2016

Interfacing Relay with Raspberry Pi and Running code at the startup

**Author: Palani K**

Introduction:

Raspberry Pi is a credit card sized computer that plugs into a computer monitor or TV, and uses standard keyboard and mouse. It's capable of doing everything you'd expect a desktop computer to do, from browsing the internet and playing high-definition video, to making spreadsheets, word-processing, and playing games. Here we are going to control 230V home appliances using relays.

Hardware Requirements:

1. Raspberry Pi board.
2. Tenet Power supply breakout board
3. Hookup wires.
4. Tenet 2 channel Relay breakout board

Relay:

A relay is an electromagnetic switch operated by a relatively small electric current that can turn on or off a much larger electric current. The heart of a relay is an electromagnet (a coil of wire that becomes a temporary magnet when electricity flows through it). You can think of a relay as a kind of electric lever: switch it on with a tiny current and it switches on ("leverages") another appliance using a much bigger current. Why is that useful? As the name suggests, many sensors are incredibly sensitive pieces of electronic equipment and produce only small electric currents. But often we need them to drive bigger pieces of apparatus that use bigger currents. Relays bridge the gap, making it possible for small currents to activate larger ones. That means relays can work either as switches (turning things on and off) or as amplifiers (converting small currents into larger ones).Here we are introducing two channel breakout boards. Through this we can control two AC devices at the same time. There are four pins are available. First pin is for VCC=12V, Second pin and Third pin is input to microcontroller/microprocessor for controlling.
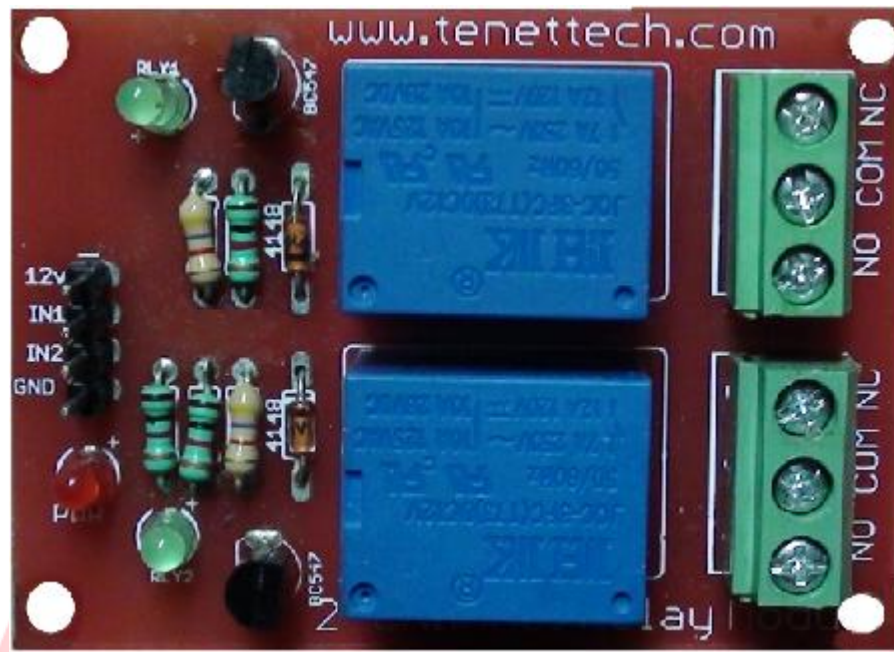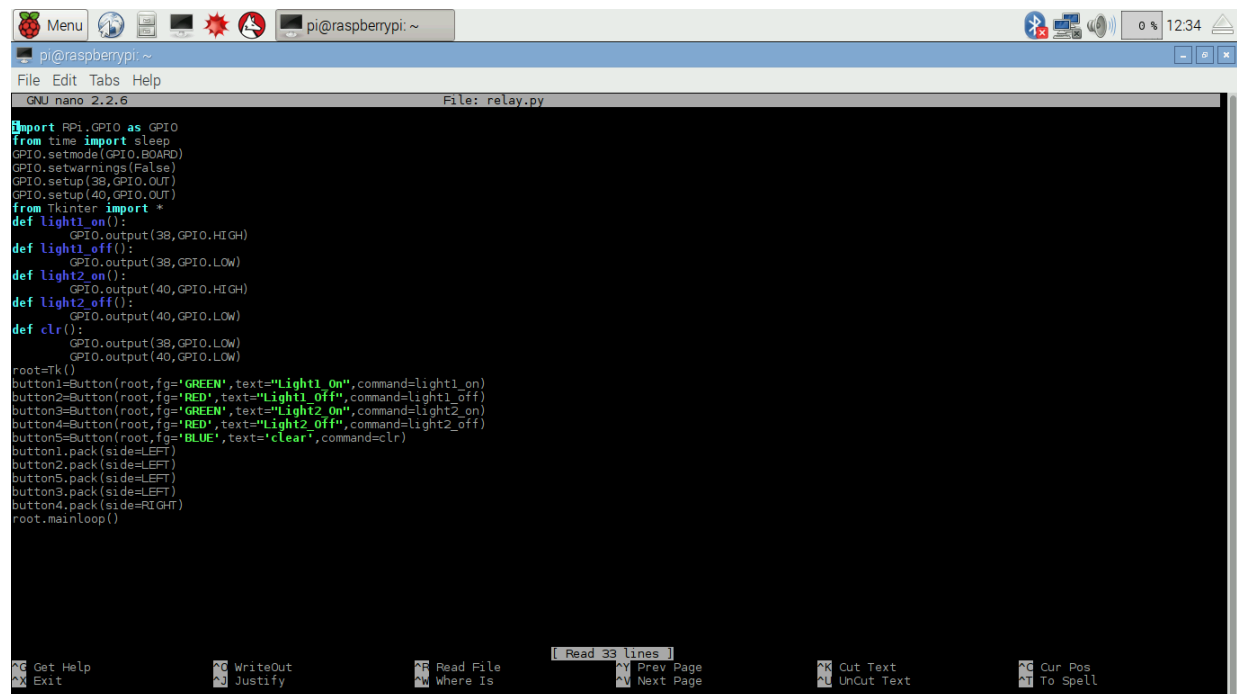
Two channel relay breakout

Circuit diagram:
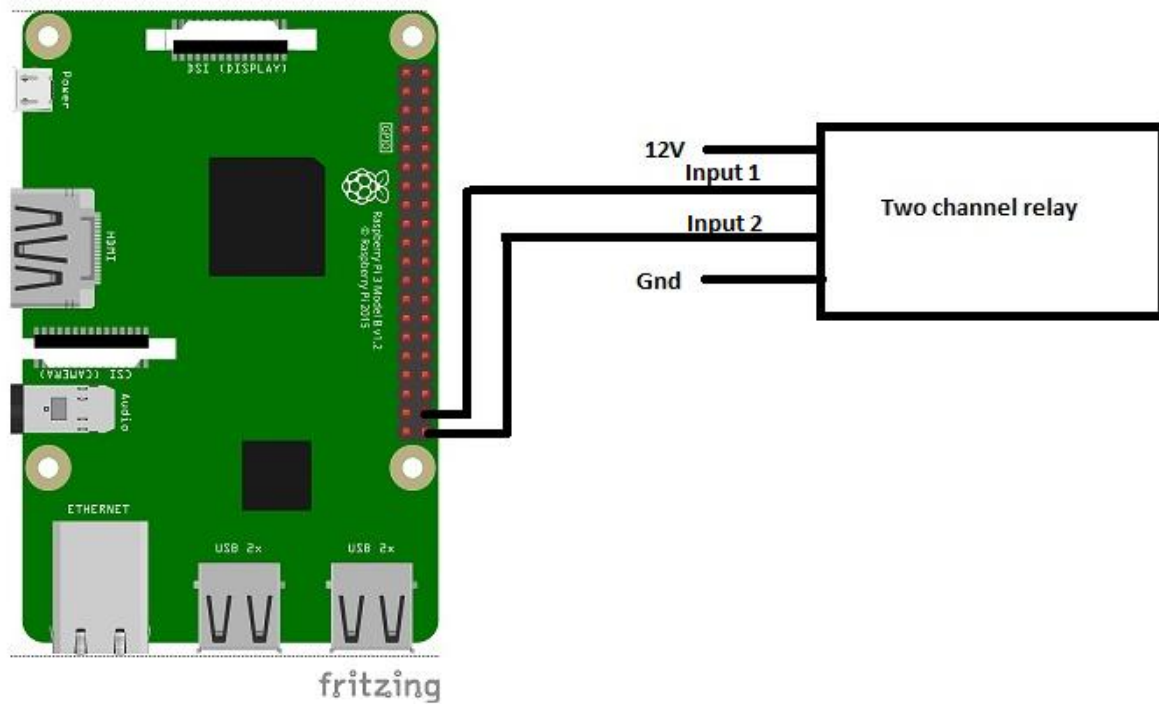
Circuit diagram

Coding:

GUI control program

import RPi.GPIO as GPIO

from time import sleep

GPIO.setwarnings(False)

GPIO.setmode(GPIO.BOARD)

GPIO.setup(38,GPIO.OUT)

GPIO.setup(40,GPIO.OUT)

from Tkinter import *

def light1_on():

        GPIO.output(38,GPIO.HIGH)

def light1_off():

        GPIO.output(38,GPIO.LOW)

```python
def light2_on():

        GPIO.output(40,GPIO.HIGH)

def light2_off():

        GPIO.output(40,GPIO.LOW)

def clr():

        GPIO.output(40,GPIO.LOW)

        GPIO.output(38,GPIO.LOW)

Root=Tk()

button1=Button(root,fg='GREEN',text='Light1_On',command=light1_on)

button2=Button(root,fg='RED',text='Light1_Off',command=light1_on)

button3=Button(root,fg='GREEN',text='Light2_On',command=light2_on)

button4=Button(root,fg='RED',text='Light2_Off',command=light2_off)

button5=Button(root,fg='BLUE', text='clear', command=clr)

button1.pack(side=LEFT)

button2.pack(side=LEFT)

button5.pack(side=LEFT)

button3.pack(side=LEFT)

button4.pack(side=RIGHT)

root.mainloop()
```
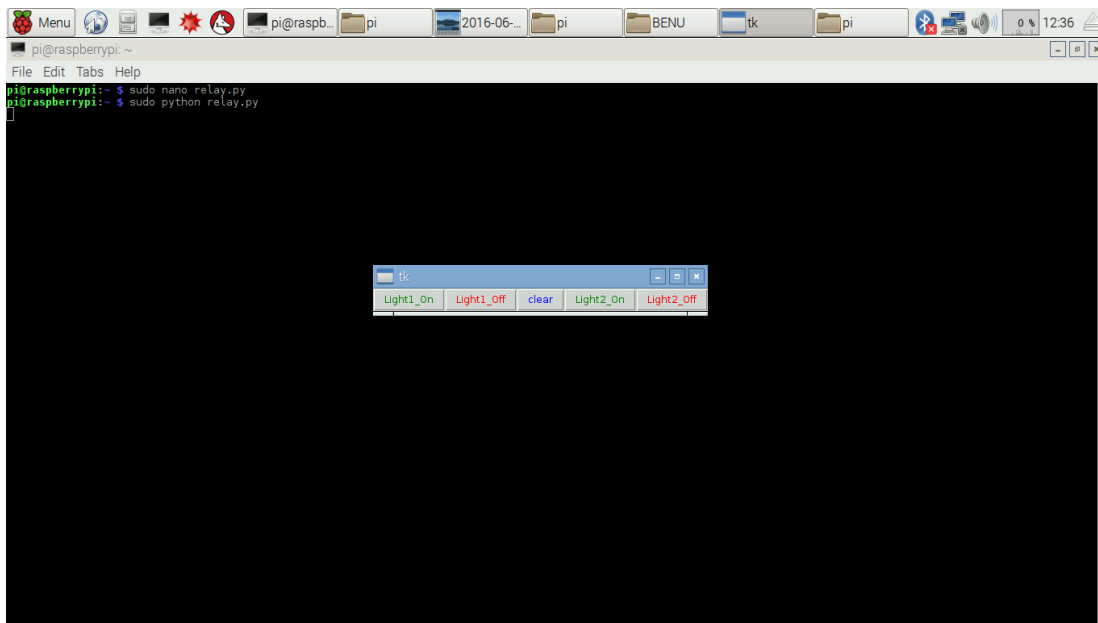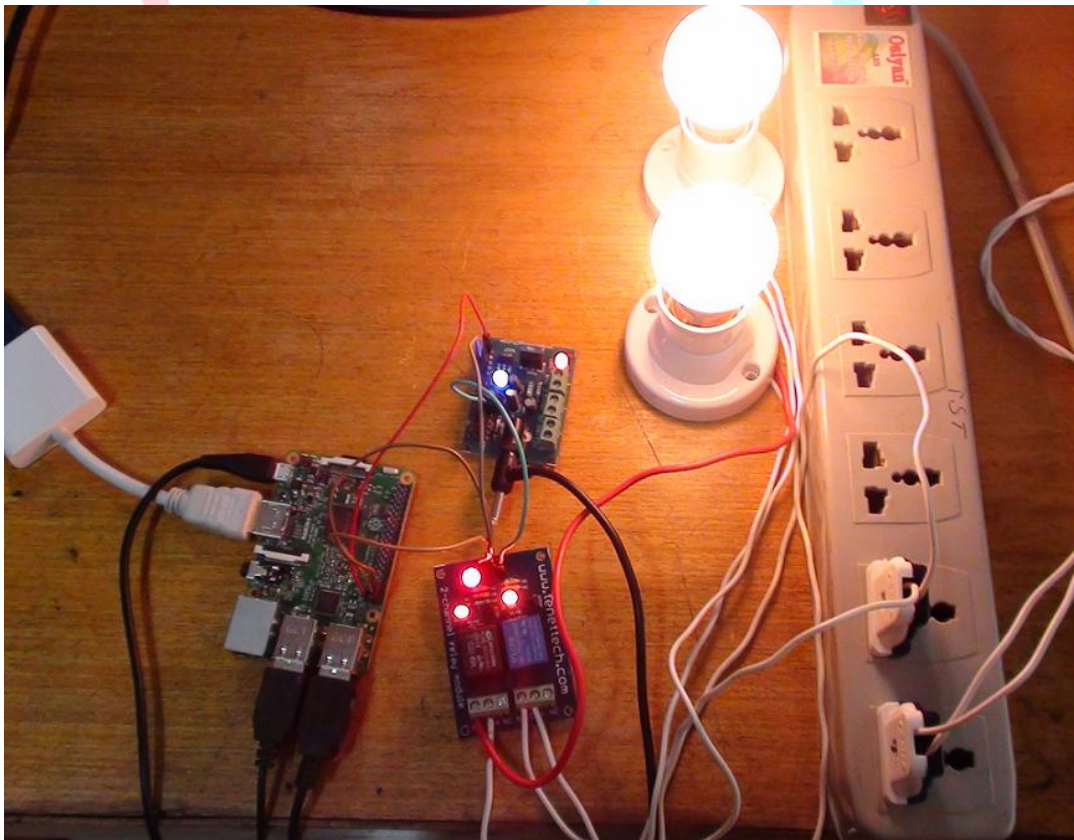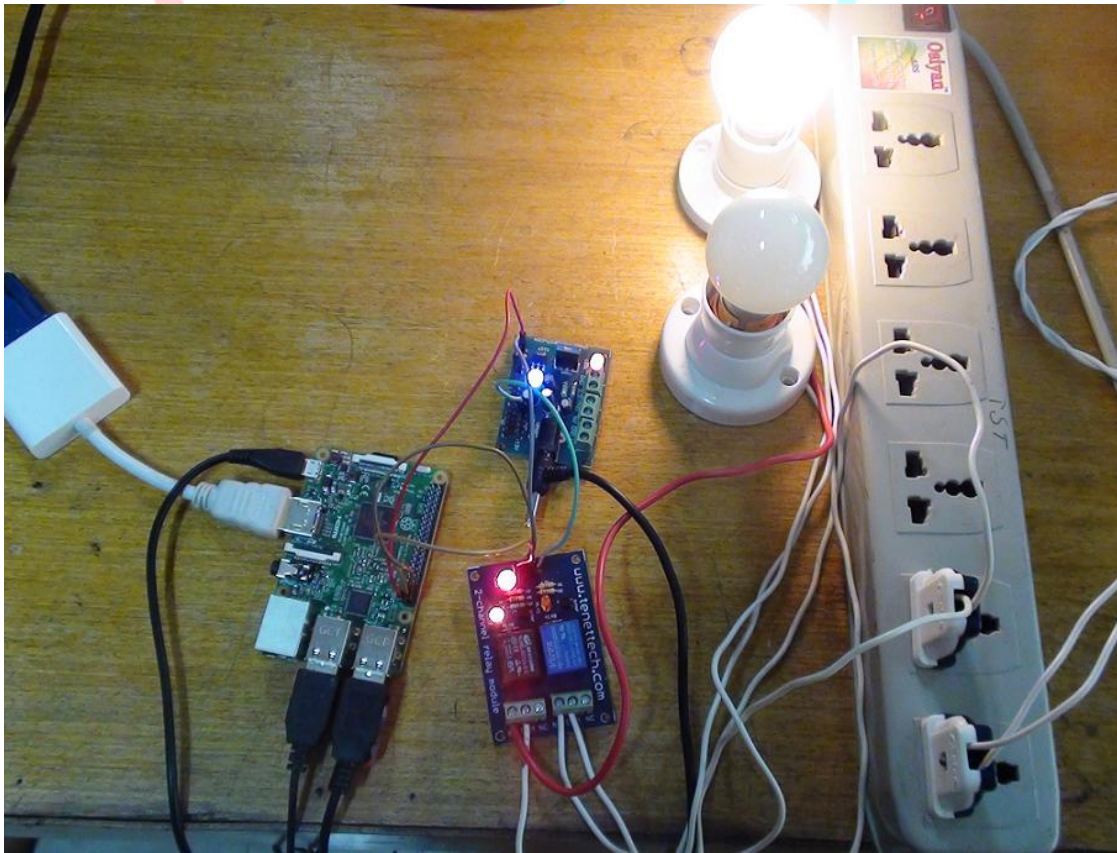
Output:

GUI window for controlling two bulbs

Two bulbs glowing

9/3, 2nd floor, SreeLaksmi Complex, opp, to Vivekananda Park, Girinagar, Bangalore - 560085,

Email: info@tenettech.com, Phone: 080 - 26722726

9/3, 2nd floor, SreeLaksmi Complex, opp, to Vivekananda Park, Girinagar, Bangalore - 560085,
 Email: info@tenettech.com, Phone: 080 - 26722726
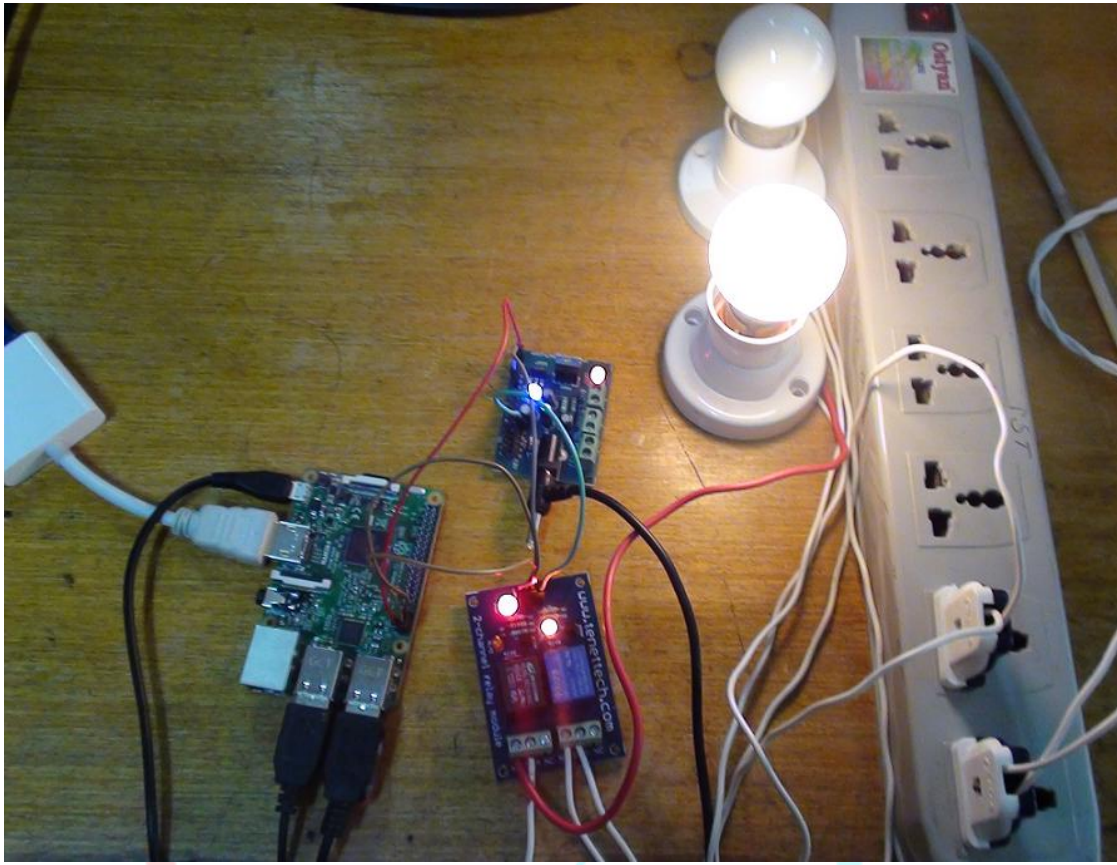
Running code at the startup:

Open terminal window in the Raspberry Pi

Enter the below command in order to modify the startup command

      Sudo nano .bashrc

At the end of the line add your location of the program which has to be start at the booting

For example:

      sudo python /home/pi/file.py(if your file presence in the /home/pi/ folder)

For product link:

1. http://tenettech.com/product/7021/raspberry-pi-2-model-b-basic-kit-tt-sp-19022015

2. http://www.tenettech.com/product/6068/power-supply-breakout-board.

3. http://www.tenettech.com/product/2985/mcp3008-8-channel-10-bit-adc-with-spi-interface

4. http://tenettech.com/product/7039/ldr

For more information please visit: www.tenettech.com

For technical query please send an e-mail: info@tenettech.com