



M5STACK

StopWatch

1. Description

StopWatch is a compact round smart terminal built for on-the-go interaction. Featuring an ESP32-S3R8 with 16MB Flash and 8MB PSRAM, it supports reliable 2.4GHz Wi-Fi +BLE communication. Its AMOLED touch display, programmable keys, and haptic vibration motor create a responsive and user-friendly experience. Combined with audio I/O, IMU sensing, RTC support, and versatile expansion options, StopWatch is a practical platform for timing tools, wearable interfaces, portable dashboards, and embedded IoT projects.



2. Specifications

Specification	Parameters
SoC	ESP32-S3R8 @ Dual-core Xtensa LX7 Processor, up to 240MHz
PSRAM	8MB
Flash	16MB
Communication	2.4 GHz Wi-Fi;BLE
Display	Touch-enabled circular AMOLED display
Keys	2 x programmable keys + 1 x power key
Haptic Feedback	Built-in vibration motor
Audio Codec	ES8311
Microphone	MEMS MIC
Audio Amplifier	AW8737A
IMU	BMI270 + BMM150
RTC	RX8130CE
Expansion Port	HY2.0-4P
Rear Expansion Bus	2.54 1x7P, 2.54 1x6P
Mechanical Design	Lanyard hole
Power Management	M5PM1 multi-stage power management
Battery Capacity	450mAh
Power Input	USB Type-C, DC 5V
Frequency Range for CE	2.4GWi-Fi:2412-2472MHz BLE:2402-2480MHz
Maximum EIRP for CE	2.4GWi-Fi: 15.25 dBm BLE:7.26 dBm
Hardware version NO.	V1.0
Software version NO.	V1.0

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3. Quick Start

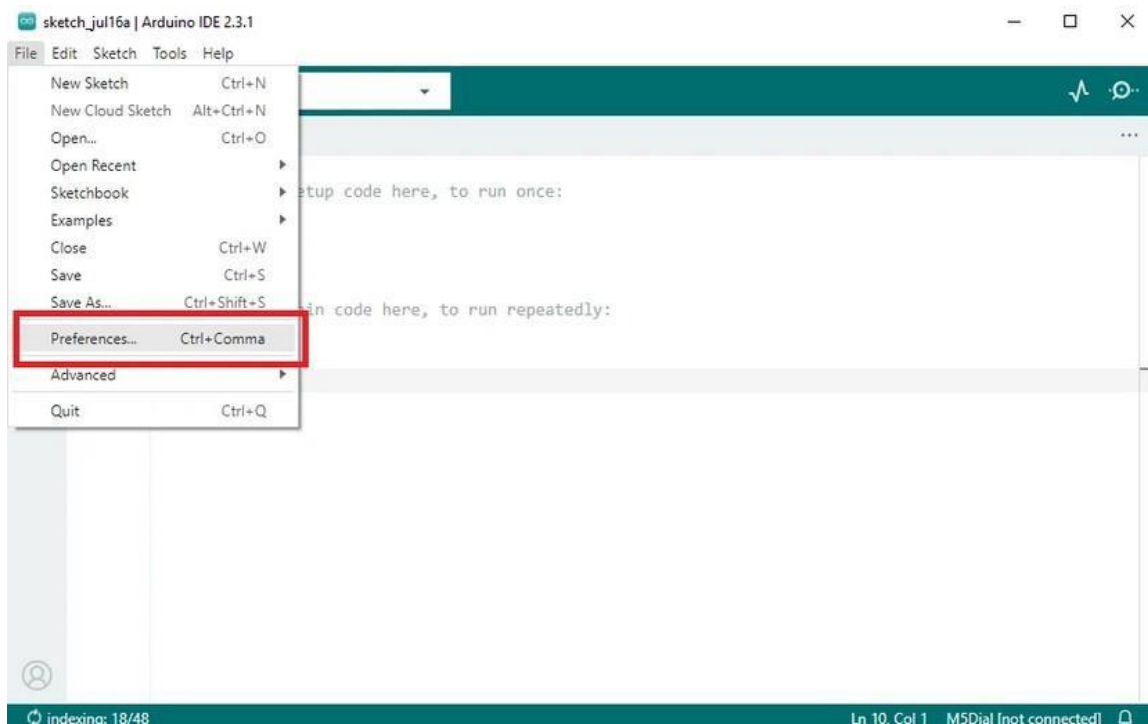
3.1 Preparation

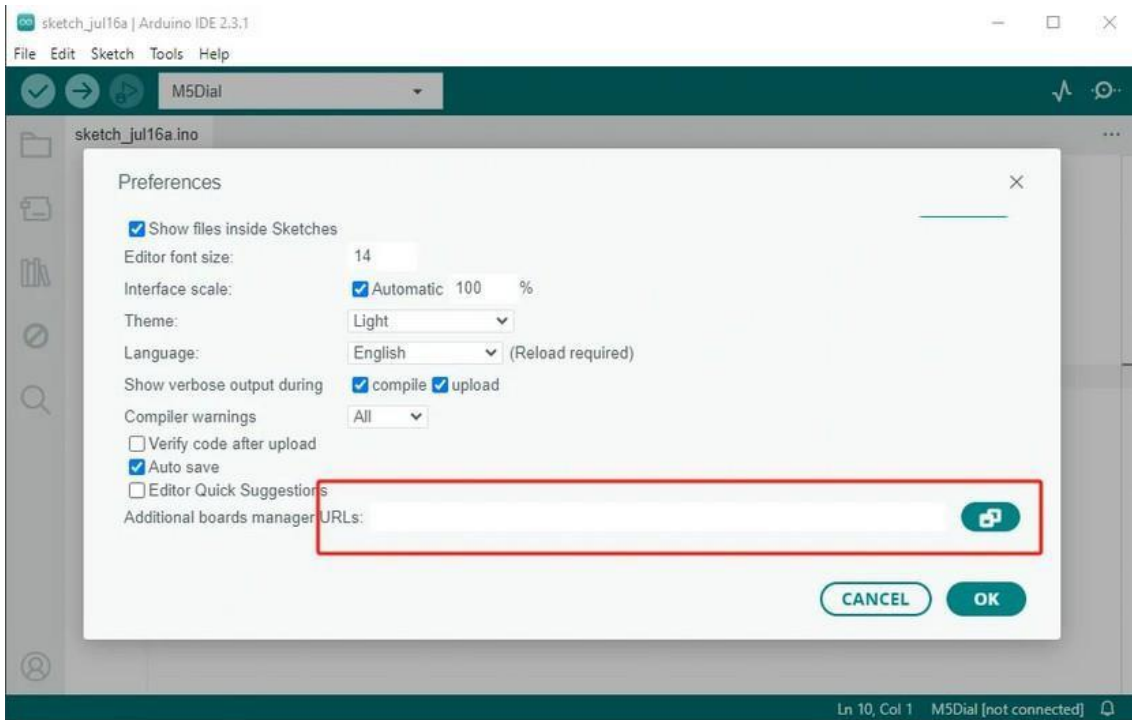
1. Visit the official Arduino website and install the Arduino IDE

<https://www.arduino.cc/en/Main/Software>

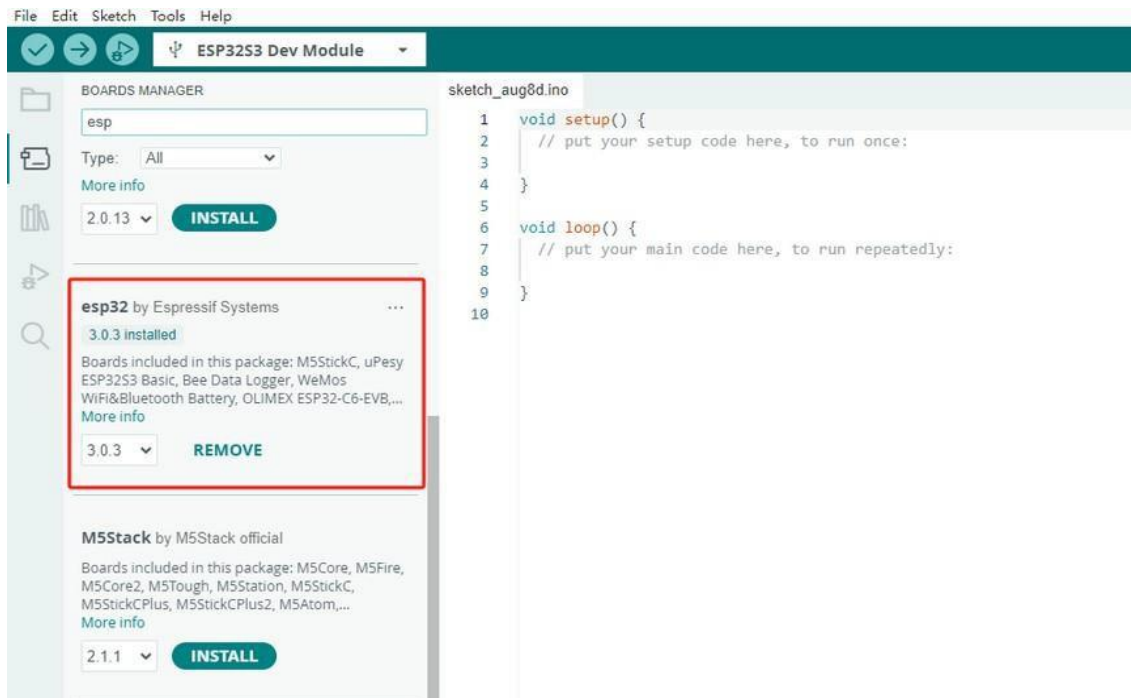
2. Add the following Board Manager URL to File → Preferences → Additional Boards Manager URLs:

https://espressif.github.io/arduino-esp32/package_esp32_dev_index.json



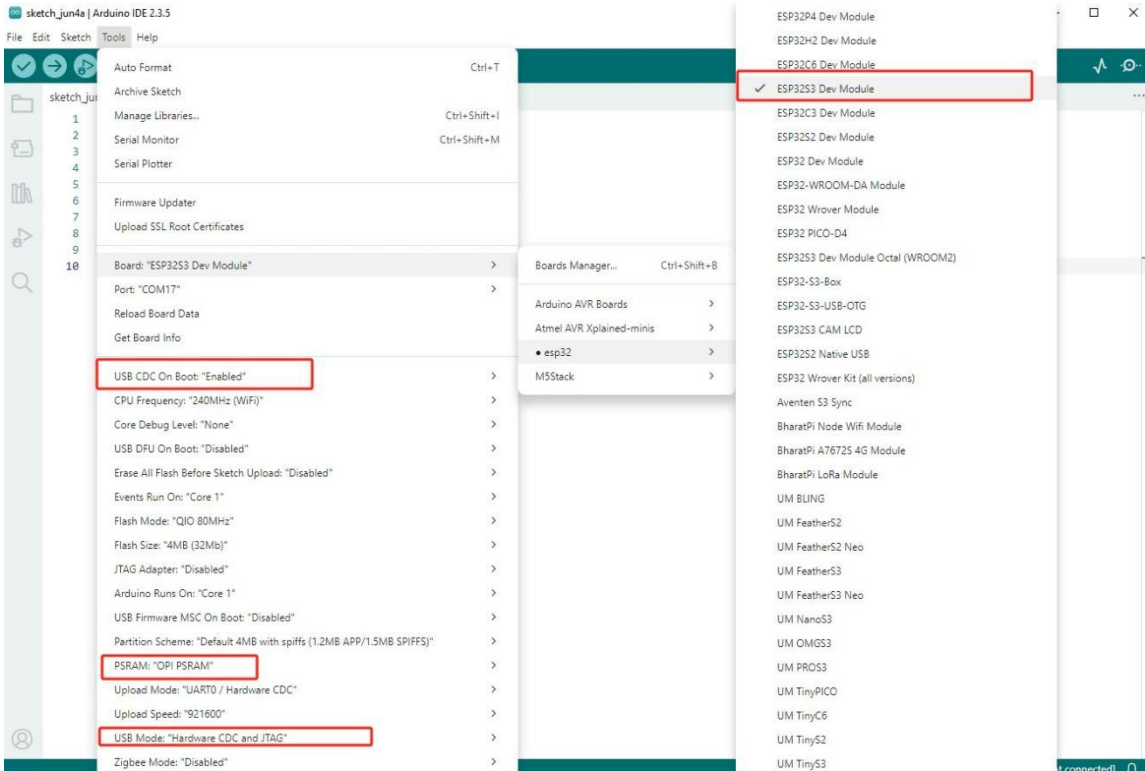


3. Open the Boards Manager, search for "ESP32", and click install.



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4. After installation, select the board "ESP32S3 Dev Module"
5. Configure the following options. USB CDC On Boot: "Enabled", PSRAM: "OPI PSRAM", USB Mode: "Hardware CDC and JTAG"

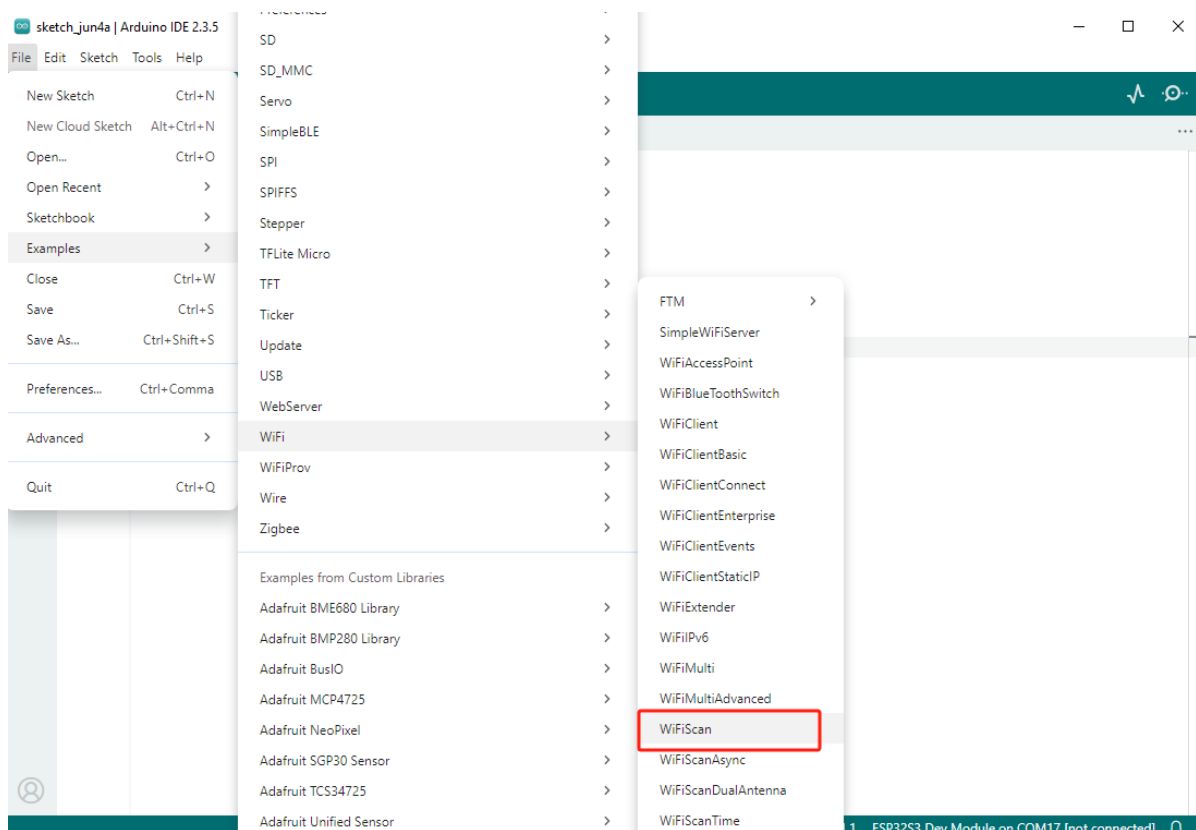


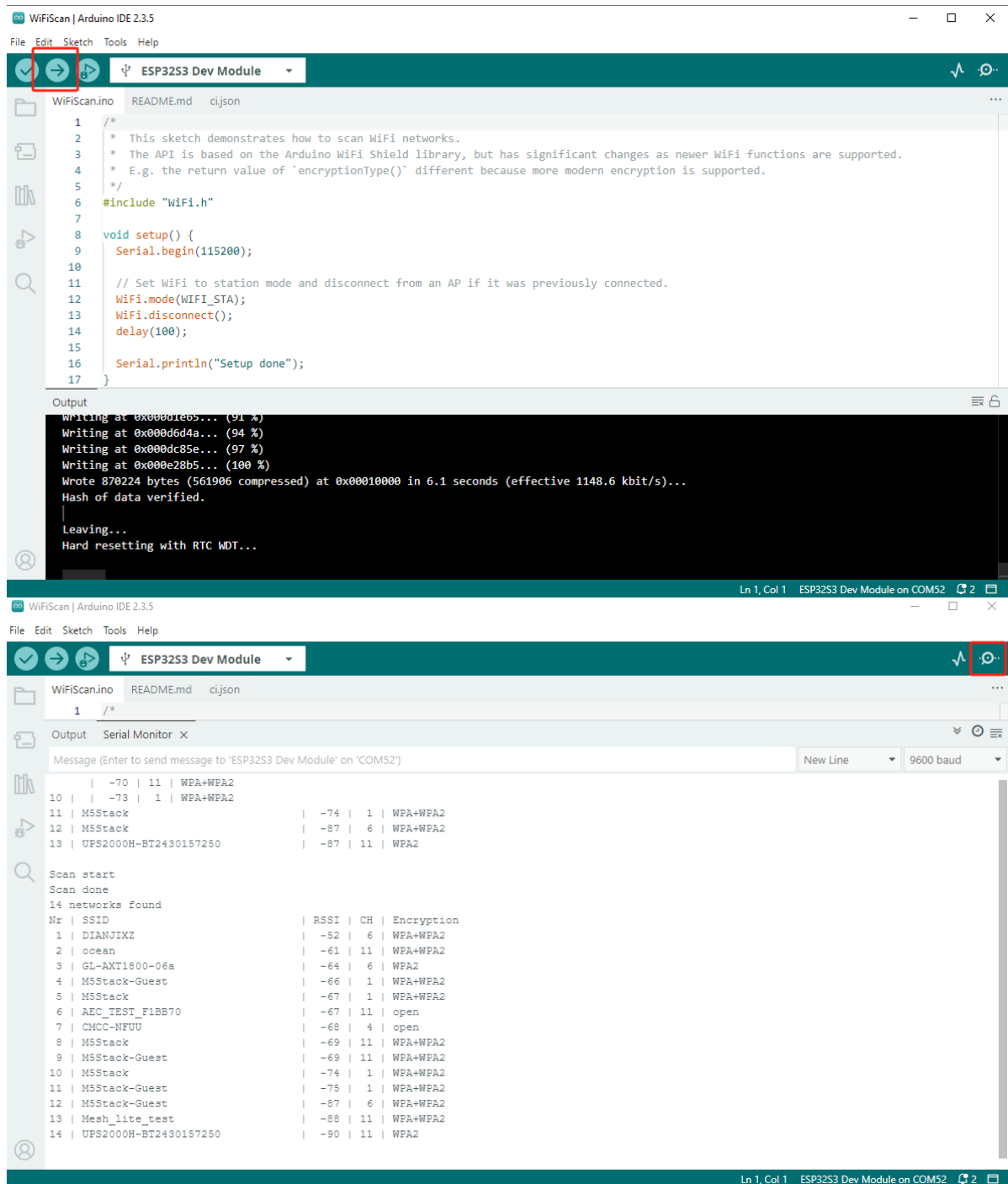
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3.2 Wi-Fi Scan

Select the example program "Examples" → "WiFi" → "WiFiScan", choose the port corresponding to your device, and click the compile and upload button in the top-left corner. After uploading is complete, open the Serial Monitor to view Wi-Fi scan information.

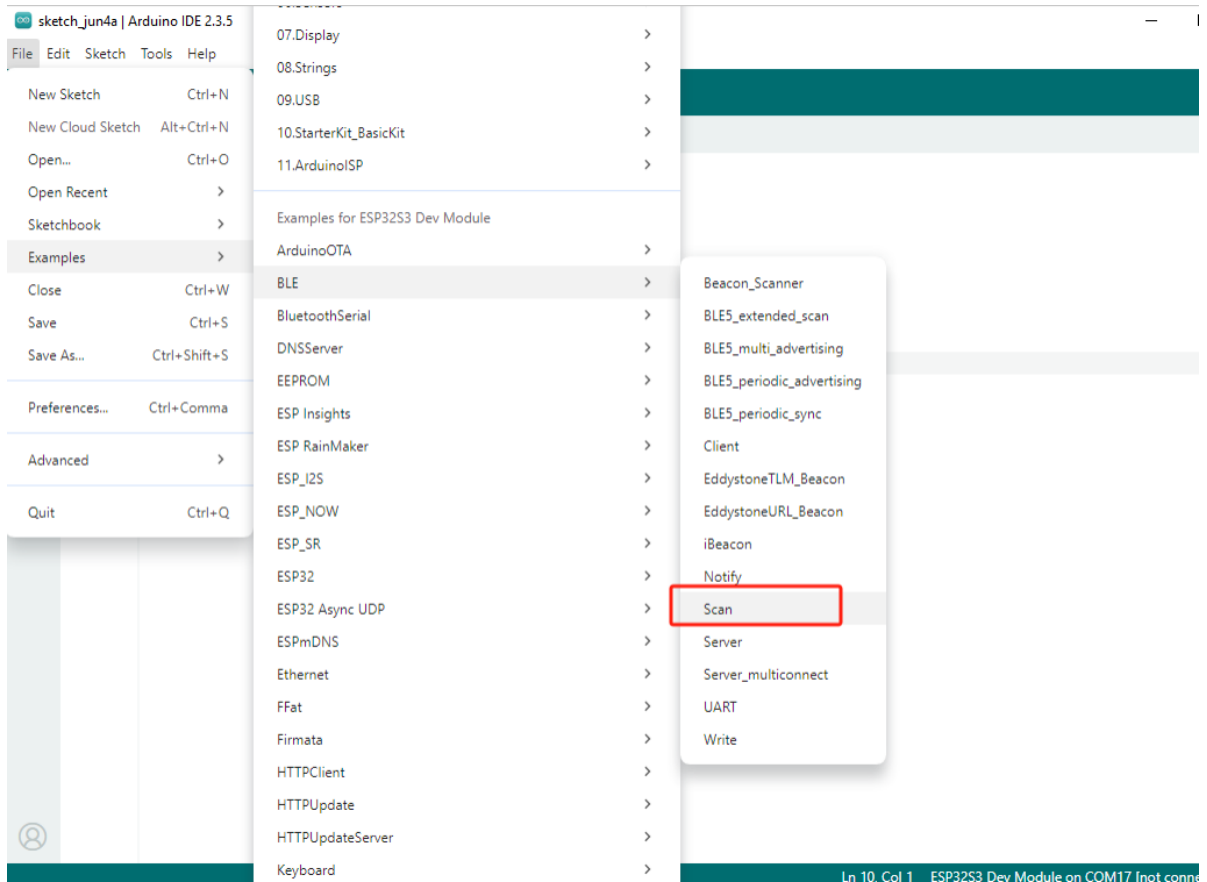
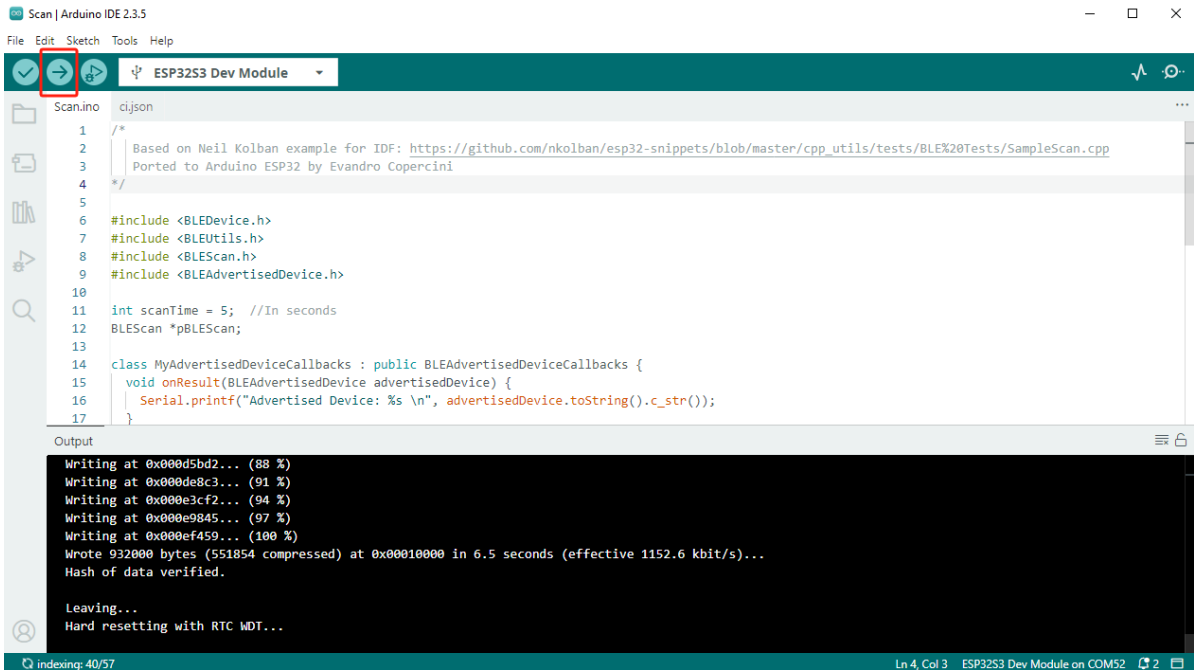




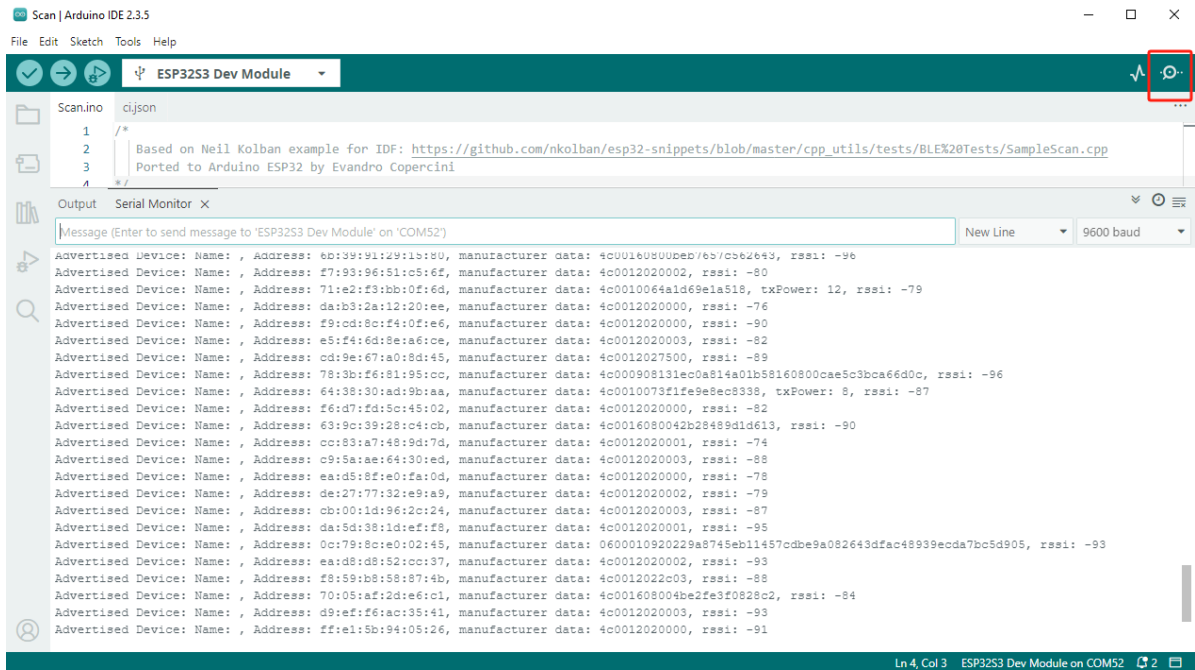
3.3 BLE Scan

Select the example program "Examples" → "BLE" → "Scan", choose the port corresponding to your device, and click the compile and upload button in the top-left corner. After uploading is complete, open the Serial Monitor to view BLE scan information.

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4. FCC Warning

FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna. — Increase the separation between the equipment and receiver. — Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. The device has been tested and comply with FCC SAR limits.