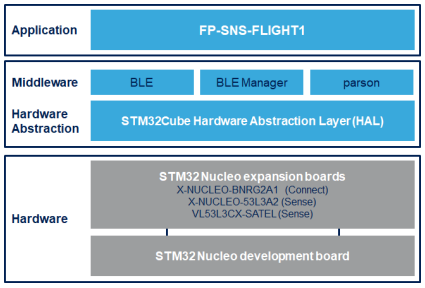
FP-SNS-FLIGHT1

Data brief

STM32Cube function pack for IoT node with BLE connectivity and Time-of-Flight sensors



STM32 Open Development Environment

Features

- Complete firmware to develop an IoT node with BLE connectivity, and Time-of-Flight sensors
- Compatible with STBLESensor application for Android/iOS to perform distance data reading and firmware update (FOTA)
- Multitarget ranging sensor application based on the VL53L3CX Time-of-Flight (ToF) sensor
- Sample implementation available for X-NUCLEO-53L3A2 (or VL53L3CX-SATEL) and X-NUCLEO-BNRG2A1 connected to a NUCLEO-F401RE, NUCLEO-L476RG or NUCLEO-U575ZI-Q
- Compatible with STM32CubeMX, can be downloaded from and installed directly into STM32CubeMX
- Easy portability across different MCU families, thanks to STM32Cube
- Free, user-friendly license terms

Description

The FP-SNS-FLIGHT1 is an STM32Cube function pack, which lets your IoT node connect to a smartphone via BLE and uses a suitable Android™ or iOS™ application like the STBLESensor app to view real-time object distance data read by the Time-of-Flight sensor.

The package also enables advanced functions, such as presence detection inside a fixed range distance.

This package, together with the suggested combination of the STM32 and ST devices, can be used to develop wearable applications or smart thing applications in general.

The software runs on the STM32 microcontroller and includes all the necessary drivers to recognize the devices on the STM32 Nucleo development board.

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

Product summary	
STM32Cube function pack for IoT node with BLE connectivity and Time-of-Flight sensors	FP-SNS-FLIGHT1
Multitarget ranging sensor expansion board based on VL53L3CX for STM32 Nucleo	X-NUCLEO-53L3A2
BLE expansion board based on the BLUENRG-M2SP module for STM32 Nucleo	X-NUCLEO-BNRG2A1
Breakout board with VL53L3CX multi-target detection ToF ranging sensor for easy integration into customer device	VL53L3CX-SATEL
Applications	Bluetooth Low Energy

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 STM32 ODE function pack complement STM32Cube?

This software is based on the STM32CubeHAL. It extends STM32Cube by providing a board support package (BSP) for the BlueNRG-2 network processor (embedded in the BlueNRG-M2SP module), Time-of-Flight ranging expansion board and middleware components for communication with other Bluetooth devices.

Revision history

Table 1. **Document revision history**

Date	Version	Changes
01-Mar-2016	1	Initial release.
05-Dec-2016	2	Updated title, cover image, Features, Description Added STM32 ODE compatibility.
20-Feb-2017	3	Updated cover page image and Features and Description sections. Updated section How does STM32 ODE Function Pack complement STM32Cube? Added X-NUCLEO-IKS01A2 expansion board compatibility information.
29-Mar-2017	4	Updated cover page image, features and description. Updated *How does STM32 ODE function pack complement STM32Cube?*
19-Jul-2017	5	Updated cover image, features and description.
05-Sep-2018	6	Updated cover image, features and description.
25-Sep-2020	7	Updated cover page image, features and description. Updated Section 1.3 How does STM32 ODE function pack complement STM32Cube?.
02-Nov-2020	8	Updated title.
07-Oct-2021	9	Updated cover page image, features, and product summary table. Added references to X-NUCLEO-53L3A2 expansion board.
07-Mar-2023	10	Added reference to GitHub.
03-May-2023	11	Modified title, cover image, product summary, features and description in cover page. Updated Section 1.3 How does STM32 ODE function pack complement STM32Cube?.
06-Jun-2023	12	Updated Features. Added STM32CubeMX compatibility.
11-Feb-2025	13	Updated Cover image, Features and Product summary. Added references to VL53L3CX-SATEL.