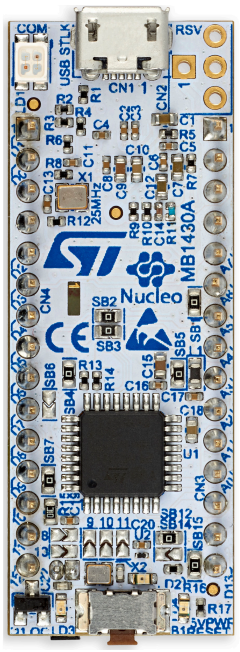
NUCLEO-xxxxKx

Data brief

STM32 Nucleo-32 boards



NUCLEO-G431KB example. Designs with different references show different layouts. Picture is not contractual. PCB color may differ.

Product link
NUCLEO-xxxxKx
NUCLEO-F031K6, NUCLEO-F042K6, NUCLEO-F301K8, NUCLEO-F303K8, NUCLEO-G031K8, NUCLEO-G431KB, NUCLEO-L011K4, NUCLEO-L031K6, NUCLEO-L412KB, NUCLEO-L432KC

Features

Common features

- STM32 microcontroller in a 32-pin package
- 1 user LED
- 1 reset push-button
- Board connectors:
  - ARDUINO® Nano V3 expansion connector
  - Micro-AB USB connector for the ST-LINK
- 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

Feature specific to some of the boards (refer to the ordering information section of the data brief for details):

- 24 MHz crystal oscillator

Description

The STM32 Nucleo-32 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.

The ARDUINO® Nano V3 connectivity support allows the easy expansion of the functionality of the STM32 Nucleo open development platform with a wide choice of specialized shields.

The STM32 Nucleo-32 board does not require any separate probe as it integrates the ST-LINK debugger/programmer.

The STM32 Nucleo-32 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-32 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

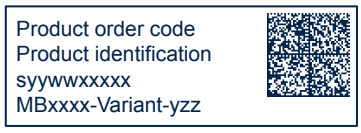
Order code	Board reference	User manual	Target STM32	Differentiating feature
NUCLEO-F031K6	MB1180	UM1956	STM32F031K6T6	• ST-LINK/V2-1
NUCLEO-F042K6			STM32F042K6T6	• ST-LINK/V2-1
NUCLEO-F301K8			STM32F301K8T6	• ST-LINK/V2-1
NUCLEO-F303K8			STM32F303K8T6	• ST-LINK/V2-1
NUCLEO-G031K8	MB1455	UM2591	STM32G031K8T6	• ST-LINK/V2-1
NUCLEO-G431KB	MB1430	UM2397	STM32G431KBT6	• STLINK-V3E • 24 MHz crystal oscillator
NUCLEO-L011K4	MB1180	UM1956	STM32L011K4T6	• ST-LINK/V2-1
NUCLEO-L031K6			STM32L031K6T6	• ST-LINK/V2-1
NUCLEO-L412KB			STM32L412KBU6	• ST-LINK/V2-1
NUCLEO-L432KC			STM32L432KCU6	• ST-LINK/V2-1

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:

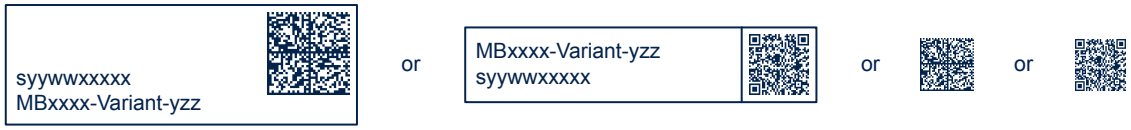
  

  Dual-sticker example:

- 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-XXYYKT	Description	Example: NUCLEO-G431KB
XX	MCU series in STM32 32-bit Arm Cortex MCUs	STM32G4 series
YY	MCU product line in the series	STM32G431
K	STM32 package pin or ball count	32 pins
T	STM32 flash memory size: • 4 for 16 Kbytes • 6 for 32 Kbytes • 8 for 64 Kbytes • B for 128 Kbytes • C for 256 Kbytes	128 Kbytes

2 Development environment

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

arm

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2.1 System requirements

- Multi-OS support: Windows® 10 or 11, Linux® 64-bit, or macOS®
- USB Type-A or USB Type-C® to Micro-B cable

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) (2)
- STMicroelectronics - STM32CubeIDE

1. *On Windows® only.*
2. *Free MDK-ARM for Arm® Cortex®-M0/M0+ cores.*

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*.

2.4 EDA resources

All board design resources, including schematics, EDA databases, manufacturing files, and the bill of materials, are available from the corresponding product page at *www.st.com*.

Revision history

Table 3. **Document revision history**

Date	Revision	Changes
08-Sep-2015	1	Initial release.
15-Jan-2016	2	Added *Table 1: Device summary* and updated *Table 2: Ordering information*.
09-Jun-2016	3	Updated S*ection : Description* and *Section : System requirements* to add NUCLEO-L432KC.
07-Jul-2017	4	Updated *Features*.
23-Aug-2018	5	Extended document scope to NUCLEO-L412KB. Updated *Table 1: Device summary*, *System requirements*, *Development toolchains*, and *Ordering information*. Added *Demonstration software*.
13-Nov-2018	6	Extended document scope to NUCLEO-F301K8: updated *Features*, *Table 1: Device summary*, and *Table 2: Ordering information*.
10-May-2019	7	Revised the entire document to accommodate multiple feature combinations: • Reorganized *Features* • Updated *Description* • Updated *Ordering information* • Added *Development environment* • Updated *Table 1. List of available products* and *Table 2. Codification explanation* Extended document scope to the NUCLEO-G431KB board.
05-Jun-2019	8	Extended document scope to the NUCLEO-G031K8 board. Global product description: updated *Features*, *Ordering information*, and *System requirements*.
02-Apr-2026	9	Updated: • Target STM32 references in Table 1. List of available products • Section 1.1: Product marking • Global development environment in Section Features, Section 2.1: System requirements, and Section 2.2: Development toolchains Added: • Section 2.4: EDA resources Removed the references to Arm® Mbed™.