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Programming the Raspberry Pi Pico with Arduino



PRODUCT TUTORIAL

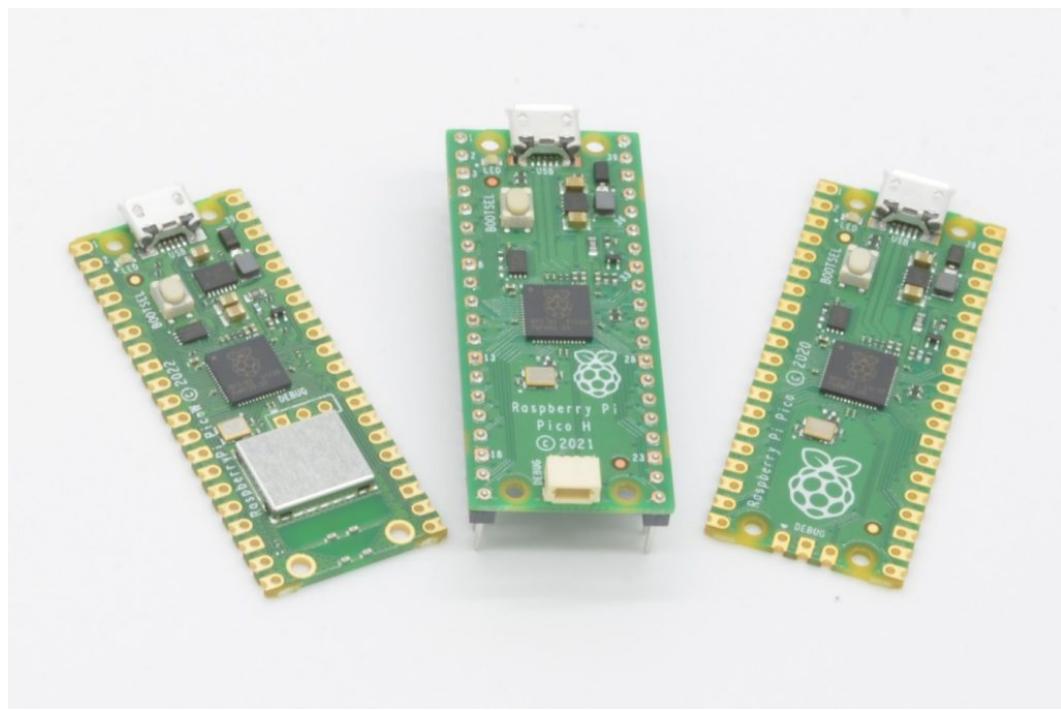
② Chris @ BCR | September 26, 2022 | 2:13 pm | One Comment

If Python isn't your thing, and you want to use the new Raspberry Pi Pico – fear not as the Raspberry Pi Pico can be programmed using the Arduino IDE! In this short tutorial we will go through setting up the Arduino IDE to use the Raspberry Pi Pico and a few of the options available when programming.

Why use the Pico? This is the Raspberry Pi Foundation's first attempt at an extremely low cost, highly capable, microcontroller. It packs a powerful dual-core processor, plenty of RAM, and numerous multi-function IO pins that make it a popular choice in the microcontroller category. We manufacture a variety of **Raspberry Pi Pico add-on boards** to extend its functionality.



The Parts Needed:



This tutorial will need a few different parts:

- Raspberry Pi Pico (any version)
- USB A – USB micro cable
- Computer / Laptop capable of running the Arduino IDE

Step 1: Install The Arduino IDE

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Downloads

Arduino IDE 2.0.0

The new major release of the Arduino IDE is faster and even more powerful! In addition to a more modern editor and a more responsive interface it features autocompletion, code navigation, and even a live debugger.

For more details, please refer to the [Arduino IDE 2.0 documentation](#).

Nightly builds with the latest bugfixes are available through the section below.

SOURCE CODE
The Arduino IDE 2.0 is open source and its source code is hosted on [GitHub](#).

DOWNLOAD OPTIONS

Windows	Win 10 and newer, 64 bits
Windows	MSI installer
Windows	ZIP file
Linux	Applimage 64 bits (X86-64)
Linux	ZIP file 64 bits (X86-64)
macOS	10.14: "Mojave" or newer, 64 bits

Nightly Builds

Download a [preview of the incoming release](#) with the most updated features and bugfixes.

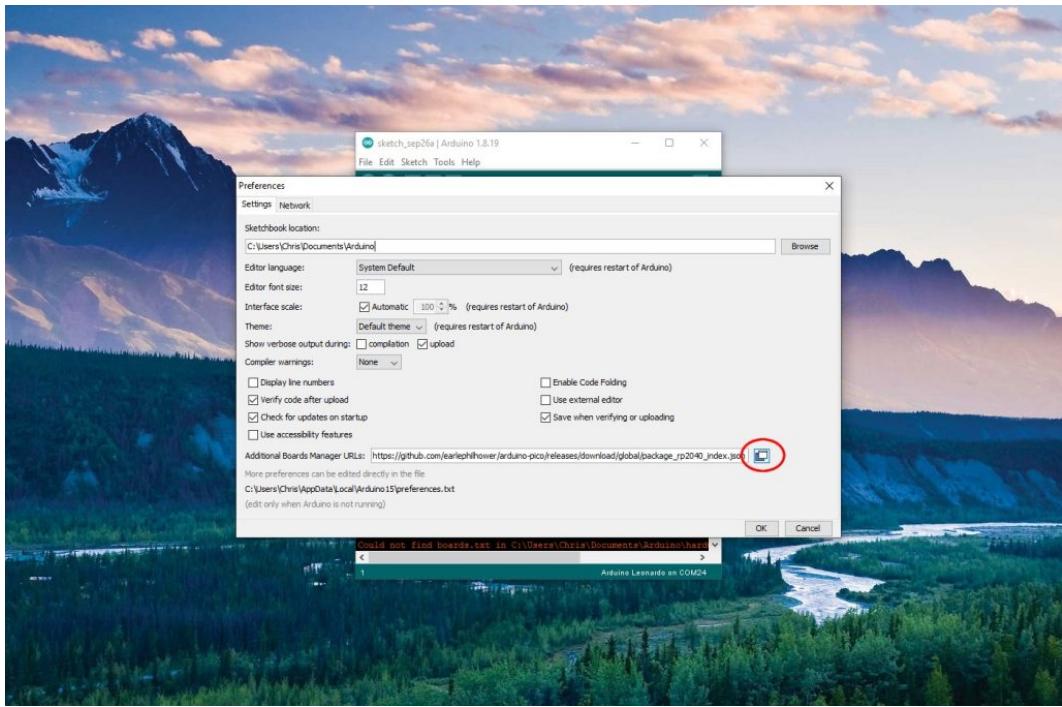
Windows	
macOS	Version 10.14: "Mojave" or newer, 64 bits
Linux	Applimage 64 bits (X86-64)
Linux	ZIP file 64 bits (X86-64)

Before we plug in the Raspberry Pi Pico, we need to get the Arduino IDE (Integrated Development Environment) installed. We are using version 1.8.19 for this tutorial, however if you are using version 2.0 or newer, the instructions remain the same, but the dialogues many look a little different..

The Arduino IDE can be downloaded from Arduino's website: <https://www.arduino.cc/en/software>

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Step 2 - Arduino Preferences

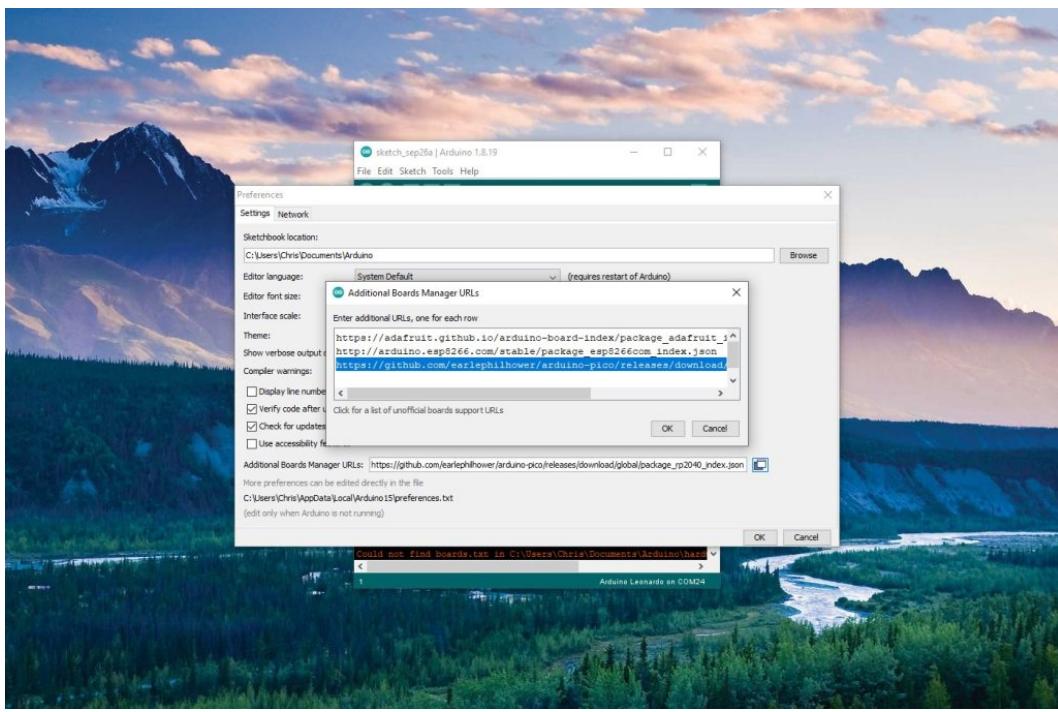


Once it is installed, we need to add an additional Board Manager URL to the Arduino Board Manager. Basically, we are going to tell the Arduino Board Manager to look at an additional location so that the program can automatically install the Raspberry Pi Pico support – don't worry, it sounds much more complicated than it is.

Start by opening the Arduino IDE. In the top menu navigate to: File -> Preferences. This will open the Preference dialogue. Click the little window button (highlighted in red in the image) to add additional URLs.

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Step 3 - Board Manager URLs



On opening the Additional Board Manager URL window, you will see a small text box with 1 (or more) addresses. Don't remove anything! This is just a simple list of addresses, one per line. On a new line add the following URL:

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

Once that has been added, Click "OK" and close the Preferences window.

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Step 4 - Arduino Boards Manager

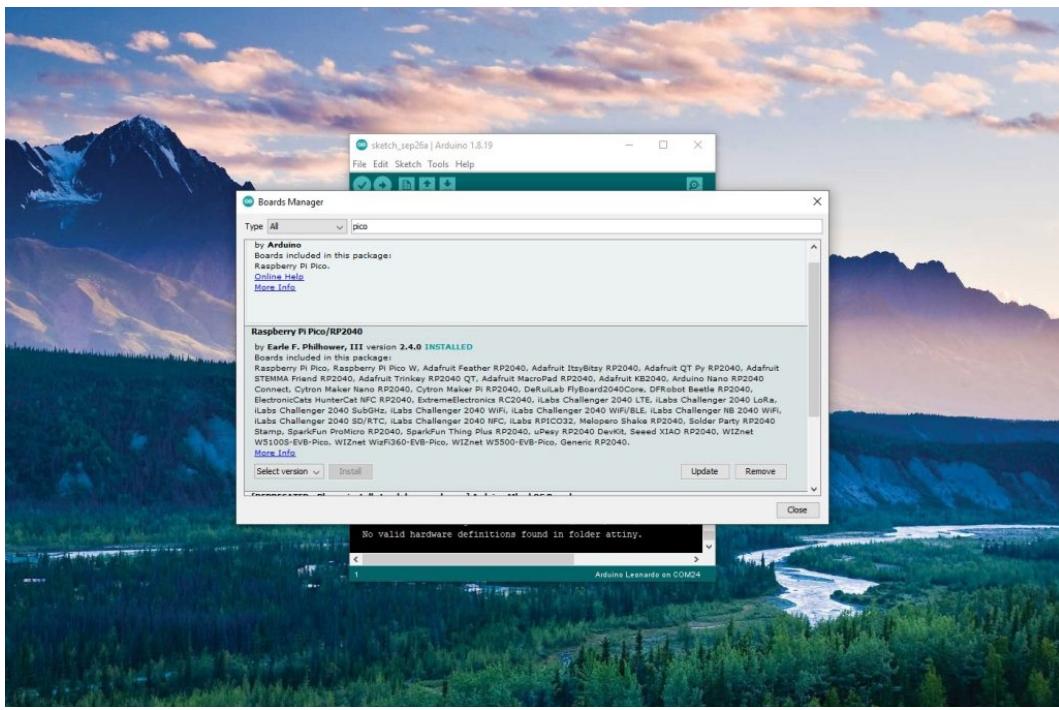


Next we are going to add the Raspberry Pi Pico to the Arduino Boards Manager, this will enable the Raspberry Pi

Pico to be programmed using Arduino. In the top menu navigate to: Tools -> Board -> Board Manager. This will open the Board Manager Dialogue.

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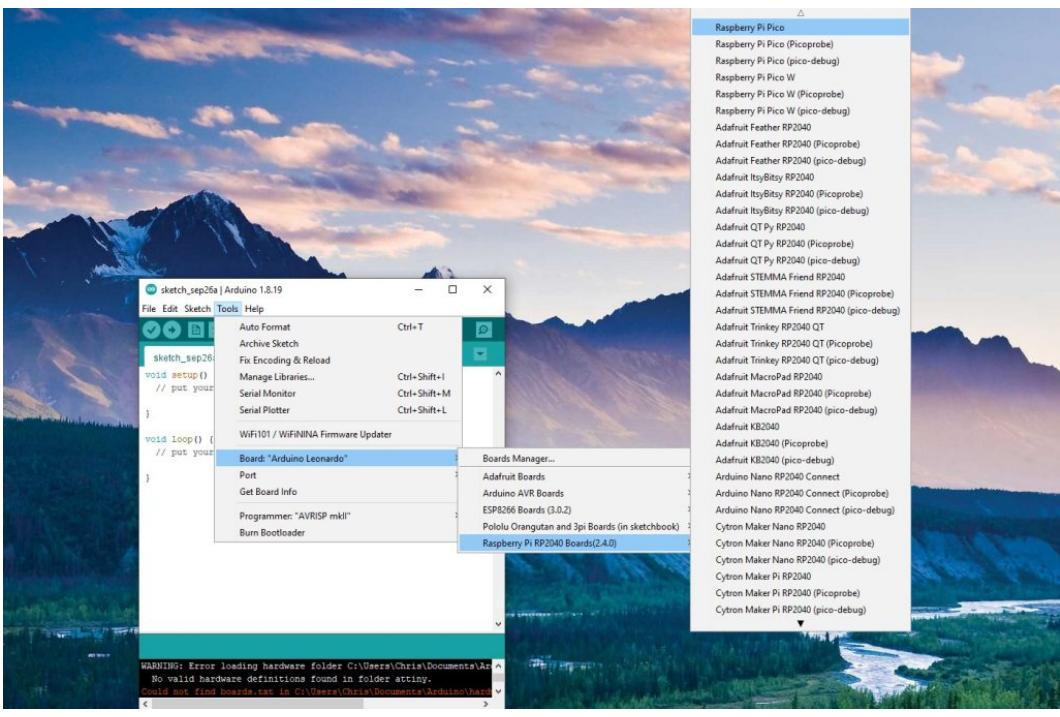
Step 5 - Add Raspberry Pi Pico



Now we can add the Raspberry Pi Pico library – type “pico” into the search bar, and the library “Raspberry Pi Pico / RP2040 will appear. Click Install in the bottom right corner and let it do its thing! Once completed, click “Close”. We are all done the setup!

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Step 6 - Select Your Board



With everything set up, we can now select the appropriate Pico from the boards list. If you are using a plain Raspberry Pi Pico or a Pico H, select “Raspberry Pi Pico”, for a Pico W, select “Raspberry Pi Pico W”. It will take a moment, but once the board has been selected, you can then proceed to look at the board options.

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Step 7 - Pico Configuration Settings



Unlike plain Arduinos, there are quite a few settings that can be configured with the Pico. These settings are uploaded with your code. From here you can set the Flash memory size, overclock (or underclock) the CPU, and a variety of other settings. For the most part, basic projects can just use the default settings.

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Step 8 - First Use with Arduino



Each time you use a Pico with Arduino for the first time, you will need to connect the Pico to the computer while holding the "BootSel" button. This will cause the Pico to connect as a USB drive. When attempting to upload your code for the first time, the Arduino IDE will see this drive and install the correct firmware that will allow your Pico to communicate with the Arduino IDE.

Hold the Bootsel button, and connect your Pico to your computer. Depending on your computer / operating system you may be notified that a new USB Drive has been detected.

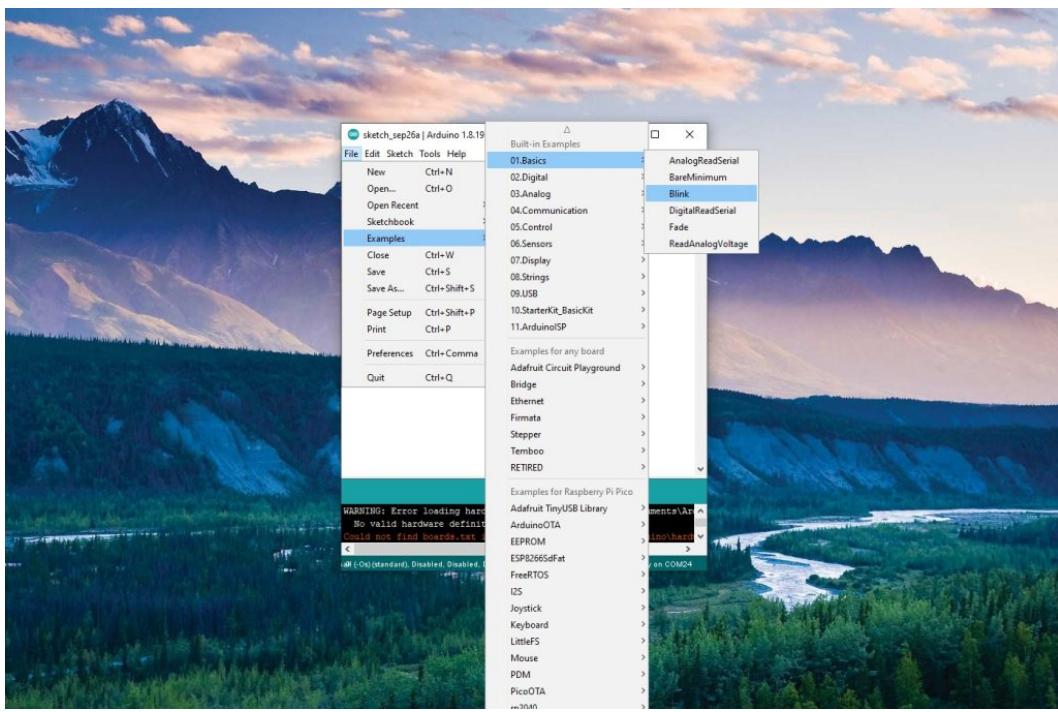
After First Upload:

Once the firmware has been installed on that first upload, the process for uploading to a Pico is the same as any "normal" Arduino, just plug it in to the USB cable and select the appropriate Port.

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Step 9 - Upload An Example



To ensure everything has been done correctly, load the blink example from File -> Examples -> 01.Basics -> Blink.
Click the Upload button and after a moment, the LED on your Pico should begin to blink.

That's it – now your Raspberry Pi Pico is all set to work with Arduino!

100%



ONE THOUGHT ON “PROGRAMMING THE RASPBERRY PI PICO WITH ARDUINO”

**STEVE.EELVES**

February 9, 2023

[Reply](#)

This worked perfectly the first time. Well-explained and clear.

**JIM HANK***Your comment is awaiting moderation.*

May 15, 2023

[Reply](#)

Works fantastic. Thank you for posting this. Note to users of the v2 Arduino IDE: You may have to click on the board combo box at the top and choose “Select other Board and Port” > “Show all ports” to select the board manually and upload the first time. Other than that, it works basically the same in the new IDE for me. Thanks again!