NXP 50-MHz, 32-bit Cortex-M0™ MCUs LPC11C00

Industry's first integrated CAN transceiver microcontroller solution

Offering a low-cost entry point for CAN-based applications, the LPC11C00 series reduce product development risk, lower total system cost, and speed time-to-market for high-performance embedded designs.

Key features

- ARM Cortex-M0 processor
  - 50 MHz operation
  - Nested Vectored Interrupt Controller
  - Three reduced-power modes: Sleep, Deep-sleep, and Deep power-down
  - Serial Wire Debug (4 breakpoints)
- Memories
  - 16/32 KB Flash memory
  - 8 KB SRAM
- Serial peripherals
  - CAN 2.0 B C_CAN controller with on-chip CANopen drivers
  - On-chip, high-speed CAN tranceiver (parts LPC11C22/C24 only)
  - UART with fractional baud rate generation
  - 2 SPI controllers with FIFO and multi-protocol capabilities
  - I^2C-bus interface supporting Fast mode plus
- Analog peripheral
  - 10-bit analog-to-digital converter with 8 channels and conversion rates up to 400 K samples per second with ±1LSB DNL
- Timers
  - 4 general-purpose counter/timers - Two 32-bit counter/timers & Two 16-bit counter/timers - with a total of four capture inputs and 13 (LPC11C12/C14) or 12 (LPC11C22/C24) match ouputs.
  - Programmable Watchdog Timer (WDT) with lock-out feature
  - 24-bit System timer
- I/O
  - 42 general-purpose I/O (GPIO) pins on the LPC11C12/14 part
  - 36 general-purpose I/O (GPIO) pins on the LPC11C22/C24 parts
- Clock generation unit
  - 12 MHz Internal RC Oscillator trimmed to 1% accuracy
  - Crystal oscillator with an operating range of 1 to 25 MHz
  - Programmable watchdog oscillator
  - Clock output function
- Other
  - Unique device serial number for identification
  - Integrated PMU (Power Management Unit) to minimize
  - Brownout detect
  - Power-On Reset (POR)

Applications

- Remote sensors
- Industrial networking
- White goods
- Elevator systems
- Consumer peripherals
- System supervisors
- e-Metering
- 8/16-bit applications

CAN has long been considered one of the best choices for robust real-time communication, but has been price-prohibitive for low-cost embedded applications. Built around the Cortex-M0 architecture, the smallest, lowest power, and most energy-efficient ARM core ever developed, the LPC11C00 series with 16/32 KB Flash and 8 KB SRAM are ideal for CAN-based applications

On-chip CAN and CANopen drivers

On-chip CAN and CANopen drivers provide design engineers with easy-to-use API commands to the CANopen protocol, enabling rapid integration of the LPC11C00 series into CAN-based networks and thereby greatly simplifying the plug-and-play integration process. Furthermore, these drivers are incorporated in low-power ROM, freeing up as much as 8 KB of user code space. This reduces operating power and enables safe, secure bootloading via CAN and other on-chip serial channels. In System Programming updates the Flash memory using secure, reliable ROM-based drivers and the CAN bus. The whole range of functionality is supported, from programming blank parts in production to changing system parameters and full in-field re-programmability.

Enabling Higher Code Density and Superior Performance

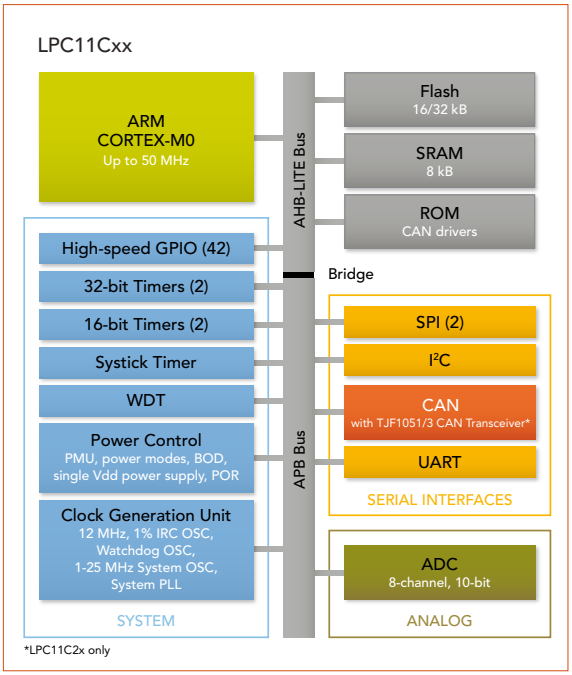
The LPC11C00 requires 40-50 percent smaller code size than typical 8/16-bit microcontrollers for common tasks. This is enabled by the powerful Cortex-M0 v6-M instruction set, which is built on a fundamental base of 16-bit Thumb instructions unique to 32-bit microcontrollers today. With over 45 DMIPS of performance, the LPC11C00 series provides powerful message and data handing for CAN device nodes, in a power-optimized solution unavailable with today's 8/16-bit microcontrollers.

Development tools

The LPC1100 family is supported by the LPCXpresso, an easy-to-use, comprehensive development tool platform for under USD30. It's also supported by development tools from IAR, Keil, Hitex, Code Red, and many others.

CAN is recognized as a robust and reliable communication channel for rugged environments. With the introduction of the LPC11C22 and LPC11C24 integrated CAN transceiver microcontroller solution, NXP has opened the door for widespread adoption of low-cost CAN in an increasing variety of industrial and automation applications for factories, buildings and in the home. Typically, CAN transceivers can cost as much as or even more than the microcontroller itself. Integrating the CAN transceiver on board increases system reliability and quality, reduces electrical interconnect and compatibility issues, and reduces board space by over 50 percent while adding less than 20 percent to the MCU cost.

Block diagram LPC11C00



Selector guide

Type number	Flash	Total SRAM	UART RS-485	I²C/ Fast+	SPI	C_CAN	On-chip CAN Transceiver	ADC channels	Package
LPC11C12FBD48/301	16 KB	8 KB	1	1	2	1	-	8	LQFP48
LPC11C14FBD48/301	32 KB	8 KB	1	1	2	1	-	8	LQFP48
LPC11C122FBD48/301	16 KB	8 KB	1	1	2	1	Yes	8	LQFP48
LPC11C24FBD48/301	32 KB	8 KB	1	1	2	1	Yes	8	LQFP48

Fore more information, please visit www.nxp.com/microcontrollers.

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Date of release: January 2011
Document order number: 9397 750 17050
Printed in the Netherlands