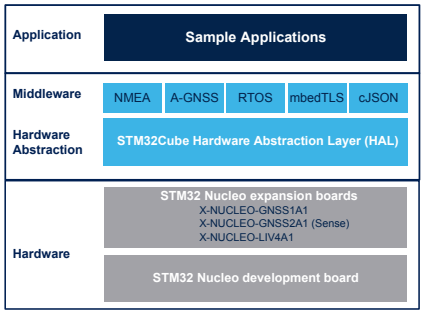
X-CUBE-GNSS1

Data brief

Global navigation satellite system software expansion for STM32Cube



Product summary	
GNSS software expansion for STM32Cube	X-CUBE-GNSS1
GNSS standalone module	Teseo-LIV3F
Automotive GNSS dead reckoning module with 6-axis IMU	Teseo-VIC3DA
Tiny GNSS dual-bands low power module	Teseo-LIV4F
GNSS expansion board based on Teseo-LIV3F module for STM32 Nucleo	X-NUCLEO-GNSS1A1
Dead-reckoning GNSS expansion board based on Teseo-VIC3DA for STM32 Nucleo	X-NUCLEO-GNSS2A1
GNSS expansion board based on Teseo-LIV4F module for STM32 Nucleo	X-NUCLEO-LIV4A1
STM32L4 Discovery kit IoT node	B-L475E-IOT01A

Features

- Complete software to build applications using the Teseo-LIV3F or Teseo-VIC3DA or Teseo-LIV4F 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, Teseo-LIV4F 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, X-NUCLEO-GNSS2A1 and the X-NUCLEO-LIV4A1 expansion boards, when connected to a NUCLEO-F401RE, NUCLEO-H563ZI. 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, Teseo-LIV4F and Teseo-VIC3DA GNSS devices. The application is tailored for the B-L475E-IOT01A discovery kit for IoT nodes.

Product summary	
STM32 Nucleo-64 development boards with STM32F401RE/ STM32H563ZI/ STM32L476RG/ STM32L073RZ/ STM32U575ZI MCUs	NUCLEO-F401RE/ NUCLEO-H563ZI/ 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.
08-Feb-2024	8	Updated cover image, product summary table, features, and description.
12-Sep-2025	9	Updated Product summary and Description. Added references to NUCLEO-H563ZI and support for STM32H5 series.

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.

In the event of any conflict between the provisions of this document and the provisions of any contractual arrangement in force between the purchasers and ST, the provisions of such contractual arrangement shall prevail.

The 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.

The 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 the 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.

If the purchasers identify an ST product that meets their functional and performance requirements but that is not designated for the purchasers' market segment, the purchasers shall contact ST for more information.

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.