Product Datasheet

Wireless Temperature Probe Sensor

Overview

95.0 mm
(3.74 inches)

66.0 mm
(2.60 inches)

25.0 mm
(0.98 inches)

Specifications

Temperature Measurement

Measurement Range	-200 to +650°C / -328 to +1202°F
Accuracy	± 0.2°C / ± 0.36°F*
Technology	RTD (PT100 / PT1000)
Connection	2-, 3-, 4-Wire

*See Sensor Accuracy (Page 4)

Battery Specification

Battery Type	2x AA
Battery Life	Up to 15 Years
Replaceable	Yes

Radio & Communication

Communication Protocol	SecureDataShot™
Radio Frequency	868 MHz / 915 MHz
Radio Range	Up to 250 m / 820 ft indoors

Mechanical Properties

Size	95x66x25 mm / 3.74x2.60x0.98 in
Weight	116 grams / 4.1 oz
Material	Polycarbonate (PC)
Mounting Method	Adhesive or screw

Description

The Wireless Temperature Probe Sensor measures Temperature (°C/°F) through an industry standard PT100 or PT1000 temperature probe. The sensor comes with a 4-pin connector that supports, and automatically detects, probes with 2, 3 and 4 wire configuration. The measurement is wirelessly transmitted to the cloud through a Cloud Connector.

Cloud Connectors relay sensor data into the DT cloud infrastructure. From here, data can be integrated into other services using our developer APIs, or viewed directly in DT Studio (web application).

Applications

• Vaccine Storage Temperature Monitoring
• Cryogenic Storage Monitoring
• High Temperature Monitoring

Product Name	Product Number	Region	Order Code
Wireless Temperature Probe Sensor EU	102772	Europe	102773
Wireless Temperature Probe Sensor US	102774	North America	102775
Ultra Low Temperature Probe	-	Global	-
Cryogenic Temperature Probe	-	Global	-
High Temperature Probe	-	Global	-

How it works

Default Operation

The Wireless Temperature Probe Sensor periodically measures the temperature through a temperature probe and wirelessly transmits the results to the cloud through a SecureDataShot™ enabled gateway at a predetermined interval. The sensor works with any PT100 or PT1000 temperature probe and the 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 infrastructure 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 intervals for the available Heartbeat Intervals.

Heartbeat Interval	Measurement Interval
2.5 min	30 sec
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 controls how often data is sent to the cloud. Sensors can be set to 2.5, 5, 15, 30, 45, or 60-minute Heartbeat Intervals using Studio or the API.

Sensor Event			Sensor Event			Sensor Event
1	Temp:	15.324°C	1	Temp:	12.912°C	1	Temp:	23.342°C
2	Temp:	7.476°C	2	Temp:	22.474°C	2	Temp:	15.475°C
3	Temp:	8.485°C	3	Temp:	29.591°C	3	Temp:	6.891°C
4	Temp:	10.263°C	4	Temp:	31.856°C	4	Temp:	4.427°C
5	Temp:	17.586°C	5	Temp:	17.223°C	5	Temp:	6.283°C
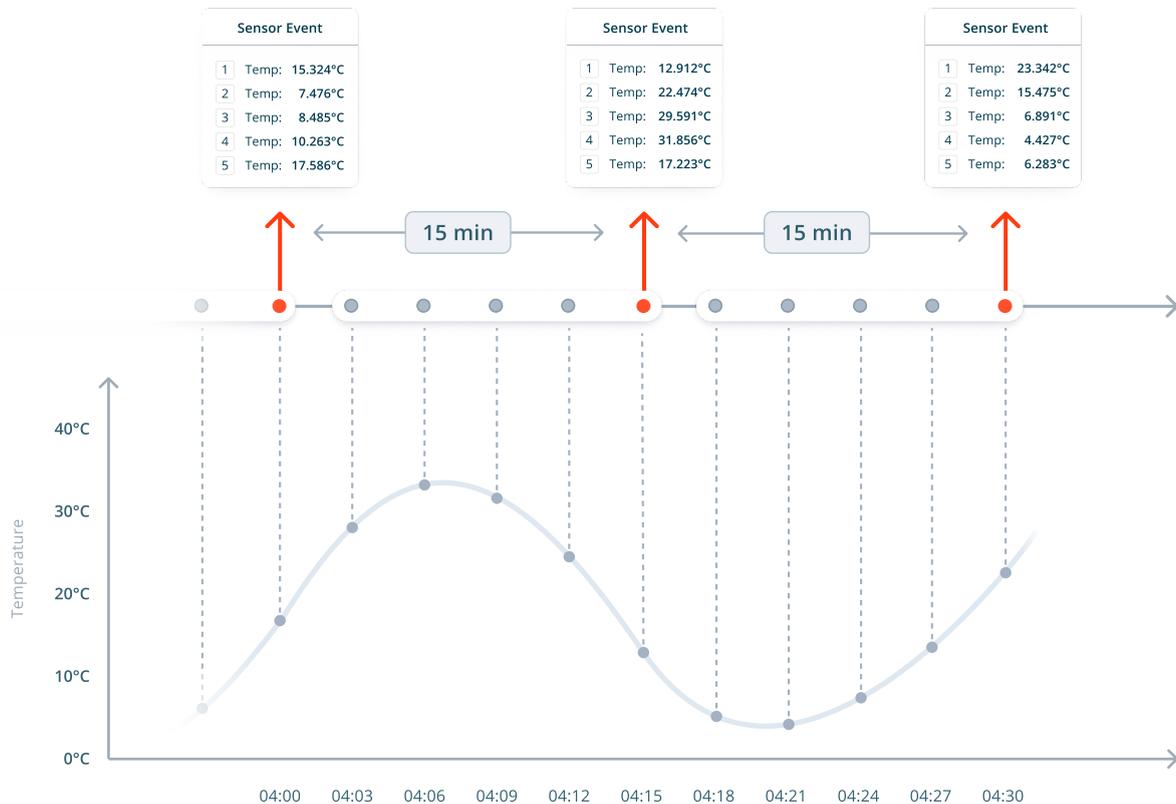
Events for a sensor configured to 3 minute measurement interval and 15 minute heartbeat.

Technical Specification

Measurement Range	-200°C to 650°C (-328°F to 1202°F)
Sensor Technology	Resistance temperature detector (RTD)

Sensor Accuracy

The Wireless Temperature Sensor, used in conjunction with a platinum (PT) probe, provides accurate temperature measurements. The accuracy of these measurements depends on two components:

Wireless Temperature Probe Sensor: The sensor measures resistance and is calibrated by DT during manufacturing. The resistance is automatically converted to temperature based on the selected probe type.

RTD Temperature Probe: The accuracy of the temperature readings is influenced by the calibration status and the quality of the RTD temperature probe used. The quality of an RTD temperature probe is determined by its accuracy class and wire configuration.

If a calibrated, 4-wire, temperature probe is used, the following accuracy can be achieved:

	Temperature Range	Accuracy	
4-wire	-200 to 100°C / -328 to 212°F	±0.2°C	±0.36°F
	100°C to 300°C / 212 to 572°F	±0.5°C	±0.9°F
	300 to 650°C / 572 to 1202°F	±1.0°C	±1.8°F

The accuracy of temperature readings from temperature probes without a certificate depends on the accuracy class and wiring configuration of the probe. The Wireless Temperature Sensor Probe supports 2-, 3- and 4-wire configurations and custom probe coefficients can be applied in Studio.

Measurement Resolution	0.001°C
Temperature Drift	See probe specification for details.

Data Backfill

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 50,000 datapoints   **Timestamp accuracy[1]**: 1%

(**1**): 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%.

Technical Specification

Operating & Storage Conditions

Operating Conditions (Sensor unit)	**Temperature:** 0°C to 50°C (32°F to 120°F) **Humidity:** 0 to 95% RH (non condensing)
Storage Conditions	Cool and dry, near normal room temperature.

Battery Specification

Battery	2x AA
Lifetime	15 years with sensor unit placed in room temperature.
	The battery life is limited by the shelf life of AA batteries. The Heartbeat Interval (HBI), Measurement Interval or temperature measured by the temperature probe has no impact on the battery life.

Wireless Communication

Radio Protocol	SecureDataShot™
Radio Frequency	**EU:** 868 MHz ISM band **US:** 915 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)	160 m	525 ft	5 km	16 400 ft
Cloud Connector (2nd Gen)	250 m	820 ft	10 km	32 800 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 **US/Canada:** FCC, ISED
	IC: 25087-102774 **FCC ID:** 2ATFX-102774

Mechanical Properties

Size	95 x 66 x 25 mm / 3.74 x 2.60 x 0.98 inches
Weight	116 grams / 4.1 oz
Material	Polycarbonate (PC)
Mounting method	Adhesive or screw
IP Rating	IP20

95.0 mm
(3.74 inches)

66.0 mm
(2.60 inches)

25.0 mm
(0.98 inches)

Adhesive backside
& QR Code
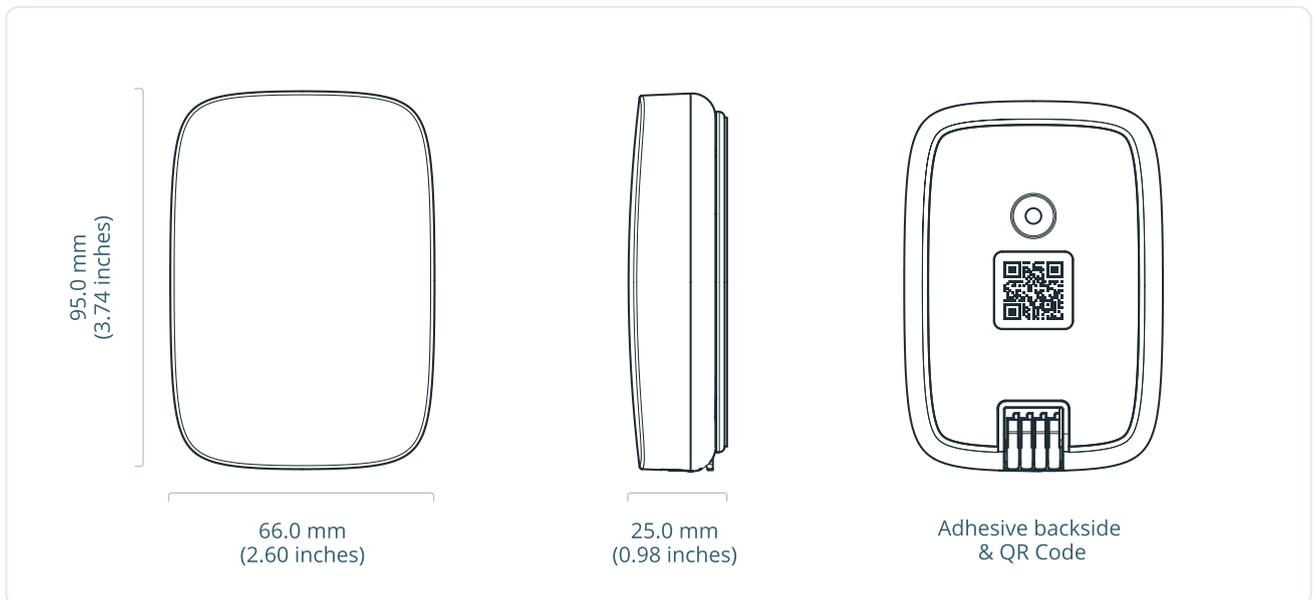
Product Variants

EU Version	**Product Number:** 102772	**Region** : Europe
US Version	**Product Number:** 102774	**Region**: North America

Connection Guidelines

1 Open the terminals **fully,** this may require some force.
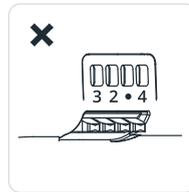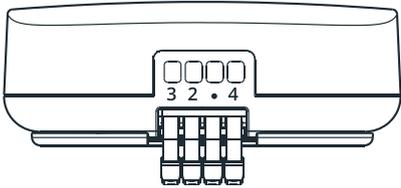
2 Insert the cables according to the diagrams below. Colors may differ between manufacturers.

2 Wire

3 Wire

4 Wire
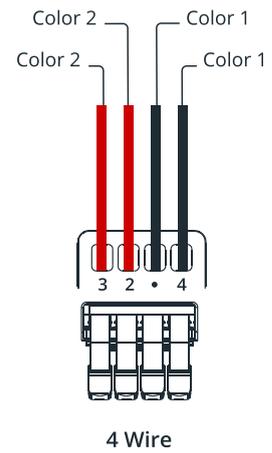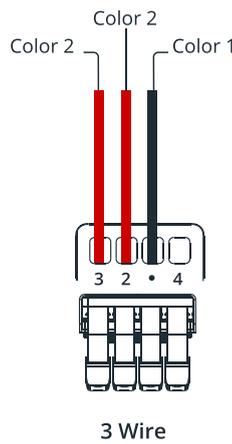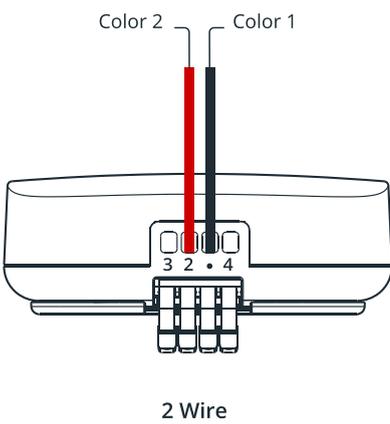
3 Close the terminals. Pull on the wires to ensure they have a secure connection.

The sensor will automatically detect the wire configuration and display it in Studio.

Temperature Probe Sensor
-38.95°C
Today at 11:44:02

2 Wire

Probe Connection ⌄
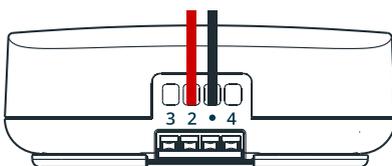
Screenshot from Studio

Installation Guidelines

1 Pull the battery tab to activate the sensor.
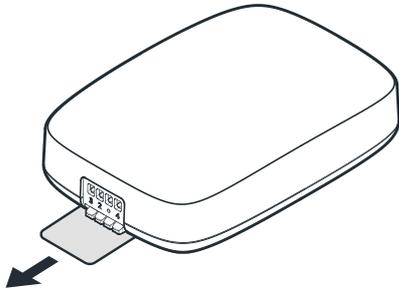
2 Connect the PT100 probe according to the guidelines on the previous page.
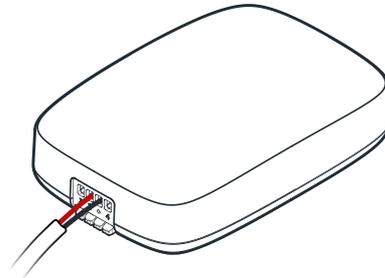
3 Make sure the mounting surface is clean and dry.
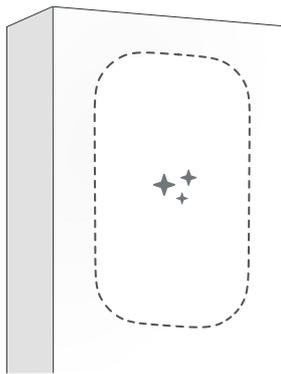
4 Mount the sensor using the adhesive backing, or mount the sensor using a screw.

Or
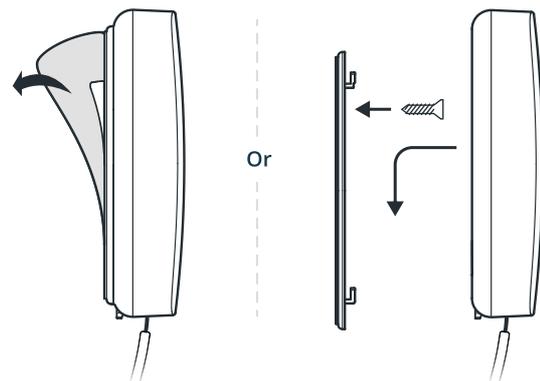
Battery Replacement

1 Remove the main housing from the bracket by pushing it upwards.
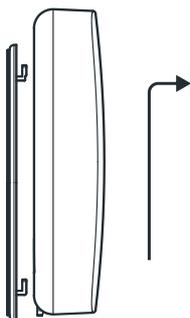
2 Replace the batteries with two new AA type batteries. Pay attention to the polarity.
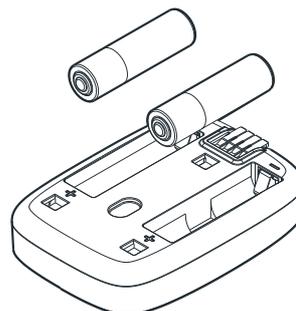
Ordering Information

Europe

Product No.	Name	Order Code	Region	Quantity
102772	Wireless Temperature Probe Sensor EU	102773	Europe	1

North America

Product No.	Name	Order Code	Region	Quantity
102774	Wireless Temperature Probe Sensor US	102775	North America	1

Sensor Subscription (mandatory)

Name	1 Year	3 Year	5 Year
Sensor Subscription - Temperature	800001	800002	800003

Temperature Probe (optional)

Product No.	Name	Order Code	Region	Quantity
Coming Soon	Ultra Low Temperature Probe	Coming Soon	Global	1
Coming Soon	Cryogenic Temperature Probe	Coming Soon	Global	1
Coming Soon	High Temperature Probe	Coming Soon	Global	1

sales@d21s.com Disruptive Technologies Research AS © 2023

Solution Overview

Secure Data Shot (SDS)

Webhook

Event

DT Cloud

Event

Your Cloud
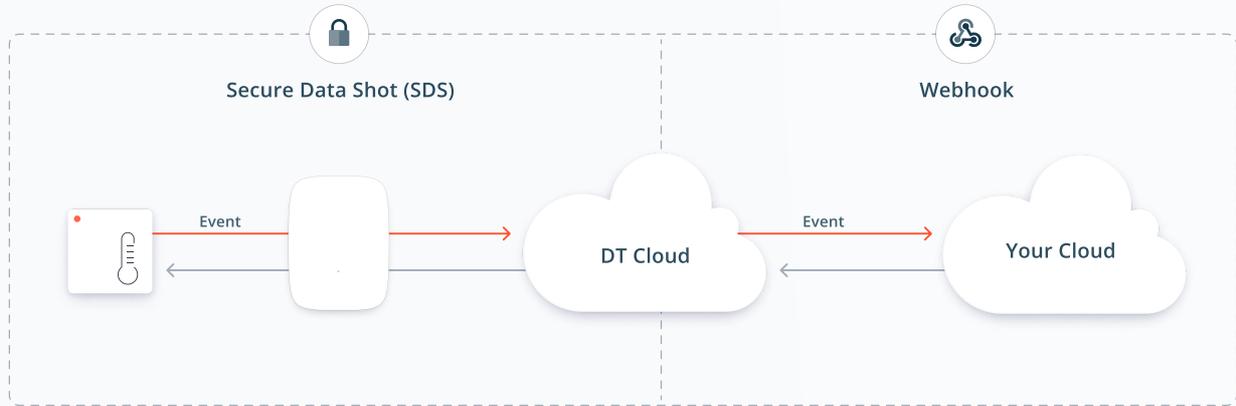
Wireless Sensors

Wireless sensors instantly connects and send data to the cloud via SecureDataShot™

Cloud Connectors

Cloud Connectors automatically connect and relay data to the cloud service

Cloud Service

No servers, databases, or on-prem clients to manage - simply just install sensors and integrate the data into your own service.

Why use a cloud based sensor solution?

Zero-touch Connectivity

No pairing needed, sensors automatically communicate through all Cloud Connectors which results in a quick and easy installation process.

24/7 Monitoring

All Disruptive system components are instrumented and monitored 24 hours per day, 7 days per week. Anomalies trigger alarms and notifies our response team.

Data Connector
Webhook

Real-time Events

Your Service
HTTP POST Endpoint

REST API
via Service Account

Request

Response

Your **Script**
Your **Webapp**
Your **Cloud Service**
And more...

Easy to Scale

Cloud Connectors support thousands of sensors and the cloud service automatically scales for users with increasing number of sensors.

Centralized Management

No servers, databases, or on-prem clients to manage. A modern cloud platform enables secure access on any device from anywhere in the world.
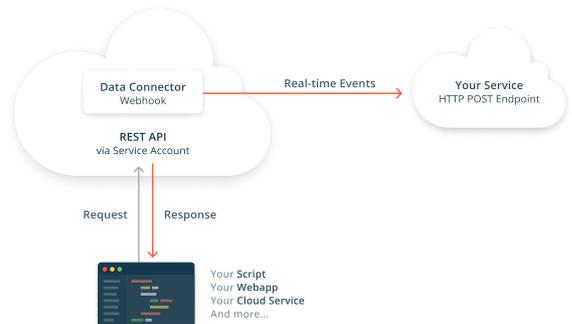
REST API & Webhooks

Easily integrate the sensor data into your own, or a third-party service, using our REST API or webhooks.
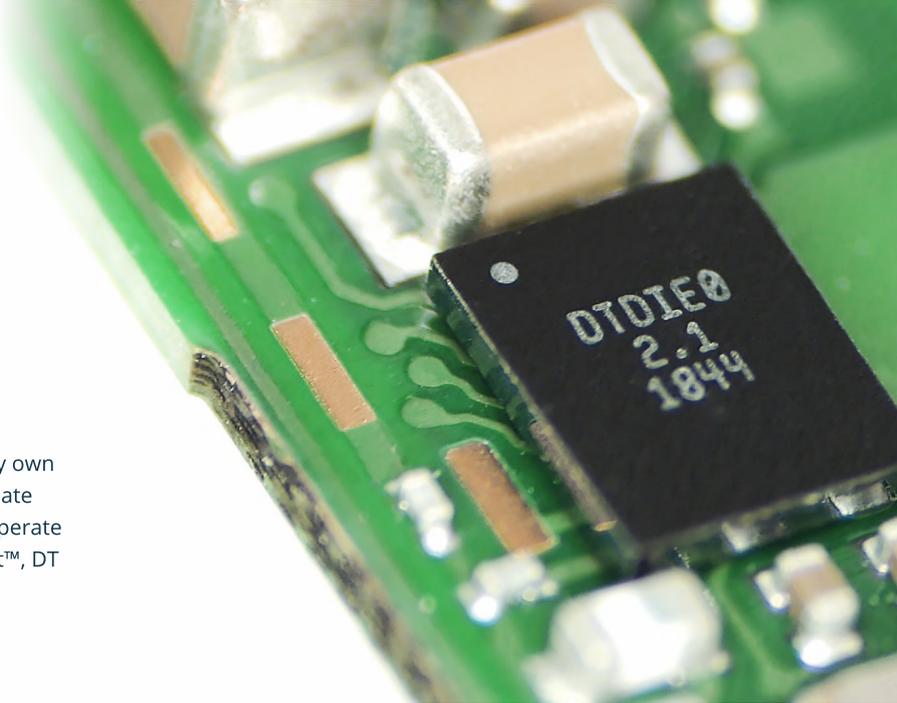
Take advantage of industry leading battery life with DT Silicon

DT Wireless Sensors are powered by DT Silicon - our very own proprietary chip technology that makes it possible to create sensors that use an order of magnitude less energy to operate than other wireless sensors. Paired with SecureDataShot™, DT sensors have superior battery life while maintaining the highest level of security and ease-of-use.

- Enables tiny sensors with long battery life
- Tailor made for the SecureDataShot™ protocol

Secure by default with SecureDataShot™

SecureDataShot™ creates a secure communication channel between the sensor and the cloud instead of between the sensor and the gateway. This reduces the potential for a manipulator-in-the-middle attack by exploiting vulnerabilities in the security architecture of gateways. Cloud Connectors can forward data to and from sensors but cannot decrypt the sensor data.

- During manufacturing, each sensor is assigned a unique 256 bit assymmetric encryption key, generated by a tamper-proof 140-2 Level 3 certified hardware security module.

- Cloud Connector includes a Secure Element (SE) for hardware Root of Trust.

- The public part of the asymmetric key is exchanged with Disruptive Technologies cloud via encrypted channels.

- In addition to the keys assigned during manufacturing, the sensor and cloud also hold a unique SecureDataShot™ session key.

- Sensor data is encrypted using symmetric AES-128 encryption/decryption in CCM-mode.

- Cloud Connectors are provisioned with Transport Layer Security (TLS) certificates to establish a secure connection between the Cloud Connector and the cloud.

Fleetmanagement & Data Insights with Studio

Device Overview

Sort devices into projects for easy access and get an overview over data, health status and radio coverage

Flexible Dashboards

Get a quick overview of sensors and compare data with easy-to-use drag-and-drop dashboard cards

Access Control

Create role-based user accounts for people and services that need access to sensor data

Notifications

Set up simple rules for sensors and receive automatic sensor triggered notifications

Data Forwarding & API Integrations made simple

Data Connectors / Webhooks

Easily configure secure webhooks to forward the data to your own service.

Service Accounts

Create and manage role-based service accounts to let your own cloud service authenticate with the REST API.

Sensor Emulators

Create emulated sensors to test your API integrations without access to physical hardware.
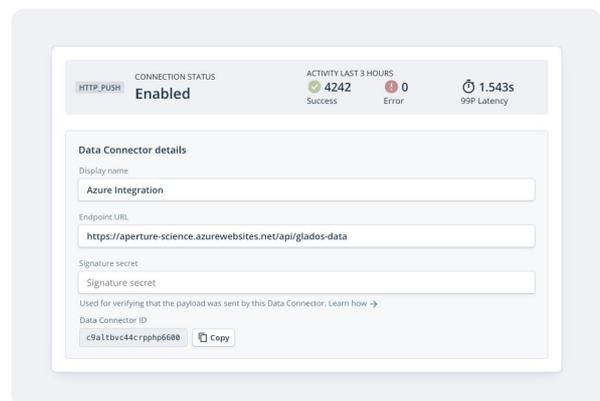
Designed in Norway,
Manufactured in Germany

All our Wireless Sensors and Cloud
Connectors are designed in Norway and
manufactured in Germany.

We have created a tailor made, high
volume manufacturing method that
enables our ultra small size and low cost.
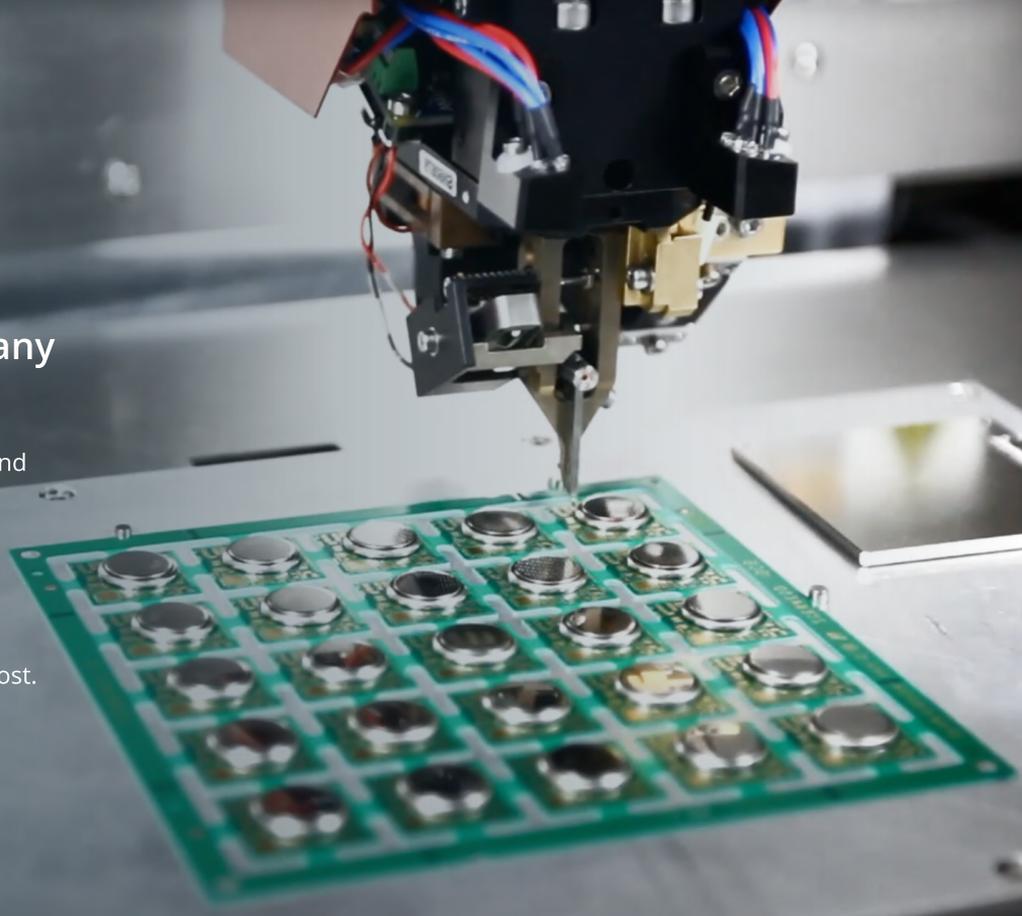
Ready to learn more?

To learn more about DT's wireless sensor solution and how you can benefit from it, visit our website or schedule a demo with a member of our sales team at **https://www.disruptive-technologies.com/contact-us** or contact us directly via email at **sales@disruptive-technologies.com**
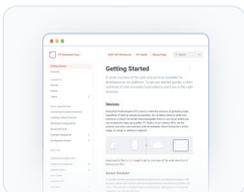
Developer Docs

Browse our developer documentation to find everything you need to know about the system, tutorials, integration guides, and API references.

Learn more
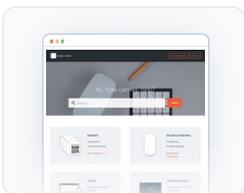
Support Center

Browse our support center to find details about our products, technology, installation guidelines, and answers to frequently asked questions.

Learn more
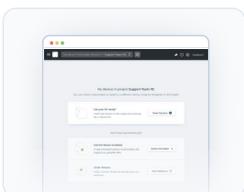
Sign Up for Studio

Create a Studio account and test our software and API integrations using emulated sensor events.

Learn more

Revision History

Revision 1.0

Change: Initial release.

Date: November 23rd, 2023