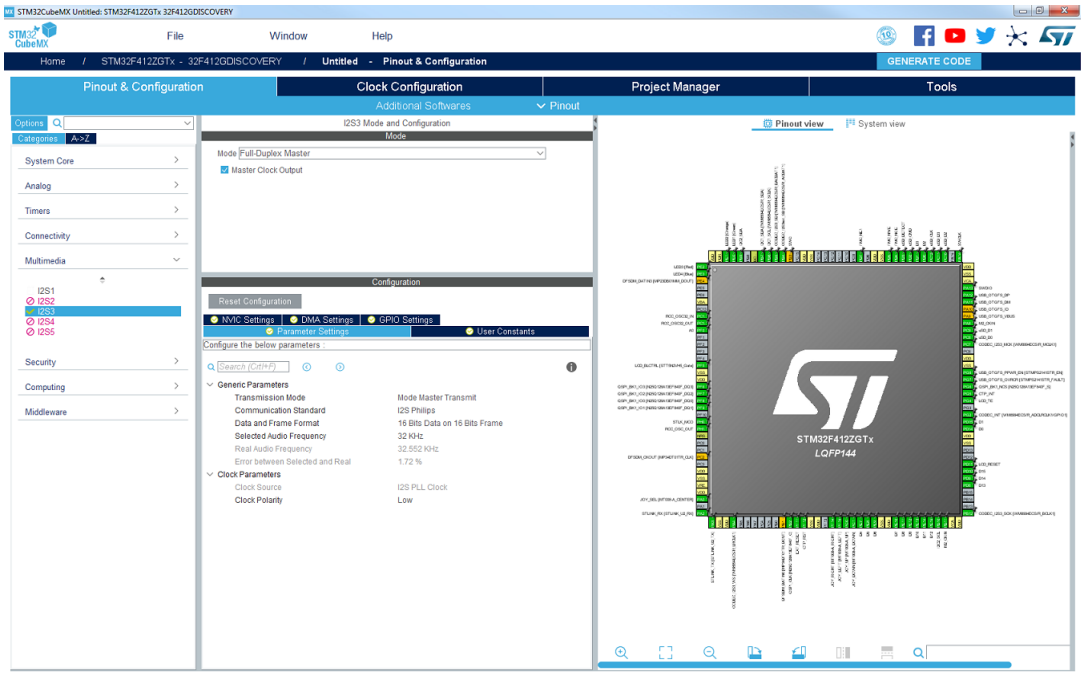
STM32 configuration and initialization C code generation



Product status link
STM32CubeMX

Features

- Intuitive STM32 microcontroller and microprocessor selection
- Rich easy-to-use graphical user interface allowing the configuration of:
  - Pinout with automatic conflict resolution
  - Peripherals and middleware functional modes with dynamic validation of parameter constraints for Arm® Cortex®-M core
  - Clock tree with dynamic validation of the configuration
  - Power sequence with estimated consumption results
- Generation of initialization C code project, compliant with IAR™, Keil® and GCC compilers, for Arm® Cortex®-M core
- Generation of a partial Linux® Device Tree for Arm® Cortex®-A core (STM32 microprocessors)
- Availability as standalone software running on Windows®, Linux® and macOS® (macOS® is a trademark of Apple Inc. registered in the U.S. and other countries.) operating systems, or through Eclipse plug-in

Description

STM32CubeMX is a graphical tool that allows a very easy configuration of STM32 microcontrollers and microprocessors, as well as the generation of the corresponding initialization C code for the Arm® Cortex®-M core or a partial Linux® Device Tree for Arm® Cortex®-A core), through a step-by-step process.

The first step consists in selecting the STMicroelectronics STM32 microcontroller or microprocessor that matches the required set of peripherals.

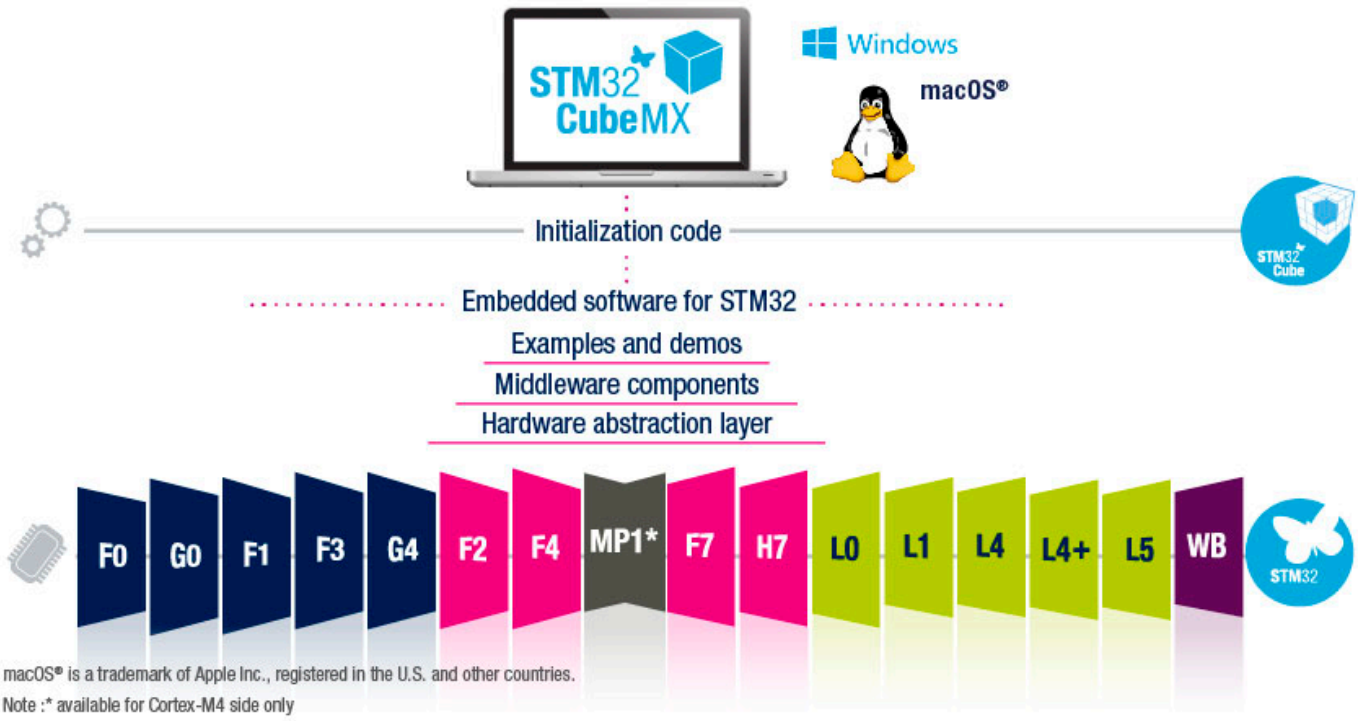
For microprocessors, the second step allows to configure the GPIOs and the clock setup for the whole system, and to interactively assign peripherals either to the Arm® Cortex®-M or to the Cortex®A world. Specific utilities, such as DDR configuration and tuning, make it easy to get started with STM32 microprocessors. For Cortex®-M core, the configuration includes additional steps that are exactly similar to those described for microcontrollers.

For microcontrollers and microprocessor Arm® Cortex®-M, the second step consists in configuring each required embedded software thanks to a pinout-conflict solver, a clock-tree setting helper, a power-consumption calculator, and an utility that configures the peripherals (such as GPIO or USART) and the middleware stacks (such as USB or TCP/IP).

Eventually the user launches the generation that matches the selected configuration choices. This step provides the initialization C code for the Arm® Cortex®-M, ready to be used within several development environments, or a partial Linux® device tree for the Arm® Cortex®-A.

STM32CubeMX is delivered within STM32Cube.

Figure 1. STM32CubeMX within STM32Cube



1 What is STM32Cube?

STM32CubeMX is part of STM32Cube.

STM32Cube is an STMicroelectronics original initiative to significantly improve developer's productivity 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 all the phases of a project development from conception to realization, among which:
  - STM32CubeMX, a graphical software configuration tool that allows the automatic generation of C initialization code using graphical wizards.
  - STM32CubeProgrammer (STM32CubeProg), a programming tool available in graphical and command-line versions.
  - STM32CubeMonitor-Power (STM32CubeMonPwr), a monitoring tool to measure and help in the optimization of the power consumption of the MCU.
- STM32Cube MCU Packages, comprehensive embedded-software platforms specific to each microcontroller series (such as STM32CubeF4 for the STM32F4 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 the hardware
  - A consistent set of middleware components such as RTOS, USB, TCP/IP, and graphics.
  - All embedded software utilities with full sets of peripheral and applicative examples.

2 Ordering Information

STM32CubeMX is available for free download from http://www.st.com/en/product/stm32cubemx.

3 License

STM32CubeMX is delivered under the Mix Ultimate Liberty+OSS+3rd-party V1 (SLA0048) software license agreement.

The STM32CubeMX embedded software package runs on STM32 microcontrollers and microprocessors, based on Arm® cores.

Note: Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.

Revision history

Table 1. Document revision history

Date	Revision	Changes
14-Feb-2014	1	Initial release.
19-Jun-2014	2	UpdatedSection Description and Figure 1. STM32CubeMX within STM32Cube.
16-Jan-2015	3	STM32CubeMX extended to all STM32 series.
08-Feb-2016	4	Added Windows® and Linux® operating systems in Section Features. Removed mention of MicroXplorer tool in Section Description. Updated Figure 1. STM32CubeMX within STM32Cube.
29-Apr-2016	5	Added OS X operating system.
28-Jun-2017	6	Add low-layer APIs. Replace OS X by macOS operating system. Updated Figure 1. STM32CubeMX within STM32Cube
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 Section Description and Figure 1. STM32CubeMX within STM32Cube
03-Jul-2018	9	Updated Section Description Added Section 3 License
20-Nov-2018	10	Added STM32CubeMX logo on cover page. Updated Section Features and Section Description. Updated STM32CubeMX GUI on cover page and Figure 1. STM32CubeMX within STM32Cube. Updated web page url in Section 2 Ordering Information.
13-Dec-2018	11	Updated Section Description and Figure 1. STM32CubeMX within STM32Cube. Added Section 1 What is STM32Cube?.
22-Feb-2019	12	Updated the whole document to support STM32MP1 microprocessor Series. Updated Figure 1. STM32CubeMX within STM32Cube to add STM32WB microcontroller.
03-Jun-2019	13	Added STM32G4 microcontroller Series.
08-Oct-2019	14	Added STM32L5 microcontroller Series.