

QuickAI HW/SW Platform

Enabling Artificial Intelligence (AI) and Cognitive Sensing at the Endpoint



The new QuickAI™ platform provides an all-inclusive low power solution and development environment to economically incorporate the benefits of AI in endpoint applications. It features technology, software and toolkits from QuickLogic, Nepes, and SensiML which together have formed a tightly coupled platform to solve the challenges associated with the implementation of AI for endpoint applications.

Benefits

A Complete AI System Platform

- Sensor Processing
- eFPGA for HW Acceleration and Feature Extraction
- Neurons for AI Computing
- Data Analytics SW for Data Training and Model/Classifier Building
- QuickAI HW Platforms That Support Time Series and Vision Applications

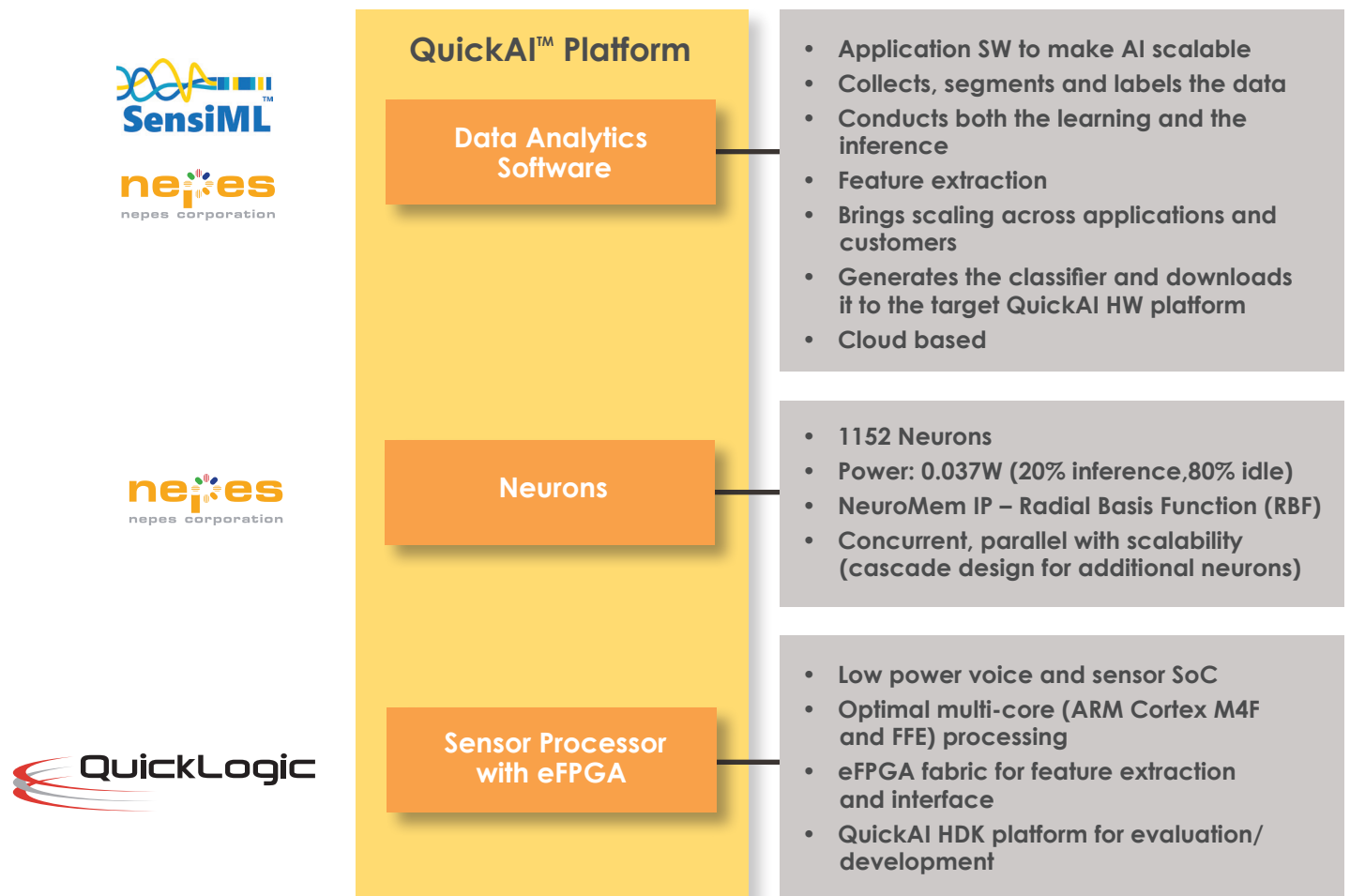
Delivers an AI Module Solution That Can be Deployed at the Endpoint Devices with Different Connectivity, Sensor and Camera Options.

Target Applications

- Industrial IoT
- Predictive Maintenance
- Smart Agriculture

Addressing the Challenges of Endpoint Applications

- Companies developing endpoint devices often lack the resources to work effectively with the complexities of cloud-based AI
- Endpoint applications often benefit from local AI resources that can react quickly, lower endpoint power consumption and lower life-cycle cost
- Endpoint design teams often lack the Data Science and Firmware Engineering resources needed to develop AI model
- The diversity and uniqueness of endpoint use cases drive the need to develop application specific algorithms and models
- Once deployed, endpoint companies must have a plan to manage the distributed endpoints, leverage the information they collect and often update AI models remotely

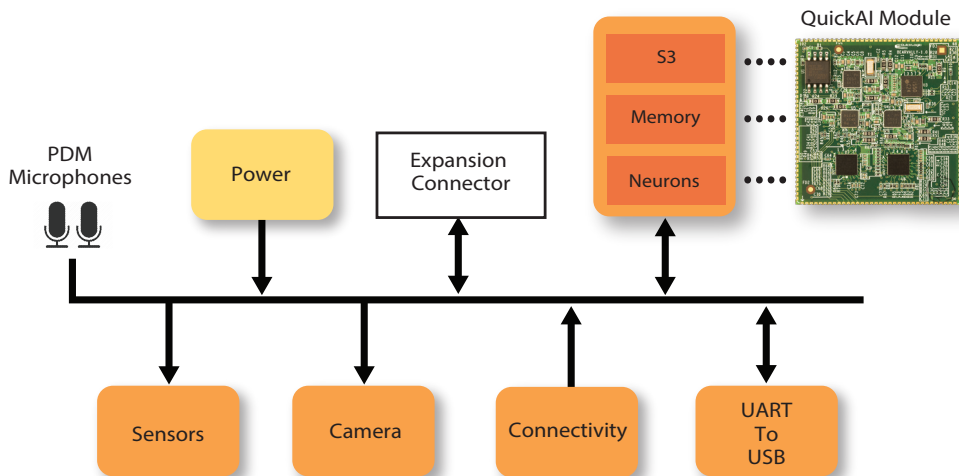


QuickLogic – The EOS™ S3 voice and sensor processing platform make it the ideal host SoC for the NM500. It can implement the proprietary interface for the NM500, sample the IoT sensor data, and extract features using its embedded FPGA technology.

SensiML – The analytics toolkit quickly and easily trains the data, builds the model and classifier and programs the EOS S3 for endpoint AI.

Nepes – The NM500 implements the NeuroMem technology in an energy efficient, small form factor component. It can be trained in the field to recognize patterns in real time, and multiple devices can be chained to provide any number of neurons. The Knowledge Studio software tool can be used to configure and train the neurons in the NM500 device.

QuickAI Module HDK Platform

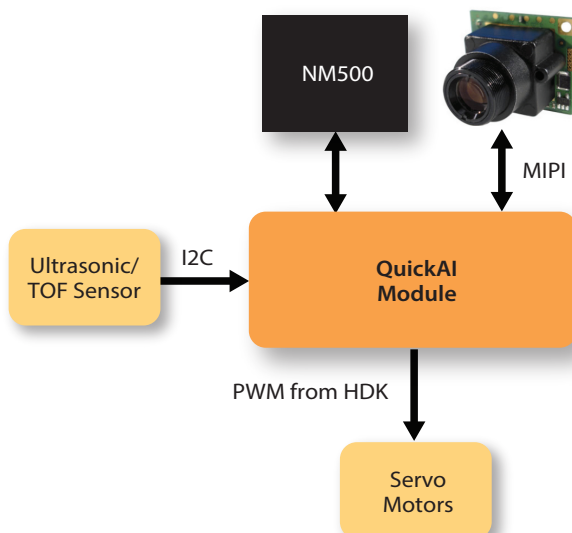


Features

- HDK Platform can be used for evaluation and/or deployment
- Enables AI (data collection, feature extraction, classifier) with motion, acoustic and image processing
- Expandable for more NM500s
- Supports MIPI camera

QuickAI Applications

Vision Inspection for Fruit/Vegetable Harvesting



* Available Q2 2019

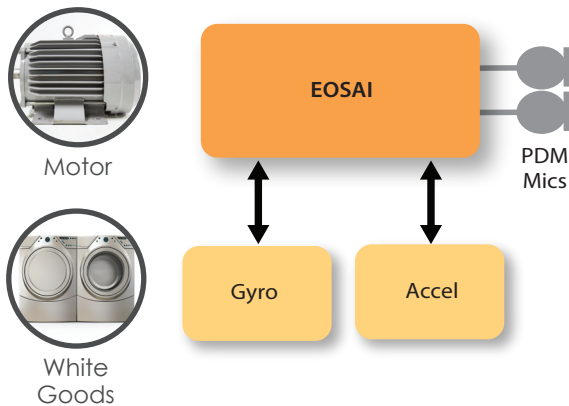
Features

- Identify ripe fruit/vegetable from unripe fruit/vegetable
- QuickAI Module supports MIPI camera interface
- HDK using PWM to control servo motor diver system

FPGA Features

- Sensor Data → Feature Extraction → Vector
- Interface to neurons and camera

Industrial Predictive Maintenance



Industrial Predictive Maintenance

- Unique model doesn't scale across similar motor differences in mounting or loading
- Endpoint AI decreases system bandwidth, latency, power

Algorithm Development: SensiML Toolkit for Time Series

- Data collection, segmenting, labeling
- Sensor input: motion, audio, pressure, temp/humidity, other time series data
- Feature extraction
- Model building

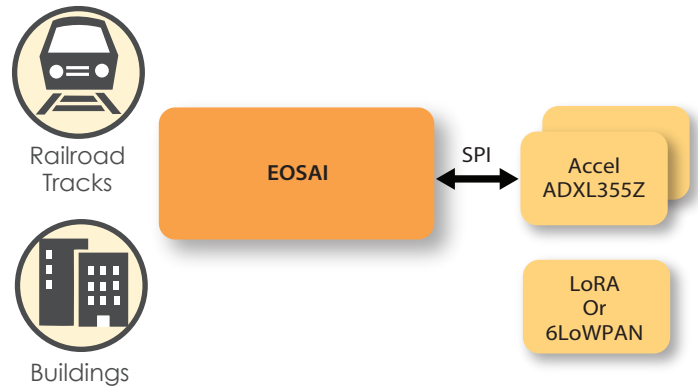
FPGA Features

- Sensor Data Creation → Feature Extraction → Feature Vector
- Hardware accelerator (FFT & MFCC)
- NM500 hard neuron interface

FFE Enabled Features

- Event trigger (segmentation)
- Feature extraction for simpler features
- Ultra-low power AON function

SHM (Structural Health Monitoring)



Structural Health Monitoring

- Damage detection
- Structural Integrity reporting

Algorithm Development: SensiML Toolkit for Time Series

- Data collection, segmenting, labeling
- Sensor input: motion, audio
- Feature extraction
- Model building

FPGA Features

- Sensor Data Creation → Feature Extraction → Feature Vector
- Hardware accelerator (FFT)
- NM500 hard neuron Interface

FFE Enabled Features

- Event trigger (segmentation)
- Feature extraction for simpler features
- Vibration (high precision accel) analysis at 200Hz ODR



For more information about QuickLogic, please visit www.quicklogic.com

Corporate Headquarters:
Sunnyvale, CA USA | 1-408-990-4000 | info@quicklogic.com

Sales Offices: <https://www.quicklogic.com/company/sales-locations/>
North America: america-sales@quicklogic.com | China: asia-sales@quicklogic.com | Japan: japan-sales@quicklogic.com
Korea: korea-sales@quicklogic.com | Taiwan: asia-sales@quicklogic.com | United Kingdom: europe-sales@quicklogic.com