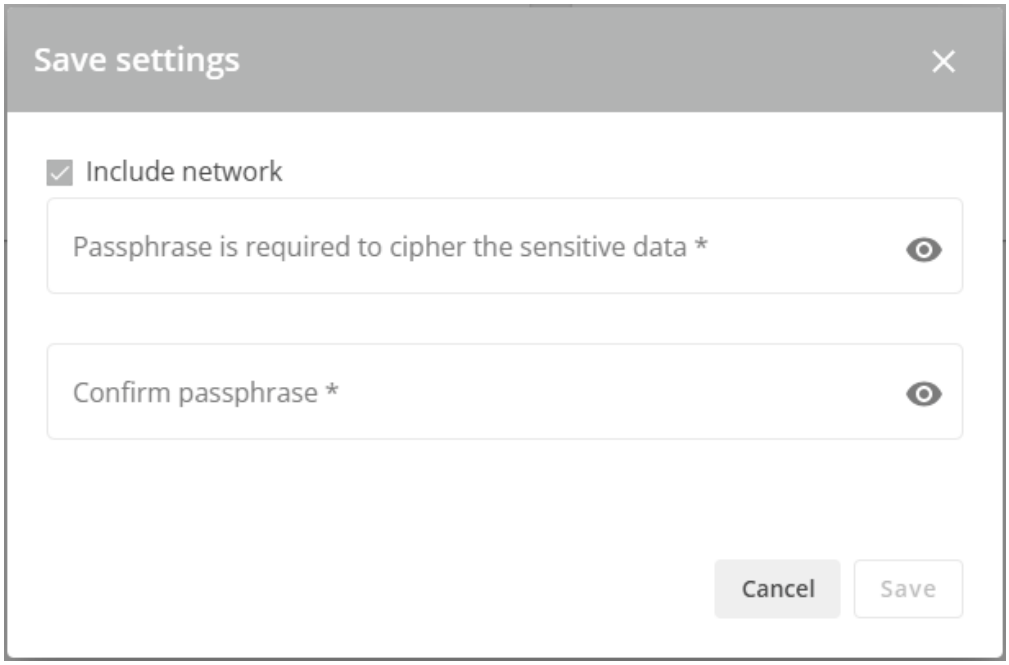
1. Configure a unit as you want all the other devices to be configured.

2. Go to Maintenance/Service/Settings and click on Save



3. Include the network settings if needed and enter a password. This password is used to cipher the sensitive data included in the config file.

A settings.json will be downloaded.



4. The downloaded file is protected by password, the sensitive data are ciphered.

```
{
        "passphrase": "ufgFWi9Fc4Z5xCcShMnoPg==:r++93Li3qdipn0vKPAIkGYncddqHPDFeHHasrwRijOA=",
        "version": "1.0",
        "features": {
                "certificateSettings": {
                        "data": {
                                "version": "1.0",
                                "dmeData": {
                                        "country": "FR",
                                        "state": "38",
                                        "location": "Grenoble",
                                        "organizationName": "Eaton",
                                        "organizationUnit": "Power Quality",
                                        "contact": ""
                                }
                        }
                },
"smtp": {
        "data": {
                "version": "2.0",
                "certificateData": {
                        "ca": []
                },
                "dmeData": {
                        "port": 25,
                        "enabled": true,
                        "server": "",
                        "requireAuth": false,
                        "user": "",
                        "password": {
                                "plaintext": null,
                                "cyphered": "VQSx5f/81cZv9y1GVFbcpQ==:6Dbj3qAVsH9Altky/nZZkQ=="
                        },
                        "fromAddress": "networkcard@eaton.com",
                        "ssl": 3,
                        "verifyTlsCert": false
                }
        }
},
```


Note

Important :

ZTP does NOT support protected settings.json files. If a files starts by "passphrase":... , the files won't be applied at boot.

b Part 2 : Getting the config file ready for ZTP usage

Using provided script

Use a python script to decipher the file and get a settings.json file ready for ZTP usage. (Available on company website)

python3 Save-Restore-file-decipher.py <PathToSettingsFile>/settings.json <PassphraseUsedForCiphering>

c Part 3 : Setup the DHCP server

ZTP uses option 66/67 or option 43 of a DHCP server.

These options specify where the card will download the config file.

Expected values

Option	Expected value
43	`protocol://` [`username:password@`] `host` [`:port`] / `file path`
66	`protocol://` [`username:password@`] `host` [`:port`]
67	/ `file path`

Supported protocols:

- FTP
- FTPS
- HTTP
- HTTPS

Note

[`Parameters between brackets`] are optional.
Values should be URL encoded.
Option 66/67 work by pair and are concatenated to generate the destination URL
If both options are provided, option 66/67 prevails.

d ZTP per product

On DHCP configuration side, you can specify the following keywords.

Keyword	Description
$(DeviceSerialNumber)	Serial number of monitored device (UPS, PDU, ATS, ...)
$(NICSerialNumber)	Serial number of the Network Interface Controller (NIC)
$(MACAddress)	MAC address of the interface which has received the DHCP option

When the module receives the URL in the lease provided by the DHCP server, it replaces these keywords with its own information

Example:
Option 43 = http://10.130.01.01/$(NICSerialNumber)/settings.json

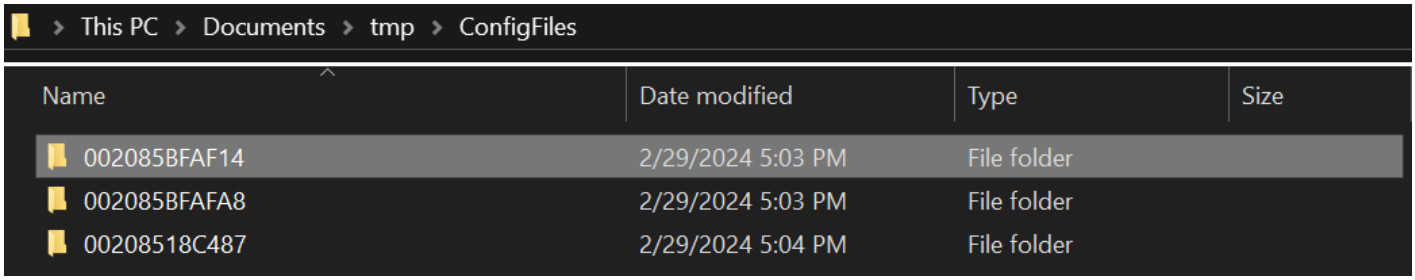
e Part 4 : Setup the FTP/HTTP server

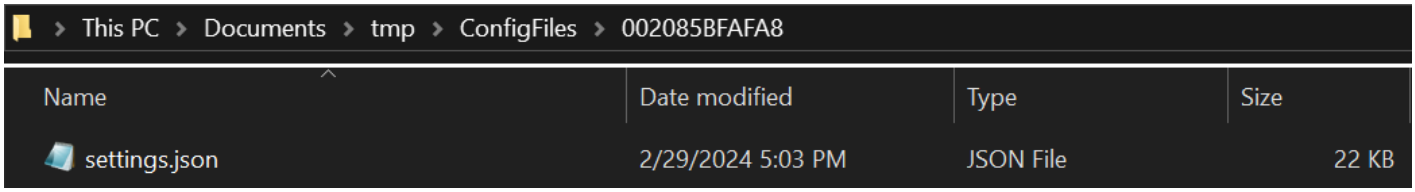
On the config file host server, store the config files accordingly to the file path precised above.

To apply a file per product, create a folder with the serial number of each product.

Example of document structure:

```
.
├── 002085BFAF17
│   └── settings.json
├── 002085BFAF85
│   └── settings.json
└── 002085BFAFAF
    └── settings.json
```





URL used by the card for its configuration: http://10.130.01.01/G4784512/settings.json

Known limitations

Config file must be a valid Save & Restore file from a card (settings.json)
File size shouldn't exceed 500 Kb
Http uses basic authentication

Note: Tested on Windows Server.

3.9.2.2 Specifics

3.9.2.3 Access rights per profiles

	Administrator	Operator	Viewer
Services	✓	✗	✗

3.9.2.3.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.9.2.4 CLI commands

Maintenance (CLI)

Description

Creates a maintenance report file which may be handed to the technical support.

Help

```
maintenance
   <cr> Create maintenance report file.
   -h, --help Display help page
```

Examples of usage

Generate the maintenance report by running the "maintenance" command.

Then retrieve the report from the card using SCP

From a linux host:

sshpass -p $PASSWORD scp $USER@$CARD_ADDRESS:report.zip .

From a Windows host:

pscp -scp -pw $PASSWORD $USER@$CARD_ADDRESS:report.zip report.zip

(Require pscp tools from putty)

Where:

- $USER is user name (the user shall have administrator profile)
- $PASSWORD is the user password
- $CARD_ADDRESS is IP or hostname of the card

reboot

Description

Tool to Reboot the card.

Help

```
Usage: reboot [OPTION]
    <cr>                    Reboot the card
    --help                  Display help
    --withoutconfirmation   Reboot the card without confirmation
```

save_configuration | restore_configuration

Description

Save_configuration and restore_configuration are using JSON format to save and restore certain part of the configuration of the card.

Help

```
save_configuration -h
  save_configuration: print the card configuration in JSON format to standard output.
```

```
restore_configuration -h
  restore_configuration: restore the card configuration from a JSON-formatted standard
input.
```

Examples of usage

From a linux host:

Save over SSH: sshpass -p $PASSWORD ssh $USER@$CARD_ADDRESS save_configuration -p $PASSPHRASE> $FILE
Restore over SSH: cat $FILE | sshpass -p $PASSWORD ssh $USER@$CARD_ADDRESS restore_configuration -p $PASSPHRASE

From a Windows host:

Save over SSH: plink $USER@$CARD_ADDRESS -pw $PASSWORD -batch save_configuration -p $PASSPHRASE > $FILE
Restore over SSH: type $FILE | plink $USER@$CARD_ADDRESS -pw $PASSWORD -batch restore_configuration -p $PASSPHRASE
(Require plink tools from putty)

Where:

- $USER is user name (the user shall have administrator profile)
- $PASSWORD is the user password
- $PASSPHRASE is any passphrase to encrypt/decrypt sensible data.
- $CARD_ADDRESS is IP or hostname of the card
- $FILE is a path to the JSON file (on your host computer) where the configuration is saved or restored.

sanitize

Description

Sanitize command to return card to factory reset configuration.

Access

- Administrator

Help

```
sanitize
  -h, --help            Display help page
```

```
  --withoutconfirmation  Do factory reset of the card without confirmation
  <cr>                   Do factory reset of the card
```

3.9.2.4.1 For other CLI commands

See the CLI commands in the Information>>>CLI section.

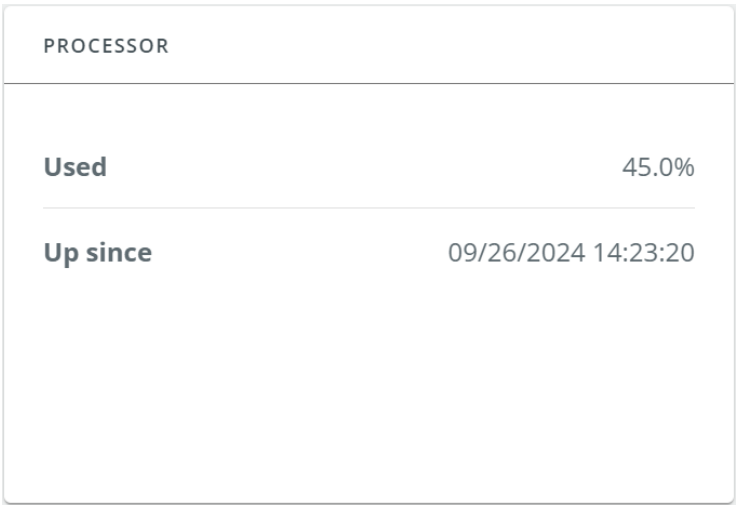
3.9.3 Resources

Card resources is an overview of the Network Module processor, memory and storage information.

The COPY TO CLIPBOARD button will copy the information to your clipboard so that it can be past.

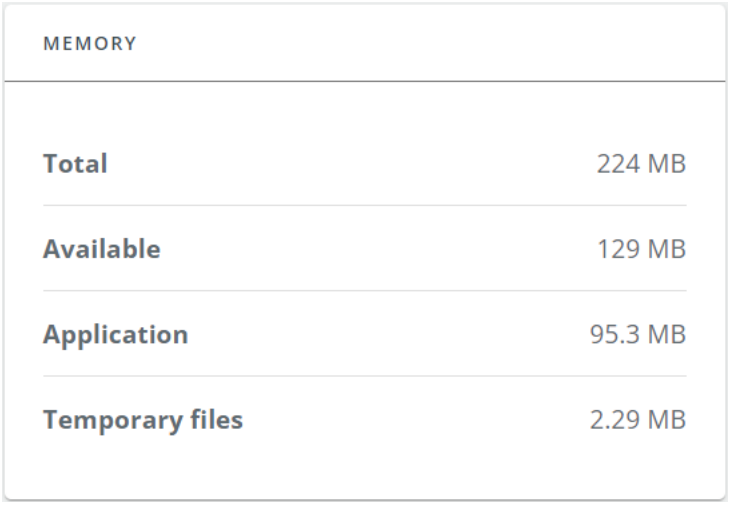
For example, you can copy and paste information into an email.

3.9.3.1 Processor



- Used in %
- Up since date

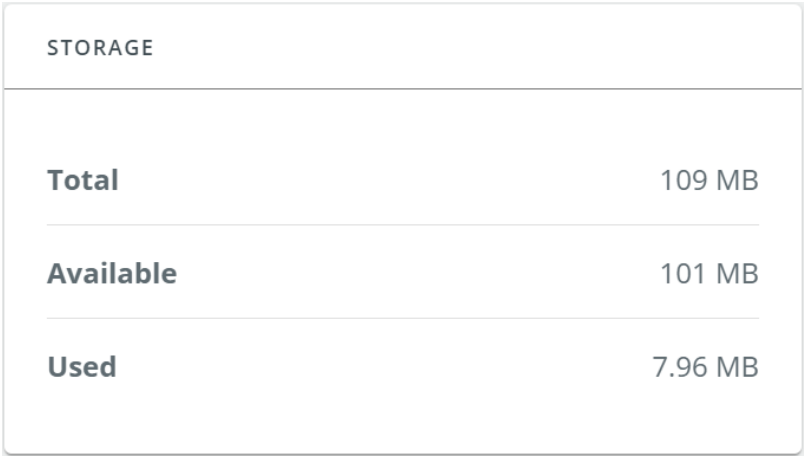
3.9.3.2 Memory



- Total size in MB

- Available size in MB
- Application size in MB
- Temporary files size in MB

3.9.3.3 Storage



- Total size in MB
- Available size in MB
- Used size in MB

3.9.3.4 Specifics

3.9.3.5 Access rights per profiles

	Administrator	Operator	Viewer
Resources	✓	✓	✓

3.9.3.5.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.9.3.6 CLI commands

systeminfo_statistics

Description

Displays the following system information usage:

1. CPU
   a. usage : %
   b. upSince : date since the system started
2. Ram
   a. total: MB
   b. free: MB
   c. used: MB

d. tmpfs: temporary files usage (MB)

3. Flash
   a. user data
      i. total: MB
      ii. free: MB
      iii. used: MB

Help

```
systeminfo_statistics
                      Display systeminfo statistics

        -h, --help       Display the help page.
```

3.9.3.6.1 For other CLI commands

See the CLI commands in the Information>>>CLI section.

3.9.4 System logs

3.9.4.1 System logs

There are 5 types of logs available:

- Update
- Account
- Session
- System
- Configuration

Select the log files to download and press the download icon: 

For the list of system logs, see the Information>>>System Logs codes section.

3.9.4.2 Specifics

3.9.4.3 Access rights per profiles

	Administrator	Operator	Viewer
System logs	✓	✗	✗

3.9.4.3.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.9.5 System information

System information is an overview of the main Network Module information.

The **COPY TO CLIPBOARD** button will copy the information to the clipboard.

3.9.5.1 System Info

- Name (By default the card product name can be configured in system details)
- Location (As set in system details)
- Contact (As set in system details)

3.9.5.2 Card Info

- UUID (Unique identifier)
- Product
- Vendor
- Model number
- Part number
- Serial number
- Hardware version
- Firmware version
- Firmware type
- Bootloader version
- MAC address

3.9.5.3 Device Info

- UUID (Unique identifier)
- Product
- Vendor
- Part number
- Serial number
- Firmware version

3.9.5.4 Specifics

3.9.5.5 Access rights per profiles

	Administrator	Operator	Viewer
System information	✓	✓	✓

3.9.5.5.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.9.6 Sessions

3.9.6.1 Sessions

- Monitors the information for the connected sessions
- End any session as an admin with a re-authentication

3.9.6.1.1 Session information

a Username

This can be either a default profile name or a custom name

b Profile

Displays if the session belongs to an administrator, operator or viewer profile

c Service

Displays on which service the session is going on (Web, SSH, Serial , etc...)

d IP Address

Displays the IP address of the active session.

e Interface

Displays the type of connection (Web, LAN, etc...)

f Connected since

Displays the last opened session time

3.9.6.2 Specifics

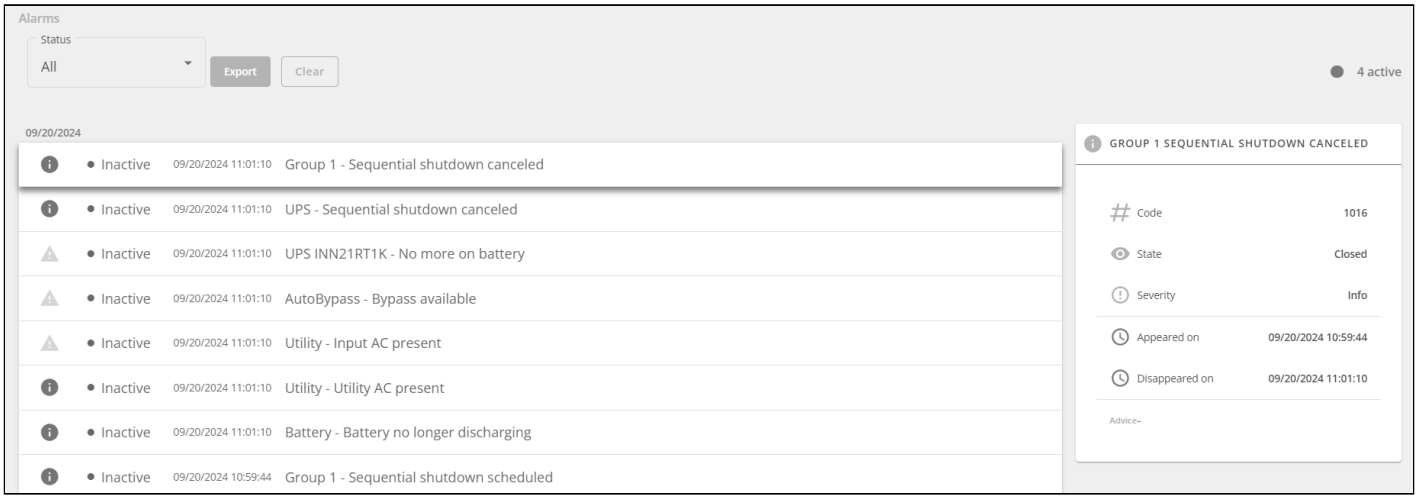
3.9.6.3 Access rights per profiles

	Administrator	Operator	Viewer
Firmware	✓	✗	✗

3.9.6.3.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.10 Alarms



3.10.1 Alarm sorting

Alarms can be sorted by selecting:

- All
- Active only

3.10.2 Active alarm counter

Alarms with a severity set as Good are not taken into account into the counter of active alarms.

3.10.3 Alarm details

All alarms are displayed and sorted by date, with alert level, time, description, and status.

	Info/Warning/Critical logo	Alarm description text
Active	In color	In bold with "Active" label
Opened	In color	
Closed	Greyed	

3.10.4 Alarm paging

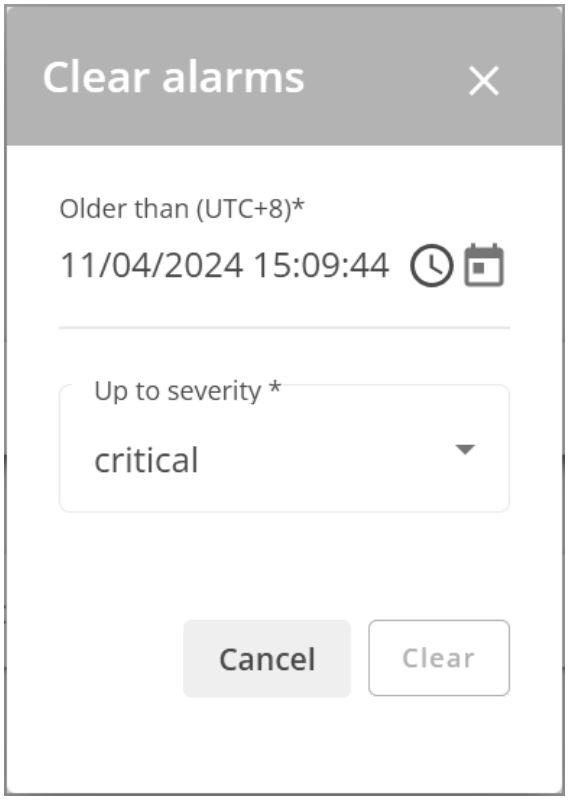
The number of alarms per page can be changed (10-15-25-50-100).

When the number of alarms is above the number of alarms per page, the buttons **First**, **Previous** and **Next** appears to allow navigation in the Alarm list.

3.10.5 Export

Press the **Export** button to download the file.

3.10.6 Clear



Press the **Clear** button to clear alarms that are older than a specified date and up to a defined severity.

3.10.7 Specifics

3.10.8 Alarms list with codes

To get access to the Alarm log codes or the System log codes for email subscription, see sections below:

3.10.9 Access rights per profiles

	Administrator	Operator	Viewer
Alarm list	✓	✓	✓
Export	✓	✓	✓
Clear	✓	✓	✗

3.10.9.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.10.10 Troubleshooting

The alarm list has been cleared after an upgrade

Symptom

After a FW upgrade, the alarm list has been cleared and is now empty.

Action

The alarm list has been saved on a csv file and can be retrieved using Rest API calls.

Authenticate:

```
curl --location --request POST 'https://{{domain}}/rest/mbdetnrs/1.0/oauth2/token' \
--header 'Content-Type: application/json' \
--data-raw '{ "username":"admin", "password":"supersecretpassword",
"grant_type":"password", "scope":"GUIAccess" }'
```

Get Alarm Log Backup:

```
curl --location --request GET 'https://{{domain}}/rest/mbdetnrs/1.0/alarmService/actions/
downloadBackup' \
--header 'Authorization: Bearer {{access_token}}'
```

3.10.10.1 For other issues

For details on other issues, see the Troubleshooting section.

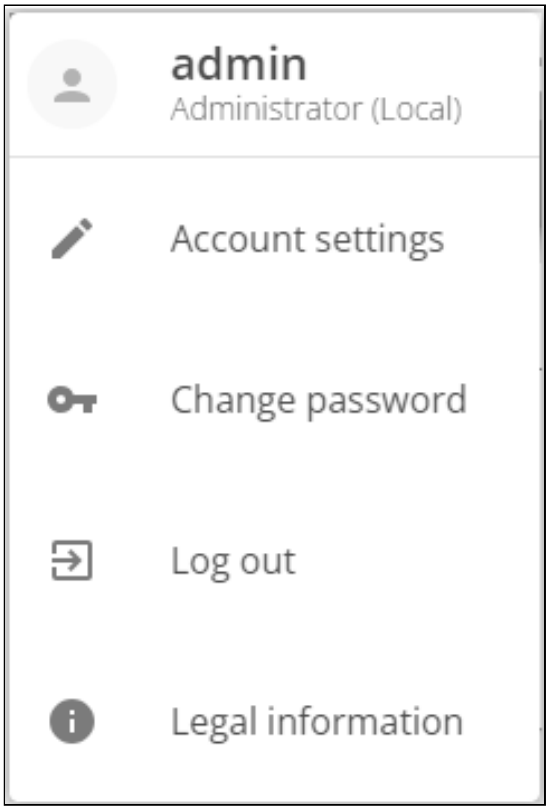
3.11 User profile

3.11.1 Access to the user profile

Press the icon on the top right side of the page to access the user profile window: 

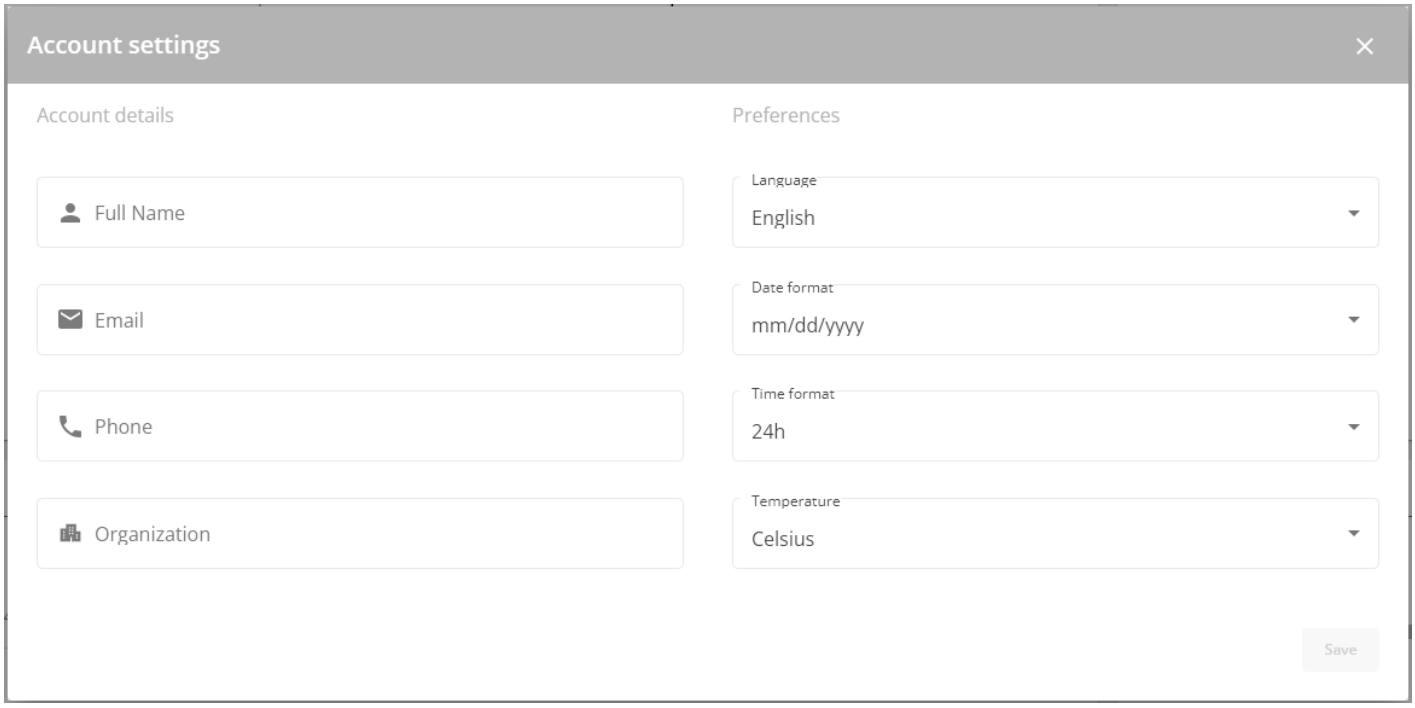
This page is in read-only mode when connected through LDAP and it displays the preferences applied to all LDAP users as configured in the Contextual help>>>Settings>>>Remote users>>>LDAP section.

3.11.2 User profile



This page displays the current username with its realm (local, remote) and allows to Change passwords, Edit account and Log out.

3.11.2.1 Account settings



If you have the administrator's rights, you can click on **Edit account** to edit user profile and update the following information:

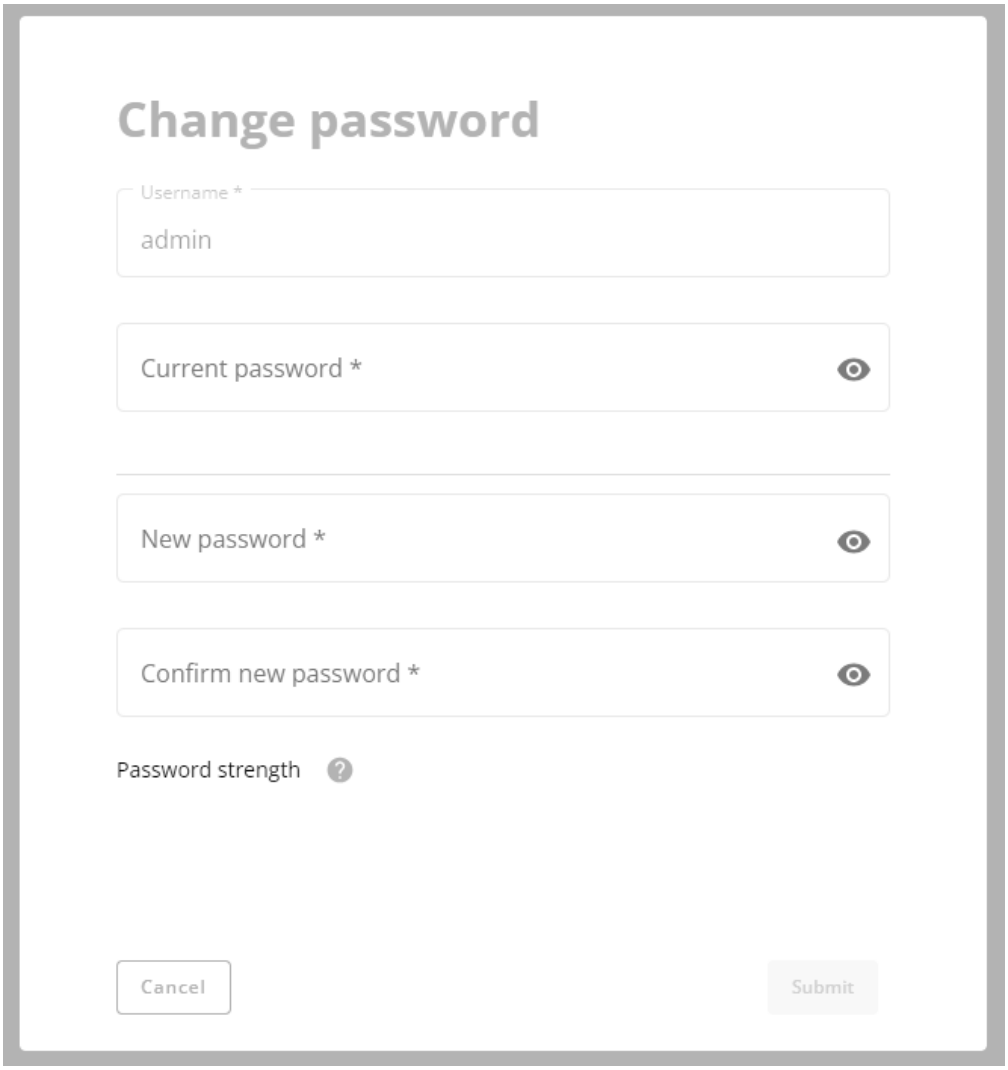
Account details

- Full name
- Email
- Phone
- Organization

Preferences

- Language
- Date format
- Time format
- Temperature

3.11.2.2 Change password



Click on **Change password** to change the password.

In some cases, it is not possible to change the password if it has already been changed within a day period. Refer to the troubleshooting section.

3.11.2.3 Log out

Click **Log out** to close the session.

3.11.3 Legal information

This Network Module includes software components that are either licensed under various open source license, or under a proprietary license.

3.11.4 Component

All the open source components included in the Network Module are listed with their licenses.

3.11.5 Availability of source code

Provides the way to obtain the source code of open source components that are made available by their licensors.

3.11.6 Notice for proprietary elements

Provides notice for our proprietary (i.e. non-Open source) elements.

3.11.7 Specifics

3.11.8 Default settings and possible parameters - User profile

	Default setting	Possible parameters
Profile	Account details: • Full name — Administrator • Email — blank • Phone — blank • Organization — blank Preferences: • Language — English • Date format — mm/dd/yyyy • Time format — hh:mm:ss (24h) • Temperature — °C (Celsius)	Account details: • Full name — 128 characters maximum • Email — 128 characters maximum • Phone — 64 characters maximum • Organization — 128 characters maximum Preferences: • Language — English, French, German, Italian, Polish, Russian, Simplified Chinese, Spanish, Traditional Chinese, Turkish • Date format — dd/mm/yyyy / yyyy/mm/dd / mm/dd/yyyy • Time format — hh:mm:ss (24h) / hh:mm:ss (12h) • Temperature — °C (Celsius)/°F (Fahrenheit)

3.11.8.1 For other settings

For other settings, see the Information>>>Default settings parameters section.

3.11.9 Access rights per profiles

	Administrator	Operator	Viewer
User profile	✓	✓	✓

	Administrator	Operator	Viewer

Legal information	✓	✓	✓

3.11.9.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

3.11.10 CLI commands

logout

Description

Logout the current user.

Help

```
logout
  <cr> logout the user
```

whoami

Description

whoami displays current user information:

- Username
- Profile
- Realm

3.11.10.1 For other CLI commands

See the CLI commands in the Information>>>CLI section.

3.11.11 Troubleshooting

Password change in My profile is not working

Symptoms

The password change shows "***Invalid credentials***" when I try to change my password in My profile menu: 

Possible cause

The password has already been changed once within a day period.

Action

Let one day between your last password change and retry.

3.11.11.1 For other issues

For details on other issues, see the Troubleshooting section.

3.11.12 Save and Restore

	SRR section	Settings	Possible values
Account details	vCard	fullName	String: refer to default settings an possible parameters for constraints.
		email	String: refer to default settings an possible parameters for constraints.
		phone	String: refer to default settings an possible parameters for constraints.
		organization	String: refer to default settings an possible parameters for constraints.
Preferences	preferences	notifyByMail	true/false
		licenseAgreed	true/false
		language	de: Deutsch en: English es: Español fr: Français it: Italiano pl: Polskojęzyczna ru: **русский** th: **ภาษาไทย** tr: Türkiye zh_Hans: **简体中文** zh_Hant: **繁體中文**

		dateFormat	Y-m-d: YYYY-MM-DD d-m-Y: DD-MM-YYYY d.m.Y: DD.MM.YYYY d/m/Y: DD/MM/YYYY m/d/Y: MM/DD/YYYY d m Y: DD MM YYYY
		timeFormat	1: 24h 0: 12h
		temperatureUnit	1: °C 2: °F

3.11.12.1 Additional information

For details on Save and Restore, see the Save and Restore section.

3.12 Documentation

3.12.1 Access to the embedded documentation

Press the ? icon on the top right side of the page to access the documentation in a new window:

The focus will be made on the contextual page.

You can then navigate into below sections:

Installing the Network Management Module	How to install and access the Network module.
Contextual help of the web interface	Help for each webpage. **Extracts from the sections below when they are related to the web page.**
Servicing the Network Management Module	How to install and use the Network module.
Securing the Network Management Module	How to secure the Network module.
Information	General information of the Network Module and Devices.
Troubleshooting	How to troubleshoot the Network Module.

Search feature is indexed.

3.12.2 Specifics

3.12.3 Access rights per profiles

	Administrator	Operator	Viewer
Contextual help	✓	✓	✓
Full documentation	✓	✓	✓

3.12.3.1 For other access rights

For other access rights, see the Information>>>Access rights per profiles section.

4 Servicing the Network Management Module

4.1 Configuring/Commissioning/Testing LDAP

4.1.1 Commissioning

Refer to the section Contextual help>>>Settings>>>Remote users>>>LDAP to get help on the configuration.

4.1.1.1 Configuring connection to LDAP database

This step configures the LDAP client of the network module to request data from an LDAP base.

1. Activate LDAP.
2. Define security parameters according to LDAP servers' requirements.
3. Configure primary server (and optionally a secondary one).
4. If security configuration needs server certificate verification, import your LDAP server certificate.
   Refer to the section to get help on certificate import.
   a. In case LDAP server certificate is self-signed, import the self-signed certificate in the *Trusted remote certificate* list for *LDAP* service.
   b. in case LDAP server certificate has been signed by a CA, import the corresponding CA in the *Certificate authorities (CA)* list for *LDAP* service.
5. Configure credentials to bind with the LDAP server or select *anonymous* if no credentials are required.
6. Configure the *Search base DN*.
7. Configure the request parameters (see examples below).

4.1.1.1.1 Typical request parameters

Parameter	OpenLDAP	Active Directory™ with POSIX account activated	Active Directory™
User base DN	ou=users, dc=example, dc=com	ou=users, dc=example, dc=com	ou=users, dc=example, dc=com
User name attribute	uid	uid	sAMAccountName
Group base DN	ou=groups, dc=example, dc=com	ou=groups, dc=example, dc=com	ou=groups, dc=example, dc=com
Group name attribute	gid	gid	sAMAccountName

4.1.1.2 Map remote users to profile

This step is mandatory and configures the Network module to give permissions to the LDAP users.
Users not belonging to a group mapped on a profile will be rejected.

Configure the rules to mapped LDAP users to profile:

1. Enter LDAP group name.
2. Select the profile to assigned.

You can define up to 20 mapping rules.

All LDAP users belonging to the configured LDAP group will have permissions granted by the associated profile.

If a user belongs to multiple LDAP groups mapped to different profiles, the behavior is undefined.

4.1.1.3 Define LDAP user's preferences

This step configures the user's preferences to apply to **all** LDAP users.

4.1.2 Testing LDAP connection

1. Click on Test icon right to Status column
2. Enter the User credentials then click on Test.
3. This test will verify all the parameters from the connection to the Database to the user credentials.
4. In case of error, the test displays where the issue is located.

4.1.3 Limitations

- If the same username exists in both local and LDAP databases, the behavior is undefined.
- If a user belongs to multiple LDAP groups mapped to different profiles, the behavior is undefined.
- No client certificate provided. It is not possible for the server to verify the client authenticity.
- It is not possible to configure LDAP to work with 2 different search bases.
- LDAP user's preferences are common to all LDAP users.
- LDAP users cannot change their password through the Network Module.
- The remote groupname entered in profile mapping settings must be composed only of **alphanumeric**s, underscore and hyphen characters (but this last one can't be at the beginning).

4.2 Pairing agent to the Network Module

Authentication and encryption of connections between the UPS network module and shutdown agents is based on matching certificates.

4.2.1 Pairing with credentials on the agent

STEP 1: Action on the agent (SPS G2/Winpower G2).

1. Connect to the web interface of the agent.

2. Detect the UPS Network Module with an **Address(es) scan**, select Override global authentication settings and type the UPS Network Module credentials.

4.2.2 Pairing with automatic acceptance (recommended if done in a secure and trusted network)

Pairing with automatic acceptance of shutdown agents and UPS network modules is recommended in case the installation is done in a secure and trusted network, and when certificates cannot be created in other ways.

STEP 1: Action on the Network Module

1. Connect to the Network Module

- On a network computer, launch a supported web browser. The browser window appears.
- In the Address/Location field, enter: https://xxx.xxx.xxx.xxx where xxx.xxx.xxx.xxx is the static IP address of the Network Module.
- The log in screen appears.
- Enter the user name in the User Name field.
- Enter the password in the Password field.
- Click **Login**. The Network Module web interface appears.

2. Navigate to Contextual help>>>Protection>>>Agents list page

3. In the **Pairing with shutdown agents** section, select the time to accept new agents and press the **Start** button and the press **Continue**. During the selected timeframe, new agent connections to the Network Module are automatically trusted and accepted.

STEP 2: Action on the agent (SPS G2/Winpower G2) while the time to accepts new agents is running on the Network Module

1. Connect to the web interface of the agent.
2. Detect the UPS Network Module with a **Quick scan**, **Range scan** or an **Address(es) scan**.
3. Right-click on the UPS Network Module when discovered and then **Set as power source**, **Configure** it, and **Save** it.

STEP 3: Action on the Network Module

1. Make sure all listed agents in the card (Contextual help>>>Protection>>>Agents list) belong to your infrastructure, if not, access may be revoked using the **Delete** button.
2. If the time for pairing still runs, you can stop it. Press **Stop** in the **Pairing with shutdown agents** section.

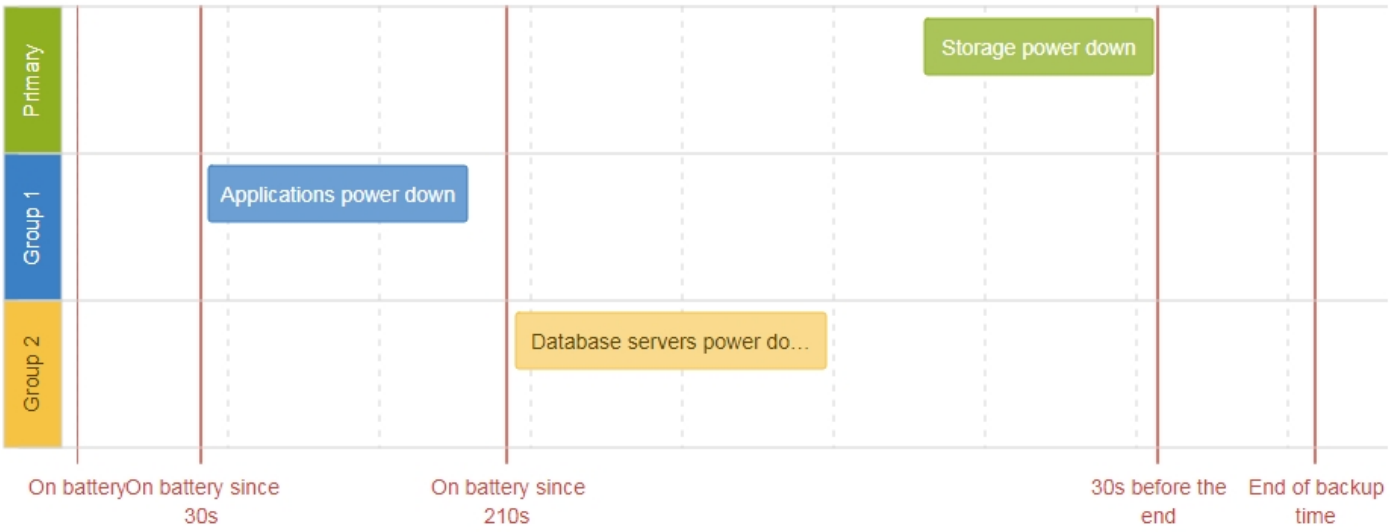
STEP 1 and **STEP2** can be done either ways.

4.3 Powering down/up applications (examples)

4.3.1 Powering down IT system in a specific order

4.3.1.1 Target

Powering down applications first (when on battery for 30s), database servers next (3min after the applications), and storage last (as late as possible).



4.3.1.2 Step 1: Installation setup

4.3.1.2.1 Objective

Use load segmentation provided by the UPS to independently control the power supply of each IT equipment categories (Applications, Database servers, Storage).

It also allows IT equipment to sequentially restart on utility recovery (Restart sequentially the IT equipment on utility recovery).

4.3.1.2.2 Resulting setup

UPS provides outlets (Group 1 and Group 2) and a primary output.

When primary shuts OFF, both group 1 and group 2 shut OFF immediately.

Connections to UPS are done as described below:

- Group 1: Applications
- Group 2: Database servers
- Primary: Storage

4.3.1.3 Step 2: Agent settings

4.3.1.3.1 Objective

Ensure IT solution is shutdown gracefully.

4.3.1.3.2 Resulting setup

1. Install SPS G2 Software on each server (Application, Database servers, Storage) and register the UPS load segment as power source:

- Applications: Group 1
- Database servers: Group 2
- Storage: Entire UPS

2. Pair agent to the Network Module (Pairing agent to the Network Module).

   When done, each server appears in the Agent list.

3. Navigate to Contextual help>>>Protection>>>Agent shutdown sequencing page.

For examples of Agent settings, see the Agent shutdown sequencing examples section.

4. Set the OS shutdown duration to the time needed for your server to shutdown gracefully.

   This will make sure SPS G2 shutdowns your servers before the load segment is powered down.

   As a result, it will define the overall shutdown sequence duration for each load segments.

4.3.1.4 Step 3: Power outage policy settings

4.3.1.4.1 Objective

Use load segment policies to define shutdown sequencing.

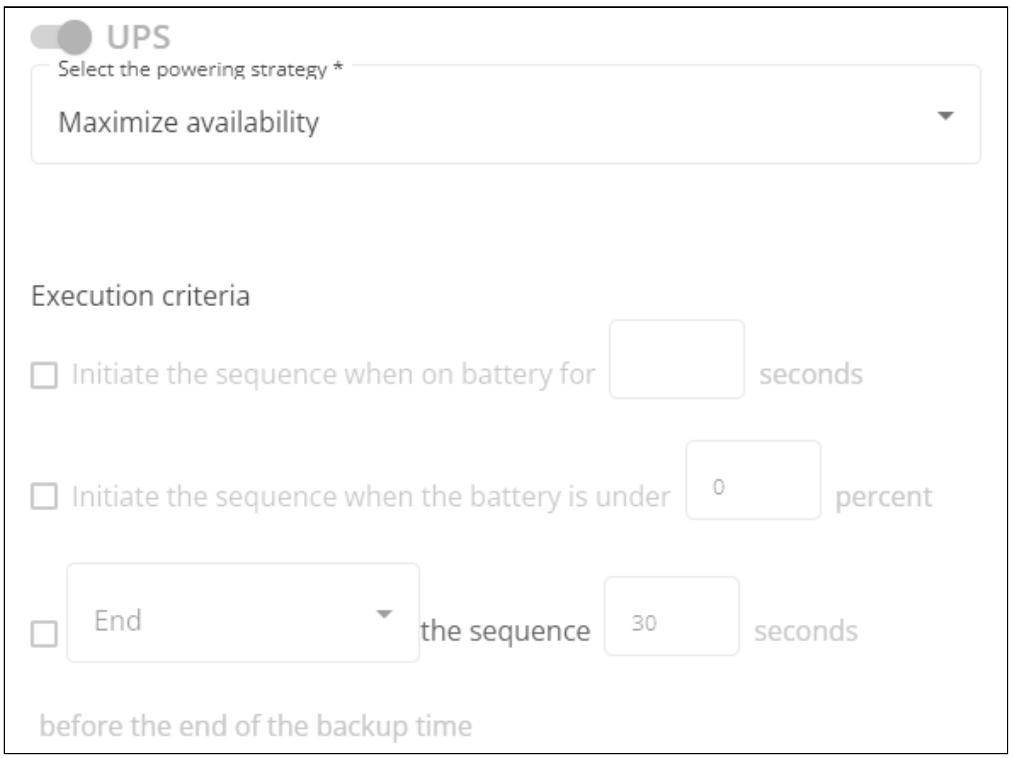
4.3.1.4.2 Resulting setup

1. Navigate to Contextual help>>>Protection>>>Shutdown on power outage page of the Network Module

For examples of Power outage policy, see the following sections:

- Maximize availability policy example
- Immediate graceful shutdown policy example
- Load shedding policy examples
- Custom policy examples

2. Make sure Primary is set to: **Maximize availability**.

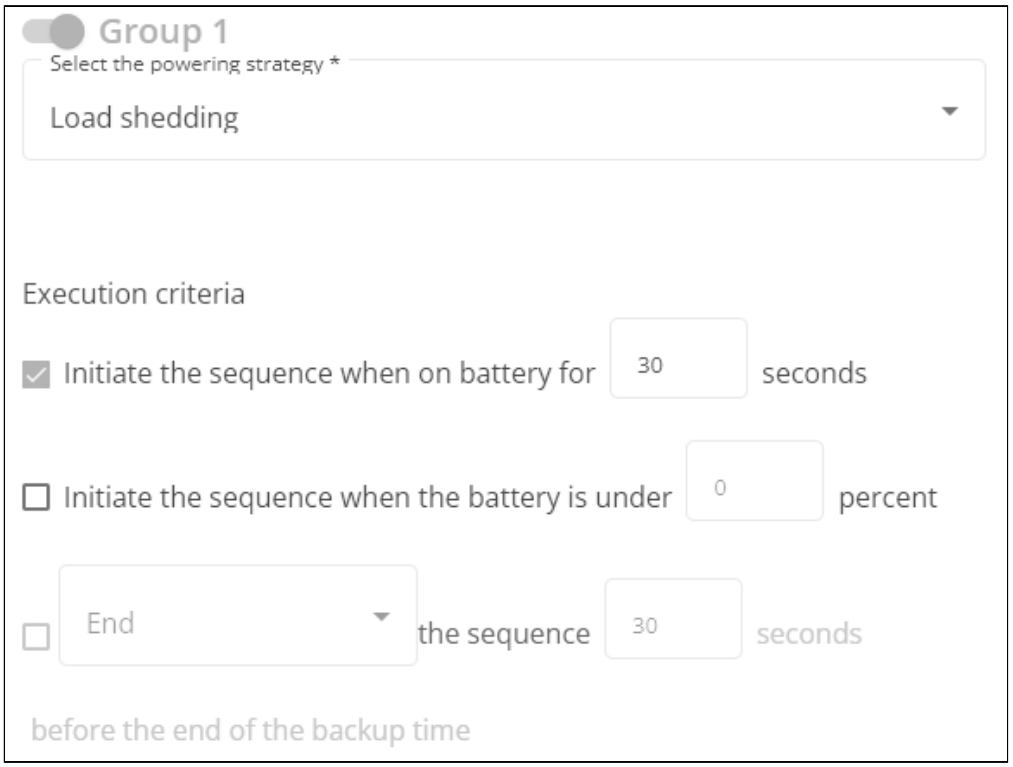


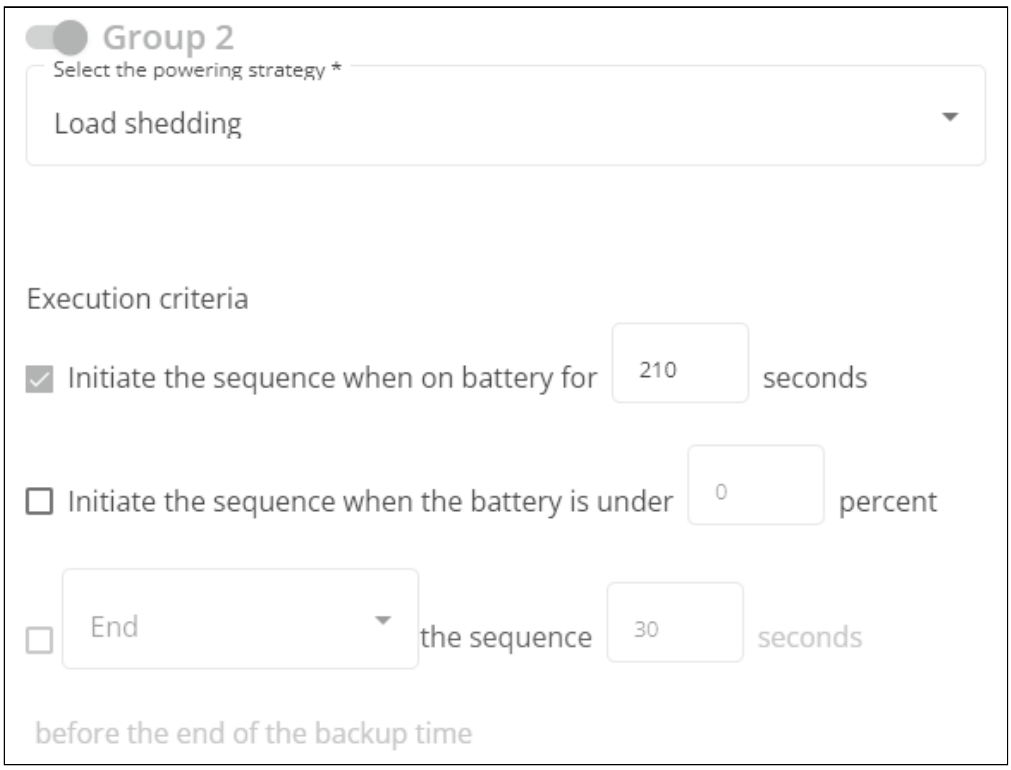
Storage is the last one to power down, its availability is maximized, and its shutdown will end 30s before the end of backup time.

3. Set Group 1 and Group 2 to: **Custom**.

Applications must shutdown first so Group 1 has been set to start shutdown when on battery for 30s.

Servers must shutdown second, so Group 2 has been set to start shutdown when on battery for 210s, so 3min after the applications.



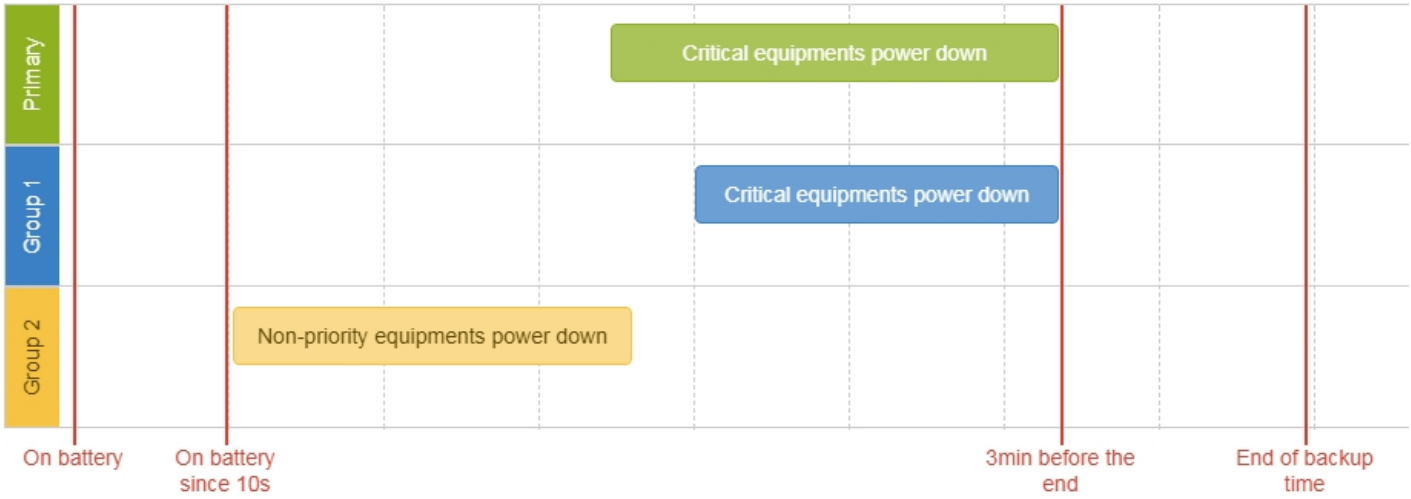


4.3.2 Powering down non-priority equipment first

4.3.2.1 Target

Powering down non-priority equipment first (immediately) and keep battery power for critical equipment.

Powering down critical equipment 3min before the end of backup time.



4.3.2.2 Step 1: Installation setup

4.3.2.2.1 Objective

Use load segmentation provided by the UPS to independently control the power supply of each IT equipment categories (Applications, Database servers, Storage).

Load segmentation also allows IT equipment to restart sequentially on utility recovery (Restart sequentially the IT equipment on utility recovery).

4.3.2.2.2 Resulting setup

UPS provides outlets (Group 1 and Group 2) and a primary output.

When primary shuts OFF, both group 1 and group 2 shut OFF immediately.

Connections can be done as described below:

- Group 2: non-priority equipment
- Group 1: critical equipment
- Primary: critical equipment

4.3.2.3 Step 2: Agent settings

4.3.2.3.1 Objective

Ensure IT solution is shutdown gracefully.

4.3.2.3.2 Resulting setup

1. Install SPS G2 Software on each server (Application, Database servers, Storage) and register the UPS load segment as power source:

- Critical equipment: Group 1
- Non-priority equipment: Group 2
- Critical equipment: Entire UPS

2. Pair agent to the Network Module (Pairing agent to the Network Module#Agent pairing).

   When done, each server appears in the Agent list.

3. Navigate to Contextual help>>>Protection>>>Agent shutdown sequencing page

For examples of Agent settings, see the Agents shutdown sequencing sections.

4. Set the OS shutdown duration to the time needed for your server to shutdown gracefully.

   This will make sure SPS G2 shutdowns your servers before the load segment is powered down.

   As a result, it will define the overall shutdown sequence duration for each load segments.

4.3.2.4 Step 3: Power outage policy settings

4.3.2.4.1 Objective

Use load segment policies to define shutdown sequencing.

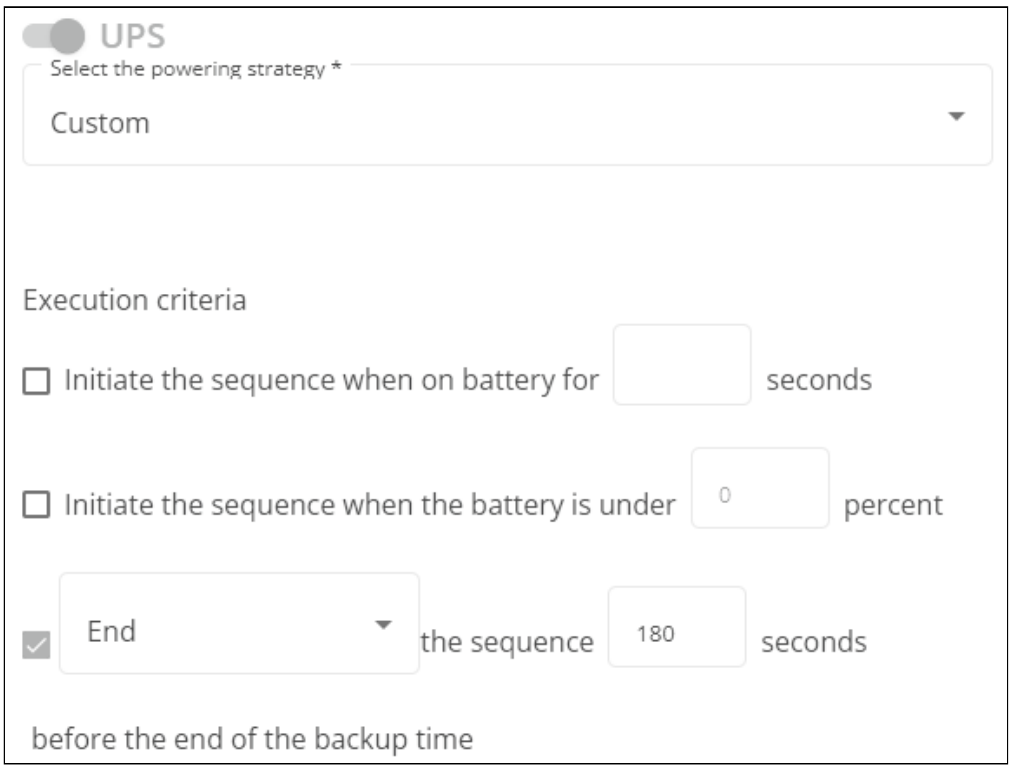
4.3.2.4.2 Resulting setup

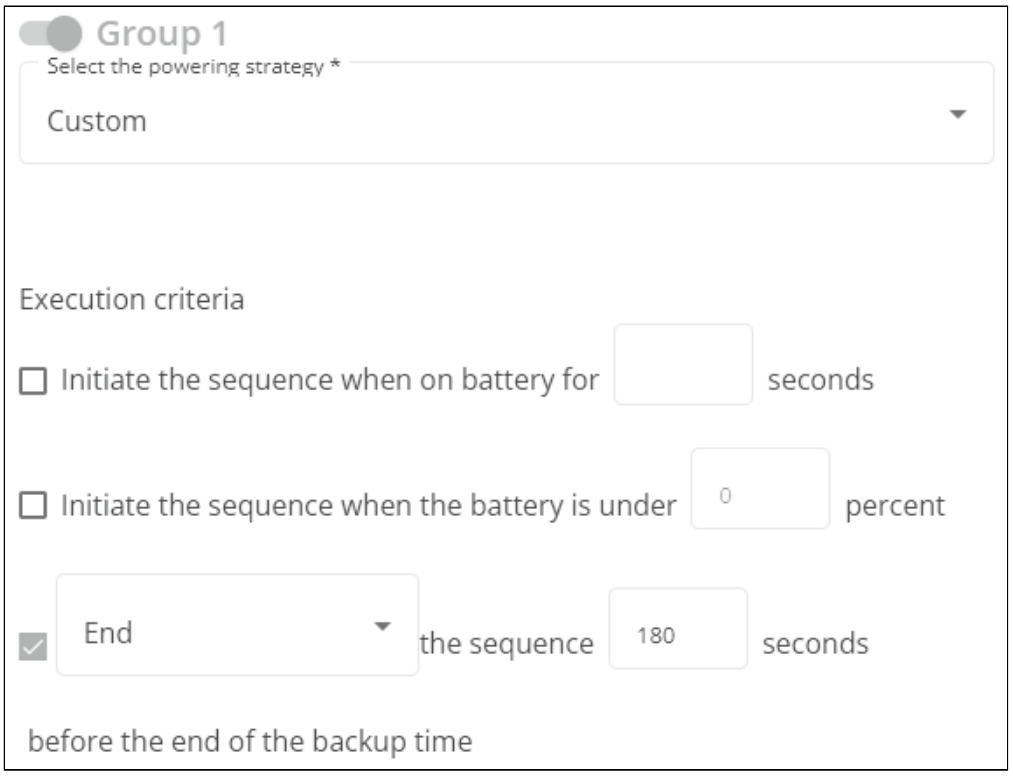
1. Navigate to Contextual help>>>Protection>>>Shutdown on power outage page on the Network Module

For examples of Power outage policy, see the following sections:

- Maximize availability policy example
- Immediate graceful shutdown policy example
- Load shedding policy examples
- Custom policy examples

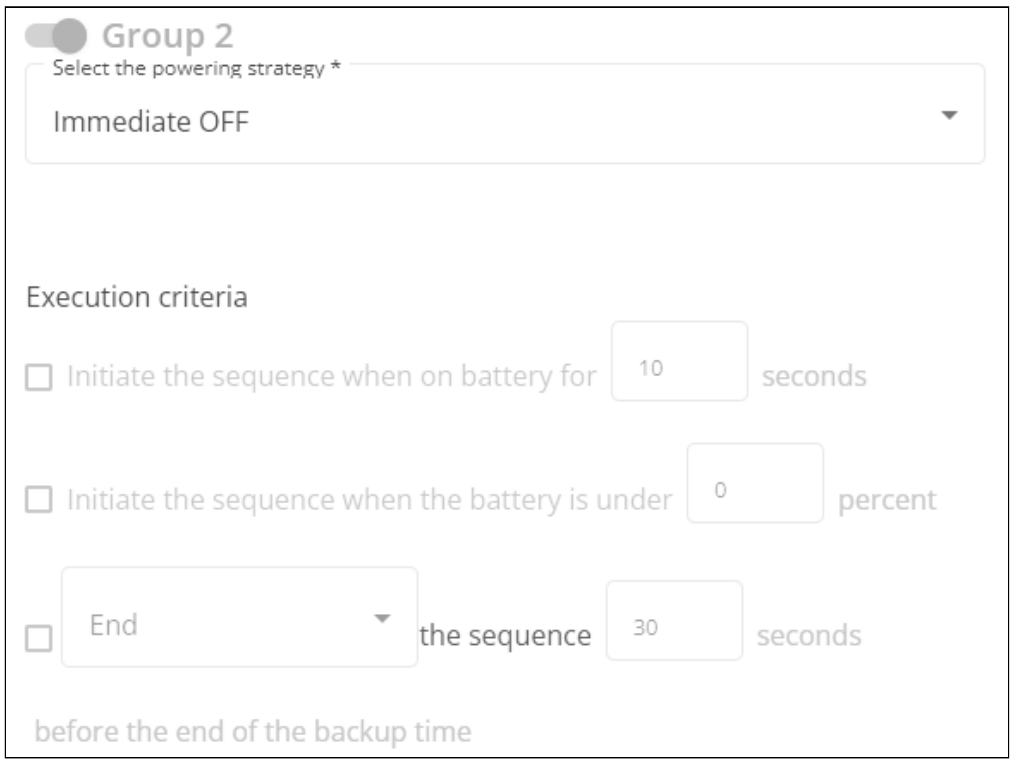
2. Set Primary and Group 1 to: **Custom** and set it to end shutdown sequence 180s before the end of backup time.





Critical equipment is the last one to power down, their availability will be maximized and their shutdown will end 180s before the end of backup time.

3. Set Group 2 to: **Immediate off**.

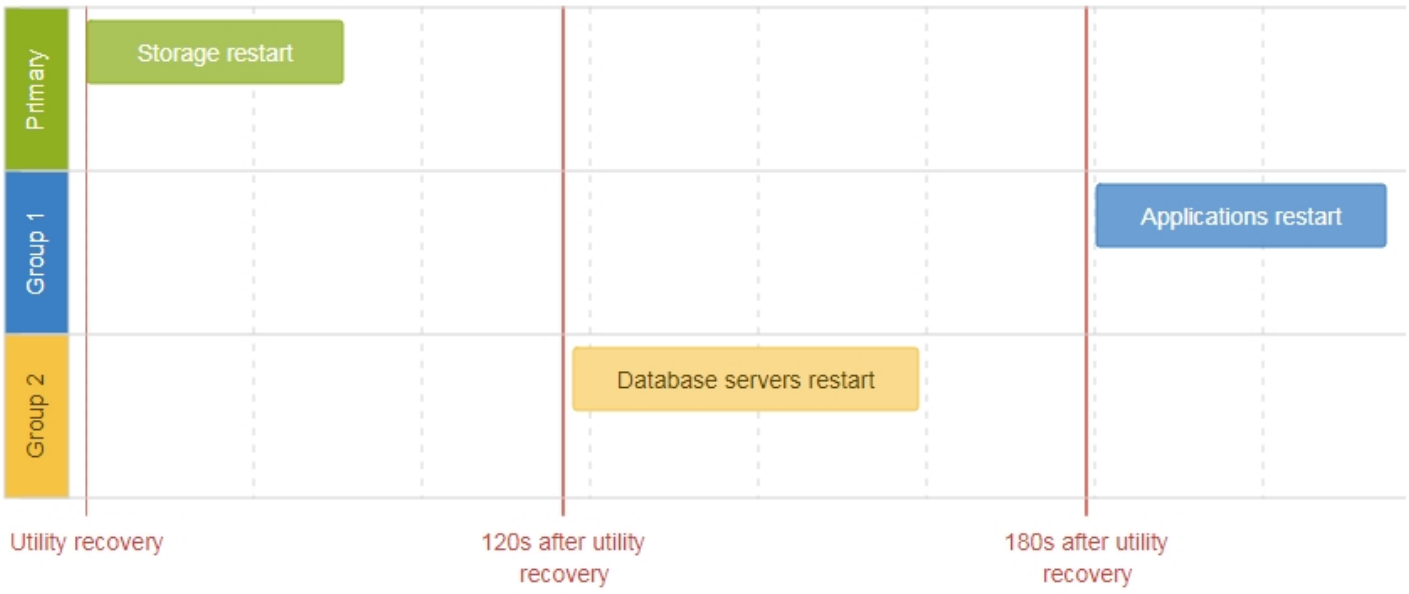


Non-priority equipment immediately shuts down when on battery for 10s to keep battery power for critical equipment.

4.3.3 Restart sequentially the IT equipment on utility recovery

4.3.3.1 Target

Restart the storage first (right after utility recovery), database servers next (2min after utility recovery) and applications last (3min after utility recovery).



4.3.3.2 Step 1: Installation setup

4.3.3.2.1 Objective

Use load segmentation provided by the UPS to independently control the power supply of each IT equipment categories (Applications, Database servers, Storage).

This will allow to restart sequentially the IT equipment on utility recovery.

4.3.3.2.2 Resulting setup

UPS provides outlets (Group 1 and Group 2) and a primary output.

When utility recovers, primary starts immediately.

Connections to UPS can be done as described below:

- Group 1: Applications
- Group 2: Database servers
- Primary: Storage

4.3.3.3 Step 2: Power outage policy settings

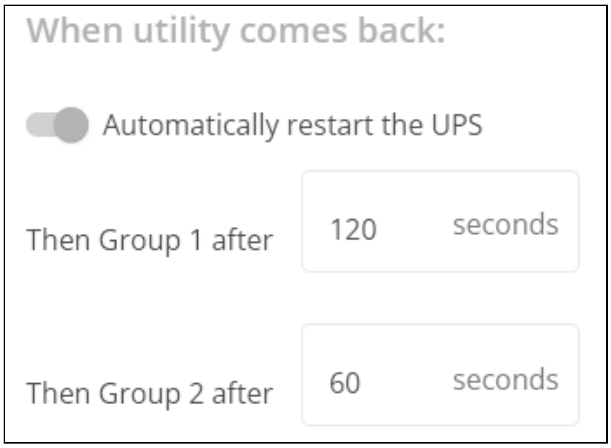
4.3.3.3.1 Objective

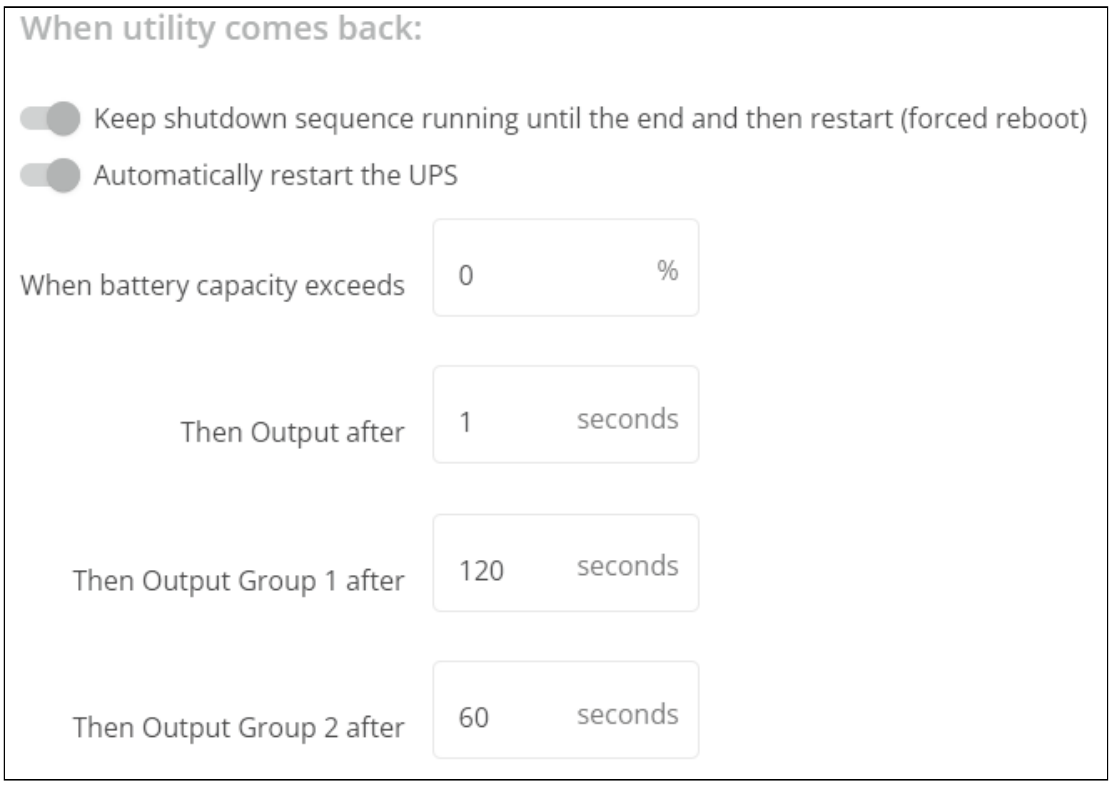
Use load segment restart settings to define restart sequencing.

4.3.3.3.2 Resulting setup

1. Navigate to Contextual help>>>Protection>>>Shutdown on power outage page and to the **When utility comes back** section.

With different types of UPS, this part will be different as below:





2. Enable the "Keep shutdown sequence running until the end and then restart (forced reboot)".
3. Enable the "Automatically restart the UPS when battery capacity exceeds" and set it to 0%.

   The storage will restart first, right after utility recovery without waiting the battery capacity to exceed a % limit.
4. Set Then Group 1 after to 120s.

   The database servers will restart 120s after the utility recovery.
5. Set Then Group 2 after to 60s.

   The database servers will restart 180s after the utility recovery.

4.4 Checking the current firmware version of the Network Module

Current firmware of the Network Module can be accessed in :

- The Top bar: Firmware version: x.xx.x
- The Card menu : Contextual help>>>Maintenance>>>System information>>>Firmware information: Version x.xx.x
- The Card menu : Contextual help>>>Maintenance>>>Firmware: Active FW version x.xx.x

4.5 Accessing to the latest Network Module firmware/driver/ script

Download the latest Network Module firmware, driver or script from the our company website

4.6 Upgrading the card firmware (Web interface / shell script)

For instructions on accessing to the latest firmware and script, refer to: Accessing to the latest firmware and script

4.6.1 Web interface

To upgrade the Network module through the Web interface, refer to the section: Firmware upgrade through the Web interface.

4.6.2 Shell script

4.6.2.1 Prerequisite

Shell script uses the following tools: sshpass, scp.

To get it installed on your Linux host, use the following commands.

Debian/Ubuntu

```
$ sudo apt-get install openssh-client sshpass
```

RedHat/Fedora/CentOS

```
$ sudo dnf install openssh-clients sshpass
```

Make shell script executable:

```
$ chmod 700 install_updatePackage.sh
```

4.6.2.2 Procedure

To upgrade the Network module using:

1. Open a shell terminal on your computer (Linux or cygwin; meaning real or emulated Linux operating system).
2. Use the shell script *install_updatePackage.sh*

```
Usage: 'install_updatePackage.sh' [options]
Upgrade tool
Mandatory arguments are -f, -i, -u and -p
-h : show help
-f <path> : path of the upgrade file
-u <username> : admin username
-p <password> : admin password
-i <ipaddress> : IP address of the Network card to be upgraded
-r : reboot the card after the upgrade
-b : reboot the card before the upgrade
-s : sanitize the card after the upgrade (card will reboot)
-k : allow connection to host with unknown public key (UNSAFE)
```

4.6.3 Example:

```
$ ./install_updatePackage.sh -u admin -p <mypassword> -f FW_Update.tar -i <cardIpAddress> -r
```

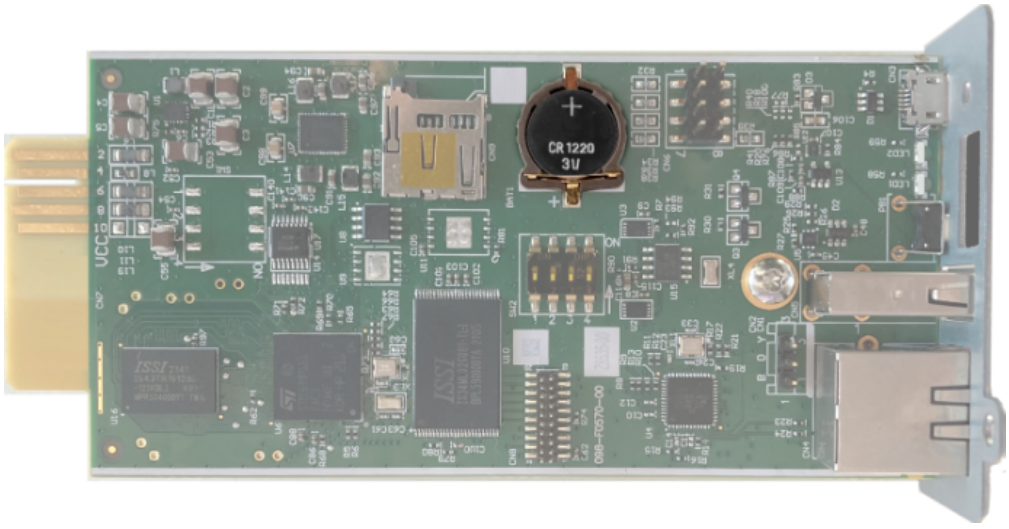
```
STARTING UPDATE FROM: [FW_Update.tar] to [X.X.X.X]

Transfer by scp (FW_Update.tar) to [X.X.X.X]
```

```
Warning: Permanently added 'X.X.X.X' (ECDSA) to the list of known hosts.
Transfer done.
Check running upgrade status ...
Check firmware binary signature
Uncompress and flash upgrade  - inProgress(%):11
Uncompress and flash upgrade  - inProgress(%):28
Uncompress and flash upgrade  - inProgress(%):44
Uncompress and flash upgrade  - inProgress(%):61
Uncompress and flash upgrade  - inProgress(%):78
Uncompress and flash upgrade  - inProgress(%):92
Uncompress and flash upgrade  - inProgress(%):100
Uncompress and flash upgrade  - inProgress(%):100
Uncompress and flash upgrade
Executing post post_upgrade.sh script upgrade
Upgrade done
Warning: Permanently added 'X.X.X.X' (ECDSA) to the list of known hosts.
Rebooting...
res: Y
Update:  OK
```

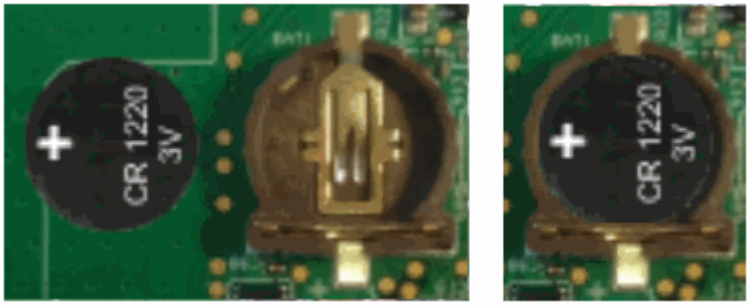
4.7 Changing the RTC battery cell

1. Access the Network Module, and then disconnect the Network cable, if needed.
2. Unscrew the Network Module and remove it from the slot.
3. Locate the RTC battery cell located on the back of the Network Module.



4. Get a new battery cell (CR1220 type).

5. Replace the battery cell, the positive mark (+) should be visible when inserting it.



6. Replace the Network Module and secure the screw, reconnect the Network cable if it was unplugged during the operation.
7. Connect the Network Module and set the date and time. For more information, see the Date & Time#NTP section.

4.8 Updating the time of the Network Module precisely and permanently (ntp server)

For an accurate and quick update of the RTC for the Network Module, we recommend implementing a NTP server as time source for the Network Module.

LANs have an internal NTP server (Domain Controller, mail servers, Outlook servers are generally time servers too) but you can use a public ntp server like pool.ntp.org (after addition of the related rules to your firewall system).

For more information, see the Contextual help>>>Settings>>>General>>>System details>>>Time & date settings section.

4.9 Synchronizing the time of the Network Module and the UPS

This section is valid only when the UPS can manage date and time (refer to the UPS user manual for confirmation).

The Network Module use UTC time and manage the time zone and the DST.
The UPS manage only the local time.

4.9.1 Automatic time synchronization

4.9.1.1 Every day at 5 a.m. (UTC time)

The UPS time (local time) is synchronized with the Network Module.

4.9.1.2 If the Network Module time is lost

The Network Module and the UPS time is synchronized with the oldest time between the last know Network Module time and the UPS time.

4.9.2 Manual time synchronization

4.9.2.1 From the Network Module

On the Network Module, navigate to Contextual help>>>Settings>>>General>>>System details>>>Time & date settings section and update the time.

The UPS time (local time) is directly synchronized with the Network Module.

4.9.2.2 From the UPS

When the time is updated on the UPS, it is not synchronized on the Network Module.

4.10 Changing the language of the web pages

Update the language of the web page in the Settings menu.

1. Navigate to Contextual help>>>User profile>>>Edit account.
2. Select the language, and then press the **Save** button.

The language of the login page is English by default or browser language when it is supported.

4.11 Resetting username and password

4.11.1 As an admin for other users

1. Navigate to Contextual help>>>Settings>>>Local users.
2. Press the pen icon to edit user information:
3. Change username and **save** the changes.
4. Select **Reset password** and choose from the following options :
   - Generate randomly
   - Enter manually
   - Force password to be changed on next login
5. Enter your own password to confirm the changes.
6. **Save** the changes.

4.11.2 Resetting its own password

1. Navigate to Contextual help>>>User profile.
2. Press Change password
3. Enter your current password, the new password twice.
4. Press **Submit** to save the changes.

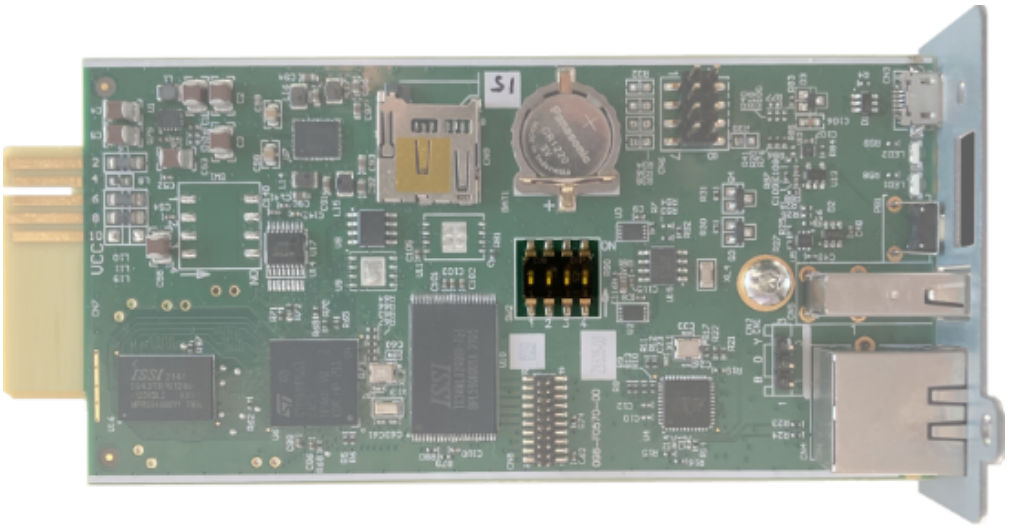
4.12 Recovering main administrator password

To recover the main administrator password, ask another administrator to initialize the password.

If it is not possible, proceed to the card sanitization:

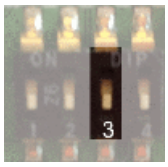
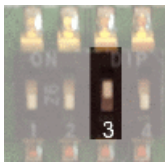
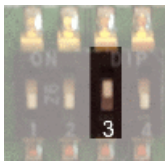
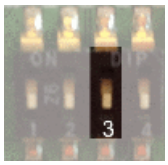
Below instruction will sanitize the card and blank all the data.
Depending on your network configuration, the Network Module may restart with a different IP address.
Only main administrator user will remain with default login and password.
Refresh the browser after the Network module reboot time to get access to the login page.

1. Access the Network Module, disconnect the Network cable, if needed.
2. Unscrew the Network Module and remove it from the slot.
3. Locate the SANITIZATION switch that is located either on the back or on the Network Module.



4. Peel off the protection :

5. Change the position of switch number 3, this change is detected during next power ON and the sanitization will be applied :

Case 1 :		
Case 2 :		

Changes of the switches 1, 2 or 4 has no effect.

6. Replace the Network Module and secure the screw, connect the Network cable, if needed.
7. Connect the Network Module by using the default credentials of the main administrator : admin/admin.
8. You will be forced to change the password accordingly to the current password strength rules.

4.13 Switching to static IP (Manual) / Changing IP address of the Network Module

Administrators can switch to static IP in the Settings menu and change the IP address of the Network Module.

1. Navigate to Contextual help>>>Settings>>>Network & Protocol>>>IPV4.
2. Select Manual (Static IP).
3. Input the following information:
   - IPv4 Address

- Subnet Mask
- Default Gateway

4. Save the changes.

4.14 Reading device information in a simple way

4.14.1 Web page

The product information is located in the , specifically with the button on the top of the diagram:

4.15 Subscribing to a set of alarms for email notification

4.15.1 Example #1: subscribing only to one alarm (load unprotected)

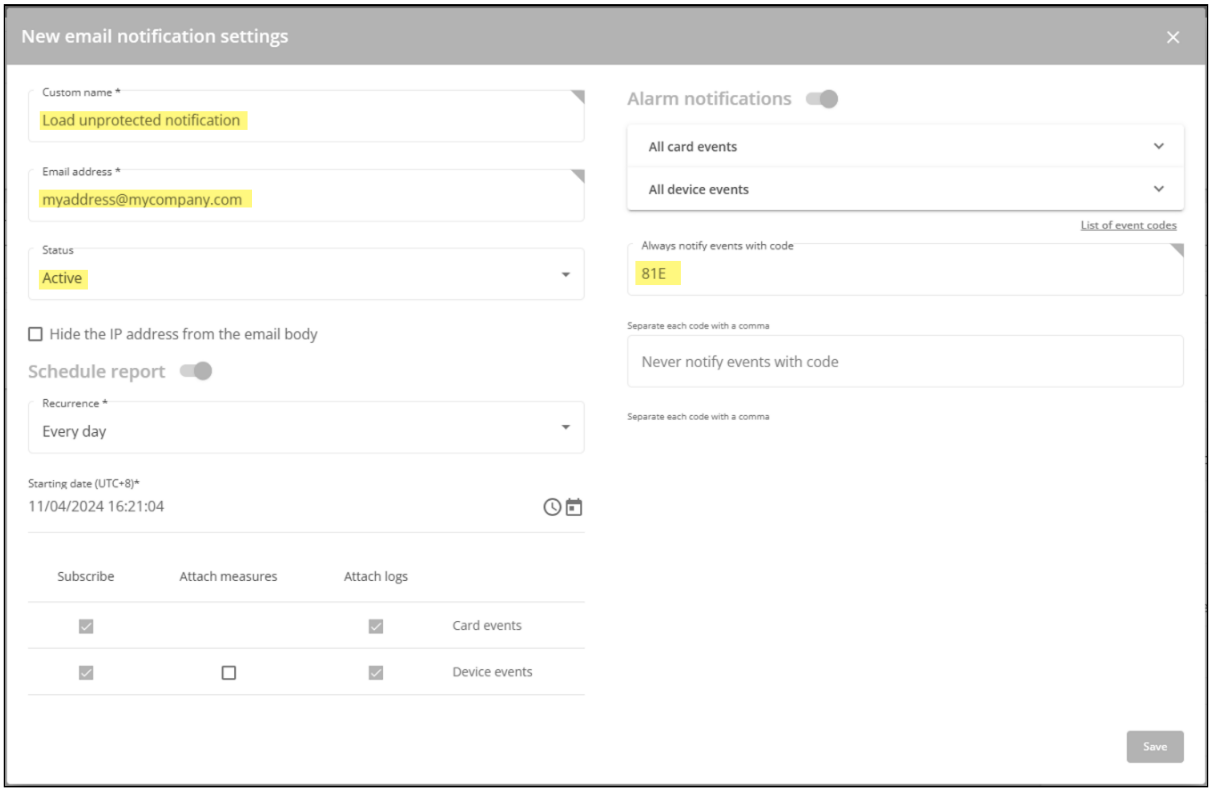
Follow the steps below:

1. Navigate to Contextual help>>>Settings>>>General>>>Email notification settings.

2. Press the button **New** to create a new configuration.

3. Select:

- Active: Yes
- Configuration name: Load unprotected notification
- Email address: myaddress@mycompany.com
- Notify on events: Active
- Always notify events with code: 81E (Load unprotected)



Logs will be attached by default in that example even if there is no subscription on card or device events.

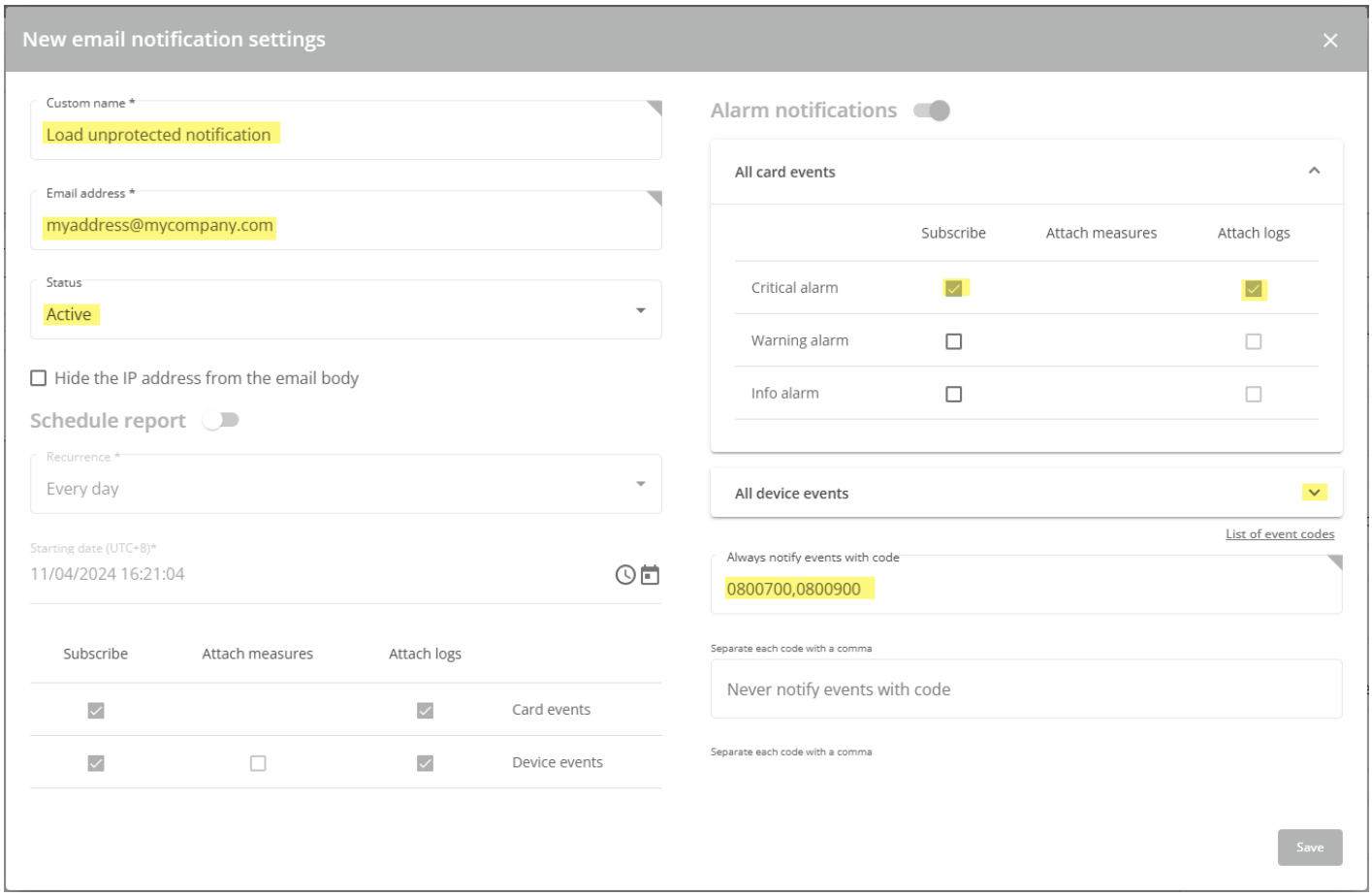
4. Press **Save**, the table will show the new configuration.

4.15.2 Example #2: subscribing to all Critical alarms and some specific Warnings

Follow the steps below:

1. Navigate to Contextual help>>>Settings>>>General>>>Email notification settings.
2. Press the button **New** to create a new configuration.
3. Select:

- Active: Yes
- Configuration name: ALL Critical and User account Warning notification
- Email address: myaddress@mycompany.com
- Notify on events: Active
- Subscribe to Critical card events and Critical device events
- Always notify events with code: 0800700, 0800900 (User account - password expired, User account- locked)



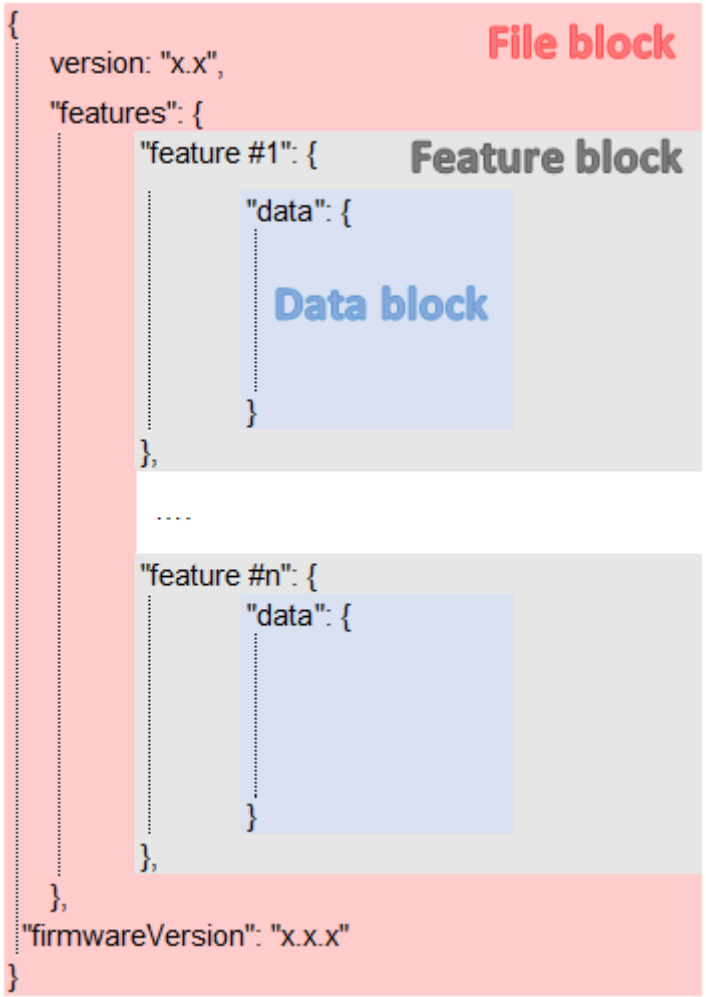
4. Press **Save**, the table will show the new configuration.

4.16 Saving/Restoring/Duplicating Network module configuration settings

4.16.1 Modifying the JSON configuration settings file

4.16.1.1 JSON file structure

The JSON file is structured into 3 blocks:



4.16.1.1.1 File block

File block cannot be modified, this is the mandatory structure of the JSON file.

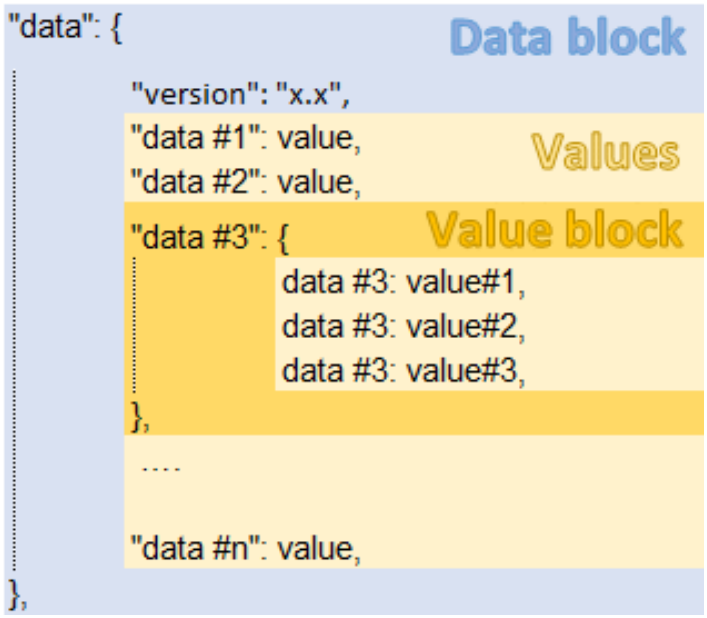
4.16.1.1.2 Feature block

Feature block contains the full definition of a feature.

If it is removed from the JSON file, this feature settings will not be updated/restored in the card.

4.16.1.1.3 Data block

Data block contains all the feature settings values.



a Data block

Data block cannot be modified, this is the mandatory structure of the JSON file.

b Value block

If some values inside the Value block need to be kept, Value block structure cannot be modified, this is the mandatory structure of the JSON file.

If it is removed from the JSON file, these values will not be updated/restored.

c Values

Values can be kept as is, modified or removed.

Removed values will not be updated/restored.

4.16.1.2 Sensitive data (like passwords)

JSON file structure will slightly varies if sensitive data are exported with passphrase or not.

4.16.1.2.1 The JSON file is saved using passphrase (preferred)

All sensitive data will have below structure:

```
"password": {
        plaintext: "null",
        cyphered: "p-twlcjoV-a8FjMjkagL6w"
},
```

When restoring the file, the corresponding setting will be updated based on the cyphered value.

4.16.1.2.2 The JSON file is saved without passphrase

All sensitive data will have below structure:

```
"password": {
        plaintext: "null",
},
```

When restoring the file, the corresponding setting will not be set.
This may lead to restoration failure if corresponding setting was not previously set with a valid value.

4.16.1.3 Modifying JSON file examples

4.16.1.3.1 Modifying sensitive data

To change sensitive data, plain text must be filled with the new value **and the Cyphered entry (if existing) must be removed:**

```
"password": {
        plaintext: "New password",
},
```

4.16.1.3.2 Adding local users

Adding or modifying local users is not yet available, only the predefined account (main administrator) can be modified.

4.16.1.3.3 Modifying SNMP settings

Original file:	Modified file:
SNMP disabled	SNMP enabled on port 161 SNMPv1 disabled SNMPv3 enabled 2 x accounts 1 x read only user (enabled) with Auth-Priv security level and passwords 1x read write user (enabled) with Auth-Priv security level and passwords 1 x active trap

Original file:

```
snmp: {
        data: {
                version: "x.x",
                dmeData: {
                        enabled: false,
                        port: xxxx,
                        v1: {
                                enabled: false,
                                communities: {
                                ..................................
                                }
                        },
                        v3: {
                                enabled: false,
                                users: [
                                                ..................................
                                ]
                        },
                        traps: {
                                receivers: [
                                ]
                        }
                }
        }
},
```

Modified file:

```
snmp: {
        data: {
                version: "x.x",
                dmeData: {
                        enabled: true,
                        port: 161,
                        v1: {
                                enabled: false,
                                communities: {
                                ..................................
                                }
                        },
                        v3: {
                                enabled: true,
                                users: [
                                        {
                                                name: "readonly",
                                                allowWrite: false,
                                                enabled: true,
                                                auth: {
                                                        enabled: true,
                                                        password: {
                                                                plaintext: xxxxxxxxxxxxxx
                                                        }
                                                },
                                                priv: {
                                                        enabled: true,
                                                        password: {
                                                                plaintext: yyyyyyyyyyyyyy
                                                        }
                                                }
                                        },
                                        {
                                                name: "readwrite",
                                                allowWrite: true,
                                                enabled: true,
                                                auth: {
                                                        enabled: true,
                                                        password: {
                                                                plaintext: zzzzzzzzzzzzzzzz
                                                        }
                                                },
                                                priv: {
                                                        enabled: true,
                                                        password: {
                                                                plaintext: wwwwwwwww
                                                        }
                                                }
                                        }
                                ]
                        },
                        traps: {
                                receivers: [
                                        {
                                                name: "xxxxxxxx",
                                                host: "xxx.xx.xxx.xx",
                                                port: xxx,
                                                community: "xxxxx",
                                                protocol: x,
                                                user: "",
                                                enabled: xxxx
                                        },
                                ]
                        }
                }
        }
},
```

4.16.1.3.4 Making a partial update/restoration

a Example: Updating/Restoring only LDAP settings

If you restore below JSON content, only LDAP settings will be updated/restored, everything else will remain unchanged.

```
{
    "version": "x.x",
    "features": {
```

```
        "ldap": {
            "data": {
            "version": "x.x",
            "certificateData": [],
            "dmeData": {
                "enabled": true,
                "baseAccess": {
                    "security": {"ssl": 1,"verifyTlsCert": false},
                    "primary": {"name": "Primary","hostname": "xxxxxxxxx","port": xxxx},
                    "secondary": {"name": "xxxxxx","hostname": "xxxxxx","port": xxxx},
                    "credentials": {
                        "anonymousSearchBind": false,
                        "searchUserDN":
                        "CN=xxxx,OU=xxxx,OU=xxxx,OU=xxxx,DC=xxxx,DC=xxxx",
                        "password": {"plaintext": null}},
                    "searchBase": {"searchBaseDN": "DC=xxx,DC=xxx,DC=xxx"}
                    },
                "requestParameters": {
                    "userBaseDN": "OU=xxxx,DC=xxxx",
                    "userNameAttribute": "xxxx",
                    "uidAttribute":"objectSid:x-x-x-xx-xxxxxxxxxx-xxxxxxxxxx-xxxxxxxxxx",
                    "groupBaseDN": "OU=xxxx,DC=xxxx",
                    "groupNameAttribute": "xx",
                    "gidAttribute":"objectSid:x-x-x-xx-xxxxxxxxxx-xxxxxxxxxx-xxxxxxxxxx"
                    },
                "profileMapping": [
                    { "remoteGroup": "xxxxxxxxxxxxxx","profile": 1},
                    { "remoteGroup": "xxxxxxxxxxxxxx","profile": 2},
                    { "remoteGroup": "","profile": 0},
                    { "remoteGroup": "","profile": 0},
                    { "remoteGroup": "","profile": 0}
                    ]
                    }
                }
            },
        },
"firmwareVersion": "x.x.x"
}
```


4.16.2 Saving/Restoring/Duplicating settings through the CLI

Navigate to Information>>>CLI>>>save_configuration | restore_configuration section to get example on how to save and restore settings through the CLI.

4.16.3 Saving/Restoring/Duplicating settings through the Web interface

Navigate to Contextual help>>>Maintenance>>>Services section to get information on how to save and restore settings through the Web interface.

5 Securing the Network Management Module

5.1 Security considerations overview

The UPS Network Module implements strict security for the following reasons:

- The UPS Network Module manages devices that have the potential to perform operations that are sensitive and destructive.
- The UPS Network Module has browser accessibility.

To better ensure the security of the UPS Network Module and the devices it manages, consider the following topics in accordance with your organization's security policies and the environment in which the UPS Network Module operates.

- Remote access to the UPS Network Module requires a user account. Logging in requires the use of a user name and password, which should be kept properly secured.
- Each account can be given different access levels, providing different capabilities. Ensure that the appropriate access level is granted to users.
- Browsing to the UPS Network Module can be done using SSL, which encrypts the data between the browser and UPS Network Module. The UPS Network Module is supported by a 128-bit encryption level. SSL also provides authentication of the UPS Network Module by means of its digital certificate. Securely importing this certificate must be done to ensure the identification of the UPS Network Module.

5.2 Cybersecurity considerations for electrical distribution systems

5.2.1 Purpose

The purpose of this section is to provide high-level guidance to help customers across industries and applications apply our company solutions for power management of electrical systems in accordance with current cybersecurity standards.
This document is intended to provide an overview of key security features and practices to consider in order to meet industry recommended standards and best practices.

5.2.2 Introduction

Every day, cyber-attacks against government and commercial computer networks number in the millions. According to U.S. Cyber Command, Pentagon systems are probed 250,000 times per hour. Similar attacks are becoming more prevalent on other kinds of information-based smart networks as well, such as those that operate buildings and utility systems. Whether the objective is to steal intellectual property or halt operations, the tools and the techniques used for unauthorized network access are increasingly sophisticated.

5.2.3 Connectivity—why do we need to address cybersecurity for industrial control systems (ICS)?

There is increasing concern regarding cybersecurity across industries where companies are steadily integrating field devices into enterprise-wide information systems. This occurs in discrete manufacturing and process industrial environments, a wide range of general and specific purpose commercial buildings, and even utility networks. Traditionally, electrical systems were controlled through serial devices connected to computers via dedicated transceivers with proprietary protocols. In contrast, today's control systems are increasingly connected to larger enterprise networks, which can expose these systems to similar vulnerabilities that are typically found in computer systems. The differences between information technology (IT) and ICS networks can be summarized as follows:

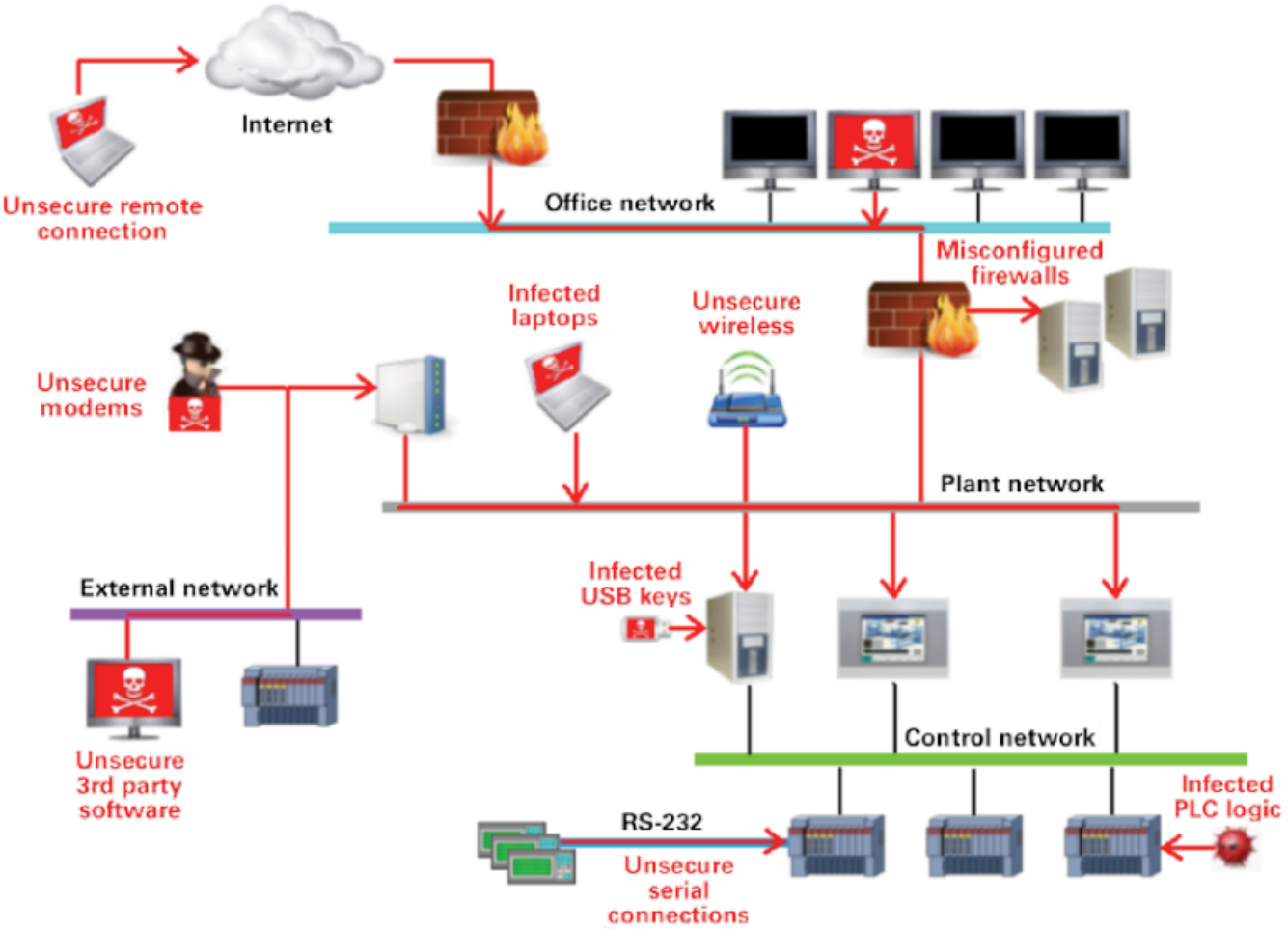
- The main focus of the IT network is to ensure the **confidentiality** and the **integrity** of the data using rigorous access control and data encryption
- The main focus of the ICS network is **safety**, **availability**, and **integrity** of data
- Enterprise security protects the servers' data from attack

- Control system security protects the facility's ability to safely and securely operate, regardless of what may befall the rest of the network

5.2.4 Cybersecurity threat vectors

Cybersecurity threat vectors are paths or tools that an entity can use to gain access to a device or a control network in order to deliver a malicious attack. Figure below shows examples of attack vectors on a network that might otherwise seem secure.

5.2.4.1 Paths to the control network



The paths in above figure include:

- External users accessing the network through the Internet
- Misconfigured firewalls
- Unsecure wireless routers and wired modems
- Infected laptops located elsewhere that can access the network behind the firewall
- Infected USB keys and PLC logic programs
- Unsecure RS-232 serial links

The most common malicious attacks come in the following forms:

- Virus—a software program that spreads from one device to another, affecting operation
- Trojan horse—a malicious device program that hides inside other programs and provides access to that device
- Worm—a device program that spreads without user interaction and affects the stability and performance of the ICS network
- Spyware—a device program that changes the configuration of a device

5.2.5 Defense in depth

While there are differences between traditional IT systems and ICS, the fundamental concept of "defense in depth" is applicable to both. Defense in depth is a strategy of integrating technology, people, and operations capabilities to establish variable barriers

across multiple layers of an organization. These barriers include electronic countermeasures such as firewalls, intrusion detection software/components, and antivirus software, coupled with physical protection policies and training. Fundamentally, the barriers are intended to reduce the probability of attacks on the network and provide mechanisms to detect "intruders."

5.2.6 Designing for the threat vectors

5.2.6.1 Firewalls

Firewalls provide the capability to add stringent and multifaceted rules for communication between various network segments and zones in an ICS network. They can be configured to block data from certain segments, while allowing the relevant and necessary data through. A thorough understanding of the devices, applications, and services that are in a network will guide the appropriate deployment and configuration of firewalls in a network. Typical types of firewalls that can be deployed in a network include:

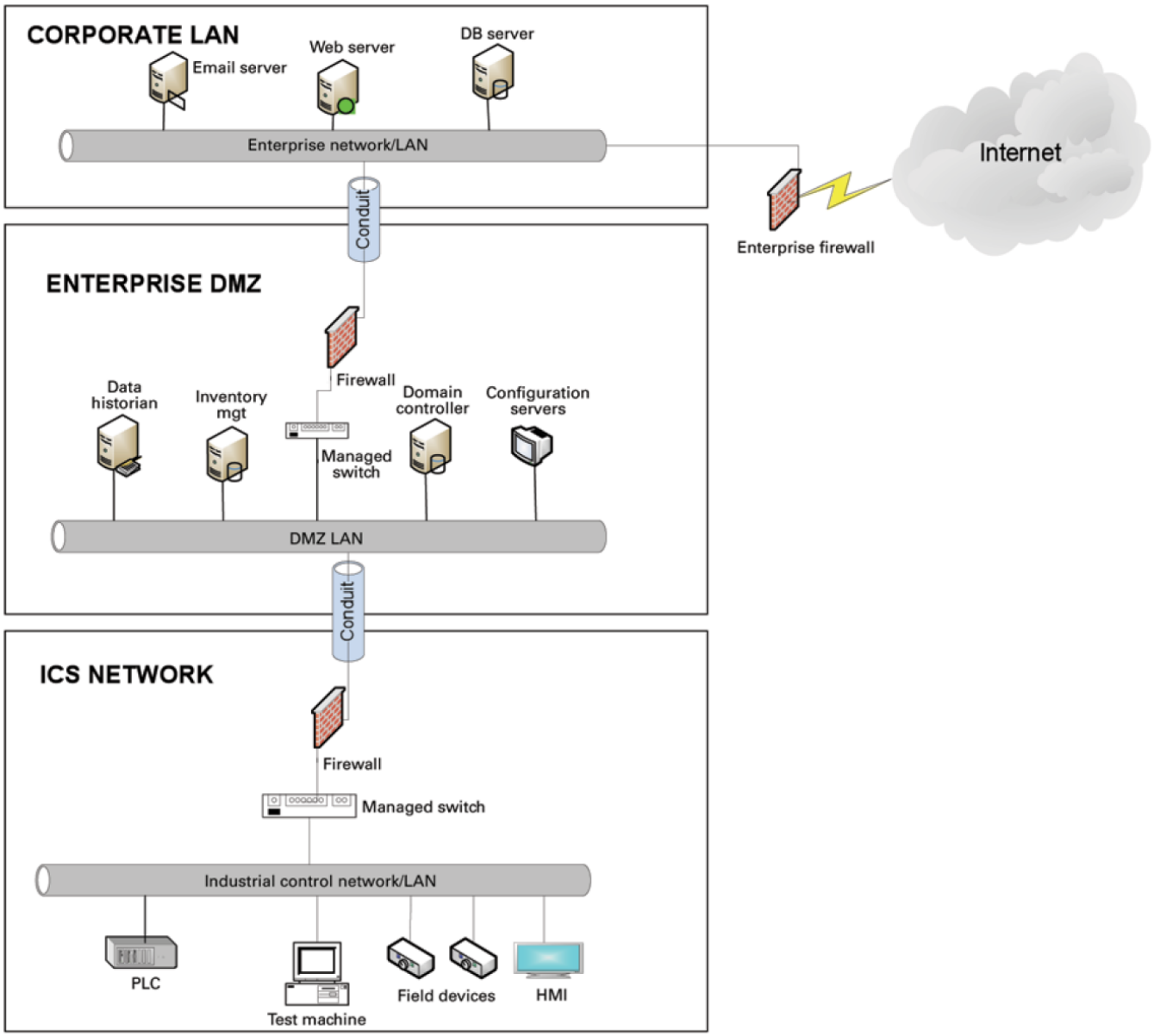
- Packet filter or boundary firewalls that work on the network layer
  These firewalls mainly operate at the network layer, using pre-established rules based on port numbers and protocols to analyze the packets going into or out of a separated network.
  These firewalls either permit or deny passage based on these rules.
- Host firewalls
  These firewalls are software firewall solutions that protect ports and services on devices. Host firewalls can apply rules that track, allow, or deny incoming and outgoing traffic on the device and are mainly found on mobile devices, laptops, and desktops that can be easily connected to an ICS.

- Application-level proxy firewalls
  These firewalls are highly secure firewall protection methods that hide and protect individual devices and computers in a control network. These firewalls communicate at the application layer and can provide better inspection capabilities. Because they collect extensive log data, application-level proxy firewalls can negatively impact the performance of an ICS network.
- Stateful inspection firewalls
  These firewalls work at the network, session, and application layers of the open system interconnection (OSI). Stateful inspection firewalls are more secure than packet filter firewalls because they only allow packets belonging to allowed sessions.
  These firewalls can authenticate users when a session is established and analyze a packet to determine whether they contain the expected payload type or enforce constraints at the application layer.
- SCADA hardware firewalls
  These are hardware-based firewalls that provide defense for an ICS based on observing abnormal behavior on a device within the control network. For example, if an operator station computer suddenly attempts to program a PLC, this activity could be blocked and an alarm could be raised to prevent serious risk to the system.

5.2.6.2 Demilitarized zones (DMZ)

Network segmentation is a key consideration in establishing secure control networks. Firewalls should be used to create DMZ by grouping critical components and isolating them from the traditional business IT network. A three-tier architecture should be employed at a minimum, with a DMZ between the organization's core network and an isolated control system's network as shown in below figure.

5.2.6.2.1 Three-tier architecture for a secure control network



Above figure shows that the control networks are divided into layers or zones based on control functions, which are then connected by conduits (connections between the zones) that provide security controls to:

- Control access to zones
- Resist denial of services (DOS) attacks or the transfer of malware
- Shield other network systems
- Protect the integrity and the confidentiality of network traffic

Beyond network segmentation, access control (both physical and logical) should be defined and implemented.

The key consideration when designing access control is defining the **required** interactions both within a given zone and between zones. These interactions should be mapped out clearly and prioritized based on need. It is important to realize that every hole poked in a firewall and each non-essential functionality that provides access or creates additional connectivity increases potential exposure to attacks. A system then becomes only as secure as the devices connecting to it.

If mapped correctly, the potential adverse impact to control system reliability and functionality should be negligible. However, this element introduces additional costs (in terms of firewall and other network infrastructure) and complexity to the environment.

5.2.6.3 Intrusion detection and prevention systems (IDPS)

These are systems that are primarily focused on identifying possible incidents in an ICS network, logging the information about them, attempting to stop them, and reporting them to ICS security administrators.

Because these systems are critical in an ICS network, they are regular targets for attacks and securing them is extremely important.

The type of IDPS technology deployed will vary with the type of events that need to be monitored.

There are four classes of IDPS technology:

- Network-based IDPS monitors network traffic for particular ICS network segments or devices and analyzes the network and application protocol activity to identify suspicious activity
- Wireless IDPS monitors and analyzes wireless network traffic to identify suspicious activity involving the ICS wireless network protocol
- Network behavior analysis IDPS examines ICS network traffic to identify threats that generate unusual traffic flows such as DOS attacks
- Host-based IDPS monitors the characteristics and the events occurring within a single ICS network host for suspicious activity

5.2.7 Policies, procedures, standards, and guidelines

For the defense in depth strategy to succeed, there must be well-documented and continuously reviewed policies, procedures, standards, and guidelines.

- Policies provide procedures or actions that must be carried out to meet objectives and to address the who, what, and why
- Procedures provide detailed steps to follow for operations and to address the how, where, and when
- Standards typically refer to specific hardware and software, and specify uniform use and implementation of specific technologies or parameters
- Guidelines provide recommendations on a method to implement the policies, procedures, and standards

5.2.7.1 Understanding an ICS network

Creating an inventory of all the devices, applications, and services that are hosted in a network can establish an initial baseline for what to monitor. Once those components are identified and understood, control, ownership, and operational consideration can be developed.

5.2.7.2 Log and event management

It is important to understand what is happening within the network from both a performance and security perspective. This is especially true in a control systems environment.

Log and event management entails monitoring infrastructure components such as routers, firewalls, and IDS/IPS, as well as host assets. Security Information and Event Management (SIEM) systems can collect events from various sources and provide correlation and alerts.

Generating and collecting events, or even implementing a SIEM is not sufficient by itself. Many organizations have SIEM solutions, but alerts go unwatched or unnoticed.

Monitoring includes both the capability to monitor environments and the capacity to perform the monitoring. Capability relates to the
design and the architecture of the environment. Has it been built in a manner that takes into consideration the ability to monitor? Capacity speaks to the resources (personnel, tools, expertise) needed to perform meaningful interpretation of the information and initiate timely and appropriate action.

Through monitoring, the organization can identify issues such as suspicious or malicious activities. Awareness can be raised when new (potentially unauthorized) devices appear in the environment. Careful consideration should be taken into account to ensure that log and event management does not adversely impact the functionality or the reliability of the control system devices.

5.2.7.3 Security policy and procedures

It is important to identify "asset owners," and to develop policies and procedures for a cybersecurity program. These policies need to be practical and enforceable in order to be effective. Policies should also address access related issues, such as physical access, contractors, and vendors.

Existing (traditional) IT standards and policies may not apply (or have not been considered) for control systems. A gap analysis should be performed to determine which components are not covered (or not adequately covered) by existing policies. Relationships with existing policies and standards should be explicitly identified and new or supporting policies should be developed. It is important that industrial control system administrators have proper authorizations and full support of their management to implement policies that will help secure the ICS network.

5.2.7.4 ICS hardening

The goal for system hardening is to reduce as many security risks as possible by securely configuring ICS networks. The idea is to establish configurations based on what is required and eliminate unnecessary services and applications that could potentially provide another possible entry point to an intruder.

Minimum security baselines should be established for the various platforms and products deployed (operating system, application, and infrastructure elements such as drives, meters, HMI devices). The following actions should be implemented where applicable:

- Disable unnecessary services
- Disable anonymous FTP
- Do not use clear text protocols (e.g., use SSH v2 instead of Telnet)
- Install only required packages/applications/features
- Deploy antivirus solutions (where possible)
- Disable or otherwise control use of USB devices
- Establish a warning banner
- Change default passwords (e.g., SNMP)

It may be easier to implement these actions on devices for which you control the base operating system platform. However, several
of the items listed above can be configured from the product specific configuration options.

Changes such as these could potentially impact the functionality of a control system device. Extensive testing needs to be conducted before deployment to minimize this impact.

5.2.7.5 Continuous assessment and security training

It is critical that ICS network administrators and regular users be properly trained to ensure the security of the ICS and the safety of the people who operate and depend on it.

Ongoing vulnerability assessments are critical to identify issues and understand the effectiveness of other defensible network elements.

Assessments should include testing and validating the following:

- Monitoring capabilities and alerts are triggered and responded to as expected
- Device configuration of services and applications
- Expected connectivity within and between zones
- Existence of previously unknown vulnerabilities in the environment
- Effectiveness of patching

A program should be established for performing assessments.
The actual assessment should be performed by a qualified resource, which can be an in-house or third-party organization. Regardless of who performs the assessments, in-house resources need to be involved in the planning, scoping, and supporting of assessment activities and must be appropriately trained to do so.

Assessments should be conducted according to a methodology that is clearly defined to address:

- Physical security
- People and processes
- Network security
- Host security
- Applications security (both internally developed and commercially off-the-shelf (COTS))

5.2.7.6 Patch management planning and procedures

A patching and vulnerability management process should be established based on the timely awareness of issues and appropriate action. This process should take all of the elements that make up the control system environment into consideration.

Information resources should be identified for vulnerability and advisory information for the various components in the environment. These should include vendor-specific sources as well as other public or commercial services that provide vulnerability advisory information. For example, the National Vulnerability Database (NVD) provides information related to vulnerabilities identified in

general IT components, while the Industrial Control Systems Cyber Emergency Response Team (ICS-CERT) publishes advisories specific to control systems.

A regular patch deployment schedule should be established for each component in the environment. Depending on the component, this could range from a monthly schedule to an as-needed deployment, depending on the historical frequency of patch or vulnerability related issues for the component or the vendor. Additionally, out-of-band or emergency patch management needs to be
considered and qualifications need to be defined.

Vulnerability information and advisories should be reviewed regularly and assessments should be performed to determine the relative severity and urgency of issues.

Elements of the process should also include the preparation, scheduling, and change controls; testing and rollback procedures; and pre-deployment notification to stakeholders that includes scope, expectations, and reporting. Testing is a significant element, as
the effect of the patch application needs to be clearly understood; unintended or unexpected impacts to a control system component influence the decision to deploy a patch. In the event that it is determined that a patch cannot be safely deployed but the severity of the issue represents a significant concern, compensating controls should be investigated.

5.2.8 Conclusion

To protect important assets, all organizations must take cybersecurity threats seriously and meet them proactively with a system-wide defensive approach specific to organizational needs.

There is no protection method that is completely secure. A defense mechanism that is effective today may not be effective tomorrow– the ways and means of cyber-attacks constantly change. It is critical ICS administrators remain aware of changes in cybersecurity and continue to work to prevent any potential vulnerabilities in the systems they manage.

5.2.9 Terms and definitions

DMZ	A demilitarized zone is a logical or physical sub network that interfaces an organization's external services to a larger, untrusted network and providing an additional layer of security.
Encryption	The process of transforming plain or clear text using an algorithm to make it unreadable to anyone except those possessing special knowledge.
ICS	A device or set of device that manage, command, direct, or regulate the behavior of other devices or systems.
Protocol	A set of standard rules for data representation, signaling, authentication, and error detection required to send information over a communications channel

5.2.10 Acronyms

COTS	Commercially Off-the-Shelf
DMZ	Demilitarized Zone
DOS	Denial of Service
FTP	File Transfer Protocol
HMI	Human Machine Interface
ICS	Industrial Control Systems
ICS-CERT	Industrial Control Systems - Cyber Emergency Response Team
IDPS	Intrusion Detection and Prevention Systems
IDS	Intrusion Detection Systems

IPS	Intrusion Prevention Systems
IT	Information Technology
NVD	National Vulnerability Database
OSI	Open System Interconnection
PLC	Programmable Logic Controller
SCADA	Supervisory Control and Data Acquisition
SNMP	Simple Network Management Protocol
SSH	Secure Shell
SIEM	Security Information and Event Management
USB	Universal Serial Bus

5.2.11 References

[1] Recommended Practice: Improving Industrial Control Systems Cybersecurity with Defense-In-Depth Strategies, October 2009
https://ics-cert.us-cert.gov/sites/default/files/FactSheets/NCCIC%20ICS_FactSheet_Defense_in_Depth_Strategies_S508C.pdf
[2] NIST.SP.800-82 Guide to Industrial Control Systems (ICS) Security, June 2011
http://csrc.nist.gov/publications/nistpubs/800-82/SP800-82-final.pdf
[3] NIST.SP.800-94 Guide to Intrusion Detection and Prevention Systems (IDPS), Feb 2007
http://csrc.nist.gov/publications/nistpubs/800-94/SP800-94.pdf
[4] Common Cybersecurity Vulnerabilities in Industrial Control Systems, May 2011
http://ics-cert.uscert.gov/sites/default/files/recommended_practices/DHS_Common_Cybersecurity_Vulnerabilities_ICS_2010.pdf
[5] The Tao of Network Security Monitoring, 2005 Richard Bejtlich

5.3 Cybersecurity recommended secure hardening guidelines

5.3.1 Introduction

This Network module has been designed with cybersecurity as an important consideration. Number of features are offered in the product to address cybersecurity risks. These Cybersecurity Recommendations provide information to help users to deploy and maintain the product in a manner that minimizes the cybersecurity risks. These Cybersecurity Recommendations are not intended to provide a comprehensive guide to cybersecurity, but rather to complement customers' existing cybersecurity programs.

Our company is committed to minimizing the cybersecurity risk in its products and deploying cybersecurity best practices in its products and solutions, making them more secure, reliable and competitive for customers.

The following whitepapers are available for more information on general cybersecurity best practices and guidelines:

Cybersecurity Considerations for Electrical Distribution Systems (WP152002EN): http://www.eaton.com/ecm/groups/public/@pub/@eaton/@corp/documents/content/pct_1603172.pdf

Cybersecurity Best Practices Checklist Reminder (WP910003EN): http://www.cooperindustries.com/content/dam/public/powersystems/resources/library/1100_EAS/WP910003EN.pdf

Cybersecurity Best Practices for Modern Vehicles - NHTSA: https://www.nhtsa.gov/staticfiles/nvs/pdf/812333_CybersecurityForModernVehicles.pdf

5.3.2 Secure configuration guidelines

5.3.2.1 Asset Management

Keeping track of software and hardware assets in your environment is a pre-requisite for effectively managing cybersecurity. Our company recommends that you maintain an asset inventory that uniquely identifies each important component.

To facilitate this, Network module supports the following identifying information:

5.3.2.1.1 Network Module identification and its firmware information

It can be retrieved by navigating to *Card>>>System information or Maintenance>>>System information*.

Identification

- System name
- Product
- Physical name
- Vendor
- UUID

- Part number
- Serial number
- Hardware version
- Location
- Contact

Firmware information

- Firmware version
- Firmware SHA
- Firmware date
- Firmware installation date
- Firmware activation date
- Bootloader version

5.3.2.1.2 Communication settings

It can be retrieved by navigating to *Settings>>>Network or Settings>>>Network & Protocol*

LAN

- Link status
- MAC address
- Configuration

IPV4

- Status
- Mode
- Address
- Netmask
- Gateway

Domain

- Mode
- FQDN
- Primary DNS
- Secondary DNS

IPV6

- Status
- Mode
- Addresses

5.3.2.1.3 UPS details

It can be retrieved by navigating to *Home>>>Details or Home>>>Energy flow* .

Details

- Name
- Model
- P/N
- S/N
- Location
- FW version

Most of above information are discoverable using SNMP, refer to Settings>>>SNMP.

5.3.2.2 Defense in Depth

Defense in Depth basically means applying multiple counter-measures for mitigating risks, in a layered or step wise manner. A layered approach to security as shown in the below diagram is what is recommended. Defense in Depth is the responsibility of both the manufacturer and the customer.

5.3.2.3 Risk Assessment

Our company recommends conducting a risk assessment to identify and assess reasonably foreseeable internal and external risks to the confidentiality, availability and integrity of the system | device and its environment. This exercise should be conducted in accordance with applicable technical and regulatory frameworks such as IEC 62443 and NERC-CIP. The risk assessment should be repeated periodically.

5.3.2.4 Physical Security

An attacker with unauthorized physical access can cause serious disruption to system/device functionality. Additionally, Industrial Control Protocols don't offer cryptographic protections, making ICS and SCADA communications especially vulnerable to threats to their confidentiality. Physical security is an important layer of defense in such cases. The Network module is designed to be deployed and operated in a physically secure location. Following are some best practices that our company recommends to physically secure your system/device:

- Secure the facility and equipment rooms or closets with access control mechanisms such as locks, entry card readers, guards, man traps, CCTV, etc. as appropriate.
- Restrict physical access to cabinets and/or enclosures containing the Network module and the associated system. Monitor and log the access at all times.
- Physical access to the telecommunication lines and network cabling should be restricted to protect against attempts to intercept or sabotage communications. It's a best practice to use metal conduits for the network cabling running between equipment cabinets.
- The Network module supports the following physical access ports: RJ45, USB A, USB Micro-B. Access to these ports should be restricted.
- Do not connect removable media (e.g., USB devices, SD cards, etc.) for any operation (e.g., firmware upgrade, configuration change, or boot application change) unless the origin of the media is known and trusted.
- Before connecting any portable device through a USB port or SD card slot, scan the device for malware and viruses.

5.3.2.5 Account management

Logical access to the system | device should be restricted to legitimate users, who should be assigned only the privileges necessary to complete their job roles/functions. Some of the following best practices may need to be implemented by incorporating them into the organization's written policies:

- Ensure default credentials are changed upon first login Network module should not be deployed in production environments with default credentials, as default credentials are publicly known.
- No account sharing – Each user should be provisioned a unique account instead of sharing accounts and passwords. Security monitoring/logging features in the product are designed based on each user having a unique account. Allowing users to share credentials weakens security.

- Restrict administrative privileges - Attackers seek to gain control of legitimate credentials, especially those for highly privileged accounts. Administrative privileges should be assigned only to accounts specifically designated for administrative duties and not for regular use.
- Leverage the roles / access privileges *admin, operator, viewer* to provide tiered access to the users as per the business / operational need. Follow the principle of least privilege (allocate the minimum authority level and access to system resources required for the role).
- Perform periodic account maintenance (remove unused accounts).
- Ensure password length, complexity and expiration requirements are appropriately set, particularly for all administrative accounts (e.g., minimum 10 characters, mix of upper- and lower-case and special characters, and expire every 90 days, or otherwise in accordance with your organization's policies).
- Enforce session time-out after a period of inactivity.

5.3.2.5.1 Description of the User management in the Network Module:

- User and profiles management: (Navigate to Settings>>>Users)

  Add users (admin, operator, viewer)
  Remove users
  Edit users

- Password/Account/Session management: (Navigate to Settings>>>Users)

  Password strength rules – Minimum length/Minimum upper case/Minimum lower case/Minimum digit/Special character
  Account expiration – Number of days before the account expiration/Number of tries before blocking the account
  Session expiration – No activity timeout/Session lease time

  See "Default settings parameters" in the embedded help for (recommended) default values.
  Additionally, it is possible to enable account expiration to force users renew their password periodically.

- Default credentials: admin/admin

  The change of the default "admin" password is enforced at first connection.

  It is also recommended to change the default "admin" user name through the *Settings>>>Users or Settings>>>Local users* page.
  Follow embedded help for instructions on how to edit a user account.

- Local and Trusted remote certificate configuration: (Navigate to Settings>>>Certificate)
  Follow embedded help for instructions on how to configure it.
- Supported authentication: LDAP and Radius, follow embedded help for instructions on how to configure it.

5.3.2.6 Time Synchronization

Many operations in power grids and IT networks heavily depend on precise timing information.

Ensure the system clock is synchronized with an authoritative time source (using manual configuration, NTP). (Navigate to Settings>>>General>>>Time&date settings)

Follow embedded help for instructions on how to configure it.

5.3.2.7 Deactivate unused features

Network module provides multiple options to upgrade firmware, change configurations, set power schedules, etc. The device also provide multiple options to connect with the device i.e. SSH, SNMP,SMTP,HTTPS etc. Services like SNMPv1 are considered insecure and our company recommends disabling all such insecure services.

- It is recommended to disable unused physical ports like USB and SD card.
- Disable insecure services like SNMP v1

5.3.2.8 Network Security

Network module supports network communication with other devices in the environment. This capability can present risks if it's not configured securely. Following are our company recommended best practices to help secure the network.

Our company recommends segmentation of networks into logical enclaves, denying traffic between segments except that which is specifically allowed, and restricting communication to host-to-host paths (for example, using router ACLs and firewall rules). This helps to protect sensitive information and critical services and creates additional barriers in the event of a network perimeter

breach. At a minimum, a utility Industrial Control Systems network should be segmented into a three-tiered architecture (as recommended by NIST SP 800-82[R3]) for better security control.

Communication Protection: Network module provides the option to encrypt its network communications. Please ensure that encryption options are enabled. You can secure the product's communication capabilities by taking the following steps:

- Local and Trusted remote certificate configuration: (Navigate to Settings>>>Certificate)
  Follow embedded help for instructions on how to configure it.

Our company recommends opening only those ports that are **required** for operations and protect the network communication using network protection systems like firewalls and intrusion detection systems / intrusion prevention systems. Use the information below to configure your firewall rules to allow access needed for Network module to operate smoothly

- Navigate to *Information>>>Specifications/Technical characteristics>>>Port* to get the list of all ports and services running on the device.
- SNMP V1/SNMP V3 can be disabled or configured by navigating to *Settings>>>SNMP*.
  Follow embedded help for instructions on how to configure it.
- If available, Modbus and Bacnet can be configured by navigating to Settings>>>Protocols or Settings>>>Industrial protocols.
  Follow embedded help for instructions on how to configure it.

5.3.2.9 Remote access

Remote access to devices/systems creates another entry point into the network. Strict management and validation of termination of such access is vital for maintaining control over overall ICS security.

Remote access capabilities and permissions can be configured in Settings>>>Remote users for LDAP and Radius.

Follow embedded help for instructions on how to configure it.

5.3.2.10 Logging and Event Management

Navigate to Information>>>List of events codes to get log information and how to export it.

Good Practices

- Our company recommends logging all relevant system and application events, including all administrative and maintenance activities.
- Logs should be protected from tampering and other risks to their integrity (for example, by restricting permissions to access and modify logs, transmitting logs to a security information and event management system, etc.).
- Ensure that logs are retained for a reasonable and appropriate length of time.
- Review the logs regularly. The frequency of review should be reasonable, taking into account the sensitivity and criticality of the system | device and any data it processes.

5.3.2.11 Malware defenses

Our company recommends deploying adequate malware defenses to protect the product or the platforms used to run our company product.

5.3.2.12 Secure Maintenance

Troubleshooting information are available in the embedded help for diagnostic purposes.

The Network module includes also Servicing, Securing sections to allow a service engineer with help from site administrator to trouble shoot the device functionality.

- Configuring/Commissioning/Testing LDAP
- Pairing agent to the Network Module
- Powering down/up applications (examples)
- Checking the current firmware version of the Network Module
- Accessing to the latest Network Module firmware/driver/script
- Upgrading the card firmware (Web interface / shell script)
- Changing the RTC battery cell
- Updating the time of the Network Module precisely and permanently (ntp server)
- Synchronizing the time of the Network Module and the UPS
- Changing the language of the web pages
- Resetting username and password
- Recovering main administrator password
- Switching to static IP (Manual) / Changing IP address of the Network Module

- Reading device information in a simple way
- Subscribing to a set of alarms for email notification
- Saving/Restoring/Duplicating Network module configuration settings
- Configuring user permissions through profiles
- Decommissioning the Network Management module

Our company publishes patches and updates for its products to protect them against vulnerabilities that are discovered. Our company encourages customers to maintain a consistent process to promptly monitor for and install new firmware updates.

Good Practices

- Update device firmware prior to putting the device into production.
- Thereafter, apply firmware updates and software patches regularly.

Please check our company website for information bulletins about available firmware and software updates.

- Navigate in the help to *Contextual help>>>Card>>>Administration* to get information on how to upgrade the Network Module.
- Our company also has a robust vulnerability response process. In the event of any security vulnerability getting discovered in its products, our company patches the vulnerability and releases firmware update information through its website.

5.3.2.13 Business Continuity / Cybersecurity Disaster Recovery

5.3.2.13.1 Plan for Business Continuity / Cybersecurity Disaster Recovery

Our company recommends incorporating the Network module into the organization's business continuity and disaster recovery plans. Organizations should establish a Business Continuity Plan and a Disaster Recovery Plan and should periodically review and, where possible, exercise these plans. As part of the plan, important system | device data should be backed up and securely stored, including:

- Updated firmware for the Network module. Make it a part of standard operating procedure to update the backup copy as soon as the latest firmware is updated.
- The current configuration.
- Documentation of the current permissions / access controls, if not backed up as part of the configuration.

The following section describes the details of failures states and backup functions:

- Communication and power status indicators: Navigate in the help to Information>>>Front panel connectors and LED indicators.
- Configuration of backup and recovery: Navigate in the help to Servicing the Network Management Module>>>Saving/ Restoring/Duplicating Network module configuration settings.

5.3.2.14 Sensitive Information Disclosure

Our company recommends that sensitive information (i.e. connectivity, log data, personal information) that may be stored by Network module be adequately protected through the deployment of organizational security practices.

- Full name
- Email
- Phone
- Organization
- The mail credentials in the CDS storage
- PKI signed server's (HTTP + MQTT) certificate and associated private key
- Server's (HTTP + MQTT) self-signed private keys (they are self-generated by the device upon user request, so unique per device)
- Username's (in clear) and their "vCard" (Full name, Organization, Phone, Email, …)
- Hashed passwords
- IP addresses, hostnames (DNS, Gateway, mail servers, …) of customer network devices (in database or logs)
- Maintenance report AES key/password

5.3.2.15 Decommissioning or Zeroization

It is a best practice to purge data before disposing of any device containing data. Guidelines for decommissioning are provided in NIST SP 800-88. Our company recommends that products containing embedded flash memory be securely destroyed to ensure data is unrecoverable.

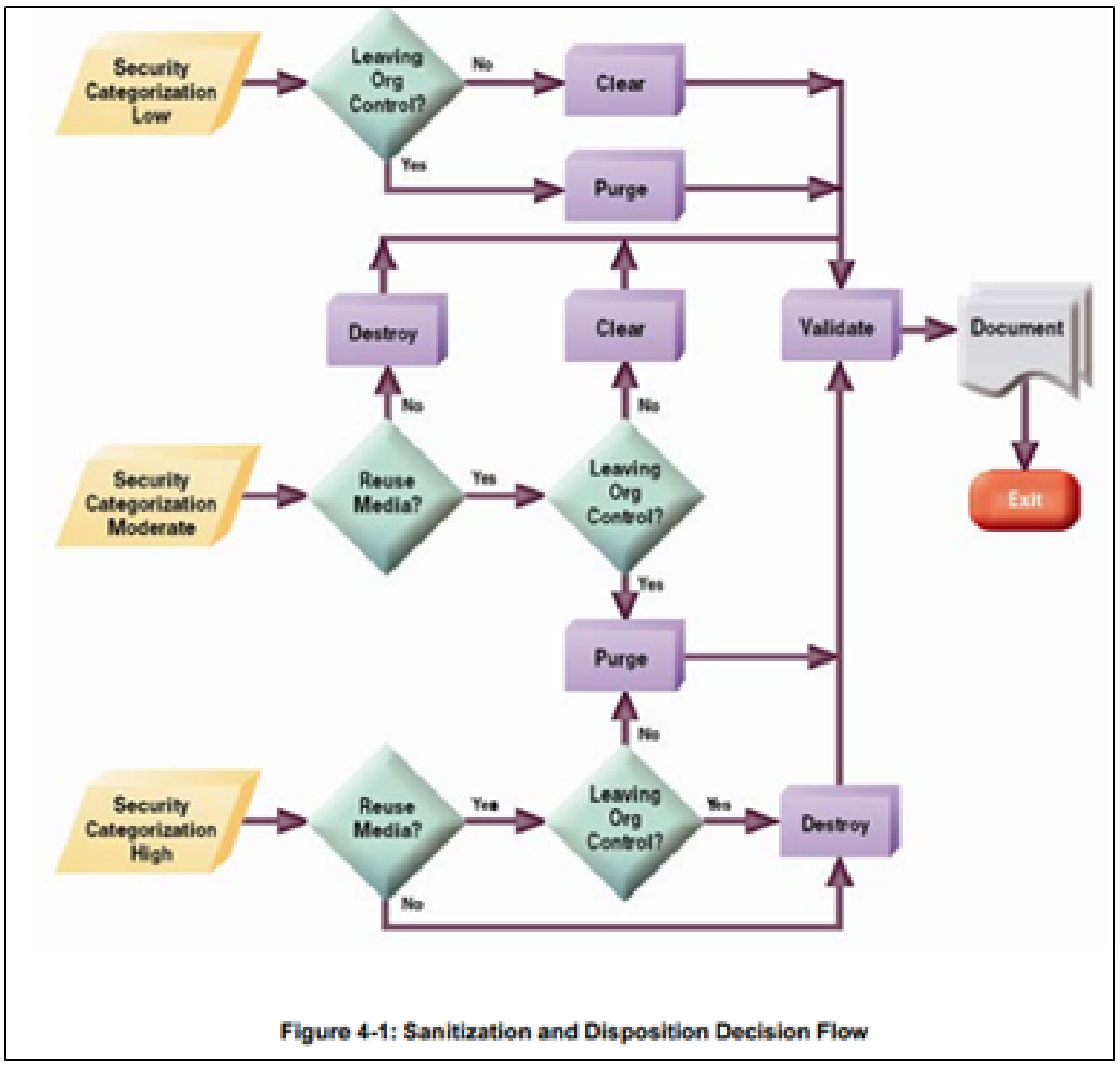


Figure 4-1: Sanitization and Disposition Decision Flow

**Figure and data from NIST SP800-88*

- Embedded Flash Memory on Boards and Devices
- Our company recommends the following methods for disposing of motherboards, peripheral cards such as network adapters, or any other adapter containing non-volatile flash memory.
- Clear: If supported by the device, reset the state to original factory settings.
  Navigate to Securing the Network Management Module>>>Decommissioning the Network Management module.
- Purge: If the flash memory can be easily identified and removed from the board, the flash memory may be destroyed independently of the board that contained the flash memory. Otherwise, the whole board should be destroyed.
  For the Network module the whole board should be destroyed.
- Destroy: Shred, disintegrate, pulverize, or Incinerate by burning the device in a licensed incinerator.

5.3.3 References

[R1] Cybersecurity Considerations for Electrical Distribution Systems (WP152002EN): http://www.eaton.com/ecm/groups/public/@pub/@eaton/@corp/documents/content/pct_1603172.pdf

[R2] Cybersecurity Best Practices Checklist Reminder (WP910003EN): http://www.cooperindustries.com/content/dam/public/powersystems/resources/library/1100_EAS/WP910003EN.pdf

[R3] NIST SP 800-82 Rev 2, Guide to Industrial Control Systems (ICS) Security, May 2015: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-82r2.pdf

[R4] National Institute of Technology (NIST) Interagency "Guidelines on Firewalls and Firewall Policy, NIST Special Publication 800-41", October 2009: http://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-41r1.pdf

[R5] NIST SP 800-88, Guidelines for Media Sanitization, September 2006: http://ws680.nist.gov/publication/get_pdf.cfm?pub_id=50819

[R6] Cybersecurity Best Practices for Modern Vehicles - NHTSA: https://www.nhtsa.gov/staticfiles/nvs/pdf/812333_CybersecurityForModernVehicles.pdf

[R7] A Summary of Cybersecurity Best Practices - Homeland Security: https://www.hsdl.org/?view&did=806518

[R8] Characterization of Potential Security Threats in Modern Automobiles - NHTSA: https://www.nhtsa.gov/DOT/NHTSA/NVS/Crash%20Avoidance/Technical%20Publications/2014/812074_Characterization_PotentialThreatsAutos(1).pdf

[R9] Threat Modeling for Automotive Security Analysis: http://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-41r1.pdf

5.4 Configuring user permissions through profiles

The user profile can be defined when creating a new users or changed when modifying an existing one.

Refer to the section Contextual help>>>Settings>>>Local users in the settings.

5.5 Decommissioning the Network Management module

With the increased frequency of reported data breaches, it's becoming more and more necessary for companies to implement effective and reliable decommissioning policies and procedures.

In order to protect the data stored on retired IT equipment from falling into the wrong hands, or a data breach, we recommend to follow below decommissioning steps:

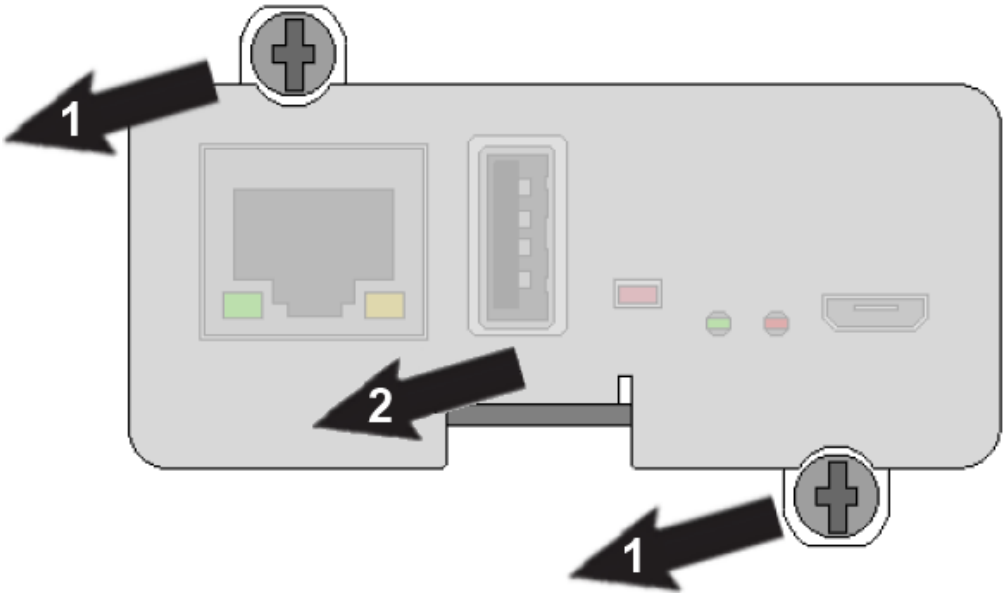
1- Sanitize the Network Module

Sanitization erases all the data (user name and password, certificates, keys, settings, logs...).

To sanitize the Network Module refer to the Contextual help>>>Maintenance>>>Services>>>Sanitization section.

2- Unmount the Network Module from the device.

Unscrew the Network Module and remove it from the slot.



6 Servicing the EMP

6.1 Description and features

The optional Environmental Monitoring Probe enables you to collect temperature and humidity readings and monitor the environmental data remotely.

You can also collect and retrieve the status of one or two dry contact devices (not included).

Up to 3 Environmental Monitoring Probe can be daisy chained on one device.

You can monitor readings remotely using SNMP or a standard Web browser through the Network module.

This provides greater power management control and flexible monitoring options.

The EMP device is delivered with a screw and screw anchor, nylon fasteners, tie wraps, and magnets. You can install the device anywhere on the rack or on the wall near the rack.

For more information, refer to the device manual.

The EMP has the following features:

- The hot-swap feature simplifies installation by enabling you to install the probe safely without turning off power to the device or to the loads that are connected to it.
- The EMP monitors temperature and humidity information to help you protect critical equipment.
- The EMP measures temperatures from 0°C to 70°C with an accuracy of ±2°C.
- The EMP measures relative humidity from 10% to 90% with an accuracy of ±5%.
- The EMP can be located some distance away from the device with a CAT5 network cable up to 50m (165 ft) long.
- The EMP monitors the status of the two user-provided contact devices.
- Temperature, humidity, and contact closure status can be displayed through a Web browser through the Network module or LCD interface (if available)
- A Temperature and Humidity Offset can be set.

6.2 Unpacking the EMP

The sensor will include the following:

- Dry contact terminal block
- Installation instructions
- USB to RS485 converter
- RJ45 female to female connector
- Wall mounting screw and anchor
- Rack mounting screw nut and washer
- Tie wraps (x2)
- Nylon fastener

Packing materials must be disposed of in compliance with all local regulations concerning waste.
Recycling symbols are printed on the packing materials to facilitate sorting.

6.3 Installing the EMP

6.3.1 Defining EMPs address and termination

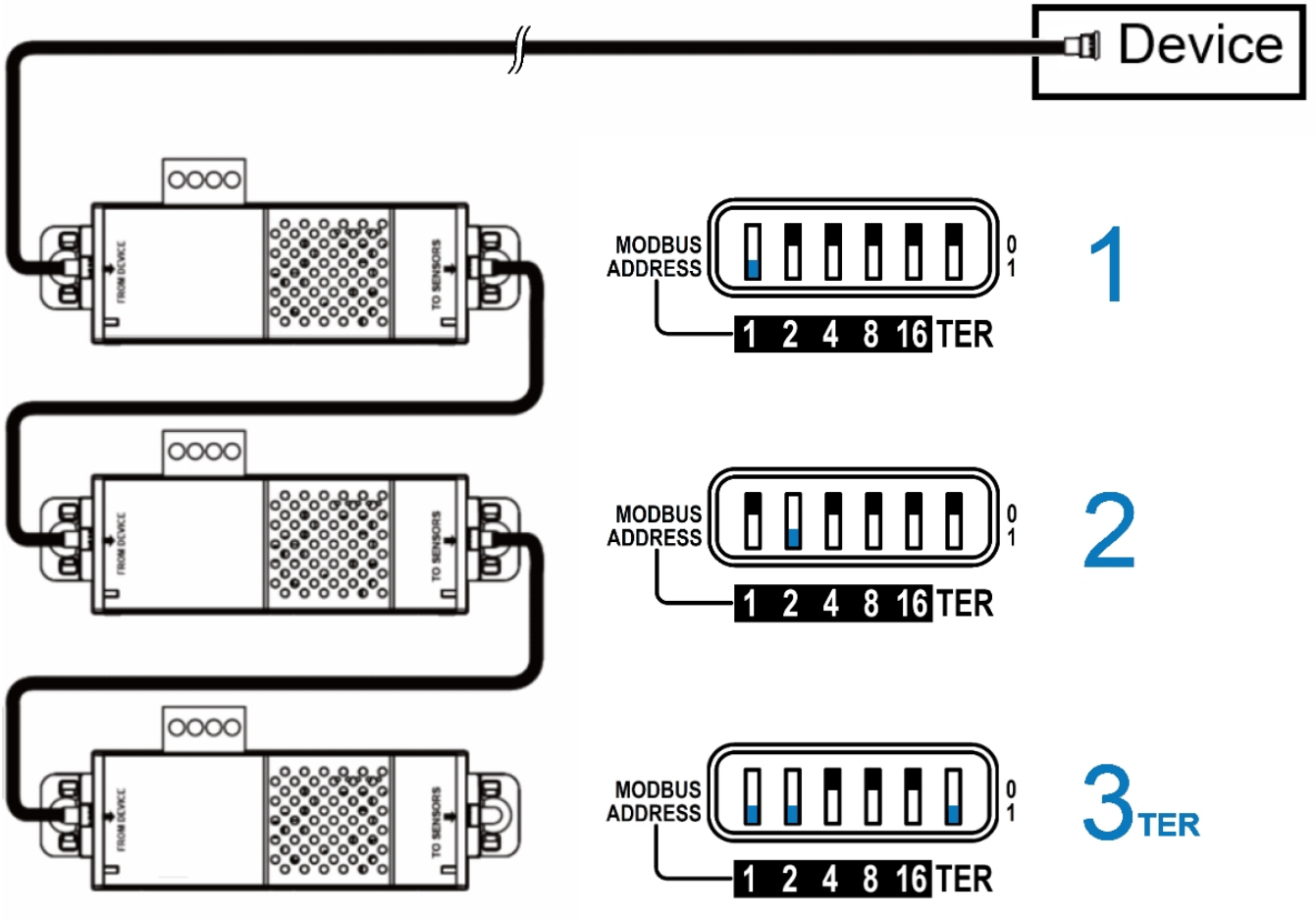
6.3.1.1 Manual addressing

Address must be defined before the EMP power-up otherwise the changes won't be taken into account.
o not set Modbus address to 0, otherwise the EMP will not be detected.

Define **different address** for all the EMPs in the daisy-chain.

Set the RS485 termination (TER) to 1 on the last EMP of the daisy chain, set it to 0 on all the other EMPs.

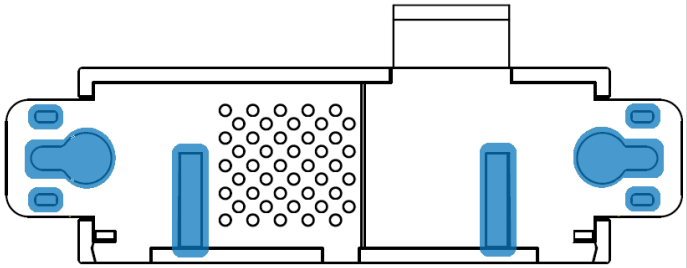
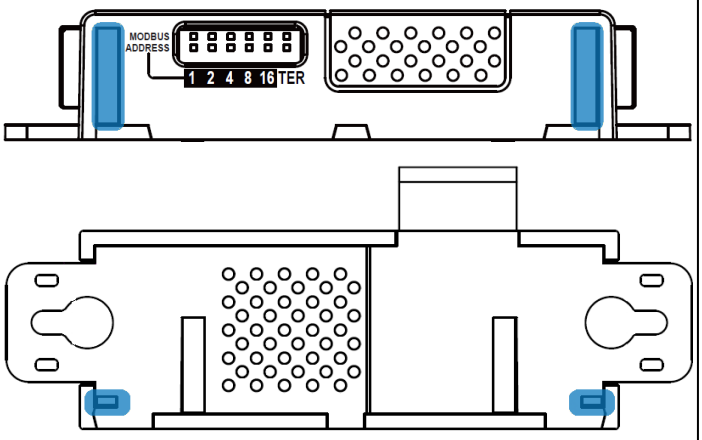
6.3.1.1.1 Example: manual addressing of 3 EMPs connected to the Device



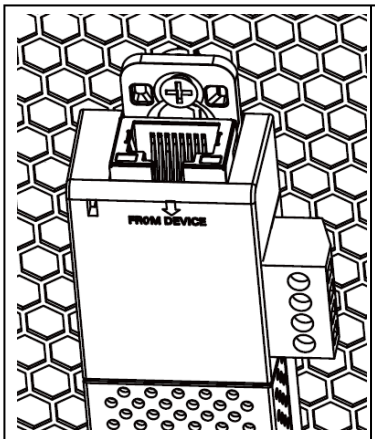
Green LED of the TO DEVICE RJ45 connector shows if the EMP is powered by the Network module.

6.3.2 Mounting the EMP

The EMP includes magnets, cable ties slots and keyholes to enable multiple ways of mounting it on your installation.

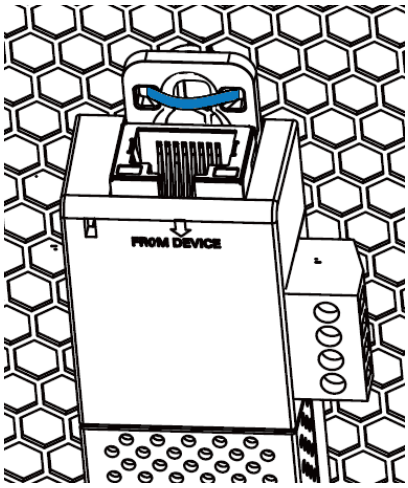
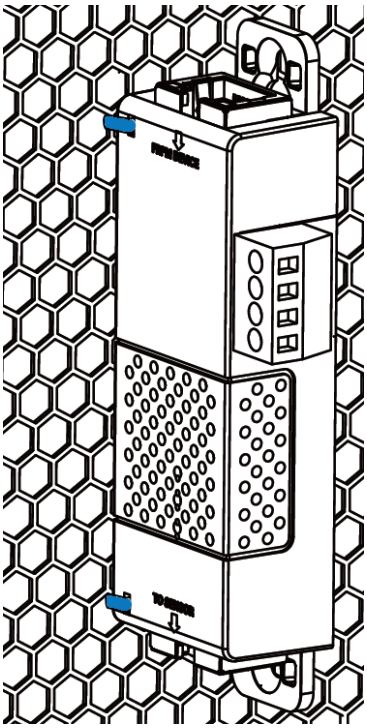
Bottom mounting capabilities:	Side mounting:
• magnets • keyholes • tie wraps • nylon fastener	• magnets • tie wraps
	

6.3.2.1 Rack mounting with keyhole example

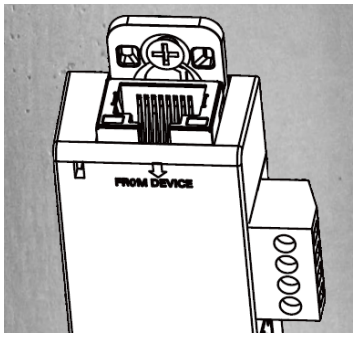
	To mount the EMP on the rack, use the supplied screw, washer and nut. Then, mount the EMP on the screw and tighten it.

6.3.2.2 Rack mounting with tie wraps example

To mount the EMP on the door of the rack, use the supplied cable ties.

Bottom mounting	Side mounting
	

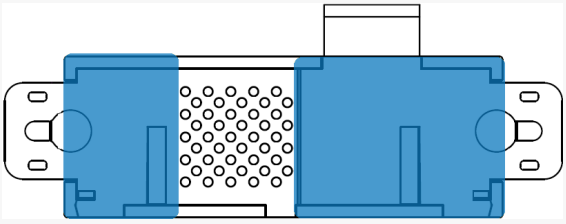
6.3.2.3 Wall mounting with screws example

	To mount the EMP on the wall close to the rack, use the supplied screw and screw anchor. Then, mount the EMP on the screw and tighten it.

6.3.2.4 Wall mounting with nylon fastener example

To mount the EMP within the enclosure environment, attach one nylon fastener to the EMP and the other nylon fastener to an enclosure rail post. Then, press the two nylon strips together to secure the EMP to the rail post.

Cut nylon fastener and stick it on the EMP bottom on the location highlighted below,this will prevent to interfere with the EMP data acquisition parts.



6.3.3 Cabling the first EMP to the device

6.3.3.1 Available Devices

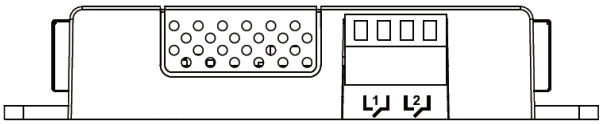
6.3.3.2 Connecting the EMP to the device

Address must be defined before the EMP power-up otherwise the changes won't be taken into account.
Do not set Modbus address to 0, otherwise the EMP will not be detected.

6.3.3.2.1 Material needed:

- EMP
- RJ45 female/female connector (supplied in EMP accessories)
- USB to RS485 converter cable (supplied in EMP accessories)
- Ethernet cable (**not supplied**).
- Device

6.3.4 Connecting an external contact device



To connect an external device to the EMP:

STEP 1 – Connect the external contact closure inputs to the terminal block on the EMP (see the table and the figure below):

- External contact device 1. Connect the return and signal input wires from device 1 to screw terminals 1.
- External contact device 2. Connect the return and signal input wires from device 2 to screw terminals 2.

STEP 2 – Tighten the corresponding tightening screws on top of the EMP to secure the wires.

6.4 Using the EMP for temperature compensated battery charging

This section applies only to UPS that provides temperature compensated battery charging option.

Address must be defined before EMP power-up; otherwise, the changes will not be applied.
Do not set Modbus address to 0; otherwise, the EMP will not be detected.
Define a **unique address** for all the EMPs in the daisy-chain.
Set the RS485 termination (TER) to 1 on the last EMP of the daisy chain. On other EMPs this should be set to 0.

6.4.1 Addressing the EMP

Set the address 31 to the sensor dedicated to the battery room temperature:

- Set all the Modbus address switches to 1 to set the EMP to the address 31 as indicated on the picture below:

6.4.2 Commissioning the EMP

Refer to the section Contextual help>>>Environment>>>Commissioning/Status.

6.4.3 Enabling temperature compensated battery charging in the UPS

The temperature compensated battery charging feature needs to be enabled in the UPS.

To enable the temperature compensated battery charging, refer to the UPS user manual.

6.5 Commissioning the EMP

6.5.1 On the Network Module device

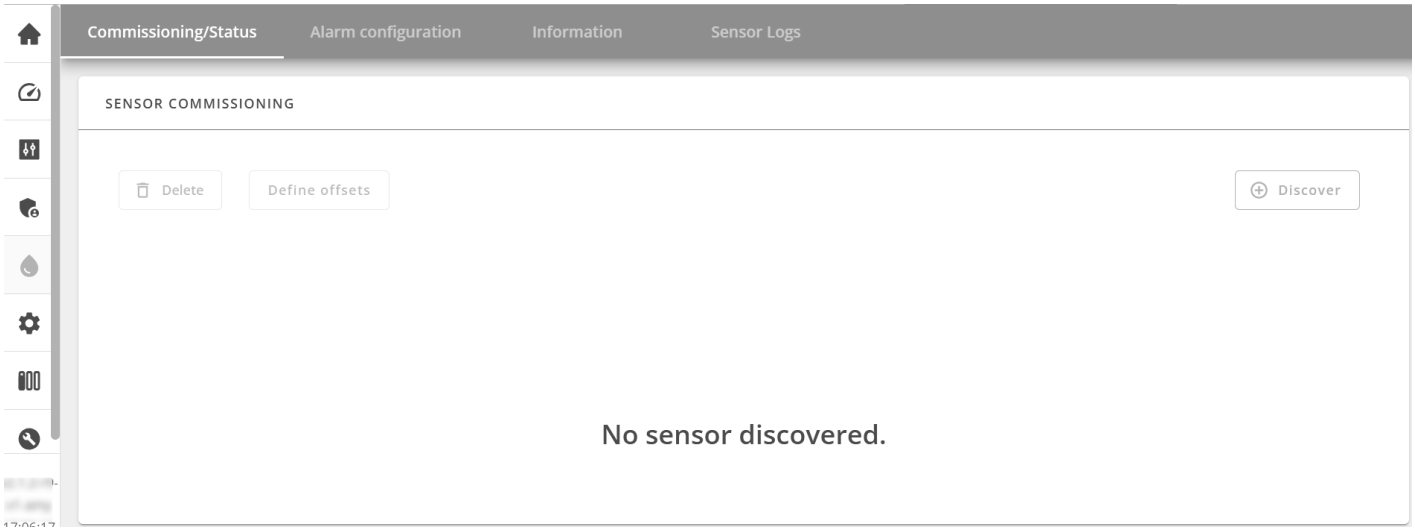
STEP 1 – Connect to the Network Module

- On a network computer, launch a supported web browser. The browser window appears.
- In the Address/Location field, enter the IP address of the Network Module.
- Enter username, password and click on **Login**.

STEP 2 - Navigate to Environment menu

STEP 3 – Proceed to the commissioning, refer to the contextual help for details.

- Click **Discover**. The EMP connected to the Network module appears in the table.



When discovered, the orange LEDs of the EMP RJ45 connectors shows the data traffic.

- Press the pen logo to edit EMP information and access its settings.
- Click **Define offsets** to define temperature or humidity offsets if needed.

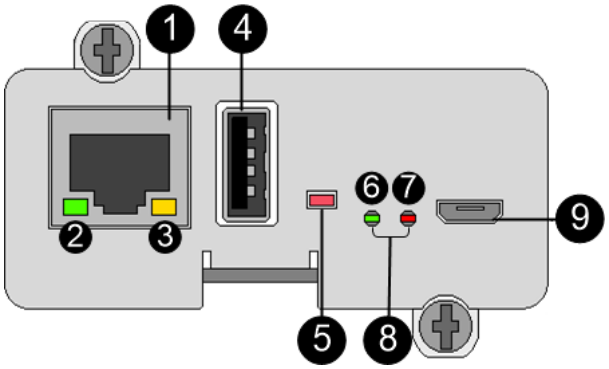
STEP 4 – Define alarm configuration, refer to the contextual help for details.

- Select the **Alarm configuration** page.
- Enable or disable alarms.
- Define thresholds, hysteresis and severity of temperature, humidity and dry contacts alarms.

:

7 Information

7.1 Front panel connectors and LED indicators



Nbr	Name	Description
1	Network connector	Ethernet port
2	Network speed LED	Flashing green sequences: • 1 flash — Port operating at 10Mbps • 2 flashes — Port operating at 100Mbps • 3 flashes — Port operating at 1Gbps
3	Network link/activity LED	• Off — UPS Network Module is not connected to the network. • Solid yellow — UPS Network Module is connected to the network, but no activity detected. • Flashing yellow — UPS Network Module is connected to the network and sending or receiving data.
4	AUX connector	For Network Module accessories only. ⚠ *Do not use for general power supply or USB charger.*
5	Restart button	Ball point pen or equivalent will be needed to restart: • Short press (<6s) — Safe software restart (firmware safely shutdown before restart). • Long press (>9s) — Forced hardware restart.
6	ON LED	Flashing green — Network Module is operating normally.
7	Warning LED	Solid red — Network Module is in error state. Flashing red - Network Module is being shutdown or rebooting
8	Boot LEDs	Solid green and flashing red — Network Module is starting boot sequence.

9	Settings/UPS data connector	Configuration port. Access to Network Module's web interface through RNDIS (Emulated Network port). Access to the Network Module console through Serial (Emulated Serial port).

7.2 Specifications/Technical characteristics

Physical characteristics	
Dimensions (wxdxh)	Long card: 132 x 66 x 42 mm | 5.2 x 2.6 x 1.65 in Short card: 67 x 68 x 42 mm | 2.63 x 2.67 x 1.65 in
Weight	Long card: 70 g | 0.15 lb Short card: 59 g | 0.13 lb
RoHS	100% compatible

Storage	
Storage temperature network only	-25°C to 70°C (14°F to 158°F)

Ambient conditions	
Operating temperature	0°C to 40°C (32°F to 104°F)
Relative humidity	5%-95%, noncondensing

Module performance	
Module input power	5V-12V ±5% | 1A
AUX output power	5V ±5% | 200mA
Date/Time backup	CR1220 battery coin cell | The RTC is able to keep the date and the time when Network Module is OFF

Functions	
Languages	English, French, German, Italian, Polish, Russian, Simplified Chinese, Spanish, Traditional Chinese, Turkish
Alarms/Log	Email, SNMP trap, web interface / Log on events
Network	Gigabit ETHERNET, 10/100/1000Mb/s, auto neg., HTTP 1.1, SNMP V1/V2C, SNMP V3, NTP, SMTP, DHCP
Security	Restricted to TLS 1.2
Supported MIBs	*Standard IETF UPS MIB (RFC 1628) | EPPC*
Browsers	Google Chrome, Edge

Settings (default values)	
IP network	DHCP enabled | NTP server: pool.ntp.org
Port	443 (https), 22 (ssh), 161 (snmp), 162 (snmp trap), 25 (smtp), 8883 (mqtts), 123 (ntp), 5353 (mdns-sd), 80 (http), 514 (syslog),636 (LDAP), 1812 (RADIUS)

Settings (default values)	
Web interface access control	User name: admin | Password: admin
Settings/Device data connector	USB RNDIS Apipa compatible | IP address: 169.254.0.1 | Subnet mask: 255.255.0.0

7.3 List of event codes

To get access to the Alarm log codes or the System log codes for email subscription, see sections below:

7.3.1 System log codes

To retrieve System logs, navigate to Contextual help>>>Maintenance>>>System logs section and press the **Download System logs** button.

Below codes are the one to be used to add "Exceptions on events notification" on email sending configurations. Some zeros maybe added in front of the code when displayed in emails or logs.

7.3.1.1 Critical

Code	Severity	Log message	File
0801000	Alert	User account - admin password reset to default	logAccount.csv
0E00400	Critical	The [selfsign/PKI] signed certificate of the <service> server is not valid	logSystem.csv
0A00700	Error	Network module file system integrity corrupted <f/w: xx.yy.zzzz>	logUpdate.csv
0000D00	Error	Card reboot due to database error	logSystem.csv
0700200	Error	Failed to start execution of script "<script description>". Client not registered. (<script uuid>)	logSystem.csv
0700400	Error	Execution of script "<script description>" failed with return code: <script return code>. (<script uuid>)	logSystem.csv
0700500	Error	Execution of script "<script description>" timeout! (<script uuid>)	logSystem.csv
0700700	Alert	Failed to prepare isolated environment for script execution. Protection service startup is aborted.	logSystem.csv
0700800	Error	Starting execution of script "<script description>" failed. (<script uuid>)	logSystem.csv
0700900	Error	Failed to clean isolated environment after script execution.	logSystem.csv

7.3.1.2 Warning

Code	Severity	Log message	File
0A00200	Warning	Network module upgrade failed <f/w: xx.yy.zzzz>	logUpdate.csv

0A00A00	Warning	Network module bootloader upgrade failed <f/w: xx.yy.zzzz>	logUpdate.csv
0B00500	Warning	RTC battery cell low	logSystem.csv
0E00200	Warning	New [self/PKI] signed certificate [generated/imported] for <service> server	logSystem.csv
0E00300	Warning	The [self/PKI] signed certificate of the <service> server will expires in <X> days	logSystem.csv
0800700	Warning	User account - password expired	logAccount.csv
0800900	Warning	User account- locked	logAccount.csv
0C00100	Warning	Unable to send email: Smtp server is unknown	logSystem.csv
0C00200	Warning	Unable to send email: Authentication method is not supported	logSystem.csv
0C00300	Warning	Unable to send email: Authentication error	logSystem.csv
0C00500	Warning	Unable to send email: Certificate Authority not recognized	logSystem.csv
0C00600	Warning	Unable to send email: Secure connection required	logSystem.csv
0C00800	Warning	Unable to send email: Unknown error	logSystem.csv
0C00B00	Warning	Unable to send email: Recipient not specified	logSystem.csv
0F01300	Warning	Card reboot due to Device FW upgrade	logSystem.csv
1000F00	Warning	<*feature*> settings partial restoration	logSystem.csv
1001000	Warning	<*feature*> settings restoration error	logSystem.csv
1000C00	Warning	Settings partial restoration	logSystem.csv
1000D00	Warning	Settings restoration error	logSystem.csv
1200100	Warning	Authentication to remote server failed	logSystem.csv
1200200	Warning	Fetching configuration file failed with HTTP reponse: <http_code>	logSystem.csv
1200300	Warning	Fetching configuration file failed with cURL code: <curl_code>	logSystem.csv
1200400	Warning	<protocol_type> protocol is disabled	logSystem.csv
1200500	Warning	Config file is empty	logSystem.csv
1200600	Warning	Config file size <real_file_size> exceeds maximum of bytes <max_size>	logSystem.csv
1200800	Warning	Invalid url	logSystem.csv
1200900	Warning	Internal error	logSystem.csv
1200A00	Warning	Wrong config file format	logSystem.csv
1200B00	Warning	Config file has been applied partially	logSystem.csv
1200C00	Warning	Config file restore failed with SRR code: <code>	logSystem.csv
D01000	Warning	Network wake-up command failed to send, local network exception	logSystem.csv

7.3.1.3 Info

Code	Severity	Log message	File
0A01800	Info	Start of a new log entry	logSystem.csv
0A00500	Notice	Network module sanitized	logUpdate.csv
0A00900	Notice	Network module bootloader upgrade success <f/w: xx.yy.zzzz>	logUpdate.csv
0A00B00	Notice	Network module bootloader upgrade started <f/w: xx.yy.zzzz>	logUpdate.csv
0A00C00	Notice	Periodic system integrity check started	logUpdate.csv
0B00100	Notice	Time manually changed	logSystem.csv
0B00700	Notice	NTP sever not available <NTP server address>	logSystem.csv
0900100	Notice	Session - opened	logSession.csv
0900200	Notice	Session - closed	logSession.csv
0900300	Notice	Session - invalid token	logSession.csv
0900400	Notice	Session - authentication failed	logSession.csv
0300F00	Notice	User action - network module admin password reset switch activated	logSystem.csv
0E00500	Notice	[Certificate authority/ Client certificate] <id> is added for <service>	logSystem.csv
0E00600	Notice	[Certificate authority/ Client certificate] <id> is revoked for <service>	logSystem.csv
0700100	Info	Start execution of script "<script description>". (<script uuid>)	logSystem.csv
0700300	Info	Execution of script "<script description>" succeeded. (<script uuid>)	logSystem.csv
0700600	Info/Notice/ Error/Debug	<Script execution log message>	logSystem.csv
0800100	Notice	User account - created <user account id>	logAccount.csv
0800200	Notice	User account - deleted <user account id>	logAccount.csv
0800400	Notice	User account - name changed <user account id>	logAccount.csv
0800600	Notice	User account - password changed	logAccount.csv
0800800	Notice	User account- password reset <user account id>	logAccount.csv
0800A00	Notice	User account- unlocked	logAccount.csv
0800B00	Notice	User account - activated <user account id>	logAccount.csv
0800C00	Notice	User account - deactivated <user account id>	logAccount.csv
0801401	Info	User account - Invalid credentials reserved username	logAccount.csv
0900D00	Notice	<user> connected into interactive CLI with session id XXXXXX	logSession.csv

0900E00	Notice	<user> disconnected from interactive CLI with session id XXXXXX	logSession.csv
0900F00	Notice	<user> doesn't have access to CLI - CLI session id XXXXXX	logSession.csv
0901000	Notice	<user> connected and executes remote command <command> into the CLI - CLI session id XXXXXX	logSession.csv
0901100	Notice	<user> finished executing remote command <command> into the CLI - CLI session id XXXXXX	logSession.csv
0901200	Notice	<user> connection rejected - CLI session id XXXXXX	logSession.csv
0901300	Notice	<user> disconnected from interactive CLI with session id XXXXXX due to session timeout	logSession.csv
0901400	Notice	<user> disconnected from interactive CLI with session id XXXXXX due to concurrent connection with session id XXXXXX	logSession.csv
0100C00	Notice	Syslog is started	logSystem.csv
0100B00	Notice	Syslog is stopping	logSystem.csv
0100D00	Notice	Network module is booting	logSystem.csv
0100E00	Notice	Network module is operating	logSystem.csv
0100F00	Notice	Network module is starting shutdown sequence	logSystem.csv
0101000	Notice	Network module is ending shutdown sequence	logSystem.csv
0101400	Notice	Network module shutdown requested	logSystem.csv
0101500	Notice	Network module reboot requested	logSystem.csv
0101600	Notice	Network module reboot rejected	logSystem.csv
0100200	Notice	<nb alarms> alarms exported and flushed	logSystem.csv
0A00100	Info	Network module upgrade success <f/w: xx.yy.zzzz>	logUpdate.csv
0A00300	Info	Network module upgrade started	logUpdate.csv
0A00600	Info	Network module file system integrity OK <f/w: xx.yy.zzzz>	logUpdate.csv
0B00300	Info	Time with NTP synchronized	logSystem.csv
0B00600	Info	Time settings changed	logSystem.csv
0B01100	Info	Time reset to last known date: "date"	logSystem.csv
0C00F00	Info	Test email	
1000100	Info	Settings saving requested	logSystem.csv
1000200	Info	<*feature*> settings saved	logSystem.csv
1000A00	Info	Settings restoration requested	logSystem.csv
1000E00	Info	<*feature*> settings restoration success	logSystem.csv
1000B00	Info	Settings restoration success	logSystem.csv

0301500	Notice	Sanitization switch changed	logSystem.csv
0A01600	Notice	Major version downgrade	logUpdate.csv
0D00800	Notice	DHCP client script called with <script parameters>	logSystem.csv
0D00900	Notice	IPv4 configuration changed to <ipsv4_address>	logSystem.csv
0D01000	Notice	IPv6 configuration changed to <ipsv6_address>	logSystem.csv
0E00100	Notice	Outlet State change	logSystem.csv
1200700	Notice	Config file has been applied	logSystem.csv
0D00F00	Info	The network wake-up command was successfully sent	logSystem.csv

Event with code 0700600 is used within shutdown script. The severity may vary according to the event context.

7.3.2 UPS(HID) alarm log codes

This table applies to all UPS except to the 9130 UPS.

To retrieve Alarm logs, navigate to Contextual help>>>Alarms section and press the **Download alarms** button.

Below codes are the one to be used to add "Exceptions on events notification" on email sending configurations. Some zeros maybe added in front of the code when displayed in emails or logs.

7.3.2.1 Critical

Code	Severity	Active message	Non-active message	Advice
002	Critical	Internal failure	End of internal failure	Service required
004	Critical	Temperature alarm	Temperature OK	Check air conditioner
100	Critical	Rectifier fuse fault	Rectifier fuse OK	Service required
105	Critical	Input AC module failure	Input AC module OK	Service required
207	Critical	Bypass AC module failure	Bypass AC module OK	-
208	Critical	Bypass overload	No bypass overload	-
305	Critical	Rectifier failure	Rectifier OK	Service required
306	Critical	Rectifier overload	Rectifier OK	Reduce output load
308	Critical	Rectifier short circuit	Rectifier OK	Reduce output load
400	Critical	DCDC converter failure	DCDC converter OK	Service required
500	Critical	Battery charger fault	Battery charger OK	Service required
607	Critical	Battery test failed	Battery test OK	Check battery
60D	Critical	No battery	Battery present	Check battery
61B	Critical	Battery BMS fault	Battery BMS OK	Check battery
622	Critical	Battery short circuit	Battery OK	Check battery
629	Critical	Battery voltage low critical	Battery voltage OK	Check battery
62B	Critical	Battery voltage high critical	Battery voltage OK	Check battery
62D	Critical	Battery charge current low critical	Battery charge current OK	Check battery
62F	Critical	Battery charge current high critical	Battery charge current OK	Check battery
631	Critical	Battery discharge current low critical	Battery discharge current OK	Check battery

633	Critical	Battery discharge current high critical	Battery discharge current OK	Check battery
635	Critical	Battery temperature low critical	Battery temperature OK	Check battery
637	Critical	Battery temperature high critical	Battery temperature OK	Check battery
63E	Critical	Battery fault	Battery OK	Check battery
704	Critical	Inverter internal failure	UPS OK	Service required
705	Critical	Inverter overload	No power overload	Reduce output load
706	Critical	Temperature alarm	Temperature OK	Check air conditioner
70B	Critical	Inverter short circuit	End of inverter short circuit	Service required
805	Critical	Output short circuit	Output OK	Reduce output load
811	Critical	Parallel negative power	Parallel power OK	Reduce output load
815	Critical	Calibration fault	Calibration OK	Service required
81E	Critical	Load unprotected	Load protected	-

7.3.2.2 Warning

Code	Severity	Active message	Non-active message	Advice
001	Warning	On battery	No more on battery	-
007	Warning	Fan fault	Fan OK	Service required
00B	Warning	Parallel UPS redundancy lost	Parallel UPS redundancy OK	Reduce output load
00E	Warning	Parallel UPS communication lost	Parallel UPS communication OK	Service required
00F	Warning	Parallel UPS not compatible	Parallel UPS compatibility OK	Service required
010	Warning	UPS power supply fault	UPS power supply OK	Service required
011	Warning	Parallel UPS protection lost	Parallel UPS protection OK	Reduce output load
012	Warning	Parallel UPS measure inconsistent	Parallel UPS measure OK	Service required
020	Warning	On battery	On normal mode	
021	Warning	On bypass	On normal mode	
022	Warning	Alarm signaled	No alarm reported	-
103	Warning	Utility breaker open	Utility breaker closed	-
104	Warning	Input AC frequency out of range	Input AC frequency in range	-
106	Warning	Input AC not present	Input AC present	-
107	Warning	Input bad wiring	Input wiring OK	Check input wiring

108	Warning	Input AC voltage out of range (-)	Input AC voltage in range	-
109	Warning	Input AC voltage out of range (+)	Input AC voltage in range	-
110	Warning	Building alarm (through dry contact)	Building alarm OK	-
11F	Warning	Building alarm (through Network module)	Building alarm OK	-
10A	Warning	Input AC unbalanced	End of input AC unbalanced	-
124	Warning	Main Input phases out of sequence	Main Input phases wired OK	Check input wiring
200	Warning	Bypass phase out range	Bypass phase in range	-
201	Warning	Bypass not available	Bypass available	Service required
202	Warning	Bypass thermal overload	Bypass thermal OK	Reduce output load
203	Warning	Bypass temperature alarm	Bypass temperature OK	Check air conditioner
204	Warning	Bypass breaker open	Bypass breaker closed	-
205	Warning	Bypass mode	No more on bypass	-
206	Warning	Bypass frequency out of range	Bypass frequency in range	-
209	Warning	Bypass voltage out of range	Bypass voltage in range	-
20A	Warning	Bypass AC over voltage	End of bypass AC over voltage	-
20B	Warning	Bypass AC under voltage	End of bypass AC under voltage	-
20C	Warning	Bypass bad wiring	Bypass wiring OK	Check bypass wiring
212	Warning	Bypass phases out of sequence	Bypass phases wired OK	Check bypass wiring
300	Warning	DC bus + too high	DC bus + voltage OK	Service required
301	Warning	DC bus - too high	DC bus - voltage OK	Service required
302	Warning	DC bus + too low	DC bus + voltage OK	Service required
303	Warning	DC bus - too low	DC bus - voltage OK	Service required
304	Warning	DC bus unbalanced	DC bus OK	Service required
501	Warning	Charger temperature alarm	Charger temperature OK	Service required
502	Warning	Max charger voltage	Charger voltage OK	Service required
503	Warning	Min charger voltage	Charger voltage OK	Service required
600	Warning	Battery fuse fault	Battery fuse OK	Service required
602	Warning	Battery fuse fault	Battery fuse OK	Service required
604	Warning	Battery low state of charge	Battery state of charge OK	-
605	Warning	Battery temperature alarm	Battery temperature OK	Service required

606	Warning	Battery breaker open	Battery breaker closed	Service required
610	Warning	Battery low voltage	Battery voltage OK	Check battery
613	Warning	Battery voltage too high	Battery voltage OK	Check battery
616	Warning	Battery voltage unbalanced	Battery voltage OK	Check battery
618	Warning	Battery voltage too low	Battery voltage OK	Check battery
61C	Warning	Communication with battery lost	Communication with battery recovered	Check battery
61E	Warning	At least one breaker in battery is open	All battery breakers are closed	Check battery
61F	Warning	Battery State Of Charge below limit	Battery State Of Charge OK	-
620	Warning	Battery State Of Health below limit	Battery State Of Health OK	Check battery
621	Warning	Battery discharge current too high	Battery discharge current OK	Check battery
623	Warning	Battery low state of health	Battery state of health OK	Check battery
626	Warning	Battery temperature too high	Battery temperature OK	Check battery
627	Warning	Battery temperature too low	Battery temperature OK	Check battery
628	Warning	Battery voltage low warning	Battery voltage OK	Check battery
62A	Warning	Battery voltage high warning	Battery voltage OK	Check battery
62C	Warning	Battery charge current low warning	Battery charge current OK	Check battery
62E	Warning	Battery charge current high warning	Battery charge current OK	Check battery
630	Warning	Battery discharge current low warning	Battery discharge current OK	Check battery
632	Warning	Battery discharge current high warning	Battery discharge current OK	Check battery
634	Warning	Battery temperature low warning	Battery temperature OK	Check battery
636	Warning	Battery temperature high warning	Battery temperature OK	Check battery
638	Warning	Battery BMS failure	Battery BMS OK	Check battery
639	Warning	Battery temperature unbalanced	Battery temperature OK	Check battery
63D	Warning	Battery warning	Battery OK	Check battery
700	Warning	Inverter limitation	No current limitation	Reduce output load
701	Warning	Inverter fuse fault	Inverter fuse OK	Service required
70A	Warning	Inverter thermal overload	No power overload	Reduce output load
70C	Warning	Inverter voltage too low	Inverter voltage OK	Service required

70D	Warning	Inverter voltage too high	Inverter voltage OK	Service required
801	Warning	Load not powered	Load powered	-
803	Warning	Output breaker open	Output breaker closed	-
806	Warning	Emergency power OFF	No emergency OFF	-
808	Warning	Power overload	No power overload	Reduce output load
80D	Warning	Internal configuration failure	Internal configuration OK	Service required
80E	Warning	Overload pre-alarm	No overload pre-alarm	Reduce output load
810	Warning	Overload alarm	No overload	Reduce output load
814	Warning	Firmware watchdog reset	Firmware watchdog OK	Service required
816	Warning	Compatibility failure	Compatibility OK	Service required
817	Warning	Output over current	No output over current	Reduce output load
818	Warning	Output frequency out of range	Output frequency in range	Service required
819	Warning	Output voltage too high	Output voltage OK	Service required
81A	Warning	Output voltage too low	Output voltage OK	Service required
81B	Warning	UPS Shutoff requested	End of UPS shutoff requested	Service required
81D	Warning	Load not powered	Load protected	-
81F	Warning	Output phase 1 overload	Output phase 1 no overload	-
820	Warning	Output phase 2 overload	Output phase 2 no overload	-
821	Warning	Output phase 3 overload	Output phase 3 no overload	-
900	Warning	Maintenance bypass	Not on maintenance bypass	-
901	Warning	Maintenance bypass breaker closed	Maintenance bypass breaker open	-
B01	Warning	Batteries are aging. Consider replacement	Batteries aging condition cleared	-

7.3.2.3 Info

Code	Severity	Active message	Non-active message	Advice
005	Info	Communication lost (with UPS)	Communication recovered (with UPS)	Service required
013	Info	Upgrading: limited communication	End of upgrade mode	-
01E	Info	Inactive	On normal mode	'
025	Info	Not present	On normal mode	'

101	Info	On AVR (Boost)	End of AVR (Boost)	-
102	Info	On AVR (Buck)	End of AVR (Buck)	-
603	Info	Battery discharging	End of UPS battery discharge	-
63C	Info	Battery information	Battery OK	-
A00	Info	Group 1 is OFF	Group 1 is ON	-
A01	Info	Group 2 is OFF	Group 2 is ON	-
A0F	Info	Group is OFF	Group is ON	-

7.3.2.4 Good

Alarms with a severity set as Good are not taken into account into the counter of active alarms.

Code	Severity	Active message	Non-active message
009	Good	On high efficiency / On ESS mode	High efficiency disabled / ESS disabled
01F	Good	Ready	On normal mode
60E	Good	UPS external battery set as “No battery”	UPS external battery set as present
826	Good	Load powered with no continuity	Load protected

7.3.3 EMP alarm log codes

To retrieve Alarm logs, navigate to Contextual help>>>Alarms section and press the **Download alarms** button.

Below codes are the one to be used to add "Exceptions on events notification" on email sending configurations. Some zeros maybe added in front of the code when displayed in emails or logs.

7.3.3.1 Critical

Code	Severity	Active message	Non-active message	Advice
1201	Critical	Temperature is critically low	Temperature is back to low	-
1204	Critical	Temperature is critically high	Temperature is back to high	-
1211	Critical	Humidity is critically low	Humidity is back to low	-
1214	Critical	Humidity is critically high	Humidity is back to high	-

7.3.3.2 Warning

Code	Severity	Active message	Non-active message	Advice
1200	Warning	Communication lost	Communication recovered	-
1202	Warning	Temperature is low	Temperature is back to normal	-
1203	Warning	Temperature is high	Temperature is back to normal	-
1212	Warning	Humidity is low	Humidity is back to normal	-
1213	Warning	Humidity is high	Humidity is back to normal	-

7.3.3.3 With settable severity

Code	Severity	Active message	Non-active message	Advice
1221	Settable	Contact is active	Contact is back to normal	-

7.3.4 Network module alarm log codes

To retrieve Alarm logs, navigate to Contextual help>>>Alarms section and press the **Download alarms** button.

Below codes are the one to be used to add "Exceptions on events notification" on email sending configurations. Some zeros maybe added in front of the code when displayed in emails or logs.

7.3.4.1 Warning

7.3.4.1.1 Protection

Code	Severity	Active message	Non-active message	Advice
1032	Warning	Protection: immediate shutdown in progress	Protection: immediate shutdown completed	-
1053	Warning	Protection: communication lost with agent	Protection: communication recovered with agent	-

7.3.4.1.2 Alarms

Code	Severity	Active message	Non-active message	Advice
1303	Warning	Alarms: the number of alarms is too high and above 6 000	Alarms: the number of alarms is back to normal	2 000 alarms have been erased and saved in a backup file.

7.3.4.2 Info

7.3.4.2.1 Protection

Code	Severity	Active message	Non-active message	Advice
1016	Info	Protection: sequential shutdown scheduled	Protection: sequential shutdown canceled	-
1017	Info	Protection: sequential shutdown in progress	Protection: sequential shutdown completed	-
1054	Info	Protection: agent is in unknown state	Protection: agent is in service	-
1055	Info	Protection: agent is starting	Protection: agent is in service	-
1056	Info	Protection: agent is stopping	Protection: agent is in service	-
1057	Info	Protection: agent is stopped	Protection: agent is in service	-
1100	Info	Schedule: shutdown date reached	Schedule: shutdown initiated	-

7.3.4.2.2 Communication

Code	Severity	Active message	Non-active message	Advice
1300	Info	Communication: No device connected	Communication: Communication with the device is back	-
1301	Info	Communication: Device not supported	Communication: Communication with the device is back	-

7.3.4.2.3 Alarms

Code	Severity	Active message	Non-active message	Advice
1302	Info	Alarms: the number of alarms is high and above 5 000	Alarms: the number of alarms is back to normal	It is recommended to Export and Clear the alarm log.

7.3.5 UPS(Q) alarm log codes

To retrieve Alarm logs, navigate to Contextual help>>>Alarms section and press the **Download alarms** button.

7.3.5.1 Critical

Code	Severity	Active message	Non-active message	Advice
002	Critical	Internal failure	End of internal failure	Service required
305	Critical	Rectifier failure	Rectifier OK	Service required
500	Critical	Battery charger fault	Battery charger OK	Service required
607	Critical	Battery test failed	Battery test OK	Check battery
60D	Critical	No battery	Battery present	Check battery
81E	Critical	Load unprotected	Load protected	
2055	Critical	UPS shutdown imminent	UPS shutdown no longer imminent	
2149	Critical	Battery needs service	Battery OK	Check battery

7.3.5.2 Warning

Code	Severity	Active message	Non-active message	Advice
001	Warning	On battery	No more on battery	
005	Warning	Communication lost with device	Communication recovered with device	
007	Warning	Fan fault	Fan OK	

023	Warning	Fan maintenance required	No fan maintenance required	
024	Warning	Internal warning	No longer internal warning	
106	Warning	Input AC not present	Input AC present	
107	Warning	Input bad wiring	Input wiring OK	
120	Warning	Utility input neutral lost	No utility input neutral lost	
124	Warning	Input phases out of sequence	Input phases wired OK	
201	Warning	Bypass not available	Bypass available	
205	Warning	Bypass mode	No longer on bypass	
20C	Warning	Bypass bad wiring	Bypass wiring OK	
212	Warning	Bypass phases out of sequence	Bypass phases wired OK	
502	Warning	Max charger voltage	Charger voltage OK	
604	Warning	Battery low state of charge	Battery state of charge OK	
626	Warning	Battery temperature too high	Battery temperature OK	
66E	Warning	Battery polarity reversed	No battery polarity reversed	
806	Warning	Emergency power OFF	No emergency OFF	
808	Warning	Power overload	No power overload	
80E	Warning	Overload pre-alarm	No overload pre-alarm	
81D	Warning	Load not powered	Load protected	
900	Warning	Maintenance bypass	Not on maintenance bypass	
B00	Warning	End of warranty	End of warranty cleared	
2132	Warning	Parallel UPS redundancy lost	Parallel UPS redundancy OK	
2202	Warning	Ambient temperature is too Low	Ambient temperature is OK	
2203	Warning	Ambient temperature is too high	Ambient temperature is Ok	

7.3.5.3 Info

Code	Severity	Active message	Non-active message	Advice
101	Info	On AVR (Boost)	End of AVR (Boost)	
102	Info	On AVR (Buck)	End of AVR (Buck)	
603	Info	Battery discharging	Battery no longer discharging	
A0F	Info	Group is OFF	Group is ON	
2059	Info	Utility AC not present	Utility AC present	

2385	Info	Service scheduled	Service no longer scheduled	

7.3.5.4 Good

Code	Severity	Active message	Non-active message	Advice
009	Good	On high efficiency / On ESS mode	High efficiency disabled / ESS disabled	

7.4 SNMP traps

7.4.1 UPS Mib

7.4.1.1 IETF Mib-2 Ups traps

This information is for reference only.

Trap oid : .1.3.6.1.2.1.33.2.0.x	Description :
.1.3.6.1.2.1.33.2.0.**1**	Sent whenever the UPS transfers on battery, then sent every minutes until the UPS Comes back to AC Input.
.1.3.6.1.2.1.33.2.0.**3**	Sent whenever an alarm appears. The matching alarm oid is added as bound variables in the table below.
.1.3.6.1.2.1.33.2.0.4	Sent whenever an alarm disappears. The matching alarm oid is added as bound variables in the table below.

Alarm oid at : .1.3.6.1.2.1.33.1.6.3.x	Description when trap 3	Description when trap 4
.1.3.6.1.2.1.33.1.6.3.**1**	Battery test failed	Battery test OK
.1.3.6.1.2.1.33.1.6.3.**2**	Battery discharging	End of UPS battery discharge
.1.3.6.1.2.1.33.1.6.3.**3**	Low battery	Battery OK
.1.3.6.1.2.1.33.1.6.3.**5**	Temperature alarm	Temperature OK
.1.3.6.1.2.1.33.1.6.3.**6**	Input AC not present	Input AC present
.1.3.6.1.2.1.33.1.6.3.**8**	Power overload	No power overload
.1.3.6.1.2.1.33.1.6.3.**9**	Bypass mode	No more on bypass
.1.3.6.1.2.1.33.1.6.3.**10**	Bypass not available	Bypass available
.1.3.6.1.2.1.33.1.6.3.**13**	Battery charger fault	Battery charger OK
.1.3.6.1.2.1.33.1.6.3.**14**	Not powered	Powered (Protected or Not protected)
.1.3.6.1.2.1.33.1.6.3.**16**	Fan fault	Fan OK

Alarm oid at : .1.3.6.1.2.1.33.1.6.3.x	Description when trap 3	Description when trap 4
.1.3.6.1.2.1.33.1.6.3.**17**	Battery fuse fault Rectifier fuse fault Inverter fuse fault	Battery fuse OK Rectifier fuse OK Inverter fuse OK
.1.3.6.1.2.1.33.1.6.3.**18**	Internal failure	End of internal failure
.1.3.6.1.2.1.33.1.6.3.**20**	Communication lost	Communication recovered
.1.3.6.1.2.1.33.1.6.3.**23**	Shutdown imminent	Shutdown canceled

7.4.1.2 EPPC Mib traps

This information is for reference only.

Trap oid : .1.3.6.1.4.1.935.10.1.2.0.x	Trap message at oid	UPS warning code
.1.3.6.1.4.1.935.10.1.2.0.1	WARNING: Utility power not available.	104,106,2059,2067
.1.3.6.1.4.1.935.10.1.2.0.2	INFORMATION: Utility power has restored.	
.1.3.6.1.4.1.935.10.1.2.0.3	SEVERE: The UPS batteries are low and will soon be exhausted.	604,2056,2369
.1.3.6.1.4.1.935.10.1.2.0.4	INFORMATION: The UPS has return from a low battery condition.	
.1.3.6.1.4.1.935.10.1.2.0.5	SEVERE: The UPS is not working fine.	002,2384
.1.3.6.1.4.1.935.10.1.2.0.6	INFORMATION: The UPS is working fine.	
.1.3.6.1.4.1.935.10.1.2.0.7	WARNING: The UPS has switched to battery backup power.	001,020,603,2057,2168
.1.3.6.1.4.1.935.10.1.2.0.8	INFORMATION: The UPS is not on battery power.	
.1.3.6.1.4.1.935.10.1.2.0.11	INFORMATION: The UPS has enabled bypass.	205,2169
.1.3.6.1.4.1.935.10.1.2.0.12	INFORMATION: The UPS is not on bypass.	
.1.3.6.1.4.1.935.10.1.2.0.13	SEVERE: Communication to the UPS has been lost.	005
.1.3.6.1.4.1.935.10.1.2.0.14	INFORMATION: Communication with the UPS has been established.	
.1.3.6.1.4.1.935.10.1.2.0.15	WARNING: The UPS is going to shutdown output.	1017,1032,2055
.1.3.6.1.4.1.935.10.1.2.0.16	INFORMATION: The UPS is not going to shutdown output.	
.1.3.6.1.4.1.935.10.1.2.0.17	WARNING: The UPS is going to shutdown outlet1.	1017,1032
.1.3.6.1.4.1.935.10.1.2.0.18	INFORMATION: The UPS is not going to shutdown outlet1.	
.1.3.6.1.4.1.935.10.1.2.0.19	WARNING: The UPS is going to shutdown outlet2.	1017,1032
.1.3.6.1.4.1.935.10.1.2.0.20	INFORMATION: The UPS is not going to shutdown outlet2.	

Trap oid : .1.3.6.1.4.1.935.10.1.2.0.x	Trap message at oid	UPS warning code
.1.3.6.1.4.1.935.10.1.2.0.29	WARNING: Sensor Temperature over high Set point.	1203,1204
.1.3.6.1.4.1.935.10.1.2.0.30	INFORMATION: Sensor Temperature not over high Set point.	
.1.3.6.1.4.1.935.10.1.2.0.31	WARNING: Sensor Temperature under low Set point.	1201,1202,
.1.3.6.1.4.1.935.10.1.2.0.32	INFORMATION: Sensor Temperature not under low Set point.	
.1.3.6.1.4.1.935.10.1.2.0.33	WARNING: Sensor Humidity over high Set point.	1213,1214
.1.3.6.1.4.1.935.10.1.2.0.34	INFORMATION: Sensor Humidity not over high Set point.	
.1.3.6.1.4.1.935.10.1.2.0.35	WARNING: Sensor Humidity under low Set point.	1211,1212
.1.3.6.1.4.1.935.10.1.2.0.36	INFORMATION: Sensor Humidity not under low Set point.	
.1.3.6.1.4.1.935.10.1.2.0.37	WARNING: Contact Alarm-1 activated.	1221
.1.3.6.1.4.1.935.10.1.2.0.38	INFORMATION: Contact Alarm-1 not active.	
.1.3.6.1.4.1.935.10.1.2.0.39	WARNING: Contact Alarm-2 activated.	1221
.1.3.6.1.4.1.935.10.1.2.0.40	INFORMATION: Contact Alarm-2 not active.	
.1.3.6.1.4.1.935.10.1.2.0.41	WARNING: Internal warning.	010,024,105,305,400,621,80D,814,816,2002,2026,2031,2047,2048,2051,2063,2068,2070, 2077,2089,2112,2135,2147,2224,2229,2364,2365
.1.3.6.1.4.1.935.10.1.2.0.42	INFORMATION: Return from Internal warning.	
.1.3.6.1.4.1.935.10.1.2.0.43	WARNING: EPO Active.	806
.1.3.6.1.4.1.935.10.1.2.0.44	INFORMATION: Return from EPO Active.	
.1.3.6.1.4.1.935.10.1.2.0.47	WARNING: Main 1 Neutral loss.	120
.1.3.6.1.4.1.935.10.1.2.0.48	INFORMATION: Return from Main 1 Neutral loss.	
.1.3.6.1.4.1.935.10.1.2.0.49	WARNING: Main 1 phase error.	124
.1.3.6.1.4.1.935.10.1.2.0.50	INFORMATION: Return from Main 1 phase error.	
.1.3.6.1.4.1.935.10.1.2.0.51	WARNING: Site fault.	107,20C
.1.3.6.1.4.1.935.10.1.2.0.52	INFORMATION: Return from Site fault.	
.1.3.6.1.4.1.935.10.1.2.0.53	WARNING: Bypass Abnormal.	200,201,206,207,209,20A,20B,2003,2004,2005,2142,2326,2327
.1.3.6.1.4.1.935.10.1.2.0.54	INFORMATION: Return from Bypass Abnormal.	
.1.3.6.1.4.1.935.10.1.2.0.55	WARNING: Bypass Phase Error.	212,2119
.1.3.6.1.4.1.935.10.1.2.0.56	INFORMATION: Return from Bypass Phase Error.	

Trap oid : .1.3.6.1.4.1.935.10.1.2.0.x	Trap message at oid	UPS warning code
.1.3.6.1.4.1.935.10.1.2.0.57	WARNING: Battery Open.	60D
.1.3.6.1.4.1.935.10.1.2.0.58	INFORMATION: Return from Battery Open.	
.1.3.6.1.4.1.935.10.1.2.0.59	WARNING: Battery Over Charge.	502,62E,62F
.1.3.6.1.4.1.935.10.1.2.0.60	INFORMATION: Return from Battery Over Charge.	
.1.3.6.1.4.1.935.10.1.2.0.61	WARNING: Battery Reverse.	66E
.1.3.6.1.4.1.935.10.1.2.0.62	INFORMATION: Return from Battery Reverse.	
.1.3.6.1.4.1.935.10.1.2.0.63	WARNING: Overload forewarning.	80E,2159,2160,2161,2342
.1.3.6.1.4.1.935.10.1.2.0.64	INFORMATION: Return from Overload forewarning.	
.1.3.6.1.4.1.935.10.1.2.0.65	WARNING: Overload Warning.	208,306,705,808,810,81F,820,821,2025,2027,2102,2103,2104,2162,2163,2164,2165,2166, 2167,2323,2325,2380,2381,2382
.1.3.6.1.4.1.935.10.1.2.0.66	INFORMATION: Return from Overload Warning.	
.1.3.6.1.4.1.935.10.1.2.0.67	WARNING: Fan Lock.	007,2193
.1.3.6.1.4.1.935.10.1.2.0.68	INFORMATION: Return from Fan Lock.	
.1.3.6.1.4.1.935.10.1.2.0.69	WARNING: Maintain cover is open.	900
.1.3.6.1.4.1.935.10.1.2.0.70	INFORMATION: Return from Maintain cover is open.	
.1.3.6.1.4.1.935.10.1.2.0.71	WARNING: Charger fault.	500,2022,2030,2034,2075,2076,2208,2259,2260,2261
.1.3.6.1.4.1.935.10.1.2.0.72	INFORMATION: Return from Charger fault.	
.1.3.6.1.4.1.935.10.1.2.0.77	WARNING: Redundancy loss.	00B,2132
.1.3.6.1.4.1.935.10.1.2.0.78	INFORMATION: Return from Redundancy loss.	
.1.3.6.1.4.1.935.10.1.2.0.81	WARNING: Battery Inform.	2149
.1.3.6.1.4.1.935.10.1.2.0.82	INFORMATION: Return from Battery Inform.	
.1.3.6.1.4.1.935.10.1.2.0.83	WARNING: Inspection Inform.	2385,2386
.1.3.6.1.4.1.935.10.1.2.0.84	INFORMATION: Return from Inspection Inform.	
.1.3.6.1.4.1.935.10.1.2.0.85	WARNING: Guarantee Inform.	B00
.1.3.6.1.4.1.935.10.1.2.0.86	INFORMATION: Return from Guarantee Inform.	
.1.3.6.1.4.1.935.10.1.2.0.87	WARNING: Temperature Low.	2202
.1.3.6.1.4.1.935.10.1.2.0.88	INFORMATION: Return from Temperature Low.	
.1.3.6.1.4.1.935.10.1.2.0.89	INFORMATION: Return from Temperature Low.	2203
.1.3.6.1.4.1.935.10.1.2.0.90	INFORMATION: Return from Temperature High.	

Trap oid : .1.3.6.1.4.1.935.10.1.2.0.x	Trap message at oid	UPS warning code
.1.3.6.1.4.1.935.10.1.2.0.91	WARNING: Battery Over Temperature.	626,636,2322
.1.3.6.1.4.1.935.10.1.2.0.92	INFORMATION: Return from Battery Over Temperature.	
.1.3.6.1.4.1.935.10.1.2.0.93	WARNING: Fan Maintain Inform.	023
.1.3.6.1.4.1.935.10.1.2.0.94	INFORMATION: Return from Fan Maintain Inform.	
.1.3.6.1.4.1.935.10.1.2.0.95	WARNING: Bus Capacitance Maintain Inform.	300,301,302,303,304,2028,2029,2231
.1.3.6.1.4.1.935.10.1.2.0.96	INFORMATION: Return from Bus Capacitance Maintain Inform.	
.1.3.6.1.4.1.935.10.1.2.0.99	WARNING: Batteries are aging. Consider replacement.	B01
.1.3.6.1.4.1.935.10.1.2.0.100	INFORMATION: Batteries aging condition cleared.	
.1.3.6.1.4.1.935.10.1.2.0.101	SEVERE: UPS output short circuit fault, Please check the loads.	805
.1.3.6.1.4.1.935.10.1.2.0.102	INFORMATION: Return from UPS output short circuit fault.	
.1.3.6.1.4.1.935.10.1.2.0.103	SEVERE: Inverter Voltage is too High.	70D,2000
.1.3.6.1.4.1.935.10.1.2.0.104	INFORMATION: Inverter Voltage returns to normal.	
.1.3.6.1.4.1.935.10.1.2.0.105	SEVERE: Inverter Voltage is too Low.	70C,2001
.1.3.6.1.4.1.935.10.1.2.0.106	INFORMATION: Inverter Voltage is not too High.	
.1.3.6.1.4.1.935.10.1.2.0.107	WARNING: Current Limitation.	817
.1.3.6.1.4.1.935.10.1.2.0.108	INFORMATION: Return from Current Limitation.	
.1.3.6.1.4.1.935.10.1.2.0.109	WARNING: UPS Output Off.	818,819,81A,81D,A0F,2170
.1.3.6.1.4.1.935.10.1.2.0.110	INFORMATION: UPS Output On.	
.1.3.6.1.4.1.935.10.1.2.0.111	INFORMATION: The UPS has enabled HE Mode.	009,2227
.1.3.6.1.4.1.935.10.1.2.0.112	INFORMATION: The UPS is not on HE Mode/ESS Mode.	
.1.3.6.1.4.1.935.10.1.2.0.115	INFORMATION: On AVR (Boost).	101,2197
.1.3.6.1.4.1.935.10.1.2.0.116	INFORMATION: Not On AVR (Boost).	
.1.3.6.1.4.1.935.10.1.2.0.117	INFORMATION: On AVR (Buck).	102,2196
.1.3.6.1.4.1.935.10.1.2.0.118	INFORMATION: Not On AVR (Buck).	
.1.3.6.1.4.1.935.10.1.2.0.119	WARNING: Sensor communication lost.	1200
.1.3.6.1.4.1.935.10.1.2.0.120	INFORMATION: Sensor communication restore.	
.1.3.6.1.4.1.935.10.1.2.0.127	WARNING: Load segment 1 is off.	A0F

Trap oid : .1.3.6.1.4.1.935.10.1.2.0.x	Trap message at oid	UPS warning code
.1.3.6.1.4.1.935.10.1.2.0.128	INFORMATION: Load segment 1 is on.	
.1.3.6.1.4.1.935.10.1.2.0.129	WARNING: Load segment 2 is off.	A0F
.1.3.6.1.4.1.935.10.1.2.0.130	INFORMATION: Load segment 2 is on.	
.1.3.6.1.4.1.935.10.1.2.0.301	INFORMATION: Trap receiver setting is OK.	

7.5 CLI

CLI can be accessed through:

- SSH
- Serial terminal emulation (refer to section Servicing the Network Management Module>>>Installing the Network Module>>>Accessing the card through serial terminal emulation).

It is intended mainly for automated configuration of the network and time settings of the network card. It can also be used for troubleshooting and remote reboot/reset of the network interface in case the web user interface is not accessible.

Warning: Changing network parameters may cause the card to become unavailable remotely. If this happens it can only be reconfigured locally through USB.

7.5.1 Commands available

You can see this list anytime by typing in the CLI:

```
?
```

7.5.2 Contextual help

You can see this help anytime by typing in the CLI:

```
help
```

```
CONTEXT SENSITIVE HELP
[?] - Display context sensitive help. This is either a list of possible
      command completions with summaries, or the full syntax of the
      current command. A subsequent repeat of this key, when a command
      has been resolved, will display a detailed reference.

AUTO-COMPLETION
The following keys both perform auto-completion for the current command line.
If the command prefix is not unique then the bell will ring and a subsequent
repeat of the key will display possible completions.

[enter] - Auto-completes, syntax-checks then executes a command. If there is
          a syntax error then offending part of the command line will be
          highlighted and explained.

[space] - Auto-completes, or if the command is already resolved inserts a space.

MOVEMENT KEYS
[CTRL-A] - Move to the start of the line
[CTRL-E] - Move to the end of the line.
```

```
[up]     - Move to the previous command line held in history.
[down]   - Move to the next command line held in history.
[left]   - Move the insertion point left one character.
[right]  - Move the insertion point right one character.

DELETION KEYS
[CTRL-C]    - Delete and abort the current line
[CTRL-D]    - Delete the character to the right on the insertion point.
[CTRL-K]    - Delete all the characters to the right of the insertion point.
[CTRL-U]    - Delete the whole line.
[backspace] - Delete the character to the left of the insertion point.

ESCAPE SEQUENCES
!!  - Substitute the last command line.
!N  - Substitute the Nth command line (absolute as per 'history' command)
!-N - Substitute the command line entered N lines before (relative)
```

7.5.3 get release info

7.5.3.1 Description

Displays certain basic information related to the firmware release.

7.5.3.2 Help

```
get_release_info
  -d  Get current release date
  -s  Get current release sha1
  -t  Get current release time
  -v  Get current release version number
```

7.5.3.3 Specifics

7.5.3.4 Access rights per profiles

	Administrator	Operator	Viewer
get release info	✅	✅	✅

7.5.4 history

7.5.4.1 Description

Displays recent commands executed on the card.

7.5.4.2 Help

```
history
  <cr>               Display the current session's command line history(by default display
last 10 commands)
```

```
  <Unsigned integer>  Set the size of history list (zero means unbounded). Example 'history
6' display the 6 last command
```

7.5.4.3 Specifics

7.5.4.4 Access rights per profiles

	Administrator	Operator	Viewer
history	✅	✅	✅

7.5.5 logout

7.5.5.1 Description

Logout the current user.

7.5.5.2 Help

```
logout
  <cr> logout the user
```

7.5.5.3 Specifics

7.5.5.4 Access rights per profiles

	Administrator	Operator	Viewer
logout	✅	✅	✅

7.5.6 Maintenance (CLI)

7.5.6.1 Description

Creates a maintenance report file which may be handed to the technical support.

7.5.6.2 Help

```
maintenance
   <cr> Create maintenance report file.
   -h, --help Display help page
```

7.5.6.3 Examples of usage

Generate the maintenance report by running the "maintenance" command.

Then retrieve the report from the card using SCP

7.5.6.3.1 From a linux host:

sshpass -p $PASSWORD scp $USER@$CARD_ADDRESS:report.zip .

7.5.6.3.2 From a Windows host:

pscp -scp -pw $PASSWORD $USER@$CARD_ADDRESS:report.zip report.zip

(Require pscp tools from putty)

Where:

- $USER is user name (the user shall have administrator profile)
- $PASSWORD is the user password
- $CARD_ADDRESS is IP or hostname of the card

7.5.6.4 Specifics

7.5.6.5 Access rights per profiles

	Administrator	Operator	Viewer
maintenance	✅	❌	❌

7.5.7 netconf

7.5.7.1 Description

Tools to display or change the network configuration of the card.

7.5.7.2 Help

For Viewer and Operator profiles:

```
netconf -h
 Usage: netconf [OPTION]...
 Display network information and change configuration.

   -h, --help      display help page
   -l, --lan       display Link status and MAC address
   -4, --ipv4      display IPv4 Mode, Address, Netmask and Gateway
   -6, --ipv6      display IPv6 Mode, Addresses and Gateway
   -d, --domain    display Domain mode, FQDN, Primary and Secondary DNS
```

For Administrator profile:

```
netconf -h
 Usage: netconf [OPTION]...
 Display network information and change configuration.
  -h, --help      display help page
  -l, --lan       display Link status and MAC address
  -d, --domain    display Domain mode, FQDN, Primary and Secondary DNS
```

```
  -4, --ipv4      display IPv4 Mode, Address, Netmask and Gateway
  -6, --ipv6      display IPv6 Mode, Addresses and Gateway
    Set commands are used to modify the settings.
  -s, --set-lan <link speed>
      Link speed values:
      auto       Auto negotiation
      10hf       10 Mbps - Half duplex
      10ff       10 Mbps - Full duplex
      100hf      100 Mbps - Half duplex
      100ff      100 Mbps - Full duplex
      1000ff     1.0 Gbps - Full duplex
  -f, --set-domain hostname <hostname>    set custom hostname
  -f, --set-domain <mode>
          Mode values:
          - set custom Network address, Netmask and Gateway:
              manual <domain name> <primary DNS> <secondary DNS>
          - automatically set Domain name, Primary and Secondary DNS
              dhcp
  -i, --set-ipv4 <mode>
          Mode values:
          - set custom Network address, Netmask and Gateway
              manual <network> <mask> <gateway>
          - automatically set Network address, Netmask and Gateway
              dhcp
  -x, --set-ipv6 <status>
          Status values:
          - enable IPv6
              enable
          - disable IPv6
              disable
  -x, --set-ipv6 <mode>
          Mode values:
          - set custom Network address, Prefix and Gateway
              manual <network> <prefix> <gateway>
          - automatically set Network address, Prefix and Gateway
              router
Examples of usage:
-> Display Link status and MAC address
     netconf -l
-> Set Auto negotiation to Link
     netconf --set-lan auto
-> Set custom hostname
     netconf --set-domain hostname ups-00-00-00-00-00-00
-> Set Adress, Netmask and Gateway
     netconf --set-ipv4 manual 192.168.0.1 255.255.255.0 192.168.0.2
-> Disable IPv6
```

7.5.7.3 Examples of usage

```
 -> Display Link status and MAC address
      netconf -l
 -> Set Auto negotiation to Link
      netconf -s auto
 -> Set custom hostname
      netconf -f hostname ups-00-00-00-00-00-00
 -> Set Adress, Netmask and Gateway
```

```
      netconf -i manual 192.168.0.1 255.255.255.0 192.168.0.2
 -> Disable IPv6
      netconf -6 disable
```

7.5.7.4 Specifics

7.5.7.5 Access rights per profiles

	Administrator	Operator	Viewer
netconf	✅	✅ (read-only)	✅ (read-only)

7.5.8 ping and ping6

7.5.8.1 Description

Ping and ping6 utilities are used to test network connection.

7.5.8.2 Help

```
ping
  The ping utility uses the ICMP protocol's mandatory ECHO_REQUEST datagram
  to elicit an ICMP ECHO_RESPONSE from a host or gateway.  ECHO_REQUEST
  datagrams (``pings'') have an IP and ICMP header, followed by a ``struct
  timeval'' and then an arbitrary number of ``pad'' bytes used to fill out
  the packet.

  -c                Specify the number of echo requests to be sent
  -h                Specify maximum number of hops
  <Hostname or IP>  Host name or IP address
```

```
ping6
  The ping6 utility uses the ICMP protocol's mandatory ECHO_REQUEST datagram
  to elicit an ICMP ECHO_RESPONSE from a host or gateway.  ECHO_REQUEST
  datagrams (``pings'') have an IP and ICMP header, followed by a ``struct
  timeval'' and then an arbitrary number of ``pad'' bytes used to fill out
  the packet.

  -c                Specify the number of echo requests to be sent
  <IPv6 address>    IPv6 address
```

7.5.8.3 Specifics

7.5.8.4 Access rights per profiles

	Administrator	Operator	Viewer
ping	✅	❌	❌
ping6	✅	❌	❌

7.5.9 reboot

7.5.9.1 Description

Tool to Reboot the card.

7.5.9.2 Help

```
Usage: reboot [OPTION]
    <cr>                    Reboot the card
    --help                  Display help
    --withoutconfirmation   Reboot the card without confirmation
```

7.5.9.3 Specifics

7.5.9.4 Access rights per profiles

	Administrator	Operator	Viewer
reboot	✓	✗	✗

7.5.10 rest list

7.5.10.1 Usage

rest list <path>
This command shall list the endpoints starting from <path>
If no path provided, the command shall list all resources starting from "/"

rest list ?
This command print the help for the command.

7.5.10.2 Options

-d <number> : number of levels to show in the response
if no number provided, the default value is 1

7.5.10.3 Example

Command :

rest list /managers/1/networkService/networkInterfaces/eth0/ipv4

Result :

/managers/1/networkService/networkInterfaces/eth0/ipv4/status
/managers/1/networkService/networkInterfaces/eth0/ipv4/address
/managers/1/networkService/networkInterfaces/eth0/ipv4/subnetMask
/managers/1/networkService/networkInterfaces/eth0/ipv4/gateway
/managers/1/networkService/networkInterfaces/eth0/ipv4/settings

7.5.11 rest get

7.5.11.1 Usage

rest get <option> <path>
This command returns the payload starting from <path>
If no path provided, the command returns the payload starting from "/" with a depth of 1

rest get ?
This command print the help for the command.

7.5.11.2 Options

-d <number> : number of levels to show in the response
if no number provided, the default value is 1

7.5.11.3 Example

rest get /managers/1/networkService/networkInterfaces/eth1/ipv4/address
=>
10.130.33.195

7.5.12 rest set

7.5.12.1 Usage

rest set <path> <payload>
This command sets the resource identified by <path> with the given <payload>

rest set ?
This command print the help for the command.

7.5.12.2 Example

Set IPv4 address :

rest set /managers/1/networkService/networkInterfaces/eth1/ipv4/settings/manual/address 192.168.47.136

Set a field to an empty value or reset a field :

rest set /managers/1/identification/location ""

7.5.13 rest exec

7.5.13.1 Usage

rest exec <path> [payload]
This command runs the action at the resource identified by <path>. <payload> is an optional argument and is action dependent.

rest exec ?
This command will print the help for the command.

7.5.13.2 Example

Switch On immediately:

rest exec /powerDistributions/1/outlets/1/actions/switchOn

Switch On After 5 second delay:

rest exec /powerDistributions/1/outlets/1/actions/switchOn 5

7.5.14 save_configuration | restore_configuration

7.5.14.1 Description

Save_configuration and restore_configuration are using JSON format to save and restore certain part of the configuration of the card.

7.5.14.2 Help

```
save_configuration -h
  save_configuration: print the card configuration in JSON format to standard output.
```

```
restore_configuration -h
  restore_configuration: restore the card configuration from a JSON-formatted standard input.
```

7.5.14.3 Examples of usage

7.5.14.3.1 From a linux host:

Save over SSH: sshpass -p $PASSWORD ssh $USER@$CARD_ADDRESS save_configuration -p $PASSPHRASE> $FILE
Restore over SSH: cat $FILE | sshpass -p $PASSWORD ssh $USER@$CARD_ADDRESS restore_configuration -p $PASSPHRASE

7.5.14.3.2 From a Windows host:

Save over SSH: plink $USER@$CARD_ADDRESS -pw $PASSWORD -batch save_configuration -p $PASSPHRASE > $FILE
Restore over SSH: type $FILE | plink $USER@$CARD_ADDRESS -pw $PASSWORD -batch restore_configuration -p $PASSPHRASE
(Require plink tools from putty)

Where:

- $USER is user name (the user shall have administrator profile)
- $PASSWORD is the user password
- $PASSPHRASE is any passphrase to encrypt/decrypt sensible data.
- $CARD_ADDRESS is IP or hostname of the card
- $FILE is a path to the JSON file (on your host computer) where the configuration is saved or restored.

7.5.14.4 Specifics

7.5.14.5 Access rights per profiles

	Administrator	Operator	Viewer
save_configuration	✓	✗	✗
restore_configuration	✓	✗	✗

7.5.15 sanitize

7.5.15.1 Description

Sanitize command to return card to factory reset configuration.

7.5.15.2 Access

- Administrator

7.5.15.3 Help

```
sanitize
  -h, --help             Display help page
  --withoutconfirmation  Do factory reset of the card without confirmation
  <cr>                   Do factory reset of the card
```

7.5.15.4 Access rights per profiles

	Administrator	Operator	Viewer
sanitize	✓	✗	✗

7.5.16 ssh-keygen

7.5.16.1 Description

Command used for generating the ssh keys.

7.5.16.2 Help

```
ssh-keygen
  -h, --help  Display help
  <cr>        Renew SSH keys
```

7.5.16.3 Specifics

7.5.16.4 Access rights per profiles

	Administrator	Operator	Viewer
ssh-keygen	✓	✗	✗

7.5.17 time

7.5.17.1 Description

Command used to display or change time and date.

7.5.17.2 Help

For Viewer and Operator profiles:

```
time -h
 Usage: time [OPTION]...
 Display time and date.

   -h, --help      display help page
   -p, --print     display date and time in YYYYMMDDhhmmss format
```

For Administrator profile:

```
time -h
 Usage: time [OPTION]...
Display time and date, change time and date.
  -h, --help      display help page
  -p, --print     display date and time in YYYYMMDDhhmmss format
  -s, --set <mode>
      Mode values:
      - set date and time (format YYYYMMDDhhmmss)
          manual <date and time>
      - set preferred and alternate NTP servers
          ntpmanual <preferred server> <alternate server>
      - automatically set date and time
          ntpauto
Examples of usage:
-> Set date 2017-11-08 and time 22:00
     time --set manual 201711082200
-> Set preferred and alternate NTP servers
     time --set ntpmanual fr.pool.ntp.org de.pool.ntp.org
```

7.5.17.3 Examples of usage

```
 -> Set date 2017-11-08 and time 22:00
      time --set manual 201711082200
 -> Set preferred and alternate NTP servers
      time --set ntpmanual fr.pool.ntp.org de.pool.ntp.org
```

7.5.17.4 Specifics

7.5.17.5 Access rights per profiles

	Administrator	Operator	Viewer
time	✅	✅ (read-only)	✅ (read-only)

7.5.18 traceroute and traceroute6

7.5.18.1 Description

Traceroute and traceroute6 utilities are for checking the configuration of the network.

7.5.18.2 Help

```
traceroute
  -h                Specify maximum number of hops
  <Hostname or IP>  Remote system to trace
```

```
traceroute6
  -h                Specify maximum number of hops
  <IPv6 address>    IPv6 address
```

7.5.18.3 Specifics

7.5.18.4 Access rights per profiles

	Administrator	Operator	Viewer
traceroute	✓	✗	✗
traceroute6	✓	✗	✗

7.5.19 whoami

7.5.19.1 Description

whoami displays current user information:

- Username
- Profile
- Realm

7.5.19.2 Specifics

7.5.19.3 Access rights per profiles

	Administrator	Operator	Viewer
whoami	✓	✓	✓

7.5.20 email-test

7.5.20.1 Description

mail-test sends test email to troubleshoot SMTP issues.

7.5.20.2 Help

```
        Usage: email-test <command> ...
Test SMTP configuration.

Commands:
  email-test -h, --help, Display help page

  email-test -r, --recipient <recipient_address>
  Send test email to the
    <recipient_address>      Email address of the recipient
```

7.5.20.3 Specifics

7.5.20.4 Access rights per profiles

	Administrator	Operator	Viewer
email-test	✓	✗	✗

7.5.21 systeminfo_statistics

7.5.21.1 Description

Displays the following system information usage:

1. CPU
   a. usage : %
   b. upSince : date since the system started
2. Ram
   a. total: MB
   b. free: MB
   c. used: MB
   d. tmpfs: temporary files usage (MB)
3. Flash
   a. user data
      i. total: MB
      ii. free: MB
      iii. used: MB

7.5.21.2 Help

```
systeminfo_statistics
                      Display systeminfo statistics

        -h, --help       Display the help page.
```

7.5.21.3 Specifics

7.5.21.4 Access rights per profiles

	Administrator	Operator	Viewer
systeminfo_statistics	✔	✔	✔

7.5.22 certificates

7.5.22.1 Description

Allows to manage certificates through the CLI.

7.5.22.2 Help

```
certificates <target> <action> <service_name>
  <target> :
        - local
  <action> :
        - print: provides a given certificate detailed information.
        - revoke: revokes a given certificate.
        - export: returns a given certificate contents.
        - import: upload a given certificate for the server CSR. This will replace the CSR
with the certificate given.
        - csr: get the server CSR contents. This will create the CSR if not already existing.
  <service_name>: mqtt/syslog/webserver
```

7.5.22.3 Examples of usage

7.5.22.3.1 From a linux host:

print over SSH: sshpass -p $PASSWORD ssh $USER@$CARD_ADDRESS certificates local print $SERVICE_NAME
revoke over SSH: sshpass -p $PASSWORD ssh $USER@$CARD_ADDRESS certificates local revoke $SERVICE_NAME

export over SSH: sshpass -p $PASSWORD ssh $USER@$CARD_ADDRESS certificates local export $SERVICE_NAME
import over SSH: cat $FILE | sshpass -p $PASSWORD ssh $USER@$CARD_ADDRESS certificates local import $SERVICE_NAME

csr over SSH: sshpass -p $PASSWORD ssh $USER@$CARD_ADDRESS certificates local csr mqtt

7.5.22.3.2 From a Windows host: (plink tools from putty is required)

print over SSH: plink $USER@$CARD_ADDRESS -pw $PASSWORD -batch certificates local print $SERVICE_NAME
revoke over SSH: plink $USER@$CARD_ADDRESS -pw $PASSWORD -batch certificates local revoke $SERVICE_NAME

export over SSH: plink $USER@$CARD_ADDRESS -pw $PASSWORD -batch certificates local export $SERVICE_NAME
import over SSH: type $FILE | plink $USER@$CARD_ADDRESS -pw $PASSWORD -batch certificates local import $SERVICE_NAME

csr over SSH: plink $USER@$CARD_ADDRESS -pw $PASSWORD -batch certificates local csr mqtt

7.5.22.3.3 Where:

- $USER is user name (the user shall have administrator profile)
- $PASSWORD is the user password
- $PASSPHRASE is any passphrase to encrypt/decrypt sensible data.

- $CARD_ADDRESS is IP or hostname of the card
- $FILE is a certificate file
- $SERVICE_NAME is the name one of the following services : mqtt / syslog / webserver.

7.5.22.4 Specifics

7.5.22.5 Access rights per profiles

	Administrator	Operator	Viewer
certificates	✓	✗	✗

7.6 Acronyms and abbreviations

AC: Alternating current.

bps: bit per second

BOM: In Syslog, placing an encoded Byte Order Mark at the start of a text stream can indicates that the text is Unicode and identify the encoding scheme used.

CA: Certificate Authority

CLI: Command Line Interface.
Aim is to interact with the Network Module by using commands in the form of successive lines of text (command lines).

CSR: Certificate Signing Request

DC: Direct current.

DN: Distinguished Name (LDAP).

DHCPv6: The Dynamic Host Configuration Protocol version 6 is a network protocol for configuring Internet Protocol version 6 (IPv6) hosts with IP addresses, IP prefixes and other configuration data required to operate in an IPv6 network.
It is the IPv6 equivalent of the Dynamic Host Configuration Protocol for IPv4.

DNS: The Domain Name System is a hierarchical decentralized naming system for computers, services, or other resources connected to the Internet or a private network.

DST: The daylight saving time.

GID: Group Identifier is a numeric value used to represent a specific group (LDAP).

HTTPS: HTTPS consists of communication over Hypertext Transfer Protocol (HTTP) within a connection encrypted by Transport Layer Security (TLS).

IPv4: Internet Protocol version 4 is the fourth version of the Internet Protocol (IP).

IPv6: Internet Protocol version 6 is the most recent version of the Internet Protocol (IP).

JSON: JavaScript Object Notation is an open-standard file format that uses human-readable text to transmit data objects consisting of attribute–value pairs and array data types.

LAN: A LAN is a local area network, a computer network covering a small local area, such as a home or office.

LDAP: The Lightweight Directory Access Protocol is an industry standard application protocol for accessing and maintaining distributed directory information services over an Internet Protocol.

MAC: A media access control address of a computer is a unique identifier assigned to network interfaces for communications at the data link layer of a network segment.

MIB: A management information base is a database used for managing the entities in a communication network. Most often associated with the Simple Network Management Protocol (SNMP).

NTP: Network Time Protocol is a networking protocol for clock synchronization between computer systems.

P/N: Part number.

RTC: Real time clock.

S/N: Serial number.

SMTP: Simple Mail Transfer Protocol is an Internet standard for electronic mail (email) transmission.

SNMP: Simple Network Management Protocol is an Internet-standard protocol for collecting and organizing information about managed devices on IP networks and for modifying that information to change device behavior.

SSH: Secure Shell is a cryptographic network protocol for operating network services securely over an unsecured network.

SSL: Secure Sockets Layer, is a cryptographic protocol used for network traffic.

TLS: Transport Layer Security is cryptographic protocol that provide communications security over a computer network.

TFTP: Trivial File Transfer Protocol is a simple lockstep File Transfer Protocol which allows a client to get a file from or put a file onto a remote host.

UID: User identifier (LDAP).

UTC: Coordinated Universal Time is the primary time standard by which the world regulates clocks and time.

8 Troubleshooting

8.1 Action not allowed in Control/Schedule/Power outage policy

8.1.1 Symptom

Below message is displayed when you access the Control, Schedule or Power outage policy page.

This action is not allowed by the UPS.

To enable it, please refer to the user manual of the UPS and its instructions on how to configure the UPS settings and allow remote commands.

8.1.2 Possible Cause

1- Remote commands are not allowed due to the UPS configuration (see the action below)

2- The UPS does not support remote commands.

8.1.3 Action

Refer to the UPS user manual and its instruction on how to configure the UPS settings and allow remote commands.

Example: UPS menu Settings>>>ON/OFF settings>>>Remote command>>>Enable.

8.2 Client server is not restarting

8.2.1 Symptom

Utility power has been restored, the UPS and its load segments are powered on, but the Client server does not restart.

8.2.2 Possible Cause

The “Automatic Power ON” server setup setting might be disabled.

8.2.3 Action

In the server system BIOS, change the setting for Automatic Power ON to "Enabled".

8.3 EMP detection fails at discovery stage

In the Network Module, in Contextual help>>>Environment>>>Commissioning/Status, EMPs are missing in the Sensor commissioning table.

8.3.1 Symptom #1

The EMPs green RJ45 LED (FROM DEVICE) is not ON.

8.3.1.1 Possible causes

The EMPs are not powered by the Network module.

8.3.1.2 Action #1-1

Launch again the discovery, if it is still not ok, go to Action #1-2.

8.3.1.3 Action #1-2

1- Check the EMPs connection and cables.

Refer to the sections Servicing the EMP>>>Installing the EMP>>>Cabling the first EMP to the device and Servicing the EMP>>>Installing the EMP>>>Daisy chaining 3 EMPs.

2- Disconnect and reconnect the USB to RS485 cable.

3- Launch the discovery, if it is still not ok, go to Action #1-3.

8.3.1.4 Action #1-3

1- Reboot the Network module.

2- Launch the discovery.

8.3.2 Symptom #2

The EMPs orange RJ45 LEDs are not blinking.

8.3.2.1 Possible causes

C#1: the EMP address switches are all set to 0.

C#2: the EMPs are daisy chained, the Modbus address is the same on the missing EMPs.

8.3.2.2 Action #2-1

1- Change the address of the EMPs to have different address and avoid all switches to 0.

Refer to the section Servicing the EMP>>>Defining EMPs address and termination>>>Manual addressing.

2- Disconnect and reconnect the USB to RS485 cable. The address change is only taken into account after an EMP power-up.

3- Launch the discovery, if it is still not ok, go to Action #2-2.

8.3.2.3 Action #2-2

1- Reboot the Network module.

Refer to the section Contextual help>>>Maintenance>>>Services>>>Reboot.

2- Launch the discovery.

8.4 How do I log in if I forgot my password?

8.4.1 Action

- Ask your administrator for password initialization.
- If you are the main administrator, your password can be reset manually by following steps described in the Servicing the Network Management Module>>>Recovering main administrator password.

8.5 LDAP configuration/commissioning is not working

Refer to the section Servicing the Network Management Module>>>Commissioning/Testing LDAP.

8.6 Modbus communication doesn't work

8.6.1 Symptoms

- Communication doesn't work

Refer to the section Servicing the Network Management Module>>>Configuring Modbus to get configuration and testing information.

8.6.2 Possible cause

- Incorrect communication parameters.

Verify that the communication parameters are set to the desired settings.

Contextual help>>>Settings>>>Modbus>>>Modbus TCP

For Modbus TCP configuration refer to the section .

8.7 Password change in My profile is not working

8.7.1 Symptoms

The password change shows "*Invalid credentials*" when I try to change my password in My profile menu: 

8.7.2 Possible cause

The password has already been changed once within a day period.

8.7.3 Action

Let one day between your last password change and retry.

8.8 The alarm list has been cleared after an upgrade

8.8.1 Symptom

After a FW upgrade, the alarm list has been cleared and is now empty.

8.8.2 Action

The alarm list has been saved on a csv file and can be retrieved using Rest API calls.

8.8.2.1 Authenticate:

```
curl --location --request POST 'https://{{domain}}/rest/mbdetnrs/1.0/oauth2/token' \
--header 'Content-Type: application/json' \
--data-raw '{ "username":"admin", "password":"supersecretpassword", "grant_type":"password",
"scope":"GUIAccess" }'
```

8.8.2.2 Get Alarm Log Backup:

```
curl --location --request GET 'https://{{domain}}/rest/mbdetnrs/1.0/alarmService/actions/
downloadBackup' \
--header 'Authorization: Bearer {{access_token}}'
```

8.9 The Network Module fails to boot after upgrading the firmware

8.9.1 Possible Cause

1- The IP address has changed.

2- The Network module LED shows solid red after the upgrade.

3- The first boot after the upgrade takes a longer time.

Note: If the application is corrupt, due to an interruption while flashing the firmware for example, the boot will be done on previous firmware.

8.9.2 Action

1- Recover the IP address and connect to the card.

2- Reset the Network module by using the Restart button on the front panel.

3- Wait until the Network module LED shows flashing green.

Refer to Installing the Network Management Module>>>Accessing the Network Module>>>Finding and setting the IP address section.

8.10 Web user interface is not up to date after a FW upgrade

8.10.1 Symptom

After an upgrade:

- The Web interface is not up to date
- New features of the new FW are not displayed
- An infinite spinner is displayed on a tile

8.10.1.1 Possible causes

The browser is displaying the Web interface through the cache that contains previous FW data.

8.10.1.2 Action

Empty the cache of your browser using F5 or CTRL+F5.

8.11 Software is not able to communicate with the Network module

8.11.1 Symptoms

- In the Network Module, in Contextual help>>>Protection>>>Agent list>>>Agent list table, agent is showing "**Lost**" as a status.
- In the Network Module, in Contextual help>>>Settings>>>Certificate>>>Trusted remote certificates, the status of the Protected applications (MQTT) is showing **"Not valid yet"**.
- SPS G2/Winpower G2 shows "System time setting error" or "Add failed devices".

8.11.2 Possible cause

The SPS G2/Winpower G2 certificate is not yet valid for the Network Module.

Certificates of SPS G2/Winpower G2 and the Network Module are not matching so that authentication and encryption of connections between the Network Module and the shutdown agents is not working.

8.11.3 Setup

SPS G2/Winpower G2 is started.

Network module is connected to the UPS and to the network.

8.11.4 Action #1

Check if the SPS G2/Winpower G2 certificate validity for the Network Module.

STEP 1: Connect to the Network Module

- On a network computer, launch a supported web browser. The browser window appears.
- In the Address/Location field, enter: https://xxx.xxx.xxx.xxx/ where xxx.xxx.xxx.xxx is the static IP address of the Network Module.
- The log in screen appears.
- Enter the user name in the User Name field.
- Enter the password in the Password field.
- Click **Login**. The Network Module web interface appears.

STEP 2: Navigate to **Settings/Certificates** page

STEP 3: In the **Trusted remote certificates** section, check the status of the **Protected applications (MQTT)**.

If it is "**Valid**" go to Action#2 STEP 2, if it is "**Not yet valid**", time of the need to be synchronized with SPS G2/Winpower G2.

STEP 4: Synchronize the time of the Network Module with SPS G2/Winpower G2 and check that the status of the **Protected applications (MQTT)** is now valid.

Communication will then recover, if not go to Action#2 STEP 2.

8.11.5 Action #2

Pair agent to the Network Module with automatic acceptance (recommended in case the installation is done in a secure and trusted network).

For manual pairing (maximum security), go to Servicing the Network Management Module*>>>Pairing agent to the Network Module* section and then go to STEP 2, item 1.

STEP 1: Connect to the Network Module.

- On a network computer, launch a supported web browser. The browser window appears.
- In the Address/Location field, enter: https://xxx.xxx.xxx.xxx/ where xxx.xxx.xxx.xxx is the static IP address of the Network Module.
- The log in screen appears.
- Enter the user name in the User Name field.
- Enter the password in the Password field.
- Click **Login**. The Network Module web interface appears.

STEP 2: Navigate to **Protection/Agents list** page.

STEP 3: In the **Pairing with shutdown agents** section, select the time to accept new agents and press the **Start** button and **Continue**. During the selected timeframe, new agent connections to the Network Module are automatically trusted and accepted.

STEP 4: Action on the agent (SPS G2/Winpower G2) while the time to accepts new agents is running on the Network Module

Try to search the Network Module and connect it.