

# Pin output PWM

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1. Driver library
2. LED

For controlling the Raspberry Pi GPIO pins, our tutorial uses the GPIO Zero library.

## 1. Driver library

If users have used the RPi.GPIO library and wiringPi library before, they will find that the GPIO Zero library and the RPi.GPIO library/wiringPi library handle pins differently:

Driver library	Control pin mode
GPIO Zero Library	Device Class: LED (Output)
RPi.GPIO library/wiringPi library	Output status

The GPIO Zero library has more control methods associated with the device, while the RPi.GPIO library and wiringPi library control pins directly.

## 2. LED

In the GPIO Zero library, we can use the LED interface to control the PWM output of the pin.

- Control BCM pin number 17PWM output: Manually set brightness

```
from gpiozero import PWMLED
from time import sleep

led = PWMLED(17)

while True:
    led.value = 0 #off
    sleep(1)
    led.value = 0.5 # half brightness
    sleep(1)
    led.value = 1 # full brightness
    sleep(1)
    led.value = 0.5 # half brightness
    sleep(1)
    led.value = 0 #off
    sleep(1)
```

- Control BCM pin number 17PWM output:

```
from gpiozero import PWMLED
from signal import pause

led = PWMLED(17)

led.pulse(3,1)

pause()
```

led.pulse can set the fade-in and fade-out time: in the code, it takes 3 seconds from off to on (fade in), and 1 second from on to off (fade out) (if no parameters are used, the default is 1 second).