NXP ARM Cortex-M0™ microcontrollers LPC1200

Up to 128 KB Flash and configurable peripherals for industrial control

Powered by the smallest, most energy-efficient Cortex-M0 core, the LPC1200 provides compelling solutions for industrial control. The series includes up to 128 KB Flash and 8 KB SRAM, and offers configurable peripherals ideally suited for energy-efficient controls and appliances.

Key features

▶ ARM Cortex-M0 processor
  - Up to 30 MHz CPU frequency with zero wait state from Flash
  - Nested Vectored Interrupt Controller (NVIC) supports 32 vectored interrupts with fast and deterministic latency
  - Three reduced-power modes: Sleep, Deep-sleep, and Deep power-down
▶ Memories
  - Up to 8 KB SRAM
  - Up to 128 KB Flash memory with 512 Byte page erase
▶ Serial communication interfaces
  - Two UARTs with fractional baud-rate generation and internal FIFO plus RS-485, modem, and IrDA supports
  - I²C with Fast-mode Plus for twice the devices on one bus and longer transmission distances
▶ SSP (SPI) controller with FIFO and multi-protocol capabilities
▶ Analog peripherals
  - 10-bit Analog-to-Digital Converter (ADC) with eight channels and conversion rates up to 400 ksps
  - Two comparators, each with up to six selectable external sources, fully configurable on either positive or negative comparator input channels

▶ Other peripherals
  - Direct Memory Access (DMA) controller with 21 channels supports onboard UART, SPI, ADC, RTC, counters/timers, comparators, I²C, and GPIO
  - Cyclic Redundancy Check (CRC) engine with programmable polynomial settings and support for several CRC standards
  - Two 32-bit general-purpose counter/timers with four capture inputs and four match outputs
  - Two 16-bit general-purpose counter/timers with two capture inputs and two match outputs
  - Windowed Watchdog Timer (WDT) designed to comply with IEC 60730 Class B safety requirements
  - 32-bit Real-time Clock (RTC)
  - Up to 55 general-purpose I/O (GPIO) pins, all with configurators and a digital filter

Applications
▶ White goods
▶ Industrial control
▶ Home automation
▶ Power conversion
▶ UPS

- ▸ Lighting
- ▸ Alarm systems
- ▸ PC peripherals
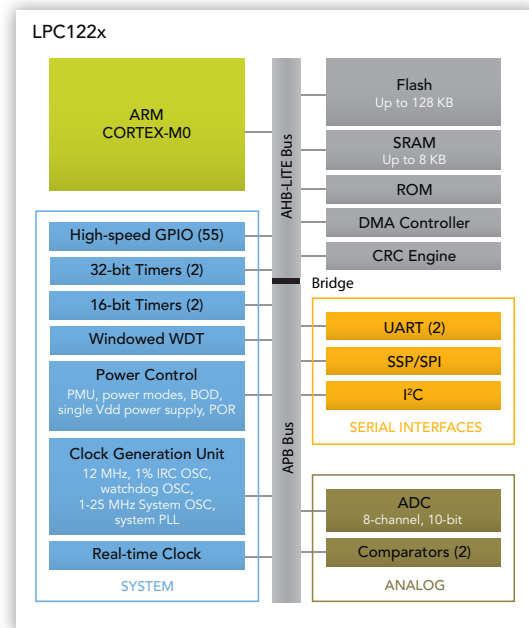- ▸ POS

General description

The LPC1200 series extends NXP's 32-bit ARM microcontroller continuum by targeting a wide range of industrial applications in the areas of factory and home automation. The series offers a wide range of Flash memory sizes, from 32 to 128 KB, with 512 Bytes page erase. Benefitting from the ARM Cortex-M0 Thumb instruction set, the LPC1200 has up to 50% higher code density compared to common 8/16-bit MCUs performing typical tasks. The LPC1200 also features an optimized ROM-based divide library for Cortex-M0, which offers code size saving and several times the arithmetic performance of software based libraries. The high efficiency of the Cortex-M0 core also helps the LPC1200 achieve lower average power for similar applications. The LPC1200 has up to 55 GPIO and new onboard peripherals including DMA, CRC, comparators, an RTC, and a 1% internal oscillator, which provides the accuracy needed for Baud rate generation.

Development tools

The easy-to-use LPCXpresso IDE for the LPC1200 series is priced under $30. Other development tools from IAR, Keil, Hitex, and Code Red can be found at www.nxp.com/ microcontrollers. All NXP's Cortex-M microcontrollers are upwardly binary compatible and offer all the advantages of a single development toolchain. Users can easily migrate their designs between Cortex-M0 and Cortex-M3 with minimum effort.

Additional features

- ▸ Programmable high-current output driver on four pins
- ▸ Processor wake-up from Deep-sleep mode via 12 port pins or peripherals interrupts
- ▸ Power-On Reset (POR)
- ▸ Brownout detect with four separate thresholds for interrupt and forced reset
- ▸ 12 MHz internal RC oscillator trimmed to 1% accuracy that can also be used as a system clock or Baud rate generator
- ▸ PLL allows CPU operation up to the maximum CPU rate without the need for a high-frequency crystal. Can be run from the main oscillator, the internal RC oscillator, or the Watchdog oscillator
- ▸ Clock generation unit with divider that can reflect the main oscillator clock, IRC clock, CPU clock, and Watchdog clock.
- ▸ Available in 48- or 64-pin LQFP package

LPC122x

ARM CORTEX-M0	Flash Up to 128 KB
	SRAM Up to 8 KB
	ROM
	DMA Controller
High-speed GPIO (55)	CRC Engine
32-bit Timers (2)	Bridge
16-bit Timers (2)	UART (2)
Windowed WDT	SSP/SPI
Power Control PMU, power modes, BOD, single Vdd power supply, POR	I²C
	SERIAL INTERFACES
Clock Generation Unit 12 MHz, 1% IRC OSC, watchdog OSC, 1-25 MHz System OSC, system PLL	ADC 8-channel, 10-bit
Real-time Clock	Comparators (2)
SYSTEM	ANALOG

AHB-LITE Bus · APB Bus

Selection guide

Type	f_{max} (MHz)	FLASH (KB)	RAM (KB)	I/O pins	DMA	CRC	RS-485	UART	I²C/FM+	SPI	ADC
LPC1227FBD64/301	30	128	8	55	1	1	1	2	1	1	1
LPC1226FBD64/301	30	96	8	55	1	1	1	2	1	1	1
LPC1225FBD64/321	30	80	8	55	1	1	1	2	1	1	1
LPC1225FBD64/301	30	64	8	55	1	1	1	2	1	1	1
LPC1224FBD64/121	30	48	4	55	1	1	1	2	1	1	1
LPC1224FBD64/101	30	32	4	55	1	1	1	2	1	1	1
LPC1227FBD48/301	30	128	8	39	1	1	1	2	1	1	1
LPC1226FBD48/301	30	96	8	39	1	1	1	2	1	1	1
LPC1225FBD48/321	30	80	8	39	1	1	1	2	1	1	1
LPC1225FBD48/301	30	64	8	39	1	1	1	2	1	1	1
LPC1224FBD48/121	30	48	4	39	1	1	1	2	1	1	1
LPC1224FBD48/101	30	32	4	39	1	1	1	2	1	1	1