M5STACK Unit C6L Intelligent Edge Computing Unit Owner’s Manual

September 16, 2025

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1. OUTLINE

Unit C6L is an intelligent edge computing unit integrated with the M5Stack_Lora_C6module — featuring an Espressif ESP32-C6 SoC and Semtech SX1262 LoRa transceiver — and engineered with a modular design for long-range, low-power LoRaWAN communication alongside high-speed 2.4 GHz Wi-Fi and BLE

connectivity.

It includes a 0.66″ SPI OLED display for real-time data visualization, a WS2812Caddressable RGB LED for system-status indication, a built-in buzzer for audible alerts, and front-panel buttons (SYS_SW) with a reset switch for local interaction. Astandard Grove I²C interface allows seamless integration with M5Stack hosts and various Grove sensors. The onboard USB Type-C port supports ESP32- C6 firmware programming, serial debugging, and 5 V power input, while automatic power switching and multi-channel ESD/surge protection ensure stable operation. Unit C6L excels at real-time data acquisition, edge-intelligence processing, and remote control, making it ideal for IoT applications such as smart agriculture, environmental monitoring, industrial IoT, smart buildings, asset tracking, and urban infrastructure sensing.\

1.1. Unit C6L

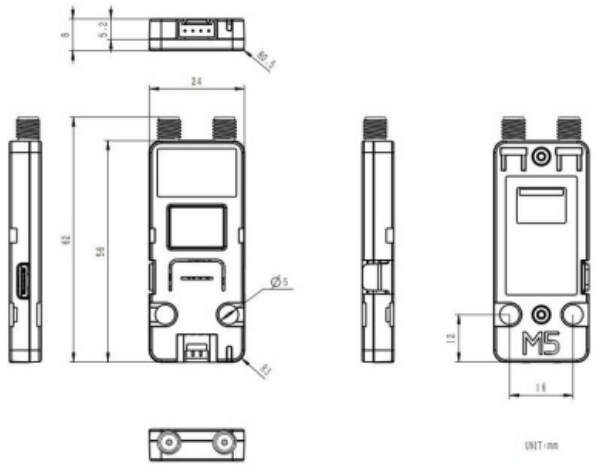
1. **Communication Capabilities**
   Integrated LoRa (Semtech SX1262), supporting LoRaWAN Class A/B/Candpointto-point modes 2.4 GHz Wi-Fi and BLE via ESP32-C6-MINI-1U
2. **Processor & Performance**
   Main Controller: Espressif ESP32-C6 (single-core RISC-V, up to 40 MHz) On-chip Memory: 512 KB SRAM with integrated ROM
3. **Power & Energy Management**
   Power Input: USB Type-C (5 V input) and Grove 5 V input
4. **Display & Indicators**
   0.66″ SPI OLED display for real-time data visualization and status monitoringWS2812C addressable RGB LED for system-status indication Built-in buzzer for audible alerts
5. **Interfaces & Controls**
   Grove I²C interface (with 5 V power) for seamless connection to M5Stack hostsandGrove sensors USB Type-C port for firmware programming, serial debugging, and power input Front-panel buttons (SYS_SW) and reset switch (MCU_RST) for local control
6. **Expansion & Debug Pads**
   Bootloader pad: predefined jumper pad for entering bootloader mode Test points (TP1–TP8) for signal probing and in-circuit debug

2. SPECIFICATIONS

Parameter	Specification
MCU	Espressif ESP32-C6(single-core RISC-V, up to 40 MHz)
Communication	LoRaWAN; 2.4 GHz Wi-Fi BLE
Power Input	USB Type-C(5V)and Grove 5V
Supply Voltage	3.3 V(on-board LDO)
Flash Storage	16 MB SPI Flash(128 Mbit)
Display	0.66”SPI OLED(128×64)
Indicator	WS2812C addressable RGB LED
Buzzer	On-board buzzer
Buttons	System button (SYS_SW)and reset button (MCU_RST)
Interfaces	Grove I²C;USB Type-C;bootloader pad;TP1-TP8 debug pads
Antennas	2×SSMB-JEF clamp connectors;2×IPEX-4 antenna connectors
Operating Temperature	Operating Temperature
Additional Features	Multi-channel ESD/surge protection
Manufacturer	M5Stack Technology Co., Ltd Block A10, Expo Bay South Coast, Fuhai Street, Bao’an District, Shenzhen, China

Frequency Range for CE	2.4G Wi-Fi: 2412-2472MHz BLE: 2402-2480MHz Lora: 868-868.6MHz
Maximum EIRP for CE	BLE: 5.03dBm 2.4G Wi-Fi: 16.96dBm Lora: 9.45dBm
Receiver category	The equipment provider declared that the receiver category for the EUTis2.

2.1 Module Size



3. FCC Warning

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 ClassBdigital 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

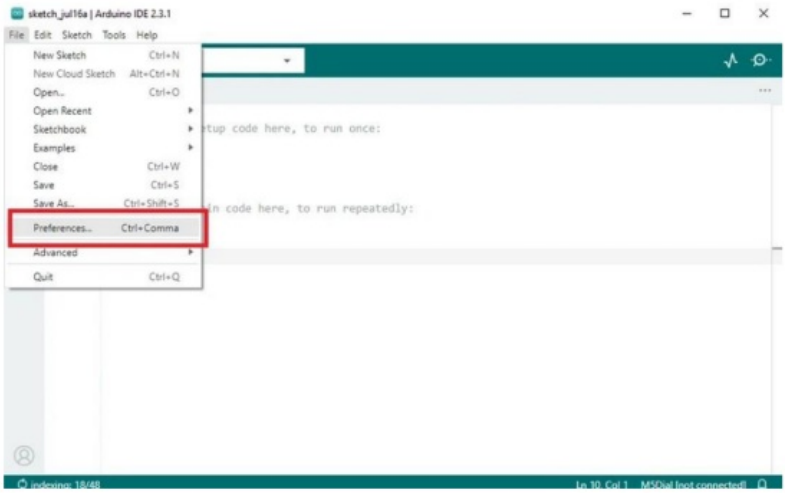
to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to

correct the interference by one or more of the following measures:

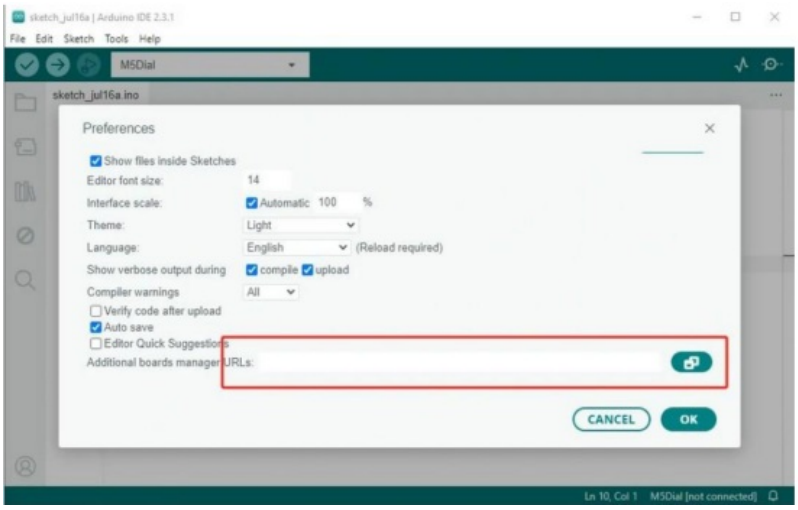
- Reorient or relocate the receiving antenna.
- Increase the separation betweentheequipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. — Consult the dealer or an experienced radio/TV technician for help. FCC Radiation Exposure Statement: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator&your body.

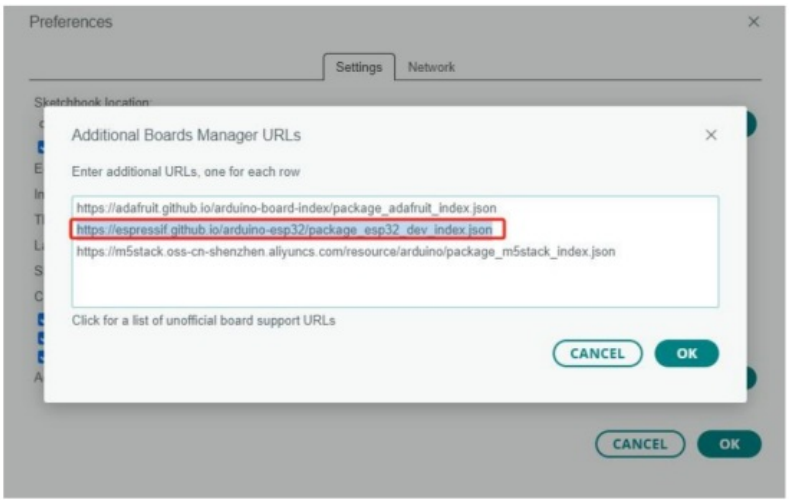
Arduino Install

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

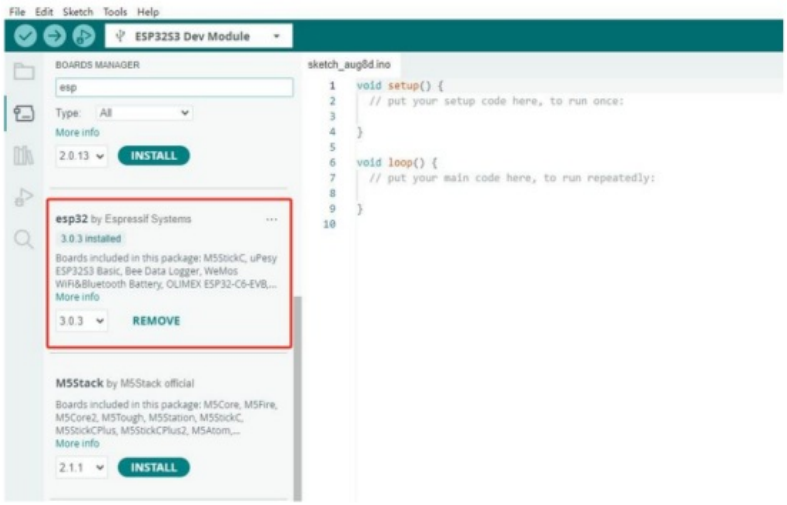


2.Copy the ESP board management URL below into the Additional Board Manager **URLs**: field, and save.
https://espressif.github.io/arduino-esp32/package_esp32_dev_index.json



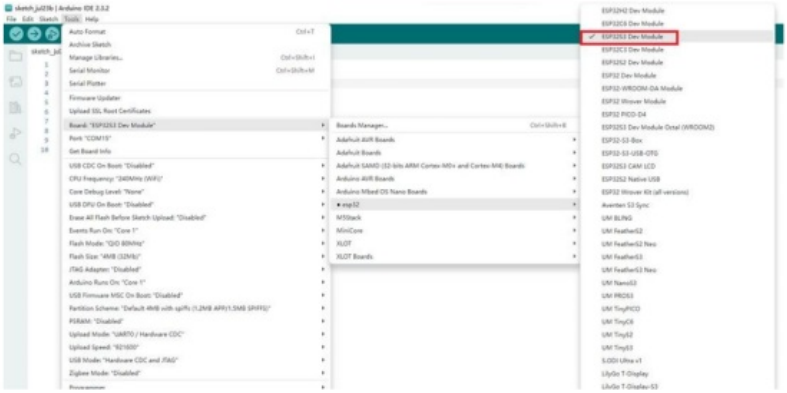


3. In the sidebar, select Board Manager, search for ESP, and click Install.



4. 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}.



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

Documents / Resources

Unit C6L M5STACK	M5STACK Unit C6L Intelligent Edge Computing Unit [pdf] Owner's Manual M5UNITC6L, 2AN3WM5UNITC6L, Unit C6L Intelligent Edge Computing Unit, Unit C6L, Intelligent Edge Computing Unit, Edge Computing Unit, Computing Unit, Unit

References

- User Manual

M5STACK

2AN3WM5UNITC6L, Computing Unit, Edge Computing Unit, Intelligent Edge Computing Unit, M5STACK, M5UNITC6L, Unit, Unit C6L, Unit C6L Intelligent Edge Computing Unit

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