

Global navigation satellite system software expansion for STM32Cube

Application	Sample Applications
Middleware	NMEA A-GNSS RTOS mbedTLS cJSON
Hardware Abstraction	STM32Cube Hardware Abstraction Layer (HAL)
Hardware	STM32 Nucleo expansion boards X-NUCLEO-GNSS1A1/X-NUCLEO-GNSS2A1 (Sense) STM32 Nucleo development board



Features

- Complete software to build applications using the [Teseo-LIV3F](#) or [Teseo-VIC3DA](#) GNSS device
- Middleware for the NMEA protocol and for assisted GNSS (A-GNSS) support
- RTOS (Azure[®] RTOS ThreadX or FreeRTOS[™]) task scheduling to ensure a better asynchronous message parsing
- Easy portability across different MCU families, thanks to [STM32Cube](#)
- Sample application to transmit GNSS data to a PC and for A-GNSS support
- Free, user-friendly license terms

Description

The [X-CUBE-GNSS1](#) is an expansion software package for [STM32Cube](#).

The software runs on the STM32 and includes drivers for the [Teseo-LIV3F](#) and [Teseo-VIC3DA](#) global navigation satellite system (GNSS) devices, middleware for the NMEA protocol support, and RTOS (Azure[®] RTOS ThreadX or FreeRTOS[™]) for task scheduling to ensure a better asynchronous message parsing.

It is built on top of the [STM32Cube](#) software technology for easy portability across different STM32 microcontrollers.

The software comes with sample implementations for the drivers running on the [X-NUCLEO-GNSS1A1](#) and the [X-NUCLEO-GNSS2A1](#) expansion boards, when connected to a [NUCLEO-F401RE](#), [NUCLEO-L476RG](#), [NUCLEO-L073RZ](#), or [NUCLEO-U575ZI-Q](#) development board.

The software also includes a sample application for assisted GNSS provided by the [Teseo-LIV3F](#) and [Teseo-VIC3DA](#) GNSS devices. The application is tailored for the [B-L475E-IOT01A](#) discovery kit for IoT nodes.

Product summary	
GNSS software expansion for STM32Cube	X-CUBE-GNSS1
GNSS standalone module/ Automotive GNSS dead reckoning module with 6-axis IMU	Teseo-LIV3F/Teseo-VIC3DA
GNSS expansion board based on Teseo-LIV3F module for STM32 Nucleo	X-NUCLEO-GNSS1A1/X-NUCLEO-GNSS2A1
STM32L4 Discovery kit IoT node	B-L475E-IOT01A
STM32 Nucleo-64 development boards with STM32F401RE/ STM32L476RG/ STM32L073RZ/ STM32U575ZI MCUs	NUCLEO-F401RE/ NUCLEO-L476RG/ NUCLEO-L073RZ/ NUCLEO-U575ZI-Q
Applications	Asset Tracking

1 Detailed description

1.1 What is STM32Cube?

STM32Cube is a combination of a full set of PC software tools and embedded software blocks running on STM32 microcontrollers and microprocessors:

- **STM32CubeMX** configuration tool for any STM32 device; it generates initialization C code for Cortex-M cores and the Linux device tree source for Cortex-A cores
- **STM32CubeIDE** integrated development environment based on open-source solutions like Eclipse or the GNU C/C++ toolchain, including compilation reporting features and advanced debug features
- **STM32CubeProgrammer** programming tool that provides an easy-to-use and efficient environment for reading, writing and verifying devices and external memories via a wide variety of available communication media (JTAG, SWD, UART, USB DFU, I2C, SPI, CAN, etc.)
- **STM32CubeMonitor** family of tools (**STM32CubeMonRF**, **STM32CubeMonUCPD**, **STM32CubeMonPwr**) to help developers customize their applications in real-time
- **STM32Cube MCU and MPU packages** specific to each STM32 series with drivers (HAL, low-layer, etc.), middleware, and lots of example code used in a wide variety of real-world use cases
- **STM32Cube expansion packages** for application-oriented solutions.

1.2 How does this software complement STM32Cube?

This software is based on the STM32CubeHAL hardware abstraction layer for the STM32 microcontroller. The package extends **STM32Cube** by providing a board support package (BSP) for the global navigation satellite system expansion board and the drivers for serial communication with a PC.

The drivers abstract low-level details of the hardware and allow the middleware components and applications to access GNSS data in a hardware independent manner.

The software package also includes a sample application to help the developer start experimenting with the code, a Java tool application to update the **Teseo-LIV3F** firmware to latest version and the related application for the **STM32 Nucleo** board.

Revision history

Table 1. Document revision history

Date	Version	Changes
05-Dec-2017	1	Initial release.
10-May-2018	2	Updated cover page image, features and description.
11-Oct-2018	3	Updated cover page image, features and description.
19-Apr-2019	4	Updated cover page image.
14-Apr-2022	5	Minor text changes.
21-Jun-2022	6	Updated cover page image, product summary table, features, and description.
22-Jul-2022	7	Updated cover page image, product summary table, features, and description. Added Teseo-VIC3DA, X-NUCLEO-GNSS2A1, and NUCLEO-U575ZI-Q compatibility information.

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