Teros-12
Transmitter

Enables wireless operation of your Teros-12 soil sensor. Connects to the Teros-12 sensor via an M8 4-pin A-code connector. 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
TDSPHT02.010	EU868	European Union
TDSPHTU2.010	US920	United States of America, Canada, South America, Australia, New Zealand
TDSPHTU2.010	AS923	BRN, KHM, HKG, IDN, LAO, TWN, THA, VNM, MYS, SGP
TDSPHTJ2.010	JP923	Japan
Not available	KR923	South Korea

Transmitter cable specifications

Length	1 m	3.3 ft
Cable material	PVC	
Operating temperature (flexing)	-10–80 °C	14–176 °C
Operating temperature (fixed)	-30–80 °C	-22–176 °C
Connector	Female M8 4-pin A-code connector	

- Probe extension cable (5 m / 16.4 ft) is available as accessory upon request.

Cable connection instructions
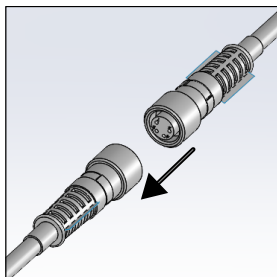
Step 1: Align the pins of the connector and firmly insert it into place.
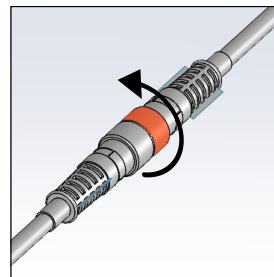
Step 2: Use your fingers to securely tighten the locking nut until it is snug.

Teros-12 sensor performance

General notes

- The Teros-12 sensor **is not bundled with this product**. It is the responsibility of the user to procure a Teros-12 sensor for connection to this transmitter. Nevertheless, the data in this section encompasses parameters offered by the Teros-12 sensor, serving to provide comprehensive information and detailing the data that will be transmitted to the Aranet base station.

- 95 % of the sensors perform within the specified accuracy limits at the time of purchase, assuming they are in an equilibrium state.

Volumetric water content

Range	0–100 %
Resolution	0.1 %
Accuracy	±3 %

- The VWC range is dependent on the media the sensor is calibrated to. A custom calibration will accommodate the necessary ranges for most substrates.

- Given accuracy figure is typical for mineral soils that have solution electrical conductivity of <8 dS/m. The VWC accuracy is dependent on the media the sensor is calibrated to. A custom calibration can improve the accuracy up to 1 % of VWC reading.

Apparent dielectric permittivity

Range	1–80	
Resolution	0.01	
Accuracy	±1 % (in range 1–40)	±15 % (in range 40–80)

Bulk electrical conductivity

Range	0–20 dS/m
Resolution	0.001 dS/m
Accuracy	±8 % of reading

Temperature

Range	-40–60 °C	-40–140 °F
Resolution	0.1 °C	0.1 °F
Accuracy	±0.5 °C	±1.0 °F

- Temperature measurement may not be accurate if sensor is not fully immersed in the medium of interest, due to longer time required to reach thermal equilibrium.

General specifications

Ingress protection rating	IP68	
Operating temperature range	-40–60 °C	-40–140 °F
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	

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	1.2 years
2 min	1.7 years	2.3 years
5 min	3.9 years	5.3 years
10 min	6.6 years	9.5 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):
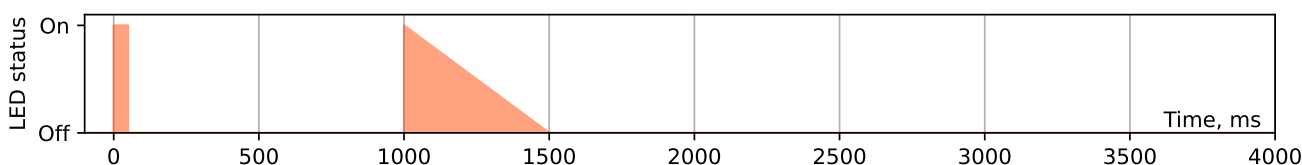
- If pairing fails, the sensor won't appear in the Web GUI, and the LED blink sequence will consist only of three short blinks. In this case, repeat the procedure closer to the base station.
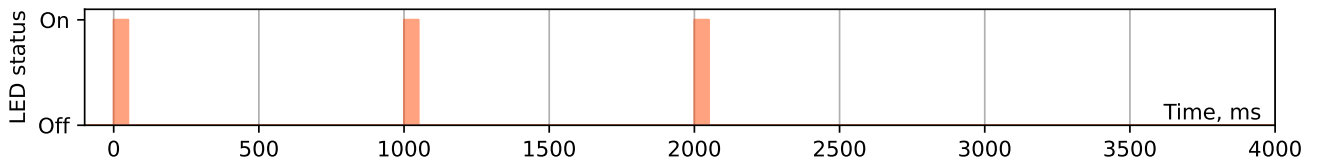
- After successful pairing, customize parameters like name and tags in the Web GUI. Close the sensor casing and install it in the desired location.

Compliance information

$\mathsf{C}\mathsf{E}$ Conformité Européenne

FC   Federal Communications Commission (USA)

IC   Innovation, Science and Economic Development Canada