SOLUTION BRIEF:

RAPID DEVELOPMENT OF TINYML APPLICATIONS WITH SILICON LABS[®]

Al Sensor Algorithms for the Extreme Edge

OVERVIEW

Silicon Labs and SensiML have partnered to enable the rapid development of TinyML smart IoT sensing applications. Using Silicon Labs Thunderboard Sense 2 IoT Development Starter Kit along with the SensiML Analytics Toolkit, embedded developers with or without machine learning expertise can rapidly construct smart sensor algorithms that run at the IoT edge.

Example Applications:

- Industrial predictive maintenance
- Remote process and equipment monitoring
- Wearable activity detection and form analysis
- Gesture recognition
- Acoustic event detection
- Smart home and smart building sensors



SensiML's AutoML code generation engine produces optimized predictive sensing algorithms with minimal AI expertise required.

SENSIML / SILICON LAB SOLUTION

Combining SensiML Analytics Toolkit with Silicon Labs EFM32/EFR32 SoCs enables:

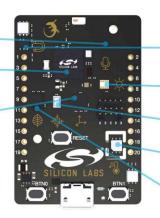
- Intelligent IoT products that utilize example training data to 'learn' patterns of interest for local inference models
- · Ability to add AI/ML functionality to products without in-depth data science experience or expertise
- Faster time-to-market with differentiated intelligent IoT devices that function without dependence on cloud and smartphone AI processing to deliver sensor insights
- High AI modeling confidence from an end-to-end workflow that includes powerful dataset annotation, automated data labeling, full model transparency, and flexibility to tune or modify all aspects of the code

Default SensiML Supported Components* Audio Sensing

Audio Sensing 12S digital microphone TDK InvenSense ICS-43434

Compute and Comms ARM Cortex-M4 multi-protocol radio Soc Silicon Labs Wireless Gecko EFR32MG12 1MB Flash, Z5GKB RAM CMSIS DSP/NN accelerated SensiML models

> Motion / Vibration Sensing 6DoF accel/gyro IMU sensor TDK InvenSense ICM-20648



Additional SensiML Capable Sensors

- Magnetism and Proximity Hall effect sensor Silicon Labs Si7210 SensiML capable sensor
- UV and Light UV index, ambient light, and proximity Silicon Labs Sil133 SensiML capable sensor Pressure Absolute barometric pressure Bosch BMP280 SensiML capable sensor

Environmental Sensors Precision temperature and humidity (RH) Silicon Labs Si7021 SensiML capable sensor

Air Quality Air pollution, air quality, breath analysis Cambridge CMOS CCS811 SensiML capable sensor

Thunderboard Sense 2 supported in SensiML Analytics Toolkit for rapid application prototyping.

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