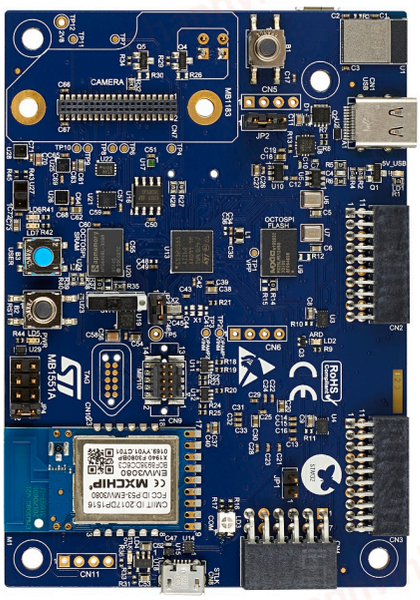
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B-U585I-IOT02A

Data brief

Discovery kit for IoT node with STM32U5 Series



B-U585I-IOT02A top view. Picture is not contractual.

Product status link
B-U585I-IOT02A

Features

- Ultra-low-power STM32U585AII6Q microcontroller based on the Arm® Cortex®-M33 core with Arm® TrustZone®, 2 Mbytes of Flash memory and 786 Kbytes of SRAM, and SMPS in UFBGA169 package
- 512-Mbit Quad-SPI Flash memory, 64-Mbit Octo-SPI PSRAM, 256-Kbit I^2C EEPROM
- USB FS, Sink and Source power, 2.5 W power capability
- 802.11 b/g/n compliant Wi-Fi® module from MXCHIP
- Bluetooth® Low Energy from STMicroelectronics
- MEMS sensors from STMicroelectronics
  - 2 digital microphones
  - Relative humidity and temperature sensor
  - 3-axis magnetometer
  - 3D accelerometer and 3D gyroscope
  - Pressure sensor, 260-1260 hPa absolute digital output barometer
  - Time-of-flight and gesture-detection sensor
- Ambient-light sensor
- Authentication and security for peripherals and IoT devices from STMicroelectronics
- 2 user LEDs
- User push-button
- Reset push-button
- Board connectors
  - USB Type-C®
  - ARDUINO® Uno V3 expansion connectors
  - Camera module expansion connector
  - 2× STMod+ expansion connectors
  - Pmod™ expansion connector
- Flexible power-supply options: ST-LINK USB V_{BUS}, USB connector, or external sources
- On-board STLINK-V3E debugger/programmer with USB re-enumeration capability: mass storage, Virtual COM port, and debug port
- Comprehensive free software libraries and examples available with the STM32CubeU5 MCU Package
- Support of a wide choice of Integrated Development Environments (IDEs) including IAR Embedded Workbench®, MDK-ARM, and STM32CubeIDE

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1 Description

The B-U585I-IOT02A Discovery kit provides a complete demonstration and development platform for the STM32U585AI microcontroller, featuring an Arm® Cortex®-M33 core with Arm® TrustZone® and Armv8-M mainline security extension, 2 Mbytes of Flash memory and 786 Kbytes of SRAM, as well as smart peripheral resources.

This Discovery kit enables a wide diversity of applications by exploiting low-power communication, multiway sensing, and direct connection to cloud servers.

It includes Wi-Fi® and Bluetooth® modules, as well as microphones, temperature and humidity, magnetometer, accelerometer and gyroscope, pressure, time-of-flight, and gesture-detection sensors.

The support for ARDUINO® Uno V3, STMod+, and Pmod™ connectivity provides unlimited expansion capabilities with a large choice of specialized add-on boards.

For even more user-friendliness, the on-board STLINK-V3E debugger provides out-of-the-box loading and debugging capabilities, as well as a USB Virtual COM port bridge.

The B-U585I-IOT02A Discovery kit leverages the STM32U5 Series key assets to enable prototyping for a variety of wearable or sensor applications in fitness, metering, industrial, or medical, with state-of-the-art energy efficiency and higher security.

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2 Ordering information

To order the B-U585I-IOT02A Discovery kit, 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. Ordering information

Order code	Board reference	User manual	Target STM32
B-U585I-IOT02A	MB1551	UM2839	STM32U585AII6Q

2.1 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.

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2.2 Codification

The meaning of the codification is explained in Table 2.

Table 2. Codification explanation

B-XXXXM-AAANNT	Description	B-U585I-IOT02A
B	Discovery kit with application focus	Discovery kit for IoT node
XXXX	MCU product line in STM32 32-bit Arm Cortex MCUs	STM32U575/585 in the STM32U5 Series of ultra-low-power microcontrollers
M	STM32 Flash memory size: • I for 2 Mbytes	2 Mbytes
AAA	Application focus: • IOT for Internet of Things	Internet of Things
NN	Sequential number	Second Discovery kit for IoT node (after B-L475E-IOT01A and its B-L4S5I-IOT01A upgrade)
T	Connector type: • A for ARDUINO® • M for ST morpho • Z for Zio connector	ARDUINO® connector

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3 Development environment

The B-U585I-IOT02A runs with the STM32U585AI 32-bit microcontroller based on the Arm® Cortex®-M33 core with Arm® TrustZone® and the Armv8-M mainline security extension.

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

3.1 System requirements

- Multi-OS support: Windows® 10, 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.
Linux® is a registered trademark of Linus Torvalds.
All other trademarks are the property of their respective owners.

3.2 Development toolchains

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

1. *On Windows® only.*

3.3 Demonstration software

The demonstration software, included in the STM32CubeU5 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 *www.st.com*.

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4 Laser consideration

The VL53L5 contains a laser emitter and the corresponding drive circuitry. The laser output is designed to remain within Class 1 laser safety limits under all reasonably foreseeable conditions including single faults in compliance with IEC 60825-1:2014 (third edition). The laser output remains within Class 1 limits as long as the STMicroelectronics recommended device settings are used and the operating conditions specified in the STM32U5 datasheets are respected. The laser output power must not be increased by any means and no optics used to focus the laser beam. Figure 1 shows the warning label for Class 1 laser products.

Figure 1. Class 1 laser product label



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Revision history

Table 3. **Document revision history**

Date	Revision	Changes
23-Feb-2021	1	Initial release.
22-Sep-2021	2	Updated for Arm® Mbed™ compliance in *Features* and *Development toolchains*. Board Flash memory description updated in *Features*.
10-Dec-2021	3	Updated Codification. Removed the references to Arm® Mbed™.

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