



Bluetooth® Low Energy manager software expansion for STM32Cube

Application	SensorDataTransmit
Middleware	BLE, BLE_Manager, parson
Hardware Abstraction	STM32Cube Hardware Abstraction Layer (HAL)
Hardware	STM32 Nucleo expansion boards X-NUCLEO-BNRG2A1 (Connect) X-NUCLEO-WB05KN1 (Connect) STM32 Nucleo development board STEVAL-MKBOXPRO evaluation board



Features

- Sample implementation of a Bluetooth® Low Energy connection to the [STBLESensor](#) mobile application
- STM32_BLE_Manager library to manage the Bluetooth® Low Energy service according to the Bluetooth® Low Energy middleware APIs
- Sample applications that the developer can use to start experimenting with the code
- References to free Android and iOS apps that can be used with the sample applications
- Sample implementations available for:
 - [X-NUCLEO-BNRG2A1](#) connected to a [NUCLEO-L476RG](#) or [NUCLEO-U575ZI-Q](#) board
 - [X-NUCLEO-WB05KN1](#) connected to a [NUCLEO-U575ZI-Q](#) board
 - [STEVAL-MKBOXPRO](#) evaluation boards
- 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 [X-CUBE-BLEMGR](#) is an expansion software package for [STM32Cube](#) for the Bluetooth® Low Energy manager and runs on the STM32.

This expansion software includes the STM32_BLE_Manager library, which provides APIs to manage the Bluetooth® Low Energy service according to the [BlueNRG-MS](#), [BlueNRG-1](#), [BlueNRG-2](#), [BlueNRG-LP](#), [STM32WB07_06](#) and [STM32WB05N](#) middleware APIs.

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 manager software expansion for STM32Cube	X-CUBE-BLEMGR
X-NUCLEO-WB05KN1 expansion board for STM32 Nucleo based on STM32WB05KN	X-NUCLEO-WB05KN1
Ultra-low-power, Arm Cortex-M0+ MCU 64 MHz with 256 Kbytes of Flash memory, 64 Kbytes of RAM, Bluetooth LE 5.4	STM32WB07KC
Ultra-low-power, Arm Cortex-M0+ MCU 64 MHz with 256 Kbytes of Flash memory, 32 Kbytes of RAM, Bluetooth LE 5.4	STM32WB06KC
Ultra-low-power, 2.4 GHz network processor, Bluetooth LE 5.4 certified	STM32WB05KN
Bluetooth® Low Energy expansion board based on the BlueNRG-M2SP module for STM32 Nucleo	X-NUCLEO-BNRG2A1
STM32 Nucleo-144 development board with STM32U575ZIT6Q	NUCLEO-U575ZI-Q

Product summary	
SensorTile.box PRO with multi-sensors and wireless connectivity for any intelligent IoT node	STEVAL-MKBOXPRO
Bluetooth® Low Energy wireless system-on-chip	BlueNRG-2
STM32 Nucleo-64 development board with STM32L476RG MCU, supports Arduino and ST morpho connectivity	NUCLEO-L476RG
Programmable Bluetooth Low Energy 5.3 Wireless SoC	BlueNRG-LP
Applications	Connectivity Mobility services Sensing Smart farming Gaming and XR accessories

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?

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-2** network processor (embedded in the **BlueNRG-M2SP** module) and middleware components for communication with other Bluetooth LE devices and to help the users to manage the Bluetooth connectivity, for example with mobile application such as **STBLESensor**.

The package includes a sample applications and 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	Revision	Changes
04-Jul-2022	1	Initial release.
02-Mar-2023	2	Added reference to GitHub.
06-Jun-2023	3	Updated Features. Added STM32CubeMX compatibility.
07-Nov-2023	4	Updated Product summary. Added BlueNRG-LP.
12-Nov-2024	5	Updated Cover image, Features and Product summary. Added references to NUCLEO-U575ZI-Q and STEVAL-MKBOXPRO.
09-May-2025	6	Updated cover image. Added X-NUCLEO-WB05KN1, STM32WB07KC, STM32WB06KC and STM32WB05KN in Product summary.

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