# X-CUBE-MCSDK

STM32 MC SDK software expansion for STM32Cube

Data brief

Features

- Single/dual simultaneous field oriented control (FOC)
- Motor profiler and one-touch tuning for a fast startup of unknown motors
- Simplified firmware architecture based on the STM32Cube HAL/LL libraries
- Current reading topologies supported:
  - 1 shunt resistor
  - 3 shunt resistors
  - 2 ICS (isolated current sensor)
- Speed/position sensors (encoder and Hall) and sensorless operation (state observer) supported
- On-the-fly startup for fans
- Speed and torque control
- Motor control algorithms implemented for specific applications, among them MTPA (maximum torque per ampere), flux weakening, feed forward, and start-on-the-fly
- Full customization and real time communication through STM32 Motor Control Workbench PC software
  - New project creation starting from the board
  - Workflow supporting the STM32CubeMX GUI configurator
  - Wide range of STM32 microcontrollers supported

STM32 Motor Control SDK
Plug-and-Spin with STM32Cube

MS49927V2
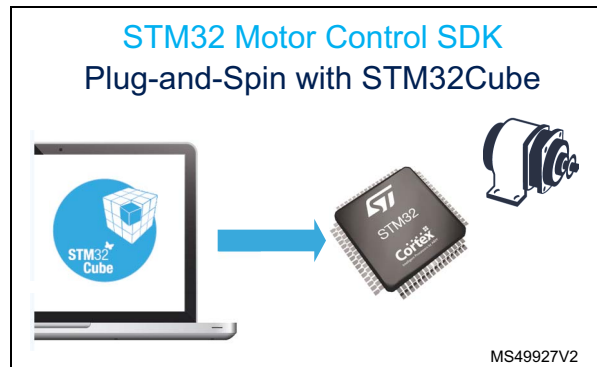
Description

STM32 microcontrollers offer the performance of the industry-standard Arm® Cortex®-M cores. They run either vector control or FOC modes, widely used in high-performance drives for air conditioning, home appliances, drones, building and industrial automation, medical and e-bike applications.

STM32 MC SDK (motor control software development kit) firmware includes the permanent magnet synchronous motor (PMSM) firmware library (FOC control) and the STM32 motor control workbench (to configure the FOC firmware library parameters), with its graphical user interface (GUI).

STM32 motor control workbench is a PC software that reduces the design effort and time needed for the STM32 PMSM FOC firmware configuration.

The user generates a project file through the GUI, and initializes the library according to the application needs. Some algorithm variables can be monitored and changed in real time.

For further information contact your local STMicroelectronics sales office.

www.st.com

1 Ordering information

STM32 MC SDK firmware (X-CUBE-MCSDK) is available for free download from the *www.st.com* website.

2 License

X-CUBE-MCSDK is delivered under the *Mix Ultimate Liberty + OSS + 3rd party V1* (SLA0048) license.

The software components provided in this package come with different license schemes, as shown in *Table 1*. For more details, refer to the license agreement of each component.

Table 1. Software component license agreements

Software component		Owner	License
ST motor profiler	Utilities/PC_Software/STMotorProfiler	STMicroelectronics	Binary Image
ST MC workbench	Utilities/PC_Software/STMCWB		Binary Image
ST MC FOC FW	Middlewares/ST/MotorControl		Ultimate Liberty (source release)

The X-CUBE-MCSDK Expansion Package runs on STM32 32-bit microcontrollers, based on Arm[®][a] Cortex[®] processors.

arm

---

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

3 Revision history

Table 2. Document revision history

Date	Revision	Changes
08-Mar-2018	1	Initial release.
31-Jan-2023	2	Scope limited to X-CUBE-MCSDK. Minor text edits across the whole document.

IMPORTANT NOTICE – READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgment.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.