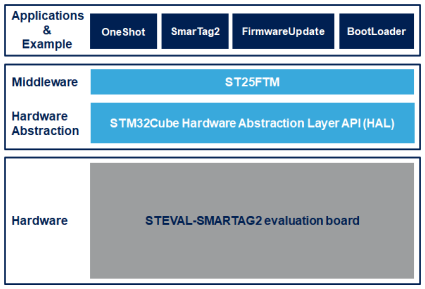
FP-SNS-SMARTAG2

Data brief

STM32Cube function pack for STEVAL-SMARTAG2 evaluation board with Dynamic NFC Tag, environmental, motion, and ambient light sensors



STM32 Open Development Environment

STM32 Cube

Product summary	
STM32Cube function pack for STEVAL-SMARTAG2 evaluation board with Dynamic NFC Tag, environmental, motion and ambient light sensors	FP-SNS-SMARTAG2
NFC dynamic tag sensor and processing node evaluation board	STEVAL-SMARTAG2
ST Asset Tracking app to configure a Sigfox or a BLE node	STAssetTracking
Cloud Amazon-based web application for asset tracking	DSH-ASSETRACKING
NFC Sensor TAG mobile application	STNFCSensor
Applications	IoT for Smart Home and City Medical and Healthcare Sensing

Features

- Complete firmware to access data from an IoT node with a dynamic NFC tag, environmental, motion, and ambient light sensors
  - Ultra-low power operations, with the support of energy harvesting (only for version B of the evaluation board STEVAL$SMARTAG2B) and battery operated use cases
  - Compatible with the STAssetTracking application for Android/iOS. This allows data logs reading from the NFC tag and data logs sending to the DSH-ASSETRACKING cloud-based dashboard
  - Compatible with the STNFCSensor application for Android/iOS for reading and setting the data logs
- The package contains also one example that shows how to update the firmware using the fast transfer mode protocol (ST25FTM)
  - Compatible with the ST25 NFC tag application to download the firmware on the board via NFC
- Sample implementation available for the STEVAL-SMARTAG2 evaluation board
- Easy portability across different MCU families, thanks to STM32Cube

Description

FP-SNS-SMARTAG2 is an STM32Cube function pack that allows you to read the ambient light, the motion, and the environmental sensor data on the STEVAL-SMARTAG2 evaluation board. These functions are performed via an NFC-enabled reader, such as a mobile phone or a tablet.

The package supports energy harvesting (enabled by NFC and only for version B of the evaluation board STEVAL$SMARTAG2B) and battery operated use cases.

This software, together with the suggested combination of STM32 and ST devices, can be used to develop tracking, cold chain, medical, smart sensing, smart home, city, and building applications.

The package contains also a simple example that shows how to update the firmware using the NFC and ST25 NFC tag application for Android/iOS.

The software runs on an STM32L4 ultralow power microcontroller. It includes drivers for the dynamic NFC tag and for the ambient light, motion, and environmental sensors.

You can register the NFC sensor tag node on the DSH-ASSETRACKING web application for asset tracking. This app stores and monitors on-board sensor data, as well as the geo-localization of the smartphone used to read the IoT node data.

The software is available also on GitHub, where the users can signal bugs and propose new ideas through [Issues] and [Pull Requests] tabs.

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.

1.2.1 How does this function pack 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 dynamic NFC/RFID tag IC expansion board based on ST25DV. It can be used for the ambient light, environmental, and motion MEMS sensors expansion boards, and for the STEVAL-SMARTAG2 evaluation board. The drivers abstract low-level details of the hardware and allow the sample applications to leverage NFC communication and access sensor data in a hardware-independent manner.

The package supports different use cases featuring ultra low power modes of operation:

- One-shot mode leverages the energy harvesting feature of the dynamic NFC tag from a mobile device to provide enough energy to power the reading of environmental sensor data that can be viewed in the same mobile device using the STAssetTracking or STNFCSensor mobile application.
  This use case is only for version B of the evaluation board STEVAL$SMARTAG2B.
- A battery operated data-logger mode, enables continuous sensor data reading, which can be viewed on a mobile device using the STAssetTracking or STNFCSensor mobile application. Developers can use this package to prototype ultralow power IoT applications requiring sensor data reading through NFC communication.

Revision history

Table 1. **Document revision history**

Date	Revision	Changes
11-Oct-2022	1	Initial release.
02-Mar-2023	2	Updated Cover Image, Features, Description, Product Summary and Section 1.2.1 How does this function pack complement STM32Cube?. Added references to STEVAL$SMARTAG2B, GitHub and STNFCSensor.