SATEL NETCO NMS Documentation

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Introduction

SATEL NETCO NMS is an intuitive and user-friendly network configuration software for network design and management with radio network monitoring option. The software supports configuration of the Routing Setup and NMS Routing Setup modes for SATEL-EASy+ product family. NMS Routing refers to NMS (Network Management System) Message Routing feature, where messages can be automatically routed over the radio network to correct recipient terminal, monitoring and diagnostics included for the radio network. Graphical design of topology for NMS Message Routing, remote modification of settings, online storing and trending of field data with programmable alarm triggers. Routing Setup refers to Message Routing feature for SATEL-EASy+, SATELLINE-3AS NMS family radio modems, where messages can be automatically routed over the radio network to correct recipient terminal.

The user interface of the product is web-browser-based and can therefore be used both locally and remotely. Design with graphical user interface for easy optimizing network design and deployment in a few simple steps, with local and remote connection to SATEL radios. SATEL NETCO Design supports also .saxd file format, configuration files created with the SATEL NMS PC SW. Installation requires valid, company specific license key. License keys are available from your local SATEL distributor or from SATEL directly.

SATEL NETCO NMS includes the following tools:

- SATEL NETCO Design for network management
- Alerta for alert management
- Docker for containerization
- Grafana for displaying monitoring information
- InfluxDB for time series database

System requirements

The system requirements are:

- Modern 4+ Core cpu.
- 8GB+ of memory.
- 1TB+ disk space.
- Ubuntu 20.04 LTS or Windows 10 or 11 with Windows Subsystem for Linux (WSL2).

Additional requirements for Windows installations:

- Requires Windows 10 64-bit Pro/Enterprise (version ~2019.09 or newer) or Windows 11.
- Requires at least one hard drive which is not Bitlocker protected
- Using other hypervisors than Microsoft Hyper-V required by WSL2 is not recommended and can lead to failure of installation or operation.
- Local Administrator rights are required
- ExecutionPolicy must allow running PowerShell scripts

Terminology

Term	Description
Network GUID	An identifier which is unique to each network and will not change.
Node GUID	An identifier which is unique to each node and will not change.
SatelNMS	Satel's network protocol to communicate with modems.
NTF	Network Transport Format - NETCO Design's JSON file format which is used to import/export networks across systems.
MSPE	Monitoring Specification - The definition of thresholds to apply warning / alarm criteria to received values.
Alert	Alerts are announcing abnormal situations and conditions requiring attention. Alerts are divided in two types: alarms and warnings.
Alarm	An alert with is the highest priority: a condition requiring immediate attention

Term	Description
Warning	An alert condition requiring no immediate attention. Warnings are presented for precautionary reasons to highlight changed conditions before they become critical.
Severity	Which alert condition was met: either Critical or Warning.
Status	Current alert status: one of Open/Closed/Shelved/Acknowledged. See Alert status for more information.
Resource	This tells which network and node generated the alert.
Event	This specifies alarm type. For example: 'threshold' or 'deadband'.
Threshold	The limits that received values are compared against to create alerts. These are set in the Node monitoring settings in Design.
Deadband	Node is not responding. Deadband Timeout can be configured in the Network monitoring settings in Design.

Installation and updates

Installing

NETCO NMS installation packages are distributed in .zip file format.

Copy the package to the target machine.

Ensure the target machine adheres to the system requirements

Installation instructions for Linux

**1. Extract archive and open terminal in created folder**

Open the target folder with NETCO NMS package in the file manager:

Right click on the zip file and select ***Extract here***.
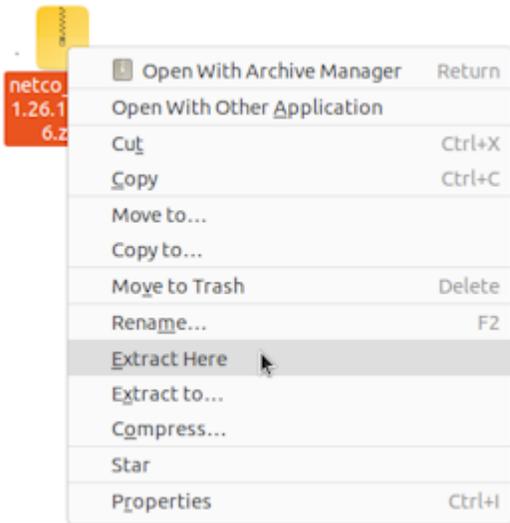
IMPORTANT! If you are installing NETCO NMS into a Linux host, it is very important to extract (unzip) the zip-package inside that Linux host, because otherwise file permission bits are not set correctly and this will cause installation to fail partially or completely.

Next, right click on the created folder and select **_Open in Terminal_**.
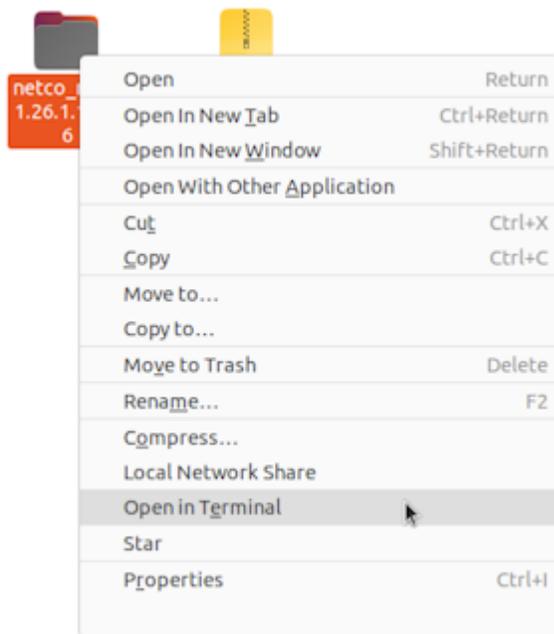
2. Launch installer in the terminal

Issue the following commands:

chmod +x ./environments/compose-for-single-node-linux.sh

sudo ./environments/compose-for-single-node-linux.sh

sudo ./LocalUp.ps1

Installation instructions for Windows

1. Extract archive

Right click on the zip file and select ***Extract All***

Choose the folder where you'd like to extract the NETCO NMS package.

**2. Download and install Docker Desktop for Windows**

Visit the NETCO NMS Release Notes page to find information about the recommended version of Docker Desktop. Please note that the latest version of Docker Desktop might not be tested and thus not recommended by Satel. Follow the installation instructions provided at https://docs.docker.com/desktop/install/windows-install/ and select the WSL2 backend option.

If it is requested, please create docker.com user account.

3. Start Docker Desktop

Type "Docker" in Windows search box, and select Docker Desktop in the search results.

Set "Start Docker Desktop when you log in" to ON state in the General Settings page.
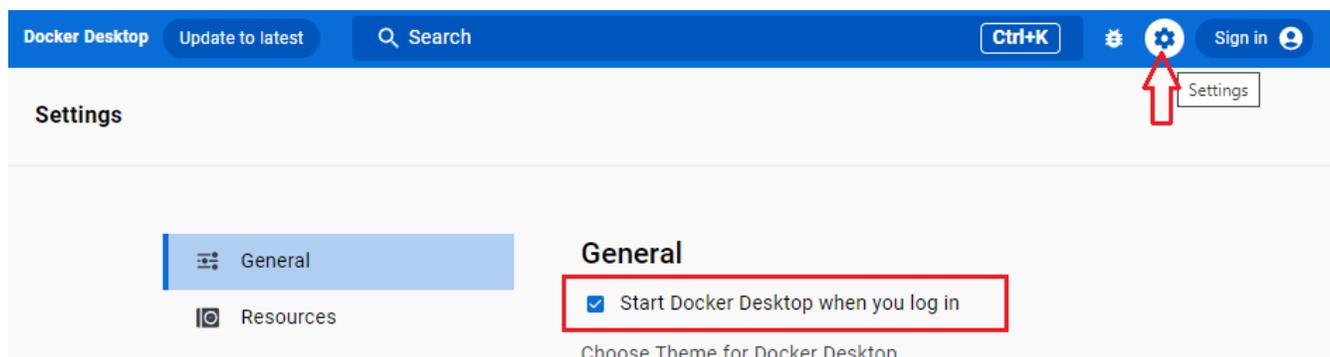
4. Enable Unrestricted Execution Policy

To enable running Powershell scripts, start Powershell with "Run as Administrator" and run the following:

> Set-Executionpolicy Unrestricted

This will prompt:

> Execution Policy Change The execution policy helps protect you from scripts that you do not trust. Changing the execution policy might expose you to the security risks described in the about_Execution_Policies help topic at https:/go.microsoft.com/fwlink/?LinkID=135170. Do you want to change the execution policy? [Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help (default is "N"):

Type **a** and press Enter.

5. Start the NETCO NMS stack

Start Powershell with "Run as Administrator", go to the directory where you extracted the zip with ***cd*** command, and run this:

> .\LocalUp.ps1

(!) If you are asked to trust .ps1 scripts in this directory during the following steps, please choose option R = Run once. You may have to do this 2-3 times during installation.

You will be presented a menu where you can change configuration. See more information about the menu in next chapter.

The installation takes some minutes and after that you are presented with an url to direct your browser to and admin username and password. Please save the password for later logins as it is the only way to login as admin.

Initial configuration

At first LocalUp.ps1 will allow making changes to the initial configuration. The available options are:

Option	OS	Description
1. Allow access to local serial device: none	Linux	For installations where a local serial port on the NETCO NMS machine is used to access the radio network's root node. Common examples may be */dev/ttyS0* or */dev/ttyUSB0*. The ttyS* devices are typically hardware serial ports directly on the computer's motherboard. For USB serial adapters the device name can be obtained by looking at dmesg |tail output immediately after the adapter has been connected.
2. Listen address for NETCO NMS user interface: 0.0.0.0	Win Linux	The default listens to all network interfaces. If NETCO NMS should be restricted to a specific network interface, provide its IP address here.
3. Listen port for NETCO NMS user interface: 2080	Win Linux	Listen Port: By default, the application uses port 2080 in Windows and port 80 in Linux.
4. Retention policy for monitoring data: INF	Win Linux	The time to store monitoring data in the database. The value must be either a number and unit [e.g. '105d'] or 'INF', which will never delete monitoring data. **Note: This can not be changed later.**
5. Internal Docker address space: 10.99.99.0/24	Win Linux	NETCO NMS creates a subnet to communicate across its components locally. This address space is not otherwise visible to NETCO NMS users, however it should not collide with networks within the Intranet.
6. User profile path	Win	NETCO NMS istaller will configure WSL2 to limit memory usage with 4Gb. A file ".wslconfig" will be saved to the user profile folder.

Note: If you are installing NETCO NMS on a Windows machine and wish to establish a serial connection to your devices, it is recommended to utilize port mapping scripts, which can be found in ./win_ports folder. These scripts assist in mapping TCP ports within the Docker container to the serial port on your Windows host machine. More information is in a chapter Serial ports setup

When ***Configure option:*** is prompted, most users can simply press Enter to continue with default settings.

Installation complete

Once installation is completed, the terminal will return to a command prompt. NETCO NMS is now installed and running. It will also be started automatically on reboot.

```
satel@ubuntu-20: ~/Downloads/netco_nms-1.27.5-716456fd.20093267

Status: Downloaded newer image for eu.gcr.io/satel-192308/netco-monitoring-mediator:release-0.0.8.148
58
Creating netco_nms_kapacitor_1        ... done
Creating netco_nms_api_1              ... done
Creating netco_nms_auth_1             ... done
Creating netco_nms_alerta-mailer_1    ... done
Creating netco_nms_alerta_1           ... done
Creating netco_nms_monitoring-webui_1 ... done
Creating netco_nms_mongodb_1          ... done
Creating netco_nms_influxdb_1         ... done
Creating netco_nms_grafana_1          ... done
Creating netco_nms_markdown_1         ... done
Creating netco_nms_trace_1            ... done
Creating netco_nms_telegraf_1         ... done
Creating netco_nms_nginx_1            ... done
Creating netco_nms_controller_1       ... done
Creating netco_nms_ich_1              ... done
Creating netco_nms_cs_1               ... done
Creating netco_nms_ich_ca_1           ... done
Creating netco_nms_ds_1               ... done
Creating netco_nms_webui_1            ... done
Creating netco_nms_ss_1               ... done
Creating netco_nms_nml_1                 ... done
Creating netco_nms_liveview_1            ... done
Creating netco_nms_monitoring-mediator_1 ... done
Waiting for database connection...
Updated retention policies: rp_raw (INF), rp_processed (INF)

Navigate to http://localhost/
Initial admin login with username: 'admin', password: 'Q8ntxv+hPtHd58CqnNYZrU44PXLy3MGahAMFcGsQAQw='.
satel@ubuntu-20:~/Downloads/netco_nms-1.27.5-716456fd.20093267$
```

Follow the instructions in green to log in to NETCO NMS. The displayed password is randomly generated and is unique to each system. **Make sure to store or change the password for later use.**

Updating

Simply extract a newer NETCO NMS package to some folder and run ./LocalUp.ps1.

Note: A new initial admin password will be generated. If you wish to use your previous admin password, please ensure to copy the .env.secret file from the directory where your previous version of NETCO NMS was extracted before running LocalUp.ps1.

Uninstalling

Uninstallation involves the following three step process:

- Shut down the NETCO NMS stack:
- on Ubuntu: open a terminal, enter the extracted NETCO NMS folder and run sudo ./LocalDown.ps1
- on Windows: open PowerShell as Administrator. Enter the extracted NETCO NMS folder and run .\LocalDown.ps1
- Remove unused docker images: docker image prune −a
- Remove unused docker volumes: docker volume prune -- this deletes NETCO NMS data including imported networks and monitoring data

These instructions assume docker was set up specifically for NETCO NMS. If other docker containers are used, make sure to prune NETCO NMS specific containers and volumes only.

Accessing and navigating NETCO NMS

Accessing NETCO NMS

Use a web browser to navigate to the host and port where NETCO NMS was installed. By default the address is http://localhost in Linux and http://localhost:2080 in Windows, but configuration changes during installation may alter the used address and port. Accessing NETCO NMS will initially present the login page.

Logging in

If the password has not been changed after installation, use the initial admin password as displayed in the final phase of the installation instructions.

If the password is lost, see the Lost password section on the Troubleshooting page.
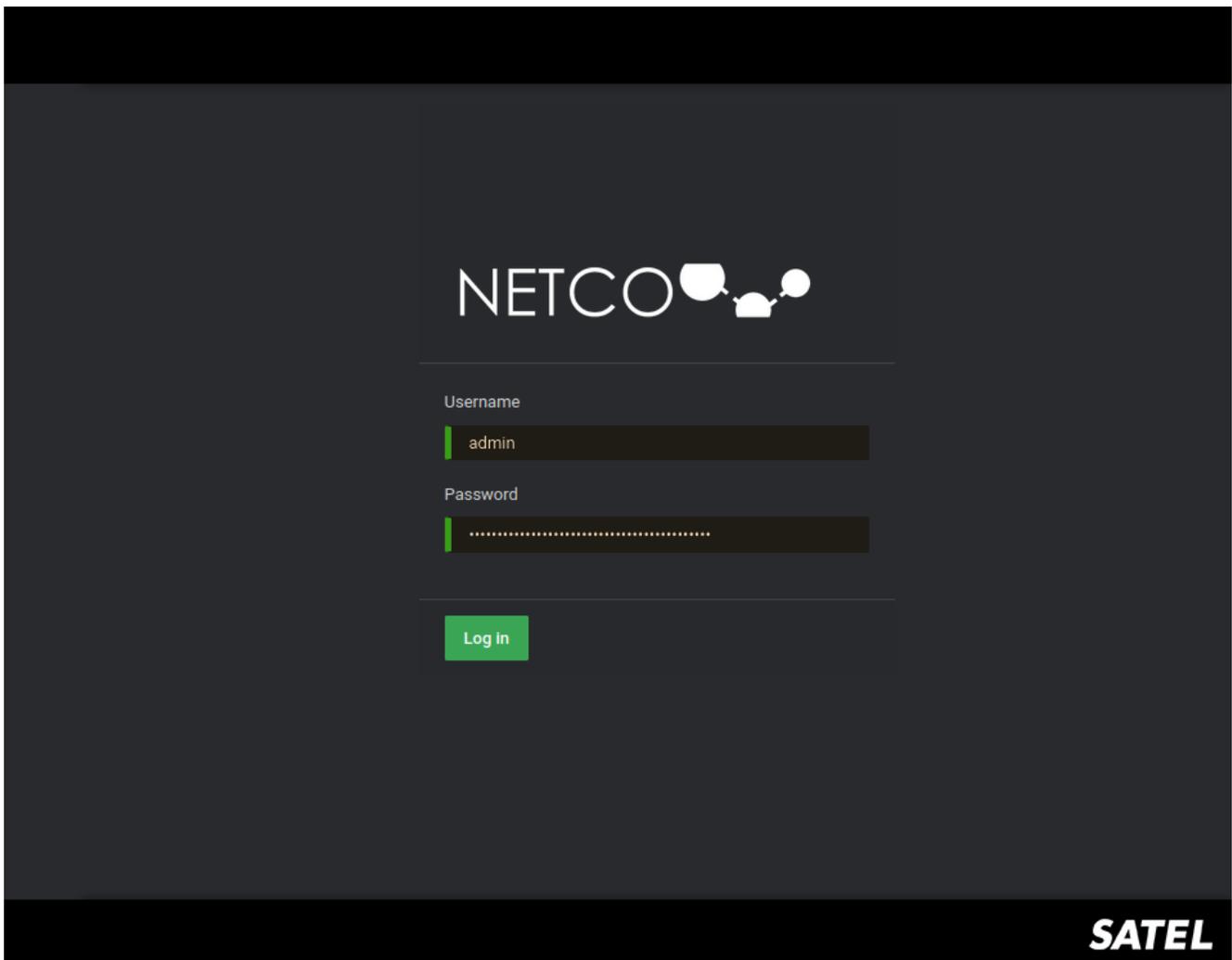
After logging in, the user is directed to the Home dashboard. The login session expires after 24 hours, and the user will be automatically redirected to the login page.
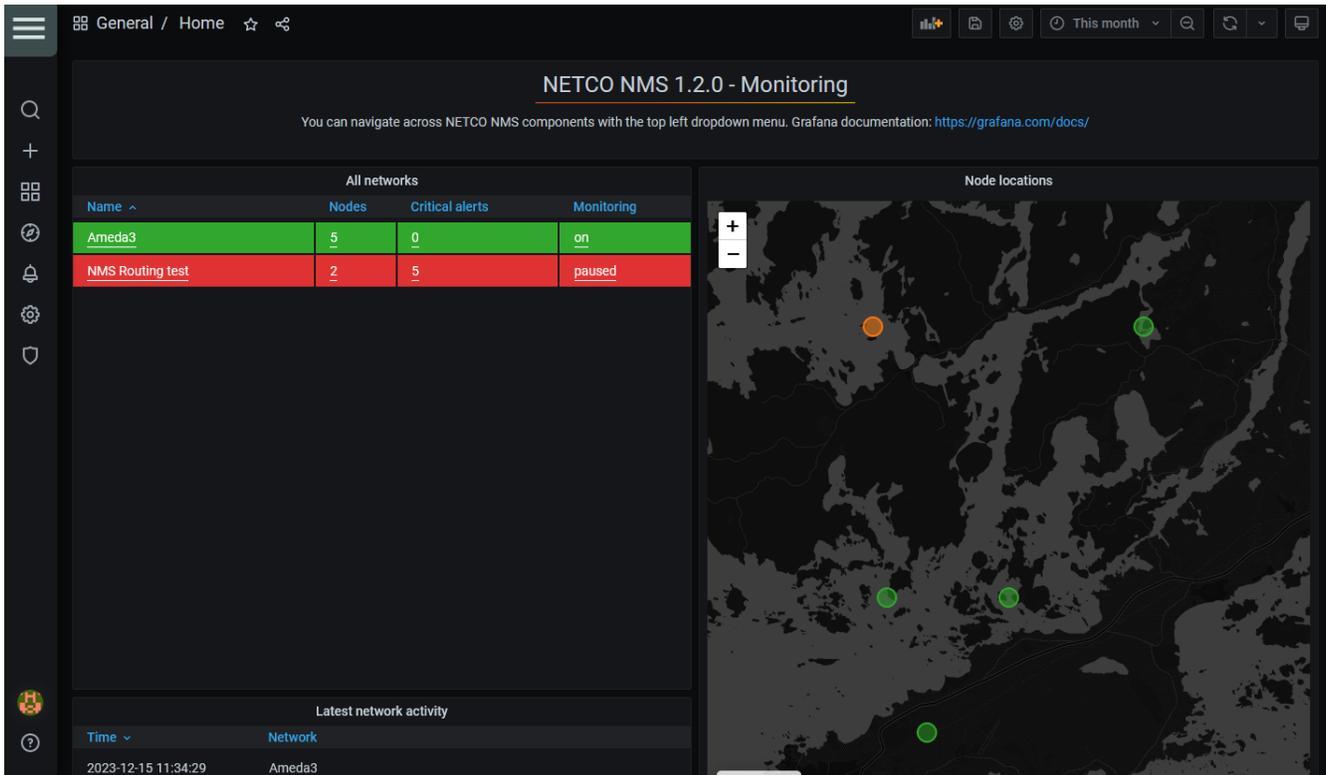
Main menu

The top left corner includes a hamburger menu which exposes the main menu to navigate across NETCO NMS components. As right click on the main menu does not work in NETCO Design, it is recommended to use the middle mouse button to open into a new tab from the main menu.
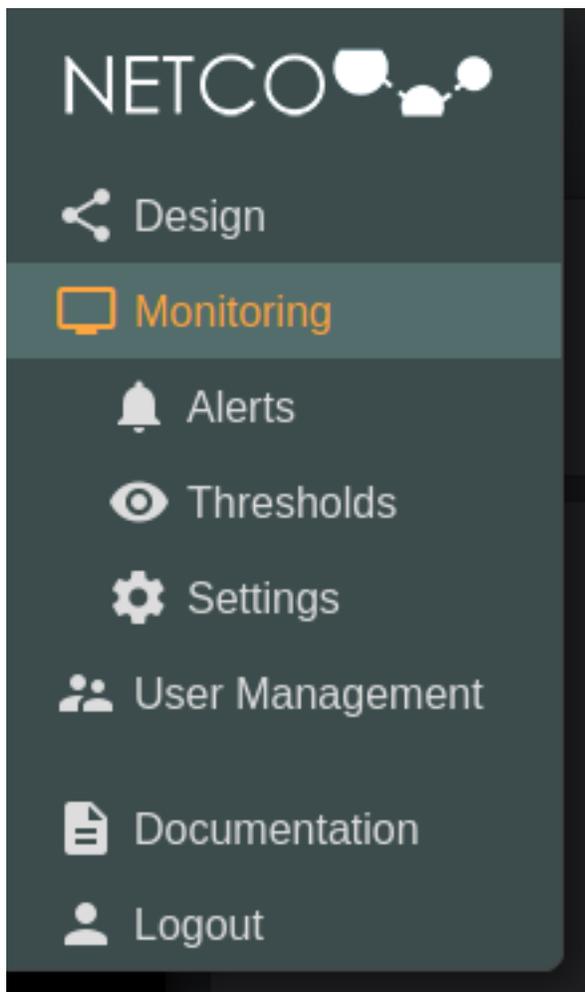
A full listing of all NETCO NMS components and their respective documentation can be found in the Table of contents.

Serial port setup in Windows

1. Helper scripts

Port mapping scripts help you to map TCP ports in Docker container to serial port in your host Windows machine.

An open source tool hub4com.exe is used to redirect serial to TCP/IP and TCP/IP to serial. https://sourceforge.net/projects/com0com/

The scripts are in **win_ports** folder of NETCO NMS package.

1.1 Create port mapping Run a script *create_port.bat* to install serial port mapping as a Windows service. The script starts the mapping, so it will be available even after PC restart.

NOTE! The script must be launched with **Administrator rights**.

Parameters:

- Serial port at Windows machine.

- Serial port baud rate
- TCP port which should be mapped to the serial port

Example:

create_port.bat COM5 115200 8282

IMPORTANT! Avoid using ports associated with well-known services (0-1023) to prevent conflicts.

1.2 Update port mapping If you once installed port mapping, but you want to change its baud rate or TCP port, you should run create_port.bat with new parameters.

1.3 Delete port mapping Use a script *delete_port.bat* to stop port mapping and uninstall the Windows service. It takes the serial port name as parameter. The script must be launched with **Administrator rights**.

Example:

delete_port.bat COM5

1.4 Temporary Stop and Start mapping You can temporary stop port mapping without uninstalling the Windows service, for example, to release the serial port. Use a script *stop_port.bat* for that and a script *start_port.bat* to start the Windows service back. The scripts take the serial port name as parameter and must be launched with **Administrator rights**.

Example:

stop_port.bat COM5

1.5 Get port mapping info Use a script *get_info.bat* to view what serial port mapping is in use, what are the parameters and the service status.

Running *get_info.bat* without parameters will display a mapped ports list.

Running *get_info.bat* with parameter specifying a serial port will display the port mapping details and its service status.

2. Connection from NETCO Design

Once the port mapping is installed you can access your device connected to that serial port with ip address *host.docker.internal* and TCP port which you specified for the mapping.

Example of connection string:

sockettcp:ip=host.docker.internal,port=8282

Monitoring Configuration

Create your network and configure monitoring parameters with SATEL NETCO Design, an intuitive and user-friendly network configuration software for SATEL radio modems, including

SATEL-EASy+ and the legacy SATELLINE-3AS NMS product series. SATEL NETCO Design also supports importing .saxd file format for networks created with the SATEL NMS PC software.

This document outlines the NETCO NMS specific aspects of NETCO Design. For the full NETCO Design usage documentation see the NETCO Design User Guide.
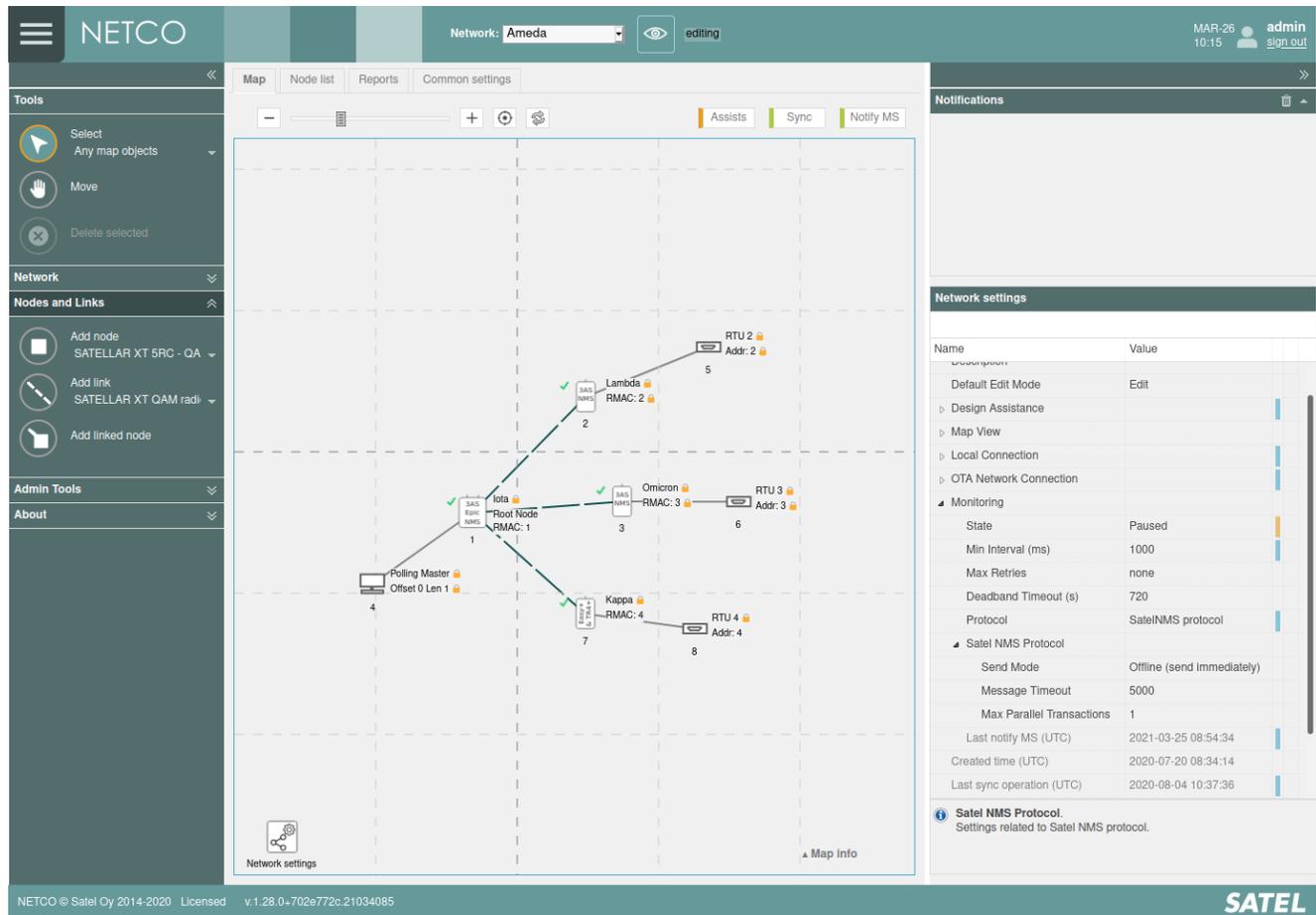
NETCO Design as part of NETCO NMS stack will use a green color theme. This also implies the availability of NETCO NMS specific features that are missing in standalone NETCO Design installations: the Update Monitoring button, the Network monitoring settings and Node monitoring settings.

'Update Monitoring' button'

The "Update Monitoring" button is added to the top of the map view. This sends the settings of the current network to monitoring. **Note: Any changes made to monitoring settings will not be applied until Update Monitoring has been pressed**.
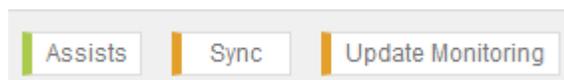
Network monitoring settings

When accessing Network settings from the bottom left corner of the map view, a section for "Monitoring" is found in the property tree editor:

Settings under Network settings / Monitoring:

- **State**: **On** - Monitoring active. **Paused** - Monitoring inactive but network is listed in monitoring. **Off** - Monitoring disabled and network not listed in monitoring.
- **Min Interval (ms)**: Minimum time in milliseconds between monitoring queries.
- **Max Retries**: Maximum number of retries to failed query.
- **Deadband Timeout (s)**: Timeout in seconds, for monitoring stack to create alarm of non-responsive node. 0=deadband monitoring inactive.
- **Protocol**: This specifies by which external format or protocol the network synchronization will happen. Currently the only supported value is Satel NMS Protocol

Settings under Network settings / Monitoring / Satel NMS Protocol:

- **Send mode**: **Offline** - Radio network monitoring requests sent spontaneously. Not recommended for networks with system data, without radio layer collision avoidance. **Online** - Radio network monitoring requests sent only along with system data. Monitoring parameters should be adjusted according to the system data frames. Recommended especially for serial data based network protocols (polling type), system data together with radio network monitoring without radio layer collision avoidance. Remote terminal addresses are used. **Online Anycast** - Online mode, which uses ANYCAST address. In other words, a monitoring request goes to whichever address the next data packet is headed. **Online Hybrid** - This mode utilizes Online Anycast, but if a node doesn't reply within a certain period, it is polled with a specific (non-Anycast) address. The period is calculated based on the Deadband Timeout value. This mode is useful when a network contains dedicated repeaters that cannot be polled with Anycast mode.

  NOTE: Link RSSI cannot be monitored with ANYCAST address. NETCO always uses the terminal address for polling Link RSSI, even if Anycast or Hybrid mode is selected.

- **Message Timeout**: Message timeout in milliseconds.

Monitoring	
State	Paused
Min Interval (ms)	10000
Max Retries	none
Deadband Timeout (s)	120
Protocol	SatelNMS protocol
⊿ Satel NMS Protocol	
Send Mode	Offline (send immediately)
Message Timeout (ms)	5000
Last Monitoring Update (UTC)	2023-12-15 09:11:58

Node monitoring settings

After selecting a node from the map view, the property tree editor displays a "Filter" dropdown to allow viewing monitoring related properties exclusively:
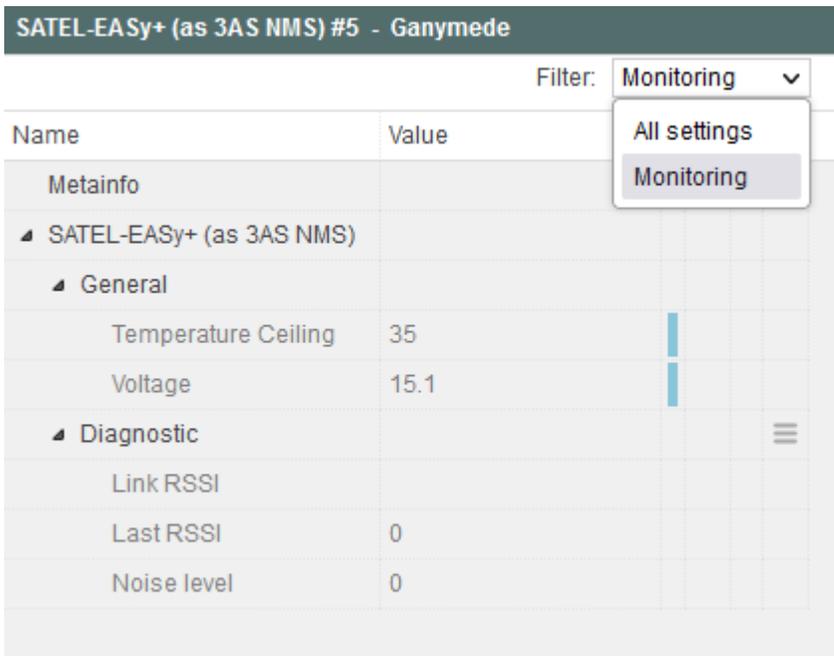
The Setting menu for a single property adds the "Monitoring" section to edit the Monitoring Specification ("MSPE") of the property:
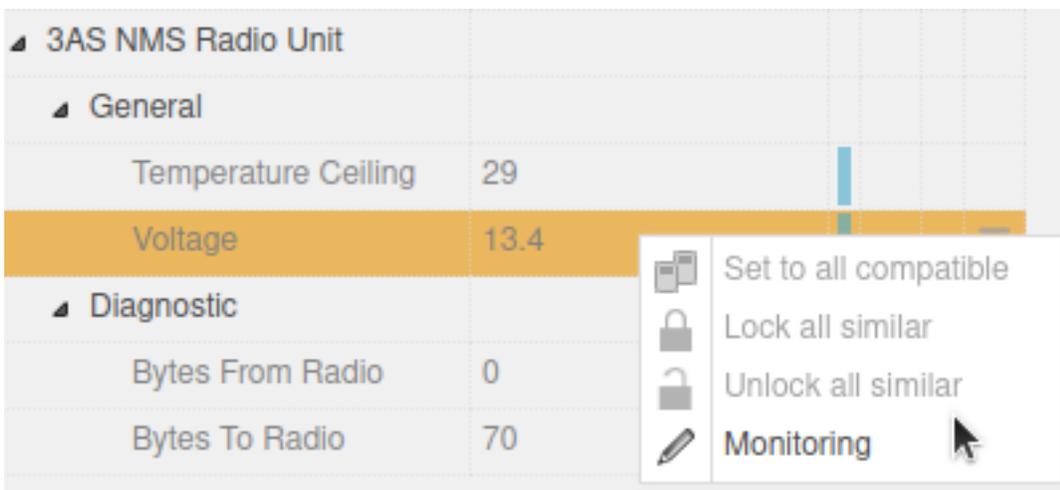
Settings in the MSPE editor:

| Property	Description
Monitoring enabled	Enable monitoring to collect this property from the device.
Monitoring alerts enabled	Compare received values against preset thresholds to create warnings/alarms.
Monitoring alert thresholds	Set alarm/warning limits or alert priority.
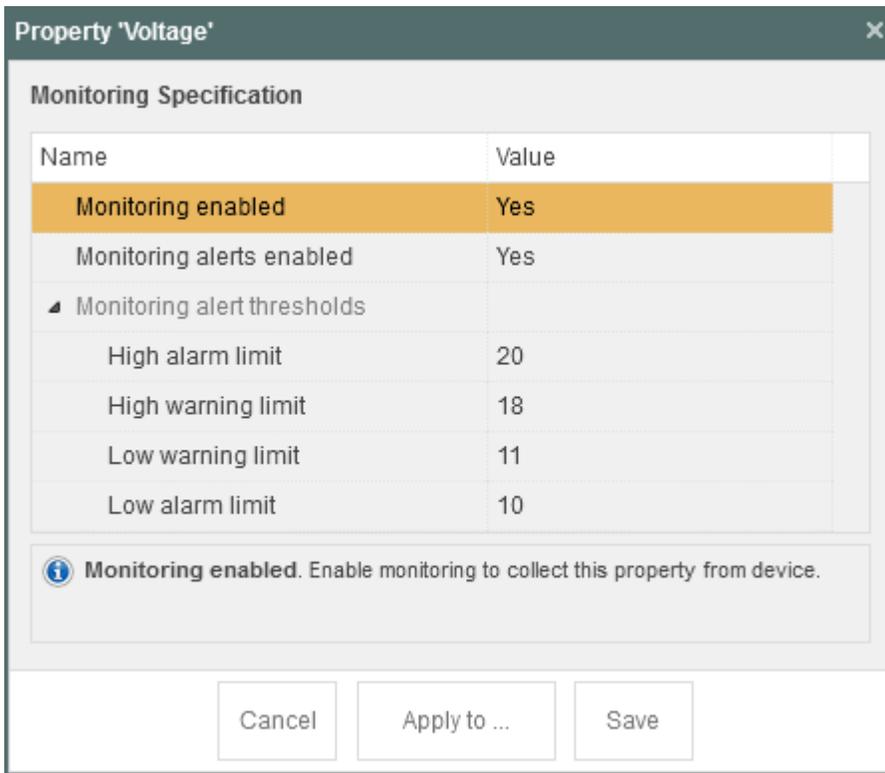
The buttons in the monitoring specification window:

- **Save**: Applies the monitoring parameters for the selected property in the selected network node.
- **Apply to ...**: Opens a dialog where the user can select which other nodes the monitoring specification should be applied to.
- **Cancel**: Discards all changes.

It is also possible to enable or disable monitoring for individual nodes. To do this, open the context menu for the node and select the desired option.
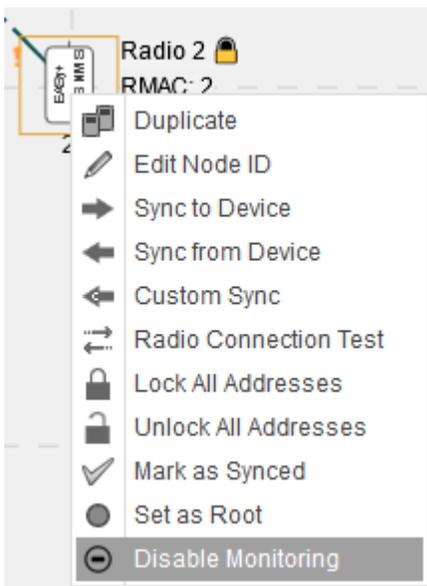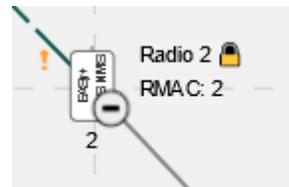
A disabled node will be marked on the map with a special icon:

Monitoring Reports

Monitoring information can be accessed from the Reports tab view.

- **Monitoring List**: Displays the poll list in the order that NETCO NMS will send requests to the devices. For efficiency, NETCO utilizes a single request called 'Combined Diagnostic Values' (CDV), which includes Last RSSI, Noise Level, Voltage, and Temperature measurements. Similarly, the 'Link Data' request retrieves values for Link RSSI and Link SNR (if supported by the device).
- **Monitoring Specification**: Displays the current monitoring specification for all monitorable properties in the network.
- **Monitoring Changes**: Displays monitoring configuration changes made by the user since the last 'Update Monitoring' button press.

Example creating a new SATEL-EASy+ network to test monitoring

- Select "Design" option from NETCO main menu
- Select "Create new" in Network section
- Select the "Serial data, NMS routing / EASy+" template
- Configure desired radio parameters in Common settings tab
- Run Assists
- Select "Network and Monitoring settings" in the bottom left corner of the map view
- Set "Local Connection / Connection string"
- Synchronize settings from NETCO to test devices
- Set "OTA Network Connection / Connection string" to enable OTA communication with the network
- Set "Monitoring / State" to "On"
- Set "Monitoring / Satel NMS Protocol / Send Mode" to the preferred monitoring mode
- Click "Update Monitorong" button to enable monitoring on this network
- The network will now be displayed on the Monitoring page, accessible from the main menu.

Monitoring

The **Monitoring** section is built on the open source monitoring framework Grafana, which is structured around **dashboards** and **panels**. Panels display individual metrics (such as a voltage graph) and the dashboard is a collection of panels arranged in a grid.

A list of existing dashboards is available in the top left corner of the page, next to the main menu.

Dashboards included with NETCO NMS are:

- Home dashboard
- Network monitoring dashboard

- [Data export dashboard](#)
- [System dashboard](#)

The option to create [custom dashboards](#) is also available.

Home dashboard

Selecting **Monitoring** from the main menu brings the user to the Home dashboard, which is also the default page loaded after logging in.
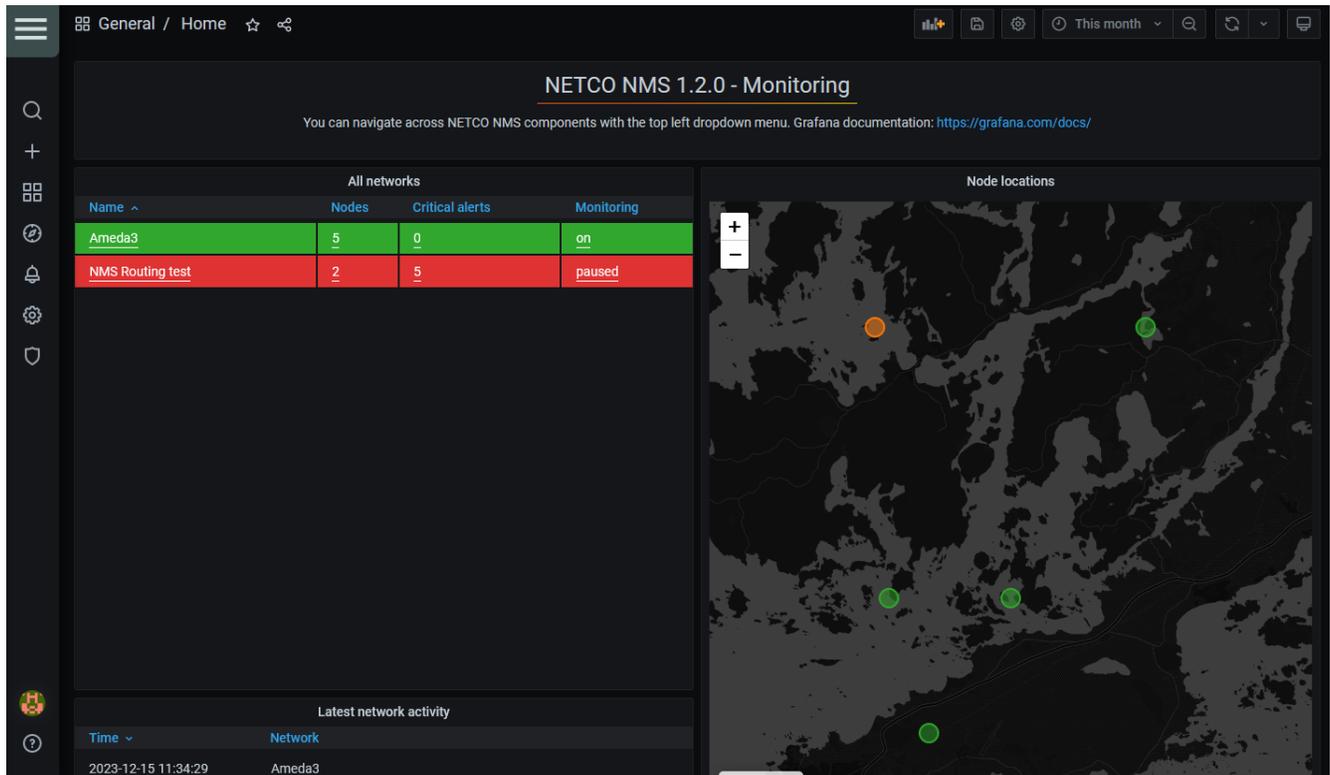
Networks list

The Home dashboard lists all networks that have **"Monitoring state"** set to either **"on"** or **"paused"**. To remove a network from this list, change the network's **Monitoring / State** to **"off"** under [Network settings in NETCO Design](#).

The network listing also features quick navigation:

- Network name links the [network monitoring dashboard](#)
- The node count opens the network in NETCO Design
- Critical alert count links to alerts view
- Monitoring state also opens the network in NETCO Design

Red highlighting indicates that the network currently has open alerts. On the other hand, green highlighting signals that the network either has no alerts or that all alerts have been acknowledged or closed.

Node locations map view

The Node Locations view provides quick insights into the status and health of individual devices. Each device is represented as a colored circle, showing its monitoring status. Green means "no alarms," yellow signals a "warning," and red indicates a "critical error." Hover over a circle with your mouse to view detailed information about the node, including its last monitored values.

Geolocation coordinates should be specified in NETCO DESIGN. Select a node, then find the Geolocation setting in the nodes' properties tree view, in the Metainfo section. Enter the node location in the format "Latitude Longitude" (example: 60.402785 23.073595). Remember that Northern latitudes are positive (0..+90 degrees), and Southern latitudes are negative (0. . . .-90 degrees). Similarly, Western (clockwise) longitudes are negative, and Eastern (counter-clockwise) longitudes are positive.

Nodes are shown on the map exclusively for networks under monitoring, where the Monitoring state is 'on'.

You can zoom the map in and out and view node details by hovering the mouse over a node. While browsing the map, it's recommended to set the Grafana dashboard update interval to 'Off.' Remember to set it back to '5s' afterward; otherwise, the view won't be automatically updated.

For demonstration purposes, NETCO automatically sets default coordinates for your network if it's the only network in the system and if no geolocation is assigned to its nodes. If you set coordinates for one node in your network, NETCO will automatically create random coordinates for other nodes around the specified location. Note that this feature works when there is only one network in the system.

Network monitoring dashboard

The Network monitoring dashboard is the default view for monitoring network performance. This dashboard is automatically generated and subject to change with NETCO NMS updates, therefore it can not be modified. A customizable copy of the original can be made, more on that in the Custom dashboards paragraph.

The main navigation aides in the dashboard are:

- Network and Node selection in top left corner
- Time range selection in top right toolbar
- Update interval selection in top right toolbar

Live Monitoring Map View

The Live Monitoring Map View panel presents the network topology. Monitoring values are displayed alongside the respective nodes, and for links, Link RSSI and Link SNR (if available) are shown at the top of the link. User can select what values are shown by using dedicated checkboxes.

Value colors meaning:

- Green: A valid value within the threshold range
- Orange: A value outside the warning threshold range
- Red: A value outside out of the error threshold range
- Gray: An old value, received earlier the Deadband timeout

Events log

Check the Events Log panel for the newest network logs. It helps spot issues and makes fixing problems easier. The log panel shows up to 500 lines. To get logs from the last ten days, use the

script LocalGetEventsLog.ps1. LocalGetEventsLog.ps1 generates a zip-file containing logs for each monitored network in the system in .csv format.

In the logs, you can find the node name, monitoring method (UNICAST or ANYCAST), setting name and its value. For efficiency, NETCO utilizes a single request called 'Combined Diagnostic Values' (CDV), which includes Last RSSI, Noise Level, Voltage, and Temperature measurements. Similarly, the 'Link Data' request retrieves values for Link RSSI and Link SNR (if supported by the device).

Data export dashboard

The Data export dashboard allows pulling raw monitoring data in CSV format. To create the CSV file, click the panel name and select "Inspect" -> "Data" -> "Download CSV".


System monitoring dashboard

The NETCO NMS server's system performance can be viewed from the System monitoring dashboard.
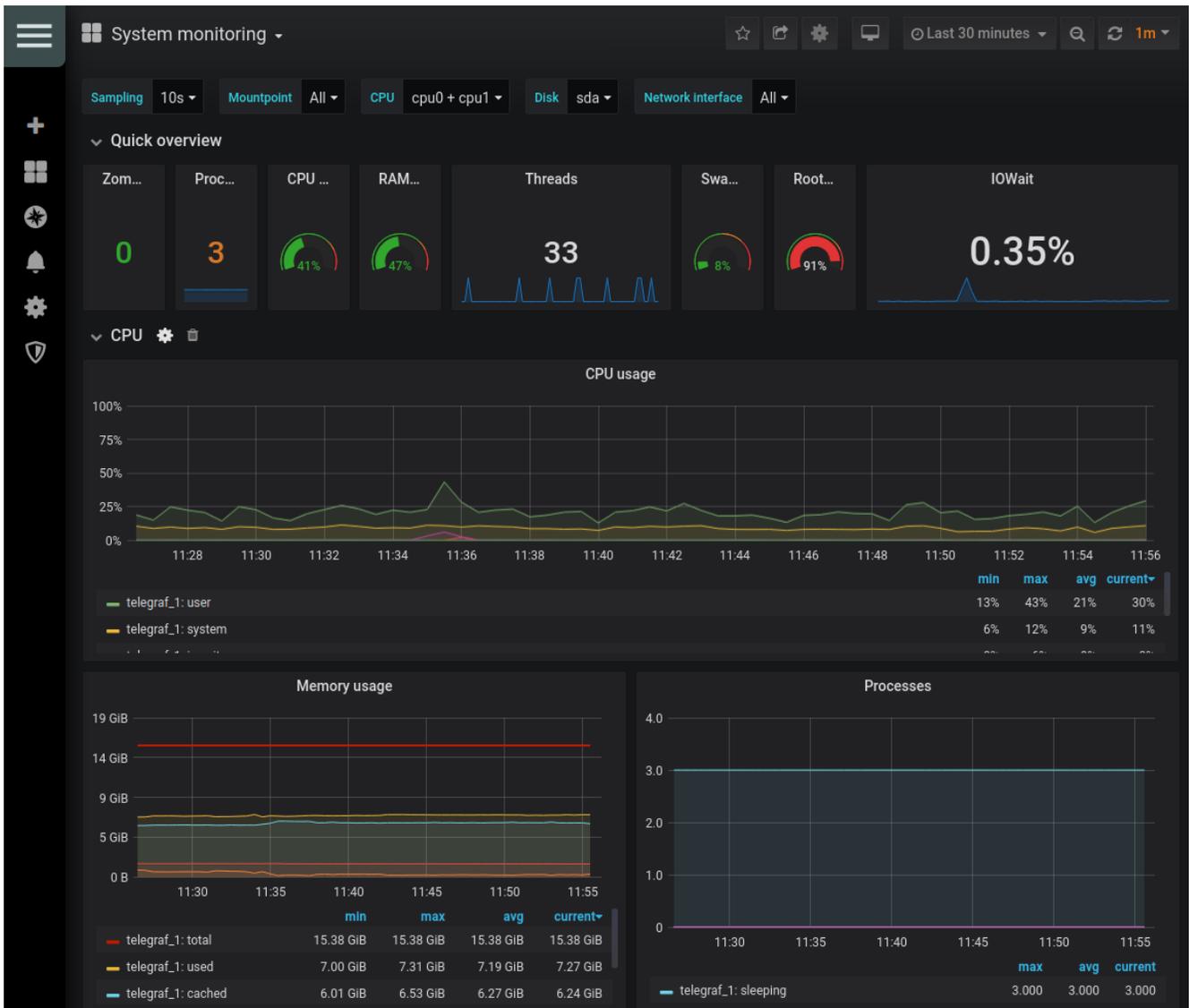
Custom dashboards

All of the builtin dashboards mentioned above are automatically generated and are not editable.

To make a editable copy of an existing dashboard, open the dashboard to copy, enter dashboard settings in the top right toolbar and select "Save As...".
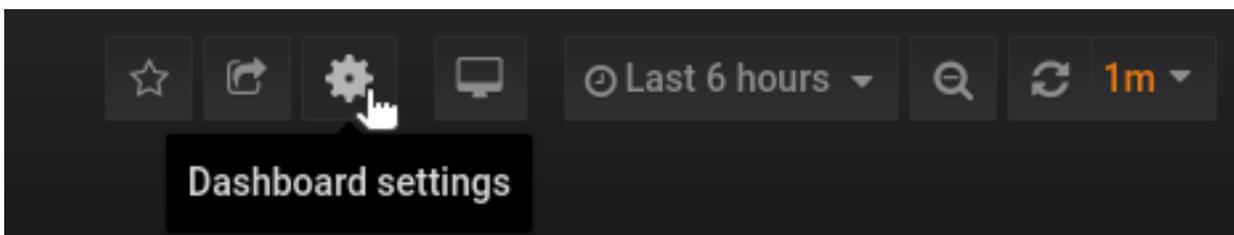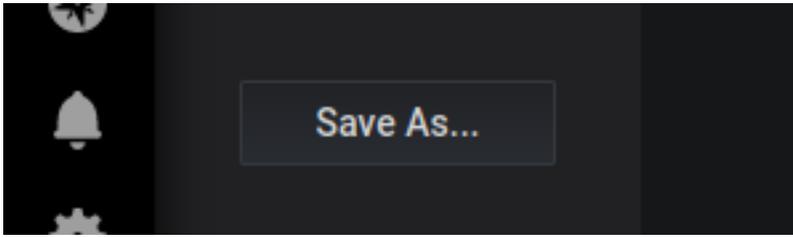
Within editable dashboards the bottom right corner of each panel has a grab handle that allows resizing. Panels may also be deleted and rearranged. The panel's top bar has a drop down menu that allows editing layout settings and the data queries to visualize.
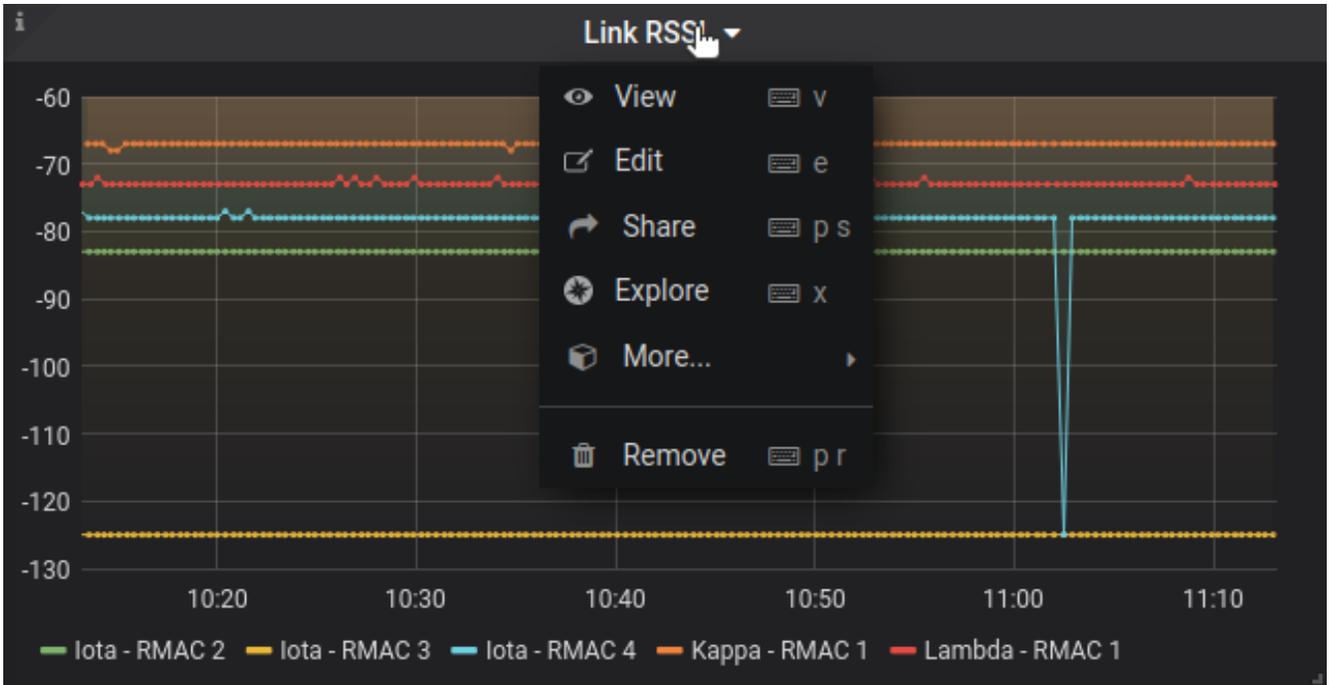
Full documentation on dashboard customization is available at the Grafana documentation page.

Alerts

Alert handling is based on the industry standard Alerta framework.

Alerts page

The Alerts page displays a listing of all the alerts:

Status	Last Receive ∨ Time	Dupl.	Environment	Service	Resource	Event	Value	Text
Closed	Wed 24 March 12:01	0	Production	Kapacitor: monitoring	NetworkGuid: 8988caa0-3261-11e8-816c-010c05050709, NodeGuid: a1b4fe50-3261-11e8-816c-02040407080e, Network: Jupiter SatelNMS test, Node: Ganymede	deadman		8988caa0-3261-11e8-816c-010c05050709/a1b4fe50-3261-11e8-816c-02040407080e is alive: 100.000 points/1m0s.
Open	Wed 24 March 11:59	0	Production	Kapacitor: monitoring	NetworkGuid: 8988caa0-3261-11e8-816c-010c05050709, NodeGuid: a1b377b0-3261-11e8-816c-020409000503, Network: Jupiter SatelNMS test, Node: Io	deadman		8988caa0-3261-11e8-816c-010c05050709/a1b377b0-3261-11e8-816c-020409000503 is dead: 0.000 points/1m0s.
Closed	Wed 24 March 11:58	0	Production	Kapacitor: monitoring	NetworkGuid: 8988caa0-3261-11e8-816c-010c05050709, NodeGuid: a1b413f0-3261-11e8-816c-02070a080405, Network: Jupiter SatelNMS test, Node: Europa	deadman		8988caa0-3261-11e8-816c-010c05050709/a1b413f0-3261-11e8-816c-02070a080405 is alive: 100.000 points/1m0s.
Closed	Wed 24 March 11:56	0	Production	Kapacitor: monitoring	NetworkGuid: 8988caa0-3261-11e8-816c-010c05050709, NodeGuid: a1b48920-3261-11e8-816c-02040f070f08, Network: Jupiter SatelNMS test, Node: Callisto	deadman		8988caa0-3261-11e8-816c-010c05050709/a1b48920-3261-11e8-816c-02040f070f08 is dead: 0.000 points/1m0s.
Open	Wed 24 March 10:36	0	Production	Kapacitor: monitoring	NetworkGuid: 25cbb5a0-9196-11e9-8092-01080b040d0e, NodeGuid: 3cf71b20-9196-11e9-8092-02020e000607, Network: Ameda, Node: Omicron	deadman		25cbb5a0-9196-11e9-8092-01080b040d0e/3cf71b20-9196-11e9-8092-02020e000607 is dead: 0.000 points/12m0s.
Open	Wed 24 March 10:19	0	Production	Kapacitor: monitoring	Network: Ameda, Node: Lambda	threshold: voltage	11	Warning from expression: "voltage" < 11.8 OR "voltage" > 20

Colors help provide a quick overview of the alerts:

- Alarms are displayed in red
- Warnings are displayed in blue
- Once the alarm/warning condition is no longer met, the row turns green

Clicking on a row in the listing will display additional information about the alert:

Alert ID	2150f45c-7c02-4c1e-9a0c-200ebb9db868	
Last Receive Alert ID	2150f45c-7c02-4c1e-9a0c-200ebb9db868	
Create Time	24/3/2021 10:19:26.885 AM (2 hours ago)	
Receive Time	24/3/2021 10:19:26.890 AM (2 hours ago)	
Last Receive Time	24/3/2021 10:19:26.890 AM (2 hours ago)	
Service	Kapacitor: monitoring	
Environment	Production	
Resource	Network: Ameda, Node: Lambda	
Event	threshold: voltage	
Correlate		
Group	25cbb5a0-9196-11e9-8092-01080b040d0e/3bd07570-9196-11e9-8092-020f09010207:voltage_v_mspe	
Severity	→ Indeterminate Warning	
Status	Open	
Value	11	
Text	Warning from expression: "voltage" < 11.8 OR "voltage" > 20	
Trend Indication	More Severe	
Timeout	86400	
Type	Exception Alert	
Duplicate Count	0	
Repeat	False	
Origin	Kapacitor	
Tags	network=Ameda, network_guid=25cbb5a0-9196-11e9-8092-01080b040d0e, node=Lambda, node_guid=3bd07570-9196-11e9-8092-020f09010207, retention_policy=rp_raw, host=mediator0	
IP	10.99.99.100	

■ Raw Data ■ JSON-format

Alert ID	Update Time	Change	Type	Event	Value	Text
2150f45c-7c02-4c1e-9a0c-200ebb9db868	24/3/2021 10:19:26.885 AM	Open	New	threshold: voltage	11	new alert

The buttons on the top of the alert information view allow changing the alert status.

Alert status

An alert status may be any of the following:

- Open - This is the default status a newly generated alert will receive. It implies the alert is still relevant as it has not been responded to.
- Shelve - This allows disregarding an alert temporarily, for example due to a maintenance window.

- Ack - The alert is acknowledged. Each organization decides how to use the status internally, but commonly Ack is set when a request has been generated for someone to investigate the issue.
- Close - The alert is no longer relevant.

Changing the alert status does not affect the color of the entry in the alert listing.

Configure alert conditions

Network specific settings are under Network monitoring settings in Design. Node specific settings are configured under Node monitoring settings in Design.

Alert emails

When alert e-mail settings are properly configured, notification emails can be sent for new events. E-Mail settings are configured on the Settings page.

Thresholds

The **Thresholds** section allows viewing all active alert conditions that received monitoring values are compared against. These values can be modified using the MSPE editor in Design.

The top bar allows filtering results:

1. the dropdown list on the right allows limiting results to specific networks, supports multiple selection
2. the Filter text field allows adding raw text filter criteria; regular expressions are not supported.
3. the copy button on the left copies a URL to the clipboard with currently active filters in place, allowing returning to the same view directly

Settings

When alert e-mail settings are properly configured, notification emails can be sent for new events. The relevant settings are:

- Outgoing email SMTP server
- Outgoing email SMTP server password
- Alert notification email addresses (comma separated)
- Email from address for outgoing email, currently this is also the SMTP username
- Public url where email receiver should go after alert email - defaults to http://localhost/monitoring/alerts

For alert e-mails to be generated, the following conditions must be met:

1. A new alert is generated -- if the alert was already visible in the alerts listing, an e-mail will not be sent. This avoids repeated e-mails for existing events.
2. The alert must have severity level set to *Critical*

Example configuration using GMail

In this example configuration, a gmail account is created specifically for email alerts. ***It is important to not use your personal or any other critical mail account for this the since the password is stored in plain text on the NETCO NMS server.*** Once the gmail account has been made, create an app password on https://myaccount.google.com/apppasswords, then use it with the Google SMTP server:

Field	Value
Outgoing email SMTP server	smtp.gmail.com
Outgoing email SMTP server password	Password from https://myaccount.google.com/apppasswords
Alert notification email addresses	primary@yourcompany.com, secondary@yourcompany.com
Email from address for outgoing email	your_dummy_gmail@gmail.com
Public url where email receiver should go after alert email	Public url for email alerts dashboard.

Now after a new critical alarm is triggered, addresses on the notification list should receive e-mails about the alarm.

User management

All actions related to user accounts should be performed on the NETCO User Manager page, accessible through the NETCO menu. Please refrain from using Grafana's Server Admin page.

The main view under User management displays all accounts within the system. This view can be used to create, edit or delete accounts:

NOTE: When creating a new user, no roles or password are initially set. The administrator should select the 'Details' button to assign an initial password and set roles for the user.
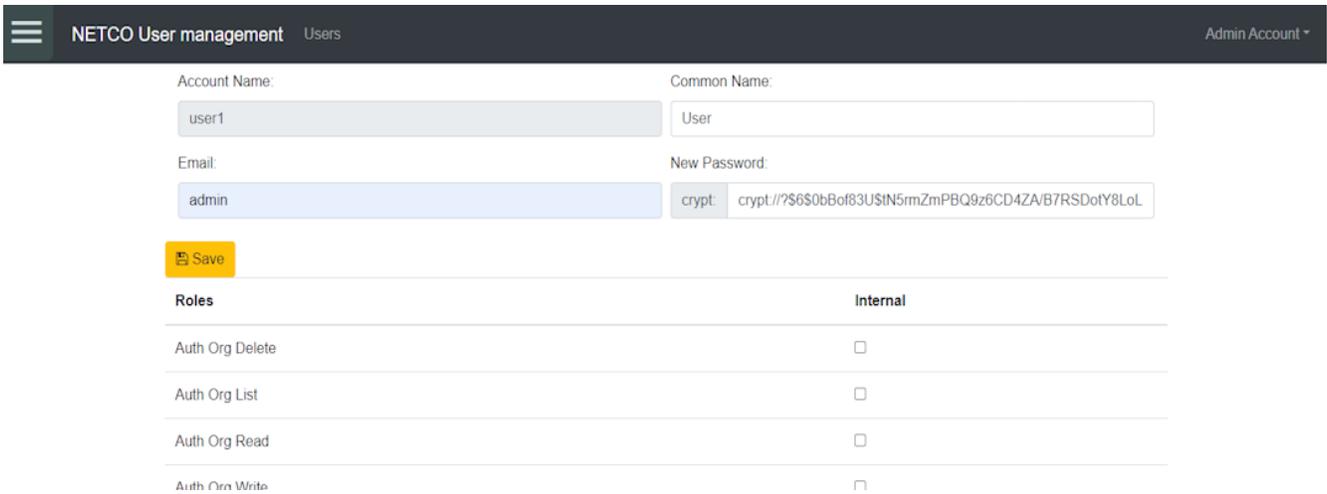
User Roles

- **Grafana roles:** To allow a user to access a monitoring page, you must select one of the Grafana roles.

- **Design roles:** To allow a user to open and use the Design page, you must select one of the Design roles.

- **Auth roles:** Auth roles allow the user to view and edit the User list and user settings.

Changing your own password

The top right corner of the page includes a drop down menu with the option "Change password":
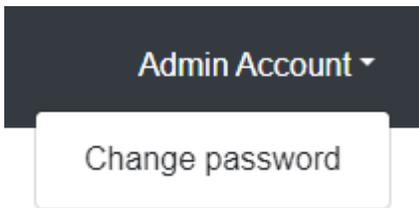
This will prompt for the password twice to avoid locking oneself out in the event of a typing error:

Once the new password has been entered in both fields, hit **Save**.

Changing the password on a different account

Open Details on the account to set the password for. Click on the password field under the "New Password" headline.

Enter the new password, click **Crypt**, and finally click **Save**.

Troubleshooting

Running into issues

If there are issues with the way pages are rendered, a hard refresh is recommended with Ctrl+F5.

If the system is not responsive or appears to have stalled, a stack restart may help:

- Run in the extracted NETCO NMS folder:
  - In Ubuntu: sudo ./LocalDown.ps1
  - In Windows: .\LocalDown.ps1 (Terminal must be run as Administrator)
- To the question Are you sure you want to stop and clear Satel stack? answer **y** and press enter
- To the question Do you want to preserve system configurations? answer **y** and press enter
- Now restart the stack with
  - In Ubuntu: sudo ./LocalUp.ps1
  - In Windows: .\LocalUp.ps1 (Terminal must be run as Administrator)

Lost password

If the admin password has not been changed after installation, it can still be recovered:

- Open the extracted NETCO NMS folder in the file manager
- Ubuntu users: enable "Show Hidden Files" from the top right hamburger menu in the file manager window. Windows users can skip this step.
- Double click ".env.secrets" to open the file in a text editor
- The password is displayed on the line INITIAL_ADMIN_PASSWORD=...

If admin password has been changed, it can be reset by restarting the stack:

- Run in the extracted NETCO NMS folder:
  - In Ubuntu: sudo ./LocalDown.ps1
  - In Windows: .\LocalDown.ps1 (Terminal must be run as Administrator)
- To the question Are you sure you want to stop and clear Satel stack? answer **y** and press enter
- To the question Do you want to preserve system configurations? answer **n** and press enter to reset the admin password
- Now restart the stack:
  - In Ubuntu: sudo ./LocalUp.ps1
  - In Windows: .\LocalUp.ps1 (Terminal must be run as Administrator)
- A new admin password will be generated and displayed similarly to during installation.

Error reporting

Included with the installation is LocalNETCODiagnostics.ps1 script which can be used to collect logs for diagnosing problems. Run in the extracted NETCO NMS folder:

- In Ubuntu: sudo ./LocalNETCODiagnostics.ps1
- In Windows: .\LocalNETCODiagnostics.ps1 (Terminal must be run as Administrator)

The script collects logs for last 10 days. Pass a number of days as a parameter of the script, if you want to change the logs period.

Once the diagnostic ZIP-file has been generated, please send it to SATEL Technical support along with a description and preferably screenshots of the problem.