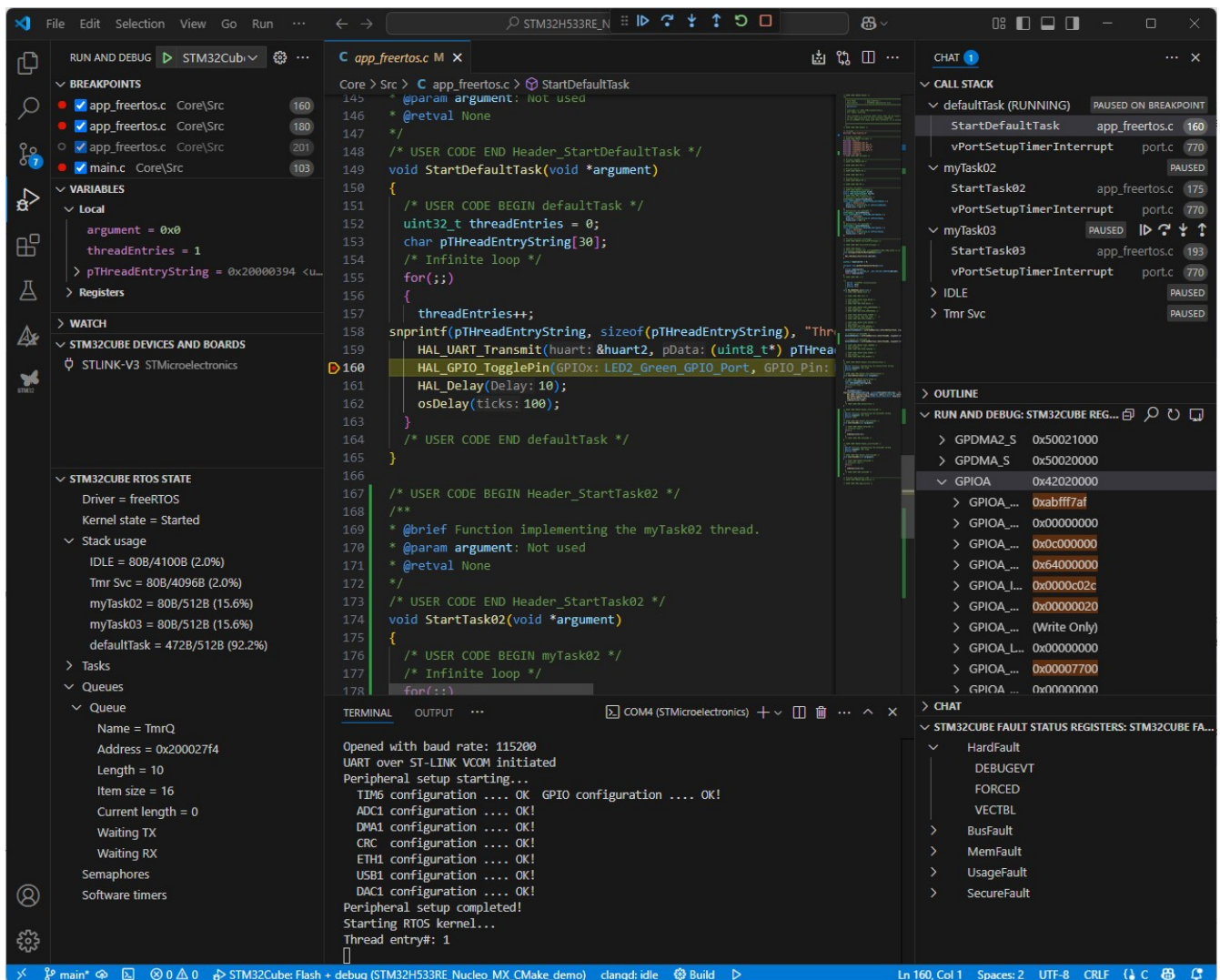




## STM32Cube for Visual Studio Code, a free IDE for STM32 MCUs



## Product status

STM32VSCode



## Features

### Project creation and import

- Project wizard to create empty CMake projects
- Import of [STM32CubeMX](#) projects using the STM32CubeMX CMake exporter

### Powerful editor features

- Intelligent code completion, navigation, refactoring, and formatting

### CMake-based build system

- Adoption of open standards instead of proprietary project formats
  - Removal of entry barriers
  - Interoperability with third-party tools
- Fast build of large code bases with CMake and Ninja build tools

### Debugging for STM32 MCUs

- ST DAP implementation with support for ST-LINK and SEGGER probes
- Debugging features on top of native VS Code® debugging features:
  - Peripheral registers
  - Memory inspector
  - FreeRTOS™ kernel and ThreadX® debugging
  - Fault analyzer
  - Integrated serial terminal

### Version control

- Support for Git™ or other version control systems

### High customization level

- Key bindings, user code snippets, task runner, multiple themes through the VS Code® marketplace

### Host OS support

- Windows®
- Linux®
- macOS®

## Description

STM32Cube for Visual Studio Code ([STM32VSCode](#)), in short STM32Cube for VS Code, is a powerful C/C++ development tool based on Microsoft® VS Code®. It expands the [STM32Cube](#) software ecosystem with the support for the full STM32 MCU portfolio in VS Code®.

STM32Cube for VS Code is STMicroelectronics' proposal to the developers who prefer the VS Code®-style development experience over the more GUI-rich [STM32CubeIDE](#) user experience.

STM32Cube for VS Code offers a rich feature-set with a focus on code editing. The editor is, by default, powered by *clangd*. CMake and Microsoft® CMake Tools extension drive the build system, offering great flexibility, compiler freedom, and minimum tool lock-in.

Furthermore, VS Code® offers a rich marketplace allowing developers to extend the tool with additional features.

Unlike STM32CubeIDE, STM32Cube for VS Code is not an all-in-one preintegrated tool. Instead, it is composed of three individually updatable building blocks:

- VS Code® extensions, which provide the GUI experience inside VS Code®. Extensions are separated into feature blocks to allow updatability and flexibility of end-user installation.
- Bundles, which are CLI tools downloaded, installed, and updated by the bundle manager. Bundles include CMake, Ninja, compilers, debuggers, and more.
- CMSIS-Packs, which provide device support for STM32 MCUs. The packs include startup code, linker scripts, svd-files, and more.

This architecture split allows tool updates independently from STM32 microcontroller product launches. It opens the way to more frequent updates in terms of features and bug fixes.

STM32Cube for VS Code is a new software tool with a completely new tool architecture. As such, it is published on the VS Code® marketplace as a prerelease to indicate its beta status. ST develops and matures the tool together with the STM32 developer community to offer a set of features comparable to STM32CubeIDE.

## 1 General information

STM32VSCode supports STM32 products based on the Arm® Cortex®-M processor.

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

**arm**

### 1.1 Access information

Get access to Microsoft® VS Code® and its STM32Cube for VS Code extension through the [STM32VSCode](#) product page on STMicroelectronics website, the [STM32 MCU Developer Zone](#) dedicated web page, or directly at:

- Microsoft® VS Code® download page at [code.visualstudio.com/download](https://code.visualstudio.com/download)
- Microsoft® marketplace at [marketplace.visualstudio.com](https://marketplace.visualstudio.com)

*Note:* Microsoft, Visual Studio, and VS Code are trademarks of the Microsoft group of companies.

### 1.2 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 all-in-one development tool with peripheral configuration, code generation, code compilation, and debug features
  - [STM32CubeCLT](#), an all-in-one command-line development toolset with code compilation, board programming, and debug features
  - 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
- [STM32Cube MCU and MPU Packages](#), comprehensive embedded-software platforms specific to each microcontroller and microprocessor 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 hardware
  - A consistent set of middleware components such as RTOS, USB, TCP/IP, graphics, and FAT file system
  - 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

## 1.3

### License

STM32VSCode is delivered under the *Mix Ultimate Liberty+OSS+3rd-party V1* software license agreement (SLA0048).

For more details about the license agreement of each component, refer to STM32Cube for VS Code in the VS Code® marketplace.

## Revision history

**Table 1. Document revision history**

Date	Revision	Changes
15-May-2025	1	Initial release.

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