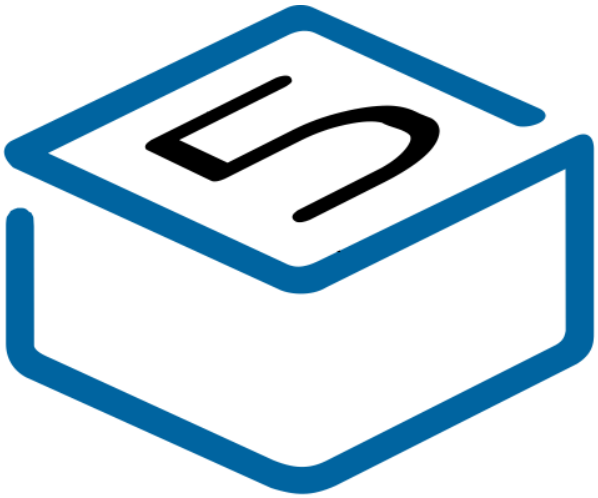
M5STAMP C3



M5STACK

2021

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1.OUTLINE

C3 is the smallest ESP32 system board launched by M5Stack. It focuses on cost-effectiveness and simplification. It embeds an ESP32-C3 IoT control on a small and exquisite PCB board as small as a stamp (STAMP). Provide 13 IO expansion pins and a programmable RGB LED, combined with ESP32 internal interface resources (UART, I2C, SPI, etc.), can expand various peripheral sensors. It can be embedded in all kinds of IoT devices as the control core.

1.1.ESP32 C3

- A complete Wi-Fi subsystem that complies with IEEE 802.11b/g/n protocol and supports Station mode, SoftAP mode, SoftAP + Station mode, and promiscuous mode
- A Bluetooth LE subsystem that supports features of Bluetooth 5 and Bluetooth mesh
- State-of-the-art power and RF performance
- 32-bit RISC-V single-core processor with a four-stage pipeline that operates at up to 160 MHz
- 400 KB of SRAM (16 KB for cache) and 384 KB of ROM on the chip, and SPI, Dual SPI, Quad SPI, and QPI interfaces that allow connection to external flash
- Reliable security features ensured by
    1. Cryptographic hardware accelerators that support AES-128/256, Hash, RSA, HMAC, digital signature and secure boot
    2. Random number generator
    3. Permission control on accessing internal memory, external memory, and peripherals – External memory encryption and decryption
- Rich set of peripheral interfaces and GPIOs, ideal for various scenarios and complex applications.

2. SPECIFICATIONS

Resources	Parameter
Processor ESP32-C3	RISC-V single-core processor with a four-stage pipeline that operates at up to 160 MHz
Flash	4MB
Input voltage	5V @ 500mA
button	Programmable buttons x 1
Programmable RGB LED	SK6812 x 1
Antenna	PIFA Antenna
IO x13	G4, G5, G6, G7, G8, G10, G1, G0, G21, G20, G9, G18, G19
Operating temperature	32°F to 104°F (0°C to 40°C)

3.QUICK START

3.1.ARDUINO IDE

Visit Arduino's official website(https://www.arduino.cc/en/Main/Software),Select the installation package for your own operating system to download.

>1.Open up Arduino IDE, navigate to `File`->`Peferences`->`Settings`

>2.Copy the following M5Stack Boards Manager url to `Additional Boards Manager URLs:`

https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_dev_index.json

>3.Navigate to `Tools`->`Board:`->`Boards Manager...`

>4.Search `ESP32` in the pop-up window, find it and click `Install`

>5.select `Tools`->`Board:`->`ESP32-Arduino-ESP32 DEV Module

>6Please install CP2104 driver before use: https://docs.m5stack.com/en/download

3.2.BLUETOOTH SERIAL

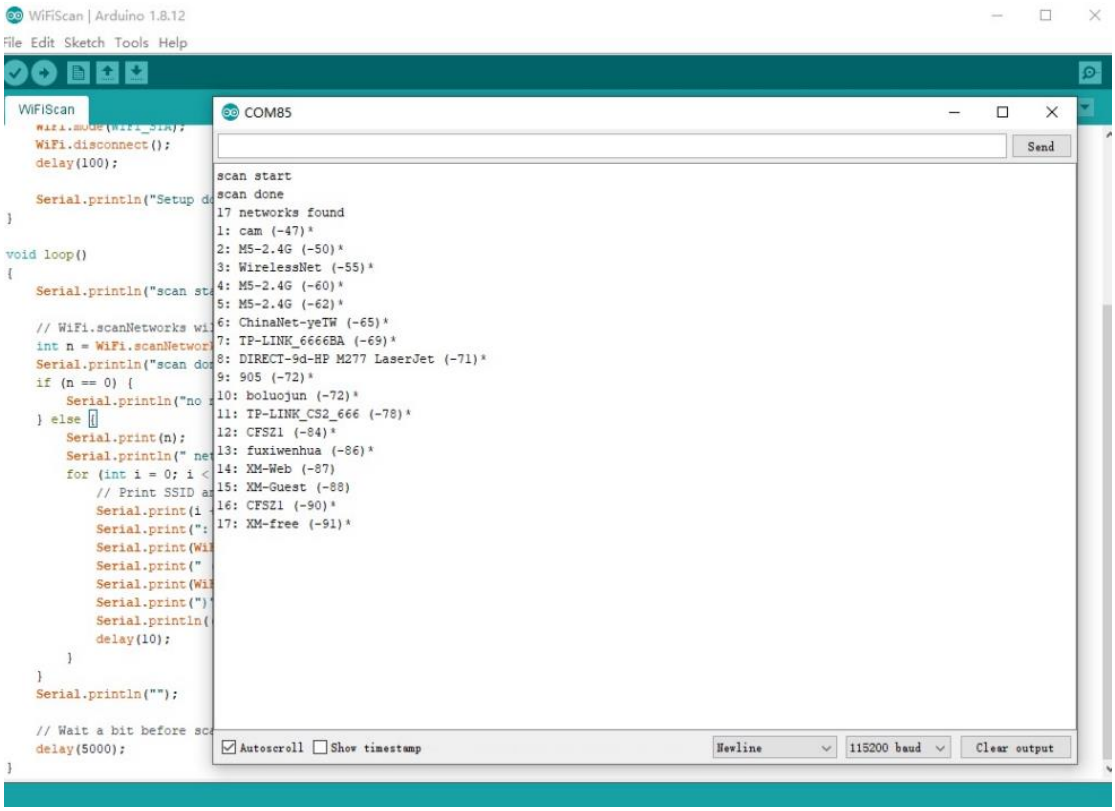
Open the Arduino IDE and open the example program `File`->`Examples`->`BluetoothSerial`->`SerialToSerialBT`. Connect the device to the computer and select the corresponding port to burn. After completion, the device will automatically run Bluetooth, and the device name is `ESP32test`. At this time, use the Bluetooth serial port sending tool on the PC to realize the transparent transmission of Bluetooth serial data.


```
#include "BluetoothSerial.h"

#if !defined(CONFIG_BT_ENABLED) || !defined(CONFIG_BLUEDROID_ENABLED)
#error Bluetooth is not enabled! Please run `make menuconfig` to and en
able it
#endif

BluetoothSerial SerialBT;

void setup() {
  Serial.begin(115200);
```

```
  SerialBT.begin("ESP32test"); //Bluetooth device name
  Serial.println("The device started, now you can pair it with bluetoot
h!");
}

void loop() {
  if (Serial.available()) {
    SerialBT.write(Serial.read());
  }
  if (SerialBT.available()) {
    Serial.write(SerialBT.read());
  }
  delay(20);
}
```

3.3. WIFI SCANNING

Open the Arduino IDE and open the example program `File`->`Examples`->`WiFi`->`WiFiScan`. Connect the device to the computer and select the corresponding port to burn. After completion, the device will automatically run the WiFi scan, and the current WiFi scan result can be obtained through the serial port monitor that comes with the Arduino.



```ino
#include "WiFi.h"

void setup()
{
    Serial.begin(115200);
    // Set WiFi to station mode and disconnect from an AP if it was pre
viously connected
    WiFi.mode(WIFI_STA);
    WiFi.disconnect();
    delay(100);

    Serial.println("Setup done");
}

void loop()
{
    Serial.println("scan start");

    // WiFi.scanNetworks will return the number of networks found
    int n = WiFi.scanNetworks();
    Serial.println("scan done");
    if (n == 0) {
        Serial.println("no networks found");
    } else {
        Serial.print(n);
        Serial.println(" networks found");
        for (int i = 0; i < n; ++i) {
            // Print SSID and RSSI for each network found
            Serial.print(i + 1);
            Serial.print(": ");
            Serial.print(WiFi.SSID(i));
            Serial.print(" (");
            Serial.print(WiFi.RSSI(i));
            Serial.print(")");
            Serial.println((WiFi.encryptionType(i) == WIFI_AUTH_OPEN)?"
 ":"*");
            delay(10);
        }
    }
    Serial.println("");

    // Wait a bit before scanning again
    delay(5000);
}
```

FCC Statement:

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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

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.