CogniStix™

Introduction

CogniStix™ is a compact, low cost USB-powered hardware neural network device. It contains the ideal module for simplifying the evaluation of the capabilities and performance of the CM1K for performing machine learning and pattern matching using the component classifiers RBF and KNN.

CogniStix can also be used by system integrators for rapid prototyping. This hardware accelerator can enhance new and/or existing product performance, and/or simplify application development, reducing time-to-market.

Among the many application tasks that can exploit the capabilities of CogniStix include (but are not limited to):
- object detection / tracking
- data clustering / mining
- real-time signal processing
- image processing and recognition
- audio processing and recognition
- supervised and / or unsupervised learning

The module features one CM1K chip interfaced to an ARM microcontroller Cortex-M3 via the parallel bus for fast recognition time[1].

Features

- USB Plug and Play capability

- USB Powered

- Complete integration of the CM1K with a 32bit Arm Cortex-M3

- Integrated Flash 1MB

- Interface to Windows 7 & Windows 8 Operating System[2]

- Reprogrammable thru USB and JTAG

- Demonstrations with Sample Code

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[1] I2C interface will be available in Q1 2015 with the complete reference design .
[2] Support for additional software platforms available. Contact factory at cognistix.support@cognimem.com
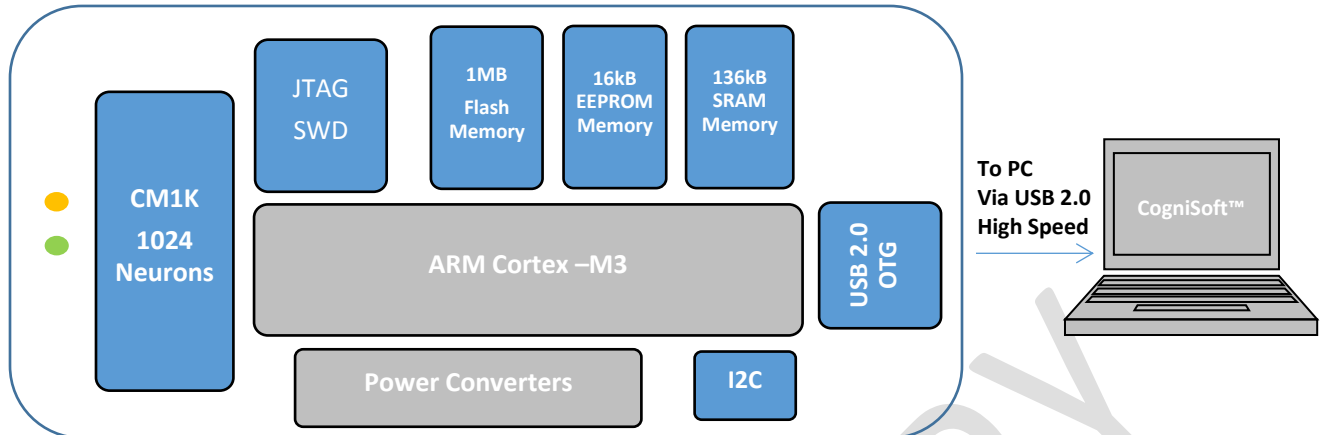
Specifications

- ARM Cortex-M3 processor, running at CPU frequencies of 180 MHz.
- JTAG and Serial Wire Debug. [3]
- 1 MB on-chip dual bank flash memory with flash accelerator. [4]
- 16 kB on-chip EEPROM data memory. [5]
- 136 kB SRAM for code and data use.
- 64 kB ROM containing boot code and on-chip software drivers.
- High-speed USB 2.0 Host/Device/OTG interface with DMA support and on-chip high-speed PHY
- 1024 silicon neurons working in parallel
- Classify vectors of up to 256 bytes, Up to 32K categories
- Radial Basis Function (Restricted Coulomb Energy machine learning) and K-Nearest Neighbor non-linear classifiers
- Yellow/Green LED status and error code indicators

Factory Firmware

The factory firmware programmed on the Arm Cortex-M3 implements a simple Register Transfer Level Protocol to access a single CM1K, with a network of 1024 Neurons for Pattern Matching Applications. Refer to the CogniStix Hardware Manual and the "Programming the CM1K made easy" white paper for complete operation and training guidelines.

Ordering Information

Part Number: 901-3022

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[3] Will be available in Q1 2015 with the complete reference design
[4] User Flash Code execution for future software release reference design
[5] Available in a future software release