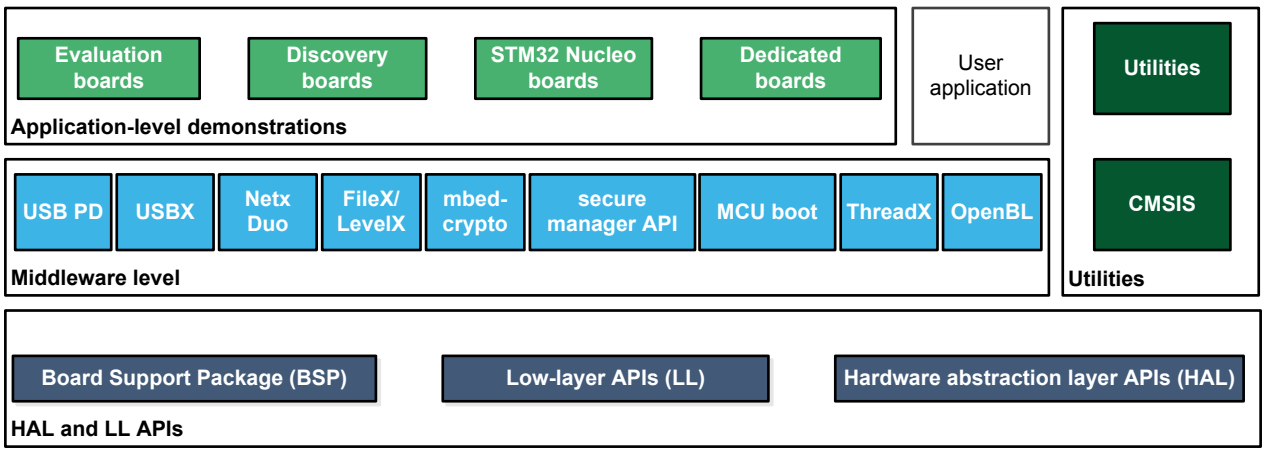
STM32CubeH5

Data brief

STM32Cube embedded software for STM32H5 series including LL/HAL drivers, USB, Crypto, secure manager API and RTOS



Product link
STM32CubeH5

Features

- Consistent and complete embedded software that provides hardware abstraction to easily develop end-user firmware
- Maximized portability between all STM32 series supported by STM32Cube
- Up to 290 examples and applications for easy understanding, all compatible with STM32CubeMX to facilitate the configuration through a graphical tool
- HAL and LL APIs, developed in compliance with MISRA C®:2012 guidelines, elimination of possible runtime errors with Synopsys® Coverity® static analysis tool, and code coverage by running tests on STM32 hardware with the LDRA dynamic analysis tool
- CMSIS CORE, DSP and RTOS software components
- STM32H5 comprehensive middleware offer built around Microsoft® Azure® RTOS middleware and other in-house (secure manager API, OpenBL)
- Free-of-charge, user-friendly license terms
- Update mechanism with new-release notification capability
- Published on GitHub in addition to *www.st.com* to propagate bug fixes and improvements faster, open for pull requests and issues to facilitate user contributions and direct feedback

1 Description

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 STM32CubeMX, a graphical software configuration tool that allows the generation of C initialization code using graphical wizards.

It also comprises the STM32CubeH5 MCU Package composed of the STM32Cube hardware abstraction layer (HAL) and the low-layer (LL) APIs, plus a consistent set of middleware components (Azure® RTOS USBX, FileX/LevelX,ThreadX, NetX Duo, USB Power Delivery, mcu-boot, mbed-crypto, secure manager API, and OpenBootloader). All embedded software utilities are delivered with a full set of examples running on STMicroelectronics boards.

The STM32Cube HAL is an STM32 embedded software layer that ensures maximized portability across the STM32 portfolio, while the LL APIs make up a fast, light-weight, expert-oriented layer which is closer to the hardware than the HAL. HAL and LL APIs can be used simultaneously with a few restrictions.

Both the HAL and LL drivers have been developed in compliance with V-Model requirements for design, implementation, and tests. Furthermore, the STMicroelectronics-specific validation process adds a deeper qualification level, such as compliance with MISRA C®:2012 guidelines, elimination of possible runtime errors with the Synopsys® Coverity® static analysis tool, and code coverage by running tests on STM32 hardware with the LDRA dynamic analysis tool (on new drivers or with recent significant updates). Reports are available on demand.

STM32CubeH5 gathers in one single package all the generic embedded software components required to develop an application on STM32H5 microcontrollers. Following STM32Cube initiative, this set of components is highly portable to other STM32 series. In addition, the low-layer APIs provide an alternative, high-performance, low-footprint solution to the STM32CubeH5 HAL at the cost of portability and simplicity.

HAL and LL APIs are available in open-source BSD license for user convenience.

STM32H5 devices support Arm® PSA security model. The STM32CubeH5 reference firmware supports all the different configurations of the SMT32H5. It implements Secure Boot and Secure Firmware Update functions managed into the two iRot (when ST-iRoT not active) and uRot memory areas. TF-M source code is now available under Arm® github and no more included into the STM32Cube firmware delivery. It is replaced by an ST proprietary SMAK solution, Arm® PSA API Compliant, and accessible by the non-secure domain. It can be additionally installed on STM32H5 to enable Cryptographic, Secure key management, Platform Attestation, Secure Firmware Update functions. Refer to the SMAK application, which is integrated in the Firmware package.

2 General information

The STM32CubeH5 MCU Package runs on STM32 microcontrollers based on the Arm® Cortex® processor.

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arm

2.1 Ordering information

STM32CubeH5 is available for free download from *www.st.com*.

2.2 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 (STM32CubeWiSEcg, STM32CubeWiSEre), graphical tools designed to evaluate and test the capabilities of sub-GHz radios and protocols
- 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

3 License

STM32CubeH5 is delivered under the SLA0048 software license agreement and its Additional License Terms.

Revision history

Table 1. **Document revision history**

Date	Revision	Changes
06-Feb-2023	1	Initial release.
20-Jan-2026	2	Updated Section Features and Section 1: Description. Added General information and Section 2.2: What is STM32Cube?. Minor text changes.

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