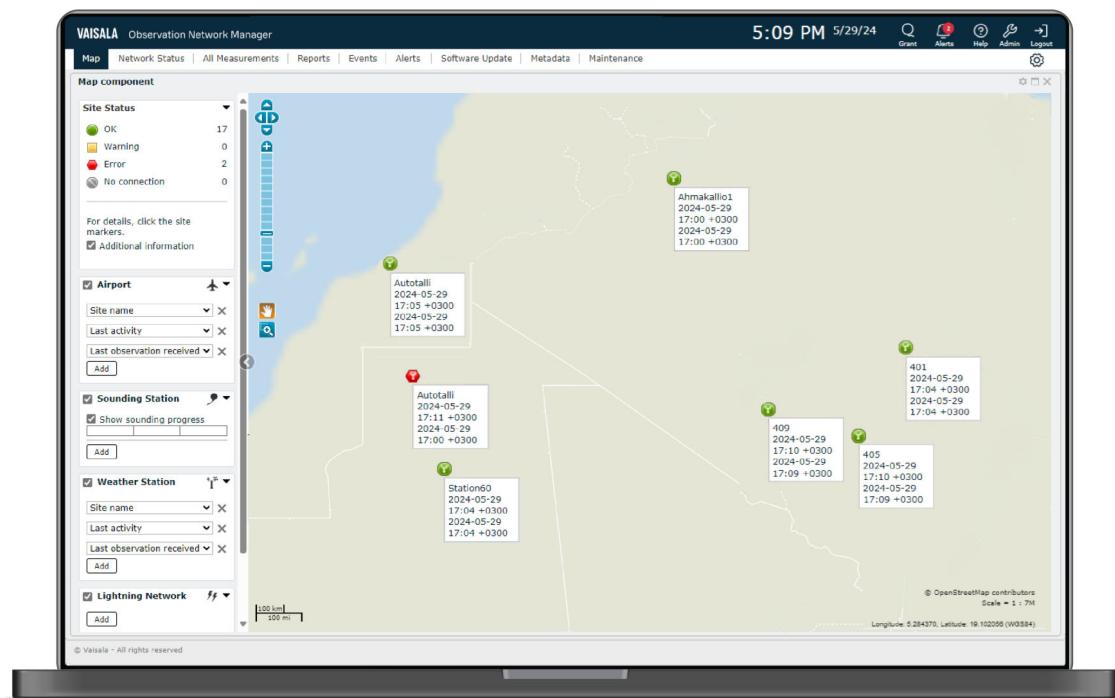


Installation and Configuration Guide

Vaisala Observation Network Manager
NM10



VAISALA

PUBLISHED BY

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1. About this document

1.1 Version information

This manual provides instructions for installing and configuring Vaisala Observation Network Manager NM10. It also provides information on the basic system architecture and the general operating principles.

Depending on your system details, the available specifications and options may differ from the ones described here. For details on your system, refer to the delivery and tender documentation, including system proposal.

Table 1 Document versions (English)

Document code	Date	Description
M212997EN-F	August 2024	Applicable for software version 4.8.1. Instructions added for updating the map server IP address when map is not visible after multiserver installation. See Troubleshooting (page 180) .
M212997EN-E	June 2024	Applicable for software version 4.8. Images updated with new brand colors.
M212997EN-D	May 2024	Applicable for software version 4.7.1. Instructions for updating from 3.9 version added, multiserver installation details improved.

1.2 Related manuals



Some of these documents can be found in our product documentation portal at docs.vaisala.com.

Table 2 Related manuals

Document code	Name
M213021EN	<i>Vaisala Observation Network Manager NM10 User Guide</i>
-	<i>Vaisala Observation Network Manager NM10 online help</i>
M213082EN	<i>NM10 Migration Guide</i>
M211938EN	<i>Vaisala Automatic Weather Station AWS310 System Description</i>
M211939EN	<i>Vaisala Automatic Weather Station AWS310 Configuration and Maintenance Manual</i>
M211948EN	<i>Vaisala Automatic Weather Station AWS310 Installation Manual</i>
M212925EN	<i>IRIS and RDA Utilities Guide</i>
M212419EN	<i>Vaisala Automatic Weather Station AWS810 Configuration and Maintenance Guide</i>

1.3 Documentation conventions



WARNING! Warning alerts you to a serious hazard. If you do not read and follow instructions carefully at this point, there is a risk of injury or even death.



CAUTION! Caution warns you of a potential hazard. If you do not read and follow instructions carefully at this point, the product could be damaged or important data could be lost.



Highlights important information on using the product.



Gives information for using the product more efficiently.



Lists tools needed to perform the task.



Indicates that you need to take some notes during the task.

1.4 Trademarks

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2. Product overview

NM10 is a stand-alone system installed in customer premises and configured individually for each customer, either by Vaisala or the customer.

The number and types of the components depend on the installation and purchased licenses.

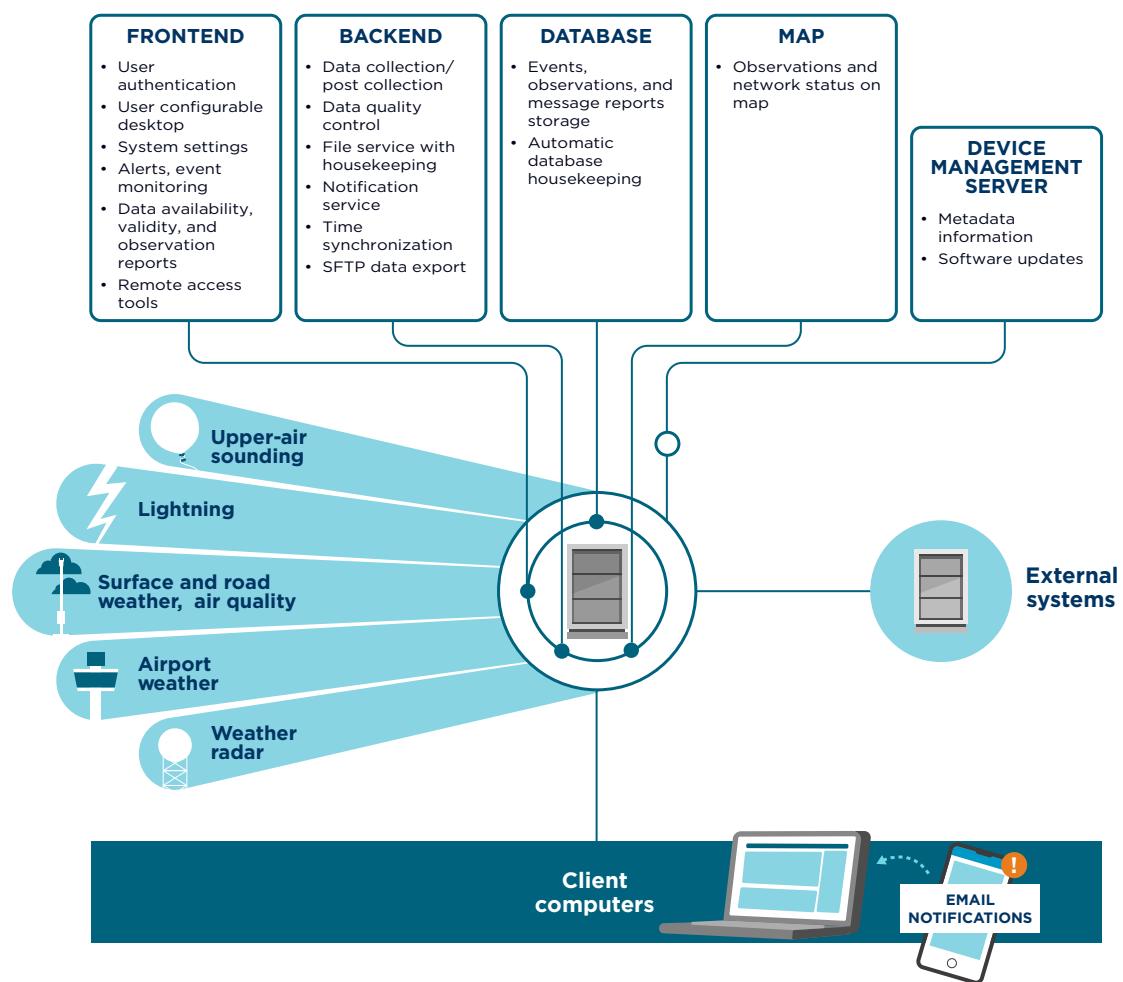


Figure 1 Vaisala Observation Network Manager main components

2.1 System components

The main components of the system consist of the observation sites and the software needed for getting the observations and other data from the observation sites. Depending on the system delivery type and system requirements, the number of components and the software installed varies. The following sections briefly introduce the available components for typical observation systems.



The features are available depending on the activated software feature licenses.

2.1.1 Application servers

Typically, there are one to four servers installed in the customer premises. The number of servers and the exact system requirements depend on the number and type of the observation sites connected, amount of data collected, data acquisition interval(s), data storage time, the maximum number of concurrent web clients connected, and features selected by the customer.

Table 3 Minimum system requirements for single-site systems

Item	Specification
Processor	4-core CPU or higher
RAM	16 GB
Hard disk space	500 GB
Operating system	One of the following: <ul style="list-style-type: none">• Microsoft Windows Server 2019 or newer• Enterprise Linux 8

Table 4 Minimum system requirements for single-server systems

Item	Specification
Processor	6-core CPU or higher
RAM	32 GB
Hard disk space	1TB
Operating system	One of the following: <ul style="list-style-type: none">• Microsoft Windows Server 2019 or newer• Enterprise Linux 8

Table 5 Minimum system requirements for multi-server systems

Item	Specification
Processor	6-core CPU or higher
RAM	32 GB
Hard disk space	1TB
Operating system	One of the following: <ul style="list-style-type: none">• Microsoft Windows Server 2019 or newer• Enterprise Linux 8

2.1.2 Web client computers

The web client computers for using the web user interface are connected to the system through HTTPS connection. The minimum resolution for the client computer display is 1366 x 768.

2.1.3 Weather observation sites

NM10 can be connected to monitor and manage surface weather observation sites and sensors, airport weather observation sites, web camera sites, manual and automatic sounding systems, weather radar, lightning, and rain corrections sites. lot sensors can be connected via SensorThings API.

The number and type of sites and sensors connected depend on the configuration of the system.

More information

- [Adding and editing sites \(page 70\)](#)

2.1.4 FTP server

FileZilla FTP server is installed with NM10 (in Windows operating systems) for file transfer between the sites and NM10. FTP can also be used for data export to external systems.

2.1.5 SFTP server

Bitvise SFTP server can be installed with NM10 (in Windows operating systems) for file transfer between the sites and NM10. SFTP can also be used for data export to external systems.

2.2 Device management using LwM2M

LwM2M (Light Weight Machine to Machine) protocol can be used for surface weather station connectivity and device management, including for example receiving metadata, updating the software, and restarting the device.

The LwM2M server can be installed separately and site connections between NM10 and LwM2M server must be configured.

2.3 Remote desktop server

Thinfinity Workspace can be used for remote desktop connection with airport and sounding sites. Thinfinity Workspace requires separate installation and configuration.

3. Network connections and firewall settings

3.1 Network connections

- The monitored sites, for example, AviMet, MOG, AUTOSONDE, MW41, Weather radar, TLP, and Ceilometer sites must know NM10 IP address.
- NM10 must know the IP address or DNS name of the weather stations or WXT that it polls.
- For remote desktop connection (RDP), the user workstations must have network connection to the AviMet servers.
- For remote desktop connection (RDP) and AUTOSONDE / MW41 web user interface, the user workstations must have network connection to the AUTOSONDE and MW41 sounding servers.

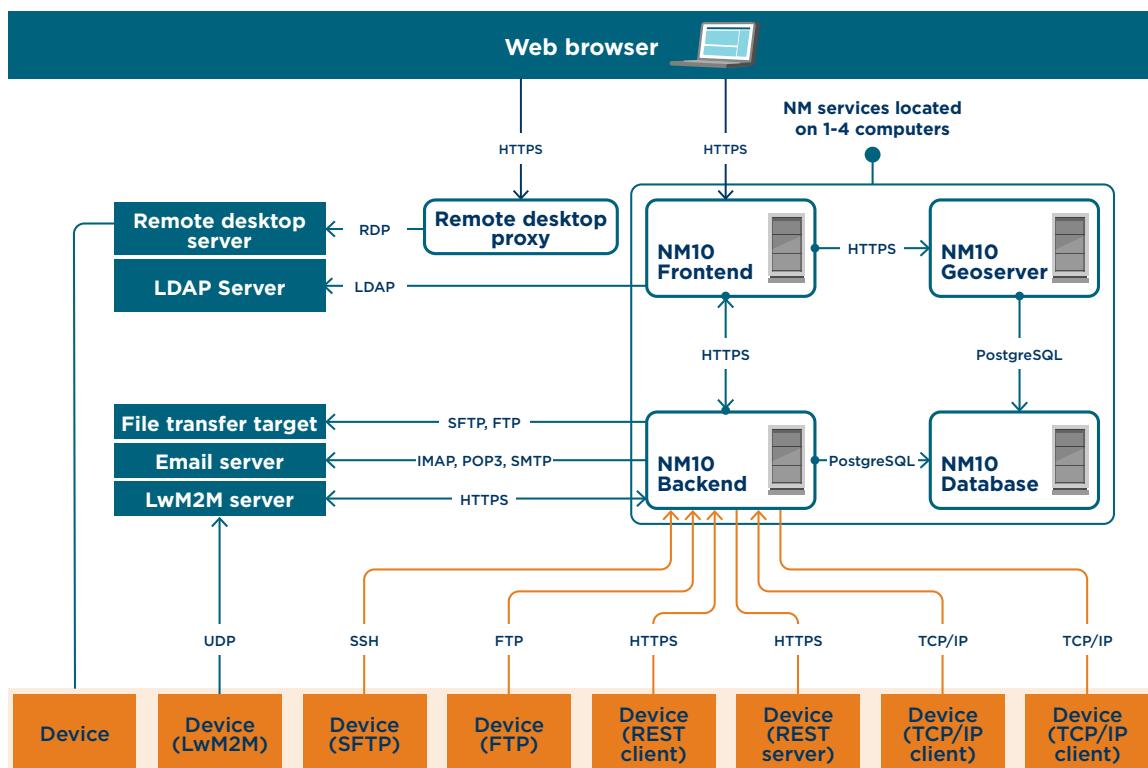


Figure 2 NM10 architecture and connections

3.2 Firewall settings

The following table lists the ports that must be open in the firewall(s) and what the ports are used for. The NM10 software installer opens automatically the Windows/Linux firewall for the ports and protocols marked with *.

Table 6 Firewall settings (open ports)

From	To	Protocol	Target Port	Purpose
Sites that use SFTP transfer (for example, AUTOSONDE, MW41, AWS810)	NM10 Backend Server (DCP)	TCP	22 *	SFTP file transfer from AUTOSONDE or MW41
AUTOSONDE, MW41, weather radar, TLP	NM10 Backend Server (DCP)	TCP	8443 *	HTTPS connection from AUTOSONDE, MW41, weather radar, or TLP
NM10 Backend Server (DCP)	AUTOSONDE AS15	TCP	8443	HTTPS connection to AUTOSONDE AS15
NM10 Backend Server (DCP)	AUTOSONDE AS41	TCP	9443	HTTPS connection to AUTOSONDE AS41
NM10 user's network	AUTOSONDE AS15 or MW41	TCP	8443	AUTOSONDE AS15 or MW41 web user interface
NM10 user's network	AUTOSONDE AS41	TCP	9443	AUTOSONDE AS41 web user interface
NM10 user's network	AUTOSONDE or MW41	TCP	8081	AUTOSONDE or MW41 RDP connection
NM10 user's network	TLP lightning processor	TCP	8081	TLP Web UI and TLP DB Management web user interface
AviMet	NM10 Backend Server (DCP)	TCP	8080	AviMet alarm, event, and system status information Note! Open the ports in the firewalls only when AviMet systems are part of the network. Allow only connections from AviMet systems.
AviMet	NM10 Backend Server (DCP)	TCP	Configured ports for AviMet systems	AviMet observations
AviMet	NM10 Backend Server (DCP)	ICMP		Optional pinging of AviMet servers
NM10 Backend Server (DCP)	AviMet	ICMP		Optional pinging of AviMet servers
NM10 user's network	AviMet	TCP	8081	AviMet RDP connections

From	To	Protocol	Target Port	Purpose
Weather stations that send data to NM10	NM10 Backend Server (DCP)	TCP	Configured ports for weather stations	Observation and status data from weather stations
Ceilometer	NM10 Backend Server (DCP)	TCP	Configured ports for ceilometer	Observations and status data from ceilometers
MOG sites (WXT and AQT sensors)	NM10 Backend Server (DCP)	TCP	8443	Observation and status data from MOG sites
Weather station that sends data to NM10 with the default single-site installation configuration	NM10 Backend Server (DCP)	TCP	50000	Observation and status data from weather station
NM10 Backend Server (DCP)	Polled weather stations, RWS200, WXT, or Pluvio ²	TCP	Configured ports in each weather station, RWS200, WXT, or Pluvio ² .	Observation and status data from polled weather stations Note! Depending on the firewall settings, you may have to open ports for outbound traffic when polling.
NM10 Backend Server (DCP)	SensorThings server	TCP	SensorThings service port	Observations, Things, and Metadata Note! Depending on the firewall settings, ports may have to be opened for outbound traffic when polling.
NM10 Backend Server (DCP)	Email server that receives emails from Iridium	TCP	993 (IMAP) or 995 (POP3)	Observations from weather stations Note! Depending on the firewall settings, ports may have to be opened for outbound traffic when polling.
NM10 Backend Server (DCP)	NM10 DB Server	TCP	5432 *	Database connection. Only needed when DB server is in another server than Frontend (WEB).
NM10 Frontend Server (WEB)	NM10 Backend Server (DCP)	TCP	8443 *	Observations, events, alerts, and network status. Only needed when Frontend server (WEB) is in another server than Backend (DCP).
NM10 Frontend Server (WEB)	NM10 MAP Server	TCP	2080 *	Map tiles. Only needed when MAP server is in another server than Frontend (WEB).

From	To	Protocol	Target Port	Purpose
NM10 Backend Server (DCP)	NM10 DB Server	ICMP *		Pinging of NM10 servers. Only needed when DB server is in another server than Backend (DCP).
NM10 Backend Server (DCP)	NM10 Frontend Server (WEB)	ICMP *		Pinging of NM10 servers. Only needed when Frontend server (WEB) is in another server than Backend (DCP).
NM10 Backend Server (DCP)	NM10 MAP Server	ICMP *		Pinging of NM10 servers. Only needed when MAP server is in another server than Backend (DCP).
NM10 Backend Server (DCP)	Email Server	TCP	25, 465, or 587	Email notifications from NM10. Target port depends on the email server configuration (SMTP, SMTPS, or STARTTLS).
NM10 DB Server	NM10 Backend Server (DCP)	ICMP *		Pinging of NM10 servers. Only needed when DB server is in another server than Backend (DCP).
NM10 Frontend Server (WEB)	NM10 Backend Server (DCP)	ICMP *		Pinging of NM10 servers. Only needed when Frontend server (WEB) is in another server than Backend (DCP).
NM10 MAP Server	NM10 Backend Server (DCP)	ICMP *		Pinging of NM10 servers. Only needed when MAP server is in another server than Backend (DCP).
NM10 user's network	NM10 Frontend Server (WEB)	TCP	443 *	NM10 web user interface
AWS810 and BWS500 weather stations or RWS200 road weather station	LwM2M Server	UDP	5683, 5684, 5693, 5694	When AWS810 and BWS500 weather stations or RWS200 road weather stations are connected. Status and metadata with LwM2M.
AWS810 and BWS500 weather stations or RWS200 road weather station	LwM2M Server	UDP	10301	When AWS810 and BWS500 weather stations or RWS200 road weather stations are connected. Firmware upgrade download with coap.

From	To	Protocol	Target Port	Purpose
AWS810 and BWS500 weather stations or RWS200 road weather station	LwM2M Server	TCP	10302	When AWS810 and BWS500 weather stations or RWS200 road weather stations are connected. Firmware upgrade download with http.
NM10 Backend Server (DCP)	LwM2M Server	TCP	8087	When AWS810 and BWS500 weather stations or RWS200 road weather stations are connected. Status and meta data from AWS810 or RWS200 through LwM2M Server with https/REST.
LwM2M Server	NM10 Backend Server (DCP)	TCP	7443	When BWS500 weather stations are connected. Observations from BWS500 through LwM2M Server with https/REST.

4. Installation

4.1 Software product package contents

NM10 cardboard product package contains the following USB memory sticks:

- *NM10 Software Installer for Windows* or *NM10 Software Installer for Linux*:
NM10 software and software installer, including user documentation
- *NM10 Utility Programs and Files*:
Other programs and files, including user documentation:
 - Product keys (sw license codes) for NM10 and for utility programs, when applicable
 - RoboMirror backup tool
 - Bitvise SSH server installation package, needed for receiving files using SFTP
 - Thinfinity Remote Desktop Server Workstation installation package for Remote desktop
 - NM10 Migration tool for migrating configurations from version 3.9 to 4.7 or later

Instructions leaflets

NM10 cardboard product package contains the following documentation in paper format:

- *Vaisala Observation Network Manager NM10 Cover Letter*: Welcome letter with NM10 Product Key (sw license code)

In addition, other material may be included, typically delivery-specific.

4.2 Pre-installed NM10

If you have purchased an option where NM10 software has been installed in the computer delivered to you and configured for your use by Vaisala, you can skip installation instructions and just log in using the credentials given to you by Vaisala and start monitoring your network.

After initial configuration by Vaisala, administrator-level users can edit the configuration, when needed, using the NM10 web user interface.



Unauthorized editing of configuration files (for example .INI files) can result in data loss and incorrect operation of the NM10 system. Vaisala assumes no liability for system errors caused by unauthorized editing of the configuration files.

Vaisala Observation Network Manager software license has been activated by Vaisala when installing the software. In case of a backend server hardware breakdown, or if the backend server hardware is changed for some other reason, the license code might be required to be reactivated. Reactivating is also needed when the number of sites (weather stations or airports) exceeds the predefined maximum number. To activate the license, go to Windows start menu and browse to **Vaisala License Manager**.

4.3 Updating from 3.9 version

If you have an older version of NM10 installed (3.9 or older), follow these steps to update to 4.x version:

- ▶ 1. Export the 3.9 configurations using the NM10 Migration tool in the *NM10 Utility Programs and Files* USB drive. Follow the instructions in *NM10 Migration Guide*, available in the same USB drive.
- 2. Uninstall the 3.9 version using the 3.9 installer, and delete the following folders:
 - postgresql
 - NetworkManagerConfigBackup
- 3. Install the new NM10 version, as described in the later sections in this chapter.
- 4. Import the configurations to the new system. Follow the instructions in *NM10 Migration Guide*.

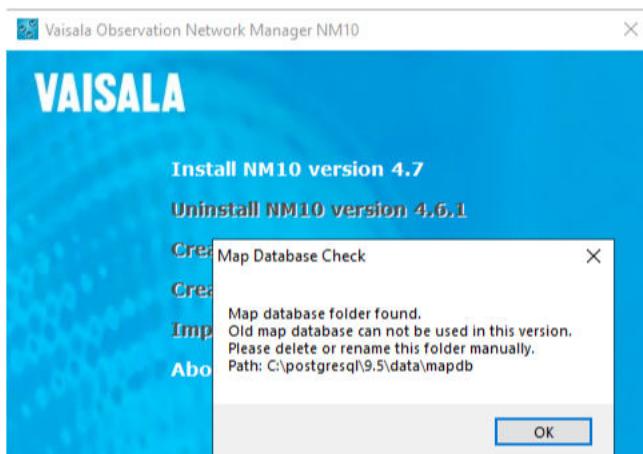
4.4 Updating NM10 in Windows

If you have a previous 4.x version of NM10 installed, you can install an update using the installer.



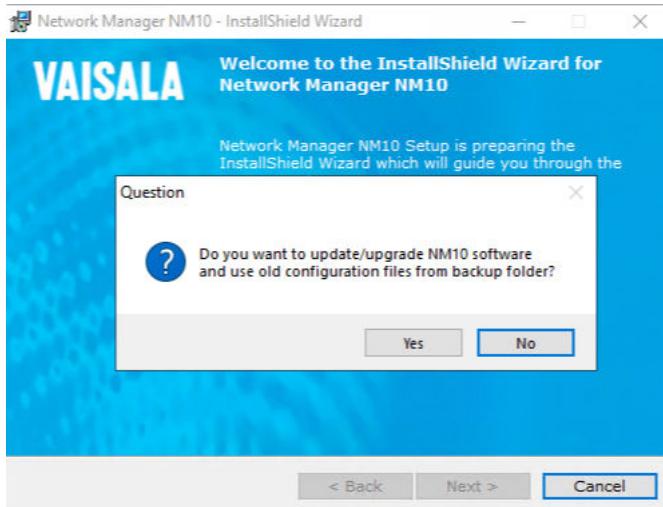
If you have an older version of NM10 installed (3.9 or older), follow the steps in [Updating from 3.9 version \(page 23\)](#).

- ▶ 1. Start installing NM10 using the software installer as described in [Installing NM10 software in Windows \(page 27\)](#) but note the following exceptions:
- 2. When prompted about the old map database folder, delete or rename the old folder and proceed with the installation. The database contains read-only map material that will be replaced by new data with the new installation and there is no visible change to the end user.



3. When prompted about using the old configuration files:

- If you want keep the old configuration files, select **Yes**. Data of the old database and configuration files are migrated.
- If you do not want to use the old configuration files, select **No**. Data of the old database is backed up and the installation is performed with a clean database of the new version.



4. When prompted, restart the computer.

4.5 Updating NM10 in Linux

If you have a previous 4.x version of NM10 installed, you can install an update using the installer.



If you have an older version of NM10 installed (3.9 or older), follow the steps in [Updating from 3.9 version \(page 23\)](#).

- ▶ 1. Run `./nm10-installer`
- 2. Select **Uninstall** to uninstall old NM10 installation.
- 3. When uninstalling is finished, install the new version of NM10 as described in [Installing NM10 software in Linux \(page 37\)](#).
- 4. If the following error is displayed, delete the old map directory `/var/nm10-geoserver-mapdb`. It contains read-only map material that will be replaced by new data with the new installation and there is no visible change to the end user.

`Map database folder found: /var/nm10-geoserver-mapdb.`
`Installer cannot continue with existing map data. Please delete or rename this folder manually.`

5. If 4.6 database exists on the server, installer asks you to convert the existing data:

Existing NM10 v4.x data detected. It needs to be converted in order to be used in this NM10 version. If conversion is done, you will be able to use your existing data, otherwise system will be installed with fresh database. In either case, old data with old database format can be found at `/var/nm10-data-9.5`

- Approve the conversion so the data is converted from old PostgreSQL to new database version.
- If you do not approve, a fresh database is installed. The old data will be available in old database format in `/var/nm10-data-9.5`.

6. Restart frontend and backend services:

- **`systemctl restart nm10-backend.service`**
- **`systemctl restart nm10-frontend.service`**

4.6 Prerequisites for Installation



If you have purchased a computer with preinstalled NM10 software, or the NM10 software has been installed and configured for your use by Vaisala, you can skip the installation instructions and continue from section [Opening NM10 web user interface and logging in \(page 52\)](#).

4.6.1 Static IP address

A static IP address must be set for the computer. Contact your IT department for instructions.

4.6.2 UTC time

The computer's time must be set to UTC (+00), not your local time.

4.6.3 Windows paging file size

In default Windows installation the paging file size is the same as the amount of installed RAM. For NM10 installation it is recommended to set the size of the paging file to 1 - 1.5 times the amount of installed RAM. See [Changing Windows paging file size \(page 183\)](#).

4.6.4 Use of anti-virus software

Although typically the NM10 software runs on computers that have anti-virus software running, it is known that anti-virus software can have functions that significantly consume computer resources. This may affect the NM10 software performance.

When the Vaisala Observation Network Manager system is in operational use only anti-virus software accepted by Vaisala can be used.

4.6.5 Use of other software

Running other software in the computer where NM10 software is installed can significantly consume computer resources and affect the NM10 software performance. However, you may need to install software that is needed for configuring the communication devices between the weather station and NM10. For instructions, see AWS310 documentation.

4.7 Preparing for installation

- ▶ 1. Open the NM10 product package.
- 2. Locate the following items that you will need for installation:
 - USB memory stick containing the NM10 software installer: *NM10 Software Installer for Windows* or *NM10 Software Installer for Linux*.
 - *Vaisala Observation Network Manager NM10 Cover Letter* with the Product Key needed for license activation.
 - The Product Key is also available in electronic format on the USB memory stick: *NM10 Utility Programs and Files*.
- 3. Switch on the computer.
- 4. Connect the network cable.
- 5. Log into the computer with administrator-level rights.
 - With software delivery no computer is delivered from Vaisala. Contact your IT department for the needed credentials for the computer.
 - On computers delivered from Vaisala the default user name and password are: **administrator / vaisala**
 - On computers delivered from Vaisala for AUTOSONDE deliveries the default user name and password: are **administrator / adpw_VA1**
- 6. Change the password as soon as possible. See the operating system instructions. Take note of the new password and save it securely.



CAUTION! To maintain sufficient level of security, you must change the default password as soon as possible.

4.8 Multiserver installation order

NM10 services can be installed all in one server or the installation can be split in two to four separate servers. When installing NM10 to several servers, install the NM10 services in the following order:

Order of server installation on a 2-server system:

1. Backend services ("Backend" and "Backend configurations") and Database services to the first server
2. Frontend services and Map services to the second server

Order of server installation on a 3-server system:

1. Database services to the first server
2. Backend services ("Backend" and "Backend configurations") to the second server
3. Frontend services and Map services to the third server

Order of server installation on a 4-server system:

1. Database services to the first server
2. Map services to the second server
3. Backend services ("Backend" and "Backend configurations") to the third server
4. Frontend services to the fourth server

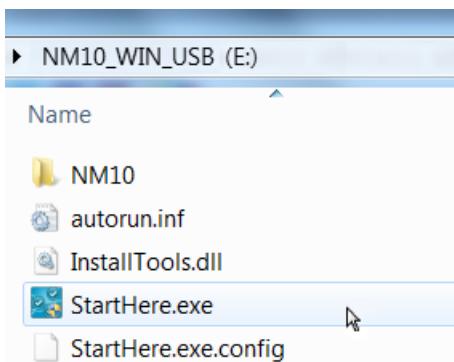
4.9 Installing NM10 software in Windows

Make sure you have read [Prerequisites for Installation \(page 25\)](#) and [Preparing for installation \(page 26\)](#) and performed any necessary changes in the computer. For multi-server installation, check the installation order in [Multiserver installation order \(page 27\)](#).



If updating, see also [Updating NM10 in Windows \(page 23\)](#).

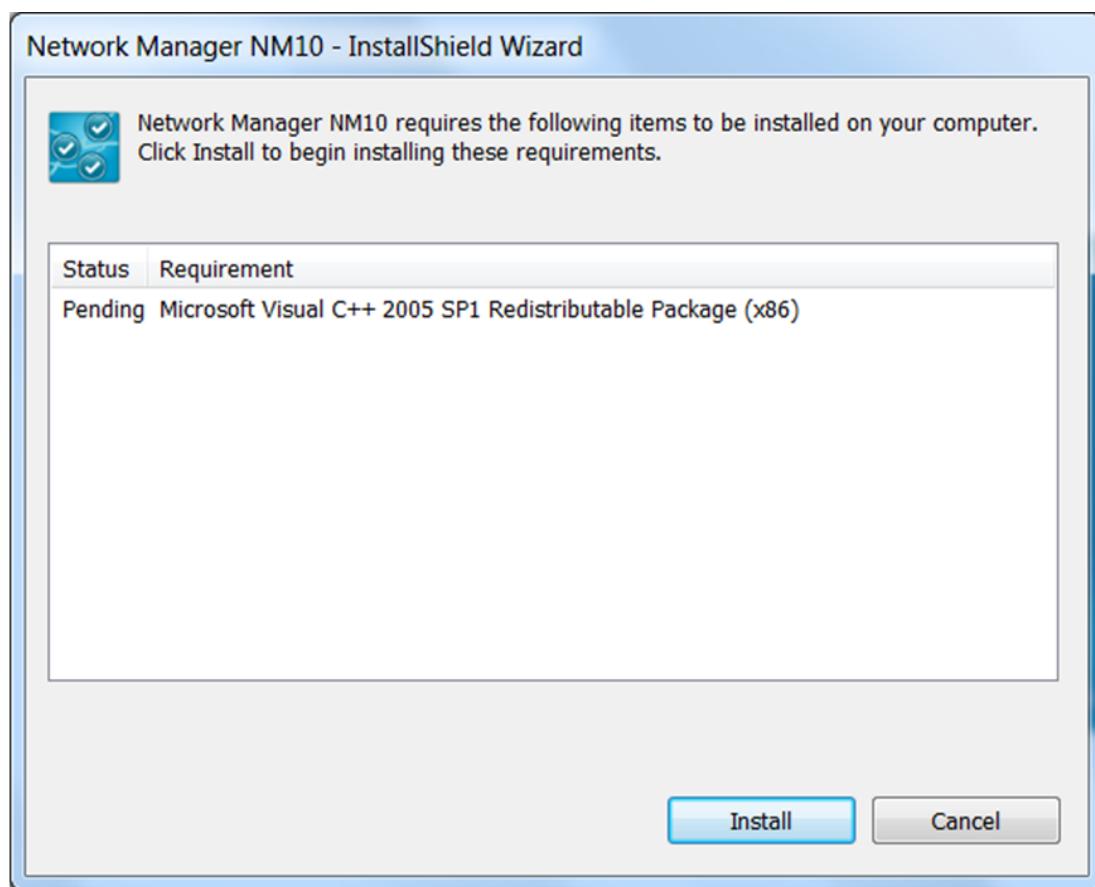
- ▶ 1. Insert the USB memory stick containing the NM10 software installer into a USB port. If available, use a USB 3.0 port for faster processing.
- 2. Run *StartHere.exe* from the USB stick:



3. Select **Install NM10 version <number>**.



4. Depending on the system, the installation may require some additional software modules to be installed. Select **Install**:



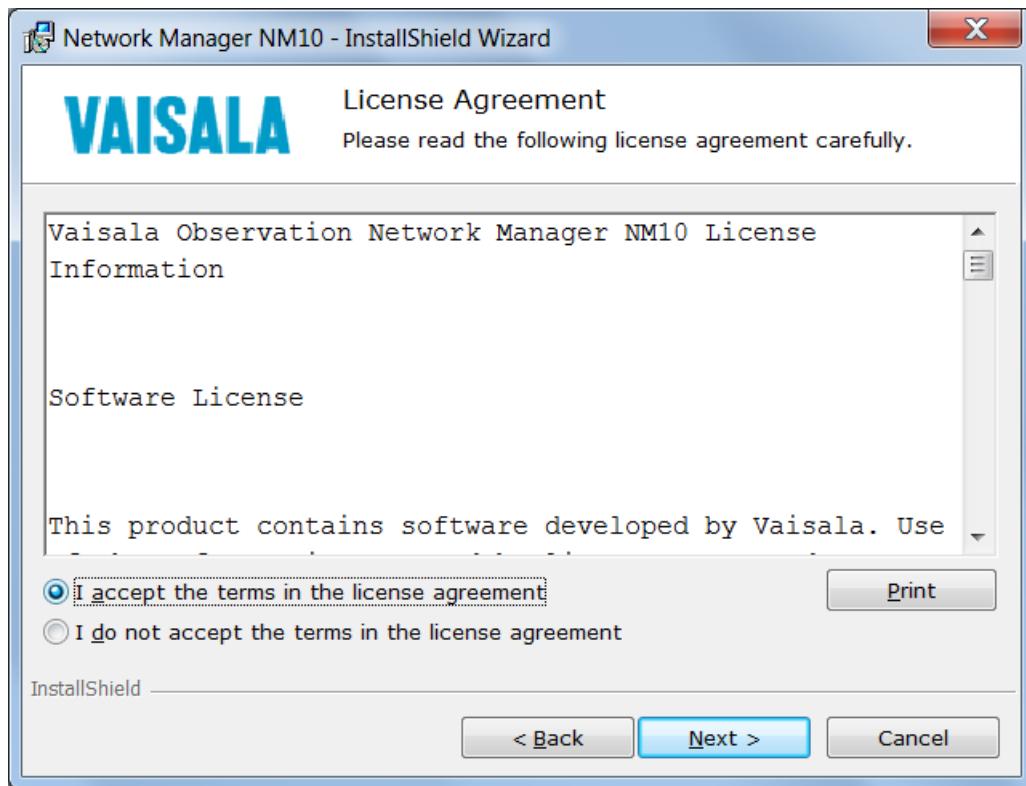
5. Wait until the installer prepares the wizard and extracts the files. Depending on the computer, this may take several minutes.



- When the installer is ready to install, select **Next**.

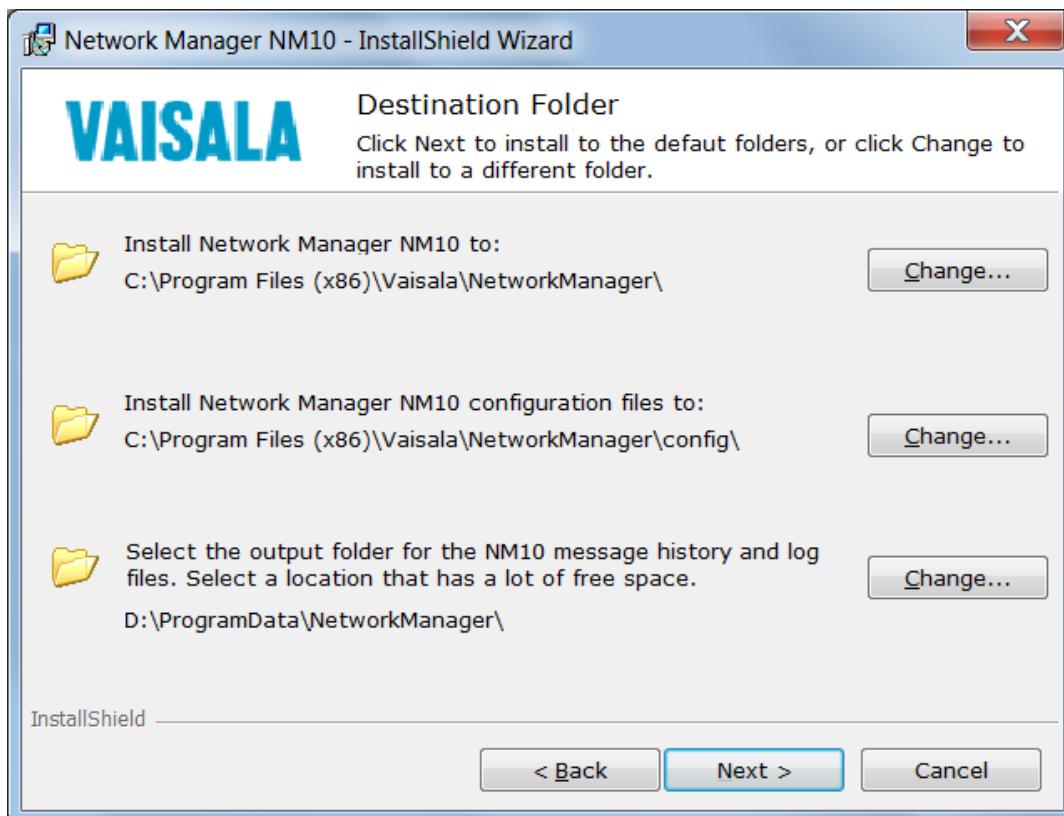


7. In the license page, select **I accept the terms in the license agreement** and **Next**.



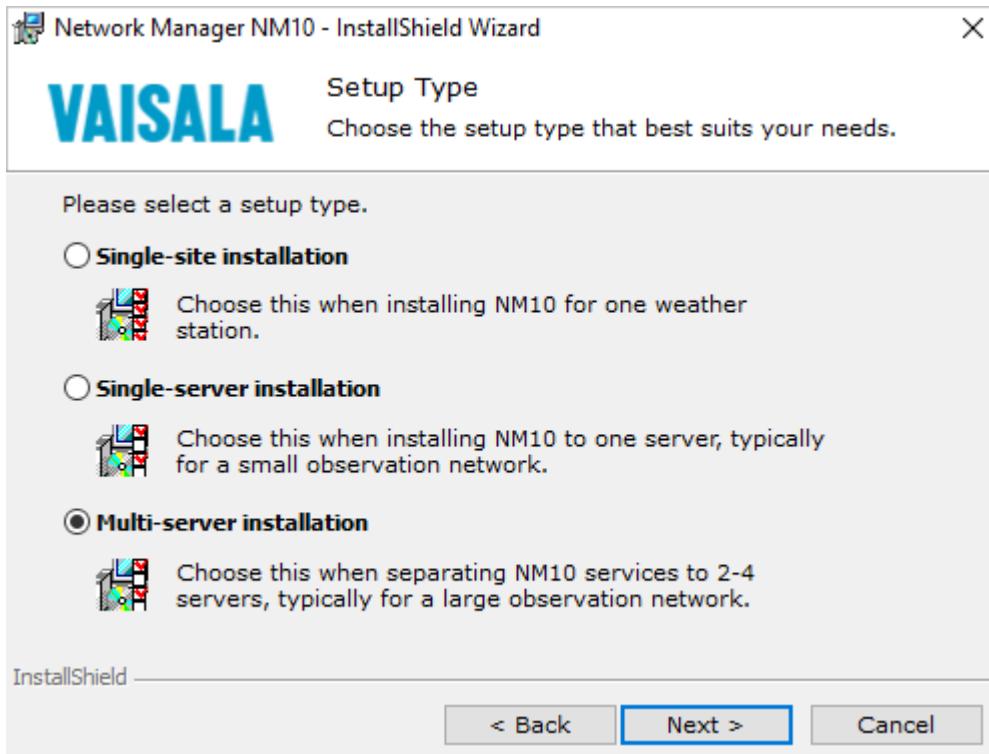
8. In the **Destination folders** page, select **Next** to accept the default destination folders for the files:

- The output folder for NM10 message history and log files must have plenty of free space.
- If the computer has more than one suitable drive available, using the system drive (C:) to store the message history and log files is not recommended.
- If needed, select another folder by selecting **Change**.



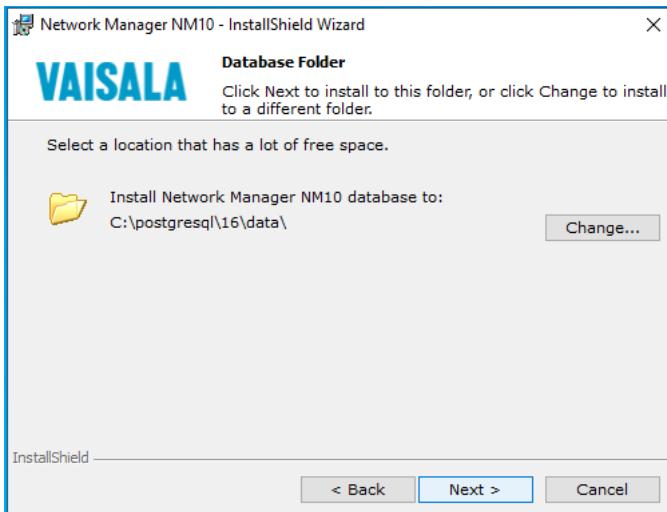
9. In the **Setup type** page, select one of the following:

- When installing NM10 for one weather station, select **Single-site installation**.
- When installing NM10 to one server, typically for monitoring a small observation network, select **Single-server installation**.
- When separating NM10 services to several servers, typically for a large observation network, select **Multi-server installation**.

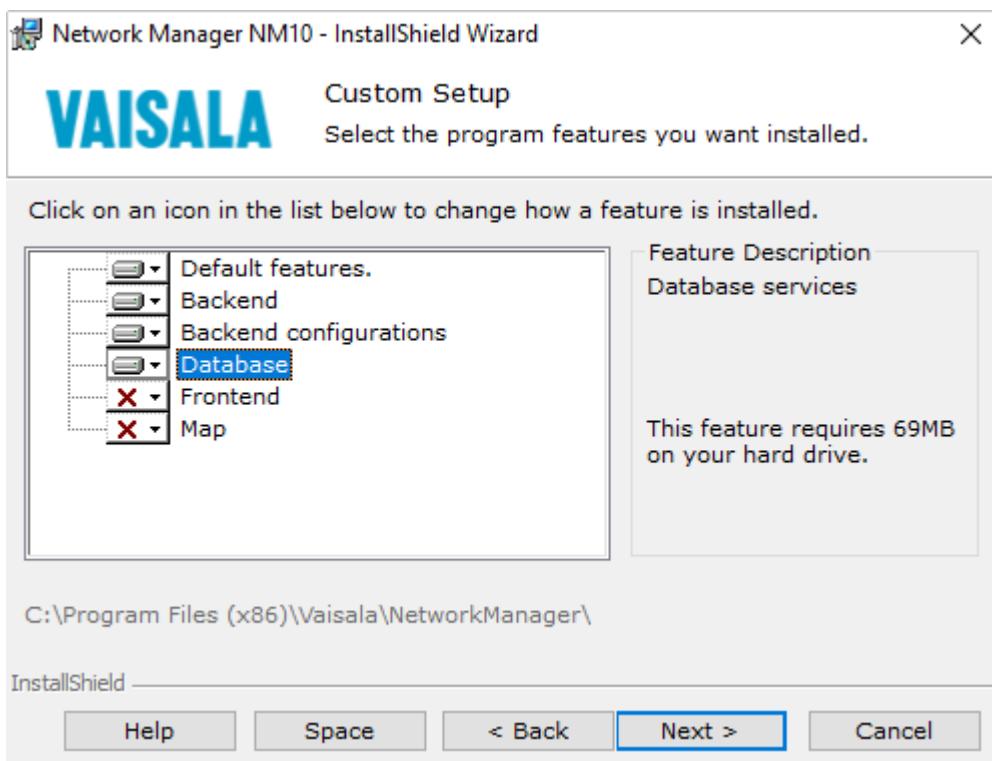


10. Select **Next**.

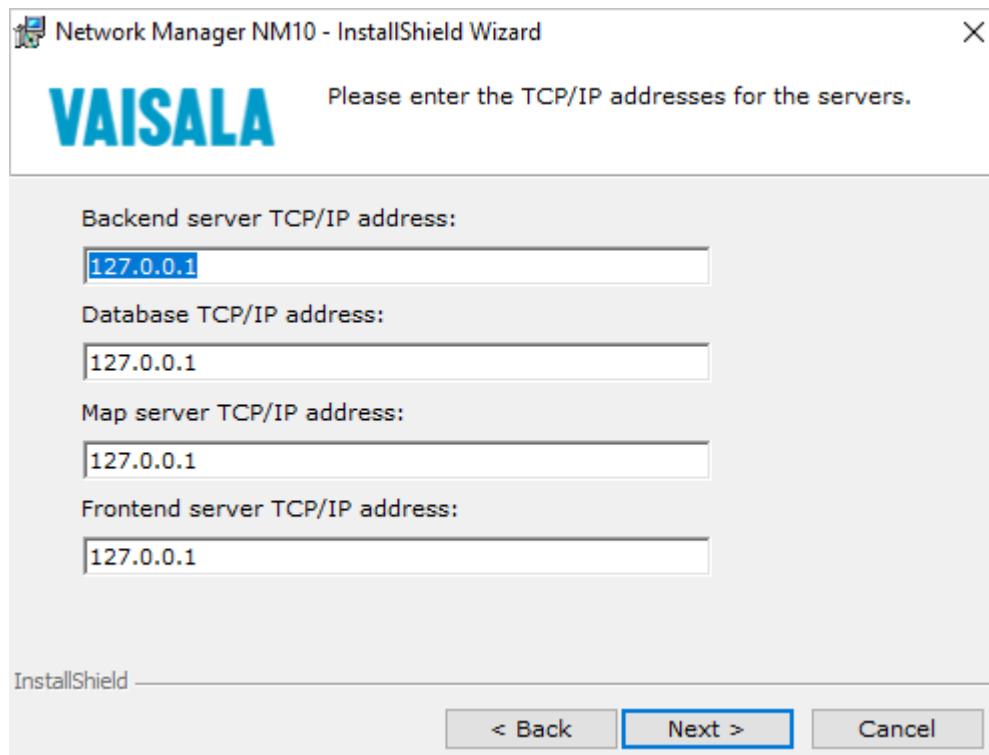
11. In the **Database folder** page, select **Next** to accept the default destination folder for the database.
 - The database folder must have plenty of free space.
 - If the computer has more than one suitable drive available, the database should not be installed on a system drive (C:).
 - If needed, select another folder by selecting **Change**.



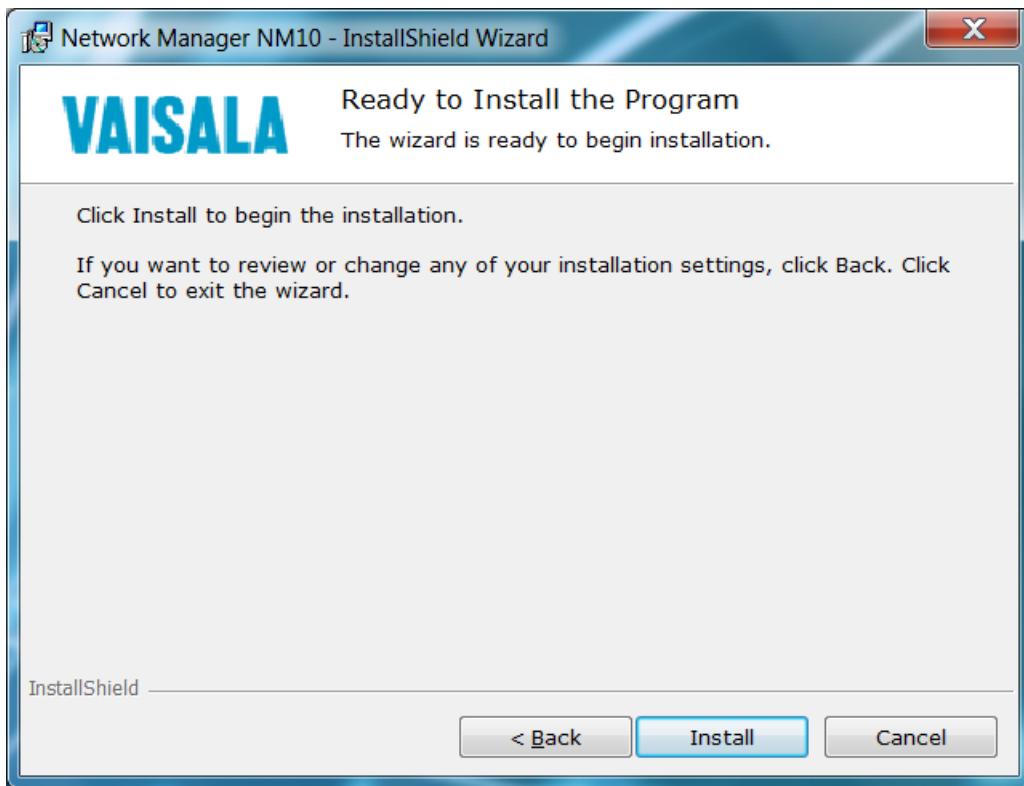
12. For multi-server installation, select the features to be installed in the first server. For example, in a typical 2-server system, first install the backend server with the following features: **Backend**, **Backend configurations**, and **Database**. After finalizing the backend server installation, run the installer again in the frontend server and select the **Frontend** and **Map** features. For more information on the order, see [Multiserver installation order \(page 27\)](#).



13. For multi-server installation, enter the static IP addresses of the servers, also for the other servers that you install later. Make sure they are correct because they are used for Firewall settings.



14. Select **Install** to begin the installation:



Wait while the installation program installs NM10. This may take several minutes.

15. When the software installation is finished, select **Finish**.

Vaisala License Manager will start. Continue with the activation of the software license.

4.10 Installing NM10 software in Linux

Make sure you have read [Prerequisites for Installation \(page 25\)](#) and [Preparing for installation \(page 26\)](#) and performed any necessary changes in the computer. For multi-server installation, check the installation order in [Multiserver installation order \(page 27\)](#).



If updating, see also [Updating NM10 in Linux \(page 24\)](#).

- ▶ 1. Ensure your system is up-to-date by executing command: `dnf update`.
- 2. Insert the USB memory stick containing the NM10 software installer into a USB port. If available, use a USB 3.0 port for faster processing.

3. Execute the installer. Select the server which you want to install. For multi-server installation, check the installation order in [Multiserver installation order \(page 27\)](#).

The screenshot shows a terminal window with the title 'Vaisala Observation Network Manager NM10 4.7.0.0 Installer'. Below the title is a menu with the following options:

[1] Single server	Install/upgrade all features
[2] Single-site display	Install for one AWS310 weather station
[3] Multiple servers	Install multi server setup
[4] Uninstall	Remove all installed features
 [5] Show install status	
[6] Reconfigure NM10 application RAM share (Single server only)	
 Enter char to select feature or [q] to quit	
Select option: []

4. When the installer asks for a database data folder location, provide a valid path or press enter to use the default location. For multi-server installations, when the installer asks for IP addresses of other servers, use only the external static IP addresses.
5. Installation can take up to 30 minutes. During the installation, you can see the hash sign being appended to the output as the installation progresses.
6. When the installation is finished, select q.

4.11 Activating software license in Windows

For activating the license you need the product key that is located in the printed *Vaisala Observation Network Manager NM10 Cover Letter* and in electronic format on the *NM10 Utility Programs and Files* USB stick, both available in the NM10 installation media package.

License activation must be done on the server where NM10 backend services (DCP/JDCP) are installed in.

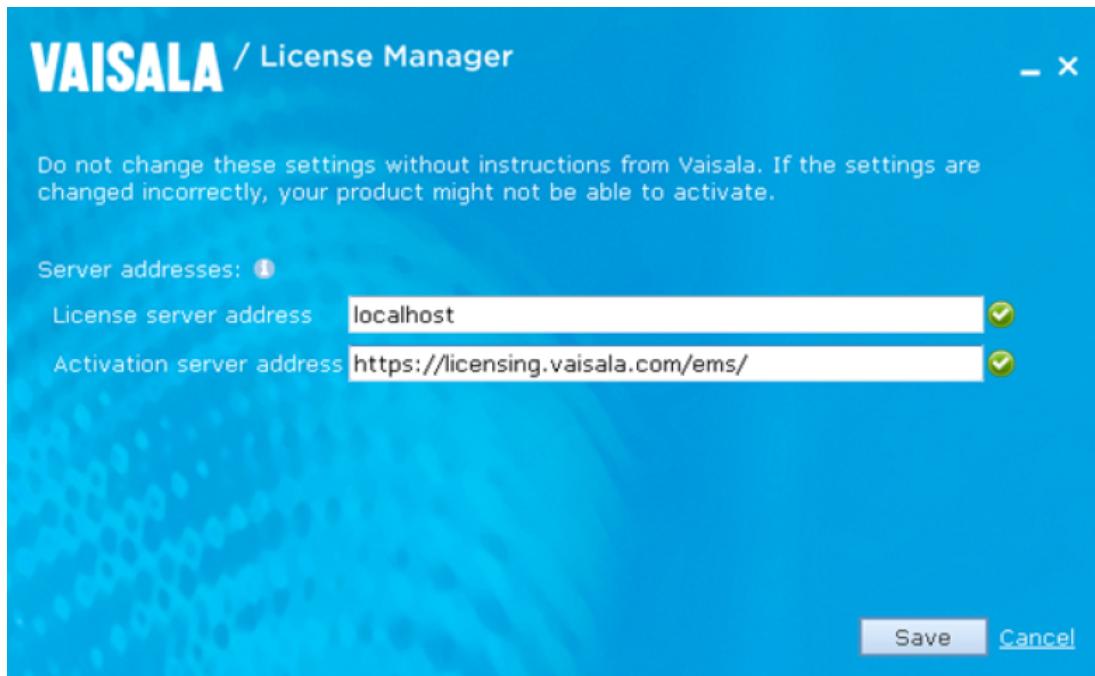
Activating the NM10 software license requires Internet connection. If the installation computer does not have Internet connection, see section [Activating license without Internet connection \(page 42\)](#).

4.11.1 Activating license with Internet connection available

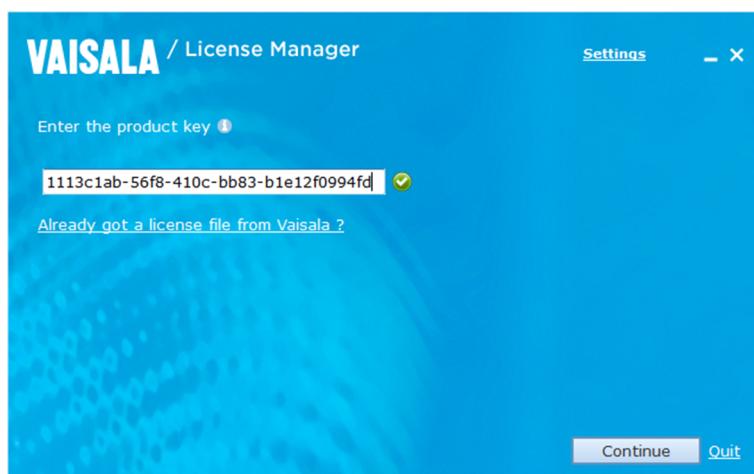
- ▶ 1. When the License Manager opens after software installation, click **Continue**.
 - If License Manager does not start, you can open it from the Windows **Start menu** > **All programs > Vaisala > Vaisala License Manager**.
- 2. If you are using the official license activation server, all the settings are preconfigured correctly. Click **Settings** at the top of the start page to check settings and network connection.



3. There should be green icons at the end of text fields. If not, make sure that there is network connection from server to ems server. If green icons do not appear, activation server address can be changed from https to http, it will be redirected to https anyway. If everything is OK (green), select **Cancel**.



4. Enter the product key that is located in the printed *Vaisala Observation Network Manager NM10 Cover Letter* and on the *NM10 Utility Programs and Files* USB memory stick. Then click **Continue**.



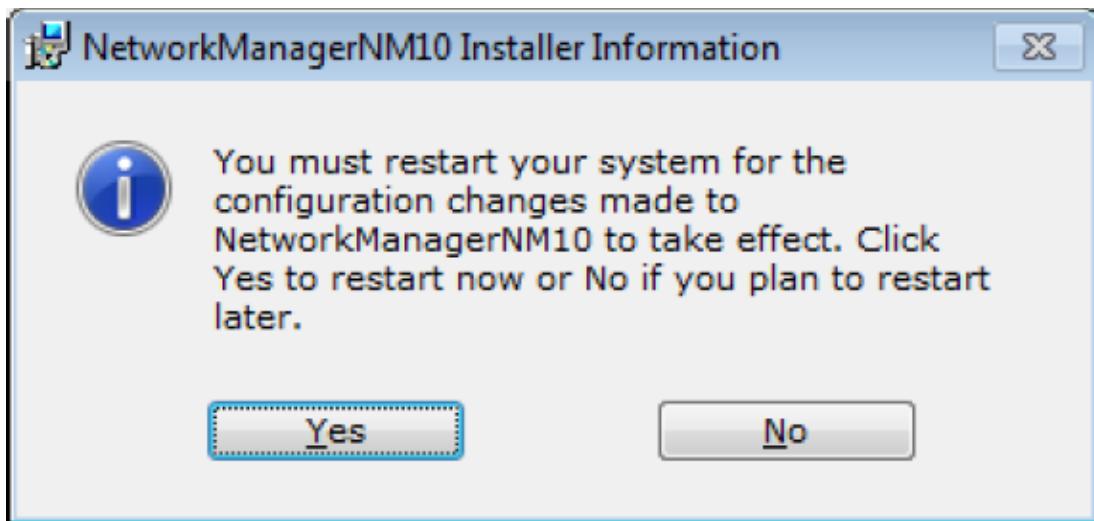
5. The license starts activating. Wait a while.

6. After a successful activation, a window is displayed listing the activated features. Check that the installed features match your license:
 - For a single-site display, typical activated features include, for example, *NM_ConnectedAWSs 1*, *NM_SurfaceWeatherDisplay*, and *NM_ServerCore*.
 - For a small monitoring network, typical basic features include, for example, *NM_Connected AWSs 10* and *NM_ServerCore*.
 - Other features may have been activated depending on the purchased licenses.



7. Click **Quit** to exit License Manager.

8. The system asks you to restart the computer. Click **Yes** to restart the system.



After the system has restarted:

- The license activation and Network Manager installation is complete. In case the activation fails, the reason and remedy for the failure are displayed. If you need further assistance, contact Vaisala Help Desk.
 - The NM10 software has been installed and NM10 is running in the background.
9. With multi-server system, continue with installing any other server(s) and/or finalizing the installation by copying the properties and certificates between servers. See [Finalizing multi-server installation in Windows \(page 49\)](#).

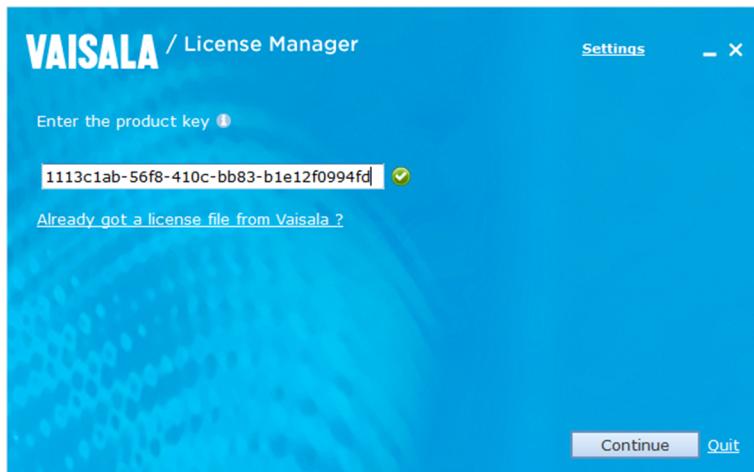
4.11.2 Activating license without Internet connection

To activate the license when the NM10 computer does not have internet connection available, you also need the following:

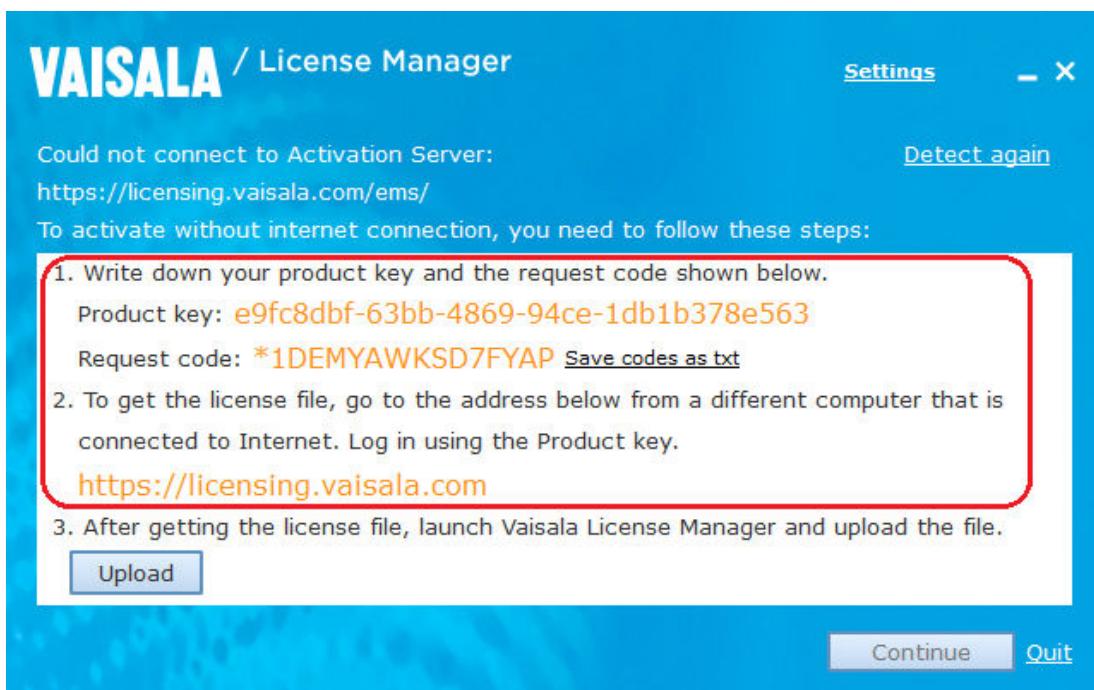
- Another computer with Internet connection available
- USB memory stick for storing the license file and for transferring it to the NM10 computer.

- 1. When the License Manager opens after software installation, click **Continue**.
- If License Manager does not start, you can open it from the Windows **Start menu > All programs > Vaisala > Vaisala License Manager**.

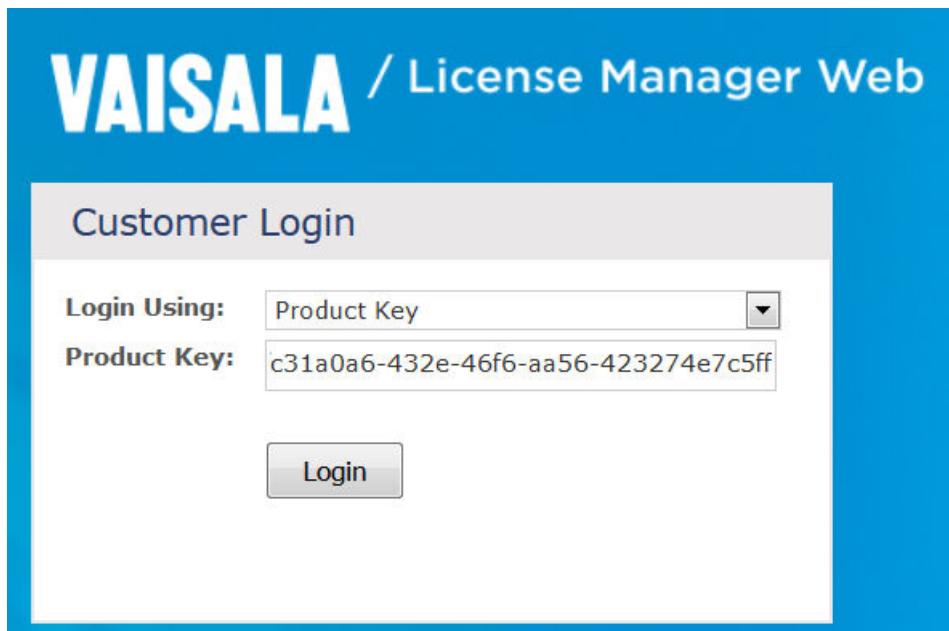
2. Enter the product key that is located in the printed *Vaisala Observation Network Manager NM10 Cover Letter* and on the *NM10 Utility Programs and Files* USB memory stick. Then click **Continue**.



3. A window with the message **Could not connect to Activation Server** is displayed. Follow the instructions on the page to do the following:
- Write down the displayed product key and the request code, or click **Save codes as txt** to save the codes as a .txt file, for example, on a memory stick.
 - Do not close the License Manager window, you will need to upload the license file with License Manager at a later stage of the procedure.



4. Go to another computer that is connected to Internet:
 - a. Open an internet browser and go to <https://licensing.vaisala.com>.
 - b. Select **Login Using: Product Key** and enter the product key in the window.
 - c. Click **Login**.

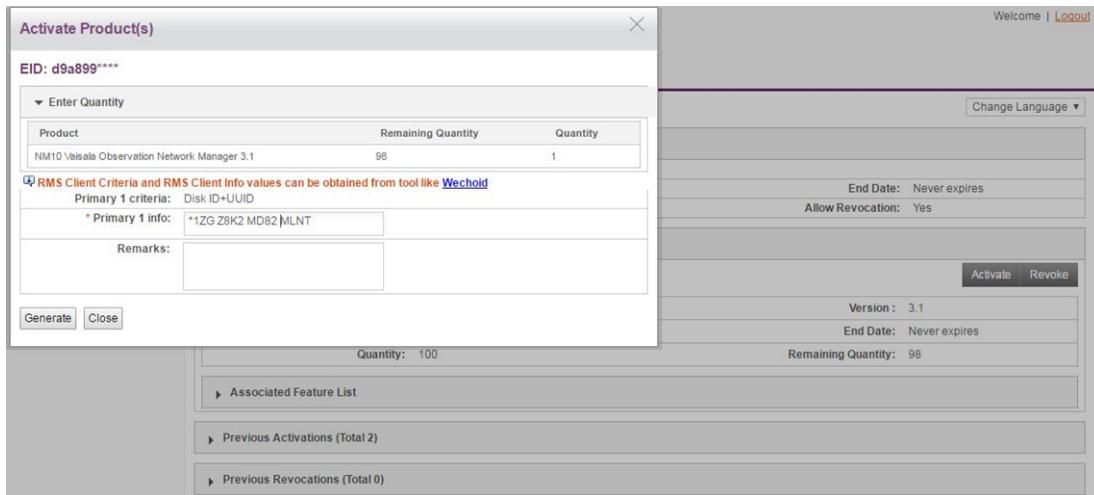


5. In the window that opens, click **Product Details** open and click **Activate**.

Product Key : e9fc8dbf-63bb-4869-94ce-1db1b378e563 Change Language ▾

Entitlement Details	
EID:	e530f7****
Start Date:	03/10/2017
Allow Activation:	Yes
Product Details	
Activate	
Product Name :	NM10 Vaisala Observation Network Manager
Start Date:	03/10/2017
Quantity:	5
Associated Feature List	
Previous Activations (Total 0)	
Previous Revocations (Total 0)	

6. Enter the request code in the **Primary 1 info** text box, manually add spaces after every 4 characters, and select **Generate**.

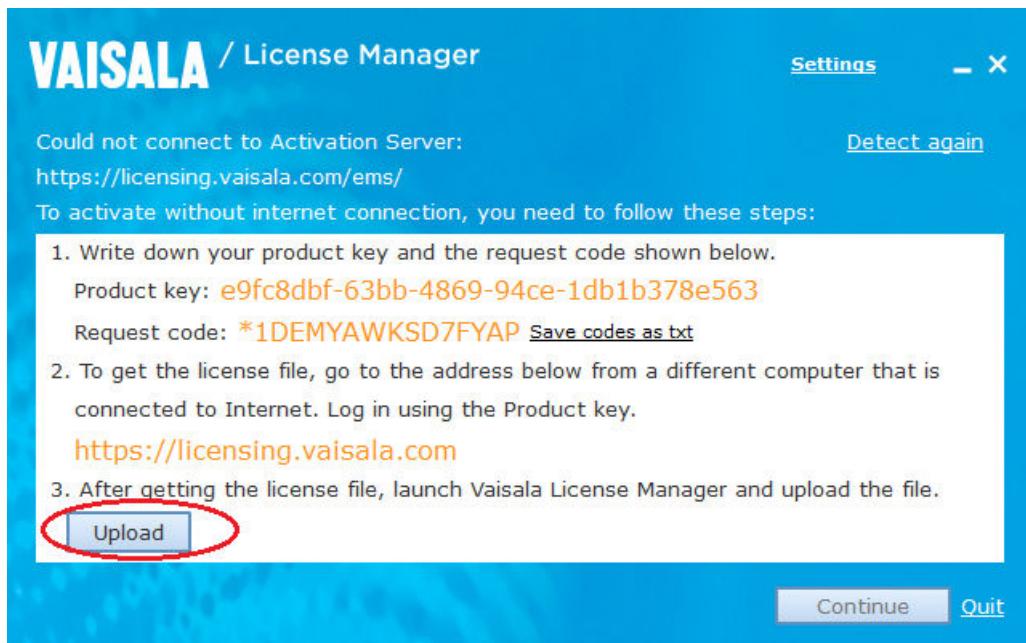


CAUTION! You have to manually add spaces after every 4 characters in the text box.

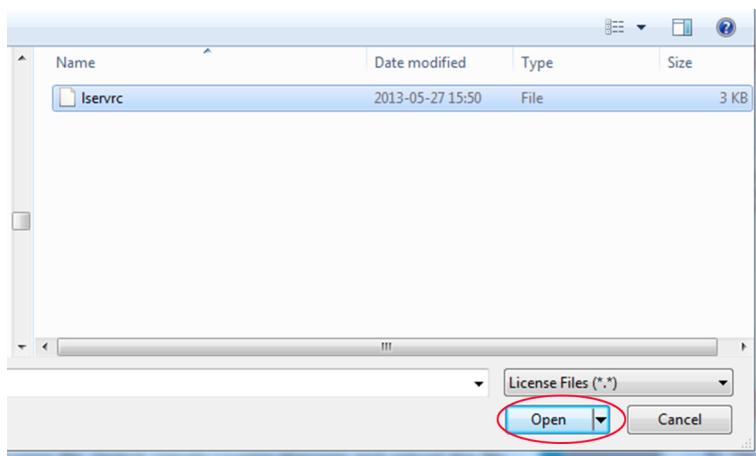
7. The license file is generated. Click **Save to File** to save the license file to a media that you can transfer to the system, for example, a memory stick.

- If not automatically added by the browser, add the file format extension, for example, .txt.
- Note that the way in which the file is saved depends on the browser used. If you do not provide a specific location on your computer, files downloaded from the Internet are usually saved in a default location, for example, C:\users\<your name>\downloads.

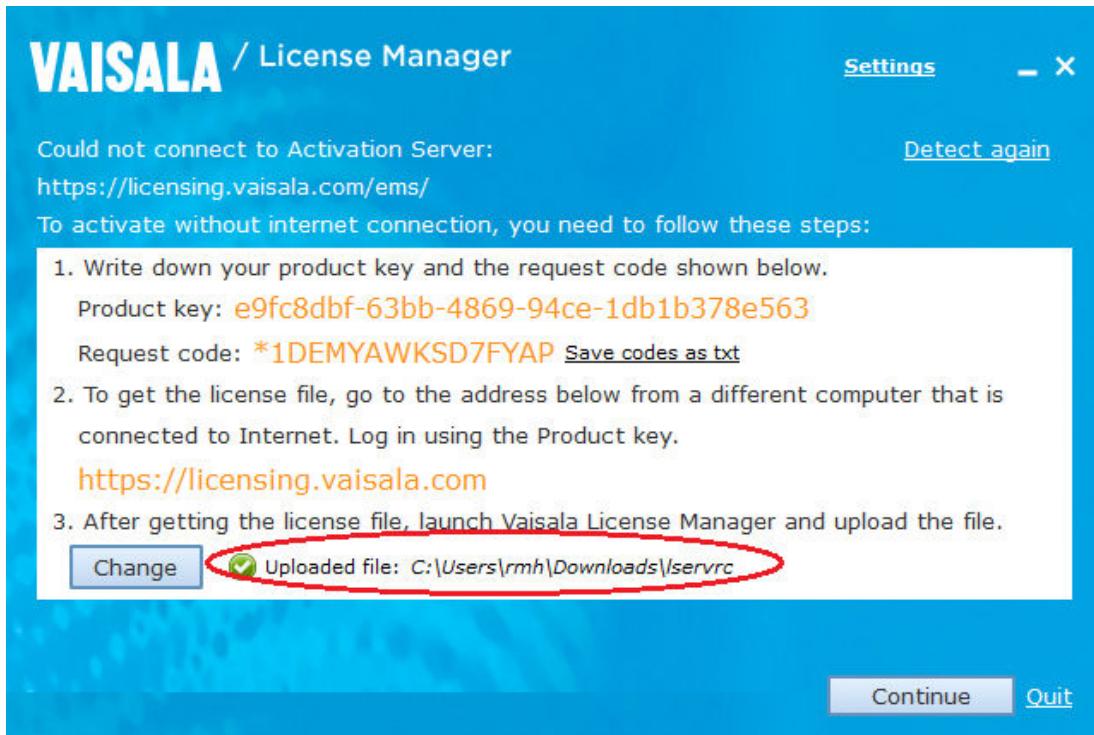
8. Go back to the computer where the License Manager window is still open. Click **Upload** to load the license file to the system.



9. Browse to the location where the license file is stored and click **Open**.



10. The green icon indicates that the upload was successful. Click **Continue**. The licensed software starts activating.



11. After a successful activation, a window is displayed listing the activated features. Check that the features installed match your license.
12. Click **Quit** to exit License Manager.
13. Click **Yes** to restart the system.

After the system has restarted:

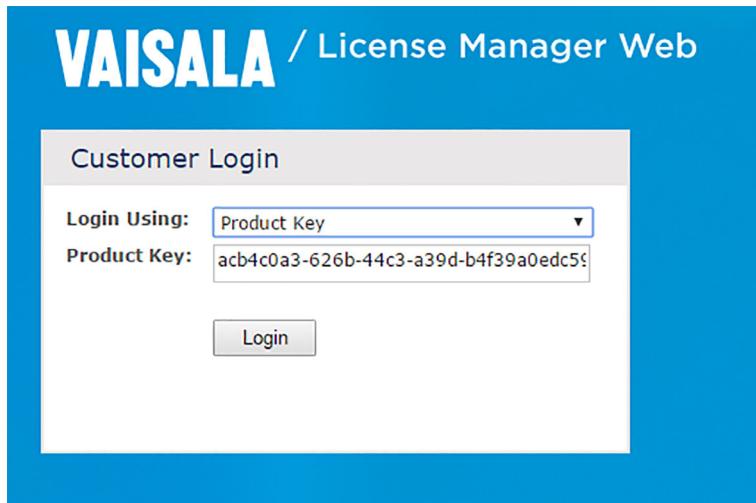
- The license activation and Network Manager installation is complete. In case the activation fails, the reason and remedy for the failure are displayed. If you need further assistance, contact Vaisala Help Desk.
- The NM10 software has been installed and NM10 is running in the background.

4.12 Activating software license in Linux

Follow the steps below to get the machine locking code of the installation server before proceeding to the NM10 License activation:

- ▶ 1. Check that you have *glibc.i686* installed.
- 2. Log in as root.
- 3. Switch to the location in the server where NM10 was installed: */opt/vaisala/nm10/licensing_utils*

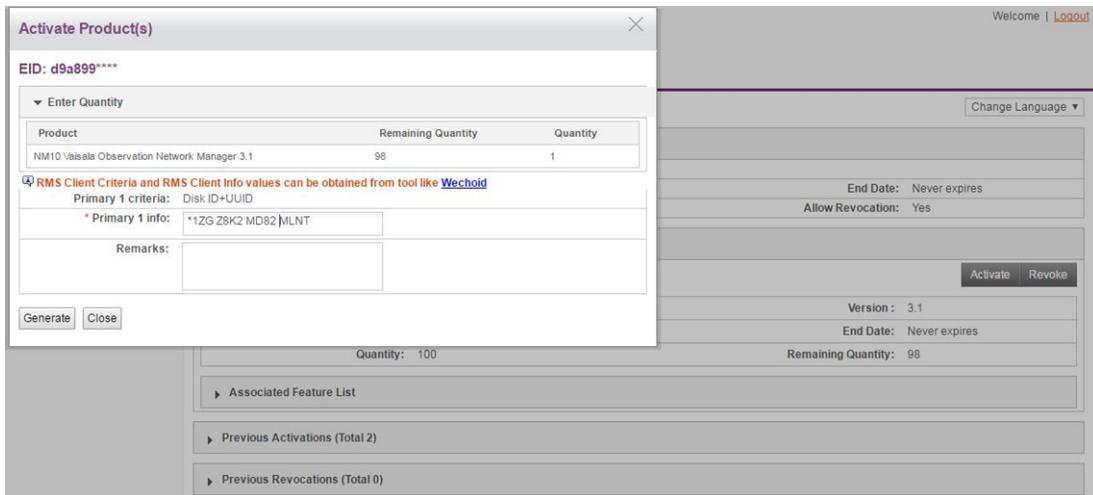
4. Execute the file as: `./nm10-license-machineocode.sh`, which will give you the machine Locking Code.
5. Write down the machine locking code.
6. Open an internet browser and go to: <https://licensing.vaisala.com>.
7. In **Login Using**, select **Product Key**, enter the product key, and select **Login**.



8. In the window that opens, select **Product Details** and **Activate**.

Product Key : e9fc8dbf-63bb-4869-94ce-1db1b378e563		Change Language
Entitlement Details		
EID:	e530f7****	
Start Date:	03/10/2017	End Date: Never expires
Allow Activation:	Yes	
Product Details		
Activate		
Product Name :	NM10 Vaisala Observation Network Manager	Version : 3.5
Start Date:	03/10/2017	End Date: Never expires
Quantity:	5	Remaining Quantity: 3
Associated Feature List		
Previous Activations (Total 0)		
Previous Revocations (Total 0)		

9. Enter the request code in the **Primary 1 info** text box, manually add spaces after every 4 characters, and select **Generate**.



10. The license file is generated. After viewing the license, select **Save to File** and save the license file to a media that you can transfer to the system, for example, a memory stick.
- If not automatically added by the browser, add the file format extension, for example, .txt.
 - Note that the way in which the file is saved depends on the browser used. If you do not provide a specific location on your computer, files downloaded from the Internet are usually saved in a default location, for example, C:\users\<yourname>\downloads.
11. Rename the license file `lservrc` into `nm10_license.txt`, give the 644 permission (`chmod 644`), and place the license file to the NM10 backend (DCP / JDCP) installation server to the file path: `/etc/vaisala/nm10_license.txt`

4.13 Finalizing multi-server installation in Windows

- 1. After reboot, copy the file: `NM10Backend.properties` from this directory in the backend server:

```
C:\Program Files (x86)\Vaisala\NetworkManager\config\jdcpc_conf\
```

to the same directory in the frontend server (if the default installation locations were used).

2. Copy nm10-frontend certificate (.cer file) on the frontend server located at:

```
C:\Program Files (x86)\Vaisala\NetworkManager\config\KeyStore\
```

to the backend server directory:

```
C:\Program Files (x86)\Vaisala\NetworkManager\config\jdcp_conf\certificates
```

3. Restart Vaisala nm10-frontend Apache Tomcat service.

4.14 Finalizing multi-server installation in Linux

- ▶ 1. After reboot, copy the frontend certificate from:

```
/opt/vaisala/nm10/nm10-backend-conf/certificates/nm10-frontend.cer
```

to the backend server:

```
/opt/vaisala/nm10/nm10-backend-conf/certificates/
```

2. Copy the backend certificate from:

```
/opt/vaisala/nm10/nm10-backend-conf/certificates/nm10-backend.cer
```

to the frontend server:

```
/opt/vaisala/nm10/nm10-frontend-conf/certificates/
```

3. Copy the *NM10Backend.properties* file

from:

```
/opt/vaisala/nm10/nm10-backend-conf/
```

to the frontend server:

```
/opt/vaisala/nm10/nm10-backend-conf
```

4. Restart Vaisala nm10-frontend Apache Tomcat service.

4.15 Verifying installation success

- ▶ 1. Verify that the servers are correctly up and running by opening web browser in the server with address *https://localhost*.
 - When connecting to the Network Manager for the first time, there is a prompt to accept unsafe connection. This is due to self-signed certificate which is issued as a placeholder until the final certificate is provided.
 - Login to *https://<ip_address>/nm10/login* with the following credentials:
admin / #4dMin:36,

5. Opening NM10 web user interface and logging in

Once installed, the Vaisala Observation Network Manager (NM10) software is running in the background in the computer it was installed in.

To start configuring the system or monitoring the configured network, open the NM10 Web user interface (Web UI). Basic access authentication to NM10 is provided using HTTPS. Access to the system is restricted by user name and password. Typically, the users are created in NM10. In some systems Windows Active Directory is used for authenticating, in which case the users and passwords are created during system configuration and cannot be managed in NM10.

To log in for the first time:

- 1. Open a web browser and go to the following address:

Remote connection:

https://<web_server_name>/nm10/login

where <web_server_name> = the IP address, or the name of the web server.

Local connection:

https://localhost/nm10/login

Or click the NM10 icon on the desktop: 

2. If logging in for the first time and a signed certificate has not been imported to the system, the browser may indicate that the connection is untrusted. Go through the browser-specific steps of indicating that that connection is trusted, for example, by confirming a security exception.

- For information on certificates and instructions for creating a Certificate Signing Request (CSR), see [Creating Certificate Signing Request \(CSR\) \(page 185\)](#).
- Deal with any other browser messages as instructed by your IT department. See also [Browser requirements \(page 53\)](#).

3. Log in using the root-level administrator credentials to be able to configure the system:

- If the root-level administrator password was already changed during delivery, check from your delivery documentation what the current administrator password is and log in using the password.
- If the password was not yet changed, log in with the default password:
 - Default root-level administrator user name: **admin**
 - Default root-level administrator password: **#4dMin:36,**



The password is case-sensitive and contains special characters, including the comma character.

You are redirected to a page where you must change the password.

4. Change the password as explained in [Changing root-level administrator password \(page 53\)](#).
5. Log in with the new password.

When you successfully log in for the first time, the desktop pages common to all users are displayed. If you have logged in before, the page that you last viewed before logging out is displayed.



A maximum number of simultaneous users may have been defined. If the maximum number is exceeded, you may not be able to log in until another user logs out.

5.1 Browser requirements

This software works best with the latest versions of Microsoft Edge and Google Chrome.

5.2 Changing root-level administrator password

The system forces you to change the default root-level administrator password when logging in the first time.



CAUTION! To maintain the sufficient level of security, change the root-level password often.

- ▶ 1. In the application header, select **Admin**.
- 2. Select **User > My Profile**.
- 3. Select **Reset password**.
- 4. In the **Change password** window that opens, enter the old password, the new password, and confirm the new password.
 - If you try to create a password that does not match the defined password requirements, the system will prompt you to edit the password.
 - As a root-level administrator you can also configure the password requirements for all the passwords created in the system. Go to **User > Password Configuration**.
- 5. Select **Save**.

6. Take note of the new password and save it securely. If you lose or forget the password, you may have to reinstall NM10 software and you may lose all the data in your system.



CAUTION! Make sure there is a root-level administrator with a known password at all times. Without this, you may have to reinstall the NM10 software and all the data may be lost. If needed, contact Vaisala for resetting the password.

7. Log in with the new password.

5.3 Viewing pages as guest user

The system typically enables viewing the pages without logging in:

- ▶ 1. Enter the address in the following format:
https://<web_server_name>/nm10/
- 2. You can now view the pages with limited access to the software features.



If you accidentally access the software using this address, you can still log in with your user name by clicking the **Login** button in the application header.

More information

- [User roles and types \(page 59\)](#)
- [Managing users \(page 154\)](#)

5.4 Logging out and changing user

To log out, select **Logout** in the application header. The changes you have made are saved and they will be available the next time you log in (this is not available for guest users).

The login page is displayed and you can log in with another user name.

Root-level administrators can also log out other users.

6. Getting started with web user interface

6.1 NM10 web user interface basics



After installation, NM10 web user interface is displayed with a set of default pages and settings, which depend on the installation setup type and the purchased licenses.

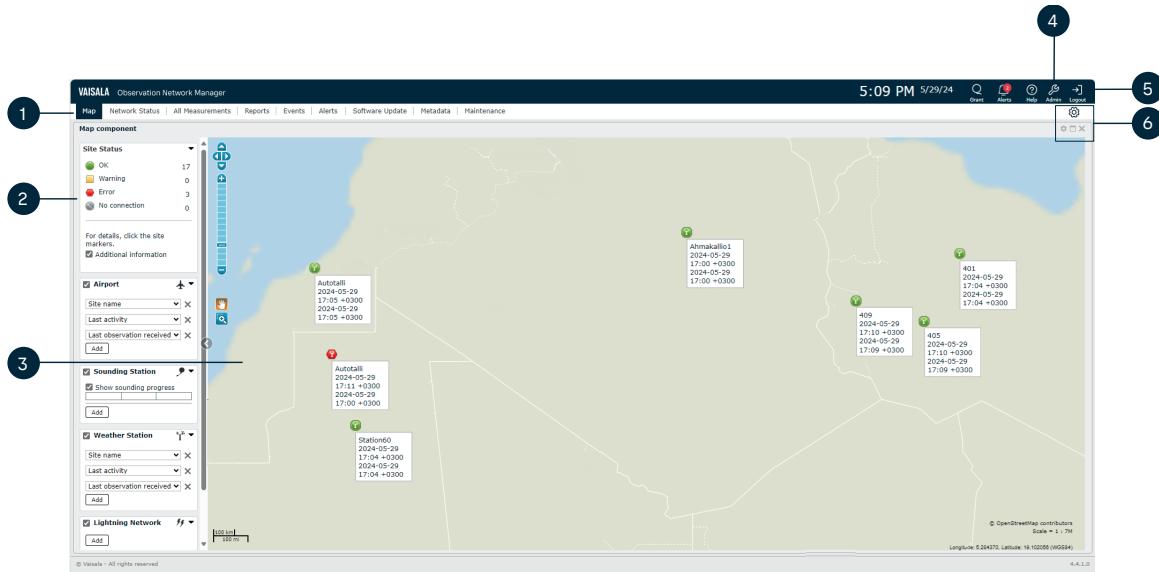


Figure 3 NM10 web user interface (example)

- 1 Tabs for accessing the pages
- 2 Side panel for showing site status and selecting the displayed data, and the related legends
- 3 Main page area, for example, map
- 4 Access to administrator pages, for example, for adding the weather station sites
- 5 Application header, for example, for selecting site group or organization, accessing help pages and logging in and out
- 6 Icons for adding and editing pages and components



The content and options are different depending on the available software feature licenses.

6.2 Application header

Application header is located at the top of the application. It contains the application name and the options available for your user type and the activated licenses.



The content and options are different depending on the available software feature licenses.

Table 7 Application header elements

Icon	Element	Description
-	Site group or organization name and selection list	When available, shows the organization name and a list of the available site groups or organizations that you can select to display.
-	Time and date	Time and date are displayed at the top of the screen, in the time zone defined in the user profile. The time zone used is indicated with the +/- UTC marking.
Q	Inactive balloon release indicator	Indicates that no AUTOSONDE sites are waiting for the permission to release a balloon.
Q ² Q ²	Active balloon release indicator	Indicates the number of AUTOSONDE sites that are waiting for the permission to release a balloon. Users with AUTOSONDE operator role can give the permission by clicking the Grant button.
L ³	Indicator for alarm/error-level alerts	Indicates that there are new active alarm/error severity alerts. To see the alerts, click the icon and the Alerts view is displayed.
L ³	Indicator for warning-level alerts	Indicates that there are new active warning severity alerts. To see the alerts, click the icon and the Alerts view is displayed.
L ³	Indicator for info-level alerts	Indicates that there are new active info severity alerts. To see the alerts, click the icon and the Alerts view is displayed.
L ³	Indicator for debug-level alerts	Indicates that there are new active debug severity alerts. To see the alerts, click the icon and the Alerts view is displayed.
L ²	Indicator for active alerts	Indicates that there are active alerts but the user has already clicked the icon and seen the alerts in the Alerts view.
!	Indicator for inactive alerts	Indicates that there are no active alerts in the Alerts view.

Icon	Element	Description
(?)	Help	Opens the online help start page.  For the administrator-level users there are also help icons in the administrator view at the top corner of each page. When you click these icons, the online help page that is the most relevant to the specific page opens.
🔧	Admin	Opens the administrator view.
↶	Exit Admin	Exits the administrator view and opens the desktop view.
→]	Logout	Logs you out of NM10.
→]	Login	Opens the page for logging in. When viewing the pages as a guest user, click the Login button to log in with a user name.

6.2.1 Changing site group or organization

If configured in your system, you can change which site group or organization is displayed. Root-level administrators have created the organizations and the view contexts that define which selections are available for you. The view contexts can contain for example site groups based on geographical or administrative areas.

- ▶ 1. If you belong to several organizations, you can select the organization in the application header.
The desktop and the visible sites might change depending on the configuration.
- 2. If the organization contains several view contexts, you can select the view context in the application header. The view context list can contain for example site groups based on geographical or administrative areas.
The visible sites typically change, depending on the configuration.



If the lists are not shown, or do not contain the content you expect, make sure that you are logged in with the correct username.



The selection affects all views. For example, alerts and events will be shown only for the sites that are part of the selected organization or group.

More information

- [Creating custom site groups \(page 99\)](#)
- [Adding new View Contexts \(page 159\)](#)

6.2.2 Sounding notifications

In sounding systems, notification messages may be displayed on top of the application header and other page content.

If configured, an audio message consisting of a beep sound and a prerecorded spoken message is played.

6.2.3 Granting permission for AUTOSONDE balloon release

When there are AUTOSONDE sites waiting for the permission to release a balloon:

- the balloon release icon is activated in the application header
- the radiosonde launch permission window is displayed.

- 1. In the launch permission window, click the **Grant** button for the site you want to grant the permission. The permission is forwarded to the AUTOSONDE site and the balloon will be released.



Users with AUTOSONDE operator rights can grant the permission.

2. Repeat for other AUTOSONDE sites, if needed.

6.3 Application toolbar (Desktop view)



In translated documentation the English names are used for the main views. These view names also remain in English in the localized software until configured by Vaisala or customer during system delivery.

In addition, for administrator-level users, the application toolbar contains the options icon for adding and removing pages and their components:

Add Portal Page

Opens a window for adding a new page without tabs.

Add Tabbed Page

Opens a window for adding a new page with tabs.

Copy Page

Copies the active portal page.

Edit page

Opens a window for modifying pages.

Move Page

Opens a window for moving the page.

Remove Page

Deletes the active page.

Add New Component

Opens a window for adding new components to the active page.

6.4 User roles and types

There are 5 user roles: **user**, **administrator**, **AUTOSONDE operator**, **IO terminal operator**, and **guest**.

There are 2 types of **administrator** users:

- Root-level administrator: Administrator of the root organization, with the widest set of user rights.
- Organization-level administrator: Administrator at organization-level, with a more limited set of rights inside their organization.

One user can have several roles, for example, **administrator** and **AUTOSONDE operator**.

Depending on your user role and type, different features are available in the software. The following table lists possible user rights for each user role and type.



The features are available depending on the activated software feature licenses.

Table 8 User roles and types

User role and type	Description
user	Users can, for example: <ul style="list-style-type: none"> • Access the available pages and select the displayed parameters. • Add maintenance tasks. • Create reports and delete their own reports. • Change their own password. • Edit their own personal information (user profile).
AUTOSONDE operator	AUTOSONDE operators can: <ul style="list-style-type: none"> • Grant a permission for balloon launch in AUTOSONDE stations. • Access the available pages and select the displayed parameters. • Change their own password. • Edit their own personal information (user profile).

User role and type	Description
IO terminal operator	IO terminal operators can use the terminal connection to monitor the messages from weather stations and send commands to the stations. Administrators have this role by default.
administrator , at root level	Root-level administrator can configure the system, for example <ul style="list-style-type: none"> • Add and edit organizations and users. • Change the passwords for all users. • Modify the user interface (pages and page components) for all users. • Add and edit weather stations and other observation sites, and manage the related settings. • Manage system settings. • Restart the data management unit of the sites that use the LwM2M device management (for example, RWS200 and AWS810). • Update data management unit software of the sites that use the LwM2M device management (for example, RWS200 and AWS810).
administrator , at organization level	Organization-level administrators can, for example: <ul style="list-style-type: none"> • Modify the user interface (pages and page components) in their organization. • Add and edit users in their organization. • Change the passwords for the users in their organization. • Restart the data management unit of the sites that use the LwM2M device management (for example, RWS200 and AWS810). • Update data management unit software of the sites that use the LwM2M device management (for example, RWS200 and AWS810).
guest	Guest users can: <ul style="list-style-type: none"> • Access the available pages and select the displayed parameters. <p>The guest role enables viewing the pages without logging in. See Viewing pages as guest user (page 54).</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;">  <p>CAUTION! The pre-configured guest user with the guest role must not be deleted, unless specifically instructed by Vaisala. The guest role should not be assigned to other users.</p> </div>

More information

- [Viewing pages as guest user \(page 54\)](#)
- [Managing users \(page 154\)](#)

6.5 Web user interface components

Depending on the configuration, the web user interface can consist of the following views and components:

- Application header: Site group or organization selection, alert indication, balloon release indicator for AUTOSONDE sites, access to administrator pages, access to online help, and logout.
- Application toolbar: For selecting between the available views.
- **Map** view: Map with site markers indicating the available observation sites, their status, and the selected parameters.

- **Network Status** view: The status of the whole network, including observation sites, communication devices, and servers.
- **All Measurements** view: The available and selected data from the observation sites.
- **Site Details** window: Detailed information from the site, depending on the site type and system configuration.
- **Reports** view: For creating reports from the available data.
- **Events** view: The preconfigured and available events, including events from sites and events from NM10 system applications and services.
- **Alerts** view: The preconfigured and available alerts from sites and system alerts.
- **Wind widget** component: A wind display component displaying the selected wind variables from the selected observation site in wind rose format.
- **Chart component**: The selected variables from the selected observation site in graph format.
- **Text Observation Widget**: The latest observations in text format for the configured parameters.
- **Web Component**: A preconfigured embedded web site.
- **Software Update** view: For updating the firmware when LwM2M device management is in use, for example RWS200 data management unit (DMU703) and AWS810 (DMU801).
- **Metadata**: A component for viewing metadata from observation sites, when available.
- **Maintenance**: A component for viewing the maintenance tasks from observation sites, when available.
- Administrator view (**Admin**): User and system management.



Depending on your system configuration and activated licenses, the view names and content may differ from the ones described here.



In translated documentation the English names are used for the main views. These view names also remain in English in the localized software until configured by Vaisala or customer during system delivery.

6.6 Desktop view (Application toolbar)

To access the available pages in the NM10 desktop, select the view names in the application toolbar, located under the application header.

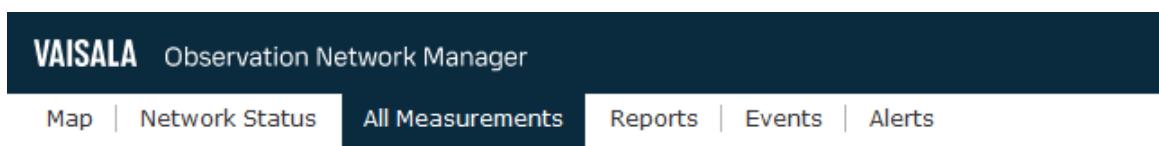


Figure 4 Application toolbar example (Desktop)



Depending on your system configuration and activated licenses, the view names and content may differ from the ones described here.



In translated documentation the English names are used for the main views. These view names also remain in English in the localized software until configured by Vaisala or customer during system delivery.

If you are currently in the administrator view, select **Exit Admin** in the application header to access the desktop view.

6.7 Administrator view

To enter the administrator view, select **Admin** in the application header. The available administrator view options are different for each user role.

The administrator view is not available for guest users.

Use the application toolbar located under the application header to select between the available administrator pages.

6.7.1 Administrator view for users

Users with the user role **user** have only access to their own user information.

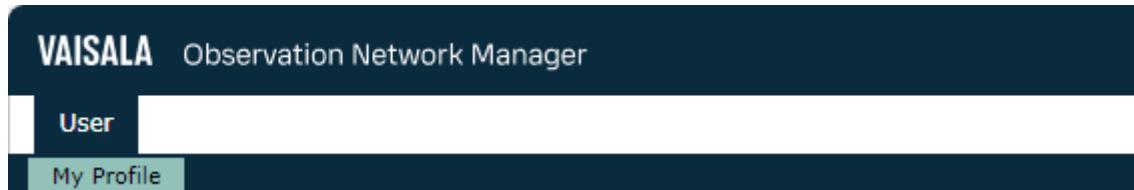


Figure 5 Administrator view for users

6.7.2 Administrator view for organization-level administrators

For organization-level administrators, only the **User** tab is available, for example, for creating new users.

Username	State	Email	First name	Last name	Organizations and roles
admin	Active	admin@vaisala.com			root (administrator)
guest	Active	guest@vaisala.com			root (guest)
user	Active	user@vaisala.com			VONM (user)

Figure 6 Administrator view for organization-level administrator

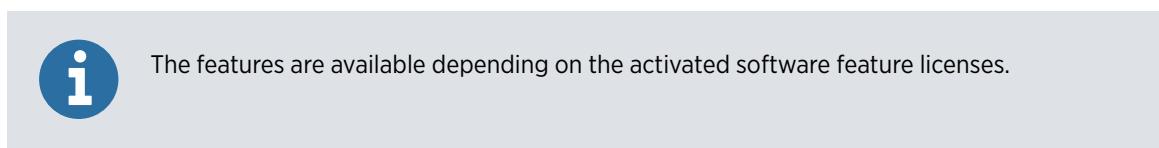
6.7.3 Administrator view for root-level administrators

Several options are available for root-level administrators, depending on the activated licensed features:

Configuration name	Message type	Header type	Actions
DEFAULT_AWS310_CS	Tagged_CS		Edit Delete
SMSAWS 2.0 (auto)	SMSAWS_2.0		Edit Delete
SMSAWS 2.1 (auto)	SMSAWS_2.1		Edit Delete

Figure 7 Example administrator view for root-level administrator

For root-level administrators, the administrator view can contain some of the following:



- **Info** tab: quick instructions for configuring a new standard small Observation Network Manager system.
- **Map** tab, for configuring the map server address and for selecting which map layers are displayed (rarely needed).
- **Application** tab, for managing applications and application subscriptions, which are used for mapping the application (desktop) with organizations.
- **View Context** tab, for defining what site types are visible in the desktop.
- **System** tab, for example, for viewing logged-in users, managing monitored servers, and configuring file transfer jobs and time synchronization.
- **Events and alerts** tab, for configuring system alerts, congestion control for events, email notifications and sounding notifications.

- **User** tab, for creating and editing users and organizations and for modifying password requirements and account lockout policy.
- **Sites** tab, for adding and configuring weather stations and other sites.
- **Observations** tab, for managing observation-related parameters, such as post collection settings. Also for creating observation message parsers.
- **Storing policy** tab, for managing the storing policy for different data and file types.
- **Quality control** tab, for defining the quality control configurations.
- **Security** tab, for managing the authentication keys for the connection between sounding stations and Network Manager systems.



CAUTION! Modification of the system configuration is only allowed after receiving a specific permission and instructions from Vaisala.



CAUTION! Unauthorized editing of configuration files (.INI files) can result in data loss and incorrect operation of the NM10 system. Vaisala assumes no liability for system errors caused by unauthorized editing of the configuration files.

6.7.4 Working with administrator view

In the administrator pages, certain actions are typically available for the different components.

6.7.4.1 Searching

- 1. Select the applicable tab, for example, **Users**.
2. In the search field(s) at the top of the page, enter the name of the component. In some pages, you can use different search criteria, for example, organization, role, or user name.
3. The matching components are displayed in a table. The table columns contain relevant information for each component type.

To show all components again, empty the **Search** field.

6.7.4.2 Editing details

Once the component you are looking for is displayed in the table, you can edit it:

- 1. In the row for your chosen component, select **Edit**.
2. Edit the component details as needed.
3. Select **Save**.

6.7.4.3 Creating new

- 1. Select **Add New...** at the top of the page, for example, **Add new user**.

2. Edit the component details as needed.
3. Select **Save**.

6.7.4.4 Deleting component

- 1. In the row for your chosen component, select **Delete**.
 2. Confirm the deletion.

6.8 NM10 software version

NM10 software version is displayed at the bottom of the NM10 login page and the NM10 web user interface pages.

6.9 Getting help in web user interface

Observation Network Manager web user interface includes online help pages that provide more information about the software. The following figure explains where you can find help when using the web pages.

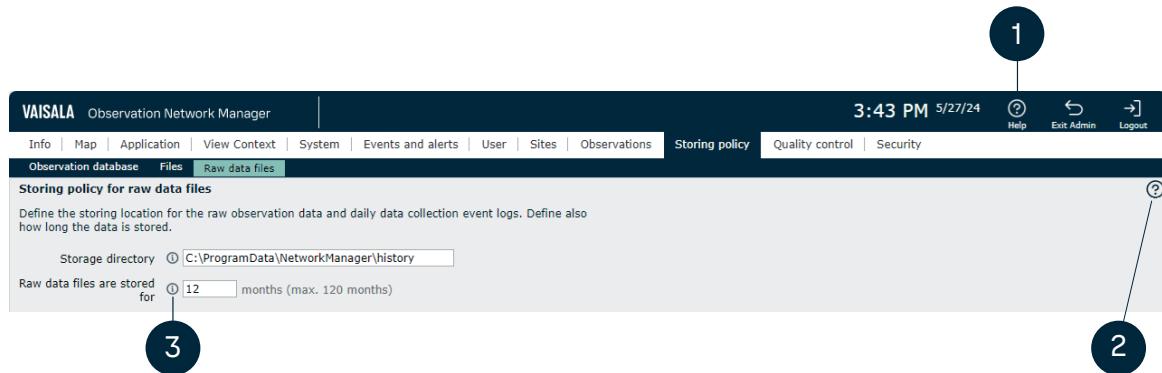


Figure 8 Help options

- 1 ⓘ Opens the online help from the start page.
- 2 ⓘ Opens the online help page that is the most relevant to the active page (in administrator view).
- 3 ⓘ Hovering the mouse over these icons opens short help texts relevant to the specific elements (in administrator view)



Depending on your organization and your user rights in the organization, you may have customer-specific options available that are not covered in this online help.

7. Configuring single-site display for surface weather

7.1 Single-site display for surface weather

If the setup type **Single-site installation** was selected during NM10 software installation, a set of widgets is automatically displayed in the NM10 web user interface.

You just need to select the site for the widgets and adjust the displayed parameters to match the observation value parameters of the site.

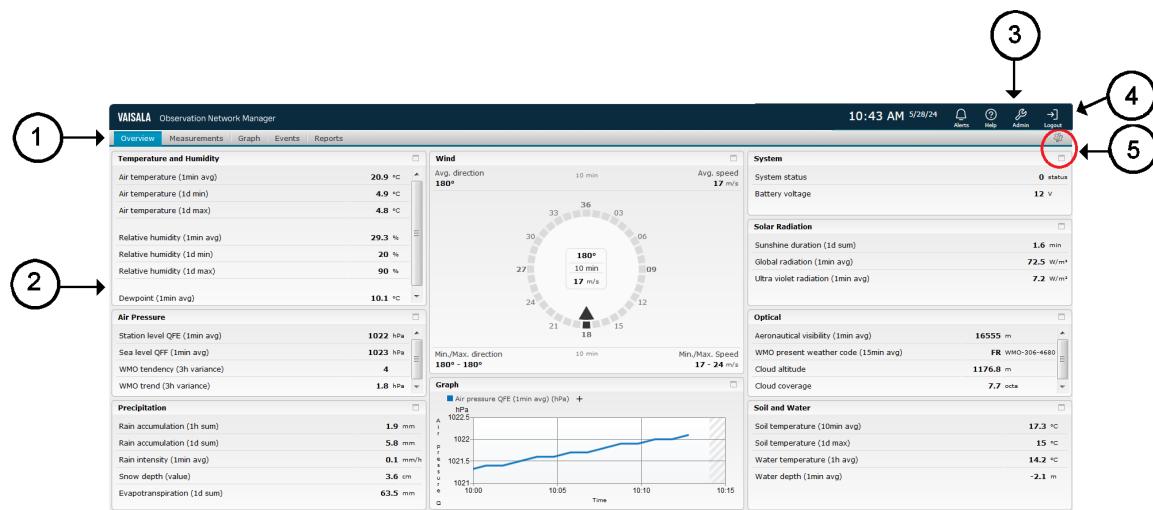


Figure 9 NM10 web user interface for single-site display (example)

- 1 Tabs for accessing the pages
- 2 Main page area: Displays the default values from the selected site when the weather station and communication settings have been configured correctly.
- 3 Access to administrator pages
- 4 Application header, for example, for accessing help pages and logging in/out
- 5 Icons for adding and editing pages, components, and widgets



The content and options are different depending on the available software feature licenses.

7.2 Selecting site for single-site display

The weather station and the needed communication devices and settings must have been configured correctly, and the weather station must send observations. If the site is not displayed, or if there is a problem with getting observations, see the **Events** view for information.

- ▶ 1. Log in as administrator.
- 2. Click the  icon at the top right corner of the widget.
- 3. In the configuration window, select the correct site.
- 4. Select **Save**.
- 5. Repeat for all the widgets.

7.3 Modifying single-site display

Modify the widgets to match the weather station parameters.



It is recommended to remove the unused parameters from the widgets (the parameters that do not receive observations).

- ▶ 1. Log in as administrator.
- 2. Click the  icon at the top right corner of the widget.
- 3. Adjust and remove unused parameters. Make sure the parameters match the site configuration.
- 4. Make any other needed modifications.
- 5. Select **Save**.

More information

- ▶ [Modifying text observation components \(page 149\)](#)
- ▶ [Modifying chart components \(page 146\)](#)
- ▶ [Modifying components \(page 145\)](#)

8. Configuration summary

The following describes the configuration tasks that you can perform in the Observation Network Manager (NM10) web user interface. Prior to this, the system parts must have been successfully installed and configured during system installation.

This section provides a quick overview of configuring the NM10 software for a larger system. This is typically done by Vaisala personnel.

After installing the NM10 software from the installation media, the default desktop views are in place, depending on the activated feature licenses. The default values and selections are used for configuration options. The VONM (Vaisala Observation Network Manager) organization has been created automatically, together with the related application and application subscription. The organization includes one root-level administrator.

- ▶ 1. Add the sites to the system by selecting **Admin > Sites**.



Some site types are automatically added after the site and other required components have been correctly configured.

- 2. Check and define the needed site configuration elements on the following pages:
 - Define the message parser configurations in the **Observations > Message parser** page.
 - Define the time synchronization settings in the **System > Time synchronization** page.
- 3. Depending on the available licensed features, check and modify the following:
 - Define the quality control configurations in the **Quality control** page.
 - Define the data post collection settings for the sites in the **Observations > Post collection** page.
- 4. Return to the **Sites** tab to link the defined configuration elements to the sites, as needed.
- 5. Define the data storing practices for different data types in the **Storing policy** page.
- 6. Define how observation data is exported into CSV format in the **Observations > CSV export** page.

7. Create the needed organizations:
 - a. Create the new organizations in the **User > Organizations** page.
 - b. For each organization, create a new application that defines the available desktop pages in the **Application > Applications** page. You can copy the VONM application with its desktop, create a new application with an empty desktop, or, if you have exported an existing application, import it as a basis.
 - c. Link the applications with the organizations by creating the application subscriptions in the **Application > Application Subscriptions** page.
 - d. Create the view context subscription that links the view context with the application subscription in the **View Context > View Context Subscriptions** page. You can select the default view context that contains all site types, or you can create a new view context with only one site type visible. If the users need to be able to select which site group to view, create the site groups and use view contexts to link them to the organization.
8. Create at least one administrator-level user into every new organization in the **User > Users** page. The organization-level users can then add users and edit the desktop pages in their organizations.
9. Configure the common system parameters related to passwords and logging in the **User > Password Configuration** page and in the **User > Identity Configuration** page.
10. Define event-related settings:
 - Define how emails are sent about events, in the **Events and alerts > Email** page.
 - Define how system is protected from congestion caused by a large number of events, in the **Events and alerts > Event Limitation** page.
11. If available in your system, define the rules for generating certain system alerts, in **Events and alerts > System alerts**.
12. Define which servers or other network equipment are monitored, in the **System > Servers** page.
13. If you use the map server provided with the system, there is no need to update the map server address. If another map server is used, change the map server address in the **Map > Map Layers** page.

For details, see the individual instructions for each phase.

9. Adding and editing sites

You can add and edit weather stations and other sites to the system on the **Sites** tab in the administrator view.

Depending on your system, you may have several types of sites configured. Select the page that matches your site.

If you have a single-site display for surface weather, see [Single-site display for surface weather \(page 66\)](#).



Before the sites can be added in the NM10 system, they must match the site configuration requirements.



You have to define the time synchronization, post collection, message parser configuration, and quality control on other pages. On the **Sites** pages you select which stations use these features.

More information

- [Weather observation sites \(page 16\)](#)

9.1 Adding weather station sites (AWS)

You can add automatic weather stations that send the data through a TCP server port, typically in SMSAWS message format (for example, AWS310 automatic weather stations, also when NM10 polls the stations). For more information, see the weather station documentation.

- ▶ 1. Select **Admin** in the application header.
- 2. Select **Sites > AWS** in the administrator view.
- 3. The page contains a prefilled station configuration for 1 site. To edit and enable the configuration:
 - a. Move the scroll bar to the right and select **Edit**.
 - b. Change the configuration, if needed. For explanations of the options, see the following steps.
 - c. Select the **Station in use** option.
 - d. Select **Save**.
- 4. To add another site, select **Add new station**. The station configuration window is displayed.

5. In **Station configuration**, add the station configuration information, as applicable:

Station in use

Select this to take the station into use.

Station ID

A unique name for the station. The name can contain letters, numbers, and the following special characters: underscore (_), period (.), comma (,), semicolon (;), colon (:), hash (#), hyphen (-), and space. The length must be between 1 and 100 characters.

If the station sends SMSAWS messages with headers, the ID must match the ID part of the frame header of the SMSAWS message. For example, if the frame header is <SOH>SMS 401<STX>, the station ID must be 401.

Connection mode

Select the connection mode of NM10:

Client

Select this when NM10 polls the station (NM10 opens the connection to the station).

Server

Select this when the station sends data to NM10. NM10 functions as the server and listens to incoming messages from the station. Firewall settings must allow this.

Address

If you selected **Client** in **Connection mode**, enter the host name or IP address of the station to be polled.

TCP port

The port used for communicating with the station. Accepted values are between 1024 and 65535.

When the connection mode is **Server**:

- One TCP port can be used for several sites only when the frame decoder is **SMSAWS with header**.
- With other frame decoders use one port for one site only.

Time sync

When available and applicable, select time synchronization for the station. It is needed for keeping the station clocks on time only when there is no GPS or NTP time synchronization available. If needed, define the settings on the **System > Time synchronization** page.

Post collection

If you selected **Server** in **Connection mode**, select this to use post collection for the station.

This option is not available if you selected **Line (CSV)** or **SMSAWS without header** in **Frame decoding**. Define the post collection settings on the **Observations > Post collection** page.



This feature is a licensed option. It is available only with the applicable software feature license.

Custom location

If the station does not send location information, select this and type the information in the fields provided.

6. In **Message configuration**, depending on the connection type you selected, enter the following:

Message creation interval

The message creation interval that the station uses. This information is needed for data quality calculations.

Interval of sending message(s)

The message sending interval that the station uses when sending messages in bursts.

Polling interval

The interval used for polling the station.

Polling message

The type of the polling message used.

Custom polling message

The customized message used for polling the station.

Frame decoding

Select the type of frame decoding, depending on the message format:

SMSAWS with header

Frame decoder for SMSAWS messages with header, for example:

```
<SOH>SMS 401<STX>(S:MAWS;D:100622;...RH|VALUE||2||  
SCODE|:0;)<CR><LF><ETX>
```

SMSAWS without header

Frame decoder for SMSAWS messages without header, for example:

```
(S:MAWS;D:100622;....;WD|VALUE||10||deg|:52;)A0BEEF66
```

Line (CSV)

Frame decoder for the following message types:

```
$,TAAVG1M,14.8,TAAVG1H,8.1,TAAVG1D,15.3,TAMIN1D,4.9,TAMAX1D,4.8  
,*EA87<CR><LF>
```

7. Select if **Checksum** is used and select the type of checksum calculation, when applicable.

CRC16_X25

For CSV messages.

SMSAWS2.1

For SMSAWS messages.

CUSTOM

Custom checksum defined in file: *NetworkManager/jdcp_conf/CustomChecksum.properties*.

8. Select which **Observation Message Parser** configuration is used for the station.

DEFAULT_AWS310_CSV

For stations that send the reports in tagged CSV format.

SMSAWS 2.0 (auto)

For stations that send the reports in the standard SMSAWS 2.0 message format.

SMSAWS 2.1 (auto)

For stations that send the reports in the standard SMSAWS 2.1 message format.

If there is no matching message parser to choose from, go to **Observations > Message parser** tab to create or edit an observation message parser configuration. Then return to the tab to take the observation message parser configuration into use.

9. Under **Quality control**, select the quality control configuration that the station supports.

If there are no matching quality control configurations to choose from, go to the **Quality control** tab to create or edit them. Then return to take the quality control configuration into use.



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- Under **BUFR configuration**, when applicable, enter the following:

Enabled

Select to take BUFR report generation into use.

WMO block number

Block number assigned by WMO and listed in *OSCAR/Surface* system.

WMO station number

Station number assigned by WMO and listed in *OSCAR/Surface* system.

WMO station type

Station type code as defined in *BUFR/CREX Code and Flag Tables*, table 0 02 001.



For sending the BUFR reports also the BUFR service and the BUFR file transfer job must be configured.

- Select **Save**.



Make sure the **Station in use** option is selected.

- In a few minutes, the station is added to the system and displayed in the desktop applications.
- Select **Exit Admin** in the application header.
 - Check that the station with observation data is displayed in all the relevant pages available in your system. If the station or data is not displayed, check the **Events** view for messages.



Data is received from the station only after a valid message parser has been defined. If there are problems with parsing, an event is displayed in the **Events** view. You can modify the message parser on the **Observations > Message parser** page.

More information

- [SMSAWS 2.0 Message Format \(page 187\)](#)
- [SMSAWS 2.1 Message Format \(page 193\)](#)

9.1.1 Standard AWS310 default settings

One standard AWS310 weather station site configuration is automatically added to NM10 site settings.

The following lists the default site configuration settings used in NM10, displayed on the **Admin > Sites > AWS** page.

Typically there is no need to change the settings with AWS310. If making changes, wait a while for the settings to take effect (by default 1 minute, the sending interval from the weather station). Note that the AWS310 configuration must match the changed settings.

Station in use

Must be selected.

Station ID

AWS310

Connection mode

Server selected. The station sends data to NM10. NM10 functions as the server and listens to incoming messages from the station. Firewall settings must allow this.

TCP port

50000

Time synchronization

Not selected by default. Time synchronization is needed for keeping the station clocks in time only when there is no GPS or NTP time synchronization available. If this is needed, select this option and define the settings on the **System > Time synchronization** page.

Custom location

Not selected by default. Select this only if needed, and enter the location information.

Message creation interval

The message creation interval that the station uses. By default, 1 minute.

Interval of sending message(s)

By default, 0 seconds, meaning that messages are not sent in bursts.

Checksum

Selected, and the **CRC16_X25** checksum calculation type selected.

Frame decoding

Line (CSV) selected.

Observation Message Parser

DEFAULT_AWS310_CSV selected.

9.2 Adding sites that send files (AWS Files)

You can add weather stations that provide the data as files, for example through (S)FTP servers. Other available options are through satellite (DRGS) or using the file system (manually copying files to the folder).

The required (S)FTP server applications have to be installed and configured, and the weather station has to be configured accordingly. For more information, refer to the weather station documentation. For SFTP, the Bitvise server requires a license.

- ▶ 1. Select **Sites > AWS Files** in the administrator view.
- 2. Select **Add new station**.

3. Under **Station configuration**, add the station configuration information, as applicable:

Station in use

Select this to take the station into use.

Station ID

A unique name for the station. The name can contain letters, numbers, and the following special characters: underscore (_), period (.), comma (,), semicolon (;), colon (:), hash (#), hyphen (-), and space. The length must be between 1 and 100 characters.

Custom location

If the station does not send location information, select this and type the information in the fields provided.

LwM2M ID

Only if LwM2M device management is used for AWS810, enter the LwM2M ID.

Format: *urn:dev:ops:16961-DMU801-<DeviceSerialNumber>* The device serial number is available in AWS810 documentation, for example in the AWS810 activation guide.

4. Under **Message configuration**, enter the following:

Observation Message Parser

Select which observation message parser is used for the station.

If there is no matching observation message parser to choose from, go to the

Observations > Message parser page to create or edit a configuration. Then return to take the observation message parser configuration into use.



Data is received from the station only when a valid message parser configuration has been defined.

5. Under **Connection Settings**, enter the following:

Connection mode

Always **File transfer**.

File transfer type

The file transfer type used, for example, **FTP**, **SFTP**, **DRGS**, or **File system** (= files are manually copied to the folder)

Directory

The specified (S)FTP server directory where the files are transferred to and which is being polled.

File filter

The type of the files to be included, for example, *** .msg**.

Message creation interval

The message creation interval that the station uses. This information is needed for data quality calculations.

Polling interval

The interval of polling for new files in the specified (S)FTP server directory.

Interval of sending message(s)

The message sending interval that the station uses when sending messages in bursts.

Multiline message

Select this if the file must be processed row by row instead of a whole file.

6. Under **Quality control**, select the quality control configuration that the station supports.

If there are no matching quality control configurations to choose from, go to the **Quality control** tab to create or edit them. Then return to take the quality control configuration into use.



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7. Under **BUFR configuration**, when applicable, enter the following:

Enabled

Select to take BUFR report generation into use.

WMO block number

Block number assigned by WMO and listed in *OSCAR/Surface* system.

WMO station number

Station number assigned by WMO and listed in *OSCAR/Surface* system.

WMO station type

Station type code as defined in *BUFR/CREX Code and Flag Tables*, table 0 02 001.



For sending the BUFR reports also the BUFR service and the BUFR file transfer job must be configured.

8. Select **Save**.



Make sure the **Station in use** option is selected.

In a few minutes, the station is added to the system and displayed in the desktop applications.

If the station is not displayed or no data is received, check the weather station configuration, (S)FTP server configuration, license for SFTP server (Bitvise), and observation message parser configuration.



You can also later edit this site configuration, for example, to choose from the created quality control configuration.

9.3 Adding and editing sites using LwM2M

The weather stations that have been configured to connect and register to the LwM2M management server are automatically displayed in NM110 when management server has been correctly configured. You can open the site configuration for editing.

- ▶ 1. Select **Sites > LwM2M** in the administrator view.
- 2. Find the site from the list, or use the search field.
- 3. Click **Edit** in the corresponding row. You may have to scroll to the right to see the text.

- Under **Station configuration**, add the station configuration information:

Station in use

Select this to take the site into use.

Commissioning date

Enter the commissioning date of the weather station.

Station ID

Automatic station ID.

Custom Web UI address

Select this if you want to override the automatic web user interface link.

Custom location

If the station does not send location information, select this and type the information in the fields provided.

Block alerts

When needed, select this to block alerts from the station.

Reason for blocking

Write the reason for blocking the alerts, for example, Maintenance.

Alerts blocked until

Select or type the end date for blocking. The default end time for blocking is 23:59. If needed, type another time.

- In **Message creation interval**, enter the message creation interval that the site uses. By default, 1 minute. This information is needed for data quality calculations.
- Under **Quality control**, select the quality control configuration that the station supports.

If there are no matching quality control configurations to choose from, go to the **Quality control** tab to create or edit them. Then return to take the quality control configuration into use.



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7. Under **BUFR configuration**, when applicable, enter the following:

Enabled

Select to take BUFR report generation into use.

WMO block number

Block number assigned by WMO and listed in *OSCAR/Surface* system.

WMO station number

Station number assigned by WMO and listed in *OSCAR/Surface* system.

WMO station type

Station type code as defined in *BUFR/CREX Code and Flag Tables*, table 0 02 001.



For sending the BUFR reports also the BUFR service and the BUFR file transfer job must be configured.

8. Select **Save**.



Make sure the **Station in use** option is selected.

9. Select **Exit Admin** in the application header.
10. Check that the station with observation data is displayed in all the relevant pages available in your system. If the station or data is not displayed, check the **Events** tab for relevant messages.

9.4 Adding road weather station sites

You can add road weather stations that provide the data using Datex II or XML DTO (Vaisala RWS200 road weather stations), MES14 (Vaisala RoSA/DSC road weather stations), or UMB interface (Lufft road weather stations).

- ▶ 1. Select **Sites > Road Weather Stations** in the administrator view.
- 2. Select **Add new station**. The station configuration window is displayed.

3. Add the station configuration information, as applicable:

Station in use

Selected: Take the station in use.

Not selected: Add the site configuration, but do not take the station in use yet.

Select a suitable reason from the list.

Commissioning date

Enter the commissioning date of the weather station.

Interface

Select the interface used for getting data from the road weather station.

Station ID

For **Datex II (Vaisala RWS200)**: There is no field for typing the station name or ID. The station ID is added automatically after receiving data from the station for the first time.

For other interface options: Type a unique name that will be displayed as the site name in NM10. The name does not have to match the name in the message received from the station. The name can contain letters, numbers, and the following special characters: underscore (_), period (.), comma (,), semicolon (;), colon (:), hash (#), hyphen (-), and space. The length must be between 1 and 100 characters.

Polling interval

The interval for polling the station.

Address

The IP address or the domain name of the station. The address must be in the *https://* format. If you type *http*, the system changes it into *https* automatically.

Port

The number of the port used for polling.

Username

(RWS200 only) The administrator username needed to access the station, as defined in the station configuration for that station.

Password

(RWS200 only) The password needed to access the station, as defined in the station configuration for that station.

Custom location

(RWS200 only) If you want to override the location information sent by the station, select this and type the information in the fields provided.

Latitude, Longitude, Altitude

Type the location information.

4. When needed, select **Block alerts** to block alerts from this station.

Reason for blocking

Write the reason for blocking the alerts, for example, Maintenance.

Alerts blocked until

Select or type the end date for blocking. The default end time for blocking is 23:59. If needed, type another time.

5. With the **Site Images** option you can upload images to be shown in the **Site Details** window. First you have to save the site configuration. See [Adding site images \(page 83\)](#).
6. Under **Connected sensors**, select the sensors that are connected in this road weather station.

Template

(When available) Select the metadata template supported by this station's sensors.

Add sensor

Select **Add** to add a sensor. The list shows the sensors that have not yet been added.

Also define if the sensor is active or inactive. If the sensor is defined as inactive, missing sensor alert is not created about that sensor even if it is missing.

Additional information

(When available) Enter additional information, when applicable.

Add all the needed sensors. This list of sensors is used when generating alerts about missing sensors, if configured in **System alerts**.

7. In **Additional information**, select the additional information template supported by this station and enter the additional information in the available fields.
8. Under **Quality control**, select the quality control configuration that the station supports.

If there are no matching quality control configurations to choose from, go to the **Quality control** tab to create or edit them. Then return to take the quality control configuration into use.



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- Under **BUFR configuration**, when applicable, enter the following:

Enabled

Select to take BUFR report generation into use.

WMO block number

Block number assigned by WMO and listed in *OSCAR/Surface* system.

WMO station number

Station number assigned by WMO and listed in *OSCAR/Surface* system.

WMO station type

Station type code as defined in *BUFR/CREX Code and Flag Tables*, table 0 02 001.



For sending the BUFR reports also the BUFR service and the BUFR file transfer job must be configured.

- Select **Save**.

In a few minutes, the station is added to the system and displayed in the desktop applications. When using **Datex II (Vaisala RWS200)** protocol, the station name is added after receiving data from the station for the first time.



You can also return later to edit the station configuration, for example, after creating quality control configurations to choose from, or to add images.

9.4.1 Adding site images

You can upload images to NM10 to be shown in the **Site Details** windows of the road weather station sites.

- ▶ 1. Make sure you have already created and saved the road weather station site configuration.
- 2. Select **Sites > Road Weather Stations** in the administrator view.
- 3. Find the site from the list and select **Edit** in the corresponding row.
- 4. Scroll down to **Site Images**.
- 5. Select and upload the images. Note the following:
 - The supported image format is .jpg
 - The maximum size of one image is 5 MB.
 - The maximum number of images is 5.
 - You can replace images by deleting old images.

The images are shown in the **Site Details** window, in the **Site Images** tab.

9.4.2 Importing sites from CSV file

You can add several new road weather stations sites in the system by importing the site configurations as a CSV file. The import does not override or modify the existing sites in the system. If the CSV file contains a site with the same Station ID or the same address and port combination as an existing site, the site is not imported.

- ▶ 1. Create the CSV file. The file must contain all the mandatory column headers and the data field values must be in the correct format.



You can download a CSV file template in the importing window. More information about the CSV file content and format is also available in the appendix about CSV file for site import.

- 2. Select **Sites > Road Weather Stations** in the administrator view.
- 3. Select **Import from CSV file**.
- 4. Browse to the CSV file that you want to import. You can also download a CSV file template as a basis for the file.
- 5. Enter the CSV separator, by default comma (,).
- 6. Select **Upload**.
- 7. If validation errors are displayed:
 - Take note of the listed errors.
 - Fix the issues in the CSV file.
 - Upload the fixed file again.
- 8. When the file is uploaded without errors, select **Import**.
- 9. When the import is complete, select **OK**.

The sites are now added in the system. If needed, you can edit them in the sites list.

More information

- ▶ [CSV file for site import \(page 201\)](#)

9.4.3 Exporting sites to CSV file

You can export the road weather station site configurations as a CSV file.

- ▶ 1. **Sites > Road Weather Stations** in the administrator view.
- 2. Select **Export to CSV file**.

The site configurations are saved in a comma-separated CSV file.

- 3. Depending on your browser and settings, you may have to save the file or the report is automatically saved on your computer.

The CSV file contains all road weather sites, filtering with search does not limit the number of sites. For security reasons, the passwords are not exported.

9.5 Adding sensor sites

For sensor site requirements, see [Sensor configuration requirements \(page 86\)](#).

To add sensor sites that provide the data through a TCP client socket, do the following:

- ▶ 1. Select **Sites > Sensors** in the administrator view.
- 2. Select **Add new station**.
- 3. Add the site configuration information, as applicable:

Station in use

Select this to take the sensor site into use.

Station ID

A unique name for the sensor site. The name can contain letters, numbers, and the following special characters: underscore (_), period (.), comma (,), semicolon (;), colon (:), hash (#), hyphen (-), and space. The length must be between 1 and 100 characters.

Sensor type

Select the sensor type. The displayed sensor types depend on the available licenses.

WXT: NM10 functions as the TCP client, connects to WXT, and polls WXT.

Ceilometer: NM10 functions as the TCP server. The ceilometer connects to NM10 and sends the data automatically.

Pluvio2: NM10 functions as the TCP client, connects to Pluvio², and polls it.

Address

The IP address or the domain name of the sensor site.

Port

The number of the port used for communicating with the sensor.

Custom location

If you want to override the location information sent by the sensor, select this and enter the information in the fields provided.

4. Under **Message configuration**, when applicable, enter the following:

Polling interval

The interval for polling WXT and Pluvio².

Message creation interval

The message creation interval that the ceilometer uses.

5. Under **Quality control**, select the quality control configuration that the station supports.

If there are no matching quality control configurations to choose from, go to the **Quality control** tab to create or edit them. Then return to take the quality control configuration into use.



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6. Under **BUFR configuration**, when applicable, enter the following:

Enabled

Select to take BUFR report generation into use.

WMO block number

Block number assigned by WMO and listed in OSCAR/Surface system.

WMO station number

Station number assigned by WMO and listed in OSCAR/Surface system.

WMO station type

Station type code as defined in *BUFR/CREX Code and Flag Tables*, table 0 02 001.



For sending the BUFR reports also the BUFR service and the BUFR file transfer job must be configured.

7. Select **Save**.



Make sure the **Station in use** option is selected.

In a few minutes, the sensor site is added to the system and displayed in the desktop applications.



You can also return later to edit the site configuration, for example, after creating quality control configurations to choose from.

9.5.1 Sensor configuration requirements

The sensor sites that provide the data through a TCP client socket must fulfill the following requirements.

Ceilometer configuration requirements

- Ceilometer model must be CL31 or CL51.
- Ceilometers must be configured to send data to NM10 in auto-send mode.
- Ceilometers must be configured to use data message 1 or 2 (NM10 supports data message subclasses 11, 15, 16, 18, 21, 25, 26, and 28).
- Ceilometers must be configured to use the operation mode **TCP Client Mode**, and to connect to the NM10 TCP server port that has been configured in NM10.

Pluvio² configuration requirements

The Pluvio² sensors must be configured correctly with the OTT Pluvio² operating software to support NM10:

- Communication interface: RS-485
- RS-485 protocol type: ASCII text retrieval
- Transmission parameters: according to the port server used (for example 9600 8N1)
- Temperature units: °C
- Intensity units: mm/h

In addition, the following is needed for generating the rain correction files for weather radar:

- The site must be enabled.
- The site must have valid location coordinates set.
- The site must provide hourly rain accumulation observations (Total Accumulation Non-Realtime precipitation observations).

WXT configuration requirements

The WXT transmitters must use the WXT NMEA message format. The following configuration options must be set in WXT configuration:

```
[Device]
Communication protocol=NMEA query

[Wind]
Use XDR in NMEA wind=XDR

[Wind message]
Direction minimum=Enabled
Direction average=Enabled
Direction maximum=Enabled
Speed minimum=Enabled
Speed average=Enabled
Speed maximum=Enabled

[PTU]
[PTU message]
Air temperature=Enabled
Pressure temperature=Disabled
Relative humidity=Enabled
Barometric pressure=Enabled

[Precipitation]
[Precipitation message]
Rain amount=Enabled
Rain duration=Enabled
Rain intensity=Enabled
Hail amount=Enabled
Hail duration=Enabled
Hail intensity=Enabled
Rain peak=Enabled
Hail peak=Enabled
```

The WXT NMEA message format may also contain data from additional sensors attached to WXT.

More information

- [Rain correction files \(page 96\)](#)
- [Creating file transfer jobs \(page 128\)](#)

9.6 Adding sites that send email

The weather station must be configured to send the observations in the correct CSV format (CSV Message Format for Iridium), with 1 observation message per connection, to the Iridium gateway. See the weather station documentation about configuring Iridium transmission.

The Iridium gateway delivers the received observations as file attachments to a predefined email address (one email account per weather station must be configured in Iridium service). Configuring the email accounts and the related data security is customer's responsibility.

To add weather station sites that provide the data as email attachments, for example, through a satellite (Iridium):



The required satellite and email server applications must be configured separately and the AWS site has to be configured accordingly.

- ▶ 1. Select **Sites > Email** in the administrator view.
- 2. Select **Add new station**.
- 3. Under **Station configuration**, add the station configuration information, as applicable:

Station in use

Select this to take the station into use.

Station ID

A unique name for the station. The name can contain letters, numbers, and the following special characters: underscore (_), period (.), comma (,), semicolon (;), colon (:), hash (#), hyphen (-), and space. The length must be between 1 and 100 characters.

Latitude, Longitude, Altitude

If the station does not send location information, type the location information in the fields provided.

- 4. Under **Email Server Configuration** enter the information needed to poll the email account where the station sends the data to.
- 5. Under **Message configuration**:

Message creation interval

The message creation interval that the station uses. This information is needed for data quality calculations.

Polling interval

The interval for polling the email account.

Observation Message Parser

Select which configuration is used for the station. For Iridium, select

Tagless_CSV

If there is no matching observation message parser to choose from, go to the **Observations > Message parser** page to create or edit a configuration. Then return to take the observation message parser configuration into use.

6. Under **Quality control**, select the quality control configuration that the station supports.

If there are no matching quality control configurations to choose from, go to the **Quality control** tab to create or edit them. Then return to take the quality control configuration into use.



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7. Under **BUFR configuration**, when applicable, enter the following:

Enabled

Select to take BUFR report generation into use.

WMO block number

Block number assigned by WMO and listed in OSCAR/Surface system.

WMO station number

Station number assigned by WMO and listed in OSCAR/Surface system.

WMO station type

Station type code as defined in *BUFR/CREX Code and Flag Tables*, table 0 02 001.



For sending the BUFR reports also the BUFR service and the BUFR file transfer job must be configured.

8. Select **Save**.



Make sure the **Station in use** option is selected.

In a few minutes, the station is added to the system and displayed in the desktop applications.



You can also return later to edit the station, for example, after creating quality control configurations to choose from.

9.7 Adding MOG sites

MOG (Multi-Observation Gateway) sites provide the data from the WXT and AQT sensors that are connected to the MOG communication unit. The MOG site will be automatically added and displayed in Network Manager when the MOG site has been correctly configured. The configuration includes adding the correct NM10 address, for example, `https://<example.com>:8443/endpoints/mog/100`. For more information on the correct configuration, refer to MOG documentation.

When Observation Network Manager receives the first message from the MOG site, the site configuration is created automatically. You can edit the configuration:

- ▶ 1. Select **Sites > MOG** in the administrator view.
- 2. Select **Add new station**. Or, if the site has been automatically added, open the site configuration from the site list.
- 3. Under **Station configuration**, add the station configuration information:

Station in use

Select this to take the site into use.

Station ID

The serial number received from the site as part of the message. This is automatically entered if a message has been received from the MOG site. You can also enter it in advance, just make sure that the numbers match.

Latitude, Longitude, Altitude

The location information.

- 4. Under **Message configuration**:

Message creation interval

The message creation interval that the site uses. By default, 1 minute. This information is needed for data quality calculations.

Interval of sending message(s)

The message sending interval that the station uses when sending messages in bursts. By default, 10 minutes.

- 5. Under **Quality control**, select the quality control configuration that the station supports.

If there are no matching quality control configurations to choose from, go to the **Quality control** tab to create or edit them. Then return to take the quality control configuration into use.



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6. Under **Measurement corrections**, enter the gain and offset measurement corrections for the parameters.

Measurement corrections

Measurement corrections can be used to make adjustments to the air quality measurements.

Take a supplementary measurement device, for example, AQT400 series, next to a reference measurement device for some time, and calculate the gain and offset corrections based on the difference between the supplementary and the reference observations.

All received air quality measurement values will be then corrected using the configured gain and offset values, and the received value shall be overwritten by the corrected one.

The values will be rounded to 3 decimals.

7. Under **BUFR configuration**, when applicable, enter the following:

Enabled

Select to take BUFR report generation into use.

WMO block number

Block number assigned by WMO and listed in OSCAR/Surface system.

WMO station number

Station number assigned by WMO and listed in OSCAR/Surface system.

WMO station type

Station type code as defined in *BUFR/CREX Code and Flag Tables*, table 0 02 001.



For sending the BUFR reports also the BUFR service and the BUFR file transfer job must be configured.

8. Select **Save**.



Make sure the **Station in use** option is selected.

In a few minutes, the station is added to the system and displayed in the desktop applications.



You can also return later to edit the station, for example, after creating quality control configurations to choose from.

9. Select **Exit Admin** in the application header.

10. Check that the station with observation data is displayed in all the relevant pages available in your system. If the station or data is not displayed, check the **Events** tab for relevant messages.

9.8 Adding and editing SensorThings sites

SensorThings sites are automatically displayed in NM10 when NM10 and the SensorThings API server have been correctly configured, including the correct URL of the SensorThings API server in NM10 configuration files. The SensorThings API server must have been correctly configured and conform to the OGC Implementation Standard "*OGC SensorThings API Part 1: Sensing*".

You can edit the SensorThings site configuration:

- ▶ 1. Select **Sites > SensorThings** in the administrator view.
- 2. Find the site from the list, or use the search field.
- 3. Click **Edit** in the corresponding row. You may have to scroll to the right to see the text.
- 4. Edit the site information, as applicable:

Thing ID

The "@iot.id" property of the Thing. Cannot be edited.

Description

The "description" property of the Thing. Cannot be edited.

Station in use

Must be selected to take the site into use.

Station ID

Automatically generated from the "name" property of the Thing. Can be edited.

Polling interval

Enter the interval for retrieving the data from the Thing's data streams on the SensorThings API server.

Custom location

The location created automatically from the Thing's location information. Can be edited. Location information is not updated when getting updates from the SensorThings API server.

Quality Control Configuration

A default quality control configuration is in use by default but it is empty. Go to the **Quality control** tab to modify it.



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5. Select **Save**.

6. The data from SensorThings sites will be displayed after a SensorThings message parser has been created in the system. If it does not exist yet, you can create it on the **Observations > Message parser** tab.

9.9 Adding airport sites

AviMet airport weather observation sites can be configured to send observations, events, state changes, and METAR and SPECI message reports in auto-send mode in the preconfigured schedule, typically through TCP/IP Socket. The schedule and XML data output must have been configured and activated during system delivery. AviMet system software version must be 7.1 or later.

- ▶ 1. Select **Sites > Airports** in the administrator view.
- 2. Enter the maximum number of airports that your system uses.
- 3. Enter the first TCP server port number that airports use for connecting to the system. The system completes the range based on the maximum number of airports you entered.
- 4. Select **Save**.

More information

- [Remote desktop connection \(page 166\)](#)

9.10 Adding web camera sites

NM10 includes the capability to receive status data from configured web camera sites. NM10 polls the web camera HTTP URL at a predefined interval. A valid jpg image file received from the web camera verifies that the connection is ok.

- ▶ 1. Select **Sites > Cameras** in the administrator view.
- 2. Select **Add new station**.

3. Add the camera site configuration information as applicable:

Station in use

Select this to take the web camera site in use.

Camera name

Enter a unique name that will be displayed as the web camera name in NM10.

The name can contain letters, numbers, and the following special characters: underscore (_), period (.), comma (,), semicolon (;), colon (:), hash (#), hyphen (-), and space. The length must be between 1 and 100 characters.

Polling interval

The interval for polling the camera site (1 minute - 1 day).

Address

The IP address or the domain name of the camera.

Username

If the camera has authentication in use, enter the administrator username needed to access the camera.

Password

If the camera has authentication in use, enter the administrator password needed to access the camera.

Latitude, Longitude, Altitude

The location information.

4. When needed, select **Block alerts** to block alerts from the site.

Reason for blocking

Write the reason for blocking the alerts, for example, Maintenance.

Alerts blocked until

Select or type the end date for blocking. The default end time for blocking is 23:59. If needed, type another time.

5. In **Additional information**, select the additional information template supported by this station and enter the additional information in the available fields.
6. Select **Save**.

9.11 Adding sounding sites

NM10 works best with Vaisala AUTOSONDE® AS41 software version 1.0 or later, AS15 software version 1.3 or later, and MW41 software version 2.9 or later.

Sounding sites (AUTOSONDE and MW41) are automatically displayed in NM10 when the systems have been correctly configured. The correct configuration includes:

- ▶ 1. Install and configure SSL/TLS certificates in NM10, AUTOSONDE, or MW41 in the correct order.
- 2. Create authentication keys in NM10.

3. Enter the created authentication keys and the correct NM10 address in the sounding software. For more information, see AUTOSONDE and MW41 documentation.

For remote desktop connection, the Thinfinity Remote Desktop Connection server software must be installed and configured in the AUTOSONDE or MW41 site servers.

For passing on the TEMP / BUFR messages to external systems, an (S)FTP server must be installed and configured in NM10.

More information

- [Remote desktop connection to sounding sites \(page 168\)](#)
- [Configuring authentication keys \(page 124\)](#)

9.12 Adding weather radar sites

Vaisala Weather Radar IRIS/RDA environment must be version 9.0.0 or later. Network connection to weather radar site servers must exist, including the correct Firewall settings.

NM10 displays status data and alerts from Vaisala Weather radar sites automatically when the systems have been correctly configured during system delivery. Correct configuration includes:

- ▶ 1. Create authentication keys in NM10.
- 2. Enter the created authentication keys and the correct NM10 address in Weather Radar Setup Utility software. For more information, see weather radar documentation.

More information

- [Configuring authentication keys \(page 124\)](#)

9.12.1 Rain correction files



This feature is a licensed option. It is available only with the applicable software feature license.

The rain correction files contain rainfall accumulation data from the Pluvio² rain gauges connected to NM10. The rain correction files can be sent to the IRIS weather radar software by configuring a file transfer job in NM10. The IRIS weather radar software can take advantage of the rainfall accumulation data to improve its products. NM10 software creates the rain correction files automatically once an hour, three minutes past the hour if NM10 includes the applicable software feature license.

More information

- [Sensor configuration requirements \(page 86\)](#)
- [Creating file transfer jobs \(page 128\)](#)

9.13 Adding lightning sites

Vaisala lightning sites include lightning processors and the lightning sensors connected to the lightning processors. Total Lightning Processor (TLP) software version must be 1.2.3 or later. Network connection to lightning processor servers must exist, including correct Firewall settings.

NM10 displays Vaisala lightning sites automatically when the systems have been correctly configured during system delivery. The correct configuration includes:

- ▶ 1. Create authentication keys in NM10.
- 2. Enter the created authentication keys and the correct NM10 address in lightning processor software. For more information, see lightning processor documentation.

More information

- ▶ [Configuring authentication keys \(page 124\)](#)

9.14 Adding service centers

You can add service centers for storing assets that are not installed at any site.

- ▶ 1. Select **Sites > Service Centers** in the administrator view.
- 2. Select **Add New Service Center**.
- 3. Edit the site information, as applicable:

Service center in use

Select this to take the service center into use.

Service center name

Type a unique name that will be displayed as the site name in NM10. The name can contain letters, numbers, and the following special characters: underscore (_), period (.), comma (,), semicolon (;), colon (:), hash (#), hyphen (-), and space. The length must be between 1 and 100 characters.

Latitude, Longitude, Altitude

The location information.

- 4. Select **Save**.

More information

- ▶ [Relocating assets \(page 175\)](#)

9.15 Deleting site configuration

You can temporarily disable a site by editing the site and deselecting the **Station in use** check box in the corresponding page in the **Sites** page.

To remove a site configuration permanently from the system:

- ▶ 1. Go to the **Sites** page in the administrator view.

2. Select the correct tab for the site type, for example, **AWS** for automatic weather stations.



If the site type is not listed here, go to **System > Data Removal** to remove the site from the database.

3. Find the site from the list, or use the search field.
4. Select **Delete** in the corresponding row. You might need to scroll to the right to see it.
5. Confirm the deletion. This will delete the site configuration from the system. The automatic weather station site is still displayed in the desktop pages and the data saved from that site is still available in the database.



SensorThings sites will reappear when NM10 checks for updates to Things. To prevent this, delete the site from the SensorThings API server.

6. To remove the site data from the database, go to **System > Data Removal** tab. Site data in the database includes, depending on the site type, for example, observations and events. For some site types this is the only way to delete the site from the system.

More information

- [Data removal \(page 131\)](#)

9.16 Editing sites

-
1. Go to the **Sites** page in the administrator view.
 2. Select the correct tab for the site type, for example, **AWS** for standard automatic weather stations.
 3. Find the site from the list, or use the search field.
 4. Select **Edit** in the corresponding row. You may have to scroll to the right to see the text.
 5. On the editing page, edit the site information as needed.
 6. Select **Save**.

9.17 Searching sites

You can search for a site on the **Sites** tab by entering, for example, station/site ID, internal ID, supported message parser configuration, or port in the **Search** field.

If the site has been given a separate display name, go to **System > Site display names** tab to check what its site/station ID is, and use that for search.

9.18 Creating custom site groups

The system creates automatic site groups based on site types. In addition, you can create custom site groups based on the needs of your users. For example, you can divide the weather stations in your system into groups based on geographical or administrative areas. The site groups can then be mapped in organizations so that users in the organizations can select which site group is displayed.

To create custom site groups:

- ▶ 1. Select **Sites > Site groups** in the administrator view.

The **Site groups** page opens, listing the existing custom site groups and automatic site groups that the system has created based on the site types.

2. Select **Create new**.
3. Enter a name for the group and select **Create**.
The new group is listed in the **Site groups** page.
4. Select **Add sites**.
5. Select the sites from the site list and select **Add**.

The site group is displayed in the **Custom site groups** list.

The site group is also displayed as a selectable source group in the **View Context** page. You can then link the view contexts with the organizations by creating view context subscriptions and linking them with the application subscriptions that the organizations use.

More information

- ▶ [Changing site group or organization \(page 57\)](#)
- ▶ [Adding new View Contexts \(page 159\)](#)
- ▶ [Making view contexts selectable in application header \(page 99\)](#)

9.18.1 Editing and deleting custom site groups

You can edit the site group name, and add or remove sites from the groups.

You can also delete the whole site group. If you delete a site group, it is no longer available in the view context and users cannot see the sites. You have to edit the view context so that it contains other sites.

9.19 Making view contexts selectable in application header

If users in one organization need the option of changing which site group is displayed, you can enable it with view contexts:

- ▶ 1. Create the custom site groups that you need. See [Creating custom site groups \(page 99\)](#).

2. For each site group, create a view context. See [Adding new View Contexts \(page 159\)](#).
3. For each view context, create a view context subscription where you select the application subscription that the organization uses. See [Adding view context subscriptions \(page 160\)](#).

The users in the organization that is linked to that application subscription can now see the view contexts in the application header and select which site group to view.

More information

- [Adding new View Contexts \(page 159\)](#)
- [Adding view context subscriptions \(page 160\)](#)
- [Creating custom site groups \(page 99\)](#)

10. Configuring maps

10.1 Editing map server address

If you use the map server provided with the system, there is no need to update the server address. You may need to edit the map server address if you use your own map server or cloud-based maps and the server URL changes.

If the map server has changed, edit the URL of the map server to match the map server URL:

- ▶ 1. Select **Map > Map Layers** in the administrator view.
- 2. Locate all layers in the table and select **Edit** for each row.
- 3. In the editing window, edit the following:

Type

For NM10 base maps: **wms**

For cloud-based maps: **xyz**

URL:

For NM10 base maps: */nm10/geo/basemap*

For cloud-based maps, enter the MapTiler API service URL including the API key received from Vaisala, for example:

https://api.maptiler.com/maps/9e0e10ed-595f-40f7-b86c-1d72d7aeb33f/256/\${z}/\${x}/\${y}.png?key=<API_key>

- 4. Select **Save**.



If you use a Web server other than those delivered by Vaisala, Vaisala assumes no liability for the functionality of the software.

10.2 Editing map layers

When the system is up and running there is typically no need to edit the map layers.

However, if the map server URL changes, you need to edit the URL.

10.3 Creating new map layers

Typically, there is no need to create new map layers. If for some reason you need to create new map layers, Vaisala assumes no liability for their functionality.



If you use any layer type other than "**wms**" and "**xyz**", Vaisala assumes no liability for the functionality of the software.

If you create new map layers, the following selections have to be made:

Title

Name for the map layer, in free text format.

Type

For NM10 base maps: **wms**

For cloud-based maps: **xyz**

URL

For **wms**: */nm10/geo/basemap*

For **xyz**: Enter the MapTiler API service URL including the API key received from Vaisala, for example:

https://api.maptiler.com/maps/9e0e10ed-595f-40f7-b86c-1d72d7aeb33f/256/\${z}/\${x}/\${y}.png?key=<API_key>

Layer

For "**wms**": Define what kind of data the layer is used to display.

Base layer

For "**wms**": Select this option for the "landbase" layer.

MIME type

For "**wms**": Select "image/png".

Supported Coordinate Reference Systems

Select the map projection that better suits your area.

The rest of the layer parameters can be selected according to your needs. For more information, click the  icons in the user interface.

11. Configuring observation handling

Observation data is stored automatically in the observation database after the observation site has been successfully added in the system.

To manage how the data observations are parsed, handled, and exported, select the **Observations** page in the administrator view.

More information

- ▶ [Configuring storing policy for observation database \(page 116\)](#)

11.1 Configuring observation data export (CSV)

The system can export the observation data in the CSV format. You can define what data the generated CSV files will contain and how, when, where, and from which sites the files will be stored and sent. You can create several different export configurations.

- ▶
 1. Select **Observations > CSV export** in the administrator view.
 2. Select **Create new**.
 3. In **Configuration name**, enter a unique name for the configuration.
 4. Select the **Enable export** option to enable CSV export.
 5. From **Select sites**, select which sites to include in the data export.
 6. In **CSV content customization settings**, if you want to customize the CSV file content, select **Enable customization**. For more information, see [Customizing CSV file content \(page 107\)](#).

7. In **Data export settings**, define what kind of data to export and when:

Start time

Select the start time for data export. The data is exported from the time period immediately preceding the export start time.

Repeated every

Select how often the data export is repeated.

Data period length

Select the length of the period from which the data is exported, ending in the export start time. For example, when the data period length is 1 hour, the data from the last hour before the export start time is exported.

Time between period end and data export

Sometimes data is not ready for export at the exact data export start time. This might lead into data being left out from the end of the time period. To avoid this, you can enter a time gap between the data period end and the data export time. For example, if the data export starts at "00:15" and you enter a time gap of "00:10", the data is exported ending at "00:05", instead of 00:15.

Maximum number of CSV records

Enter the maximum number of observations allowed in the export file. If the defined maximum number is exceeded, data from the end of the data period is not exported.

Include quality controlled data only

Select this to export only the data for which Observation Network Manager has performed quality control. Parameters that have not been configured any quality controls are not exported.

Exclude data flagged as suspicious or missing

Select this if you do not want to export the data that Observation Network Manager quality control has marked as suspicious or missing. Parameters that have been marked as suspicious or missing are not exported.

Enable missing data replacement

Select this if you want to replace missing observation values with text.

Replace missing data with

Enter the text that will replace the missing observation values.

8. In **File Settings**, define the following:

Directory for files ready for transfer

The directory where the exported files are saved for transfer.

In Windows, the directory must be in valid Windows format and contain “vaisala”, for example, *C:\Vaisala\observation_csv\ready_for_transfer*.

In Linux, the default file path is */opt/vaisala/nm10/observation_csv/*.

File name prefix

The beginning of the file name. The name of the export file consists of the file name prefix, the site name, and the time range in the selected time zone. For example,

"observations_401_2014-09-26T12-15-00+0000-2014-09-26T13-15-00+0000.csv".

File encoding

File encoding used, UTF-8.

Time zone in reports

The data export start is always defined in UTC time, but you can select the time zone in which the times are shown in the exported CSV report. Daylight saving time is used if the selected time zone observes it.

Time format used in file name

Select which time format is used in the file name.

Apply time format into record timestamps

Select this to use the selected time format also in the CSV record timestamps.

Value delimiter, Quote character, Quote escape character

Define which delimiter and quote characters are used in the CSV files.

9. In **File transfer (SFTP) settings**, define the settings for remote transfer:

Enable remote transfer

Select this option to enable the remote transfer of the CSV files. If the remote transfer is not enabled, the export files are only saved locally in the **Directory for files ready for transfer** folder.

Host address

Enter the remote host address.

Username

Enter the username needed to access the remote host.

Password

Enter the password needed to access the remote host.

Destination directory

Enter the directory where the files are transferred in the remote host.

Connection timeout

Enter the seconds after which to stop trying to connect if there is no response.

Directory for transferred files

The directory where the files are saved locally after transferring the files successfully.

In Windows, the directory must be in valid Windows format and contain "vaisala", for example, `C:\Vaisala\observation_csv\transferred\`.

In Linux, the default file path is `/opt/vaisala/nm10/observation_csv/transferred/`.

Directory for failed files

The directory where the files are saved locally when the transfer fails.

In Windows, the directory must be in valid Windows format and contain "vaisala", for example, `C:\Vaisala\observation_csv\failed\`

In Linux, the default file path is `/opt/vaisala/nm10/observation_csv/failed/`.

10. In **Housekeeping settings**, define the housekeeping settings for the local export files. In housekeeping, the system checks if old files exist, and deletes them in accordance with the storing time defined for each file type.

Start time

Select the start time for housekeeping.

Repeated every

Select the interval for housekeeping.

Storing time before deleting

Define for each file type when the files are considered old and ready to be deleted.



It is recommended to delete data often in small chunks. Long housekeeping intervals may cause performance issues because there will be more data to be deleted during each cleanup.

11. Select **Save**.

11.1.1 Customizing CSV file content

You can customize the CSV export file content, for example add, reorder, and edit the columns in the exported table.

- 1. In **Observations > CSV export**, select the CSV export configuration that you want to edit, or create a new one.
2. In the configuration page, in **CSV content customization settings**, select **Enable customization**.
- The current headers are shown in a table.
3. To modify the current headers, you can:
- Reorder the headers with the up and down arrows.
 - Modify the headers by selecting **Edit** or **Delete**.
4. To add new headers, select **Add new header**.
5. In the **Add header name** window, define the new header:

Custom header name

Enter a name for the new header.

Actual header name

Select the content for the new header from the list of available parameters.

6. Select **Add** to add the new header.
7. Select **Save** to save the configuration.

11.1.2 Editing CSV file export configuration

- 1. Select **Observations > CSV export** in the administrator view.
- The saved configurations are displayed.
2. Click the existing configuration that you want to edit.
3. Edit the displayed configuration settings.
4. Select **Save**.

11.1.3 Deleting CSV file export configuration

- 1. Select **Observations > CSV export** in the administrator view.
- The saved configurations are displayed.
2. Click the configuration that you want to delete.
3. Select **Delete** at the bottom of the configuration page.

11.2 Configuring post collection



This feature is a licensed option. It is available only with the applicable software feature license.

Define how the system handles data post-collection when data gaps are found in the database. The system searches the observation database for data gaps every 10 minutes, by default. If the interval needs to be changed, contact Vaisala. If data gaps are found, the system sends the weather station a post-collection request. You can define the following details:

- ▶ 1. Select **Observations > Post collection** in the administrator view.
- 2. Select the maximum period of data in one request.



Requesting data from a long period in one request means that the weather station must send a large response back. Therefore, if the data gap is very long, it is split into multiple requests.

- 3. Select from what period to search for the data gaps, for example, from the last 2 days.
- 4. If data gaps are found, the system sends the weather station a post-collection request:
 - If the post-collection is successful, the station responds to the request by sending a single message to the system.
 - If the station does not reply to the request in the defined time, an event is created. Select how long the system waits for a reply from the station before creating the failure event.
 - Define how many times the system sends the request before generating an alert about failed post-collection.
- 5. Select **Save**.
- 6. To select that post collection is used for a specific weather station, select the **Post collection** option for that station on the appropriate **Sites** page.

11.3 Configuring message parser

To define how the messages from the sites are read, extracted, and stored in the database, an observation message parser is needed. You can create different message parser configurations for different kinds of messages and site types.

When adding a weather station site to the system you can do one of the following:

- If the weather station sends the messages in the exact standard message format (for example, "SMSAWS 2.0"), you can just select the corresponding message parser configuration when adding the weather station site in the system on the **Sites** tab.

- If the message that the weather station sends does not exactly comply with any of the standard message formats, you can create a new message parser configuration based on the existing ones in the **Observations > Message parser** tab.
- You can also create the message parser configuration from scratch in the **Message parser** tab by manually adding all parameters.

For other site types, see [Message types and templates \(page 114\)](#).

In the **Message parser** tab you can enter example messages, or use messages sent by the stations, to test if the message parser configuration works for the message. The system will display any errors, so you can edit the message parser configuration to match the message received.

11.3.1 Adding new message parser configuration

If a weather station sends the messages in the exact standard message format (for example, "SMSAWS 2.0") you can just select the corresponding automatic message parser configuration (for example, **SMSAWS 2.0 (auto)**) when adding the weather station in the system on the **Sites** page.

If the message that a site sends does not comply exactly with any of the standard message formats, you can create a new message parser configuration based on the available templates.

- 1. Select **Observations > Message parser** in the administrator view.
2. Select **Add New Configuration**.
3. Select a message parser configuration template that matches the type of message sent by the site, for example, **Tagless_CSV** and select **OK**.



If **SensorThings_1.0** is not displayed in the template list, the parser already exists and is automatically used for all SensorThings sites.

4. Edit the message parser configuration, as available for the selected parser template:

Configuration name

Enter a unique name for the message parser configuration. This cannot be edited in SensorThings_1.0 message parser configuration.

Header type ID

(In SMSAWS configurations) The message type used in the message header. Must start with a letter "S" and it must be 1- 3 characters long. For example, SMS.

Separator character

(In CSV configurations) Select the character that is used to mark the division between the CSV fields.

Use receive time as timestamp

(In CSV configurations) Select this if you want to use the time of receiving the message as the observation timestamp.

Missing values

Characters indicating missing values in the message, filled in based on the message type.

To add a new value, enter the value and click **Add new value**.

To delete a value, click **Delete** in the list.

5. When available, you can use an existing message as basis for the message parser configuration:
 - a. Select **Browse messages**.
 - b. Select a message from the list of recent messages from stations. The message will be shown in the **Test message** field. You can also type, or copy and paste, an example message in the field.
 - c. Click **Configure parser**. The system creates the message parser configuration based on the message, filling in the **Metadata configuration** and **Parameter configuration** tables.
 - d. If there are errors, click the error message open at the bottom of the page to get more information.
6. Correct the errors and add new rows or edit the details, if needed.
7. If there are no existing messages available, you can add the rows manually:
 - a. Select **Add new row**.
 - b. Click the table cell and select from the list, or enter the parameter directly. For explanation of the parameter columns, see [Parameter configuration table elements \(page 111\)](#) and [Metadata configuration table elements \(page 112\)](#).
 - c. Select **OK**.
8. When available, select **Parse test message** to see that the message parser configuration is working for the message in the **Test message** field.
9. Select **Save**.

10. Go to the **Sites** tab to map the new message parser configuration to the sites where you want to use it. For SensorThings sites the parser is used automatically after it has been created.

If the selected message parser configuration does not work for the selected station, there will be an event in the **Events** view.

11.3.1.1 Parameter configuration table elements

The following lists the typical column names in the **Parameter configuration** table. Some columns are relevant and available only for certain message parser types.

Header type ID

(In SMSAWS configurations) The message type used in the message header. Must start with the letter “S” and must be 1- 3 characters long. For example, **SMS**.

Index

The position of the parameter in the message that was parsed, or row number when editing an existing configuration. Can be edited and saved with configuration only when configuring tagless CSV.

Ignore

When this is selected, the parameter is ignored, that is, not displayed in the Web displays and not saved into database. The data is saved in the history files.

Ignore missing

When this is selected, the missing parameter does not affect the data validity/ availability values. The data is saved in the history files. Used for parameters that are only occasionally sent from the sites, for example, for wind gust, cloud amount, and cloud type.

Tag

The message part for one parameter, in the format that it is received from the station. For example, **WS | AVG | PT10M | 2 | mps |**.

ObservedProperty ID

The **@iot.id** property of the **ObservedProperty** entity in SensorThings configurations.

ObservedProperty name

The **name** property of the **ObservedProperty** entity in SensorThings configurations.

Parameter

Parameter name, observation, or other data type. For example, **Wind speed**.

Unit

Unit for the parameter. For example, **m/s**.

Statistic name

The method used for calculating the value. For example, **avg** (= average).

Statistic period

The calculation time period for the observation value. For example, **PT10M** (= 10 minutes). If there is a quality control configuration defined for this parameter, select the same statistic period that is used in the quality control configuration.

Height (m)

Height of the measurement. For example, 2 (= 2 meters).

Sequence number

When there are several same parameters, the sequence number identifying them.

Custom identifier

Free text field that will show in the beginning of the parameter. Can be used, for example, for grouping the parameters.

Value

The actual value of the parameter: Textual or numerical data. For example, 5.

The colors used in table cells indicate the following:

Red

There is an error. Click to accept or to modify the value.

Blue

The value has been modified.

11.3.1.2 Metadata configuration table elements

The following lists the typical column names in the **Metadata configuration** table. Not all message parser types include this table.

Index

The position of the metadata in the message. Can be edited and saved with configuration when configuring tagless CSV.

Metadata type

The type of the metadata. For example, **Observation date**.

Metadata format

The format of metadata. For example, yyyy/MM/dd.

Value

The metadata value. For example, 2016/04/22.

The colors used in table cells indicate the following:

Red

There is an error. Click to accept or modify the value.

Blue

The value has been modified.

11.3.1.3 Date and time format

Date and time formats are specified by date and time pattern strings. Within date and time pattern strings, unquoted letters from 'A' to 'Z' and from 'a' to 'z' are interpreted as pattern letters representing the components of a date or time string.

Text can be quoted using single quotes ('') to avoid interpretation. " '' " represents a single quote.

All other characters are not interpreted; they're simply copied into the output string during formatting or matched against the input string during parsing.

The following pattern letters are defined (all other characters from 'A' to 'Z' and from 'a' to 'z' are reserved):

Letter	Date or Time component	Presentation	Examples
y	Year	Year	1996; 96
Y	Week year	Year	2009; 09
M	Month in year	Month	July; Jul; 07
w	Week in year	Number	27
W	Week in month	Number	2
D	Day in year	Number	189
d	Day in month	Number	10
F	Day of week in month	Number	2
E	Day name in week	Text	Tuesday; Tue
u	Day number of week (1 = Monday, ..., 7 = Sunday)	Number	1
a	Am/pm marker	Text	PM
H	Hour in day (0-23)	Number	0
k	Hour in day (1-24)	Number	24
K	Hour in am/pm (0-11)	Number	0
h	Hour in am/pm (1-12)	Number	12
m	Minute in hour	Number	30
s	Second in minute	Number	55
S	Millisecond	Number	978
z	Time zone	General time zone	Pacific Standard Time; PST; GMT-08:00
Z	Time zone	RFC 822 time zone	-0800
X	Time zone	ISO 8601 time zone	-08; -0800; -08:00

Examples:

Input	Pattern
2001.07.04 AD at 12:08:56 PDT	yyyy.MM.dd G 'at' HH:mm:ss z
Wed, Jul 4, '01	EEE, MMM d, "yy
12:08 PM	h:mm a
12 o'clock PM, Pacific Daylight Time	hh 'o'clock' a, zzzz
0:08 PM, PDT	K:mm a, z
02001.July.04 AD 12:08 PM	yyyyy.MMMMM.dd GGG hh:mm aaa
Wed, 4 Jul 2001 12:08:56 -0700	EEE, d MMM yyyy HH:mm:ss Z

Input	Pattern
010704120856-0700	yyMMddHHmmssZ
2001-07-04T12:08:56.235-0700	yyyy-MM-dd'T'HH:mm:ss.SSSZ
2001-07-04T12:08:56.235-07:00	yyyy-MM-dd'T'HH:mm:ss.SSSXXX
2001-W27-3	YYYY-'W'ww-u

For detailed information, see <https://docs.oracle.com/javase/7/docs/api/java/text/SimpleDateFormat.html>

11.3.2 Message types and templates

The message type templates can be selected in the **Message parser** tab when creating the message parser configurations.

11.3.2.1 SMSAWS 2.0

You can select the "SMSAWS 2.0" message type if the station sends the standard SMSAWS 2.0 message. That is, the following conditions have to be met:

- Weather station sends data to a DCP server using a known TCP port.
- The header and trailer of the message are in the correct format: <SOH>SMS
xxx<STX> ... <ETX>.
- The message contains metadata including the message ID.

For example, the "SMSAWS 2.0" message parser template does the following when you click the **Configure parser** button:

- Checks message start.
- Checks message end.
- Splits message to key value parts.
- Splits keys to types.
- Checks that default fields are received.
- Creates JX observations.
- Return observations and additional information related for parsing (errors).

In addition, when you click the **Parse test message** button, the template does the following:

- Checks that all configured fields are received.
- Checks there are no fields that have no configuration.

11.3.2.2 SMSAWS 2.1

SMSAWS 2.1 message type is the same as SMSAWS 2.0 with the difference that the "-" character indicates that a value is not available and should not be counted as missing.

11.3.2.3 SMSAWS 1.2

SMSAWS 1.2 message type needs configuration for every field. This message type is typically used in custom systems.

11.3.2.4 Tagless CSV

Tagless CSV parser parses all items separated by a defined separator, as values. It requires that the number of parameters is equal to the number of values in the data. Its parameter configuration relies on the position of the parameters in the data, thus the index has to be specified. Does not require any metadata fields to be present.

This template is typically used for messages sent as files, for example, via FTP.

11.3.2.5 Tagged CSV

Tagged CSV parser assumes that the data is presented in comma (or other separator) separated format so that every other value is a "tag" and every other a value related to the tag. E.g. `Tag1,value,Tag2,another value`. Its parameter configuration relies on the configured tag names and thus does not care about the position of the value in the data. Tagged CSV parser does not force all configured fields to be present in the data at the same time, nor does it require that all received values have been configured in the parameter configuration. Does not require any metadata fields to be present.

This template is typically used for messages sent as files, for example, via FTP.

11.3.2.6 SMSAWS METMAN

SMSAWS_METMAN messages are similar to SMSAWS 1.2 messages, but the messages are surrounded by mandatory parentheses. One complete message surrounded with mandatory parentheses can contain one or more sub messages, which are separated from each other with line separator.

This template is typically used for messages sent as files, for example, via DRGS satellite.

11.3.2.7 SensorThings_1.0

SensorThings_1.0 message type is used for defining how the SensorThings `ObservedProperties` are parsed when retrieving data from the SensorThings API server. There are no metadata fields. Once a SensorThings_1.0 message parser has been created, it is used for all SensorThings sites automatically.

12. Configuring storing policy

To manage the storing and deleting policy for different data and file types, select **Storing policy** in the administrator view.

12.1 Configuring storing policy for observation database

Define how long the observation data is stored in the database and how often it is deleted.

- ▶ 1. Select **Storing policy > Observation database** in the administrator view.
- 2. Fill in how many months the observation data is stored in the database. Older data will be deleted during the next housekeeping.



When selecting the data storing time, take into account the size of the observation network, the data collection frequency, and available disk space.

- 3. Select the housekeeping interval, that is, how often the system checks if there is old data. If old data exists, it is deleted from the database.

It is recommended to delete data often in small chunks. Long housekeeping intervals may cause performance issues because there will be more data to be deleted during each cleanup.

- 4. Select **Save**.

More information

- [Configuring observation handling \(page 103\)](#)

12.2 Configuring storing policy for files

Define how long the different file types are stored before deleting them.

- ▶ 1. Select **Storing policy > Files** in the administrator view.
- 2. For each file type, enter the storing period in months. When defining the storing period take into account the available disk space and the number and size of the files.
- 3. If you want to keep some file types, enter the file types that will NOT be deleted in the **File exclude filter** field. Use comma as separator. For example, *.xml, *.doc.
- 4. Select **Save**.

12.3 Configuring storing policy for raw data files

All observation data from weather stations is stored in history text files (raw data files / ASCII files) in comma-separated or tab-separated format. Thus, the collected data can be easily viewed with general purpose data analysis and processing tools, such as Microsoft Excel. The text files contain raw observation data directly from weather stations and do not contain quality controlled data. In some cases basic quality control is performed at the weather station.

Typically the files are located in the following location: *D:\ProgramData\NetworkManager\history*. The folder structure may have been changed during installation.

Raw data files consist of the following:

- Raw observation data is the data that NM10 receives from the weather stations. For raw observation data, no quality checks have been performed by NM10.
- Data collection event logs are daily logs created about data collection events, such as exceptions in data collection.
- AUTOSONDE event logs
- Event logs from airport sites

Define the storing location for the raw data files and how long the data is stored:

- 1. Select **Storing policy > Raw data files** in the administrator view.
2. Enter the directory where you want to save the data. Use the absolute path format, for example, *D:\Network Manager\RawData*.

In Linux, use */var/vaisala/nm10/nm10-dcp/history*.



It is recommended **not** to use the drive where the NM10 software is installed.



It is recommended **not** to use any root directory.

3. Enter the storage period, in months. When defining the storage period take into account the available disk space, the observation network size, and the number and size of the messages from the sites. You can calculate the estimated disk space needed by using the following formula:

$$DS = s * m * mrh * sph$$

where:

Value	Description
DS	= Rough estimate of storage disk space need
s	= Number of sites connected to NM10
m	= Size of one message
mrh	= Number of messages received in an hour
sph	= Storage period in hours

Example estimation for 10 sites:

$$10 * 1 \text{ kB} * 60 / \text{h} * 8760 \text{h} = 5256000 \text{k} = 5256 \text{ MB} = 5,3 \text{ GB}$$

Example estimation for 100 sites:

$$100 * 1 \text{ kB} * 60 / \text{h} * 8760 \text{h} = 52560000 \text{k} = 52560 \text{ MB} = 53 \text{ GB}$$

4. Select **Save**.

12.3.1 Dealing with decreasing disk space

If the automatic clean-up is not functioning, the free disk space continues decreasing. It is recommended to occasionally check that there is free disk space available, and to compress the files.

The default minimum disk space for raw data files has been set to 1 GB. When the disk space limit is reached, the oldest logs will be deleted. For custom systems, the limit can be configured by Vaisala personnel according to customer requirements or specifications.

12.3.2 NM10 backend event logs

NM10 backend log file *NM10.log* is stored in:

C:\Program Files (x86)\Vaisala\NetworkManager\nm10-backend\logs.

When the size of the NM10 backend log file reaches the preconfigured limit (by default 100 MB), the log is zipped and moved into an archive folder in:

C:\Program Files (x86)\Vaisala\NetworkManager\nm10-backend\logs\archive.

Archive file name example: *NM10-1.log.zip*

When the maximum number of zip files in the archive is reached (by default 20) the oldest zip file is replaced with the new one.

The approximate size of the archive folder is 440 MB (20 x 22 MB).



CAUTION! Use the files only for troubleshooting purposes. Modifying the files can lead to important data loss.

More information

- [NM10 backend events \(page 184\)](#)

12.3.3 NM10 frontend logs

NM10 frontend log file *webui.log* is stored in:

C:\Program Files (x86)\Vaisala\NetworkManager\nm10-frontend\logs.

When the size of the NM10 frontend log file reaches the preconfigured limit (by default 100 MB), the log is zipped and moved into an archive folder in:

C:\Program Files (x86)\Vaisala\NetworkManager\nm10-frontend\logs\archive.

Archive file name example: *webui-1.log.zip*

When the maximum number of zip files in the archive is reached (by default 20) the oldest zip file is replaced with the new one.

The approximate size of the archive folder is 180 MB (20 x 9 MB).



CAUTION! Use the files only for troubleshooting purposes. Modifying the files can lead to important data loss.

12.3.4 Postgres database logs

The Postgres database log files are stored in:

C:\postgresql\9.5\data\vonm\pg_log.

File name example: *postgresql-Mon.log*

By default, one log file is created every weekday for 7 days, after which the files are overwritten.

The approximate size of the log file folder is 210 MB (7 x 30 MB).

13. Configuring quality control settings



This feature is a licensed option. It is available only with the applicable software feature license.

Define the parameters and limits for the quality control checks that NM10 performs for the data received from the weather stations. You can create different quality control configurations, which you can later add to the site configurations. One quality control configuration can contain one or several parameters and the related quality checks.

- ▶ 1. Log in as root-level administrator.
- 2. Select **Quality control** in the administrator view.
- 3. Select **Add New Configuration**.
- 4. Enter a unique descriptive name for the new configuration.

5. Select Add New Parameter:

- Add the parameters one by one in the window that opens. For more information, see the following table.
- Select the **Enabled** option for the checks that you want to use.

Table 9 Quality control parameters

Element name	Description / Note	Examples
Name	Select the observation parameter. Also the option "unknown" is available for selection if required by the message parser configuration.	Wind speed
Unit	Unit of the observation parameter. Also the option "unknown" is available for selection if required by the message parser configuration.	m/s
Observation height	Height of the observation in meters. Fill in only if there is a need to limit the check for certain observation height. If the field is empty, observations from all heights are checked.	2
Statistic name	The method used for calculating the observation value. If you select "All statistic names", all values regardless of the method will be checked.	avg (average)
Statistic period	The calculation time period for the observation value. If no option is selected, all values regardless of the statistic period will be checked.	10 minutes
Event enabled	Select if you want the system to create a system event when this quality control is triggered.	
Range check	Checks that the values are reasonable, that is, inside the accepted range of values.	
	Enabled: Select to take the check into use.	
	Minimum accepted value: The minimum observation value on the accepted range of values.	0
	Maximum accepted value: The maximum observation value on the accepted range of values.	50

Element name	Description / Note	Examples
Persistence check	Checks that the sensor is not stuck, that is, the values change frequently enough.	
	Enabled: Select to take the check into use.	
	Persistence time: The time period in which the observation value is expected to change.	60 minutes
	Threshold: The minimum expected change of the observation value in the persistence time.	0.1
Step check	Checks that values do not change too much between consecutive observations. A sudden big change between observations may indicate malfunction.	
	Enabled: Select to take the check into use.	
	Value change rate: The maximum allowed change between consecutive observation value.	20
	Step check interval: The interval between observation step checks. Must be equal or larger than the polling interval.	

6. Select **Save** in the **Add new parameter** window.
7. After adding all the needed parameters in the quality control configuration, select **Save**. The configuration is displayed in the list of configurations.
8. To take the created quality controls into use, add them to the weather station configurations on the appropriate **Sites** page.

14. Configuring authentication keys

Authentication keys are security tokens needed when establishing connections to NM10 from other systems (“incoming authentication key”) and from NM10 to other systems (“outgoing authentication key”).

Typically, the keys are needed for the connection with the AUTOSONDE, MW41, weather radar, and lightning sites. The authentication keys consist of two parts; the authentication key and the authentication secret.

See also the documentation provided with the source, for example, AUTOSONDE documentation.



This feature is a licensed option. It is available only with the applicable software feature license.

More information

- [Adding sounding sites \(page 95\)](#)
- [Adding weather radar sites \(page 96\)](#)
- [Adding lightning sites \(page 97\)](#)

14.1 Creating new authentication key

- 1. Select **Security > Authentication** in the administrator view.
A list of the existing authentication keys is displayed.
2. Select **Generate new key**.
3. A pop-up window shows the created key. Copy or export the key:
- Copy the key from the pop-up window, including both the “incoming authentication key” and the “authentication secret”.
 - or export the key to a text file by clicking **Export**. This is needed, for example, when you cannot copy the key directly to the source site software but instead have to transfer the key on a memory stick.



This is the only time that the “authentication secret” is displayed, so make sure to make a note of it either by copying or exporting it.

4. Close the pop-up window by selecting **Close**.
5. The generated “incoming authentication key” is displayed in the list. Check that the **Enabled** option is selected and continue with registering the source.

14.2 Using the key for registering the source



For source-specific instructions, refer to the instructions available at the source, for example, in the documentation delivered with the AUTOSONDE software.

- ▶ 1. Before registering the source, enter the incoming authentication key and authentication secret that were created in NM10 to the appropriate location in the source software, for example, in the AUTOSONDE site software. You can also transfer the information on a memory stick and then copy it from the file to the source.
- 2. Register the source. For information on how to do it, see the documentation provided with the source.



For AUTOSONDE: The data that AUTOSONDE source sends during registration must contain the “outgoing authentication key” that the source has generated. This key will enable NM10 to connect to the site. If this key is missing, the warning event “Could not find authentication information in source” will be displayed in the **Events** view.

3. Check that the source is displayed in the **Authentication keys** list. For AUTOSONDE, check that it has an outgoing authentication key.

One key can be used for registering only one source. Create new keys for other sources. **Authentication keys** list contains the following:

Element	Description	Comment
Source	Name of the source that uses this authentication key.	Displayed only after the source has registered the key.
Incoming authentication key	The authentication key created in NM10.	The source needs this to be able to register. In addition, the "authentication secret" is needed for registering.
Outgoing authentication key	(AUTOSONDE only) The authentication key that NM10 receives as part of source registration from the source. This key has to be generated by AUTOSONDE.	(AUTOSONDE only) Displayed only after the source has been registered. Automatically filled in NM10 after receiving the registration data. If the registration data from the source does not contain the key, the warning event "Could not find authentication information in source" is displayed in NM10 Events view.
Enabled	You can disable unused keys.	Do not disable keys that are in use.
Actions	You can delete unused keys.	Do not delete keys that are in use.

15. Managing system settings

As a root-level administrator you can view and edit the system settings in the administrator view. The **System** tab contains several common settings.

Also other tabs contain settings that are common for the whole system, for example, the **User** tab contains the settings for common password requirements and **Events and alerts** tab the common settings for alerts and events.



The features are available depending on the activated software feature licenses.

15.1 Viewing active users

To view which users are logged in in your organization:

- ▶ 1. Select **System > Logged in Users** in the administrator view.

A list of the users that are currently logged in is displayed. As a root-level administrator you can view users from all organizations.

15.2 Logging out a user

As a root-level administrator you can log out users:

- ▶ 1. In the administrator view, select **System > Logged in Users**.
- 2. In the list of users, click **Log out user** in the user row for the user that you want to log out.
- 3. Confirm by selecting **OK**.

15.3 Configuring monitored servers



This feature is a licensed option. It is available only with the applicable software feature license.

As a root-level administrator you can define which servers, such as database servers or routers, are monitored in the **Network Status** view. The data collection server is monitored automatically and this cannot be changed.

- ▶ 1. Select **System > Servers** in the administrator view.
- 2. Select **Add new**.

3. Enter the server name, ID, and IP address (in IPV4 format) and select **Save**.

The server is displayed in the list of servers and will be displayed in the **Servers** tab in the **Network Status** view.

To edit the server information, select **Edit** in the corresponding server row and select **Save**.

To delete the server from the monitoring list, select **Delete** in the corresponding server row and confirm the deletion.

15.4 Configuring site display names

You can enter descriptive names for the weather stations and other sites. These names will be used in the desktop views instead of the default site IDs.

- ▶ 1. Select **System > Site display names** in the administrator view.
The sites are listed organized under site types, for example **Airport**.
- 2. Enter the display names for each site. The names can include 1–25 characters.
- 3. Select **Save**.

15.5 Creating file transfer jobs

The system can transfer data files to remote locations via SFTP. These files can be for example soundings log files received from AUTOSONDE sites or rain correction files for weather radar. You can define several transfer jobs, for example, for different types of files and different remote locations.



SFTP transfer is only available if the required SFTP server application has been installed and configured in your system.



Rain correction files are created only if NM10 includes the applicable software feature license and if the rain gauge sites have been correctly configured.

To define how files are exported using SFTP:

- ▶ 1. Select **System > File Transfer Jobs** in the administrator view.
A list of the existing jobs is displayed.
- 2. Select **Add new job**.
- 3. In **Job name**, enter a transfer job name that:
 - is unique and between 1 and 150 characters in length
 - does not contain any of the following characters: \ / : * “ < > | ? .
 - does not contain any reserved Windows names

4. Make sure that **Enabled** is selected to take the transfer job into use.

5. In **Transfer settings**, define the transfer details for the job:

Transfer starts at, and is repeated every

Select the start time of the first transfer and how often the transfer is repeated.

For rain correction files, select **00 : 04** and **60** minutes since a new rain correction file is created three minutes past every hour.

Local file directory

The name of the directory from which the files will be transferred. Use the directory that was defined when installing the SFTP server application.

The path must be in valid Windows format and contain the text "Vaisala".

For rain correction files, for example: **C : \ProgramData\NetworkManager\work\vaisalaraincorrection**

See also [Work directories \(page 130\)](#).

Files to include

Define which files or file types are transferred.

To transfer all files in the selected directory, enter the asterisk character *****.

To transfer only certain types of files, enter the asterisk character and the file type extension, for example, ***.log**.

For rain correction files, enter ***.txt**.

Remote file directory

The directory at the remote host where the files are transferred to. The path is absolute but the user account may have a virtual root configured.

For rain correction files, enter **/usr/iris_data/raingage_in/**

6. In **Connection Settings**, define the connection settings. Click the  icons in the software for more information.



For **Connection protocol**, select **SFTP**. FTP protocol is not secure. To transfer the files over a secure channel, select SFTP, as recommended by Vaisala.

7. If you selected **KEY** as the **Authentication type**, generate the authentication key in **SFTP Settings**:

- a. Click the **Generate Authentication Key** button.
- b. In the pop-up window, enter a comment, if needed for identifying the key, and select **Generate**.
- c. The key text is displayed in the **Authentication public key** field. Copy the key text by selecting **Copy to Clipboard**.
- d. Paste the key text to a suitable location for further use.

8. Select **Save**.

The created file transfer job is displayed in the list.

More information

- [Sensor configuration requirements \(page 86\)](#)
- [Rain correction files \(page 96\)](#)

15.5.1 Work directories

Different file transfer jobs can use the same source directory and the same kind of file filters because the files from source directories are copied to separate work directories for each transfer job before sending. For example, rain correction files created under `\ProgramData\NetworkManager\work\vaisalaraincorrection` will be moved to `\ProgramData\NetworkManager\work\<Job name>` before sending.

Typically original source files are deleted only after they have been copied to all the needed work directories. Copying and deleting from original directory is made once in a minute. File transfer jobs will try to resend files from the work directory until a successful transfer is made, only then the files are deleted from work directory.

If a file transfer job has not been defined for rain correction files, the files older than 1 month are deleted from the `work\veisalaraincorrection` directory. Checking and possible deleting is done once an hour.

The work directory is located by default under the same directory that was defined as the output folder for history and log files during NM10 installation.

- For example, in `D:\ProgramData\NetworkManager\work`.
- The file location can be checked from `C:\Program Files (x86)\Vaisala\NetworkManager\config\jdcp_conf\FileTransfer.properties`.

15.5.2 Editing file transfer jobs

- 1. Select **System > File Transfer Jobs** in the administrator view. A list of the existing jobs is displayed.
2. Find the file transfer job from the list, or use the search field.
 3. Select **Edit** in the corresponding row.
 4. In the editing page, edit the information as needed.
 5. Select **Save**.

15.5.3 Deleting file transfer jobs

- 1. Select **System > File Transfer Jobs** in the administrator view. A list of the existing jobs is displayed.
2. Find the file transfer job from the list, or use the search field.
 3. Select **Delete** in the corresponding row.

4. Confirm the deletion.



You can temporarily disable a file transfer job by deselecting the **Enabled** selection in the file transfer job row.

15.6 Configuring time synchronization

You can define when the weather station clocks are automatically synchronized. Time synchronization is needed for keeping the station clocks in time when there is no GPS or NTP time synchronization available. The station clocks determine the timestamps for the observations.

- ▶ 1. Select **System > Time synchronization** in the administrator view.
- 2. Select when the first synchronization occurs. For example, at 00:15 UTC.
- 3. Select how often the synchronization will be repeated. For example, every 24 hours.
- 4. If the weather station time is not in UTC, enter the time difference in the **Time adjustment** field, in seconds. For example, “0” = UTC time, “7200” = UTC +2.



Configure the time synchronization schedule so that it does not disturb or interrupt the on-going data collection activities. Synchronizing at midnight is not recommended.



In order not to disturb the calculation of average values, the actual time synchronization takes place 30 seconds after the selected time.

5. Select **Save**.
6. To select that the automatic time synchronization is used for a specific weather station, select the **Time synchronization** option for that station on the appropriate **Sites** page.

15.7 Data removal

The **System > Data Removal** page contains the following options, depending on the available site types:

Delete data

Removes observations, events, and alerts from the database, as applicable for the site.

Delete data and source registration

Removes the site, including events, alerts, source registration, and authentication keys from the database, as applicable for the site. Removes the site also from the desktop pages.

Delete

Removes the site, including events, alerts, source registration, and authentication keys from the database, as applicable for the site. Removes the site also from the desktop pages and from custom site groups.

If the site has a site configuration on the **Sites** pages, it is not removed. If new data is received from the site, the site is displayed in the desktop pages again. To prevent this, delete the site configuration first.

Delete active alerts

Removes active alerts for the site, including balloon release permission events for AUTOSONDE.

More information

- ▶ [Deleting site configuration \(page 97\)](#)

15.7.1 Deleting weather stations

To completely delete a weather station from the system you need to first delete the site configuration and then the data saved in the database.

- ▶
 1. Go to the **Sites** page in the administrator view.
 2. Select the correct tab for the site type, for example, **AWS** for automatic weather stations.
 3. Find the station from the list and select **Delete** in the corresponding row. You might need to scroll to the right to see it.
 4. Confirm the deletion. This deletes the site configuration from the system but the data saved from that site is still available in the database.
 5. Go to **System > Data Removal** in the administrator view.
 6. Find the site in the list and select **Delete**.
 7. Confirm the deletion. The removal takes several minutes.

There will be an event on the **Events** tab when the removal is complete.

More information

- ▶ [Deleting site configuration \(page 97\)](#)

15.7.2 Deleting airport sites

Airport site configurations cannot be deleted in the **Sites** pages. You can delete them from the system by deleting them from the database.

- ▶
 1. Go to **System > Data Removal** in the administrator view.
 2. Find the site in the list, or enter the site name in the **Search** field.

3. Select **Delete** in the corresponding row.
4. Confirm the deletion. The removal takes several minutes.

There will be an event on the **Events** tab when the removal is complete.

15.7.3 Deleting soundings, radar, and lightning sites

Sounding, weather radar, lightning sensor, and lightning processor sites do not have a site configuration on the **Sites** pages. You can delete them from the system by deleting them from the database.

- 1. Go to **System > Data Removal** in the administrator view.
2. Sounding sites: Find the site in the list and click **Delete data and source registration**.
 3. Radar and lightning sites: Find the site in the list and click **Delete**. For lightning sites, both the lightning processor and the lightning sensors connected to it will be removed.
 4. Confirm the deletion.

The removal takes several minutes. The sites remain visible until completely removed.

There is an event on the **Events** page when the removal is complete.

This removes the site, including events, alerts, source registration, and authentication keys from the database, as applicable for the site. The site is also removed from the desktop pages.

15.7.4 Deleting data from database

For some site types, typically, for example, AUTOSONDE, you can delete the data or active alerts without deleting the site from the database. This can be useful, for example, after a test or configuration period, when you want to start saving data from scratch.

- 1. Go to the **System > Data Removal** page in the administrator view.
2. Find the site in the list and select one of the following:
 - To delete observations, events, and alerts from the database, as applicable for the site, select **Delete data**.
 - To delete active alerts for the site, including balloon release permission events for AUTOSONDE, select **Delete active alerts**.
 3. Confirm the deletion.

16. Managing event and alert settings

As a root-level administrator you can view and edit the settings related to events and alerts in the administrator view, on the **Events and alerts** tab.

16.1 Defining system alerts



This feature is a licensed option. It is available only with the applicable software feature license.

As a root-level administrator you can define the rules for generating certain system alerts.

- ▶ 1. Select **Events and alerts > System alerts** in the administrator view.

The system alert rules available for editing are displayed.

- 2. For each alert, select the following:

Alert

Select with the on/off toggle if the alert is generated or not.

Severity

Select the severity type of the alert.

Sensitivity

When available, select the sensitivity level for triggering the alert.

The description under the selection list shows the preconfigured limits. For example, when the sensitivity option **High** is selected for **Missing observation messages**, the number of missing observation messages needed for triggering the alert is lower than when the sensitivity option **Low** is selected.

- 3. Select **Save**.

All existing system alerts are cleared and new alerts are generated based on the new rules.

Alerts are displayed in the **Alerts** view if you have the applicable software feature license. Events are displayed in the **Events** view. There is also an event when you turn alert generation on or off.

Alerts are turned off for sites that are defined as disabled (not in use) and for sensors defined inactive in the site configuration page.

16.2 Configuring event limitation

As a root-level administrator you can protect the system from congestion by limiting the number of operational events in the database.

- 1. Select **Events and alerts > Event Limitation** in the administrator view.
2. Define the following:

Maximum amount of events

The maximum number of events in the database. This selection concerns only operational events. Technical events are always generated and saved in the database.

Pause time

The time that the event generation will be paused for when the maximum number of events is exceeded. During this time the events are not saved in the database, however, they are logged in the history files.

3. Select **Save**.

16.3 Configuring email notification settings



This feature is a licensed option. It is available only with the applicable software feature license.

As a root-level administrator you can configure how email notifications about events are sent. Email notifications consist of an introductory email and the events as text file attachments.

- 1. Select **Admin** in the application header.
2. Select **Events and alerts > Email**.

3. Define the email notification settings:



Hover the mouse over the icons in the software to get more information.

Email notification sending

Select this to enable email notification sending. If this selection is disabled, email notifications are not sent. However, the events are stored in the database and displayed in the Observation Network Manager software.

Server settings

Fill in the settings of the email server, and select if authentication is used.

Email settings

Fill in the email settings, including the subject and the introductory content of the email.

Attachment settings

Fill in the attachment settings, including the maximum number of events in one email, and define the message which is shown when the attachment does not contain all the events from the period.

Error settings

If the application is unable to fetch the events from the database, an error email is sent. Define the subject and the introductory message of the error email. The actual error message is appended after this message.

4. Under **Email recipients**, select **Add new recipient** and enter the email address of the recipient.
5. Under **Event settings**, define the type and source of the events sent to this recipient:

Event severities

Select which severity level events are included in the emails.

NM10 system events

Enable this option to include events from NM10 system applications and services.

Sites

Select the sites from which the events are included in the email. If you select **None**, only system-level events are included.



If you disable NM10 system events and select no sites, no emails are sent to this recipient.

6. Select **Add**.
7. Repeat for all the needed recipients.
8. Select **Save** in the **System > Email** page.

16.4 Configuring sounding notifications and audio messages

As a root-level administrator you can configure how the sounding notifications and audio messages about sounding system events and alerts are triggered.



This feature is a licensed option. It is available only with the applicable software feature license.

- ▶ 1. Select **Admin** in the application header.
- 2. Select **Events and alerts > Notifications**.
- 3. To edit an existing notification, select **Edit** in the corresponding row.
- 4. To create a new notification, select **Add New Notification**.
- 5. From the list, select which event or alert triggers the notification:
 - Each alert and event can be selected only once, so if you can not find the event/alert from the list, a notification for it has already been created.
 - **Other sounding events and alerts** options include other alerts and events that are not listed separately. There are separate triggers for alarm-level and warning-level alerts.
- 6. Take the written notifications into use by enabling **Notification**.
- 7. To also hear the sound notification, enable the notification sounds:

Beep sound

A prerecorded beep sound is played. The sound is different for events and alerts.

Spoken message

A prerecorded spoken message is played after the beep sound.

To test how the sound notification will sound, click **Play**.

- 8. Select **Save**.

The actual notifications are not displayed or played when you are working in the administrator view. Select **Exit Admin** in the application header to access the desktop view.

17. Configuring desktop views (Managing pages)

As a user with administrator-level rights, you can manage the pages in the NM10 web user interface. You can add new pages available to all users in your organization, and edit the existing pages, for example, by adding components to them.



Managing pages can only be performed by administrator-level users.

17.1 Desktop (Application)

The set of pages available in an organization is referred to as the desktop or the application. When configuring the system, the desktop for a new organization can be empty or can be based on an existing desktop.

For managing the desktop pages, select the desktop view instead of the administrator view, by selecting **Exit Admin** in the application header.

You can link the desktops (applications) to the organizations in the **Application Subscriptions** tab in the administrator view.

More information

- [Managing applications \(page 157\)](#)

17.2 Planning pages

Before adding a new page, plan ahead what the page will contain, including the following:

- Will you need a normal page (portal page) or a page with tabs (tabbed page).
- Which components the page will contain.
- How the available space will be divided between the components on the page.

After the basic layout of the page is clear, you can add the new page, and then add the components into it.

17.2.1 Page types

There are two page types: portal page and tabbed page. The following table describes the page types.

Table 10 Page types

Page Type	Description
Portal page	Portal pages do not have subtabs.
	You can add the components directly on the portal page.
	You can copy portal pages as a basis for new pages.
	You can add portal pages on the main level and as subtabs on tabbed pages.
Tabbed page	Tabbed pages always have subtabs.
	You must add the subtabs before you can add components on the tabbed page.
	You can add tabbed pages only on the main level.
	You cannot copy tabbed pages.

In the following example, the **Map** page is a portal page. There are no subtabs and the map component is added directly on the **Map** page.

The screenshot shows the VAISALA Observation Network Manager interface. At the top, there is a navigation bar with the title "VAISALA Observation Network Manager". Below the title, there is a horizontal menu with the following items: "Map" (which is highlighted with a red circle), "Network Status", "All Measurements", "Reports", "Events", and "Alerts".

The main content area is titled "Map component". It contains several sections:

- Site Status:** A table showing the count of sites in different status categories: OK (16), Warning (0), Error (0), and No connection (1).
- For details, click the site markers:** A note with a checkmark indicating additional information is available.
- Airport:** A dropdown menu set to "Airport" with three filter options: "Site name", "Last activity", and "Last observation received". There is also an "Add" button.
- Weather Station:** A dropdown menu set to "Weather Station" with one filter option: "Site name".
- Map View:** A central map area where site markers are displayed. One marker is highlighted with a green circle and has a tooltip showing details: "Autotalli" with timestamp "2024-05-28 10:43 +0300" repeated twice. Another marker is labeled "401" with the same timestamp. A third marker is labeled "AWS310".
- Control Buttons:** On the right side of the map area, there are several small icons: a magnifying glass, a gear, a plus sign, and a minus sign.

Figure 10 Example portal page (Map page)

In the following example, the **Network Status** page is a tabbed page. The content for the page comes from the three added subtabs.

Device status	Device name	
Error	002_RWS_XML.DTO	
OK	001_AVIMET_SENSOR_PORT	
OK	001_TCPSERVERPORT	
OK	002_AVIMET_SENSOR_PORT	
OK	003_AVIMET_SENSOR_PORT	

Figure 11 Example tabbed page (with portal pages as subtabs)

17.2.2 Page component types

The following list describes the page component types:



The content and options are different depending on the available software feature licenses.



Chart component, **Text Observation Widget**, and **Wind Widget** are not suitable for large systems.

All Measurements

A table format component displaying the selected variables from all the observation sites.

Chart component

A graph component displaying the selected variables from the selected observation site.

This component works best with single-site systems.

Communication device table

A table format component displaying the status of communication devices.

Event table

A table format component displaying the list of events from all observation sites.

Map component

A map displaying the observation sites and their status on the map.

Server table

A table format component displaying the status of the servers.

Text Observation Widget

A component displaying the selected latest observations in text format.
This component works best with single-site systems.

Wind Widget

A wind display component showing the selected wind variables from the selected observation site.
This component works best with single-site systems.

Alert Table Component

A table component displaying alerts. This component is also needed for the balloon release feature.

Web Component

A component displaying an embedded web site.

Software Update

A component for updating the software of the weather station data management units when LwM2M protocol is used for device management. For example, RWS200 data management unit (DMU703) and AWS810 (DMU801).

Reports

A module for generating reports.

Metadata

A component for viewing metadata from observation sites, when available.

Maintenance

A component for viewing the maintenance tasks from observation sites, when available.

More information

- [Adding components \(page 144\)](#)
- [Modifying components \(page 145\)](#)

17.2.3 Column types

You can select the following for columns:

- Number of columns
- Width of columns
- Resizable columns: Columns that you can resize by clicking and dragging the column border.
- Collapsible columns: Columns that you can collapse into a single row by clicking the arrow in the component title bar. To show the collapsed column again, click the arrow sign again.

17.3 Adding and modifying pages

After planning the basic layout of the page you can add the new pages and their components.

- ▶ 1. If you are in the administrator view, enter the desktop view by clicking **Exit Admin** in the application header.
2. Click the  icon on the application toolbar and select the type of page from the list. The following options are typically available, depending on, for example, which page type is active:
- **Add Portal Page:** Opens the window for adding a new page without tabs.
 - **Add Tabbed Page:** Opens the window for adding a new page with tabs.
 - **Edit page:** Opens the window for modifying the active page.
 - **Remove Page:** Deletes the active page.
 - **Add New Component:** Opens the window for adding a new component to the active page.
 - **Move Page:** Opens the window for moving a page.
 - **Copy Page:** Opens the window for copying the page.

17.3.1 Copying portal pages

You can copy existing portal pages. Tabbed pages cannot be copied.

- ▶ 1. Open the tab of the portal page that you want to copy.
2. Click the options icon in the application toolbar: 
3. Select **Copy Page**.
4. Give the page a new title and select **Copy**.
- The application toolbar now contains the new tab for the copied portal page.
5. If you want to edit the page layout and components, click the options icons at the top right corner of the page.

17.3.2 Adding portal pages

To create a portal page from scratch:

- ▶ 1. Click the  icon in the application toolbar and select **Add Portal Page**.
2. Enter a descriptive name for the page. The name will be shown on the page tab in the application toolbar.
3. Select the number of columns, that is, how many components the page will contain next to each other. A small image will show a preview of the page layout.
4. Select if the columns will be resizable and collapsible.
5. Enter the column widths.
6. Select **Save**. The application toolbar now contains the new tab for the page.
7. Add content to the page by clicking the  icon in the application toolbar and select **Add New Component**.
8. Select the component type, height, position, and width.
9. Select **Save**.

10. If you need to modify the component, click the settings icon  at the top corner of the component, in the component title bar.
11. Add other components, when applicable.

17.3.3 Adding tabbed pages

To add a tabbed page and the subtabs for showing the content, do the following:

- ▶ 1. Click the options icon  in the application toolbar and select **Add Tabbed Page**.
- 2. Enter a descriptive name for the page. Keep the name short, as the name will be shown on the page tab in the application toolbar.
- 3. Select **Save**. The application toolbar now contains the new tab with an empty space for the subtabs (portal pages).
- 4. Add the subtabs (= portal pages) by clicking the options icon  on the right of the empty space and select **Add Portal Page**.
- 5. Enter a descriptive name for the subtab.
- 6. Enter the number of columns, that is, how many components there will be side by side on the page:
 - The system calculates the default column width for each column in the following table.
 - A small image will show a preview of the page layout.
 - You can change the column widths, if needed, and select if the columns will be resizable and collapsible.
- 7. Select **Save**.
- 8. Add as many subtabs (portal pages) as you need.
- 9. Finally, add the content to the subtab pages (portal pages) by clicking the options icon  and selecting **Add New Component**.
- 10. Select the component type, height, position, and width.
- 11. Select **Save**.
- 12. If you need to modify the component, click the settings icon  at the top corner of the component, in the component title bar.
- 13. Add other components, when applicable.

17.3.4 Editing pages

As an administrator, you can edit the existing pages, by doing the following:

- ▶ 1. In the application toolbar, or next to the subtabs of a page, click the  icon.
- 2. Select **Edit page**.
- 3. In the editing window, you can edit the page name, and for portal pages also the number of columns, and the width of columns.
- 4. Select **Save**.

17.3.5 Moving pages

- ▶ 1. Select the tab of the page that you want to move.
- 2. Click the options icon  in the application toolbar and select **Move Page**.
- 3. A window is displayed with all the pages in your system in a "tree view". Select a page and click either **Move before** or **Move after** to move the page to a new position.

17.3.6 Deleting pages

The default pages may contain pages that are not needed in your system. To delete them:

- ▶ 1. Select the tab of the page that you want to delete.



CAUTION! Because deletion cannot be undone, consider carefully before deleting and make sure that you are deleting the correct page.

- 2. Click the options icon  in the application toolbar and select **Remove Page**.
- 3. Confirm the deletion by selecting **OK**.

17.4 Adding components

As an administrator, you can add components to the pages. Once you have created an empty page, you can add components into it.



Chart component, **Text Observation Widget**, and **Wind Widget** are not suitable for large systems.

- ▶ 1. Select the page where you want to add the component.
- 2. Click the  icon in the application toolbar.
If you want to add the component in a subtab, click the icon to the right of the sub tab name.
- 3. Select **Add New Component** from the list.

4. Select the component type and fill in the basic information:

Title

Select the component type from the list. You can edit the name later when modifying the component.

Component height

Enter the height of the module in percent, pixels, or based on content. 100% is the total height of the browser page.

Column

Select the column where you want the component to be positioned. For example, "1" is the first column from the left.

Column span

Select how many columns the component spans across.

5. Select **Save**.

After adding the component you can modify the components, for example, by moving the modules and setting the options for the component.



If you cannot see the component, it may have been inserted below an existing component. Scroll down the page and move the component, if needed.

More information

- ▶ [Page component types \(page 140\)](#)

17.5 Modifying components

As an administrator, you can modify the components on the pages by doing the following:

- ▶ 1. Click the icon at the top corner of the component, in the component title bar.



If the icon is not displayed, see [Showing component title bar \(page 153\)](#).

2. Depending on the component type, you can, for example:

- Modify the component appearance, for example, title and height of component.
- Change which parameters are displayed, and which units are used, when applicable.
- Select the sources where the data comes from.
- For an example, see [Modifying chart components \(page 146\)](#).



The content and options are different depending on the available software feature licenses.

3. Select **Save**.

The component title bar contains the component name, if configured, and the following icons for modifying the component:

Table 11 Component title bar

Icons	Description
	When available, collapses the component into a single row.
	When available, opens the collapsed component.
	Opens the configuration window for modifying the content, data source, and appearance of the component.
	Maximizes the component into full browser window size.
	Deletes the component.
	Minimizes the component into its normal size.

More information

- [Page component types \(page 140\)](#)

17.5.1 Modifying chart components

After creating the chart component, you can adjust the chart properties and select the data sources and the displayed parameters.

- 1. Click the icon at the top corner of the chart component.



If the icon is not displayed, see [Showing component title bar \(page 153\)](#).

2. On the **Component** tab, edit the basic component settings. The following describe the typical available options:

Title

The text that is displayed in the component title bar.

Auto-hide title bar

Select this to hide the component title bar.



Also the icon will be hidden. To display the component title bar again, see [Showing component title bar \(page 153\)](#).

Component height

The height of the module in percent, pixels, or based on content. 100% is the total height of the browser page.

Column span

Select how many columns the component spans across.

Collapsible

Select this if you want that the component can be collapsed into a single row.

3. On the **Data sources** tab, select the observation sites or other sources from which the data is displayed in the component.

4. On the **Parameters** tab, define the detailed properties for the component.

Chart length (seconds)

Length of the time period that is displayed in the chart.

Chart title visible

Select to show the title at the top of the chart.

Chart title

Enter the title for the chart.

West axis title visible

Select to show the title for the west axis.

West axis title

Enter the title for the west axis at the left side of the chart. To use the title from the original parameter name, enter **{auto}**.

East axis title visible

Select to show the title for the east axis.

East axis title

Enter the title for the east axis at the right side of the chart. To use the title from the original parameter name, enter **{auto}**.

South axis title visible

Select to show the title for the south axis.

South axis title

Enter the title for the south axis at the bottom of the chart. To use the title from the original parameter name, enter **{auto}**.

West axis scale override

Select this to define manually the west axis scale limits.



When this option is NOT selected, the scale is automatically defined by the displayed data.

West axis scale min

The minimum value for the axis, for example, "0" for wind direction.

West axis scale max

The maximum value for the axis, for example, "360" for wind direction.

West axis scale min tick

The minimum stepping (space between tick marks) on the west axis. If there is not enough space, a multiple of this tick is used. For example, if for wind direction 0-360 degrees the minimum tick 10 is entered, the stepping of 20 degrees will be used.

East axis scale override

Select this to define manually the east axis scale limits.



When this option is NOT selected, the scale is automatically defined by the displayed data.

East axis scale min

The minimum value for the axis, for example, "0" for wind direction.

East axis scale max

The maximum value for the axis, for example, "360" for wind direction.

East axis scale min tick

The minimum stepping (space between tick marks) on the east axis. If there is not enough space, a multiple of this tick is used. For example, if for wind direction 0 - 360 degrees the minimum tick 10 is entered, the stepping of 20 degrees will be used.

5. Select **Save**. Check the result and modify again, if needed.

17.5.1.1 Selecting variables for graph

- ▶ 1. To select variables for the graph, click the icon near the graph line legend.
- 2. If available, select the data source.
- 3. Select a variable from the list of available variables.
- 4. The graph for the selected parameter is displayed.



The graph can only display two (2) different units. You can select more parameters only if the number of different units does not exceed 2.



If the graph is not displayed, the chart settings may need modifying. Administrator-level users can modify the graph component.

5. If you want to remove a graph line, click the graph line name in the legend and select **Remove curve**.

17.5.2 Modifying text observation components

After creating a text observation component, you can adjust its properties and select the data sources and the displayed parameters.

- 1. Click the  icon at the top corner of the component.



If the icon is not displayed, see [Showing component title bar \(page 153\)](#).

2. On the **General** tab, edit the basic component settings.
3. On the **Data source selection** tab, select the sources where the data comes from.
4. On the **Parameters** tab, select the parameters:

Value timeout

Enter the time in seconds that the system waits before marking the data as "missing" (///). If the timeout value is "-1", the data will never be marked as missing, instead, the last received value will stay in the field.

Add parameter

Select a parameter from the list to add it in the widget.

Use the option **Empty row** to add space between the parameter rows.

5. Select **Add** after each row.
6. To modify the selected parameters you can:
 - Change the parameter row order by clicking the up and down arrow icons.
 - Remove rows by selecting **Remove**.
 - Edit the parameter name by clicking and deleting the original parameter name and writing the new name in the same space. To view the original name, place the mouse on the parameter name in the configuration window.

		Wind speed Average	Remove
		Wind direction	Remove
		Empty row	Remove

7. Select **Save**. Check the result and modify again, if needed.

17.5.3 Modifying web components

After creating the web component, you must modify it to contain the URL:

- 1. Click the  icon at the top corner of the component. The component settings page is displayed.



If the icon is not displayed, see [Showing component title bar \(page 153\)](#).

2. Edit the settings as needed.

Title

Text that is displayed in the component title bar.

Component height

Height of the component.

Column span

Width of the component in columns when the component has several columns.

Auto-hide title bar

Select this to hide the component title bar.



Also the  icon will be hidden. To display the component title bar again, see [Showing component title bar \(page 153\)](#).

Collapsible

Select this if you want that the component can be collapsed into a single row.

URL

The URL of the embedded web page, in the **https** format.

If the web page is hosted in the NM10 server, the URL in the web component properties must be configured as:

/nm10/<webpage>.html

The web page files must be stored in the folder:

... \Vaisala\NetworkManager\nm10-frontend\webapps\nm10

For example, in Windows:

C:\Program Files (x86)\Vaisala\NetworkManager\nm10-frontend\webapps\nm10

For example, in Linux:

/opt/vaisala/nm10/nm10-frontend/webapps/nm10/

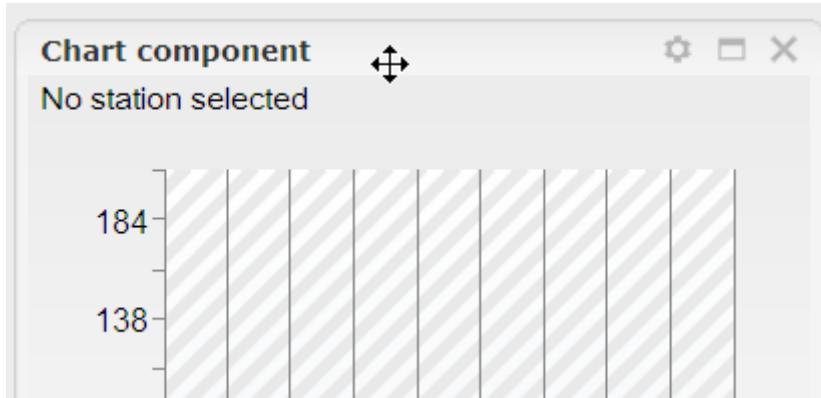
URL source

This is not needed.

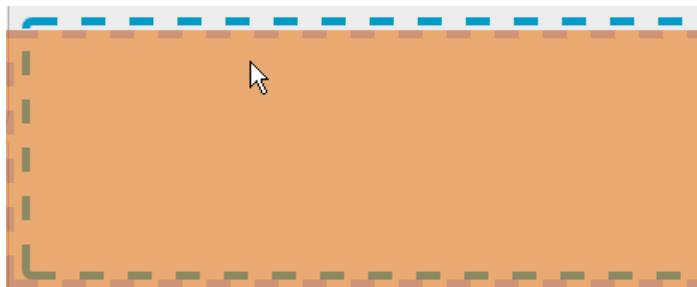
3. Select **Save**. Check the result and modify again, if needed.

17.5.4 Moving components

- ▶ 1. Click at the top of the component and keep the mouse button pressed down. The mouse pointer symbol changes into an arrow symbol:



- 2. Without releasing the mouse button, drag the selected component to where you want to move it. The dotted line shows the areas where it can be placed:



- 3. When the component is at the desired location, release the mouse button. The component is resized to fit the area marked with the dotted lines.

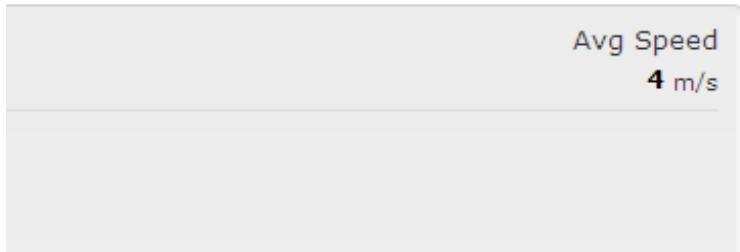
17.5.5 Hiding component title bar

The component title bar displays the component name (for all users) and the icons needed for editing the component (for administrator users).

In most of the component types you can select if the component title bar is displayed or not. To hide the component title bar, do the following:

- ▶ 1. Click the  icon at the top corner of the component.
- 2. In the component configuration window, select the **Auto-hide title bar** selection box.

3. Select **Save**. The component title bar is hidden:

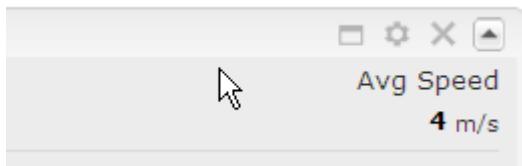


17.5.6 Showing component title bar

To temporarily show the hidden component title bar:

- 1. Press the CTRL key down and move the mouse pointer on top of the component.

The title bar is displayed:



2. To permanently show the hidden component title bar, click the gear icon to access the settings, deselect the **Auto-hide title bar** selection box, and select **Save**.

18. Managing users, organizations, and applications

You can manage users, organizations, or applications in the administrator view.

For typical work flow when configuring a new NM10 system, see [Configuration summary \(page 68\)](#).

18.1 Managing users

Users can be created and managed in NM10 web user interface as follows:

- Root-level administrators can add and edit the user accounts in the system.
- Organization-level administrators can add and edit the user accounts in their own organizations.
- All users can edit their user profile in the **User > My Profile** page. Username cannot be edited.

If Active Directory is used for authenticating in your system, users are created during system configuration and they cannot be managed in NM10. Logged in Active Directory users can be seen in the **System > Logged in Users** page.

More information

- [Viewing pages as guest user \(page 54\)](#)
- [User roles and types \(page 59\)](#)

18.1.1 Active Directory users

If Windows Active Directory is used for authenticating in your system, users are created during system configuration and they cannot be managed in NM10. If modifications are needed, contact your system administrator or Vaisala for further instructions.

Windows Active Directory users are not displayed in **Admin > User** pages.

Logged in Windows Active Directory users are displayed listed in the **System > Logged in Users** page and can be logged out by root-level administrators.

18.1.2 Adding users

-
1. Select **User > Users** in the administrator view.
 2. In the **Users** page, select **Add new user**.

3. Fill in the user account information:

Username

Username for the user.

Password and Confirm password

The user's password. The password must fulfill the minimum security levels defined in **User > Password Configuration**.

State

By default, **Password Expired**. This will force the user to change the password when logging in for the first time.

Email

Enter an email address for the user. This is a mandatory field.

First name, Last name, City, Country

Optional fields.

Time zone

Time zone used in NM10 views and reports. By default **Local** (= as set in the user's computer settings).

Language

Select which language version of the software is opened by default for the user. Users can later change the language settings by editing their profile.

4. Select the organization for the user:

- Make sure the selection box is properly selected in the correct **Selected** column. Highlighting the organization row does not select the organization.
- Select only one organization for a user.
- If the organization is not available yet, a root-level administrator can create the organization.
- A message about errors in an organization indicates that you have not selected a role for the user yet. See the next step.

5. Select the role for the user. Check that the organizations table is updated with the selected role.



Do not assign the **guest** role to any users. The guest role is reserved for the pre-configured guest user in the root organization, enabling guest users to view the pages without logging in.



To select several roles for one user, hold down the **CTRL** key when selecting the roles (for example, **administrator** and **AUTOSONDE operator**).

6. Select **Save**.

18.1.3 Deleting users

- ▶ 1. Select **User > Users** in the administrator view.
- 2. In the **Users** page, find the user from the list of users.
You can also search for the user by entering the username in the **Search** field.
- 3. Select **Delete** next to the user that you want to delete.



CAUTION! Do not delete the guest user with the role **guest**!
If you need modifications to the default configuration, contact Vaisala for further instructions.

- 4. Confirm the deletion.

18.1.4 Editing users

- ▶ 1. Select **User > Users** in the administrator view.
- 2. In the **Users** page, find the user from the list of users.
You can also search for the user by entering the username in the **Search** field.
- 3. In the list of users, select **Edit** next to the user that you want to edit.
- 4. In the **Edit user** page, edit the user account information.



CAUTION! Do not delete the guest user with the role **guest**!
If you need modifications to the default configuration, contact Vaisala for further instructions.

- 5. Select **Save**.

18.1.5 Searching users

In the **Users** page in the administrator view, you can use the **Search** field for finding users who have an account in the system. You can search users by the following criteria: organization, role, username, last name, first name, and user state.

18.2 Managing organizations

As a root-level administrator, you can add and edit organizations in the system.

To manage organizations in the system, select **User > Organizations** in the administrator view.

To create a new organization and to take it into use:

- ▶ 1. Create a new organization. See [Creating new organization \(page 157\)](#).
- 2. Create an application. An application defines the set of desktop pages available for the organization. See [Adding new application \(page 158\)](#).
- 3. Create an application subscription that links the application with the organization. See [Managing application subscriptions \(page 158\)](#).
- 4. Link the application subscription to a view context. The view context defines the available site types or site groups for the organization. See [Adding new View Contexts \(page 159\)](#).

18.2.1 Creating new organization

- ▶ 1. Select **User > Organizations** in the administrator view.
- 2. Select **Add new organization**.
- 3. Define the following:

Code

The name for the organization

Description

A description for the organization

Visible Sites

Not used. View contexts define which sites are visible.

4. Enter the code (name) and description for the new organization.
5. Select **Save**.

Continue with mapping the organization with an application by creating an application subscription. If you have not created the applications yet, do it in the **Applications** tab.

18.3 Managing applications

The set of pages available in an organization is referred to as the desktop or the application. When configuring the system, the desktop for a new organization can be empty or it can be based on an existing desktop. Desktops/applications are mapped with the organizations in the **Application Subscriptions** tab.

As a root-level administrator, you can view the application management pages by selecting **Application** in the administrator view. In application management you can:

- Define the applications (empty desktops or based on existing desktops).
- Back up existing applications by exporting the application into a file that can later be imported as a base for a new application.
- Map the applications with the organizations by creating application subscriptions.



Do not delete the "VONM" application and application subscriptions.

The application subscriptions are also used for mapping the application with a view context in **View Context > View Context Subscriptions**.

More information

- [Desktop \(Application\) \(page 138\)](#)

18.3.1 Adding new application

To add a new application:

- ▶ 1. Select **Application > Applications** in the administrator view.
- 2. Select **Add new application**.
- 3. Enter the code (name) and description for the new application.
- 4. For **Desktop**, select one of the following:
 - **Create new**: If you want to create a new application using an empty desktop. When you link an organization to this application, the desktop pages for the organization have to be created from scratch.
 - **Copy from**: If you want to use an existing desktop from a previously created application as a basis. Select the application from the list.
 - **Import from**: If you want to use an existing desktop from a previously created application as a basis and you have it as an exported file. Browse to the file and select it.
- 5. Select **Save**.

Continue with mapping the organization into an application in the **Application Subscriptions** tab.

18.3.2 Managing application subscriptions

Link the applications (the sets of desktop pages) with organizations by creating application subscriptions:

- ▶ 1. Select **Application > Application Subscriptions** in the administrator view.
- 2. Select **Add new application subscription**.
- 3. Enter the code (name) and description for the new application subscription.
- 4. Select the organization and the application that you want to map with to the organization.
- 5. Click the **Start date** and **End date** fields and select the dates for the subscription. Select a long enough period. After the end date the subscription expires and the users cannot log in.
- 6. Enter the maximum number of simultaneous users. If more than the defined number of users are trying to log in, they cannot log in until another user logs out.

7. Select **Save**.



Do not delete the "VONM" application and application subscriptions.



To map the application subscription with a view context, go to **View Context > View Context Subscriptions**.

18.3.3 Backing up applications

To create a backup file from an application:

- ▶ 1. Select **Application > Applications** in the administrator view.
- 2. In the row for the correct application, select **Export**.
- 3. Save the .json file.

18.4 Managing view contexts

View contexts define which site types or site groups are visible in the desktop. The default organization uses the default view context that shows all sites that are configured in your system.

When creating new organizations you can typically use the default view context. You must create new view contexts only if you want to restrict the number of visible sites or site types for an organization, or if the users need to have the option of changing which site groups are displayed. For example:

- If your system contains RWS200 sites and AUTOSONDE sites, but one organization needs to show only RWS200 sites, you can define this by creating view contexts for each site type.
- If your system contains weather stations from several geographical or administrative areas and the users need to be able to select which area to view, you can define this by creating view contexts for each area. For this you must first create the site groups that contain the weather stations for each area.

You can then link the view contexts with the organizations by creating view context subscriptions and linking them with the application subscriptions that the organizations use.

18.4.1 Adding new View Contexts

- ▶ 1. Select **View Context > View Contexts** in the administrator view.
- 2. Select **Add New View Context**.

3. Define the following:

Code

The name for the view context

Description

A description for the view context

Region

Enter the co-ordinates to limit the map area where users can see content.

Source Group

Select one of the options to show only the selected site type or site group, for example, **Road weather stations**.

All is the source group used in the default view context that shows all available site types. This view context, *ViewContextNM*, is available in default configuration and can be selected when creating view context subscriptions.

Map View Contexts

Select the default option.

4. Select **Save**.

More information

- [Creating custom site groups \(page 99\)](#)
- [Changing site group or organization \(page 57\)](#)
- [Adding view context subscriptions \(page 160\)](#)
- [Making view contexts selectable in application header \(page 99\)](#)

18.4.2 Adding view context subscriptions

To define which site type or site group the new organization displays, you must create a view context subscription. A view context subscription links a created view context with the application subscription.

- 1. Select **View Context > View Context Subscriptions** in the administrator view.
2. Select **Add New View Context Subscription**.
3. Define the following:

Code

The name for the view context subscription

Description

A description for the view context subscription

Application Subscription

Select the application subscription that you want to link with a view context.

View Context

Select the view context.

The default view context *ViewContextNM* displays all site types.

If the list does not contain the view context you need, create a new one in the **View Context > View Contexts** page.

4. Click the **Start date** and **End date** fields and select the dates for the subscription.

5. Select **Save**.

After the view context subscription links the view context with a specific application subscription, the organization that is defined in the application subscription shows the site types or site groups that the selected view context contains.

More information

- ▶ [Adding new View Contexts \(page 159\)](#)
- ▶ [Making view contexts selectable in application header \(page 99\)](#)

18.5 Configuring password requirements

As a root-level administrator, you can configure the common requirements for all the passwords created in the system. If the user is trying to create a password that does not match the defined requirements, the system will prompt the user to edit the password.

- ▶ 1. Select **User > Password Configuration** in the administrator view.
- 2. Enter the length requirements, select what components the password must contain, and if it must match a regular expression.
- 3. You can also define how many previous passwords are not accepted as new passwords.
- 4. Select **Save**.

To define what happens when users try to log in using a wrong password, go to the **Identity Configuration** tab.

18.6 Identity configuration (Lockout policy)

As a root-level administrator, you can configure the lockout policy, that is, what happens when users try to log in using a wrong password.

You can also define that the passwords are valid only for a limited time.

- ▶ 1. Select **User > Identity Configuration** in the administrator view.

2. Select or enter the following, as needed:

Lock on failure

Select this if you want to lock the user account when a wrong password is used.

Max attempts before lock

Enter how many times a wrong password can be used before the user account is locked.

Lock duration

Enter how long the lock lasts, in seconds. During the lock time the username cannot be used for logging in.

Expire password

Select this if you want the password to be valid only for a limited time.

Password validity

Enter the validity time in days. The system prompts to change the password after this period expires.

3. Select **Save**.

19. Terminal Connection

19.1 Terminal connection

If available, you can use the terminal connection to connect to weather stations and other field devices through a communication port.

You can monitor the messages the stations send and you can send commands to the stations to check and modify the device status.

The **Terminal** link is located in the **Actions** column on the **Sites** tab, when available.

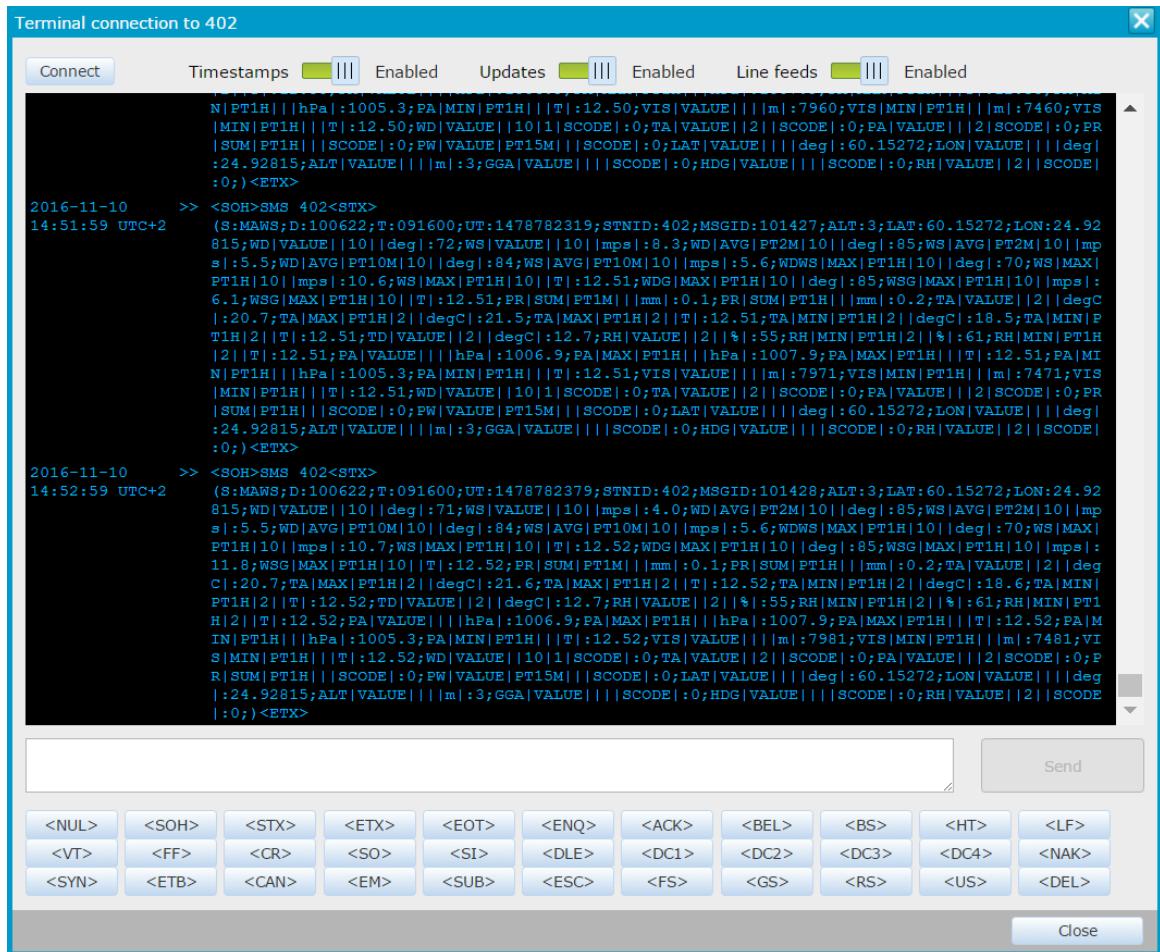
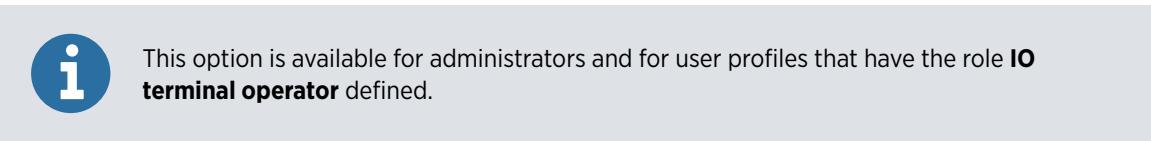


Figure 12 Terminal connection window

Service connection and data connection must have been configured to use the same port in the weather station.

19.2 Viewing messages from site

This option is available for administrators and for user profiles that have the role **IO terminal operator** defined.

- ▶ 1. Open the **Site Details** window for the site that you want to connect to by clicking the site marker in **Map** view, or by clicking the data row for the site in **All Measurements** view.



The terminal connection link is also located in the **Actions** column on the **Sites** tab, when available.

- 2. In the **Site Details** window, click the **Terminal** link.

The terminal connection window opens, showing the message flow from the station.

- 3. You can filter how the messages look by toggling the enabled/disabled buttons.

19.3 Sending messages using terminal connection

This option is available for administrators and for user profiles that have the role **IO terminal operator** defined.

- ▶ 1. Open the **Site Details** window for the site that you want to connect to by clicking the site marker in **Map** view, or by clicking the data row for the site in **All Measurements** view.



The terminal connection link is also located in the **Actions** column on the **Sites** tab, when available.

- 2. In the **Site Details** window, click the **Terminal** link.

The terminal connection window opens, showing the message flow from the station.

- 3. To enable the connection for sending commands, click the **Connect** button at the top of the window.



CAUTION! Opening connection to the station will temporarily block observation data from the station.

4. Select **Connect** in the confirmation window.
5. Enter the commands in the text field.
 - You can select the necessary ASCII characters using the buttons provided.
 - See the appropriate field device manuals for the commands you need to send.
6. Select **Send**.

20. Remote desktop connection to AviMet sites

20.1 Remote desktop connection

You may be able connect to another computer over a network connection using the Remote Desktop Protocol (RDP). Typically the remote connection is configured to the airport site servers. When the remote desktop connection is open you can use the applications in the airport site server that have been configured for remote access.



The availability and functionality of this feature depends on the configuration and roles in the airport system.

The following must have been configured in the airport system:

- The remote desktop feature must have been configured. For example, the Thinfinity Remote Desktop Connection server software must be installed in the airport site server and the applications for remote access must have been defined.
- You must have the remote desktop software credentials that you have received during system delivery.
- You must have the necessary credentials to access the airport site server.

More information

- [Adding airport sites \(page 94\)](#)

20.2 Opening remote desktop connection

You may be able to connect to the airport site servers over a network connection using the Remote Desktop Protocol (RDP).



The availability and functionality of this feature depends on the configuration and roles in the airport system.



The remote connections are supported only with HTML5-compliant web browsers (Chrome, Firefox, and Microsoft Edge).

- ▶ 1. Open the **Site Details** window for the site that you want to connect to by clicking the site marker in **Map** view, or by clicking the data row for the site in **All Measurements** view.

2. In the **Site Details** window, click the link for remote desktop connection.



If there is no link available, the functionality is not available.

3. In the security certificate warning page, select the **Continue to this website** option.
4. Enter the remote desktop software credentials that you have received during system delivery and click **OK**.
5. In the Thinfinity Remote Desktop window that is displayed, make sure that the Remote Desktop option is selected and click **Connect**.
6. Enter the AviMet server computer credentials and click **Log in**.
7. When you have successfully logged in, you can see the AviMet server remote desktop and access the applications depending on your credentials.

20.3 Closing remote desktop connection

Closing the applications does not close the remote desktop connection. To close the connection:

- ▶ 1. Click the arrow at the top of the desktop. You may have to move application windows to see the arrow.
- 2. Select **Disconnect**.
- 3. Confirm disconnecting by selecting **OK**.

21. Remote desktop connection to sounding sites

You can connect to the sounding server computer, such as the AUTOSONDE server computer, over a network connection using the Remote Desktop Protocol (RDP). When the remote desktop connection is open you can use the applications in the sounding server that have been configured for remote access.

Prerequisites

The following must have been configured and available:

- The remote desktop feature must have been configured in the AUTOSONDE or MW41 server computer. For example, the Thinfinity Remote Desktop Connection server software must be licensed and installed in the server and the applications for remote access must have been defined.
- You must have the remote desktop software credentials that you have received during system delivery.
- You must have the necessary credentials to access the AUTOSONDE/MW41 server.

More information

- [Adding sounding sites \(page 95\)](#)

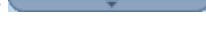
21.1 Opening remote desktop connection to sounding sites

For prerequisites, see [Remote desktop connection to sounding sites \(page 168\)](#).

-
1. Open the **Site Details** window by clicking the sounding site that you want to connect to.
 2. In the **Site Details** window, click the **Remote Desktop** link.
 3. In the security certificate warning page, select the **Continue to this website** option.
 4. Enter the remote desktop software credentials that you have received during system delivery and click **OK**.
 5. In the Thinfinity Remote Desktop window that is displayed, make sure that the Remote Desktop option is selected and click **Connect**.
 6. Enter the AUTOSONDE or MW41 server computer credentials and click **Log in**.
 7. When you have successfully logged in, you can see the AUTOSONDE or MW41 server remote desktop and access the applications depending on your credentials.

21.2 Closing remote desktop connection

Closing the applications does not close the remote desktop connection. To close the connection:

- ▶ 1. Click the arrow  at the top of the desktop. You may have to move application windows to see the arrow.
- 2. Select **Disconnect**.
- 3. Confirm disconnecting by selecting **OK**.

22. Updating site software

As an administrator, you can update the software of the sites that have the LwM2M management server connections configured and enabled (for example, RWS200 road weather stations using the XML DTO interface).

During the update, the system first uploads the new software file to a dedicated NM10 server and, when requested, updates it to the selected sites. During and after the update the site typically restarts at least once.

- ▶ 1. After you have received the software update file from Vaisala, select the **Software Update** view.
- 2. Select **Select Software File**.
- 3. In the **Select Software File** window, select the software file to be installed:
 - If the file has already been uploaded to NM10 server, select the correct file from the list and click **Select**.
 - If no files have yet been uploaded to NM10 server, browse to the correct local file, select it, and wait until it uploads. The uploaded file is automatically selected.
 - If other files have been uploaded to NM10 server, select **Upload new**, browse to the correct local file, select it, and wait until it uploads. The uploaded file is automatically selected.

The name of the selected file is displayed below the **Select Software File** button in the **Software Update** page.

- 4. In the **Software Update** page, select the sites to be updated.
- 5. Select **Update**.
 - You can follow the update status in the **Software update status** column.
 - During the update the sites typically restart at least once: Connection to the site is interrupted and data is not available. Related events are displayed in the **Events** view.
 - If the update fails, it is indicated in the **Software update status** column. For more information, see the **Events** view.
- 6. When the update for a site is completed, it is indicated in the **Software update status** column. You can also check from the NM10 views that the site is displayed normally.

22.1 Software update view

In the **Software Update** view, you can update the site software. For example, you can update the software of the RWS200 data management unit DMU703.

Select Software File

Opens the window where you can select the software file used for the update. If the file is not yet in the NM10 server, you can upload the file there first.

Site

List of the available sites.

Update completed

Time of the last successful software update.

Current software version

The software version used at the site currently.

Software update status

The progress of the update, including completion or failure, and the error code for the failure. The error code is explained in the **Details** window.

Actions

Cancel and **Details**. The **Details** window contains information about the update, for example, the name of the user who requested the update or the reason for cancellation or failure.

22.2 Details window

When you select **Details** in the **Software Update** view, the details window displays the following for the site:

Software update status

The progress of the update, including completion or failure.

Reason

If the update fails, the error code and reason from the LwM2M management server.

Software file

The name of the software update file used in the update.

Update requested

Date and time when the update was requested.

Update requested by

The user who requested the update.

Update canceled

Date and time when the update was canceled.

Update canceled by

The user who canceled the update.

Update completed

Date and time when the update was completed.

23. Restarting sites

As an administrator, you can restart the sites that have the LwM2M management server connections configured and enabled (for example, RWS200 road weather stations using the XML DTO interface). The restart means a full system restart (for example, PMU restart in RWS200).

- ▶ 1. Open the **Site Details** window for the site that you want to restart, for example, by clicking the site marker in the map view or the site row in a list view.
- 2. Select the **Operations** tab.
- 3. Select **Restart**.
- 4. In the confirmation window, select **Restart** again.

The following texts in the **Operations** tab indicate the status of the restart request:

Restart request sent

The restart request was successfully sent to the site.

Sending restart request failed

Sending the restart request failed. Check the connections and try again.

- 5. The restart takes several minutes and the connection to the site is lost during the restart operation. You can follow the restart progress in the **Events** tab.

24. Site Details window

To show the **Site Details** window, click a site marker in the **Map** view, or click a data row for example in the **All Measurements** view.

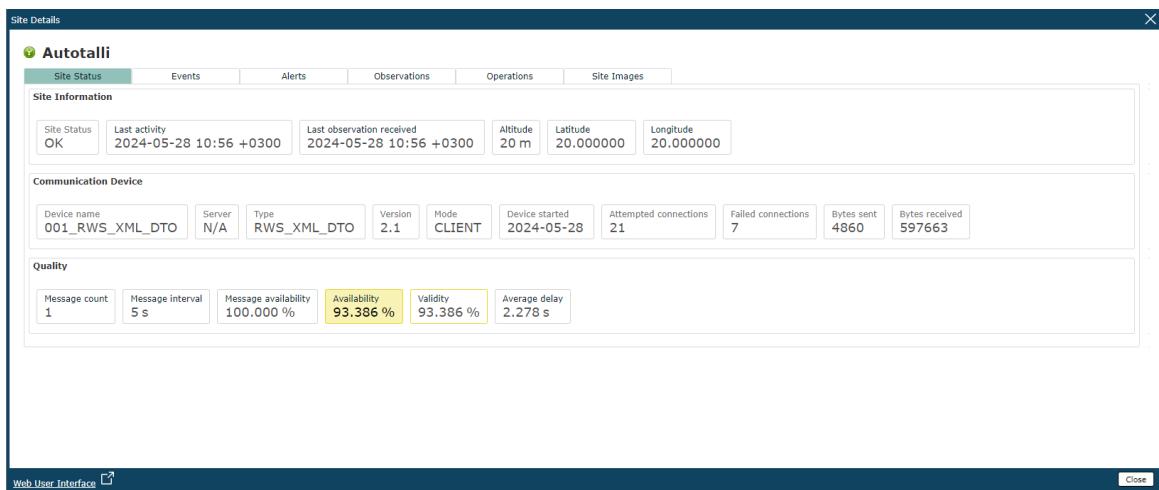


Figure 13 Site Details window example

The **Site Details** window contains detailed information from the site, depending on the site type and system configuration.

Site Status

Information on site, communication device, and quality.

When available and configured, contains also alert blocking information, sub-system status, and metadata from the site.

Events

The latest events from the site. If only part of the event message is displayed, move the mouse pointer over the message to display the whole event text.

You can filter, pause, and clear the events.

Alerts

The latest alerts for the site.

Observations

The last observation data received from the site, including METAR/SPECI report from airport sites, if configured. The data value status is indicated with the background color of the data fields.

Observations are displayed for the individual data sources at the site. To display the observation time, move the mouse pointer over the observation value.

Assets

List of the available assets on the site, for example, measurement devices and data loggers, and their metadata, such as model and serial number. Select an asset row to see detailed information. Logged-in users can also add and relocate assets.

Maintenance

List of maintenance tasks for the assets. Logged in users can also add and edit the tasks.

Operations

The available device management operations, for example, restarting.

Site Images

Images from the site that have been uploaded to NM10.



If no data has yet been received from the site, the **Site Details** cannot be displayed.



The content and options are different depending on the available software feature licenses.

More information

- [Managing maintenance tasks \(page 176\)](#)
- [Managing assets \(page 174\)](#)

24.1 Enabling and disabling automatic refresh

In the **Site Details > Site Status** tab automatic refresh is always on.

In the other tabs the automatic data refresh is by default enabled or disabled depending on the data type. You can change the setting by enabling or disabling **Updating**. When enabled, the data is automatically refreshed when new data is received from the site. When disabled, the data is not updated.

24.2 Remote access links to sites

To further diagnose the site status, you can connect to the site using the remote access links in the **Site Details** window, when available and configured. The remote access links can be, for example, remote desktop connection (RDP) links to the site server, Terminal connection or remote connection to the site web user interface.

Remote access links are not available for guest users.

24.3 Managing assets

If available in your system, the assets associated with the sites can be added and edited to match the actual changes at the site. For example, if a new sensor has been installed at the site, the sensor can be added as an asset in the system.

All users can view the assets. Logged in users can add and edit assets.

Assets are displayed in the **Site Details** window for each site, on the **Assets** tab. You can do the following:

- Move the selected assets into another location, using **Relocate selected assets to** and **Relocate**.
- Add new assets with **Add New Asset**.
- View the asset details by clicking the asset row.

More information

- [Site Details window \(page 173\)](#)

24.3.1 Adding new assets

When logged in, you can add assets in NM10 after they have been installed at the site.

- ▶ 1. Open the **Site Details** window, for example by clicking the site marker in the map view, or the site row in a list view.
- 2. Select **Assets**.
- 3. Select **Add New Asset**.
- 4. Fill in the asset information. **Category** and **Model** are mandatory, other information is optional.
- 5. Check that the **In use** option is selected.
- 6. Select **Save**.

24.3.2 Editing assets

When logged in, you can edit the assets:

- ▶ 1. Open the **Site Details** window, for example by clicking the site marker in the map view, or the site row in a list view.
- 2. Select **Assets**.
- 3. Click the asset row that you want to edit.
- 4. In the details window, select **Edit**.
- 5. Make the needed changes.
 - You can also manage the maintenance tasks related to the asset by selecting **Maintenance**.
 - You can not delete assets. You can remove them by relocating them to a service center.
- 6. Select **Save**.

24.3.3 Relocating assets

When logged in, you can relocate the assets in NM10 to match the actual relocating in the field.

- ▶ 1. Open the **Site Details** window, for example, by clicking the site marker in the map view, or the site row in a list view.
2. Select **Assets**.
3. Select the check box in the first column for the assets that you want to relocate.
4. From the **Relocate selected assets to** list, select the site where you want to relocate the assets.
5. Select **Relocate**.

More information

- [Adding service centers \(page 97\)](#)

24.3.4 Importing assets

If your system has been configured to contain assets, you can import new or updated assets from a CSV file into NM10.



If new sites are needed, they need to be created before the asset import. If the uploaded file contains sites that are not included in NM10, the import skips those site rows and does not create the sites in NM10.

- ▶ 1. Select **Admin** in the application header.
2. Select **System > Data import**.
3. Select **Import New CSV File**.
4. Browse to the CSV file, and if needed, change the separator character.
5. Select **Upload**. The window shows information on the uploaded file.
 - If an asset with the serial number or the asset name exists, the existing asset will be updated. If the existing asset is in another site, the asset will be relocated to the site defined in the import file.
 - If both serial number and asset name are empty, import will create a new asset.
6. Select **Import**.
7. Select **Close**. Check from the **Site Details** windows of the sites that the assets are displayed as they should.

24.4 Managing maintenance tasks

All users can view the maintenance task metadata associated with the actual maintenance tasks at the sites. Logged in users can add and edit the maintenance tasks.

Maintenance tasks are displayed in the **Site Details** window for each site, on the **Maintenance** tab. Alternatively, you can access them on the **Assets** tab by clicking an asset and then selecting **Maintenance**. You can do the following:

Completed tasks

Use this toggle button to show or hide the completed maintenance tasks in the list.

Add New Task

Select this to add a new maintenance task.

Planned period

This column shows the period when the maintenance task has been planned to be performed. Column colors: Red = Overdue, Green = Ongoing.

Mark as Completed

Select this to mark the maintenance task as completed.

Edit

Select this to edit the maintenance task.

More information

- ▶ [Site Details window \(page 173\)](#)

24.4.1 Adding new maintenance tasks

When logged in, you can add new maintenance tasks:

- ▶ 1. Open the **Site Details** window by clicking the site marker in the map view, or the site row in a list view.
- 2. Select **Maintenance**.
 - Alternatively, you can add a maintenance task for a particular asset by selecting the **Assets** tab, clicking the asset row, and selecting **Maintenance**.
- 3. Select **Add New Task**.
- 4. From the **Asset** list, select the asset that the maintenance task is related to. The available metadata is displayed.
- 5. Under **Task**, select or enter the following:

Maintenance type

The type of maintenance task, for example, corrective or preventive maintenance.

Details

Optional details about the maintenance task.

Planned period

The period during which the maintenance is planned to take place.

Status

Displays the status of the task, for example, **Planned** or **Completed**.

Completion date

Filled in when completed: Completion date of the maintenance task.

Performed by

Filled in when completed: Name of the maintenance person completing the task.

Comments

Optional comments.

6. Select **Save**.

24.4.2 Editing maintenance tasks

When logged in, you can edit the maintenance tasks:

- ▶ 1. Open the **Site Details** window, for example by clicking the site marker in the map view, or the site row in a list view.
- 2. Select **Maintenance**.
 - Alternatively, you can edit a maintenance task of a particular asset by selecting the **Assets** tab, clicking the asset row, and selecting **Maintenance**.
- 3. Select **Edit** in the row of the task that you want to change.
- 4. In the **Edit Task** window, make the needed changes:
 - To mark the task as completed, fill in the **Completion date** field.
 - To delete the task, select **Delete Task** and confirm the deletion.
 - Other options are explained in [Adding new maintenance tasks \(page 177\)](#).
- 5. Select **Save**.

25. NM10 Public API for observation data

Vaisala Observation Network Manager NM10 Public API provides an interface for external systems to self-process the observation data from NM10 by requesting data from NM10 via a standard REST API.

External systems can access the following APIs:

- *sources* endpoint to retrieve all stations registered on NM10
- *latest-measurements* endpoint to retrieve the latest observed data of the stations registered on NM10
- *measurements* endpoint to retrieve the observed data of the stations registered on NM10 within a given time period

The public API is hosted by the NM10 frontend server/service. The API address, HTTPS port, and certificate are the same with the web user interface.

All API functionalities are global at system level. API user has access to all devices and measurements of the system.

Server provides secure HTTPS protocol with TLS versions 1.2 and 1.3.

All endpoints require API key based authentication. API keys are managed in NM10 web user interface by the NM10 administrator. See [Configuring authentication keys \(page 124\)](#).

The full API description is available in a separate OpenAPI file in the installation USB stick.

26. Troubleshooting

26.1 Troubleshooting

The web user interface pages provide information on the status of the sites and connections, for example in **Events** view and **Site Details** window.

Table 12 Troubleshooting

Problem	Probable Cause	Solution
The data or the view elements are not displayed properly.	Check your internet browser version.	See Browser requirements (page 53) .
	Postgres database password has expired or Firewall settings prevent communication between servers.	See Checking Postgres database settings (page 183) .
Observation data is missing (empty).	Empty column in a table means there is no sensor for that parameter in the observation site.	-
Slash marks (//) are displayed instead of observation data.	There is a problem in the site or in communication.	See the events in the Events view for more information. Check database connection and the station.
	In single-site display installation, the site has not been selected. In single-site display installation, the default configuration may contain parameters that your weather station does not send.	Select the site for the widget. See Selecting site for single-site display (page 67) . You can adjust and remove the parameters by modifying the page component.
Problems with saving the data into database or with showing the data in the Web user interface.	3rd party Firewall settings may prevent communication.	Check the Firewall settings.
You cannot log in with your user name, instead the text "Login failed, please check your user name and password." is displayed.	The user name and password may be case sensitive.	Contact root-level administrator. If the default password has been changed but cannot be found, contact Vaisala.
You cannot log in, instead the text "The maximum number of users has been exceeded." is displayed.	The maximum allowed number of logged in users has been exceeded, or users have closed the browser windows without logging out in which case there is a session timeout (by default 5 minutes) before the user is actually logged out.	Wait for a few minutes and try again. Check the user settings.
AUTOSONDE site is not displayed in the user interface.	AUTOSONDE sites have not been registered, or SSL/TLS certificates or authentication keys have not been configured correctly.	Check the authentication keys on the Security tab. See Configuring authentication keys (page 124) and Adding sounding sites (page 95) .

Problem	Probable Cause	Solution
Site status is “error” but there are no related error events.	Connection to the site is not available and no heartbeat event is received.	See the Disconnect time and Disconnected since columns.
Weather radar site is not displayed in the user interface.	Weather radar site has not been registered or authentication key has not been configured correctly.	Check the authentication keys on the Security tab. See Configuring authentication keys (page 124) and Adding weather radar sites (page 96) .
Lightning processor or lightning sensor is not displayed in the user interface.	Lightning processor has not been registered or authentication key has not been configured correctly.	Check the authentication keys on the Security tab. See Configuring authentication keys (page 124) and Adding lightning sites (page 97) .
Thinfinity Remote Desktop window is not displayed.	The Connect automatically and bypass this page option may have been selected previously.	Set the user settings to defaults by removing the user's configuration file from <code>C:\ProgramData\Cybele Software\ThinVnc\DB</code> .
Title bar of a page component is not displayed. You cannot access the component settings.	Component title bar has been hidden.	Press the CTRL key down and move the mouse pointer to the top of the component where the title bar should be. See Modifying components (page 145) .
NM10 system becomes unstable, for example: <ul style="list-style-type: none"> • Map is not loading properly • Observations are not being saved in the database • Configurations cannot be changed • Services do not start properly 	The default Windows paging file size is too small (= the same as the amount of installed RAM).	Set the size of the Windows paging file to 1 - 1.5 times the amount of installed RAM. See Changing Windows paging file size (page 183) .

Problem	Probable Cause	Solution
The weather station you added is not displayed on the web pages.	The weather station is not enabled.	Go to the appropriate Admin > Sites page to enable the station.
	License is not activated or the allowed number of sites included in the license is exceeded. There is an event in the Events tab indicating that there are no more licenses available.	Check the number of sites and your license policy.
	No message parser has been selected for the station.	Select a message parser configuration for the station.
	The message parser selected for the station is incorrect. There is a "Message parsing failed" message on the Events page.	Edit the message parser in Admin > Observations > Message parser .
	The weather station has not been configured correctly.	For weather station configuration requirements, see the weather station documentation. For single-site display, refer to AWS310 documentation on how the weather station has to be configured correctly for NM10 use.
	The communication devices and communication settings between the weather station and NM10 have not been configured correctly.	See the weather station documentation. You may also need to consult your IT department on the networking policies.
Site markers are on top of each other in map view.	No location information has been received from the site and the default location 0, 0 is used.	Add custom location for the sites. Open the site configuration in Admin > Sites > <sitetype> . Then select Custom location and enter the location information.
Frozen or slow Chart component , Text Observation Widget , or Wind Widget component.	There are too many sites in the system for these components to work properly.	Use these components only in small systems, such as single-site system.
Map is not visible after installing the NM10 software as a multiserver installation.	The map server's IP address is not set correctly.	Change the map server's IP address manually in the vsoweb.ini file: <ul style="list-style-type: none"> • Go to directory NetworkManager\config\webui_conf\ • Open the vsoweb.ini file with Notepad++ or similar text editor software. • Look for config key [basemap.wms.url] and change its value to map server's IP address. • Save the changes and close the file. • Restart nm10-frontend service.

26.2 Changing Windows paging file size

In default Windows installation the paging file size is the same as the amount of installed RAM. For NM10 installation it is recommended to set the size of the paging file to 1.5 times the amount of installed RAM.

- ▶ 1. Click the **Start** button, then right-click **Computer** and select **Properties**.
- 2. In the left pane, click **Advanced system settings**. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.
- 3. On the **Advanced** tab, under **Performance**, click **Settings**.
- 4. Click the **Advanced** tab and under **Virtual memory**, click **Change**.
- 5. Clear the **Automatically manage paging file size for all drives** check box.
- 6. Under **Drive[Volume Label]**, click the drive that contains the paging file you want to change.
- 7. Select **Custom size** and type the new size in megabytes (= 1.5 times the amount of installed RAM) in the Initial size (MB) and in the Maximum size (MB) box.
- 8. Click **Set**.
- 9. Click **OK**.

26.3 Checking server communication and firewall settings

For the system to function properly, all the servers in the system must be able to communicate with each other in both directions.

- ▶ 1. Use the “ping” command to check that communication between all servers (including the database (DB) server, MAP server, WEB server etc.) works in both directions.
- 2. Check the firewall settings so that they allow communication in both directions. Check that the necessary ports are open, see [Firewall settings \(page 18\)](#).

26.4 Checking Postgres database settings

The password settings in Postgres database must be correct. If the password has been set to expire, the system will stop working.

To ensure that the Postgres user's password does not expire:

- ▶ 1. Open the **Start** menu, select **Administrative Tools > Local Security Policy**.
- 2. Select **Security Settings > Account Policies > Password Policy**.
- 3. Make sure that the **Maximum password age** is set to 0.

4. If the password was set to expire and you edited the settings, start the Postgres service and open it with PGAdmin to check that everything is ok. You may also need to check the Web Server database password. Perform the same steps in that database and restart the Web server service.

26.5 Map/Geoserver (GIS) problems

To check if the Geoserver is up and running, copy the following URL in the browser address field in the computer where the map server has been installed:

```
http://localhost:2080/geoserver/vaisala/wms?  
service=WMS&version=1.1.0&request=GetMap&layers=vaisala:vai\_all&styles=&bbox=-180.00  
00000000003,-90.0,180.0000000000003,90.0&width=768&height=383&srs=EPSG:0  
A4326&format=application/openlayers
```

- If the map is displayed, the server is functioning.
- If the map is not displayed, contact Vaisala for assistance.

26.6 NM10 backend events

The **Events** view displays events sent by the system, including events from the sites, and events created by NM10 system applications and services.

The following lists some example NM10 backend events.

Table 13 NM10 backend event examples

Example Event Message	Explanation
No observations received.	Observations from the site have not been received for a time period of 2 x the interval defined in site configuration + one minute.
OVER – No observations received.	Observations are being received again.
No more licenses available for source. Source will be registered but events or alerts are not persisted without available license.	Due to missing licenses, the site is registered but events and alerts from the site are not saved to the database.
No more licenses available for source. Event not persisted.	Due to missing licenses, the received event is not saved to the database.
No more licenses available for Site_002. Observations not persisted.	Due to missing licenses, the received observations are not saved to the database.
From endpoint 002_TCPSERVERPORT: Connection failure(s): closed / 127.0.0.1:10002 > /127.0.0.1:31002 0/1/1 initialized/identified/ configured	Connection through the port failed. (Severity: Alarm)

Example Event Message	Explanation
From endpoint 002_RWS_XML.DTO: Failed to poll observations: An exception was thrown when creating connection: org.apache.http.conn.HttpHostConnectException	Observations from the site could not be polled because of connection problems. (Severity: Warning)
From endpoint 001_TCPSERVERPORT: New connection: opened /127.0.0.1:10002 > /127.0.0.1:31002 0/1/1 initialized/identified/configured	New connection opened through the port. (Severity: Info)

More information

- ▶ [NM10 backend event logs \(page 118\)](#)

26.7 Creating Certificate Signing Request (CSR)

During installation, certificates are made automatically. For a secure and trusted connection, you can create a certificate signing request (CSR) and send it to a certificate authority from which you will receive the signed certificate.

- ▶ 1. Run “StartHere.exe” from the NM10 Installer USB stick.
- 2. Click **Create Certificate Signing Request**.
- 3. Fill in or edit the information on the Certificate Signing Request page. The prefilled fields are mandatory. Follow the instructions that are displayed next to the text fields.



Take note of the password and save it securely. You will need it when importing the signed certificate.

- 4. Click **Generate** and click **OK** in the **CSR created successfully** window.
- 5. Copy the generated CSR by clicking **Copy to Clipboard** and send it to a certificate authority.

26.8 Importing signed certificate

When you have received the signed certificate from the certificate authority, import it to the system:

- ▶ 1. Run *StartHere.exe* from the NM10 Software Installer USB stick.
- 2. Click **Import SSL Certificate**.

3. Select the server where you want to import the certificate.



CAUTION! When importing the certificate to the backend server (DCP), the data flow from the data sources will be immediately interrupted until you have installed the new certificate to all of them.

4. Browse to the folder where the certificate file is stored and select the certificate file.
5. Browse to the keystore folder and select the keystore file (.jks). Default path is *C:\ProgramData\NetworkManager\Keystore*.
For detailed information on the required files and file types, see the documentation provided with the source, for example, AUTOSONDE documentation.
6. Enter the keystore password that you gave when creating the certificate signing request (CSR).
7. Click **Import**.
8. Restart the computer.
9. If you imported the certificate to the backend server (DCP), install the same certificate to all the connected systems, for example, AUTOSONDE.

Appendix A. SMSAWS 2.0 Message Format

The text based message format used for communication between Vaisala Observation Network Manager and the weather station is called SMSAWS.

See also [Weather observation sites \(page 16\)](#).

A.1 Data Message Characteristics (SMSAWS 2.0)

The SMSAWS message format reports version 2.0 consist of elements having the following structure:

```
(S:value;D:YYMMDD;T:HHMMSS;{tag:value;}tag:value)FFFFFFF<CR><LF>
```

The first three elements in each report are fixed and they must always be defined in the report. The rest of the elements are variable and used for transmitting the actual data. These items are specific for each system depending on the parameters in the system.

The number of elements varies depending on the measured parameters in the system.

Each tag string is unique and can be only once in the report. The format is specified in *Vaisala Common Codespace Interface Control Document*.

Table 14 Message Characters and Their Descriptions

Message Character	Description
(Start Character. ASCII character 40. All the elements in one report are placed between parentheses.
:	Tag and value delimiter. Separates the tag name and value.
;	Element delimiter. The elements are separated by semicolons.
tag:value	Data element. Value refers to any textual data or numerical data in textual format, identified by the tag. Missing values for numerical data are presented using one slash character '/' (ASCII 47).
)	End character. ASCII character 41.

Message Character	Description
FFFFFFF	Checksum. CRC32 calculated over the message including start and end characters. Checksum has fixed length of 8 characters, and it is presented in ASCII HEX format. Properties of the CRC32 checksum are listed below. <ul style="list-style-type: none"> • Polynomial - 0x04C11DB7 • Initial value - 0xFFFFFFFF • Reverse data bytes - True • Reverse CRC result - True • Invert result bits - True
<CR>	Carriage return. ASCII character 13.
<LF>	Line feed. ASCII character 10.

Table 15 Message Elements and Their Descriptions

Message Element	Description
S:value	Station id (Mandatory). Identification tag for the transmitting station. Value is the name of the station.
D:YYYYMMDD	Date (Mandatory). UTC date of report generation.
T:HHMMSS	Time (Mandatory). UTC time of report generation.

A.2 Common Codespace Tag Characteristics

Vaisala common codespace defines the method for building tags that are used for identifying data in Vaisala Systems interfaces. Codespace tag format is static and does not contain any values itself. Values are part of the transmission message format (such as SMSAWS).

Tag consists of six fixed fields: parameter, statistics, period, height, sequence number, and unit. Optional fields can be empty, but six (6) pipe characters “|” must be always present.

The Common Codespace Tag consists of elements having the following structure:

Parameter|Statistics|Period|Height|Sequence number|Unit|

Pipe character “|” (ASCII code DEC 124) is used for separating fields within the tag.



It is important to have last “|” character after Unit. This ensures that SMSAWS is parsed correctly.

If there is no ambiguity in the meaning of value in fields, field can be left empty.

Parameter

(Mandatory) Parameter defines the base tag name, which can be observation or other data type. For the allowed values please contact Vaisala.

Statistics

(Optional) Statistics defines the method which was used to calculate the parameter. If statistics is not set, observation is assumed to be VALUE. For the allowed values please contact Vaisala.

Period

(Optional) Period related to the statistics name. Durations are a component of time intervals and define the amount of intervening time in a time interval. They should only be used as part of a time interval as prescribed by the standard ISO 8601. Can be left empty if period is not set.

For example, P3Y6M4DT12H30M5S represents a duration of “three years, six months, four days, twelve hours, thirty minutes, and five seconds”.

Date and time elements including their designator may be omitted if their value is zero, and lower order elements may also be omitted for reduced precision. For example, P23DT23H and P4Y are both acceptable duration representations.

Height

(Optional) Refers to height in which the parameter was created. For example, the height of the wind measurement. Height value is in meters [m]. Can be left empty if height is not set.

Sequence number

(Optional) The index for identifying the parameter. An integer value starting from 1. This is very useful when there are two or more same parameters observed at same height. Can be left empty if sequence number is not set.

Unit

(Mandatory) Unit of the parameter. For the allowed values please contact Vaisala.

A.2.1 Example Message Frame

The following is an example of the tag:

```
TA|AVG|PT2M|10|1|degC|
```

Reads: “Two minute average air temperature in degrees Celsius from the sensor one located at ten meter height”

TA

Air temperature

AVG

Average

PT2M

Two minutes

10

Observed at 10 meters (Height)

1

First temperature sensor

degC

°C

The following example illustrates the usage of DATE or TIME:

```
TA|AVG|PT2M|10|1|D|
```

Reads: "Following value is the date of observation: two minute average air temperature in degrees Celsius from the sensor one located at ten meter height"

```
TA|AVG|PT2M|10|1|T|
```

Reads: "Following value is the time of observation: two minute average air temperature in degrees Celsius from the sensor one located at ten meter height"

Observation or sensor status:

```
TA|AVG|PT2M|10|1|SCODE|
```

Reads: "Following value is the status of sensor located at ten meter and which measures two minute average air temperature."

A.3 SMSAWS Message Example 2.0

The following is an example of the SMSAWS message format utilizing Vaisala common codespace without date and time information for given observation:

```
(S:MAWS;D:130628;T:080013; RH|AVG|PT1M||%|:59;
RH|MIN|P1D||%|:50; RH|MAX|P1D||%|:90;
TA|AVG|PT1M||degC|:23.2; TA|MIN|P1D||degC|:15.0;
TA|MAX|P1D||degC|:25.0; TD|AVG|PT1M||degC|:14.7;
PA|AVG|PT1M||degC|:1002.8; QFE|AVG|PT1M||hPa|:1002.9;
QFF|AVG|PT1M||hPa|:1008.8; PATE|AVG|PT3H||hPa|:0;
PATR|AVG|PT3H||hPa|:0.1; PR|SUM|PT1M||mm|:0.5;
PR|SUM|PT1H||mm|:0.5; PR|SUM|P1D||mm|:2.0;
PRF|AVG|PT1M||mmph|:2.1;
SNH|AVG|PT1M||cm|:0; ETO|SUM|P1D||mm|:3.547;
SDUR|SUM|PT1M||min|:1; SDUR|SUM|P1D||min|:339;
SR|AVG|PT1M||Wpm2|:310;
VIS|AVG|PT1M||m|:11409; PW|AVG|PT15M||WMO-306-4680|:61;
STATUS|VALUE|||SCODE|:0;
EXTDC|VALUE|||VDC|:12.0)3115D1C3<CR><LF>
```

Data tag	Data	Data value
S	MAWS	Station name
D	130628	Date of message packet
T	80013	Time of message packet
RH AVG PT1M %	59	Relative Humidity 1 minute Average, %
RH MIN P1D %	50	Relative Humidity 1 day Minimum, %
RH MAX P1D %	90	Relative Humidity 1 day Maximum, %
TA AVG PT1M degC	23.2	Air Temperature 1 minute Average, °C
TA MIN P1D degC	15	Air Temperature 1 day Minimum, °C
TA MAX P1D degC	25	Air Temperature 1 day Maximum, °C
TD AVG PT1M degC	14.7	Dew point 1 minute Average, °C
PA AVG PT1M degC	1002.8	Air pressure 1 minute Average, hPa
QFE AVG PT1M hPa	1002.9	QFE pressure 1 minute Average, hPa
QFF AVG PT1M hPa	1008.8	QFF pressure 1 minute Average, hPa
PATE AVG PT3H hPa	0	Pressure tendency 3 hour Average, code
PATR AVG PT3H hPa	0.1	Pressure trend 3 hour Average, hPa
PR SUM PT1M mm	0.5	Rain accumulation 1 minute Sum, mm
PR SUM PT1H mm	0.5	Rain accumulation 1 hour Sum, mm
PR SUM P1D mm	2	Rain accumulation 1 day Sum, mm
PRF AVG PT1M mmph	2.1	Rain intensity 1 minute Average, mm/h
SNH AVG PT1M cm	0	Snow depth 1 minute Average, cm
ETO SUM P1D mm	3.547	Evapotranspiration 1 day Sum, mm
SDUR SUM PT1M min	1	Sunshine duration 1 minute Sum, min
SDUR SUM P1D min	339	Sunshine duration 1 day Sum, min
SR AVG PT1M Wpm2	310	Global radiation 1 minute Average, W/m ²
VIS AVG PT1M m	11409	Visibility 1 minute Average, m
PW AVG PT15M WMO-306-4680	61	Present weather 15 minute Average, code
STATUS VALUE SCODE	0	Logger status
EXTDC VALUE VDC	12	Supply voltage, V

The following example illustrates how date and time for given observation is defined using SMSAWS message format:

```
(S:MAWS;D:130628;T:080013; RH|AVG|PT1M||%|:59;
RH|AVG|PT1M|||D|:130628;RH|AVG|PT1M|||T|:080013;
RH|MIN|P1D||||:50; RH|MIN|P1D||%|:50;RH|MAX|P1D||%|:90;
TA|AVG|PT1M|||degC|:23.2; TA|MIN|P1D|||degC|:15.0;
TA|MAX|P1D|||degC|:25.0; TD|AVG|PT1M|||degC|:14.7;
PA|AVG|PT1M|||degC|:1002.8; QFE|AVG|PT1M|||hPa|:1002.9;
QFF|AVG|PT1M|||hPa|:1008.8; PATE|AVG|PT3H|||hPa|:0;
PATR|AVG|PT3H|||hPa|:0.1; PR|SUM|PT1M|||mm|:0.5;
PR|SUM|PT1H|||mm|:0.5; PR|SUM|P1D|||mm|:2.0;
PRF|AVG|PT1M|||mmpfh|:2.1;
SNH|AVG|PT1M|||cm|:0; ETO|SUM|P1D|||mm|:3.547;
SDUR|SUM|PT1M|||min|:1; SDUR|SUM|P1D|||min|:339;
SR|AVG|PT1M|||Wpm2|:310;
VIS|AVG|PT1M|||m|:11409; PW|AVG|PT15M|||WMO-306-4680|:61;
STATUS|VALUE|||SCODE|:0;
EXTDC|VALUE||||VDC|:12.0)3115D1C3<CR><LF>
```

Appendix B. SMSAWS 2.1 Message Format

The text based message format used for communication between Vaisala Observation Network Manager and the weather station is called SMSAWS.

B.1 Data Message Characteristics (SMSAWS 2.1)

The SMSAWS 2.1 message format reports consist of elements having the following structure:

```
(S:value;D:YYMMDD;T:HHMMSS;STNID:value;MSGID:value;LAT:value;LON:value;ALT:value;{tag:value;}tag:value)FFFFFFF<CR><LF>
```

The first three elements in each report are fixed and they must always be defined in the report. The rest of the elements are variable and used for transmitting the actual data. These items are specific for each system depending on the parameters in the system.

The number of elements varies depending on the measured parameters in the system.

Each tag string is unique and can be only once in the report. The format is specified in *Vaisala Common Codespace Interface Control Document*.

Table 16 Message Characters and Their Descriptions

Message Character	Description
(Start Character. ASCII character 40. All the elements in one report are placed between parentheses.
:	Tag and value delimiter. Separates the tag name and value.
;	Element delimiter. The elements are separated by semicolons.
tag:value	Data element. Value refers to any textual data or numerical data in textual format, identified by the tag. Missing values for numerical data are presented using one slash character '/' (ASCII 47). Tag format is specified in <i>Vaisala Common Codespace Interface Control Document</i> . If the parameter is not available at all, it is presented using '-' (ASCII 45) character. This is a different scenario compared to missing value.
)	End character. ASCII character 41.

Message Character	Description
FFFFFFF	Checksum. CRC32 calculated over the message including start and end characters. Checksum has fixed length of 8 characters, and it is presented in ASCII HEX format. Properties of the CRC32 checksum are listed below. <ul style="list-style-type: none"> • Polynomial - 0x04C11DB7 • Initial value - 0xFFFFFFFF • Reverse data bytes - True • Reverse CRC result - True • Invert result bits - True
<CR>	Carriage return. ASCII character 13.
<LF>	Line feed. ASCII character 10.

Table 17 Message Elements and Their Descriptions

Message Element	Description
S:value	Station name (Mandatory). Identification tag for the transmitting station. Value is the name of the station.
D:YYYYMMDD	Date (Mandatory). UTC date of report generation according ISO 8601, delimiters omitted.
T:HHMMSS	Time (Mandatory). UTC time of report generation according to ISO 8601, delimiters omitted.
STNID	(Optional) Station identifier as 32 bit unsigned integer.
MSGID	(Optional) Message id. Sequence number of message package since last reset as 32bit unsigned long integer, maximum value 4,294,967,295.
LAT	(Optional) Latitude in WGS-84 coordinate system, decimal format 'xx.xxxx...'
LON	(Optional) Longitude in WGS-84 coordinate system, decimal format 'xx.xxxx...'
ALT	(Optional) Altitude in WGS-84 coordinate system in meters.

B.1.1 Supported coordinate systems

NM10 supports the following coordinate reference systems:

- World Geodetic System 1984 (WGS84)
- Swedish Reference Frame 1999, Transverse Mercator (SWEREF 99 TM)
- Military Grid Reference System (MGRS)
- Universal Transverse Mercator (UTM)

The system persists all geospatial information in WGS84 and depending on system configuration, calculates the other coordinate system values based on the WGS84 values.

B.2 Common Codespace Tag Characteristics

Vaisala common codespace defines the method for building tags that are used for identifying data in Vaisala Systems interfaces. Codespace tag format is static and does not contain any values itself. Values are part of the transmission message format (such as SMSAWS).

Tag consists of six fixed fields: parameter, statistics, period, height, sequence number, and unit. Optional fields can be empty, but six (6) pipe characters “|” must be always present.

The Common Codespace Tag consists of elements having the following structure:

```
Parameter|Statistics|Period|Height|Sequence number|Unit|
```

Pipe character “|” (ASCII code DEC 124) is used for separating fields within the tag.



It is important to have last “|” character after Unit. This ensures that SMSAWS is parsed correctly.

If there is no ambiguity in the meaning of value in fields, field can be left empty.

Parameter

(Mandatory) Parameter defines the base tag name, which can be observation or other data type. For the allowed values please contact Vaisala.

Statistics

(Optional) Statistics defines the method which was used to calculate the parameter. If statistics is not set, observation is assumed to be VALUE. For the allowed values please contact Vaisala.

Period

(Optional) Period related to the statistics name. Durations are a component of time intervals and define the amount of intervening time in a time interval. They should only be used as part of a time interval as prescribed by the standard ISO 8601. Can be left empty if period is not set.

For example, P3Y6M4DT12H30M5S represents a duration of “three years, six months, four days, twelve hours, thirty minutes, and five seconds”.

Date and time elements including their designator may be omitted if their value is zero, and lower order elements may also be omitted for reduced precision. For example, P23DT23H and P4Y are both acceptable duration representations.

Height

(Optional) Refers to height in which the parameter was created. For example, the height of the wind measurement. Height value is in meters [m]. Can be left empty if height is not set.

Sequence number

(Optional) The index for identifying the parameter. An integer value starting from 1. This is very useful when there are two or more same parameters observed at same height. Can be left empty if sequence number is not set.

Unit

(Mandatory) Unit of the parameter. For the allowed values please contact Vaisala.

B.2.1 Example Message Frame

The following is an example of the tag:

```
TA|AVG|PT2M|10|1|degC|
```

Reads: "Two minute average air temperature in degrees Celsius from the sensor one located at ten meter height"

TA

Air temperature

AVG

Average

PT2M

Two minutes

10

Observed at 10 meters (Height)

1

First temperature sensor

degC

°C

The following example illustrates the usage of DATE or TIME:

```
TA|AVG|PT2M|10|1|D|
```

Reads: "Following value is the date of observation: two minute average air temperature in degrees Celsius from the sensor one located at ten meter height"

```
TA|AVG|PT2M|10|1|T|
```

Reads: "Following value is the time of observation: two minute average air temperature in degrees Celsius from the sensor one located at ten meter height"

Observation or sensor status:

```
TA|AVG|PT2M|10|1|SCODE|
```

Reads: "Following value is the status of sensor located at ten meter and which measures two minute average air temperature."

B.3 SMSAWS Message 2.1 Example

The following is an example of the SMSAWS message format 2.1 utilizing Vaisala common codespace without date and time information for given observation:

```
(S:MAWS;D:130628;T:080013; RH|AVG|PT1M|||%:59;
RH|MIN|P1D|||%:50; RH|MAX|P1D|||%:90;
TA|AVG|PT1M|||degC:23.2; TA|MIN|P1D|||degC:15.0;
TA|MAX|P1D|||degC:25.0; TD|AVG|PT1M|||degC:14.7;
PA|AVG|PT1M|||degC:1002.8; QFE|AVG|PT1M|||hPa:1002.9;
QFF|AVG|PT1M|||hPa:1008.8; PATE|AVG|PT3H|||hPa:0;
PATR|AVG|PT3H|||hPa:0.1; PR|SUM|PT1M|||mm:0.5;
PR|SUM|PT1H|||mm:0.5; PR|SUM|P1D|||mm:2.0;
PRF|AVG|PT1M|||mm:2.1;
SNH|AVG|PT1M|||cm:0; ETO|SUM|P1D|||mm:3.547;
SDUR|SUM|PT1M|||min:1; SDUR|SUM|P1D|||min:339;
SR|AVG|PT1M|||W/m2:310;
VIS|AVG|PT1M|||m:11409; PW|AVG|PT15M|||WMO-306-4680:61;
STATUS|||||SCODE:0; EXTDC|||||V:12.0)3115D1C3<CR><LF>
```

Data tag	Data	Data value
S	MAWS	Station name
D	130628	Date of message packet
T	80013	Time of message packet
RH AVG PT1M %	59	Relative Humidity 1 minute Average, %
RH MIN P1D %	50	Relative Humidity 1 day Minimum, %
RH MAX P1D %	90	Relative Humidity 1 day Maximum, %
TA AVG PT1M degC	23.2	Air Temperature 1 minute Average, °C
TA MIN P1D degC	15.0	Air Temperature 1 day Minimum, °C
TA MAX P1D degC	25.0	Air Temperature 1 day Maximum, °C
TD AVG PT1M degC	14.7	Dew point 1 minute Average, °C
PA AVG PT1M hPa	1002.8	Air pressure 1 minute Average, hPa
FE AVG PT1M hPa	1002.9	QFE pressure 1 minute Average, hPa
QFF AVG PT1M hPa	1008.8	QFF pressure 1 minute Average, hPa
PATE AVG PT3H hPa	0	Pressure tendency 3 hour Average, code
PATR AVG PT3H hPa	0.1	Pressure trend 3 hour Average, hPa
PR SUM PT1M mm	0.5	Rain accumulation 1 minute Sum, mm
PR SUM PT1H mm	0.5	Rain accumulation 1 hour Sum, mm
PR SUM P1D mm	2	Rain accumulation 1 day Sum, mm
PRF AVG PT1M mm	2.1	Rain intensity 1 minute Average, mm/h
SNH AVG PT1M cm	0	Snow depth 1 minute Average, cm
ETO SUM P1D mm	3.547	Evapotranspiration 1 day Sum, mm
SDUR SUM PT1M min	1	Sunshine duration 1 minute Sum, min

Data tag	Data	Data value
SDUR SUM P1D min	339	Sunshine duration 1 day Sum, min
SR AVG PT1M Wpm2	310	Global radiation 1 minute Average, W/m ²
VIS AVG PT1M m	11409	Visibility 1 minute Average, m
PW AVG PT15M WMO-306-4680	61	Present weather 15 minute Average, code
STATUS SCODE	0	Logger status
EXTDC V	12	Supply voltage, V

The following example illustrates how date and time () for given observation is defined using SMSAWS message 2.1 format:

```
(S:MAWS;D:130628;T:080013; RH|AVG|PT1M||%:59;
RH|AVG|PT1M|||D|:130628;RH|AVG|PT1M|||T|:080013;
RH|MIN|P1D||||:50; RH|MIN|P1D||%:50;RH|MAX|P1D||%:90;
TA|AVG|PT1M|||degC|:23.2; TA|MIN|P1D|||degC|:15.0;
TA|MAX|P1D|||degC|:25.0; TD|AVG|PT1M|||degC|:14.7;
PA|AVG|PT1M|||degC|:1002.8; QFE|AVG|PT1M|||hPa|:1002.9;
QFF|AVG|PT1M|||hPa|:1008.8; PATE|AVG|PT3H|||hPa|:0;
PATR|AVG|PT3H|||hPa|:0.1; PR|SUM|PT1M|||mm|:0.5;
PR|SUM|PT1H|||mm|:0.5; PR|SUM|P1D|||mm|:2.0;
PRF|AVG|PT1M|||mmph|:2.1;
SNH|AVG|PT1M|||cm|:0; ETO|SUM|P1D|||mm|:3.547;
SDUR|SUM|PT1M|||min|:1; SDUR|SUM|P1D|||min|:339;
SR|AVG|PT1M|||W/m2|:310;
VIS|AVG|PT1M|||m|:11409; PW|AVG|PT15M|||WMO-306-4680|:61;
STATUS|||||SCODE|:0; EXTDC|||||V|:12.0)3115D1C3<CR><LF>
```

Appendix C. CSV Message Format for Iridium

The text based message format used for communication between Vaisala Observation Network Manager and the Iridium weather station is called SMSAWS.

File format:	US-ASCII
Field separator:	Comma ',' tab character \t, or some other user configured character.
Decimal separator:	Dot ''
Missing values:	One or more forward slash, e.g. '///'
Checksum separator:	Asterisk '*'

Examples of the attachment:

```
183,1.0,19.7,12.9,65,1023.8,1014.7,7.760*97
```

```
/////    /////    20.8    13.5    63    1018.0    1011.8    8.147*22
```

Appendix D. CSV format for asset import

Typical columns in the CSV file used for asset import:

```
<model name>,<station ID>,<asset serial number>,<asset name>,<asset observation height>,<asset in use>,<model manufacturer name>,<category name>
```

Table 18 CSV message data fields

Name	Description
<model name>	Type of asset, for example, Hygrometer.
<station ID>	Station/Site ID displayed in NM10.
<asset serial number>	Serial number of asset, for example, SN1234567890. This is primarily used for identifying existing assets when importing the asset file.
<asset name>	Name for the asset. This is a secondary identifier for existing assets when importing the asset file.
<asset observation height>	Observation height of the asset, for example, 2m.
<asset in use>	Variable defining if the asset is active. Possible values: t, f, true, and false.
<model manufacturer name>	Optional. If missing, the default value Vaisala is used.
<category name>	Optional. If missing, the default value Sensor is used.

Example CSV file with single row for asset import:

```
Hygrometer,StationX,SN1234567890,Asset name,2m,t,Vaisala,Sensor
```

The field separator is by default , (comma) but it can be changed when importing the assets.



Different columns may have been defined for your system.

Appendix E. CSV file for site import

The CSV file used for site import must contain the mandatory column headers. For example, the mandatory column headers for RWS200 with XML DTO interface: are the following:

```
Enabled,Commissioning date,Station ID,Interface,Address,Port,Polling
interval,Username,Password,Quality control configurations,Custom
location,Latitude,Longitude,Altitude
```

The file must contain one data row for each site. The data fields in each column must be in the required format. Optional fields can be empty but the column headers must always be included.

Table 19 CSV data fields

Field	Mandatory / Optional	Description
Enabled	Mandatory	Variable defining if the site is enabled (= in use). Accepted values: TRUE and FALSE.
Commissioning date	Optional	Commissioning date of the weather station. Accepted format: yyyy-MM-dd. Example value: 2021-03-17.
Station ID	Mandatory for other interfaces, not needed for DATEX II	Station/Site ID displayed in NM10. Must be unique. When the interface is XML DTO: Accepted characters: letters (a-z), numbers, underscore (_), period (.), comma (,), semicolon (;), colon (:), hash sign (#), hyphen (-), and space (). The length must be between 1 and 100 characters. Example value: Kaivoksela. When the interface is DATEX II: ID is not needed. If the CSV file contains the ID, it will be replaced with the ID received from the station when receiving data from it for the first time.
Interface	Mandatory	Interface used for getting data from the road weather station sites. For example, for RWS200 XML DTO or DATEX II.
Address	Mandatory	IP address or the domain name of the station. The address must be in the <i>https://</i> format. Accepted length: 1 ... 255 characters. Example value: https://172.24.114.23
Port	Mandatory	Number of the port used for polling. Example value: 8443.

Field	Mandatory / Optional	Description
Polling interval	Mandatory	Interval for polling the station. Accepted range in seconds: 1 ... 86400. Example value: 60
Username	Optional	(RWS200 only) Administrator username needed to access the station, as defined in the station configuration for that station. Example value: RWS200wsadministrator
Password	Optional	(RWS200 only) The password needed to access the station, as defined in the station configuration for that station.
Quality control configurations	Optional	Names of the quality control configurations that the station supports. The quality control configuration must exist in NM10. Example value: "[Default,WMO Quality Checks]".
Custom location	Mandatory for RWS200	(RWS200 only) Variable defining if custom location is used. Accepted values: TRUE and FALSE .
Latitude	Mandatory when Custom location value is TRUE	Latitude value when custom location is used. Accepted range: -90.0 ... 90.0 Example value: 56.19306
Longitude	Mandatory when Custom location value is TRUE	Longitude value when custom location is used. Accepted range: -180.0 ... 180.0 Example value: 24.77417
Altitude	Mandatory when Custom location value is TRUE	Altitude value when custom location is used. Accepted range: -10000 ... 10000 Example value: 60.23

Example CSV file with the column headers and one data row for RWS200 with XML DTO interface:

```
Enabled,Commissioning date,Station ID,Interface,Address,Port,Polling
interval,Username,Password,Quality control configurations,Custom
location,Latitude,Longitude,Altitude
TRUE,2021-03-17,Kaivoksela,XML DTO,https://
192.168.80.6,8443,60,RWS200wsadministrator,RWS200password,"[Default,WMO
Quality Checks]",TRUE,56.19306,24.77417,60.23
```

Example for RWS200 with XML DTO interface: with some optional fields left empty:

```
Enabled,Commissioning date,Station ID,Interface,Address,Port,Polling  
interval,Username,Password,Quality control configurations,Custom  
location,Latitude,Longitude,Altitude  
TRUE,2021-03-17,Kaivoksela,XML DTO,https://  
192.168.80.6,8443,60,RWS200wsadministrator,,,TRUE,56.19306,24.77417,60.23
```

The field separator is by default comma (,) but it can be changed when importing the sites.



Different columns may have been defined for your system.

More information

- [Importing sites from CSV file \(page 84\)](#)

Technical support



Contact Vaisala technical support at helpdesk@vaisala.com. Provide at least the following supporting information as applicable:

- Product name, model, and serial number
- Software/Firmware version
- Name and location of the installation site
- Name and contact information of a technical person who can provide further information on the problem

For more information, see www.vaisala.com/support.

Warranty

For standard warranty terms and conditions, see www.vaisala.com/warranty.

Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or Conditions of Sale for details of the warranty for each product.

Recycling



Recycle all applicable material according to local regulations.

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