PAR Sensor with Holder

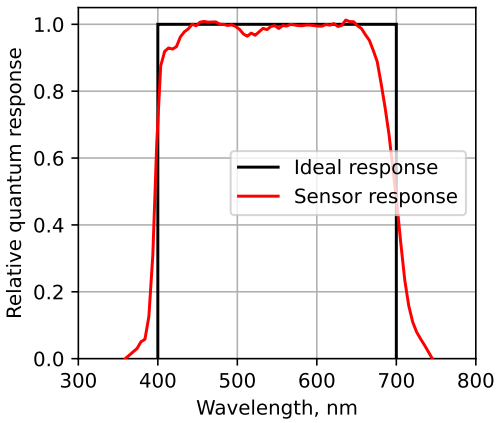
This device enables the measurement of photosynthetically active radiation (PAR), which is particularly valuable in agriculture, horticulture, and other contexts focused on monitoring plant growth parameters. This device, belonging to the PRO sensor series, includes Aranet Sub-GHz ISM band radio which wirelessly transmits sensor measurements to the Aranet PRO base station.

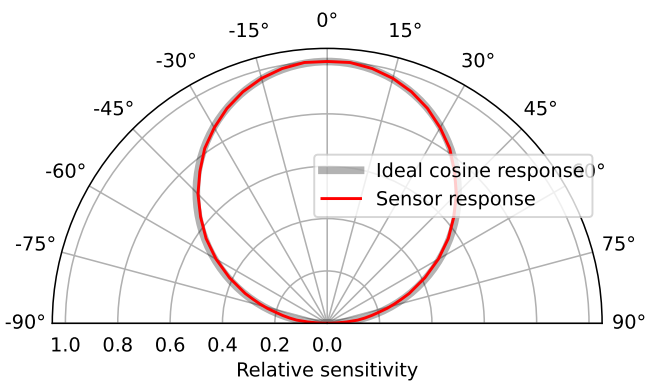
Product numbers

Product number	Radio band	To be used in
TDSKAR02	EU868	European Union
TDSKARU2	US920	United States of America, Canada, South America, Australia, New Zealand
TDSKARU2	AS923	BRN, KHM, HKG, IDN, LAO, TWN, THA, VNM, MYS, SGP
TDSKARJ2	JP923	Japan
TDSKARU2	KR923	South Korea

Photosynthetic photon flux density (PPFD) measurement performance

Range	0–4000 μmol/(s×m^2)	
Resolution	1 μmol/(s×m^2)	
Accuracy	±10 %	
Spectral range of operation	400–700 nm	
Cosine error	<2 % at 45°	<5 % at 75°





General specifications

Ingress protection rating	IP68	
Operating temperature range	-20–60 ° C	-4–140 ° F
Operating relative humidity range	0–100 %	
Dimensions	⌀35×117 mm	⌀1.38×4.60 in
Weight (incl. battery)	80 g	2.8 oz
Enclosure material	ASA plastic, aluminium	
Power supply	1 pc AA battery	
Packaging includes	1 pc AA alkaline battery	

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.

Battery lifetime

Measurement interval	Alkaline battery lifetime	Lithium battery lifetime
1 min	0.9 years	1.1 years
2 min	1.7 years	2.2 years
5 min	3.7 years	5.1 years
10 min	6.4 years	9.1 years

- Battery lifetime data has been obtained by mathematical extrapolation and is provided for descriptive purposes only

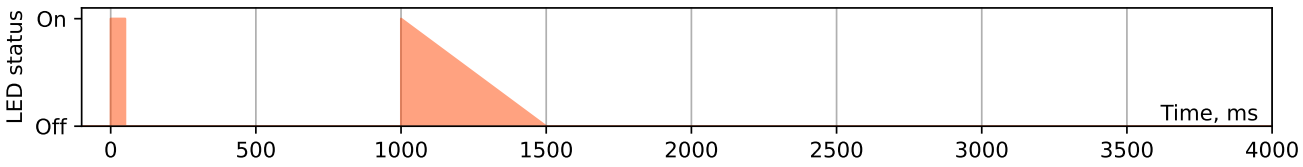
and is not intended to make or imply any guarantee or warranty.

- 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).

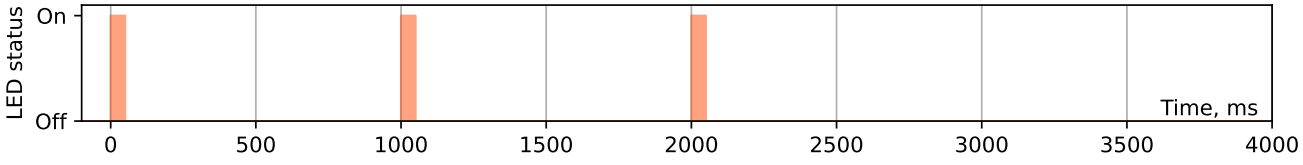
Pairing process description

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:

- **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.

Bracket installation

- Choose an installation site with illumination characteristics representative of the crop being grown. Place the sensor as close to plant level as possible, ensuring it is above any obstructions from vegetation.
- Avoid installing the sensor in areas where illumination is obstructed, especially in the sensor's main field of view (refer to the angular sensitivity dependence in the section *Photosynthetic photon flux density (PPFD) measurement performance*). Examples include locations near walls or under construction elements.
- Secure the holder bracket to the chosen surface using screws, bolts, or zip-ties, ensuring a sturdy fixture to prevent changes in orientation during operation.
- To maintain repeatability of measurements across devices and installation sites over time, ensure the sensor is vertically oriented using the built-in bubble level: Loosen the bronze screw that holds the ball joint, orient the fixture until the bubble in the level is centered, then tighten the ball joint screw.
- Pair the sensor with a base station and insert it into the bracket with the sensing element facing upward (see image to the right).

Compliance information

CE	Conformité Européenne
FC	Federal Communications Commission (USA)
IC	Innovation, Science and Economic Development Canada

Korea certification mark label

R-R-A4A-TDSPARU2

Company name	SAF Tehnika JSC
Equipment name	PAR Sensor with Holder
Model name	TDSPARU2
Manufacturer / Country	SAF Tehnika JSC, Latvia