



## 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
  - I<sup>2</sup>C 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, I<sup>2</sup>C, 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

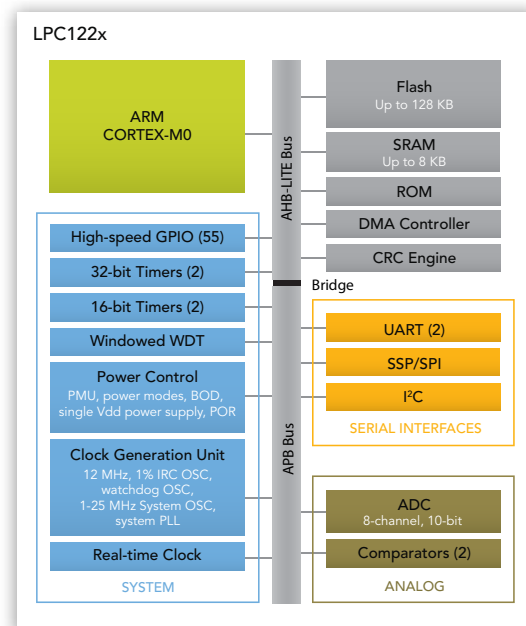
The LPC1200 series extends NXP's 32-bit ARM microcontroller continuum by targeting a wide range of industrial applications in the areas of factory and home automation. The series offers a wide range of Flash memory sizes, from 32 to 128 KB, with 512 Bytes page erase. Benefitting from the ARM Cortex-M0 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](http://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



### Selection guide

Type	f <sub>max</sub> (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

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