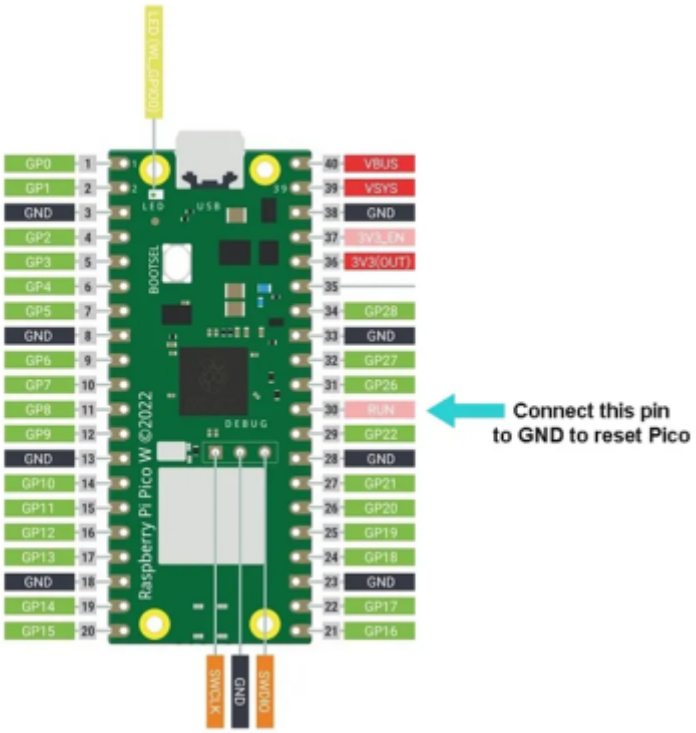
# Using the Pico RUN Pin

Jul 2026

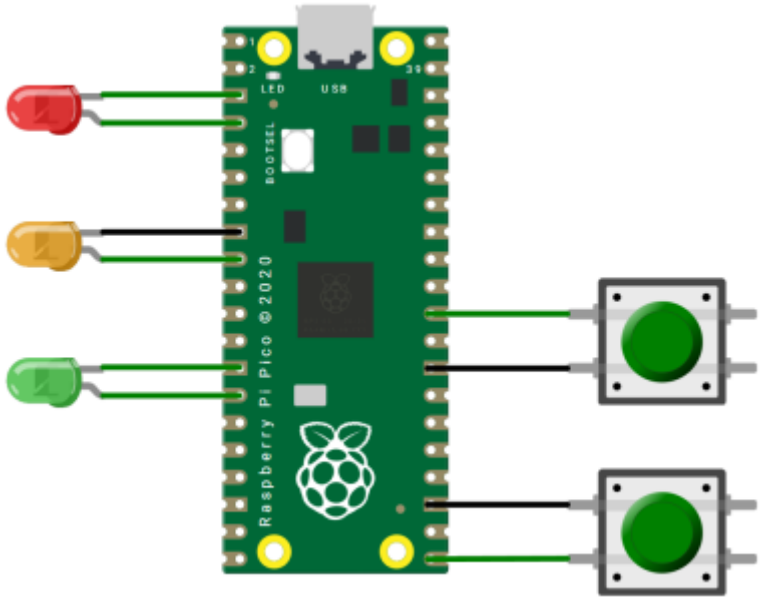
## Introduction

The Raspberry Pi Pico has a RUN pin, see below.




Connecting this Pin to GND starts (or if it is already running restarts) the Raspberry Pi Pico. For this example I am going connect a button from the RUN pin (30) to the GND Pin (28).

Connect the other button and LEDs as show below.




The code I am going to use is our traffic light code, with the breakout button. And I am using this code for a very specific reason.

- 1. The code runs as main.py so when the Pico starts (boots) the code runs.
- 2. There is a button to 'breakout' of the code, for a detailed explanation see here.
- 3. Once the breakout button has been used, the cable has to be removed and plugged back in, this causes unnecessary wear.
- By using the RUN pin, I can start/restart the Pico very simply.
- The RUN button operates at a hardware level, it requires no user generated code.

Download the following Micro Python code and save it to your Pico as main.py.

| download

```
#Traffic light LEDs using an array

from machine import Pin
import time

#######################    ADD BREAKOUT BUTTON ##############################
# Configure the button on GPIO16
# PULL_UP means the pin reads HIGH (1) until the button connects it to GND
button = Pin(16, Pin.IN, Pin.PULL_UP)
#######################    ADD BREAKOUT BUTTON ##############################


# Define GPIO pins for the LEDs
RED = Pin(2, Pin.OUT)
AMBER = Pin(6, Pin.OUT)
GREEN = Pin(10, Pin.OUT)

# Put them in an array
lights = [RED, AMBER, GREEN]

# Helper function to turn all lights off
def all_off():
    for light in lights:
        light.off()

# checks to see if the button has been pressed.
def check_breakout():
    if button.value() == 0:   # Button pressed
        print("Button pressed — stopping program.")
        all_off()
        return True
    return False
```

```
# define a function wait_with_break. This function waits 1 second in 0.1s slices. If you pass
# it the value 3, it will wait 3 seconds in 30 x .1s slices. This is so it can check the
# button state every 0.1s rather than waiting 8 whole seconds.
def wait_with_break(seconds):
    for _ in range(int(seconds * 10)):  # 0.1s slices in a loop
        if check_breakout():
            return True
        time.sleep(0.1)
    return False

while True:

    # Red
    all_off()
    RED.on()
    # passes the value 3 to the function above causing a 3s second delay in 0.1s steps
    if wait_with_break(3): break

    # Red + Amber
    AMBER.on()
    # passes the value 1 to the function above causing a 1s second delay in 0.1s steps
    if wait_with_break(1): break

    # Green
    all_off()
    GREEN.on()
    # passes the value 3 to the function above causing a 3s second delay in 0.1s steps
    if wait_with_break(3): break

    # Amber
    all_off()
    AMBER.on()
    # passes the value 1 to the function above causing a 1s second delay in 0.1s steps
    if wait_with_break(1): break

# Code End
```

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### How it Works

When you boot up the Pico, the file main.py you just created will run automatically. Pushing the lower button will stop (breakout) of the main.py. This is exactly how this was programmed, this is so that you can't get stuck in a software look with no way out.

However, once you push the breakout button, the only way to restart the main.py is to unplug the power, and plug it back in. That causes wear on the connected, and (the real reason is that) I am to lazy to keep doing this when testing a project.

If you now press the RUN button, the Pico will restart (you can restart the Pico with the RUN button even if it is not stopped).

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