M5STACK M5NANOC6 Low Power IoT Development Board User Guide

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M5STACK M5NANOC6 Low Power IoT Development Board

Specifications

- **MCU:** ESP32-C6FH4@RISC-V 32-bit single-core processor
- **Processor and Performance:**
  - RISC-V 32-bit single-core processor
  - Up to 160 MHz clock frequency
  - Industry-leading low-power and RF performance
- **Memory:**
  - Built-in 320 KB ROM
  - 512 KB SRAM
  - 16 KB low-power SRAM
  - Supports external Flash
- **GPIO Pins and Programmable Interfaces:** SPI, UART, I2C, I2S, RMT, TWAI, PWM

Product Usage Instructions

Quick Start

ARDUINO IDE

- To start using the M5STACK NanoC6 with Arduino IDE, follow the steps provided in the user manual for setting up the IDE and uploading code to the device.

BLUETOOTH SERIAL

- You can establish a Bluetooth serial connection with the M5STACK NanoC6 by enabling Bluetooth on your device and pairing it with the NanoC6. Refer to the user manual for detailed instructions on how to set up and

use Bluetooth serial communication.

WIFI SCANNING

- The M5STACK NanoC6 supports 2.4 GHz Wi-Fi 6 (802.11 ax). Use the provided instructions to scan for available Wi-Fi networks and connect the NanoC6 to a desired network.

ZIGBEE

- The NanoC6 also supports Zigbee communication. Follow the guidelines in the manual to configure and utilize Zigbee functionality for data exchange.

FAQ

Q: Can I extend the storage space of the M5STACK NanoC6?

- **A:** Yes, you can extend the storage space for program code through an external memory as the NanoC6 supports external Flash.

Q: What communication interfaces are supported by the M5STACK NanoC6?

- **A:** The NanoC6 supports SPI, UART, I2C, I2S, RMT, TWAI, and PWM interfaces for enhanced flexibility in data exchange with other devices.

OUTLINE

M5NanoC6 is a miniature, low-power IoT development board within the M5Stack development kit series. Powered by the ESP32-C6 MCU, it boasts advanced wireless communication support, including Wi-Fi 6 and Zigbee, facilitating seamless control of infrared IoT devices through its built-in infrared transmitter. The onboard ceramic antenna ensures a stable wireless communication connection. Additionally, the device features programmable RGB LEDs, adding a personalized visual touch to projects. The inclusion of Grove interfaces allows M5NanoC6 to flexibly expand with various M5 devices, supporting the connection of different device types through protocols such as UART and I2C. This provides developers with abundant hardware expansion possibilities. Suitable for applications in smart homes, industrial automation, health monitoring, and IoT devices, M5NanoC6 delivers a comprehensive development solution for innovative projects.

ESP32-C6

1. **Communication Capabilities:**
    - **Supports 2.4 GHz Wi-Fi 6 (802.11 ax):** Provides high-speed and efficient Wi-Fi communication.
    - **Bluetooth**® 5 (LE): Incorporates Bluetooth 5.0 technology for extended wireless coverage and faster data transmission.
    - **Zigbee and Thread (802.15.4):** Supports Zigbee and Thread communication protocols, offering flexible connectivity for IoT applications.
    - **RISC-V 32-bit single-core processor:** Delivers a highly flexible and scalable processor architecture.
    - **Up to 160 MHz clock frequency:** Ensures the device has fast and efficient data processing capabilities.
    - **Industry-leading** low-power and RF performance: Achieves a leading position in both power

consumption and RF performance.

2. **Memory:**
    - **Built-in** 320 KB ROM: Used for storing firmware or program code.
    - **512 KB SRAM:** Utilized for runtime data storage.
    - **16 KB low-power SRAM:** Specifically designed for low-power operations. Supports external Flash: Can extend the storage space for program code through an external memory.
3. **GPIO Pins and Programmable Interfaces:**
    - Supports SPI, UART, I2C, I2S, RMT, TWAI, and PWM: Multiple communication interfaces, enhancing flexibility for data exchange with other devices.

SPECIFICATIONS

Specification/ Parameter

- **MCU** ESP32-C6FH4@RISC-V 32-bit single-core processor 160 MHZ, 320 KB ROM, 512 KB SRAM, 16 KB low-power SRAM, supports external flash
    - **Programmable RGB** WS2812-2020
- **Input voltage** 5V
    - **Communication mode** 2.4 GHz Wi-Fi 6 (802.11 ax) Zigbee And Thread (802.15.4)And other mainstream communication methods
- **Communication Protocol** Support SPI UART I2C I2S RMT TWAI And PWM
    - **Antenna-type** Onboard ceramic antenna
- **Other peripherals** Board infrared transmitter, programmable onboard control buttons
    - **Operating temperature** 0-40°C

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, under 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 under 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 the receiver.
- Connect the equipment to 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 SAR

was tested for the device in the body-worn mode with a 5mm distance. And it can meet the SAR limit of the FCC.

QUICK START

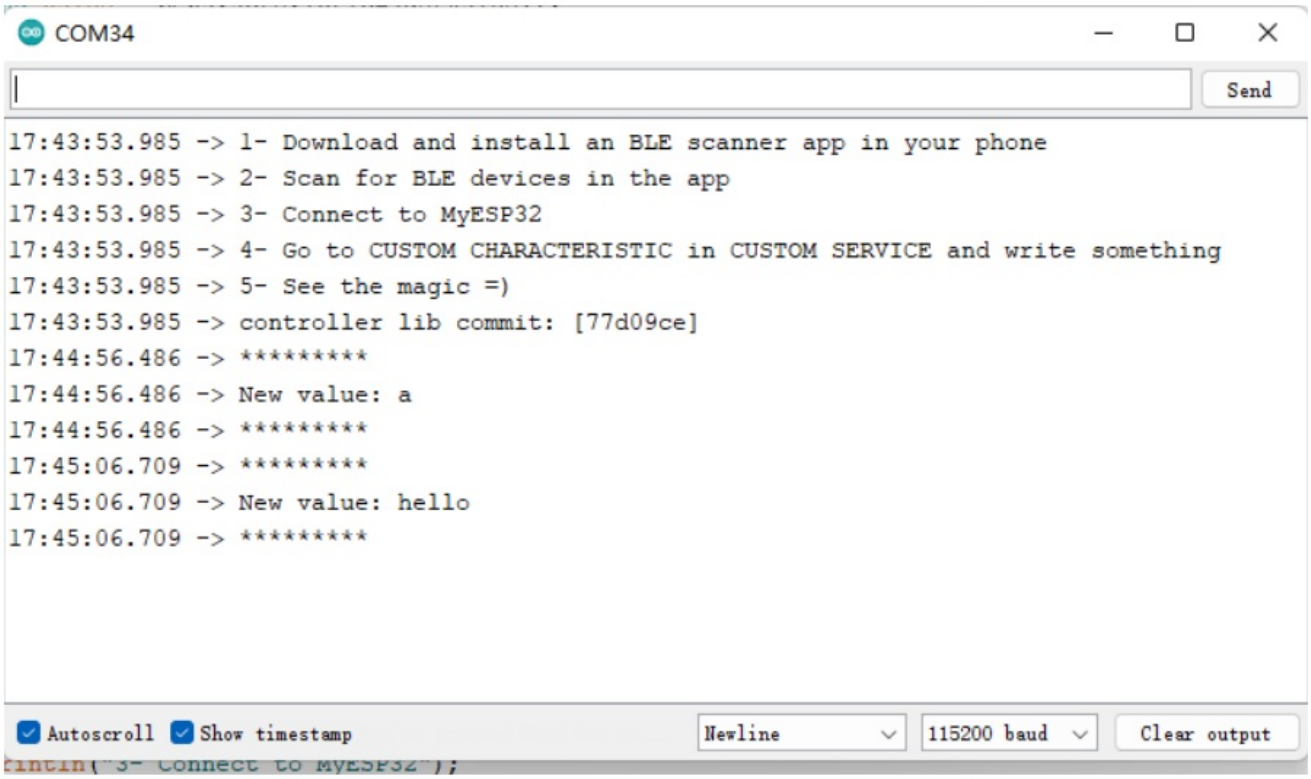
ARDUINO IDE

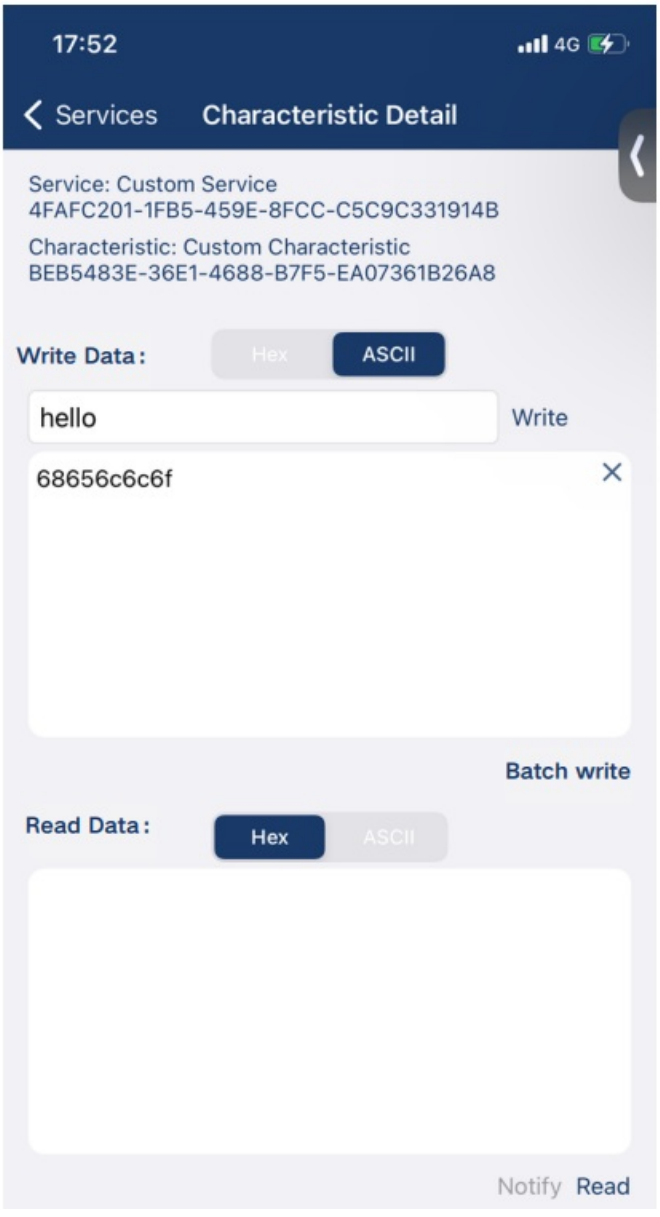
To access the Arduino official website **(https://www.arduino.cc/en/Main/Software)** and download the installation package for your operating system, follow these steps:

1. Open the Arduino IDE and navigate to File -> Preferences -> Settings.
2. Copy the following M5Stack Boards Manager URL and paste it into “Additional Boards Manager URLs”: https://m5stack.oss-cn-shenzhen.aliyuncs.com/resource/arduino/package_m5stack_index.json
3. **Go to:** Tools -> Board: -> Boards Manager…
4. Search for M5Stack, find it, and click “Install.”
5. Choose Tools -> Board: -> M5Stack Arduino
6. Select M5NanoC6

BLUETOOTH SERIAL

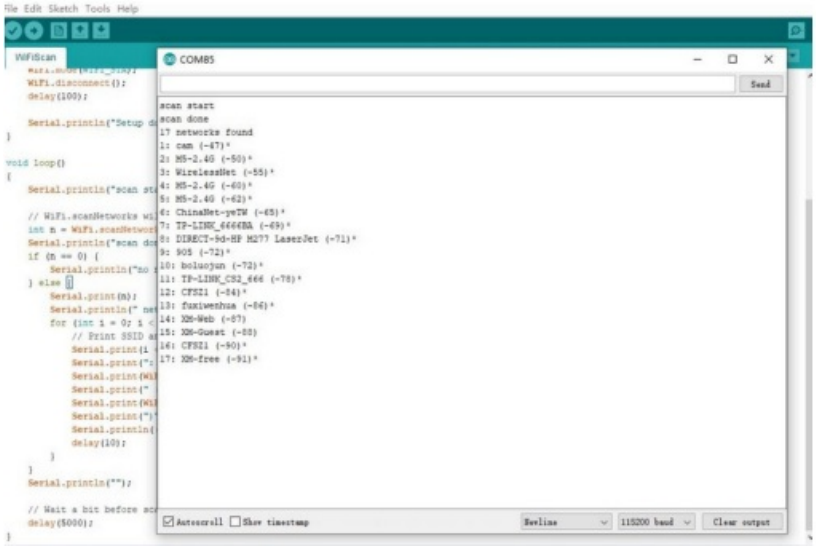
- Open the Arduino IDE and load the example program: File -> Examples -> BLE -> Write.
- Connect the device to the computer.
- Choose the appropriate port for uploading. Once completed, the device will automatically enable Bluetooth.
- The device name is set to MyESP32. Now, use a Bluetooth serial communication tool on your PC to achieve transparent transmission of Bluetooth serial data.





WIFI SCANNING

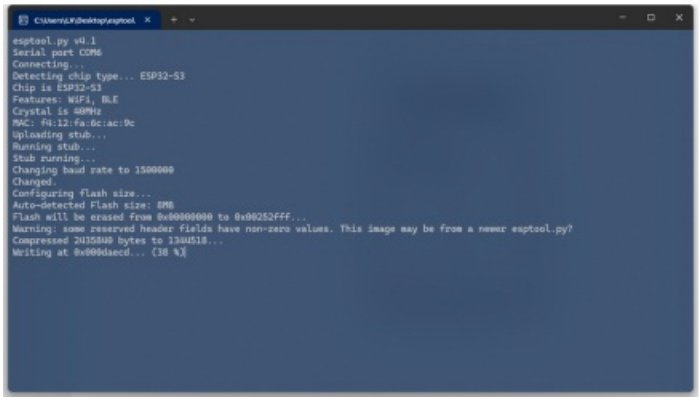
- Open the Arduino IDE and load the example program: File -> Examples -> WiFi -> WiFiScan.
- Connect the device to the computer and select the appropriate port for uploading.
- Once completed, the device will automatically execute a WiFi scan. You can obtain the current WiFi scan results through the built-in serial monitor in Arduino.



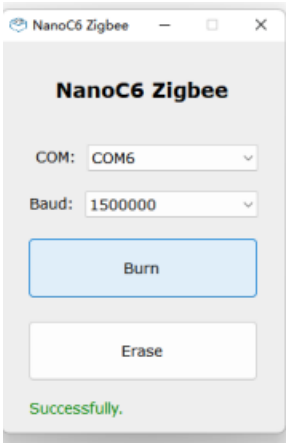
Zigbee (The Arduino program will be supported later.)

1. We can verify Zigbee functionality by running the firmware version of the program first.

2. Click Burn to write the program to the device.



3. Upload completed, you can see the effect.



Documents / Resources

M5STACK NanoC6 M5STACK	[M5STACK M5NANOC6 Low Power IoT Development Board] [pdf] User Guide M5NANOC6, M5NANOC6 Low Power IoT Development Board, Low Power IoT Development Board, IoT Development Board, Development Board, Board

References

- **User Manual**