Manuals+ — User Manuals Simplified.
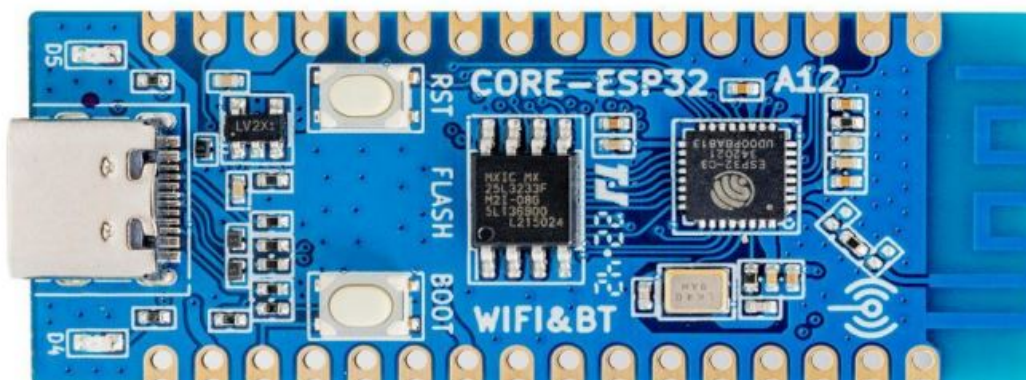
Luatos ESP32-C3 MCU Board User Guide

Contents

LuatOS

Luatos ESP32-C3 MCU Board

Product Information

The ESP32-C3 is a microcontroller board with 16MB of memory. It features 2 UART interfaces, UART0 and UART1, with UART0 serving as the download port. The board also includes a 5-channel 12-bit ADC with a maximum sampling rate of 100KSPS. Additionally, it has a low-speed SPI interface in master mode and an IIC controller. There are 4 PWM interfaces that can use any GPIO, and 15 external GPIO pins that can be multiplexed. The board is equipped with two SMD LED indicators, a reset button, a BOOT button, and a USB to TTL download

debug port.

Product Usage Instructions

1. Before powering up the ESP32, ensure that the BOOT (IO09) pin is not pulled down to avoid entering download mode.
2. During the design process, it is not recommended to externally pull down the IO08 pin, as it may prevent downloading via the serial port when the pin is low during the download and burning process.
3. In QIO mode, IO12 (GPIO12) and IO13 (GPIO13) are multiplexed for SPI signals SPIHD and SPIWP.
4. Refer to the schematic for additional reference on the pinout. Click **here** to access the schematic.
5. Ensure that any previous versions of the ESP32 package are uninstalled before using the installation package.
6. To install the program and the arduino-esp32 package, follow these steps:
    1. Open the official software download webpage and choose the corresponding system and system bits to download.
    2. Run the downloaded program and install it using the default settings.
    3. Find the espressif/arduino-esp32 repository on GitHub and click on the Installing link.
    4. Copy the URL named development release link.
    5. In the Arduino IDE, click on File > Preferences > Additional boards manager URLs and add the URL copied in the previous step.
    6. Go to Boards Manager in the Arduino IDE and install the ESP32 package.
    7. Select Tools > Board and choose ESP32C3 Dev Module from the list.
    8. Change the flash mode to DIO by going to Tools > Flash Mode and change USB CDC on Boot to Enable.
7. Your ESP32 setup is now ready to go! You can test it by running a demonstration program to ensure everything is working correctly.

SUPPORT
If you require assistance, please feel free to contact us at **tourdeuscs@gmail.com**.

OVERVIEW

The ESP32 development board is designed based on the ESP32-C3 chip from Espressif Systems.
It has a small form factor and stamp hole design, making it convenient for developers to use.The board supports multiple interfaces, including UART, GPIO, SPI, I2C, ADC, and PWM, and is ideal for mobile devices, wearable electronics, and IoT applications with low-power performance.

It can function as a standalone system or peripheral device to the main MCU, providing Wi-Fi and Bluetooth functions through SPI/SDIO or I2C/UART interfaces.

ON BOARD RESOURCE

- This development board has one SPI flash with 4MB storage capacity, which can be expanded up to 16MB.
- It features 2 UART interfaces, UART0 and UART1, with UART0 serving as the download port.
- There is a 5-channel 12-bit ADC on this board, with a maximum sampling rate of 100KSPS.
- A low-speed SPI interface is also included in master mode.
- There is an IIC controller on this board.
- It has 4 PWM interfaces that can use any GPIO.

- There are 15 external GPIO pins that can be multiplexed.
- Additionally, it includes two SMD LED indicators, a reset button, a BOOT button, and a USB to TTL download debug port.
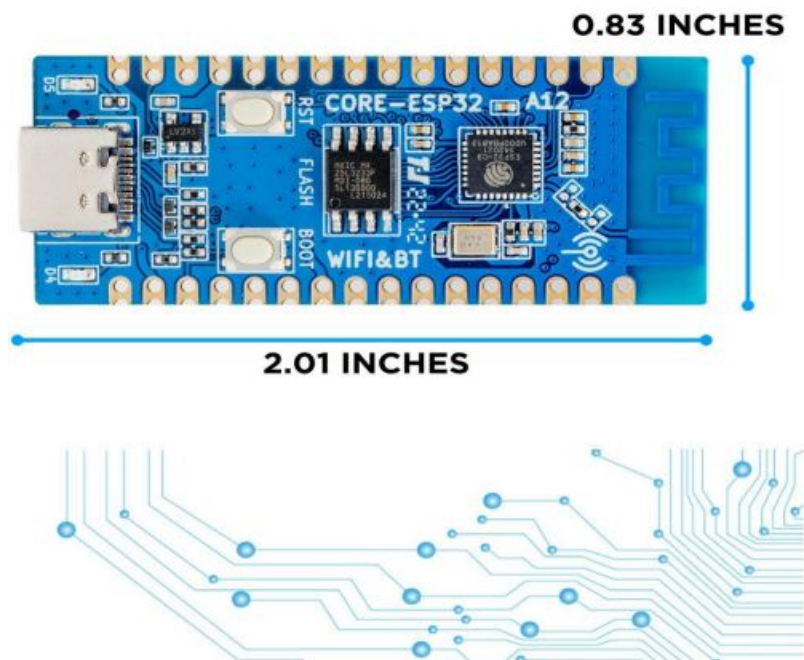
PINOUT DEFINITION
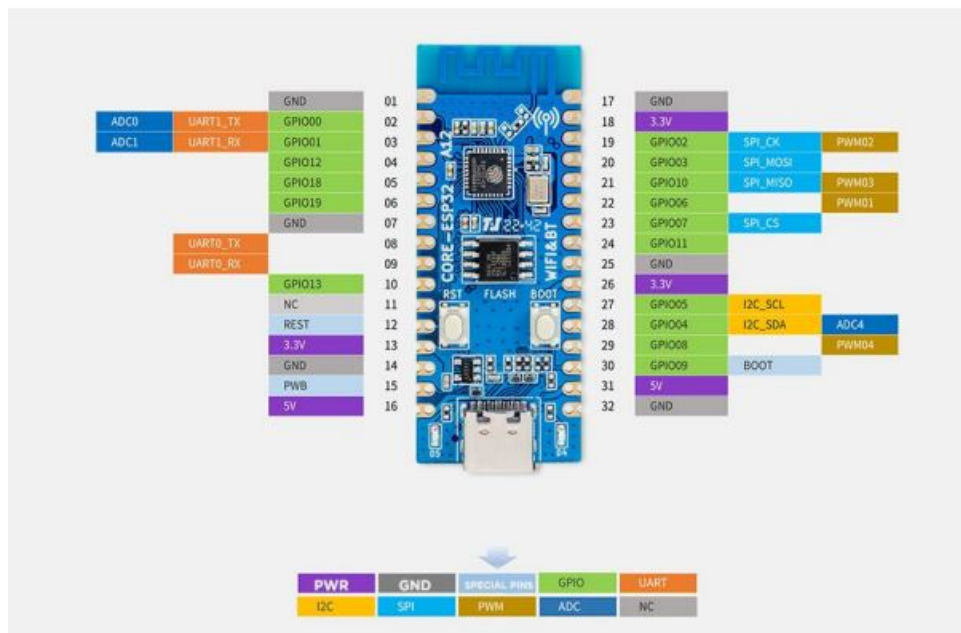
ESP32-C3 PCB
HTTPS://WIKI.LUATOS.COM/_STATIC/BOM/ESP32C3.HTML.

DIMENSIONS CLICK FOR DETAILS

NOTES ON USE

- To avoid the ESP32 from entering download mode, the BOOT (IO09) pin should not be pulled down before powering up.

- It is not recommended to externally pull down the IO08 pin when designing, as this may prevent downloading via serial port when the pin is low during the download and burning process.
- In QIO mode, IO12 (GPIO12) and IO13 (GPIO13) are multiplexed for SPI signals SPIHD and SPIWP, but for increased GPIO availability, the development board uses 2-wire SPI in DIO mode, and as such, IO12 and IO13 are not connected to flash. When using self-compiled software, flash must be configured to DIO mode accordingly.
- Since the VDD of the external SPI flash is already connected to the 3.3V power supply system, there is no requirement for additional power supply configuration, and it can be accessed using the standard 2- wire SPI communication mode.
- By default, GPIO11 serves as the VDD pin of the SPI flash, and thus requires configuration before it can be utilized as a GPIO.

SCHEMATIC
Please click the following link for reference.
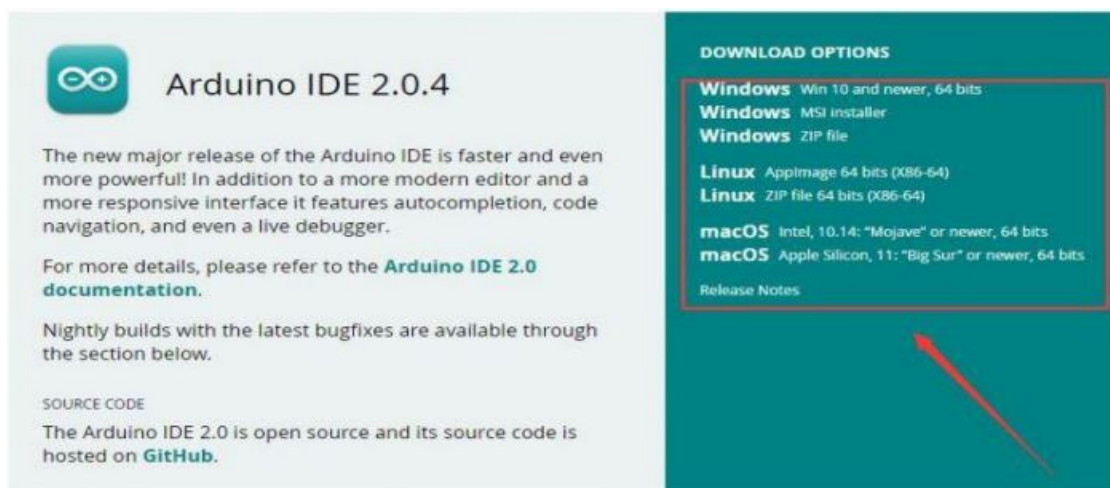https://cdn.openluat-luatcommunity.openluat.com/attachment/20220609213416069_CORE-ESP32-A12.pdf

DEVELOPMENT ENVIRONMENT CONFIGURATION

Note: The following development system is Windows by default.

NOTE: Please ensure that you have uninstalled any previous versions of the ESP32 package before using this installation package.
You can do this by navigating to the folder "%LOCALAPPDATA%/Arduino15/packages" in the file manager, and deleting the folder named "esp32".

1. Open the official software download webpage, and choose the corresponding system and system bits to download.
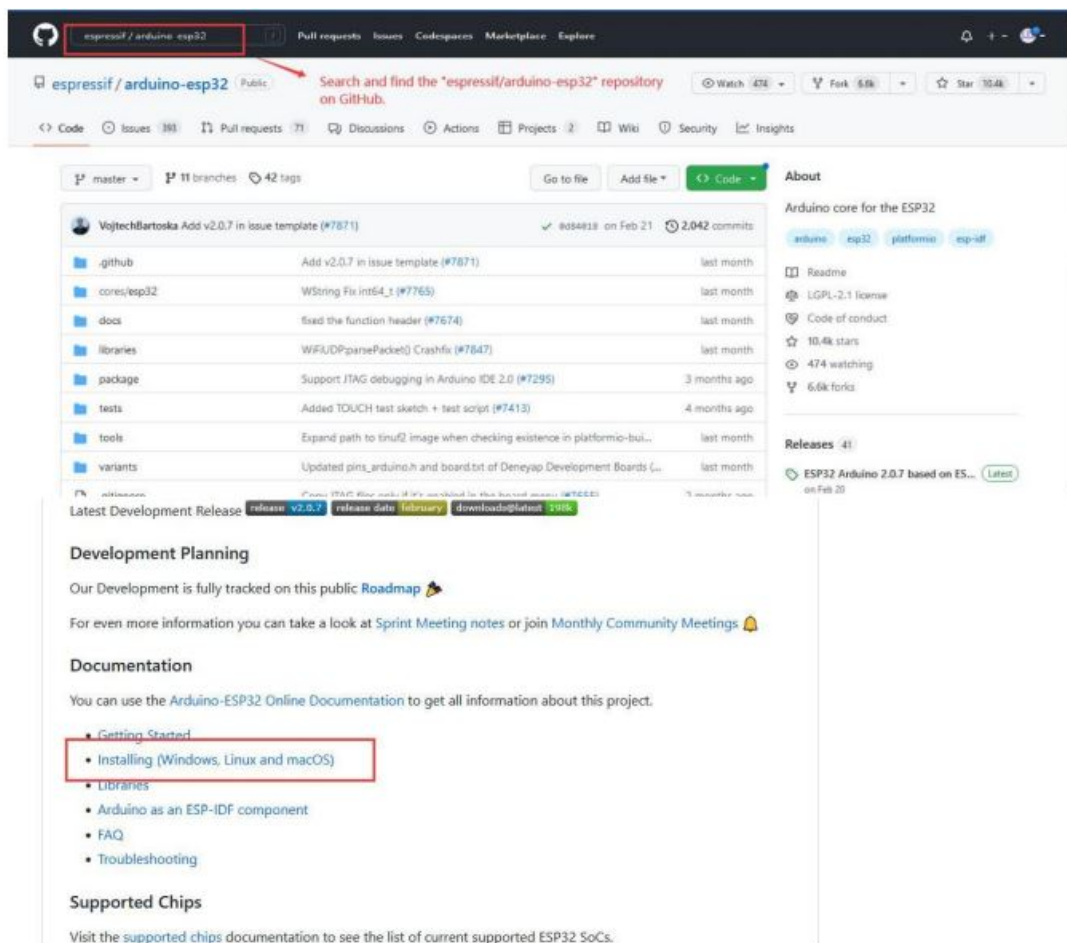

2. You can choose "Just Download", or "Contribute & Download".

Support the Arduino IDE

Since the release 1.x release in March 2015, the Arduino IDE has been downloaded **70,749,707** times — impressive! Help its development with a donation.

| $3 | $5 | $10 | $25 | $50 | Other |

JUST DOWNLOAD   **CONTRIBUTE & DOWNLOAD**
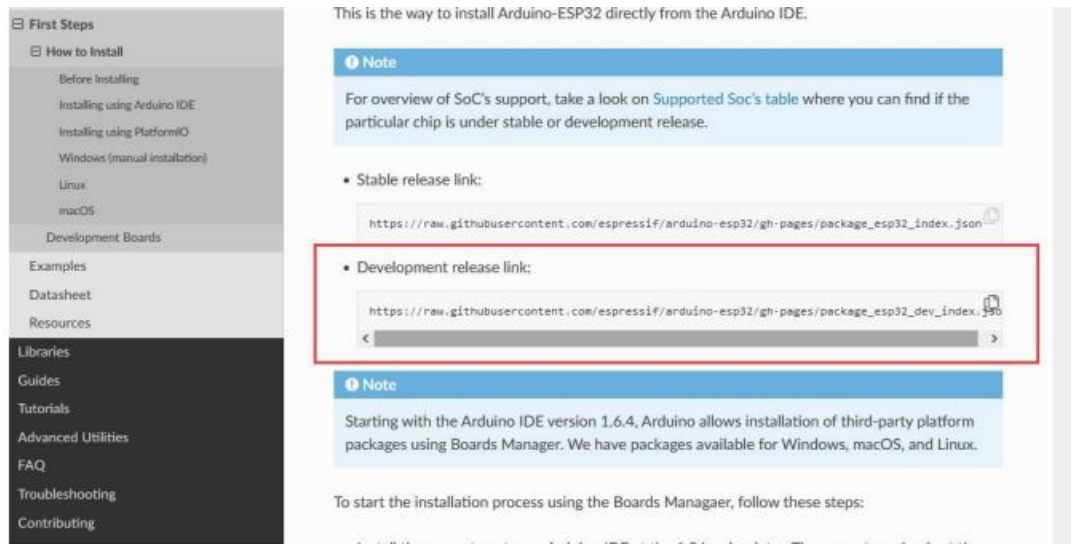
Learn more about **donating to Arduino.**

3. Run to install the program and install it all by default.

4. Install arduino-esp32

- Look for a URL named development release link and copied.

This is the way to install Arduino-ESP32 directly from the Arduino IDE.

ⓘ Note

For overview of SoC's support, take a look on Supported Soc's table where you can find if the particular chip is under stable or development release.

- Stable release link:

  https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json

- Development release link:

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

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ⓘ Note

Starting with the Arduino IDE version 1.6.4, Arduino allows installation of third-party platform packages using Boards Manager. We have packages available for Windows, macOS, and Linux.

To start the installation process using the Boards Managaer, follow these steps:

- Install the current upstream Arduino IDE at the 1.8 level or later. The current version is at the

- In the Arduino IDE, click on File > Preferences > Additional boards manager URLs and add the URL that you found in step 2.
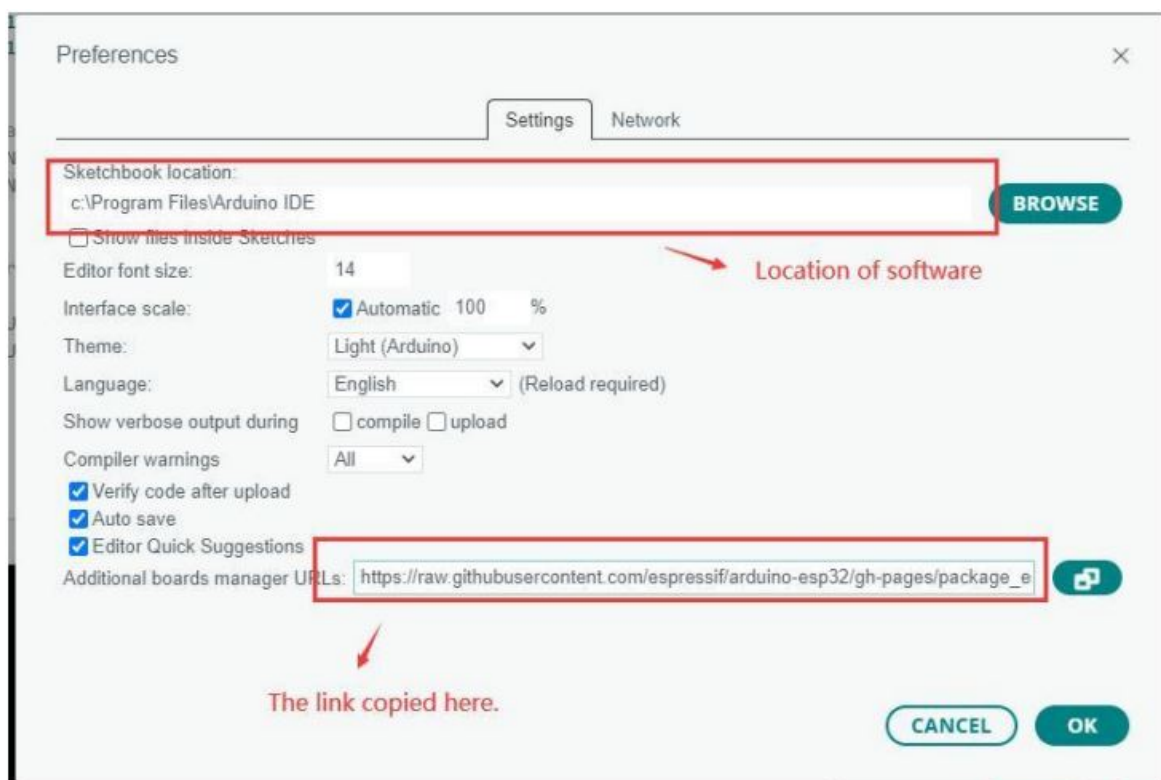
- Now, go back to Boards Manager and install the "ESP32" package.
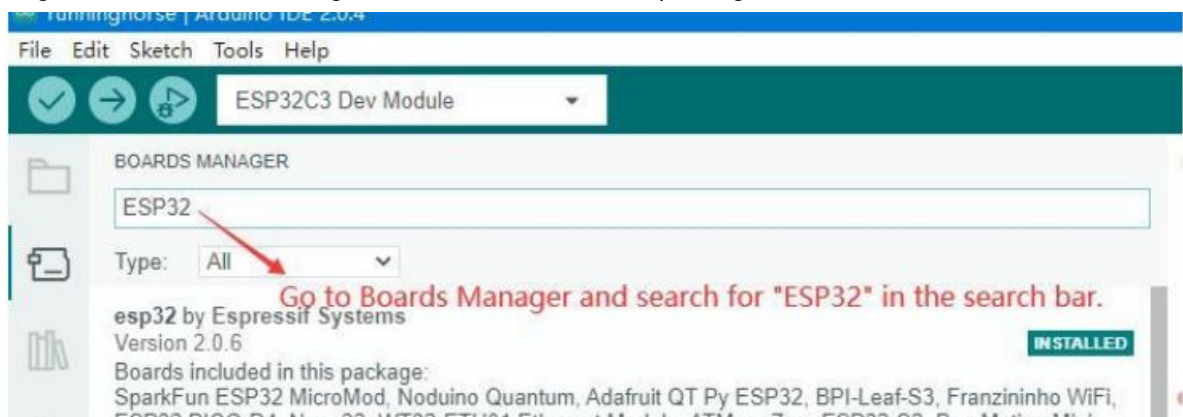
- After installation, select Tools > Board and choose "ESP32C3 Dev Module" from the list.

- Finally, change the flash mode to DIO by going to Tools > Flash Mode, and change USB CDC on Boot to Enable.

Your ESP32 setup is now ready to go! To test it, you can run a demonstration program to ensure everything is working correctly.

Documents / Resources

Luatos ESP32-C3 MCU Board [pdf] User Guide
ESP32-C3 MCU Board, ESP32-C3, MCU Board, Board

References

- **User Manual**