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STM32Cube Software Suite to support STM32 development

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Inside the STM32Cube ecosystem

COMPREHENSIVE SOFTWARE OFFERING, REDUCING DEVELOPMENT EFFORT, TIME AND COST

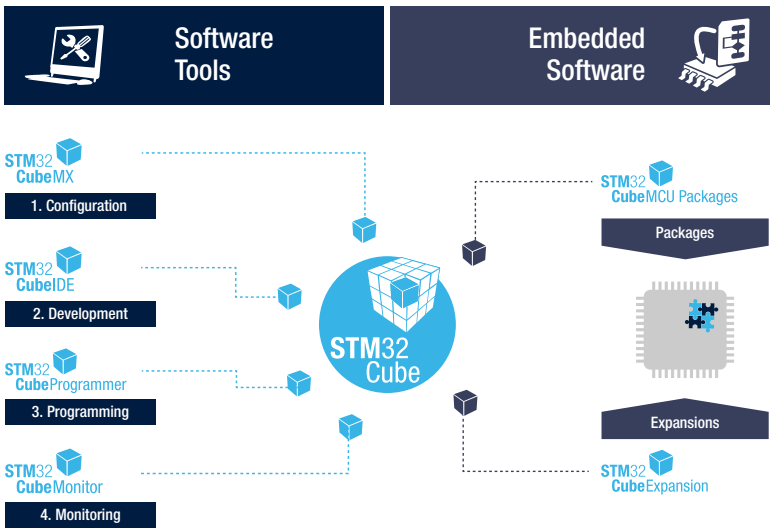
The STM32Cube ecosystem is a software solution for STM32 microcontrollers and microprocessors, created for both designers interested in a free comprehensive development environment for STM32 microcontrollers and microprocessors, and for users looking to integrate STM32 software in their existing IDE, such as Keil or IAR IDEs.

STM32Cube is a combination of software tools and embedded software libraries:

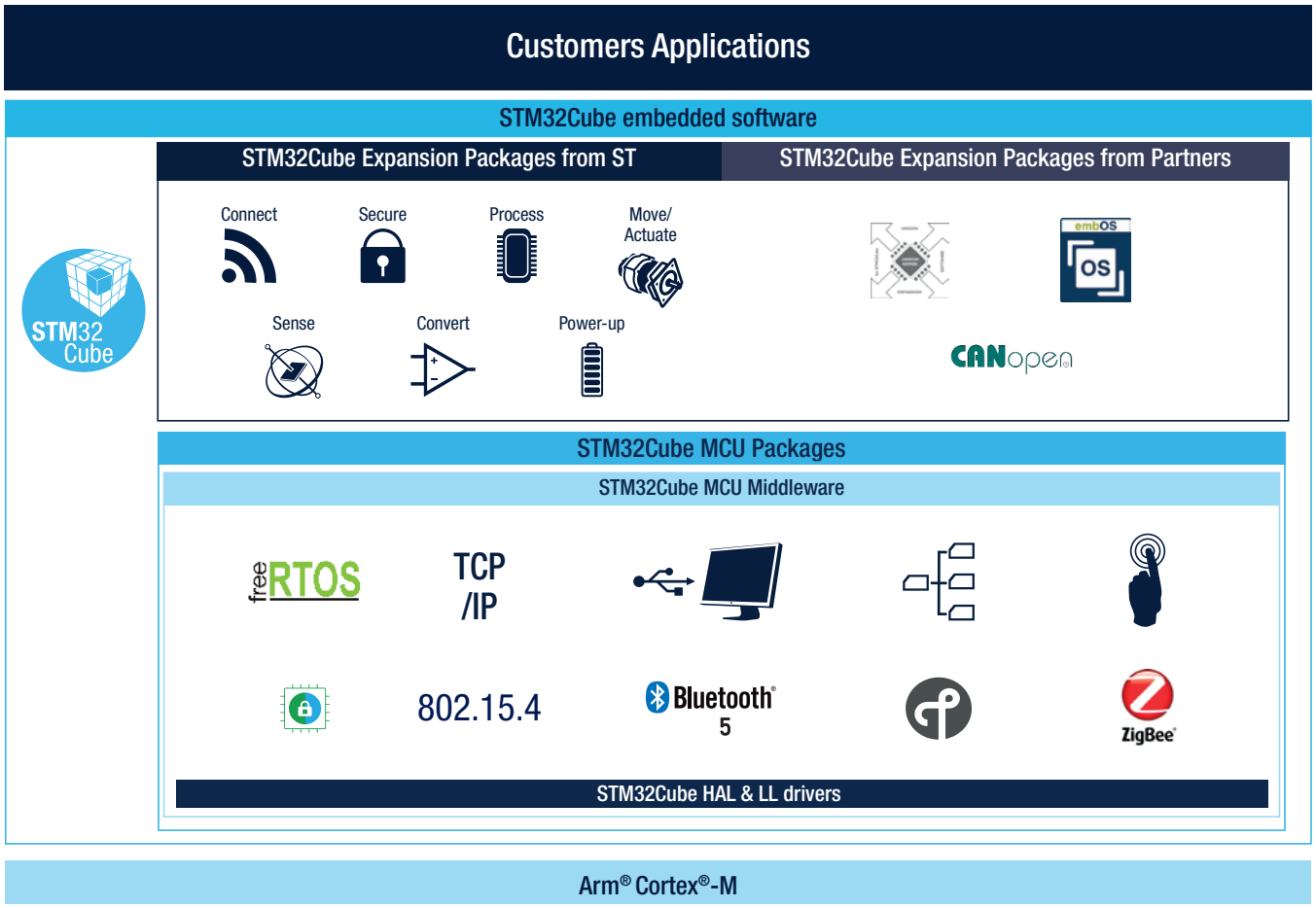
A full set of PC software tools addressing each step of a complete project development cycle : Configuration, Development, Programming and Monitoring.

Embedded software bricks enabling advanced functionnalities in STM32 microcontrollers and microprocessors (from MCU drivers to more advanced application-oriented features)

Visit www.st.com/stm32cube to learn more!



Embedded software



STM32CUBE EMBEDDED SOFTWARE OFFERS A COMPLETE DEVELOPMENT TOOL WITH A MULTI-LAYERED ARCHITECTURE

From low-level drivers to application-specific, high-level solutions, STM32Cube embedded software aims at delivering all the necessary software bricks required to design a wide variety of applications on STM32 MCUs and MPUs while maintaining software compatibility and API consistency.

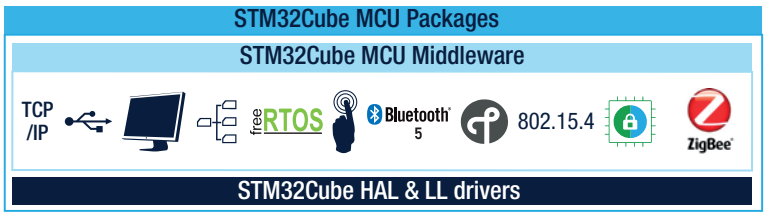
To achieve this goal and ensure project portability, flexibility and scalability, STM32Cube embedded software is divided in two main categories: STM32Cube MCU/MPU Packages and STM32Cube Expansion Packages.

Embedded software

STM32CUBE MCU AND MPU PACKAGES FOR EACH STM32 SERIES

These one-stop-shop packages, distributed under business-friendly licenses, are bundled by STM32 series (STM32CubeF4 for example) and offer the required embedded software bricks to operate the available set of STM32 peripherals. STM32Cube packages include peripheral drivers in the form of abstracted and portable HAL APIs, as well as footprint- and runtime-efficient LL APIs and middleware stacks which depend on the selected STM32 features(1) (such as TCP/IP, RTOS, RF and USB). Pre-configured examples for ST boards and several IDEs available.

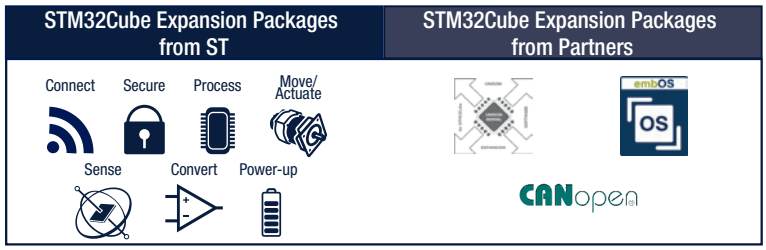
HAL and LL APIs are production–ready, developed in compliance with MISRA-C®:2012 guidelines and checked with CodeSonar static analysis tool. Reports are available on demand.



STM32CUBE EXPANSION PACKAGES, FOR APPLICATION-ORIENTED SOLUTIONS

Complementing and expanding the STM32Cube MCU Package with additional embedded software bricks, ST and Authorized Partners created STM32Cube Expansion Packages, respectively based on the X-Cube and I-Cube, to offer an extensive and scalable embedded software offer around the STM32.

Thanks to the project scalability enabled by the STM32Cube development environment, these expansion packages offer developers straightforward implementations of real application use-cases while integrating content from STM32 Cube MCU Packages. Indeed, STM32Cube Expansion Packages can include specific drivers for ST external components as well as dedicated code enabling specific high-level applicative solutions.



(1) In addition to STM32Cube Embedded Software, an open-source OpenSTLinux Distribution is available for STM32 MPUs.

Software Configuration tool

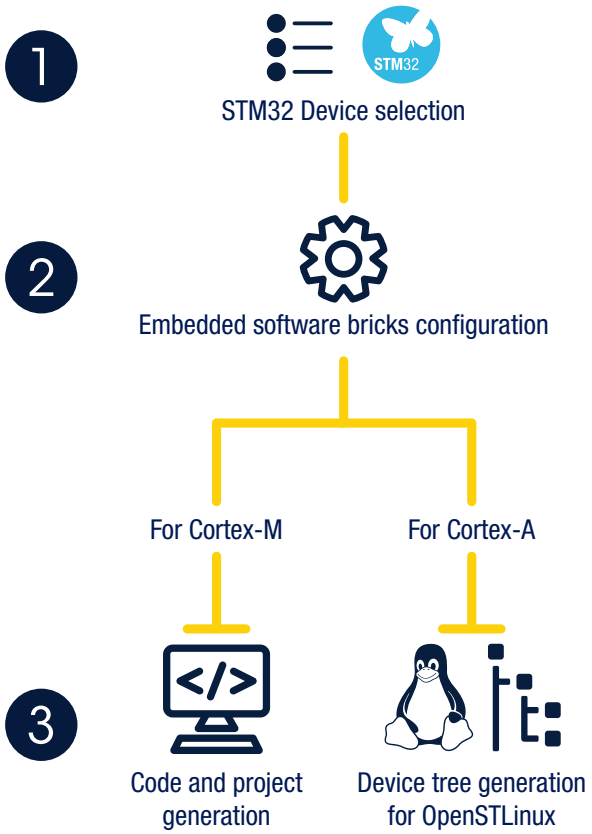
MULTI-OS SOFTWARE DEVELOPMENT TOOL FOR CONFIGURATION AND PROJECT GENERATION

STM32CubeMX software development tool helps users configure STM32 devices, thanks to many software wizards (including pinout conflict solver, peripheral core affinity, DDR tuning tool when applicable…) It can also be used to evaluate different power consumption scenarios thanks to its power consumption calculator.

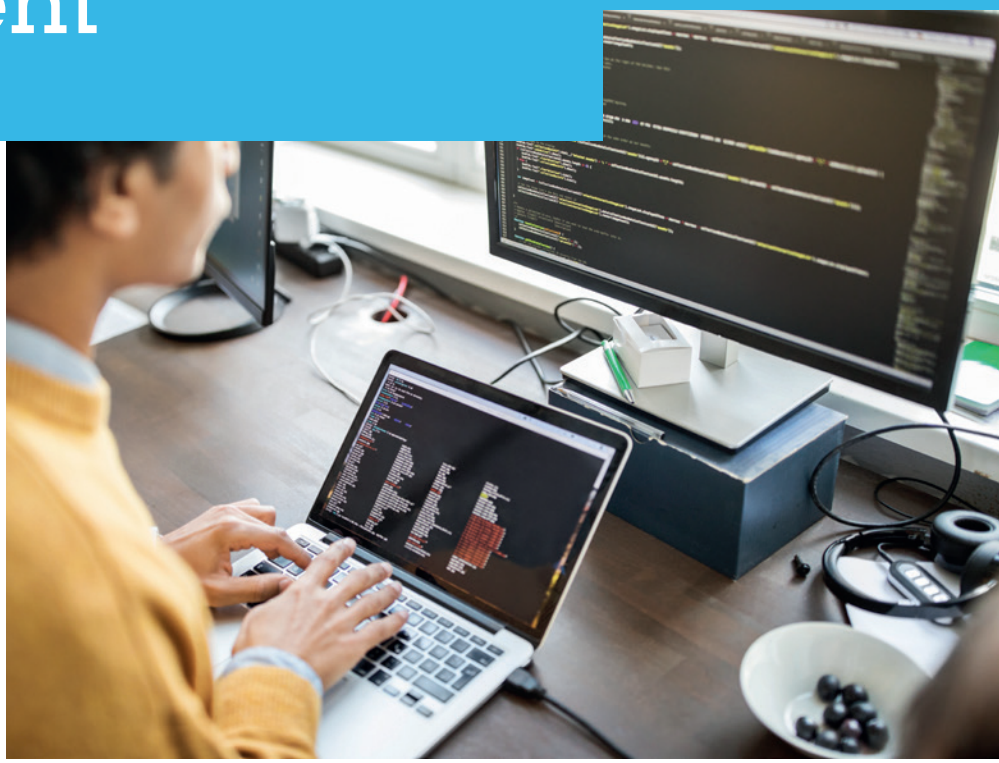
After configuring the embedded software bricks, the project generation settings are defined according to users' choices.

STM32CubeMX will generate a project with initialization C code for Cortex®-M enabled STM32 devices, which can be opened in the users' preferred IDE.

For Arm® Cortex®-A enabled STM32s devices, STM32CubeMX can generate a partial Device Tree for OpenSTLinux Distribution.



Integrated Development Environment

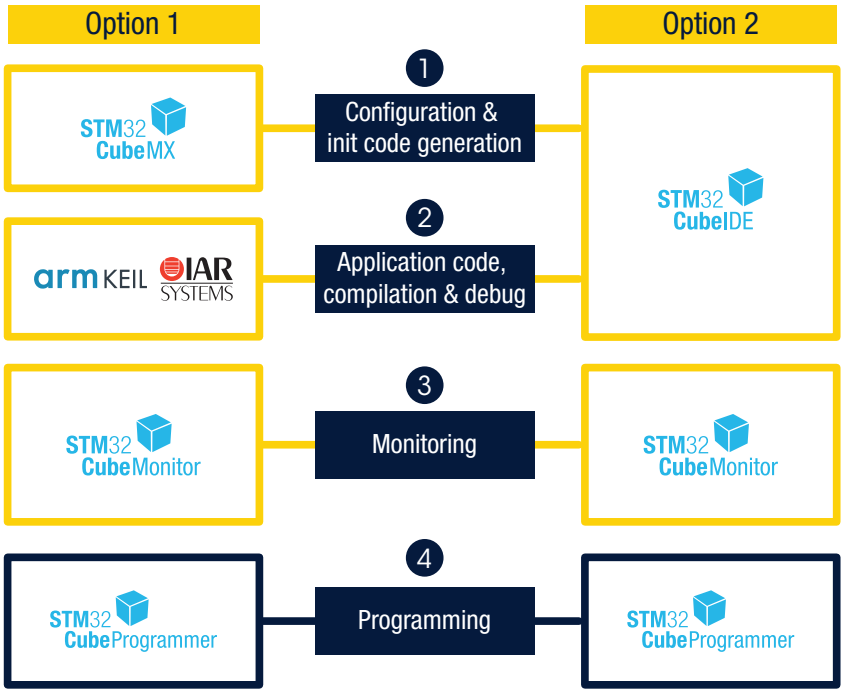


STM32 CubeIDE

ALL-IN-ONE MULTI-OS STM32 DEVELOPMENT TOOL

STM32CubeIDE is an advanced C/C++ development platform with STM32 resources and peripherals configuration, code generation, code compilation, and debug features for STM32 microcontrollers. It is based on the ECLIPSE™/CDT framework and GCC toolchain for device development, and GDB for debugging. STM32CubeIDE integrates hundreds of existing plugins that complement the features of the ECLIPSE™ IDE.

STM32CubeIDE integrates all STM32CubeMX functionalities to offer all-in-one tool experience and save installation and development time. Select either a non-programmed or a board-preconfigured STM32 MCU, create a project and generate an initialization code. STM32CubeIDE will integrate additional STM32Cube software tools in future releases.



Programming tool

STM32 CubeProgrammer

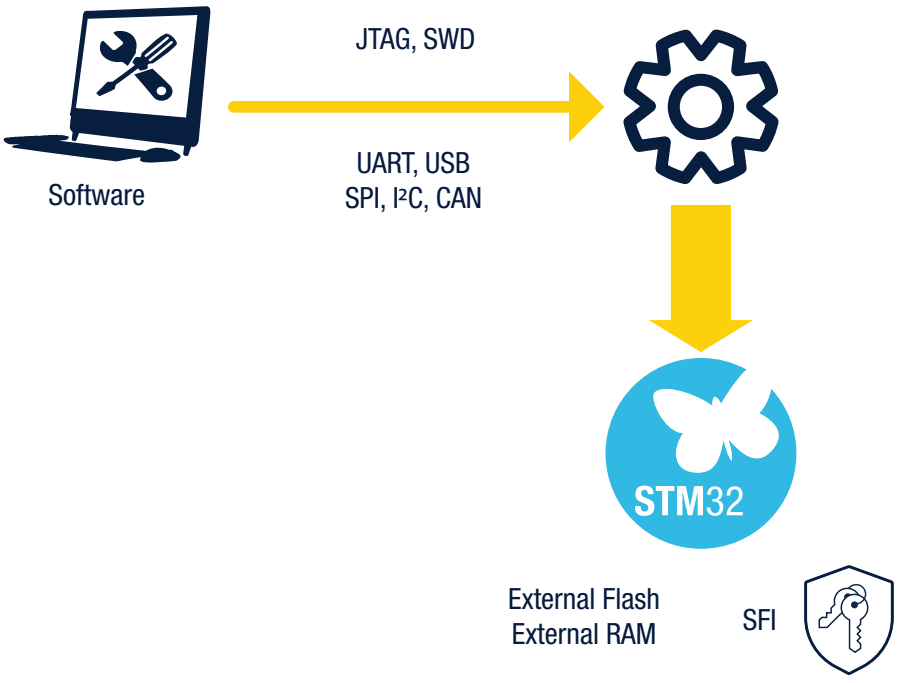
MULTI-OS SOFTWARE TOOL FOR PROGRAMMING STM32 DEVICES

STM32CubeProgrammer provides an easy-to-use and efficient environment for reading, writing and verifying device memory through both the debug interface (JTAG and SWD) and the STM32 built-in bootloader interface (UART, USB DFU, I²C, SPI, and CAN).

It offers a wide range of features to program STM32 internal memories (such as Flash, RAM, and OTP), option bytes as well as external memories.

STM32CubeProgrammer protects firmware IP with Secure Firmware Installation (SFI) on STM32 eligible products. It includes the STM32 Trusted Package Creator, which encrypts OEM firmware, and manages authentication and licensing, together with the STM32 Hardware Secure Module to restrict the number of devices which can be programmed.

STM32CubeProgrammer is delivered in a Graphical User Interface (GUI) and Command-Line Interface (CLI) versions to enable programming automation through scripting.



Monitoring tools

STM32 CubeMonitor

POWERFUL MONITORING MULTI-OS TOOLS TO HELP DEVELOPERS FINE-TUNE THE BEHAVIOR AND PERFORMANCE OF THEIR APPLICATIONS IN REAL TIME

STM32 CubeMonitor-Power

Graphical PC tool displaying power data coming from X-NUCLEO-LPM01A

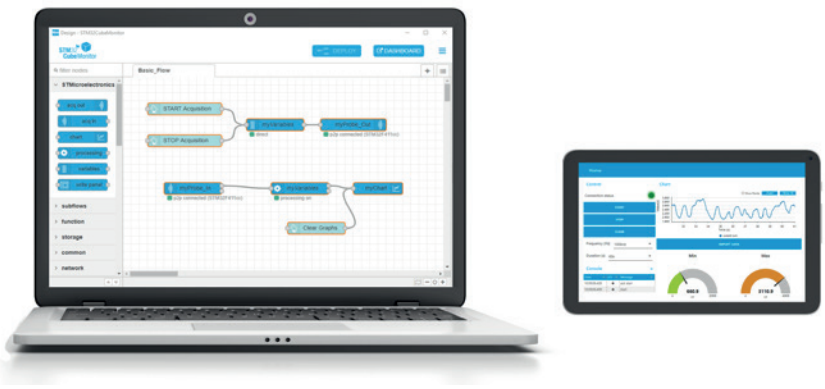
STM32 CubeMonitor-RF

Software tool to test the radio performance of STM32-based hardware devices

STM32 CubeMonitor-UCPD

Monitoring and configuration software tool for STM32 USB-C and Power Delivery 3.0 applications

- Graphically monitor application memory in real-time
- Easily create graphical dashboards with no need for programming
- Customize applications thanks to a large choice of graphical widgets (gauges, bar graphs, plots…)
- Monitor variables over a network with remote data acquisition thereby opening the door to field tests using multiple STM32 targets simultaneously.
- STM32CubeMonitor replace STM-STUDIO



Software Tools		
Link	Part Number	Summary
www.st.com/stm32cubemx	STM32CubeMX	Configure and generate initialization code
www.st.com/stm32cubeide	STM32CubeIDE	Integrated Development Environment
www.st.com/stm32cubeprog	STM32CubeProg	Programming STM32 devices and external memories
www.st.com/stm32cubemonitor	STM32CubeMonitor	Runtime variable monitoring and visualization tool
www.st.com/stm32cubemonucpd	STM32CubeMonUCPD	Check USB TYPE-CTM Power Delivery
www.st.com/stm32cubemonrf	STM32CubeMonRF	Test radio performance
www.st.com/stm32cubemonpwr	STM32CubeMonPwr	Analyze power consumption
Embedded Software / Firmware		
www.st.com/stm32cubefw	STM32CubeXX	MCU and MPU packages for each individual STM32 MCU or MPU series
Expansions packages that complement the STM32Cube MCU and MPU packages with additional libraries, classified by domain (Over 150 part numbers, the list below is non-exhaustive, more information is available at www.st.com/x-cube)		
Link	Part Number	Summary
Connect	X-CUBE-AWS	Connection to Amazon AWS cloud
	X-CUBE-AZURE	Connection to Microsoft Azure cloud
	I-CUBE-LRWAN	LoRaWAN stack for LoRa
	X-CUBE-SFOX	SigFox stack
	X-CUBE-USB-PD	USB Power Delivery stack
	X-CUBE-NFC6	NFC libraries (tags reader, card emulation mode…)
	X-CUBE-SUBG1	SubGHz libraries (WM-Bus, 6LoWPAN)
Display	X-CUBE-TOUCHGFX	Free-of-charge GUI optimized for STM32 microcontrollers
Move & Actuate	X-CUBE-MCSDK	Motor Control libraries
	X-CUBE-SPN7	Motor Control libraries, based on single driver
Play	X-CUBE-AUDIO	Audio Output processing libraries
	X-CUBE-USB-AUDIO	USB Audio streaming libraries
Process	X-CUBE-AI	Conversion of Neural Networks, and Generation of optimized library
Record	X-CUBE-VS4A	Connection to Alexa Voice Service
Safety	X-CUBE-STL	Functional Safety package for IEC 61508
	X-CUBE-CLASSB	Functional Safety package for IEC 60730
Secure	X-CUBE-CRYPOTLIB	FIPS140-certified library of Crypto algorithms
	X-CUBE-SBSFU	Secure Boot, Secure Firmware Update
Sense	X-CUBE-MEMS1	Sensor and motion algorithms
	X-CUBE-53L1A1	Drivers and examples for Long range detector

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Order code: BRSTM32CUBE0720