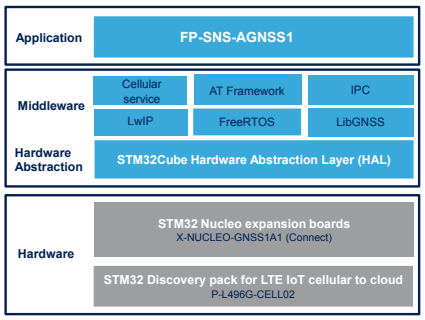
# FP-SNS-AGNSS1

Data brief

# STM32Cube function pack for GNSS and cellular connectivity enabling Assisted-GNSS applications




STM32 Open Development Environment

## Features

- Complete firmware to connect an IoT node with GNSS module to an LTE IoT cellular network
- Support for Assisted-GNSS through RxNetworks online services
- Middleware libraries with support for FreeRTOS, GNSS, NMEA and JSON parsing functionalities
- Sample implementation available for the X-NUCLEO-GNSS1A1, and the LTE IoT cellular expansion boards, when connected to a 32L496GDISCOVERY board
- Easy portability across different MCU families, thanks to STM32Cube
- Free, user-friendly license terms

## Description

The FP-SNS-AGNSS1 function pack for STM32Cube lets you connect your IoT node to a cellular network and enable Assisted-GNSS applications.

Assisted-GNSS provides ephemeris assistance from an external source (RxNetworks online service), thus considerably reducing the time to obtain a FIX, especially in critical environments when the ephemeris download time could be very long.

The software runs on STM32L496AG MCUs and it is easily portable across different MCU families thanks to STM32Cube.

The package contains a sample implementation for 32L496GDISCOVERY board equipped with the X-NUCLEO-GNSS1A1 expansion board (featuring a GNSS receiver based on Teseo-LIV3F module), and the LTE IoT expansion board featuring a Quectel BG96 module.

The cellular expansion board included in the P-L496G-CELL02 package is connected directly to the STMod+ connector of the 32L496GDISCOVERY board.

| Product summary | |
|---|---|
| STM32Cube function pack for GNSS and cellular connectivity enabling Assisted-GNSS applications | FP-SNS-AGNSS1 |
| GNSS expansion board based on Teseo-LIV3F module for STM32 Nucleo | X-NUCLEO-GNSS1A1 |
| Discovery kit with STM32L496AG MCU | 32L496GDISCOVERY |
| LTE Cellular to Cloud Pack with STM32L496AG MCU | P-L496G-CELL02 |
| Applications | IoT for Smart Industry<br>Mobility Services |

# 1 Detailed description

## 1.1 What can you do with STM32Cube function packs?

STM32Cube function packs leverage the modularity and interoperability of STM32 Nucleo and X-NUCLEO boards together with STM32Cube and X-CUBE software to create function examples for some of the most common use cases of different application technologies.

These software function packs are designed to exploit the underlying STM32 ODE hardware and software components as much as possible to best satisfy the requirements of final user applications.

Moreover, function packs may include additional libraries and frameworks that are not present in the original X-CUBE packages, thus enabling new functionalities allowing real and usable system for developers.

## 1.2 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

## 1.3 How does this function pack complement STM32Cube?

This software is based on the STM32CubeHAL. It extends STM32Cube by providing a board support package (BSP) for the LTE IoT cellular communication expansion boards, and the GNSS expansion board based on Teseo-LIV3F.

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

The package also includes some middleware libraries to implement functionalities such as GNSS, NMEA protocol, FreeRTOS and JSON parsing. Developers can use it to prototype IoT applications based on Assisted-GNSS.

# Revision history

**Table 1. Document revision history**

| Date | Version | Changes |
|---|---|---|
| 14-Jan-2020 | 1 | Initial release. |
| 11-Feb-2020 | 2 | Added P-L496G-CELL02 compatibility information. |

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