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USER GUIDE

AWS810

Vaisala · Authorized Partner

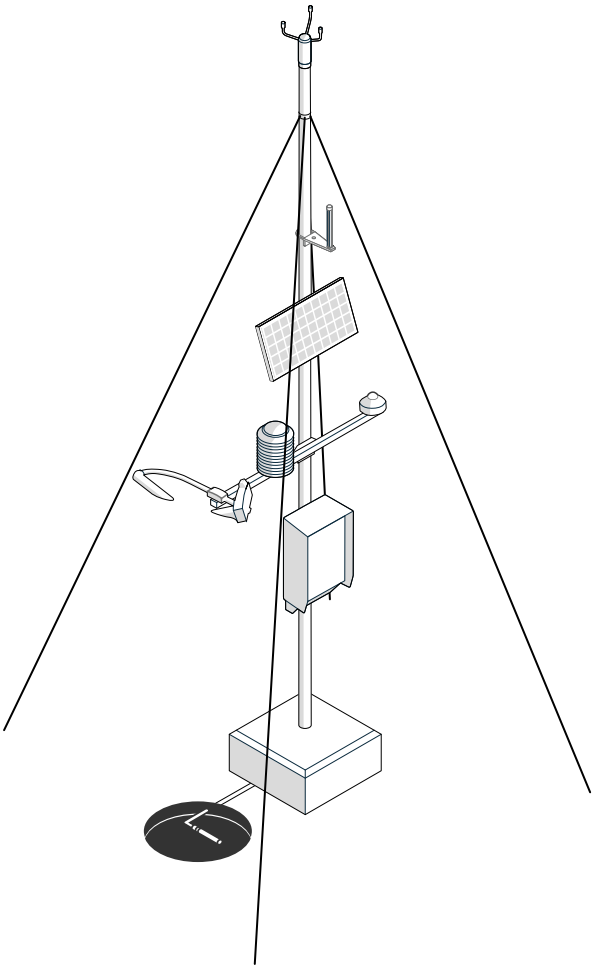
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M212419EN-N

Configuration and Maintenance Guide

Vaisala Automatic Weather Station

AWS810



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1. About this document

1.1 Version information

This document provides instructions for configuring and maintaining Vaisala Automatic Weather Station AWS810.

Table 1 Document versions (in English)

Document code	Date	Description
M212419EN-N	October 2026	The following changes have been made in Kaiku release 2.15: • Modem management system has been updated. The **Modem** view in the Web UI has been improved, and all modem configuration tasks, including CHAP (Challenge-Handshake Authentication Protocol) configuration, can be done through the view. • Managing certificates is now possible through the Web UI (**Settings > Certificates**). You can assign a signed certificate to the web server, to enable web browsers to make a secure connection to DMU801. More use cases will be supported in future releases. • New stream-based architecture and components are available for applications. For monitoring data from stream components, there is a new **Stream console** view in the Web UI. Vaisala PRECICAP Radar Precipitation Sensor RM60 has been added to the product offering. In addition, this document has the following updates: • Instructions for replacing the AC (mains) circuit breaker have been added.
M212419EN-M	June 2026	The following features have been added in Kaiku release 2.14: • Support for selectable pull-down and hardware filter capacitor included in DMA803 analog measurement module has been added. This helps with direct interfacing with certain wind sensors (such as potentiometer-type wind vanes) and eliminates the need for external adapters. • Polling of SMSAWS and CSV messages is now possible through the Kaiku HTTPS Reports API. • Observations from the weather station can be sent to and viewed in Vaisala cloud service.
M212419EN-L	December 2025	The following features have been added in Kaiku release 2.13: • The DMU801 firmware has been named Kaiku and Configuration Tool Kaiku Designer. Vaisala Observation Network Manager NM10 has been removed from the product offering. In addition, this document has the following updates: • Instructions for cleaning and maintaining painted surfaces have been added.

1.2 Related manuals

For the latest versions of these documents, see docs.vaisala.com.

Table 2 AWS810 manuals

Document code	Name
M212417EN	Vaisala Automatic Weather Station AWS810 System Description
M212418EN	Vaisala Automatic Weather Station AWS810 Installation Guide
M212419EN	Vaisala Automatic Weather Station AWS810 Configuration and Maintenance Guide

Table 3 Other manuals

Document code	Name
M212407EN	Vaisala Kaiku Designer User Guide
M212436EN	Vaisala Data Management Unit DMU801 User Guide
M213151EN	Vaisala Kaiku Event Description
M213154EN	Vaisala Kaiku Device Management API Description
M213354EN	Vaisala Kaiku HTTPS Reports API Description
M212710EN	Vaisala Battery Management Unit BMU801 User Guide
M210310EN	Vaisala Termination Box TERMBOX-9000, 1200, 1212, 1222 User Guide
M211673EN	*Vaisala GOES DCP Transmitter QST102-3 Technical Reference*
M211786EN	Grounding and Lightning Protection in Vaisala Outdoor Installations Technical Reference
M211785EN	Vaisala Lightning Protection Kits DKL201 and DKL202 Installation Guide
M211943EN	Vaisala Composite Pole Mast DKE110W and DKE110AV User Guide
DOC218122	EXEL Vaisala DKE200 Weather Mast Installation Manual
M210373EN	Vaisala Short Pole Mast DKP202, DKP203, DKP204, and DKP204W-CAMPOLE User Guide
M210315EN	Vaisala Tiltable Pole Mast DKP206 and DKP210 User Guide
M211095EN	Vaisala WINDCAP® Ultrasonic Wind Sensor Series WMT700 User Guide
M211840EN	Vaisala Weather Transmitter WXT530 Series User Guide
M210912EN	Vaisala HUMICAP® Humidity and Temperature Probe HMP155 User Guide
M211060EN	Vaisala Humidity and Temperature Probes HMP60 and HMP110 Series User Guide
M210855EN	Vaisala BAROCAP® Digital Barometer PTB330 User Guide
M213217EN	Vaisala PRECICAP Radar Precipitation Sensor RM60 Setup Guide
M213218EN	Vaisala PRECICAP Radar Precipitation Sensor RM60 User Guide

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Document code	Name
M210543EN	*Vaisala Present Weather Detector PWD22/52 User's Guide*
M212106EN	*Vaisala Visibility and Present Weather Sensor FS11 and FS11P User Guide*
M212029EN	*Vaisala Forward Scatter Sensor FD70 Technical Description*
M212221EN	Vaisala Forward Scatter Sensor FD70 Installation Guide
M212222EN	Vaisala Forward Scatter Sensor FD70 Configuration and Maintenance Guide
M210482EN	Vaisala Ceilometer CL31 User Guide
–	*R.M. Young Wind Monitor User Manual*
–	*Kipp & Zonen SMP Series Instruction Manual*
–	*Kipp & Zonen SP Lite2 Instruction Sheet*
–	*Kipp & Zonen NR Lite2 Instruction Sheet*
–	*Kipp & Zonen SUV5 Smart UV Radiometer Instruction Manual*
–	*Kipp & Zonen CSD3 Sunshine Duration Sensor Instruction Sheet*
–	*EML SBS314 Lite Rain Gauge User Manual*
–	*OTT Pluvio^2 L Precipitation Gauge Operating Instructions*
–	*Campbell Scientific SnowVUE10 Product Manual*
–	*Vega VEGAPULS C 23 Radar Sensor for Continuous Level Measurement Operating Instructions*
–	*Vega VEGAPULS 61 Radar Sensor for Continuous Level Measurement of Liquids Operating Instructions*
–	*Decagon Devices EC-5 Soil Moisture Sensor User's Manual*
–	*User Manual for the ML3 ThetaProbe Soil Moisture Sensor*

Table 4 Downloads

Code	Name	Download link
SW211572	Latest firmware package	Kaiku firmware package
SW211573	Latest Vaisala Kaiku Designer	Vaisala Kaiku Designer
DOC258453	DMU801-related wiring diagrams	DMU801 wiring diagrams

1.3 Documentation conventions



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! Alerts you to 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

2.1 Vaisala Automatic Weather Station AWS810

Vaisala Automatic Weather Station AWS810 is a weather data collection system that automatically measures, processes, and stores meteorological data for professional use. The data from AWS810 can be used in a wide range of applications, from meteorological and scientific research to synoptic observation. AWS810 can be operated as a standalone unit, or connected with other compatible Vaisala weather stations to form weather observation networks.

AWS810 weather stations are available as several preconfigured options that are targeted for the most common usage situations and environments. The preconfigured options vary in their mast types and sensor selection. Further customized options are also available, ranging from single-sensor sites to fully equipped weather stations. The configurability of AWS810 is only limited by the maximum number of incoming sensor connections to the data management unit, which handles all observation data.

All observation data from the sensors is collected and processed in DMU801 data management unit. To process the observation data, DMU801 performs advanced algorithm calculations. In addition, DMU801 validates sensor data accuracy using preconfigured criteria before sending the data forward to computers connected over the network, where the data is further processed and displayed to the user. All basic weather observations in AWS810 can be selected with options that follow World Meteorological Organization (WMO) guidelines.

DMU801 has a number of data security features to protect the data. The features include, for example, secure network protocols, secure communication interfaces with industry standard encryption protocols, and dynamic firewall protection. Systematic user management is implemented to prevent unauthorized access, and regular firmware updates are provided for continuous improvements.

AWS810 transmits weather data in the following formats:

- Plain-text CSV data message
- Vaisala SMSAWS data message
- GOES data message

2.1.1 AWS810 observations

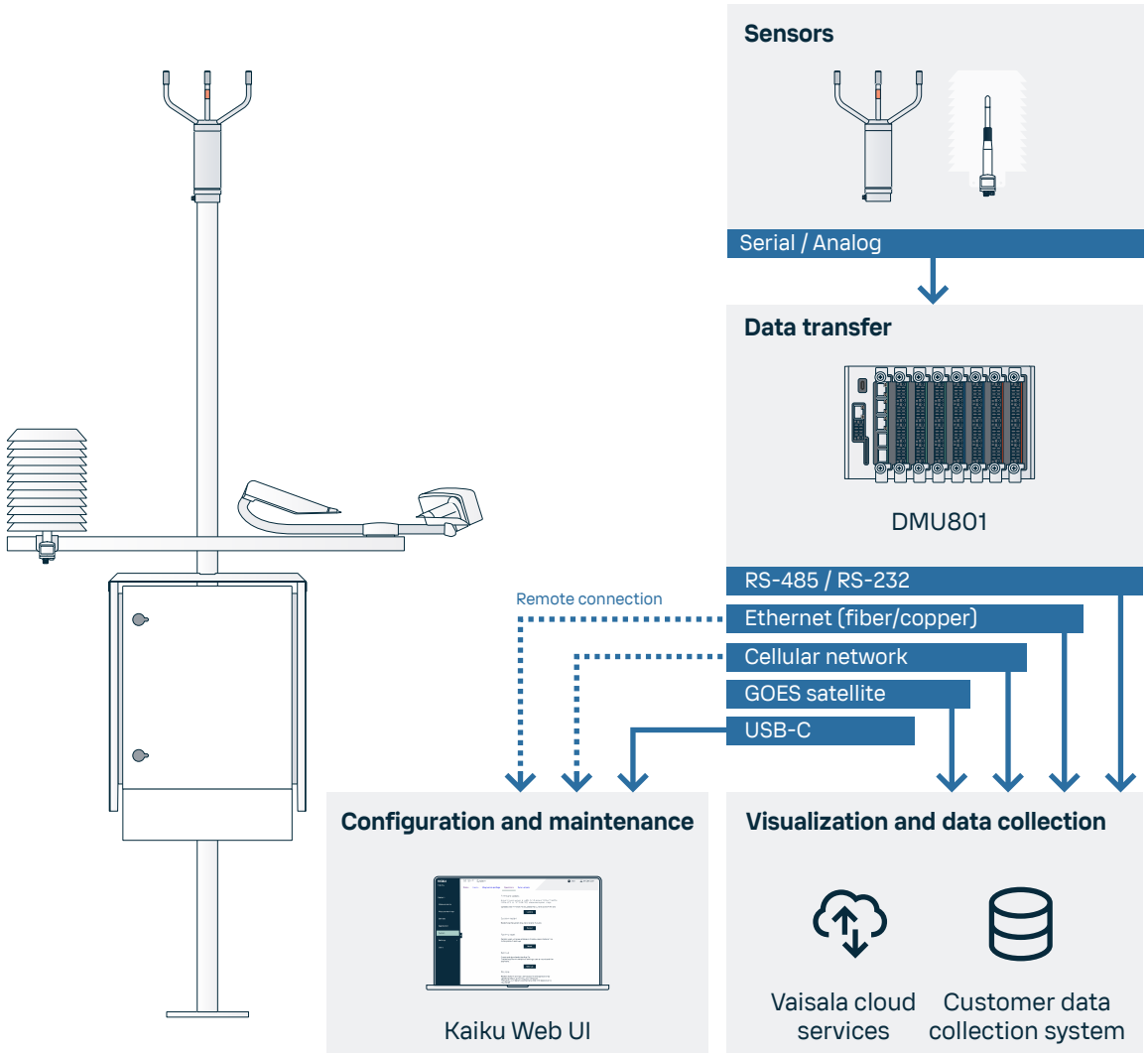


Figure 1 AWS810 system



Figure 2 AWS810 sensors

Depending on the installed sensors, AWS810 can measure the following weather parameters:

- Air temperature and humidity
- Barometric pressure
- Cloud height
- Precipitation accumulation and intensity
- Present weather and visibility
- Snow depth
- Soil temperature
- Global or net solar radiation
- Sunshine duration
- UV radiation
- Water level and temperature

- Wind speed and direction

In addition, AWS810 calculates the following parameters from the measured data:

- Dew point
- Evapotranspiration
- Precipitation accumulation and intensity
- QFF, QFE, and QNH pressure tendency
- Wet bulb temperature
- Wind gust

AWS810 also provides a hardware interface for sensors that provide the following observations (requires project-specific tailoring):

- Visibility
- Soil moisture

2.1.2 Standard installation

In standard installations, many sensors and solar panels are installed on a mast and connected to the central enclosure that houses the DMU801 data management unit and electrical components. A wall mount set for the AWS810 enclosure is also available.

A standard installation consists of the following items:

- Enclosure ENC652 that houses electrical components and an optional pressure sensor
- DMU801 data management unit
- Mast and 1 or 2 support arms
- Sensors attached to mast or support arm, or placed on the surrounding terrain
- Cabling
- Communication equipment
- Power supply components: solar panel, AC (mains) input, and batteries
- Installation and mounting accessories

AWS810 is available for the following applications:

- Meteorological application (standard AWS810)
- Airport application (AWS810 Airport Edition)
- Application tailored for solar power plants (AWS810 Solar Edition)

For more information on AWS810 for airport and solar applications, see the relevant product documentation in Vaisala product documentation portal docs.vaisala.com.

AWS810 stores the data locally in the DMU801 data management unit's internal eMMc Flash memory or in the external SD memory card. The data can be transferred for storage and further analysis through the following connections:

- GOES satellite link
- Cellular modem
- Ethernet cable (copper/fiber optic)
- RS-232/RS-485 serial line
- UHF radio modem

A built-in monitoring system also continuously checks the hardware, and reports immediately if a fault occurs.

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2.1.3 Delivery and maintenance

The weather station requires only a minimal amount of regular maintenance and can be trusted to perform effectively in all weather conditions and climates. The modular design allows easy integration of additional sensors and quick replacement of individual components, reducing downtime and overall operating cost.

Vaisala offers a variety of services related to weather stations, for example:

- Project management for custom projects
- Factory acceptance test (FAT)
- Installation
- High-quality sensor calibration (including ISO/IEC 17025 accredited calibration)
- Preventive maintenance
- Training

Additional services, such as extended warranty and express spare part delivery are available on request. For more details and an up-to-date listing of the current offering, contact Vaisala.

2.2 Product and part names

Table 5 System components

Component	Name
ENC652	Vaisala Weather Station Enclosure
DMU801	Vaisala Data Management Unit
DMA801 DMA802 DMA803	Vaisala Analog Measurement Module
DMB801	Vaisala Barometer Module
DME801	Vaisala Ethernet Switch Module
DMS801 DMS802	Vaisala Serial Module
DMX801	Vaisala Modem Carrier Module
BMU801	Vaisala Battery Management Unit
Termbox	Vaisala Termination Box
GOES	GOES Data Collection System consisting of: • Vaisala GOES DCP Transmitter QST102-3 • GOES Crossed Yagi Antenna • GOES GPS antenna
SATEL-EASy+	Radio modem
Vaisala Kaiku	DMU801 software
Kaiku Web UI	Web user interface for service connection between computer and DMU801

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Component	Name
Vaisala Kaiku Designer	Vaisala software for designing and modifying the application
Vaisala Xweather Observe	Vaisala cloud-based software for viewing and analyzing measurements
DKP202W DKP203W	Vaisala Short Pole Mast
DKP210W	Vaisala Tiltable Pole Mast
DKE110W DKE110AV	Vaisala Composite Pole Mast, white or red/orange and white
DKE200	Vaisala Frangible Lattice Mast
DKP060SUP1 DKP060SUP2	Vaisala support arm for 60-mm (2.36-in) masts, half-length or full-length
DKP12SUP1 DKP12SUP2	Vaisala support arm for 100-mm (3.94-in) masts, half-length or full-length
DKE110FSUP1 DKE110FSUP2	Vaisala support arm for frangible 106-mm (4.17-in) masts, half-length or full-length
DKE200SUP1 DKE200SUP2	Vaisala support arm for DKE200 lattice mast, half-length or full-length
DKL201	Vaisala Lightning Kit

Table 6 Sensors

Sensor	Name
WMT700	Vaisala WINDCAP Ultrasonic Wind Sensor
R.M. Young	R.M. Young Wind Monitor
WXT531 WXT532 WXT535 WXT536	Vaisala Weather Transmitter
HMP155 HMP110	Vaisala HUMICAP Humidity and Temperature Probe
PTB330	Vaisala BAROCAP Digital Barometer
NR Lite2	Kipp & Zonen Net Solar Radiation Sensor
SMP series SP Lite2	Kipp & Zonen Pyranometer
MS series	EKO MS Series Pyranometer
SUV5	Kipp & Zonen UV Radiometer
CSD3	Kipp & Zonen Sunshine Duration Sensor

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Sensor	Name
RM60	Vaisala PRECICAP Radar Precipitation Sensor
SBS314/H SBS314 Lite	EML Rain Gauge (with or without heating)
OTT Pluvio^2 L	OTT Precipitation Gauge
PWD22	Vaisala Present Weather Detector
FS11	Vaisala Visibility Sensor
FD70	Vaisala Forward Scatter Sensor
LT31	Vaisala Transmissometer
CL31	Vaisala Ceilometer
SnowVUE10	Campbell Scientific Digital Snow-Depth Sensor
PAA-36XW	Keller Water Level and Temperature Transmitter
VEGAPULS C 23 VEGAPULS 61	Vega Water Level Radar Sensor
QMT110	Vaisala Soil and Water Temperature Sensor
EC-5	Decagon Devices Soil Moisture Sensor
ML3	Delta-T Device Soil Moisture and Temperature Sensor

2.3 Safety

This product has been type-tested for safety and approved as shipped from the factory.

Note the following warning labels on the product:



WARNING! Electricity hazard



WARNING! Hot surface hazard



WARNING! Replacing the battery with an incorrect type of battery may result in serious injury. Always use the correct type of battery.



WARNING! Use Cu cable with operating temperature over +70 °C.



WARNING! The system is powered from several power sources to ensure uninterrupted service. To make the system non-energized, disconnect all power sources.



Protective ground.

Note the following precautions:



WARNING! For safety reasons, do not install the system alone. Safe installation requires at least 2 people.



WARNING! Consult local electricity professionals for the local and state legislation and regulations about grounding.



WARNING! Ground the product and verify outdoor installation grounding periodically. Failure to provide proper grounding can result in injury or death from electrical shock and can severely damage the equipment.



WARNING! Lightning protection is required to prevent injury and damage to equipment due to direct lightning strikes and lightning-induced current surges.



WARNING! Ground remote units properly. A lightning strike through a communication wire can cause a lethal current surge.



WARNING! A long cable between units (sensors, transmitters, power supplies, and displays) can cause a lethal lightning-induced current surge. Always ground the enclosure to a suitable grounded location with a short, low-resistance cable.



WARNING! Do not service the system alone. Do not reach into parts and assemblies that are AC (mains) powered and live except in the presence of someone who can provide first aid.



WARNING! Do not perform installation or maintenance procedures when there is a risk of thunderstorm or lightning activity in the area.



WARNING! Assess the risks from the installation work. Consider also the effects of local weather conditions.



WARNING! Installations must be performed only by people with experience in installing or working with weather stations.



WARNING! Only licensed experts may install electrical components. They must adhere to local and state legislation and regulations.



WARNING! After disconnecting the power cable, dangerous voltages can exist for some time. To avoid injury, disconnect the power and discharge circuits before touching them.



WARNING! Do not throw the battery into a hot oven or fire, or mechanically crush or cut the battery. Improper disposal can cause an explosion.



WARNING! Do not leave the battery in an environment surrounded by extremely high temperatures. Extremely high temperature can result in deflagration or leakage of flammable liquid or gas.



WARNING! Make sure that the battery is not subjected to an extremely low air pressure. Extremely low air pressure can result in deflagration or leakage of flammable liquid or gas.



WARNING! Photovoltaic modules generate direct current (DC) when exposed to sunlight or other sources of light. Although single modules produce low voltage and current, contact with module output wiring can cause shocks and burns.



WARNING! Make sure that you prepare or connect only de-energized wires.



WARNING! Do not replace components when the system is powered up. Disconnect all power sources before performing maintenance procedures.



WARNING! Some instruments and sensors or versions are heated. To avoid injury, do not touch heated parts when heating is on.



WARNING! Do not operate in an explosive atmosphere, for example, when flammable gases or fumes are present. Operation of electrical equipment in such an environment constitutes a safety hazard.



WARNING! If ice or snow accumulates on the mast, guy wires, or sensors, the ice or snow can fall and cause injury to persons below.



WARNING! Do not substitute parts or modify the system, or install unsuitable parts in the system. Improper modification can damage the product or lead to malfunction.



WARNING! Failure to comply with these precautions or with specific warnings elsewhere in these instructions violates safety standards of design, manufacture, and intended use of the product. Vaisala assumes no liability for the customer's failure to comply with these requirements.

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WARNING! If the equipment is used in a manner not specified by Vaisala, the protection provided by the equipment may be impaired.

CAUTION! Do not damage or change the wiring. Incorrect wiring can cause damage and prevent or limit operation.

WARNING! Follow local and state legislation and regulations on occupational safety.



Wear protective eyewear, gloves, safety helmet, and safety shoes during installation and maintenance work.

2.3.1 ESD protection

Electrostatic discharge (ESD) can damage electronic circuits. Vaisala products are adequately protected against ESD for their intended use. However, it is possible to damage the product by delivering electrostatic discharges when touching, removing, or inserting any objects in the equipment housing.

To avoid delivering high static voltages to the product:

- Handle ESD-sensitive components on a properly grounded and protected ESD workbench or by grounding yourself to the equipment chassis with a wrist strap and a resistive connection cord.
- If you are unable to take either precaution, touch a conductive part of the equipment chassis with your other hand before touching ESD-sensitive components.
- Hold component boards by the edges and avoid touching component contacts.

2.3.2 UL/CSA C22.2 regulatory caution and warning statements

Note the following warning labels on the product:

Notez l'étiquette d'avertissement suivante sur le produit :

WARNING! The system is powered from several power sources to ensure uninterrupted service. To make the system non-energized, disconnect all power sources.
AVERTISSEMENT ! Le système est alimenté par plusieurs sources de courant afin de garantir un service ininterrompu. Pour mettre le système hors tension, déconnectez toutes les sources d'alimentation.

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WARNING! Use Cu cable with operating temperature over +70 °C.
AVERTISSEMENT ! Utiliser un câble Cu avec une température de fonctionnement supérieure à +70 °C.

3. Configuration and maintenance overview

3.1 Overview of configuration

To configure AWS810, connect your laptop to DMU801 with a USB-C cable and use the Kaiku Web UI with a web browser. Later, you can also connect to the Web UI with an Ethernet or cellular connection. In the Web UI, some configuration tasks are done by editing the station parameters and others by editing the specific views in the Web UI.

The sensors included in AWS810 as well as calculations and reports related to the sensors are typically set and enabled in the application at the factory. When configuring the weather station for the first time after installation, perform the following procedures in the order presented:

1. Connect to the station and activate DMU801:
   - Connecting to station using USB connection (page 30)
   - Activating DMU801 (page 30)
2. Configure the station settings:
   - Setting site parameters (page 32)
   - Setting time (page 33)
   - Configuring settings for heated enclosure (page 35)
3. Configure the relevant sensor settings:
   - Configuring sensors (page 36)
4. Configure the communication settings:
   - Configuring Ethernet connection (page 40)
   - Configuring cellular modem settings (page 42)
   - Configuring firewall rules (page 49)
5. Configure data reporting:
   - Configuring connections for data reporting (page 52)

After the initial configuration, you only need to change it in the following situations:

- You remove, replace, or add sensors.
- You want to change the data reporting settings.
- There is a problem with the weather station and you need to do troubleshooting.

3.1.1 Information required for station configuration

Table 7 Information required for station configuration

Information	Necessity	Source
Device activation code	Mandatory	Vaisala
New username and password for the administrator	Mandatory	Customer
SIM card and the PIN code	Mandatory for cellular network connection	Cellular network provider

Information	Necessity	Source
Cellular network settings (IP address, dynamic DNS service, or APN settings)	Mandatory for cellular network connection	Cellular network provider
Customer network settings	Mandatory for customer-provided Ethernet-based communication device	Customer
Data reporting settings (transmission protocol, server address, usernames, and passwords)	Mandatory	Customer
Station name	Optional in installation. Can be configured later remotely.	Customer
Station altitude and pressure sensor level (if pressure measurement and calculations are in use)	Optional in installation. Can be configured later remotely.	Customer

3.1.2 Data security

DMU801 has a number of data security features to protect the data, such as:

- Secure network protocols
- Secure communication interfaces with industry standard encryption protocols
- Dynamic firewall protection
- Systematic user management to prevent unauthorized access
- Regular firmware updates for continuous improvements

3.1.3 Station parameters

Station parameters are application-specific parameters that identify the application and control many different options. The station parameters include, for example:

- Site information, such as name and location
- Sensor connection settings, such as port
- Installation-specific parameters, such as surface type
- Data reporting connection settings
- Parameters for calculation algorithms

The station parameters are stored in DMU801.

Station parameters and their default values are defined in the application. You can edit the application with Kaiku Designer. Once the application is uploaded to DMU801, you can view the station parameters in the Web UI and edit the values for individual stations as needed.

In the initial configuration phase, you need to configure the following settings in the station parameters:

- Site information
- Sensor settings (required only for some sensors)
- Connection settings for data reporting

For instructions, see the relevant sections in this guide.

To enable sensors and other components in the application, you need to edit the station parameters. It is typically done at the factory, but if you want to add, for example, new sensors, you need to enable them in the station parameters.

More information

- Configuring sensors (page 36)
- Configuring connections for data reporting (page 52)
- Enabling and disabling sensors and devices (page 145)

3.1.3.1 Editing station parameters in Web UI

You can edit the values of station parameters in the Web UI.

Do not edit the values of station parameters in the **capabilities** and **development** parameter groups, unless specifically instructed. They are set correctly at the factory.

1. In the Web UI, go to **Settings > Station parameters**.

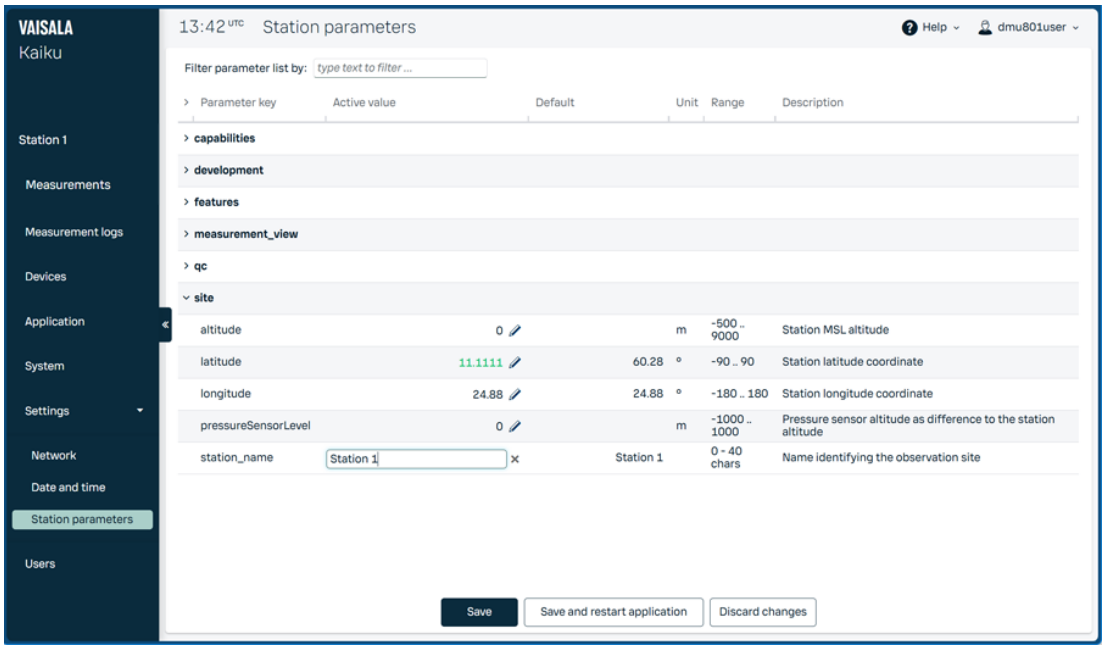
   The **Station parameters** view shows a list of all parameters and their values. The parameters are organized in groups according to their intended use.

   The **Range** column shows:
   - The allowed minimum and maximum number of characters for textual parameters
   - The allowed minimum and maximum values for numerical parameters

2. To find the parameter you want to edit, use the filter function and type search text in the **Filter parameter list by** field.

3. Locate the parameter you want to edit on the list, and select the pen icon next to the **Active value** field.

   The field becomes editable.



4. Type the new value in the field and select **Save** or **Save and restart application**.

   How the changes are applied depends on the application. When in doubt, select **Save and restart application**.

To restore the default value of a parameter, select the pen icon and then the cross icon next to the parameter.

More information

- Configuring sensors (page 36)
- Configuring connections for data reporting (page 52)

3.2 Overview of maintenance

For the recommended maintenance procedures and repair instructions, see the relevant maintenance sections in this document for different system parts and sensors.

3.3 Kaiku APIs

The following APIs are available for Kaiku (DMU801):

- Kaiku Device Management API
- Kaiku HTTPS Reports API

3.3.1 Kaiku Device Management API

With Kaiku Device Management API, you can perform device management operations for individual or several DMU801 units at the same time using applicable management software.

The Device Management API is a collection of several HTTP (Web) APIs:

- Device API for obtaining device, firmware, and hardware information, restarting the device, and performing factory reset
- Firmware API for updating firmware
- Backup and restore API for taking a backup and doing a full or selective restore from the backup

For more information, see Kaiku Device Management API Description (M213154EN).

3.3.2 Kaiku HTTPS Reports API

With Kaiku HTTPS Reports API, you can poll weather observations and reports from Kaiku (DMU801). With the API you can list, fetch, delete, and wait for reports. The API uses a buffered report architecture where reports are stored in the memory with monotonically increasing serial numbers. This enables client-side management of report delivery and processing.

For more information, see Kaiku HTTPS Reports API Description (M213354EN) .

More information

▸ Configuring polling of data messages (page 62)

4. Connecting to station

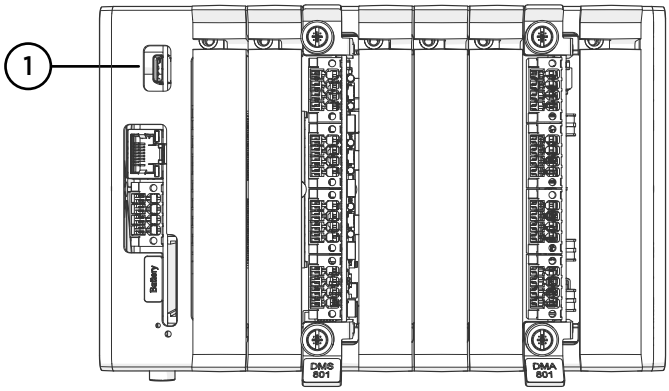
4.1 Connecting to station using USB connection

Before connecting the USB cable, power up the station.

To configure the weather station for the first time, connect to DMU801 locally with USB connection.

1. Connect DMU801 to your computer with a USB-C cable.

   Use the USB-C cable provided by Vaisala. If you use your own cable, make sure that the cable is shielded.



1 DMU801 USB-C port

4.2 Activating DMU801

1. Make sure that DMU801 is connected to your computer with a USB-C cable.

   Use the USB-C cable provided by Vaisala. If you use your own cable, make sure that the cable is shielded.

2. Open a web browser and go to the Web UI address:

   https://192.168.10.2.

3. Web browsers do not trust a self-signed certificate. If you are logging in for the first time, the browser indicates that the connection is untrusted or insecure. Ignore the warning and continue to the site.

   After activation, you can use the **Certificates** view in the Web UI to manage custom certificates and avoid future browser warnings.

4. Type the device activation code in the **Activation code** field.

   The device activation code is delivered with other product documentation. The code is unique for each DMU801. Check that the serial number in the device activation code sticker matches the serial number of your DMU801.



   Store the device activation code in a safe place. You have to re-enter the code after a factory reset. If you forget or do not know the device activation code, contact Vaisala.

5. Select **Activate**.
6. After entering the correct device activation code, you are prompted to create an administrator user account. Create a username and password for the **Administrator** user, confirm the password, and select **Create**.

   Store the username and password in a safe place. If you forget your username or password, you have to reset DMU801 to factory default settings.

   The **Administrator** user account is created, and the Web UI main view opens.

5. Configuring station settings

5.1 Setting site parameters

Site parameters identify the weather station and represent some station site conditions, such as elevation from sea level. The station-specific site parameters belong to the parameter group **site**.

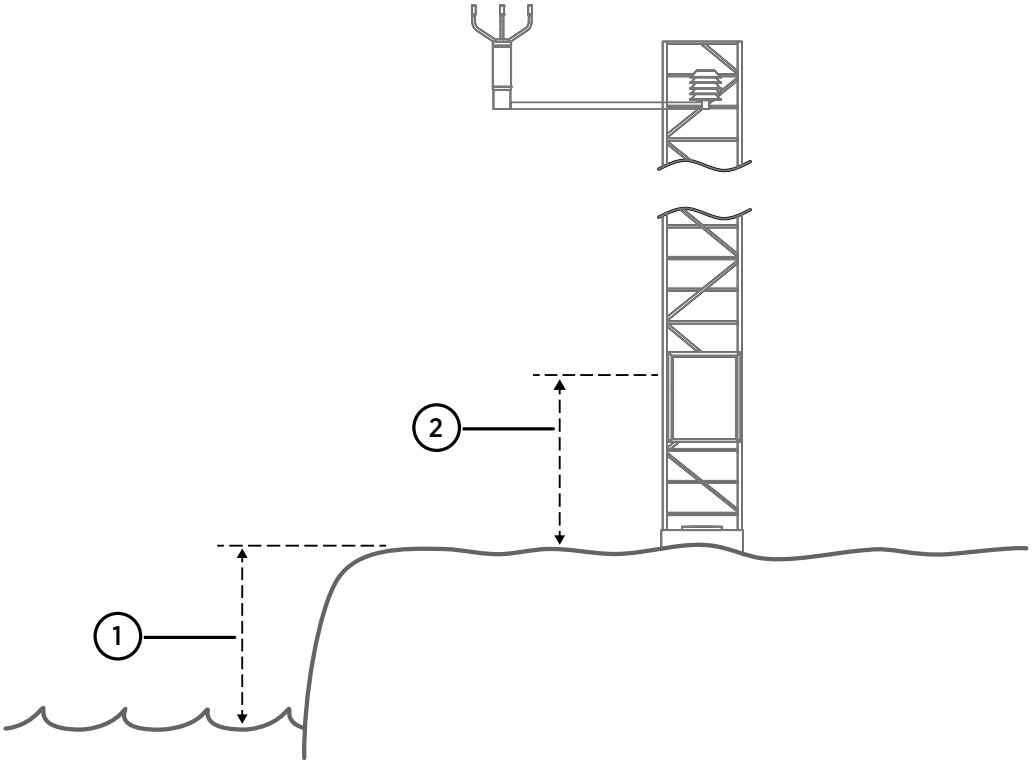


Figure 3 Determining altitude and pressure sensor level

1 Altitude = Ground level from mean sea level in meters
2 Pressure sensor level = Distance between the pressure sensor and the ground in meters

1. In the Web UI, go to **Settings > Station parameters**.

2. Under the parameter group **site**, set the following:

   altitude
   Type the weather station altitude from the mean sea level in meters. This setting is needed only if your weather station measures barometric pressure.

   latitude
   Type the station latitude coordinate.

   longitude
   Type the station longitude coordinate.

   pressureSensorLevel
   Type the height of the pressure sensor in meters from the ground. This setting is only needed if your weather station measures barometric pressure.

   station_name
   Define a name for the station. The station name is shown in the Web UI side panel.

3. To save the changes and take them into use, select **Save and restart application**.

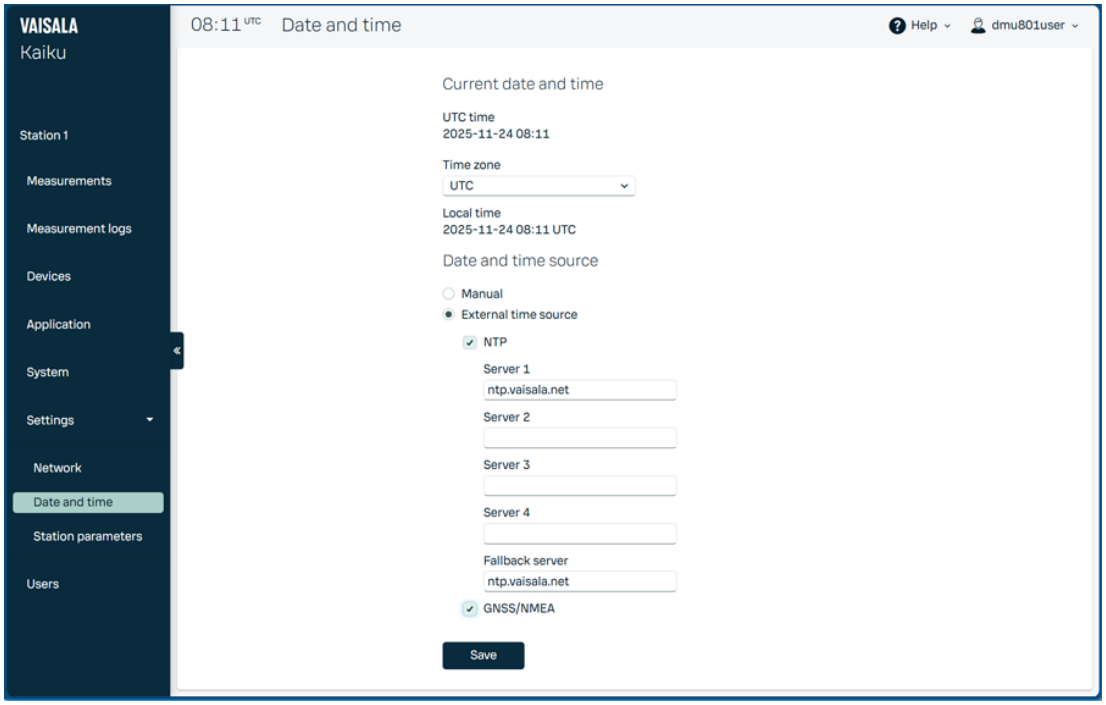
5.2 Setting time

Network Time Protocol (NTP) is used to set system clocks accurately to the current time. NTP makes sure that all observations have the correct timestamp.

You can also use GNSS (Global Navigation Satellite System) signals for time synchronization. To be able to use GNSS signals, you must have an external GNSS device in your system and an application that includes a GNSS device component.

Vaisala recommends using both NTP (if the system is connected to the Internet) and GNSS signals (if you have an external GNSS device in the system), when possible. If Internet connectivity is not available and you have no GNSS device, you can set the system time manually.

1. In the Web UI, go to **Settings > Date and time**.



2. In **Time zone**, select your local time zone or UTC time.

   If you select the local time zone, the system calculates the UTC time from the time zone information.
   The time zone setting does not affect observation data, which is always recorded and stored in UTC time. However, certain wall-clock-based events, such as precipitation sum reset, can optionally use local time.

3. In **Date and time source**, select one of the following:

   - **Manual** (if the system is not connected to the Internet)
     Set the local date and time.
   - **External time source** (if the system is connected to the Internet or you have a GNSS device in your system)

4. If you selected **External time source**, select one or both of the following options:

   - **NTP** (if the system is connected to the Internet)
     Type the address of the NTP servers that you want to use.
   - **GNSS/NMEA** (if you want to use GNSS signals for time synchronization)

5. To save the changes, select **Save**.

You are logged out of the Web UI. Logout does not happen if you select **NTP** and the resulting time does not differ considerably from the current system time.

For more information, see DMU801 Time Synchronization Management Guide (M213266EN).

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5.3 Configuring settings for heated enclosure

If your weather station is using a heated enclosure option, configure the following settings.

1. In the Web UI, go to **Settings > Station parameters**.
2. In the **encl_heat** parameter group, configure the following settings.

   hysteresis
   The hysteresis for switching the enclosure heating off (°C).

   setpoint
   The temperature for switching the enclosure heating on (°C).
3. To save the changes and take them into use, select **Save and restart application**.

6. Configuring sensor settings

6.1 Configuring sensors

The installed sensors start sending observations to the DMU801 data management unit when they are enabled in the application. Typically, the sensors included in the weather station order are enabled in the application already at the factory. If you later want to add and enable more sensors, you can do it in the Web UI.

In addition, some sensors need further configuration after installation. Configure the following sensors, if they are included in your weather station setup:

- Configuring wind sensors (page 36)
- Configuring EKO MS series pyranometer (page 37)
- Configuring rain gauge (page 37)
- Configuring SP Lite2 (page 38)
- Configuring NR Lite2 (page 38)
- Configuring SnowVUE10 (page 38)
- Configuring quality control parameters (page 39)

More information

- Editing station parameters in Web UI (page 27)

6.2 Configuring wind sensors

You can have 2 wind sensors installed in the weather station at the same time. The wind sensors are connected to DMU801 data management unit through serial ports **C1** and **D1**.

One of the sensors is set as primary and the other as secondary. Data from the primary sensor is used in all calculations, such as evaporation and wind chill, that use wind measurements as input.

Wind sensors are aligned in the weather station so that the North arrow or other alignment mark points north (or another specified reference direction based on your application). If a wind sensor is aligned to point to another direction, configure the wind direction offset by setting the deviation angle for the sensor.

For more information on wind sensor alignment, see AWS810 Installation Guide (M212418EN).

1. In the Web UI, go to **Settings > Station parameters**.
2. Locate the correct wind sensor parameter group on the list:

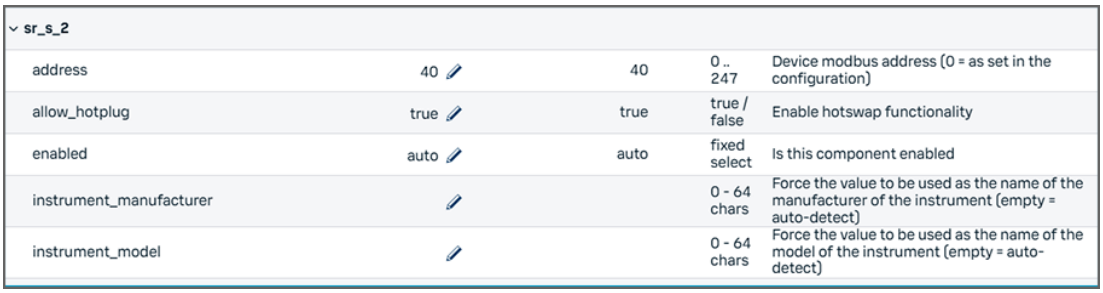
   nmea_wind_1, **nmea_wind_2**, or **wxt_1**.
3. In parameter **wind_direction_offset**, set the correct deviation angle from north (or another specified direction).
4. To save the changes and take them into use, select **Save and restart application**.

6.3 Configuring EKO MS series pyranometer

EKO MS series pyranometer is connected to DMU801 data management unit through port **D4**.

The factory default Modbus address of the EKO MS sensor equals the last 2 digits of the sensor serial number. Set the Modbus address in the station parameters.

1. In the Web UI, go to **Settings > Station parameters**.
2. Locate the **sr_s_2** parameter group on the parameter list.
3. In parameter **address**, change the value to be the last 2 digits of the EKO MS sensor serial number.
4. (Optional) In parameters **instrument_manufacturer** and **instrument_model**, type the manufacturer name and model of the sensor.
5. (Optional) In parameter **allow_hotplug**, change the value if needed. Allowing hotplug means that you can replace the sensor and the weather station detects it even without a restart. The feature is enabled by default.



sr_s_2				
address	40	40	0 .. 247	Device modbus address (0 = as set in the configuration)
allow_hotplug	true	true	true / false	Enable hotswap functionality
enabled	auto	auto	fixed select	Is this component enabled
instrument_manufacturer			0 - 64 chars	Force the value to be used as the name of the manufacturer of the instrument (empty = auto-detect)
instrument_model			0 - 64 chars	Force the value to be used as the name of the model of the instrument (empty = auto-detect)

6. To save the changes and take them into use, select **Save and restart application**.

6.4 Configuring rain gauge

Rain gauge is connected to DMU801 data management unit through port **X2**.

You can modify the rain gauge pulse factor in the station parameters.

1. In the Web UI, go to **Settings > Station parameters**.
2. Locate the **pr_d_1** parameter group on the parameter list.
3. In parameter **pulseFactor**, set the factor for converting gauge pulses to millimeters (default = `0.2`).



pr_d_1					
pulseFactor	0.2	0.2	mm/pulse	0.01 .. 5	Factor for converting gauge pulses to precipitation

4. To save the changes and take them into use, select **Save and restart application**.

6.5 Configuring SP Lite2

SP Lite2 is connected to the DMU801 data management unit through the analog channel **G3**. To get correct radiation measurements, set the channel gain sensitivity correctly in the station parameters. If the sensitivity is not set, a warning is generated to the system warning log.

1. In the Web UI, go to **Settings > Station parameters**.
2. Locate the **sr_d_1** parameter group on the parameter list.
3. In parameter **sensitivity**, set the sensitivity to the correct value.

   The sensitivity differs between specific sensor units. Check the correct sensitivity from the sensor label.

4. To save the changes and take them into use, select **Save and restart application**.

6.6 Configuring NR Lite2

NR Lite2 is connected to the DMU801 data management unit through the analog channel **G4**. To get correct radiation measurements, set the channel gain sensitivity correctly in the station parameters. If the sensitivity is not set, a warning is generated to the system warning log.

1. In the Web UI, go to **Settings > Station parameters**.
2. Locate the **nr_d_1** parameter group on the parameter list.
3. In parameter **sensitivity**, set the sensitivity to the correct value.

   The sensitivity differs between specific sensor units. Check the correct sensitivity from the sensor label.

4. To save the changes and take them into use, select **Save and restart application**.

6.7 Configuring SnowVUE10

SnowVUE10 is connected to the DMU801 data management unit through the SDI-12 serial bus. To return correct readings, the height of the sensor relative to ground level must be set with the `height` station parameter.

1. In the Web UI, go to **Settings > Station parameters**.
2. Locate the **snowvue_1** parameter group on the parameter list.
3. In parameter **height**, set the height of the sensor from the ground in meters.

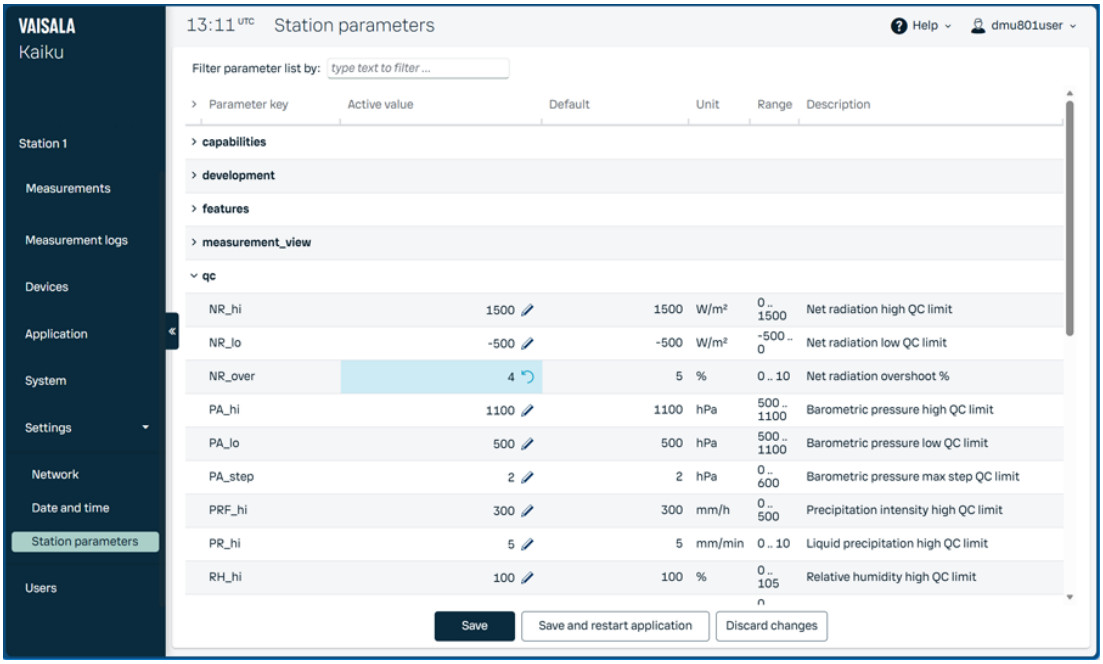
4. To save the changes and take them into use, select **Save and restart application**.

6.8 Configuring quality control parameters

The quality control (QC) parameters determine the limits for certain observations. The quality control limits are optional. If a limit is missing for a measurement, the corresponding check is omitted.

Change the values only if you understand the consequences.

1. In the Web UI, go to **Settings > Station parameters**.
2. In the **qc** parameter group, edit the values that you want.



The parameters are as follows:

- `lo`: Lower limit for the measurement
- `hi`: Upper limit for the measurement
- `over`: The allowed overshoot as percentage of the full measurement range (`hi` – `lo`). If the measurement value exceeds the lower or upper limit but stays within the overshoot value, the measurement is still considered valid but its value is set to the respective limit value.
- `step`: Maximum step between 2 successive measurements

3. To save the changes and take them into use, select **Save and restart application**.

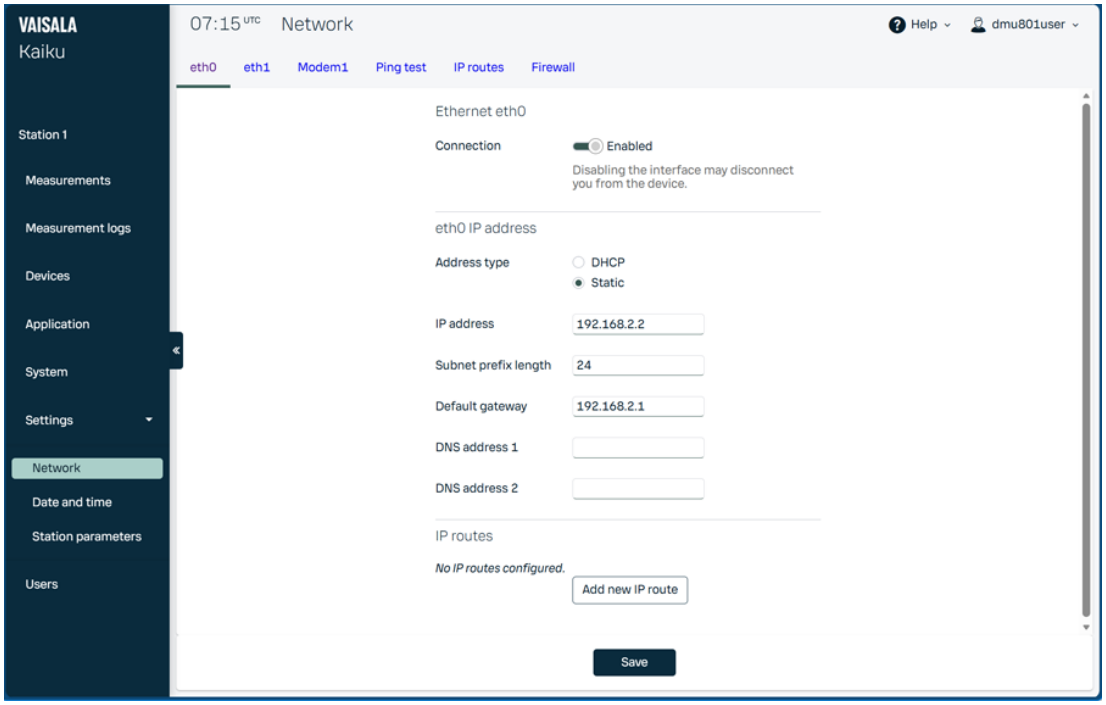
7. Configuring communication settings

7.1 Configuring Ethernet connection

Configure Ethernet connection to be able to connect to DMU801 over Ethernet.

Make sure that you are not connected to DMU801 through the same connection that you are configuring. For example, if you are configuring the **eth0** connection, make sure that you are connected to DMU801 through USB-C cable, **eth1**, or modem.

1. In the Web UI, go to **Settings > Network**.



2. In the **eth0** tab, set the following:

Connection
Select **Enabled**.

Address type
- Select **DHCP** if the network assigns network settings automatically, and refresh your web browser.
- Select **Static** to configure network settings manually.

If you selected **Static**, fill in the rest of the fields with information provided by your local network administrator.

IP address
Set a suitable IP address according to the used network (default = **192.168.2.2**).

Subnet prefix length
Give the number of network bits. For example:
- 255.255.255.0 = **24** (default)
- 255.255.255.224 = **27**

Default gateway
Default = **192.168.2.1**.

DNS address 1
IP address of the primary DNS server.

DNS address 2
IP address of the secondary DNS server.

3. If you want to set another IP route for the network interface, select **Add new IP route**, and set the following:

   Destination network IP address
   Destination network or device address.

   Subnet prefix length
   Number of network bits in **Destination network IP address**.

   Gateway
   Gateway address for connecting to the destination network or device.

   Route metric
   Route metric value according to which the routing decisions are made. If 2 or more active network interfaces that have routing entries with equal subnet length define access to the destination network, the one with the lower route metric value will be used.



4. To save the changes, select **Save**.

In the Web UI, the **eth1** tab is for configuring the Ethernet settings for Ethernet Switch Module DME801. If you have DME801 in your application, set the values in **eth1** similarly to **eth0**.

More information

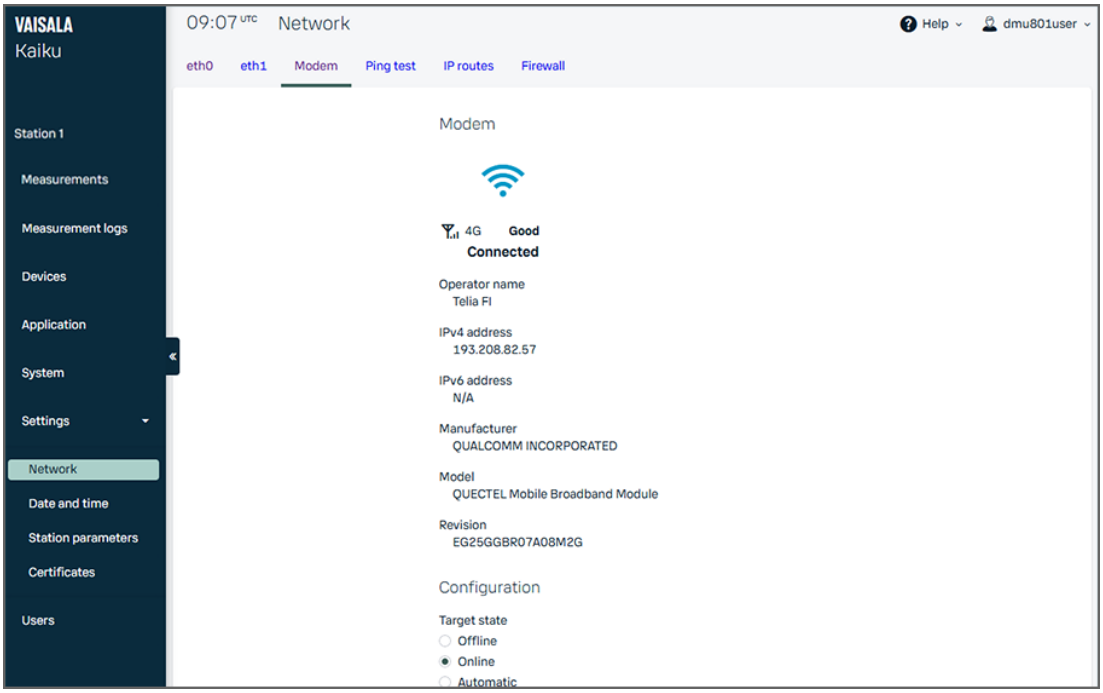
- IP routing (page 46)

7.2 Configuring cellular modem settings

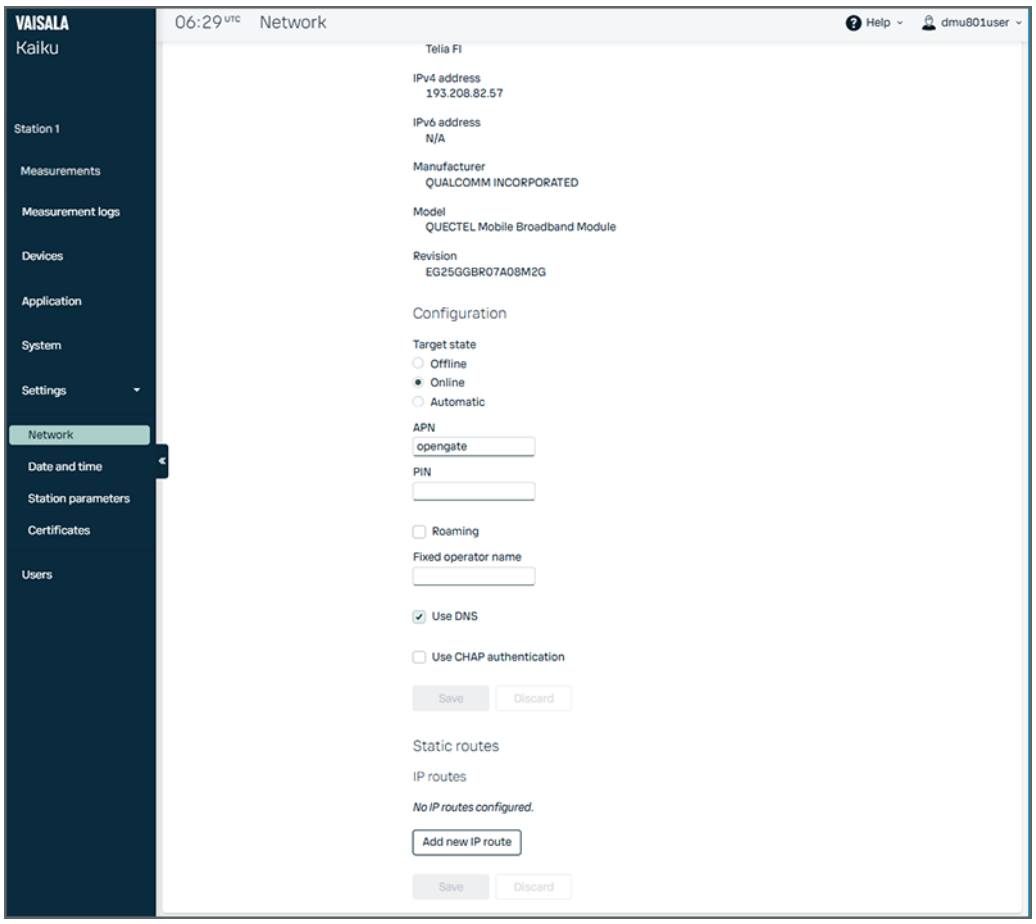
To be able to use a modem connection, you must have Modem Carrier Module DMX801 installed in DMU801. Before starting, make sure that the modem has a SIM card installed.

Configure modem settings to enable cellular connectivity for DMU801.

1. In the Web UI, go to **Settings > Network**.



2. In the **Modem** tab, set the following:



Target state

Select how the modem connection is controlled.

- **Offline**: The modem is always offline.
- **Online**: The modem is always online.
- **Automatic** (recommended): The modem is online by default. You can change the state with the **Connect** and **Disconnect** buttons. The **Automatic** state also enables automatic connection management by a Kaiku application, if the functionality is implemented in the application.

If you select the **Offline** state or the **Disconnect** button, you may not be able to restore the connection remotely.

APN

Type the Access Point Name (APN) as specified by your cellular network provider, for example `Internet`.

PIN

Type the PIN code of the SIM card.

Roaming

Check to enable data roaming.

Fixed operator name
Specify the network operator to connect to. Leave blank to let the modem choose the best available network automatically.

Use DNS
Use the DNS servers provided by your cellular network provider. When unchecked, DNS servers from the Ethernet connection are used instead.

Use CHAP authentication
Check to enable authentication of the modem connection using CHAP (Challenge-Handshake Authentication Protocol), if required by your network provider.

CHAP username
Type the CHAP username assigned to you by your network provider.

CHAP password
Type the CHAP password assigned to you by your network provider.

3. If you want to set another IP route for the network interface, select **Add new IP route**, and set the following:

   Destination network IP address
   Type the destination network or device address.

   Subnet prefix length
   Type the number of network bits in **Destination network IP address**.

   Route metric
   Type the route metric value according to which the routing decisions are made. If 2 or more active network interfaces that have routing entries with equal subnet length define access to the destination network, the one with the lower route metric value will be used.

4. To save the changes, select **Save**.

More information

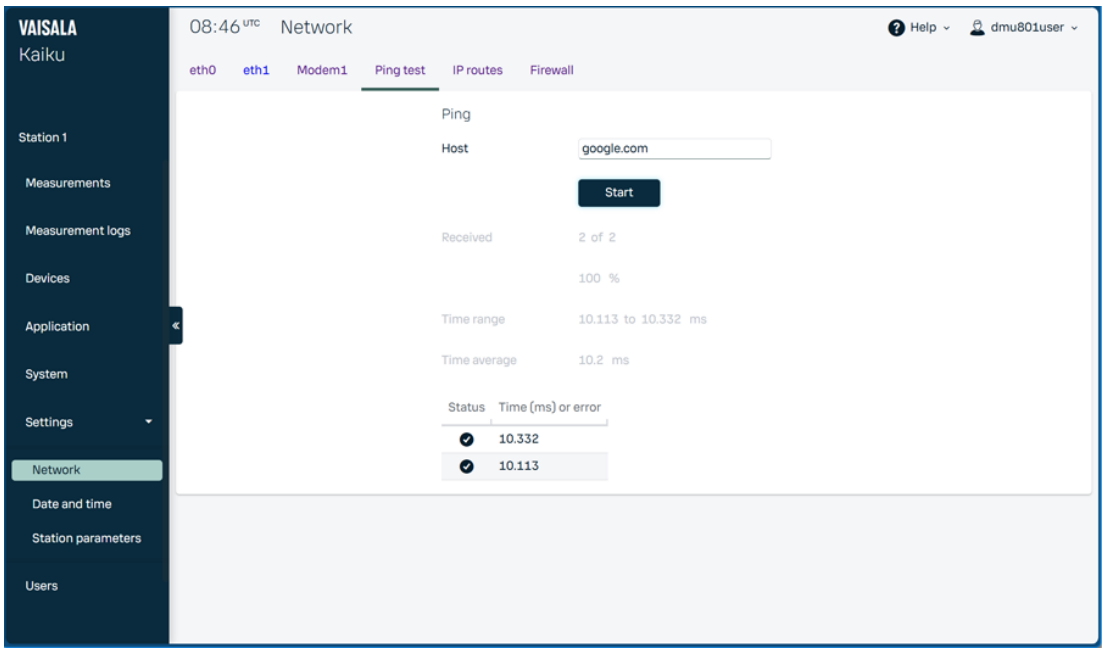
- IP routing (page 46)

7.3 Verifying network connection

You can check the network connection and speed in the Web UI.

1. In the Web UI, go to **Settings > Network > Ping test**.

2. In **Host**, write any web address or IP address, and select **Start**.



   The ping results are shown.

3. To stop pinging the connection, select **Stop**.

7.4 IP routing

IP routing allows you to define the routing rules for outgoing IP packets based on the destination IP address. IP routing rules are primarily needed when DMU801 has to connect to multiple networks through more than one network interface. You can specify which network interface DMU801 uses to communicate to a certain network or device.

Set the IP routing rules for the DMU801 network interfaces in the Web UI. A network interface can have any number of IP routing rules, or none at all.

Add new IP routes in the settings of each network interface:

- **eth0** for Ethernet interface in DMU801
- **eth1** for Ethernet interface in DME801 Ethernet Switch Module
- **Modem** for modem in DMX801 Modem Carrier Module

Changing the IP routes remotely may cause you to lose access to DMU801 over the used network.

To view the routing table, select **Settings > Network > IP routes**. The routing table is a summary of all configured rules, including the default ones.

More information

- Configuring Ethernet connection (page 40)
- Configuring cellular modem settings (page 42)

7.4.1 IP routing example

The following example shows how to configure DMU801 to use the Ethernet interface **eth0** for communicating to private subnet `172.24.84.0/24`.

Without the routing rule, DMU801 attempts to communicate to the network through the modem interface, which will fail.



You can only add an IP route for an interface with a static IP address.

To create a new route:

1. In the Web UI, go to **Settings > Network**.
2. In **eth0**, select **Add new IP route**.

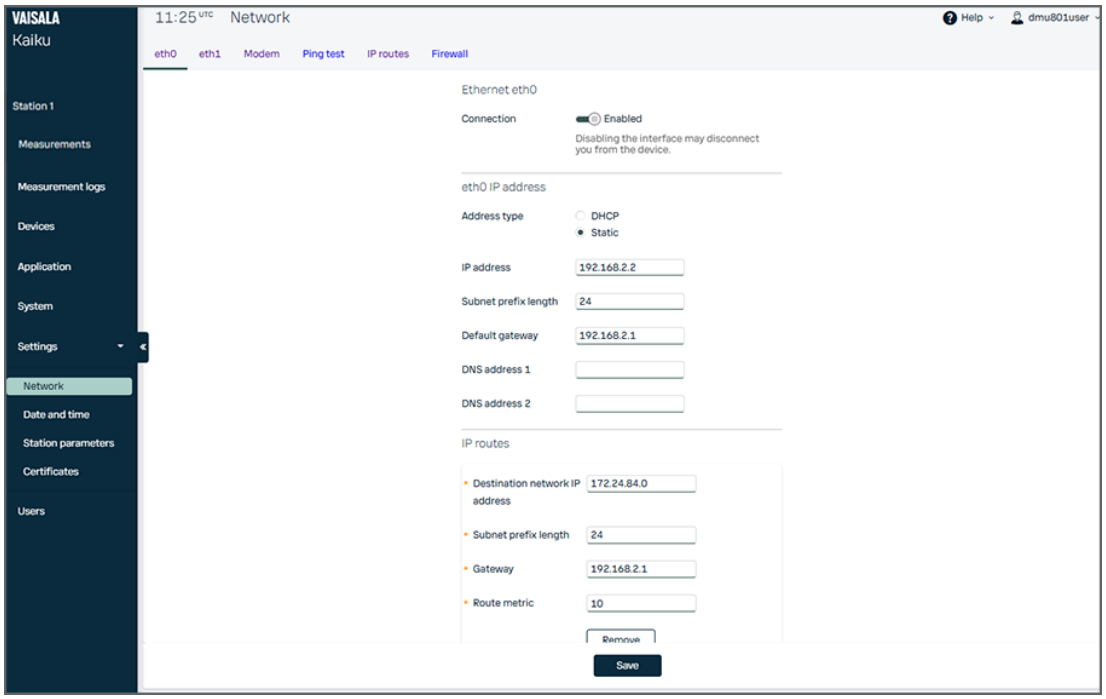
3. Set the following:

Destination network IP address
Destination network or device address.

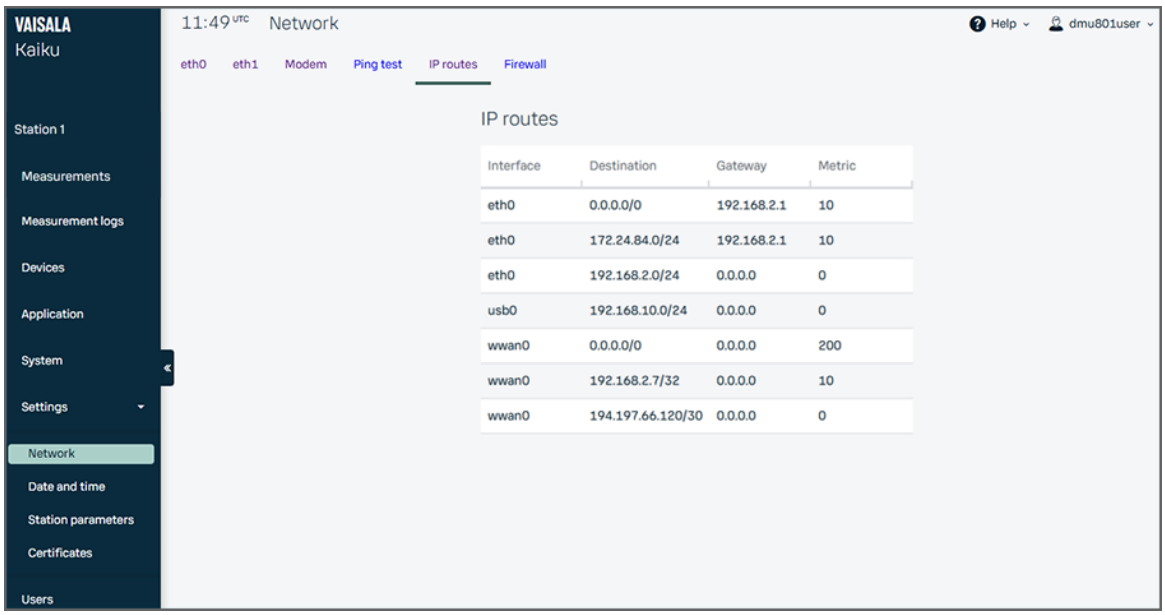
Subnet prefix length
Number of network bits in **Destination network IP address**.

Gateway
Gateway address for connecting to the destination network or device.

Route metric
Route metric value according to which the routing decisions are made. If 2 or more active network interfaces that have routing entries with equal subnet length define access to the destination network, the one with the lower route metric value will be used.



You can see a table of the created IP routing rules in **Settings > Network > IP routes**.



1) In the table, wwan0 = modem.

7.5 Configuring firewall rules

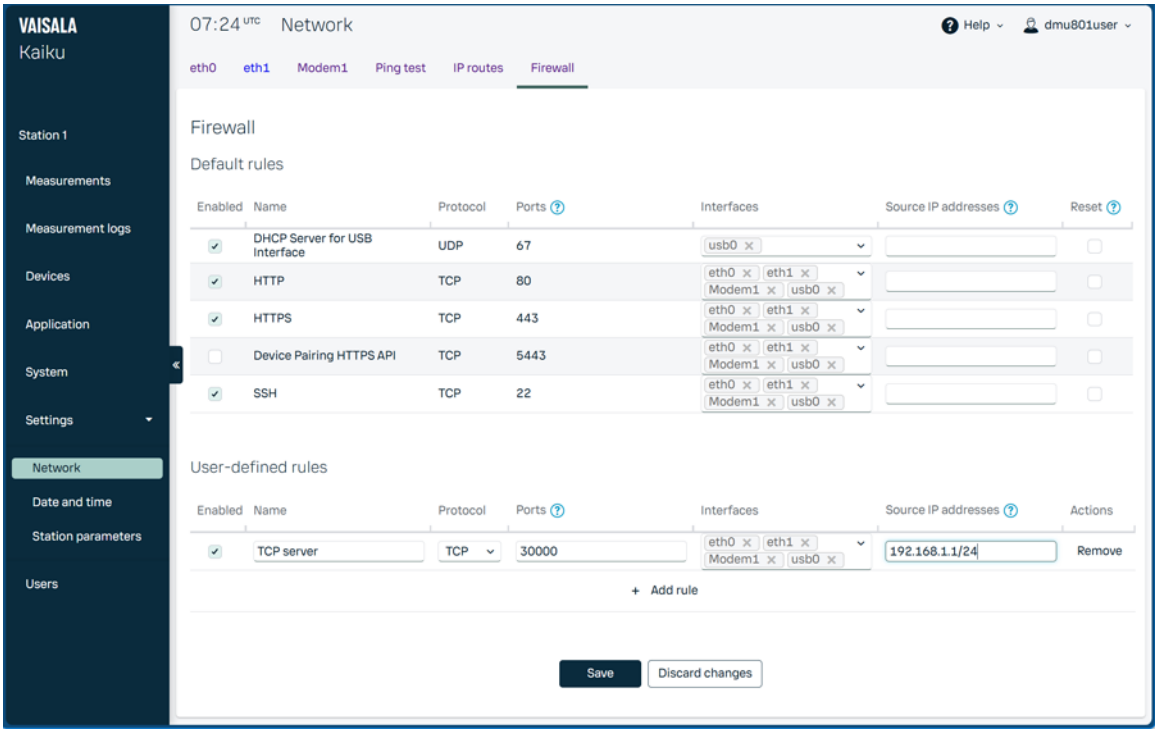
Kaiku has a dynamic firewall that allows incoming traffic only to specified ports, and optionally from selected remote IP addresses. Default firewall rules define the allowed ports for incoming connections. You can edit the default rules and also configure the ports and source IP addresses by setting your own rules.

You can:

- Open or close ports in the firewall for services running in the system
- Restrict network interfaces through which the services can be accessed
- Restrict IP subnets/hosts through which the services can be accessed

To access the Web UI, you must have HTTPS enabled in the default rules.

Traffic through HTTP is redirected to the HTTPS port.



1. In the Web UI, go to **Settings > Network > Firewall**.

   Default rules show the default set of rules configured for the device.

2. To add your own firewall rule under **User-defined rules**, select **Add rule** and set the following:

   Enabled
   Enable or disable the rule.

   Name
   Give a name for the rule.

   Protocol
   Select the protocol.

   Ports
   Type the ports to which access is allowed when this rule is enabled.

   Interfaces
   Select the network interfaces through which traffic is allowed when this rule is enabled.

   Source IP addresses
   Type the IP addresses from which connection is allowed when this rule is enabled. If left empty, any source IP address is allowed.

3. To save the changes, select **Save**.



For default rules, you can edit all other parameters except **Name**, **Protocol**, and **Ports**. If you have edited a default rule and want to revert to the original default values, select **Reset** and **Save**.

8. Configuring data reporting

8.1 Configuring data reporting

To transmit observation messages from the weather station, configure communication options that you want to use and the formats that you want to send. The available communications channels depend on your application.

Communication options

The following communication interfaces are available for transferring data from the station:

- Cellular modem
- Wired Ethernet adapter
- Direct serial (RS-232/RS-485) connection
- GOES satellite link

In addition to the standard interfaces, the following interfaces are available through project-specific tailoring:

- UHF radio modem

For convenient data access, the Ethernet and cellular options can be configured to:

- Send data messages to an SFTP or FTP server
- Connect to a TCP/IP socket

You can also poll SMSAWS and CSV messages through the Kaiku HTTPS Reports API. See Kaiku HTTPS Reports API Description (M213354EN).

Report formats

The following report formats are available:

- CSV data message
- SMSAWS data message
- GOES data message

8.2 Configuring connections for data reporting

For configuration instructions, see:

- Configuring SFTP or FTP server connection (page 53)
- Configuring TCP/IP socket for data reporting (page 55)
- Configuring serial line connection (page 57)
- Configuring GOES transmission (page 58)
- Configuring polling of data messages (page 62)

More information

- Editing station parameters in Web UI (page 27)

8.2.1 Configuring SFTP or FTP server connection

You can configure observation messages to be sent automatically to an SFTP or FTP server.



Vaisala recommends using SFTP for secure file transfer.

The observation reports are stored in the SFTP or FTP server in station-specific directories. The filenames contain the station name and the timestamp of the observation as follows:

aws810/`<station name>`*/obs_*`<type>_<timestamp>.<extension>`

- `<station name>` = Name of the station set in the station parameters
- `<type>` = Report type (`csv` or `smsaws`)
- `<timestamp>` = Timestamp in format `<YYYYMMDD>T<hhmmss>` (year, month, day / hours, minutes, seconds)
- `<extension>` = Filename extension (`csv` or `rep`)

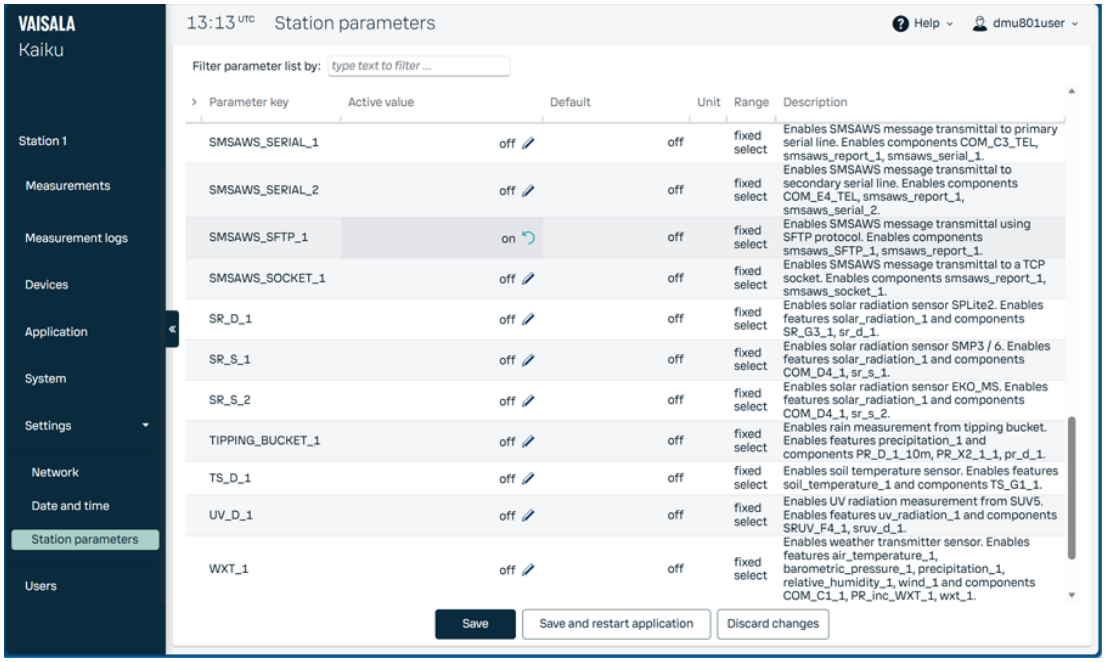
For example:

aws810/test-site/obs_smsaws_20250516T140602.rep

If sending to the server fails, the generated observation reports are added to the fail queue for later transmission. The maximum fail queue size is defined in the application.

1. In the Web UI, go to **Settings > Station parameters**.

2. Under the parameter group **features**, set the **Active value** to **on** for one of the following parameters. This enables the desired message format (SMSAWS or CSV) and the use of SFTP or FTP server for data reporting.
   - **SMSAWS_SFTP_1** or **CSV_SFTP_1** for SFTP
   - **SMSAWS_FTP_1** or **CSV_FTP_1** for FTP



3. To save the changes and take them into use, select **Save and restart application**.

   When the application has restarted, refresh the browser to make the changes visible.
4. Find the parameter group for the SFTP or FTP server parameter you enabled (for example, **smsaws_SFTP_1**, if you are configuring SMSAWS messages to be sent to SFTP).

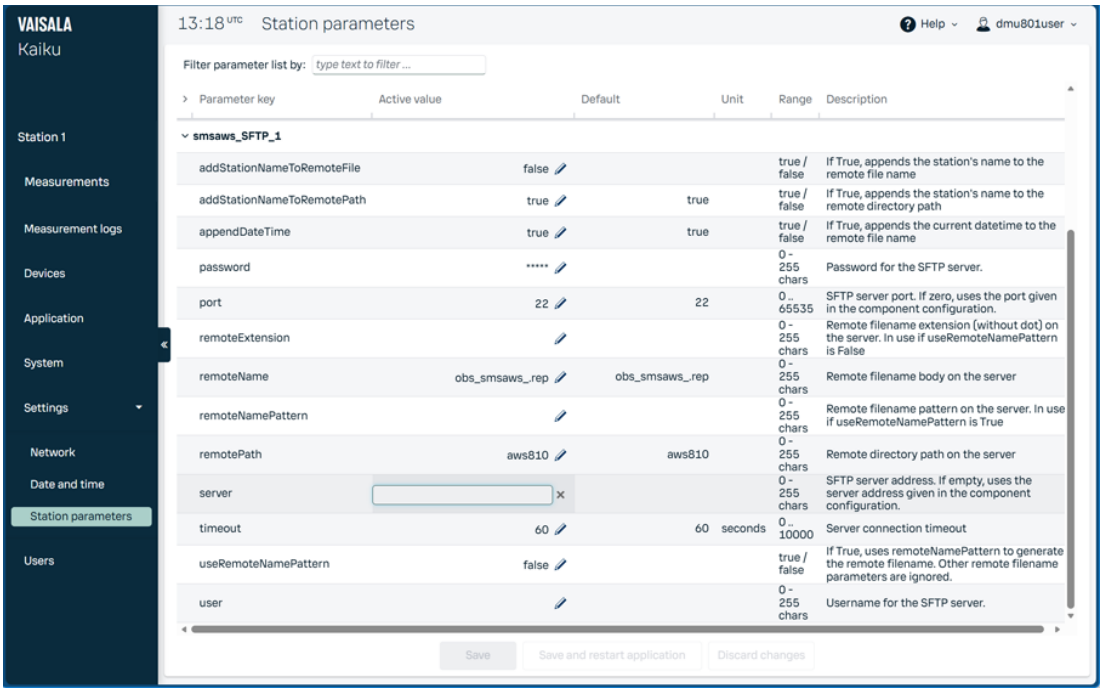
5. Configure the SFTP or FTP connection settings.

   server
   Hostname or IP address of the SFTP or FTP server.

   user
   Username for the SFTP or FTP server authentication.

   password
   Password for the SFTP or FTP server authentication. The password is protected and shown with asterisk characters (*) in the Web UI.

   port
   Number of the SFTP or FTP server port. Set this only if you want to use another port than the default port number defined in the application.



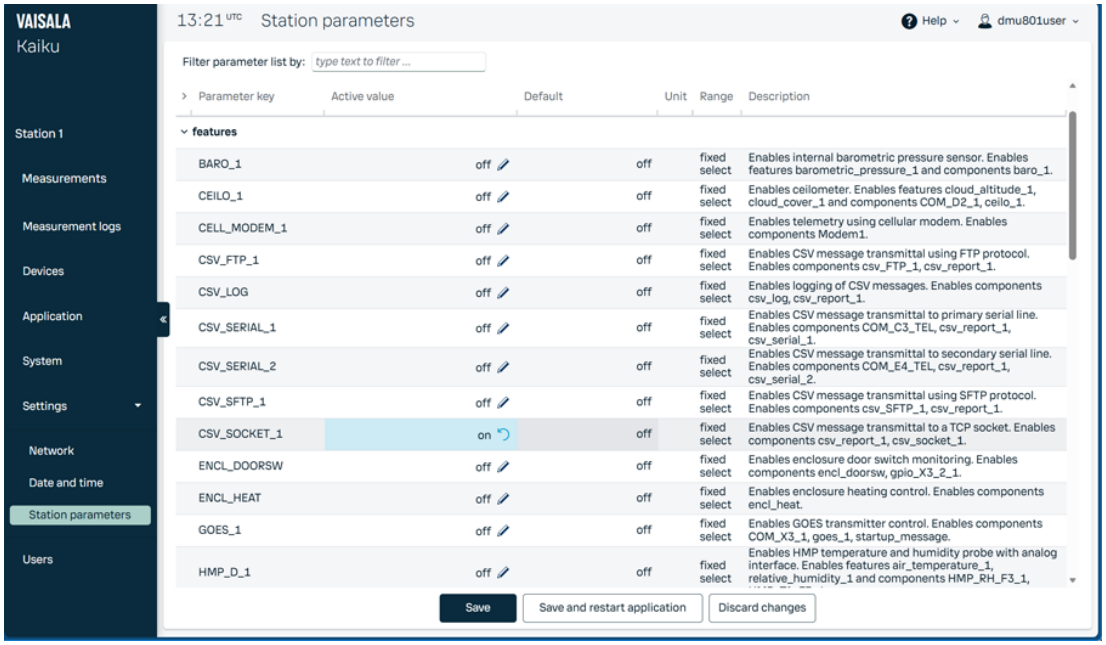
6. To save the changes and take them into use, select **Save and restart application**.

8.2.2 Configuring TCP/IP socket for data reporting

You can enable TCP/IP socket connections for data reporting.

1. In the Web UI, go to **Settings > Station parameters**.

2. Under the parameter group **features**, set the **Active value** to **on** for one of the following parameters. This enables the desired message format (SMSAWS or CSV) and the use of TCP/IP socket connection for data reporting.
   - **SMSAWS_SOCKET_1**
   - **CSV_SOCKET_1**



3. To save the changes and take them into use, select **Save and restart application**.

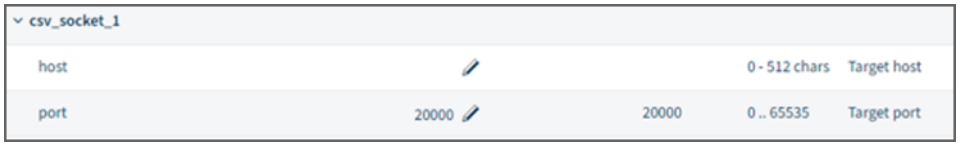
   When the application has restarted, refresh the browser to make the changes visible.

4. Find the parameter group for the socket parameter you enabled in step 2 (for example, **csv_socket_1** if you are configuring CSV messages to be sent to a TCP/IP socket).

5. Configure the TCP/IP connection settings.

   host
   DNS name or IPv4 address of the host.

   port
   Port number of the host server.



6. To save the changes and take them into use, select **Save and restart application**.

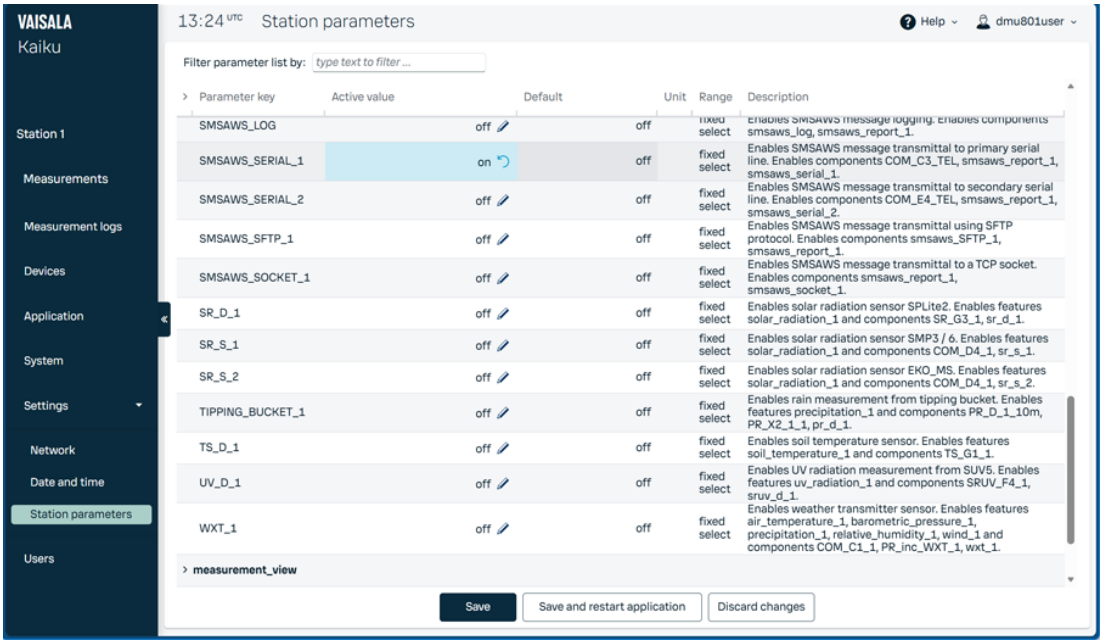
8.2.3 Configuring serial line connection

You can configure observation messages to be sent automatically to a local serial line connection through the following DMU801 ports, if the ports are available in the weather station:

- **C3** (primary) for RS-485 connection
- **E4** (secondary) for RS-232/RS-485 connection

If you change the serial port mode from RS-485 to RS-232, or the other way around, you must restart DMU801. Restarting the application alone is not sufficient.

1. In the Web UI, go to **Settings > Station parameters**.
2. Under the parameter group **features**, set the **Active value** to **on** for one of the following parameters. This enables the desired message format (SMSAWS or CSV) and the use of serial line for data reporting.
   - **SMSAWS_SERIAL_1** or **CSV_SERIAL_1** for port **COM_C3_TEL**
   - **SMSAWS_SERIAL_2** or **CSV_SERIAL_2** for port **COM_E4_TEL**



3. To save the changes and take them into use, select **Save and restart application**.

   When the application has restarted, refresh the browser to make the changes visible.

4. In the **COM_C3_TEL** or **COM_E4_TEL** parameter group (depending on which port you use), configure the serial line connection settings.

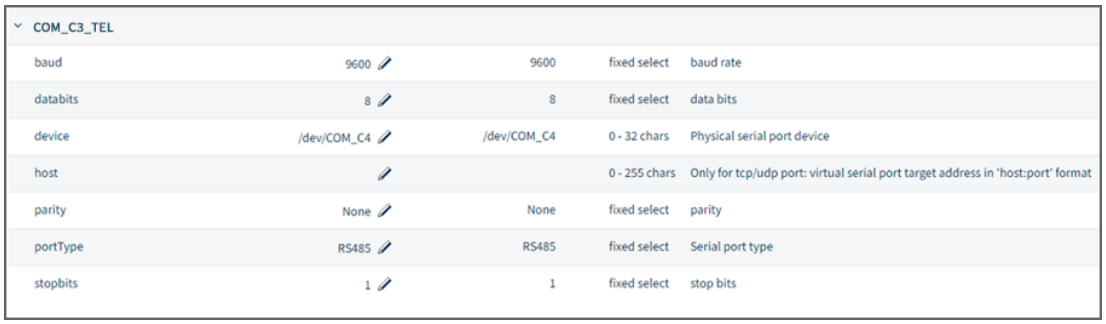
   baud
   Connection speed (default = `9600`).

   databits
   Number of data bits used in characters (default = `8`).

   parity
   Parity setting.

   portType
   Serial port type.

   stopbits
   Number of stop bits used (default = `1`).



5. To save the changes and take them into use, select **Save and restart application**.

8.2.4 Configuring GOES transmission

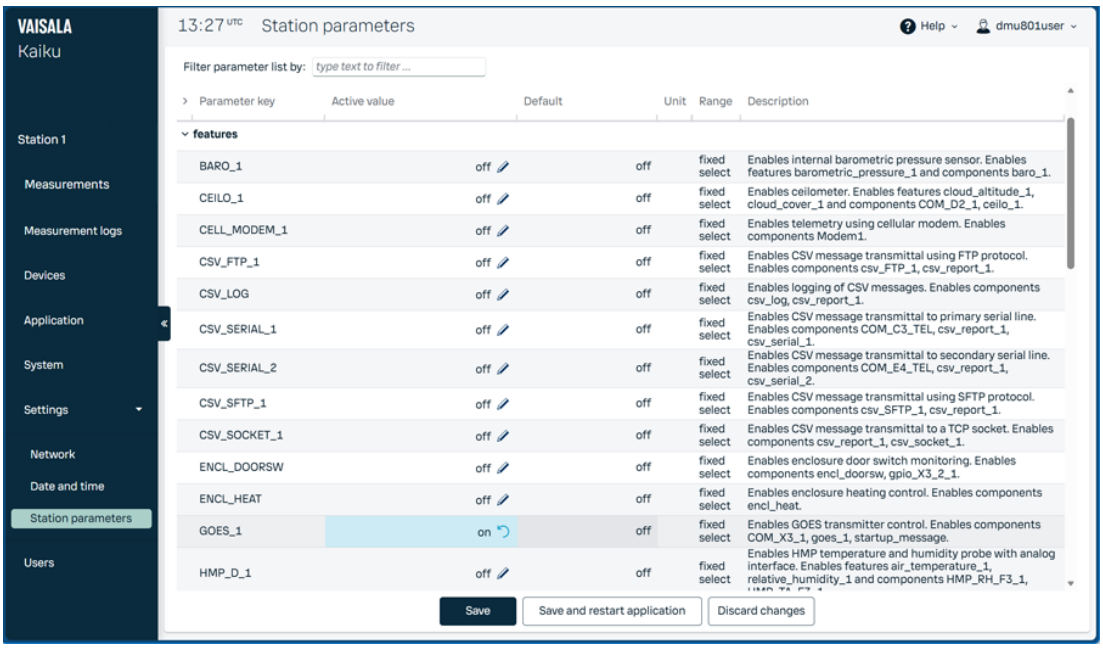
You can configure GOES data message to be sent automatically to the GOES link if you have a GOES transmitter in the weather station.

By default, GOES transmission bit rate is set to 300 bps and transmission is centered, that is, occurs in the middle of the transmission window. The transmission interval is set to 1 hour.

1. In the Web UI, go to **Settings > Station parameters**.
2. Under the parameter group **features**, set the **Active value** to **on** for the parameter **GOES_1**.
3. To save the changes and take them into use, select **Save and restart application**.

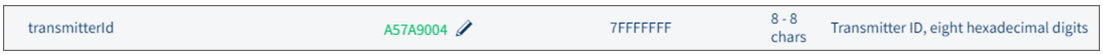
   When the application has restarted, refresh the browser to make the changes visible.

4. Find the parameter group **goes_1** .



5. Type the GOES transmitter identifier in the following parameter:

transmitterId
Unique transmitter identifier (8 hexadecimal digits). Provided by the satellite service operator.



6. Configure the following settings for the timed (primary) message. The settings are provided by the satellite service operator.

   primaryBitRate
   Assigned transmission bit rate for timed messages (default = `300`).

   primaryChannel
   Number of the assigned transmission channel for timed messages.

   primaryTransmitInterval
   Assigned transmission interval for timed messages.

   primaryTransmitTime
   Assigned transmission time for timed messages.

   primaryTransmitWindow
   Assigned transmission window length for timed messages.
   For example, if the transmission interval is `01:00` (hh:mm), transmission time `00:16` (hh:mm), and transmission window `00:10` (mm:ss), the timed (primary) messages are transmitted once per hour, within 10-seconds window that starts 16 minutes past the full hour.

   primaryTransmitEnabled
   Select **true** to enable transmission of timed (primary) messages.

7. Configure the following settings for random (secondary) message.

   Transmitting of random (secondary) messages is not part of the default application. Configure these parameters only if your system uses random (secondary) messages.

   secondaryBitRate
   Transmission bit rate for random messages (default = `300`).

   secondaryChannel
   Number of transmission channel for random messages.

   secondaryTransmitdelay
   Time delay from message creation to transmission start.

   secondaryTransmitRepeat
   Number of transmission repeats, that is, how many times the message is sent.

   secondaryTransmitInterval
   Interval for transmission repeats.
   For example, if the transmission delay is `00:10:00` (hh:mm:ss), transmission repeat `2`, and transmission interval `00:05` (hh:mm), the random (secondary) message transmission starts 10 minutes after the message has been created and gets sent twice with an interval of 5 minutes.

   secondaryTransmitEnabled
   Select **true** to enable transmission of random (secondary) messages.

8. Configure the following common settings for GOES connection.

   centerTransmit
   - **true** (default): Transmission of the timed (primary) message occurs centered to the given transmission time window. If the transmission takes, for example, 4 seconds and the window length is set to 10 seconds, a centered transmission starts 3 seconds after the scheduled transmission time. Vaisala recommends to use this option.
   - **false**: Transmission of the timed (primary) message starts at the beginning of the given transmission time window, that is, at the scheduled transmission time.

   maxTimeDiff
   Allowed system time error (in seconds) before adjusting time from the transmitter's GPS.

   pollInterval
   Forced transmitter polling interval (default = `1:00:00`).

   You can edit the polling interval to provide value updates more frequently, for example during commissioning and troubleshooting.

   rfPowerReduction
   RF power reduction in 0.5 dB steps. `0` = Full power.

9. To save the changes, select **Save**.

8.2.4.1 Configuring GOES messaging

The default application contains a GOES data message template. With station parameters, you can edit the format, order, and observation sampling intervals.

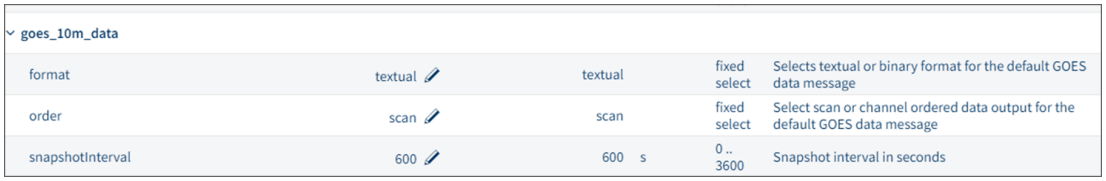
1. In the Web UI, go to **Settings > Station parameters**.
2. Under the parameter group **features**, set the **Active value** to **on** for the parameter **MSG_GOES_10m**. This enables the default 10-minute message for GOES.

3. In the **goes_10m_data** parameter group, configure the following parameters for GOES message:

   format
   Format for the default GOES data message (textual or binary).

   order
   Data output for the default GOES data message (scan-or channel-ordered).

   snapshotInterval
   Snapshot interval in seconds. For example, if the snapshot interval is 600 seconds, the observation values are sampled every 10 minutes in the outgoing message.



4. To save the changes and take them into use, select **Save and restart application**.

8.2.5 Configuring polling of data messages

You can poll data from the weather station through an HTTPS Reports API. With the API you can list, fetch, delete, and wait for reports. To be able to start polling, set the API key in the station parameters.

The default application supports polling of SMSAWS and CSV messages.

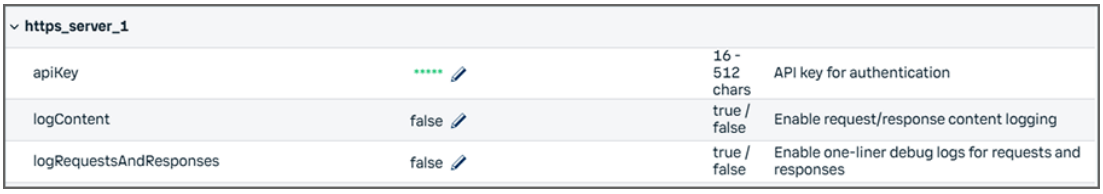
For more information on the HTTPS Reports API, see Kaiku HTTPS Reports API Description (M213354EN).

1. In the Web UI, go to **Settings > Station parameters**.
2. Under the parameter group **features**, set the **Active value** to **on** for one of the following parameters, depending on which message type you are configuring:
   - **SMSAWS_HTTPS_1**
   - **CSV_HTTPS_1**
3. To save the changes and take them into use, select **Save and restart application**.

   When the application has restarted, refresh the browser to make the changes visible.

4. In **https_server_1 > apiKey**, set an API key of your choice.

   An API key is similar to a password. The minimum length of the API key is 16 characters. It is recommended to use a password generator to generate the API key.
   Write down the API key for further reference.



5. To save the changes and take them into use, select **Save and restart application**.

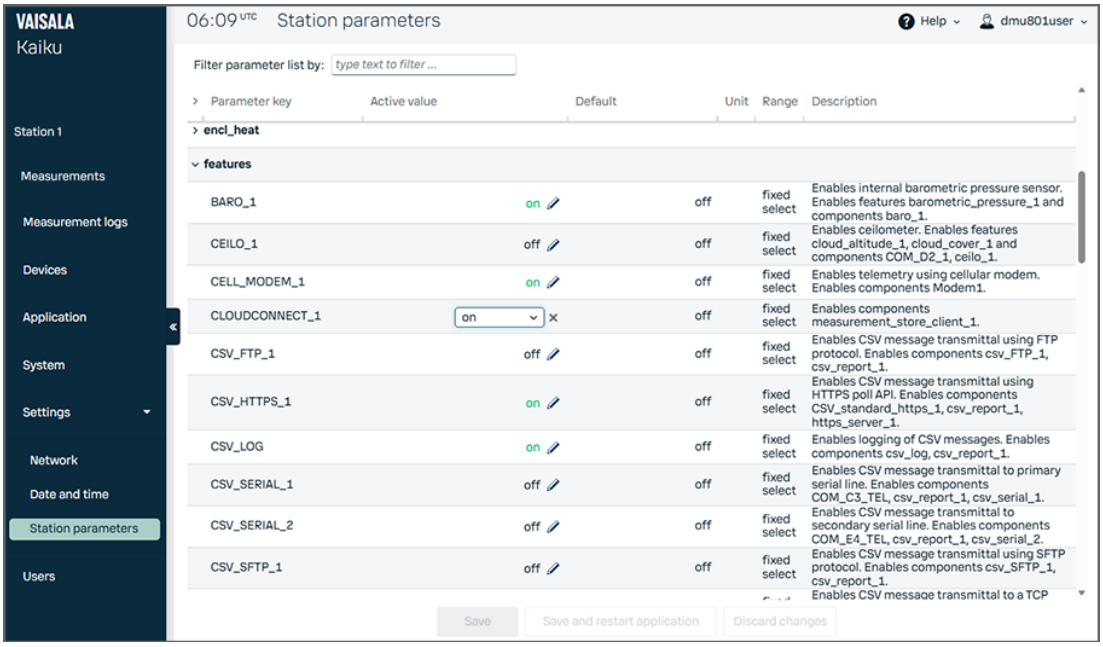
More information

- Kaiku HTTPS Reports API (page 29)

8.3 Connecting to Vaisala cloud service

To connect the weather station to Vaisala cloud service, enable the cloud connection component in the application.

1. In the Web UI, go to **Settings > Station parameters**.
2. Under the parameter group **features**, set the **Active value** to **on** for parameter **CLOUDCONNECT_1**.



3. To save the changes and take them into use, select **Save and restart application**.
4. Go to **System > Operations** and select **Restart**.

5. When the **Log in** page is shown, log in again.

8.3.1 Registering weather station in Vaisala Xweather Observe

Registration is only needed when the weather station is to be connected to Vaisala Xweather Observe.

Before you can view the data in Vaisala Xweather Observe, the weather station must be registered to your Vaisala cloud account. If Vaisala has not completed the registration on your behalf as a part of the order, you must do the registration yourself. For registration, you need the following:

- Credentials to your Vaisala Xweather Observe account (see the email sent to you with the order)
- DMU801 serial number (see the DMU801 type label)
- Installation location

You can perform the registration before or after installation.

1. Log in to your Vaisala cloud admin account at eu.insight.xweather.com.
2. Select to connect your device, and then add it as a new device.
3. Set the following for the new device:
   - Device model: **DMU801**
   - DMU801 serial number
   - Weather station latitude, longitude, and altitude from the mean sea level
   - Display name (optional)
4. After adding the new device, you can see its status, observations, and measurements in Xweather Observe.

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9. Logging

9.1 Data logging

DMU801 data management unit stores the measured and calculated data in the internal memory. DMU801 has an 8 GB internal eMMc Flash memory, of which 4 GB can be used for data logging.

The logging capability can be extended with an external SD memory card.

9.1.1 Data storage

The internal memory of DMU801 enables storing a large amount of data locally. You can also use an external SD memory card to store data. DMU801 supports SD cards of up to 32 GB.

Observation data can be stored in the internal memory or SD card. In the internal memory it is possible to store at least 12 months of 1-minute data for each parameter. System diagnostic data and station parameters are stored in the internal memory.

Observation data contains the observation values, their metadata, and timestamps. You can set the logging interval, data storage duration, and the file size limit in the application with Kaiku Designer. Data can be stored for a defined number of days, for example 90 days, or as long as possible. As long as possible means as long as there is space in the DMU801 internal memory or SD memory card, or as long as the defined file size limit is met, whichever comes first.

The logging interval can be set in 1-second intervals, starting from a minimum of 1 second. The period, over which statistical calculations are performed on the logged data, is also adjustable in 1-second intervals, starting at 1 second. To prevent overloading DMU801 processing capabilities, it is recommended to limit the statistical period to a maximum of 24 hours (86 400 seconds). For longer statistical period calculations, it is recommended to calculate statistics based on aggregated values from shorter statistical periods.



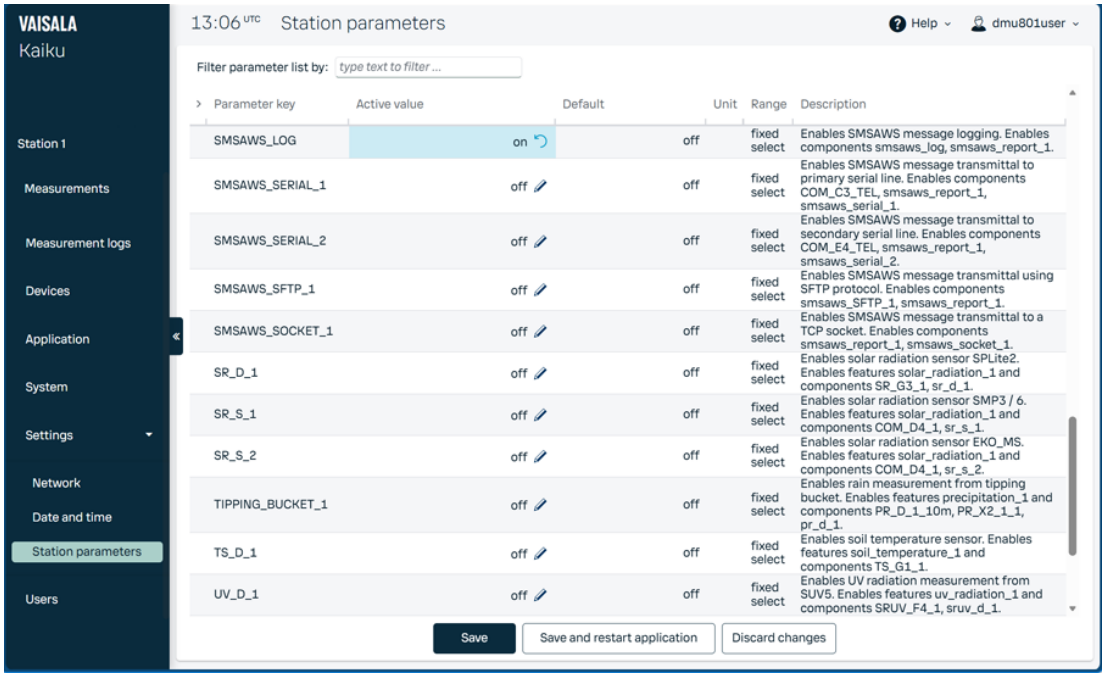
Avoid logging a very high number of data points very frequently. If the total number of data points in all logs combined exceeds 50 million, the CPU load increases remarkably, which impacts the overall performance of the system.
For example, set the logging interval to 1 minute instead of 1 second.

If the available space in the SD card or DMU801 internal memory, the file size limit, or the data retention limit is met, the oldest data log files are deleted to make room for the most recent ones.

9.2 Downloading measurement logs

You can download measurement log files from the Web UI. The measurement log file options and their settings that are displayed in the Web UI are defined in the application.

1. In the Web UI, go to **Settings > Station parameters**.
2. Under the parameter group **features**, set the **Active value** of the desired log message format to **on**.

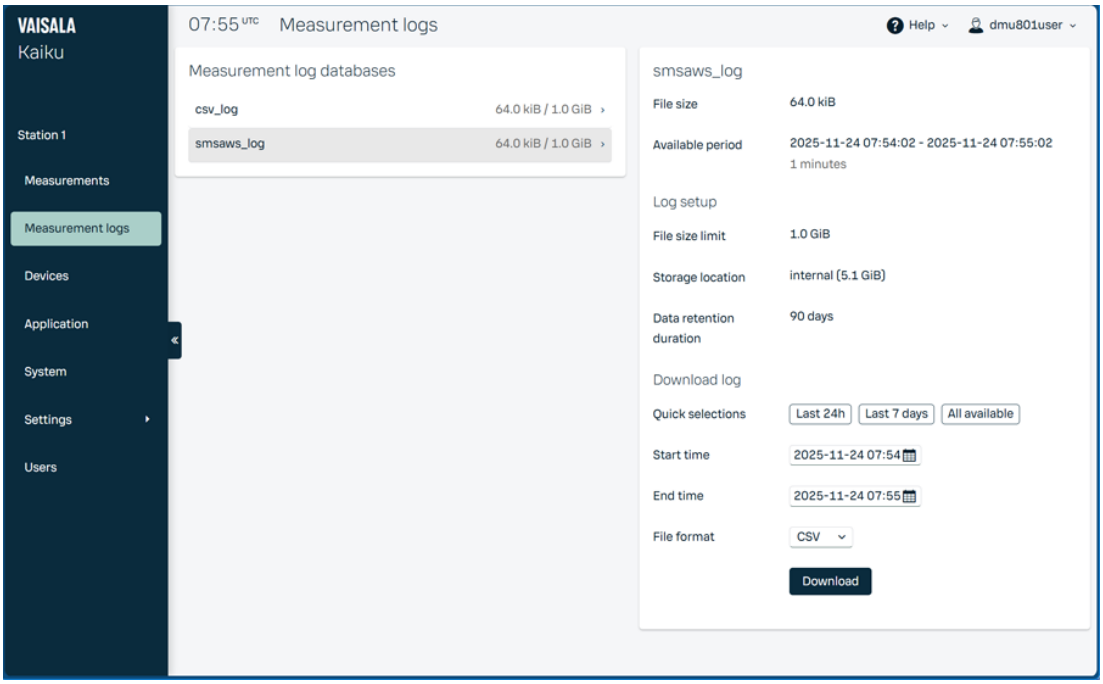


3. To save the changes and take them into use, select **Save and restart application**.

   When the application has restarted, refresh the browser to make the changes visible.

4. Go to **Measurement logs** and select the log file you want to download.

   The Web UI shows the log file information, such as storage location (internal memory or SD card), file size, and the duration of the data storing period.



5. In **Download log**, use the quick selection buttons to define the log period or select the start time and end time.
6. Select the file format (CSV or JSON) and **Download**.

10. Managing user accounts

10.1 Managing user accounts

To be able to use the Web UI and Kaiku Designer, you need a user account. User accounts are managed in the Web UI.

Only users with the **Administrator** role can add, edit, or delete user accounts.

An administrator account is created in the initial login, after DMU801 has been activated with the device activation code. There can be several **Administrator** users.

10.2 User roles

User management is handled through user roles with different levels of access rights.

For security reasons, passwords cannot be retrieved from the system. If you forget your username or password, you have to reset DMU801 to factory default settings.

Table 8 User roles and access rights

User role	Purpose
Administrator	• View observations, metadata, system status, and settings • Modify station and network settings • Perform maintenance tasks • Manage users • Manage certificates • Update firmware and application • Back up and restore application
Operator	• View observations, metadata, system status, and settings • Modify station and network settings • Perform maintenance tasks • Back up application
Viewer	• View observations, metadata, system status, and settings
API access	Machine-to-machine account for device management functions [1)]

1) *For the available functions, see Kaiku Device Management API Description (M213154EN).*

10.3 Adding new user accounts

1. Log in to the Web UI as an **Administrator**, and select **Users**.

2. Select **Add new user**, and set the following:

Username

Username for the user.

The acceptable characters are:

- Small letters a–z
- Capital letters A–Z
- Numbers 0–9
- Unicode characters 0x00A1-0xFFFF
- Following characters:
  - @ (at symbol)
  - = (equal sign)
  - . (period)
  - , (comma)
  - + (plus sign)
  - – (minus sign)
  - _ (underscore character)

First name

First name of the user (optional).

Last name

Last name of the user (optional).

Role

The role of the user.

New password

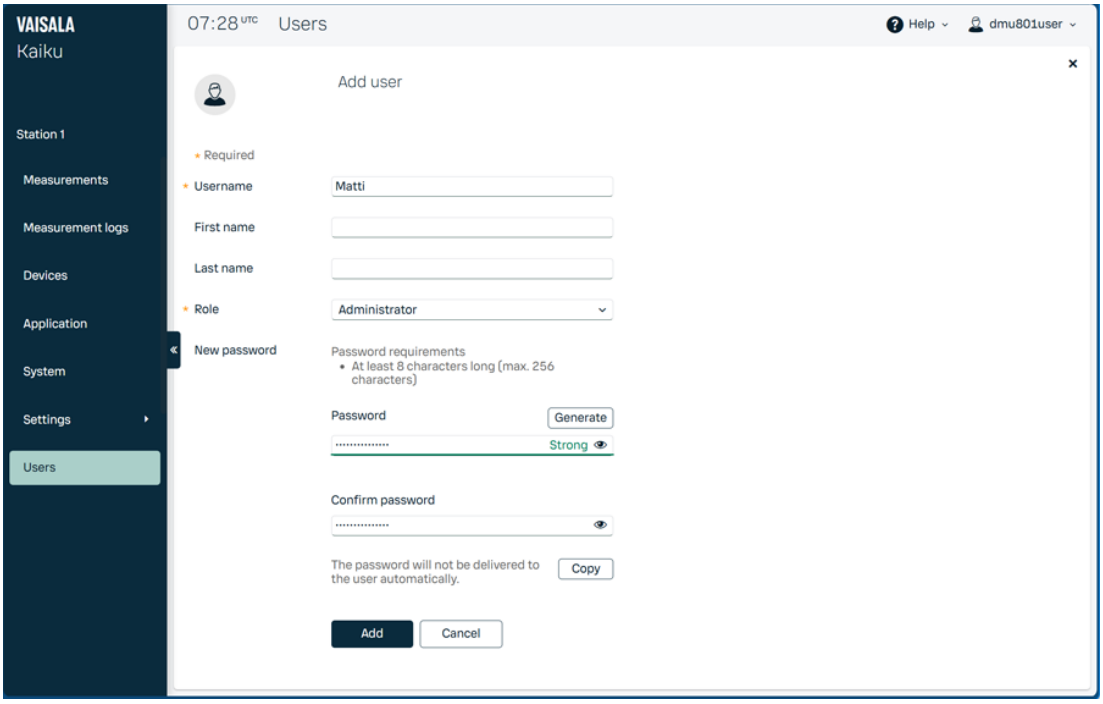
The user's password.

To use an automatically generated password, select **Generate password**.

Confirm password

Confirm the password.

To copy the password and send it to the user, select **Copy**.



3. To add the user account, select **Add**.

10.4 Editing user accounts

1. Log in to the Web UI as an **Administrator**, and select **Users**.
2. From the list of usernames, select the user you want to edit.
3. Make the changes.

If you delete your account and no other accounts exist, you need to activate DMU801 with the device activation code before you can access the Web UI again.

If you are an **Administrator** user, you can change your own password also in your own user view on the top right corner of the Web UI.

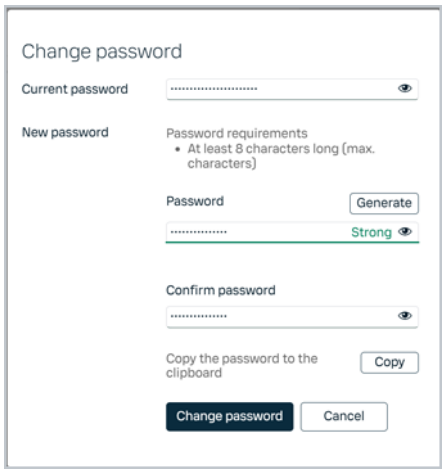
4. To save the changes, select **Save**.

10.5 Changing administrator password

If you are an **Administrator** user, you can change your own password by selecting your username on the top right corner of the Web UI.

1. In the Web UI, select your username and **Change password**.
2. Type your password in the **Current password** field.
3. Type the new password in the **New password** field.

   You can see an indication of the password strength as you type.



4. Confirm the password.
5. To save the changes, select **Change password**.

11. Managing certificates

11.1 Certification management

In the **Certificates** view you can configure endpoint (local) TLS certificates that DMU801 uses. TLS certificates allow computers to trust each other through certificate-based authentication. When configured correctly, certificate-based authentication protects against man-in-the-middle type of attacks.

With a properly configured certificate, a web browser can make a secure connection to DMU801, without any warnings about untrusted certificates. For this to work, the endpoint certificates (like the one used by DMU801's web server) must be signed by a certificate authority (CA) that the browser trusts. The CA can be either a well-known public CA or an internal CA managed by your own organization. If you use an internal CA, you need to configure the browser (or other such tools) to trust the internal CA.

11.2 Assigning web server certificate

For a secure and trusted connection between a web browser and DMU801, assign a signed certificate to the web server.

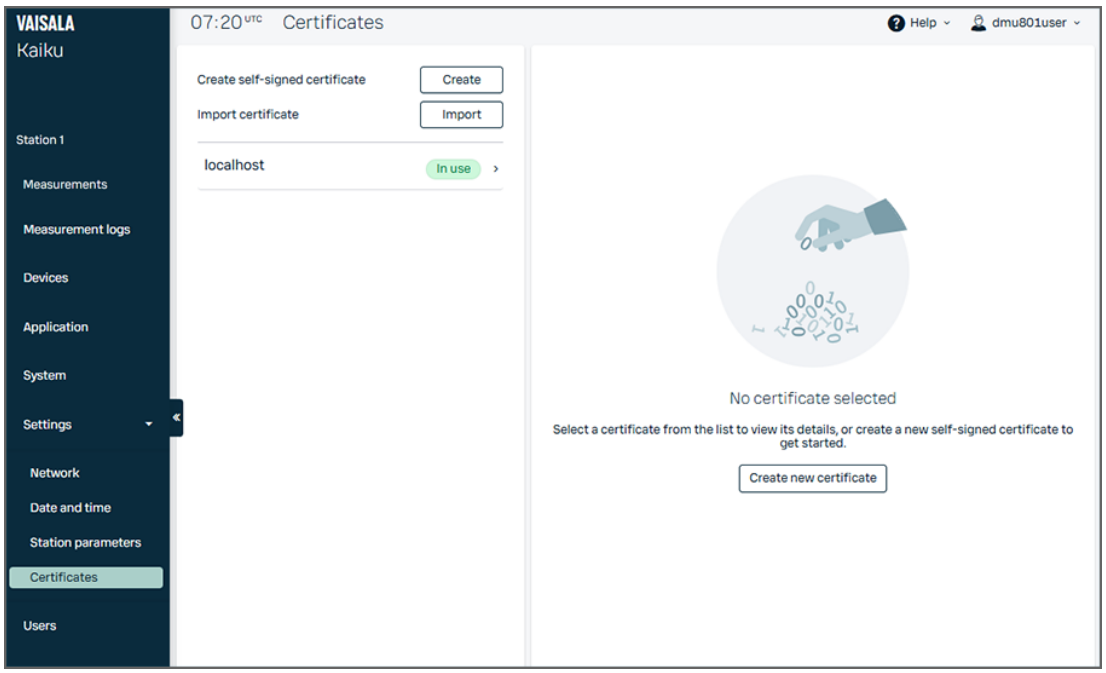
Perform the following procedures in the order presented:

1. Creating self-signed certificate (page 73)
2. Generating CSR (Certificate Signing Request) (page 75)
3. Importing signed certificate (page 76)
4. Assigning certificate to service (page 76)

11.2.1 Creating self-signed certificate

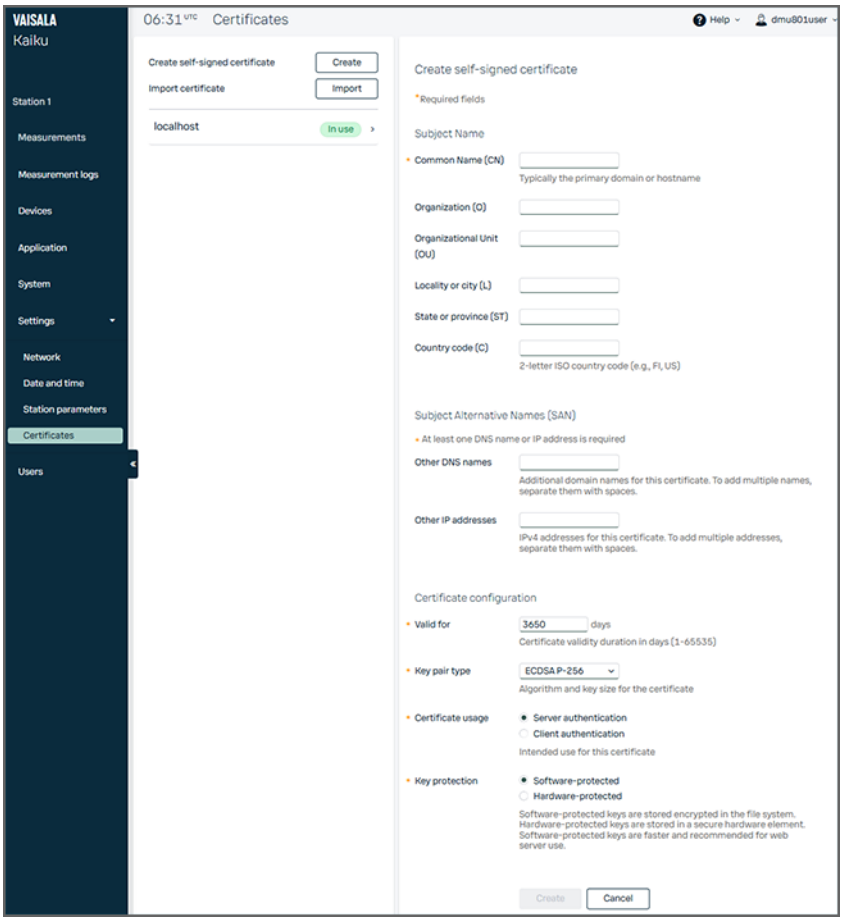
1. Log in to the Web UI as an **Administrator**.

2. Go to **Settings > Certificates**, and select **Create**.



3. Under **Subject Name**, set the following:

   Common Name (CN)
   Type the hostname or device name that identifies what the certificate is for.



4. For other fields under **Subject Name**, set the optional metadata.
5. Under **Subject Alternative Names (SAN)**, in **Other DNS names** or **Other IP addresses**, type all DNS names or IP addresses that can be used to access DMU801.
6. Under **Certificate configuration**, use the default values for other fields, and set the following:

   Valid for
   Type the number of days for which the certificate is valid, according to your organization policy.

7. Select **Create**.

   The certificate is created and appears on the list of certificates.

11.2.2 Generating CSR (Certificate Signing Request)

Generate a CSR (Certificate Signing Request) and send it to a certificate authority.

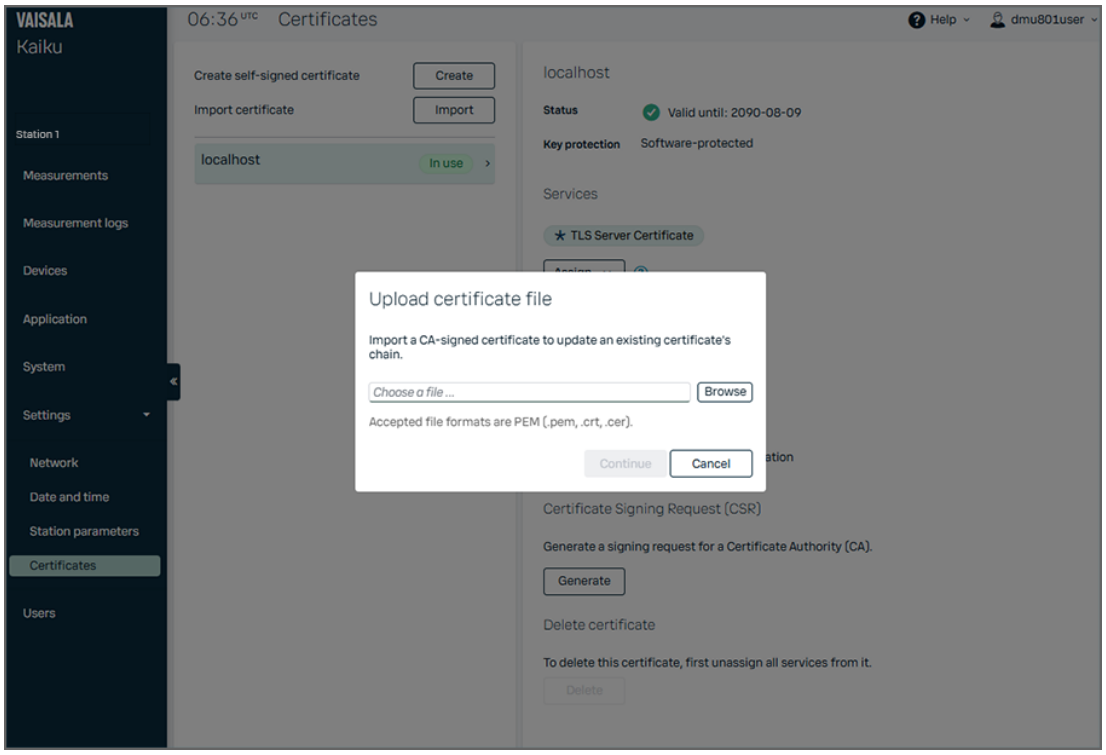
1. In the **Certificates** view, select the certificate.
2. Under **Certificate Signing Request (CSR)**, select **Generate**.
3. Copy the CSR and send it to a certificate authority (CA) to be signed.

> If you use an internal CA managed by your organization, you may need to configure the browser (or other such tools) to trust the internal CA.

11.2.3 Importing signed certificate

When you have received the signed certificate from the certificate authority, import it to the system.

1. In the **Certificates** view, select **Import**.
2. Browse to the folder where the certificate file is stored and select the certificate file.



3. Select **Continue** and **Update**.

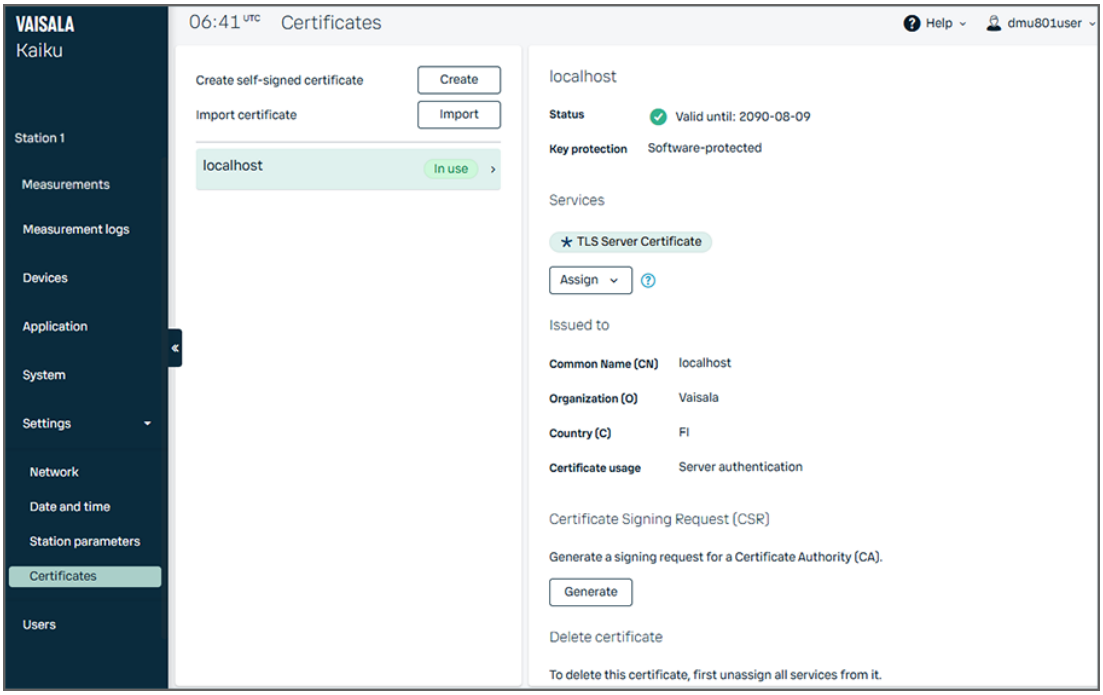
   The signed certificate is imported to the system.

11.2.4 Assigning certificate to service

1. In the **Certificates** view, select the certificate.

2. From the **Assign** drop-down menu under **Services**, select the service you want to assign the certificate to. For the web server, select **TLS Server Certificate**.

   The service appears as a tag under **Services** in the certificate details. On the list of certificates, the certificate is marked as **In use**.



3. To take the changes into use, restart DMU801 in **System > Restart**.

When authorized users access the Web UI, web browsers no longer warn about an untrusted site.

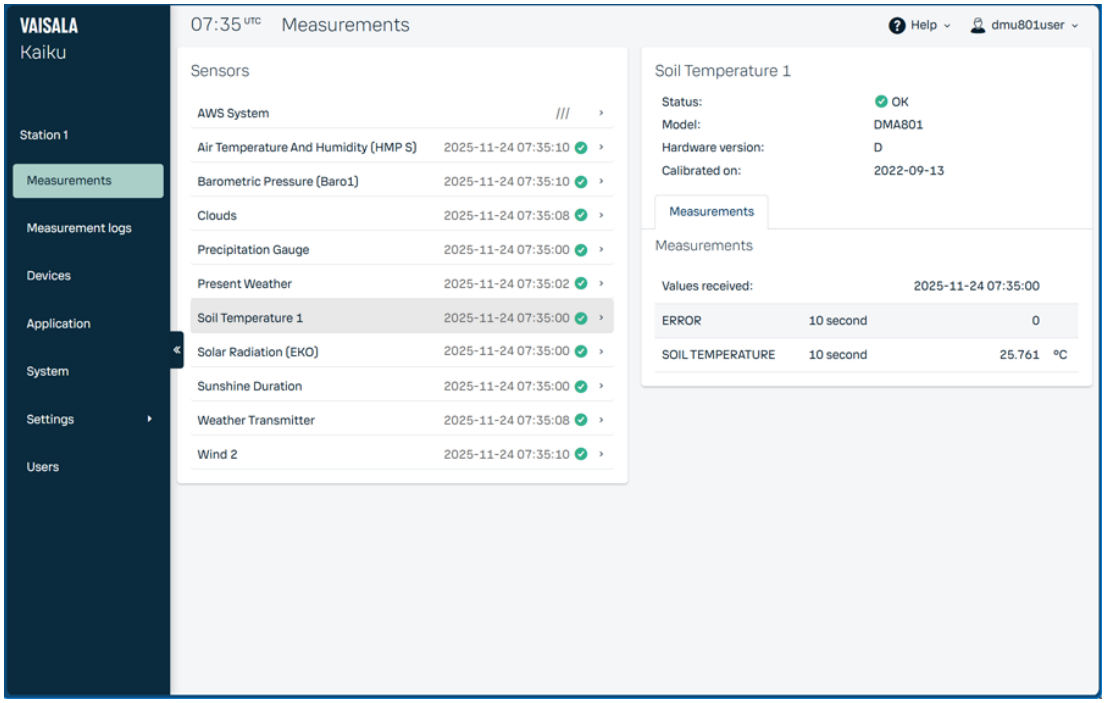
12. Verification

12.1 Viewing measurement data

To check that the installed sensors send data, go to the Web UI.

1. In the Web UI, go to **Measurements**.

   The **Measurements** view lists all the sensors that are connected to the system. Depending on the sensor, you can view the status of the sensor, observation data received from the sensor, and some metadata, such as the latest calibration date or serial number.



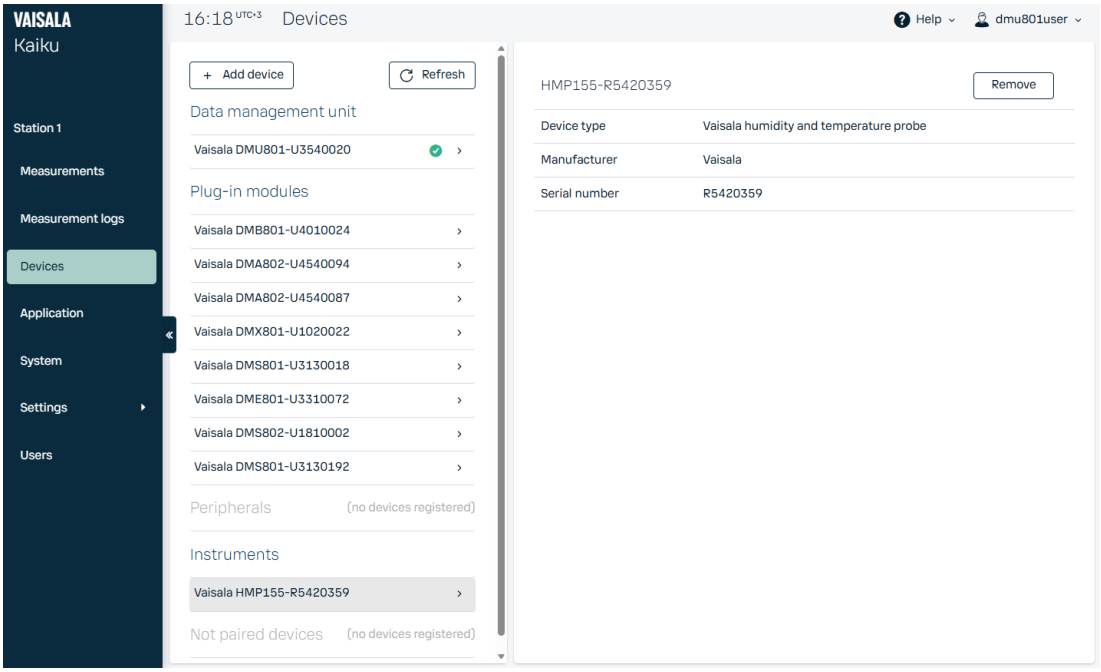
In **Measurements**, you can also complete maintenance tasks, such as calibration, for certain sensors.

12.2 Viewing connected devices

The **Devices** view shows the metadata, such as serial number, of DMU801 and the connected plug-in modules.

If you are using a Vaisala cloud service, the connected instruments and other devices are also listed in the view.

1. In the Web UI, go to **Devices**.



The devices are listed under appropriate categories.

A **Remove** button is available for devices listed under **Instruments**. When you disconnect an instrument from DMU801, for example, replace it with a new one, select the **Remove** button to delete the instrument also from the DMU801 device registry. This means that the instrument is no longer visible in the Vaisala cloud, either.

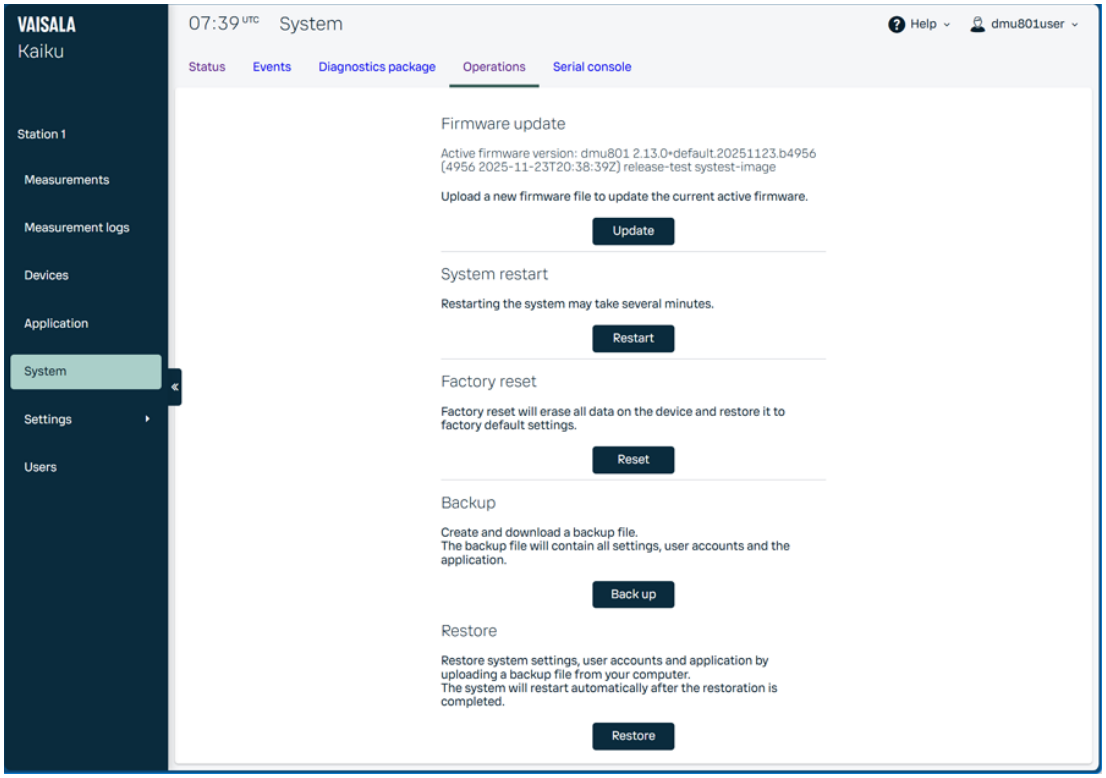
13. Backing up and restoring application and system settings

You can create a backup file of the current application and settings, save the file on your computer, and restore the application later.

In addition to the application, the backup file contains the system settings and user accounts.

Password-type station parameter values are encrypted. These values can only be restored correctly to the same device where you took the backup from.
If you upload the backup file to another device, you have to set the values again.

1. In the Web UI, go to **System > Operations**.



2. To create the backup file, select **Back up**.

   The backup file is saved on your computer.

3. To restore system settings, user accounts, and application:
   a. Log in to the Web UI as an **Administrator**.

      The restore function is available only for administrator users.

   b. Select **Restore** and the backup file from your computer.
   c. Select **Upload** and again **Restore**.

   The file is uploaded to DMU801 and the system restarts.



You can download and save the current application also through Kaiku Designer. For more information, see Kaiku Designer User Guide (M212407EN).

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14. Maintenance

14.1 Site maintenance

1. Check that the vegetation surrounding the station does not get too long or too close to equipment. Vaisala recommends regular clipping.
2. Check that there is no water leakage or other damage inside the enclosure.
3. Check that all components are powered up.
4. Check that the station grounding is in order.
5. Check that there are no outer damages to the sensors, cables, or connectors.
6. Check that the sensors are firmly mounted.
7. During wintertime, check that snow does not touch or cover the enclosure or the sensors. Keep the weather station clear of snow and ice build-up.



WARNING! If ice or snow accumulates on the mast, guy wires, or sensors, the ice or snow can fall and cause injury to persons below.

14.2 Station maintenance



Only qualified maintenance personnel may perform maintenance procedures.

Check the mechanics and cabling for any damage and corrosion, and repair if needed:

- Inspect cables for breaks, cracks in the protective coating or cable connectors, and bent, damaged, or misaligned pins.
- Wipe off or remove excess dirt, dust, sand, or leaves.
- Check the sensor and power cables, grounding wires, lugs, connectors, and connections.
- Check gaskets of the enclosures and mechanical assemblies, bolts, nuts, and so on.



CAUTION! Do not open the enclosure under poor conditions, for example, during rain or with dust in the air. In general, do not repair sensors in the field.

Use correct, high-quality tools.

14.3 Cleaning and maintaining painted surfaces

Vaisala recommends that you wash all the painted surfaces at least once a year. Use only warm water or warm, mildly soapy water. Wipe with soft cloth or sponge and rinse with clean water.

CAUTION! Do not use solvents or abrasive sponges when cleaning painted surfaces.

14.4 Mast maintenance

Your installation usually includes a mast. For maintenance instructions, see the mast documentation.

More information

- Masts and spare parts (page 185)

14.5 Support arm maintenance

When you check the mast, check that the support arm is firmly attached. Use a spirit level to verify that the alignment is level.

More information

- Support arm spare parts and accessories (page 186)

14.6 Solar panel maintenance

CAUTION! Handle the solar panel with care. Impact on the front or rear surface can damage the module. Do not bend the panel.

When working with the solar panel, use properly insulated tools and wear rubber gloves.

Preventive maintenance for the solar panel includes:

- Inspecting the module at least twice a year for overall integrity. Make sure that connections to the battery are tight and free of corrosion.
- Cleaning the module surface, if needed. Dirt accumulation on the module's front surface can reduce the light energy collected by the module. If the module surface is dirty, gently clean it using mild detergent and a soft, lint-free cloth.



CAUTION! Do not use a scrub brush. It can damage the front surface of the module.

More information

- Powering and transient protection spare parts and components (page 183)

14.7 Enclosure maintenance

The enclosure requires only a minimal amount of maintenance. At least once a year, clean the connectors and the inside of the enclosure of, for example, spider webs and other dirt. At the same time, check the following:

- Check that the internal wiring is in order and that all the screws on the mounting clamps are firmly tightened.
- Check that the door gasket is undamaged.
- Check that the flanges at the bottom of the enclosure are intact.
- Check that the door is firmly closed.
- Check and clean the static pressure head.
- Check and clean the protective vent.



After a heavy storm, open the enclosure door and check for any water leakage or other damage.



CAUTION! When you install or service components inside the enclosure, lock the door in open position with the door latch.

More information

- ENC652 spare parts and accessories (page 182)

14.8 Inside enclosure maintenance

This section contains information for the basic maintenance of the components inside the weather station enclosure.

The following figure shows AWS810 components inside the enclosure. Some of the components are optional.

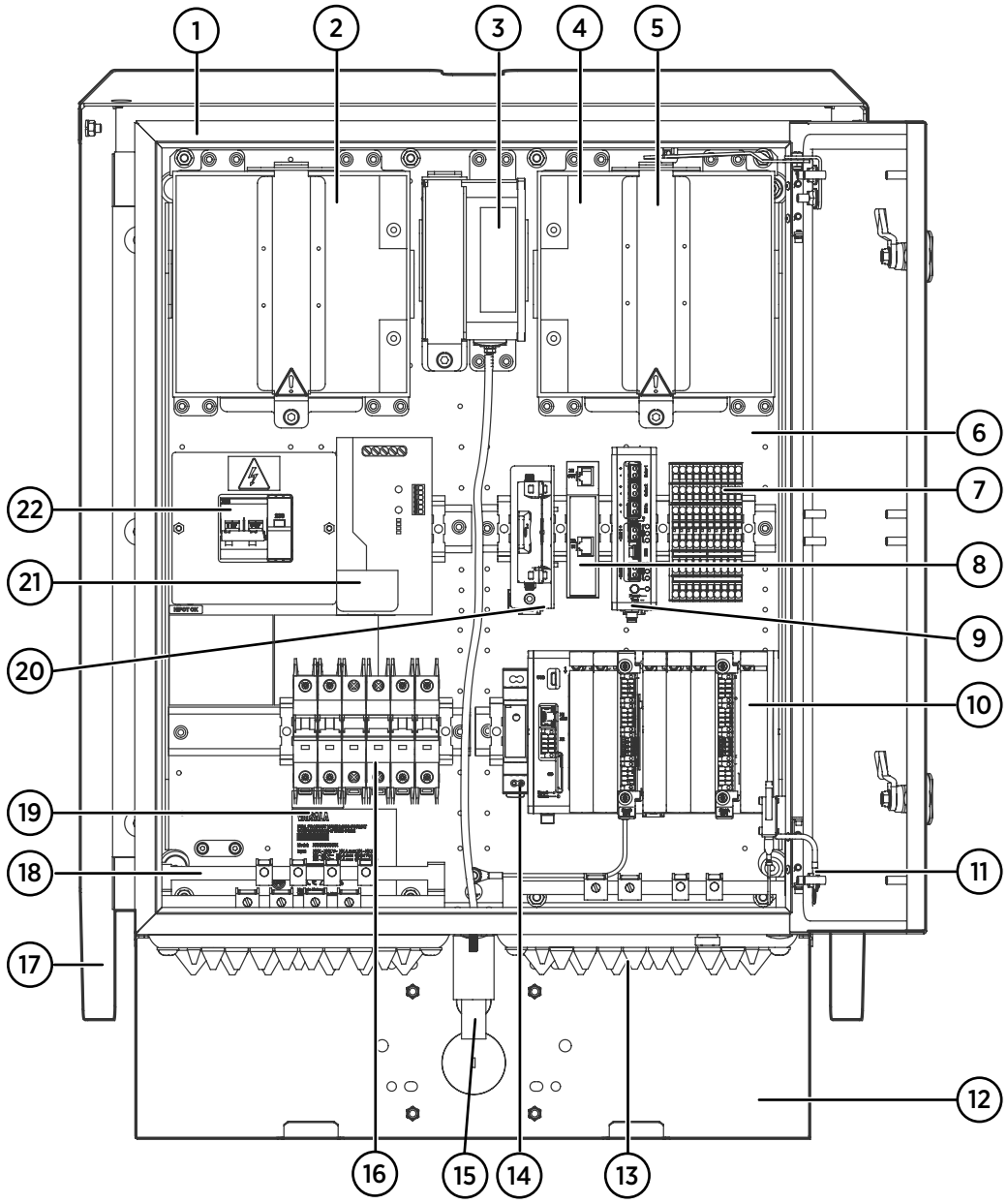


Figure 4 AWS810 main components inside ENC652

1 Enclosure ENC652
2 Backup battery 12 V / 24 or 28 Ah
3 Digital barometer PTB330
4 Optional backup battery 12 V / 24 or 28 Ah
5 Battery mounting clamp
6 Backplate
7 DC terminal block assembly
8 Ethernet surge protector
9 Battery management unit BMU801
10 Data management unit DMU801
11 Door switch
12 Cabling box

13 Rubber or stainless-steel flange (2 pcs)
14 DC/DC converter
15 Pressure port
16 External DC or sensor heating circuit breakers
17 Radiation shield
18 Sensor grounding rail
19 Type label
20 Communication device, such as leased-line modem or GOES transmitter (optional)
21 AC/DC power supply
22 AC (mains) input assembly

14.8.1 BMU801 status indications

BMU801 has status LEDs for 2 batteries (3 LED indicators for each battery) and a device status LED.

The main purpose of the battery status LEDs is to:

- Indicate if the battery is functional
- Report the battery SoC (state of charge)
- Indicate if there is a problem or the battery should be replaced

The device status LED indicates, for example, the powering status of BMU801.

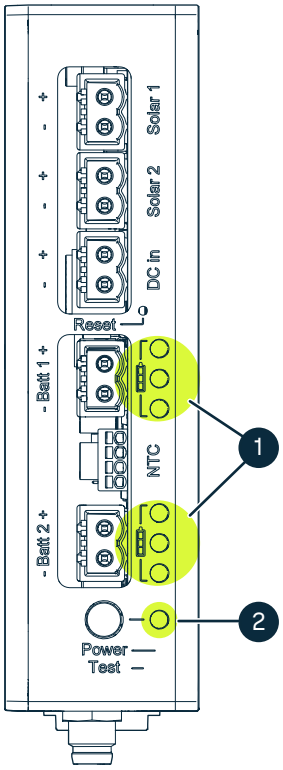


Figure 5 BMU801 LEDs

1 Battery status LEDs (3 for each battery)
2 Device status LED

14.8.2 Checking battery

To ensure safe operation of the whole system, check the battery status at least once a year and whenever you suspect that the battery may be faulty. Old or faulty batteries pose a safety hazard to the operator.



Wear protective eyewear and gloves.

1. Check the battery condition.

   If the battery is hot, swollen, or leaking, disconnect power from the station or system immediately, disconnect the battery cables, and replace the battery.



WARNING! Do not touch a hot, swollen battery or the sulfuric acid leaking from the battery without protective gloves and clothing. Sulfuric acid may cause burn upon skin contact and blindness upon eye contact.

2. Check the battery status from BMU801 LEDs.

> The following LED descriptions are valid for BMU801 devices with serial number W2440101 onwards. The serial number is printed on a sticker on the back of BMU801. For LED descriptions of older BMU801 devices (serial number W2440100 and earlier), see revision A of BMU801 User Guide (M212710EN).

Table 9 BMU801 LED modes during normal operation

LED color/Behavior	State	Actions
Battery status green, all 3 LEDs steady  Device status green, steady 	Battery is fully charged (SoC, state of charge = 100 %) DC power is available. Charging is stopped or in float mode.	–
Battery status green, blinking  SoC = 70–100 %  SoC = 40–70 %  SoC < 40 % Device status green, steady 	Battery is charging. DC power is available either from DC or solar input.	–
Battery status green, steady, 0 to 2 LEDs blank  SoC = 100 %  SoC = 70–100 %  SoC = 40–70 % Battery status yellow, steady or blinking, 2 LEDs blank  SoC = 10–40 %  SoC < 10 % Device status green, steady 	Battery is not charging. DC power is available but the voltage level is insufficient for charging. The voltage must be at least 15 V.	–

LED color/Behavior	State	Actions
Battery status blank  Device status green, blinking 	Battery is functional but discharging. There is no DC power and the system is running on batteries. Battery LEDs are powered off to save power.	If you want to check the battery SoC, short press the **Power/Test** button. The SoC is displayed in the battery LEDs.
Battery status: The last known battery status Device status yellow, steady 	BMU801 is overheated. Internal temperature sensor has detected an excessive operating temperature. Battery charging is temporarily paused until the device temperature is within the operational limits again.	–
Battery status red, steady  Device status yellow, blinking 	Battery is overheated. Battery temperature sensing resistor (NTC) has detected an excessive operating temperature. Battery charging is temporarily paused until the battery temperature is within the operational limits again.	–
Battery status red, blinking  Device status yellow, blinking 	Battery is faulty or disconnected, DC power is available. The system has detected a serious battery failure.	a. Check that the battery is connected and reconnect the battery if needed. The battery status LEDs display the last known battery status. The device status LED turns green. b. If the battery is faulty, disconnect the battery from BMU801. The device status LED turns steady green. The battery status LEDs of the disconnected battery display blank. c. Replace the faulty battery.
Battery status blank  Device status yellow, blinking 	Battery is faulty, DC power is unavailable. The system has detected a serious battery failure in one of the batteries (the other battery is still functioning).	a. To see which one of the batteries has failed, short press the **Power/Test** button. The battery status LEDs of the faulty battery start blinking red. b. Disconnect the faulty battery from BMU801. The device status LED starts blinking green. The battery status LEDs of the disconnected battery display blank. c. Replace the faulty battery.

LED color/Behavior	State	Actions
Battery status: The last known battery status Device status red, steady 	Safe input current limit (10.0 A) is exceeded. If the input current exceeds 10.5 A for 30 seconds, the DC output power is temporarily disabled for 2 minutes.	If the error situation continues and BMU801 cannot enable DC output power, detach the **DC out** connector from BMU801. If the device status LED turns into something else than steady red, it indicates that BMU801 functions correctly and there is a problem somewhere else in the system.
	DC output short circuit protection has been triggered. BMU801 tries to enable DC output periodically until the short circuit condition has been resolved. DC output is re-enabled 5 times with a 1-second interval, after which BMU801 waits for 10 seconds and tries again (this is repeated indefinitely).	
Battery status blank  Device status red, steady 	BMU801 malfunction. This state may appear during boot or operation.	a. Try pressing the **Power/Test** and **Reset** buttons. If the device status LED turns blinking red, BMU801 has malfunctioned. b. Replace BMU801.
Battery status green, steady, 0 to 2 LEDs blank  SoC = 100 %  SoC = 70–100 %  SoC = 40–70 % Battery status yellow, steady or blinking, 2 LEDs blank  SoC = 10–40 %  SoC < 10 % Device status red, blinking 	Rotary switch does not match the originally selected position during normal operation. Charging is disabled.	a. Correct the rotary switch position to match the battery capacity. BMU801 returns to normal operation.
Battery status blank  Device status red, blinking 	Rotary switch is in unsupported position at startup. DC output and charging are disabled.	a. Correct the rotary switch position to match the battery capacity. b. To confirm the switch position, reboot BMU801 or reset the battery.

LED color/Behavior	State	Actions
Battery status blank  Device status blank 	BMU801 does not power up from DC input power or BMU801 does not power up from battery power.	a. Check that the DC input power is connected (**DC in**, **Solar 1**, or **Solar 2**). b. Check the polarity of the input power connection and correct if needed. [1)] If you have only one battery in your system: a. Check that it is connected to the **Batt 1** connector. b. Long press the **Power/Test** button.
Battery status yellow, blinking slowly 	DC/solar voltage is insufficient for performing battery detection.	Connect power supply. In solar-powered systems, wait until there is enough solar voltage available.

1) *All input power connectors have reverse polarity protection, which means that no damage has been done to the system if the connector has been accidentally wired the wrong way or polarity is incorrect at the source.*

If the battery is not powering the station or system, or if the battery is not charging, replace the battery.

More information

- Replacing backup battery (page 112)
- Resetting battery SoC counter (page 115)
- Replacing BMU801 (page 120)

14.8.3 Calibrating analog measurement modules

The Analog Measurement Modules DMA80X are calibrated at the factory. The modules have excellent long-term stability, and typically no adjustments are needed. However, Vaisala recommends regular calibration to ensure measurement accuracy.

For basic validation, perform field calibration regularly, for example once a year, with a calibrated multimeter or a calibrated reference sensor, and a voltage and resistance simulator. If you suspect any change based on the field calibration, send the plug-in module to Vaisala for calibration. Replace it with a calibrated spare module, or wait until Vaisala sends the module back from calibration.

1. Remove DMA80X from DMU801.
2. Send the plug-in module to Vaisala for calibration.
3. Check the operation of the calibrated plug-in module.
   a. Install the calibrated plug-in module into DMU801.
   b. Connect the sensors.
   c. Check that the sensor connections are working, and the data reports show data.

14.8.4 Pressure module maintenance

Preventive maintenance for the pressure module includes:

- Keeping the pressure port clean. Check the pressure port every time when visiting the site.
- Calibrating the pressure module when necessary.

More information

▸ Calibrating DMB801 (page 93)

14.8.4.1 Calibrating DMB801

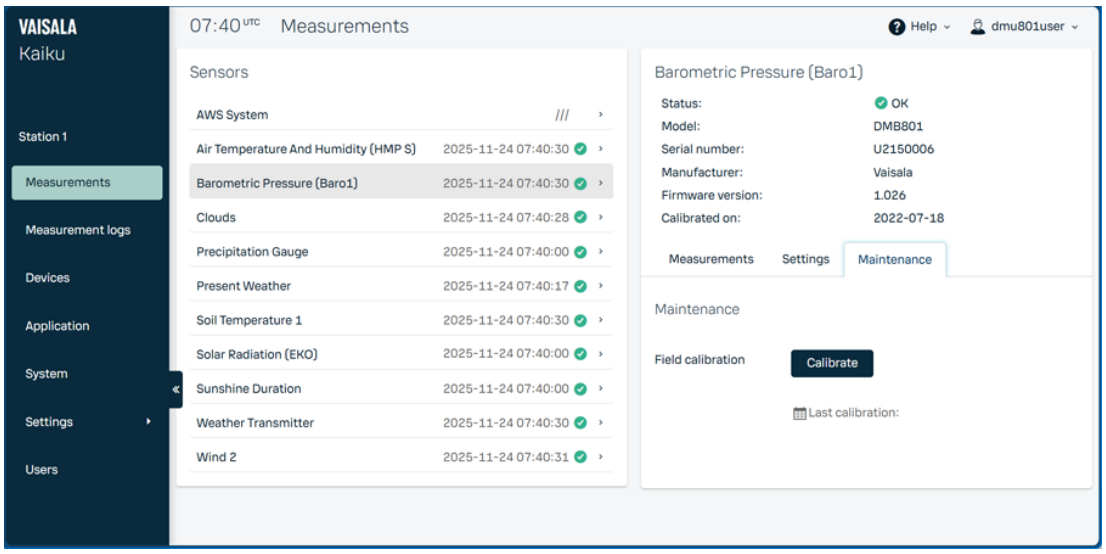
Calibrating DMB801 is a demanding, high-precision task that requires proper facilities. Vaisala recommends that you send the sensor to Vaisala for calibration.

DMB801 contains pressure module BARO-1. You can perform a 1-point field check of the pressure module using the Web UI.

- Laptop computer and access to the Web UI
- Traveling standard barometer (for example, Vaisala PTB330TS)
- USB-C cable (included in the delivery)

1. Connect DMU801 to your computer with a USB-C cable.
2. Open a web browser, log in to the Web UI, and go to **Measurements**.
3. Under **Sensors**, select **Barometric Pressure (Baro1)** (or other name given to the component).

4. In **Maintenance**, select **Calibrate**.

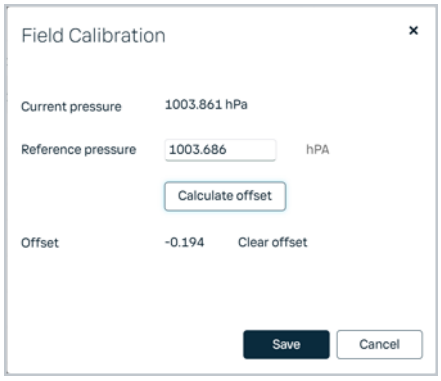


The **Field Calibration** window opens.

5. Lift the reference barometer to the same height as DMU801.

> Make sure that the wind does not interfere with the reading of the reference barometer.

6. Read the reference barometer reading.
7. If the reference reading differs from the pressure module measurement with more than 0.2 hPa, type this reference reading in **Reference pressure**.
8. Select **Calculate offset**.



The offset (measured value − reference reading) is shown.

9. To save the changes, select **Save**.
10. Repeat the calibration if necessary.

If you later want to check the latest offset value, you can always do it in **Maintenance > Calibrate > Offset**.

14.8.5 PTB330 maintenance

Perform the following maintenance tasks every time you visit the site:

- Make sure the pressure port is clean.
- Make sure the pressure hose between the sensor and the pressure port is firmly connected, and the hose is not bent upwards.

Perform the following maintenance tasks once a year:

- Compare the pressure values against a calibrated portable standard.
- Clean the barometer enclosure using mild detergent and a soft, lint-free cloth.

More information

- PTB330 settings (page 177)
- PTB330 spare parts and accessories (page 189)

14.9 Sensor maintenance

14.9.1 WMT700 maintenance

WMT700 is a very reliable and rugged sensor. Since no moving or consumable parts are used, only minimal maintenance is required.

Preventive maintenance for WMT700 includes:

- Checking that the transducers are not bent, twisted, or rotated. All transducers must be parallel to each other. A damaged array may cause inaccurate readings.
- Checking that the transducers have not been scraped or touched with sharp objects. The silicon rubber coating must be undamaged. If the transducers or the coating is damaged, send the sensor to Vaisala for repair.
- Verifying functionality by using the optional verifier to check the distance between the transducers.

WMT700 is calibrated at the factory and recalibration is not required.

Periodic calibration of WMT700 is not required for technical reasons but some quality management systems may require regular calibration of the measuring instruments. To fulfill the requirements, Vaisala recommends recalibrating the sensor every 24 months. For more information, contact Vaisala Services. Vaisala offers optional accredited wind tunnel calibration services.

If the sensor becomes contaminated, clean it carefully using mild detergent and a soft, lint-free cloth. Do not use solvents or a pressure washer to clean the sensor, since they may damage the silicon rubber transducer sleeve.



Touching a heated sensor may cause injury. Do not touch heated parts when heating is on. The sensor may detect touching as an ice blockage and start the high-power melting mode.



A heated sensor can be hot during normal operation. Wear protective gloves when working with WMT700.
Let WMT700 cool down for 20 minutes after disconnecting the heating power supply.



CAUTION! Do not clean the instrument or sensor unless it is clearly contaminated.



CAUTION! Handle with care. Any impact on the instrument or sensor array may cause damage and lead to incorrect measurements.



CAUTION! Any temporary object, such as snow, ice, or a bird, that blocks the observation path between the ultrasonic transducer heads may lead to inaccurate measurements.



CAUTION! Do not open the instrument or sensor. There are no user-serviceable parts inside.

More information

- Testing operation (page 96)
- WMT700 settings (page 173)
- WMT700 options, spare parts, and accessories (page 186)

14.9.1.1 Testing operation



Optional verifier (WMT70VERIFIER)

WMT700 measures the time it takes for an ultrasonic signal to travel from one transducer to another. Therefore, the accuracy of the sensor depends on the distance between the transducers and the time-of-flight measurement circuit, which uses a crystal oscillator for its time reference.

If necessary, you can verify the distance between the transducer arms with an optional verifier. You can order the verifier from Vaisala as an accessory.

Vaisala recommends that you test the proper operation once a year or if you suspect that the transducers may have been damaged. The sensor arms may be bent or the rubber on the transducers may be damaged. Make a visual check to verify if there is physical damage.

You can perform the test either in the field or in a laboratory.



CAUTION! Do not perform the test when the wind speed is more than 10 m/s (22 mph) or when there is a risk of thunderstorm in the area.



Some individual data samples may be lost during the verifier test. This does not indicate that the sensor or instrument is faulty.

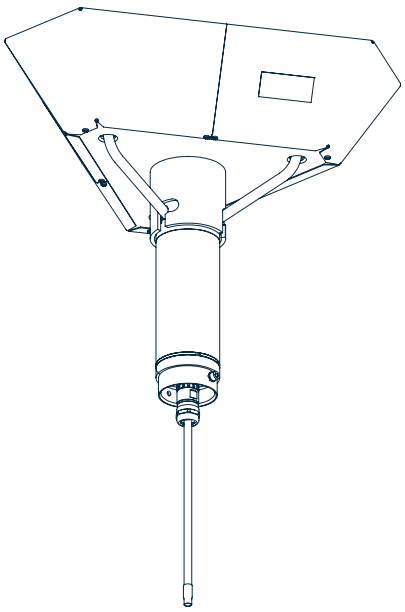


The verifier cannot be used to test the accuracy of wind direction measurement. During zero wind calibration, the wind direction data is missing. This does not indicate that the sensor is faulty.



Disable heating before performing the verifier test.

1. Slip the verifier over the 3 transducers.



2. To see the wind speed measurement, establish a terminal connection, and type the command **TABLE**.
3. Make sure that the reading does not exceed 0.22 m/s (0.5 mph) with the verifier in place.
4. Remove the verifier.

14.9.2 Weather transmitter maintenance

Preventive maintenance includes:

- Removing leaves and other such particles from the sensor.
- Replacing the PTU module at least every 2 years.
- Cleaning the sensor carefully using mild detergent and a soft, lint-free cloth.

CAUTION! Do not use alcohol-based cleaning agents.

CAUTION! Handle with care. Any impact on the instrument or sensor array may cause damage and lead to incorrect measurements.

If the sensor readings are inaccurate, send the sensor to Vaisala for calibration.

More information

- Replacing PTU module (page 99)
- WXT530 settings (page 175)
- WXT530 options, spare parts, and accessories (page 187)

14.9.2.1 Replacing PTU module

WXT536	WXT535	WXT534	WXT533	WXT532	WXT531
✔	✔	✔			



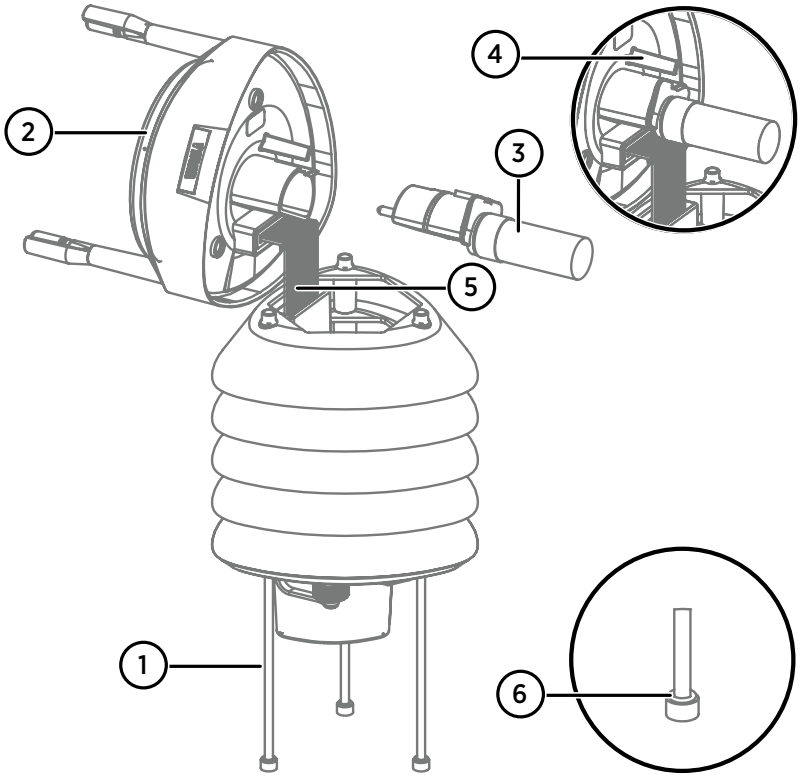
- 3-mm Allen key



In demanding applications, Vaisala recommends changing the PTU module every 2 years.

1. Turn off the power.

2. Loosen the 3 mounting screws at the bottom assembly of the transmitter and pull them out.



1 Fixing screws
2 Top of transmitter
3 PTU module
4 Latch
5 Flat cable
6 O-ring

3. Turn out the top of the transmitter.
4. Release the small white latch and remove the PTU module.
5. Remove the vacuum bag protecting the PTU module.
6. Connect the new PTU module.

CAUTION! Avoid touching the white filter cap.

7. Turn the top back in. Make sure the flat cable does not get stuck or squeezed between the top and the funnel for the flat cable and it is properly connected.
8. If the O-rings are damaged, replace them with new ones.

9. Tighten the fixing screws.

To make sure that the radiation shield stays straight, do not tighten the screws all the way in one go. Do not overtighten.

14.9.3 HMP155 maintenance

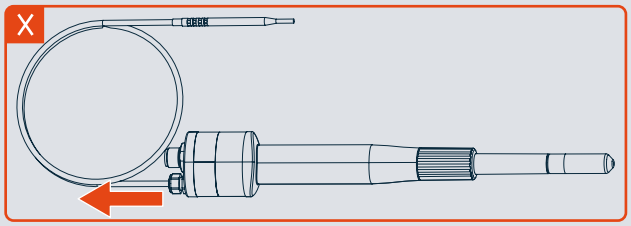
Preventive maintenance for HMP155 includes:

- Checking that the probe is securely mounted.
- Checking that the radiation shield and cable are intact.
- Cleaning the radiation shield using mild detergent and a soft, lint-free cloth.
- Changing the probe filter once a year.

If the measurement site is exposed to air pollution and dust, the probe filter may need to be changed more frequently.

- Sending the sensor to Vaisala for calibration once a year.
- Sending the sensor to Vaisala for calibration if the sensor readings seem inaccurate.

Do not pull the T-probe cable from HMP155. The cable is fixed to the circuit board.



More information

- Changing HMP155 probe filter (page 101)
- Sending HMP155 to calibration (page 102)
- HMP155 settings (page 176)
- HMP155 options, spare parts, and accessories (page 188)

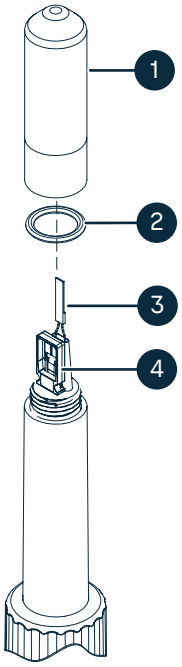
14.9.3.1 Changing HMP155 probe filter

Over time, the probe filter becomes contaminated with matter that you cannot remove by cleaning. When this happens, the response time becomes longer and measurement accuracy decreases.

CAUTION! The Pt100 temperature sensor is soldered to the probe. Do not try to remove it. The sensor does not require maintenance.

1. Remove the probe from inside the radiation shield.
2. Carefully remove the filter from the probe. Holding the filter by the plastic part, rotate the filter counterclockwise and pull it out.

CAUTION! Do not touch the sensor heads.



1 Filter
2 O-ring
3 Pt100 temperature sensor
4 HUMICAP humidity sensor

3. After removing the filter, check the O-ring and change it if necessary.
4. Install the new filter carefully without delay.
5. Install the probe back inside the radiation shield.

14.9.3.2 Sending HMP155 to calibration

Once a year, or if the sensor readings seem inaccurate, send HMP155 to Vaisala for calibration. Replace it with a calibrated spare probe if available, or wait until Vaisala sends the probe back from calibration.

1. Remove the probe from inside the radiation shield.
2. Send the probe to Vaisala for calibration.
3. Check the operation of the calibrated probe.
4. Place the calibrated probe inside the radiation shield.

14.9.4 HMP110 maintenance

Periodic maintenance for HMP110 includes:

- Cleaning the radiation shield using mild detergent and a soft, lint-free cloth.
- Changing the probe filter if the filter is damaged or dirty.
- Sending the sensor to Vaisala for calibration once a year or if the sensor readings seem inaccurate.

More information

- Changing HMP110 probe filter (page 103)
- HMP110 spare parts and accessories (page 188)

14.9.4.1 Changing HMP110 probe filter

Replace the filter when it is damaged or dirty.

1. Remove the probe from inside the radiation shield.
2. Carefully remove the filter from the probe. Holding the filter by the plastic part, rotate the filter counter-clockwise, then pull it out.



CAUTION! Do not touch the sensor heads.

3. Without delay, install the new filter carefully on the probe. Make sure the filter sits straight and meets the threads properly.
4. Install the probe back inside the radiation shield.

14.9.5 NR Lite2 maintenance

Periodic maintenance for NR Lite2 includes:

- Cleaning the detector regularly, using water or alcohol.

Vaisala recommends that you send the sensor for recalibration every 2 years. After recalibration, reconfigure the sensitivity coefficient of the detector in the weather station.

More information

- NR Lite2 spare parts and accessories (page 189)

14.9.6 SMP series sensor maintenance

Preventive maintenance for SMP series sensors includes regular cleaning of the sensor dome using pure alcohol or distilled water and a lint-free cloth. Make sure that no smears or deposits are left on the dome. The cleaning frequency depends on site conditions. In demanding conditions, you may need to clean the dome weekly.

Every 2 years, calibrate the sensor. For instructions, see manufacturer documentation.

More information

- SMP series options, spare parts, and accessories (page 189)

14.9.7 SUV5 maintenance

Periodic maintenance for SMP series sensors includes regular cleaning of the sensor dome using pure alcohol or distilled water and a lint-free cloth. Make sure that no smears or deposits are left on the dome. The cleaning frequency depends on site conditions. In demanding conditions, you may need to clean the dome weekly.

Kipp & Zonen recommends that you calibrate the sensor every 2 years. For instructions, see manufacturer documentation.

More information

- SUV5 spare parts and accessories (page 190)

14.9.8 SP Lite2 maintenance

Preventive maintenance for SP Lite2 includes:

- Cleaning the dome window using water or alcohol.
- Keeping the sensor levelled.

Kipp & Zonen recommends that you calibrate the sensor every 2 years. For instructions, see the manufacturer documentation.

More information

- SP Lite2 options, spare parts, and accessories (page 189)

14.9.9 CSD3 maintenance

Preventive maintenance for CSD3 includes:

- Cleaning the exterior glass tube of the sensor using water or alcohol.
- Keeping the sensor leveled.
- Monitoring the status of the drying cartridge at the tip of the sensor every month. Replace the cartridge when the indicator turns pink.

The drying cartridge removes internal humidity in the sensor tube. The CSD3 package includes 2 drying cartridges.

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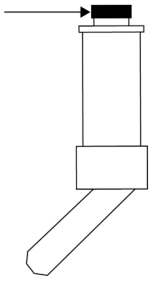


Figure 6 CSD3 drying cartridge location

Kipp & Zonen recommends that you calibrate the sensor every 2 years. For instructions, see manufacturer documentation.

More information

- CSD3 spare parts and accessories (page 190)

14.9.10 PWD maintenance

The RAINCAP rain sensor is included in PWD12, PWD22, and PWD52.

Preventive maintenance includes:

- Cleaning the transmitter and receiver windows and hoods and the RAINCAP rain sensor.
- Calibrating PWD yearly (Vaisala recommendation) and after replacing any of the optical units.

CAUTION! Do not bend the signal cable with less than 2 cm (0.8 inch) radius, and do not leave it unsupported to lean to the ground or table.

If any mechanical damage changes or weakens the receiver, the transmitter, or the tube supporting them, replace the sensor. If there is reason to suspect that sensor malfunction is caused by faults in the optical units or the rain sensor, contact Vaisala to replace the unit.

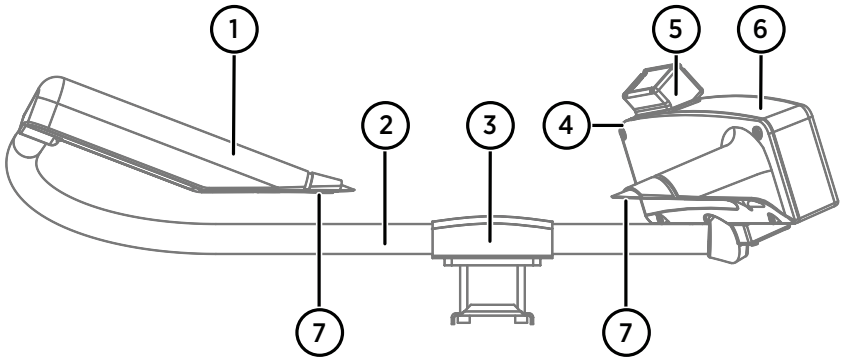


Figure 7 PWD22

1 Transmitter
2 Pt100 temperature sensor in the tube
3 Mounting clamp
4 Place for Vaisala Luminance Sensor PWL111 (optional)
5 Vaisala RAINCAP rain sensor PWR211
6 Controller/Receiver
7 Hood heaters (optional)

More information

- Cleaning PWD (page 106)
- PWD22 settings (page 178)
- PWD options, spare parts, and accessories (page 191)

14.9.10.1 Cleaning PWD

- Soft, lint-free cloth
- 50 % isopropyl alcohol
- PWD cleaning tool (PWDCLEANINGTOOL)

To ensure reliable measurements, keep the windows of the transmitter and receiver units and the RAINCAP rain sensor clean. Dirty windows give too optimistic visibility reading and too pessimistic precipitation intensity reading.

1. Check that the windows, hoods, and the rain sensor are free of condensed water, ice, or snow.
2. Before touching the rain sensor, remove excessive static charges from your body. Ground your hand first by touching grounded metallic parts of the installation.

This step is required because the measuring principle does not allow for proper ESD protection of the rain sensor.

3. Using low pressure, spray 50 % isopropyl alcohol on the transmitter and receiver windows, the rain sensor, and the rest of the mechanics. Spray enough solution to dissolve and loosen any dirt.
4. Wrap a soft, lint-free cloth around the transmitter end of the cleaning tool.
5. Wipe the transmitter window until it is clean.
6. Take a new, clean cloth and wipe the receiver window until it is clean.
7. Take a new, clean cloth and wipe the rain sensor gently until it is clean.



CAUTION! Be careful not to scratch the lens or rain sensor surfaces.

8. Wipe the rest of the mechanics as well.
9. Wait until the windows and the rain sensor are dry.

14.9.11 SBS314 maintenance

To ensure accurate operation, keep the sensor clean. Clean the sensor at least every 6 months. When leaves are falling and there is a lot of debris in circulation, check the sensor more often.



To avoid erroneous measurements, avoid tipping the cup assembly when the gauge is connected to the weather station and the station is operating.

To ensure reliable and accurate measurements, Vaisala recommends you to carry out the following checks at each visit to the rain gauge.

1. Inspect the funnel and filter for any damage or blockage.
2. Remove any obstacles from the funnel, such as leaves, debris, dirt, and dust.
3. Clean the filter by removing the end cap from the filter tube.
4. Check that the gauge is still level.

   The gauge can become tilted as a result of small ground movements, such as frost, or vandalism.
5. If the rain gauge is disconnected from the station or does not log data, check the balance arm of the bucket for stiffness.

   To perform the check, try to balance the bucket in its center position. If the bucket balances easily, examine the bucket closely for any dirt or wear on the pivot pin and bucket tubes.

More information

- SBS314 options, spare parts, and accessories (page 190)

14.9.12 OTT Pluvio^2 L maintenance

Check OTT Pluvio^2 L at least once a year:

- Carefully remove any contamination and ice.
- To make sure the collecting bucket moves freely in all directions at the lower bucket orifice edge, with the pipe housing closed, tap the inside of the bucket sideways to move it slightly. The upper bucket edge must not come into contact with the housing.

More information

- Emptying collecting bucket (page 108)
- Adding anti-freeze solution (page 108)
- OTT Pluvio2 L spare parts and accessories (page 191)

14.9.12.1 Emptying collecting bucket

To prevent overflow from the collecting bucket, empty the bucket after long periods of precipitation, and latest when the collecting bucket is 80 % full. Once or twice a year is a suitable interval.

Any overflow causes inaccurate measurements, but does not damage the balance system.

Alternatively, use an accessory drain pump for emptying. In that case, remove the pipe housing first.

1. Unscrew the three knurled screws on the pipe housing.
2. Remove the pipe housing.
3. Carefully remove the collecting bucket and empty it. If necessary, ask someone to help.



CAUTION! A full collecting bucket is heavy. Handle the collecting bucket carefully, so that it does not fall and injure you or damage the balance system.

4. Position the pipe housing (note the position of the alignment aid).
5. Retighten the three knurled screws.

14.9.12.2 Adding anti-freeze solution



The freezing of the collected precipitation of > 200 mm (7.87 in) deforms the collecting bucket floor, tips the bucket, and makes the bucket lean against the pipe housing (force shunt). This causes inaccurate measurement results.

To prevent the collecting bucket floor from deforming if the collected precipitation freezes in sub-zero temperatures, add anti-freeze solution. The manufacturer recommends that you use Thermoschema's POWERCOOL DC 924-PXL.

For the correct proportion of anti-freeze solution and information on using other anti-freeze solutions than POWERCOOL DC 924-PXL, see *OTT Pluvio^2 L Precipitation Gauge Operating Instructions*.

CAUTION! Always dilute the anti-freeze solution before adding it. Anti-freeze solutions have hygroscopic properties.

If necessary, after precipitation make sure manually that the anti-freeze solution is well mixed in the collecting bucket. Vibration caused by manual mixing may temporarily produce incorrect results.

Do not pour the anti-freeze solution to the public sewer system. Contact your local authorities regarding the correct disposal.

14.9.13 CL31 maintenance

For information on CL31 maintenance, see CL31 User Guide (M210482EN).

More information

- CL31 settings (page 179)
- CL31 spare parts and accessories (page 192)

14.9.14 SnowVUE10 maintenance

Preventive maintenance of SnowVUE10 includes replacing the transducer assembly regularly:

- Annually in a humid environment
- Every 3 years in a non-humid environment

For detailed instructions, see the manufacturer documentation.

More information

- SnowVUE10 options, spare parts, and accessories (page 192)

14.9.15 PAA-36XW maintenance

Periodic maintenance of PAA-36XW includes:

- Cleaning the sensor surface and the small holes in the sensor head with a soft cotton swab and rinsing with clear water. If the sensor is really dirty, use a solvent to clean it. The cleaning schedule depends on the water quality at the installation site:
  - In sediment-rich waters, clean the sensor monthly.
  - In clear waters, clean the sensor every 6 months.

  When installing the sensor to a new site, check the sensor after a month to determine how often cleaning is needed.

- Calibrating the sensor once a year.

In environments where marine wildlife may attach itself to the sensor and affect the observations, Vaisala recommends coating the sensor or the installation tube with antifouling tape. If the sensor already has wildlife attached to it, first remove the wildlife and then clean the attachment spot with acidic solvent.

More information

- PAA-36XW spare parts and accessories (page 192)

14.9.16 VEGAPULS C 23 maintenance

VEGAPULS C 23 is completely maintenance-free. If the sensor malfunctions, replace it.

More information

- VEGAPULS C 23 spare parts and accessories (page 192)

14.9.17 VEGAPULS 61 maintenance

VEGAPULS 61 is completely maintenance-free. If the sensor malfunctions, replace it.

More information

- VEGAPULS 61 spare parts and accessories (page 193)

14.9.18 QMT maintenance

The subsurface temperature sensor does not need regular maintenance.

Check the cabling once a year. Check that the cable visible on the ground is in good shape.

If you remove the sensor from the ground, clean the dirt accumulation on the sensor surface using mild detergent and a soft, lint-free cloth.

The sensor has no replaceable parts. If the sensor malfunctions, replace it.

More information

- QMT110 spare parts and accessories (page 193)

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15. Service

15.1 Disconnecting power

WARNING! The system is powered from several power sources to ensure uninterrupted service. To make the system non-energized, disconnect all power sources.

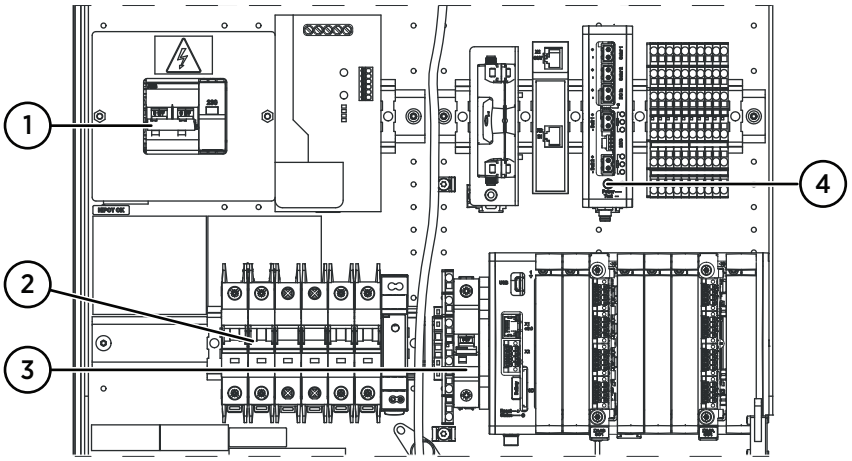


Figure 8 Circuit breakers and power switches

1 AC (mains) circuit breaker
2 External DC or sensor heating circuit breakers
3 Enclosure heating circuit breaker
4 BMU801 battery management unit's **Power/Test** button

1. To switch off AC (mains) power, switch off power from the external disconnecting device and then the AC (mains) circuit breaker.
2. To switch off external DC power, switch off power from the external disconnecting device and then the external DC circuit breaker.
3. Switch off sensor and enclosure heating power from the sensor and enclosure heating circuit breakers.
4. To switch off solar power and battery power, press and hold the BMU801 **Power/Test** button until the BMU801 device status LED turns blank.
5. When replacing batteries, disconnect the battery cables from the batteries.
6. When replacing BMU801, disconnect the battery cables from BMU801.
7. When replacing solar panel, disconnect the solar panel cable from BMU801.

15.2 Replacing system components

In some overvoltage conditions, some protective components can get damaged and need replacement (for example, surge protectors in case of a lightning strike).

To replace components other than the ones instructed in the following sections, contact Vaisala.

CAUTION! Improper modification can damage the product or lead to malfunction. Any modification voids your warranty.

More information

- Replacing backup battery (page 112)
- Replacing BMU801 (page 120)
- Replacing AC/DC power supply unit (page 123)
- Replacing surge protector (page 124)
- Replacing circuit breakers for external DC and heating (page 125)
- Replacing circuit breaker for AC (mains) (page 126)
- Replacing DMU801 plug-in modules (page 127)
- Replacing DMU801 (page 133)
- Replacing enclosure heater (page 139)
- Replacing enclosure heating control relay (page 140)
- Replacing thermostatic switch (page 141)

15.3 Replacing backup battery

- Allen keys
- Crosshead screwdriver

These instructions apply to 13 Ah and 24–28 Ah 12 V batteries.

Replace lead-acid batteries every 5 years. When operating in an environment where the ambient temperature is regularly over +25 °C (+77 °F), the battery may need to be replaced more often.

If a solar-powered station powers off during the night, it means that the battery is not working and must be replaced.

WARNING! Do not replace the battery with a battery of an incorrect type. If you do, there is a risk of deflagration. Dispose of used batteries according to statutory regulations.

WARNING! Do not leave the battery in an environment surrounded by extremely high temperatures. Extremely high temperature can result in deflagration or leakage of flammable liquid or gas.

WARNING! Make sure that the battery is not subjected to an extremely low air pressure. Extremely low air pressure can result in deflagration or leakage of flammable liquid or gas.

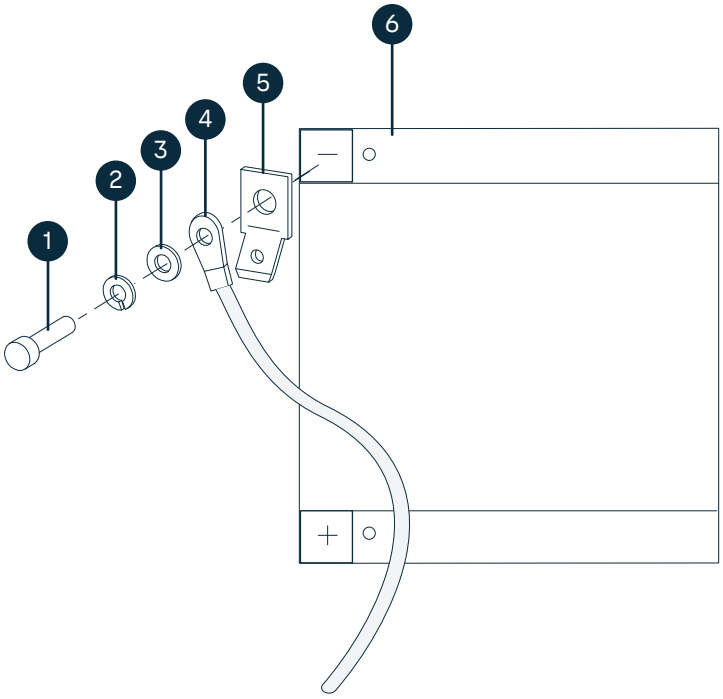
WARNING! Make sure that the battery is installed in a weather-proof and ventilated enclosure.

WARNING! Do not throw the battery into a hot oven or fire, or mechanically crush or cut the battery. Improper disposal can cause an explosion.

1. Before replacing the battery, check the condition of the spare battery.
   a. If the spare battery has been stored without charging for over 4 months, use a multimeter to measure the voltage between the terminals.
   b. If the voltage is below 11.5 V, do not take the battery into use unless you are sure that it is operational.
2. To switch off battery power, press and hold the BMU801 **Power/Test** button until the BMU801 device status LED turns blank.
3. Disconnect the battery cable from BMU801.

4. Disconnect the negative (black) cable from the battery.

> **WARNING!** Always disconnect the negative battery cable first. If the positive battery terminal contacts ground with the negative cable installed, the cables heat up and the battery can deflagrate, which could result in serious injury.



1 Screw
2 Spring washer
3 Flat washer
4 NTC temperature resistor
5 Connector
6 Battery

5. Disconnect the positive (red) cable from the battery.
6. Remove the mounting clamp and the battery from the battery holder.
7. Mount the new battery.
8. Reconnect the positive (red) cable and then the negative (black) cable.

   The terminals in the 28 Ah battery require M6 connectors in the cables. If the battery cables have M5 connectors, replace them with the M6 connectors delivered with the spare battery.
9. Reattach the mounting clamp.
10. Reattach the battery cable to BMU801.

11. To switch on battery power, press the **Power/Test** button until the BMU801 device status LED turns green.
12. Press the BMU801 **Reset** button with a small pin. The BMU801 battery status LEDs display a scanning animation to indicate that BMU801 is detecting the battery.

    BMU801 cannot perform battery detection if the input voltage is too low. In that case, the LED animation is not displayed but the battery LEDs blink slowly in yellow. Low input voltage can happen, for example, when:
    - BMU801 is powered only by the battery.
    - BMU801 is powered by the solar panel, but the weather is too cloudy or dark to provide enough power.

    Connect a power supply or wait for the solar voltage level to rise.

13. Check that the battery starts charging.

More information

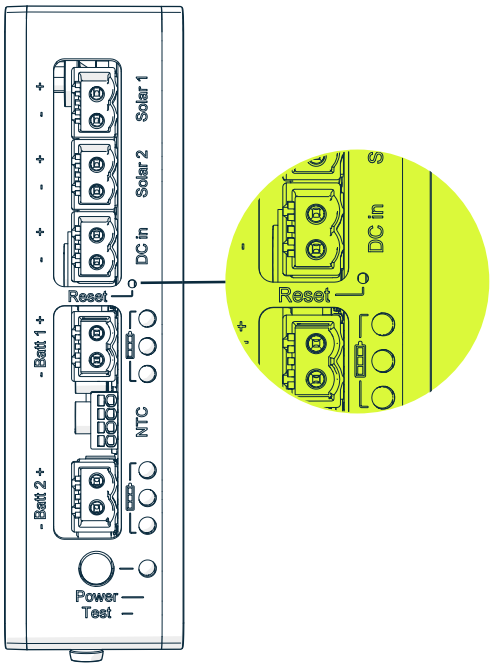
- Resetting battery SoC counter (page 115)
- Replacing NTC resistor (page 116)
- Powering and transient protection spare parts and components (page 183)

15.3.1 Resetting battery SoC counter

Small pin or similar

Use the BMU801 **Reset** button to initiate battery detection and to reset the battery SoC (state of charge) counter after replacing the battery.

Resetting is not needed if you disconnect a battery and reconnect the same battery.



After you have connected the new battery:

1. Press and hold the **Reset** button in the BMU801 front panel with a small pin. The device status LED turns steady yellow.

   When you release the button, the device status LED turns green. The battery LEDs display a scanning animation, during which the 3 LEDs are blinking in green one at a time. Then the LEDs display the current SoC. If there is no DC power available, the LEDs go into power saving mode (all 3 LED indicators are blank).

   BMU801 cannot perform battery detection if the input voltage is too low. In that case, the LED animation is not displayed but the battery LEDs blink slowly in yellow. Low input voltage can happen, for example, when:
   - BMU801 is powered only by the battery.
   - BMU801 is powered by the solar panel, but the weather is too cloudy or dark to provide enough power.

   Connect a power supply or wait for the solar voltage level to rise.

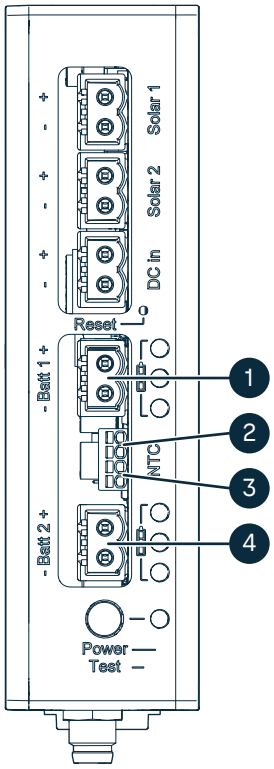
15.3.2 Replacing NTC resistor

1.5-mm flat head screwdriver

Replace the NTC resistor when replacing BMU801 or if the resistor is broken.

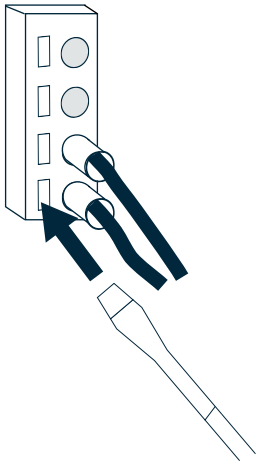
If you have 2 batteries, replace the NTC resistor first for one battery, then for the other.

1. Disconnect the battery connectors from BMU801.



1 Battery 1 connector
2 NTC resistor for battery 1
3 NTC resistor for battery 2
4 Battery 2 connector

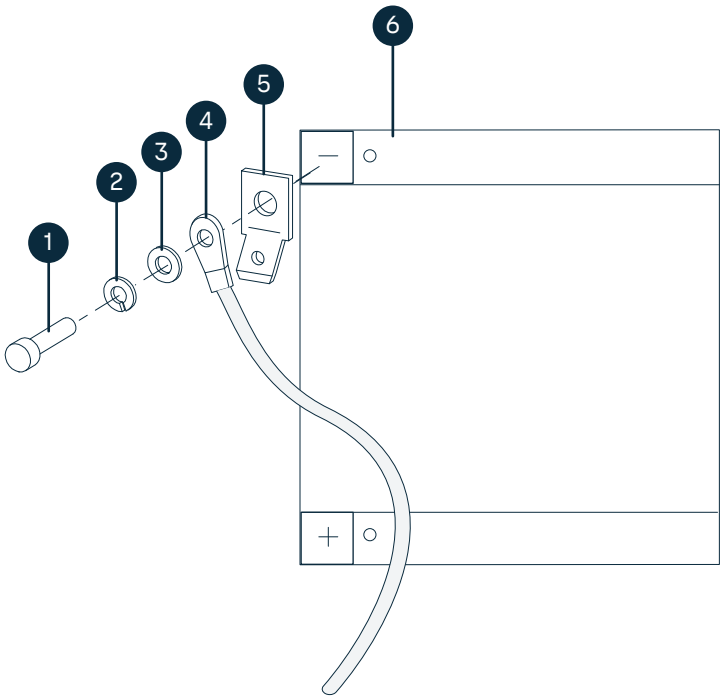
2. To disconnect the NTC resistor:
   a. Insert a 1.5-mm flat head screwdriver in the slot next to the resistor wire in the NTC connector.



   b. Push the screwdriver to the bottom of the slot and, at the same time, pull the wire out of the connector with your other hand.

      Repeat for the other wire.

3. Disconnect the other end of the NTC resistor from the battery.

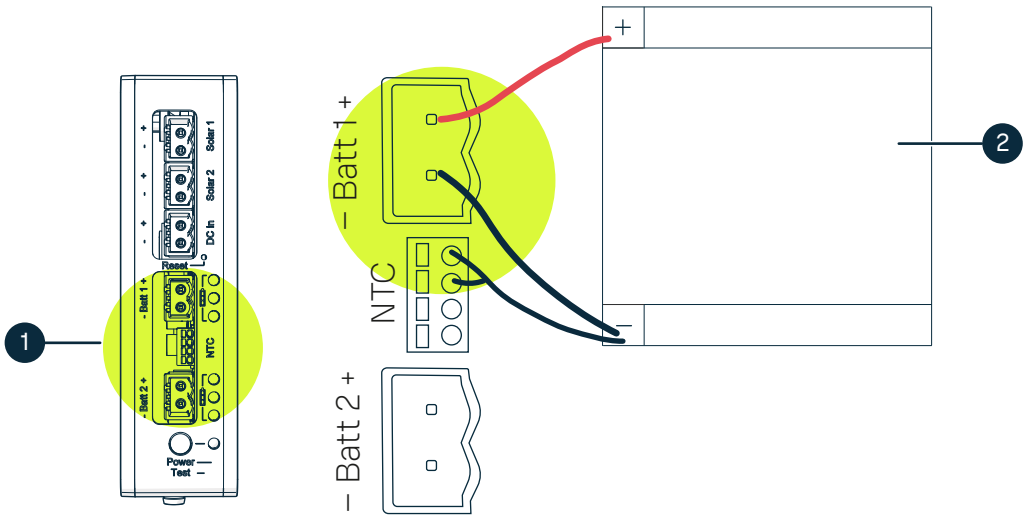


1 Screw
2 Spring washer
3 Flat washer
4 NTC temperature resistor
5 Connector
6 Battery

4. Attach the wires of the new NTC resistor to BMU801.

5. Connect the other end to the battery.

> Make sure that you connect the battery cable and the corresponding NTC resistor cable to the same battery:
> - Battery cable from BMU801 connector **Batt 1** and the NTC cable next to it to the first battery.
> - Battery cable from BMU801 connector **Batt 2** and the NTC cable next to it to the second battery (if you have a second battery in the system).



1 Battery and NTC connectors in BMU801
2 Battery 1

6. Reattach the battery connector to BMU801.

More information

- Powering and transient protection spare parts and components (page 183)

15.4 Replacing BMU801

Flat head screwdrivers

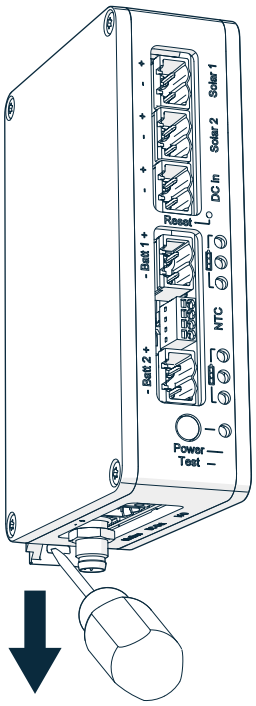
1. Power off the station or system.

2. Remove all cabling from BMU801.

   To have more slack in the wiring, you may need to cut the cable ties holding the wires.

> **CAUTION!** To avoid damaging the wiring, be careful when cutting the cable ties.

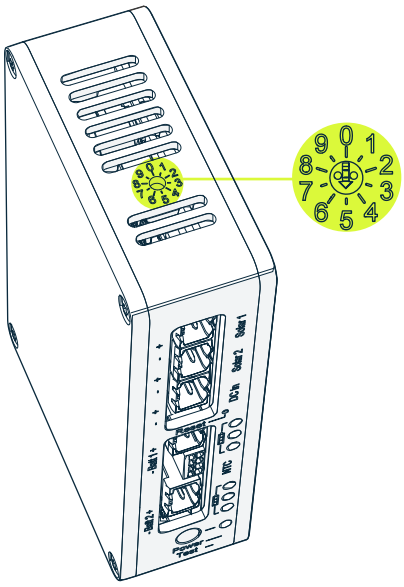
3. Remove the NTC resistor from the battery and BMU801.
4. To remove BMU801 from the DIN rail, release the locking piece with a flat head screwdriver, and lift BMU801.



5. In the new BMU801, set the battery capacity using the rotary switch on top of BMU801. With a maximum of 2.5-mm flat head screwdriver, turn the switch to point at the same number as in the removed BMU801.

   CAUTION! Make sure that you select the same capacity as the battery in your system has. Incorrect selection can cause damage to the battery and prevent or limit operation.

   To check the correct rotary switch position, see BMU801 User Guide (M212710EN). If you are unsure what the correct rotary switch position is, contact Vaisala.



6. Insert the new BMU801 on the DIN rail and snap it onto place.
7. Connect the cables to the new BMU801.
8. Attach the new NTC resistor to the battery and BMU801.

   Make sure that you connect the battery cable and the corresponding NTC resistor cable to the same battery:
   - Battery cable from BMU801 connector **Batt 1** and the NTC cable next to it to the first battery.
   - Battery cable from BMU801 connector **Batt 2** and the NTC cable next to it to the second battery (if you have a second battery in the system).

9. Use new cable ties to reattach the cables to the backplate.
10. Power up the station or system.

11. Wait for a while, and check from the BMU801 device status LED that the new BMU801 works properly.

    The device status LED should be blinking green.

More information

- Powering and transient protection spare parts and components (page 183)

15.5 Replacing AC/DC power supply unit



Flat head screwdriver



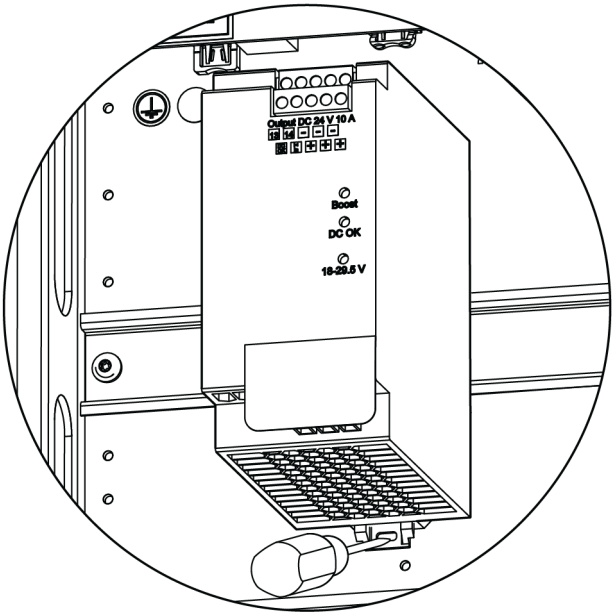
WARNING! Electricity hazard
Incorrect electrical installation can cause serious injury or death. Only licensed experts may install electrical components.



Do not open the power supply unit. There are no user-serviceable parts inside the unit. If the power supply unit is faulty, replace it.

1. Switch off AC (mains) power and make sure that there is no mains power available for the power supply unit.
2. Disconnect cabling from the power supply unit.

3. Release the DIN rail locking piece and remove the unit.



4. Insert the new unit on the DIN rail and snap it to place.
5. Remove the new power supply unit connectors.
6. Connect the old unit connectors with wires to the new unit.
7. Power up the station. This may take a while.
8. Check that the new unit works properly.

More information

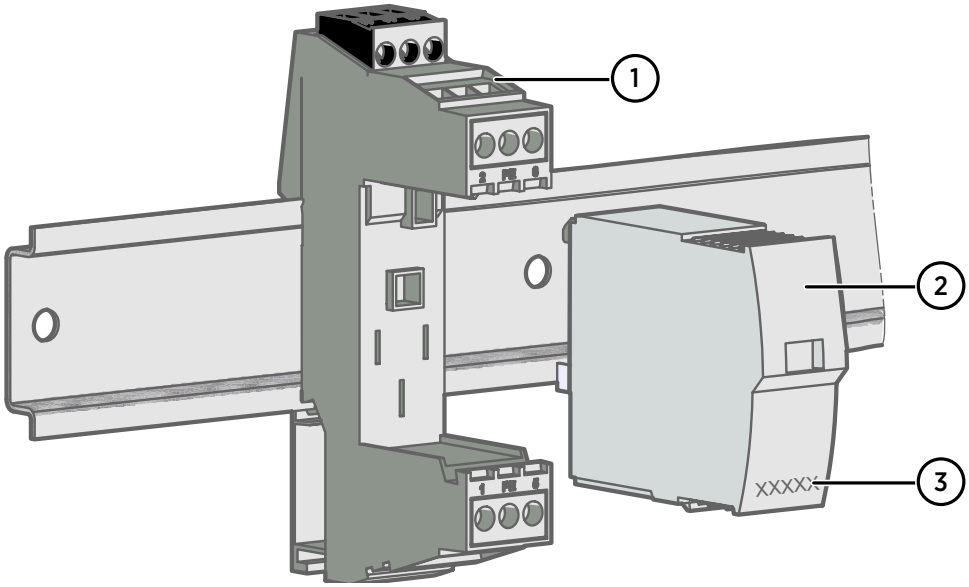
- Powering and transient protection spare parts and components (page 183)

15.6 Replacing surge protector

If the indicator on top of the surge protector plug is red, replace the unit.

1. Switch off AC (mains) power and make sure that there is no mains power available for the power supply unit.

2. Pull out the plug module, and replace the plug with a new one.



1 Surge protection socket
2 Surge protection plug
3 Manufacturer part number

3. Power up the station. This may take a while.

More information

- Powering and transient protection spare parts and components (page 183)

15.7 Replacing circuit breakers

The station may have the following circuit breakers:

- 4 A for enclosure heating
- 6 A for OTT Pluvio^2 L heating
- 10 A for WMT700 heating
- 10 A for external DC
- 10 A for AC (mains)

15.7.1 Replacing circuit breakers for external DC and heating

- Flat head screwdriver
- Crosshead screwdriver

If the enclosure heating circuit breaker is broken, the enclosure heating does not work.

If the external DC circuit breaker is broken, the station only works on battery power.

If the sensor heating circuit breaker is broken, the sensor heating does not work.

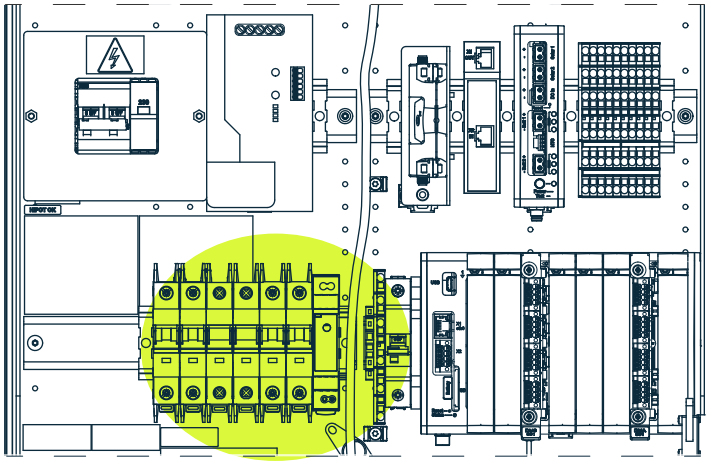


Figure 9 Circuit breakers for external DC and heating

1. Switch off AC (mains) or external DC power, depending on the powering. Make sure that there is no power available to the station.
2. Disconnect cabling from the circuit breaker.
3. Release the DIN rail locking piece and remove the circuit breaker from the DIN rail.
4. Insert the new circuit breaker on the DIN rail and snap it to place.
5. Connect the cabling to the new circuit breaker.
6. Switch on power.
7. Check that the new circuit breaker works properly.

More information

- Powering and transient protection spare parts and components (page 183)

15.7.2 Replacing circuit breaker for AC (mains)

- Flat head screwdriver
- Crosshead screwdriver
- 7-mm wrench

If the AC (mains) circuit breaker is broken, the station only works on battery power.

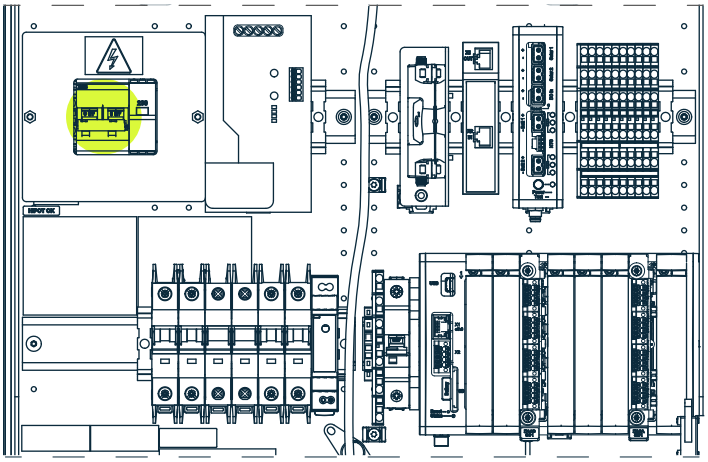


Figure 10 AC (mains) circuit breaker

1. Switch off power from the external disconnection device.
2. Switch off AC (mains) power from the AC (mains) circuit breaker. Make sure that there is no power available to the station.
3. To remove the protective shield of the AC (mains) input assembly, loosen the 2 screws with a 7-mm wrench and lift the shield.
4. Disconnect cabling from the circuit breaker.
5. Release the DIN rail locking piece and remove the circuit breaker from the DIN rail.
6. Insert the new circuit breaker on the DIN rail and snap it to place.
7. Connect the cabling to the new circuit breaker.
8. Reattach the protective shield.
9. Switch on power.
10. Check that the new circuit breaker works properly.

More information

- Powering and transient protection spare parts and components (page 183)

15.8 Replacing DMU801 plug-in modules

Crosshead PH1 screwdriver (optional)

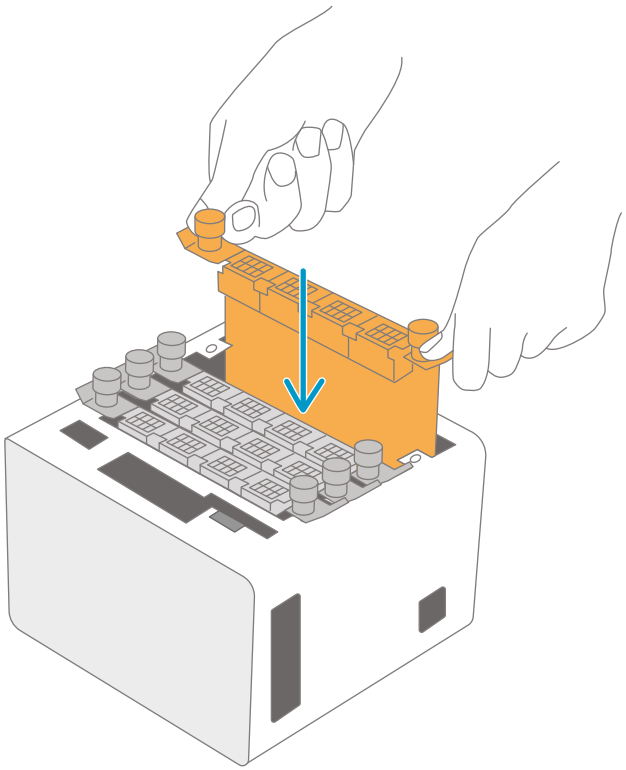
The example figures illustrate a 4-slot DMU801. The same instructions apply to all DMU801 sizes.

The plug-in module locations in DMU801 slots must be in accordance with the application. If you insert a module into a wrong slot, the module does not break but it may function incorrectly.

1. Disconnect power from the station.
2. Remove the sensor connectors from the plug-in module you are going to replace.
3. Unscrew the 2 finger screws in the plug-in module.
4. Remove the plug-in module from DMU801 by pulling from the module edges.

CAUTION! When removing or inserting the modules, be careful not to bend the connector pins.

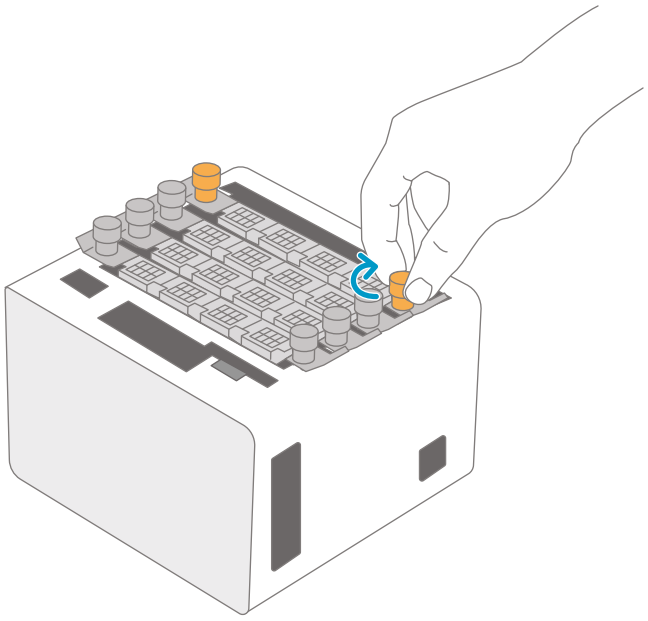
5. Place the new plug-in module in the same DMU801 slot you removed the old one from.
6. Make sure that the module is well aligned in its proper position. Gently press the module down until the handles contact the frame. Do not use force.



7. Tighten the finger screws by hand, or use a crosshead PH1 screwdriver.

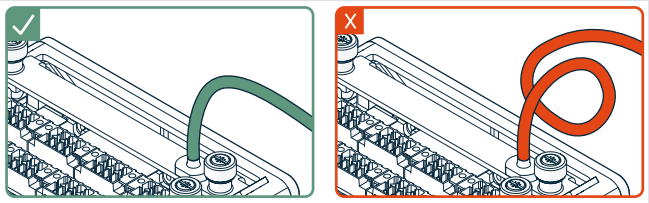
The recommended maximum torque is 1.0 Nm. If you use a tool and tighten to over 0.8 Nm, it may be difficult to unscrew the screws with fingers only.

If the screws do not tighten properly, check that the module is pressed all the way down.



8. Insert the sensor connectors in the new plug-in module, in the same order as they were in the replaced module.

When you connect a pressure hose to the DMB801 pressure port, keep the hose as straight as possible. Avoid bending the hose and make sure that there are no loops.



9. Power up the station. This may take a while.
10. Check that the sensor connections are working, and the data reports show data from each sensor.

    Plug-in modules have LEDs that blink green once a minute to indicate that the modules are functional.

More information

- Removing sensor connectors (page 130)
- DMU801 spare parts and accessories (page 182)

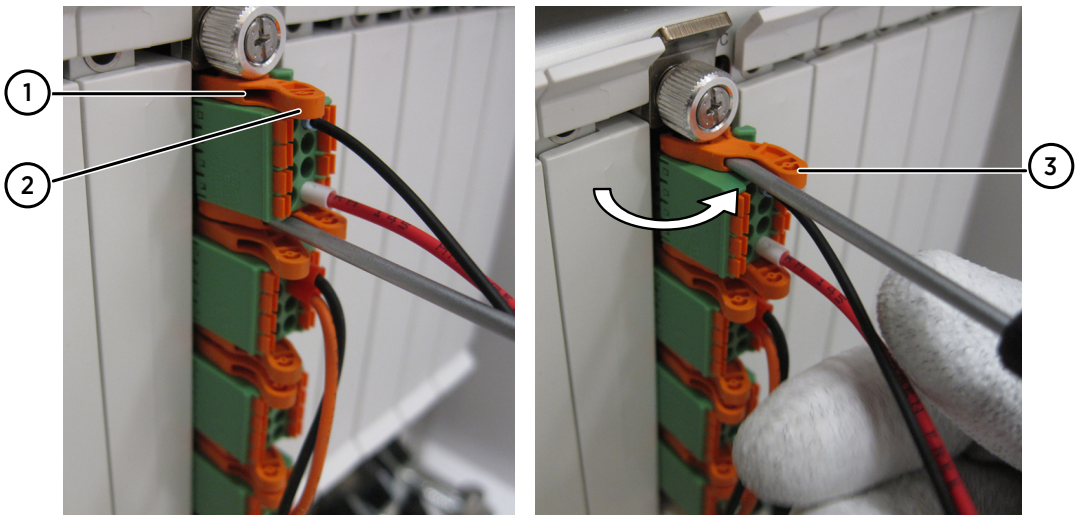
15.8.1 Removing sensor connectors

- (Optional) Flat head screwdriver, maximum size 2.5 mm (0.1 in)

1. Turn the lock levers to the middle position one by one. You can use your fingers or a flat head screwdriver.

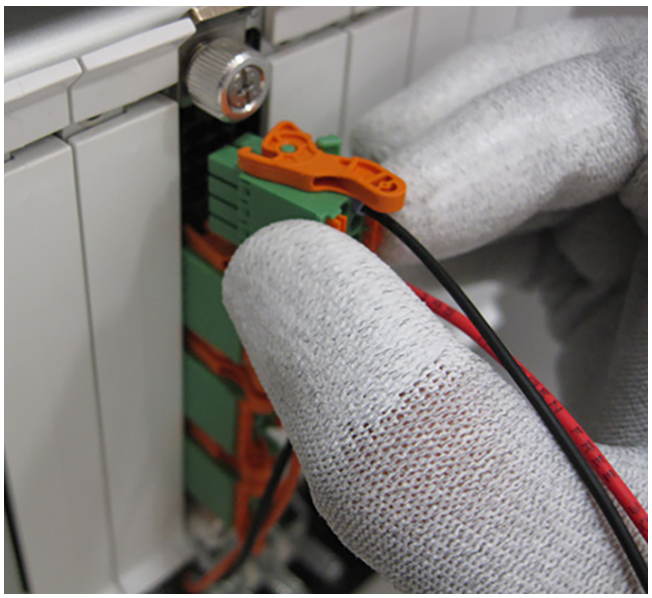
Using a screwdriver may be helpful especially in tight spaces.

CAUTION! Do not pull from the wires or try to remove the connector without first turning the lock levers to the middle position.
Do not turn the lock levers by force.

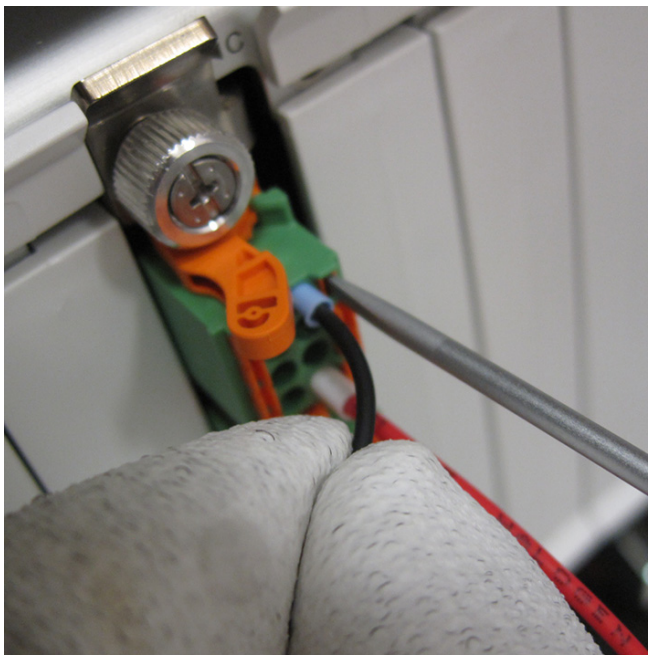


1 Slot for screwdriver
2 Lock lever locked
3 Lock lever in the middle position

2. Remove the connector with your fingers.



If you need to remove a wire from the connector, push the release button next to the wire with a flat head screwdriver and pull the wire out of the connector. The easiest way to remove a wire from the connector is to do it while the connector is attached to the plug-in module.



More information

- Replacing DMU801 plug-in modules (page 127)

15.9 Replacing DMU801



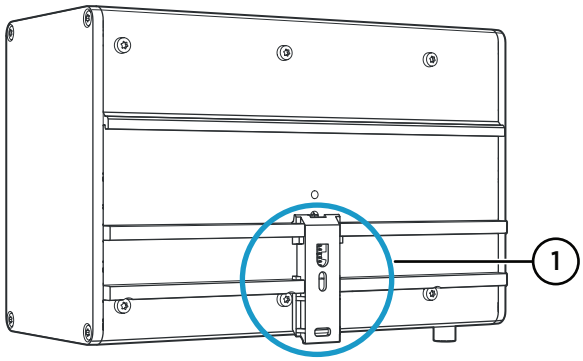
Flat head screwdriver

1. Take a backup of the application by downloading it through Kaiku Designer.
   For instructions, see Kaiku Designer User Guide (M212407EN).
2. Disconnect power from the station.
3. Remove all cabling from DMU801.
   To have more slack in the wiring, you may need to cut the cable ties holding the wires.

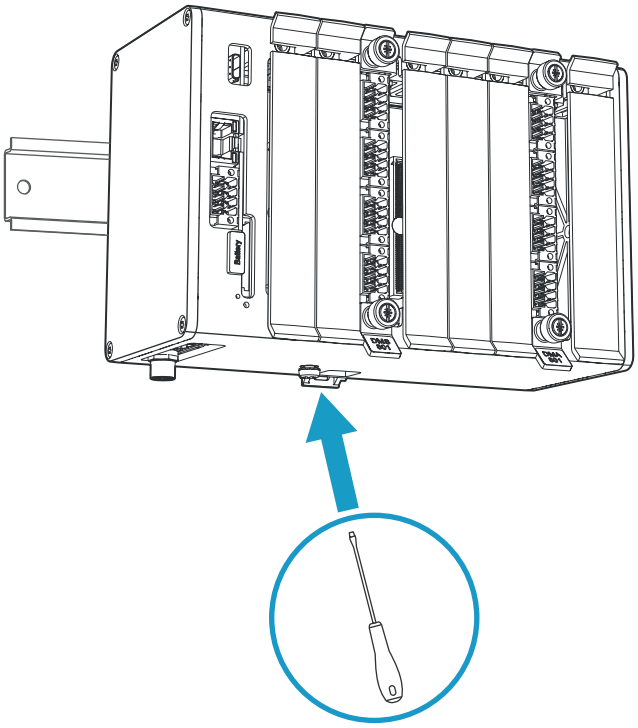


To avoid damaging the wiring, be careful when cutting the cable ties.

4. To remove DMU801 from the DIN rail, slide down the locking piece with a flat head screwdriver, and lift DMU801.



1 Locking piece on the back of DMU801



5. Remove the plug-in modules from DMU801 by pulling from the module edges.

When removing or inserting the modules, be careful not to bend the connector pins.

6. Insert the plug-in modules in the new DMU801, in the same slots.

   Use either the same plug-in modules you removed or, if you are replacing plug-in modules at the same time, insert the new plug-in modules in the new DMU801.
   It is also possible that the new DMU801 spare part has spare plug-in modules already in place.

7. Insert the new DMU801 on the DIN rail and snap it into place.
8. Connect the cables to the new DMU801.
9. Use new cable ties to reattach the cables to the backplate.
10. Power up the station. This may take a while.
11. Upload the application backup file to the new DMU801 through Kaiku Designer or Web UI.
12. To verify that the plug-in modules are functional, check that data reports show data from each sensor.

More information

- Replacing DMU801 lithium RTC battery (page 135)
- Uploading application to DMU801 through Web UI (page 144)
- DMU801 spare parts and accessories (page 182)

15.9.1 Replacing DMU801 lithium RTC battery

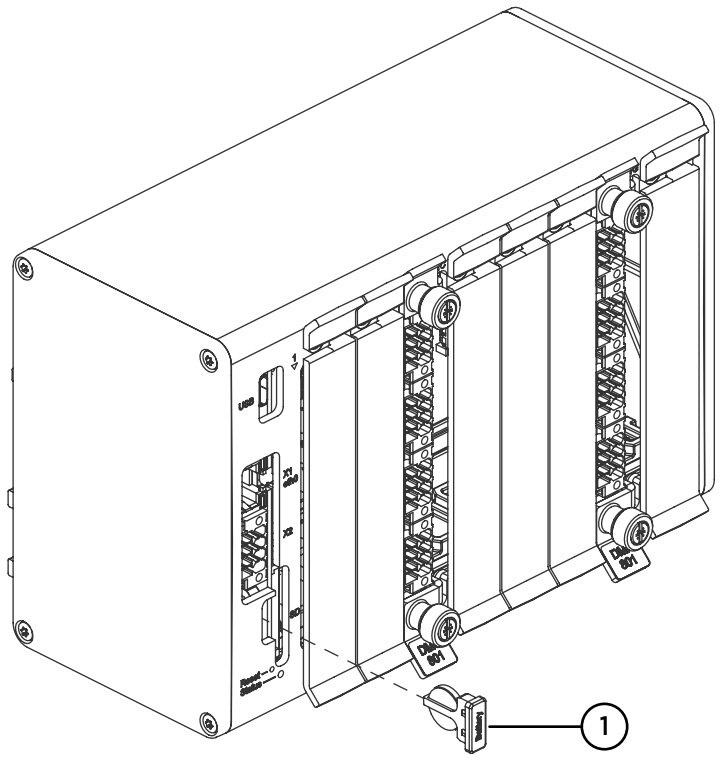
WARNING! Chemical hazard
This product contains a coin or button cell battery. If the battery is swallowed, it can cause severe internal burns in only 2 hours and can lead to death.
Keep new and used batteries away from children. If the battery compartment does not close securely, stop using the product and keep it away from children.
If you suspect that the battery may have been swallowed or placed inside any part of the body, seek immediate medical attention.

DMU801 contains a lithium real-time clock (RTC) battery to keep the system clock running during power outages. The battery type is CR1225/BR1225, which lasts for a minimum of 5 years if DMU801 is powered down. When DMU801 is operating normally, the battery lasts longer.

Replace the battery before it runs out. If the battery is empty when DMU801 is powered down, the application date and time are lost when DMU801 is powered up again. When DMU801 is operating normally (and the battery is not used), Vaisala recommends replacing the battery every 15 years, or when the expected date of expiration determined by the battery manufacturer is reached.

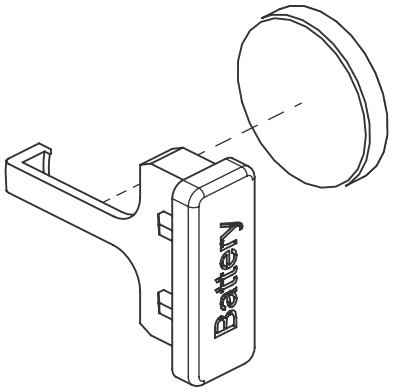
Vaisala recommends using a Panasonic, Varta, or Renata battery.

1. Locate DMU801 in the enclosure.
2. Remove the battery holder including the battery by pulling the battery cover out with fingers.



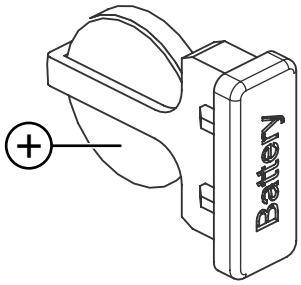
1 Battery cover

3. Remove the battery from the battery holder.



4. Insert the new battery in the holder.

Place the battery text (+) side facing towards the holder.



5. Insert the battery cover including the new battery back in DMU801.

15.9.2 Replacing external memory card

An external SD memory card can be used to increase the memory space of DMU801. DMU801 supports SD cards up to 32 GB.

Vaisala has tested and verified the use of SD card type SDHC 32 GB with DMU801. If you use some other card, follow these specifications:

Table 10 SD card specifications

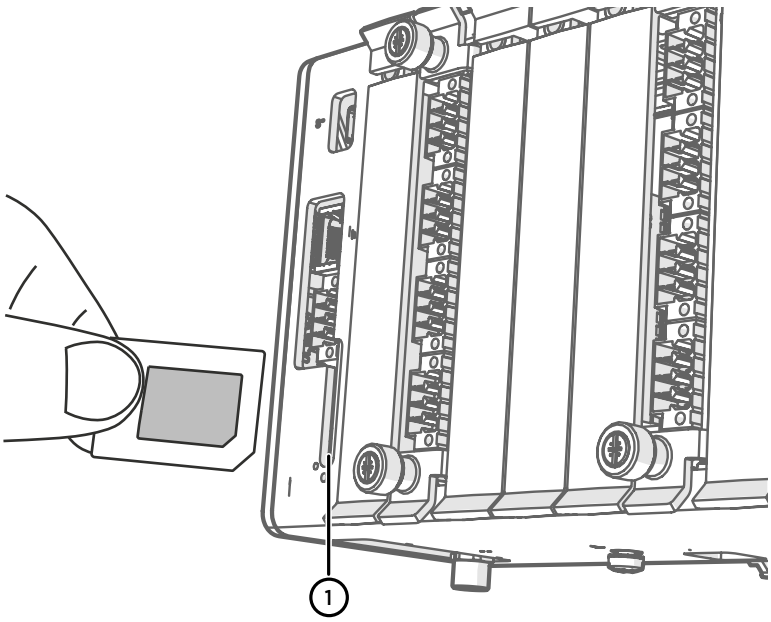
Property	Value
Card type	SDHC or SDXC
Speed class	UHS-I
Temperature range	−40 ... +85 °C (−40 ... +185 °F) [1)]

Property	Value
Memory cell technology	pSLC or SLC [2]

1) *Depends on the installation location and application. For some locations, a more limited range may be acceptable. For weather station purposes, wide temperature range cards are strongly recommended, especially if they are used as logging memory and left in the station for a long time.*
2) *Recommended for maximum reliability, especially if the SD card is used as logging memory.*

Make sure that the SD memory card has file system FAT32. If not, format the card to FAT32 with your computer.

1. To remove the old SD memory card from DMU801, slightly push the card and then pull it out from the **SD** card slot.
2. Take a new memory card and hold the card so that the colored text label points towards the body of DMU801 and the edge with a cut-off corner faces downwards.



1 **SD** card slot

3. Insert the card in the **SD** card slot and push it in.

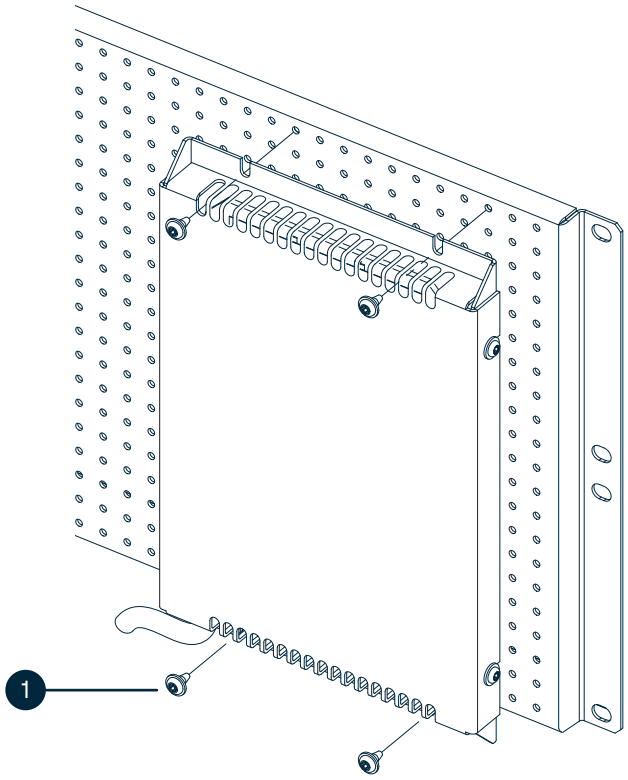
When you insert a new memory card into DMU801, the software checks that the card is ready for use.

By default, DMU801 uses its internal memory to store the data. If you insert an external memory card, use Kaiku Designer to update the application to use the memory card as data storage.

15.10 Replacing enclosure heater

- TX20 Torx screwdriver
- Flat head screwdriver

1. Switch off AC (mains) or external DC power, depending on the powering. Make sure that there is no power available to the station.
2. Disconnect cabling from the terminal block to which the heater is connected.
3. To remove the enclosure heater from the mounting plate, unscrew the fastening screws (4 pcs) and lift the heater.



1 Torx socket head screw 4×8 WN5251 (4 pcs)

4. Attach the new heater to the mounting plate with the fastening screws.
5. Connect the cabling to the terminal block.
6. Power up the station. This may take a while.

More information

‣ Powering and transient protection spare parts and components (page 183)

15.11 Replacing enclosure heating control relay

- Flat head screwdriver

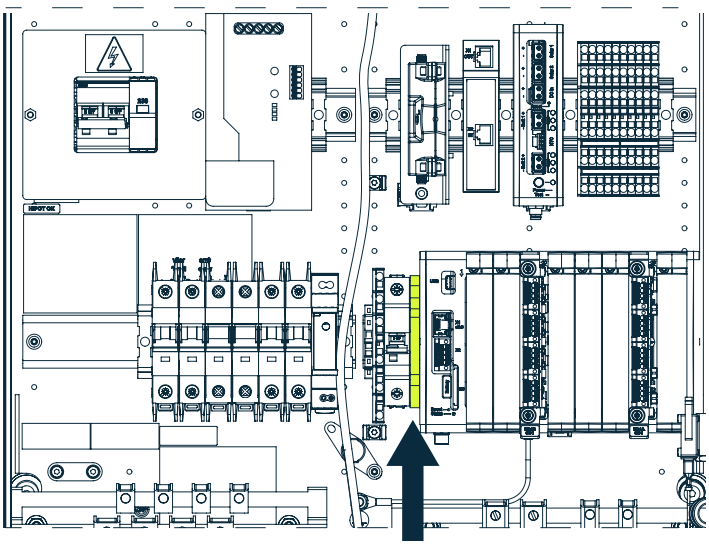


Figure 11 Enclosure heating control relay

1. Switch off AC (mains) or external DC power, depending on the powering. Make sure that there is no power available to the station.
2. Disconnect cabling from the heating control relay.
3. Release the DIN rail locking piece and remove the relay from the DIN rail.
4. Insert the new relay on the DIN rail and snap it to place.
5. Connect the cabling to the new relay.
6. Power up the station. This may take a while.

More information

- Powering and transient protection spare parts and components (page 183)

15.12 Replacing thermostatic switch

- TX20 Torx screwdriver

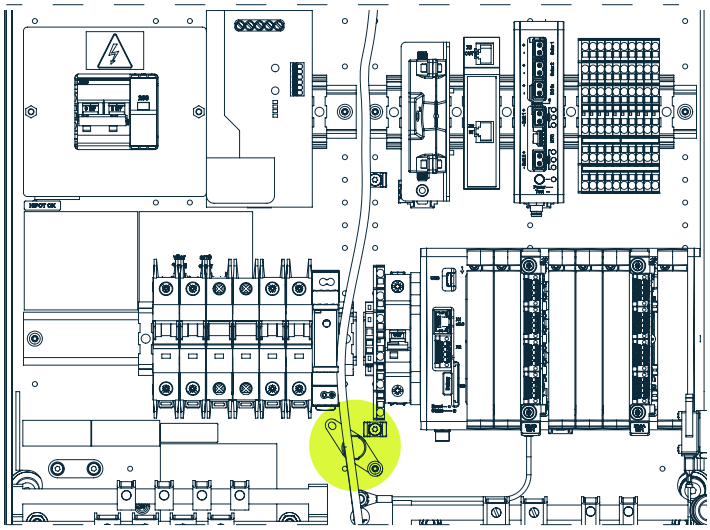


Figure 12 Thermostatic switch

1. Switch off AC (mains) or external DC power, depending on the powering. Make sure that there is no power available to the station.
2. Disconnect cabling from the thermostatic switch.
3. Unscrew the fastening screw and remove the switch.
4. Attach the new switch with the fastening screw.
5. Connect the cabling to the new switch.
6. Power up the station. This may take a while.

More information

‣ Powering and transient protection spare parts and components (page 183)

16. Upgrades

16.1 Editing application

If you need to edit the application, you can download it from your DMU801, edit it with Kaiku Designer, and upload it back to DMU801.

More information

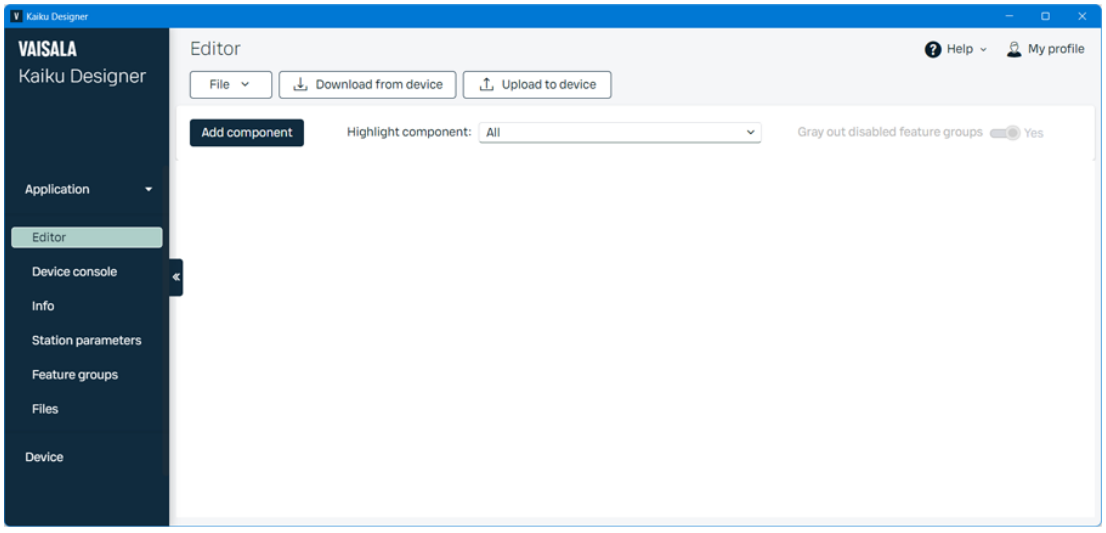
- Installing Kaiku Designer (page 142)
- Downloading application (page 143)
- Uploading application to DMU801 through Kaiku Designer (page 143)
- Uploading application to DMU801 through Web UI (page 144)

16.1.1 Installing Kaiku Designer

For using Kaiku Designer, you need a computer with Windows operating system.

Vaisala recommends using the latest version of Kaiku Designer. You can download the latest version from Vaisala product documentation portal docs.vaisala.com.

1. Go to Vaisala Kaiku Designer or use the search, and download the installation file on your computer.
2. Extract the ZIP file.
3. To open Kaiku Designer, double-click the ***KaikuDesigner.exe*** file.



For more information on Kaiku Designer, see Kaiku Designer User Guide (M212407EN).

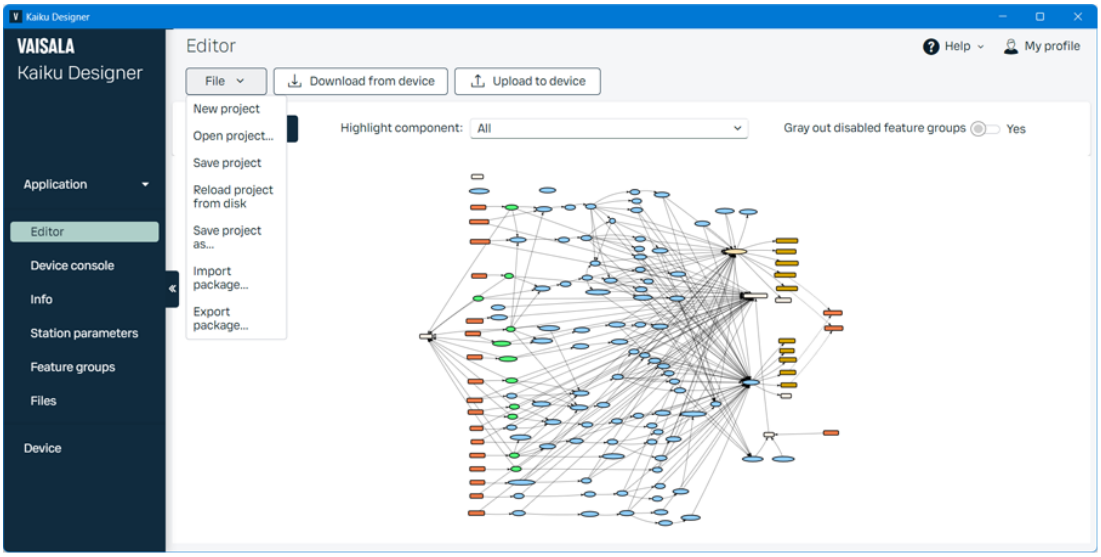
AKRIBIS · www.akribis.info · contacto@akribis.info

16.1.2 Downloading application

With Kaiku Designer, you can download the application that is currently in use in DMU801.

1. Make sure that you are connected to DMU801.
2. In Kaiku Designer, go to **Application > Editor** and select **Download from device**.

   The application opens in the **Editor** view.
3. To save the application on your computer, select **File** and one of the following:
   - **Save project** to save the current application and its metadata files as separate files on your computer.
   - **Save project as** to save the current application and its metadata files as separate files on your computer, in a chosen location and with a chosen name.
   - **Export package** to export the current application and its metadata files as one ZIP package to your computer.



16.1.3 Uploading application to DMU801 through Kaiku Designer

You can upload the application to DMU801 also in the Web UI **Application > Info** view. You have to be logged in as **Administrator**.

1. Make sure that you are connected to DMU801 as **Administrator**.
2. In Kaiku Designer, go to **Application > Editor** and select **File > Import package**.
3. Locate the application ZIP file on your computer and open it to upload the application to Kaiku Designer.
4. To upload the application from Kaiku Designer to DMU801, select **Upload to device**.

5. To follow the upload process, select **Device console**.

16.1.4 Uploading application to DMU801 through Web UI

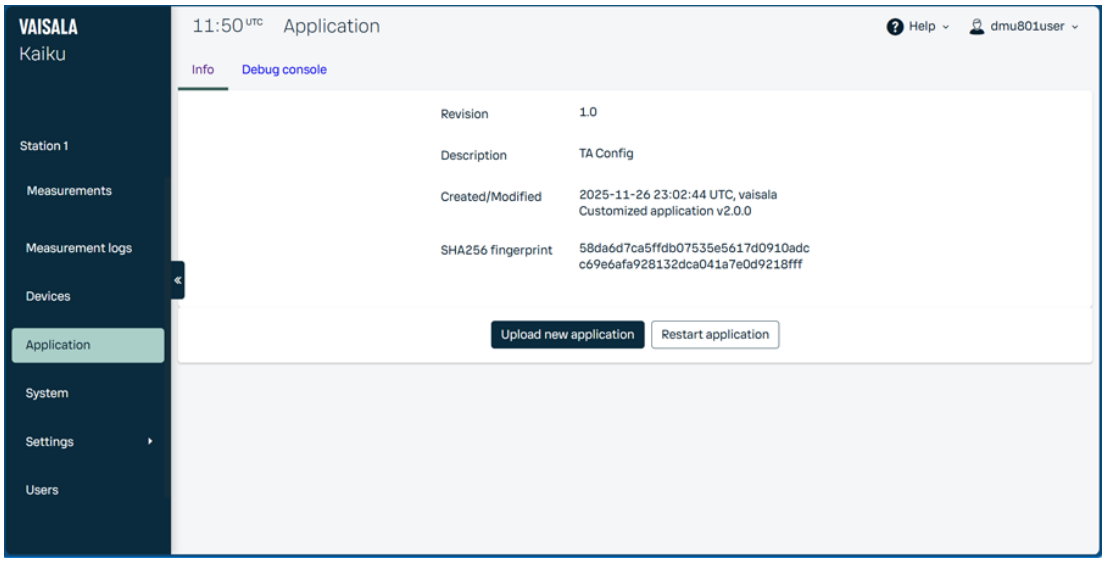
If you have an application created with an earlier DMU801 Configuration Tool (Kaiku Designer) version than 2.0.0, upload the application through Kaiku Designer.
For more information on Kaiku Designer, see Kaiku Designer User Guide (M212407EN).

You can upload a new or modified application to DMU801 through the Web UI.

When copying an application from one DMU801 to another, follow the backup and restore procedure in the Web UI **System > Operations** view. Station parameter values configured through the Web UI are device-specific and are not included in the application package.

1. Log in to the Web UI as an **Administrator**.
2. Go to **Application > Info**.
3. Select **Upload new application**, locate the application (`.zip`) in your computer, and open it to upload it to DMU801.

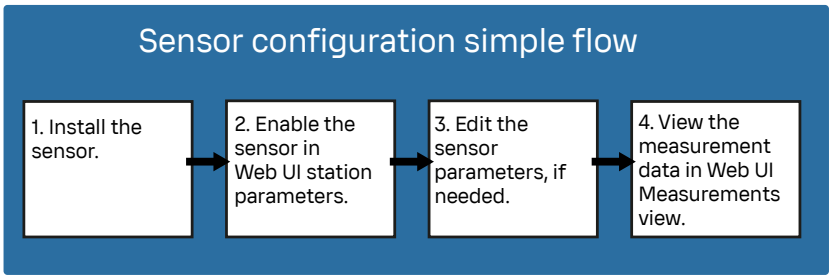
   There is no need to extract the ZIP file.



The application is automatically taken into use after uploading.

16.2 Adding new sensors to weather station

You can add new sensors to the weather station and take them into use by enabling them in the Web UI. The sensors must be included in the weather station application. The following figure shows the standard flow of taking a new sensor into use.



For sensor installation instructions, see AWS810 Installation Guide (M212418EN).

16.2.1 Enabling and disabling sensors and devices

To take a new sensor or device into use after the initial configuration, install the sensor or device and enable it in the Web UI. The parameters to be enabled are located in the **features** parameter group.

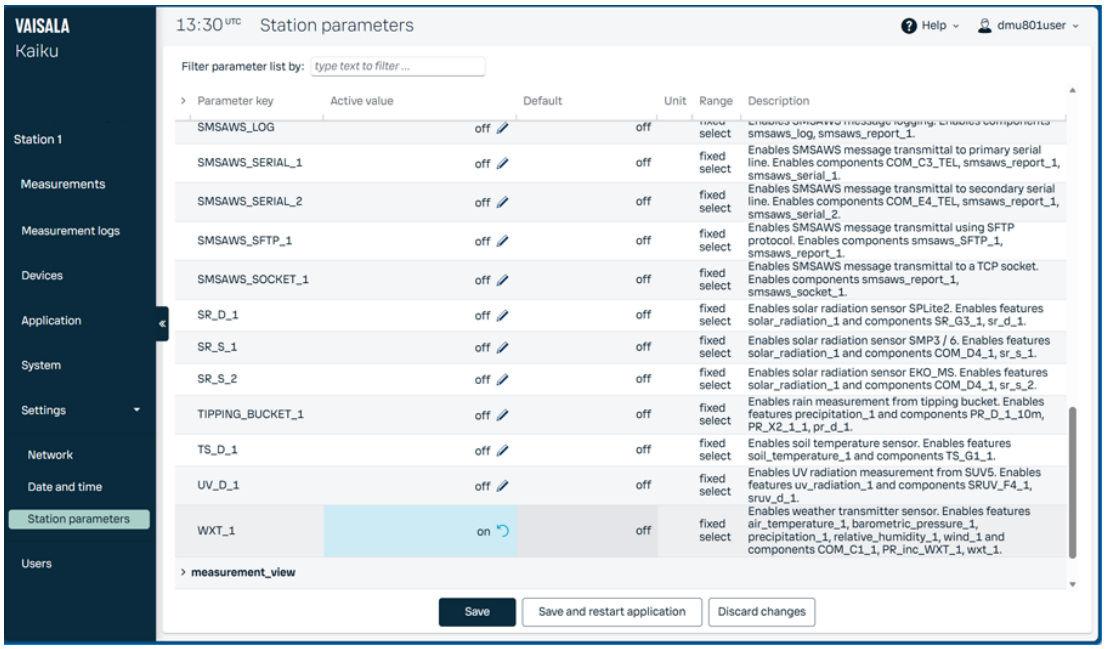
If a sensor or device is malfunctioning, you can disable it in the application to stop the related error messages.

Table 11 Sensor parameters

Parameter name	Sensor
BARO_1	Pressure Sensor BARO-1
CEILO_1	Ceilometer CL31
HMP_D_1	Humidity and Temperature Probe HMP155 (analog)
HMP_S_1	Humidity and Temperature Probe HMP155 (serial)
NR_D_1	Net Solar Radiation Sensor NR Lite2
PLUVIO_1	Precipitation Gauge OTT Pluvio^2 L
PTB_1	BAROCAP Digital Barometer PTB330
PWD_1	Present Weather Detector PWD22
RM60_1	PRECICAP Radar Precipitation Sensor RM60
SDUR_D_1	Sunshine Duration Sensor CSD3
SR_D_1	Pyranometer SP Lite2
SR_S_1	Pyranometer SMP3/SMP6 (Modbus)

Parameter name	Sensor
SR_S_2	EKO MS Series Pyranometer (interface only)
TIPPING_BUCKET_1	Rain Gauge SBS314
TS_D_1	Soil Temperature Sensor QMT110
UV_D_1	UV Radiometer SUV5
WMT700_1	WINDCAP Ultrasonic Wind Sensor WMT700
WMT700_2	Secondary WINDCAP Ultrasonic Wind Sensor WMT700 (if using 2 wind sensors)
WXT_1	WXT530 Series Weather Transmitter

1. In the Web UI, go to **Settings > Station parameters**.
2. Under the parameter group **features**, locate the parameter of the sensor or device you want to enable, for example, **WXT_1** for WXT530 Series Weather Transmitter.
3. To enable the sensor or device, set the **Active value** of the parameter to **on**.



4. To disable the sensor or device, set the **Active value** of the parameter to **off**.
5. To save the changes and take them into use, select **Save and restart application**.

More information

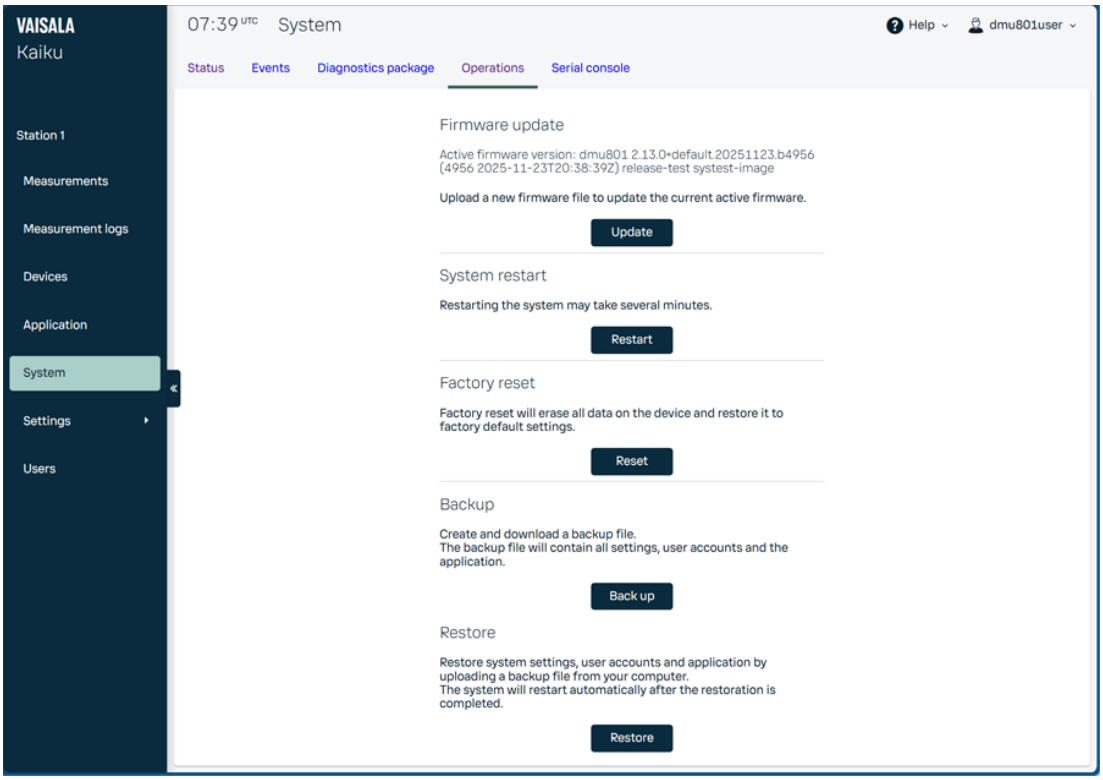
- Station parameters (page 26)

16.3 Updating firmware

To make sure that the system components stay up to date, Vaisala provides regular firmware updates to DMU801. You can download the latest firmware version from Vaisala product documentation portal: Kaiku firmware package.

1. Save the update file on your computer.
2. Log in to the Web UI as an **Administrator**.
3. Go to **System > Operations**, and under **Firmware update**, check the current firmware version.

   You can also see the current firmware version in **Help > About**.
4. To upload a new firmware version, select **Update**.



5. In the **Firmware update** window, select **Browse**, locate the new file, and select **Upload**.

   The filename ends with `.firmware`.

Once the firmware is updated, DMU801 restarts, and you are directed to the **Log in** page.

Wait at least 5 minutes after updating the firmware before switching off power from DMU801.

17. Troubleshooting

17.1 Troubleshooting checklist

When troubleshooting, check the questions listed in Technical support (page 203) before contacting Vaisala technical support.

17.2 Determining DMU801 operation mode

You can follow the DMU801 operation mode from the status LED on the DMU801 front panel.

Table 12 DMU801 status LED indications

LED color/behavior	State	Actions
Green, steady	DMU801 is functioning normally. The application is running. There are no active errors.	–
Green, blinking	DMU801 is starting up. [1)] DMU801 has powered up or reset. The application is not yet running.	–
	DMU801 is shutting down. DMU801 is in shutdown mode and not available.	
Green, blinking × 3	Factory reset acknowledgment. When the LED blinks 3 times in green, you have pressed the **Reset** button long enough (approximately 10 s). Release the button to reset DMU801 to factory settings.	–
Red, steady	Startup error occurred. DMU801 is not operational.	1. If you have plug-in modules installed in DMU801, remove the modules one by one to see if one of them causes the fault. Replace the faulty plug-in module. 2. If removing the plug-in modules does not help, replace DMU801.

1) When you connect power to DMU801, the status LED first blinks once in red.

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The Ethernet port **X1 eth0** has 2 status LEDs (green and yellow).

Table 13 **X1 eth0** port status LED indications

LED color/behavior	State
Blank, both LEDs	No Ethernet link
Green LED, steady	Ethernet link is on
Green LED, blinking	Data transfer ongoing through the port
Yellow LED, steady	100 Mbps (megabits per second) link
No yellow LED on	10 Mbps link

For example, if the green LED is blinking and the yellow LED is not on, data transfer is ongoing through the port at the speed of 10 Mbps.

DMU801 plug-in modules have their own status LEDs. The LEDs blink green once a minute to indicate that the modules are functional.

17.2.1 DME801 Ethernet port LED modes

The 3 copper ports of Ethernet Switch Module DME801 each have 2 LEDs (green and yellow) to indicate the status of the port.

Table 14 DME801 copper port status LED indications

LED color/behavior	State
Blank, both LEDs	No Ethernet link
Green LED, steady	1 Gbps (gigabits per second) link
Green LED, blinking	Data transfer ongoing through the port with 1 Gbps speed
Yellow LED, steady	100 Mbps (megabits per second) link
Yellow LED, blinking	Data transfer ongoing through the port with 100 Mbps speed
Both LEDs, steady	10 Mbps link

LED color/behavior	State
Both LEDs, blinking	Data transfer ongoing through the port with 10 Mbps speed

17.3 Logging in to Web UI

The Web UI has been tested with the latest versions of Microsoft Edge, Mozilla Firefox, and Google Chrome at the time of publishing this document.

For security reasons, passwords cannot be retrieved from the system. If you forget your username or password, you have to reset DMU801 to factory default settings.

1. Make sure that DMU801 is connected to your computer with a USB-C cable.

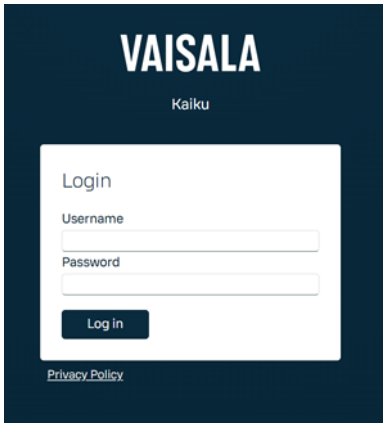
   Use the USB-C cable provided by Vaisala. If you use your own cable, make sure that the cable is shielded.

2. Open a web browser and go to the Web UI address:

   https://192.168.10.2 (local connection)
   For Ethernet connection, use IP address *https://192.168.2.2* (default), or other address if it has been configured as the network address.

3. Web browsers do not trust a self-signed certificate. If you are logging in for the first time, the browser indicates that the connection is untrusted or insecure. Ignore the warning and continue to the site.

4. On the **Log in** page, type the username and password in the fields.



5. Select **Log in**.

17.3.1 Logging in to Web UI remotely

For remote connection, the weather station must have a public, static IP address or be connected to a private access point.

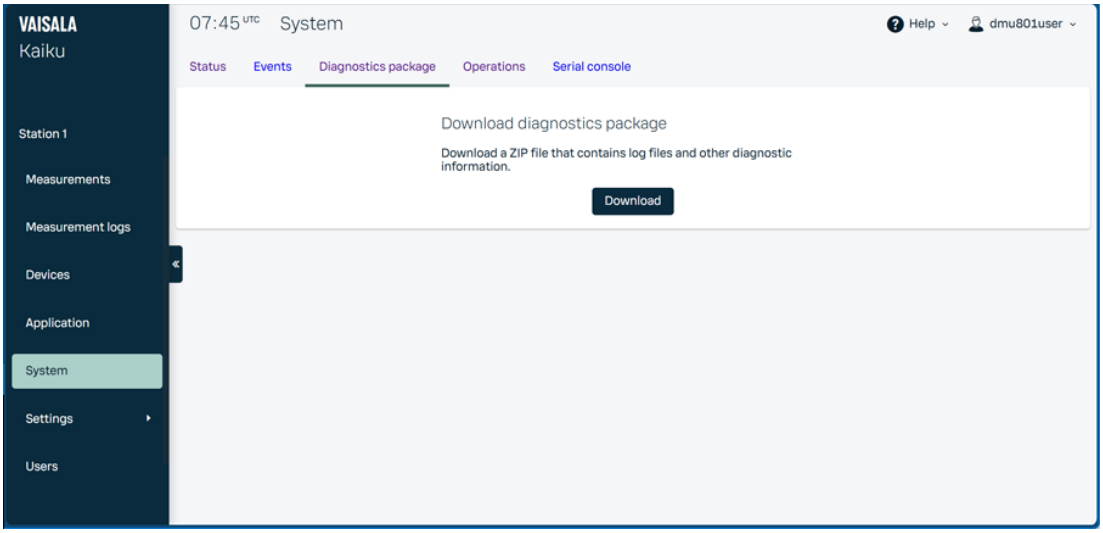
1. Connect your browser to the public IP address or address provided by the access point.
2. Follow the login instructions in Logging in to Web UI (page 150).

17.4 Downloading diagnostic data

You can download a diagnostic data package from the Web UI. The package includes data log files that are useful for troubleshooting purposes. Also the station parameters are included in the diagnostics package.

If you encounter an error situation and need to contact Vaisala technical support, provide the diagnostics package to help with troubleshooting.

1. In the Web UI, go to **System > Diagnostics package**.
2. On the **Diagnostics package** view, select **Download**.



3. Extract the ZIP file on your computer.

17.5 Downloading event logs

You can download event log files from the Web UI. In addition to the events, the log file includes details, such as severity of the event and the device from which the event originated (DMU801 or a sensor connected to DMU801). The events are timestamped according to the time setting selected in the Web UI (local time or UTC time). The available events are application-specific.

The event log files include the following information:

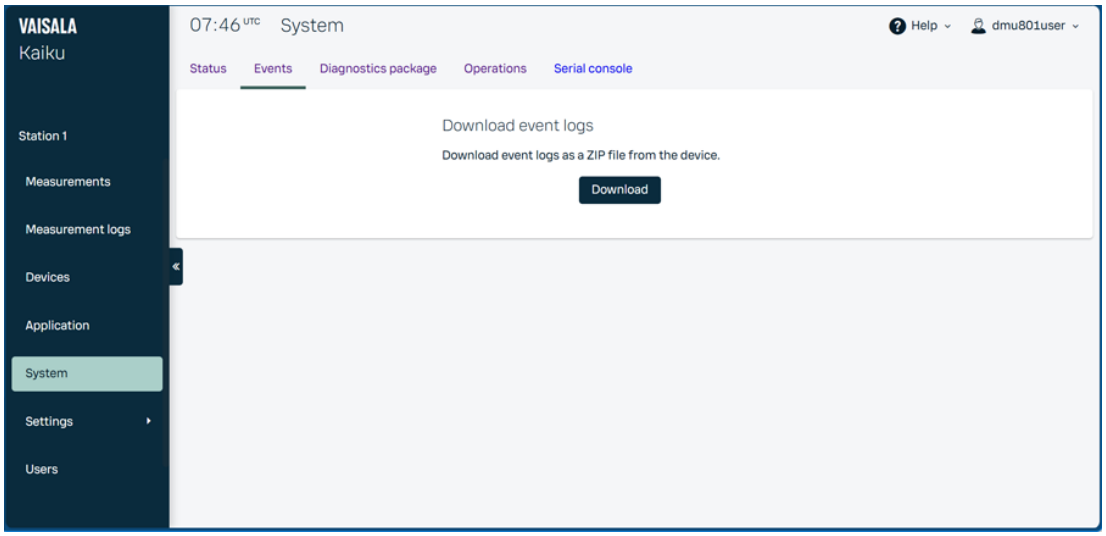
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Table 15 Event log file content

Field	Description	Example
Timestamp	Time of event creation.	`2024-09-16T22:24:00.939852+00:00`
Severity	Message severity: • `ALARM` • `CRITICAL` • `ERROR` • `WARNING` • `INFORMATIONAL`	`INFORMATIONAL`
Message	Free-form event message.	`Station parameters updated by user "dmu801user"`
Code	Event code of form `vrn:dev:event:<code>`.	`vrn:dev:event:gecko.web.stationParameterUpdate`
Device	Device URN identifying the device which the event is related to.	`urn:dev:ops:16961-DMU801-U0650006`
Reported by device	Device URN identifying the device that reported the event.	`urn:dev:ops:16961-DMU801-U0650006`
Boot ID	Unique identifier for each device restart.	–
Custom data	Custom data of the event as a JSON object.	`username=dmu801user|updatedStationParameters=site.station_name`

For more information, see Kaiku Event Description (M213151EN).

1. In the Web UI, go to **System > Events**.
2. On the **Events** page, select **Download**.

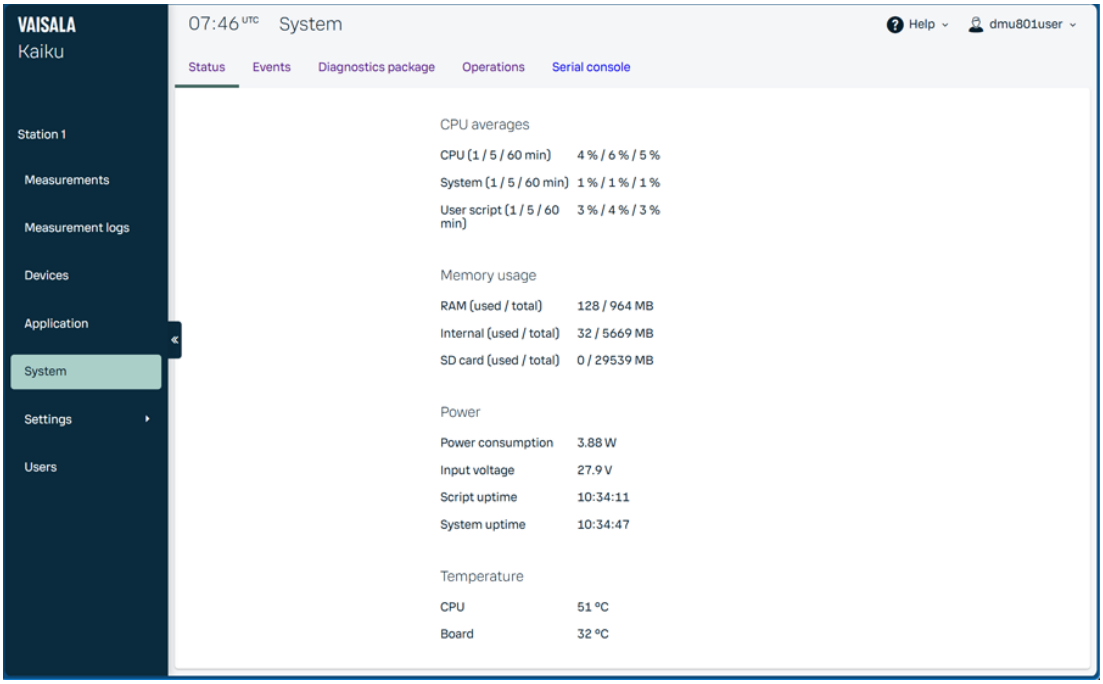


3. Extract the ZIP file on your computer.

17.6 Viewing system status

You can view the system status from the Web UI.

1. In the Web UI, go to **System > Status**.



17.7 Using console views

In the Web UI **Serial console** view you can see observation data from sensors connected to DMU801 through serial connection.

In the **Stream console** view you can see data from stream components.

The data can be used for debugging, and you can also issue commands to the sensors and components.

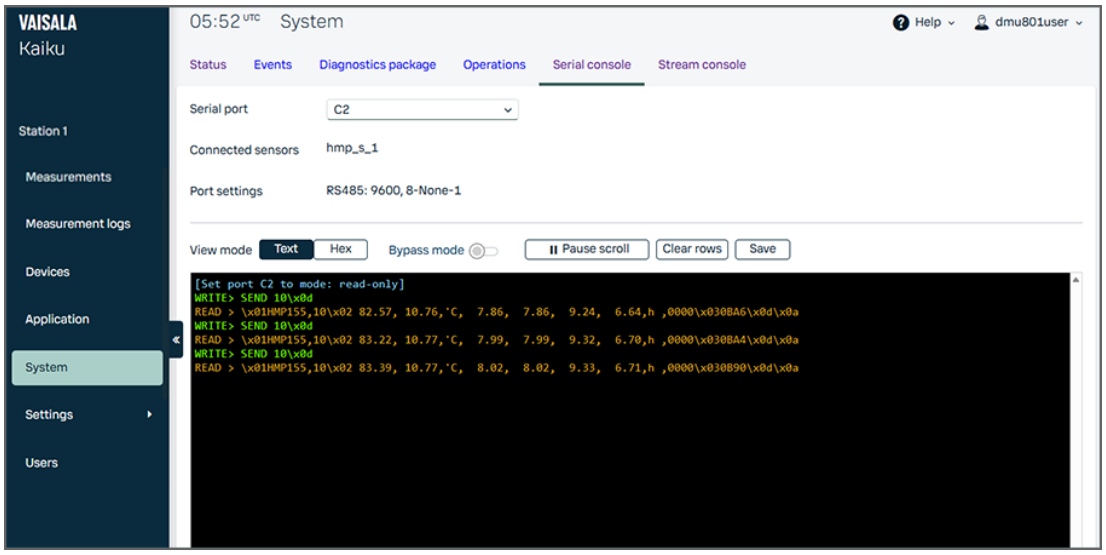
1. In the Web UI, go to **System** and select **Serial console** or **Stream console**.
2. In **Serial port** or **Component**, select the port or component from which you want to view data.

   The terminal window starts showing data polled from the selected port or component.
3. To save the data on your computer, select **Save**.

4. To start the write mode and to be able to give commands, select **Bypass mode**.

   The data is no longer printed in the terminal window. You can type commands in the text input field.

When **Bypass mode** is enabled, the user controls the selected sensor or component. The sensor or component is in the service mode and no valid data is received.



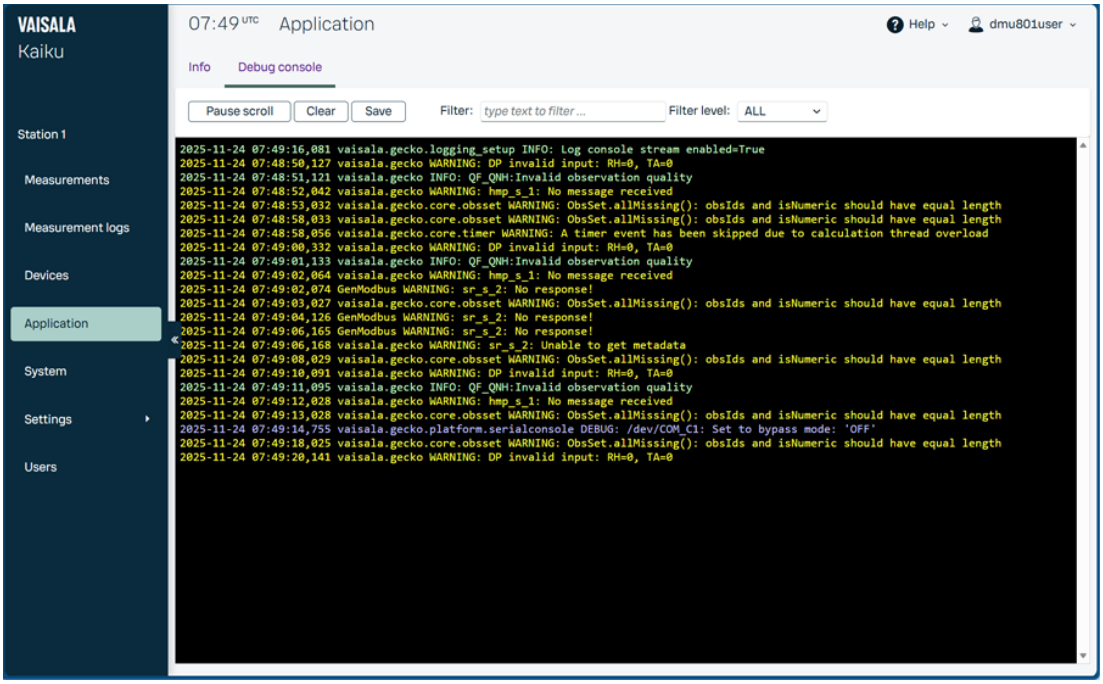
17.8 Viewing application data

You can use the application data for validating and debugging the application. The **Debug console** view in the Web UI displays data about the application uploaded to DMU801. You can see the log, make sure that data is received from the sensors, and view possible errors.

For example, after uploading a new application to DMU801, it may be useful to verify that the application is operational, observation data from the connected sensors is shown, and there are no errors in the application.

A similar **Device console** view is also available in Kaiku Designer.

1. In the Web UI, go to **Application > Debug console**.



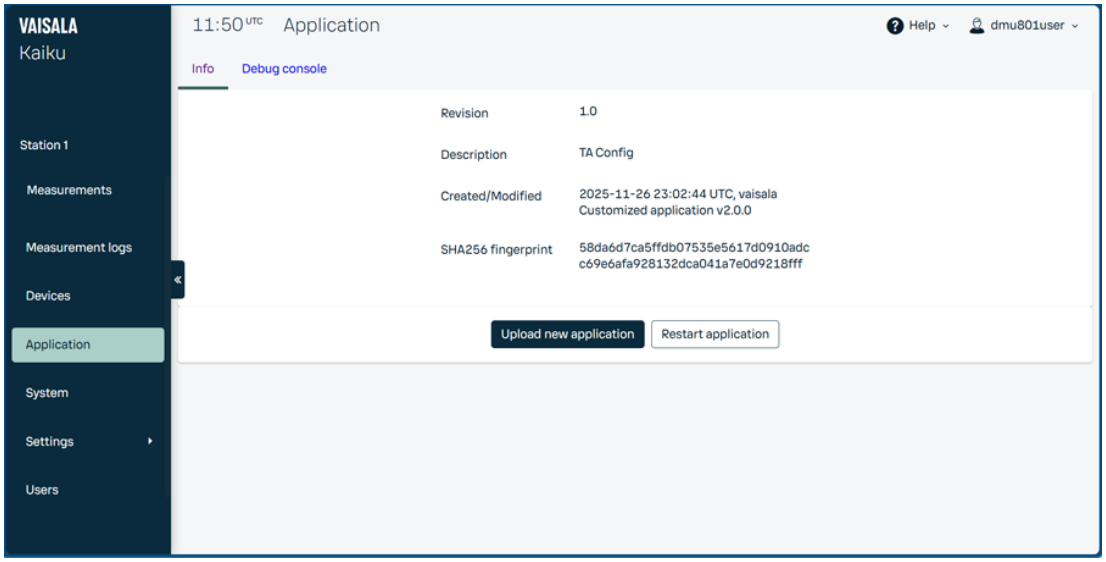
   The application log data is printed in the terminal window.

2. To filter the data:
   - Select **Filter level** to sort the logs according to the defined categories.
   - Type the filter text in the **Filter** field.

17.9 Viewing application metadata

In the Web UI, you can view information about the currently running application. The information also includes a unique digital fingerprint of the application, which allows you to compare the application with another one and check if the application has been modified.

1. In the Web UI, go to **Application > Info**, and view the application metadata.



Revision
Revision of the application.

Description
Description of the application or the latest changes.

Created/Modified
Application creation date, Kaiku Designer version, and the name of the creator or modifier.

SHA256 fingerprint
Digital fingerprint calculated for the application.

17.10 Using external termination resistor on RS-485 line

Normally, and with the sensors in the default application, the RS-485 line does not need external termination resistors. DMU801 serial plug-in modules have built-in resistors to reduce signal reflections.

Serial module	Port	Termination type
DMS801	1–3	Built-in AC termination (120 Ω resistor in series with 1 nF capacitor)
DMS801 and DMS802	4	Software-controllable 120 Ω termination

In addition, the RS-485 transceivers have fail-safe functionality and controlled transmit slew rate to eliminate the need for external resistors in most cases.

However, in case of a communication issue on the RS-485 line, you can try to fix it as follows:

- Add a 120 Ω external resistor at the end of the line (in DMS801 ports **1**–**3**).
- Switch on the software-controllable termination using Kaiku Designer (in DMS801/ DMS802 port **4**). For instructions, see Kaiku Designer User Guide (M212407EN).

The communication problem may be caused by signal reflections if there is an extra long sensor cable or high-speed slew rate at the sensor end.

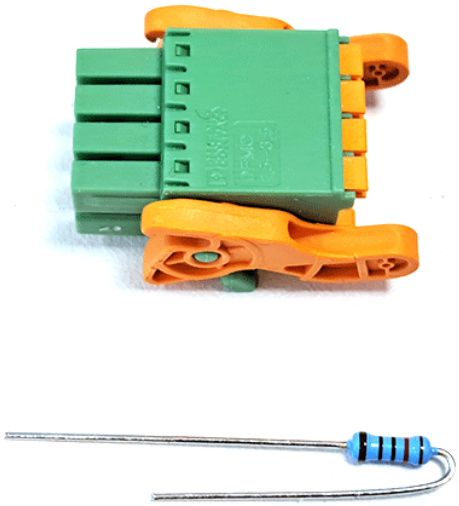
17.10.1 Installing 120 Ω termination resistor

- Side cutters

A few pieces of termination resistors are included in the weather station delivery.



1. Bend the other end of the resistor wire as shown in the following figure.

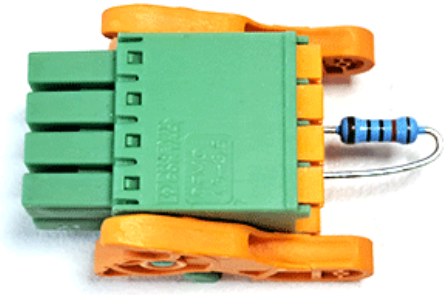


2. Cut the other end of the wire to the same length.

3. Insert the resistor ends in the spring-cage connector, between pins 2 and 3 (or 6 and 7), in ports 1–3 of Serial Module DMS801. It does not matter which end goes to which pin.

   If both pin pairs 2 and 3, and 6 and 7 are already used for sensor wiring, add external splicing connector to add the resistor.

4. Push the resistor ends to the bottom of the connector.



More information

- DMU801 spare parts and accessories (page 182)

17.11 Restoring factory default settings

You can restore DMU801 to factory settings, for example in the following cases:

- You have forgotten your administrator username or password to the Web UI.
- You want to remove the application and all settings, for example, when replacing DMU801 with a device that has been in use earlier.

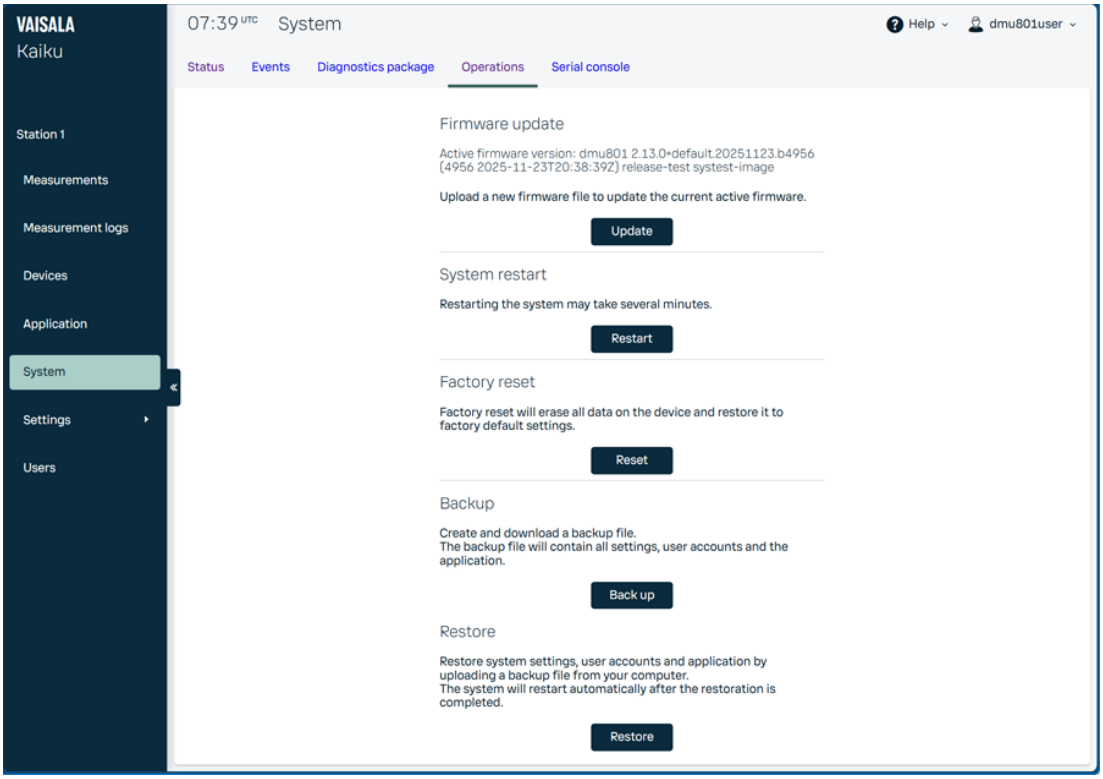
In factory reset, all data on the device will be lost, including observations, application, and settings.

After restoring the factory default settings, you need to activate DMU801 with the device activation code and create new users when you connect to the Web UI the next time.

17.11.1 Restoring factory default settings through Web UI

Erasing network settings means that you may not be able to connect to DMU801 remotely.

1. Log in to the Web UI as an **Administrator**.
2. Take a backup of the current application.
3. Go to **System > Operations**.
4. Under **Factory reset**, select **Reset**.



The reset takes up to 1 minute.

5. After the reset, log in to the Web UI, give the device activation code, and create a new user account.
6. Import the backup file through the Web UI. If you do not have a backup, configure all the settings again.

More information

- Backing up and restoring application and system settings (page 80)

17.11.2 Restoring factory default settings with Reset button

- Small pin or similar

Pressing the **Reset** button briefly reboots DMU801.
Pressing and holding the **Reset** button down for 10 seconds resets DMU801. All device settings are reverted back to factory settings. After the factory reset, you need to reconfigure the settings. You can restore the settings by importing the backup file to DMU801.

1. Unplug the USB-C cable (if connected).
2. Press and hold down the **Reset** button in the DMU801 front panel with a small pin for 10 seconds.

   The reset takes up to 1 minute.
3. After the reset, log in to the Web UI, give the device activation code, and create a new user account.
4. If you have a backup file, import it through the Web UI. If you do not have a backup, configure all the settings again.

More information

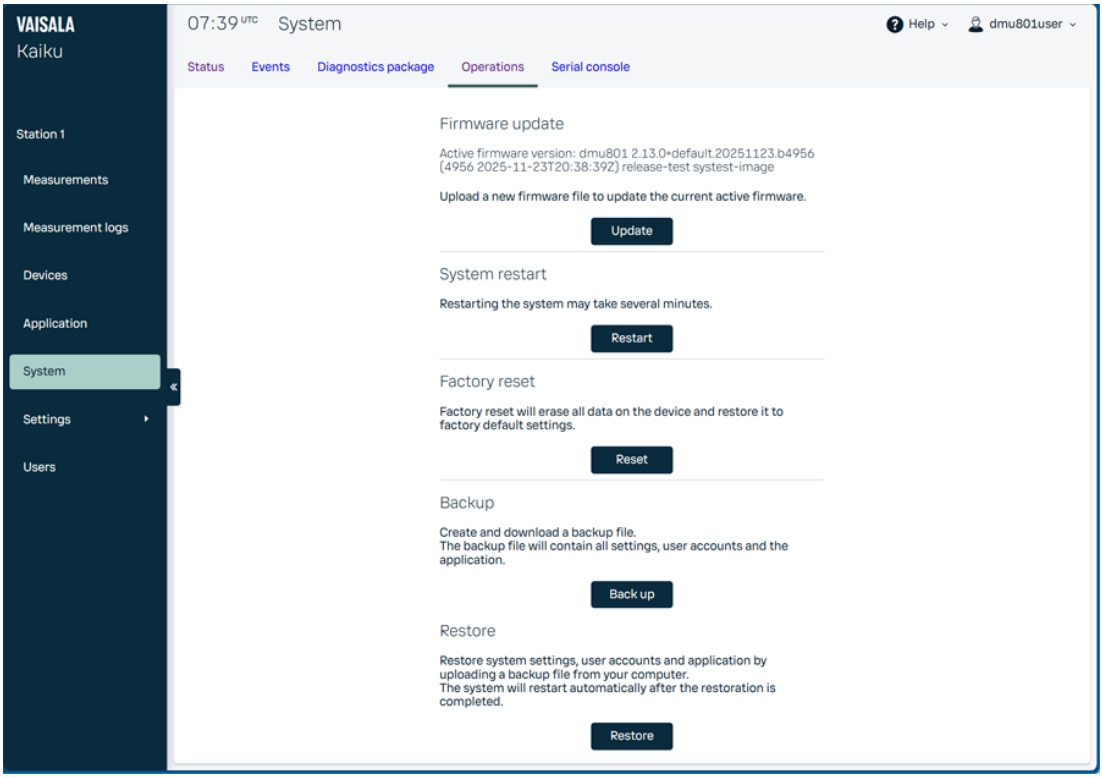
- Backing up and restoring application and system settings (page 80)

17.12 Restarting system remotely

When the application is not operating properly, restarting the system may help.

Do not restart DMU801 or the system while uploading firmware, exporting or importing settings, or calibrating sensors.

1. In the Web UI, go to **System > Operations**.



2. Under **System restart**, select **Restart**.
3. When the **Log in** page is shown, log in again.

During a system restart DMU801 turns the sensor power off and on for the sensors powered through the DMU801 **Vsupply** pins. This causes a reset for some of the sensors.

Appendix A. Observations

A.1 Observations in CSV and SMSAWS data messages

Your application may not include all the listed observations.

A dash in the table indicates that the observation period is not included in the SMSAWS message for the default application.

Table 16 Measured observations in CSV and SMSAWS data messages

Observation	Period and statistics	CSV tag	SMSAWS tag	Unit
Air temperature (dry bulb temperature)	1-minute average	TAAVG1M	TA|AVG|PT1M|||degC|	°C
	10-minute average	TAAVG10M	–	
	1-hour average	TAAVG1H	–	
	24-hour average	TAAVG1D	–	
	24-hour minimum	TAMIN1D	TA|MIN|PT24H|||degC|	
	24-hour maximum	TAMAX1D	TA|MAX|PT24H|||degC|	
Relative humidity	1-minute average	RHAVG1M	RH|AVG|PT1M|||%|	%
	10-minute average	RHAVG10M	–	
	1-hour average	RHAVG1H	–	
	24-hour average	RHAVG1D	–	
	24-hour minimum	RH1MIN1D	RH|MIN|PT24H|||%|	
	24-hour maximum	RH1MAX1D	RH|MAX|PT24H|||%|	
Dew point	1-minute average	TDAVG1M	TD|AVG|PT1M|||degC|	°C
	1-hour average	TDAVG1H	–	

Observation	Period and statistics	CSV tag	SMSAWS tag	Unit
Heat index temperature [1)]	1-minute average	HTIDXAVG1M	HTIDX|AVG|PT1M|||degC|	°C
Atmospheric pressure	1-minute average	PAAVG1M	PA|AVG|PT1M|||hPa|	hPa
	10-minute average	PAAVG10M	–	
Wind direction (primary sensor)	3-second average	WD1	WD|AVG|PT3S||1|deg|	degrees
	2-minute average	WD1AVG2M	WD|AVG|PT2M||1|deg|	
	2-minute minimum	WD1MIN2M	WD|MIN|PT2M||1|deg|	
	2-minute maximum	WD1MAX2M	WD|MAX|PT2M||1|deg|	
	10-minute average	WD1AVG10M	WD|AVG|PT10M||1|deg|	
	10-minute minimum	WD1MIN10M	WD|MIN|PT10M||1|deg|	
	10-minute maximum	WD1MAX10M	WD|MAX|PT10M||1|deg|	
Wind speed (primary sensor)	3-second average	WS1	WS|AVG|PT3S||1|mps|	m/s
	2-minute average	WS1AVG2M	WS|AVG|PT2M||1|mps|	
	2-minute minimum	WS1MIN2M	WS|MIN|PT2M||1|mps|	
	2-minute maximum	WS1MAX2M	WS|MAX|PT2M||1|mps|	
	10-minute average	WS1AVG10M	WS|AVG|PT10M||1|mps|	
	10-minute minimum	WS1MIN10M	WS|MIN|PT10M||1|mps|	
	10-minute maximum	WS1MAX10M	WS|MAX|PT10M||1|mps|	

Observation	Period and statistics	CSV tag	SMSAWS tag	Unit
Wind direction (secondary sensor)	3-second average	WD2	WD|AVG|PT3S||2|deg|	degrees
	2-minute average	WD2AVG2M	WD|AVG|PT2M||2|deg|	
	2-minute minimum	WD2MIN2M	WD|MIN|PT2M||2|deg|	
	2-minute maximum	WD2MAX2M	WD|MAX|PT2M||2|deg|	
	10-minute average	WD2AVG10M	WD|AVG|PT10M||2|deg|	
	10-minute minimum	WD2MIN10M	WD|MIN|PT10M||2|deg|	
	10-minute maximum	WD2MAX10M	WD|MAX|PT10M||2|deg|	
Wind speed (secondary sensor)	3-second average	WS2	WS|AVG|PT3S||2|mps|	m/s
	2-minute average	WS2AVG2M	WS|AVG|PT2M||2|mps|	
	2-minute minimum	WS2MIN2M	WS|MIN|PT2M||2|mps|	
	2-minute maximum	WS2MAX2M	WS|MAX|PT2M||2|mps|	
	10-minute average	WS2AVG10M	WS|AVG|PT10M||2|mps|	
	10-minute minimum	WS2MIN10M	WS|MIN|PT10M||2|mps|	
	10-minute maximum	WS2MAX10M	WS|MAX|PT10M||2|mps|	
Wind gust (primary sensor)	Direction of maximum gust within the last 10 minutes	WGD1VALUE10M	WGD|VALUE|PT10M||1|deg|	degrees
Wind gust (secondary sensor)	Direction of maximum gust within the last 10 minutes	WGD2VALUE10M	WGD|VALUE|PT10M||2|deg|	degrees

Observation	Period and statistics	CSV tag	SMSAWS tag	Unit
Rain accumulation	1 minute	PRSUM1M	PR|SUM|PT1M|||mm|	mm
	10 minutes	PRSUM10M	–	
	30 minutes	PRSUM30M	–	
	1 hour	PRSUM1H	PR|SUM|PT1H|||mm|	
	3 hours	PRSUM3H	–	
	6 hours	PRSUM6H	–	
	12 hours	PRSUM12H	–	
	24 hours	PRSUM1D	PR|SUM|PT24H|||mm|	
Rain intensity	1-minute average	PRFAVG1M	PRF|AVG|PT1M|||mmph|	mm/h
Snowfall accumulation [1)]	1 hour	SNSSUM1H	SNS|SUM|PT1H|||mm|	mm
	3 hours	SNSSUM3H	–	
	6 hours	SNSSUM6H	–	
	24 hours	SNSSUM1D	–	
Snow depth [1)]	Instant (1-minute interval)	SNH	SNH|VALUE|PT1M|||cm|	cm
	1-hour average	SNHAVG1H	–	
Net solar radiation	1-minute average	SRNAVG1M	SRN|AVG|PT1M|||Wpm2|	W/m^2
	1-hour average	SRNAVG1H	–	
	24-hour average	SRNAVG1D	–	
Global solar radiation	1-minute average	SRAVG1M	SR|AVG|PT1M|||Wpm2|	W/m^2
	1-hour average	SRAVG1H	–	
	24-hour average	SRAVG1D	–	
Sunshine duration	Daily sum	SDURSUM1D	SDUR|SUM|PT24H|||min|	min
	Current status	SDURSUM1M	SDUR|SUM|PT1M|||min|	
UV radiation	1-minute average	SRUVAVG1M	SRUV|AVG|PT1M|||Wpm2|	W/m^2
	1-hour average	SRUVAVG1H	–	
	24-hour average	SRUVAVG1D	–	

Observation	Period and statistics	CSV tag	SMSAWS tag	Unit
Soil temperature	10-minute average	TS1AVG10M	TS|AVG|PT10M||1|degC|	°C
	1-hour average	TS1AVG1H	–	
	1-hour minimum	TS1MIN1H	–	
	1-hour maximum	TS1MAX1H	–	
	24-hour average	TS1AVG1D	–	
	24-hour minimum	TS1MIN1D	–	
	24-hour maximum	TS1MAX1D	TS|MAX|PT24H||1|degC|	
Cloud base altitude	Cloud layer 1	CB1	CB1|AVG|PT1M|||m|	m
	Cloud layer 2	CB2	–	
	Cloud layer 3	CB3	–	
Cloud coverage	Cloud layer 1	CA1	CA1|VALUE|PT30M|||octa|	octa
	Cloud layer 2	CA2	–	
	Cloud layer 3	CA3	–	
	Cloud layer 4	CA4	–	
	Cloud layer 5	CA5	–	
Cloud altitude	Cloud layer 1	CL1	CL1|AVG|PT30M|||m|	m
	Cloud layer 2	CL2	–	
	Cloud layer 3	CL3	–	
	Cloud layer 4	CL4	–	
	Cloud layer 5	CL5	–	
Vertical visibility	Current visibility	VV	VV|AVG|PT10M|||m|	m
Visibility	1-minute average	VISAVG1M	VIS|AVG|PT1M|||m|	m
	10-minute average	VISAVG10M	–	

Observation	Period and statistics	CSV tag	SMSAWS tag	Unit
Present weather (WMO)	Instant present weather	PW	–	WMO METAR codes for present weather (page 171)
	15-minute present weather	PW15M	PW|VALUE|PT15M||| WMO-306-4680|	
	1-hour present weather	PW1H	–	
Present weather (METAR)	–	PWMETAR	–	WMO METAR codes for present weather (page 171)
Present weather (NWS)	–	PWNWS	–	NWS codes for present weather (page 171)
Water level [1)]	1-minute average	WLAVG1M	WL|AVG|PT1M|||m|	m
	1-hour average	WLAVG1H	WL|AVG|PT1H|||m|	
	1-hour minimum	WLMIN1H	WL|MIN|PT1H|||m|	
	1-hour maximum	WLMAX1H	WL|MAX|PT1H|||m|	
	24-hour average	WLAVG1D	WL|AVG|PT24H|||m|	
	24-hour minimum	WLMIN1D	WL|MIN|PT24H|||m|	
	24-hour maximum	WLMAX1D	WL|MAX|PT24H|||m|	
Water temperature [1)]	10-minute average	TWAVG10M	TW|AVG|PT10M|||degC|	°C
	1-hour average	TWAVG1H	TW|AVG|PT1H|||degC|	
	1-hour minimum	TWMIN1H	TW|MIN|PT1H|||degC|	
	1-hour maximum	TWMAX1H	TW|MAX|PT1H|||degC|	
	24-hour average	TWAVG1D	TW|AVG|PT24H|||degC|	
	24-hour minimum	TWMIN1D	TW|MIN|PT24H|||degC|	
	24-hour maximum	TWMAX1D	TW|MAX|PT24H|||degC|	

Observation	Period and statistics	CSV tag	SMSAWS tag	Unit
Water pressure [1]	1-minute average	PWAAVG1M	PWA|AVG|PT1M|||hPa|	hPa
	1-minute minimum	PWAMIN1M	PWA|MIN|PT1M|||hPa|	
	1-minute maximum	PWAMAX1M	PWA|MAX|PT1M|||hPa|	
	1-hour average	PWAAVG1H	PWA|AVG|PT1H|||hPa|	
	1-hour minimum	PWAMIN1H	PWA|MIN|PT1H|||hPa|	
	1-hour maximum	PWAMAX1H	PWA|MAX|PT1H|||hPa|	
	24-hour average	PWAAVG1D	PWA|AVG|PT24H|||hPa|	
	24-hour minimum	PWAMIN1D	PWA|MIN|PT24H|||hPa|	
	24-hour maximum	PWAMAX1D	PWA|MAX|PT24H|||hPa|	

1) Available only in customized applications.

Table 17 Calculated observations in CSV and SMSAWS data messages

Observation (Calculation)	Period and statistic	CSV tag	SMSAWS tag	Unit
Wet bulb temperature (MDICALC/ PRESCALC)	1-minute average	TABAVG1M	TAB|AVG|PT1M|||degC|	°C
	1-hour average	TABAVG1H	–	
Water vapor pressure [1] (MDICALC/ PRESCALC)	1-hour average	VPA1AVG1H	VPA|AVG|PT1H||1|hPa|	hPa
Wind chill [1] (WCHCALC)	1-minute average	WCHAVG1M	WCH|AVG|PT1M|||degC|	°C

Observation (Calculation)	Period and statistic	CSV tag	SMSAWS tag	Unit
QFE pressure (PRESCALC)	1-minute average	QFEAVG1M	QFE|AVG|PT1M|||hPa|	hPa
	1-hour average	QFEAVG1H	–	
	1-hour minimum	QFEMIN1H	–	
	1-hour maximum	QFEMAX1H	–	
	24-hour average	QFEAVG1D	–	
	24-hour minimum	QFEMIN1D	–	
	24-hour maximum	QFEMAX1D	–	
QFF pressure (PRESCALC)	1-minute average	QFFAVG1M	QFF|AVG|PT1M|||hPa|	hPa
	1-hour average	QFFAVG1H	–	
	1-hour minimum	QFFMIN1H	–	
	1-hour maximum	QFFMAX1H	–	
	24-hour average	QFFAVG1D	–	
	24-hour minimum	QFFMIN1D	–	
	24-hour maximum	QFFMAX1D	–	

Observation (Calculation)	Period and statistic	CSV tag	SMSAWS tag	Unit
QNH pressure (PRESCALC)	1-minute average	QNHAVG1M	QNH|AVG|PT1M|||hPa|	hPa
	1-hour average	QNHAVG1H	–	
	1-hour minimum	QNHMIN1H	–	
	1-hour maximum	QNHMAX1H	–	
	24-hour average	QNHAVG1D	–	
	24-hour minimum	QNHMIN1D	–	
	24-hour maximum	QNHMAX1D	–	
Atmospheric pressure trend (PRESCALC)	3-hour trend	PATR3H	PATR|VALUE|PT3H|||hPa|	hPa
Atmospheric pressure tendency (PRESCALC)	3-hour tendency	PATE3H	PATE|VALUE|PT3H||||	Air pressure tendency values (page 172)
Evapotranspiration (EVAPCALC/ PRESCALC)	24-hour sum	ETOSUM1D	ETO|SUM|PT24H|||mm|	mm

1) Available only in customized applications.

Table 18 System status parameters

Description	CSV tag	SMSAWS tag	Unit
DMU801 data management unit status	STATUS	STATUS|VALUE||||SCODE|	Possible values: • 0: OK • Other than 0: Internal voltages are outside of acceptable limits
Battery voltage	BATTERYV	BATTERYV|VALUE|PT1M|||V|	V
External DC voltage	EXTDC	EXTDC|VALUE|PT1M|||V|	V
System uptime	UPTIME	UPTIME|VALUE|PT1H|||h|	h

A.2 WMO METAR codes for present weather

The present weather detector reports instant present weather according to the WMO (World Meteorological Organization) code table 4678 (METAR) format.

Table 19 WMO METAR codes for present weather

Qualifier				Weather phenomena				
INTENSITY 1		DESCRIPTOR 2		PRECIPITATION 3		OBSCURATION 4		OTHER 5
–	Light	BH	Patches	DZ	Drizzle	BR	Mist	–
No qualifier	Moderate	SH	Showers	RA	Rain	FG	Fog	–
+	Heavy	FZ	Freezing	SN	Snow	DU	Widespread dust	–
				PL	Ice pellets	HZ	Haze	–

A.3 NWS codes for present weather

The present weather detector reports instant present weather according to the U.S. National Weather Service (NWS) classification.

Table 20 NWS present weather types

Present weather type	NWS code
No precipitation	C
Precipitation	P
Drizzle	L
Rain	R
Snow	S
Ice pellets	IP
Freezing drizzle	ZL
Freezing rain	ZR

NWS codes are used with an intensity indicator:

- – (minus) for light precipitation
- No indicator (space) for moderate precipitation
- + (plus) for heavy precipitation

For example, **R+** means heavy rain.

A.4 Air pressure tendency values

Table 21 Atmospheric pressure tendency as WMO code 0200

Code	Explanation
0	Increasing, then decreasing: the same as or higher than 3 hours ago.
1	Increasing, then steady: now higher than 3 hours ago.
2	Increasing (steadily or unsteadily): now higher than 3 hours ago.
3	Decreasing or steady, then increasing, or increasing, then increasing more rapidly: now higher than 3 hours ago.
4	Steady: the same as 3 hours ago.
5	Decreasing, then increasing: the same as or lower than 3 hours ago.
6	Decreasing, then steady, or decreasing, then decreasing more slowly: now lower than 3 hours ago.
7	Decreasing (steadily or unsteadily): now lower than 3 hours ago.
8	Steady or increasing, then decreasing, or decreasing, then decreasing more: now lower than 3 hours ago.

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Appendix B. Sensor settings

B.1 WMT700 settings

```
s address         ,A
s autoInt         ,1.00000
s autoPort        ,1
s autoSend        ,0
s startDelay      ,5
s com1_baud       ,4
s com1_data       ,8
s com1_parity     ,0
s com1_stop       ,1
s com1_delay      ,20
s com1_protocol   ,0
s com2_baud       ,4
s com2_data       ,8
s com2_parity     ,0
s com2_stop       ,1
s com2_delay      ,30
s com2_protocol   ,0
s com2_interf     ,0
s comOffTime      ,0.00000
s sdi12submode    ,0
s msg1            ,1
s msg2            ,2
s msg3            ,3
s msg4            ,4
s heaterOn        ,1.00000
s messages        ,1
s sleepTime       ,5
s wndAvg          ,1.00000
s wndCoast        ,0.00000
s wndCover        ,4
s wndDirOffset    ,0.00000
s wndGustTime     ,3.00000
s wndOrientation  ,0
s wndUnit         ,0
s wndVector       ,0
s aout_map        ,0
s aout1_g         ,1.00000
s aout1_o         ,0.00000
s aout1err        ,1000.00
s aout1maxv       ,32000.0
s aout1minv       ,0.00000
s aout1mode       ,3
```

```
s freqType       ,0
s aout2_g        ,1.00000
s aout2_o        ,0.00000
s aout2err       ,1000.00
s aout2maxv      ,32000.0
s aout2minv      ,0.00000
s aout2mode      ,7
s lowPower       ,0
s cal_date       ,20170407
s serial_n       ,N1430289
s serial_pcb     ,0000
s heaPeakPwr     ,30
s heaBSetpoint   ,20
s heaBMaxPower   ,100
s wndRate        ,wndRate
```

B.2 WXT530 settings

```
[Device]
Baud=9600
Data=8
Parity=None
Stopbits=1
RS-485 line delay=25
Address=1
Type=RS-485
Communication protocol=ASCII polling + CRC
[Wind]
Update interval=1
Speed unit=m/s
Direction alignment=0
Averaging time=1
Use XDR in NMEA wind=MWV
Sampling frequency=4 Hz
Gust averaging=1
[Wind message]
Direction minimum=Enabled
Direction average=Enabled
Direction maximum=Enabled
Speed minimum=Enabled
Speed average=Enabled
Speed maximum=Enabled
[PTU]
Update interval=10
Pressure unit=hPa
Temperature unit=Celsius
[PTU message]
Air temperature=Enabled
Pressure temperature=Disabled
Relative humidity=Enabled
Barometric pressure=Enabled
[Precipitation]
Auto report interval=60
Rain unit=Metric
Hail unit=Metric
Auto mode=Rain start/end
Counter reset=Overflow
Rain accumulation limit=65535
Hail accumulation limit=65535
[Precipitation message]
Rain amount=Enabled
Rain duration=Enabled
Rain intensity=Enabled
Hail amount=Enabled
Hail duration=Enabled
Hail intensity=Enabled
Rain peak=Disabled
Hail peak=Disabled
[Self diagnostic]
```

```
Update interval=15
Enable heating=Enabled
Error messaging=Disabled
[Self diagn. message]
Heating temperature=Enabled
Heat voltage=Enabled
Supply voltage=Enabled
3.5V reference voltage=Enabled
Info=Disabled
[Composite message]
Auto Report Interval=0
Direction minimum=Disabled
Direction average=Enabled
Direction maximum=Disabled
Speed minimum=Disabled
Speed average=Enabled
Speed maximum=Disabled
Analog output=Disabled
Air temperature=Enabled
Pressure temperature=Disabled
Relative humidity=Enabled
Barometric pressure=Enabled
Rain amount=Enabled
Rain duration=Disabled
Rain intensity=Disabled
Hail amount=Disabled
Hail duration=Disabled
Hail intensity=Disabled
Rain peak=Disabled
Hail peak=Disabled
Heating temperature=Enabled
Heat voltage=Enabled
Supply voltage=Disabled
3.5V reference voltage=Disabled
Info=Disabled
```

B.3 HMP155 settings

```
Serial mode     :  POLL
Baud P D S      :  9600 N 8 1
Output interval :  2 S
Serial delay    :  10
Address         :  10
Filter          :  0.800
Form            :  \001 "HMP155," ADDR \002 3.2 RH "," Ta "," U2 "," Td ","
Tdf "," Tw "," x "," STAT "," ERR \003 CS4 \r \n
Units           :  Metric
```

B.4 PTB330 settings

```
Output format   : #001 "PTB" ADDR #002 ERR " " 4.2 P " " P3H " " A3H " " P1 "
" P2 " " P3 #003 CS4 #RN
Start mode      : POLL
Baud P D S      : 9600 N 8 1
Output interval : 1 s
Address         : 20
Echo            : OFF
Module 1        : RS485-1
Module 2        : BARO-1
Module 3        : BARO-1
Module 4        : BARO-1
P               : $Metric
hPa
P3h             : hPa
P1              : hPa
P2              : hPa
P3              : hPa
DP12            : hPa
DP13            : hPa
DP23            : hPa
HCP             : hPa
QFE             : hPa
QNH             : hPa
TP1             : 'C
TP2             : 'C
TP3             : 'C
```

B.5 PWD22 settings

```
ID STRING: 7
AUTOMATIC MESSAGE   0 INTERVAL   0
BAUD RATE:   9600  N81
ALARM LIMIT 1       3
ALARM LIMIT 2       2
ALARM LIMIT 3       3
RELAY MODE        12
RELAY ON DELAY    13 OFF DELAY    5
OFFSET REF   149.14
CLEAN REFERENCES
TRANSMITTER  -0.6 RECEIVER       423
CONTAMINATION WARNING LIMITS
TRANSMITTER   1.5 RECEIVER       500
CONTAMINATION ALARM LIMITS
TRANSMITTER   5.0 RECEIVER      1000
SIGNAL SCALE 1   1.105
DAC MODE: LINEAR
 MAX VIS    2000, 10.0mA
 MIN VIS       0,  4.0mA
 20mA SCALE_1  184.3, SC_0     -3.7
 1mA  SCALE_1 3902.9, SC_0    -19.5
HOOD HEATERS USED
```

B.6 CL31 settings

```
Unit ID:         8
Port Settings
 Maintenance:    9600   bps, 8n1
 Data:           9600   bps, 8n1, rs-485
 CTS Control:    off
Modem
 Type:           N/A
 Status:         N/A
UI
 Port:           data
 Timeout:        2 min
 Echo:           off
Message Port:    data
Type:            msg2_base
Port:            data
Transmission:    request
Interval:        2 s
Transm Delay:    100 ms
Manual Msg:      disabled
Units:           feet
Height Offs:     0 ft
Angle Corr:      off
Sky Cond:        enabled
Profile
 Scale:          1.00
 Noise h2:       off
VV Limit
 Ceiling:        6562 ft
Secondary message:
 Type:            none
 Port:            maintenance
 Transmission:    none
 Interval:        2 s
```

Appendix C. AWS810 sensor connection map

The AWS810 sensor connection map shows the default sensor connections in the DMU801 plug-in modules and frame. For detailed connection descriptions, see the wiring diagrams.

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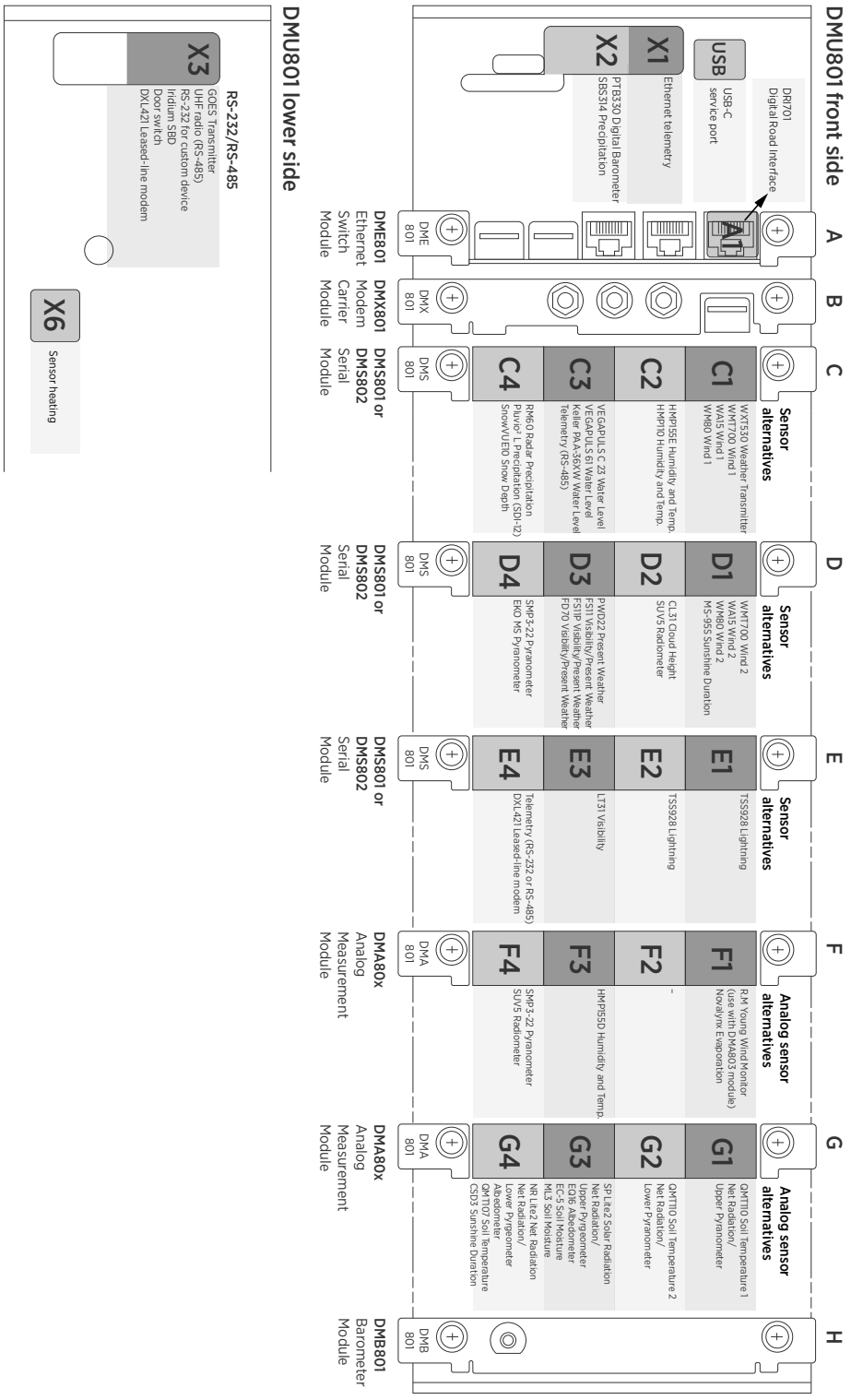


Figure 13 AWS810 sensor connection map

Appendix D. Accessories and spare parts

D.1 Safety-critical spare parts

To maintain product safety, replace safety-critical components only with the spare parts listed in the following tables. Follow the replacement instructions carefully.

D.2 ENC652 spare parts and accessories

Table 22 ENC652 spare parts

Spare part	Order code
Lock set, including key and dust cap	ASM213869SP

Table 23 ENC652 mounting kit options

Mounting kit	Order code
Wall mounting kit	234177
Mounting kit for 60 mm (2.36 in) pole mast (2 pcs)	APPK-SET60
Mounting kit for 75 mm (2.95 in) pole mast (2 pcs)	APPK-SET75
Mounting kit for 100 mm (3.94 in) pole mast (2 pcs)	APPK-SET100
Mounting kit for 106 mm (4.17 in) pole mast (2 pcs)	APPK-SET106

D.3 DMU801 spare parts and accessories

Table 24 DMU801 spare parts

Spare part	Order code
Data Management Unit DMU801	A3NNNNNNNNA1A3NNN [1)]
Analog Measurement Module DMA801	DMA801SP
Analog Measurement Module DMA802	DMA802SP
Analog Measurement Module DMA803	DMA803SP
Barometer Module DMB801	DMB801SP
Serial Module DMS801	DMS801SP
Serial Module DMS802	DMS802SP

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Spare part	Order code
Ethernet Switch Module DME801	DME801SP
Modem Carrier Module DMX801 with 4G modem	DMX801-4GSP
DMU801 connector set	262822SP
Plug-in module connector set	262861SP
Insulated connector ferrule (100 pcs)	237754SP
120 Ω termination resistor (10 pcs)	240940SP
Current loop input adapter	DCA420SP
Battery holder (10 pcs)	DRW256364SP

1) Safety-critical component.

Table 25 DMU801 accessories

Accessory	Order code
SD memory card	SD32GSP
Plug-in module slot cover set	284039SP

D.4 Powering and transient protection spare parts and components

To maintain product safety, replace safety-critical components only with the spare parts listed in the following table. Follow the replacement instructions carefully.

Table 26 Spare parts for powering and transient protection components

Item	Safety-critical	Order code
Phoenix Contact QUINT4-PS/1AC/24DC/10 AC/DC power supply unit (240 W)	Yes	271495SP
Phoenix Contact QUINT4-PS/1AC/24DC/20 AC/DC power supply unit (480 W)	Yes	271496SP
12 V / 24 Ah VRLA battery set	Yes	275547SP
12 V / 28 Ah VRLA battery set	Yes	275965SP
Battery Management Unit BMU801	Yes	BMU801SP
BMU801 connector set	No	276410SP
BMU801 NTC resistor	No	275647
Solar panel 70 W with frame, set of mounting kits, and cable	No	267871

Item	Safety-critical	Order code
Surge protector: • Surge protection plug (Phoenix Contact 2907923) • Surge protection socket (Phoenix Contact 2907924)	Yes	 • 254404SP • 254402SP
Ethernet surge protector	No	262719SP
Circuit breaker for AC (mains)	Yes	244789SP
Circuit breaker for external DC or WMT700 heating	Yes	278844
Circuit breaker for OTT Pluvio^2 L heating	Yes	278842
Circuit breaker for enclosure heating	Yes	278631
Enclosure heater without mounting plate or electronics	Yes	ASM213618
Heating control relay, 24 V DC	Yes	214992SP
Thermostatic switch	Yes	12576
TERMBOX-1200 with 1 data line	No	TERMBOX-1200SP
TERMBOX-1212 with 2 data lines	No	TERMBOX-1212

D.5 Communication device spare parts and components

D.5.1 Cellular modem components and spare parts

Table 27 Cellular modem components and spare parts

Item	Order code
Modem Carrier Module DMX801 with 4G modem	DMX801-4GSP
Omnidirectional cellular antenna with cable 10 m (32 ft 10 in)	275325
Antenna mounting kit for 60–75 mm (2.36–2.95 in) pole mast	ASM210252

D.5.2 GOES components and spare parts

Table 28 GOES components and spare parts

Item	Order code
GOES DCP transmitter	QST102-3
GOES antenna cable 5 m (16 ft 5 in)	DRW232720Z5M
GOES crossed Yagi antenna	443A
Antenna installation kit	ASM210581

Item	Order code
Protection module for GOES Antenna	212513

D.6 Masts and spare parts

Table 29 DKP210 spare parts and accessories

Item	Order code
Tiltable mast with basic accessories, 10 m (32 ft 10 in), white	DKP210W
Basic accessories	
Lifting rod	DKP200LR
Guy wire set	DKP210GW-1
Lightning protection kit	DKL201
Options	
Foundation set	DKF200-1
Winch and tilting support	DKP200IS
Winch	DKW200SP
Tilting support	DKP200TS
Additional guy wire set for DKP210	DKP210GW-2

Table 30 DKP202 and DKP203 spare parts and accessories

Item	Order code
3 m (9 ft 10 in) white aluminum mast with foundation set	DKP203W
2 m (6 ft 7 in) white aluminum mast with foundation set	DKP202W
Foundation set	DKF200-2
Options	
Screw foundation set, length 130 cm (51.18 in)	DKF200-2S13
Screw foundation set, length 200 cm (78.74 in)	DKF200-2S20
Leveling/Welding plate	DKP200LP-2
Tilt division flange	DKP200DF-2
Support stand	ASM211887SP
Lightning protection kit	DKL201

Table 31 DKE110AV/W spare parts and accessories

Item	Order code
10 m (32 ft 10 in) white composite pole mast	DKE110W
10 m (32 ft 10 in) aviation red composite pole mast	DKE110AV
Top guy wire set	DKE110-GW-RST1SP
Middle guy wire set	DKE110-GW-RST2SP
Lightning protection kit	DKL201

D.7 Support arm spare parts and accessories

Table 32 Support arm spare parts and accessories

Item	Order code
Support arm for 60-mm (2.36-in) pole mast, half-length	DKP060SUP1
Support arm for 60-mm (2.36 in) pole mast, full-length	DKP060SUP2
Support arm for 100-mm (3.94-in) pole mast, half-length	DKP12SUP1
Support arm for 100-mm (3.94-in) pole mast, full-length	DKP12SUP2
Support arm for DKE110F mast, half-length	DKE110FSUP1
Support arm for DKE110F mast, full-length	DKE110FSUP2
Support arm	10391
DKE200 mast adapter	DRW228699

D.8 Sensor spare parts and accessories

D.8.1 WMT700 options, spare parts, and accessories

Table 33 WMT700 options

Option	Order code	Configuration code
WMT703 sensor, solar low power (WMT700-CFG09)	WMT700	3C1A9A001A1A1
WMT703 sensor, heated transducers and arms (WMT700-CFG05), 150 W [1)]	WMT700	3C3A0A001A1A1
WMT703 sensor, heated transducers (WMT700-CFG06), 30 W	WMT700	3C2A0A001A1A1
WMT703 sensor, no heating (WMT700-CFG07), 0 W	WMT700	3C1A0A001A1A1

1) *Requires an additional power supply.*

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Table 34 WMT700 spare parts and accessories

Spare part or accessory	Order code
Cable 10 m (32 ft 10 in)	228260SP
Mounting adapter for support arm and pole mast	WMT70FIXSP
Mounting bracket for support arm	SENSORARMFIX60
Support arm for 60 mm (2.36 in) mast	WAC425
Mounting adapter for WS425FIX30, WS425FIX60, and WAC425	228777
Bird cage	WMT70BIRDKIT
Zero wind verifier	WMT70VERIFIER

D.8.2 WXT530 options, spare parts, and accessories

Table 35 WXT530 options

Option	Order code	Configuration code
Weather transmitter WXT531, no heating (WXT531-CFG06)	WXT530	1D1B1K1A1A1B
Weather transmitter WXT531, heated (WXT531-CFG07)	WXT530	1D1B2K1A1A1B
Weather transmitter WXT532, no heating (WXT532-CFG04)	WXT530	2D1B1K1A1A1B
Weather transmitter WXT532, heated (WXT532-CFG05)	WXT530	2D1B2K1A1A1B
Weather transmitter WXT535, no heating (WXT535-CFG08)	WXT530	5D1B1K1A1A1B
Weather transmitter WXT535, heated (WXT535-CFG09)	WXT530	5D1B2K1A1A1B
Weather transmitter WXT536, no heating (WXT536-CFG01)	WXT530	6D1B1K1A1A1B
Weather transmitter WXT536, heated (WXT536-CFG02)	WXT530	6D1B2K1A1A1B

Table 36 WXT530 spare parts and accessories

Spare part or accessory	Order code
Cable 10 m (32 ft 10 in)	222288
Cable 3.5 m (11 ft 6 in)	220496
Vaisala Configuration Tool, USB service cable	220614
Mounting kit	212792
Mounting adapter for pole mast and support arm	WMSFIX60
Radiation shield	218817SP
PTU module	WXTPTUSP
Bottom connector kit	224171
Bottom assembly with digital board	WXT530BOTTOMDIGISP

D.8.3 HMP155 options, spare parts, and accessories

Table 37 HMP155 options

Option	Order code	Configuration code
Humidity and temperature probe HMP155D, no heating, analog (HMP155-CFG05)	HMP155	D2AB11A0A0A1A0A
Humidity and temperature probe HMP155E, no heating (HMP155-CFG08)	HMP155	E1AA11A0A0E1A0A
Humidity and temperature probe HMP155E, with heating (HMP155-CFG09)	HMP155	E1AA12B0A0F1A0A

Table 38 HMP155 spare parts and accessories

Spare part or accessory	Order code
Cable 5 m (16 ft 5 in) for HMP155D	CBL210514-5M
Cable 5 m (16 ft 5 in) for HMP155E	CBL210421-5M
DTR13 radiation shield with mounting equipment	DTR13
T-probe installation adapter for DTR13	221069
DTR503 radiation shield	DTR503
Installation kit for Stevenson screen	221321
Humidity sensor	HUMICAP180R
Sintered Teflon filter	219452SP
Membrane filter	230727SP

D.8.4 HMP110 spare parts and accessories

Table 39 HMP110 spare parts and accessories

Item	Order code	Configuration code
Humidity and temperature probe HMP110 (HMP110-CFG02)	HMP110	S00A0C1A0
Radiation shield	DTR504	–
Cable 3 m (9 ft 10 in)	HMP50Z30A	–
Humidity sensor	HUMICAP180R	–
Membrane filter	DRW010525SP	–

D.8.5 PTB330 spare parts and accessories

Table 40 PTB330 spare parts and accessories

Item	Order code	Configuration code
Barometer PTB330, Class A (PTB330-CFG03)	PTB330	A9BKHHHRGBKA0A
Pressure port	16941DMSP	–
Vaisala Barometric Pressure Transfer Standard	PTB330TS	–

D.8.6 NR Lite2 spare parts and accessories

Table 41 NR Lite2 spare parts and accessories

Item	Order code
Net radiation sensor NR Lite2	274523

D.8.7 SMP series options, spare parts, and accessories

Table 42 SMP series options, spare parts, and accessories

Item	Order code
Pyranometer SMP3, including cable 10 m (32 ft 10 in)	246479SP
Pyranometer SMP6, including cable 10 m (32 ft 10 in)	246480SP
Mounting kit	KZFIXPLATE

D.8.8 SP Lite2 options, spare parts, and accessories

Table 43 SP Lite2 options, spare parts, and accessories

Item	Order code
Pyranometer SP Lite2 with cable 5 m (16 ft 5 in)	239008
Mounting kit	KZFIXPLATE
Extension cable 5 m (16 ft 5 in)	26720

D.8.9 SUV5 spare parts and accessories

Table 44 SUV5 spare parts and accessories

Item	Order code
UV radiometer SUV5, including cable 5 m (16 ft 5 in)	246484SP

D.8.10 CSD3 spare parts and accessories

Table 45 CSD3 spare parts and accessories

Item	Order code
CSD3 sensor	217078
Mounting kit	CSD3FIX

D.8.11 SBS314 options, spare parts, and accessories

Table 46 SBS314 options

Option	Order code
Rain gauge SBS314/H, heated 24 V, rainfall per pulse 0.2 mm (0.008 in), with cable 10 m (32 ft 10 in)	277148
Rain gauge SBS314 Lite, rainfall per pulse 0.1 mm (0.004 in), with cable 10 m (32 ft 10 in)	277149
Rain gauge SBS314 Lite, rainfall per pulse 0.2 mm (0.008 in), with cable 10 m (32 ft 10 in)	277150

Table 47 SBS314 spare parts

Item	Order code
Rain gauge pedestal 350 mm (13.78 in) with installation kit	RGSTAND350
Rain gauge pedestal 600 mm (23.62 in) with installation kit	RGSTAND600
Rain gauge pedestal 1140 mm (44.88 in) with installation kit	RGSTAND1140
Rain gauge spares kit (funnel screws and filters)	279853
Measuring glass	MGLASSSP
Cable 10 m (32 ft 10 in) for SBS314 Lite	CBL211358-10M
Cable 10 m (32 ft 10 in) for SBS314/H	CBL211359-10M

D.8.12 OTT Pluvio² L spare parts and accessories

Table 48 OTT Pluvio² L spare parts and accessories

Item	Order code
Precipitation gauge OTT Pluvio² L, no heating	PLUVIO2L-400
Precipitation gauge OTT Pluvio² L, heated	PLUVIO2L-400H
Installation tube for 1 m (3 ft 3 in) height	PLUVIOINST400
Installation tube for 1.5 m (4 ft 11 in) height	PLUVIOINST400-2
Mounting set for Pluvio installation tube	PLUVIOMNTSETTUBE
Cable 10 m (32 ft 10 in)	CBL210489-10M

D.8.13 PWD options, spare parts, and accessories

Table 49 PWD options

Option	Configuration code
Present weather detector PWD22, no heating (PWD-CFG07)	DNNNN4NANNNNNN
Present weather detector PWD22, heated (PWD-CFG08)	DNHNN4NANNNNNN

Table 50 PWD spare parts and accessories

Spare part or accessory	Order code
Cable 3.85 m (12 ft 8 in)	217150
Cable 8 m (26 ft 3 in)	217147
Cable 15 m (49 ft 3 in)	217148
Cable 35 m (114 ft 10 in)	217149
Calibration kit	PWA12
Controller/Receiver	PWC22
RAINCAP rain sensor	PWR211SP
Hood heater set	PWH111
Transmitter	PWT11

D.8.14 CL31 spare parts and accessories

Table 51 CL31 spare parts and accessories

Item	Order code	Configuration code
CL31 ceilometer (115 V AC) (CL31-CFG02)	CL31	1CCB1A2A1A1A2A1A
CL31 ceilometer (230 V AC) (CL31-CFG03)	CL31	2CCB1A2A1A1A2A1A
CL31 ceilometer (115 V AC) including Vaisala Sky Condition algorithm (CL31-CFG04)	CL31	1CCB1B2A1A1A2A1A
CL31 ceilometer (230 V AC) including Vaisala Sky Condition algorithm (CL31-CFG05)	CL31	2CCB1B2A1A1A2A1A
Cable 10 m (32 ft 10 in)	227120SP	–
Spare hood	CLTERMHOODSP	–

D.8.15 SnowVUE10 options, spare parts, and accessories

Table 52 SnowVUE10 options and accessories

Option	Order code
Snow depth sensor SnowVUE10	277578
Mounting kit, including mounting plate and 5 m (16 ft 5 in) cable	279013

D.8.16 PAA-36XW spare parts and accessories

Table 53 PAA-36XW spare parts and accessories

Item	Order code
Water level and temperature transmitter PAA-36XW with cable 30 m (98 ft 5 in)	255182

D.8.17 VEGAPULS C 23 spare parts and accessories

Table 54 VEGAPULS C 23 spare parts and accessories

Item	Order code
Water level radar sensor VEGAPULS C 23, Modbus RTU, with cable 5 m (16 ft 5 in)	269293

D.8.18 VEGAPULS 61 spare parts and accessories

Table 55 VEGAPULS 61 spare parts and accessories

Item	Order code
Water level radar sensor VEGAPULS 61, Modbus RTU, with cable 10 m (32 ft 10 in)	247367SP

D.8.19 QMT110 spare parts and accessories

Table 56 QMT110 spare parts and accessories

Item	Order code
QMT110 sensor with cable 10 m (32 ft 10 in)	QMT110
Extension cable 25 m (82 ft)	216547
Extension cable 1.5 m (4 ft 11 in)	223263SP

Appendix E. Recycling instructions

These recycling instructions guide you on the end-of-life treatment of this Vaisala product. As waste regulations and infrastructure vary in each country, these instructions only indicate the different components to be separated and common ways to handle them. Always follow local requirements when disposing of the product. Vaisala encourages to use the best available recycling practices to minimize related environmental impacts.

Vaisala is committed to meeting the requirements of the EU Waste Electrical and Electronic Equipment (WEEE) Directive. This directive aims to minimize the impact of electrical and electronic goods on the environment, by increasing reuse and recycling, and reducing the amount of WEEE going to landfill. This symbol indicates that the product should be collected separately from other waste streams and treated appropriately.

If applicable, Vaisala recommends removing the battery unit before recycling the rest of the device. The battery unit can be recycled separately in accordance with local waste management practices and regulations.

Integrated small sized batteries are typically left in place and removed by professionals at the recycling facilities.

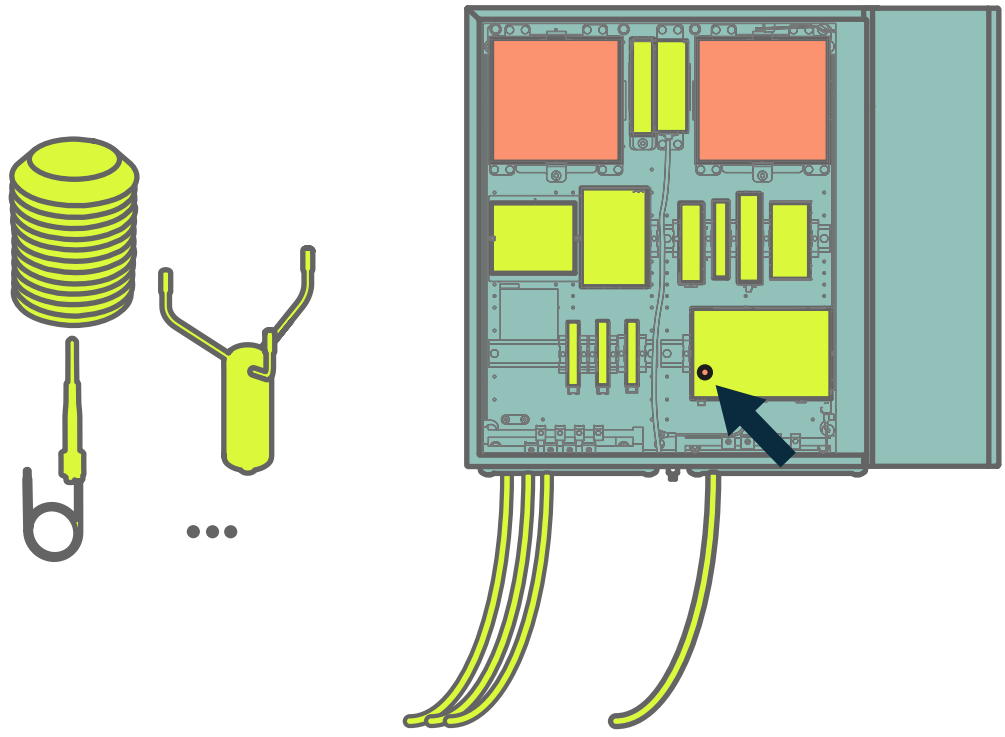


Figure 14 AWS810 materials for recycling

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Recycling	Part
Battery waste	• Backup batteries • Lithium battery inside DMU801 (CR1225/BR1225)
Electrical and electronic waste	• Sensors • Internal components • Cables
Metal waste	• Enclosure • Backplate • Mounting equipment

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Warranty

For warranty terms and conditions and the warranty claim process, see vaisala.com/warranty.

Warranty coverage may not apply if the product is damaged due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. See the applicable supply contract or Conditions of Sale for details of the warranty for each product.

Technical support



You can contact Vaisala technical support at my.vaisala.com or helpdesk@vaisala.com.
You can find all our support channels at vaisala.com/support.

When contacting technical support, provide the following 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
- Diagnostics package for the application

If applicable, also provide the following details:

- What failed (what worked / did not work)?
- Where did it fail (location and environment)?
- When did it fail (date, immediately / after a while / periodically / randomly)?
- How many failed (only one defect / other same or similar defects / several failures in one unit)?
- What was done when the failure was noticed?
- What was connected to the product and to which connectors?
- What is the input power source type, voltage, and what else (such as lighting, heaters, and motors) was connected to the same power output?
- Are all parts connected and grounded properly? Take a photo to help the troubleshooting.

Recycling



Recycle all applicable material according to local regulations.

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