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# SensorTile.box
## A ready-to-go IoT Node

# SensorTile.box
# Ready-to-go IoT node

## ST makes IoT sensing accessible with a certified and ready-to-connect device


**Built into a compact IP54 casing**

**Bundled with app for Smartphone**

Can be configured **for users of any skill level** to support learning, prototyping, or even as a module within a commercial end-product.

**Connects out-of-the-box with several Cloud services**
to further extend opportunities for learning and new-product development

Microsoft Azure

IBM Watson

aws

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www.st.com/sensortilebox

# SensorTile.box
# A uniquely flexible solution

| | |
|---|---|
| **Fast prototyping** | **Design** IoT node and wearable sensor applications quickly and easily, without performing any programming |
| **Complete solution** | From simple to advanced<br>Connectivity and cloud / ecosystem |
| **Expandable & Customizable** | **Develop** accessories to expand SensorTile.box features<br>**Tailor** the device to your needs<br>3D files of the plastic case and alternative provided for free |

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# Fast prototyping & complete solution

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# One box for many users

**Users with no programming skills / focus**

Allows potential users with no programming capabilities / no focus in programming to have an «out-of-the-box» sensor trial platform

E.g.: Non-engineering companies willing to develop IoT-related use cases



**System integrators**

Availability of integrated compact platform embedding high-performance sensing and processing capabilities

**Cloud developers**

To experiment several functions with sensors and application programming

Ready to access to **AWS, IBM Watson, Azure** or **private MQTT**

**Education**

Easy access to sensors  technology and ability to move from simple mode to programming

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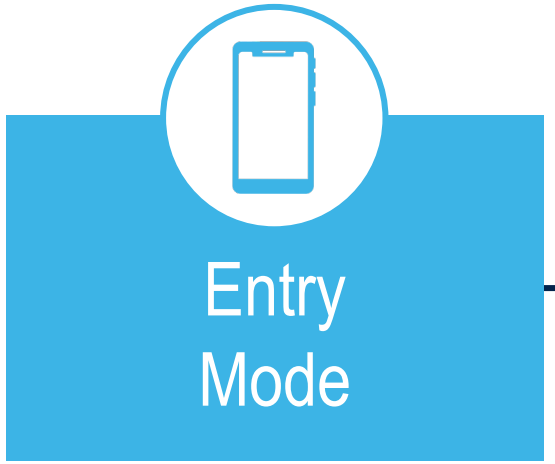
# The IoT made easy

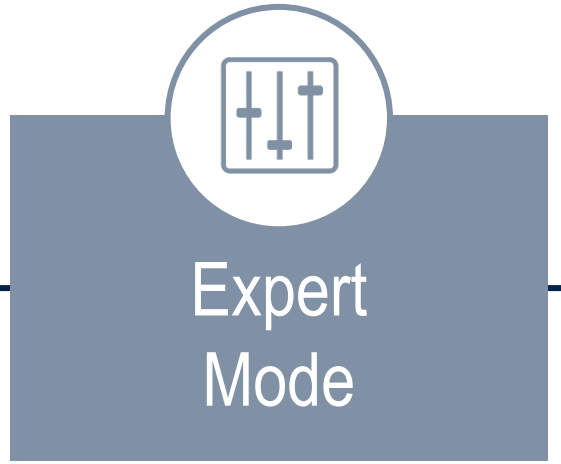
## SensorTile.box has 3 operational modes



### Entry Mode

Discovery sensors functionalities using pre-defined functions

No need to program anything



### Expert Mode

Configure and define new apps

Program - from Smartphone - with objects

### Pro Mode

Develop specific functions using development environment

Enter the powerful STM32ODE

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# Entry working mode
# No need to program anything

**Out-of-the-box SensorTile.box connects to a smartphone**

- The user access the predefined applications included in the provided Android / IOS app

- Pedometer
- Vehicle / goods tracking
- Vibration monitoring
- Inclinometer
- Sensor fusion
- Data recorder
- Compass
- Human activity
- Environmental monitoring
- Baby crying detection

AI based

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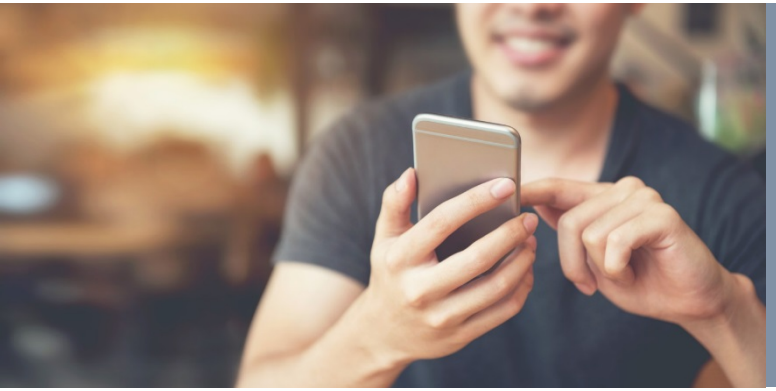
# Expert working mode



**The developer uses a graphical app on his smartphone to**

- Define additional applications, like in lego bricks
- Build his own application, without programming

Some examples of configuration in Developer mode

| Power optimization | Hard-iron compensation, offset cancelling | Pattern recognition, accuracy |
|---|---|---|
| Individual sensors can be **activated or shut down** to enable only the required sensor set | SensorTile.box can be **individually calibrated** after final assembly & positioning | **Neural network** and dedicated **sensor fusion** options can be activated |

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# Pro working mode

Full compatibility and support of STM32 Open Development Environment

Full Cube.MX compatibility

Available ALLMEMS2 and AI function packs

Adapter for STLink V2 included in bundle kit

STLink V3 programming and debug compatibility (with level shifter to 1.8V)

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# Meet the product

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# Meet the product

- Compact casing, IP54-compliant
  57 x 38 x 20 mm (L x l x h)
  Additional cases (with flanges or hinges) available
- 500 mA-h Li-Po battery
- 8 GB µSD card as mass memory
  extendable to 64 GB
- Compatible with “ST BLE Sensor” app
  Available on Google Play and App Store


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# Inside the SensorTile.box
# Sensing, processing and connectivity

## Motion Sensors

Low-power 6-axis IMU, embedding Neural Network

**LSM6DSOX**

High-performance and low power accelerometers

**LIS3DHH & LIS2DW12**

Magnetometer

**LIS2MDL**

## Environmental Sensors

Altimeter / Pressure sensor

**LPS22HH**

Accurate temperature sensor

**STTS751**

Humidity sensor

**HTS221**

Analog wide-band microphone

**MP23ABS1**

## Processing


STM32L4 low-power MCU

**STM32L4R9ZIJ6**

## Connectivity

Bluetooth Low Energy Module

**SPBTLE-1S**

## Power management

Battery charger

**STBC02**

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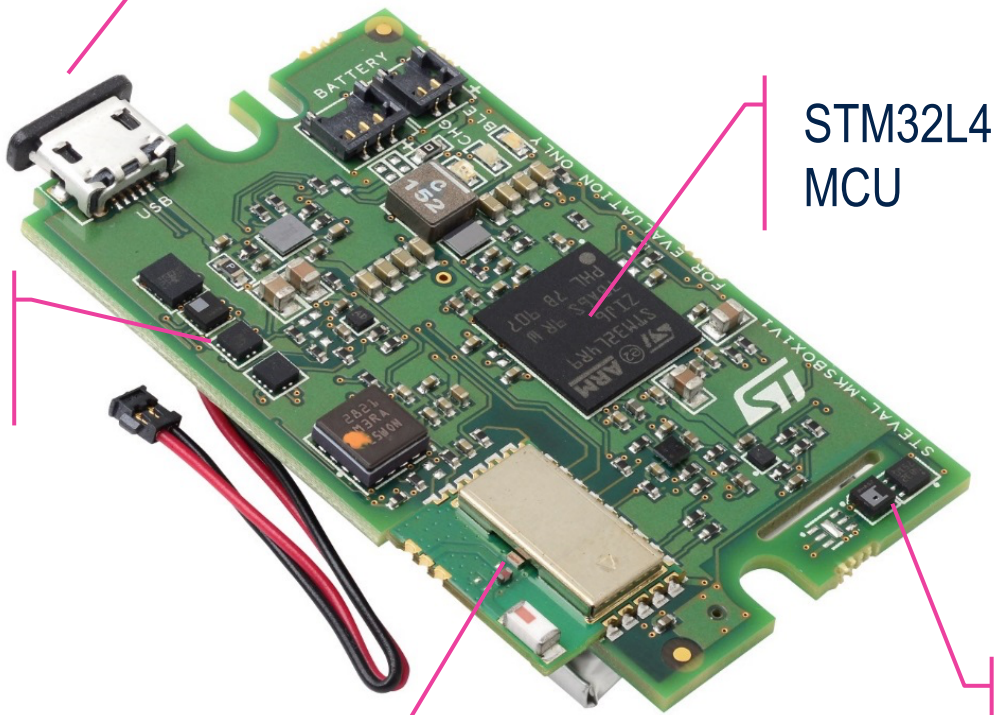
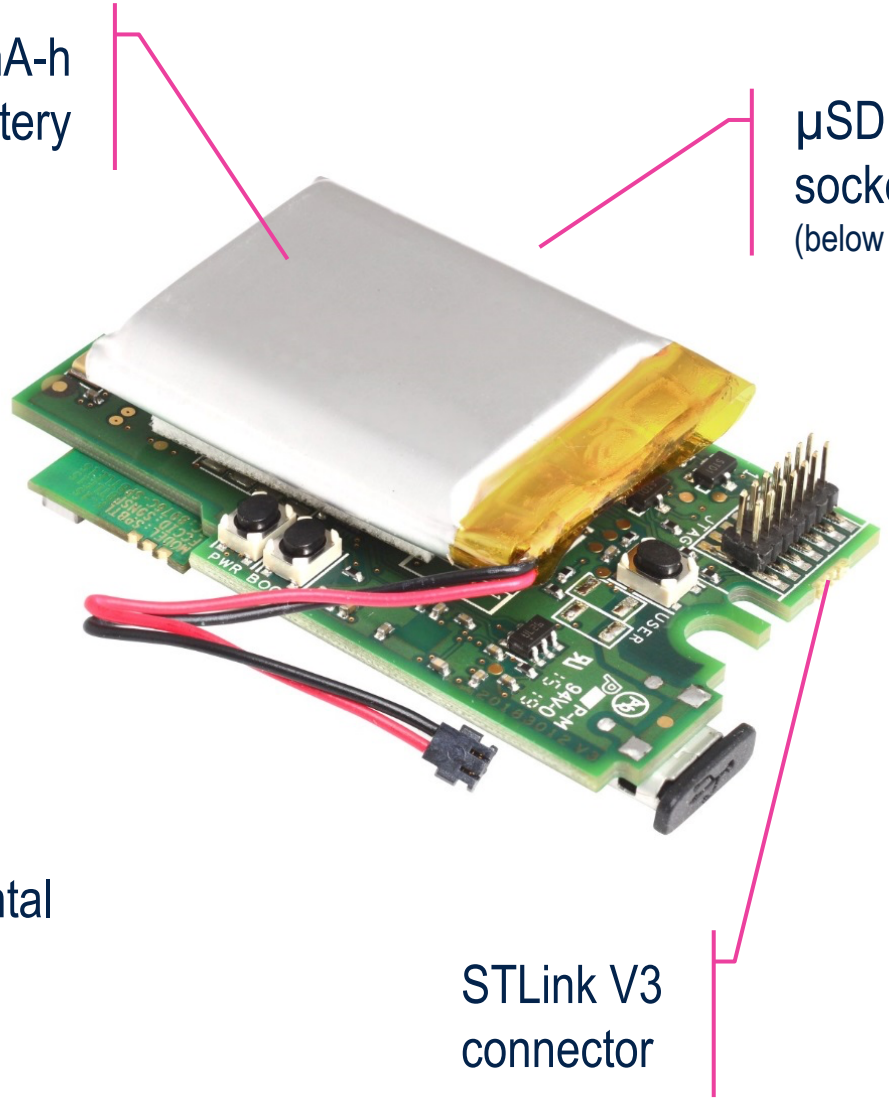
# The board

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# The kit

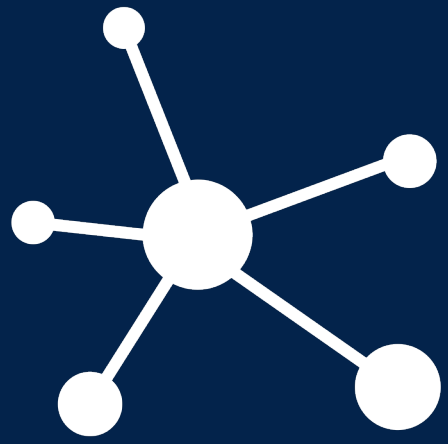

Blister with quick starting guide

STLink V2 programmer adapter and cable

SensorTile.box

Additional back with fixing points

# A strong ecosystem



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# Pre-integrated application example

**SensorTile.box is supported by several STM32Cube function pack**

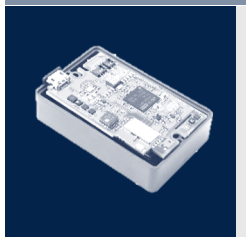
### FP-AI-SENSING1

Ultra-low power IoT node with artificial intelligence (AI) application based on audio and motion sensing

### FP-ATR-BLE1

For asset tracking using BLE connectivity

### FP-SNS-STBOX1



For building custom applications using the the Pro Mode

### FP-SNS-ALLMEMS

Ultra-low power IoT node with BLE connectivity, digital microphone, environmental and motion sensors

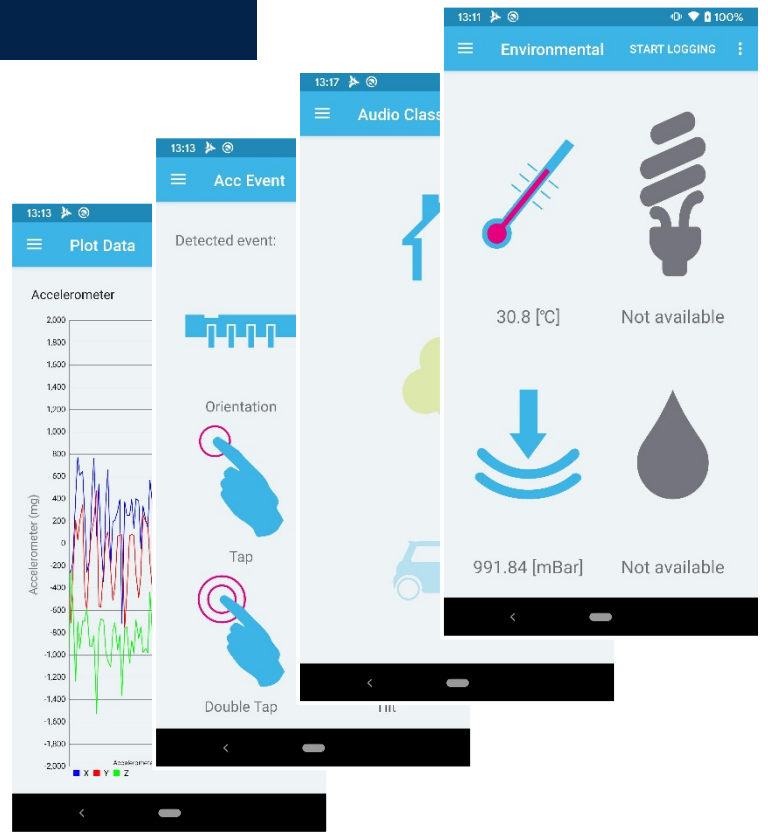
# ST BLE Sensor

## An app to get the most out of your device

GET IT ON Google Play

Download on the App Store

- Sensor data reception and command transmission over Bluetooth® Low Energy (BLE)
- Data logging, plotting & publishing on the cloud
- Support for multiple STM32Cube function packs
- App development for SensorTile.box




Environmental data – MEMS sensor fusion – Plot – Activity recognition
Carry position – Acceleration event – Pedometer – Motion intensity – Compass
Speech to text – Beamforming – Sound source localization
Switch – Cloud logging – Node status

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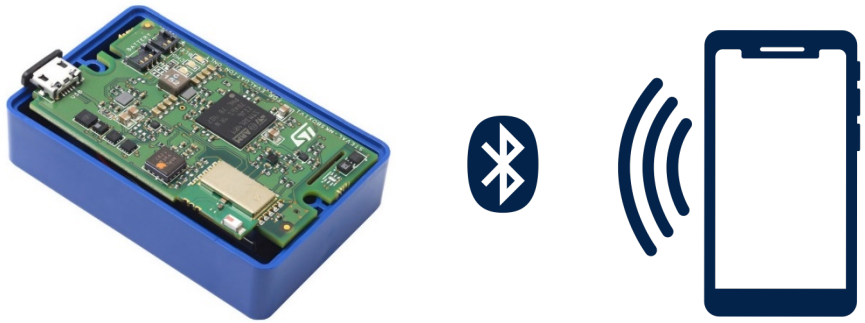
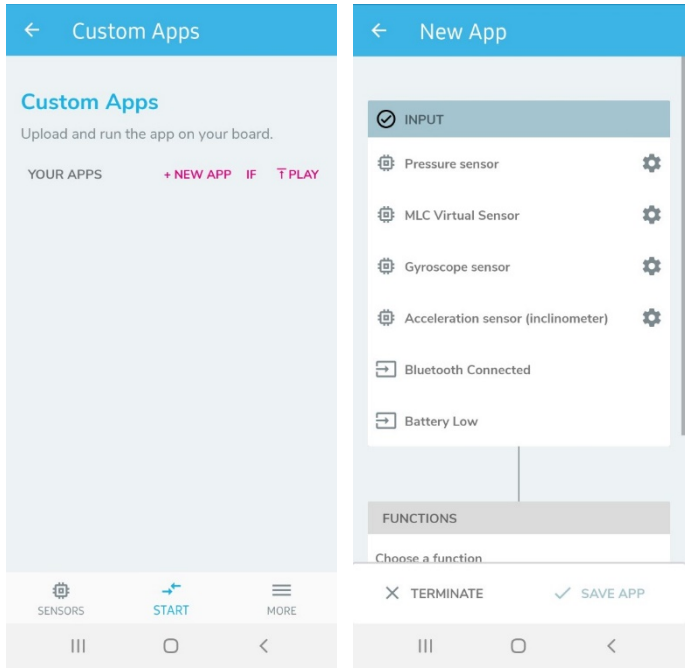
# ST BLE Sensor app & SensorTile.box

## Build your app for SensorTile.box



- Use the app builder to quickly develop your custom app using data retrieved from the device
- Browse the available app examples to speed-up your development

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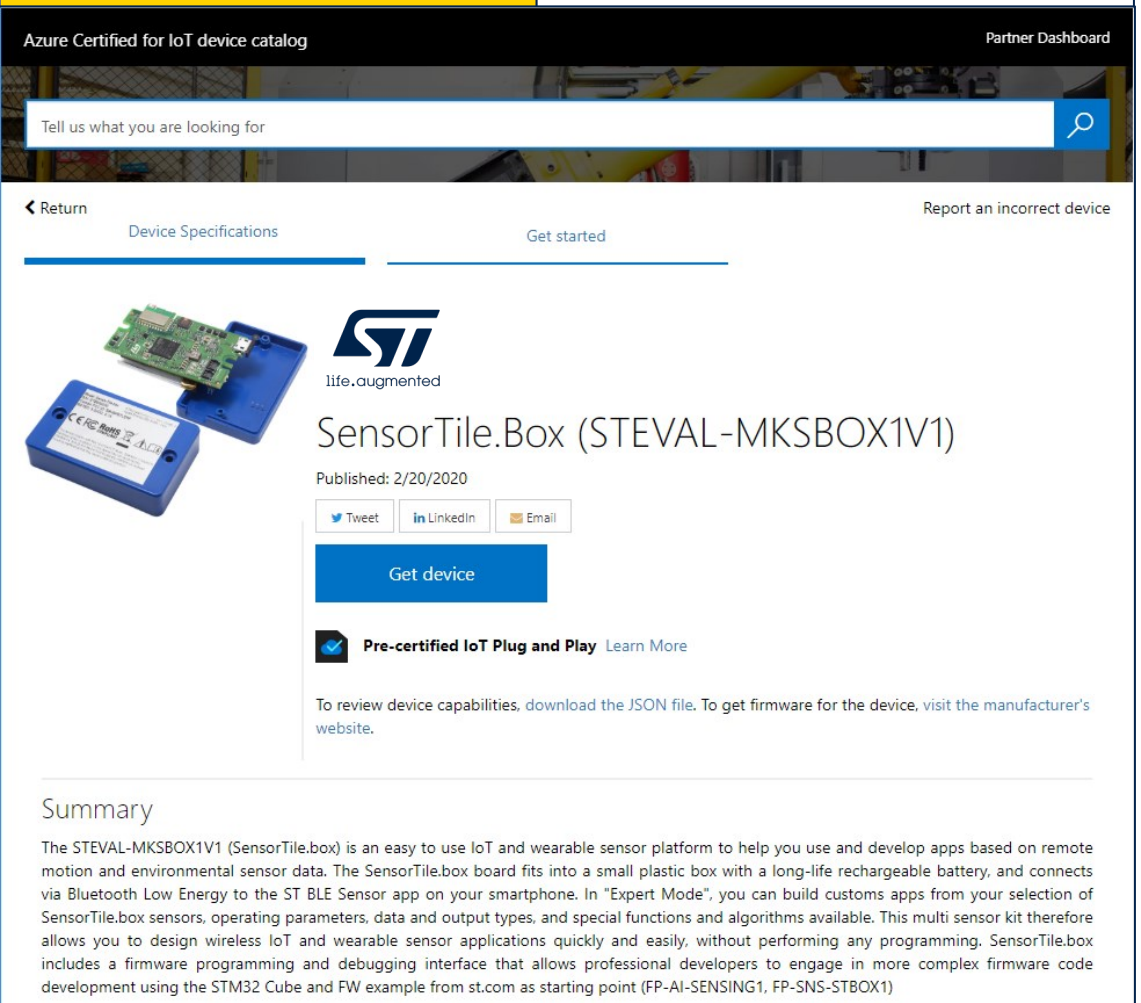
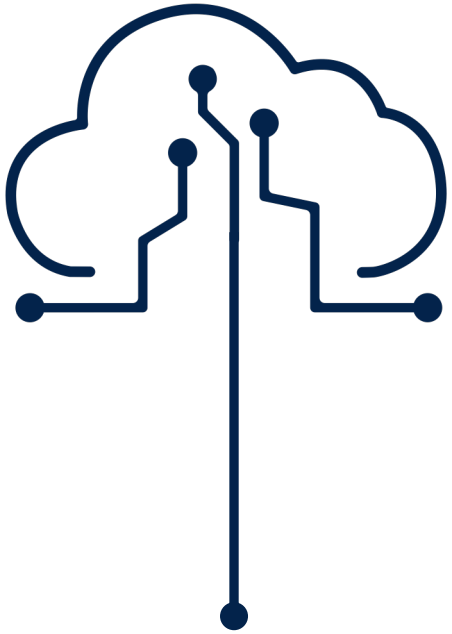
# Ready-to-connect device

**IoT Plug and Play** certified
Compatible with **IoT Central**

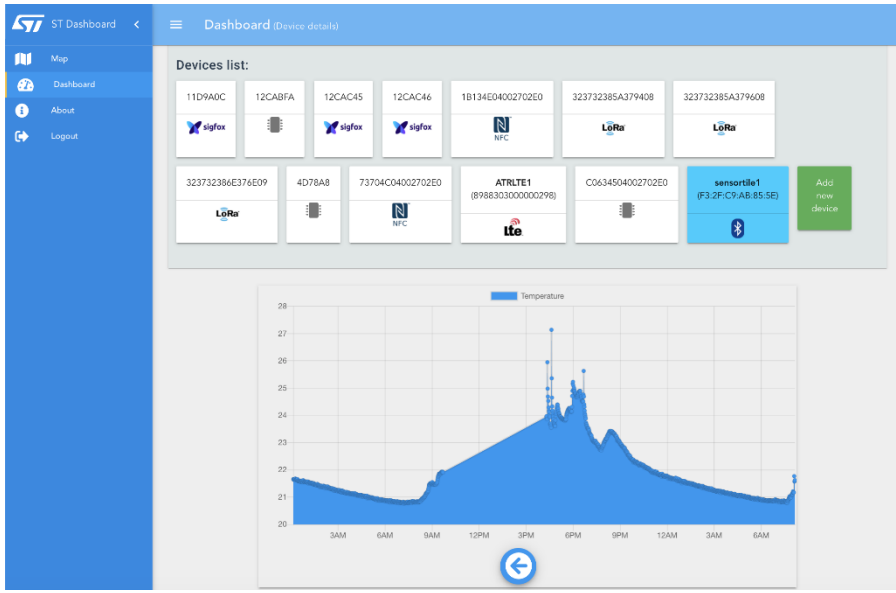
Microsoft Azure



aws

Available **dashboard** running on **AWS** for **asset tracking** applications




IBM Watson

Compatible with **IBM Watson** platform

# Engineering services By FAE technology

## FAE Technology Spa is your industrial partner to customize the SensorTile.box

### FAE technology offers the following services:

- Production-ready product with certifications
- New plastic housing to fit your form factor and your design needs
- Electronics board customization to fit different form, optimize component usage to reduce BOM costs and develop price competitive solution
- Firmware and app customization to customize your needs
- Production of hundred to thousand pieces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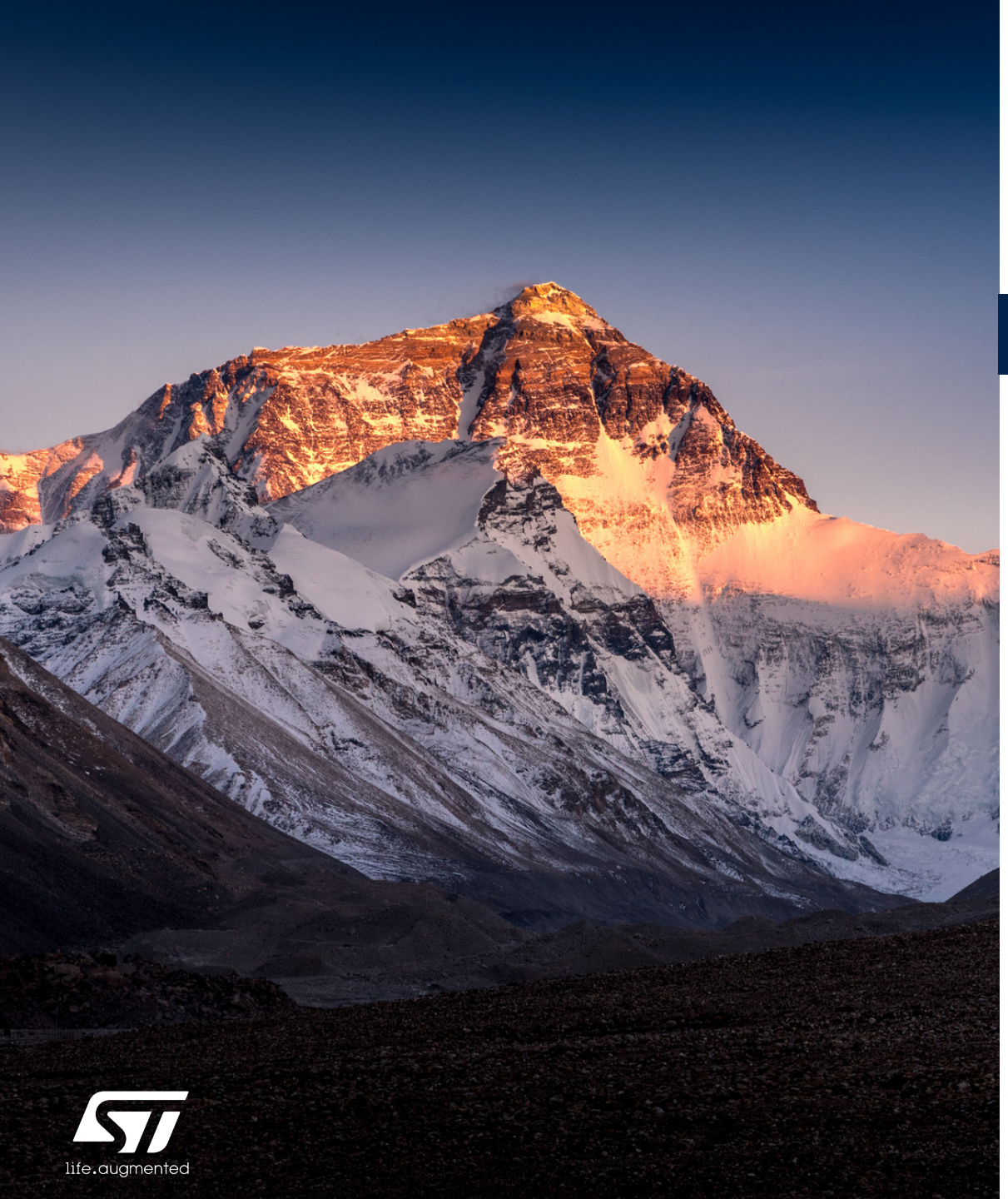
# Stories



# SensorTile.box goes to Everest

May 23rd, 2019

**SensorTile.box** runs the telemetry of the ascent and reconstructs the route in the extreme conditions of the highest peak of the globe

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# SensorTile.box goes to MilleMiglia

May 2019

**SensorTile.box** runs the movement and road condition estimation at the 2019 MilleMiglia onboard an historical car

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# SensorTile.box on board of Cybevasion

August 2019

**SensorTile.box** runs the 3D trajectory reconstruction of the “Cybevasion” hot-air-ballon at the Mondial Air Ballons event in Chambley, France.

# Thank you



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