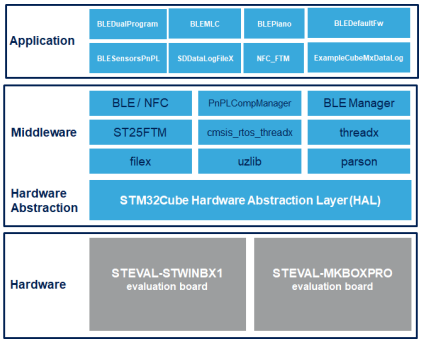
# FP-SNS-STBOX1

Data brief

# STM32Cube function pack for the Pro Mode of wireless multi sensor development kits




STM32 Open Development Environment

## Features

- Complete samples on how to:
  - create one implementation based on transmitting the data with BLE
  - use the dual bank flash feature for rollback after a FOTA update
  - program the ISM330DHCX (for STEVAL-STWINBX1) and LSM6DSV16X (for STEVAL-MKBOXPRO) machine learning core (MLC) or theirs finite state machine (FSM), control the output of theirs registers and transmit the results via BLE
  - easily send the data via BLE
  - save the sensor data to the SD card
- Compatible with STBLESensor application for Android/iOS, to perform sensor and audio data reading, motion algorithm feature demo, and FOTA via BLE connectivity
- Sample implementation available for the STEVAL-STWINBX1 and STEVAL-MKBOXPRO kits
- Compatible with STM32CubeMX, can be downloaded from st.com and installed directly into STM32CubeMX
- Easy portability across different MCU families, thanks to STM32Cube
- Free, user-friendly license terms

| Product summary | |
|---|---|
| STM32Cube function pack for the Pro Mode of the SensorTile.box wireless multi sensor development kit | FP-SNS-STBOX1 |
| STWIN.box - SensorTile Wireless Industrial Node Development Kit | STEVAL-STWINBX1 |
| SensorTile.box PRO with multi-sensors and wireless connectivity for any intelligent IoT nodes | STEVAL-MKBOXPRO |
| BLE sensor application for Android and iOS | STBLESensor |
| Applications | Cloud Connectivity |

## Description

FP-SNS-STBOX1 is an STM32Cube function pack for the Pro Mode of the STWIN.box and for Sensortile.box Pro multi-sensors and wireless connectivity development kit for any intelligent IoT node. Wireless Industrial Node Development Kit, which helps you to build custom applications.

The package includes pressure, relative humidity, temperature, accelerometer, gyroscope and magnetometer sensors, as well as an analog and digital microphones, and the SPBTLE-1S Bluetooth low energy system-on-chip application processor.

With the STEVAL-STWINBX1 and STEVAL-MKBOXPRO kits with BLE connectivity, you can monitor and log the algorithm output and sensor data using the STBLESensor app.

The software runs on the STM32 microcontroller and includes all the necessary drivers for the STEVAL-STWINBX1 and STEVAL-MKBOXPRO evaluation kits.

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.

## 1.3 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 BLE, sensors, microphone and middleware components for communication with other BLE devices.

It also provides some sample applications to demonstrate how to implement custom applications using the STWIN.box and Sensortile.box-Pro Pro Mode.

# Revision history

**Table 1. Document revision history**

| Date | Version | Changes |
|---|---|---|
| 02-Sep-2019 | 1 | Initial release. |
| 22-Apr-2020 | 2 | Updated cover page image, features and product summary table to reflect v1.2.0 firmware release. |
| 13-Jan-2023 | 3 | Updated cover page image, features, description, product summary table and *Section 1.3: How does this function pack complement STM32Cube?*. |
| 19-Apr-2023 | 4 | Updated features, description, and figure in cover page.<br>Updated *Section 1.3: How does this function pack complement STM32Cube?*. |
| 14-Nov-2023 | 5 | Updated description in cover page. |
| 04-Jul-2024 | 6 | Updated cover image, Section Features, Section Features, product summary table and Section 1.3: How does this function pack complement STM32Cube?. |