STM32™ 32-bit MCU family
Leading supplier of Arm® Cortex®-M microcontrollers

life.augmented
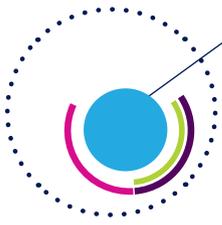
STM32

Releasing your creativity

By choosing one of ST's microcontrollers for your embedded application, you gain from our leading expertise in MCU architecture, technology, multi-source manufacturing and long-term supply.

The STM32 portfolio offers an extraordinary variety of options, including Arm® Cortex®-M cores (M0, M0+, M3, M4 and M7), giving developers flexibility to find the perfect STM32 for their applications. Particular attention is paid to accommodate porting of applications from one device to another.
Scalable and flexible software ecosytem combined with the close pinout compatibility assignment, hardware IP re-use and consistency accross product families and higher level programming language makes the development job far more convenient when dealing with the STM32 families.

HIGH-PERFORMANCE

STM32 **H7**   STM32 **F7**

STM32 **F4**   STM32 **F2**

HIGH DEGREE OF INTEGRATION AND RICH CONNECTIVITY

- **STM32H7**: highest performance STM32 MCUs with advanced features including DSP and FPU instructions based on Cortex®-M7 with 1 to 2 Mbytes of Flash memory (2020 CoreMark)
- **STM32F7**: very high performance MCUs with advanced features including DSP and FPU instructions based on Cortex®-M7 with 256 Kbytes to 2 Mbytes of Flash memory (1082 CoreMark)
- **STM32F4**: from the access line to high-performance MCUs with advanced features including DSP and FPU instructions based on Cortex®-M4 with 64 Kbytes to 2 Mbytes of Flash memory (608 CoreMark)
- **STM32F2**: mid-range MCUs with excellent price-performance ratio based on Cortex®-M3 with 128 Kbytes to 1 Mbyte of Flash memory (398 CoreMark)

MAINSTREAM

STM32 **F3**   STM32 **F1**   STM32 **F0**

SCALABLE SET OF MCUS FOR A LARGE VARIETY OF APPLICATIONS

- **STM32F3**: upgraded F1 series with various levels of advanced analog peripherals based on Cortex®-M4 with 16 to 512 Kbytes of Flash memory (245 CoreMark)
- **STM32F1**: foundation series based on Cortex-M3 with 16 Kbytes to 1 Mbyte of Flash memory (108 Cormark)
- **STM32F0**: entry-level MCUs extending to 8-/16-bit world based on Cortex®-M0 with 16 to 256 Kbytes of Flash memory (105 CoreMark)

ULTRA-LOW-POWER

STM32 **L4+**   STM32 **L4**

STM32 **L1**   STM32 **L0**

TINY POWER BUDGET APPLICATIONS

- **STM32L4+:** excellence in ultra-low-power with more performance based on Cortex®-M4 with 1 to 2 Mbytes of Flash memory (233 ULPMark-CP / 55 ULPMark-PP / 410 CoreMark)
- **STM32L4**: best-in-class in ultra-low-power with performance based on Cortex®-M4 with 128 Kbytes to 1 Mbyte of Flash memory (347 ULPMark-CP / 121 ULPMark-PP / 273 CoreMark)
- **STM32L1**: market-proven answer for 32-bit applications based on Cortex®-M3 with 32 to 512 Kbytes of Flash memory (81 ULPMark-CP / 93 CoreMark)
- **STM32L0**: perfect fit for 8-/16-bit applications and cost-sensitive designs based on Cortex®-M0+ with 8 to 192 Kbytes of Flash memory (244 ULPMark-CP / 95-ULPMark-PP / 75 CoreMark)

WIRELESS

STM32 **WB**

MULTIPROTOCOL AND ULTRA-LOW-POWER 2.4 GHZ RADIO TRANSCEIVER

- **STM32WB:** Dual-core (Cortex®-M4/M0+) architecture (216 CoreMark) supporting BLE 5.0 and IEEE 802.15.4 in Single or Concurrent mode. Strong RF link with +6 dBm output power and -96 dBm / -100 dBm sensitivity (BLE / IEEE 802.15.4) and integrated balun. From 256 Kbytes to 1 Mbyte of Flash memory. Rich set of protection features.

STM32 THE LEADING CORTEX-M PORTFOLIO

Common core peripherals and architecture:

- Communication peripherals: USART, SPI, I²C
- Multiple general-purpose timers
- Integrated reset and brown-out warning
- Multiple DMA
- 2x watchdogs Real-time clock
- Integrated regulator PLL and clock circuit
- Up to 3x 12-bit DAC
- Up to 4x 12-bit ADC (Up to 5 MSPS) Depending on series
- Main oscillator and 32 kHz oscillator
- Low- and high-speed internal RC oscillators
- -40 to +85 °C and up to 125 °C operating temperature range
- Low voltage 2.0 to 3.6 V or 1.65/1.7 to 3.6 V Depending on series
- Temperature sensor

High-performance

STM32H7 series – High performance with DSP, Double-precision FPU, JPEG Codec and Chrom-ART Accelerator™

| 400 MHz Cortex-M7 L1-Cache | Up to 2-Mbyte dual-bank Flash | Up to 1-Mbyte SRAM | 2x USB 2.0 OTG FS/HS | 2x 16-bit advanced MC timer HR timer | DFSDM HDMI-CEC Ethernet S/PDIF | Quad-SPI FMC MDIO Camera IF SDIO | Crypto-hash TRNG | 4x SAI 3x I²S 2x FDCAN LCD-TFT | 3x 16-bit ADC Op-amps comp. | STM32 H7 |

STM32F7 series – High performance with DSP, FPU, ART Accelerator™ and Chrom-ART Accelerator™

| 216 MHz Cortex-M7 L1-Cache | Up to 2-Mbyte dual-bank Flash | Up to 512-Kbyte SRAM | 2x USB 2.0 OTG FS/HS | 2x 16-bit advanced MC timer | DFSDM HDMI-CEC Ethernet S/PDIF | Quad-SPI FMC MDIO Camera IF SDIO | Crypto-hash TRNG | 2x SAI 2x I²S LCD-TFT Up to 3x CAN | MIPI-DSI | STM32 F7 |

STM32F4 series – High performance with DSP, FPU, ART Accelerator™ and Chrom-ART Accelerator™

| Up to 180 MHz Cortex-M4 | Up to 2-Mbyte dual-bank Flash | Up to 384-Kbyte SRAM | 2x USB 2.0 OTG FS/HS | 2x 16-bit advanced MC timer | DFSDM HDMI-CEC Ethernet S/PDIF | Quad-SPI FMC MDIO Camera IF SDIO | Crypto-hash TRNG | 2x SAI 5x I²S LCD-TFT Up to 2x CAN | MIPI-DSI | STM32 F4 |

STM32F2 series – High performance with ART Accelerator™

| 120 MHz Cortex-M3 CPU | Up to 1-Mbyte Flash | Up to 128-Kbyte SRAM | 2x USB 2.0 OTG FS/HS | 2x 16-bit advanced MC timer | Ethernet | FSMC Camera IF SDIO | Crypto-hash TRNG | 2x I²S Up to 2x CAN | | STM32 F2 |

Mainstream

STM32F3 series – Mixed-signal with DSP and FPU

| 72 MHz Cortex-M4 | Up to 512-Kbyte Flash | Up to 80-Kbyte SRAM CCM-RAM | USB 2.0 FS | 3x 16-bit advanced MC timer | 3x DAC 7x comp. 4x PGA | FSMC CAN | HR-Timer | ADC 3x 16-bit ΣΔ 4x 12-bit (5 MSPS) | STM32 F3 |

STM32F1 series – Mainstream

| Up to 72 MHz Cortex-M3 CPU | Up to 1-Mbyte Flash | Up to 96-Kbyte SRAM | USB 2.0 OTG FS | 2x 16-bit advanced MC timer | HDMI-CEC Ethernet | FSMC SDIO | 2x I²S 2x CAN | STM32 F1 |

STM32F0 series – Entry-level

| 48 MHz Cortex-M0 CPU | Up to 256-Kbyte Flash | Up to 32-Kbyte SRAM 20-byte backup data | USB 2.0 FS device Crystal less | Comp. HDMI-CEC | CAN DAC | STM32 F0 |

Ultra-Low-Power

STM32L4+ series – Ultra-Low-Power and more Performance with DSP, FPU, ART Accelerator™ and Chrom-ART Accelerator™

| 120 MHz Cortex-M4 CPU | Up to 2-Mbyte dual-bank Flash | Up to 640-Kbyte SRAM | USB 2.0 OTG Crystal less | 2x 16-bit advanced MC timer | DFSDM Op-amps comp. | 2x Octo-SPI FSMC SDIO 2x SAI | SHA-256 AES-256 TRNG CAN | MIPI-DSI LCD-TFT Chrom-GRC™ | STM32 L4+ |

STM32L4 series – Ultra-Low-Power and Performance with DSP, FPU, ART Accelerator™ and Chrom-ART Accelerator™

| 80 MHz Cortex-M4 CPU | Up to 1-Mbyte dual-bank Flash | Up to 320-Kbyte SRAM | USB 2.0 OTG FS | 2x 16-bit advanced MC timer | DFSDM Op-amps comp. | Quad-SPI FSMC SDIO 2x SAI | SHA-256 AES-256 TRNG 2x CAN | Up to LCD 8x40 | STM32 L4 |

STM32L1 series – Ultra-Low-Power

| 32 MHz Cortex-M3 CPU | Up to 512-Kbyte Flash | Up to 80-Kbyte SRAM | Up to 16-Kbyte EEPROM | USB 2.0 FS Device | Op-amps comp. | FSMC SDIO | AES-128 | Up to LCD 8x40 | STM32 L1 |

STM32L0 series – Ultra-Low-Power

| 32 MHz Cortex-M0+ CPU | Up to 192-Kbyte SRAM | Up to 20-Kbyte SRAM | Up to 6-Kbyte EEPROM | USB 2.0 FS device Crystal less | DAC comp. | LP ADC 12-/16-bit | TRNG AES-128 | LCD 8x48 / 4x52 | STM32 L0 |

Wireless

STM32WB series – Multiprotocol and ultra-low-power 2.4 GHz radio with DSP, FPU, ART Accelerator™ and IP Protection

| 64 MHz Cortex-M4 CPU | Up to 1-Mbyte Flash | Up to 256-Kbyte SRAM | USB 2.0 FS Crystal less BCD / LPM | 1x 16-bit advanced MC timer | Cortex-M0+ BLE 5.0 802.15.4 Concurrent | LP ADC 12x-16bit 2x comp. | Quad-SPI 1x SAI (2ch) | PKA AES-256 TRNG CKS* | LCD 8x40 4x44 | STM32 WB |

* Customer Key Storage

LONGEVITY 10 YEARS COMMITMENT

Functional Safety Design Packages for STM32 (including SIL and Class B standards)

ClassB Ready   SIL Ready

www.st.com/stm32safety

MCU Finder Free mobile and desktop application to find the right STM32 MCU

Google play   Available on the App Store

www.st.com/stmcufinder
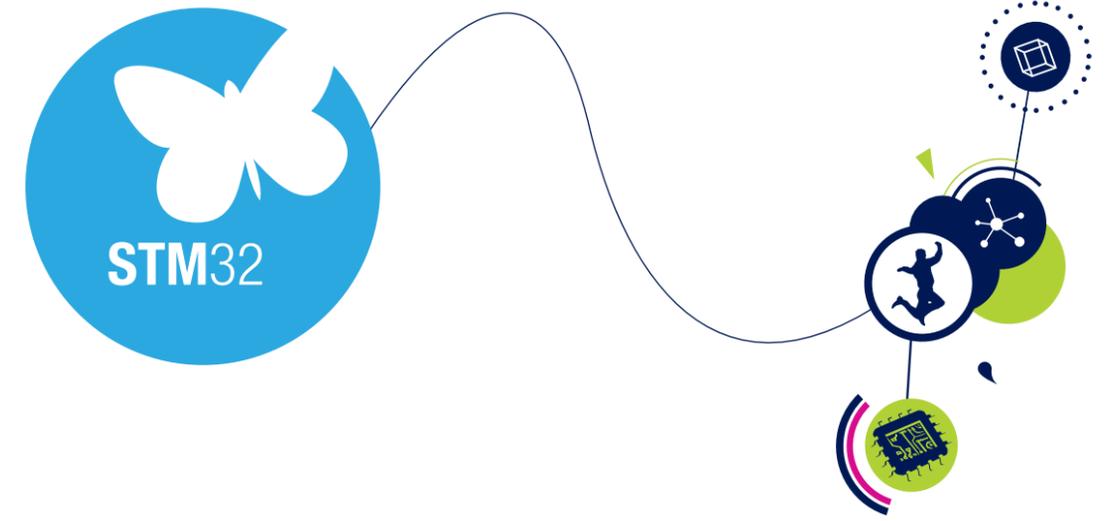
STM32 Ecosystem

HARDWARE TOOLS

www.st.com/stm32hardwaretools

STM32 Nucleo board

arm MBED Enabled

Flexible prototyping
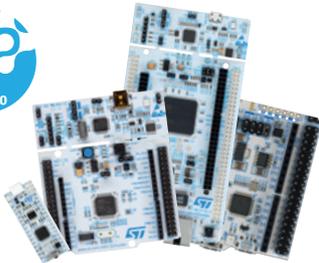
The highly affordable STM32 Nucleo boards allow anyone to try out new ideas and to quickly create prototypes with any STM32 MCU.

Sharing the same connectors, STM32 Nucleo boards can easily be extended with a large number of specialized application hardware add-ons (Nucleo-64 include Arduino Uno rev3 & ST morpho connectors, Nucleo-32 include Arduino Nano connectors).

Discovery kit

arm MBED Enabled

STM32 Discovery kits are a cheap and complete solution for the evaluation of the outstanding capabilities of STM32 MCUs. They carry the necessary infrastructure for demonstration of specific device characteristics, a HAL library and comprehensive software examples allow to fully benefit from the devices features and added values.

Extension connectors give access to most of the device's I/Os and make the connection of add-on hardware possible.

Creative demos

Evaluation board

The STM32 eval boards have been designed as a complete demonstration and development platform for the Arm® Cortex STM32 MCUs.

They carry external circuitry, such as transceivers, sensors, memory interfaces, displays and many more. The evaluation boards can be considered as a reference design for application development.

Full-feature evaluation

SOFTWARE TOOLS

www.st.com/stm32softwaretools
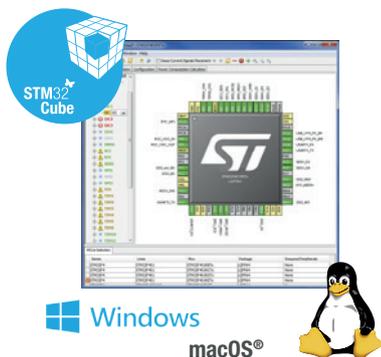
STM32CubeMX	Partner IDEs	STM32CubeMonitor-Power STMStudio

SYSPROGS IAR SYSTEMS SEGGER

TASKING RAISONANCE EMPROG X Rowley Associates

aC6 arm KEIL* ARDUINO iSYSTEM

atollic arm MBED CooCox

STM32 CubeProgrammer

Windows
macOS®

Free IDE
*Free only for Cortex-M0 and M0+
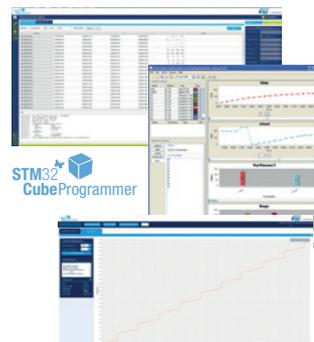
← Configure and generate code   Compile and debug   Monitor & Program →

EMBEDDED SOFTWARE

www.st.com/stm32embeddedsoftware

MATLAB SIMULINK

STM32Cube LL (low-layer APIs)	STM32Cube HAL and middleware STM32 Std Peripherals Libraries	CMSIS and mbed SDK	Virtual machines and models
High optimization low portability	Average optimization STM32 portability	Low optimization Arm portability	Low optimization large portability
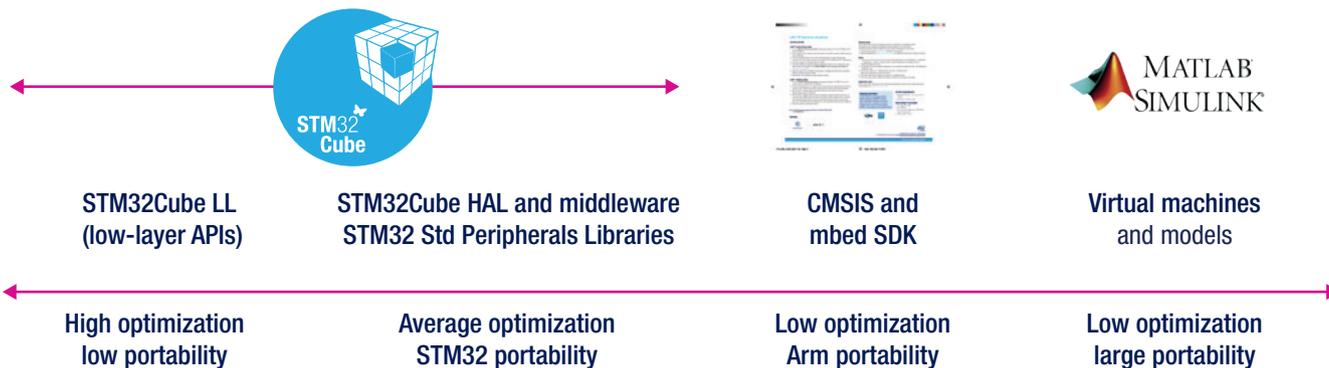
ST COMMUNITY

Ask, learn, share, discuss, become famous and engage with the community of STM32 enthusiasts on community.st.com/stm32

STM32 EDUCATION

Bring your STM32 project to life with the free educational and training resources on st.com/stm32education

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