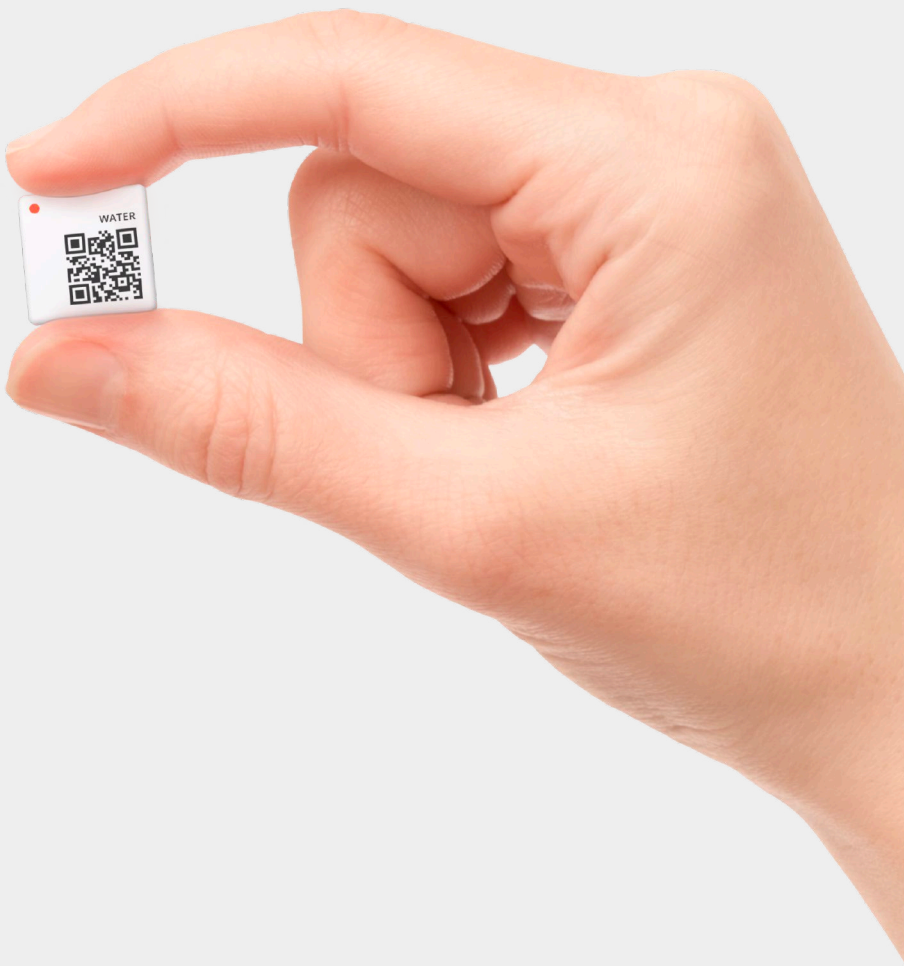
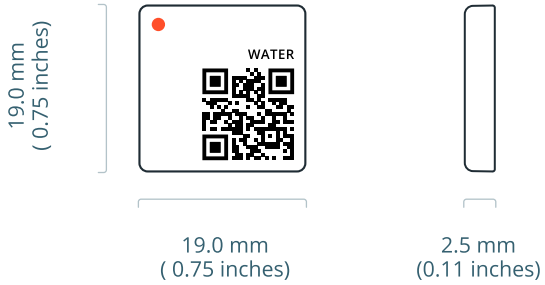
DISRUPTIVE
TECHNOLOGIES



Product Datasheet

Wireless Water Sensor

Overview



Description

The Wireless Water Sensor detects water in contact with the front of the sensor. If water is detected a message is wirelessly transmitted to the cloud through a Cloud Connector.

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

- Water leak detection

Specifications

Water Sensor

Sensor Output	Present / Not-Present
Technology	Capacative

Battery Specification

Battery Type	Lithium
Battery Life	Up to 15 Years
Replaceable	No

Radio & Communication

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

Mechanical Properties

Sensor Size	19 x 19 x 2.5 mm / 0.75 x 0.75 x 0.1 in
Weight	2.0 g (± 0.3 g) / 0.07 oz
IP Rating	IP68
Mounting Method	Adhesive

Product Name	Region	Product Number
Wireless Water Sensor EU	Europe	102078
Wireless Water Sensor US	North America	102084

How it works

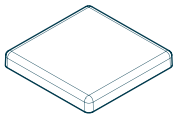
Default Operation

The Wireless Water Sensor detects water coming in contact with the front of the sensor. When water is detected the sensor will send an event with a **PRESENT** state to the cloud. Similarly, a new event is sent to the cloud with a **NOT_PRESENT** state when water is no longer detected.

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. Data can be viewed directly in Studio (web application) or sent to external services using webhooks or a REST API.

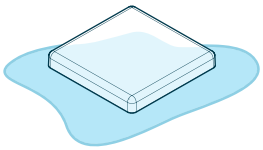
Heartbeat Interval

The Heartbeat Interval is a user configurable interval that controls how often the sensor reports to the cloud that it is online and operational. The Wireless Water Sensor can be set to 15, 30, 45, or 60-minutes.



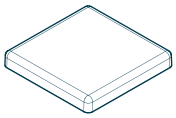
Normal operation

Sensor is sending heartbeat events to communicate that it is online and operational.



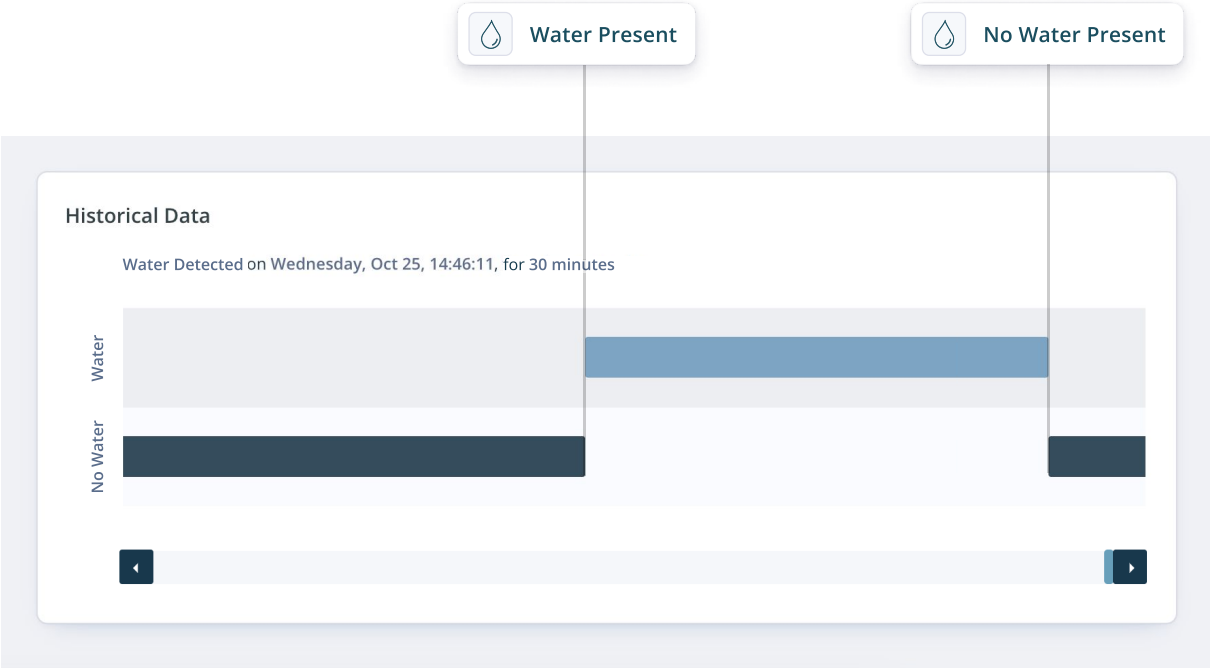
Water Detected

Water touches the front of the sensor. New event sent.



No Water Detected

Water dries up. New event sent.



Screenshot from Studio showing a sensor detecting water for for 30 minutes.

Technical Specification

Sensor Output	Detected / Not-Detected
Sensor Technology	Capacitive
Responsiveness	Instant detection

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
Radio Range	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	**US/Canada**: FCC, ISED
	IC: 25087-100541	**FCC ID**: 2ATFX-100541

(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 (Lithium Manganese Dioxide)	
Lifetime	**Standard Mode**: Up to 15 years	**High Power Mode**: Up to 3 years

There are three factors that contribute the most to the battery life of the wireless sensor:

1. Temperature Conditions
2. Radio Transmissions
3. 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.

Radio Transmissions

The wireless sensor's most energy-consuming activity is transmitting and receiving radio messages. The average number of radio transmissions per day dramatically impacts the battery life, and the battery life increases by approximately three times by sending data every 15 minutes instead of every 5 minutes.

Operating Mode

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

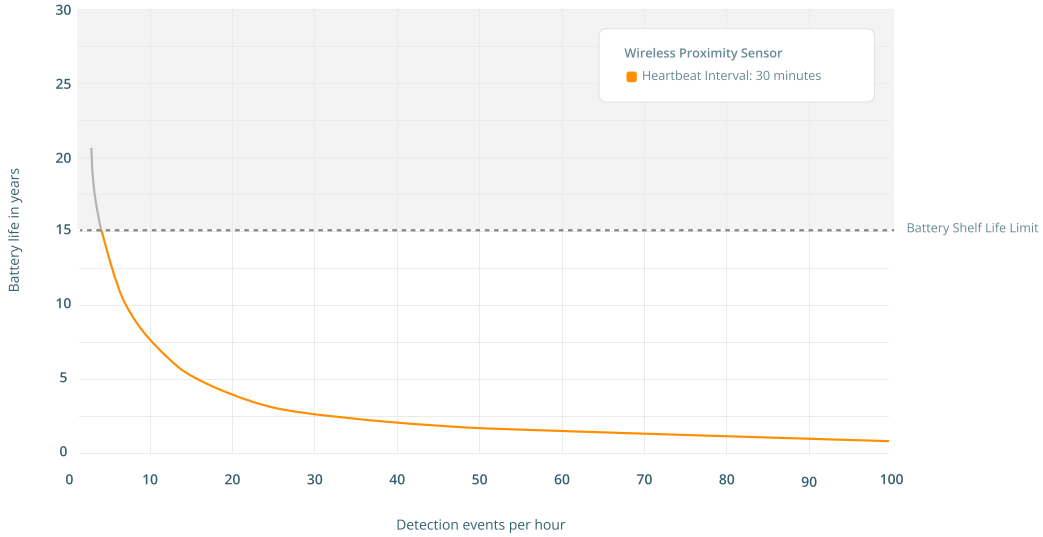
- **Standard Mode** (default)
- **High Power Boost Mode** (redundancy mode)

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.

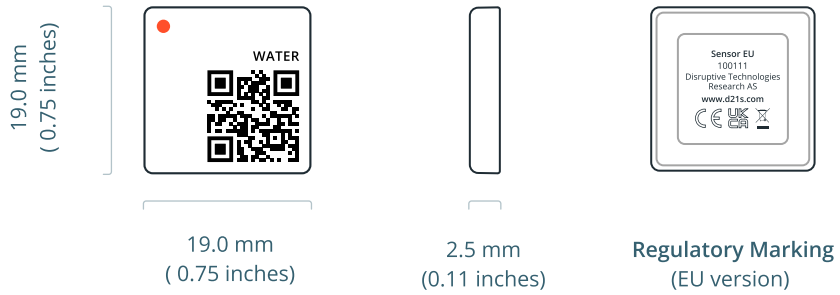
To make it easy for users to see if a device is currently operating in Standard Mode or High Power Boost Mode, the mode is sent with each sensor event on the API and visible in the Studio user interface.



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 2.5 mm (± 0.2 mm) / 0.75 x 0.75 x 0.1 inches
Weight	2.0 g (± 0.3 g) / 0.07 oz
Material	Impact modified acrylic film
Mounting method	Adhesive
IP Rating	IP68



Product Variants

EU Version	**Product Number:** 102078	**Region:** Europe
US Version	**Product Number**: 102084	**Region**: North America

Installation Guidelines

Step 1
Clean the surface to ensure good sensor adhesion

Step 2
Peel the protective film from the back of the sensor

Step 3
Attach the sensor to the surface and press for 10 seconds

Check sensor coverage

If the sensor is **not reporting data**, the sensor is outside the range of the Cloud Connector. Move the Cloud Connector or install a second Cloud Connector to extend the coverage.

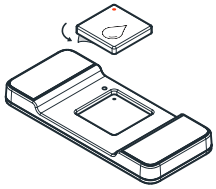
If a sensor is in **High Power Boost Mode**, the battery life will be reduced because the sensor is using more energy to reach the Cloud Connector. Either move the Cloud Connector or consider using a Range extender accessory to amplify the sensor range.

Please note before attaching the sensor

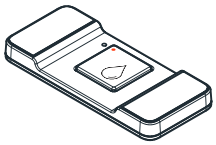
- Installing the sensor directly on a metal surface will reduce the wireless range.
- The sensor should not be placed near a magnet. It can severely affect functionality and battery life.

Installation with Water Range Extender

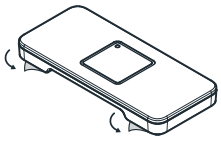
The Water Range Extender (Part Number: 101707) serves two primary functions as an accessory for your sensor. First, it facilitates a secure and proper installation of the sensor on various surfaces and positions it at an optimal distance from the surface for reliable water detection. Second, it significantly enhances the sensor's wireless connectivity, boosting its range by up to 4x.



1. Peel the protective film from the back off the sensor.



2. Attach the sensor to the range extender by aligning the dots and press firmly for 10 seconds.



3. Peel the protective film from the back of the range extender.

Ordering Information

Europe

Product Name	Order Code	Region	Quantity
Wireless Water Sensor EU	902078	Europe	1
Wireless Water Sensor EU - 25 kit	102080	Europe	25
Wireless Water Sensor EU - 100 kit	102268	Europe	100

North America

Product Name	Order Code	Region	Quantity
Wireless Water Sensor US	902084	North America	1
Wireless Water Sensor US - 25 kit	102086	North America	25
Wireless Water Sensor US - 100 kit	102312	North America	100

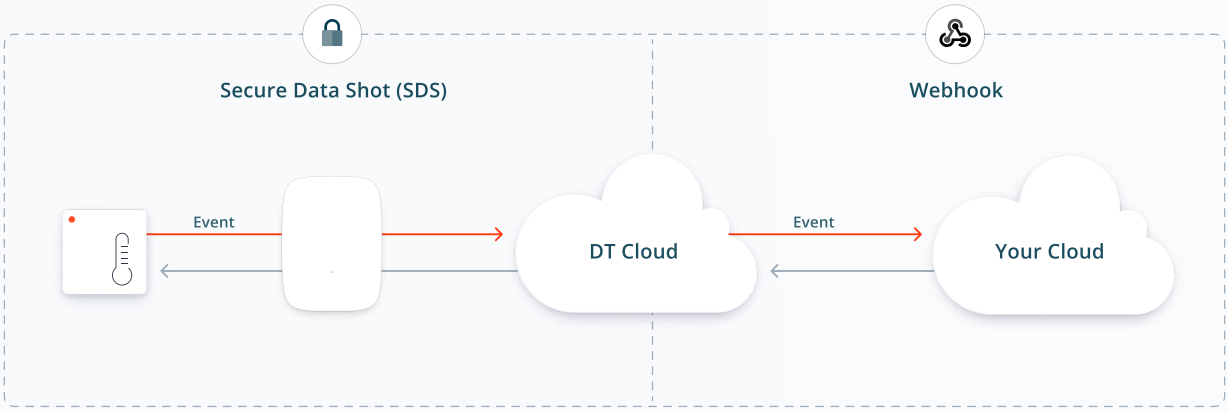
Sensor Accessories (optional)

Product Name	Order Code	Region	Quantity
Water Range Extender	101707	Global	1

Sensor Subscription (mandatory)

Name	1 Year	3 Year	5 Year
Sensor Subscription - Water	800013	800014	800015

Solution Overview



Wireless Sensors

Wireless sensors instantly connect 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

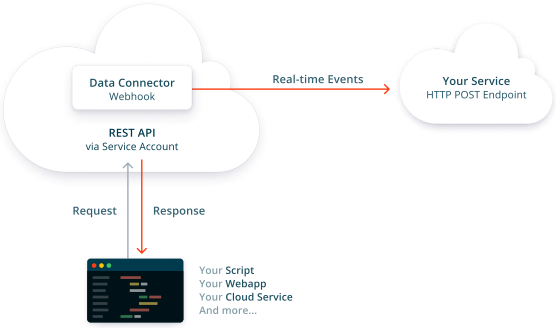
All Disruptive system components are instrumented and monitored 24 hours per day, 7 days per week. Anomalies trigger alarms and notifies our response team.

Easy to Scale

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

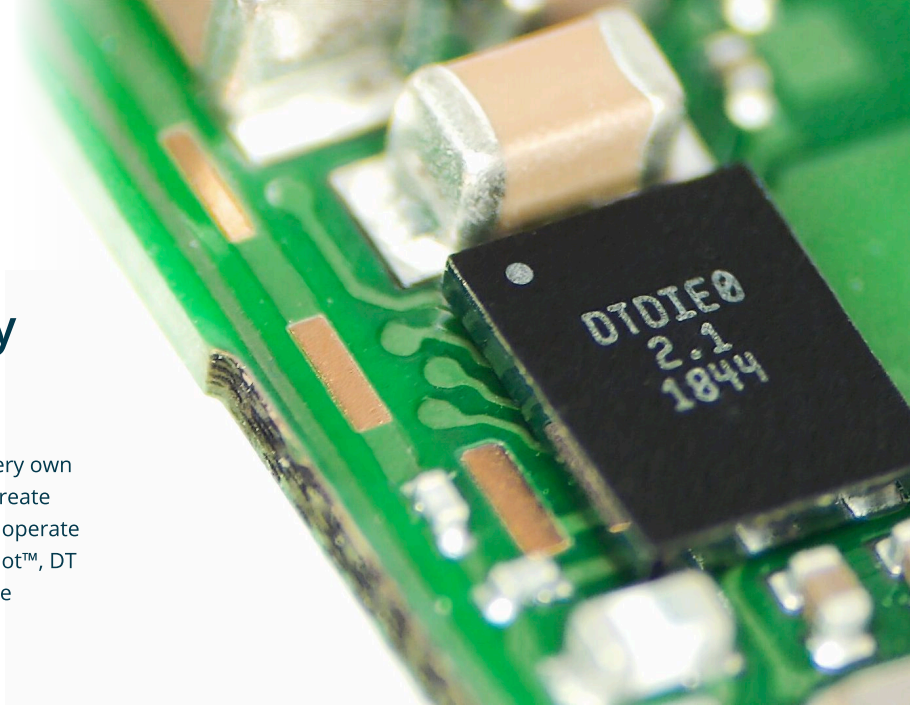
Centralized Management

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

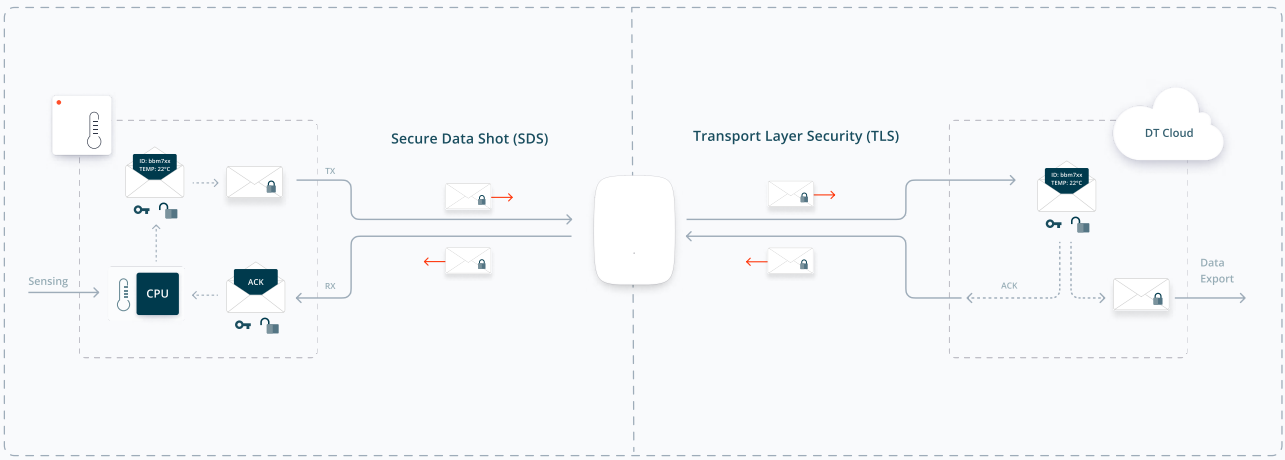
Secure by default with SecureDataShot™

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

The purpose of the keys is to allow sensors to communicate securely with the cloud. 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.
- Disruptive 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

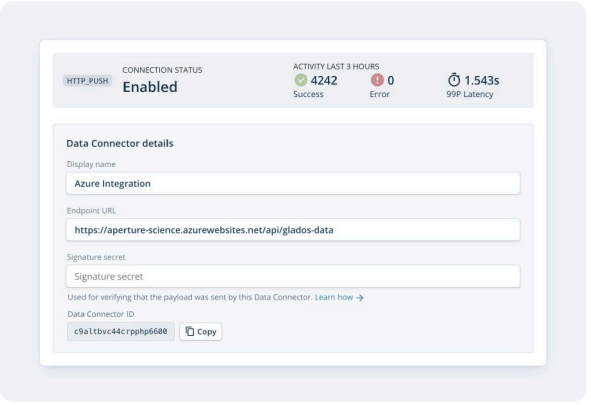
Easily configure secure webhooks to forward the data to your own service.

Service Accounts

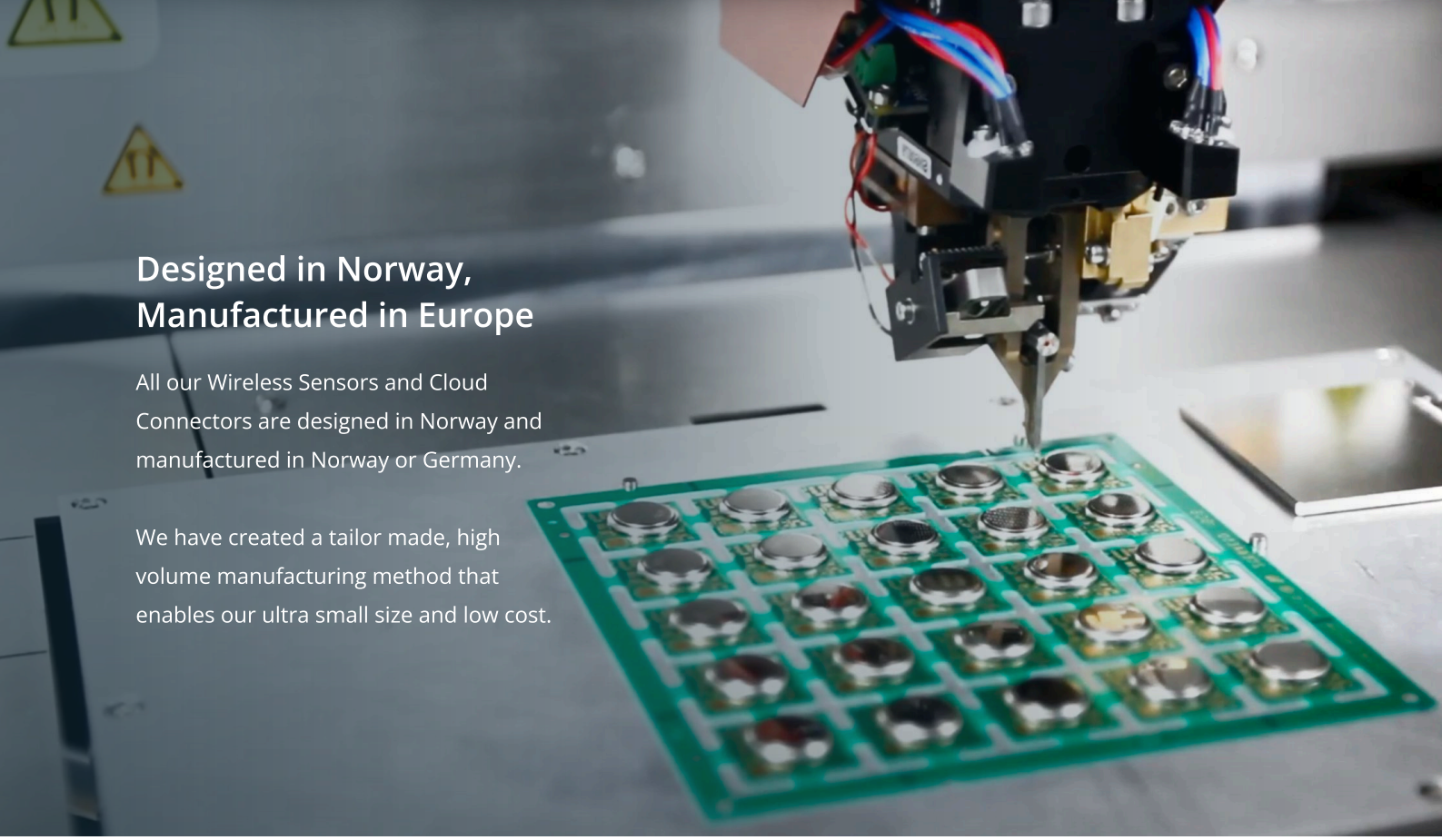
Create and manage role-based service accounts to let your own cloud service authenticate with the REST API.

Sensor Emulators

Create emulated sensors to test your API integrations without access to physical hardware.



Azure aws Google Cloud IBM Cloud



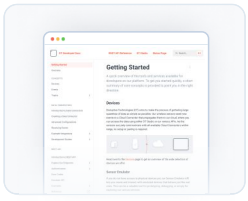
Designed in Norway, Manufactured in Europe

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

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

Ready to learn more?

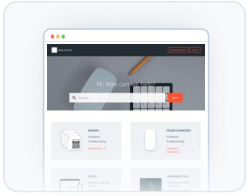
To learn more about DT's wireless sensor solution and how you can benefit from it, visit our website or schedule a demo with a member of our sales team at **https://www.disruptive-technologies.com/contact-us** or contact us directly via email at **sales@disruptive-technologies.com**



Developer Docs

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

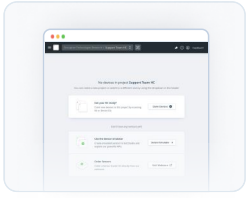
Learn more



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**: February 9th, 2024

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