/SMARTEDGE AGILE

Product Brief

Avnet part Number: AVTSEA01a-M01a-S01a-C00

PRODUCT DESCRIPTIONS

The /SMARTEDGE AGILE meta-sensor, together with the Brainium Machine Learning cloud platform, form part of an ecosystem which provides a full, machine learning IoT system. The key advantages of this system are the use of Artificial Intelligence to analyse and monitor complex behaviours in motion, or of any of the other parameters for which sensor types are built into the AGILE meta-sensor. Brainium builds a complex Machine Learning model from the raw data acquired by AGILE. That model is then deployed right back to AGILE at the edge of the IoT network; now, real AI is running at the edge, where only qualified data is now sent to the Cloud, and decisions can be taken autonomously without the need for constant involvement by Cloud services.

Brainium, and the /SMARTEDGE AGILE meta-sensor's origins lie in developments in the sports industry, where analysing motion is critically important to top sporting performance. A highly skilled software development team has built a comparatively easy to use platform, consisting of deceptively complex machine learning systems, and autonomous meta-sensors which together, deliver ease of use, and a complete configuration platform. At its heart is over four years of real machine learning. An IoT network consisting of the Brainium platform and AGILE sensors is easy to put together because of its edge-to-cloud architecture. Any gateway used by the AGILE meta-sensors to connect to the Brainium platform is completely transparent to AGILE data traffic due to its edge-to-cloud security, making deployment easy. Further, the Brainium platform itself can be consumed as a Cloud service, or it can be containerised for use within other services, or even run privately. Best in class network security has been built in from the start, with full edge-to-cloud certificate based TLS security implemented as standard, protecting you, your network, and your reputation from attack. AI at the Edge increases the immediacy of decision making, and lessens the need for high volumes of traffic, reducing the need for high bandwidth connections from Edge to Cloud. All of this means a less expensive ongoing cost of ownership. In short Brainium and the Agile meta-sensor device make AI easy to implement, and cost effective to deploy without compromising on security.

Use the same ecosystem for all stages of your IoT project

1 Proof of Concept
Demonstrate to others that the concept works

2 Proof of Value
Scale the concept to prove the business model

3 Pilot
Run your pilot to refine any operational issues and inform final deployment plan

4 Deployment
Take the hardware and use the entire ecosystem to roll out your project

COMPARISON OF ARTIFICIAL INTELLIGENCE PROJECT DEVELOPMENT PROCESSES
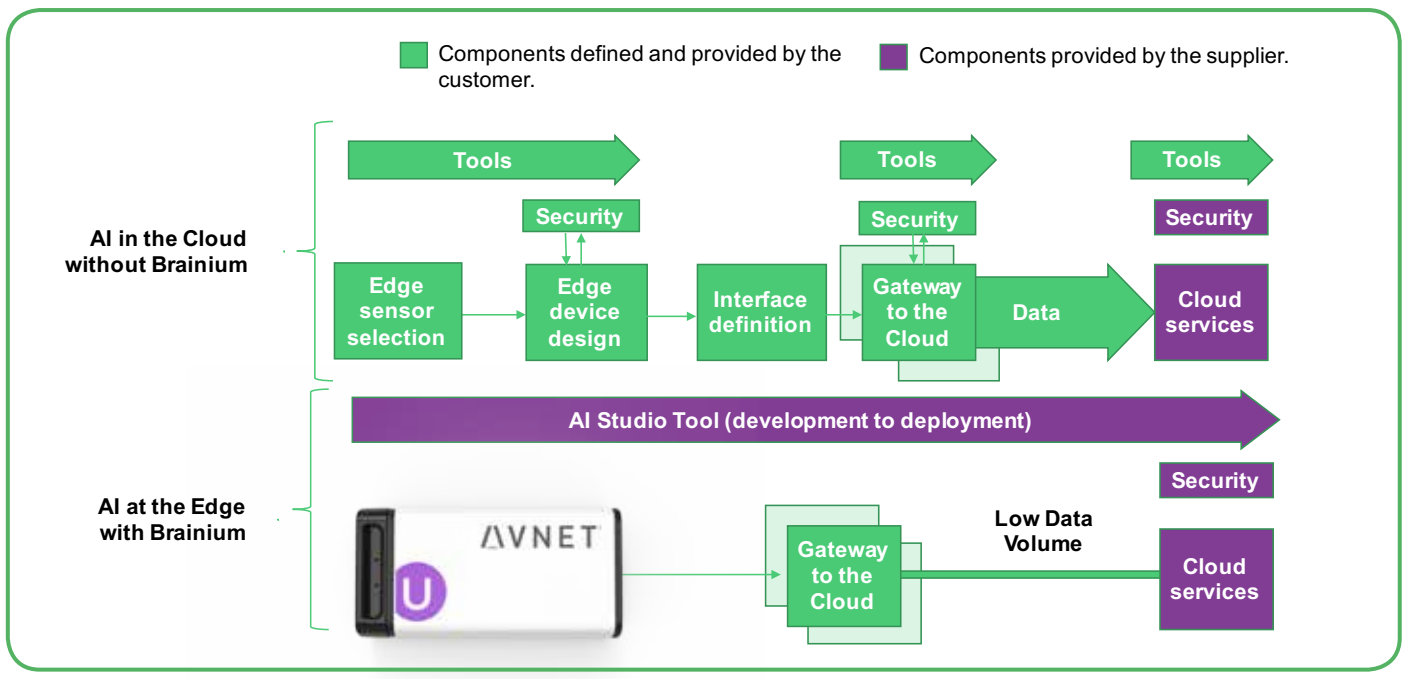

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ECOSYSTEM AND ENABLEMENT

• Brainium is your web-based development and visualisation environment which is used from Edge to Cloud, and throughout your entire IoT project
• Generate on-the-fly complex models to solve manufacturing or business industry problems at the node
• Build all kinds of projects from scratch, and easily create attractive user dashboards
• Zero-code, widget based project definition
• Easily export your data for BI
• Be confident that your data is yours
• Scale your project from one sensor, to very many sensors

Device Management

FOUNDATION FEATURES

SOFTWARE AND TOOLS

• All tools and licenses are included
• Six months of Microsoft Azure consumption included to get you started

FLEXIBLE AND SCALABLE

• Built in sensors: 3-axis accelerometer, pressure, temperature, microphone, proximity, light, humidity, magnetometer and gyroscope
• Expandable through USB port
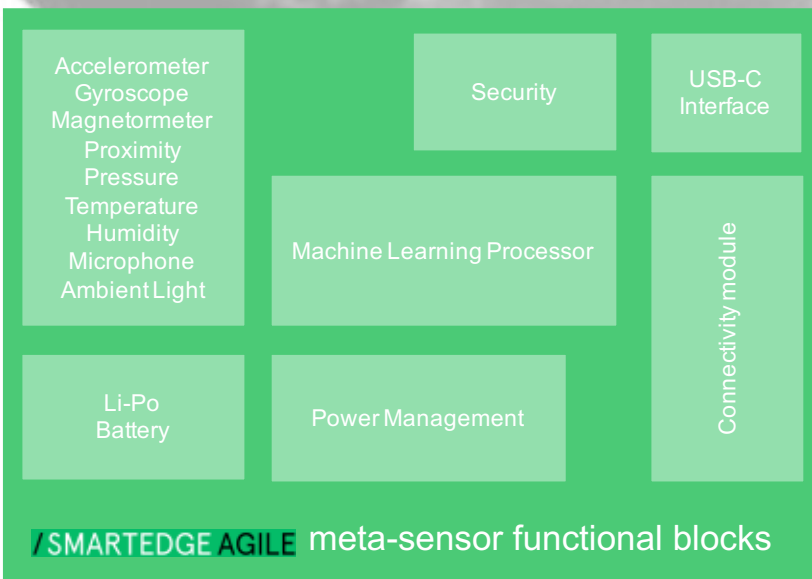• Easy onboarding to an existing Brainium IoT network
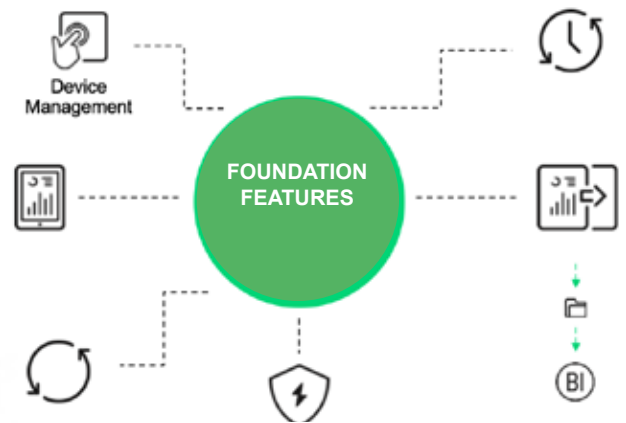
EXAMPLE APPLICATIONS

MARKET	Use case
Utilities, Plant, Machinary	Predictive maintenance of pumps, generators and other remote mechanical systems.
Elevators, Esca-lators, Travelators	Predictive maintenance, usage patterns and demand planning
Livestock Management	Monitoring of complex motion, as well as temperature, humidity and other parameters can provide livestock wellbeing insights

Accelerometer
Gyroscope
Magnetormeter
Proximity
Pressure
Temperature
Humidity
Microphone
Ambient Light

Security

USB-C Interface

Machine Learning Processor

Connectivity module

Li-Po Battery

Power Management

/SMARTEDGE AGILE meta-sensor functional blocks

FEATURES AND BENEFITS

FEATURES	BENEFITS
Brainium Machine Learning Engine	Builds models of complex behaviour that can be used monitor ongoing performance of systems, things or devices.
Agile meta sensor	Low power meta-sensor is designed to be located at the Edge of an IoT network. It has 9 built-in sensors types (see list below), which are used both to learn and build a model, and for ongoing monitoring. Default back-end connectivity is BLE 5, with other connecting options, including LoRaWAN and cellular, planned.
Intelligence right at the Edge	The Machine Learning model built in the Cloud can be deployed right to the Edge. Having such complex intelligence at the Edge enables fast decisions to be taken locally, with minimal dependency on Cloud services.
Integrated BLE V5 wireless radio	For flexible, wireless communication via a gateway to the Cloud.
Internal rechar-geable Li-Poly battery	For durable, autonomous operation.
USB-C interface	Latest version of USB interface makes avai-lable interfaces such as UART, i2c as well as USB for flexible interface and expandability options. Also allows battery recharging. Check www.avnet.com/agile for current expansion options.
Security	Best-in-class security, securing edge to cloud, included out-of-the-box
Development and Visualisation Tools included	Use the same tools all the way from proof-of-concept to deployment. Increases familiarity and confidence. Reduces risk.

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SIZE	32mm x 17mm x 68mm (w x h x l)
WEIGHT	29 g
OPERATING TEMPERATURE RANGE:	-20 °C to +60 °C
POWER SUPPLY:	Powered by USB connector, or internal rechargeable Li-Poly battery.
BATTERY CAPACITY:	260 mAh
ACCELEROMETER/GYRO: - Device - Acceleration measurement range - Angular rate range	STMicroelectronics LSM6DSLTR ±2/±4/±8/±16 g full scale ±125/±250/±500/±1000/±2000 degree per second (dps) full scale
MAGNETOMETER: Device Magnetic dynamic range Sensitivity	STMicroelectronics LIS2MDLTR ±50 Gauss 1.5 mGauss/LSB ± 7%
PRESSURE: Device Absolute pressure range Pressure output data rate Pressure accuracy	STMicroelectronics LPS22HBTR 260 to 1260 hPa 75 readings per second ±0.1 hPa after calibration, or ±1 hPa without calibration
TEMPERATURE/ HUMIDITY: Device Relative humidity range Relative humidity accuracy Temperature measurement range Temperature accuracy	STMicroelectronics HTS221TR 0 to 100% rH ± 3.5% rH inside 20 to +80% rH range Within Agile operating temperature range ± 0.5 °C,15 to +40 °C
MEMS MICROPHONE: Device Acoustic overload point Signal-to-noise ratio: Sensitivity:	STMicroelectronics MP34DT01TR-M 120 dBSPL 61 dB – 26 dBFS
AMBIENT LIGHT SENSOR: Device Channels Irradiance responsivity (integration time = 400ms, ALS gain = 16x)	ams TSL2540 2 channels; visible and IR light - Visible light (2700K): 363 counts (typ) - IR light (950nm): 353 counts (typ)
TIME-OF-FLIGHT SENSOR: Device Distance measuring range Maximum measurement rate Typical full field-of-view	STMicroelectronics VL53L1CXV0FY/1 0 to 400 cm Up to 50 measurements/sec 27°
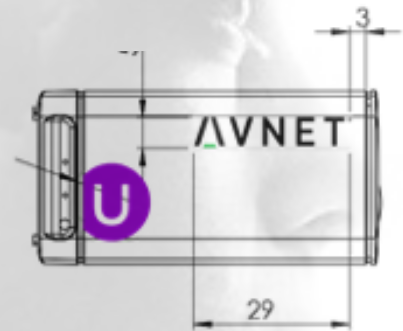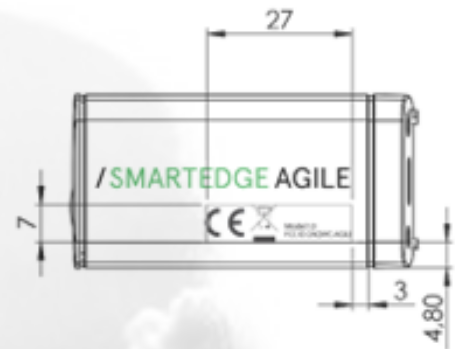
How to order this product:

Avnet part Number: AVTSEA01a-M01a-S01a-C00

More information:

www.element14.com/smartedgeagile

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