BACKGROUND

66% of Industrial companies looking for IoT projects are still in POC phase. Among them, **82 %** don't have the software resources to operate their connected projects.

Key learnings from IoT projects:

- IoT projects take **much longer** than anticipated

- **Security** is often an afterthought

- **Scalability** becomes an issue when going to thousands of devices
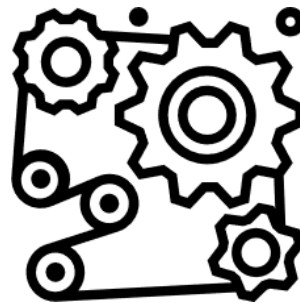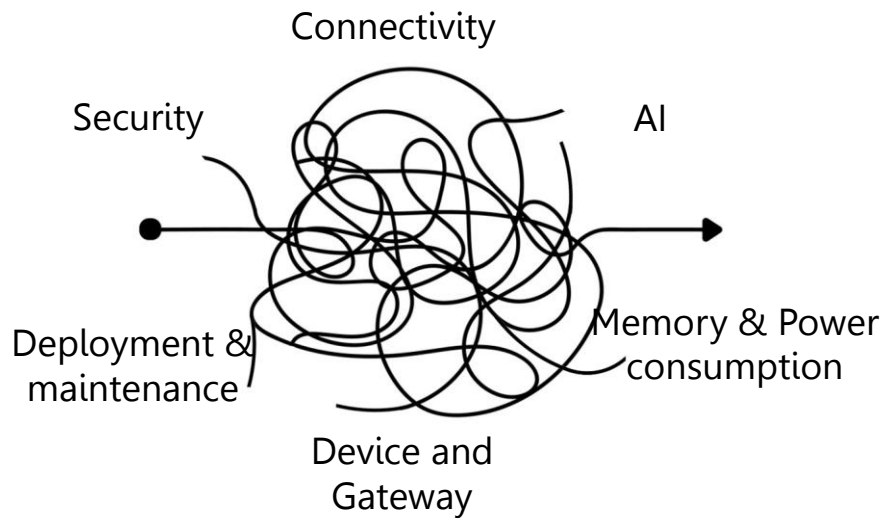
- **Necessary skills** are not available in house

Prototyping
3 months

Industrialization
18-24 months

WHY BRAINIUM

Brainium takes away the madness of Hardware & Software in the IoT so that YOU can focus on your business use cases

Connectivity

Security

AI

Deployment & maintenance

Memory & Power consumption

Device and Gateway

Focus on your Business use case

Develop your IoT project
X 3 times faster

TRIPARTITE PROJECT

ST Microelectronics, Avnet and Octonion have decided to partner in order to help Customers in their IoT strategy with a ready-to-use hardware and software solution

STM32
micro- controller

+

Hardware production

+

IoT Edge
Intelligent platform

*"**ST Microelectronics** is among the world's largest semiconductor companies. ST is a leading technology innovator with ~7,400 people working in R&D and product design, and ~18,000 patents"*

*"**Avnet** is a global technology solutions provider with an extensive ecosystem delivering design, product, marketing and supply chain expertise for customers at every stage of the product lifecycle. Avnet has 15 000+ employees worldwide with 2.1M Customers in 140+ countries."*

*"**Octonion** is an IoT Intelligent Edge software platform that has built an unprecedented AI framework at the Edge. Octonion has 70 engineers and has raised since 2014 €16m from strong International investors."*

INTRODUCING NEW CATEGORY: META SENSING

META SENSING is a new approach in IoT market, a Hardware and Software combo:
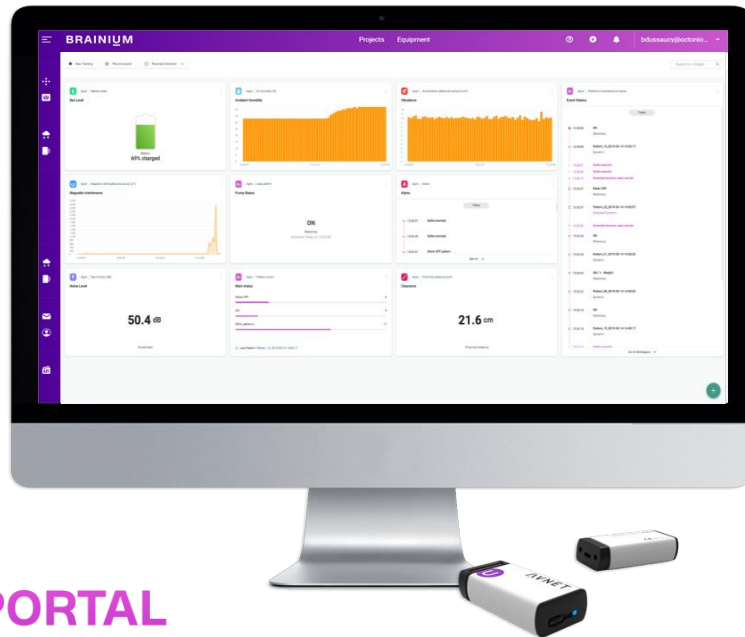

Hardware

End-to-end Software

TO START: SMARTEDGE AGILE AND BRAINIUM PORTAL

Start your IoT Project in a few days with:
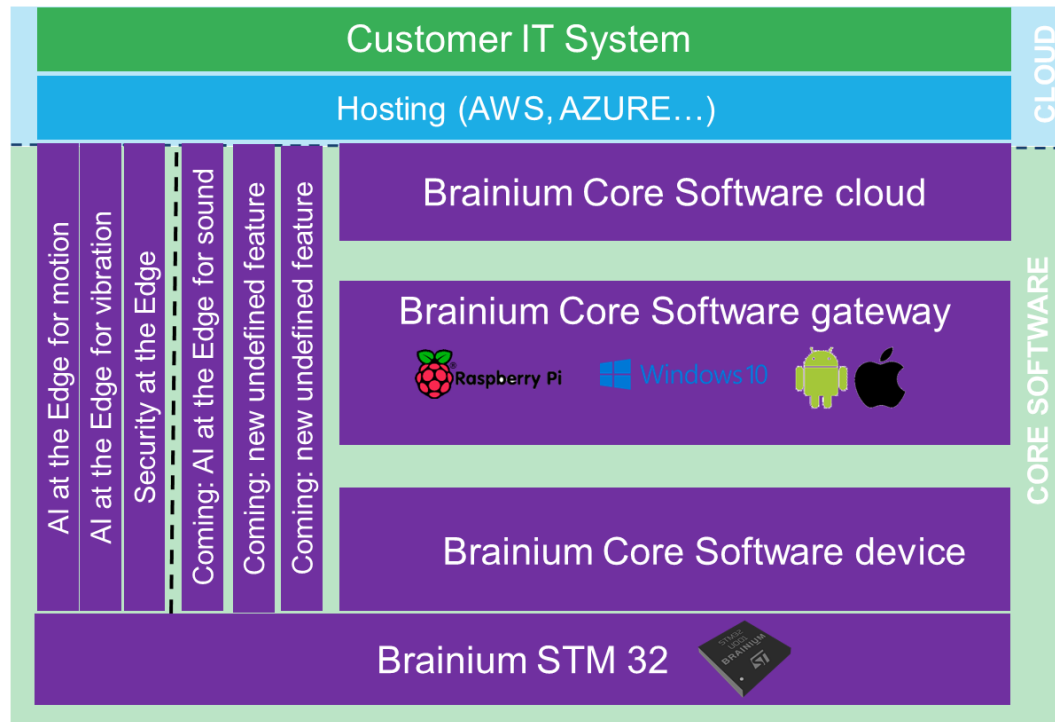

/SMARTEDGE AGILE

PORTAL

BRAINIUM

ALL IoT FEATURES IN ONE SINGLE PLATFORM
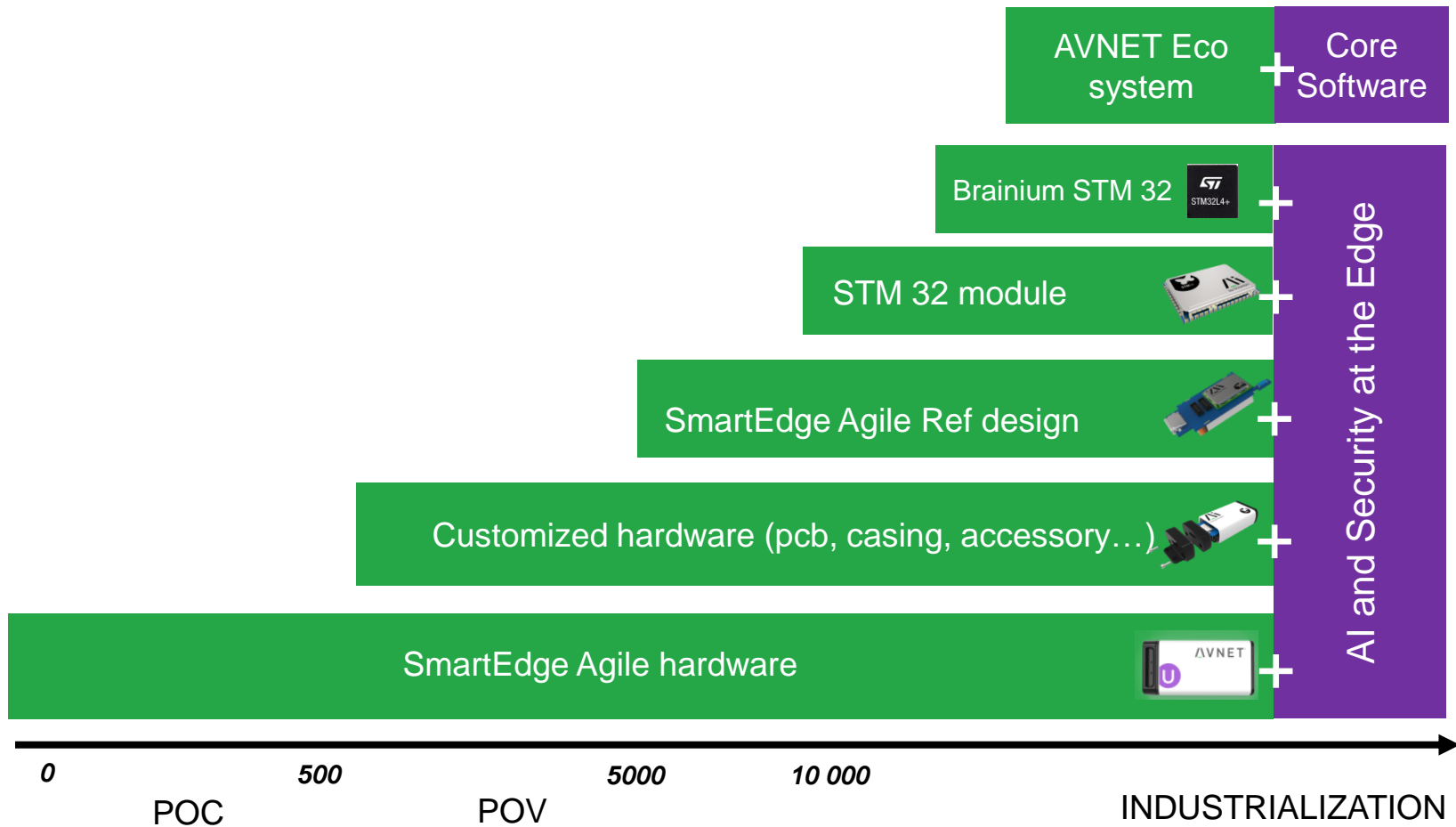
End to end IoT platform:

- State of the art end-to-end Security
- Device management and provisioning
- Real time data visualization and dashboard
- API and SDK for integration to customer environment

AI at the Edge:

- Automated machine learning (ML) pipeline
- On-the-fly ML model management
- Available for Motion and Vibration analysis
- High performance algorithms of sensors data analysis
- Neural Networks based motions classification
- Advanced sensors data fusion

WE HAVE A SOLUTION FOR EACH PRODUCT PHASE

AVNET Eco system **+** Core Software

Brainium STM 32 **+**

STM 32 module **+**

SmartEdge Agile Ref design **+**

Customized hardware (pcb, casing, accessory…) **+**

SmartEdge Agile hardware **+**

AI and Security at the Edge

0   500   5000   10 000

POC   POV   INDUSTRIALIZATION

CUSTOMER BENEFITS

- **Same environment** between prototyping and industrialization

- **Faster time to market** to launch an IoT project

- **Customer owns his data** and operates his IoT project

- Industrialization and human resources **cost reduction**

WHY AI AT THE EDGE IS IMPORTANT

Decision making

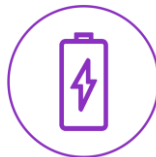Enable smart, local, real time, decision making

Security

Less vulnerable than streaming and storing data in the cloud

Power consumption

Reduce power consumption thus improving battery life

Data storage

Reduce costs for Cloud data storage as less data is transmitted

Data consumption

Reduce costs for data communication since less data is transmitted

Ultra low bandwidth

AI at the edge is necessary for ultra low bandwidth networks as raw data cannot be transmitted via these networks

CUSTOMER USE CASE

Predictive maintenance on water pumps

BRAINIUM
Intelligence in a real world

WHY DID THEY CHOOSE BRAINIUM

Water Utilities have a wide range of assets that are in need of monitoring and predictive maintenance.

Typically, a high proportion of these assets are un-connected and suffer the following:

- High operational costs when assets fail.

- High capital costs to build in redundant capacity to protect against un-foreseen asset failure.

- Fines related to non-compliance and customer satisfaction issues.

They chose Brainium as it is a ready to use solution to start Predictive Maintenance of their water pumps.

POC SCOPE

- **Location**: Nordic Region
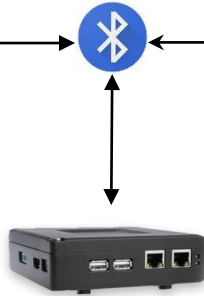- **Pump stations**: Clean and Waste water pumping stations with multiple physical pump configurations
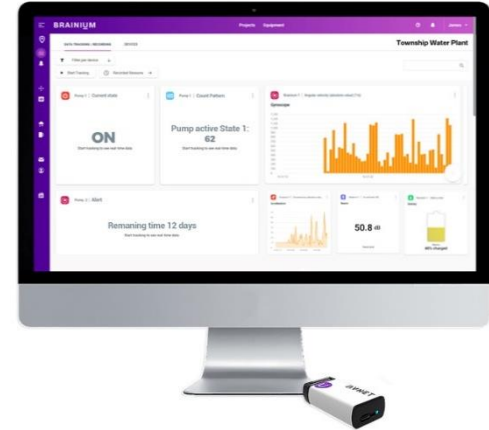
POC TIMELINE

Pumps become Intelligent in just a few days:

On site
Installation ready

AI algo
validation

Labeled PdM model

D0 D1 D2   D11   D13 D14   D28

Start data
recording

End data
recording*

Start Portal
monitoring
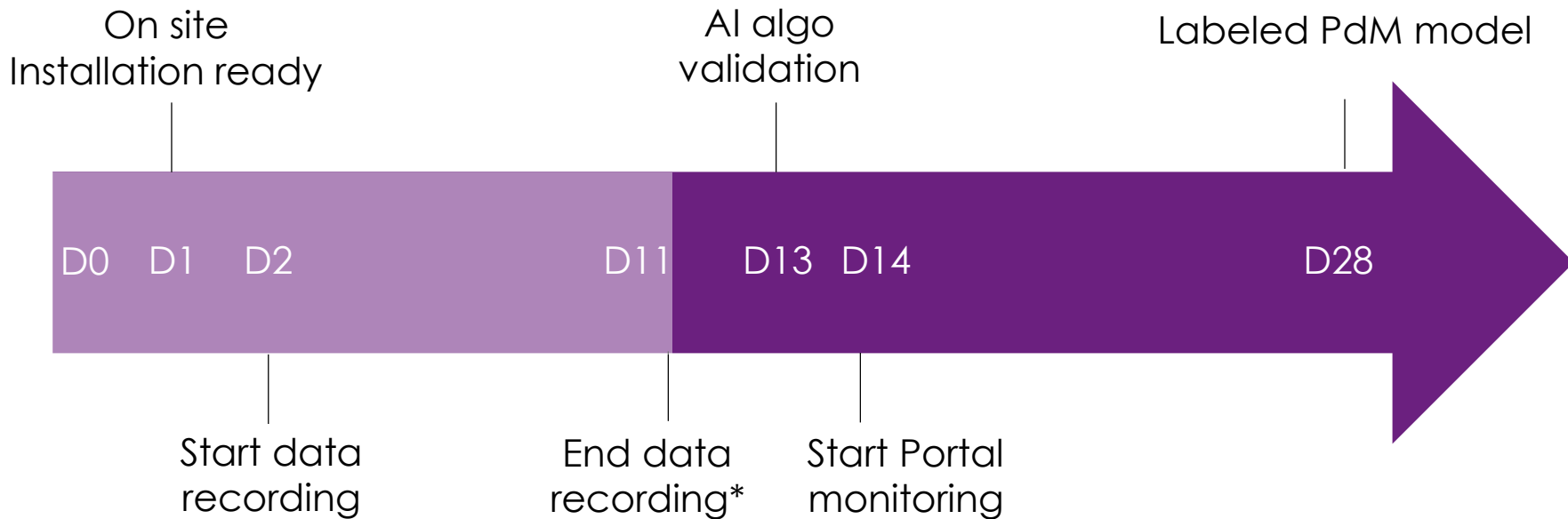
Data recording period is optional: Pdm model can run without data recording

NEXT STEPS AFTER POC

- Apply POC to other pump station configurations
- Replicate POC to a further 18 other pump stations
- Define full Project specifications with Customer
- Agree full project scope and deliverables
- Deliver custom managed service to customer
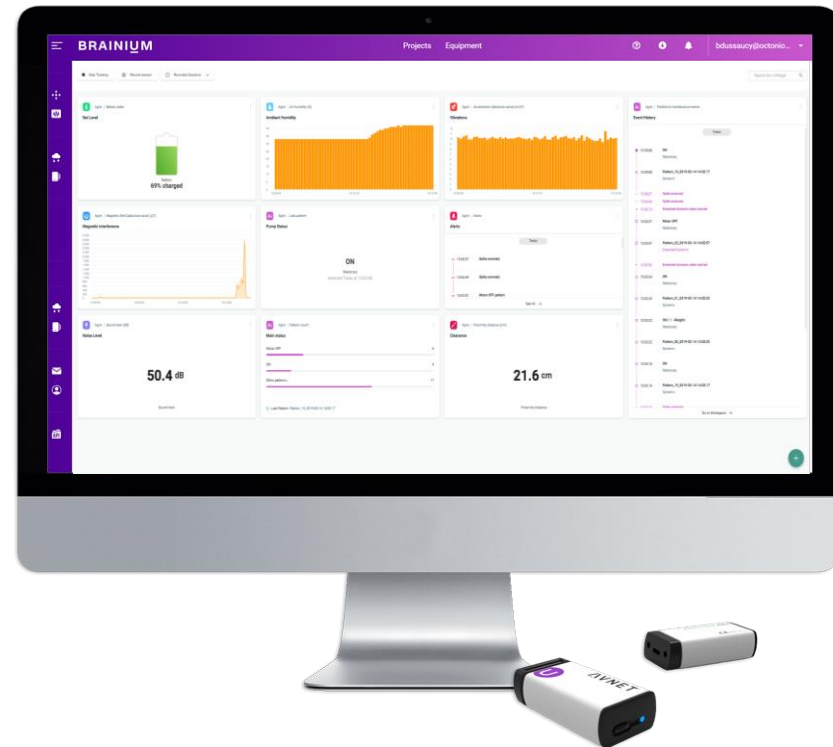- Roll-out pilot on 10k pumps in Eastern Europe

APPENDIX

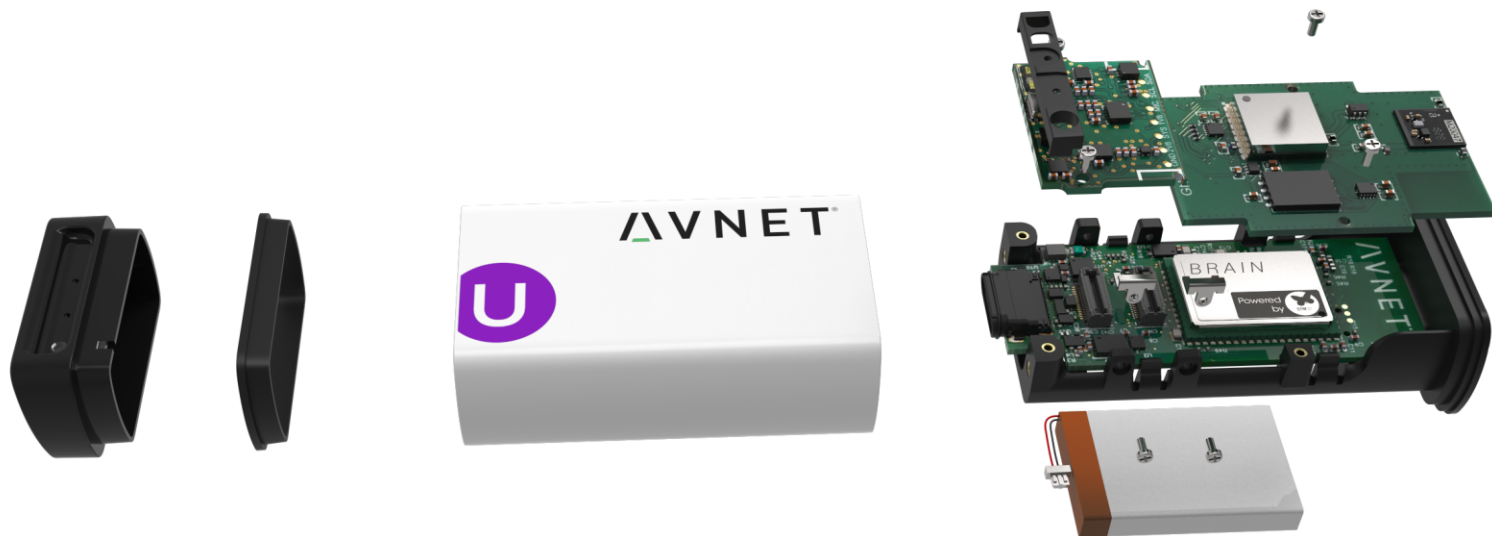**BRAINIUM**
Intelligence in a real world

TO START: BRAINIUM PORTAL

Brainium Portal enables to **start your POC project in a few days** with a Widgets Dashboard display:

- Real time visualization of Agile sensors data (acceleration, proximity, temperature, pressure...)

- Real time visualization of Agile state (alerts, battery state, pattern detected...)

- Device management, Device provisioning

- Brainium APIs access

- Data export of recorded data

- AI Studio: motion and vibration analysis with zero coding approach

TO START: SMARTEDGE AGILE

CE FC
IP65
Water & Dust
Resistance

Internal Flash
Storage

LiPo Chargeable
Battery

+60°

-20°

Bluetooth 5.0

MODULAR PCB

Pcb designed to allow a wide range of sensors and connectivity boards

SENSORS board
- Accelerometer + Gyroscope
- Magnetometer
- Pressure Sensor
- Temperature & Humidity
- Proximity / Ambient Light Sensor
- Microphone

CONNECTIVITY board
Included -
- BLE 5.0

Coming soon
- LoRaWAN
- 2G/3G/4G
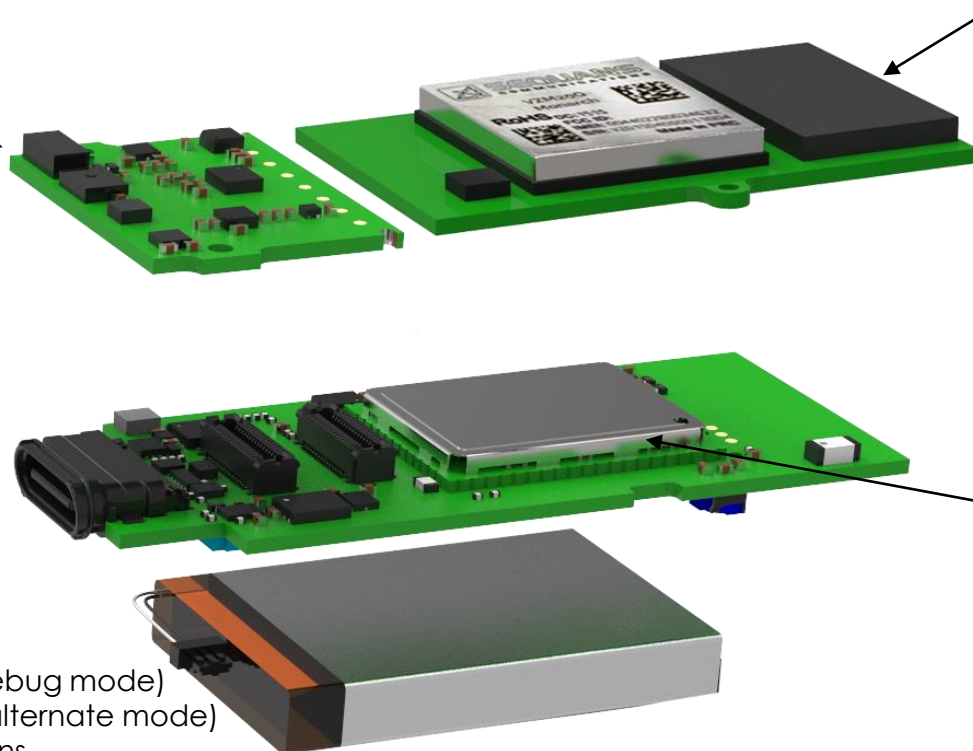- LTE-M/NB-IoT

Also planned
- Sigfox
- Wi-Fi
- …

USB-C Connector
- Charging
- External battery extension
- Supplying external devices
- Data exchange (normal & debug mode)
- Extensions I2C, I/O, UART … (alternate mode) allowing customized extensions

BRAIN module
- STM 32
- BLE 5.0
- Flash memory
- Secure element
- Accelerometer

BRING AI AT THE EDGE WITH AI STUDIO

This revolutionary tool is first on the market to bring Artificial Intelligence to your device.

3 steps to use AI Studio:

1. Build the data set   **2. Train and test the model**   **3. Deploy the model at the edge**

The Studio **deep learning models** are so efficient they can easily run locally on **low power devices**.

| FLEXIBLE MODEL BUILDER | SENSOR DATA ANALYSIS – NEURAL NETWORKS BASED | AUTOMATED TRAINING PIPELINE | NO CODING REQUIRED |