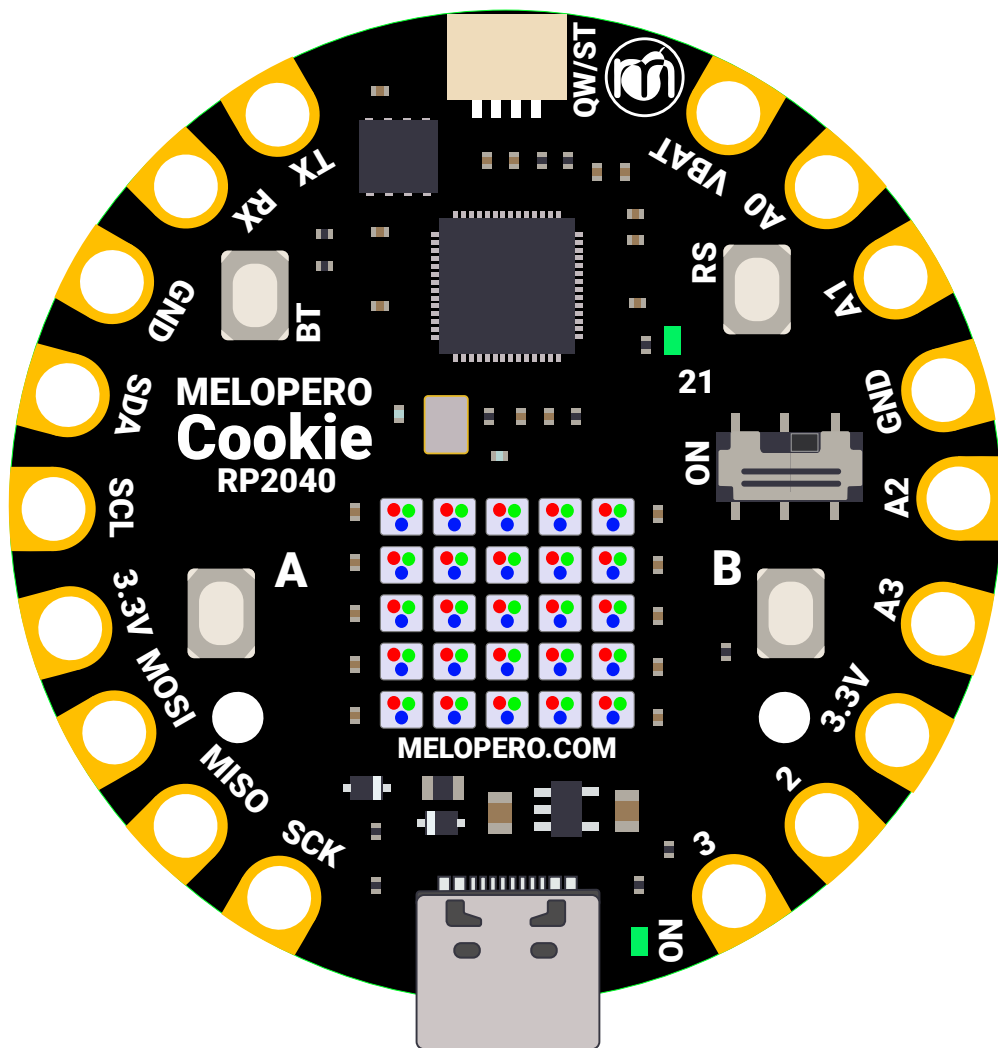


# Getting started with Melopero Cookie RP2040



This guide is constantly updated with corrections and new content.

When a new version is released, we also update the version number:

Version 1.0.1

October 2022

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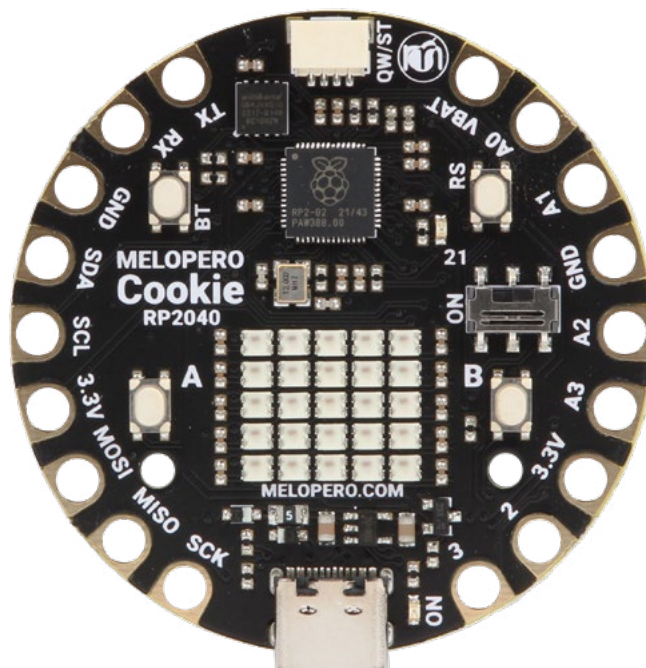
# 1. Hardware overview

The Melopero Cookie RP2040 is a development board based on the Raspberry Pi RP2040 micro-controller, programmable in C/C++, MicroPython, CircuitPython and Arduino (coming in a few days)

The board features:

- 8MB of FLASH Memory
- Reset and boot buttons (no need to detach/attach the board to enter boot mode)
- Qwiic/Stemma QT connector for attaching lots of Melopero, Adafruit and SparkFun sensors
- USB-C connector for powering, programming and charging
- Green user LED on pin 21
- WS2812 (aka NeoPixel) Matrix Display
- Green Power LED
- 2 mounting holes
- Programmable in C/C++, MicroPython, CircuitPython and with the Arduino IDE.

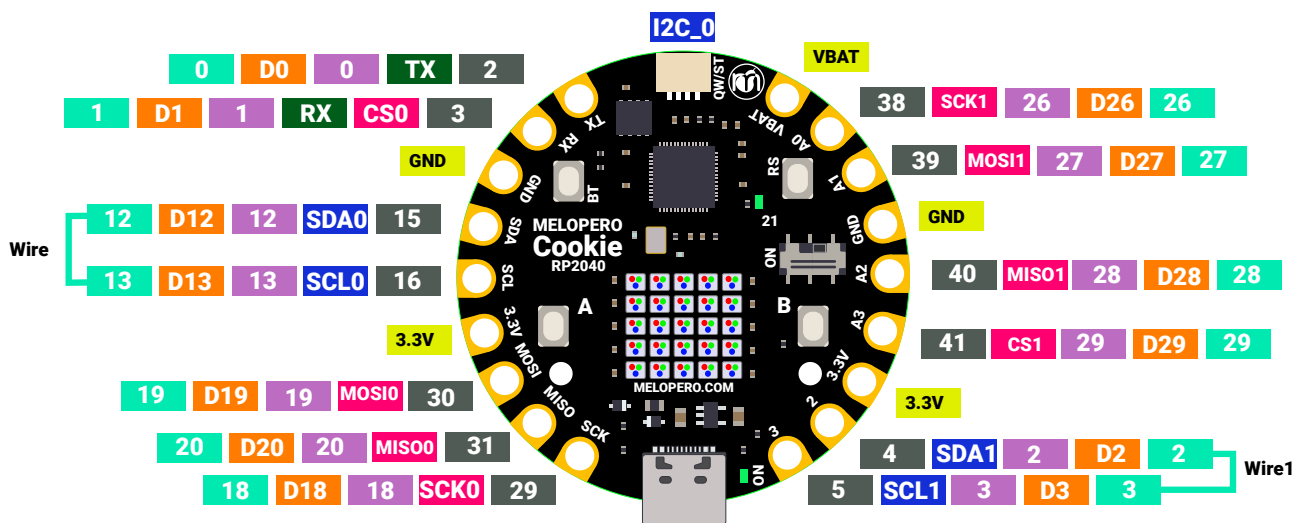
Dimensions: 50.8mm x 50.8mm



## 2. Pinout

# MELOPERO Cookie RP2040 PINOUT

	RP2020 Physical PIN
	I2C
	SPI
	UART
	RP2040 GPIO
	CircuitPython
	Arduino IDE



GPIO Max Current 12mA per pin

User LED 32 21 D21 21

User Button A 13 10 D10 10

User Button B 14 11 D11 11

NEOPIXEL

DISABLE (default is enabled, pin LOW)

27 16 D16 16

NEOPIXEL

MATRIX

28 17 D17 17

The pinout chart above is useful to quickly find the right name to use for a specific pin, depending on the language and IDE. As example, note how the pins labeled as 28 and 28 change name depending on which platform you are using to program the board:

- CircuitPython refer to those pins as D28 and D29
- In the Arduino IDE they are 28 and 29 (check the green labels)
- For use with MicroPython, they are called with the number you find in the GPxx labels (only the number)

# 3. Installing CircuitPython

CircuitPython is a derivative of MicroPython designed to simplify experimentation and education on low-cost microcontrollers. It makes it easier than ever to get prototyping by requiring no upfront desktop software downloads. Simply copy and edit files on the CIRCUITPY drive to iterate. CircuitPython is developed and maintained by Adafruit Industries, along with many sensors libraries to start your project in the blink of an eye.

## 3.1 Download CircuitPython

As we write the first version of this guide, the Melopero Shake Rp2040 is not listed yet on the official CircuitPython.org website, it's a matter of a few days.

In the meantime, you can download the latest current version (7.0.0) from our server, at the following address:

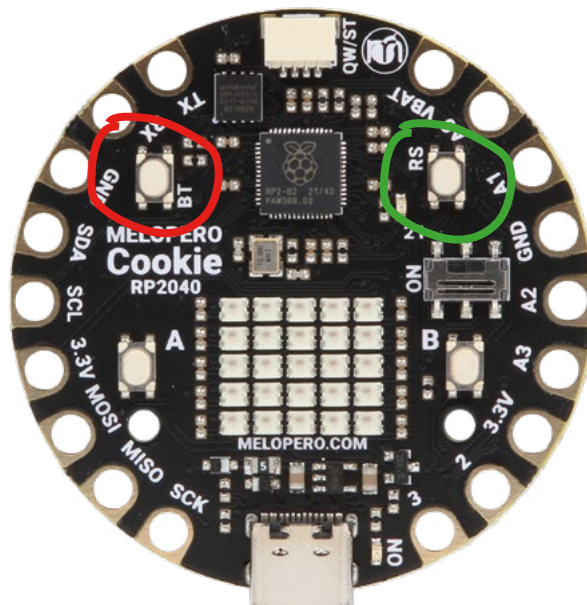
**[www.melopero.com/melopero\\_cookie\\_rp2040\\_circuitpython.uf2](http://www.melopero.com/melopero_cookie_rp2040_circuitpython.uf2)**

## 3.2 Install CircuitPython

After downloading the latest version of CircuitPython, activate the boot loader mode on your board and copy the .uf2 file to it.

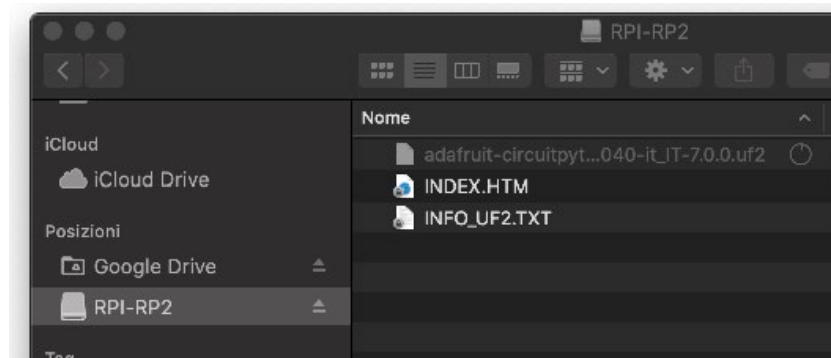
To enter the bootloader, when the Shake is already connected to your computer's USB port, press and hold the BOOT / BOOTSEL button (circled in red in the image below), then press and release the reset button (circled in green). Continue holding the BOOT / BOOTSEL button until the RPI-RP2 appears.

You can also start with your board unplugged from USB, press and hold the BOOTSEL button on your Shake RP2040. While holding the button, connect the other end of the USB cable to the Shake board. This will cause Shake to load his bootloader. You should see the RPI-RP2 appear as a new drive on your computer when you do this.



You will see a new disk drive appear called RPI-RP2.

Drag (or copy and paste) `melopero_cookie_rp2040_circuitpython.uf2` file to RPI-RP2. The RPI-RP2 drive will disappear and a new disk drive called CIRCUITPY will appear.



## 3.3 Install Mu editor

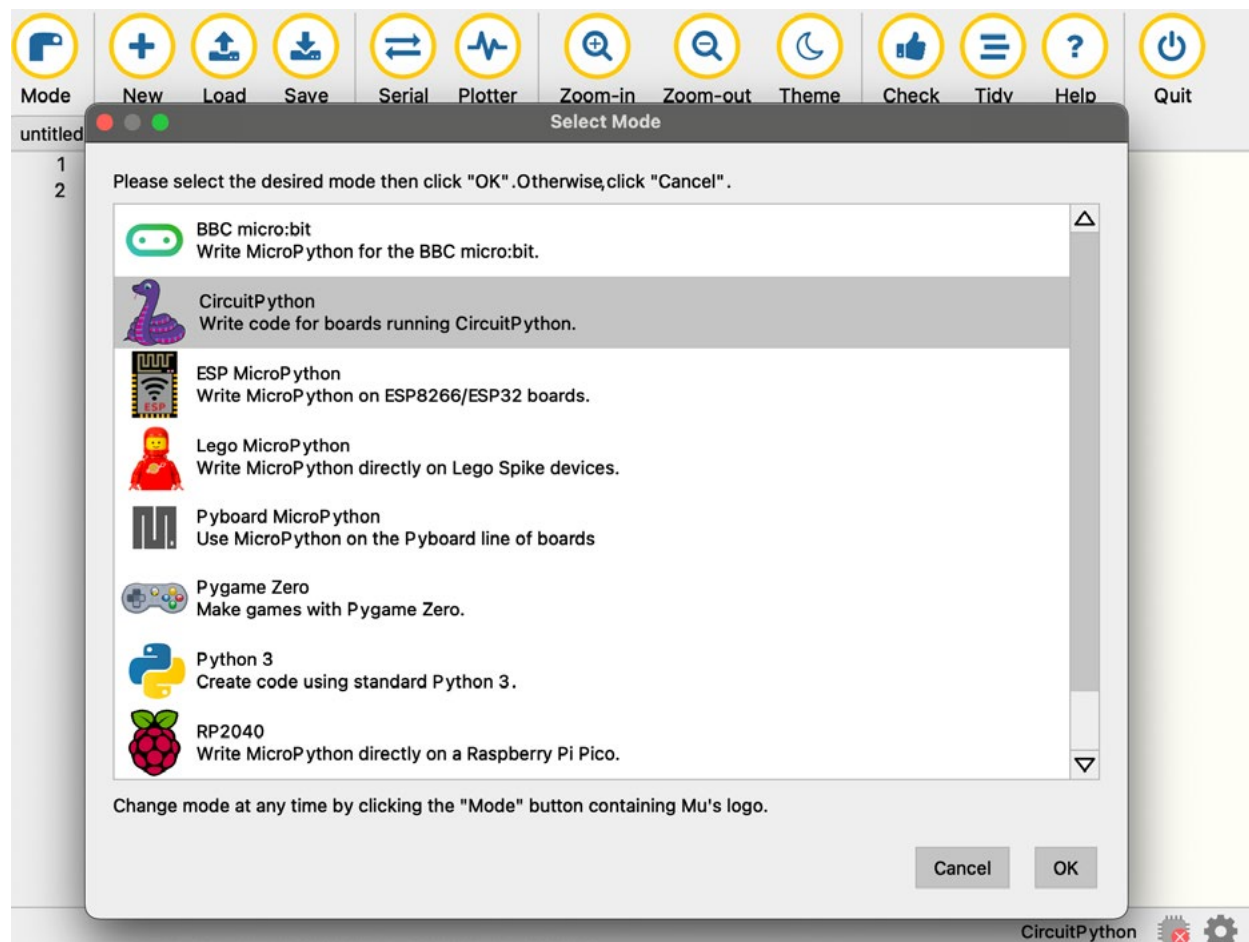
Mu is a Python code editor for beginner programmers and it's the recommended editor for programming in CircuitPython.

It's available for Windows, Mac and Linux at the following address:

<https://codewith.mu/en/download>

The first time you'll run Mu editor, it should ask for which mode you want to load.

Select "CircuitPython". You can always change mode by clicking on "mode" in the upper menu and selecting your favourite one.





## 3.4 Mu quick start

Mu will auto-detect your CircuitPython board.

On the upper menu, clicking “new”, you’ll create a new file.

Once you have connected the Melopero Cookie RP2040, click “Load”, then select the CIRCUITPY driver, and open code.py. After editing this file, click “Save”, and it’ll be loaded on your board.



## 3.5 The REPL

The REPL, Read-Evaluate-Print-Loop, allows you to execute lines of code directly in the console and get an immediate result.

Click “Serial” to open the serial console and then press any key to enter the REPL.

Use CTRL-D to reload.

Try to run the command `print("hello world")` and press enter.

The REPL will interpret the line of code and get you the result, in this case it’ll print “hello world”.

```
CircuitPython REPL
Auto reload is on. Simply save files over USB to run them or enter REPL to disable.

Press any key to enter the REPL. Use CTRL-D to reload.

Adafruit CircuitPython 7.0.0 alpha.4 851 g994d0eb34 dirty on 2021 10 06; Melopero Shake RP2040 with rp2040
>>> print("hello world")
hello world
>>>
```

CircuitPython  

# 4. Installing MicroPython

MicroPython is a lean and efficient implementation of the Python 3 programming language that includes a small subset of the Python standard library and is optimised to run on microcontrollers and in constrained environments.

MicroPython is a full Python compiler and runtime that runs on the bare-metal. You get an interactive prompt (the REPL) to execute commands immediately, along with the ability to run and import scripts from the built-in filesystem. The REPL has history, tab completion, auto-indent and paste mode for a great user experience.

## 4.1 Download MicroPython

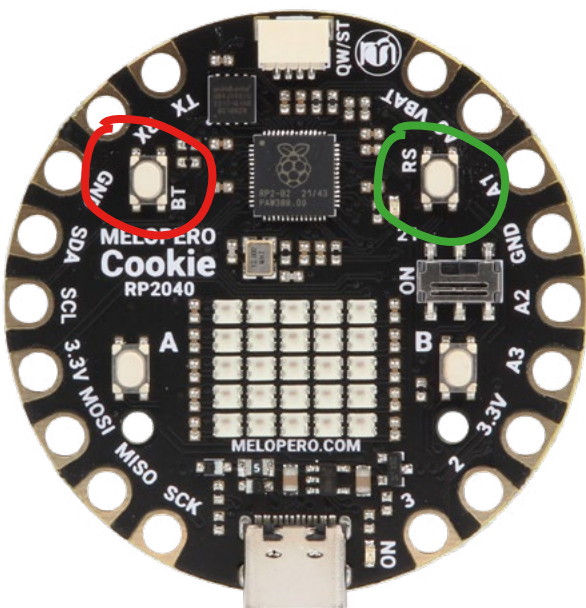
To download the latest MicroPython release for the Melopero Shake RP2040 from our server, go to the following address:

**[www.melopero.com/melopero\\_shake\\_rp2040\\_micropython.uf2](http://www.melopero.com/melopero_shake_rp2040_micropython.uf2)**

After downloading the MicroPython uf2 file, activate the boot loader mode on your board and copy the .uf2 file to it.

To enter the bootloader, when the Shake is already connected to your computer's USB port, press and hold the BOOT / BOOTSEL button (circled in red in the image below), then press and release the reset button (circled in green). Continue holding the BOOT / BOOTSEL button until the RPI-RP2 appears.

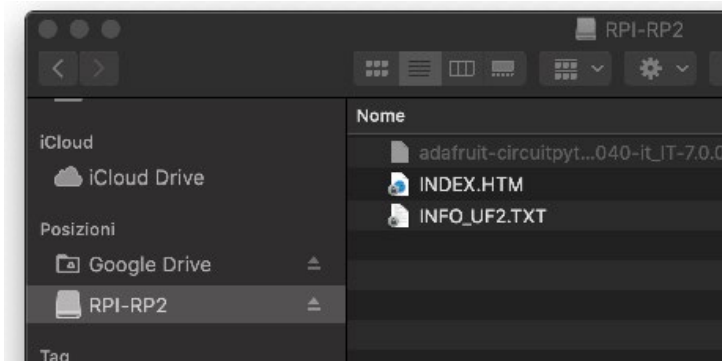
You can also start with your board unplugged from USB, press and hold the BOOTSEL button on your Shake RP2040. While holding the button, connect the other end of the USB cable to the Shake board. This will cause Shake to load his bootloader. You should see the RPI-RP2 appear as a new drive on your computer when you do this.



You will see a new disk drive appear called RPI-RP2.

Drag (or copy and paste) the melopero\_cookie\_rp2040\_micropython.uf2 file to RPI-RP2.

The RPI-RP2 drive will disappear and a new disk drive called CIRCUITPY will appear.



## 4.2 Install Thonny editor

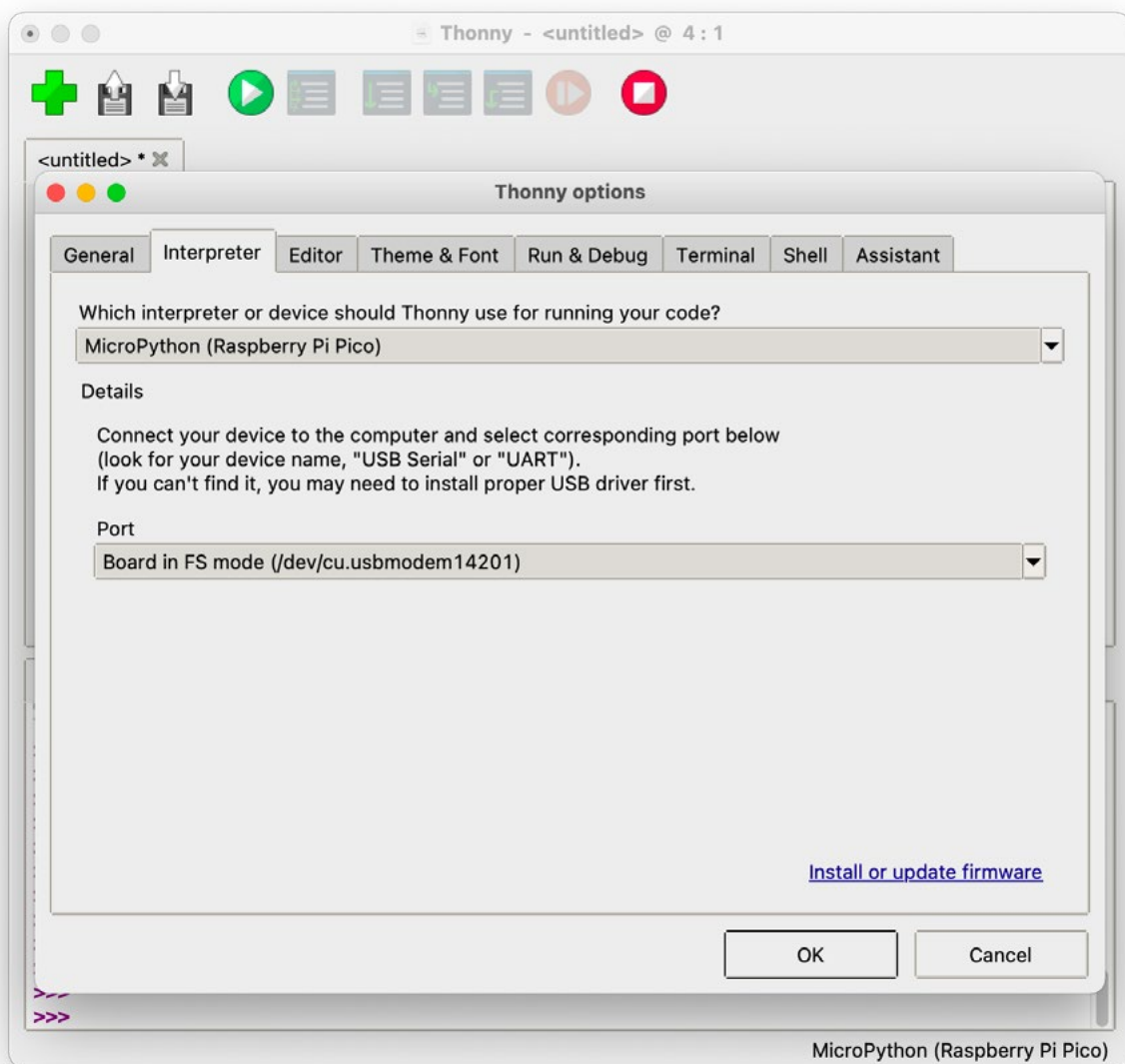
Thonny is a Python code editor for beginner programmers and it's the recommended editor for programming in RP2040 based boards with MicroPython.

It's available for Windows, Mac and Linux at the following address:

<https://thonny.org>

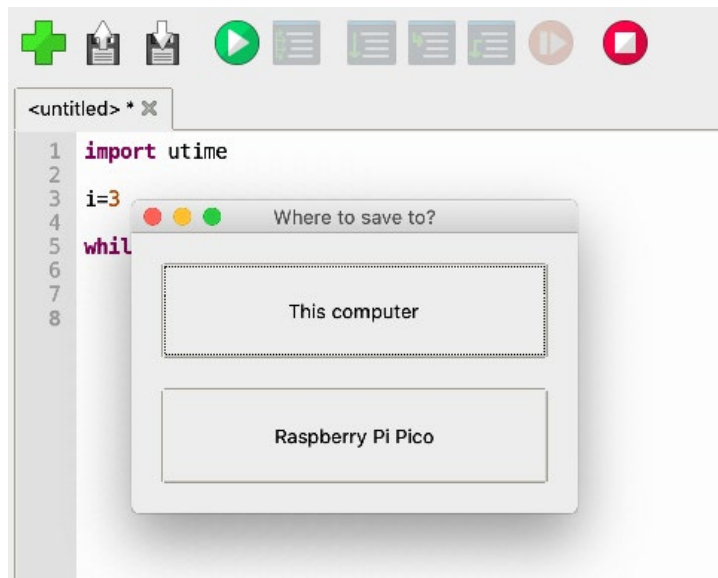
The first time you'll run Thonny editor, you should set MicroPython on Raspberry Pi Pico and select the right port for your connected device.

Go to Preferences (should be options/settings on windows), click "Interpreter" tab and then select MicroPython (Raspberry Pi Pico) and the right port from the port menu (your board must be connected and with MicroPython already installed)



## 4.3 Thonny quick start

Write some code in the script area of Thonny. When ready click RUN or SAVE, Thonny will prompt you to select where you want to execute/save the script. Select “Raspberry Pi Pico” and give a name to the file. If you have some prints in your code, you’ll see them in the Shell.



## 4.4 The REPL

The REPL, Read-Evaluate-Print-Loop, allows you to execute lines of code directly in the console and get an immediate result.

In the Shell, try to run the command `print("hello world")` and press enter.

The REPL will interpret the line of code and get you the result, in this case it'll print "hello world".



# 5. Setting up Arduino IDE

## 5.1 Download the Arduino IDE

To download the Arduino IDE for your favourite OS go to:

<https://www.arduino.cc/en/software>

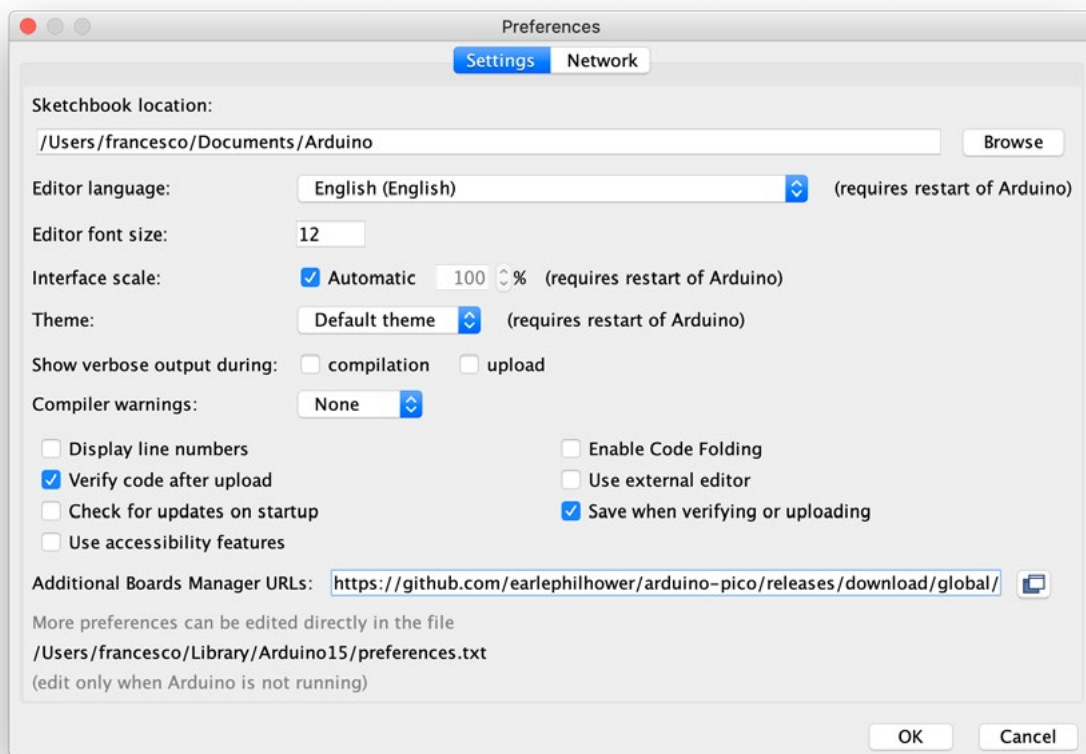
## 5.2 Add Cookie RP2040 to Arduino

Melopero Cookie support for the Arduino IDE will be available in a few days.

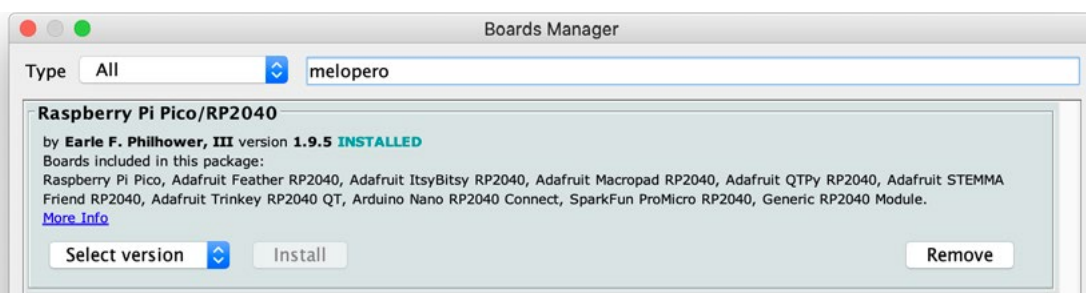
We'll use the port of the RP2040 developed by Earle F. Philhower, III (earlephilhower on GitHub)

Go to File>Preferences and enter the following URL in the "Additional Boards Manager URLs" field:

[https://github.com/earlephilhower/arduino-pico/releases/download/global/package\\_rp2040\\_index.json](https://github.com/earlephilhower/arduino-pico/releases/download/global/package_rp2040_index.json)



Once the URL has been added, go to Tools>Board>Boards Manager and search "Melopero"



After the installation, you'll be soon able to select Melopero Cooki RP2040 as the board, going to Tools>Board>Raspberry Pi RP2040 boards>Melopero Cookie RP2040

# 6. Clear the Flash memory

## 5.1 Flash nuke

If you need to do a deep clean of the flash memory, download the following uf2 file and install it on the Shake RP2040 as you did for CircuitPython or MicroPython (see sections 3.2 and 4.1):

**[www.meloper.com/meloper\\_cookie\\_rp2040\\_flash\\_nuke.uf2](http://www.meloper.com/meloper_cookie_rp2040_flash_nuke.uf2)**