



# LPCXpresso Integrated Development Environment (IDE)

## Advanced software development toolchain for LPC microcontrollers

A complete suite of enhanced, Eclipse-based tools for creating and debugging a wide range of microcontroller-based applications and end-products.

The LPCXpresso IDE gives developers a low-cost way to create high-quality applications for LPC microcontrollers (MCUs). Based on the Eclipse platform, it has many enhancements to simplify application development and debugging. It features the industry-standard GNU toolchain with a choice of libraries: a proprietary, optimized C library or the standard GNU Newlib library. The LPCXpresso IDE can be used to build an executable of any size with full code optimization.

Together, the LPCXpresso IDE and LPCXpresso development boards comprise a complete development platform, enabling quick evaluation, prototyping and development. A full-featured Free edition is available to all LPC customers; a Pro edition offers additional feature extensions and email-based support.

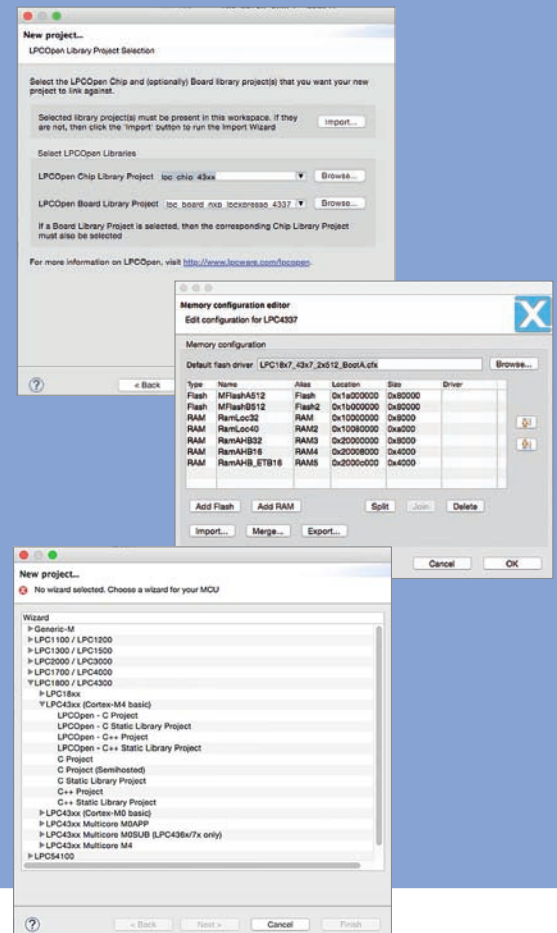
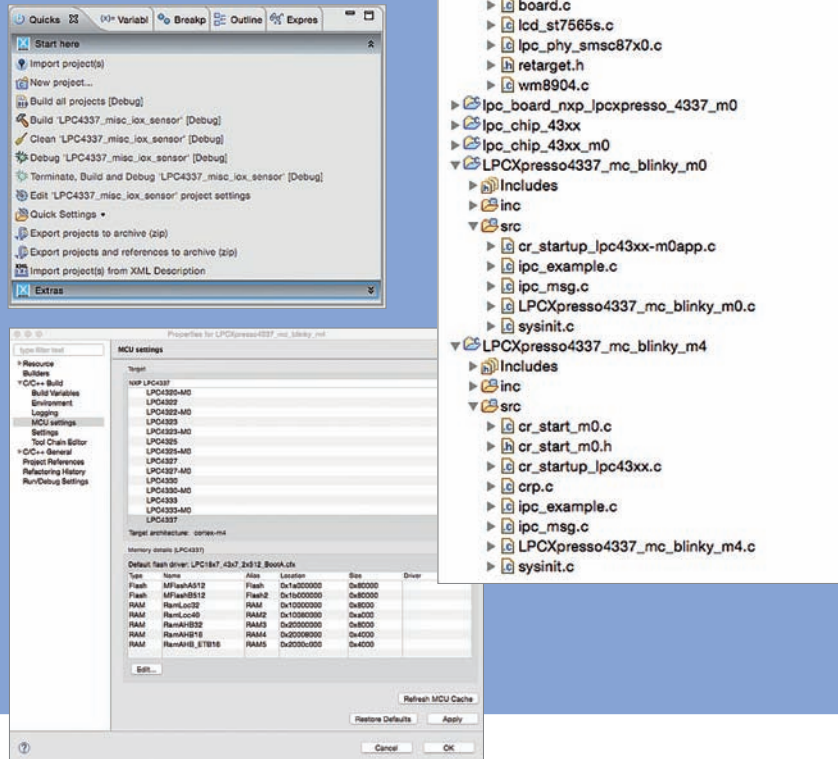
### KEY FEATURES

#### Complete integrated development environment

- ▶ Eclipse-based with many NXP-specific ease-of-use enhancements
- ▶ Device-specific support for LPC Cortex-M, ARM7 and ARM9 MCUs
- ▶ Quickstart Panel provides easy access to most commonly used functions
- ▶ Can be extended with many Eclipse plug-ins
- ▶ Built-in CVS source control support; other source control system plug-ins available including GIT, Subversion, TFS, and more
- ▶ Free and Pro editions available
- ▶ Part of a complete development platform that includes development boards for each LPC microcontroller series



The LPCXpresso IDE's intuitive, flexible project management and configuration capabilities make it easy to get started and accommodate many different system scenarios.



## PROGRAM/PROJECT CREATION AND MANAGEMENT

### Powerful project creation and build facilities

- ▶ Industry-standard GNU toolchain, including:
  - C and C++ compilers, assemblers and linker
  - Convertors for SREC, HEX and binary output files
- ▶ Advanced project wizards
  - Enable simple creation of pre-configured applications for specific MCUs
  - Facilitate easy creation and configuration of applications for specific MCUs
  - Automatic generation of MCU-specific startup code
  - No assembler required with Cortex-M MCUs

### Powerful linker and memory configuration capabilities

- ▶ MCU-specific linker scripts automatically generated for correct placement of code and data into Flash and RAM
  - Memory configuration editor allows simple changes to memory map
  - Powerful template mechanism allows application-specific code and data layouts to be easily produced
- ▶ Can build an executable of any size with full code optimization
- ▶ Headless build mechanism and command-line tools for flexible integration into build, test and production systems

### Library support includes:

- ▶ Creation of applications using NXP LPCOpen libraries (stacks, drivers, middleware, etc.)
- ▶ Redlib: an optimized, small-footprint embedded C library unique to the LPCXpresso IDE
- ▶ Newlib: standard GNU C and C++ library; plus a code-size optimized version, Newlib-Nano

## ADVANCED DEBUG WITH TRACE AND PROFILING

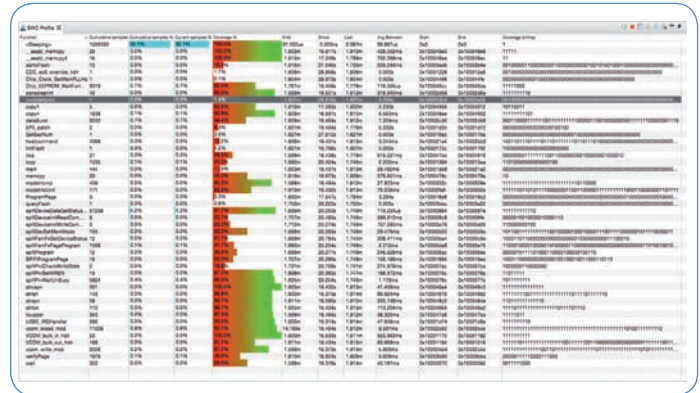
### Full-featured debugger supporting SWD and JTAG connections

- ▶ Optimized for use with LPC-Link2; compatible with many other CMSIS-DAP debug probes
- ▶ Support for multiple devices on JTAG scan-chain
- ▶ Supports use of SEGGER J-Link (using third-party plug-ins)
- ▶ Unlimited debug image size (Pro edition); up to 256 KB (Free edition)
- ▶ Built-in high-speed Flash programming
  - Appropriate Flash driver automatically selected for internal MCU Flash
  - Generic Quad SPI Flash driver detects many common external Flash devices; source provided to allow addition of more devices

- ▶ Automatic debug configuration for target MCU
- ▶ High-level and instruction-level debug
- ▶ Views of CPU registers and on-chip peripherals

## Trace and profiling

- ▶ Instruction trace via embedded trace buffer (ETB) (LPC43xx and LPC18xx devices) and micro trace buffer (MTB) (Cortex-M0+ MCUs)
- ▶ Supports ARM Cortex SWO trace on Cortex-M3/M4 MCUs via LPC-Link2 with functionality including:
  - Application profiling
  - Interrupt trace, including timeline graphing (Pro edition)
  - Data watch: one (Free edition), up to four (Pro edition)
  - Performance counter monitoring



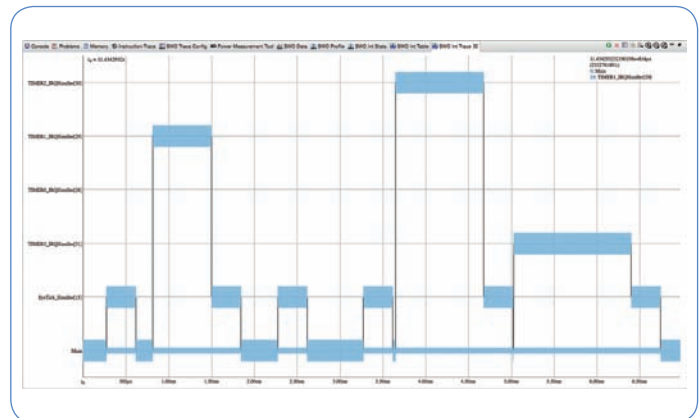
Code profiling views include code coverage and detailed timing information

## Advanced multi-core support

- ▶ Provision for creating linked projects for each core in multi-core MCUs
- ▶ Debug multi-core projects within a single IDE instance with ability to link various debug views to specific cores

## Power measurement tool

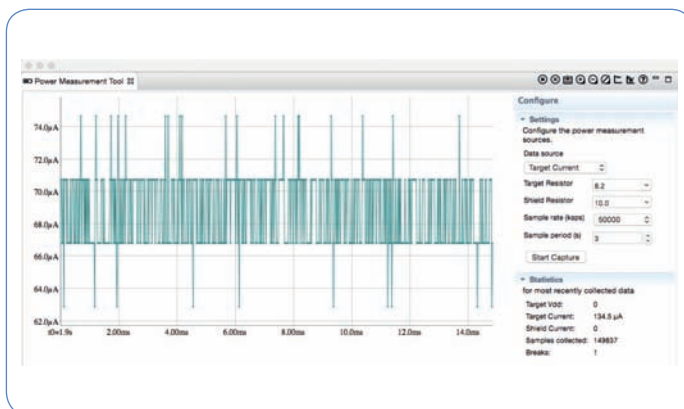
- ▶ Sample power usage at adjustable rates of up to 200 kps; average power usage display option
- ▶ Explore detailed plots of collected data in IDE
- ▶ Export data for analysis with other tools



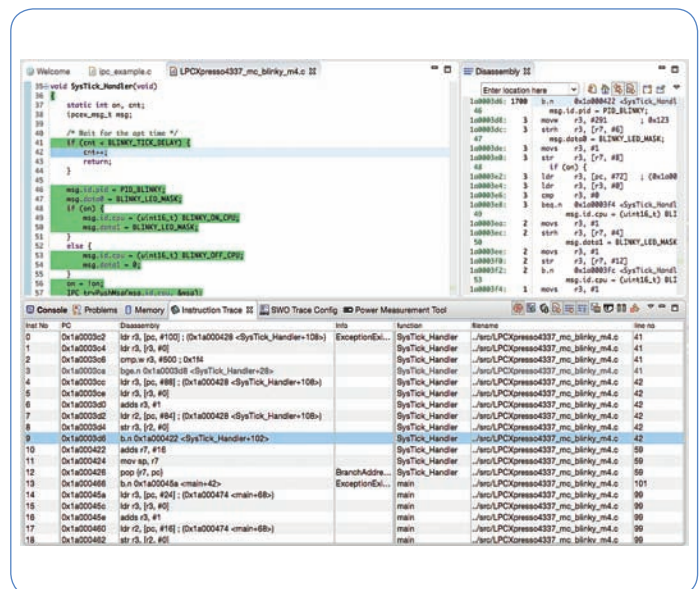
Interrupt trace

## Red State: state machine designer and code generator for state configurable timers (SCTs)

- ▶ Design state machines graphically
- ▶ Generates standard C code
- ▶ Configures SCTimer/PWM
- ▶ Can be used to create software state machine



Power measurement tool



Instruction trace



## FREE AND PRO EDITIONS

A full-featured Free edition of the LPCXpresso IDE is free to use for all LPC customers. A Pro edition offers additional feature extensions and email-based support. Licenses can be upgraded from the Free edition to the Pro edition at any time from within an installed LPCXpresso IDE.

Free edition supports:

- ▶ Debugging of projects with code size up to 256 KB
- ▶ KB Technical support: LPCXpresso community forums hosted on [lpcware.com](http://lpcware.com)

Pro edition also includes:

- ▶ No project code size limits
- ▶ Enhanced trace and profiling features
- ▶ Technical support: one year of email ticket-based support from NXP engineers (in addition to free forum-based support)

	Free	Pro
Licence fee	Free	\$495
Download limit	256 KB	Unlimited
Support	Forums	1-year NXP email, ticket-based

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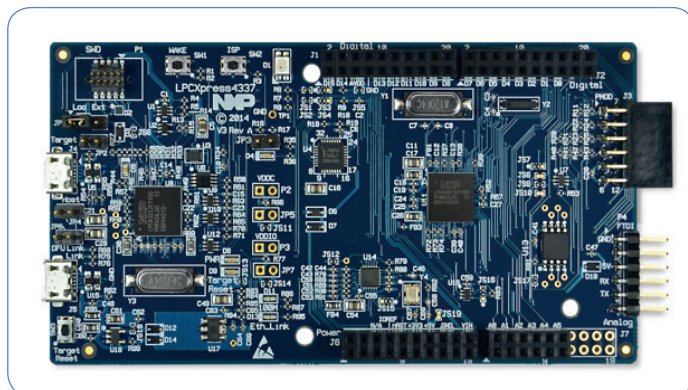
## LPCXPRESSO: A COMPLETE DEVELOPMENT PLATFORM

The LPCXpresso IDE is part of NXP's comprehensive LPCXpresso development platform designed to give developers an easy, low-cost way to create high-quality applications using LPC MCUs. Low-cost LPCXpresso development boards, available for most LPC MCU series, work with the LPCXpresso IDE or with industry-leading partner toolchains for quick evaluation, prototyping and development.

## LPC ECOSYSTEM OFFERS A CHOICE OF IDES

When choosing a toolchain for application development, the LPCXpresso IDE is only one of several choices. The extensive tools ecosystem for LPC MCUs also includes popular IDEs from IAR, Keil, Rowley, and SEGGER. These IDEs support a broad range of development platforms from partners such as Embedded Artists, Keil, Manley and NGX.

The LPCXpresso IDE can be used with any LPC MCU-based target systems. For an up-to-date list of LPCXpresso development boards, visit [www.nxp.com/LPCXpresso-boards](http://www.nxp.com/LPCXpresso-boards)



**LPCXpresso4337 development board**

