

# gO Measurement System Datasheet

## Table of contents

1. System description
2. Overview of sensor nodes and measuring configurations
3. Base Station
4. Measuring Node
5. Ambient air temperature sensor
6. Surface temperature sensor
7. Combined heat flux and surface temperature sensor
8. Combined humidity and ambient air temperature sensor
9. Cloud based analysis and control software

# gO Measurement-System

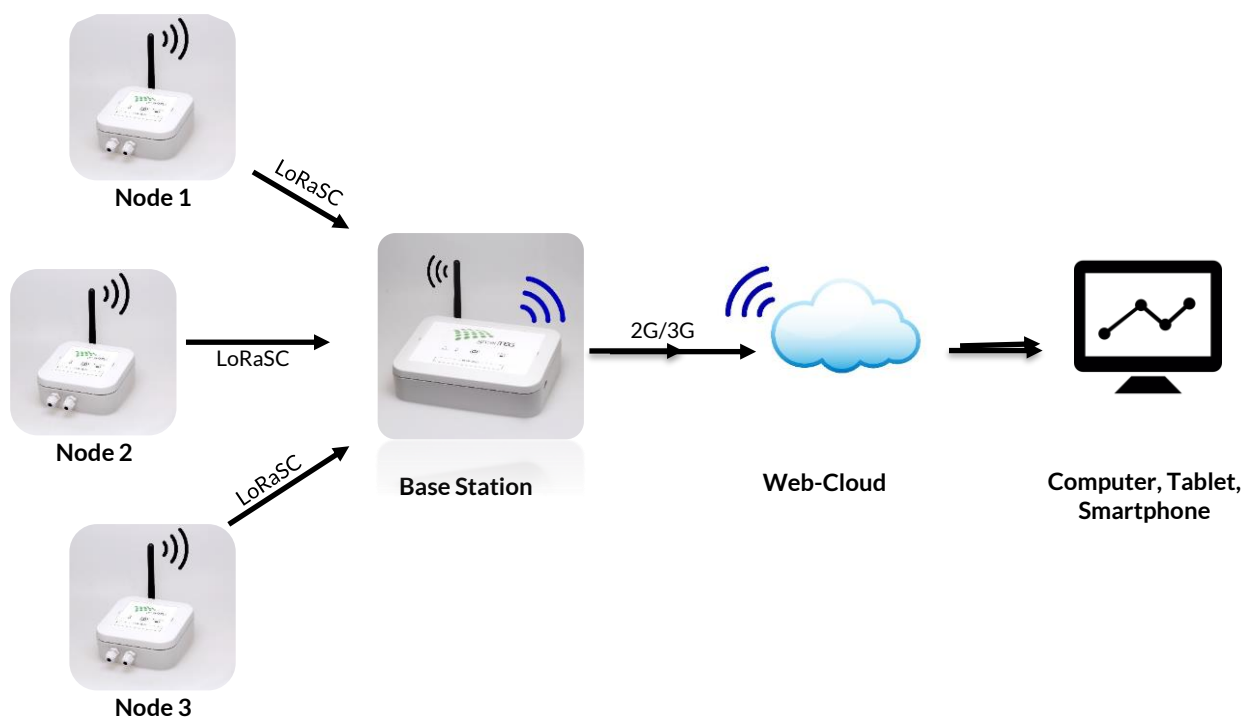
For the assessment of U-value, humidity and further parameters

gO is a portable, robust and weather-proof cloud-based measurement system which has been specially designed for temporary measurements under difficult circumstances. The gO measurement-system consists of up to 16 sensor nodes, which are connected via LoRaSC radio link (868/915MHz) to the base station. Therefore, it is possible to use the system in situations where no WiFi or mobile connection is available. The base station is connected to the internet via a global 2G/3G-module and transmits all measured data in real-time to the cloud.

The modular and user configurable set-up of the gO measurement-system is the perfect solution for quick and accurate measurements over several days with the possibility of real-time monitoring.

## Areas of application

- U-value measurement in compliance with the ISO 9869
- Monitoring of humidity and temperature inside as well as outside.
- Building moisture measurements
- Dew point temperature monitoring on the wall surface (AW-value)



# Overview of sensor nodes and measuring configurations

## Sensor nodes



### Sensor node type 1

1x combined heatflux / surface temperature sensor

1x ambient air temperature sensor



### Sensor node type 2

1x surface temperature sensor

1x ambient air temperature sensor



### Sensor node type 3

1x combined humidity / ambient air temperature sensor

## Typical applications and measuring configurations

| Application   | Required no. base station | Required no. sensor nodes type 1 | Required no. sensor nodes type 2 | Required no. sensor nodes type 3 |
|---|---------------------------|----------------------------------|----------------------------------|----------------------------------|
| U-value assessment under ISO 9869 compliance (1 building element) | 1                         | 1 (Inside)                       | 1 (Outside)                      | -                                |
| U-value assessment under ISO 9869 compliance (2 building element) | 1                         | 2 (Inside)                       | 2 (Outside)                      | -                                |
| Dew point detection (mould detection)                             | 1                         | -                                | 1 (Inside)                       | 1 (Indoor)                       |
| U-value and dew point detection (mould detection)                 | 1                         | 1 (Inside)                       | 1 (Inside)                       | 1 (Indoor)                       |
| Room-temperature monitoring (3 measuring points)                  | 1                         | -                                | -                                | 3 (Indoor)                       |

Any personalised combination of up to sixteen nodes per base station is possible.

# Base Station

- Battery powered (power supply operation possible)
- 2-7 days battery life<sup>1</sup> (rechargeable)
- Portable (wireless)
- Worldwide 2G/3G internet connection
- Weatherproof
- Battery level indicator
- Connection status indicator
- Robust enclosure
- Connection with up to 16 measuring nodes possible (more upon request)



| Product name                               | Base Station  |
|--|---|
| Article number                             | A-257611  |
| Dimensions (l x w x h) [mm x mm x mm]      | 175 x 155 x 45 (with folded antenna)  |
| Weight [g]                                 | ca. 650   |
| IP-Rating (enclosure)                      | minimum IP44 (weatherproof, splash water)                                       |
| Operational temperature range [°C]         | -20 to +60  |
| Battery                                    | 2 - 7 days battery life (internal battery), expandable with external power bank |
| Power supply                               | USB-C charger (A-001162) (mains operation possible) or power bank               |
| Wireless connection to the measuring nodes | LoRaSC-protocol (868 / 915 MHz)   |
| Internet connection                        | 2G/3G mobile communication quad band (globally)                                 |

<sup>1</sup> Battery life will be increased through software updates affecting the energy efficiency.

# Measuring Node

- Battery powered
- Up to 7 days battery life (rechargeable)
- Portable (wireless)
- Long wireless range (over several km or floors)
- Weatherproof
- Battery level indicator
- Connection status indicator
- Robust enclosure



| Product name                            | Sensor node  |  |  |
|---|--|--|--|
| Article number                          | A-257658 (type 1)  | A-257453 (type 2)  | A-257517 (type 3)  |
| Sensor type                             | <ul style="list-style-type: none"> <li>• combined heatflux / surface temperature sensor</li> <li>• ambient air temperature sensor</li> </ul> | <ul style="list-style-type: none"> <li>• surface temperature sensor</li> <li>• ambient air temperature sensor</li> </ul> | <ul style="list-style-type: none"> <li>• combined humidity and ambient air temperature sensor</li> </ul> |
| Dimensions (l x w x h) [mm x mm x mm]   | 100 x 120 x 40 (with folded antenna)   |  |  |
| Weight [g]                              | ca. 250  |  |  |
| IP-Rating (enclosure)                   | minimum IP44 (weatherproof, splash water)  |  |  |
| Operational temperature range [°C]      | -20 to +60   |  |  |
| Battery                                 | 7 days battery life (internal battery), expandable with external power bank  |  |  |
| Power supply                            | USB-C charger (A-001162) (mains operation possible) or power bank  |  |  |
| Wireless connection to the base station | LoRaSC-protocol (868 / 915 MHz)  |  |  |
| Transmitting power                      | Up to 20 dBm (100 mW)  |  |  |
| Sensor inputs                           | 2 (factory-configured)   |  |  |

# Ambient air temperature sensor

- Highest accuracy
- Robust steel case
- Simple mounting per clip
- Very low energy consumption



|                                    |   |
|------------------------------------|---|
| Product name                       | Digital ambient air temperature sensor              |
| Article number                     | Included in A-257658 (type 1) and A-257453 (type 2) |
| Material                           | Chromium-Nickel-Steel                               |
| Dimensions covering (d x l) [mm]   | 5 x 50  |
| Cable length [mm]                  | 450   |
| IP-Rating (enclosure)              | minimum IP44 (weatherproof, splash water)           |
| Operational temperature range [°C] | -50 to +80  |
| Accuracy [°C]                      | +/- 0.1   |
| Resolution [°C]                    | 0.01  |

# Surface temperature sensor

- Highest accuracy
- Robust, low-noise design
- Simple removable mounting
- Very low energy consumption



|                                    |   |
|------------------------------------|---|
| Product name                       | Digital surface temperature sensor        |
| Article number                     | Included in A-257453 (type 2)             |
| Material                           | Thermally conductive polymer              |
| Dimensions (l x w x h) [mm]        | 30 x 30 x 3.3                             |
| Cable length [mm]                  | 450                                       |
| IP-Rating                          | minimum IP44 (weatherproof, splash water) |
| Operational temperature range [°C] | -50 to +80                                |
| Accuracy [°C]                      | +/- 0.1                                   |
| Resolution [°C]                    | 0.01                                      |



# Combined heat flux and surface temperature sensor

- High-resolution heat flux measurement
- Highest accuracy
- Robust, low-noise design
- Simple removable mounting
- Very low energy consumption
- Integrated surface temperature sensor



| Product name  | Combined heatflux / surface temperature sensor |
|---|--|
| Article number  | Included in A-257658 (type 1)                  |
| Material  | Thermally conductive polymer                   |
| Dimensions (l x w x h) [mm]   | 30 x 30 x 3.3                                  |
| Cable length [mm]   | 450  |
| IP-Rating   | minimum IP44 (weatherproof, splash water)      |
| Operating temperature range [°C]  | -50 to +80                                     |
| Accuracy temperature measurement [°C]                                       | +/- 0.1  |
| Resolution temperature sensor [°C]  | 0.01   |
| Accuracy heatflux measurement [%]   | +/- 3  |
| Resolution heatflux sensor [W/m <sup>2</sup> ]                              | 0.09   |
| Measurable heatflux range [kW/m <sup>2</sup> ]                              | +/- 35   |
| Min./Avg. <sup>2</sup> heatflux sensor sensitivity [μV/(W/m <sup>2</sup> )] | 10 / 20  |

<sup>2</sup>Only a reference point

# Combined humidity and ambient air temperature sensor

- High-resolution humidity measurement
- Robust steel case
- Simple mounting per clip
- Very low energy consumption
- Integrated ambient air temperature sensor

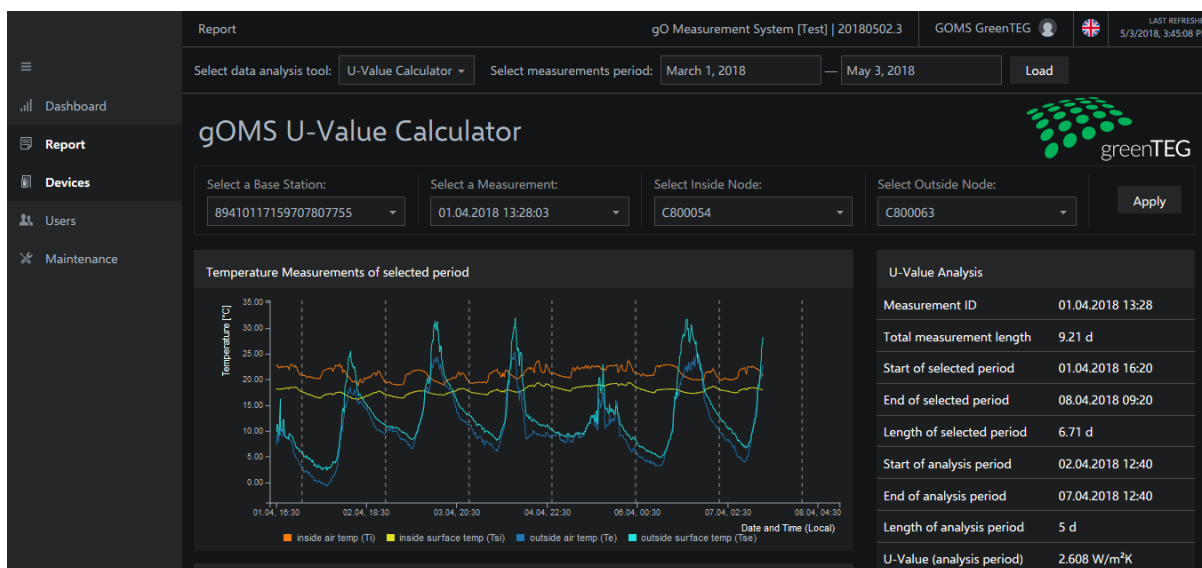


|                                       |  |
|---------------------------------------|--|
| Product name                          | Combined humidity and ambient air temperature sensor |
| Article number                        | Included in A-257517 (type 3)                        |
| Material                              | Chromium-Nickel-Steel                                |
| Dimensions covering (d x l) [mm]      | 5 x 45   |
| Cable length [mm]                     | 450  |
| IP-Rating                             | minimum IP44 (weatherproof, splash water)            |
| Operational temperature range [°C]    | -50 to +80   |
| Accuracy temperature measurement [°C] | +/- 0.3  |
| Humidity measuring range [%]          | 0 - 100 RH   |
| Accuracy humidity measurement [%]     | +/- 2 RH   |

# Cloud based analysis and control software

## Overview main functions and features

- Real time data monitoring
- Real-time status indicator of the measuring nodes and the base station
- Personal login account
- Combination of the sensors for U-value, R-value and AW-value assessment
- Status indicator for U-value measurement regarding the ISO compliance
- After the measurement all data is presented in a structured report
- csv-measurement data can be downloaded
- Simple data management and cost control
- Highest data security
- Works with any internet-ready device
- Continuous updates and maintenance



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