

Aranet4 without Display



Wireless, portable device for measuring air quality. Measures carbon dioxide (CO₂) concentration, temperature, relative humidity, and atmospheric pressure. 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
TDSPC205	EU868	European Union
TDSPC2U5	US920	United States of America, Canada, South America, Australia, New Zealand
TDSPC2U5	AS923	BRN, KHM, HKG, IDN, LAO, TWN, THA, VNM, MYS, SGP
Not available	JP923	Japan
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 τ 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.

CO₂ concentration

Range	0–9999 ppm
Resolution	1 ppm
Accuracy	$\pm(30 \text{ ppm} + 3 \% \text{ of reading})$
Long term drift	Not available
Time constant τ	100 s

- CO₂ sensor of the device is calibrated at standard atmospheric pressure. CO₂ readings are pressure compensated and comply with the specifications down to 750 hPa. If the device has to be used at high altitude for a prolonged

period of time, manual calibration of the unit should be performed for optimal performance. It is not intended to use the device higher than 4000 m (13'000 ft) above the sea level.

- CO₂ measurement accuracy is provided for a range 0–5000 ppm, temperature 15–35 °C (59–95 °F) and relative humidity 0–80 %. Accuracy above 5000 ppm is 10 % of reading, but not guaranteed since it is extrapolated from the calibrated range.
- If a drift of the CO₂ measurements occurs, calibration feature of the device should be used. Auto calibration mode is utilizing *automatic baseline calibration* (ABC) algorithm whereas manual calibration mode demands sensor to be exposed to fresh air (see section *CO₂ measurement calibration procedure*).

Temperature

Range	0–50 °C	32–122 °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 τ	10 min	

Relative humidity

Range	0–99 %
Resolution	1 %
Accuracy	±3 %
Long term drift	0.5 %/year
Time constant τ	6 min

Atmospheric pressure

Range	600–1100 hPa
Resolution	1 hPa
Accuracy	+3 hPa / -2 hPa
Long term drift	1 hPa/year
Time constant τ	0 s (instantaneous)

- Device measures absolute pressure, i.e., readings are not compensated for an elevation above the sea level.

General specifications

Ingress protection rating	IP20	
Operating temperature range	0–50 °C	32–122 °F
Operating relative humidity range	0–99 %	
Dimensions	71×71×24 mm	2.80×2.80×0.94 in
Weight (incl. batteries)	104 g	3.7 oz
Enclosure material	Polycarbonate	
Power supply	2 pcs AA batteries	
Packaging includes	2 pcs AA alkaline batteries, configuration pin	

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 at the beginning of this document.

Battery lifetime

Measurement interval	Alkaline battery lifetime	Lithium battery lifetime
1 min	2.1 years	2.8 years
2 min	3.8 years	5.2 years
5 min	8.0 years	>10 years
10 min	>10 years	>10 years

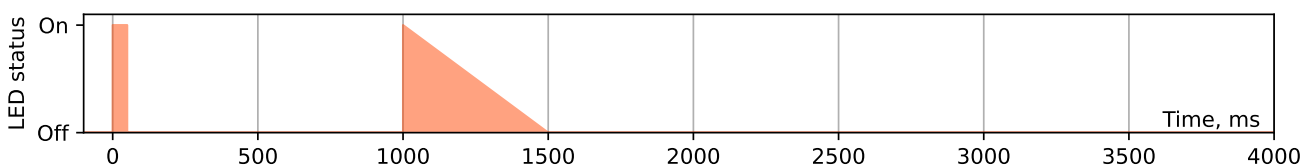
- Battery lifetime data has been obtained by mathematical extrapolation and is provided for descriptive purposes only and is not intended to make or imply any guarantee or warranty.

- 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).

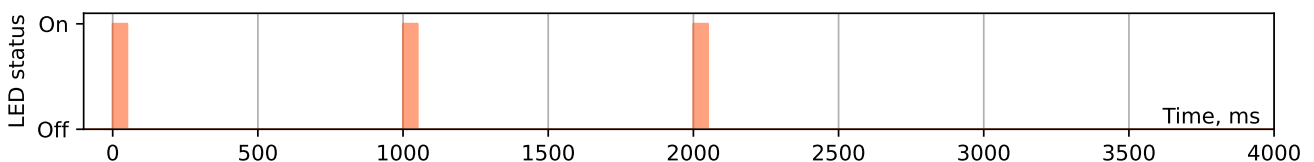
Pairing process description

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.

CO₂ measurement calibration procedure

The sensor arrives factory-calibrated and includes an auto-calibration feature. However, should measurement drift occur or any discrepancy between the sensor reading and the actual environment become apparent, manual recalibration in an ambient CO₂ level environment is possible. The steps for manual calibration are outlined below:

- Open the battery compartment, remove the batteries, and locate a two-position DIP switch on the circuit board. Ensure it is set to the “MANUAL” position.
- Locate a small button labeled “CALIBR.”. This will be used later to initiate the manual calibration procedure.
- Reinstall the batteries to power the device back on.
- By using a thin tool, reach between the batteries to press and hold the button labeled “CALIBR.” until a red LED begins blinking. This initiates the manual calibration procedure. Reinstall the battery compartment lid.
- Allow the sensor to sit for 30 minutes in an environment with ambient CO₂ concentration levels, such as fresh outdoor air, ensuring no one is close enough for breathed-out air to reach the sensor.
- Once the time has elapsed, the calibration process is complete. Reinstall the sensor in its usual location and resume normal use.



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 H₂O₂, NH₃, shall be avoided.

Compliance information

 Conformité Européenne

 Federal Communications Commission (USA)

 Innovation, Science and Economic Development Canada