

Bluetooth low energy software expansion for STM32Cube

Application	Sample applications
Middleware	BLE, Low Power Manager
Hardware Abstraction	STM32Cube Hardware Abstraction Layer (HAL)
Hardware	STM32 Nucleo expansion boards X-NUCLEO-IDB05A2 (Connect) STM32 Nucleo development board



Features

- Complete middleware to build Bluetooth low energy applications using [BlueNRG-MS/BlueNRG-M0](#) devices
- Easy portability across different MCU families, thanks to [STM32Cube](#)
- Package compatible with [STM32CubeMX](#), can be downloaded from and installed directly into [STM32CubeMX](#)
- Free, user-friendly license terms

Description

The [X-CUBE-BLE1](#) expansion software package for [STM32Cube](#) runs on the STM32 and includes drivers for [BlueNRG-MS/BlueNRG-M0](#) Bluetooth low energy devices.

The expansion is built on [STM32Cube](#) software technology to ease portability across different STM32 microcontrollers.

The software comes with sample implementations of the drivers running on the [X-NUCLEO-IDB05A2](#) expansion board, when connected to a [NUCLEO-L476RG](#) 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	
Bluetooth low energy software expansion for STM32Cube	X-CUBE-BLE1
Bluetooth® low energy expansion board based on the BlueNRG-M0 module for STM32 Nucleo	X-NUCLEO-IDB05A2
Bluetooth low energy network processor supporting Bluetooth 4.2 core specification	BlueNRG-MS/BlueNRG-M0
STM32 Nucleo-64 development board with STM32L476RG MCU	NUCLEO-L476RG
Applications	Cloud Connectivity Wearable Wireless Connectivity

1 Detailed description

1.1 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 How does this software complement STM32Cube?

The proposed software is based on the STM32CubeHAL, the hardware abstraction layer for the STM32 microcontroller. The package extends [STM32Cube](#) by providing a board support package (BSP) for the [BlueNRG-MS/BlueNRG-M0](#) expansion boards and some middleware components for communication with other Bluetooth LE devices.

[BlueNRG-MS](#) and [BlueNRG-M0](#) are very low power Bluetooth low energy (BLE) single-mode network processors, compliant with Bluetooth specifications core 4.2.

The drivers abstract low-level details of the hardware and allow the middleware components and applications to access the [BlueNRG-MS/BlueNRG-M0](#) device in a hardware-independent fashion.

The package is compatible with [STM32CubeMX](#). It can be downloaded from and installed directly into [STM32CubeMX](#), as detailed in UM1718 (freely available on www.st.com).

Revision history

Table 1. Document revision history

Date	Rev	Changes
19-Nov-2014	1	First release.
26-Jan-2015	2	Modified the document title, Features and Description on the cover page. Added the Detailed description section.
30-Jun-2015	3	Updated overall system architecture on the cover page.
16-Nov-2015	4	Updated cover page image and description.
26-Jan-2017	5	Updated cover page Features and Detailed description.
14-Feb-2017	6	Updated Detailed description .
20-Dec-2018	7	Updated cover page image, features and description. Added product summary table on the cover page. Updated Section 1.2 How does this software complement STM32Cube?.
22-Apr-2020	8	Updated cover page image, product summary table and Section 1.1 What is STM32Cube?. Added X-NUCLEO-IDB05A2 expansion board and BlueNRG-M0 module compatibility information.
27-Oct-2021	9	Updated cover page features, description, and product summary table. Updated How does this software complement STM32Cube?.
03-Nov-2022	10	Updated cover page features. Updated How does this software complement STM32Cube?.
17-Apr-2023	11	Added reference to GitHub.

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