RP2040-Zero

LUCKFOX

Overview

RP2040-Zero, A Low-Cost, High-Performance Pico-Like MCU Board Based On Raspberry Pi Microcontroller RP2040.

RP2040-Zero

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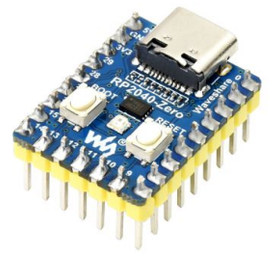
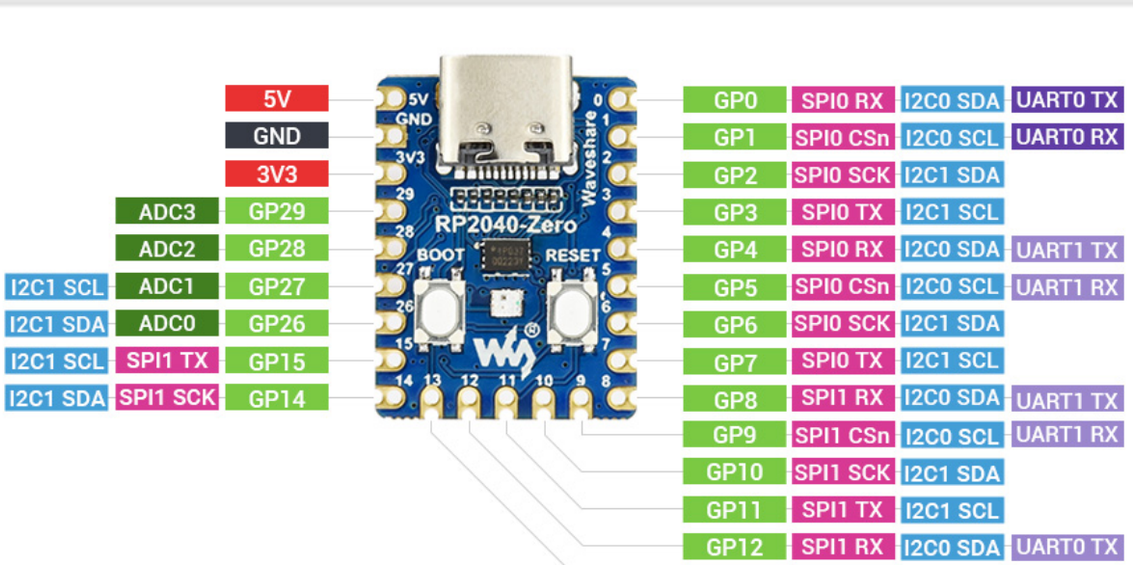
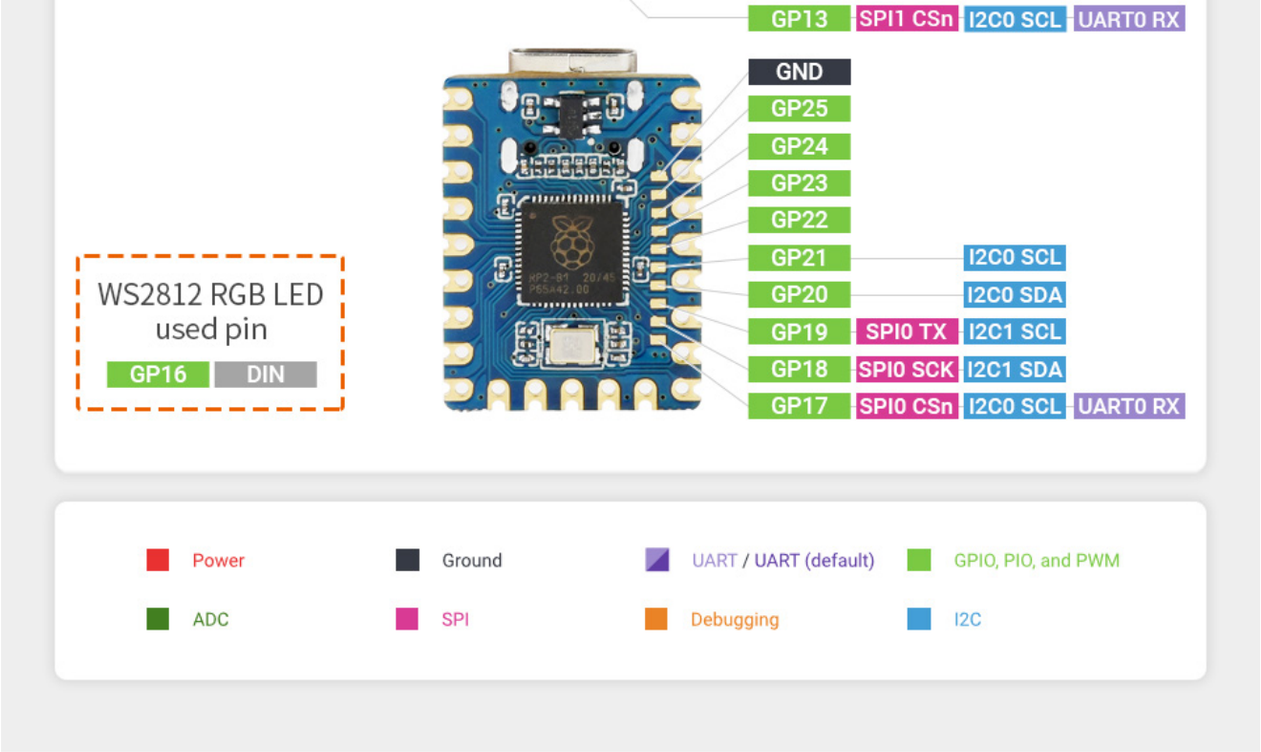


Specification

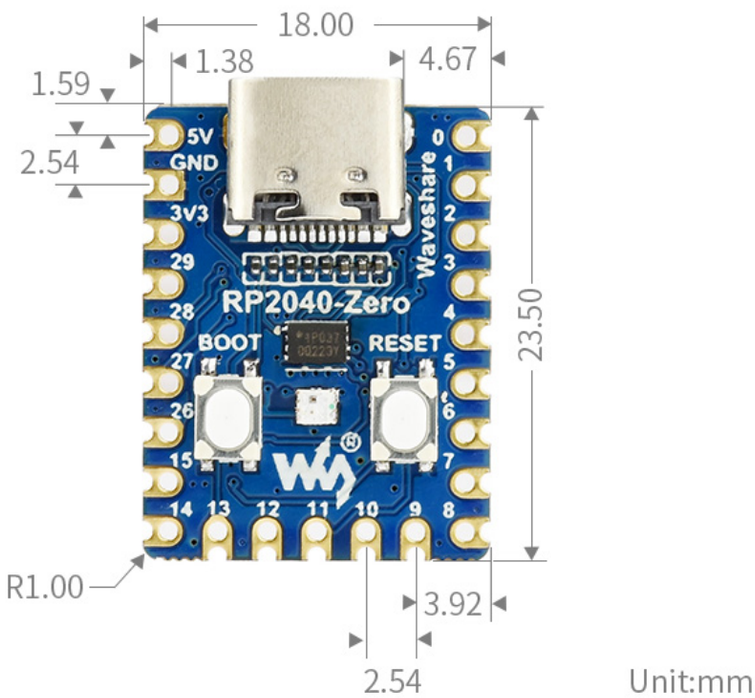
- RP2040 microcontroller chip designed by Raspberry Pi in the United Kingdom.
- Dual-core Arm Cortex M0+ processor, flexible clock running up to 133 MHz.
- 264KB of SRAM, and 2MB of on-board Flash memory.
- USB-C connector, keeps it up to date, easier to use.
- The castellated module allows soldering direct to carrier boards.
- USB 1.1 with device and host support.
- Low-power sleep and dormant modes.
- Drag-and-drop programming using mass storage over USB.
- 29 × multi-function GPIO pins (20× via edge pinout, others via solder points).
- 2 × SPI, 2 × I2C, 2 × UART, 4 × 12-bit ADC, 16 × controllable PWM channels.
- Accurate clock and timer on-chip.
- Temperature sensor.
- Accelerated floating-point libraries on-chip.
- 8 × Programmable I/O (PIO) state machines for custom peripheral support.

Pinouts





Dimension



Anti-piracy statement

There are many unscrupulous merchants in the market who maliciously copy Waveshare products, the general characteristics of these unscrupulous merchants are:

1. Copying web page descriptions, product pictures, and product information.
2. The use of poor components, the light operation is not stable and may appear short circuit, equipment burned, and other phenomena (to avoid your property losses, please beware of piracy).
3. Do not pay attention to product quality, no ability to deal with after-sales. (We not only produce excellent quality boards but also provide a strong after-sales team to protect your products and works).

- Recognize Waveshare genuine products, we have the following characteristics in terms of configuration and appearance:

  1. With Waveshare LOGO (certificate).
  2. Immersion gold process (only some models, see product description).

Pico Quick Start

Download Firmware

- MicroPython Firmware Download
- C_Blink Firmware Download [Expand]

Video Tutorial [Expand]

- Pico Tutorial I - Basic Introduction
- Pico Tutorial II - GPIO [Expand]
- Pico Tutorial III - PWM [Expand]
- Pico Tutorial IV - ADC [Expand]
- Pico Tutorial V - UART [Expand]
- Pico Tutorial VI - To be continued... [Expand]

MicroPython Series

- 【MicroPython 】 machine.Pin Function
- 【MicroPython 】 machine.PWM Function
- 【MicroPython 】 machine.ADC Function
- 【MicroPython 】 machine.UART Function
- 【MicroPython 】 machine.I2C Function
- 【MicroPython 】 machine.SPI Function
- 【MicroPython 】 rp2.StateMachine

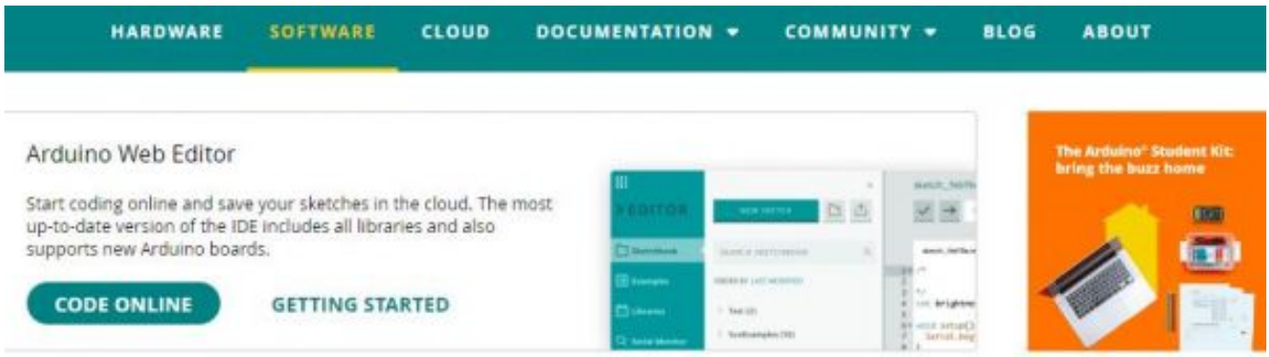
C/C++ Series

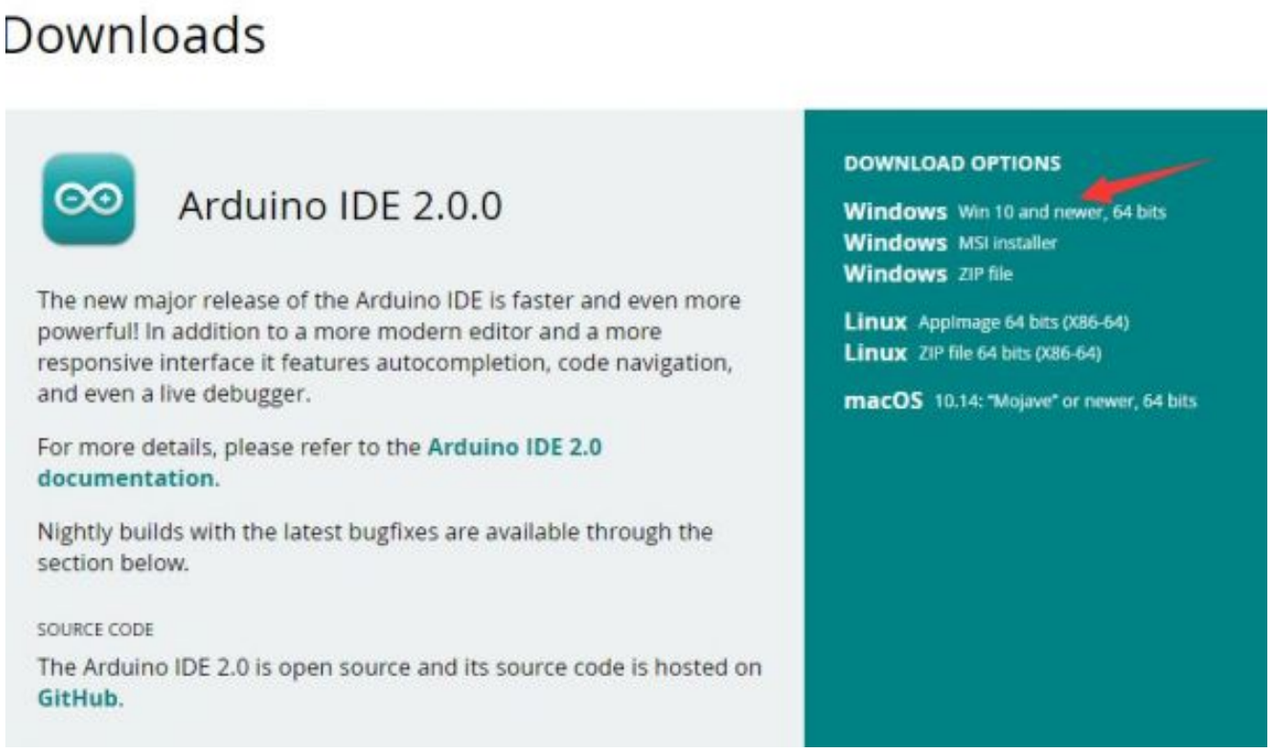
- 【C/C++ 】 Windows Tutorial 1 - Environment Setting
- 【C/C++ 】 Windows Tutorial 1 - Create New Project

Arduino IDE Series

Install Arduino IDE

1. Download the Arduino IDE installation package from Arduino website.





2. Just click on "JUST DOWNLOAD".

Learn more about **donating to Arduino.**

3. Click to install after downloading.

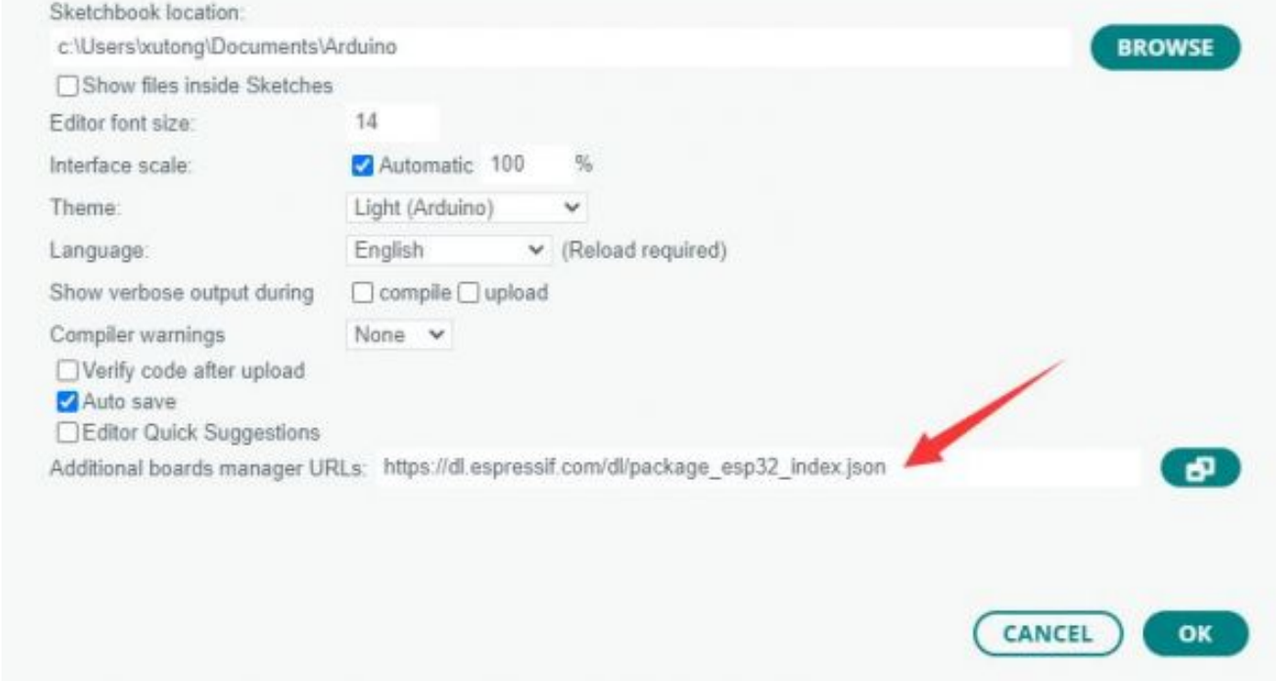
4. **Note: You will be prompted to install the driver during the installation process, we can click Install.**

Install Arduino-Pico Core on Arduino IDE

1. Open Arduino IDE, click the File on the left corner and choose "Preferences".

2. Add the following link in the additional development board manager URL, then click OK.

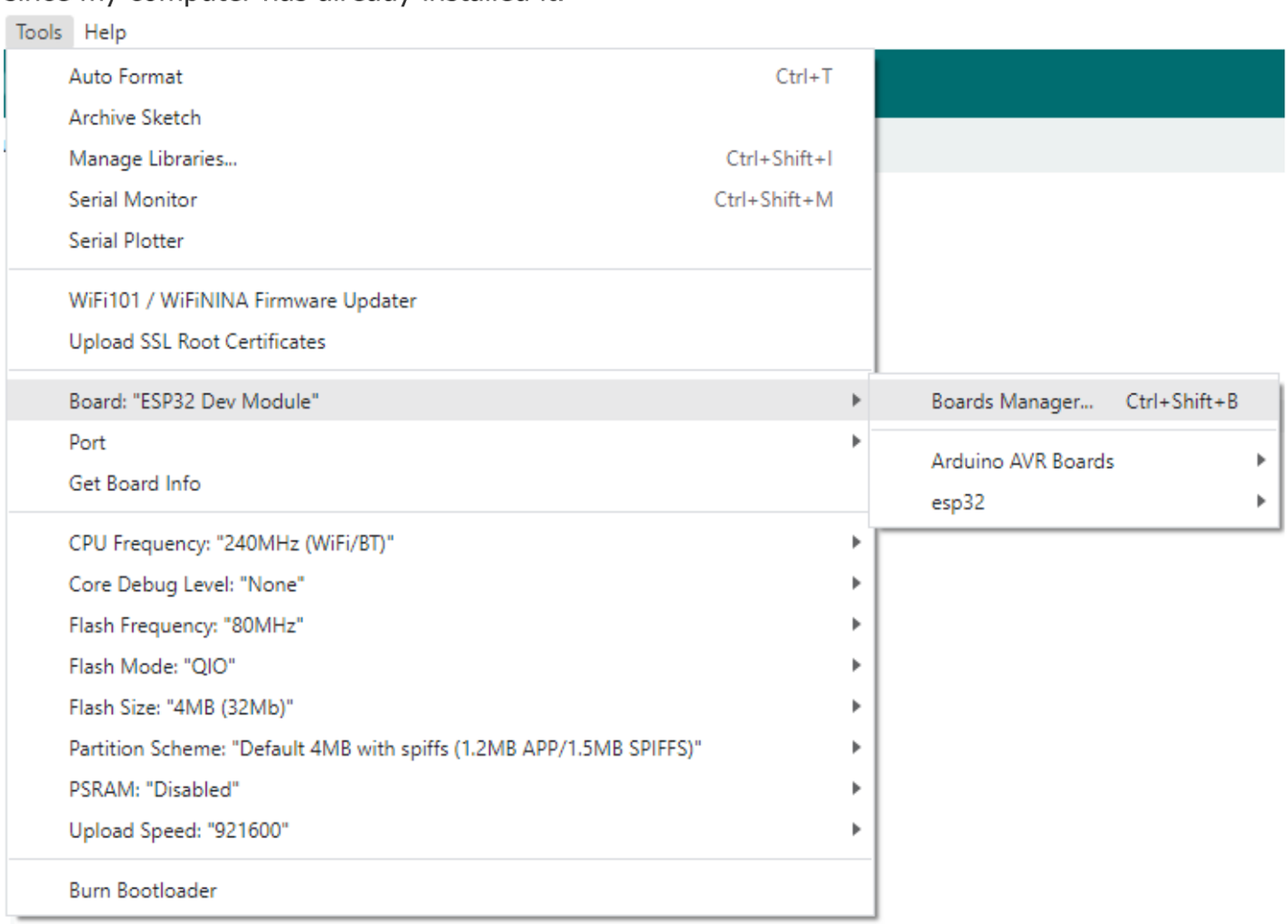
```
https://github.com/earlephilhower/arduino-pico/releases/download/global/package_rp2040_index.json
```

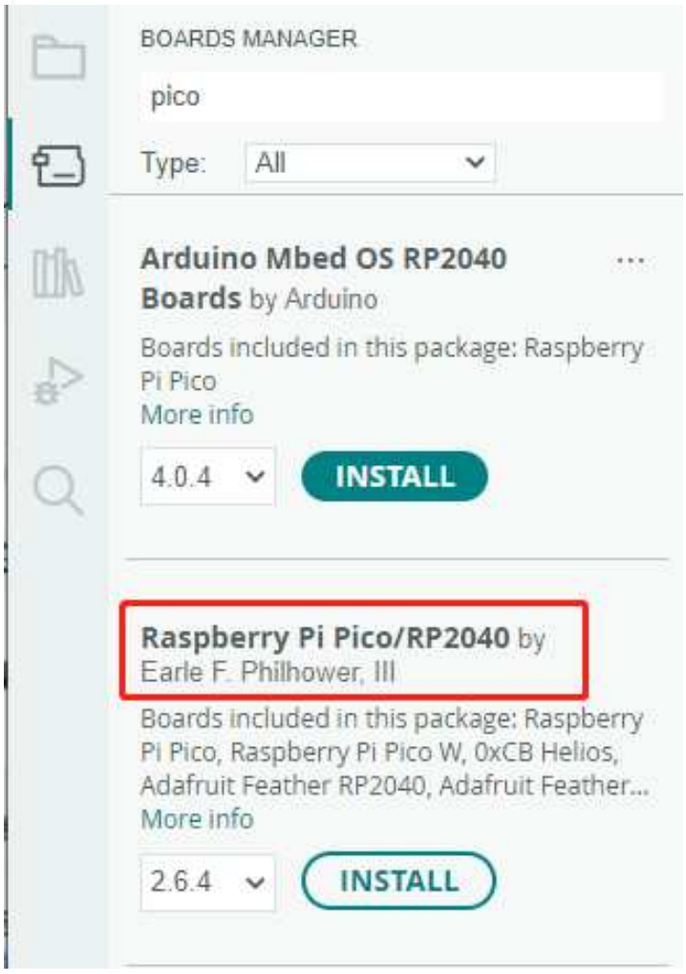


Note: If you already have the ESP8266 board URL, you can separate the URLs with commas like this:

```
https://dl.espressif.com/dl/package_esp32_index.json,https://github.com/earlephilhower/arduino-pico/releases/download/global/package_rp2040_index.json
```

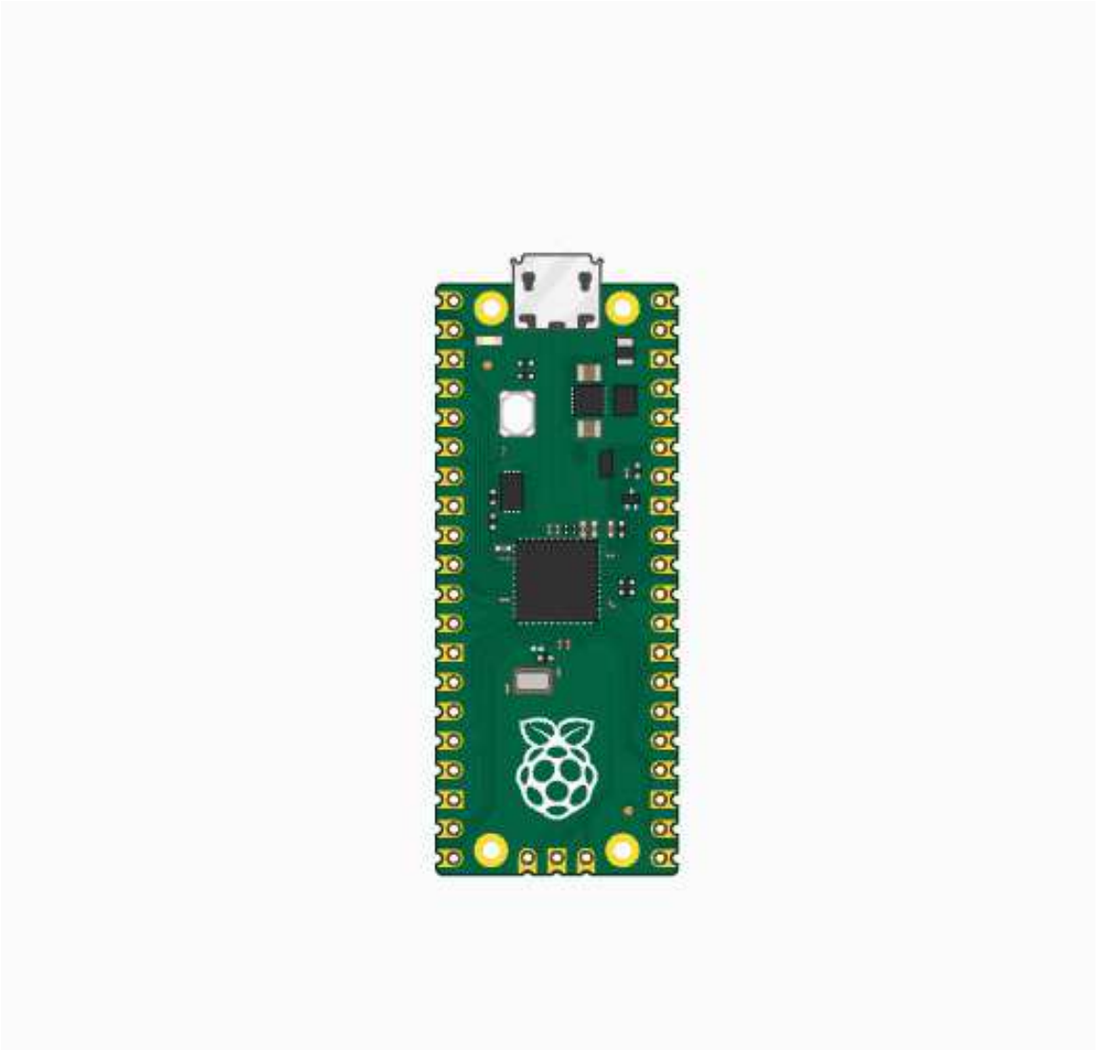
3. Click on Tools -> Dev Board -> Dev Board Manager -> Search for pico, it shows installed since my computer has already installed it.



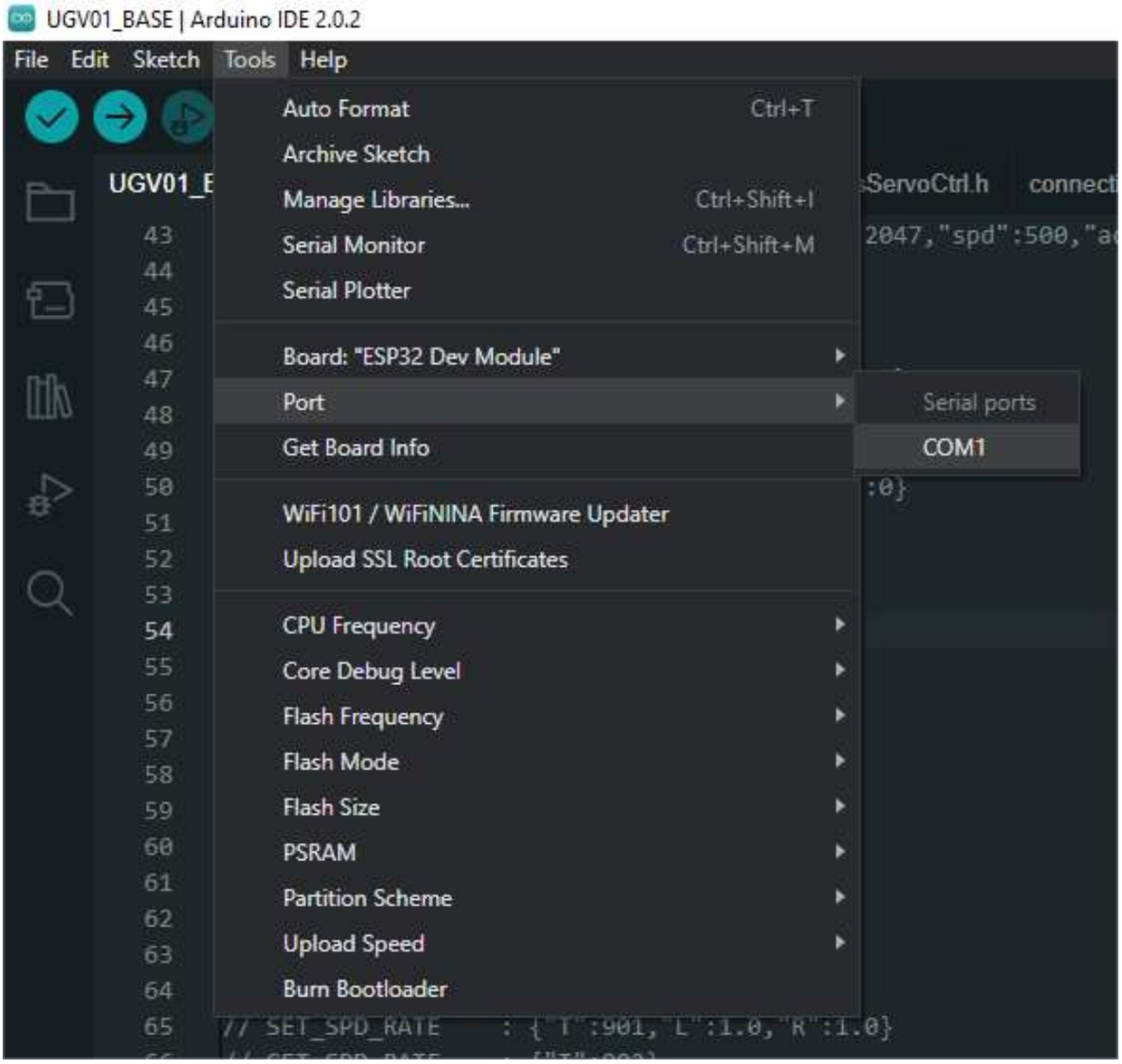


Upload Demo At the First Time

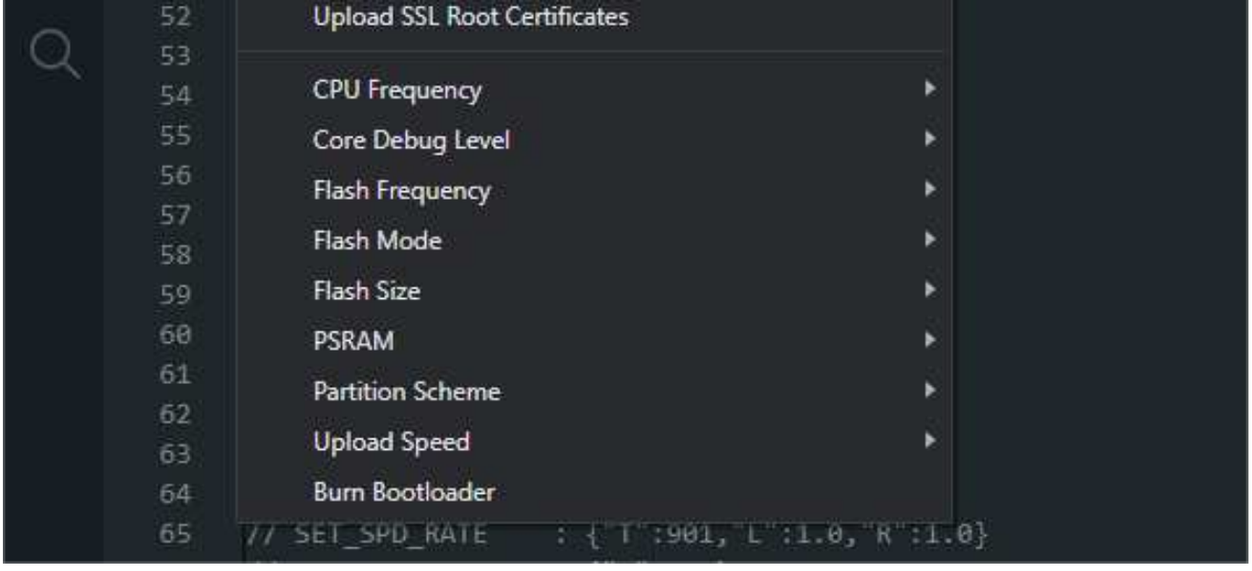
1. Press and hold the BOOTSET button on the Pico board, connect the Pico to the USB port of the computer via the Micro USB cable, and release the button when the computer recognizes a removable hard drive (RPI-RP2).



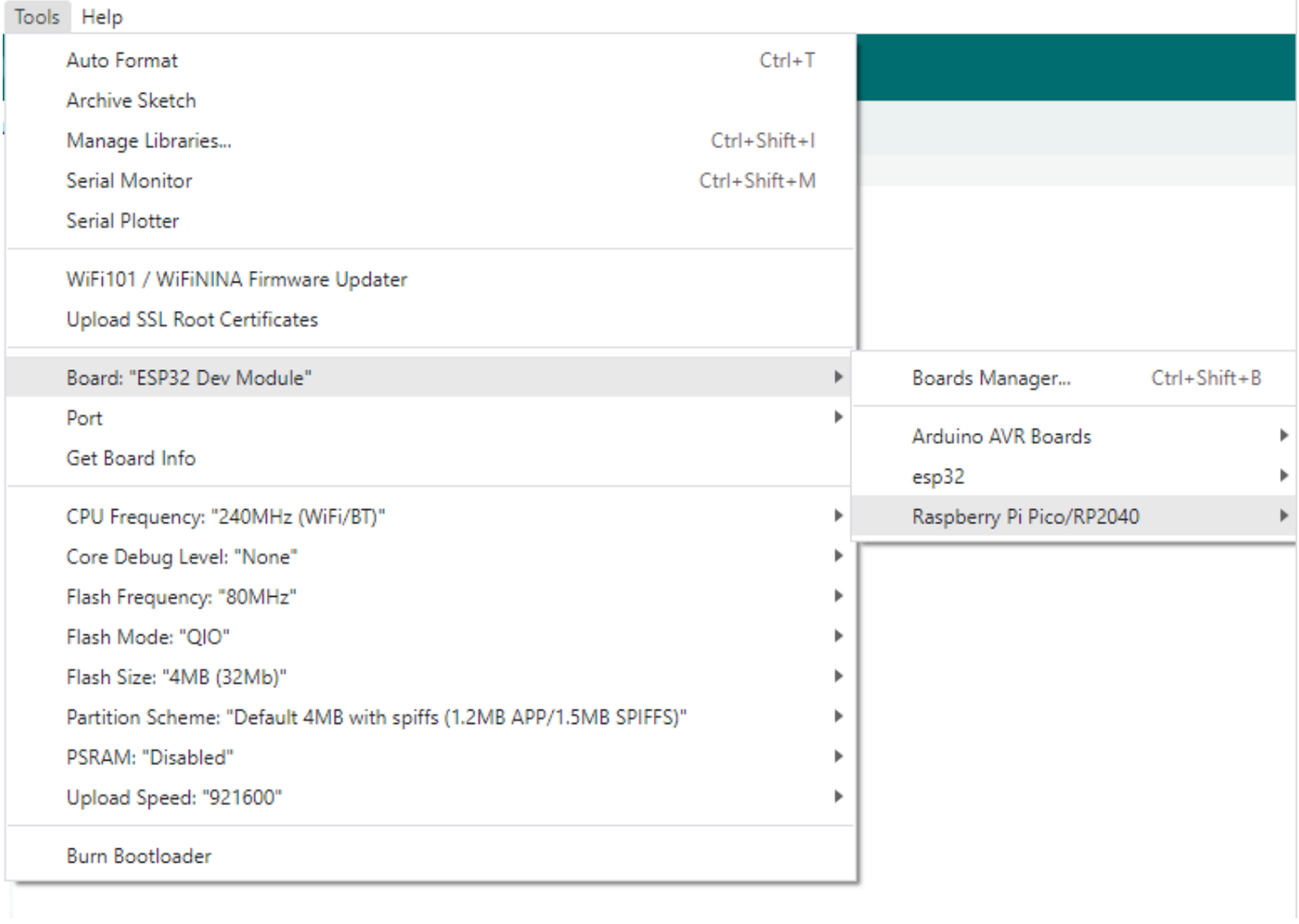
2. Download the demo, open arduino\PWM\D1-LED path under the D1-LED.ino.
3. Click Tools -> Port, remember the existing COM, do not need to click this COM (different computers show different COM, remember the existing COM on your computer).



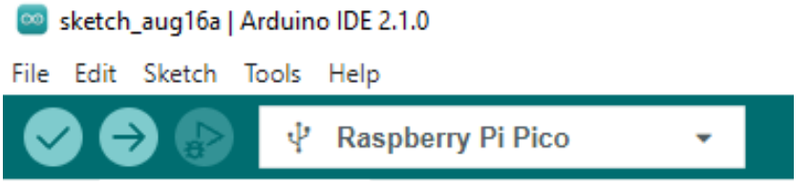
4. Connect the driver board to the computer with a USB cable, then click Tools -> Ports, select uf2 Board for the first connection, and after the upload is complete, connecting again will result in an additional COM port.



5. Click Tool -> Dev Board -> Raspberry Pi Pico/RP2040 -> Raspberry Pi Pico.



6. After setting, click the right arrow to upload.



- If you encounter problems during the period, you need to reinstall or replace the Arduino IDE version, uninstall the Arduino IDE needs to be uninstalled cleanly, after uninstalling the software you need to manually delete all the contents of the folder C:\Users\[name]\AppData\Local\Arduino15 (you need to show the hidden files in order to see it) and then reinstall.

Pico-W Series Tutorial (To be continued...)

Open Source Demo

- MicroPython Demo (GitHub)
- MicroPython Firmware/Blink Demo (C)
- Official Raspberry Pi C/C++ Demo
- Official Raspberry Pi MicroPython Demo
- Arduino Official C/C++ Demo

Resource

Example Demo

- Raspberry-Pi-Pico-Basic-Kit Example Demo
- Raspberry-Pi-Pico-Sensor-Kit Example Demo

Official Document

Pico W

- Pico W Datasheet
- Pico W Network Connection
- Pico W step (3D file)

Firmware

- Pico W MicroPython Firmware

Pico

User Manual

- Getting started with pico
- Pico c sdk
- Pico python sdk
- Raspberry-pi-pico-faq

Schematic & Datasheet

- Raspberry Pi Pico Schematic
- Pico Pinout
- Pico Datasheet

- Rp2040 Datasheet
- Hardware Design Manual

Related Books

- Raspberry Pi Pico Get Started MicroPython
- Related Raspberry Pi Books Download

Raspberry Pi Open-source Demo

- Official Raspberry Pi C?C++ Example Demo
- Official Raspberry Pi MicroPython Example Demo

Development Software

- Thonny Python IDE (Windows V3.3.3)
- Zimo221.7z
- Image2Lcd.7z

Documents

- Schematic of RP2040-Zero
- 3D drawing of the board

Demo Codes

- Demo codes for Raspberry-Pi-Pico-Basic-Kit
- Demo codes for Raspberry Pi Pico Sensor Kit
- WS2812B Test Codes

Example Project Shared by Users

- JustUSB project by Alwin

Support

Technical Support

If you need technical support or have any feedback/review, please click the **Submit Now** button to submit a ticket, Our support team will check and reply to you within 1 to 2 working days. Please be patient as we make every effort to help you to resolve the issue.
Working Time: 9 AM - 6 AM GMT+8 (Monday to Friday)

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