# STM32L152RB Ultra-low-power ARM Cortex-M3 MCU with 128 Kbytes Flash, 32 MHz CPU, LCD, USB

The ultralow power STM32L15xxx incorporates the connectivity power of the universal serial bus (USB) with the high-performance ARM Cortex™-M3 32-bit RISC core operating at a 32 MHz frequency, a memory protection unit (MPU), high-speed embedded memories (Flash memory up to 128 Kbytes and RAM up to 16 Kbytes), and an extensive range of enhanced I/Os and peripherals connected to two APB buses. All devices offer a 12-bit ADC, 2 DACs and 2 ultralow power comparators, six general-purpose 16-bit timers and two basic timers, which can be used as time bases. Moreover, the **STM32L15xxx** devices contain standard and advanced communication interfaces: up to two I2Cs and SPIs, three USARTs and a USB. They also include a real-time clock and a set of backup registers that remain powered in Standby mode. Finally, the integrated LCD controller has a built-in LCD voltage generator that allows you to drive up to 8 multiplexed LCDs with contrast independent of the supply voltage.

The ultralow power **STM32L15xxx** operates from a 1.8 to 3.6 V power supply (down to 1.65 V at power down) with BOR and from a 1.65 to 3.6 V power supply without BOR option. It is available in the -40 to +85 °C temperature range. A comprehensive set of power-saving modes allows the design of low-power applications.

Operating conditions
Operating power supply range: 1.65 V to 3.6 V (without BOR) or 1.8 V to 3.6 V (with BOR option)
Temperature range: −40 to 85 °C

Low power features

4 modes: Sleep, Low-power run (9 µA at 32 kHz), Low-power sleep (4.4 µA),Stop with RTC (1.45 µA), Stop (570 nA), Standby (300 nA)

Dynamic core voltage scaling down to 233 µA/MHz

Ultralow leakage per I/O: 50 nA

Fast wakeup from Stop: 8 µs

Three wakeup pins

Core: ARM 32-bit Cortex™-M3 CPU

32 MHz maximum frequency,33.3 DMIPS peak (Dhrystone 2.1)

Memory protection unit

Reset and supply management

Low power, ultrasafe BOR (brownout reset) with 5 selectable thresholds

Ultralow power POR/PDR

Programmable voltage detector (PVD)

Clock management

1 to 24 MHz crystal oscillator

32 kHz oscillator for RTC with calibration

Internal 16 MHz factory-trimmed RC

Internal 37 kHz low consumption RC

Internal multispeed low power RC, 65 kHz to 4.2 MHz with consumption down to 1.5 µA

PLL for CPU clock and USB (48 MHz)

Low power calendar RTC

Alarm, periodic wakeup from Stop/Standby

Memories

Up to 128 Kbyte of Flash memory with ECC

4 Kbyte of data EEPROM with ECC

Up to 16 Kbyte of RAM

Up to 83 fast I/Os (73 of which are 5 V-tolerant) all mappable on 16 external interrupt vectors

Development support

Serial wire debug, JTAG and trace

DMA: 7-channel DMA controller, supporting timers, ADC, SPIs, I2Cs and USARTs

LCD 8 × 40 or 4 × 44 with step-up converter

12-bit ADC up to 1 Msps/24 channels
Temperature sensor and internal voltage reference
Operates down to 1.8 V
2 × 12-bit DACs with output buffers
2 ultralow power comparators
Window mode and wakeup capability
10 timers:
6 × 16-bit general-purpose timers, each with up to 4 IC/OC/PWM channels
2 × 16-bit basic timers
2 × watchdog timers (independent and window)
Up to 8 communication interfaces
Up to 2 × I2C interfaces (SMBus/PMBus)
Up to 3 × USARTs (ISO 7816 interface, LIN, IrDA capability, modem control)
Up to 2 × SPIs (16 Mbit/s)
USB 2.0 full speed interface
CRC calculation unit, 96-bit unique ID