STM32Cube embedded software for STM32G4 Series including HAL, low-layer drivers and dedicated middleware

Evaluation boards	**Discovery boards**	**STM32 Nucleo boards**	**Dedicated boards**	User application	**Utilities**
Application level demonstrations					
USB Device	**USB Power Delivery**	**FAT file system**		**RTOS**	**CMSIS**
Middleware level					**Utilities**
Board Support Package (BSP)		**Low-layer APIs (LL)**		**Hardware abstraction layer APIs (HAL)**	
HAL and LL APIs					
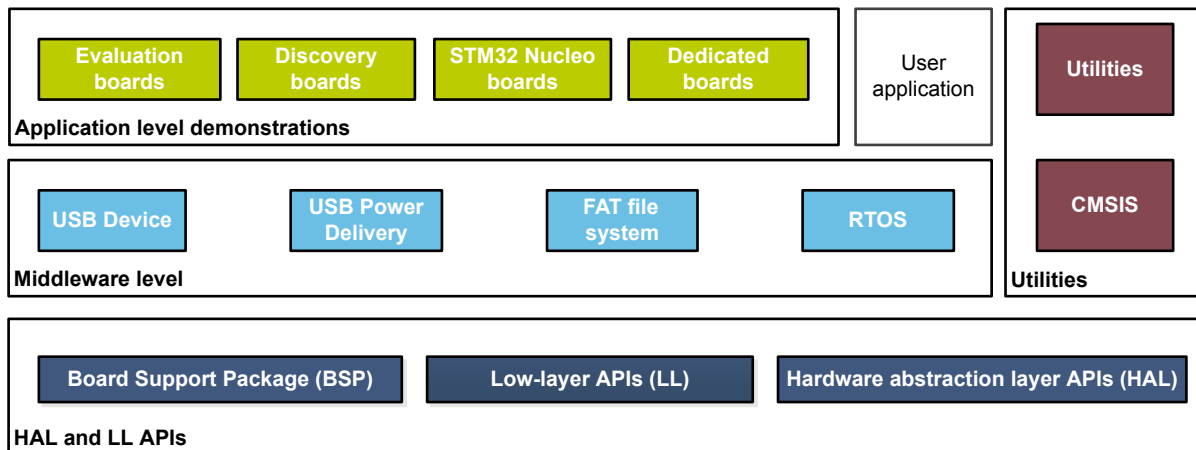
Product status link
STM32CubeG4

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
- More than 300 examples and applications for easy understanding, all compatible with STM32CubeMX to facilitate the configuration through a graphical tool.
- High quality HAL and low-layer API drivers using CodeSonar® static analysis tool
- STM32G4 dedicated middleware including USB Device, USB Power Delivery, FAT file system and RTOS
- Free user-friendly license terms
- Update mechanism with new-release notification capability

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For further information contact your local STMicroelectronics sales office.

www.st.com

1 Description

STM32Cube is an STMicroelectronics original initiative to make developers' lives easier 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 STM32CubeG4 MCU Package composed of the STM32Cube hardware abstraction layer (HAL) and the low-layer (LL) APIs, plus a consistent set of middleware components (RTOS, USB and FAT file system). All embedded software utilities are delivered with a full set of examples running on STMicroelectronics boards.

The STM32CubeG4 embeds specific APIs (such as HRTIMER, a rich set of analog APIs, FMAC and CORDIC mathematical accelerators), that make it particularly tailored for motor control and switched-mode power supply applications.

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 HAL and LL drivers are production-ready and have been developed in compliance with V-Model requirements for design, implementation and tests. Furthermore, STMicroelectronics specific validation process adds a deeper qualification level, such as compliance with MISRA-C®:2012 guidelines and elimination of possible runtime errors thanks to a static analysis tool. Reports are available on demand.

The STM32CubeG4 gathers in one single package all the generic embedded software components required to develop an application on STM32G4 microcontrollers. Following STM32Cube initiative, this set of components is highly portable, not only within the STM32G4 Series but also to other STM32 Series. In addition, the low-layer APIs provide an alternative, high-performance, low-footprint solution to the STM32CubeG4 HAL at the cost of portability and simplicity.

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

2 License

STM32CubeG4 is delivered under the *Mix Ultimate Liberty+OSS+3rd-party V1* software license agreement (SLA0048).

The software components provided in this package come with different license schemes as shown in Table 1. Software component license agreements.

A set of application projects implementing all the middleware components is also provided in the STM32CubeG4 MCU Package.

Table 1. **Software component license agreements**

Software component	Owner	License
Cortex®-M CMSIS v5.4.0	Arm®	Apache® License, Version 2.0
STM32G4 HAL/LL APIs	STMicroelectronics	BSD 3-Clause
Board Support Package (BSP)	STMicroelectronics	BSD 3-Clause
Utilities (CPU - Fonts - JPEG - Log)	STMicroelectronics	BSD 3-Clause
USB Device library	STMicroelectronics	SLA0044 (source release)
USB Power Delivery Core library	STMicroelectronics	SLA0044 (source release)
FatFS	Portions ST	SLA0044 (source release)
	Portion ChaN	FatFS License[1]
FreeRTOS™	Copyright (C) 2017 Amazon.com, Inc. or its affiliates	MIT
Application projects	STMicroelectronics	SLA0044 (source release)
Example projects	STMicroelectronics	BSD 3-Clause
Demonstration projects	STMicroelectronics	SLA0044 (source release)

1. *The FatFS License and Independent JPEG Group License are business friendly and permissive open source licenses.*

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

arm

3 Ordering information

The STM32CubeG4 is available for free download from www.st.com.

Revision history

Table 2. Document revision history

Date	Version	Changes
29-Mar-2019	1	Initial release.

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