UVAL Wireless System

Product Manual

Valid as of 01.07.2026

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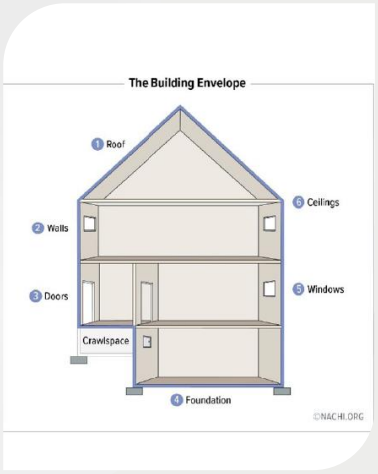
1. Quick Start Guide

1.1 Quick Start

The following six pictures describe the whole measurement process. To get detailed instructions, please read our manual and visit our homepage at https://info.greenteg.com/building

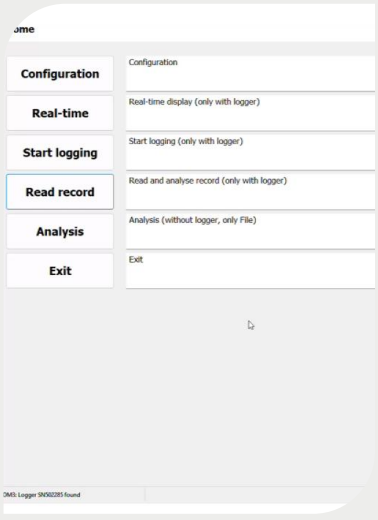
Locate and open your UVAL Wireless System.



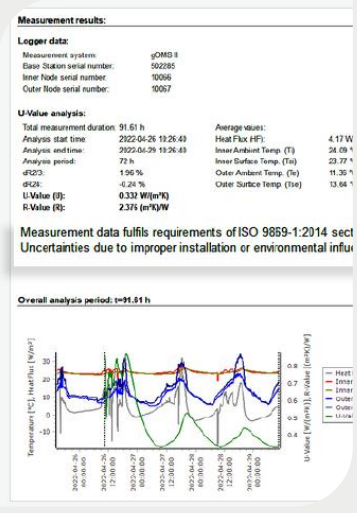
Choose your measurement spot.

Mount the indoor and outdoor sensors opposite each other.

Connect the base station to the laptop.



Start the measurement. Measuring for at least 72h.



Read and export your measurements through our UVAL Software.

2. UVAL Wireless Overview

2.1 Kit Contents

- 1 Base Station
- 2 Nodes
- 1 Inner Wall Heat Flux Sensor
- 1 Outer Wall Surface Sensor
- 2 Ambient Temperature Sensors
- 2 Ambient Sensor Mounting Clips
- 1 Roll of Double-Sided Adhesive Tape
- 1 Bag of Double-Sided Adhesive Water
- Repellent Strips
- 1 Scissors
- 1 Base Station charger
- Password and Software download QR Code

Note: For customers who have purchased more than one node pair, the products highlighted in green will double.

Figure 1: UVAL Wireless Kit in transportation box.

2.2 Nodes Overview

There are **two node configurations** required for the measurement of the U-Value and/or R-Value.

- One node is placed indoors (Type 1)
- One node is placed outdoors (Type 2)

Figure 2: UVAL Wireless Node

NODE:
UVAL Wireless System nodes have a battery lifetime of (at least) 2 years, and are adaptable to both Type 1 sensors, and Type 2 sensors.
Any node can take any sensor combination, and still remain adaptable for other sensors.

Figure 3: Inner Node Set

Figure 4: Outer Node Set

INNER NODE:

- 1x combined heat flux/surface temperature sensor
- 1x ambient air temperature sensor

OUTER NODE:

- 1x surface temperature sensor
- 1x ambient air temperature sensor

2.3 Base Station Overview

The UVAL Wireless Base Station has a 2-day battery life and can connect to up to 10 Nodes simultaneously. It is protected by a removable silicone sleeve. Do not remove the antenna.

Navigation #1: "Single Press":
Single Press – Move to the next information page within the current menu.

Navigation #2 "Long Press":
Long Press – Scroll through menu options. Release the button to select the highlighted option (e.g. Record).

Main Menu Overview:

- R+ = Recording active
- R- = Not recording
- Displays all Nodes connected to the Base Station.
- + next to a Node indicates a measurement has been received from that Node.
- Press the toggle button to view individual Node information.

Node Information

- HF = Heat Flux (W/m²)
- Ts = Surface Temperature (°C)
- T = Ambient Temperature (°C)
- A = Left Node Port
- B = Right Node Port

LED Indicators

- Red (flashing) – Data received from a Node
- Orange – Charging
- Blue (flashing) – Recording

Menu Functions:

- Record – Start or stop recording. Press once to toggle; hold to cancel.
- Reset – Clear registered Nodes. Press once to reset; hold to cancel.
- Wi-Fi Status – Connect or disconnect Wi-Fi. Press once to toggle; hold to cancel.
- Off – Turns off the display only; recording continues. The screen also switches off automatically after a period of inactivity.

Figure 4: Datalogger Settings

3. Set-Up

3.1 Node Measurement Frequency

Note: *Each node is set to a 1-minute logging interval by default.*

- Measurements can be logged every 1 minute or 10 minutes.
- To change the interval, open the node housing using a PH0 screwdriver.
- Inside the node is a switch labelled 1 min / 10 min. Move the switch to the desired logging interval.

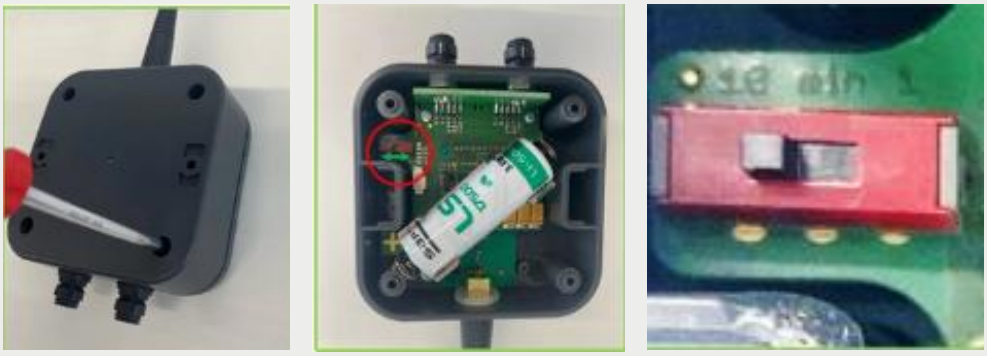


Figure 5: Changing node frequency

Caution: Sensor accuracy is only guaranteed when using UVAL-approved mounting solutions. Other mounting methods may reduce accuracy and create potential safety risks.

For U-value/R-value measurements:

- Install a Type 1 (indoor) node and a Type 2 (outdoor) node on opposite sides of the building element (see Section 2.2).
- Connect one heat flux sensor and one temperature sensor to each node.
- Carefully align the connector to avoid damaging the five sensor pins.

Optional: Use thermography to identify representative sensor locations.

Mounting Conditions

- Wet surfaces: Use the supplied mounting strips.
- Rough surfaces: Use thermal putty (available on request).

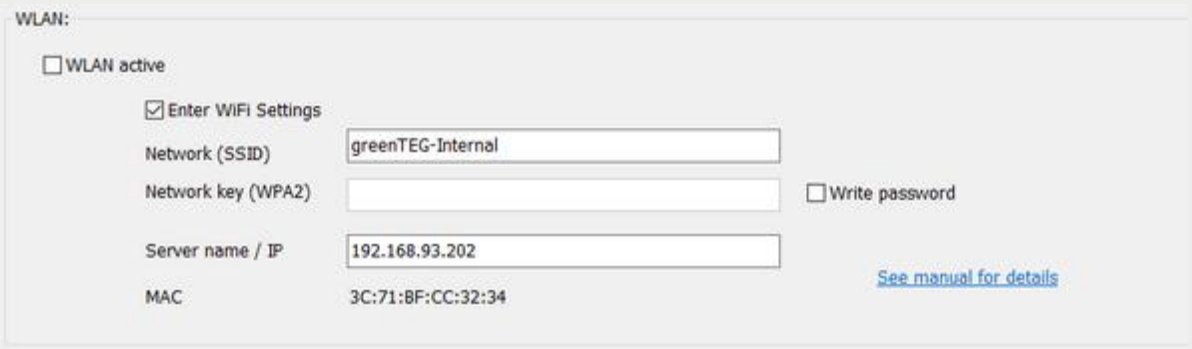
Figure 6: Mounting the nodes

3.2 Node Assignment to Base Station

Connect the Base Station to your PC and open the UVAL Wireless System software. Select Configuration to access the assignment options.

- **Option 1 – Automatic Assignment:** Automatically pairs up to 10 nearby nodes with the Base Station. Recommended when no more than 10 nodes are present.
    - *Note: It may take up to 10 minutes for all nodes to appear.*
- **Option 2 – Manual Assignment**: Enter the 5-digit serial number (S/N) printed on each node to pair specific devices. Once you have selected your preferred method, click Write to save the configuration. To cancel, click Home.

Note: The Wi-Fi settings at the bottom of the Configuration page are only required for customers using Remote Measurement Access.



3.3 Starting your Measurement

1. Click “Start Logging” to begin recording.
2. A flashing blue LED on the Base Station indicates logging is active.
3. The Base Station can then be disconnected from the PC. However, keep it connected to power whenever possible, as battery life is approximately 48 hours, which is shorter than the 72+ hours required for an ISO 9869-compliant measurement.

Checking Measurements:

- Connect the Base Station to your PC and open Real-time Measurement to view incoming data.
- Readings may not appear immediately, depending on the node logging interval.

Figure 13: Starting logging

Base Station Placement Recommendations:

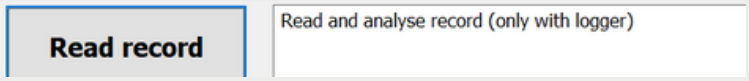
- Place the Base Station with a clear line of sight to the Nodes whenever possible.
- Typical range is up to 50 m indoors (through walls) and over 200 m outdoors.
- Range decreases with obstacles, especially thick or concrete walls.
- When measuring across multiple floors, avoid placing the Base Station directly above or below the Nodes.

4. Taking Measurements

4.1 Accessing & Selecting Your Measurements

4.1.1. Reading your Measurement Records:

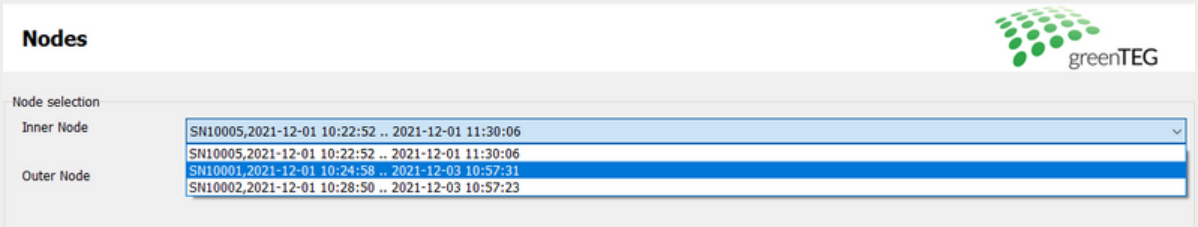
1. Connect the Base Station to your PC and select “Read Record”.
2. If recording is active, you can choose to stop the measurement. *Note: Stopping is not required to view live or stored data*.
3. Select a measurement file from the list and click Readout.
4. If recording is still active, the top file contains the data recorded so far for the current measurement.
5. Click Analysis to open UVAL measurement files already saved on your PC.



4.1.2. Reading Files Stored on your PC:

Click “**Analysis”** to access UVAL Wireless System Measurement Files already stored on your PC.

To view a measurement, select the corresponding Inner Node and Outer node pairs you would like to analyse in the drop-down menu for both the Inner Node and Outer Node. The values shown to the right of the Serial Number (S/N) will indicate the starting measurement Date and Time, and the ending measurement Date and Time.



Node Pair Selection:

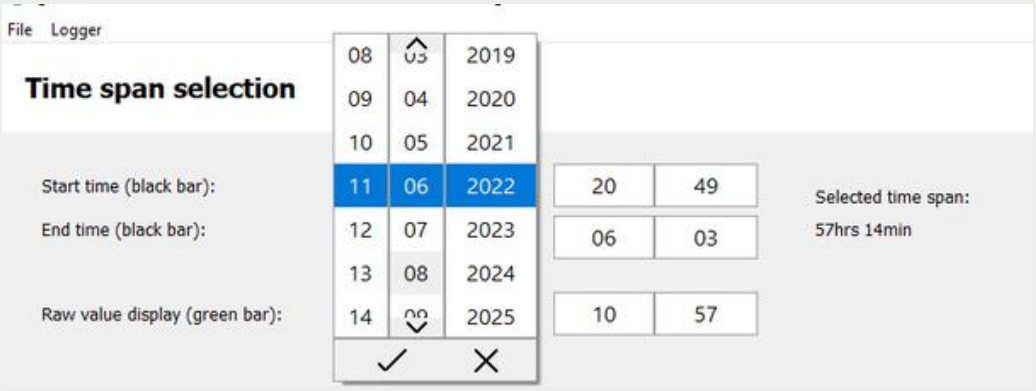
1. Select the desired node pair and click Next.
2. Only one node pair can be analyzed at a time.
3. The software does not automatically identify which nodes belong to each U-value measurement point; this must be selected by the user.

Time Span Selection:

- There are three methods for selecting the measurement period to analyze.

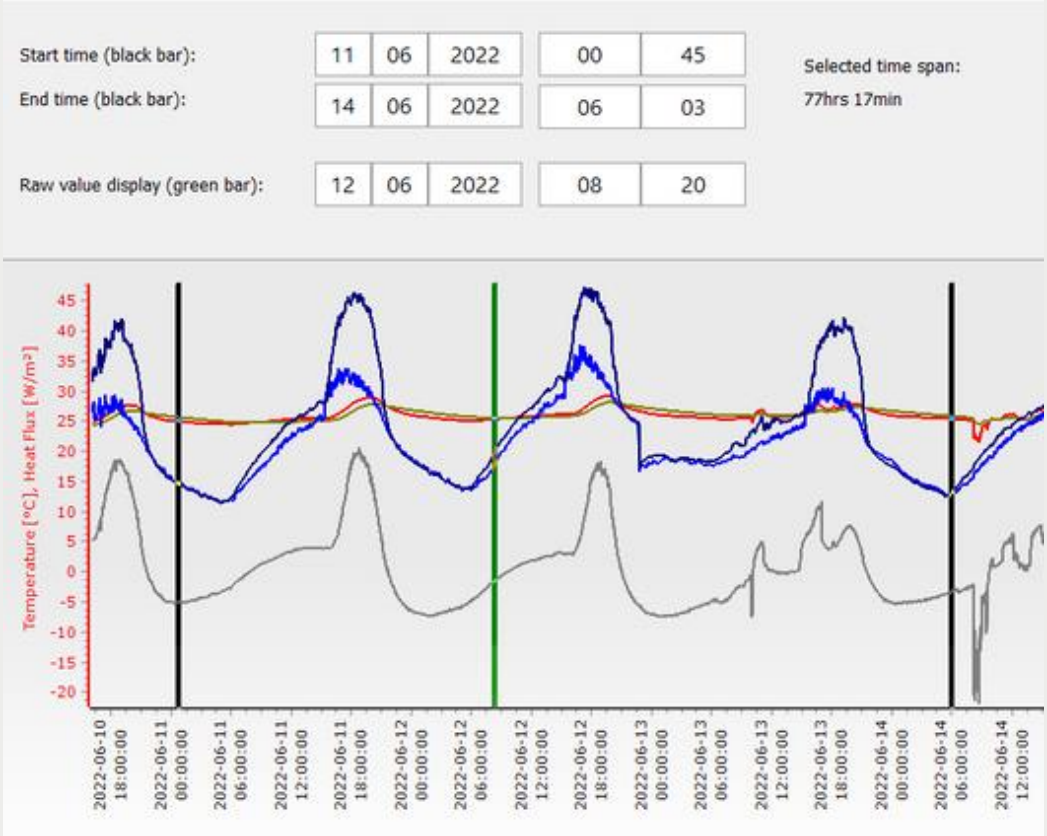
4.1.3. Selecting Date and Time with the Selection Boxes

Selecting a time earlier/later than is recorded in the measurement will automatically revert to the start/end of the measurement.



4.1.4. Sliding the black bars horizontally along the graph

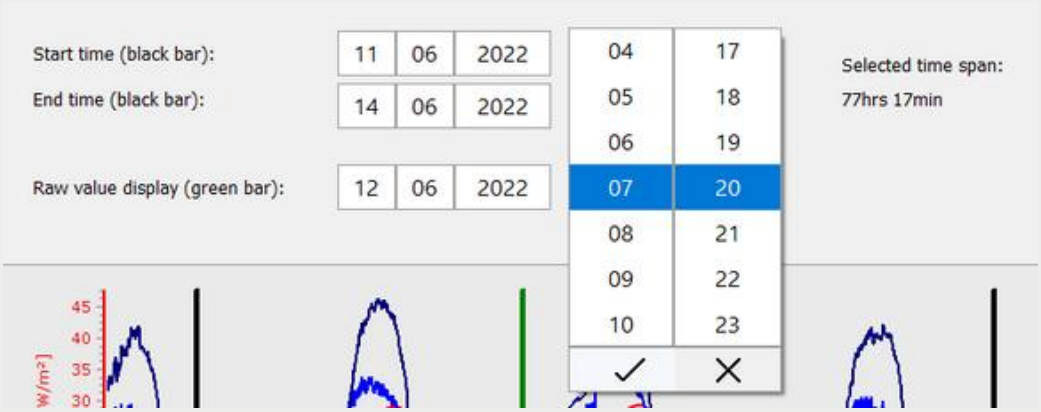
Note: The bar furthest on the left is always the start bar. If you move the end bar before the start bar, it will automatically turn into the start bar, and vice versa.



4.1.5. Raw Value Display

There are two methods to view raw data values at selected periods along your measurement:

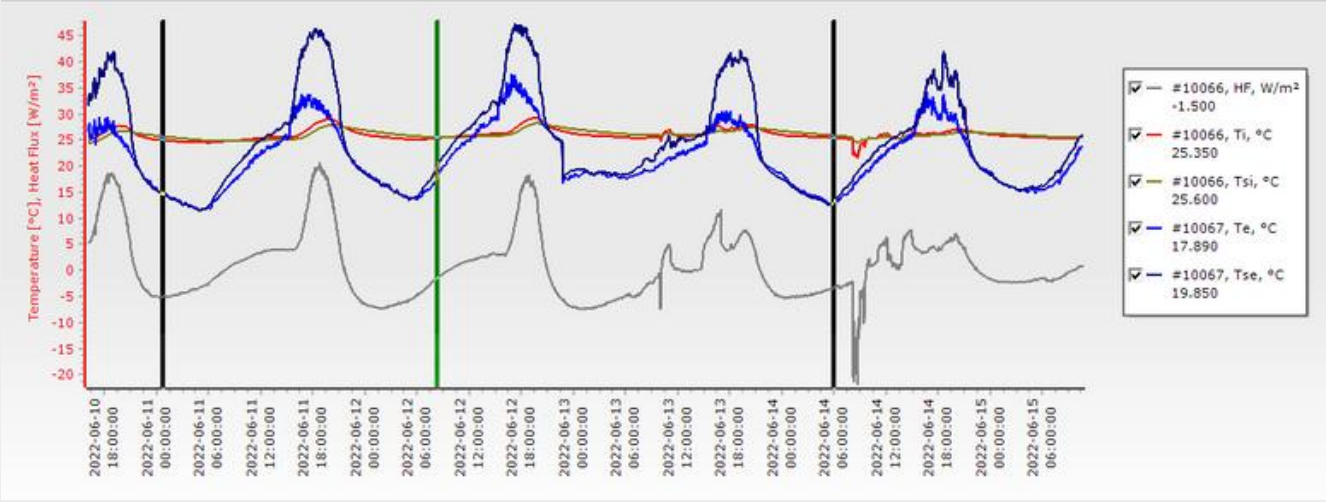
1. Selecting the data and time in the raw value display selection boxes.



2. Sliding the green bar horizontally along the graph.

The raw values are displayed underneath their corresponding measurements in the legend on the right side of the graph.

When you are happy with your measurement selection click **Next** at the bottom of the page.



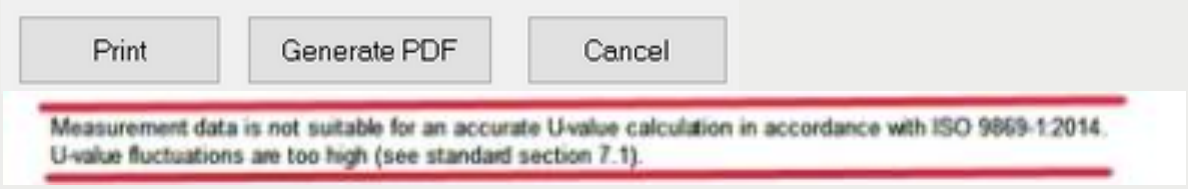
4.2 Analyzing your Measurement

All key analysis details are shown at the top of the graph, including the U-value and R-value (highlighted in bold) and the ISO conformity status. Use the legend on the right to show or hide graph data.

Click **Report** to generate a **PDF report** of the analysis.

On the next page, you will see a preview of your pdf, with the option to print, or go back to the previous page.

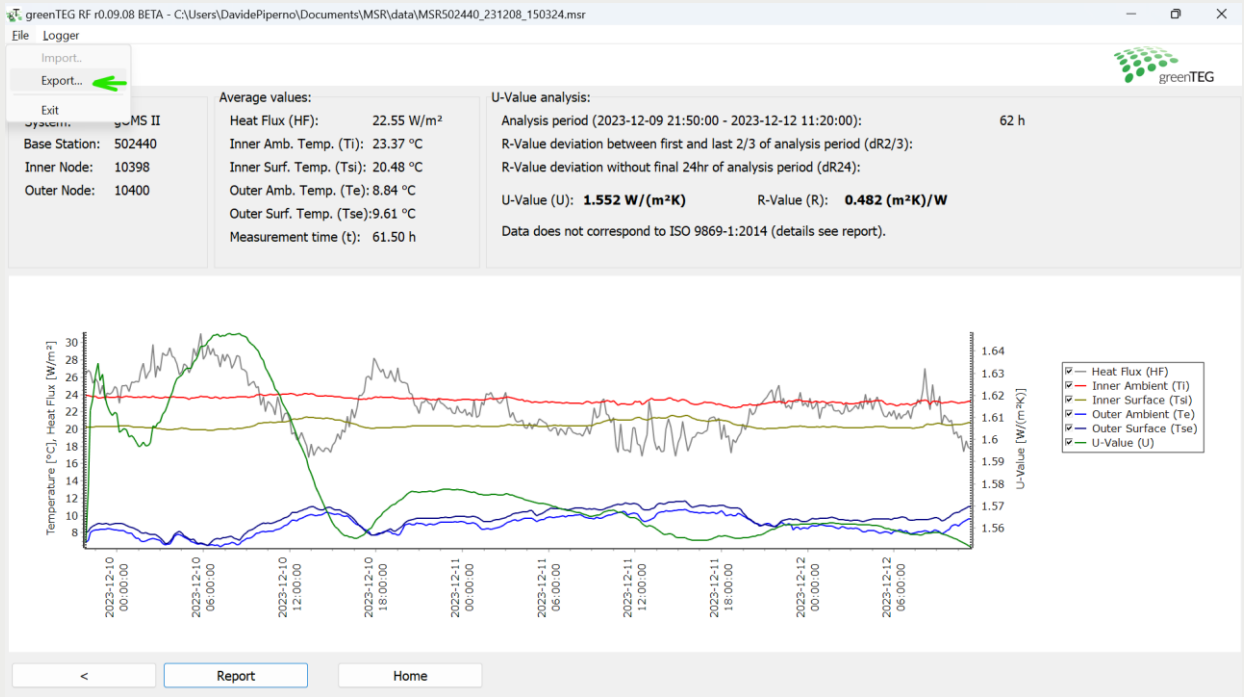
Note: Non-conforming ISO -9869 measurements will display a measure stating non-conformity upon report generation (see below).



4.3 CSV Export

Once you have analysed your data using the tools provided by the UVAL Wireless software, you may wish to export the data in CSV format in order to continue your analysis or to share the data with other people.

This can easily be done by clicking on the '**File**' button at the top left and then on the '**Export**' button.



This action will open a window allowing you to name your file. Complete the operation by clicking on '**Save**'.

The filter you can apply on the above screen won't affect your CSV file.

5. Remote Measurement Access

5.1 Connecting to the Cloud

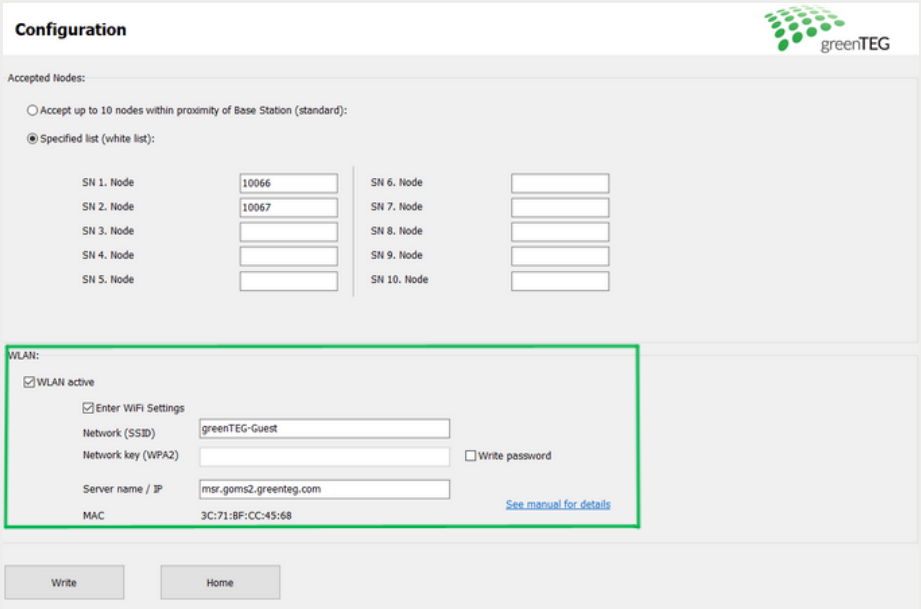
5.1.1 Remote Measurement Access

Access the portal at https://goms2.greenteg.com/login
Note: A Wi-Fi connection is required at the measurement site.

To connect the Base Station to greenteg's cloud, enter the Wi-Fi details in Configuration and enable:

- WLAN Active
- Enter Wi-Fi Settings
- Write Password

In the Server name / IP box, enter: **msr.goms2.greenteg.com**
Click "**Write**" and your base station is now enabled to send measurements to the cloud!



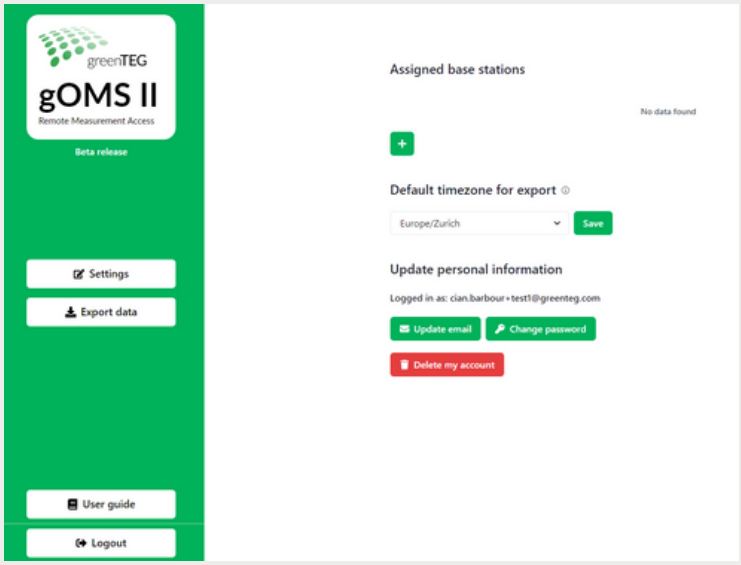
5.1.2 Remote Measurement Account Setup

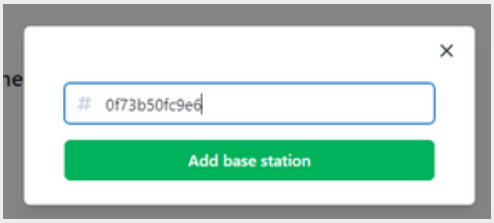
Note: Creating an account requires acceptance of the Terms & Conditions and Privacy Policy.

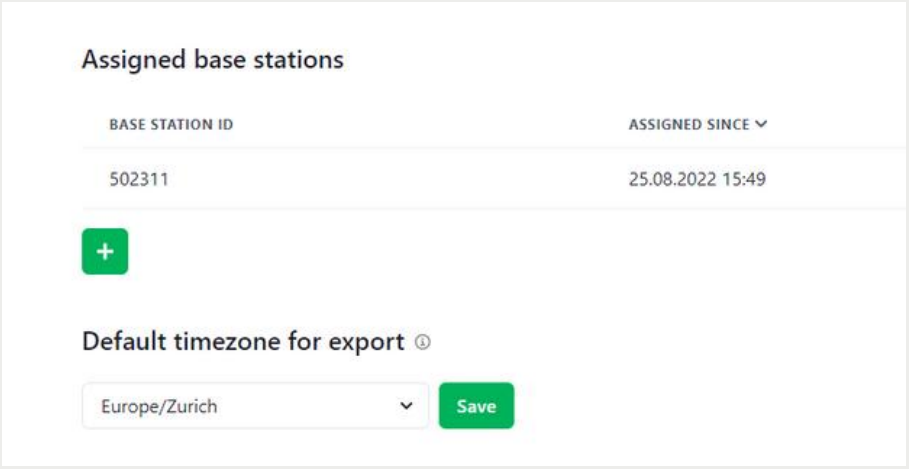
- Click Sign Up and enter your email address and password.
- We recommend using a shared/general email address, as only one Base Station can be linked to one email account at a time. Reassigning a Base Station to another user requires admin privileges.
- A confirmation email will be sent to activate your account.
- Once you have signed up and confirmed account creation, you may log in.

5.2 Assigning Base Stations

- Contact us for your Base Station activation key if you have not received it. The key is linked to your Base Station serial number. Under Assigned Base Stations, click + and enter the activation key.
- Once activated, you can remotely access measurement data through the portal.
- Select your time zone (or search for your city) to ensure correct timestamps in exported data.



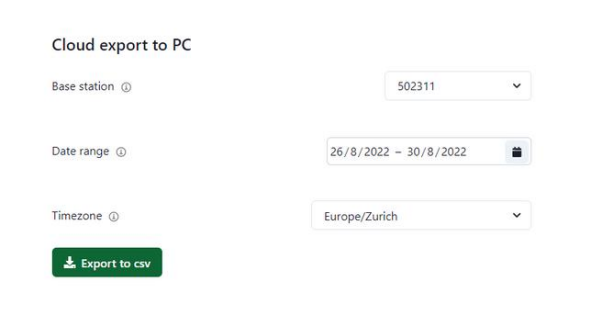




5.3 Exporting & Importing Data

5.3.1 Exporting Data:

1. Select Export Data from the left menu.
2. Choose the Base Station, date range, and time zone.
3. Click Export to CSV.



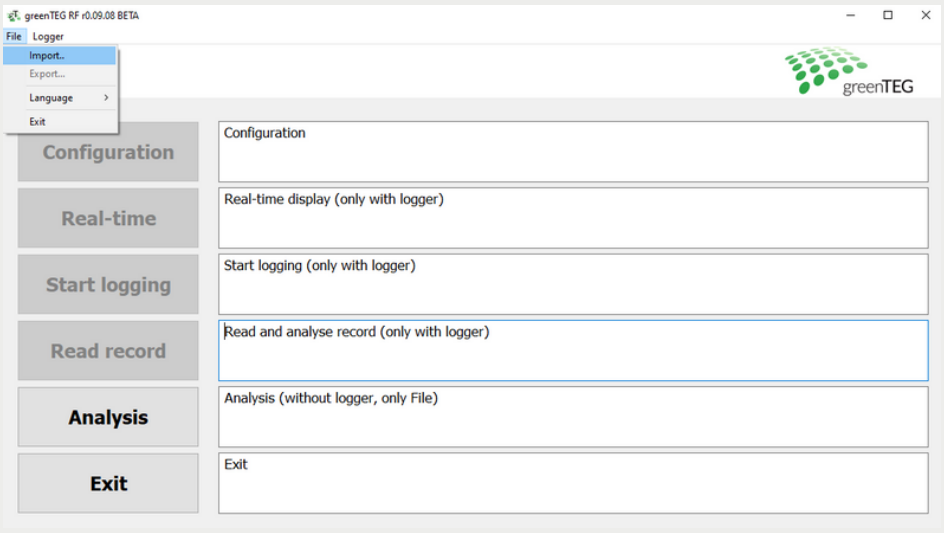
The file will be saved to your PC as: StartDate_BaseStationID.csv

Notes:

- Exports are date-based, not measurement-file based. If multiple measurements were recorded on the same day, all data within the selected date range will be included.
- The file name reflects the selected start date, even if no measurement began on that date.
- **Do not edit** the exported CSV file, as this may corrupt it and prevent successful import into the software.

5.3.2 Importing Data:

Open up the UVAL Wireless System software. In the file tab in the top-left corner is the "import" function. Select your exported Remote Measurement Access csv file to be imported.



6. ISO 9869 Compliancy

6.1 ISO 9869-1:2014

The UVAL Wireless software analyzes data according to ISO 9869-1:2014, but it is the user's responsibility to ensure the test conditions are met. For complete requirements, refer to the ISO standard.

6.1.1 Installation Requirements:

- Install heat flux and temperature sensors in a representative location.
- Avoid thermal bridges, cracks, heating/cooling sources, fans, and direct sunlight.
- Protect exterior surfaces from rain, snow, and solar radiation (artificial screening may be used).
- Use a logging interval below 30 minutes.

6.1.2 Analysis Method:

The software uses the ISO 9869 Average Method, which assumes:

- Similar wall temperature and moisture conditions at the start and end of the test.
- No direct solar radiation on the heat flux sensor.
- Stable thermal properties throughout the measurement.

Failure to meet these conditions may result in inaccurate values.

6.1.3 ISO Validation Criteria:

Measurements should be taken over whole 24-hour periods and continue until:

1. Duration > 72 hours
2. Final R-value differs by < 5% from the value calculated 24 hours earlier.
3. The R-value from the first two-thirds of the measurement differs by < 5% from that of the last two-thirds.
4. Heat stored in the wall is ≤ 5% of the heat passing through it.

Note: The UVAL Wireless software automatically checks criteria 1–3. Criterion 4 cannot be verified, as the system does not measure heat storage within the wall.

6.1.4 Sensor Installation:

- Mount surface temperature and heat flux sensors using the supplied double-sided tape, as the sensors are calibrated for it.
- Place indoor and outdoor sensors directly opposite each other on the same wall.

6.1.5 Ambient Temperature Sensor:

- Mount using the supplied sensor clips.
- Avoid direct sunlight.
- Position 5–10 cm from the heat flux or surface temperature sensor.

6.1.6 Measurement Recommendations:

- Measure for at least 72 hours.
- Maintain an indoor/outdoor temperature difference of ≥ 5°C throughout the test.
- If conditions fluctuate significantly, extend the measurement by additional 24-hour periods to achieve ISO 9869 compliance.

6.1.7 Charging:

- The Base Station requires about **5 hours** to fully charge but should remain connected to power where possible, as battery life is approximately **48 hours**.
- Node batteries last approximately **2 years** and can be replaced. Additional batteries and chargers are available from our e-shop or on request.

Disclaimer: *These guidelines do not cover all installation scenarios and may change without notice. greenteg accepts no liability for damage caused during installation or removal of the system.*