

# RAPID DEVELOPMENT OF TINYML APPLICATIONS WITH SILICON LABS®

## 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**  
I2S digital microphone  
TDK InvenSense ICS-43434
- Compute and Comms**  
ARM Cortex-M4 multi-protocol radio SoC  
Silicon Labs Wireless Gecko EFR32MG12  
1MB Flash, 256KB 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 Si1133  
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.*

### Additional Information

For further information on SensiML software, services, and datasets, please visit <https://sensiml.com> or contact us via email at [info@sensiml.com](mailto:info@sensiml.com)