



### Features & Benefits

- Self-detecting 0-10Vdc or 4-20mA
- (3-wire) output
- Fully configurable LCD Display
- Resistive temperature output option
- No jumpers or DIP-switches to select output type
- CO<sub>2</sub> self-calibration over full sensor lifetime achieved by ABC logic

### Technical Overview

The UN-1000 range offers a cost-effective single output based on the sensing element required. This can be IAQ, CO<sub>2</sub> or RH but can also include a combination of familiar passive options such as temperature, setpoint adjustment, momentary switch and fan speed, plus an LCD display.

A unique feature of the sensor is its ability to automatically detect what sort of controller input it is connected to, 4-20mA or 0-10Vdc, removing the requirement for output jumpers which can be inadvertently set incorrectly. Just connect it to the controller input and it does the rest. PCB LED indication of which output type is in operation is provided, with diagnostic LED patterns for determining faults.

### Product Codes

**GS-AQ1000-UN** Space air quality transmitter

**GS-CO2-1000-UN** Space CO<sub>2</sub> transmitter

**RH-1000-UN** Space RH transmitter

Suffixes (add to part code)

**-T** Direct resistive temperature output\*

Thermistor types:

|             |            |             |
|-------------|------------|-------------|
| A (10K3A1)  | B (10K4A1) | C (20K6A1)  |
| H (SAT1)    | K (STA1)   | L (TAC1)    |
| M (2.2K3A1) | N (3K3A1)  | P (30K6A1)  |
| Q (50K6A1)  | S (SAT2)   | T (SAT3)    |
| W (SIE1)    | Y (STA2)   | Z (10K NTC) |

Platinum types:

|            |             |
|------------|-------------|
| D (PT100a) | E (PT1000a) |
|------------|-------------|

Nickel types:

|             |                        |
|-------------|------------------------|
| F (NI1000a) | G (NI1000a/TCR (LAN1)) |
|-------------|------------------------|

Interface Options (add to part code)\*\*

|      |  |
|------|--|
| -SP  | Resistive set point 0-10kΩ or 11-1kΩ                           |
| -FS3 | Resistive 3-speed fan switch                                   |
| -FS4 | Resistive 4-speed fan switch                                   |
| -FS5 | Resistive 5-speed fan switch                                   |
| -HR  | 0-5000ppm CO <sub>2</sub> range (CO <sub>2</sub> only)         |
| -MS  | Momentary switch   |
| -LCD | Integral LCD display   |
| -LED | 3-colour LED CO <sub>2</sub> indication (CO <sub>2</sub> only) |

Accessories

|        |                                |
|--------|--------------------------------|
| DECOR  | Decorators trim plate          |
| GASKET | Insulating gasket (pack of 10) |

\*\* Interface Restrictions

- SP only
- MS only
- SP-MS only
- SP-FS only

#### WEEE Directive:



At the end of the products useful life please dispose as per the local regulations. Do not dispose of with normal household waste. Do not burn.

### Specification

Outputs 0-10Vdc or 4-20mA self-detecting (not loop powered)

Power supply 24Vac/dc

Output ranges:

|                 |  |
|-----------------|--|
| IAQ             | 0 to 10 indicates AQ value (0 = good, 10 = poor) |
| CO <sub>2</sub> | 0-2000ppm or 0 to 5000ppm                        |
| RH              | 0 to 100%  |

Optional passive outputs:

|     |                                   |
|-----|-----------------------------------|
| -T  | Resistive, PTC & NTC types        |
| -SP | 1-11kΩ linear ±30%                |
| -MS | VFC 24Vac/dc 50mA max.            |
| -FS | Resistive (see page 4 for values) |

Measurement accuracies:

CO<sub>2</sub> Accuracy: 400-2000ppm: ±25ppm ±3% of CO<sub>2</sub>  
400-5000ppm: ±30ppm ±3% of CO<sub>2</sub>

CO<sub>2</sub> Temperature dependency 5ppm per °C or 0.5% of the reading per °, whichever is greater

CO<sub>2</sub> Stability <2% of FS over life of sensor

CO<sub>2</sub> Pressure dependency 0.13% of reading per mm Hg

RH Accuracy ±3% RH

Ambient:

|             |                             |
|-------------|-----------------------------|
| Temperature | 0 to 50°C                   |
| RH          | 0 to 95% RH, non-condensing |

Housing:

|                   |                       |
|-------------------|-----------------------|
| Material          | ABS (flame retardant) |
| Colour            | Polished white finish |
| Dimensions        | 115 x 85 x 28mm       |
| Protection        | IP30                  |
| Country of origin | UK                    |

Note\*:

When using the -T option, they are not compensated for internal heating.



The products referred to in this data sheet meet the requirements of EU Directive 2014/30/EU

### Installation



Antistatic precautions must be observed when handling these sensors. The PCB contains circuitry that can be damaged by static discharge.

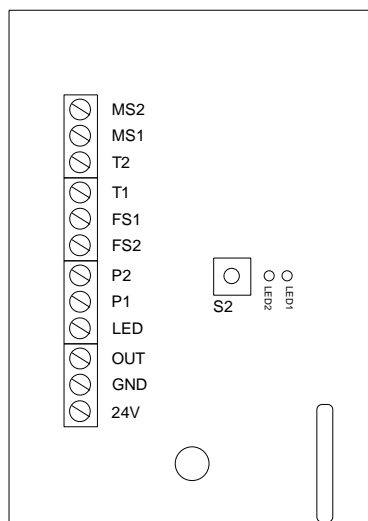
**Note:** Sontays range of RH sensors are not suitable for use in swimming pool & spa applications. Sensors used in these types of applications are not covered under Sontays warranty terms. Chemicals used in swimming pool & spas can contaminate the humidity element, which results in a reduced service life.

1. Select a location on a wall of the controlled space which will give a representative sample of the prevailing room condition. Avoid sitting the sensor in direct sunlight, on an outside wall or near heat sources. An idea mounting height is 1.5m from the floor.
2. Undo the tamperproof screw at the bottom of the housing and remove the front panel from the base.
3. Using the base as a template mark the hole centres and fix to the wall with suitable screws. Alternatively the base plate can be mounted on to a conduit box or standard recessed back box. The base plate is suitable for EU & North America fixings.
4. Feed cable through the hole in the base plate of the housing and terminate the cores at the terminal block as required. Leaving some slack inside the unit.
5. Replace the housing to the base plate and tighten the tamperproof screw (if required) through the lug at the bottom of the base plate.
6. Allow 3 minutes before checking functionality, and at least 30 minutes before carrying out pre-commissioning checks. This will allow the electronics time to stabilise.

To perform an accurate comparison between a transmitter output and a portable reference, it is essential that the two probes are held adjacent for a minimum of 30 minutes in a stable RH environment. Only in this way can speed of response and temperature factors be eliminated. It is not uncommon for test instruments and transmitters to disagree by 10% RH or more when site measurements are taken incorrectly. 'Slings' or other mechanical hygrometer should not be used as a reference.

### Connections

|     |  |
|-----|--|
| MS2 | Momentary switch output (VFC)  |
| MS1 | Momentary switch output (VFC)  |
| T2  | Direct thermistor output (resistive)                                     |
| T1  | Direct thermistor output (resistive)                                     |
| FS1 | Fan speed switch output (resistive)                                      |
| FS2 | Fan speed switch output (resistive)                                      |
| P2  | Set point (resistive)  |
| P1  | Set point (resistive)  |
| LED | 0-10Vdc input for "traffic light" led or Occupied/unoccupied text on LCD |
| OUT | Auto-selecting 0-10Vdc or 4-20mA (3-wire) output                         |
| GND | Common 0V  |
| 24V | Supply + 24Vac or Vdc  |



### Connections

#### -T (if fitted)

Direct resistive output is between terminals T1 and T2, polarity is independent. When using the -T option, they are not compensated for internal heating.

#### Fan Speed (if fitted)

The position of the selector switch will cause the resistance between the terminals to alter as shown below.

| Switch position | Output       |
|-----------------|--------------|
| 0               | Open circuit |
| 1               | 22.7kΩ       |
| 2               | 26kΩ         |
| 3               | 29.3kΩ       |
| Auto            | 32.6kΩ       |

#### Set point (if fitted)

This is available in the following values:

| -   | +    |
|-----|------|
| 1kΩ | 11kΩ |

#### Momentary switch (if fitted)

Rated at 24Vac/dc @ 500mA max.

### LED's & Self-Test

**The LEDs** are labelled LED1 and LED2. On power up or when the load resistance is in the "forbidden zone" (550R to 3K) the LEDs will flash alternately. Once the system has established which mode to operate in, the appropriate led will be on and not flashing.

- LED1 Current output
- LED2 Voltage output

Currently an 'Error Halt' will occur if:-

1. Temperature, RH, Dewpoint, Absolute Humidity or Enthalpy is selected and the appropriate sensor not fitted.
2. In CO2 mode a CO2 sensor element is not fitted or is faulty.
3. In IAQ mode a sensor is not fitted.

In all 3 cases above, both LEDs are on and the output is set to zero.

#### PCB Self Test:

Push button is for 50% output. Press and hold, the output in voltage mode it may take several seconds to settle. The screen displays 50% message when active (if display is fitted).

#### 0-10Vdc input:

- In traffic light mode: Zero to 2.5V = Green 3.5V to 6V = Amber and 8.5V to 10V = Red.
- In override mode: 0-4.9V Override Off, 5-10V Override On

### Notes

CO<sub>2</sub> option: Automatic Background Logic (ABC) is designed to be used in HVAC applications where CO<sub>2</sub> concentrations will drop to outside ambient condition (400ppm) in a 7 day period. The sensor will reach its operational accuracy after 24 hours of continuous operation. CO<sub>2</sub> sensor will maintain accuracy with ABC logic enabled, given that it is at least four times in 21 days exposed to a reference level of 400ppm.

IAQ option: Sensor element responds to a broad range of contaminants, such as Ammonia (NH<sub>3</sub>) and Hydrogen Sulphide (H<sub>2</sub>S), generated from waste materials in office and home environments. It also has high sensitivity to low concentrations of VOCs such as toluene emitted from wood finishing and construction products.

Whilst every effort has been made to ensure the accuracy of this specification, Sontay cannot accept responsibility for damage, injury, loss or expense from errors or omissions. In the interest of technical improvement, this specification may be altered without notice.

Tel: +44 (0)1732 861200 - E-mail: sales@sontay.com - Web: www.sontay.com

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