Shock Switch

Overview  
 This course will use the Raspberry Pi to get the vibration switch signal and control the LED light on and off.

Experimental Materials

RaspberryPi \*1

breadboard \*1

Shock Switch \*1

LED \*1

Dupont Line

Ready to work  
1. Install python interpreter in your Raspberry Pi system  
2. Install the RPi.GPIO library in your Raspberry Pi system  
3. Install the wiringPi library in your Raspberry Pi system  
See the attached "Installing a Python Interpreter and Corresponding Libraries in a Raspberry Pi System" for details.

Product description

I. Introduction:

The vibration switch is an electronic switch,which senses the magnitude of the shock force and transfers the sensing result to the circuit device and causing the circuit to start working.The main principle of the vibration switch is that the trigger pins are not conductive when the vibration is not normally received. After the vibration is received, the trigger pins contact with each other to generate a trigger signal.It is widely used in toys, burglar alarms and other fields.SW-520D is a ball type tilt-induced vibration unidirectional trigger switch.This switch is made of metal material. The electrical characteristics are similar to the mercury switch, but there is no danger of mercury switch and environmental protection issues. The same characteristics is of unidirectional conduction when shaking, and it is more convenient and safe to assembly.When the switch is in the quiescent state, the switch is in the conducting state when the (ON) terminal is below the level of 15 degrees;  
When the (OFF) terminal is below the horizontal 15 degrees, the switch is OFF;When the power is shaken to reach the shaking power, or set in the conduction angle range, the electrical characteristics of the conductive foot will produce short-term or continuous conduction.When the electrical characteristics are to be restored to the open state (OFF), the switch setting environment must be stationary, and the setting of the open end must be lower than the horizontal angle;When the switch is below the horizontal angle of 15 degrees, it is difficult to trigger conduction when the switch is shaken;The switch is suitable for triggering a small current circuit and is not suitable for use as a power switch;

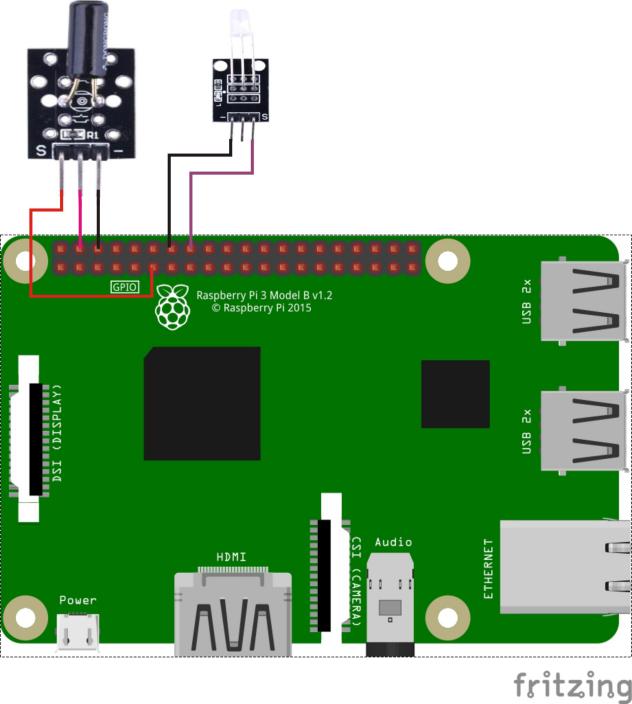


Characteristic parameters

◆Maximum voltage (Vmax): 12V ◆ Rated current: 5 mA  
◆ Open circuit resistance: more than 10MΩ ◆ On resistance: less than 5Ω  
◆ Ambient temperature: less than 100 degrees ◆ Lifetime: 500 thousand times  
◆The module is soldered with a 1KΩ pull-up resistor

◆The pull-up resistor is connected to 5V

Wiring diagram



Sample code

1. Python code

#!/usr/bin/env python

import RPi.GPIO as GPIO

ShockPin = 11

LedPin = 16

Led\_status = 0

def setup():

GPIO.setmode(GPIO.BOARD) # Numbers GPIOs by physical location

GPIO.setup(LedPin, GPIO.OUT) # Set LedPin's mode is output

GPIO.setup(ShockPin, GPIO.IN, pull\_up\_down=GPIO.PUD\_UP)

def swLed(ev=None):

global Led\_status

Led\_status = not Led\_status

GPIO.output(LedPin, Led\_status) # switch led status(on-->off; off-->on)

print "led: " + ("on" if Led\_status else "off")

def loop():

GPIO.add\_event\_detect(ShockPin, GPIO.FALLING, callback=swLed, bouncetime=200) # wait for falling

while True:

pass # Don't do anything

def destroy():

GPIO.output(LedPin, GPIO.LOW) # led off

GPIO.cleanup() # Release resource

if \_\_name\_\_ == '\_\_main\_\_': # Program start from here

setup()

try:

loop()

except KeyboardInterrupt: # When 'Ctrl+C' is pressed, the child program destroy() will be executed.

destroy()

2、C code

#include <wiringPi.h>

#include <stdio.h>

#define ShockPin 0

#define LedPin 4

void myISR(void)

{

printf("shock occured.\n");

if(digitalRead(LedPin) == HIGH)

{

digitalWrite(LedPin, LOW);

}

else

{

digitalWrite(LedPin, HIGH);

}

}

int main(void)

{

if(wiringPiSetup() == -1)

{

printf("setup wiringPi failed !\n");

return 1;

}

pinMode(ShockPin, INPUT);

pinMode(LedPin, OUTPUT);

if(wiringPiISR(ShockPin, INT\_EDGE\_FALLING, &myISR) == -1)

{

printf("setup ISR failed !");

return 1;

}

while(1);

return 0;

}

Experimental phenomena  
 Each time when a shock switch detects vibration, the status of the LED light will change once, so you can use the vibration switch to control the LED light to turn on and off.