

UVAL Wired System

Product Manual

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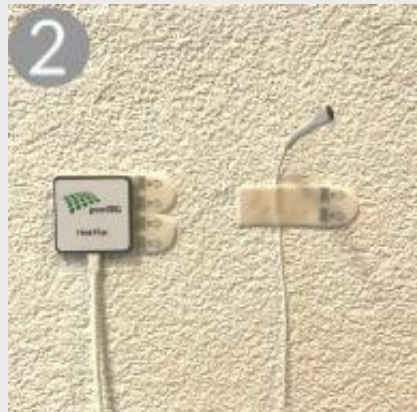
1. Quick-Start Setup Guide

1.1 Quick Set-Up Summary

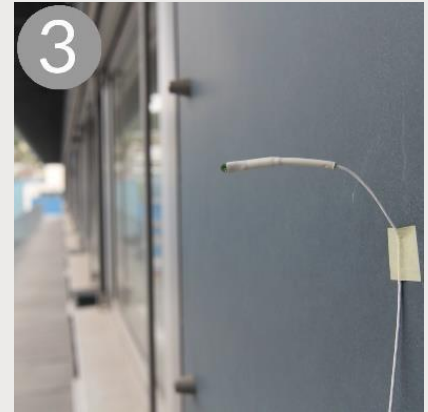
The following six pictures describe the whole measurement process. To get detailed instructions, please visit our homepage at <https://info.greenteg.com/building>



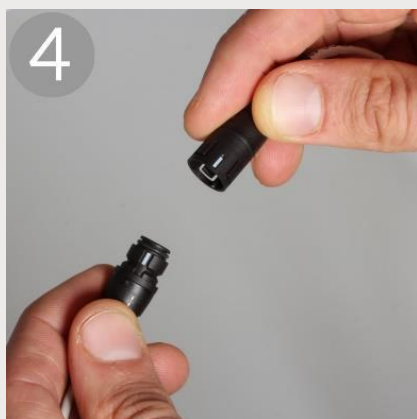
Choose an optimal measurement spot on the building element of interest.



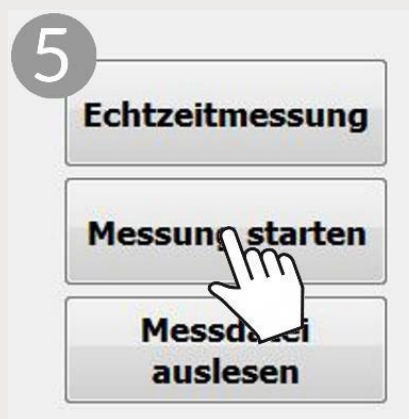
On the inside of this spot place the heat flux sensor and one temperature sensor.



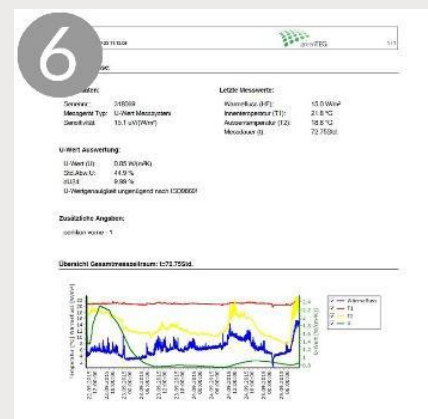
On the outside of this spot place the second temperature sensor.



Connect all three sensors to the data logging unit.



Start the measurement process (via your laptop).



Evaluate the U-value of the building element with the software included.

2. Overview of UVAL Wired

2.1 System Overview

By Post:

- 1x gSKIN® Heat Flux Sensor
- 1x gSKIN® DLOG Data Logger with 2 temperature sensors
- 1 USB cable (PC to data logger)
- 1 gOMS Mount-1235 (adhesive tape roll)
- 1 Calibration sheet
- 1 Instruction manual

By Email:

- Link for password and software download



*Figure 1: UVAL
Wired Kit in
transportation
box.*

2.2 Software Overview

The gSKIN® U-value software features a home screen with five functional buttons and two top-menu buttons (see Figure 2).

Functional Buttons:

Real time measurement – Displays live sensor data from the U-value KIT, including temperature, heat flux, and calculated U-value. This mode is for monitoring sensors and reviewing real-time values only; measurements cannot be started from this screen.

Start logging – Initiates a measurement. Before starting, select the logging interval and measurement start time. The logger can store up to two million data points.

Read record – Opens measurement files stored on the logger for analysis, data export, or PDF report generation.

Analyse record – Opens logger protocol files (*.msr) saved on your computer for further analysis.

Exit – Closes the software.

Two top-menu buttons:

Menu-button “File” – Exit the software, export data from the Read Record tab, or change the language.

Menu-button “Logger” – Stop an active measurement or delete all files stored on the data logger (Delete all stored data!).

3. Getting Ready to Measure

3.1 Ready to Measure

Ready to measure in five minutes by following these steps

1. Connect the data logger to your computer via USB and allow the drivers to install.
2. Download and install the software from info.greenteg.com/building/downloads (password provided with purchase). Run the installer as Administrator. Note: The software is currently compatible with Windows only.
3. Open the software and select your preferred language under File → Language.
4. Install the sensors as described in Sections 3.2.1 and 3.2.2.
5. In Real-time Measurement, verify that all temperature and heat flux sensors are displayed correctly and review the approximate U-value.
6. Select Start Logging, verify the sensor sensitivity, and choose the desired sampling rate.
7. Click Start Measurement. When the status changes to “measurement running...”, data logging has started.

Logger Status Indicators:

- Blue flashing: Logging in progress
- Yellow flashing: Charging
- Yellow off: Fully charged
- Red: No connection to the computer; check sensor connections

For an ISO 9869-compliant U-value, measure for approximately 72 hours (see Section 3.4). To stop logging, select Logger → Stop Measurement. Before stopping, review the recorded data in Read Record, where you can open and analyze saved measurement files (ordered by start time, with the latest file preselected).

8. Select the latest logging file to review the logged dataset. In the “Analysis” window, the latest measured data points appear.
 - **Blue line:** Heat flux (primary y-axis)
 - **Red line:** Indoor temperature T1 (primary y-axis)
 - **Yellow line:** Outdoor temperature T2 (primary y-axis)
 - **Green line:** Calculated U-value (secondary y-axis)
 - **Dotted vertical line:** Start of analysis period



Figure 2: Analysis window

9. In Read Record → Analysis, select File → Export Data to save raw data as a CSV file.
10. To analyze logger files stored on your computer, select “Analyse Record” from the home screen.
11. To clear the logger, select Logger → Delete All Stored Data. This permanently deletes all logger data and cannot be undone unless the files were previously saved as CSV or MSR files.
12. To close the software, select Exit from the home screen or File → Exit. Closing the software does not stop an active measurement. To end a measurement, select Logger → Stop Measurement.

3.2 Mounting Sensor Guide

3.2.1 Heat Flux Sensor Placement

1. Install the heat flux sensor indoors with the gSKIN logo facing outward.
2. Attach the sensor using the supplied adhesive tape.
3. Cover the entire sensor with the tape, leaving about 2 cm extra to create a removal tab.
4. Remove the yellow backing and press the sensor firmly onto the surface for 4–5 seconds.
5. Protect the sensor from direct sunlight, heating sources, and drafts.

Optional:

- Use a stronger adhesive for wet or rough surfaces.
- Use thermal imaging to identify suitable sensor locations.
- Cover the sensor with material like the surrounding surface.
- For non-uniform building elements, use multiple sensors and average the results.



Figure 3: How to mount the sensor correctly

3.2.2 Temperature Sensor Placement

1. Place the two temperature sensors on opposite sides of the wall or window, aligned with the heat flux sensor.
2. Attach the sensors using the supplied double-sided tape or a suitable alternative.
3. For accurate U-value measurements, measure ambient air temperature by positioning the sensors at least 5 cm from the surface and away from direct sunlight.

3.3 Demounting Sensors

1. Pull the adhesive tape along its length, in the direction of the tape.
2. Do not pull the cable.
3. Do not pull the tape away from the wall (perpendicular to the surface).
4. Remove the tape slowly and carefully to avoid damaging the wall surface.

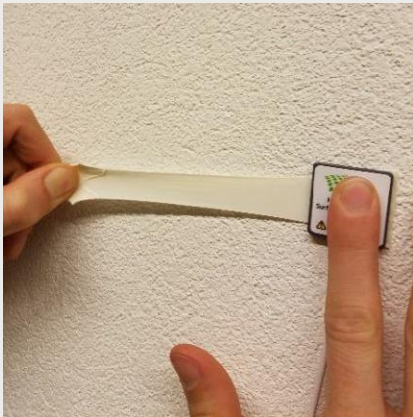


Figure 4: How to demount the sensors

3.4 ISO Compliance

3.4.1 ISO 9869 Validation Criteria

1. Measurement duration: >72 hours (plus a multiple of 24 hours). The software automatically determines the required duration.
2. 24-hour stability: The final U-value must differ by less than 5% from the value calculated 24 hours earlier (dR24).
3. Period consistency: The U-value from the first two-thirds of the measurement must differ by less than 5% from that of the last two-thirds.
4. Heat storage: Heat stored in the wall must be $\leq 5\%$ of the heat passing through it.

Note: The software automatically verifies the first three criteria. Heat storage effects are not measured by the system and must be assessed separately.

3.4.2 Key ISO 9869 Requirements

ISO 9869-1:2014 provides guidance on both measurement setup and data analysis. Key installation requirements include:

1. Install heat flux and temperature sensors in a representative location of the building element. Thermography can help identify suitable locations.
2. Avoid placing sensors near thermal bridges, cracks, heating/cooling sources, or fan drafts.
3. Protect exterior surfaces from rain, snow, and direct solar radiation; artificial shielding may be used if necessary.
4. Use a data logging interval below 30 minutes.

3.4.3 How the Software Evaluates Measurements

The software analyzes the longest available measurement period that is a multiple of 24 hours. If the data does not meet ISO requirements, it searches for the longest compliant period. If no measurement period longer than 72 hours meets the criteria, the result is flagged as non-ISO compliant.

3.5 Data Logger Characteristics

The table below shows the maximum measurement time for the adjustable measurement intervals

Measurement interval	Duration [days]	Duration [years]
1s	8,1	0
1min	485,5	1,3
10min	4854,5	13,3
30min	14563,6	39,9
1h	29127,1	79,8

Figure 5: Maximum measurement time for the adjustable measurement interval.

1. If the memory of data logger is full, the oldest data is being overwritten until the current measurement takes up the whole available memory of 8 MB. Then data logging stops automatically.
2. If the battery is fully charged, it is possible to log the data up to 5 weeks with 10 min intervals.
3. A USB-charger can be attached to the MSR logger to keep the battery fully charged and therefore use the data logger for longer periods of time.