X-NUCLEO-WB05KN1

Data brief

Bluetooth® Low Energy expansion board based on the STM32WB05KN for STM32 Nucleo boards

X-NUCLEO-WB05KN1 global view.
Picture is not contractual.

Product status link
X-NUCLEO-WB05KN1

Features

- Based on STM32WB05KN with preloaded network coprocessor firmware with UART interface
  - Bluetooth® v5.4 compliant
  - Bluetooth® Low Energy data packet length extension
- Embedded MLPF-NRG-01D3 integrated impedance matching network with harmonics filter
- On-board PCB antenna
- SPI interface optional through dedicated firmware
- Compatible with STM32 Nucleo boards
- Equipped with ARDUINO® Uno V3 expansion connector
- Scalable solution, capable of cascading multiple boards for larger systems
- Free comprehensive development firmware library and examples, compatible with the X-CUBE-WB05N expansion software package for STM32Cube

Description

The X-NUCLEO-WB05KN1 expansion board provides Bluetooth® Low Energy connectivity for developer applications and can be plugged into an STM32 Nucleo development board (for example NUCLEO-U575ZI-Q) through its ARDUINO® Uno V3 connectors.

The expansion board features Bluetooth® v5.4 compliant and FCC-certified STM32WB05KN. This SoC manages the complete Bluetooth® Low Energy stack and protocols on its Arm® Cortex®-M0+ core and programmable flash memory. STM32WB05KN supports central and peripheral modes and increased transfer rates with data length extension (DLE).

X-NUCLEO-WB05KN1 interfaces with the STM32 Nucleo microcontroller via UART (default) with and without hardware flow control. Full duplex SPI with an interrupt line is also available. The firmware loaded on the module defines the host interface and, to modify it, simply change the firmware without modifying the hardware.

1 Ordering information

To order the X-NUCLEO-WB05KN1 expansion board, refer to Table 1. For a detailed description, refer to its user manual on the product web page. Additional information is available from the datasheet and reference manual of the target STM32.

Table 1. List of available products

Order code	Board references	User manual	Target STM32
X-NUCLEO-WB05KN1	• MB2160(1) • MB2032(2)	UM3355	STM32WB05KNV6

1. *ARDUINO® interface board*
2. *MCU RF board*

1.1 Product marking

The stickers located on the top or bottom side of all PCBs provide product information:

- First sticker: product order code and product identification, generally placed on the main board featuring the target device.
  Example:

  Product order code
  Product identification

- Second sticker: board reference with revision and serial number, available on each PCB.
  Example:

  MBxxxx-Variant-yzz
  syywwxxxxx

On the first sticker, the first line provides the product order code, and the second line the product identification.

On the second sticker, the first line has the following format: *"MBxxxx-Variant-yzz"*, where *"MBxxxx"* is the board reference, *"Variant"* (optional) identifies the mounting variant when several exist, *"y"* is the PCB revision, and *"zz"* is the assembly revision, for example B01. The second line shows the board serial number used for traceability.

Parts marked as *"ES"* or *"E"* are not yet qualified and therefore not approved for use in production. ST is not responsible for any consequences resulting from such use. In no event will ST be liable for the customer using any of these engineering samples in production. ST's Quality department must be contacted prior to any decision to use these engineering samples to run a qualification activity.

"ES" or *"E"* marking examples of location:

- On the targeted STM32 that is soldered on the board (for an illustration of STM32 marking, refer to the STM32 datasheet *Package information* paragraph at the *www.st.com* website).
- Next to the evaluation tool ordering part number that is stuck, or silk-screen printed on the board.

Some boards feature a specific STM32 device version, which allows the operation of any bundled commercial stack/library available. This STM32 device shows a *"U"* marking option at the end of the standard part number and is not available for sales.

To use the same commercial stack in their applications, the developers might need to purchase a part number specific to this stack/library. The price of those part numbers includes the stack/library royalties.

1.2 Codification

The meaning of the codification is explained in Table 2.

Table 2. Codification explanation

X-NUCLEO-XXYYZTN	Description	Example: X-NUCLEO-WB05KN1
X-NUCLEO	STM32 Nucleo expansion boards	STM32 Nucleo expansion boards
XX	MCU series in STM32 32-bit Arm Cortex MCUs	STM32WB0 series
YY	MCU product line in the series	STM32WB05 product line
Z	STM32 package pin count: • K for 32 pins	32 pins
T	Target application	Network coprocessor
N	Sequential number	First generation of Bluetooth® Low Energy expansion board based on the STM32WB05KN for STM32 Nucleo boards

2 General information

The X-NUCLEO-WB05KN1 board runs with the STM32WB05KNV6 32-bit microcontroller based on the Arm® Cortex®-M0+ core.

Note: Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.

Revision history

Table 3. **Document revision history**

Date	Revision	Changes
02-Jul-2024	1	Initial release.