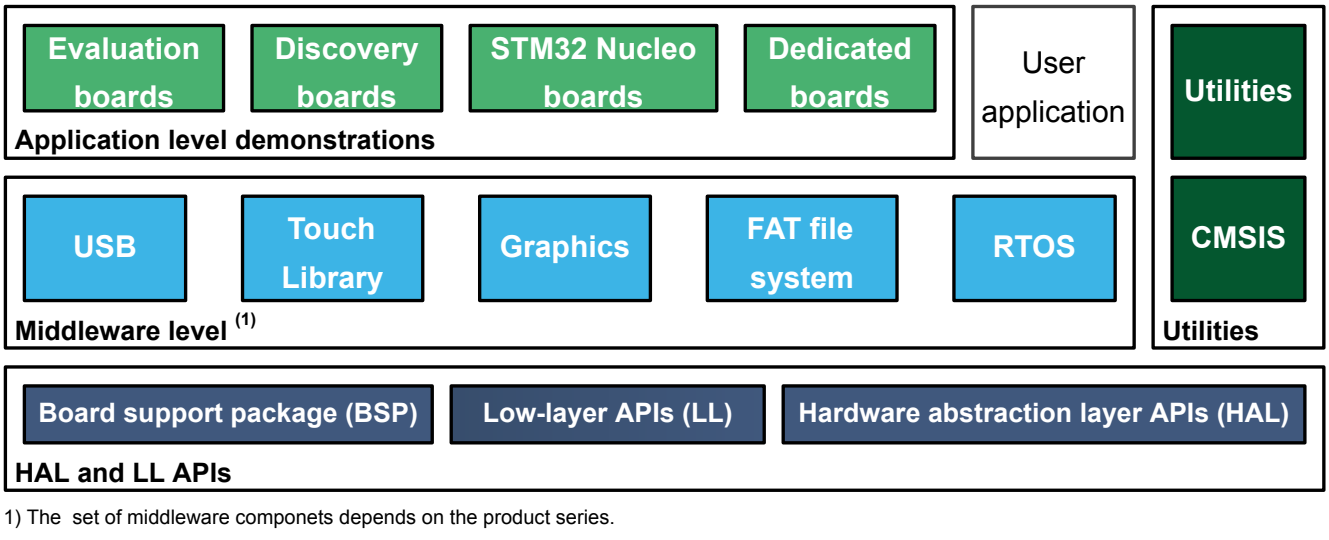
STM32CubeL1

Data brief

STM32Cube MCU package for STM32L1 series with HAL, LL drivers and dedicated middleware



1) The set of middleware componets depends on the product series.

Product link
STM32CubeL1

Features

- Consistent and complete embedded software offer that frees the user from dependency issues
- Maximized portability between all STM32 series supported by STM32Cube
- More than 90 examples for easy understanding
- HAL and LL APIs, developed in compliance with MISRA C®:2012 guidelines, and elimination of possible runtime errors with Synopsys® Coverity® static analysis tool
- STM32CubeL1-dedicated middleware including USB host and device, FAT file system, RTOS, graphics and touch sensing library
- Free-of-charge, user-friendly license terms
- Update mechanism with new-release notification capability

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 STM32CubeL1 MCU Package composed of the STM32Cube hardware abstraction layer (HAL) and the LL APIs, plus a consistent set of middleware components (RTOS, USB, FAT file system, graphics and STM32 touch sensing). 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, and elimination of possible runtime errors with the Synopsys®Coverity® static analysis tool. Reports are available on demand.

STM32CubeL1 gathers in one single package all the generic embedded software components required to develop an application on STM32L1 microcontrollers. Following STM32Cube initiative, this set of components is highly portable, not only within STM32L1 series but also to other STM32 series. In addition, the low-layer APIs provide an alternative, high-performance, low-footprint solution to the STM32CubeL1 HAL at the cost of portability and simplicity.

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

2 General information

The STM32CubeL1 MCU Package runs on STM32 microcontrollers based on the Arm® Cortex® processor.

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2.1 Ordering information

STM32CubeL1 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 (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 STM32CubeL1 for the STM32L1 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, USBX, touch library, 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

STM32CubeL1 is delivered under the SLA0048 software license agreement and its Additional License Terms.

Revision history

Table 1. **Document revision history**

Date	Revision	Changes
16-Sep-2014	1	Initial release.
09-Jan-2015	2	Updated Section: STM32CubeL1 package.
23-Jun-2017	3	Updated cover page: schematics, Features and Description to introduce low-layer APIs.
1-Dec-2017	4	Updated title and schematic. Updated Features, Description and STM32CubeL1 MCU Package to introduce the 'STM32CubeL1 MCU Package' denomination.
23-Mar-2026	5	Updated Section Features and Section 1: Description. Added Section 2.2: What is STM32Cube?. Removed *STM32CubeL1 package*. Minor text changes.