



M5STACK

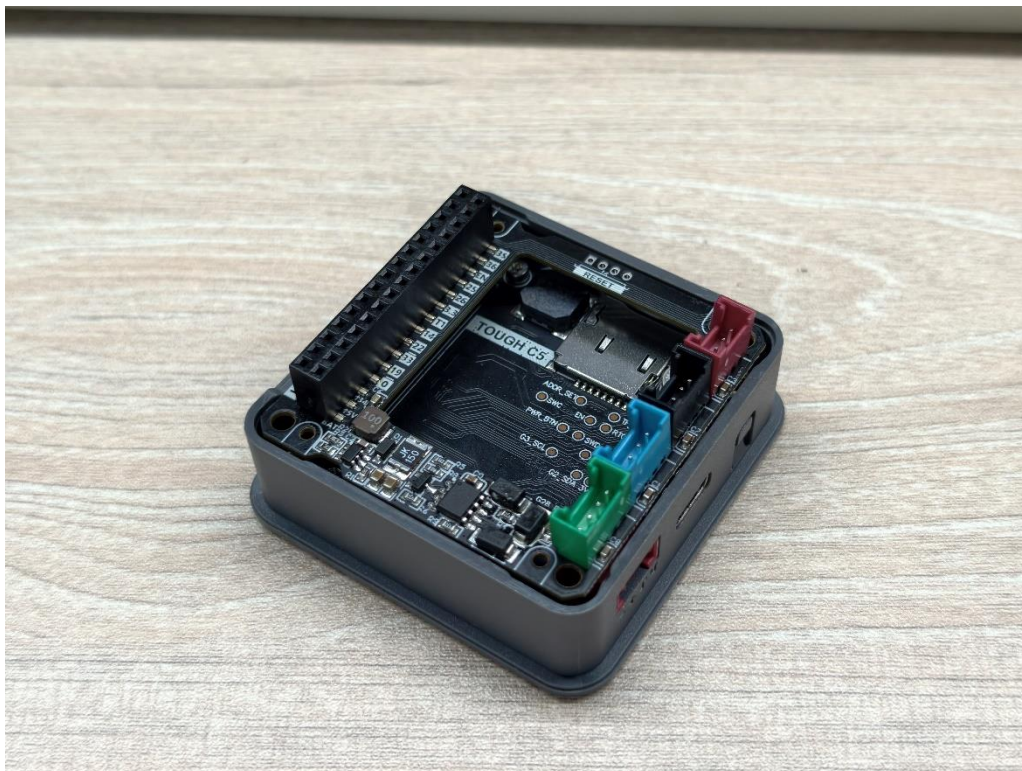
ToughC5

1. Description

ToughC5 is a highly integrated programmable embedded controller built on the Espressif ESP32-C5HR8 chip, designed for IoT applications that require efficient, stable wireless communication and local human-machine interaction. It supports multi-protocol connectivity, including 2.4 GHz & 5 GHz, meeting device access and data communication requirements across diverse network scenarios.

Equipped with a 32-bit single-core RISC-V processor running at up to 240 MHz, the controller integrates 8 MB Flash and 8 MB PSRAM, along with rich hardware peripherals such as a 2.0-inch 320 x 240 full-color IPS display, high-sensitivity capacitive touch panel, microSD card slot, USB Type-C port, HY2.0-4P expansion ports, M5-Bus expansion interface, and an independent peripheral expansion board. Its multi-power-domain design and PYB IOEXP peripheral control system further enhance expandability and deployment flexibility in complex applications.

While delivering reliable wireless connectivity, an intuitive interaction experience, and extensive peripheral expansion capabilities, ToughC5 helps developers accelerate prototype verification and streamline product deployment for industrial field control, smart buildings, edge data acquisition nodes, industrial gateways, and other IoT scenarios.



2. Specifications

Specification	Parameters
SoC	ESP32-C5HR8, RISC-V 32-bit single-core processor, up to 240 MHz
SRAM	384KB
Flash	8MB
Wi-Fi	2.4 & 5 GHz dual-band Wi-Fi 6
BLE	BLE 5
USB Interface	USB Type-C
Input Voltage	USB 5V / RS485 interface 6 ~ 24V
Antenna Interface	IPEX-4
Dual-band Duplexer	LFD182G45DCHD481 (shared antenna for 2.4 & 5 GHz)
Display	2.0-inch 320 × 240 full-color IPS display
Touch Panel	Capacitive touch panel, CHSC6540 driver IC
USB-to-UART IC	CH9102
microSD Slot	Supports up to 16GB memory card
Grove Interface	RS485 / I2C / GPIO / UART
Expansion Interface	2 × 15P expansion header

3. Quick Start

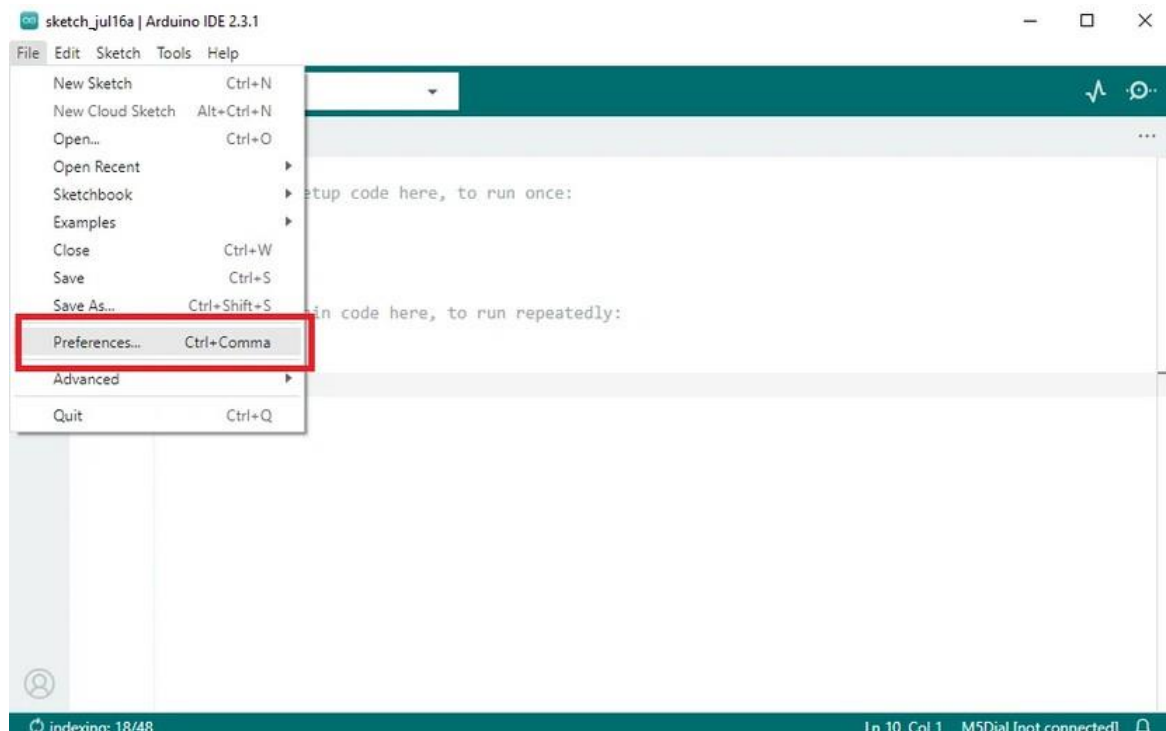
3.1 Preparation

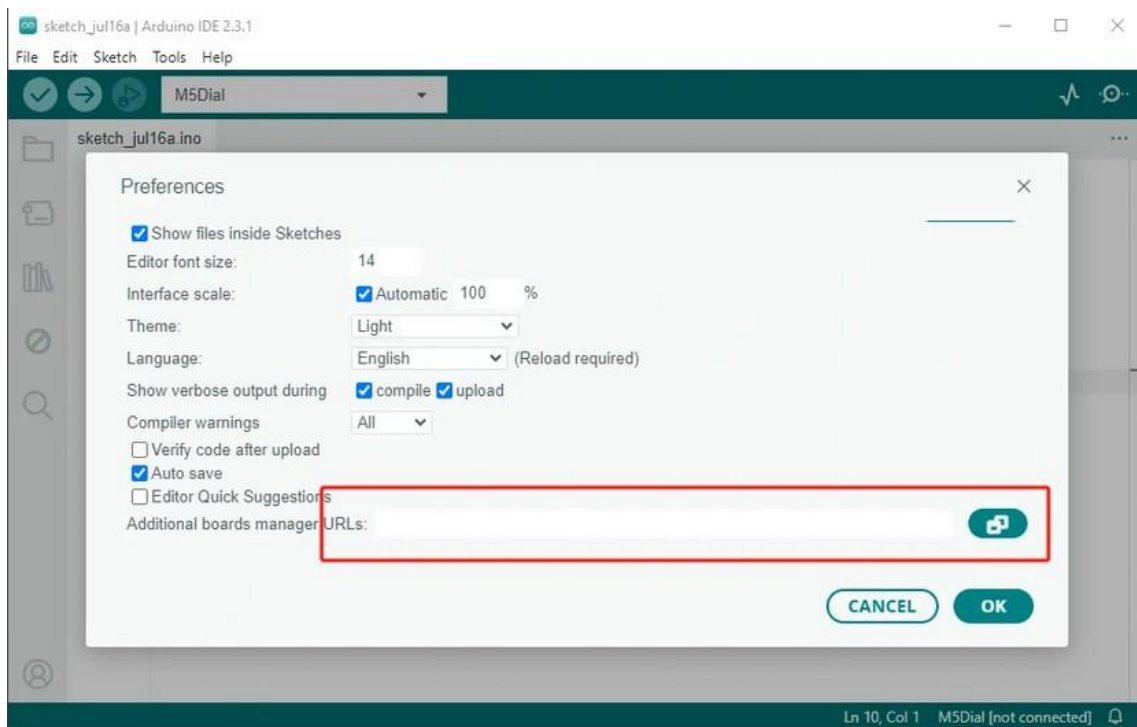
1. Visit the official Arduino website and install the Arduino IDE

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

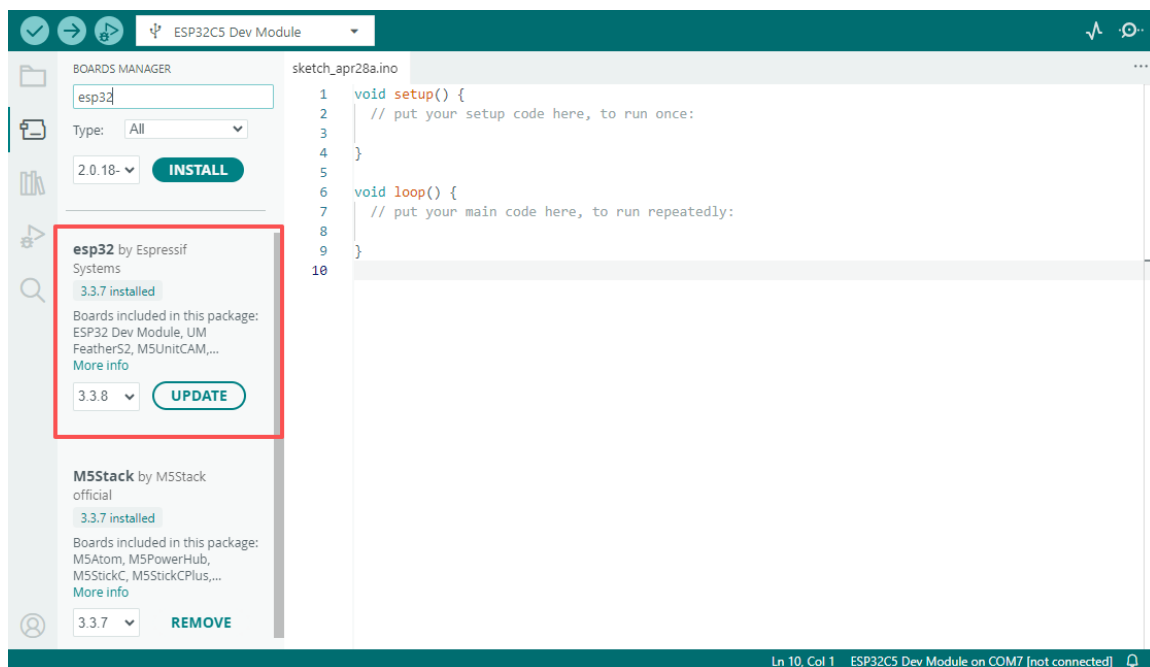
2. Add the following Board Manager URL to File → Preferences → Additional Boards Manager URLs:

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

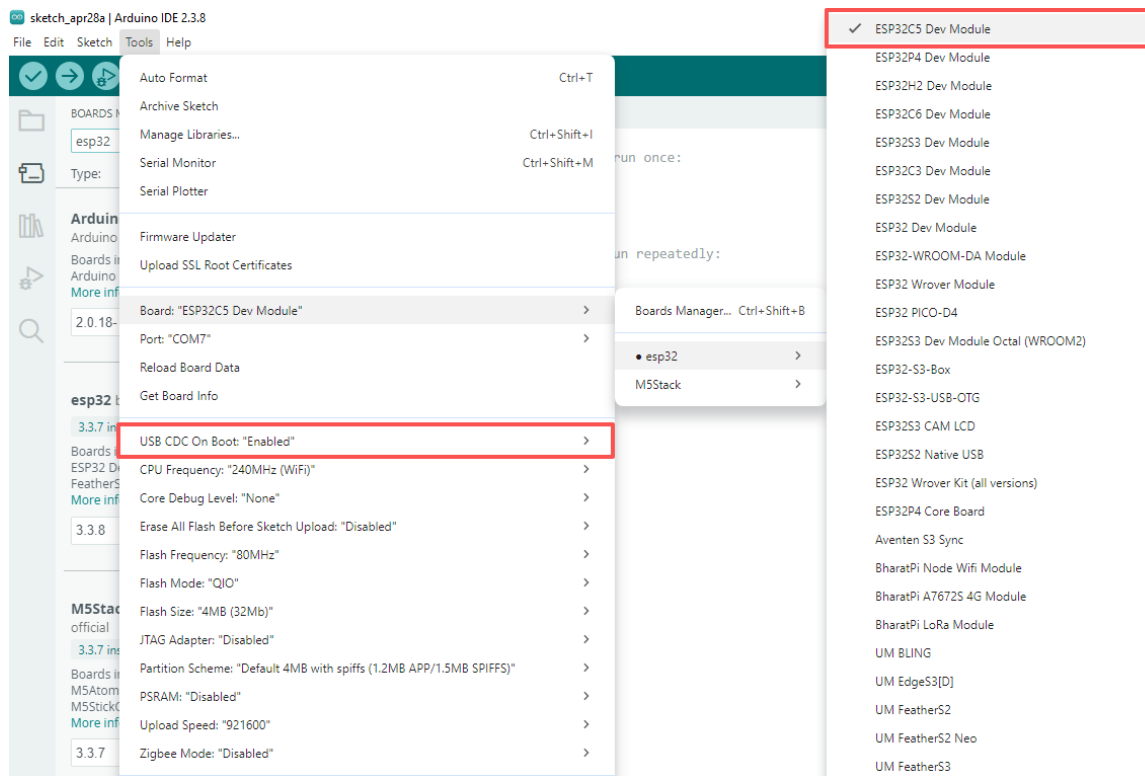




3. Open the Boards Manager, search for "ESP32", and click install.



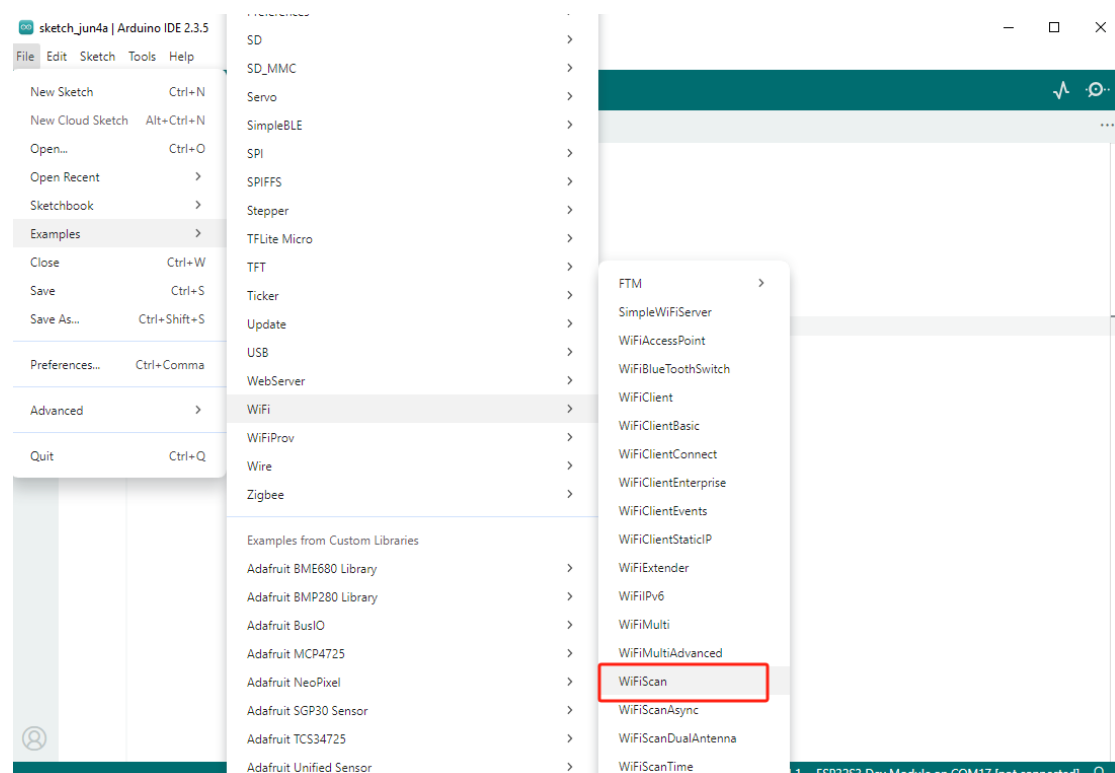
4. After installation, select the board "ESP32C5 Dev Module"
5. Configure the following options. USB CDC On Boot: "Enabled"

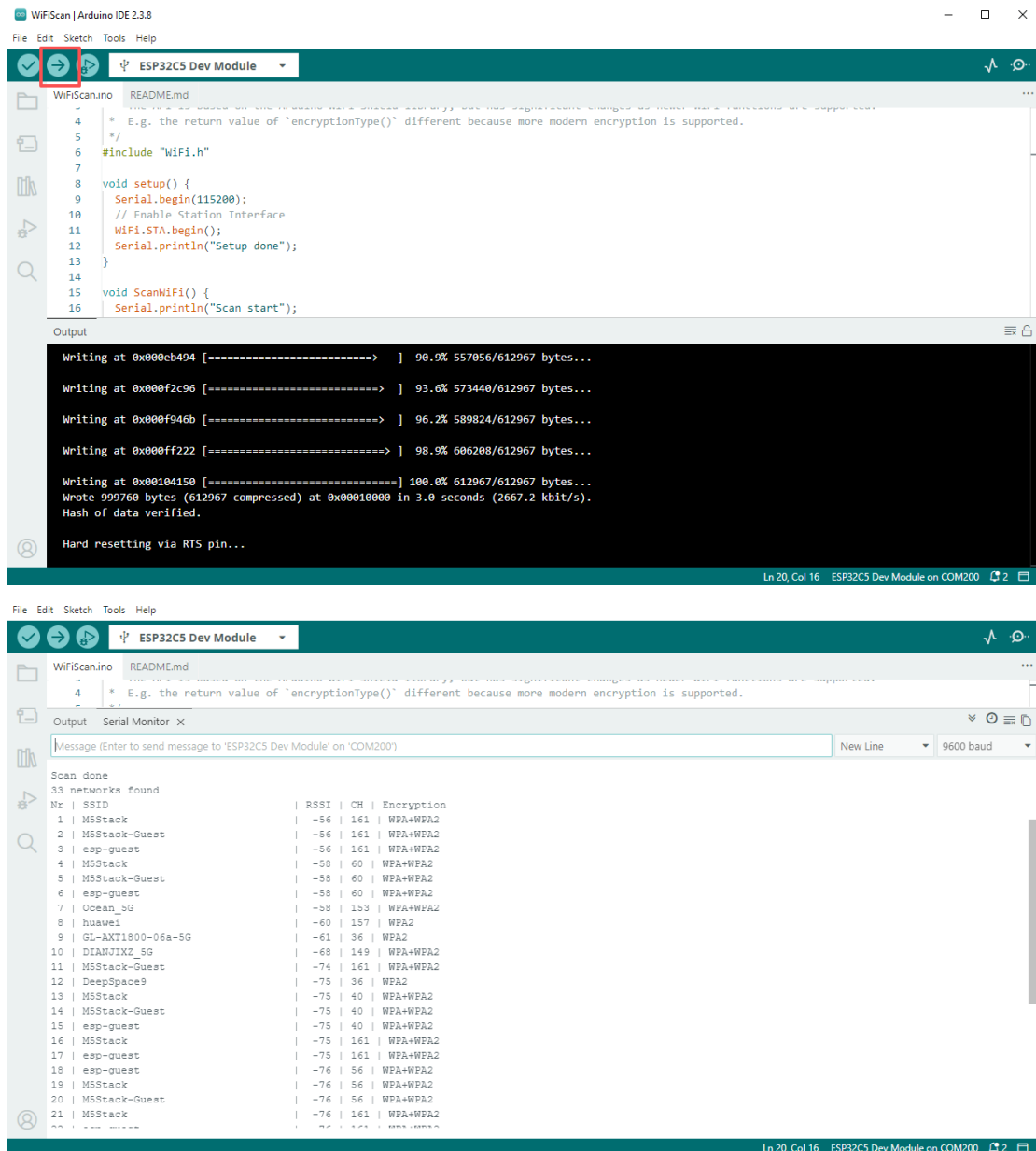


3.2 Wi-Fi Scan

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.

