ARM CORTEX M0 WORKSHOP

## MISSION: TO MIGRATE FROM 8-BIT TO 32-BIT MCU

Existing 8 –bit architectures have their origins in the early era of the semiconductor industry resulting in limitations of address range, register restrictions, limited functionality, unsuitability for high level languages, and little attention to power and scaling issues.

The ARM® Cortex™ – M0 processor core and system architecture take full advantage of today's optimized low-power design techniques, tools, and the latest low-power high-density silicon Flash process. (It is the smallest, lowest power and most energy efficient core from ARM)

CORTEX M0 MCU FROM NXP

[1]NXP Semiconductors® is the 1st ARM partner to licence the Cortex-M0 and launch the LPC1100 series of MCUs which could be the lowest priced 32-bit MCU solution in the market (starts at ₹30) bringing higher value and ease of use than existing 8/16-bit microcontrollers through unprecedented performance, simplicity, low power, and more importantly, dramatic reductions in code size for all 8/16–bit applications. The LPC1100 offers a seamless entry point for 8/16-bit

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[1] NXP Semiconductors® (formerly Philips Semiconductors) provides High Performance Mixed Signal and Standard Product solutions that leverage its leading RF, Analog, Power, Digital Processing and manufacturing expertise.
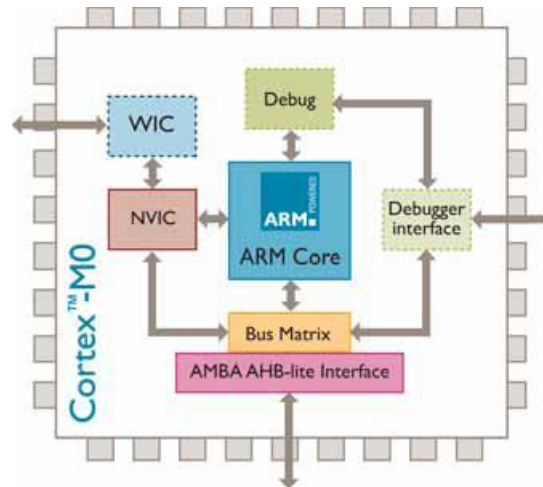
designers looking to start with the scalable ARM architecture throughout their entire range of product development.

Performance and energy consumption are two most important criteria for selecting a microcontroller.

Superior Performance: With over 45 DMIPS of performance compared to the sub-DMIP performance of typical 8-bit MCUs and 3-5 DMIPS for 16-bit MCUs, the LPC1100 can execute not only basic control tasks but also sophisticated algorithms, making even the most complex tasks within reach. Shorter time to do more tasks translates directly into lower energy consumption. This level of performance (45 DMIPS) is delivered at 50 MHz, with extensive power optimization at less than 10mA.

Smaller Code Size: Completely shattering the myth that 8/16 bit microcontrollers use less code, the industry standard EEMBC's Coremark benchmarks dramatically illustrate that the LPC1100 requires 40-50% smaller code for most common microcontroller tasks.

Features of the NXP LPC1100 family of microcontrollers include:

- 50 MHz Cortex-M0 processor with SWD/debug (4 breakpoints)
- 32 Vectored Interrupts; 4 priority levels; Dedicated interrupts on up to 13 GPIOs
- UART, 1 or 2 SPI, I2C (FM+), 2 16-bit and 2 32-bit timers with PWM/Match/Capture
- 12 MHz Internal RC Oscillator with 1% accuracy over temperature and voltage
- Power-On-Reset (POR); Multi-level Brown-Out-Detect (BOD); 10-50 MHz Phase-Locked Loop
- 8-channel high precision 10-bit ADC with +/- 1 LSB DNL
- Up to 28 or 42 fast 5V tolerant GPIO pins for HVQFN33 and LQFP48 respectively, high drive (20 mA) on select pins
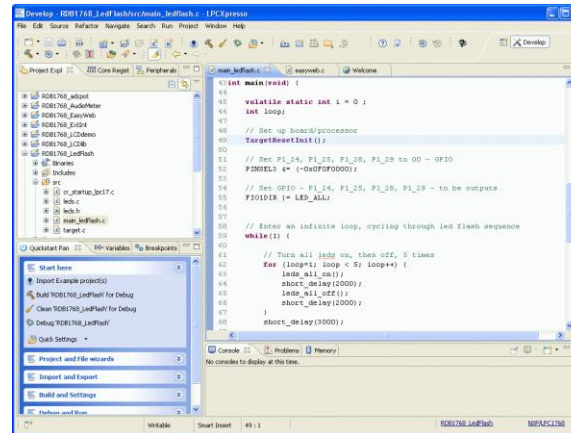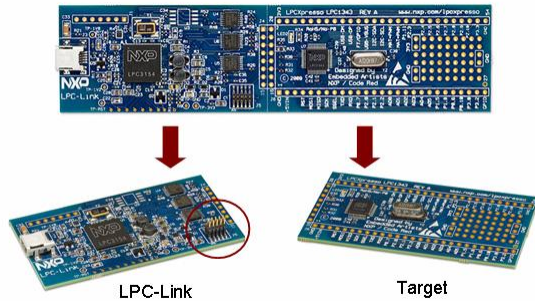- Single 1.8-3.6V power supply, over 5 kV ESD for rugged applications

Future features planned in this range include Ultra Low Power options, CAN, 12-bit ADC and DAC, temperature sensor, high resolution timer features and advanced sensor interface.

WHO SHOULD PARTICIPATE

This workshop is designed for all students and professionals who are currently working on 8-bit MCUs and who intend to work on 32-bit MCUs.
Since Cortex M0 is the smallest of the ARM family, it would be an appropriate starting point for novices. With clear migration plans towards Cortex M3, and the more recent launches such as LPC4300, and ARM 15, the participants will find the information and hands

on training on the LPC1100 useful for embedded projects at hand.

LPC-Link   Target

TOPICS TO BE COVERED

- The key values of the Cortex-M0 core.
- Overview of the rich mix of the NXP Microcontroller portfolio.
- LPC1100 Data Sheet and User Manual
- Hands on training on LPCXpresso – an easy to use, comprehensive development tool platform (see figures above).

REGISTRATION FEE

Students ₹ 150, Faculty ₹ 300, Industry ₹ 600 (covers Tea and Lunch). The program is non-residential. Prior registration required.

For registration, send an e-mail to vk@kvah.in with the following particulars: Name, Organization, Designation, Current Activity and get confirmation.

Hurry - arrangements made for limited seats.

FACULTY

Dr. Vithal N. Kamat, Principal, ICCT Kamat (PhD in AI, UNB Canada, and MTech in Control & Inst. from IIT Mumbai) a technical consultant to NXP; has developed embedded solutions in varied areas such as White goods, Automotive, Metering, and Lighting.

Ms. Mithila Zodape
Mithila is a graduate student studying in Microprocessor Systems, M.S. University.

ABOUT THE VENUE

ICCT is the 1st Engineering College in Gujarat set up to promote women's education in professional courses (this course is open to both genders.). Located in a quiet satellite township - New Vallabh Vidyanagar that is about 10 kms from Anand railway station (WR), or 50 and 80 kms from Vadodara and Ahmedabad Airports respectively.

One Day Workshop on ARM CORTEX M0

Monday 3rd January 2011
Time : 11:00 AM to 5:00 PM

ORGANIZED BY

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