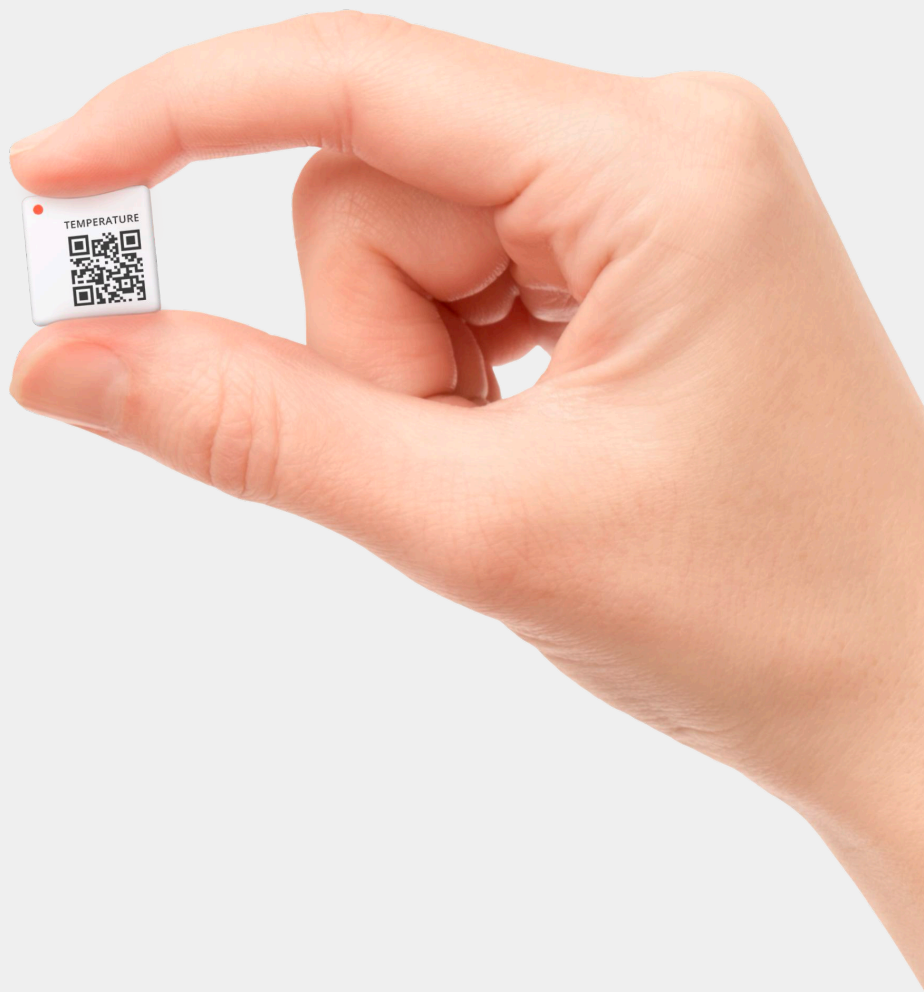




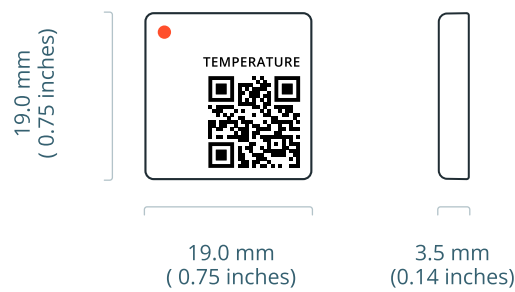
DISRUPTIVE
TECHNOLOGIES



Product Datasheet

Wireless Temperature Sensor

Overview



Description

The Wireless Temperature Sensor periodically measures the temperature in the surrounding environment and wirelessly transmits the results to nearby Cloud Connectors at a predetermined interval.

Cloud Connectors relay data from wireless sensors to the cloud via cellular or ethernet connectivity. From the cloud, the data can be integrated into other services using REST APIs and webhooks or viewed directly in Studio (web application).

Applications

- Refrigerator Temperature Monitoring
- Freezer Temperature Monitoring
- Incubator / Hot-hold monitoring
- HVAC Monitoring

Specifications

Temperature Measurement

Measurement Range	-40 to +85°C / -40 to +185°F
Accuracy	± 0.25°C / ± 0.45°F*
Technology	CMOS

*See Sensor Accuracy (Page 4)

Battery Specification

Battery Type	Lithium (Poly-Carbon Monofluoride)
Battery Life	Up to 15 Years
Replaceable	No

Radio & Communication

Communication Protocol	SecureDataShot™
Radio Frequency	868 MHz / 915 MHz / 920 MHz
Radio Range	Up to 40 m / 131 ft indoors

Mechanical Properties

Sensor Size	19x19x3.5mm / 0.75x0.75x0.14 in
Weight	3.0 g (± 0.5 g) / 0.11 oz
IP Rating	IP68
Mounting Method	Adhesive

Product Name	Region	Product Number
Wireless Temperature Sensor EU	Europe	102739
Wireless Temperature Sensor US	North America	102740
Wireless Temperature Sensor with Data Backfill EU	Europe	102683
Wireless Temperature Sensor with Data Backfill EU EN12830 HA	Europe	103035
Wireless Temperature Sensor with Data Backfill US	North America	102685
Wireless Temperature Sensor with Data Backfill APAC	Australia, New Zealand, Singapore	103072

How it works

Default Operation

The Wireless Temperature Sensor periodically measures the temperature in the surrounding environment and wirelessly transmits the results to nearby Cloud Connectors at a predetermined interval. The temperature measurement interval can be configured to as low as every 30 seconds.

The radio protocol used is SecureDataShot™, and the data is relayed to DT Cloud using a SecureDataShot™ enabled gateway, also known as a Cloud Connector. From the cloud, the data can be viewed directly in Studio (web application) or sent to external services using webhooks or a REST API.

Measurement Interval

The time between measurements depends on the Heartbeat Interval (HBI) and the number of samples in each heartbeat.

Users can adjust the sensor to capture 1 to 30 samples during a single heartbeat. The table to the right displays the shortest measurement interval for different heartbeat intervals.

HBI	Measurement Interval
5 min	30 sec
15 min	30 sec
30 min	60 sec
45 min	90 sec
60 min	120 sec

Heartbeat Interval

The Heartbeat Interval (HBI) controls how often data is sent to the cloud and can be set using Studio or the API. The Wireless Temperature Sensor can be set to 5, 15, 30, 45, or 60-minutes.

Exception: sensors certified to EN 12830 have a maximum heartbeat interval of 15 minutes.



Sensor events during default operation with 3 minute measurement interval and 15 minute heartbeat

Technical Specification

Measurement Range	-40°C to 85°C (-40°F to 185°F)
Sensor Technology	CMOS
Sensor Accuracy	The accuracy of the sensor depends on the temperature. See the table underneath for typical accuracy at specific temperatures.

Temperature Range		Typical		Max	
-40°C to -25°C	-40°F to -13°F	±0.6°C	±1.08°F		
-25°C to 5°C	-13°F to 41°F	±0.3°C	±0.54°F		
5°C to 60°C	41°F to 140°F	±0.2°C	±0.36°F	±0.7°C	±1.26°F (1)
15°C to 45°C	59°F to 113°F	±0.2°C	±0.36°F	±0.4°C	±0.72°F (1)
45°C to 85°C	113°F to 185°F	±0.3°C	±0.54°F		

(1) Accuracy values for these temperature ranges are based on design characterization and are not individually verified in production testing. Actual performance may vary slightly between units.

By calibrating the sensors, the accuracy can be improved to max ±0.25°C (±0.45°F), see the “Calibration Service” section for more information.

For EN12830: Accuracy Class: 0.5 in the range -30°C to 55°C

Measurement Resolution	0.05°C / 0.09°F
Temperature Drift	0.04°C / 0.072°F per year (max)
Data backfill (optional)	If the sensor goes offline, it will start storing temperature measurements locally until the connection to the cloud is restored. The sensor will backfill data, starting with the most recent samples first. The sensor will overwrite the oldest data if the memory becomes full. The number of datapoints that can be stored in an offline period depends on the sampling rate, heartbeat configuration and temperature fluctuations. Offline storage: Up to 100,000 datapoints Timestamp accuracy: 1%⁽²⁾ Practical example: A sensor with 15 minute heartbeat and 30 second sampling rate in a stable temperature environment can store data for 1 month before it starts overwriting data. (2) The timestamps are sensitive to variations in temperature and the duration of the offline period. For sensors in a stable temperature environment the typical accuracy is 1%.

Calibration Service (optional)

Wireless Temperature Sensors can be calibrated by DT for improved and documented accuracy. The setup meets the requirements of traceability stated in the ISO 17025:2017 standard. The sensors are calibrated to ±0.25°C / ± 0.45°F in a 5-point calibration routine (-20°C to 50°C) and delivered with a digital downloadable calibration certificate.

Contact sales at sales@disruptive-technologies.com for more information.

Technical Specification

Operating & Storage Conditions

Operating Conditions	Temperature: -40°C to 85°C (-40°F to 185°F) Humidity: 0 to 100% RH (non condensing) ¹
Storage Conditions	Cool and dry, near normal room temperature. To maximize battery life, DT recommends storing sensors within range of an online Cloud Connector.

Wireless Communication

Radio Protocol

SecureDataShot™

Radio Frequency

EU: 868 MHz ISM band

US: 915 MHz ISM band

APAC: 920 MHz ISM band

Radio Range¹

The wireless range is dependent on the gateway the sensor is communicating with.

Product	Indoor		Free Space	
Cloud Connector (1st Gen)				
Standalone Sensor	25 m	82 ft	300 m	984 ft
Sensor with range extender	100 m	328 ft	2 km	6561 ft
Cloud Connector (2nd Gen)				
Standalone Sensor	40 m	131 ft	600 m	1968 ft
Sensor with range extender	150 m	492 ft	4 km	13123 ft

Estimates are based on standard ITU-R P.1238 (indoor) and ITU-R P.525 (free-space).

Certification & Compliance

Certification	EU: CE, UKCA, WEEE IC: 25087-100541	US/Canada: FCC, ISED FCC ID: 2ATFX-100541	APAC: RCM, IMDA
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EN12830 Compliance (for EN12830 products only)

Accuracy Class	0.5 in the range -30°C to 55°C
Software Verification Level	Class III Type B (according to WELMEC 7.2) (EN12830:2018-10)
Test Report Number	ATP-MUC K-P-TS-26-200

(1): The sensor is waterproof, but should not be used in applications where the sensor is submerged or exposed to extremely high humidity over prolonged periods of time. Long time exposure to water or humid air close to condensation, in particular in combination with elevated temperatures, will result in water ingress and reduced sensor lifetime.

Battery Specification

Battery

Chemistry: Lithium (Poly-Carbon Monofluoride)

Lifetime

Standard Mode: Up to 15 years

High Power Mode: Up to 5 years

There are four factors that contribute the most to the battery life of the wireless sensor: temperature conditions, radio transmissions, sampling interval, and operating mode.

Temperature Conditions

The battery's ability to hold and deliver energy is affected by its operating temperature. At high temperatures, the battery will have increased self-discharge, and at low temperatures, it has less ability to deliver the total amount of its stored energy.

Environments with rapid, repeated temperature changes can significantly reduce sensor life. Cycles that swing from cool/ambient conditions to above ~60°C (140°F) are especially demanding. Such cycling accelerates battery self-discharge and material fatigue, increasing the likelihood of intermittent operation and early failure.

Radio Transmissions

The wireless sensor's most energy-consuming activity is transmitting and receiving radio messages. The average number of radio transmissions per day impacts the battery life.

Sampling Interval

The sampling interval determines how often the temperature is measured, and when compared to the heartbeat interval, it has a negligible impact on the battery life. However, if the sampling rate is set to a very short interval, it can have a noticeable effect at some temperatures over many years of operation.

Operating Mode

The sensor automatically selects and switches between the two following modes to optimise range and battery life:

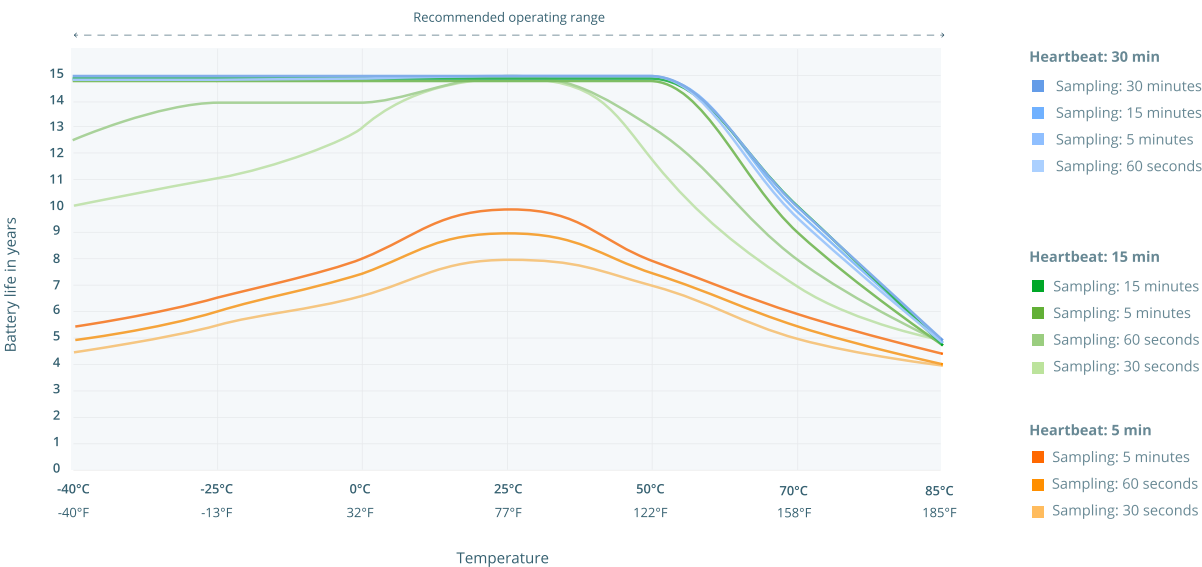
- **Standard Mode** (default)
- **High Power Boost Mode** (redundancy mode) 

In Standard Mode, when the sensor transmits a message, it expects to receive a message back from the cloud acknowledging that the sensor message has been received.

As a redundancy feature, if there is something preventing the message from reaching the cloud, the sensor will re-transmit the message using more power, in what is called High Power Boost Mode.

High Power Boost Mode gives the sensor increased wireless range, at the expense of battery life. To extend the battery life, sensors should not be permanently operating in High Power Boost Mode. The sensor uses roughly 3x the amount of energy to use the radio in High Power Boost Mode vs Standard Mode.

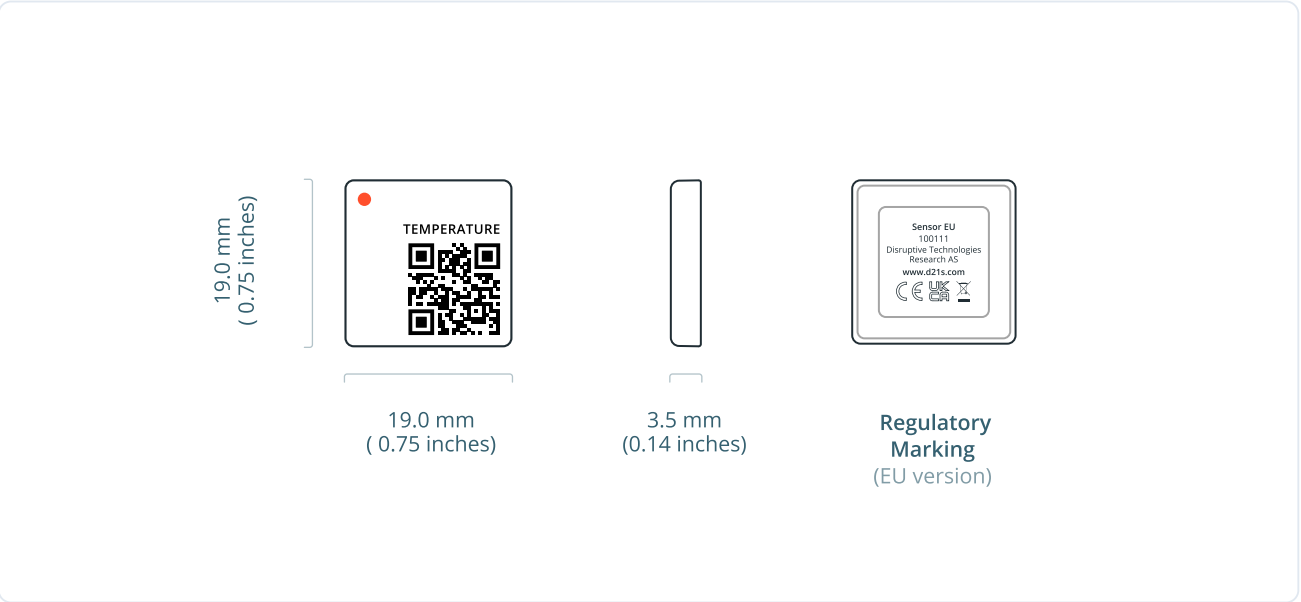
To make it easy for users to see if a device is currently operating in Standard Mode or High Power Boost Mode, the mode is sent with each sensor event on the API and visible in the Studio user interface.



Please note: The battery lifetimes listed here are estimates and can vary from sensor to sensor depending on usage pattern, wireless coverage and other environmental variables.

Mechanical Properties

Size	19 x 19 x 3.5 mm (± 0.2 mm) / 0.75 x 0.75 x 0.14 inches
Weight	3.0 g (± 0.5 g) / 0.11 oz
Material	Impact modified acrylic film
Mounting method	Adhesive
IP Rating	IP68



Revision History

Revision 1.0	Change: Initial release Date: February 9th, 2024
Revision 1.1	Change: Added section about temperature cycling and updated calibration info Date: September 9th, 2025
Revision 1.2	Change: Added details on sensor accuracy characterization Date: December 3rd, 2025
Revision 1.3	Change: Added EN12830 variant Date: September 28th, 2026
Revision 1.4	Change: Added APAC variant Date: October 11th, 2026

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