

Bluetooth low energy and dynamic NFC tag software expansion for STM32Cube

Application	FP-SEC-BLENFC1
Middleware	BLE, NDEF Library
Hardware Abstraction	STM32Cube Hardware Abstraction Layer (HAL)
Hardware	STM32 Nucleo expansion boards X-NUCLEO-IDB05A1 (Connect) X-NUCLEO-NFC04A1 (Connect) STM32 Nucleo development board



Features

- Complete middleware to build applications with the [ST25DV04K](#) dynamic NFC/RFID tag using NDEF standard
- A very low power Bluetooth low energy ([BlueNRG-MS](#)) single-mode network processor, compliant with Bluetooth specifications core 4.2 ([X-NUCLEO-IDB05A1](#)) for transmitting information to one client
- Easy portability across different MCU families, thanks to [STM32Cube](#)
- Compatible with [BlueMS](#) application for Android/iOS (Version 2.1.0 and above) available at the respective Play/iTunes stores
- Free, user-friendly license terms
- Sample implementation available for [X-NUCLEO-NFC04A1](#) and [X-NUCLEO-IDB05A1](#) expansion boards on a [NUCLEO-F401RE](#) or [NUCLEO-L053R8](#) development board.

Description

The [FP-SEC-BLENFC1](#) software runs on STM32 microcontrollers with the [BlueNRG-MS](#) Bluetooth low energy communication protocol. It writes NDEF protocol information for secure Bluetooth pairing, storing the BLE MAC address and the connection pin on the NFC tag.

The [FP-SEC-BLENFC1](#) also exports a Bluetooth characteristic for switching the [STM32 Nucleo](#) board LED on and off, and one for transmitting simulated temperature sensor data.

The software, based on [STM32Cube](#) technology, provides a sample implementation for the featured STM32 Nucleo development boards and expansion boards.

Product summary	
Bluetooth Low Energy and Dynamic NFC tag software expansion for STM32Cube	FP-SEC-BLENFC1
Bluetooth low energy expansion board based on SPBTLE-RF module for STM32 Nucleo	X-NUCLEO-IDB05A1
Dynamic NFC/RFID tag IC expansion board	X-NUCLEO-NFC04A1
Dynamic NFC/RFID tag NFC with I ² C interface	ST25DV04K

1 Detailed description

1.1 What can you do with STM32Cube function packs?

The [STM32Cube](#) function packs leverage the modularity and interoperability of STM32 Nucleo and X-NUCLEO boards, and STM32Cube and X-CUBE software, to create function examples, embodying some of the most common use cases, for each application area.

These software function packs are designed to exploit as much as possible the underlying [STM32 ODE](#) hardware and software components to best fit the requirements of final users' applications.

Moreover, function packs may include additional libraries and frameworks which do not present the original X-CUBE packages, thus enabling new functionalities and creating a real and usable system for developers.

1.2 What is STM32Cube?

STM32Cube™ is designed by STMicroelectronics to reduce development effort, time and cost across the entire STM32 portfolio.

STM32Cube version 1.x includes:

- STM32CubeMX, a graphical software configuration tool that allows the generation of C initialization code using graphical wizards.
- A comprehensive embedded software platform specific to each series (such as the STM32CubeF4 for the STM32F4 series), which includes:
 - the STM32Cube HAL embedded abstraction-layer software, ensuring maximized portability across the STM32 portfolio
 - a consistent set of middleware components such as RTOS, USB, TCP/IP and graphics
 - all embedded software utilities with a full set of examples

1.2.1 How does this STM32Cube 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 [BlueNRG-MS](#) and the dynamic NFC tag expansion boards, and some middleware components for communication with other Bluetooth low energy devices, and to enable data exchange with an NFC-capable device using the NDEF standard.

The implementation makes use of low power consumption strategies suitable for this field of application, compliant with the Bluetooth specifications core 4.2 [X-NUCLEO-IDB05A1](#).

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

The package includes a sample application that the developer can use to start experimenting with the code. It enables NFC pairing and bi-directional communication with a Bluetooth low energy-enabled device, such as a smartphone (Android or iOS-based).

Revision history

Table 1. Document revision history

Date	Version	Changes
08-Feb-2016	1	Initial release.
26-Jun-2018	2	Updated all content to reflect FP-SEC-BLENFC1 V1.2.0 release. Replaced X-NUCLEO-NFC0A1 expansion board with X-NUCLEO-NFC04A1 expansion board compatibility information. Removed X-NUCLEO-IDB04A1 expansion board compatibility information.

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