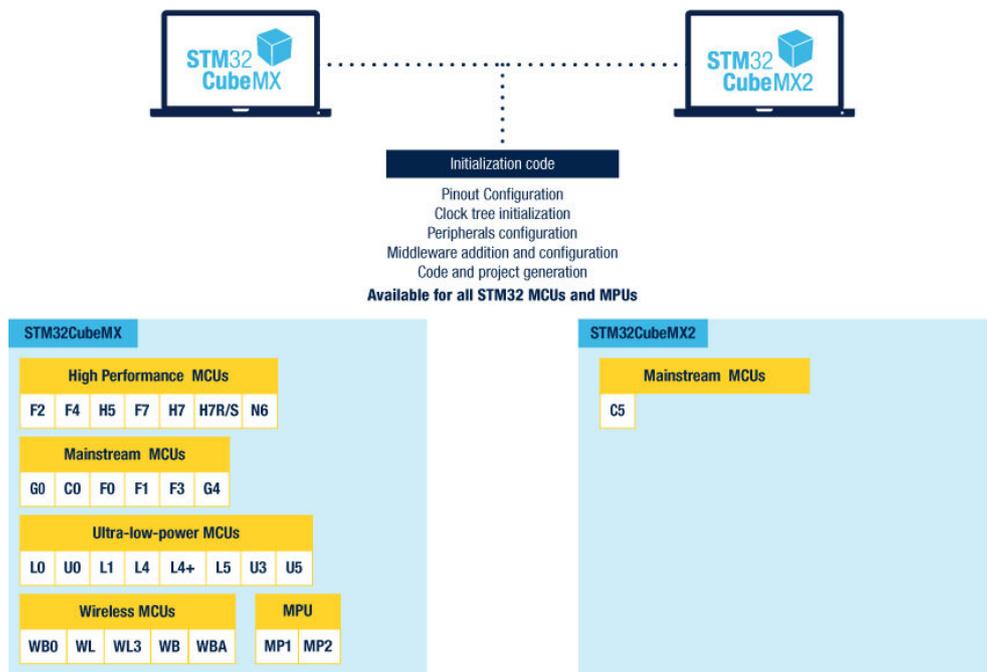


STM32 configuration and initialization C code generation



DT146966V2

Product status

STM32CubeMX



Features

- Rich easy-to-use graphical user interface to configure:
 - Pinout with automatic conflict resolution
 - Peripherals and middleware functional modes with dynamic validation of parameter constraints
 - Clock tree with dynamic validation of the configuration
- Decreasing development time, by generating error free configurations for all supported STM32 peripherals.
- Generation of initialization C code project, compliant with IAR Embedded Workbench®, MDK-ARM, and STM32CubeIDE
- Integration of STM32Cube Expansion Packages into the project
- Multi-OS support: Windows®, Linux®, and macOS®
- See more at ST developer zone (see the link to the software developer zone: https://www.st.com/content/st_com/en/stm32cubemx.html)
- Clock tree, offering real-time validation of the entire clock configuration and a configuration solver.

- Reduced development time through the code generation of error-free configurations for all supported STM32 peripherals.
- Generation of initialization C code projects, compliant with IAR Embedded Workbench®, MDK-ARM, or and STM32CubeIDE.

Description

STM32CubeMX, which includes the STM32CubeMX and STM32CubeMX2, is a graphical tool that simplifies the configuration of STM32 products, and generates the corresponding initialization code through a guided step-by-step process.

The first step consists in selecting either an STMicroelectronics STM32 microcontroller, microprocessor, or development platform that matches the required set of peripherals, or an example running on a specific development platform.

In the second step, the user can interactively configure the GPIOs, set up the system clock tree, and select and configure the required peripherals and middleware for the application. The default software and middleware stacks can be extended using enhanced STM32Cube Expansion Packages. STMicroelectronics and partner packages can be downloaded directly from a dedicated package manager available within the Cube Ecosystem, while the other packages can be installed from a local drive.

1 What is STM32Cube?

STM32Cube is an STMicroelectronics original initiative to improve designer productivity significantly by reducing development effort, time, and cost. STM32Cube covers the whole STM32 portfolio.

STM32Cube includes:

- A set of user-friendly software development tools to cover project development from conception to realization, among which are:
 - [STM32CubeMX](#), a graphical software configuration tool that allows the automatic generation of C initialization code using graphical wizards
 - [STM32CubeIDE](#), an Eclipse®-based IDE, providing code edition, compilation, programming, and debugging capabilities
 - [STM32CubeCLT](#), an all-in-one command-line development toolset with code compilation, board programming, and debug features
 - [STM32CubeIDE for Visual Studio Code \(STM32VSCode\)](#), a complete IDE based on VS Code® platform
 - [STM32CubeProgrammer \(STM32CubeProg\)](#), a programming tool available in graphical and command-line versions
 - [STM32CubeMonitor \(STM32CubeMonitor, STM32CubeMonPwr, STM32CubeMonRF, STM32CubeMonUCPD\)](#), powerful monitoring tools to fine-tune the behavior and performance of STM32 applications in real time
 - [STM32CubeWiSE \(STM32CubeWiSEbe, STM32CubeWiSEce, STM32CubeWiSEcg, STM32CubeWiSEre, STM32CubeWiSE8e\)](#), graphical tools designed to evaluate and test the capabilities of RF radios and protocols (Bluetooth® LE, sub-GHz, IEEE 802.15.4)
- [STM32Cube MCU and MPU Packages](#), comprehensive embedded-software platforms specific to each microcontroller and microprocessor series (such as STM32CubeH5 for the STM32H5 series), which include:
 - STM32Cube hardware abstraction layer (HAL), ensuring maximized portability across the STM32 portfolio
 - STM32Cube low-layer APIs, ensuring the best performance and footprints with a high degree of user control over hardware
 - A consistent set of middleware components such as ThreadX, FileX, LevelX, NetX Duo, USBX, USB PD, mbed-crypto, MCUboot, and OpenBL
 - All embedded software utilities with full sets of peripheral and applicative examples
- [STM32Cube Expansion Packages](#), which contain embedded software components that complement the functionalities of the STM32Cube MCU and MPU Packages with:
 - Middleware extensions and applicative layers
 - Examples running on some specific STMicroelectronics development boards

2 Ordering information

STM32CubeMX is available for free download from STMicroelectronics website:

- From the product page, at www.st.com/en/product/stm32cubemx
- From the Developer Zone, at www.st.com/stm32cubemx

3 License

STM32CubeMX is delivered under the [SLA0048](#) software license agreement and its Additional License Terms. STM32CubeMX runs on computers with Windows®, Linux®, or macOS® operating systems for the configuration of STM32 microcontrollers and microprocessors based on Arm® cores.



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Revision history

Table 1. Document revision history

Date	Revision	Changes
14-Feb-2014	1	Initial release.
19-Jun-2014	2	Updated <i>Section Description</i> and <i>Figure 1. STM32CubeMX within STM32Cube</i> .
16-Jan-2015	3	STM32CubeMX extended to all STM32 series.
08-Feb-2016	4	Added Windows® and Linux® operating systems in <i>Section Features</i> . Removed mention of MicroXplorer tool in <i>Section Description</i> . Updated <i>Figure 1. STM32CubeMX within STM32Cube</i> .
29-Apr-2016	5	Added OS X operating system.
28-Jun-2017	6	Added low-layer APIs. Replaced OS X by macOS operating system. Updated <i>Figure 1. STM32CubeMX within STM32Cube</i> .
04-Jul-2017	7	The footnote on cover page related to macOS has been embedded in the list of features.
14-Nov-2017	8	Updated <i>Section Description</i> and <i>Figure 1. STM32CubeMX within STM32Cube</i> .
03-Jul-2018	9	Updated <i>Section Description</i> . Added <i>Section 3 License</i> .
20-Nov-2018	10	Added STM32CubeMX logo on cover page. Updated <i>Section Features</i> and <i>Section Description</i> . Updated STM32CubeMX GUI on cover page and <i>Figure 1. STM32CubeMX within STM32Cube</i> . Updated web page url in <i>Section 2 Ordering Information</i> .
13-Dec-2018	11	Updated <i>Section Description</i> and <i>Figure 1. STM32CubeMX within STM32Cube</i> . Added <i>Section 1 What is STM32Cube?</i>
22-Feb-2019	12	Updated the whole document to support STM32MP1 microprocessor series. Updated <i>Figure 1. STM32CubeMX within STM32Cube</i> to add STM32WB microcontroller.
03-Jun-2019	13	Added STM32G4 microcontroller series.
08-Oct-2019	14	Added STM32L5 microcontroller series.
09-Jul-2020	15	Updated <i>Section Features</i> and <i>Section Description</i> .
12-Nov-2020	16	Replaced Keil® by MDK-ARM, and IAR Systems® by IAR Embedded Workbench®. Added STM32WL series in <i>Figure 1. STM32CubeMX within STM32Cube</i> . Replaced STM32CubeMonitor-Power by STM32CubeMonitor in <i>Section 1 What is STM32Cube?</i>
08-Jul-2021	17	Added STM32U5 series in <i>Figure 1. STM32CubeMX within STM32Cube</i> . Updated <i>Section 3 License</i> .
11-Feb-2022	18	Added STM32C0 series in <i>Figure 1. STM32CubeMX within STM32Cube</i> .
22-Feb-2023	19	Updated <i>Figure 1. STM32CubeMX within STM32Cube</i> to add STM32H5 and STM32WBA series.
02-Dec-2025	20	Updated <i>Figure 1</i> to add the STM32MP2, STM32N6, STM32U0, STM32U3, and STM32WB0 series, and the STM32H7Rx/7Sx, STM32MP13x, STM32MP15x, and STM32WL3x product lines. Updated the cover image, Ordering information , License , and What is STM32Cube? Applied minor text edits across the document.
12-Mar-2026	21	Updated: <ul style="list-style-type: none"> • Cover image • Features • Description • Section 3: License

Date	Revision	Changes
		Removed: Figure 1

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