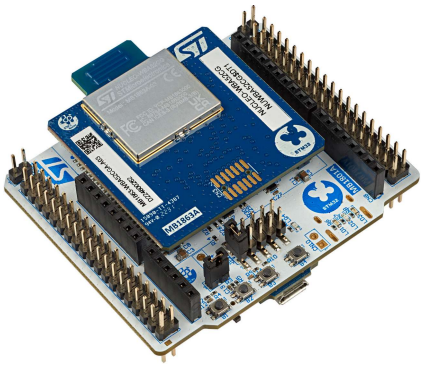
NUCLEO-WBA52CG NUCLEO-WBA55CG NUCLEO-WBA65RI

Data brief

STM32WBA Nucleo-64 boards



NUCLEO-WBA52CG global view. Picture is not contractual.

Product status link
NUCLEO-WBA52CG
NUCLEO-WBA55CG
NUCLEO-WBA65RI

Features

- Ultra-low-power wireless STM32WBA series microcontroller based on the Arm® Cortex®-M33 core, featuring:
  - 1 Mbyte of flash memory and 128 Kbytes of SRAM in a UFQFPN48 package for NUCLEO-WBA52CG and NUCLEO-WBA55CG
  - 2 Mbytes of flash memory and 512 Kbytes of SRAM in a VFQFPN68 package for NUCLEO-WBA65RI
- MCU RF board (MB1863/MB1803/MB2130):
  - 2.4 GHz RF transceiver supporting Bluetooth® LE
  - Bluetooth® LE:
    - LE 2M
    - LE Coded
    - Direction-finding
    - LE Power control
    - Isochronous channels
    - Extended advertising
    - Periodic advertising
    - LE Secure connections
    - LE Audio
    - Mesh networking
    - Core specification v6.0
  - IEEE 802.15.4-2015 PHY and MAC, supporting Thread, Matter, and Zigbee® (for NUCLEO-WBA55CG and NUCLEO-WBA65RI)
  - Arm® Cortex®-M33 CPU with TrustZone®, MPU, DSP, and FPU
  - Integrated PCB antenna
- Three user LEDs
- Three user and one reset push buttons
- Board connectors:
  - USB Micro-B (NUCLEO-WBA52CG) or USB Type-C® (NUCLEO-WBA55CG and NUCLEO-WBA65RI)
  - ARDUINO® Uno V3 expansion connector
  - ST morpho headers for full access to all STM32 I/Os
- Flexible power-supply options: ST-LINK USB V_{BUS} or external sources
- On-board STLINK-V3 debugger/programmer with USB re-enumeration capability: mass storage, Virtual COM port, and debug port
- Comprehensive free software libraries and examples available with the STM32CubeWBA MCU Package
- Support of a wide choice of Integrated Development Environments (IDEs) including IAR Embedded Workbench®, MDK-ARM, and STM32CubeIDE

Description

NUCLEO-WBA52CG, NUCLEO-WBA55CG, and NUCLEO-WBA65RI are Bluetooth® LE wireless and ultra-low-power boards embedding a powerful and ultra-low-power radio compliant with the Bluetooth® LE SIG specification, IEEE 802.15.4-2015 PHY and MAC, supporting Thread, Matter, and Zigbee®.

The ARDUINO® Uno V3 connectivity support and the ST morpho headers allow the easy expansion of the functionality of the STM32 Nucleo open development platform with a wide choice of specialized shields.

1 Ordering information

To order an STM32WBA Nucleo-64 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 microcontroller.

Table 1. List of available products

Order code	Board reference	User manual	Target STM32
NUCLEO-WBA52CG	• MB1801(1) • MB1863(2)	UM3103	STM32WBA52CG
NUCLEO-WBA55CG	• MB1801(1) • MB1803(2)	UM3301	STM32WBA55CG
NUCLEO-WBA65RI	• MB1801(1) • MB2130(2)	UM3448	STM32WBA65RI

1. *Mezzanine board*
2. *MCU RF board*

1.1 Product marking

The product and each board composing the product are identified with one or several stickers. The stickers, located on the top or bottom side of each PCB, provide product information:

- Main board featuring the target device: product order code, product identification, serial number, and board reference with revision.

  Single-sticker example:

  Dual-sticker example:

- Other boards if any: board reference with revision and serial number.

  Examples:

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

On all board stickers, the line formatted as *"MBxxxx-Variant-yzz"* shows the board reference *"MBxxxx"*, the mounting variant *"Variant"* when several exist (optional), the PCB revision *"y"*, and the assembly revision *"zz"*, for example B01. The other line shows the board serial number used for traceability.

Products and parts labeled as *"ES"* or *"E"* are not yet qualified or feature devices that are not yet qualified. STMicroelectronics disclaims any responsibility for consequences arising from their use. Under no circumstances will STMicroelectronics be liable for the customer's use of these engineering samples. Before deciding to use these engineering samples for qualification activities, contact STMicroelectronics' quality department.

"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 ordering part number of the evaluation tool 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

NUCLEO-XXXYYZT	Description	Example: NUCLEO-WBA65RI
XXX	MCU series in STM32 32-bit Arm Cortex MCUs	STM32WBA series
YY	MCU product line in the series	STM32WBA64/65 product line
Z	STM32 package pin count: • C for 48 pins • R for 68 pins	68 pins
T	STM32 flash memory size: • G for 1 Mbyte • I for 2 Mbytes	2 Mbytes

2 Development environment

The STM32WBA Nucleo-64 boards feature the STM32WBA series 32-bit microcontrollers based on the Arm® Cortex®-M33 processor with Arm® TrustZone®.

Note: Arm and TrustZone are registered trademarks of Arm Limited (or its subsidiaries) in the US and/or elsewhere.

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2.1 System requirements

- Multi-OS support: Windows® 10, Linux® 64-bit, or macOS®
- USB Type-A or USB Type-C® to Micro-B cable for NUCLEO-WBA52CG
- USB Type-A or USB Type-C® to USB Type-C® cable for NUCLEO-WBA55CG or NUCLEO-WBA65RI

Note: macOS® is a trademark of Apple Inc., registered in the U.S. and other countries and regions.
Linux® is a registered trademark of Linus Torvalds.
Windows is a trademark of the Microsoft group of companies.

2.2 Development toolchains

- IAR Systems® - IAR Embedded Workbench®(1)
- Keil® - MDK-ARM(1)
- STMicroelectronics - STM32CubeIDE

1. *On Windows® only.*

Revision history

Table 3. **Document revision history**

Date	Revision	Changes
13-Jan-2023	1	Initial release.
06-Feb-2024	2	Added NUCLEO-WBA55CG. Updated all sections due to this product addition.
04-Oct-2024	3	Updated Bluetooth® specification version, support list, and STM32Cube link.
17-Jan-2025	4	Added NUCLEO-WBA65RI. Updated all sections due to this product addition.
19-Mar-2025	5	Updated Features and Description with Bluetooth® LE trademark.