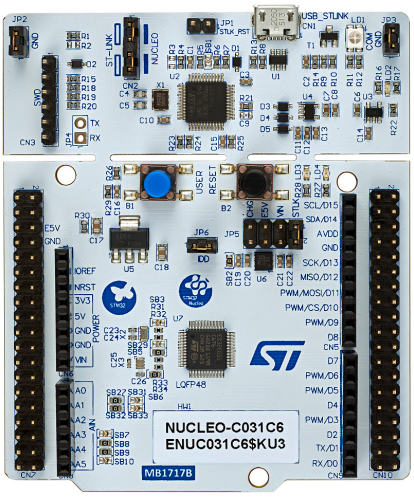
NUCLEO-XXXXCX NUCLEO-XXXXRX
NUCLEO-XXXXRX-P

Data brief

STM32 Nucleo-64 boards



NUCLEO-C031C6 example. Boards with different references show different layouts. Picture is not contractual.

Product status link
NUCLEO-XXXXCX
NUCLEO-C031C6
NUCLEO-XXXXRX
NUCLEO-F030R8, NUCLEO-F070RB, NUCLEO-F072RB, NUCLEO-F091RC, NUCLEO-F103RB, NUCLEO-F302R8, NUCLEO-F303RE, NUCLEO-F334R8, NUCLEO-F401RE, NUCLEO-F410RB, NUCLEO-F411RE, NUCLEO-F446RE, NUCLEO-G070RB, NUCLEO-G071RB, NUCLEO-G0B1RE, NUCLEO-G431RB, NUCLEO-G474RE, NUCLEO-G491RE, NUCLEO-L010RB, NUCLEO-L053R8, NUCLEO-L073RZ, NUCLEO-L152RE, NUCLEO-L452RE, NUCLEO-L476RG
NUCLEO-XXXXRX-P
NUCLEO-L412RB-P, NUCLEO-L433RC-P, NUCLEO-L452RE-P

Features

- Common features
  - STM32 microcontroller in LQFP64 or LQFP48 package
  - 1 user LED shared with ARDUINO®
  - 1 user and 1 reset push-buttons
  - 32.768 kHz crystal oscillator
  - Board connectors:
    - ARDUINO® Uno V3 expansion connector
    - ST morpho extension pin headers for full access to all STM32 I/Os
  - Flexible power-supply options: ST-LINK USB V_{BUS} or external sources
  - On-board ST-LINK debugger/programmer with USB re-enumeration capability: mass storage, Virtual COM port, and debug port
  - Comprehensive free software libraries and examples available with the STM32Cube MCU Package
  - Support of a wide choice of Integrated Development Environments (IDEs) including IAR Embedded Workbench®, MDK-ARM, and STM32CubeIDE
- Board-specific features
  - External SMPS to generate V_{core} logic supply
  - 24 MHz or 48 MHz HSE
  - Board connectors:
    - External SMPS experimentation dedicated connector
    - Micro-B or Mini-B USB connector for the ST-LINK
    - MIPI® debug connector

Description

The STM32 Nucleo-64 board provides an affordable and flexible way for users to try out new concepts and build prototypes by choosing from the various combinations of performance and power consumption features, provided by the STM32 microcontroller. For the compatible boards, the external SMPS significantly reduces power consumption in Run mode.

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.

The STM32 Nucleo-64 board does not require any separate probe as it integrates the ST-LINK debugger/programmer.

The STM32 Nucleo-64 board comes with the STM32 comprehensive free software libraries and examples available with the STM32Cube MCU Package.

1 Ordering information

To order an STM32 Nucleo-64 board, refer to Table 1. For a detailed description of each board, 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 reference	User manual	Target STM32	Differentiating features
NUCLEO-C031C6	MB1717	UM2953	STM32C031C6T6	• ST-LINK/V2-1 on Micro-B USB connector • 48 MHz HSE • LQFP48
NUCLEO-F030R8	MB1136	UM1724	STM32F030R8T6	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-F070RB			STM32F070RBT6	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-F072RB			STM32F072RBT6	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-F091RC			STM32F091RCT6U	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-F103RB			STM32F103RBT6	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-F302R8			STM32F302R8T6	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-F303RE			STM32F303RET6	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-F334R8			STM32F334R8T6	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-F401RE			STM32F401RET6U	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-F410RB			STM32F410RBT6U	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-F411RE			STM32F411RET6U	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-F446RE			STM32F446RET6U	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-G070RB	MB1360	UM2324	STM32G070RBT6	• ST-LINK/V2-1 on Micro-B USB connector • LQFP64

Order code	Board reference	User manual	Target STM32	Differentiating features
NUCLEO-G071RB	MB1360	UM2324	STM32G071RBT6	• ST-LINK/V2-1 on Micro-B USB connector • LQFP64
NUCLEO-G0B1RE			STM32G0B1RET6	• ST-LINK/V2-1 on Micro-B USB connector • LQFP64
NUCLEO-G431RB	MB1367	UM2505	STM32G431RBT6U	• STLINK-V3E on Micro-B USB connector • 24 MHz HSE • MIPI® debug connector • LQFP64
NUCLEO-G474RE			STM32G474RET6U	• STLINK-V3E on Micro-B USB connector • 24 MHz HSE • MIPI® debug connector • LQFP64
NUCLEO-G491RE			STM32G491RET6U	• STLINK-V3E on Micro-B USB connector • 24 MHz HSE • MIPI® debug connector • LQFP64
NUCLEO-L010RB	MB1136	UM1724	STM32L010RBT6	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-L053R8			STM32L053R8T6	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-L073RZ			STM32L073RZT6U	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-L152RE			STM32L152RET6	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-L412RB-P	MB1319	UM2206	STM32L412RBT6PU	• ST-LINK/V2-1 on Micro-B USB connector • External SMPS • LQFP64
NUCLEO-L433RC-P			STM32L433RCT6PU	• ST-LINK/V2-1 on Micro-B USB connector • External SMPS • LQFP64
NUCLEO-L452RE	MB1136	UM1724	STM32L452RET6U	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64
NUCLEO-L452RE-P	MB1319	UM2206	STM32L452RET6PU	• ST-LINK/V2-1 on Micro-B USB connector • External SMPS • LQFP64
NUCLEO-L476RG	MB1136	UM1724	STM32L476RGT6U	• ST-LINK/V2-1 on Mini-B USB connector • LQFP64

1.1 Product marking

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

- Product order code and product identification for the first sticker
- Board reference with revision, and serial number for the second sticker

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.

Evaluation tools marked as “ES” or “E” are not yet qualified and therefore not ready to be used as reference design or in production. Any consequences deriving from such usage will not be at ST charge. In no event, ST will be liable for any customer usage of these engineering sample tools as reference designs or in production.

“E” or “ES” 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.

In order to use the same commercial stack in his application, a developer may 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-XXYYZT NUCLEO-XXYYZT-P	Description	Example: NUCLEO-L452RE
XX	MCU series in STM32 Arm Cortex MCUs	STM32L4 Series
YY	MCU product line in the series	STM32L452
Z	STM32 package pin count • C for 48 pins • R for 64 pins	64 pins
T	STM32 Flash memory size: • 6 for 32 Kbytes • 8 for 64 Kbytes • B for 128 Kbytes • C for 256 Kbytes • E for 512 Kbytes • G for 1 Mbyte • Z for 192 Kbytes	512 Kbytes
-P	STM32 has external SMPS function	No SMPS

2 Development environment

STM32 32-bit microcontrollers are based on the Arm® Cortex®-M processor.

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

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, or USB Type-A or USB Type-C® to Mini-B cable (depending on the board reference)

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.

All other trademarks are the property of their respective owners.

2.2 Development toolchains

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

1. *On Windows® only.*

2.3 Demonstration software

The demonstration software, included in the STM32Cube MCU Package corresponding to the on-board microcontroller, is preloaded in the STM32 Flash memory for easy demonstration of the device peripherals in standalone mode. The latest versions of the demonstration source code and associated documentation can be downloaded from *www.st.com*.

Revision history

Table 3. **Document revision history**

Date	Revision	Changes
10-Feb-2014	1	Initial release.
13-Feb-2014	2	Added *Table 1: Device summary* and updated *Table 2: Ordering information*.
11-Apr-2014	3	Extended the applicability to NUCLEO-F302R8. Updated *Table 1: Device summary* and *Table 2: Ordering information*.
26-May-2014	4	Extended the applicability to NUCLEO-L053R8, NUCLEO-F072RB, NUCLEO-F334R8 and NUCLEO-F411RE. Updated *Table 1* and *Table 2*.
9-Sep-2014	5	Extended the applicability to NUCLEO-F091RC and NUCLEO-F303RE. Updated *Features*. Updated *Table 1: Device summary* and *Table 2: Ordering information*.
16-Dec-2014	6	Extended the applicability to NUCLEO-F070RB, NUCLEO-L073RZ and NUCLEO-L476RG. Updated *Table 1: Device summary* and *Table 2: Ordering information*.
8-Jul-2015	7	Extended the applicability to NUCLEO-F410RB, NUCLEO-F446RE. Updated *Table 1: Device summary* and *Table 2: Ordering information*.
29-Nov-2016	8	Extended the applicability to NUCLEO-L452RE. Updated *Table 1: Device summary* and *Table 2: Ordering information*. Added *Table 3: Codification explanation*.
16-Nov-2017	9	Extended document scope to the NUCLEO-L452RE-P and NUCLEO-L433RC-P boards: • Updated *Features* • Updated *Table 1: Device summary*, *Table 2: Ordering information* and *Table 3: Codification explanation* • Updated *System requirement*, *Development toolchains* and *Demonstration software*
15-Dec-2017	10	Updated *Features*, *Description* and *System requirement*. Extended document scope to the NUCLEO-L010RB board: updated *Table 1: Device summary* and *Table 2: Ordering information*.
24-Aug-2018	11	Extended document scope to the NUCLEO-L412RB-P board: updated *Table 1: Device summary* and *Table 2: Ordering information*.
22-Oct-2018	12	Extended document scope to the NUCLEO-G070RB and NUCLEO-G071RB boards: • Updated *Table 1: Device summary* and *Table 2: Ordering information* • Added NUCLEO-GXXXRX top view on the cover page
8-Apr-2019	13	Revised the entire document to accommodate to multiple feature combinations: • Reorganized *Features* • Updated *Description* • Added *Ordering information* and *Development environment* • Updated *Table 1. List of available products* and *Table 2. Codification explanation* Extended document scope to the NUCLEO-G431RB and NUCLEO-G474RE boards.
25-Oct-2020	14	Extended document scope to the NUCLEO-G0B1RE and NUCLEO-G491RE: updated *List of available products*.

Date	Revision	Changes
17-Dec-2021	15	Extended document scope to the NUCLEO-C031C6. Updated ST-LINK USB connectors in List of available products. Removed the references to Arm® Mbed™.

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