

M5Tab5



M5STACK

2025

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1. OUTLINE

Tab5 is a highly integrated and multifunctional portable device, ideally suited for education, research, commercial, and advanced DIY projects. It is equipped with an **ESP32-P4** main controller, featuring **16MB of Flash and 32MB of PSRAM**, and provides **Wi-Fi** and Bluetooth 5.2 connectivity through a **ESP32-C6-MINI-1U** module, ensuring excellent wireless performance. The device emphasizes visual experience, equipped with a **5-inch IPS touch screen**, offering a resolution of 1280x720, controlled by an IL9881 driver, providing vivid imagery and smooth touch response. Additionally, Tab5 is equipped with an SC2356 **camera**, supporting high-resolution 1600x1200, capable of high-definition video recording and suitable for image processing and video surveillance applications, as well as complex AI capabilities like facial recognition and object tracking.

In terms of connectivity, the Tab5 device boasts **USB-A** and **USB Type-C** ports. The USB-A port allows for the connection of traditional **USB devices** such as mice and keyboards, while the USB Type-C port supports **OTG** functionality for fast connection of modern external devices. The **GROVE** interface and **M5BUS** modular interface enhance its expandability, suitable for various sensors and modules. Additionally, the device supports the connection of a **standard keyboard**, offering additional input flexibility. The device also includes a **Micro SD** card slot, providing extra data storage and convenient data logging capabilities, enhancing its storage capacity.

For communication, the Tab5 device includes an **RS485** port, using the SIT3088 chip, and is equipped with a dial switch connected to a **120Ω** termination resistor to reduce signal reflection and ensure stable data transmission. Furthermore, a reserved **STMAP** pad interface can be expanded to support communication modules such as Cat.M, NB-IoT, or LoRaWAN.

In terms of audio, the device uses an ES8388 chip, equipped with a **1W** NS4150B **speaker** and a **3.5mm headphone jack**, providing high-quality audio output. Moreover, Tab5 is equipped with an efficient **dual-microphone** system, enhancing audio recording quality and voice recognition precision, suitable for advanced voice control applications.

Additionally, Tab5 is equipped with a bottom battery interface, outfitted with a **2S battery**, ensuring continuous operation even in the absence of an external power source, enhancing its portability and applicability. To enhance dynamic monitoring capabilities, Tab5 also integrates a **BMI270 sensor**, a high-performance **6-axis** motion sensor, providing precise acceleration and gyroscope monitoring, supporting motion tracking and orientation determination, suitable for dynamic environments.

Tab5 also includes an easily accessible **user button**, designed to simplify device operation, including power on/off and quick entry into programming mode, enhancing the interactivity and functionality of the user interface.

The integration of these features makes Tab5 an ideal choice for smart home applications, remote monitoring, IoT device development, and more, meeting professional and innovative needs while ensuring portability and high performance.

1.1. Tab5

Communication Capabilities:

- Main Controller: Tab5 is equipped with the ESP32-P4, supporting Wi-Fi and Bluetooth 5.2 for exceptional wireless performance. The device uses a dual-antenna ESP32-C6-MINI-1U module for stable connectivity.

Processor and Performance:

- Processor Model: ESP32-P4 features a dual-core architecture for efficient multitasking.
- Storage Capacity: Comes with 16MB of Flash and 32MB of PSRAM, suitable for handling complex data and applications.
- Operating Frequency: Operates at up to 240 MHz, ensuring swift processing and execution of tasks.

Display and Input:

- Display: A 5-inch IPS touchscreen with a resolution of 1280x720, controlled by an IL9881 driver, offers sharp visuals and responsive touch interactions.
- User Interaction: Equipped with an RGB LED for interactive and status indications.

Connectivity:

- USB Ports: Includes USB-A and USB Type-C ports, supporting connections with both traditional and modern external devices. The Type-C port features OTG functionality.
- Modular Interfaces: Equipped with GROVE and M5BUS interfaces, facilitating expansion and connection of various sensors and modules.
- Data Storage: Features a Micro SD card slot for additional storage options.

Communication Interfaces:

- RS485 Port: Utilizes the SIT3088 chip, enhanced with a 120Ω termination resistor to optimize stability in data transmission.
- Expandable Communications: The reserved STMAP pad interface can be expanded to support modules such as Cat.M, NB-IoT, or LoRaWAN.

Audio Features:

- Audio Processing: Utilizes the ES8388 chip, equipped with a 1W NS4150B speaker and a 3.5mm headphone jack.
- Dual Microphone System: Enhances audio recording quality and voice recognition precision, suitable for advanced voice control applications.

Power and Portability:

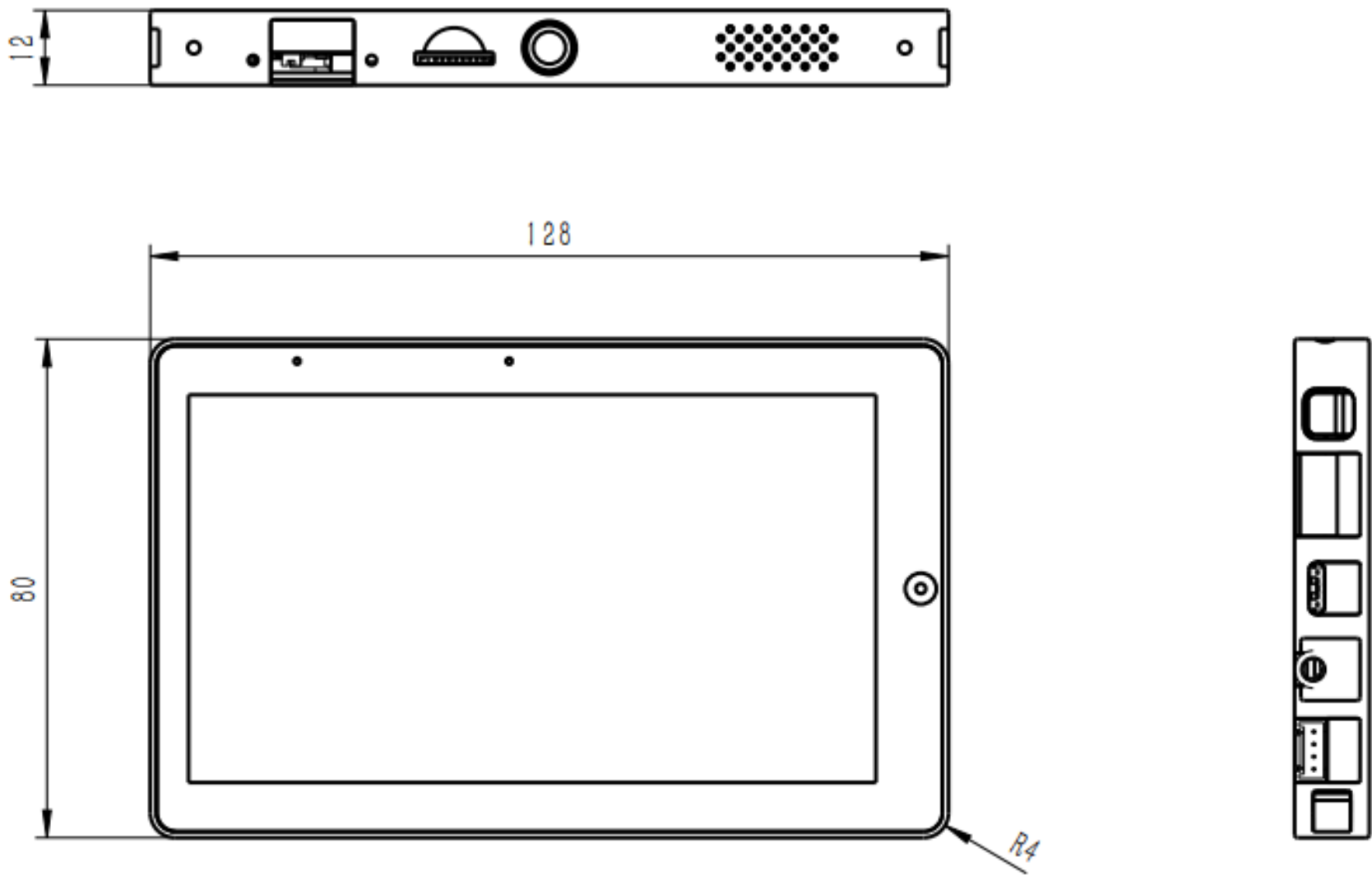
- Battery Configuration: Features a bottom battery interface with a 2S battery, ensuring continuous operation even without an external power source.
- Dynamic Monitoring: Integrates a BMI270 six-axis motion sensor, providing high-precision motion tracking and orientation determination.

User Interface:

- Operation Button: Includes an easily accessible user button to simplify device operation, including power on/off and quick entry into programming mode, enhancing user interaction.

2. SPECIFICATIONS

2.1 Module Size



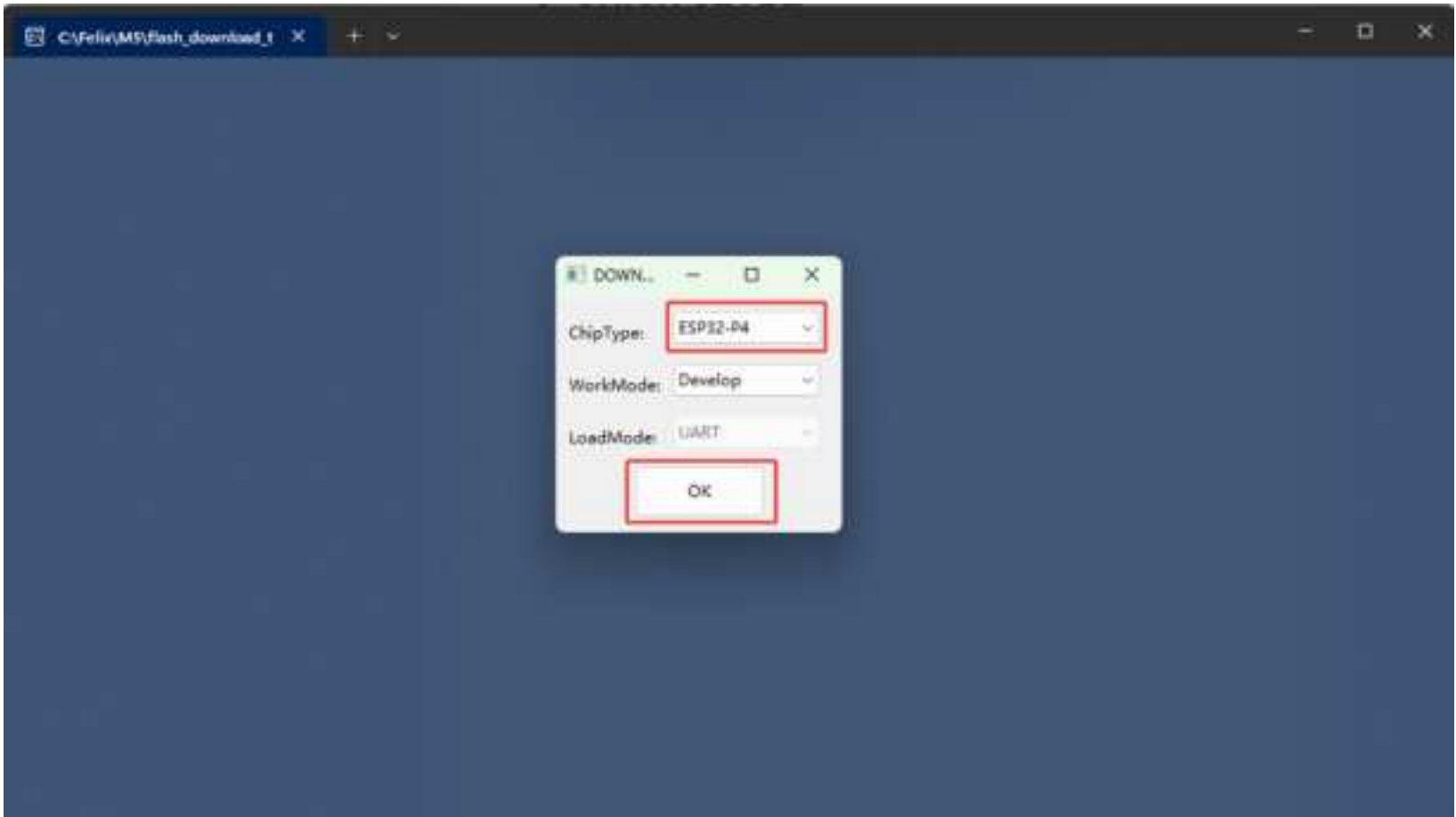
UNIT : mm

3. QUICK START

Before you do this step, look at the text in the final appendix: Installing Flash Download Tools(https://docs.espressif.com/projects/esp-test-tools/zh_CN/latest/esp32/production_stage/tools/flash_download_tool.html)

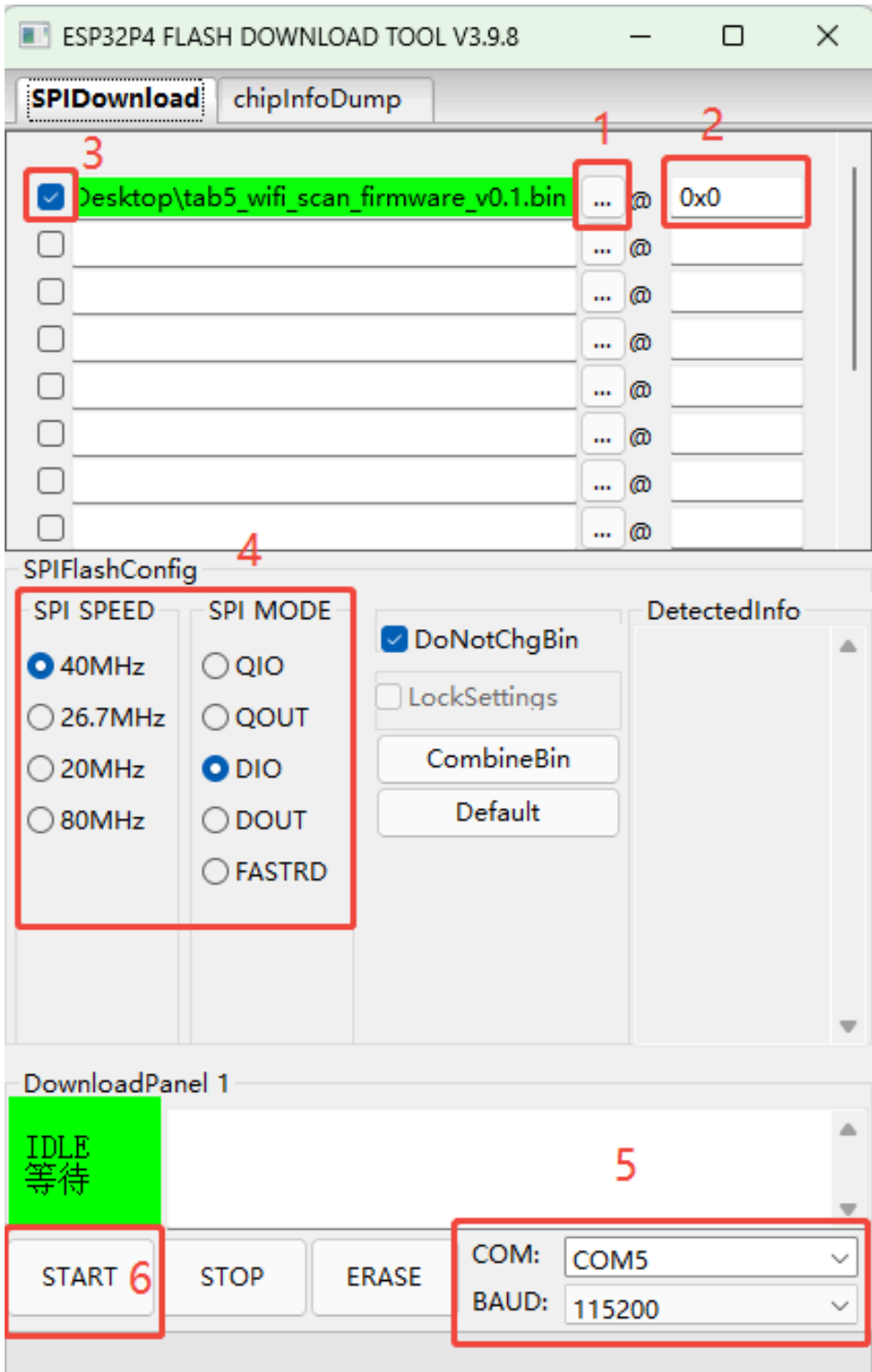
3.1. SCAN WiFi

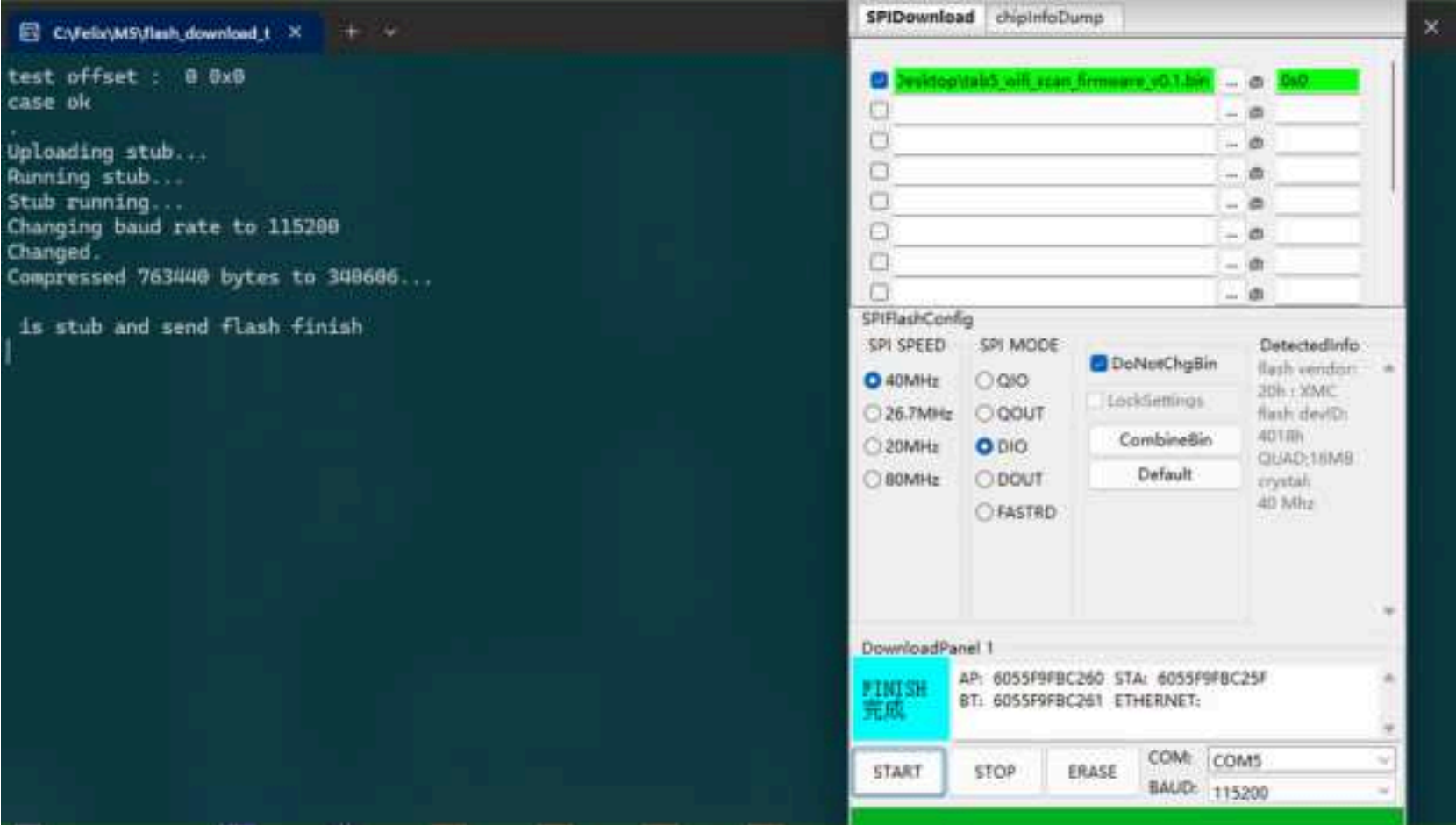
1.OPEN Flash Download Tools.exe, Select ESP32-P4



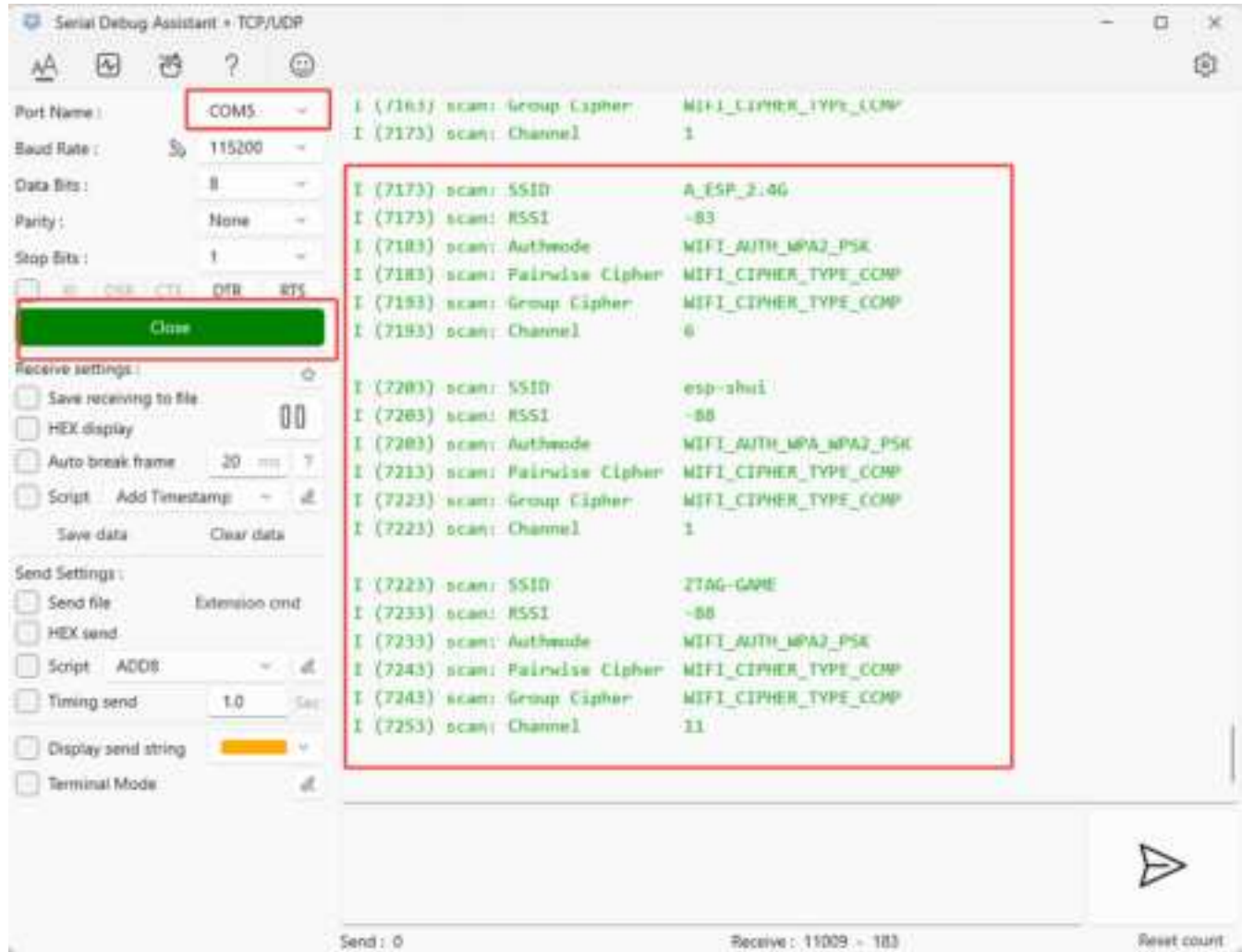
2.Setting

- 1. Select the prepared Wi-Fi scan firmware (.bin) file (**tab5_wifi_scan_firmware_v0.1.bin**)
- 2. Set the starting flash address to 0x0.
- 3. Check (enable) the firmware you need to upload.
- 4. Set the upload speed and mode.
- 5. Choose the corresponding port and baud rate.
- 6. Click “START” to begin flashing. When the flashing is complete, it will appear as shown in the figure.



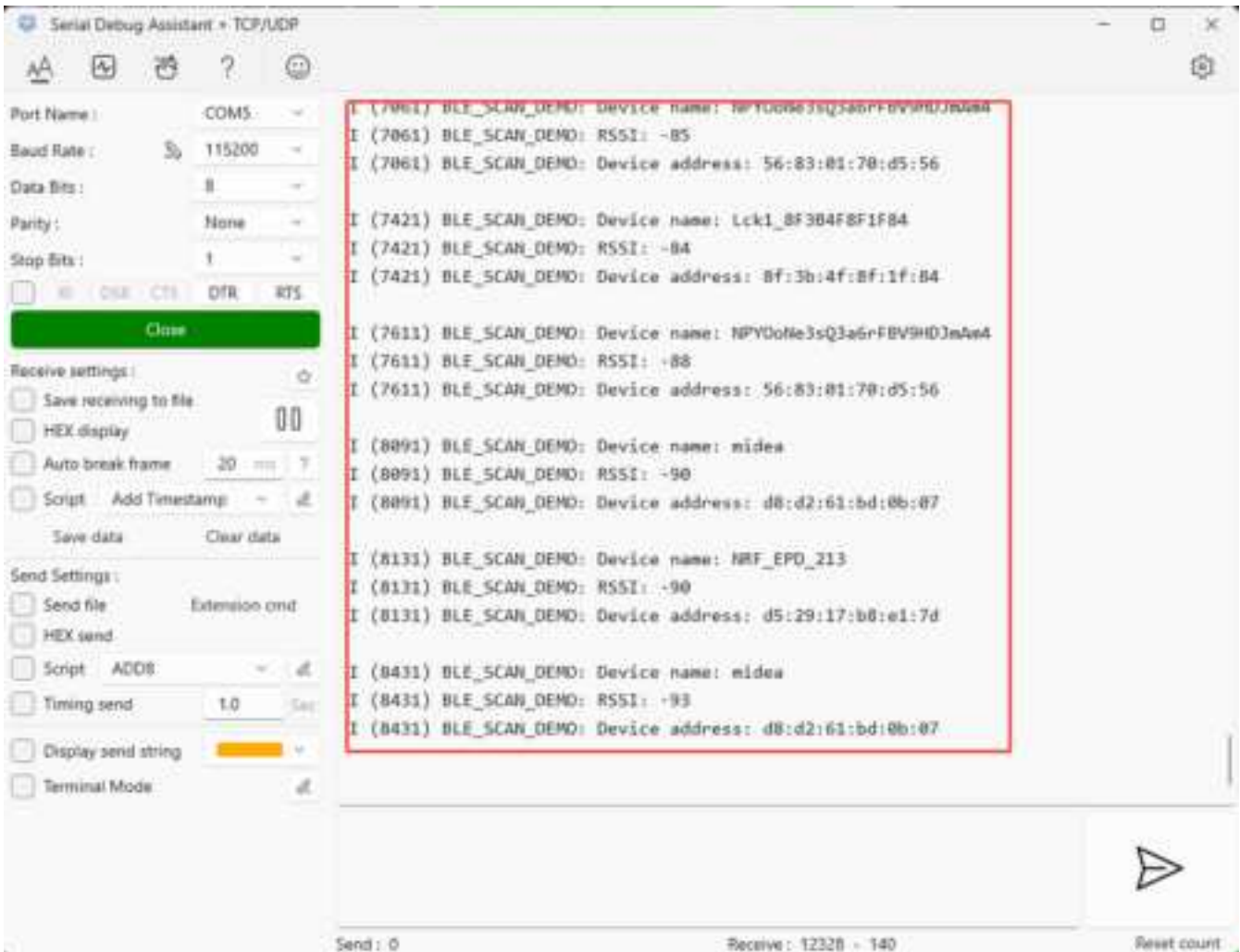


- 3.Reset the device (press the reset button or reconnect it to the computer).
- 4.Then open a serial port tool (the computer’s built-in tool can also be used).
- 5.Select the corresponding port.
- 6.Click “OPEN.”
- 7.The Wi-Fi scan results will appear as shown in the figure on the right.



3.2. SCAN BLE Device

Select the tab5_bluetooth_scan_firmware_v0.1.bin firmware for flashing. All other steps are the same as in the Wi-Fi scanning process described above. The scan results are shown below:



FCC Statement

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.

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 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.

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

FCC Radiation Exposure Statement

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device must operate with a minimum distance of 20 cm between the radiator and user body.