PM Sensor

A device designed to monitor air pollution levels and safeguard against harmful particulate matter (PM) present in the air. 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
TDSPPM02	EU868	European Union
TDSPPMU2	US920	United States of America, Canada, South America, Australia, New Zealand
TDSPPMU2	AS923	BRN, KHM, HKG, IDN, LAO, TWN, THA, VNM, MYS, SGP
Not available	JP923	Japan
Not available	KR923	South Korea

Particulate matter concentration measurement performance

	PM1.0	PM2.5	PM10
Range	0–1000 μg/m^3	0–1000 μg/m^3	0–1000 μg/m^3
Resolution	1 μg/m^3	1 μg/m^3	1 μg/m^3
Accuracy (up to 100 μg/m^3)	±10 μg/m^3	±10 μg/m^3	±25 μg/m^3
Accuracy (100–1000 μg/m^3)	±10 %	±10 %	±25 %
Maximum long-term drift	±1.25 %/year	±1.25 %/year	±1.25 %/year

• The concentration metrics provided for PM1.0, PM2.5, and PM10 indicate particle concentration with overlapping size ranges: 0.3–1.0 μm, 0.3–2.5 μm, and 0.3–10 μm, respectively.

General specifications

Ingress protection rating	IP42	
Operating temperature range	-10–60 °C	14–140 °F
Operating relative humidity range	0–95 %	
Dimensions	104×67×37 mm	4.10×2.64×1.46 in
Weight (excl. wall mount)	116 g	4.1 oz
Packaging includes	Power supply unit, wall mount	

Power supply specifications

Power supply	External 12–24 VDC power supply unit
Power consumption	0.5 W

LED mode description

LED mode	Air quality index	Category
Green	0–50	Good
Yellow	51–100	Moderate
Orange	101–150	Unhealthy for sensitive groups
Red	151–200	Unhealthy
Purple	201–300	Very unhealthy
Flashing	>301	Hazardous

• The calculation of the air quality index and the corresponding implementation of LED modes were guided by the document titled: *U.S. Environmental Protection Agency, "Technical Assistance Document for the Reporting of Daily Air Quality" (2018)*.

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	

• Specifically for JP923 radio band, reduced transmitter power of 13 dBm (20 mW) is used.

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.

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:

- **Preparing for pairing:** 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).

- **Power off the sensor:** If the sensor comes with a battery-disconnect pull tab, leave it in place for now. For battery-powered sensors that are already on, open the casing and remove the battery for at least 20 seconds. If the sensor uses a power supply, unplug it. For newer hardware versions, locate the PAIRING button on the sensor PCB which can be used to initiate pairing without the removal of battery.

- **Start the pairing process:** Access the SENSORS menu in the base station Web GUI. Set the measurement interval and select PAIR SENSOR to start the pairing process.

- **Power on the sensor:** Within 2 minutes, pull the battery tab, reinsert the battery, connect the power supply, or press the PAIRING button to initiate pairing.

- **Confirm successful 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):
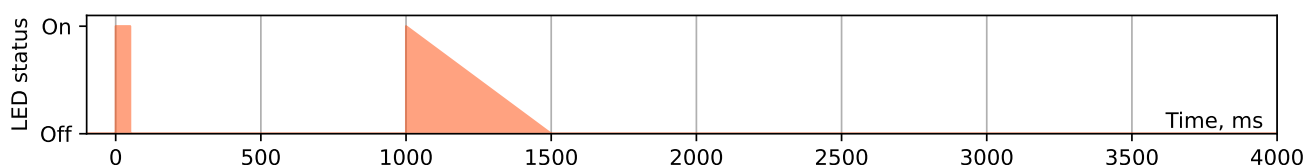
- **Troubleshooting:** If pairing fails, the sensor won't appear in the Web GUI, and the LED blink sequence will consist only of three short blinks. In this case, repeat the process closer to the base station.
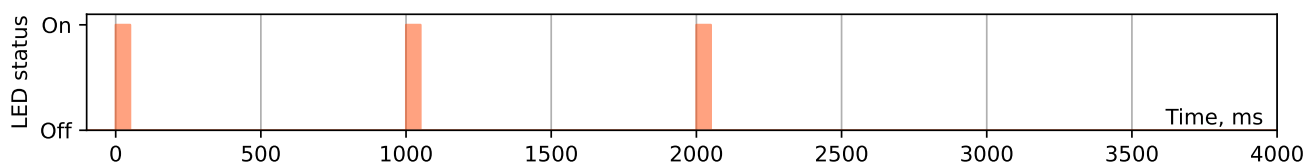
- **Final setup:** After successful pairing, customize parameters like name and tags in the Web GUI. Close the sensor casing and install it in the desired location.

Important notes

- The sensor best performs when operated within 10–40 °C (50–104 °F) and 20–80 % RH, should be placed in stable temperature and relative humidity locations. Avoid operating in a heavily contaminated environment, under excessive ambient light, and/or wind.

Compliance information

CE   Conformité Européenne

FC   Federal Communications Commission (USA)

IC   Innovation, Science and Economic Development Canada