Apogee Transmitter

A universal Aranet transmitter compatible with a range of Apogee Instruments sensors, enabling measurement of PAR, ePAR, temperature, and other parameters across horticultural, research, and industrial environments. 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
`TDSAT001`	`EU868`	European Union
`TDSAT0U1`	`US920`	United States of America, Canada, South America, Australia, New Zealand
`TDSAT0U1`	`AS923`	BRN, KHM, HKG, IDN, LAO, TWN, THA, VNM, MYS, SGP
Not available	`JP923`	Japan
Not available	`KR923`	South Korea

Sensor solutions including this transmitter

- This transmitter is part of the joint Aranet and Apogee Instruments solution. **Each sensor assembly consists of Aranet Apogee Transmitter, a corresponding Apogee Sensor, and a sensor mounting bracket.**
- The product numbers for the sensor assemblies (transmitter, sensor, mounting bracket) are listed below.

Product number	Product name	Measurand
`TDSAPS*1`	Apogee PAR Sensor SQ-500	PAR (400–700 nm)
`TDSAPE*1`	Apogee ePAR SQ-610	ePAR (400–750 nm)
`TDSAPF*1`	Apogee PAR-FAR Sensor S2-141	PAR (400–700 nm), far-red (700–750 nm)
`TDSAPM*1`	Apogee Pyranometer SP-110	Solar radiation (350–1100 nm)
`TDSARS*1`	Apogee Standard FOV IR Radiometer SI-111	Temperature (22 ° FOV)
`TDSARU*1`	Apogee Narrow FOV IR Radiometer SI-121	Temperature (18 ° FOV)
`TDSARN*1`	Apogee Ultra Narrow FOV IR Radiometer SI-131	Temperature (14 ° FOV)
`TDSARH*1`	Apogee Horizontal FOV IR Radiometer SI-1H1	Temperature (32 °×13 ° FOV)

- Aranet product number designations include the symbol `*` to indicate multiple product variants. Depending on the region of use, the asterisk is replaced with either `0` or `U`. The `0` variant corresponds to `TDSAT001`, while the `U` variant corresponds to `TDSAT0U1` transmitter.

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- For detailed Apogee sensor specifications, refer to the relevant datasheet on the Aranet product page or the Apogee Instruments website (`https://www.apogeeinstruments.com`) using the product code provided at the end of the sensor name (e.g., SQ-500).

General specifications

Ingress protection rating	IP64	
Operating temperature range	-20–60 °C	-4–140 °F
Aranet transmitter dimensions	⌀35×120 mm	⌀1.4×4.7 in
Cable length	50 cm	1.64 ft
Total weight (incl. battery, cable)	100 g	3.5 oz
Power supply	1 pc AA battery	
Packaging includes	1 pc AA alkaline battery	

Battery lifetime

Measurement interval	Alkaline battery lifetime	Lithium battery lifetime
1 min	1.1 years	1.4 years
2 min	2.0 years	2.7 years
5 min	4.8 years	6.7 years
10 min	7.8 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	

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

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Aranet radio bands and channels

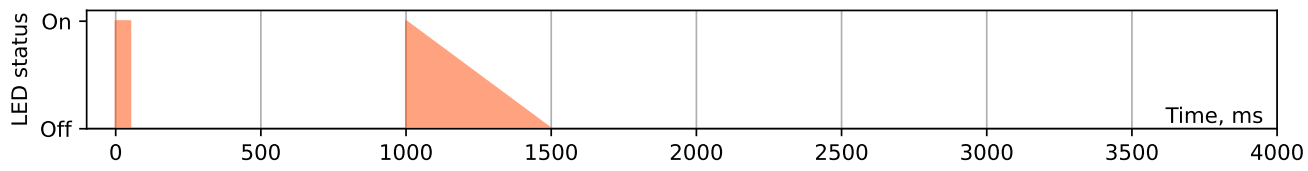
Radio band	Channel 1	Channel 2	Channel 3	Channel 4
`EU868`	868.1 MHz	868.3 MHz	868.5 MHz	—
`US920`	917.3 and 922.9 MHz	917.5 and 923.1 MHz	917.7 and 923.3 MHz	917.9 and 923.5 MHz
`AS923`	923.1 MHz	923.3 MHz	—	—
`JP923`	923.0 MHz	923.4 MHz	—	—
`KR923`	923.1 MHz	923.3 MHz	—	—

- 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.

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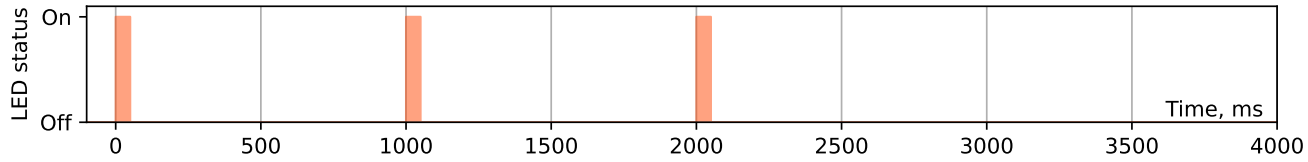

- **Final setup:** After successful pairing, customize parameters like name and tags in the Web GUI. Close the sensor casing and install it in the desired location.

Installation instruction

- **Alignment:** When reconnecting a sensor, arrows on the connector jacket and an alignment notch ensure proper orientation.
- **Tightening:** Connectors are designed to be tightened by hand only. An O-ring inside the connector can be over-compressed if a wrench is used. Pay close attention to thread alignment to avoid cross-threading. When fully tightened, one to two threads may still be visible.
- **Sensor configuration:** After completing the pairing procedure, go to the sensor configuration menu and select the connected Apogee sensor. For the Apogee PAR-FAR Sensor S2-141 and infrared radiometers, apply the calibration coefficients provided with the sensors.
- **Sensor change:** If the connected sensor is replaced, use the sensor edit feature to update the selected Apogee sensor.

Compatability

- The table below presents a list of sensors manufactured by Apogee Instruments that are compatible with this transmitter.

Apogee product number	Apogee product name
`SQ-500-SS`	Full-Spectrum Quantum Sensor
`SQ-610-SS`	400-750 nm ePAR Sensor
`S2-141-SS`	PAR-FAR Sensor
`SP-110-SS`	Self-Powered Pyranometer
`SI-111-SS`	Research-Grade Standard Field of View Infrared Radiometer Sensor
`SI-121-SS`	Research-Grade Narrow Field of View Infrared Radiometer Sensor
`SI-131-SS`	Research-Grade Ultra-Narrow Field of View Infrared Radiometer Sensor
`SI-1H1-SS`	Research-Grade Horizontal Field of View Infrared Radiometer Sensor

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Compliance information

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

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