NUCLEO-XXXXRX
NUCLEO-XXXXRX-P

STM32 Nucleo-64 boards

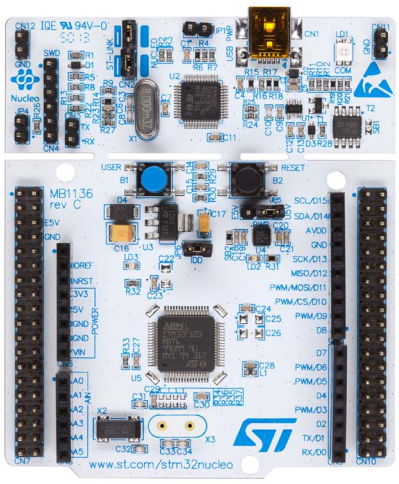
Data brief

Features

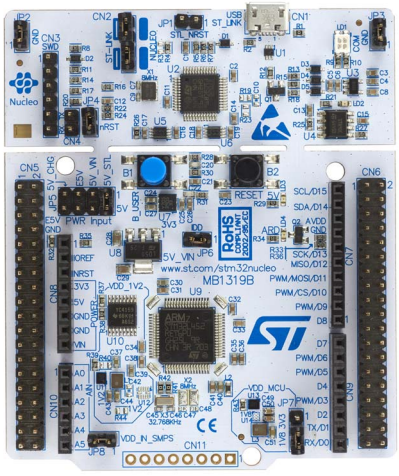
- STM32 microcontroller in LQFP64 package
- SMPS: significantly reduces power consumption in Run mode, by generating Vcore logic supply from an external DC/DC converter. This function is only available on '-P' suffixed boards
- 1 user LED shared with Arduino™
- 1 user and 1 reset push-buttons
- 32.768 kHz LSE crystal oscillator
- Board expansion connectors:
  - Arduino™ Uno V3
  - ST morpho extension pin headers for full access to all STM32 I/Os
  - External SMPS experimentation dedicated connector. This function is only available on '-P' suffixed boards
- Flexible power-supply options: ST-LINK USB V_{BUS} or external sources
- On-board ST-LINK/V2-1 debugger/programmer with USB re-enumeration capability. Three different interfaces supported on USB: 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™, Keil®, GCC-based IDEs, Arm® Mbed™
- Arm® Mbed Enabled™ compliant (only for some Nucleo part numbers)

Table 1. Device summary

Reference	Part number
NUCLEO-XXXXRX (-P)	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-L053R8, NUCLEO-L073RZ, NUCLEO-L152RE, NUCLEO-L452RE, NUCLEO-L476RG, NUCLEO-L452RE-P, NUCLEO-L433RC-P.



Top view of a NUCLEO-XXXRX board.



Top view of a NUCLEO-XXXXRX-P board with SMPS.

Pictures are not contractual.

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Description

The STM32 Nucleo board provides an affordable and flexible way for users to try out new concepts and build prototypes with the STM32 microcontroller, choosing from the various combinations of performance, power consumption and features. The Arduino™ Uno V3 connectivity support and the ST Morpho headers allow to expand easily the functionality of the STM32 Nucleo open development platform with a wide choice of specialized shields. The STM32 Nucleo board does not require any separate probe as it integrates the ST-LINK/V2-1 debugger and programmer. The STM32 Nucleo board comes with the STM32 comprehensive software HAL library together with various packaged software examples, as well as direct access to the Arm® Mbed™ online resources at http://mbed.org.

System requirement

- Windows® OS (7 and 8), Linux® 64-bit or macOS®
- USB Type-A to Mini-B cable or USB Type-A to Micro-B cable

Development toolchains

- Keil®: MDK-ARM(a)
- IAR™: EWARM(a)
- GCC-based IDEs (free AC6: SW4STM32, Atollic TrueSTUDIO®(a) and others)
- Arm® Mbed™ online(b) (see http://mbed.org)

Demonstration software

The demonstration software, included in the STM32Cube MCU Package, 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 the www.st.com/stm32nucleo website.

a. On Windows® only.

b. Refer to the https://www.mbed.com website and to *Table 2: Ordering information*, to determine which Nucleo-board order codes are supported.

Ordering information

Table 2 lists the order codes and the respective targeted STM32.

Table 2. Ordering information

Order code	Targeted STM32
NUCLEO-F030R8(1)	STM32F030R8T6
NUCLEO-F070RB(1)	STM32F070RBT6
NUCLEO-F072RB(1)	STM32F072RBT6
NUCLEO-F091RC(1)	STM32F091RCT6
NUCLEO-F103RB(1)	STM32F103RBT6
NUCLEO-F302R8(1)	STM32F302R8T6
NUCLEO-F303RE(1)	STM32F303RET6
NUCLEO-F334R8(1)	STM32F334R8T6
NUCLEO-F401RE(1)	STM32F401RET6
NUCLEO-F410RB(1)	STM32F410RBT6
NUCLEO-F411RE(1)	STM32F411RET6
NUCLEO-F446RE(1)	STM32F446RET6
NUCLEO-L053R8(1)	STM32L053R8T6
NUCLEO-L073RZ(1)	STM32L073RZT6
NUCLEO-L152RE(1)	STM32L152RET6
NUCLEO-L452RE	STM32L452RET6
NUCLEO-L476RG(1)	STM32L476RGT6
NUCLEO-L433RC-P	STM32L433RCT6P
NUCLEO-L452RE-P	STM32L452RET6P

1. Arm® Mbed Enabled™.

The meaning of the NUCLEO-TXXXRY-P codification is explained in *Table 3* with an example:

Table 3. Codification explanation

NUCLEO-TXXXRY-P	Description	Example: NUCLEO-L452RE
TXXX	STM32 product line	STM32L452
R	STM32 package pin count	64 pins
Y	STM32 Flash memory size: – 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 = SMPS	MCU has SMPS function	-

The order code is printed on a sticker placed at the top or bottom side of the board.

Revision history

Table 4. 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*.
09-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*.
08-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*

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