

# T/RH Sensor with Radiation Shield

Supplies temperature and relative humidity readings specific to greenhouse conditions. To counter the impact of solar radiation on sensor accuracy, a radiation shield is employed. This shield utilizes passive ventilation, promoting extended battery life while maintaining precise measurements. This device, belonging to the PRO sensor series, includes Aranet Sub-GHz ISM band radio which wirelessly transmits sensor measurements to the Aranet PRO base station.



## Product numbers

Product number	Radio band	To be used in
TDSPT509	EU868	European Union
TDSPT5U9	US920	United States of America, Canada, South America
TDSPT5U9	AS923	Brunei, Cambodia, Hong Kong, Indonesia, Laos, Taiwan, Thailand, Vietnam
TDSPT5J9	JP923	Japan, Malaysia, Singapore
Not available	KR923	South Korea

## Sensor performance

### General notes

- 95 % of the sensors perform within the specified accuracy limits at the time of purchase, assuming they are in an equilibrium state. For evaluation of the total measurement error, long-term drift has to be taken into account.
- Measurement time constant  $\tau$  is determined at 1 m/s airflow. This constant refers to the time it takes for the sensor reading to reach 63 % of a new steady-state value in response to a step change in the environment. It essentially represents the speed at which the sensor adjusts to changes in the measured quantity.

### Temperature

Range	-40–60 °C	-40–140 °F
Resolution	0.1 °C	0.1 °F
Accuracy	±0.3 °C	±0.5 °F
Long-term drift	0.03 °C/year	0.05 °F/year
Time constant $\tau$	1 min	

## Relative Humidity

Range	0–100 %
Resolution	0.1 %
Accuracy	±2 %
Long-term drift	0.5 %/year
Time constant $\tau$	TBD

- Provided accuracy is relevant for the relative humidity measurement range 0–80 % at 23 °C (73 °F).
- Long-term drift value is provided at laboratory conditions: 23 °C (73 °F) and 30–70 % relative humidity. In significantly different conditions, higher long-term drift might occur.
- Long-term exposure to high humidity conditions (>80 %, especially condensing atmosphere) might temporarily increase the relative humidity reading above the actual value. To rectify this, it's advisable to dry the probe in an environment with low relative humidity.

## General specifications

Ingress protection rating	IP65	
Maximum operating temperature	-40–60 °C	-40–140 °F
Dimensions	∅80×660 mm	∅3.1×26 in
Weight (incl. battery)	230 g	8.1 oz
Enclosure material	ASA and PP plastics	
Power supply	1 pc AA battery	
Packaging includes	1 pc AA alkaline battery, polyester string for hanging the device	

## Battery lifetime

Measurement interval	Alkaline battery lifetime	Lithium battery lifetime
1 min	1.5 years	1.9 years
2 min	2.7 years	3.6 years
5 min	5.8 years	8.2 years
10 min	9.2 years	>10 years

- Battery lifetime data has been obtained by mathematical extrapolation and is provided for descriptive purposes only and is not intended to make or imply any guarantee or warranty.
- Battery lifetime tests and calculations performed assuming device is at 20 °C (68 °F) and using *Fujitsu Premium LR6G07* (alkaline) and *Energizer Ultimate Lithium L91* (lithium) AA batteries as reference.
- The operating temperature range may vary based on the battery type used. Generally, the range for alkaline batteries is between -20–50 °C (-4–122 °F), whereas for lithium batteries, it is -40–60 °C (-40–140 °F).

## Aranet radio parameters

Line of sight range	3 km	1.9 mi
Transmitter power	14 dBm	25 mW
Data transmission interval	1, 2, 5 or 10 min	
Data protection	XXTEA encryption	

## Aranet radio bands and channels

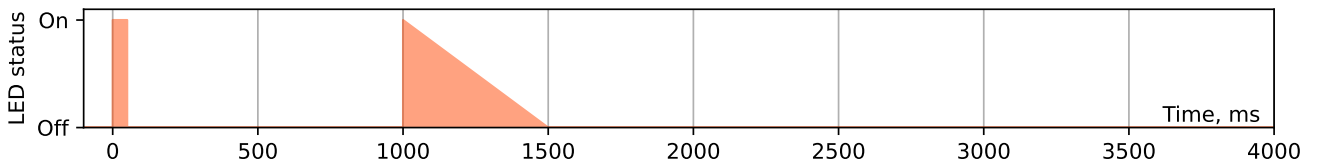
Radio band	Channel 1	Channel 2	Channel 3	Channel 4
EU868	868.1 MHz	868.3 MHz	868.5 MHz	—
US920	917.3 and 922.9 MHz	917.5 and 923.1 MHz	917.7 and 923.3 MHz	917.9 and 923.5 MHz
AS923	923.1 MHz	923.3 MHz	—	—
JP923	923.0 MHz	923.4 MHz	—	—
KR923	923.1 MHz	923.3 MHz	—	—

- This table outlines the radio channels utilized by Aranet Sub-GHz radio technology for transmitting sensor data to the base station, complying with the legislation in various regions. To determine availability of this product in your region and the corresponding channels used, refer to the “Product numbers” table located at the beginning of this document.

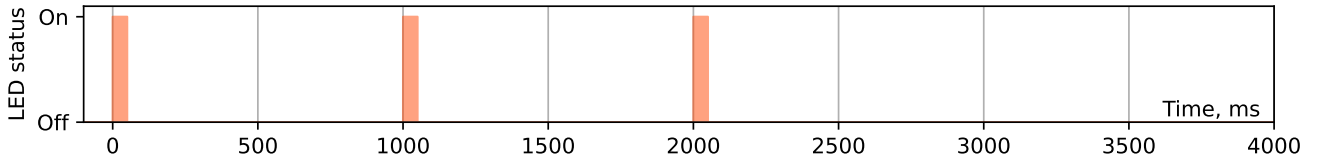
## Pairing process description

As part of the Aranet PRO product series, this device enables wireless sensor reading transmission to the Aranet PRO and PRO Plus base station. Here’s how to pair the sensor with the base station:

- Place the sensor within 20 m (60 ft) of the base station during pairing. Once paired, it can communicate over a much greater distance (up to 3 km / 1.9 mi line of sight).
- If the sensor uses a power supply unit, unplug it. Open the sensor casing and remove the battery for at least 20 seconds. Alternatively (for newer hardware revisions), locate the PAIRING button on the sensor PCB which can be used to initiate pairing without the removal of battery.
- Access the SENSORS menu in the base station Web GUI. Set the measurement interval and select PAIR SENSOR to start the pairing process.
- Within a 2-minute window, insert the battery or press the PAIRING button on the sensor PCB (for newer hardware revisions) to initiate pairing.
- A successful pairing is indicated by the sensor appearing in the Web GUI and a specific LED blink sequence on the sensor PCB (one to three short blinks followed by a longer fade-out blink of the LED):



- If pairing fails, the sensor won't appear in the Web GUI, and the LED blink sequence will consist only of three short blinks. In this case, repeat the procedure closer to the base station.



- After successful pairing, customize parameters like name and tags in the Web GUI. Close the sensor casing and install it in the desired location.

## Important notes

- Device is qualified to work properly within ambient clean air. Qualification for use in harsh environment is the duty of the user of the sensor. Exposure to volatile organic compounds, acids or bases, etching substances such as  $H_2O_2$ ,  $NH_3$ , shall be avoided.

## Compliance information

**CE** Conformité Européenne

**FC** Federal Communications Commission (USA)

**IC** Innovation, Science and Economic Development Canada