MoreSense MS-07 user manual

Wireless temperature, humidity, particulate matter, CO_2, NOx and VOC sensor

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Layout

Micro SD card

3.5 inch capacitive IPS touch screen

Sensirion SEN66 multisensor

Battery button
(push shortly to switch the sensor on in battery mode. The main battery switch must be switched on. Hold for +/- 10 seconds to switch the device off)

5V USB-C

Wall mounts
(distance in between = 47 mm)

Main battery switch
(switch off to completely disconnect the battery from the sensor and charging chip)

Reset button

Chapter 1 - General description

The MoreSense MS-07 is based on the Sensirion SEN66 and measures temperature, humidity, particulate matter (PM), CO_2, NO_x, and VOC. Sensirion is a Swiss manufacturer renowned for its highly accurate sensors with a long operational lifespan.

To display measurements and adjust settings, the sensor is equipped with a 3.5-inch capacitive IPS touchscreen with a resolution of 480×320 pixels. The MS-07 also features a built-in speaker for audio playback. A 512 MB microSD memory card is included for storing measurement data and audio files. Settings can be adjusted both via the touchscreen and through the web interface.

While the sensor can be used perfectly well as a stand-alone device, connectivity has been a key focus in its design. The MS-07 can easily connect to a network via WiFi and includes an MQTT client for integration with an MQTT server so it can connect to for example Home Assistant or Domoticz. It can also be seamlessly integrated into a Homey smart home system. Measurement data can also be accessed directly via “HTTP GET” commands.

The sensor includes a 3180 mAh rechargeable battery, offering an average of 10 hours of operation on a single charge. This can vary significantly depending on your settings. To maximize battery life, use Eco Mode, which automatically cycles the sensor's power at user-set intervals.

Panasonic NCR18650BD 3180mAh

Chapter 2 - Getting started

Power

Please connect the USB cable featuring the "A-type" connector to the power adapter (100–240 V, 50/60 Hz) and attach the "USB-C" connector firmly to the sensor, ensuring it is fully inserted.

Warning: When connecting the USB-C cable, make sure the display side of the sensor is placed flat on the table to prevent mechanical stress or damage to the connector or housing. Also ensure that the USB-C connector on the sensor side is properly pressed in. A loose connection may prevent the sensor from powering up or cause it to reset spontaneously.

Continue by plugging the usb adapter into the wall socket. Subsequently, the sensor will commence its initialization sequence, which typically lasts between 10–20 seconds depending on the settings. Various messages will be displayed during this startup process. The sensor may require several minutes to stabilize. It is important to note that initial readings may exhibit significant deviations.

Location selection

The sensor is intended for indoor usage and should not be exposed to excessively humid, cold (below -10°C), hot (above 50°C), or windy conditions. The device can be utilized in both a stand-up position or mounted on a wall.

For optimal placement, the sensor should be positioned at a specific height above ground level, typically recommended between 1.5 meters and 1.8 meters. It is advisable to select an open, level area and avoid placing it near vents close to entrances, windows, etc., in order to minimize external environmental factors that could impact the accuracy of the sensor readings.

The positioning of the sensor could impact measurement precision. Placing the sensor too low may subject it to ground-level air, leading to inaccurate readings. Conversely, installing it too high could expose it to thermal convection, resulting in unstable readings. Hence, selecting an appropriate installation site is vital for obtaining precise concentration measurements.

Avoiding direct sunlight is advisable.

Sensors should not be exposed to direct sunlight, as it can distort sensor readings. Opt for a shaded spot on the sensor surface away from direct sunlight.

Preventing electromagnetic interference is crucial.

Keep the sensor clear of sources of electromagnetic interference, like induction cookers, microwave ovens, and other electrical devices. These appliances emit electromagnetic fields that might disrupt the correct functioning of the sensor.

Start Procedure

The screen brightness is always set to 100% at startup. After this, the following procedures are executed:

1. The Sensirion SEN66 is initialized and checked for proper operation.
2. The presence of a micro SD card is verified, along with a report of the available free space.
3. Connection to the Wi-Fi network*.
4. Display of the web server URL and IP address*.
5. Connection to a Homey home automation controller*.
6. Connection to the MQTT server*.
7. Setting the screen brightness according to the user’s preference.
8. Play start.wav*

* Only if configured.

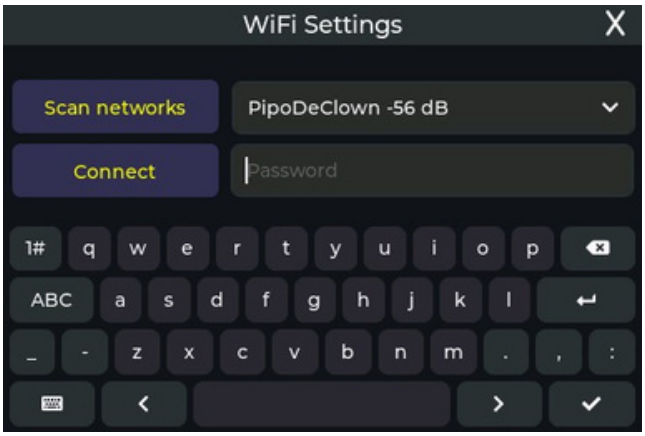
Connecting to a WiFi network

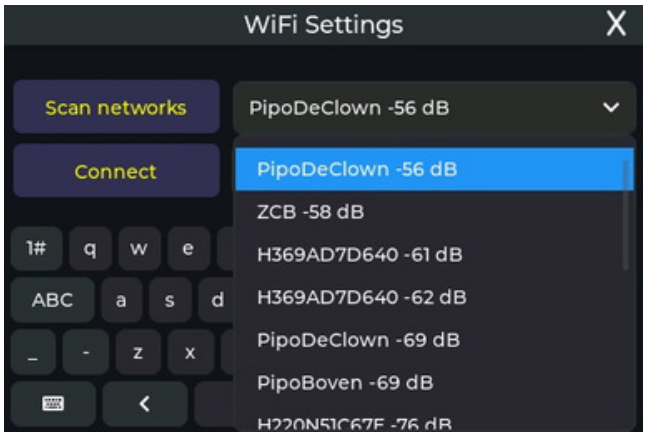
General

Connecting the sensor to a WiFi network is not mandatory. However, to store date and time information along with the measurements, it is necessary to connect the device to a WiFi network with internet access. The date and time settings are obtained from a so-called NTP (Network Time Protocol) server (pool.ntp.org). Please note that the device only operates on the 2.4 GHz band.

Connection Procedure

1. Navigate to the WiFi settings screen
2. Press the "Scan networks" button to scan all available WiFi networks.
3. Select the desired network from the upper selection box (the strongest networks are displayed first).
4. Enter the password
5. Press connect





When a connection is successful, the credentials are saved. As a fail-safe, the device will keep its previous network settings if it fails to connect to a new one. Please note that for your privacy, the last used Wi-Fi network is not shown in the list after a restart.

Guest Network Limitations

Be aware that due to possible safety limitations of your router, connecting the device to a guest network might cause the built-in web server to become inaccessible.

Dual-band routers

If you are experiencing difficulties connecting to a dual-band router with the same SSID (WiFi network name) for both 2.4 and 5 GHz, temporarily switching off the 5 GHz band on your router may help.

Web server

The web interface consists of several web pages with gauges, charts, setup options, firmware updates and an information page. By default, the web server becomes active after a successful WiFi connection. However, you may switch off the web server on the Connections page. The web server can be accessed using either an IP address or a URL (web address). The IP address and the URL can be found on info page 1 of the sensor.

By default, the URL has the following format: "http://ms-xxxx.local". "xxxx" represents the last 4 characters of the MAC address. A MAC address is a unique identifier for devices that can connect to a network. The hostname (URL) is derived from the "Unique device name, which can be modified on the initial setup page of the web server. For instance, if you change the "Unique device name" to "kitchen" the web server can then be accessed via "http://kitchen.local". Make sure to only use ASCII characters. Spaces are not allowed.

Chapter 3 - Main screens

Screen after startup

Tiles screen and status bar

Upon startup, the main screen displays nine tiles showing the current sensor readings. On the right side of each tile, three color indicators show the status of the measurement:

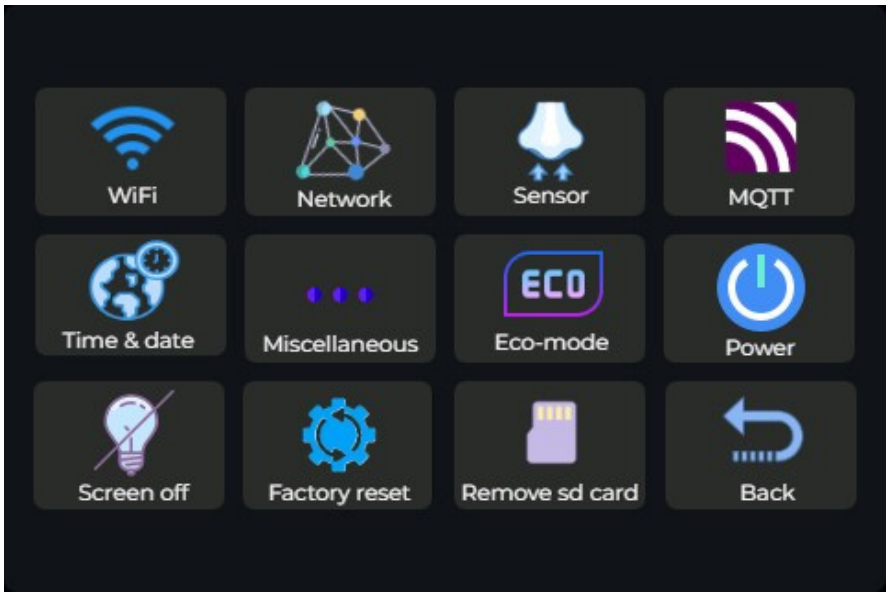
- Green: The reading is normal.
- Orange: The reading is at an acceptable warning level.
- Red: The reading has exceeded the defined limit.

All thresholds are user-definable.

A status bar at the top of the screen provides additional information about the device's status. The tile readings refresh approximately every five seconds. Elements marked with an asterisk (*) are only visible when the sensor is configured for that specific feature. To use the clock, the sensor must be connected to a Wi-Fi network with internet access to synchronize the date and time with an NTP server.

Settings

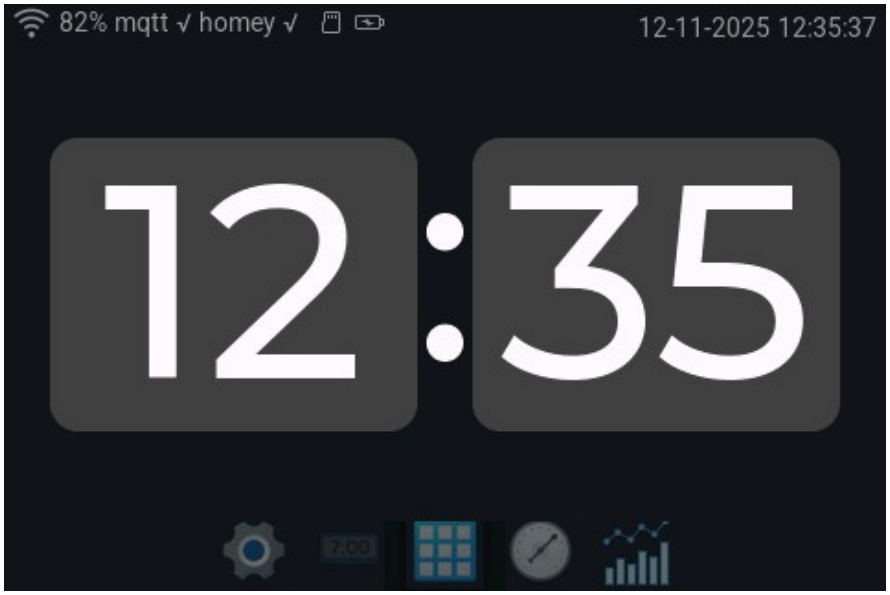
By pressing the settings button in the main menu the main settings page will appear.



Main settings screen

Clock

Click the clock button to display a 24-hour digital clock. The time shown is based on the location configured in the Time & Date settings and will automatically adjust for daylight saving time.



Gauges

Press any button to display its reading as a large gauge. This larger format is easier to read from a distance. The gauge's color (green, orange, or red) shows the current status.

Charts

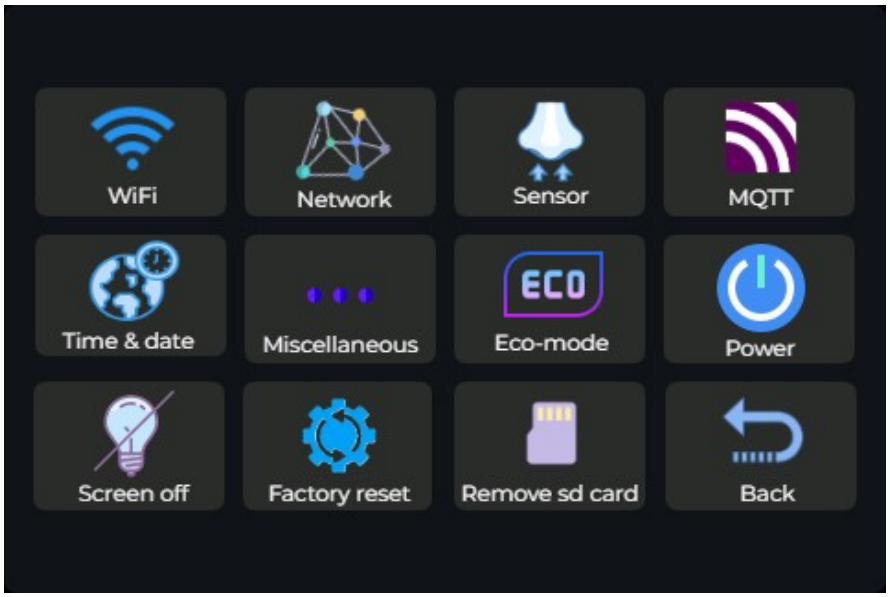
View a 24-hour graph of any reading. Tap a data point for its exact time and date. Use the slider to zoom and swipe to pan.

Chapter 4 - Settings

There are various setup screens to make adjustments for WiFi, the Sensirion SEN66 sensor, date format, time zone, home automation connections, and more. Some settings can only be changed through the web interface.

Setup menu

The setup menu contains 12 options. The first 7 options (WiFi, Network, Sensor, MQTT, Time & Date, Miscellaneous, and Eco-Mode) will open a subscreen. The last 5 options (Power, Screen off, Factory reset, Remove SD card) directly execute the corresponding functions.

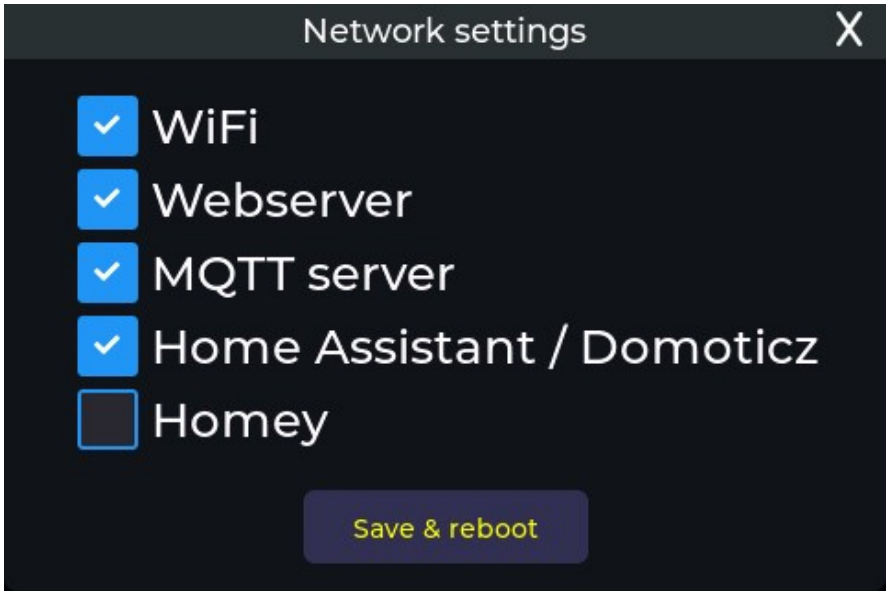


WiFi

To connect to a Wi-Fi network, please refer to the "Connecting to a Wi-Fi network" section in the "Getting started" chapter.

Network Settings

This screen allows you to enable or disable all network-related services. Press the Save & Reboot button to apply any changes.



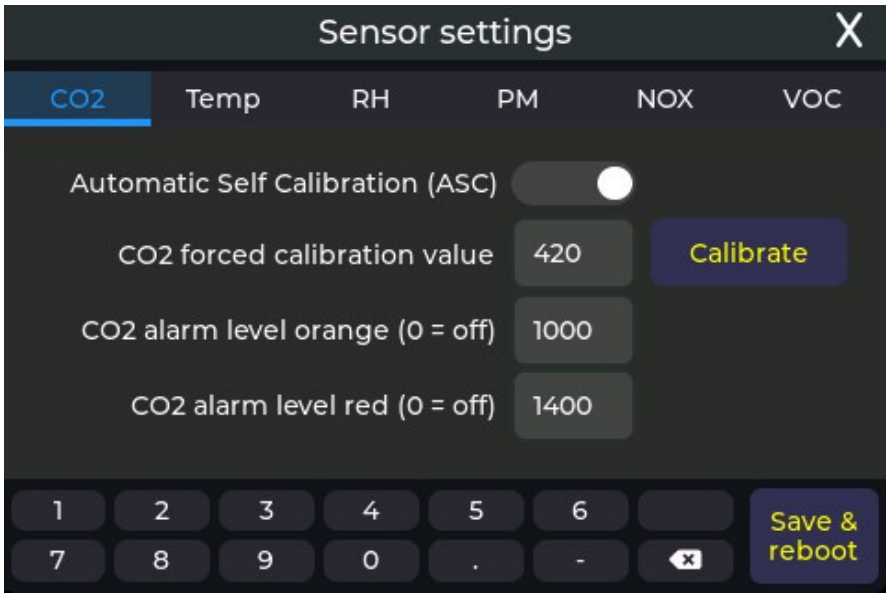
You can configure the following:

- **WiFi:** The main switch for all wireless connectivity.
- **Web Interface:** Access to the device's web portal.
- **MQTT Server:** For general home automation integration.
- **Home Assistant / Domoticz:** Enables automatic detection by Home Assistant and Domoticz when using MQTT.
- **Homey**: Enables direct integration with a Homey controller.

Warning: Disabling the main WiFi option will also disable the web server, all home automation connections, and clock synchronization. As a result, measurements will be saved without a timestamp.

Sensor settings

This page has separate tabs for each measurement type: CO2, temperature, humidity, particulate matter (PM), NOx, and VOC. Use these tabs to calibrate, adjust offsets, and set alert thresholds for each specific measurement.



CO_2 Automatic Self-Calibration (ASC)

- Purpose: Maintains the sensor's long-term accuracy by automatically correcting for measurement drift.
- Process: Every 6.5 days of uninterrupted power, the sensor uses its lowest CO_2 reading as a new 420 ppm baseline.
- Default Status: Enabled by default.
- When to Disable: Turn ASC off if the sensor is in a space where CO_2 levels rarely or never drop to 420 ppm (e.g., a constantly occupied room). Leaving it on in such an environment will cause inaccurate readings.
- Important: If ASC is disabled, perform a manual calibration about once per month.

CO_2 Forced calibration value

Normally, when the automatic calibration is activated, it is not necessary to manually calibrate the CO_2 sensor. However, the automatic calibration function assumes the sensor is exposed to fresh air (420 parts per million CO_2) once every 6.5 days. If this does not occur or if there is a significant deviation, there is also the option to manually calibrate the sensor using a reference value. This reference value can be obtained from a reliable source such as another CO_2 sensor or from the outside air, which typically contains about 420 ppm CO_2. It is important to note that in areas with heavy traffic or abundant trees and plants, the CO_2 concentration may vary significantly from the global average of approximately +/-420 ppm (2024). The sensor can be calibrated either directly on the device itself or through the web interface. The recommended method is to calibrate via the web interface to prevent the sensor from being influenced by CO_2 emitted by the user operating the device nearby.

Procedure for manual calibration

1. Set the reference value or leave it at 420 ppm when you calibrate in fresh air.
2. Make sure that before calibration the sensor has been in a stable environment for at least 5 minutes (longer = better). A stable environment is an environment where the CO_2 concentration is constant. The location should not be too windy and direct sunlight must be avoided.
3. Keep a distance of at least one meter from the device during the calibration process (no humans, animals, or plants should be closer to the device during calibration).
4. Press "calibrate".

Temperature compensation

Both the sensor itself and all other electronic components in the MoreSense MS-07 produce heat. To accurately measure the ambient temperature, it is necessary to compensate for this additional heat. In addition to the internal temperature compensation (which is not visible to the user), an extra value can be set here. By compensating for the temperature, the humidity will also be automatically adjusted.

In case the included rechargeable battery is charged, the charging electronics will produce notable heat when charging at full capacity (500 mA / 2.5 Watts). Even though this is totally safe, the temperature readings will be considerably higher than the ambient temperature. The temperature compensation does not correct for these higher temperatures because they fluctuate. After the battery is fully charged, the temperature readings will normalize. Other values are never affected by the temperature.

MQTT

On this page you can configure a connection to an MQTT server (also called MQTT broker). The section containing the fields can be swiped up or down. The MQTT settings can also be configured through the webinterface.

Available fields

- **MQTT server URL / IP Address** Enter the hostname or IP address of the MQTT broker. Prefixes such as mqtt:// or mqtts:// are not allowed.
- **Port** The network port used for MQTT communication. Default: 1883 (non-TLS) or 8883 (TLS).
- **TLS on/off** Enables or disables TLS encryption.
- **Verify server on/off** Enables server certificate verification.
- **Certificate file** (dropdown) Select a certificate file to use for TLS server verification. Certificate files can be uploaded through the webinterface.
- **Username** Enter a username if your MQTT broker requires authentication.
- **Password** Password matching the username above.
- **MQTT Client ID** (Mandatory) A unique identifier for the device on the broker.
- **Publishing topic** The topic on which the device publishes sensor readings.

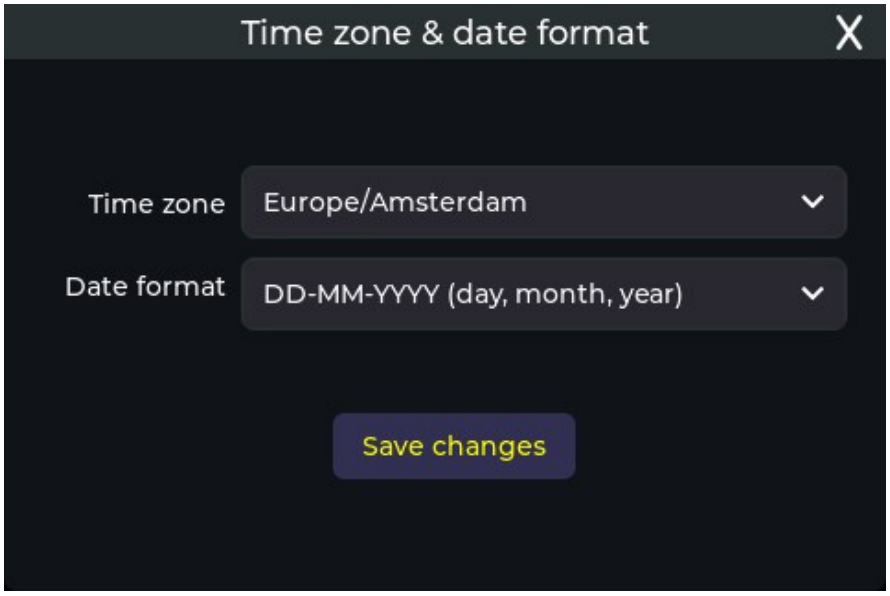
Available fields (continued)

- **Command topic** The topic the device listens to for incoming control commands.
- **Home Assistant / Domoticz autodiscovery topic** Root topic for autodiscovery systems such as Home Assistant or Domoticz.
- **Publishing interval** How often the device sends sensor data to the broker (in seconds).

After filling in the fields, you can test the connection by tapping the Test button. If the connection is successful, tap Save & reboot to store the settings and restart the device.

Time & Date

This section allows you to configure your time zone and customize the date format to your preference (e.g., DD-MM-YYYY, MM-DD-YYYY or YYYY-MM-DD). The MS-07 sensor automatically synchronizes with the pool.ntp.org server to ensure precise timekeeping. Daylight Saving Time adjustments are applied automatically based on your selected time zone.



Miscellaneous

This page contains the settings for sound effects, the volume and the screen brightness. All settings take effect immediately. If you want the settings to be saved permanently (after a power cycle) tap the "Save changes" button.

Sound effects

Disabling sound effects will mute all device audio, including the startup chime and all alarm alerts.

Volume Level

Drag the slider to set the desired volume intensity for all device sounds and alerts.

Brightness

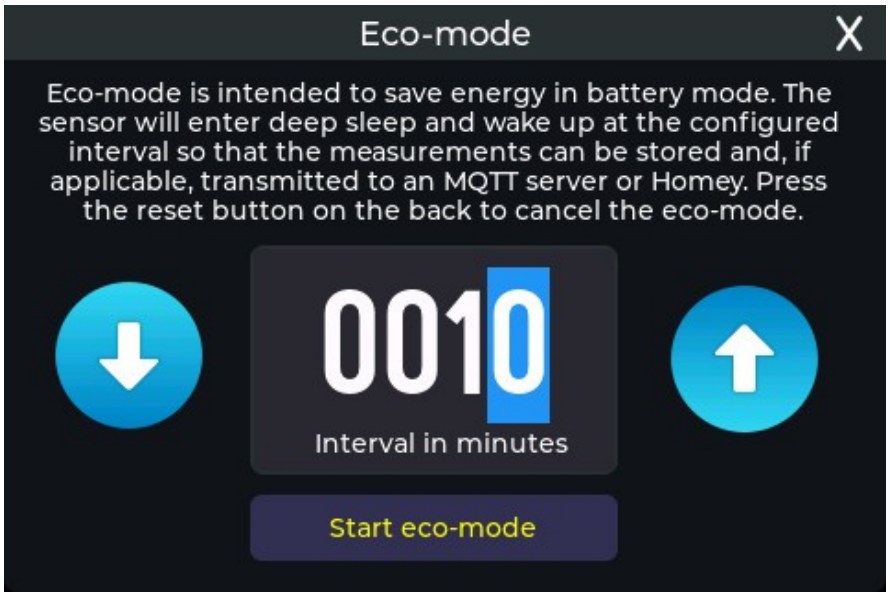
Adjust the brightness using the slider and press Save to store the setting. The slider maintains a minimum brightness level to keep the display visible. To turn the screen off completely, use the Screen off button. Tap anywhere on the screen to wake it up.

Eco-mode

This mode extends battery life by putting the sensor into deep sleep between measurements. The device wakes up at your configured interval, allows 2 minutes for sensor stabilization, and then captures, stores (internal & microSD), and transmits data (MQTT/Homey).

Please note: Due to the lack of device self-heating during sleep, temperature readings will be lower and humidity readings higher compared to standard operation.

To cancel Eco-mode and return to normal operation, press the reset button on the back.



Power

Tap this button to turn off the sensor (standby). To reactivate the device, press the Reset button on the back.

Note: Even when turned off via the screen, the sensor consumes a small amount of power. For long-term storage, we recommend turning off the physical battery switch on the back to prevent battery drain.

During charging, power consumption may peak at approximately 3 Watts.

Screen off button

Use this button to turn off the display completely. This is ideal for dark environments (e.g., bedrooms) and helps conserve power when running on battery. To reactivate the screen, simply tap anywhere on the display.

Factory reset

Press this button to restore the device to its factory default settings. You will be asked to confirm this action. Once confirmed, all custom settings and internal data will be permanently erased. Data stored on the microSD card will remain unaffected.

Remove the microSD card

To ensure no data is lost or corrupted, tap Remove SD card to prepare the card for removal. You can then safely take it out of the device.

Chapter 6 - Web Interface

The web interface can be used to read sensor values, consult historical data, adjust settings, and perform firmware updates. The web server becomes active (unless deactivated) after the device has been connected to a WiFi network and can be accessed via a browser using either an IP address or a URL (web address). The website is optimized for viewing on a PC, laptop, or tablet, but it is also accessible on a smartphone. Please note that the device must be connected to the same network as the sensor. Both the IP address and the hostname are shown during startup.

When entering the IP address or hostname, your browser will probably show a "Not Secure" message. Because the sensor only operates on your local network which is a trusted environment there is no risk for unauthorized access from outside your local network; the "Not secure" warning can be safely ignored.

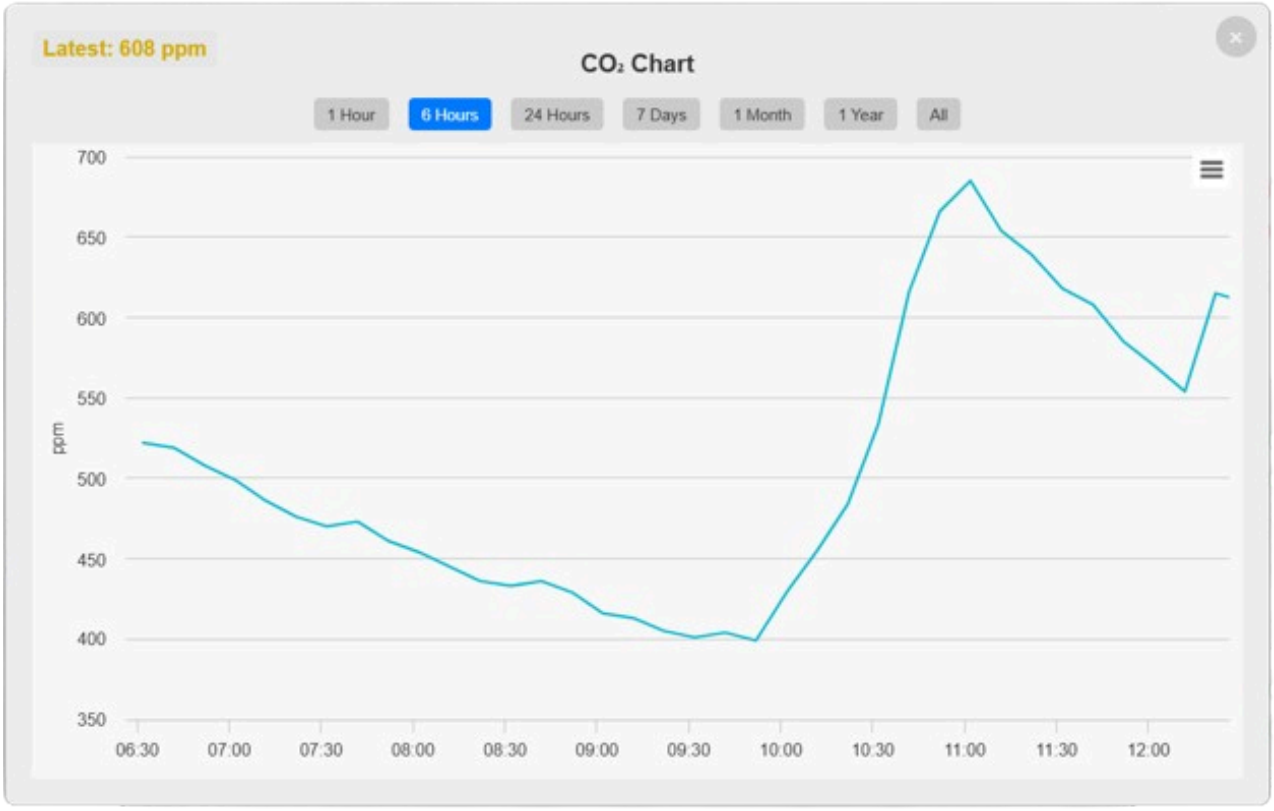
Top and bottom bars

On the far left of the top bar, the device name is displayed. The name consists of the characters "ms-" followed by the last four characters of the MAC address. On the right side of the bar, there are two menu options, "Gauges" and "Settings," and a button to change the appearance of the page from a light to a dark theme and vice versa.

Gauges page

After entering the URL or IP address in your browser, the homepage with gauges will appear (see previous page). Clicking the charts icon opens a pop-up displaying historical data for that measurement type.

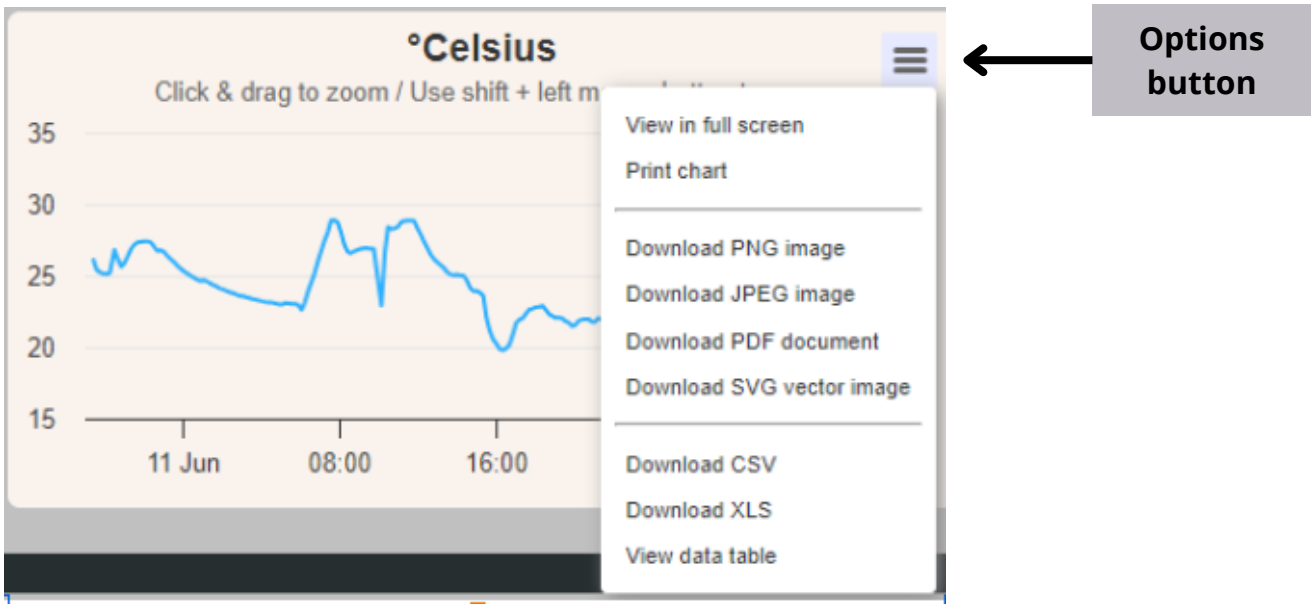
This data is stored in a CSV file (moresense.csv) on the flash drive, which can contain a maximum of 56,880 records. Since measurements are logged every 10 minutes (144 records per day), the file can store up to one year and 30 days of data. Once this limit is reached, the file is automatically reduced to 52,560 records, which corresponds to exactly one year of data.



Charts page (continued)

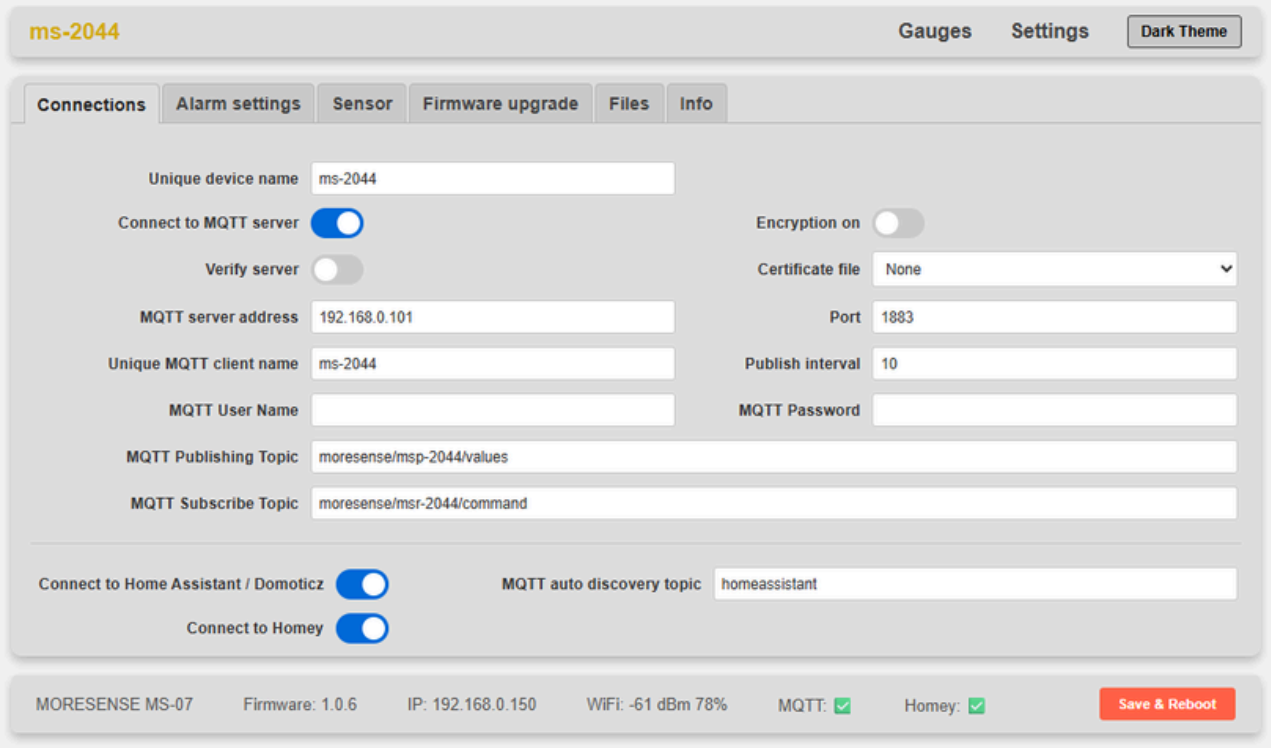
If you want to see the actual records enter the following address in your browser: http://ms-xxxx.local/moresense.csv (replace ms-xxxx with your specific device name).

For every graph you can click the options button. This will open a dropdown menu with additional options for viewing and downloading the data in all kinds of formats.



Settings page

The settings page is organized into several pages for different configurations, including connections, alarm levels, and sensor settings. Additionally, pages are available for firmware upgrades, file management, and general information.



Connections page

Unique device name

By default, the device name is composed of "ms-" and the last 4 characters of the MAC address, but this name can be changed to your own wishes. To "**bedroom"** for example. The unique device name will also determine the URL address (this will become **http://bedroom.local**) as well as the name for Homey. If you have already added the sensor to Homey you will have to manually rename the Homey device name too. Do **not** add the extension ".local" and use a maximum of 40 alphabetic and/or numerical characters. Spaces are not allowed.

Connect to MQTT server

Switch the button to the right if you want the sensor to connect to an MQTT server (also called MQTT broker). Make sure to also enter all necessary parameters for the MQTT server.

Encryption on

Toggle this switch to enable encryption for the MQTT server connection. Note that encrypted and unencrypted connections typically use different default ports.

Verify Server

Enable this option to verify the identity of the MQTT server. When this check is active, the sensor will validate the server's security certificate during the connection process.

Certificate File (Dropdown)

Use this dropdown menu to select the specific CA certificate (Certificate Authority) required for the encrypted connection.

- Note: Before a certificate can be selected here, it must first be uploaded via the Files page. Once uploaded, the file will automatically appear in this list.

MQTT server address

The MQTT address can be either an IP address (i.e. **192.168.0.101**) or a URL (i.e. **test.mosquitto.org**). Do **not** use any prefixes like MQTT://, HTTP:// or HTTPS://. Do also **not** add the port number to the URL yet.

Port number

The default port number for most MQTT servers is 1883. For secure, encrypted connections, port 8883 is typically used.

Unique MQTT client name

This is the name by which the sensor identifies itself to the MQTT server. It is used to distinguish the sensor from other MQTT clients on the same network.

MQTT user name and password

These are the credentials used to log in to your MQTT server. Whether these are mandatory depends on your specific server settings.

MQTT Publishing topic

The publishing topic determines the location to which the measurement data is sent. You can compare a topic to a directory structure on a computer. In many cases, providing only the last part of the topic is sufficient.

The data is sent in the "JSON" format and looks like this:

{"ClientID":"ms-2044","Date":"25-04-2026","Time":"14:38:15","TempCelsius":20.38,"TempFahrenheit":68.68,"Humidity":49.69,"PM1":1.80,"PM25":3.80,"PM40":5.40,"PM10":6.20,"CO2":793,"NOX": 1,"VOC":499}

MQTT Subscription topic

Via the subscription topic the sensor can receive commands. The commands must be in JSON format like: **{ "cmd" : "command" }** or in case a value is required **{ "cmd" : "command", "value" : 100 }** The following commands are available:

{ "cmd" : "setbright", "value" : 100 } Screen brightness (value 5-100%)
{ "cmd" : "screenoff" } Screen off
{ "cmd" : "screenon" } Screen on

MQTT publish interval in seconds

This is the interval in seconds to send the measurement data to the MQTT server. To avoid overhead, it is advisable to maintain an interval of at least 10 seconds.

Connect to Home Assistant / Domoticz

When this option is enabled, the device will publish MQTT messages (one for each sensor value) to the "Autodiscovery" topic. This informs Home Assistant and Domoticz which sensors are available, how to configure them, and where to find the measurement data. Both platforms require an MQTT client to be installed and properly configured. Additionally, an active MQTT server (broker) is required. Please note that Home Assistant can also connect via REST. A detailed explanation on how to connect the sensor to Home Assistant and Domoticz is provided further on in this manual.

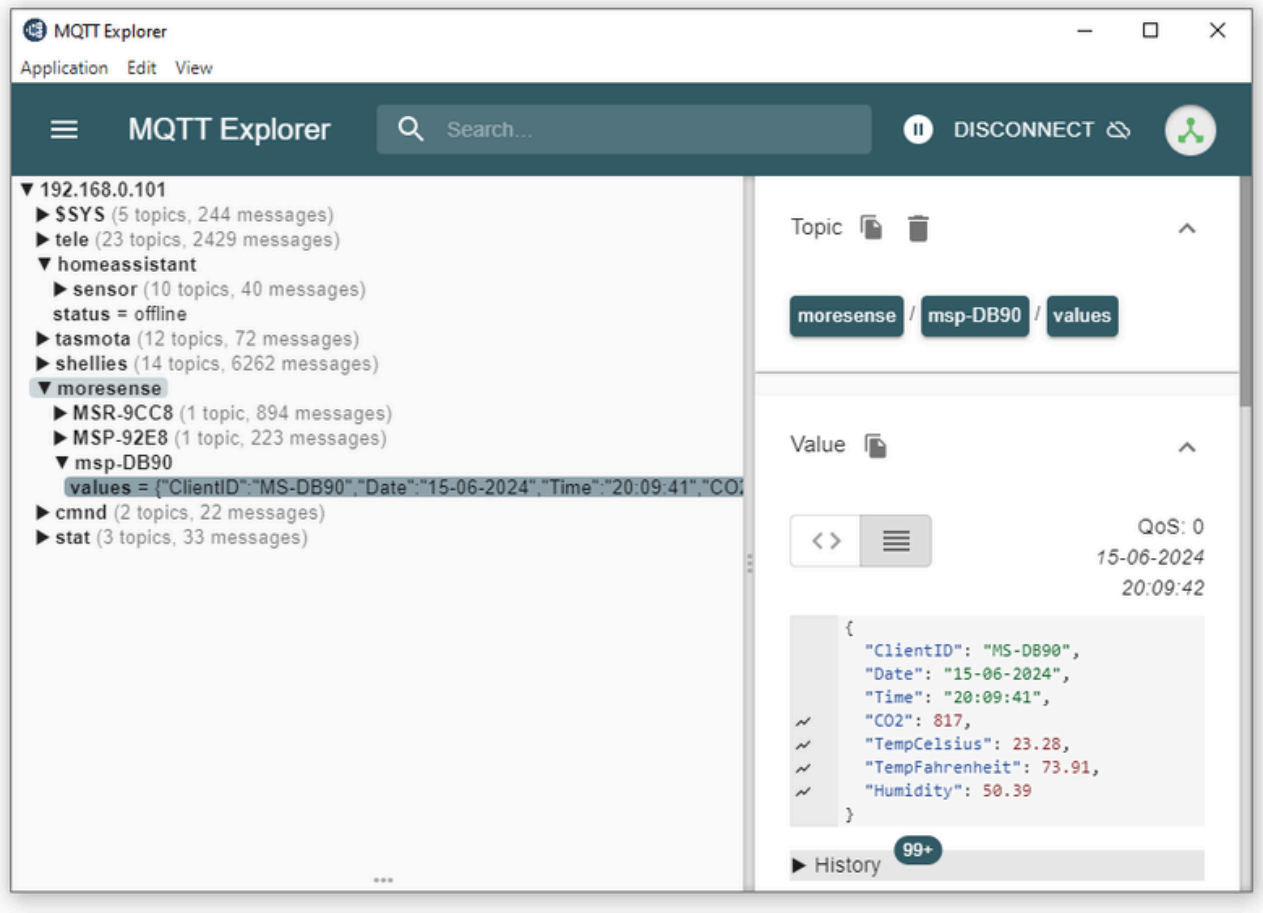
Auto discovery path

This is the topic (or path) where Home Assistant and Domoticz will look for available sensors. The default topic for both Home Assistant and Domoticz is just "**homeassistant"**. There is no need to add "**sensor"** to this path.

Testing MQTT client

If you have not installed an MQTT server yourself, you can use a test server on the Internet (i.e. test.mosquitto.org). But please note: all data you send is public.

A useful program for checking MQTT messages is the free-to-use program MQTT explorer (https://mqtt-explorer.com/). This program is available for various platforms including Linux and Windows.



MQTT explorer

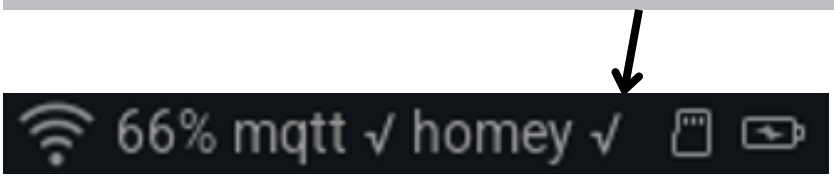
Connect to Homey

The MoreSense MS-07 can connect directly to a Homey controller. There is no need for an MQTT server.

Follow the following steps to connect the MoreSense MS-07 to a Homey controller.

1. Make sure both Homey and the sensor are connected to the same network
2. Install the Homeyduino app on your Homey
3. On the MoreSense setup page switch the "Connect to Homey" to **on** and click the "**Save & reboot"** button
4. Add the MoreSense MS-07 sensor to your Homey (select add device, choose the Homeyduino App and follow Homey's instructions)

On the status bar you can check whether the sensor is connected to Homey. After a sensor restart it can take a couple of seconds before the check marker shows up.

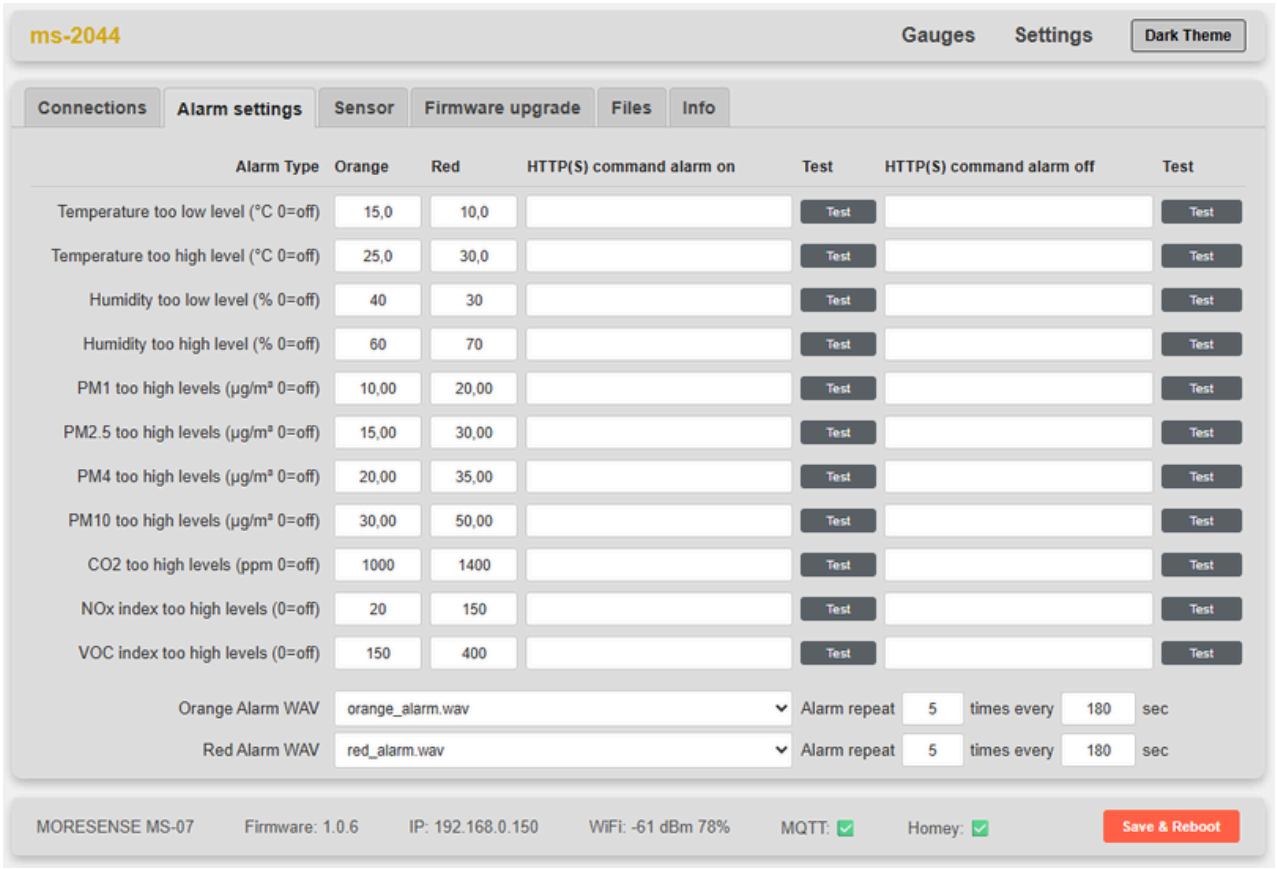


If you change the unique device name of the MS-07 you will also have to change the name on your Homey controller.

Homey is updated every 10 seconds.

Homey pro

Alarm Settings



Smart plug with Tasmota firmware

Alarm Notifications and Thresholds

The MoreSense MS-07 features extensive alarm notification options. Two separate alarm levels—Warning (Orange) and Critical (Red)—can be configured for each measurement type.

HTTP GET Commands

When the first alarm threshold (Orange) is exceeded, the sensor can trigger a predefined HTTP GET command. Once the value drops back below the threshold (including a 10% margin to prevent rapid switching/oscillation), an "OFF" command can be sent.

- Example: You can automatically trigger a smart plug to activate a ventilation system when CO2 levels are too high.
- Testing: You can use the "Test" buttons to verify if your commands are working correctly.

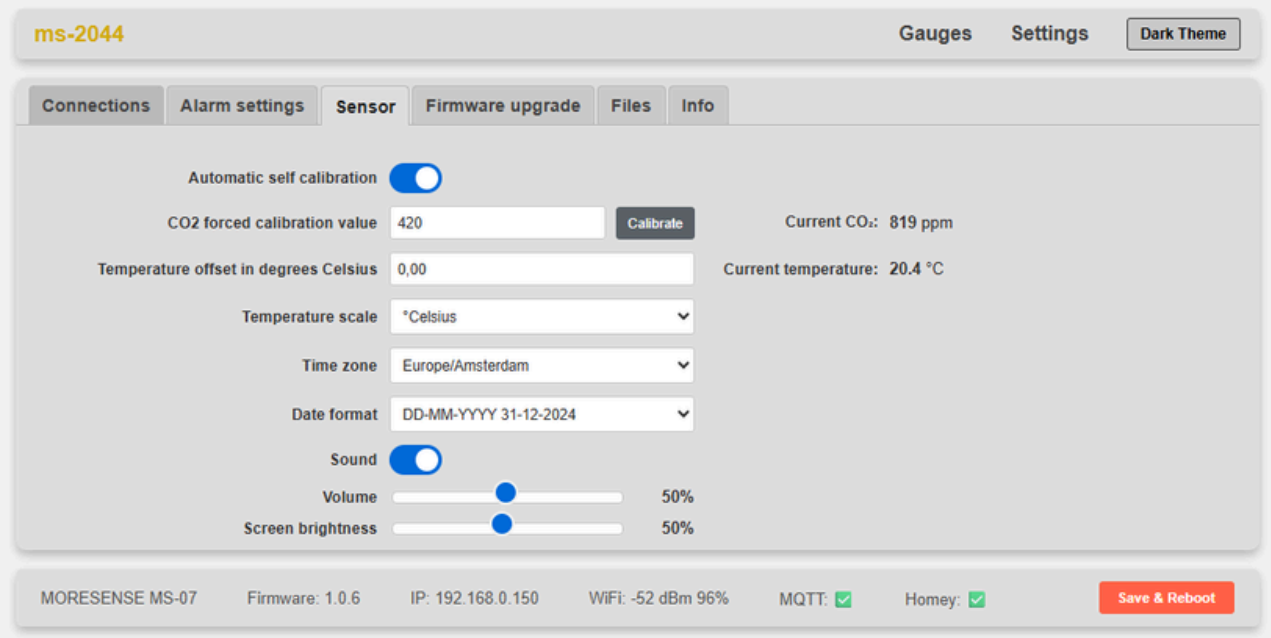
Visual Indicators

The configured alarm values also determine the colors of the meters and "traffic lights" on both the physical sensor's display and the Gauges page of the web interface.

Audible Alarms

Additionally, the sensor can play audible alarms when the Orange or Red thresholds are exceeded.

- Audio Files: You can select specific alarm sounds in the form of .wav files from a dropdown menu.
- File Management: These sound files can be played, uploaded, or deleted via the Files page.
- Frequency: You can also adjust the frequency (repetition interval) of the alarm sounds to suit your needs.



Sensor page

The Sensor page allows you to configure various device settings. This is also where you can calibrate the CO2 and temperature sensors to ensure maximum accuracy.

Automatic Self-Calibration (ASC)

The Sensirion SEN66-T is equipped with an Automatic Self-Calibration (ASC) algorithm designed to compensate for sensor drift over its lifetime.

- How it works: The algorithm tracks the lowest CO2 concentration measured over a period (every 6.5 days) and assumes this minimum value corresponds to fresh outdoor air (approximately 420 ppm).

- Requirement: For ASC to function correctly, the sensor must be exposed to fresh air (or a well-ventilated room with outdoor-level CO2) at least once during this period. This makes it an ideal "set-and-forget" option for standard environments.

CO2 Forced Calibration Value

This option allows you to manually calibrate the CO2 sensor based on a specific reference value. This reference can be obtained from another calibrated sensor or by using outdoor air.

Please refer to the CO2 calibration procedure elsewhere in this manual.

Temperature Offset (Celsius)

Although every sensor is individually tested and calibrated before shipment, specific environmental factors or housing conditions may require a temperature adjustment. Use this field to apply a positive or negative offset to the readings.

Temperature Scale

This dropdown menu allows you to choose your preferred unit of measurement: Degrees Celsius (°C) or Degrees Fahrenheit (°F). This setting will update all temperature readings across the display and the web interface.

Time Zone and Date Format

Configure your local time zone and preferred date format here. The internal clock automatically adjusts for Daylight Saving Time (summer and winter time).

Sound and Volume

Use this toggle to enable or disable alarm and sound effects. The volume slider determines the output level.

- Note: These changes take effect immediately, but they will only be permanently stored after clicking Save & Reboot.

Screen Brightness

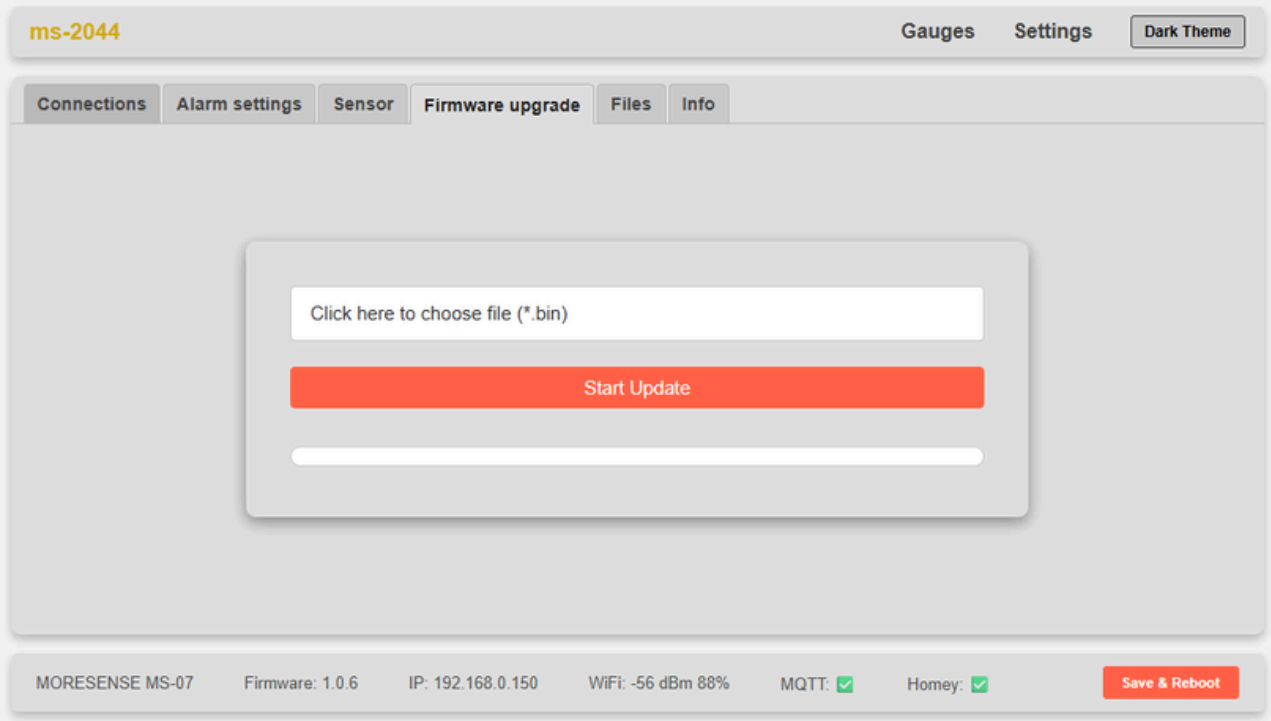
Adjust the display brightness to your preference. As with the sound settings, the change is visible immediately, but you must click Save & Reboot to save the setting permanently.

Firmware upgrade page

If there is a new firmware release on this page you can perform the firmware update. You can check your current firmware in the footer bar.

The file name should have the following format: **MS07_Vn.n.n.bin** (n.n.n. stands for the firmware version)

Before updating, make sure you have a good WiFi connection. Select the file from your device and click the "**update"** button. While updating a progress bar is shown. After the update has been completed, the sensor will reboot and the browser will be redirected to the gauges page.



Firmware update page

Chapter 7 - Connecting to Home Assistant

The sensor can be connected to Home Assistant (HA) via either an MQTT server or REST (HTTP GET). Both options will be covered.

Connecting HA via an MQTT server

First of all you will need an MQTT server that acts like an intermediate station in between the sensor and HA. Secondly HA needs to have MQTT client software installed. If you do not already have an MQTT server (also called broker) running you can install an MQTT server and client on the same system HA is running. By installing the Mosquitto MQTT broker both the MQTT broker and MQTT client will be installed.

Home Assistant

Installing Mosquitto MQTT broker & client on HA version 2024.6.3

Follow the next steps to install the Mosquitto MQTT broker and client on HA. Please note that on other versions of HA the procedure may be different.

1. From the HA main page click "**Settings"**
2. Select "**Add-ons"**
3. In the lower right corner click on the "**ADD-ON STORE"** button
4. Search for "**Mosquitto"**
5. Select "**Mosquitto broker**"
6. Click "**INSTALL**" and wait for the Mosquitto broker to be installed
7. Make sure the "**Start on boot**" option is switched on
8. Click the **start** button
9. From the HA main page click "**Settings**" again
10. Select "**Devices & Services**"
11. Search for **MQTT**
12. In the "**Discovered**" list select "**MQTT**" and click "**CONFIGURE**"
13. Click the "**SUBMIT**" button in the "MQTT Broker via Home Assistant add-on" pop-up screen
14. A pop-up "**Success**" message should now appear

Connecting the sensor to the MQTT broker on the MoreSense MS-07

1. Open a web browser and go to the MoreSense **setup** page
2. Switch on "**Connect to MQTT server**"
3. Enter the **MQTT server address** (default is homeassistant.local, IP address may also be used)
4. Enter the **user name** and **password** (the same as needed to log in to home assistant)
5. Leave the default settings for the "**MQTT publishing topic**" (moresense/msp-**xxxx**/values) and "**Auto discovery path**" (homeassistant). **xxxx** stands for the last 4 MAC characters
6. Switch on the "**Connect to Home Assistant / Domoticz**" option
7. Click the "**Save & reboot**" button and check whether the sensor can connect to the MQTT server
8. The sensors should now be available in HA.

Installing Mosquitto MQTT client only on HA version 2024.6.3

If you already have an MQTT server running there is no need to install the Mosquitto broker. Just the client is enough (in HA it is called "**MQTT integration"**). The easiest way is to connect the sensor to the MQTT broker first (see previous page) so the sensor will be immediately visible once the MQTT client is installed.

1. From the HA main page click "**Settings**"
2. Select "**Devices & Services**"
3. Search for "MQTT". If found, the MQTT client is already installed. Just make sure it is properly configured
4. If not found, click "**ADD INTEGRATION**" and search again for MQTT. Select just **MQTT** 2 more times until the MQTT configuration screen is shown
5. Enter the MQTT broker address (URL or IP address), the user name and password and press "**SUBMIT**"
6. After a successful connection a "Success!" message will appear showing the MoreSense MS06 sensor

Connection to Home Assistant via "REST"

You can also connect to Home Assistant via REST. In this case you need to adjust the configuration.yaml of Home Assistant. To do this, add the text on the next page to the configuration.yaml file. Replace ms-XXXX.local with the unique device name + the extension .local or the IP address of the sensor. On the sensor both WiFi and the Web server need to be switched on. Make sure all indentations, blank lines etc. are exactly the same as in the text.

After the adjustment and a restart of Home Assistant, the sensor should become visible in the entities of Home Assistant. In the Settings->Devices & Services->Entities section you can assign an area to the entities. If you want more information on how to edit the yaml configuration file please refer to: https://www.home-assistant.io/docs/configuration/

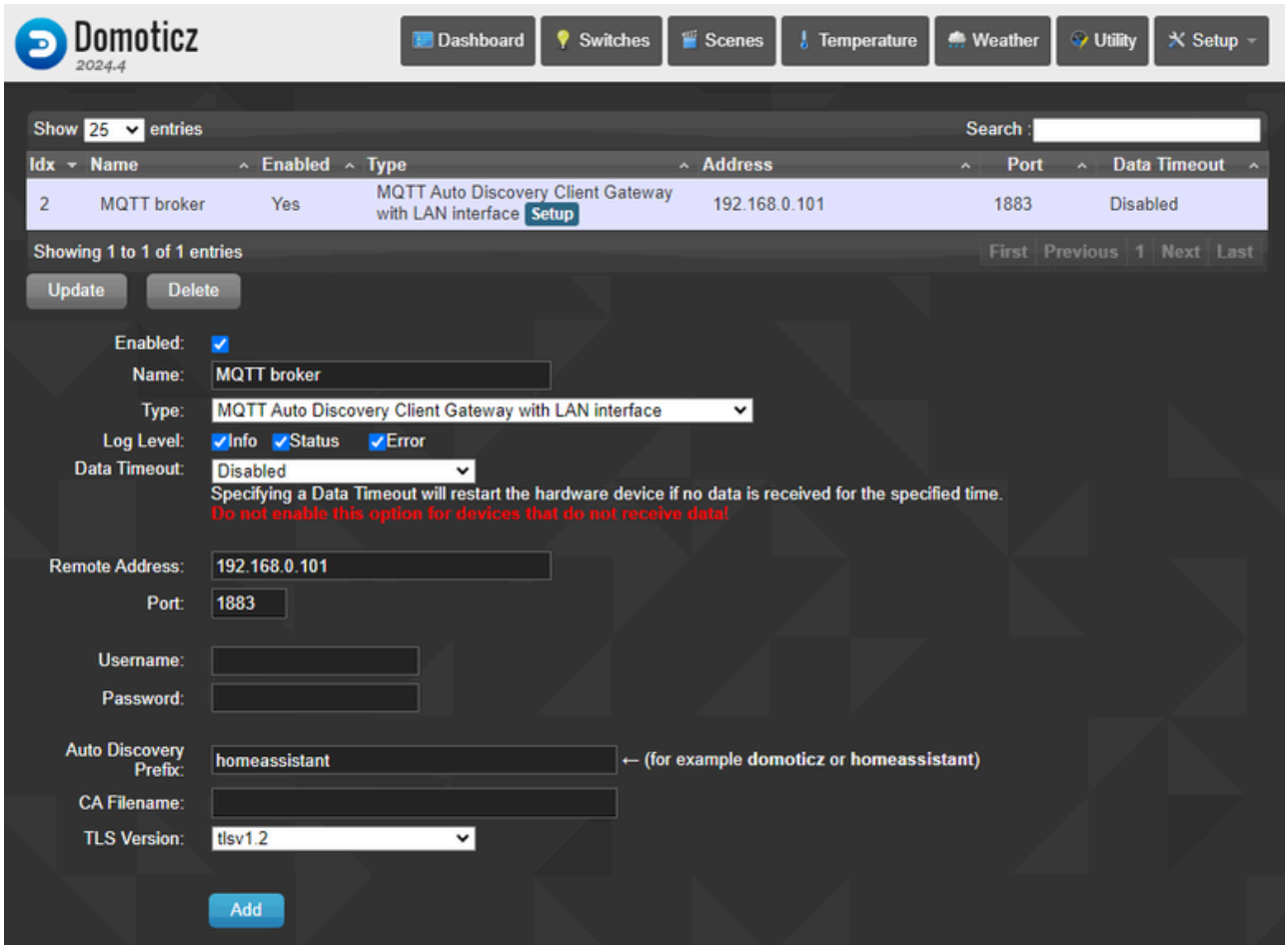
```
rest:
  - resource: http://ms-xxxx.local/values
    scan_interval: 10
    sensor:
      # Sensor for Temperature
      - name: "MoreSense MS-07 Temperature"
        unique_id: MoreSense MS-07_temp_celsius
        value_template: "{{ value_json.tempCelsius }}"
        device_class: temperature
        unit_of_measurement: "°C"
        state_class: measurement

      # Sensor for Humidity
      - name: "MoreSense MS-07 Humidity"
        unique_id: MoreSense MS-07_humidity
        value_template: "{{ value_json.humidity }}"
        device_class: humidity
        unit_of_measurement: "%"
        state_class: measurement

      # Sensor for CO2
      - name: "MoreSense MS-07 CO2"
        unique_id: MoreSense MS-07_co2
        value_template: "{{ value_json.co2 }}"
        device_class: carbon_dioxide
        unit_of_measurement: "ppm"
        state_class: measurement

      # Sensor for Particulate Matter PM1.0
      - name: "MoreSense MS-07 PM1.0"
        unique_id: MoreSense MS-07_pm1
        value_template: "{{ value_json.pm1 }}"
        device_class: pm1
        unit_of_measurement: "µg/m³"
        state_class: measurement
        icon: mdi:blur

      # Sensor for Particulate Matter PM2.5
      - name: "MoreSense MS-07 PM2.5"
        unique_id: MoreSense MS-07_pm25
        value_template: "{{ value_json.pm25 }}"
        device_class: pm25
        unit_of_measurement: "µg/m³"
        state_class: measurement
        icon: mdi:blur

      # Sensor for Particulate Matter PM4.0
      - name: "MoreSense MS-07 PM4.0"
        unique_id: MoreSense MS-07_pm40
        value_template: "{{ value_json.pm40 }}"
        unit_of_measurement: "µg/m³"
        state_class: measurement
        icon: mdi:blur

      # Sensor for Particulate Matter PM10
      - name: "MoreSense MS-07 PM10"
        unique_id: MoreSense MS-07_pm10
        value_template: "{{ value_json.pm10 }}"
        device_class: pm10
        unit_of_measurement: "µg/m³"
        state_class: measurement
        icon: mdi:blur

      # Sensor for VOC (Volitile Organic Compounds)
      - name: "MoreSense MS-07 VOC Index"
        unique_id: MoreSense MS-07_voc
        value_template: "{{ value_json.voc }}"
        state_class: measurement
        icon: mdi:chemical-weapon

      # Sensor voor NOx (Nitrogen oxides)
      - name: "MoreSense MS-07 NOx Index"
        unique_id: MoreSense MS-07_nox
        value_template: "{{ value_json.nox }}"
        state_class: measurement
        icon: mdi:smog
```

Chapter 8 - Connecting to Domoticz

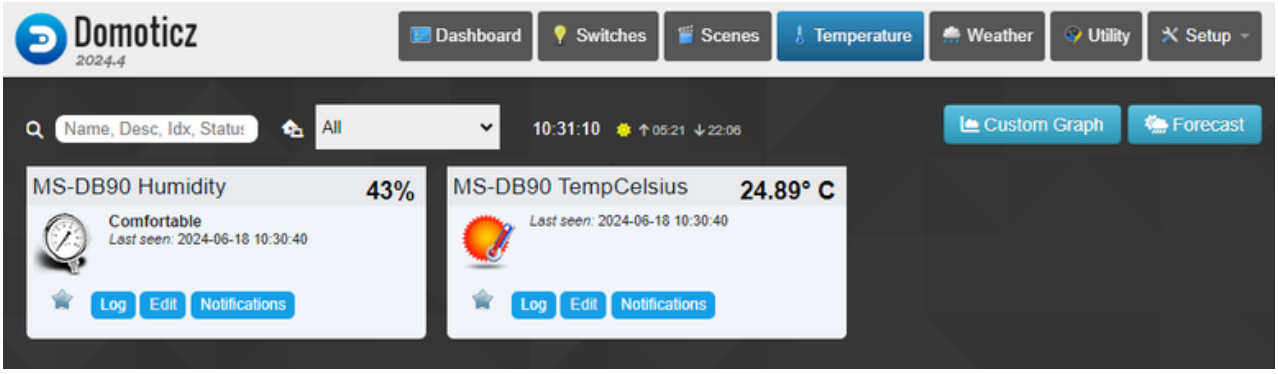
The easiest way to connect the sensor to Domoticz is using an MQTT broker. For installing an MQTT broker on your Domoticz system please refer to **https://www.domoticz.com/wiki/MQTT**

Domoticz also makes use of the so called "Auto discovery" method. This means that Domoticz checks the "Auto discovery" topic on the MQTT broker for available sensors, how to configure them and on which topic to find the actual measurements. This "Auto Discovery" message (generated by the sensor) is exactly the same for both Domoticz and Home Assistant. Follow the next steps to connect the sensor to Domoticz.

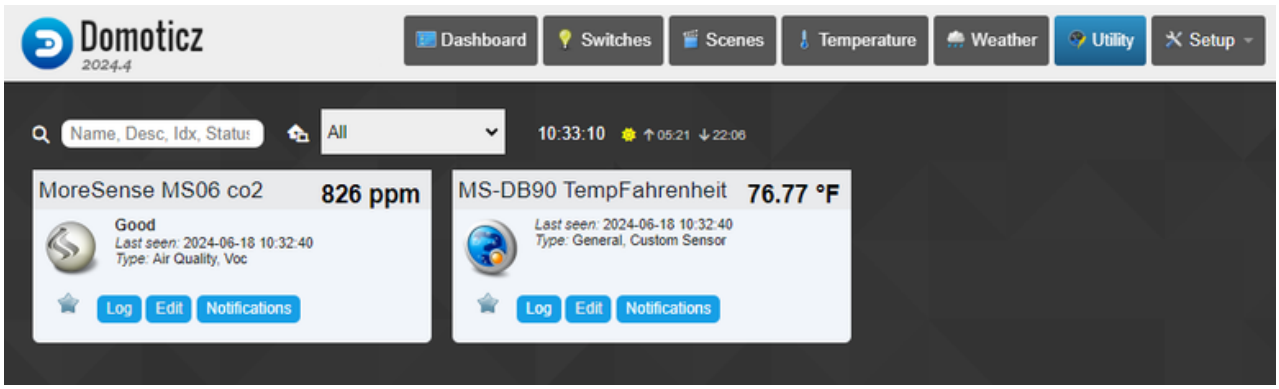
1. First make sure the MQTT broker is up and running
2. Connect the sensor with the MQTT broker (see page 38 under the paragraph "*Connecting the sensor to the MQTT broker on the MoreSense MS-07"*
3. On the Domoticz web page go to "**Setup->Hardware"**
4. In the "**Type"** dropdown menu select "**MQTT Auto Discovery Client Gateway with LAN interface"**
5. Enter a name of your own choosing like "**MQTT broker"**
6. Enter the URL or the IP address of the MQTT broker in the "**Remote address"** field
7. If applicable enter the "**Username"** and "**Password"** for logging in to the MQTT broker
8. Leave the "**Auto Discovery Prefix"** ("**homeassistant"**) unchanged
9. Click the "**add"** button
10. The sensors (every measurement type will create a separate sensor) should be added automatically
11. Click the "**Temperature"** and "**Utility"** buttons to check if the sensors were added properly



Domoticz Hardware setup



Domoticz Temperature



Domoticz Utility

Technical information

Model	MoreSense MS-07	
Power	Input voltage Consumption Consumption when charging	5V USB-C ± 1 Watt / ± 200 mA ± 2 Watt / ± 400 mA

Parameter	Range	Accuracy	Unit
CO2 (Carbon Dioxide)	400 – 5,000	±(40 ppm + 5% of reading)	ppm
PM1 & PM2.5	0 – 1,000	±5 µg/m³ or ±5% of reading	µg/m³
PM4 & PM10	0 – 1,000	±25 µg/m³	µg/m³
Temperature	-10 – +60	±0.45	°C
Relative Humidity	0 – 100	±4.5	% RH
VOC Index	1 – 500	±15 index points or %	Index
NOx Index	1 – 500	±15 index points or %	Index