# 4xT-Probe Sensor

Measures temperature simultaneously with four platinum resistance thermometer probes. The four cabled probes facilitate easy installation, e.g., across multiple pipelines in boiler or mechanical rooms, ensuring efficient and accurate temperature monitoring. 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.
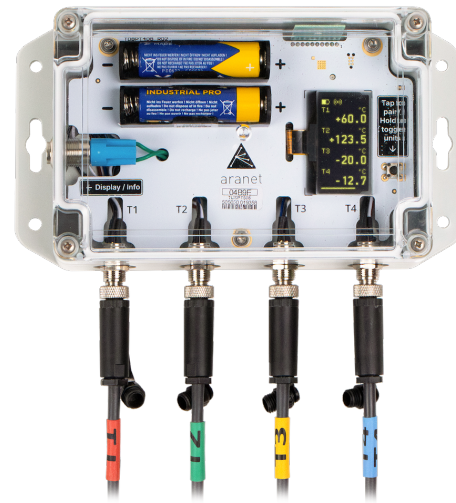
Product numbers

Product number	Radio band	To be used in
TDSPT508	EU868	European Union
TDSPT5U8	US920	United States of America, Canada, South America, Australia, New Zealand
TDSPT5U8	AS923	BRN, KHM, HKG, IDN, LAO, TWN, THA, VNM, MYS, SGP
Not available	JP923	Japan
Not available	KR923	South Korea

Temperature measurement performance

Probe compatibility	2-wire PT1000 (any class)	
Range	-200–600 °C	-328–1112 °F
Resolution	0.1 °C	0.1 °F
Accuracy at ±0 °C (32 °F)	±0.3 °C	±0.5 °F
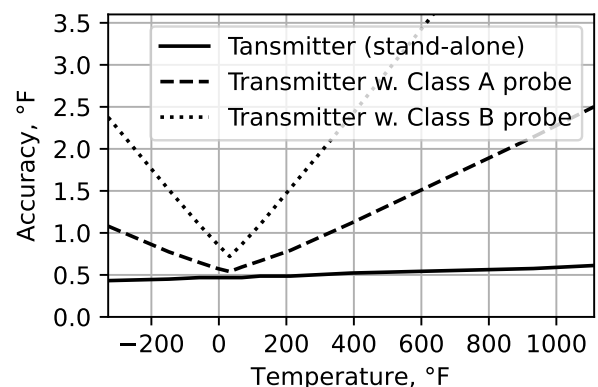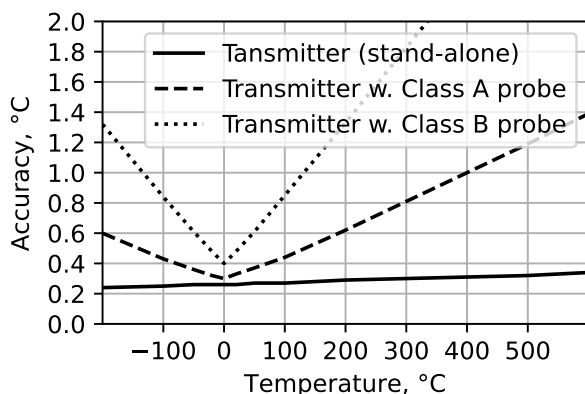
• The table displays the three-sigma (99.7 %) confidence error attributed solely to the transmitter when operating at

25 °C (77 °F). The overall measurement uncertainty depends on the accuracy of the PT100 probe used. Refer to the figures provided above for the calculated total accuracy values of the transmitter when used in combination with standard Class A and Class B platinum sensors.

- Temperature measurement accuracy data provided considering temperature of the radio transmitter being constant 25 °C.

Temperature probe specifications

Probe count	4	
Probe precision class	B	
Time constant τ	3 min	
Connection plug	M8 A-code connector with locking nut	
Operating temperature range	-30–180 °C	-22–356 °F
Probe dimensions	$\varnothing 6 \times 100$ mm	$\varnothing 0.24 \times 4$ in
Probe material	V4A stainless steel	
Cable insulation material	Silicone	
Weight (one probe)	175 g	6.2 oz
Cable length	5 m	16.5 ft

Sensor display performance

Size	27×19 mm	1.1×0.8 in
Resolution	128×64 px	
Type	OLED (monochrome yellow content on black background)	

Transmitter specifications

Ingress protection rating	IP65	
Operating temperature range	-40–60 °C	-40–140 °F
Dimensions	$150 \times 100 \times 45$ mm	$5.9 \times 3.9 \times 1.8$ in
Weight (incl. batteries, excl. probes)	362 g	12.8 oz
Enclosure material	Polycarbonate	
Power supply	2 pcs AA batteries	
Packaging includes	2 pcs AA alkaline batteries, 4 pcs temperature probes	

- DImensions are given for the overall body dimensions, without the mounting tabs or temperature probe sockets.

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

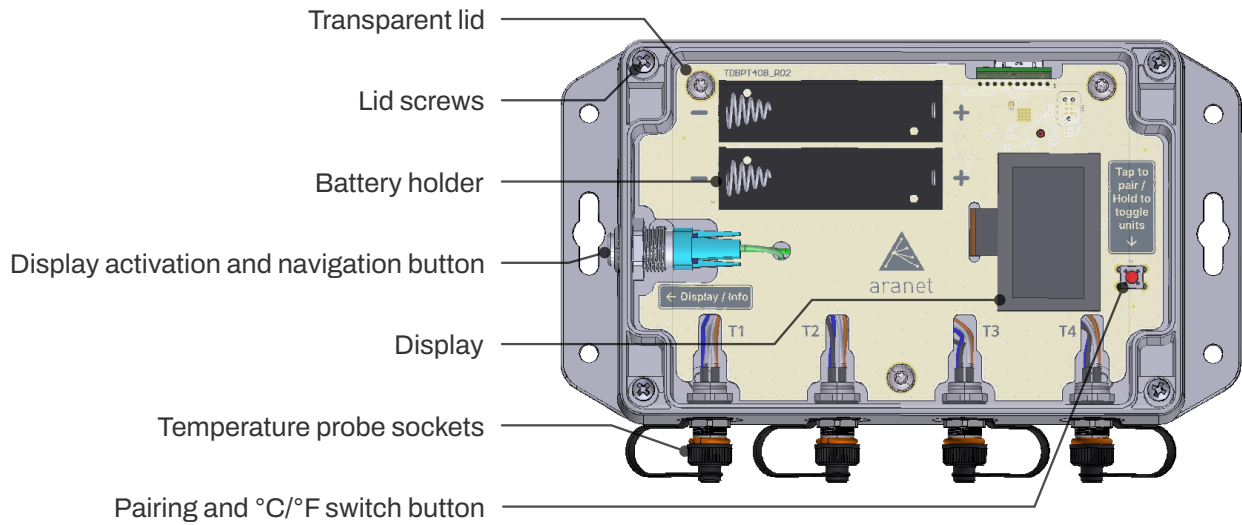| Radio band	Channel 1	Channel 2	Channel 3	Channel 4
EU868	868.1 MHz	868.3 MHz	868.5 MHz	—
US920	917.3 and 922.9 MHz	917.5 and 923.1 MHz	917.7 and 923.3 MHz	917.9 and 923.5 MHz
AS923	923.1 MHz	923.3 MHz	—	—
JP923	923.0 MHz	923.4 MHz	—	—
KR923	923.1 MHz	923.3 MHz	—	—

- 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.
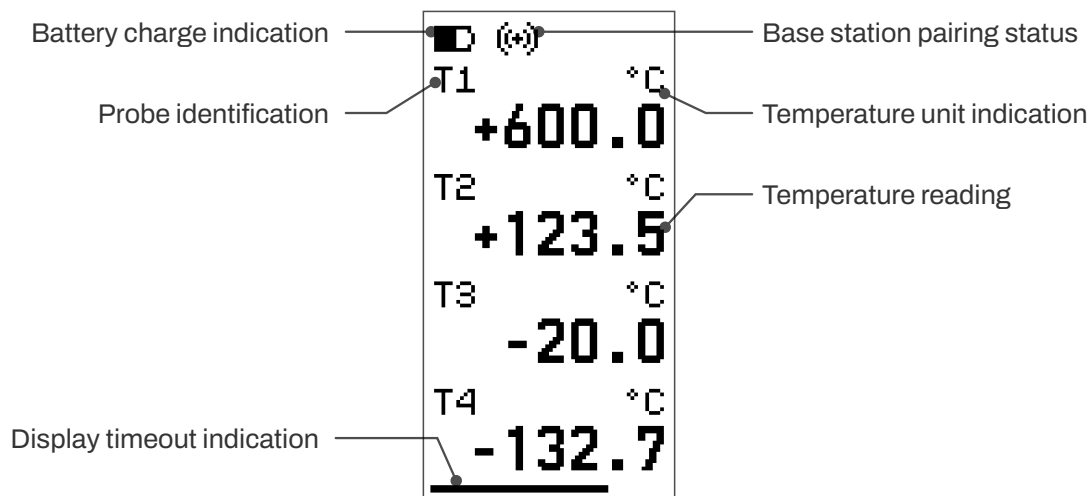
Battery lifetime

Measurement interval	Alkaline battery lifetime	Lithium battery lifetime
1 min	1.8 years	2.4 years
2 min	3.3 years	4.5 years
5 min	6.8 years	9.8 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).

Physical characteristics

Transparent lid
Lid screws
Battery holder
Display activation and navigation button
Display
Temperature probe sockets
Pairing and °C/°F switch button

Display contents

Battery charge indication
Probe identification
Base station pairing status
Temperature unit indication
Temperature reading
Display timeout indication

Probe and socket identification

| Product number	Probe marking	Probe sleeve color	Socket marking (printed on PCB)
TDAPT508.105	T1	Red	T1
TDAPT508.205	T2	Green	T2
TDAPT508.305	T3	Yellow	T3
TDAPT508.405	T4	Blue	T4

Initial setup

(1) **Connect the probes:** Attach the probes to the sockets according to the markings and tighten the locking nuts.

(2) **Remove the lid:** Unscrew the four screws of the transparent lid using a Phillips screwdriver and remove the lid.

(3) **Insert batteries:** Insert the two provided AA batteries into the holders, ensuring the correct polarity as indicated on the sensor's PCB.

(4) **Confirm power-on:** The display will light up and show the startup screen as seen on the right: hardware version and device serial number as a Data Matrix symbol.
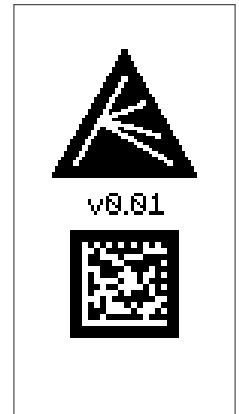
Verifying operation and setting temperature units

(5) **Main screen:** After displaying the startup screen, the device will enter pairing mode for approximately 3 s (as described in *Pairing process description* section). It will then switch to the main measurement screen as shown on the right.

(6) **Screen timeout:** To conserve battery life, the screen will turn off after 16 s. To reactivate the display, press the screen activation button on the left side of the casing.

(7) **Switching temperature units:** To switch between °C and °F, press and hold the small button on the PCB for 5 s.

(8) **Pairing status:** The pairing status with the base station is indicated by icons: (not paired) or (paired). If the sensor is not paired and shows , please pair it with a base station as described in the *Pairing process description* section below.
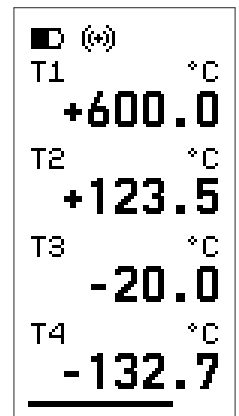
Pairing process description

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:
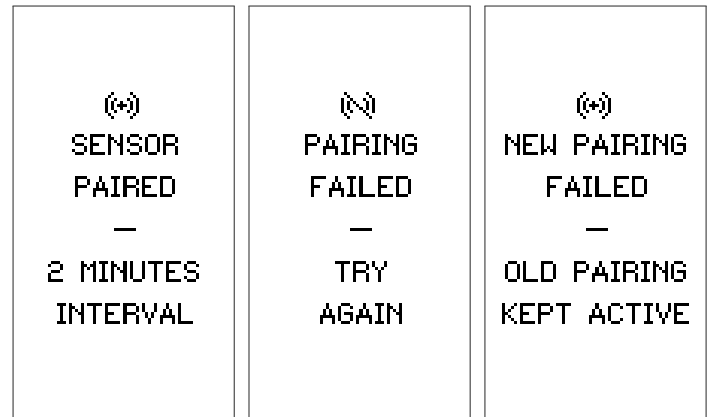
(9) **Proximity for pairing:** Place the sensor within 20 m (60 ft) of the base station during the pairing process. Once paired, the sensor can communicate over much greater distances (up to 3 km / 1.9 mi line of sight).

(10) **Initiate pairing on base station:** Access the SENSORS menu in the base station's Web GUI. Set the measurement interval and select PAIR SENSOR to start the pairing process.

(11) **Initiate pairing on sensor:** Within a 2-minute window, press the PAIRING button on the sensor PCB to initiate pairing. The pairing screen will appear (see image to the right).
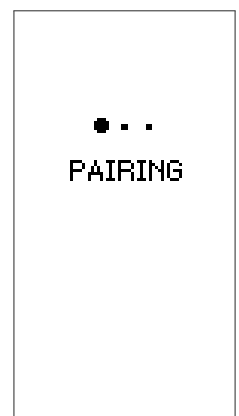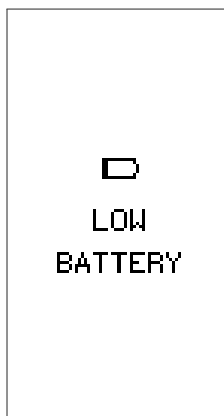
(12) **Confirmation of successful pairing:** Successful pairing is indicated when the sensor appears in the Web GUI and the corresponding screen on the device shows the chosen data transmission interval.

(13) **Handling pairing failure:** If pairing fails, the sensor will not appear in the Web GUI, and the device will show a failure message. In this case, repeat the pairing procedure closer to the base station. If the sensor was previously paired, the old pairing settings will remain.

```
 ((•))

SENSOR
PAIRED
—
2 MINUTES
INTERVAL
```

```
 (N)

PAIRING
FAILED
—
TRY
AGAIN
```

```
 ((•))

NEW PAIRING
FAILED
—
OLD PAIRING
KEPT ACTIVE
```

(14) **Post-pairing customization:** After successful pairing, customize parameters such as the sensor name and tags in the Web GUI. Finally, install the device in the desired location and close the sensor casing by screwing the lid back on.
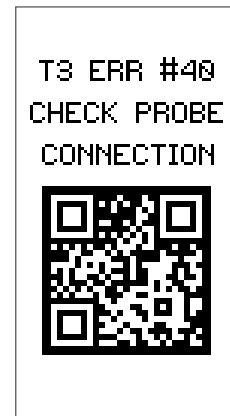
Error messages displayed on screen

```
 ▭

LOW
BATTERY
```

```
▮ ((•))
T1        °C
  +600.0
T2        °C
  +123.5
T3        °C
  ERROR #40
T4        °C
  -132.7
```

```
T3 ERR #40
CHECK PROBE
CONNECTION

[QR code]
```

Low battery: Appears for 2 s after activating the display, if battery level is low.
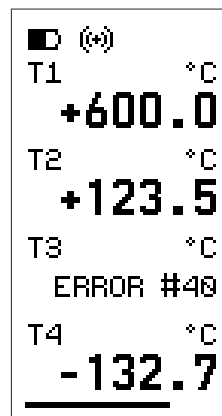
Probe error: If probe measurement cannot be shown, error code is shown instead.

Error info: Press display activation button again to show QR code with URL that leads to error description.

Error code interpretation

Error code	Description	Recommendation
#01	Probe not connected	Verify and tighten probe connections
#33/#40/#45	Probe partially connected	Verify and tighten probe connections
#02	Probe resistance above measurement range	Verify probe type / Replace damaged probe
#03	Probe resistance below measurement range	Verify probe type / Replace damaged probe
#04	SPI timeout or Hardware issue	Report the error to support@aranet.com
#05	Overvoltage fault detected	Report the error to support@aranet.com
#06	Error calculating temperature value	Report the error to support@aranet.com
—	Any other error	Report the error to support@aranet.com

Compliance information

$C\,E$ Conformité Européenne

FC   Federal Communications Commission (USA)

IC   Innovation, Science and Economic Development Canada