

LED DRIVER FOR GPIO SUBSYSTEM

This project is a demonstration of using GPIO subsystem in the raspberry Pi 3. There are two LEDs and one press button connected to the Raspberry Pi. One LED is connected to GPIO 25 (Red), another LED (Green) to GPIO 24 and the button connected to GPIO 20.

The functionality is quite simple. On pressing the button, the LED on GPIO 25 turns on, and remains on until button is pressed again. On the button press again, the LED turns off, the LED on GPIO 24 can be turned on, turned off or kept into flashing mode depending upon the input given from the terminal. The flashing period can also be changed by the user.

Requirements

- linux kernel source
 - download kernel source into `/usr/src/linux`
- Raspberry Pi 3
- 2 LEDs
- resistor
 - 330[ohm]
 - 10k[ohm]
- Button

Hardware

Raspberry Pi 3 GPIO Header			
Pin#	NAME		NAME Pin#
01	3.3v DC Power	•	DC Power 5v 02
03	GPIO02 (SDA1 , I ² C)	•	DC Power 5v 04
05	GPIO03 (SCL1 , I ² C)	•	Ground 06
07	GPIO04 (GPIO_GCLK)	•	(TXD0) GPIO14 08
09	Ground	•	(RXD0) GPIO15 10
11	GPIO17 (GPIO_GEN0)	•	(GPIO_GEN1) GPIO18 12
13	GPIO27 (GPIO_GEN2)	•	Ground 14
15	GPIO22 (GPIO_GEN3)	•	(GPIO_GEN4) GPIO23 16
17	3.3v DC Power	•	(GPIO_GEN5) GPIO24 18
19	GPIO10 (SPI_MOSI)	•	Ground 20
21	GPIO09 (SPI_MISO)	•	(GPIO_GEN6) GPIO25 22
23	GPIO11 (SPI_CLK)	•	(SPI_CE0_N) GPIO08 24
25	Ground	•	(SPI_CE1_N) GPIO07 26
27	ID_SD (I ² C ID EEPROM)	•	(I ² C ID EEPROM) ID_SC 28
29	GPIO05	•	Ground 30
31	GPIO06	•	GPIO12 32
33	GPIO13	•	Ground 34
35	GPIO19	•	GPIO16 36
37	GPIO26	•	GPIO20 38
39	Ground	•	GPIO21 40

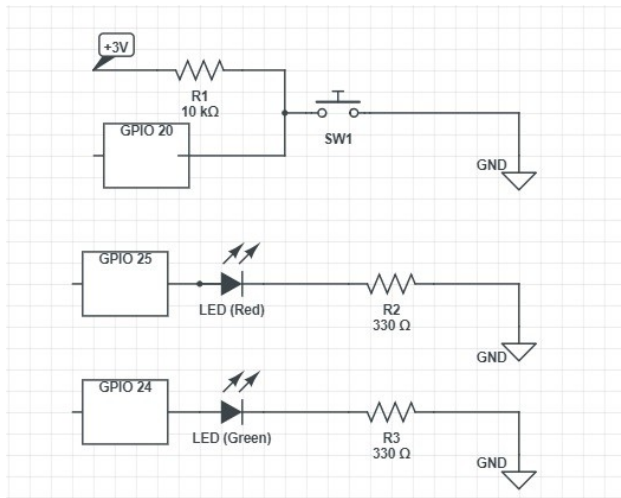
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www.element14.com/RaspberryPi

The Pinout of Raspberry Pi 3 is given below. The pins used in the project are as follows:

Pin No. 38	GPIO 20	push Button
Pin No. 22	GPIO 25	Red LED
Pin No. 18	GPIO 24	Green LED
Pin No. 06	GND	All Ground
Pin No. 17	3.3V	DC Power

Schematic



Connect led, resistors, switch to Raspberry Pi as shown in schematic.

Usage

```
File Edit Tabs Help
pi@raspberrypi:~/LEDDriver $ make all
make -C /lib/modules/4.14.98-v7+/build M=/home/pi/LEDDriver modules
make[1]: Entering directory '/usr/src/linux-headers-4.14.98-v7+'
Building modules, stage 2.
MODPOST 1 modules
make[1]: Leaving directory '/usr/src/linux-headers-4.14.98-v7+'
pi@raspberrypi:~/LEDDriver $ sudo insmod GPIOled.ko
pi@raspberrypi:~/LEDDriver $ cd /sys/ebb2/led25
pi@raspberrypi:/sys/ebb2/led25 $ sudo chmod 777 blinkPeriod
pi@raspberrypi:/sys/ebb2/led25 $ sudo chmod 777 mode
pi@raspberrypi:/sys/ebb2/led25 $ cat blinkPeriod
1000
pi@raspberrypi:/sys/ebb2/led25 $ cat mode
flash
pi@raspberrypi:/sys/ebb2/led25 $ echo 200 > blinkPeriod
pi@raspberrypi:/sys/ebb2/led25 $ cat blinkPeriod
200
pi@raspberrypi:/sys/ebb2/led25 $ echo on > mode
pi@raspberrypi:/sys/ebb2/led25 $ echo off > mode
```

echo on > mode

Turns LED on

echo off> mode

Turns LED off

echo 200 blinkPeriod

Blinks the LED connected to GPIO 24 with time period of 200ms