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M5STACK SwitchC6 Smart Wireless Switch

OUTLINE

- StickC6 is a smart wireless switch product based on a single-wire energy harvesting scheme that extracts energy via leakage from the live wire and uses a supercapacitor to supply stable DC power to the system.
- The product integrates a high-efficiency DC-DC conversion circuit, precise power filtering design, and an ESP32-C6-MINI-1 wireless control core, supporting dual-mode wireless communication with 2.4GHz
- Wi-Fi and BLE, while utilizing high-current MOSFETs for efficient and safe AC load switching.
- It features a dedicated external switch interface for connecting physical buttons or sensors, enabling both manual and automatic control; an integrated download indicator LED provides visual feedback during firmware burning and upgrades, and a program download pad is provided for easy firmware updates and debugging.
- Additionally, the product includes a 1.25-3P interface used as an IO expansion port for the ESP32-C6-MINI-1, facilitating the addition of more peripheral functions.
- StickC6 is ideally suited for smart home, industrial automation, and IoT applications, offering a highly efficient, safe, stable, and easily expandable smart switch solution.

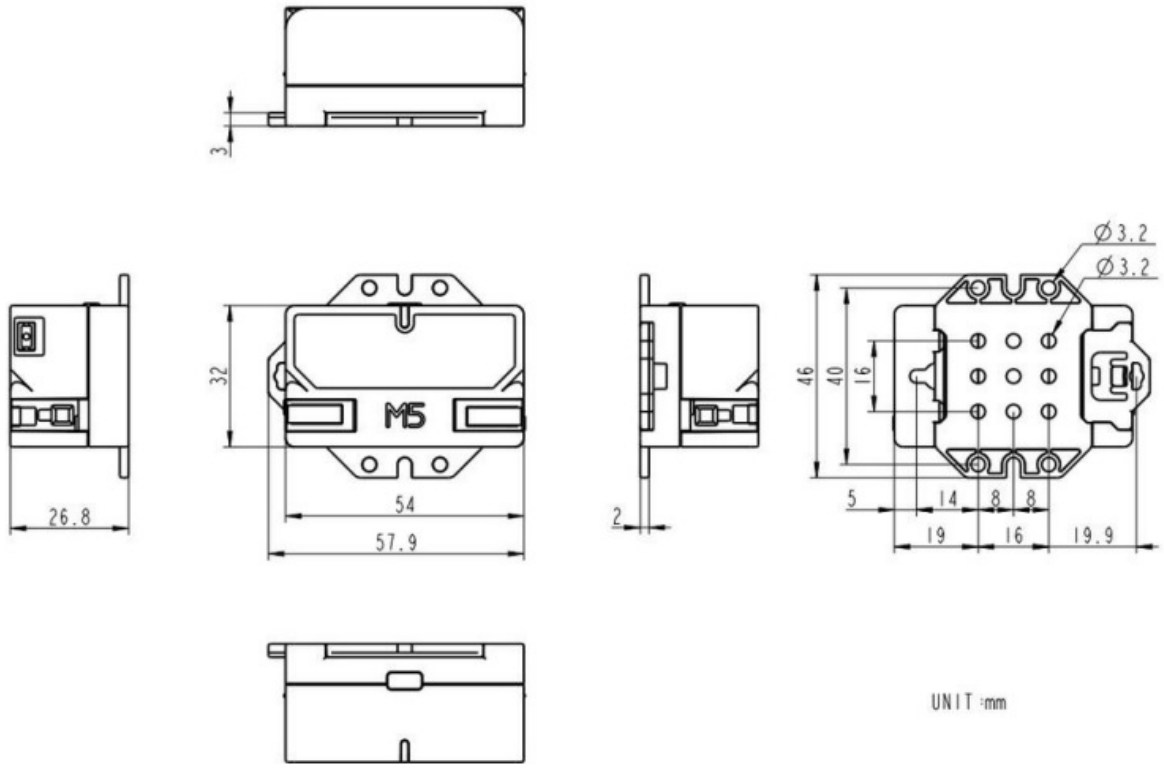
SwitchC6

1. Communication Capabilities
    1. Main Controller: ESP32-C6-MINI-1 (based on a single-core RISC-V architecture) Wireless Communication: Supports 2.4 GHz Wi-Fi and BLE
2. Processor & Performance
    1. Maximum Operating Frequency: Up to 160 MHz
    2. On-chip Memory: 512 KB SRAM (typical) with integrated ROM
3. Power & Energy Management
    1. Single-Wire Energy Harvesting Design: Utilizes leakage energy from the live wire, followed by rectification and filtering, with supercapacitor storage to provide a stable DC power supply for the system. Efficient DC-DC Conversion & Precision Power Filtering: Ensures voltage stability throughout the circuit
4. Switching & Control
    1. High-Current MOSFET Drive: Enables efficient and safe switching of AC loads for high-power control.External Switch Interface: Dedicated interface for connecting physical buttons or sensors, facilitating both manual and automatic control
5. Display & Input
    1. Download Indicator LED: Built-in LED provides intuitive status feedback during firmware burning and upgrades
6. GPIO & Expansion Interfaces
    1. Rich GPIO Interface: Supports a wide range of peripheral extensions, facilitating secondary development 1.25-3P Interface: Serves as an IO expansion port for the ESP32-C6-MINI-1, making it easy to add additional functions
7. Firmware Programming & Upgrade
    1. Program Download Pad: Predefined solder pad for firmware burning and upgrades, allowing developers to easily debug and update the firmware

SPECIFICATIONS

Parameter and Specification		Value
MCU		ESP32-C6-MINI-1 (RISC-V single-core, up to 160 MHz)
Communication Capability		2.4GHz WiFi & BLE
MIC	Frequency Range	MIC: 2.4G Wi-Fi: 802.11b/g/n20/ax20:2412MHz-2472MHz 802.11n40: 2422MHz-2462MHz BLE: 2402-2480MHz
	Rated Output Power	2.4G Wi-Fi: 802.11b:5.5mW/MHz 802.11g:2.5mW/MHz 802.11n20/ax20:1.5mW/MHz 802.11n40:1.0mW/MHz BLE: 2mW
CE	Frequency Range	2.4G Wi-Fi: 2412-2472MHz, 2422-2462MHz BLE: 2402-2480MHz
	Maximum EIRP	2.4G WIFI: 16.17dBm BLE: 4.61dBm
Input Voltage & AC Load		AC 100-230V, supports up to 10A load
Supply Voltage		Single-wire energy harvesting + super capacitor storage (typical output ~3.3 V)
Flash Storage		4MB (integrated)
Indicator LED		Single LED for firmware download/upgrade indication
Expansion Interface		1.25 3P interface (serves as an IO expansion port for ESP32-C6-MINI-1 and external switch interface)
Operating Temperature		-10-50℃
Antenna Type		Onboard PCB antenna
Additional Features		Efficient DC-DC conversion, high-current MOSFET drive, live wire leakage energy harvesting
Manufacturer		M5Stack Technology Co., Ltd Block A10, Expo Bay South Coast, Fuhai Street, Bao'an District, Shenzhen, China

Module Size

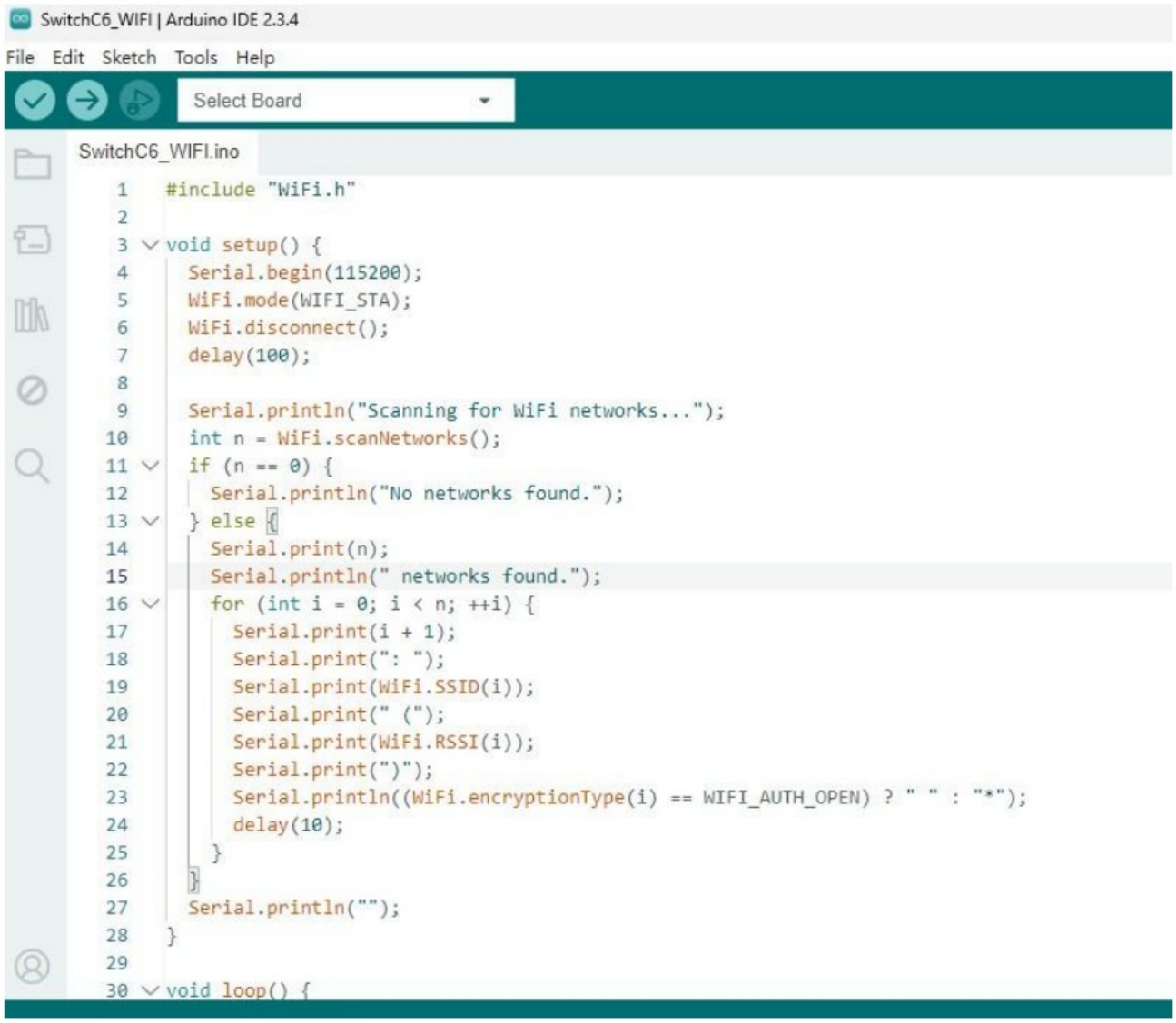


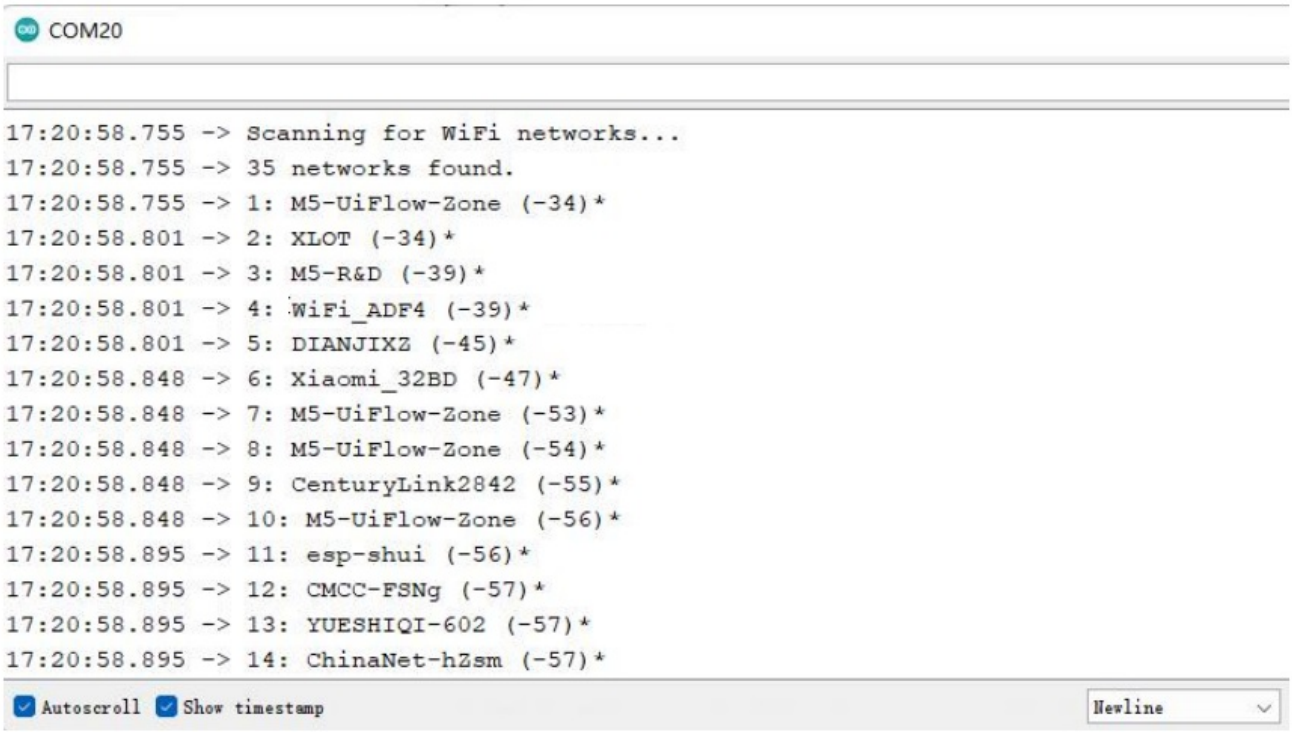
QUICK START

Before you do this step, look at the text in the final appendix: Installing Arduino

Print WiFi information

1. Open Arduino IDE (Refer to https://docs.m5stack.com/en/arduino/arduino_ide for the installation guide for the development board and software)
2. Select the ESP32C6 DEV Module board and the\ corresponding port, then upload the code
3. Open the serial monitor to display the scanned WiFi and signal strength information

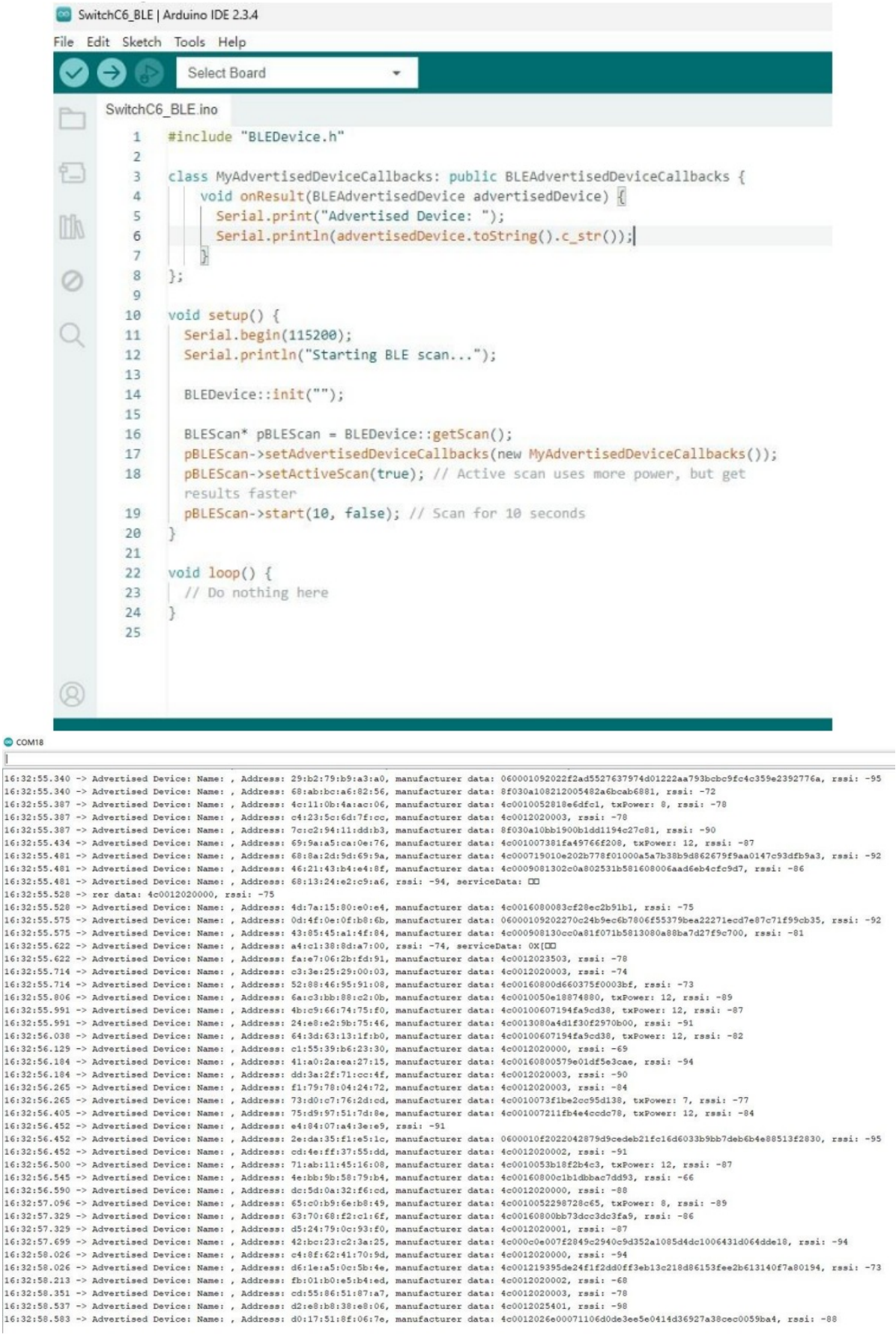




Before you do this step, look at the text in the final appendix: Installing Arduino

Print BLE information

1. Open Arduino IDE (Refer to https://docs.m5stack.com/en/arduino/arduino_ide for the installation guide for the development board and software)
2. Select the ESP32C6 DEV Module board and the corresponding port, then upload the code
3. Open the serial monitor to display the scanned BLE and signal strength information

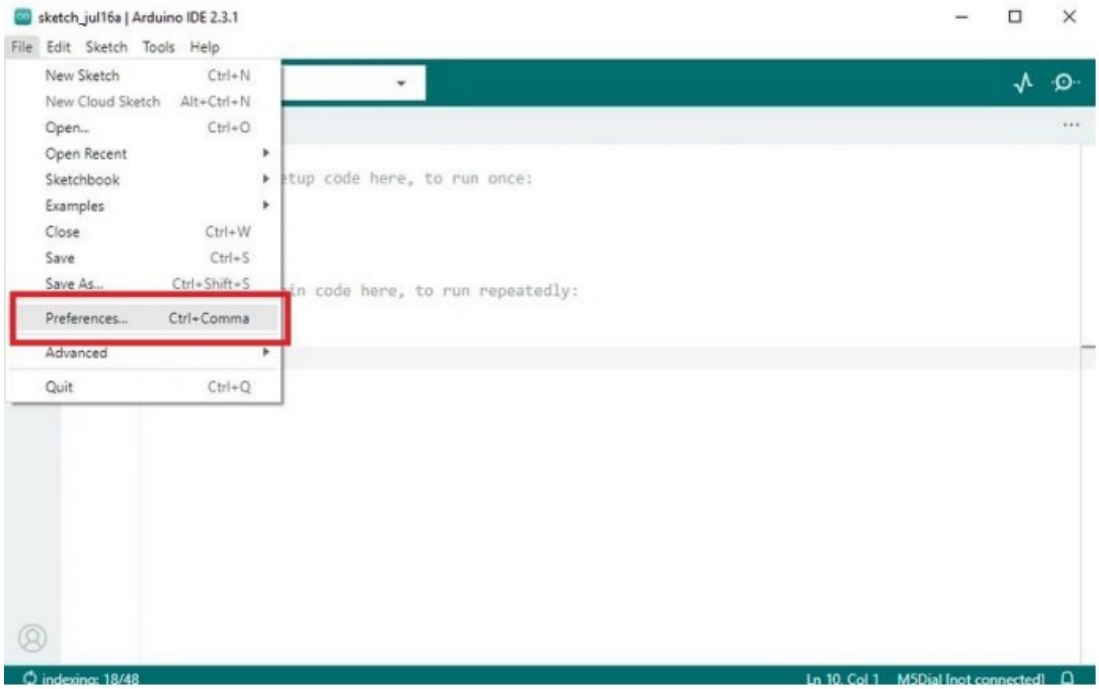


Arduino Install

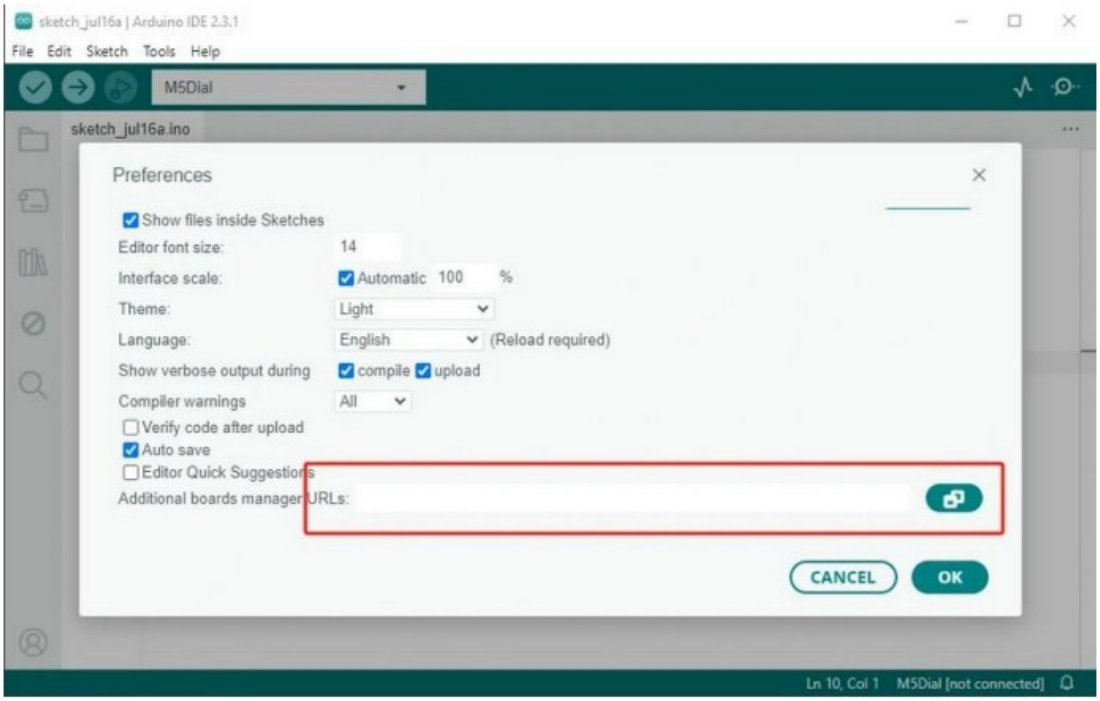
Installing Arduino IDE(https://www.arduino.cc/en/Main/Software)

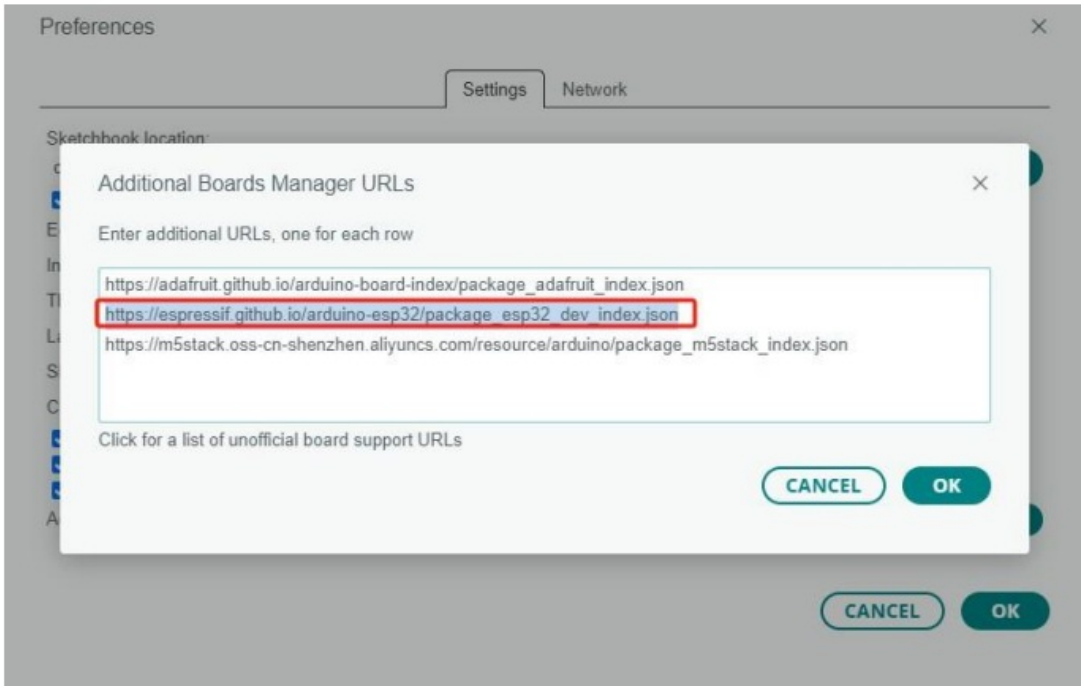
Click to visit the Arduino official website , and select the installation package for your operating system to download.

- Installing Arduino Board Management
- The Board Manager URL is used to index the development board information for a specific platform. In the Arduino IDE menu, select File -> Preferences



- Copy the ESP board management URL below into the Additional Board Manager URLs: field, and save. https://espressif.github.io/arduino-esp32/package_esp32_dev_index.json

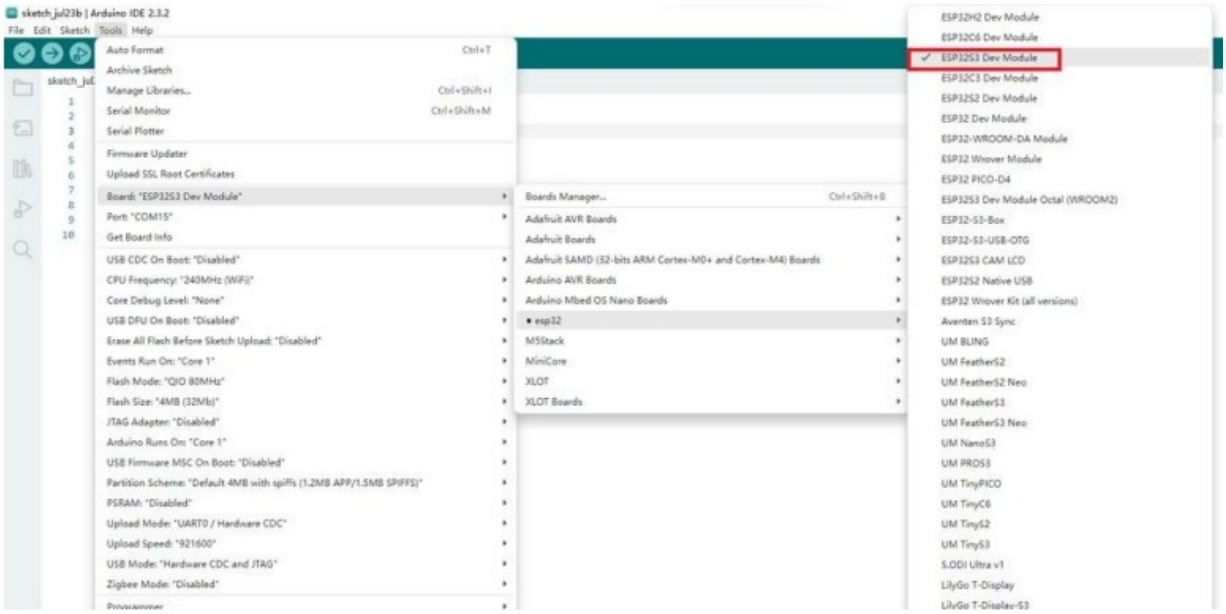




- In the sidebar, select Board Manager, search for ESP, and click Install.

- In the sidebar, select Board Manager, search for M5Stack, and click Install.

Depending on the product used, select the corresponding development board under Tools -> Board -> M5Stack -> {ESP32C6 DEV Module board}.



- Connect the device to your computer with a data cable to upload the program

FCC statement

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.This equipment should be installed and operated with a minimum distance of 20cm between the radiator& your body.

FAQ

- **Q**: Is there a guide for installing Arduino?
- **A:** Yes, please refer to the “Installing Arduino” section in the final appendix of the user manual for detailed instructions on installing Arduino.

Documents / Resources

SwitchC6 M5STACK	M5STACK SwitchC6 Smart Wireless Switch [pdf] User Manual M5SWITCHC6, 2AN3WM5SWITCHC6, SwitchC6 Smart Wireless Switch, SwitchC6, Smart Wireless Switch, Wireless Switch, Switch

References

- User Manual

M5STACK

2AN3WM5SWITCHC6, M5STACK, M5SWITCHC6, Smart Wireless Switch, switch, SwitchC6, SwitchC6 Smart Wireless Switch, Wireless Switch

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