

GPIO Zero Python library

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GPIO Zero is a Python library for beginners, used to control the GPIO interface of the Raspberry Pi;

It provides a simple and easy-to-use interface for controlling peripheral devices such as LEDs, buttons, servos, motors, and various sensors.

1. Install GPIO Zero

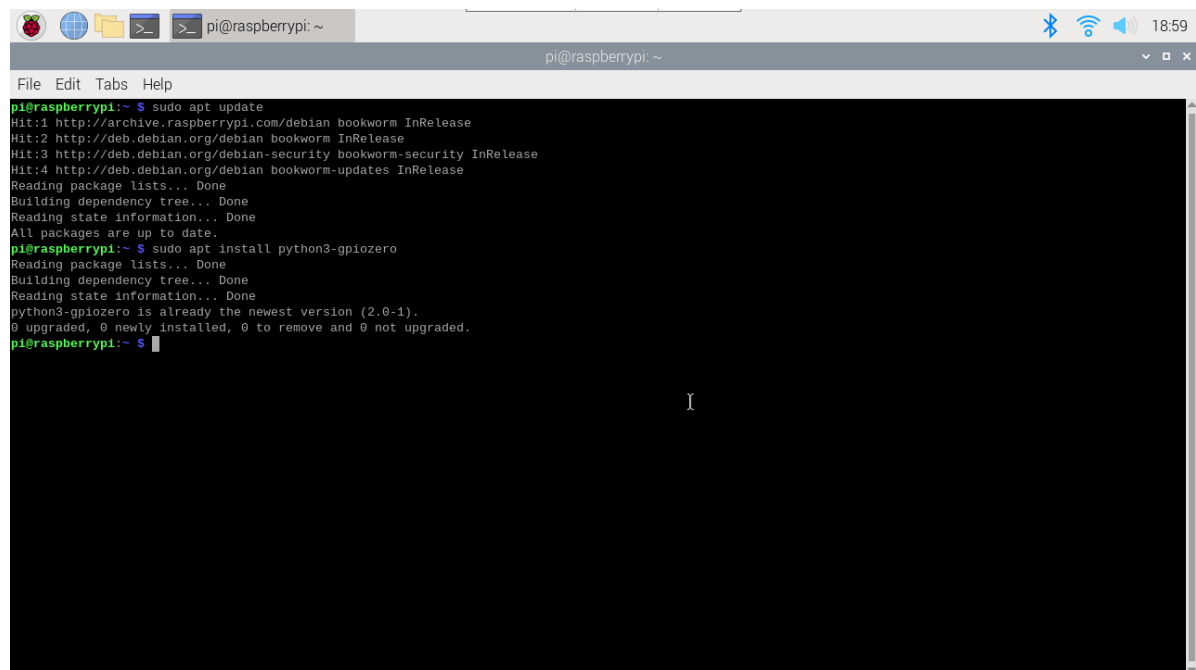
GPIO Zero is installed by default in Raspberry Pi OS desktop images and Raspberry Pi OS Lite images.

- Updated repository list and software

```
sudo apt update
```

- Install GPIO Zero

```
sudo apt install python3-gpiozero
```

A screenshot of a Raspberry Pi terminal window. The window title is 'pi@raspberrypi: ~'. The terminal shows the following commands and output:

```
pi@raspberrypi:~$ sudo apt update
Hit:1 http://archive.raspberrypi.com/debian bookworm InRelease
Hit:2 http://deb.debian.org/debian bookworm InRelease
Hit:3 http://deb.debian.org/debian-security bookworm-security InRelease
Hit:4 http://deb.debian.org/debian bookworm-updates InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
pi@raspberrypi:~$ sudo apt install python3-gpiozero
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
python3-gpiozero is already the newest version (2.0-1).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
pi@raspberrypi:~$
```

2. GPIO pin arrangement

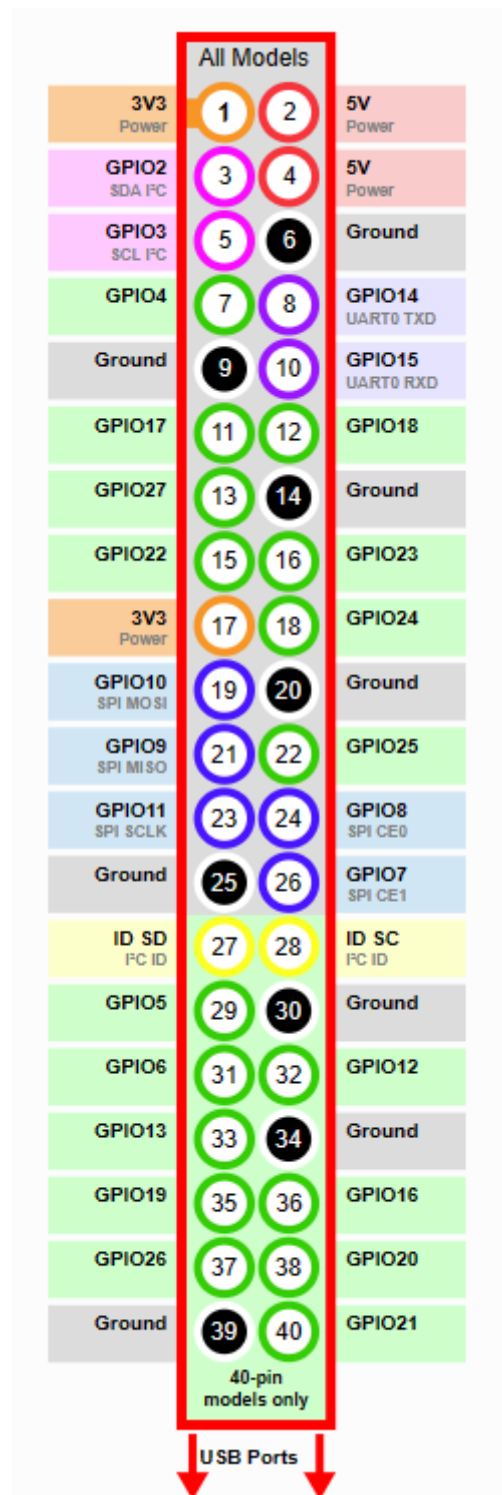
Open the terminal and run the command: pinout

This tool is provided by the GPIO Zero Python library

```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberrypi:~$ pinout  
Description      : Raspberry Pi 5B rev 1.0  
Revision         : c04170  
SoC              : BCM2712  
RAM              : 4GB  
Storage          : MicroSD  
USB ports        : 4 (of which 2 USB3)  
Ethernet ports   : 1 (1000Mbps max. speed)  
Wi-fi            : True  
Bluetooth        : True  
Camera ports (CSI) : 2  
Display ports (DSI) : 2  
  
-----  
| 00000000000000000000 J8  : +=====  
| 10000000000000000000  : |USB2  
| Wi Pi Model 5B V1.0 fan +=====  
| F1  +---+ +---+ |  
| |RAM| |RP1| +=====  
| | +---+ +---+ |USB3  
| | SoC | |c|c| J14 |  
| J2 bat uart |s|s| 12 +=====  
| pwr |..|hd|...|hd| |1|0| Net  
| | 1e|m0|...|m1|-----  
  
J8:  
3V3 (1) (2) 5V  
GPIO2 (3) (4) 5V  
GPIO3 (5) (6) GND  
GPIO4 (7) (8) GPIO14  
GND (9) (10) GPIO15  
GPIO17 (11) (12) GPIO18  
GPIO27 (13) (14) GND  
GPIO22 (15) (16) GPIO23  
3V3 (17) (18) GPIO24  
GPIO10 (19) (20) GND  
GPIO9 (21) (22) GPIO25  
GPIO11 (23) (24) GPIO8  
GND (25) (26) GPIO7  
GPIO0 (27) (28) GPIO1  
GPIO5 (29) (30) GND  
GPIO6 (31) (32) GPIO12  
GPIO13 (33) (34) GND  
GPIO19 (35) (36) GPIO16  
GPIO26 (37) (38) GPIO20  
GND (39) (40) GPIO21  
  
J2:  
RUN (1)  
GND (2)  
  
J7:  
COMPOSITE (1)  
GND (2)  
  
J14:  
TR01 TAP (1) (2) TR00 TAP  
TR03 TAP (3) (4) TR02 TAP  
  
For further information, please refer to https://pinout.xyz/
```

3. Pin number

The GPIO Zero library uses Broadcom (BCM) pin numbers instead of physical (BOARD) numbers: that is, to control GPIO17, you need to specify 17 instead of 11 for the pin number in the program.



Note: When using the Raspberry Pi GPIO pins, you need to pay attention to the pin connection method between the module and the Raspberry Pi motherboard to prevent damage to the motherboard.

common problem:

LED: When using LED, a current limiting resistor should be added;

Motor: connected through the motor control board/driver board, not directly connected.

4. Import the GPIO Zero library

- Import the entire library

```
import gpiozero
```

- Import a single interface: use the Button interface in the GPIO Zero library

```
from gpiozero import Button
```

5. Reference materials

For more GPIO pin usage, please refer to the tutorial provided on the official website of the GPIO Zero library!

```
official website link: https://gpiozero.readthedocs.io/en/latest/
```