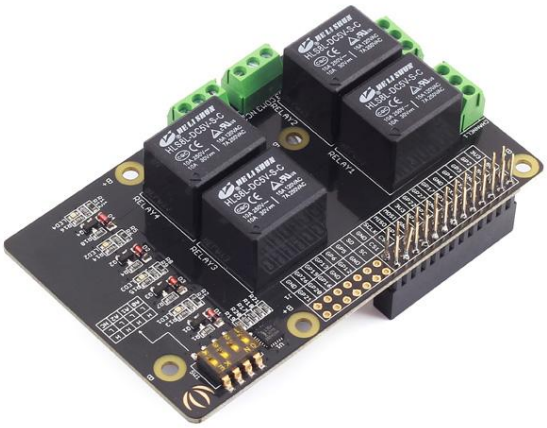
Raspberry Pi Relay Board v1.0

Introduction



The Relay Shield utilizes four high quality relays and provides NO/NC interfaces that control the load of high current. Which means it could be a nice solution for controlling devices that couldn’t be directly controlled by IIC bus. Standardized shield form factor enables smoothly connection with the Raspberry Pi . The shield also has four dynamic indicators show the on/off state of each relay.

Features

- Raspberry Pi compatible
- Interface: IIC, Three hardware SW1 (1, 2, 3) select the fixed I2C-bus address
- Relay screw terminals
- Standardized shield shape and design
- LED working status indicators for each relay
- COM, NO (Normally Open), and NC (Normally Closed) relay pins for each relay
- High quality relays
- Working status indicators for each relay

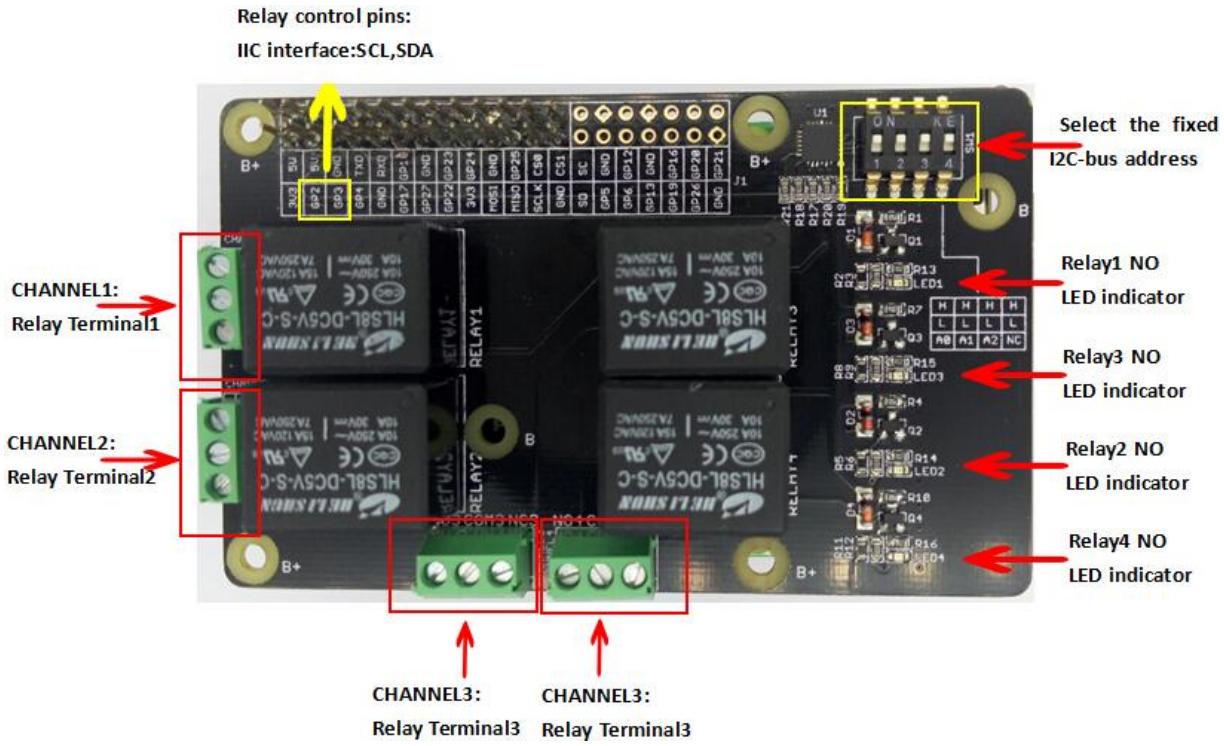
Specifications

Item	Min	Typical	Max	Unit
Supply Voltage	4.75	5	5.5	VDC
Working Current	10	/	360	mA
Switching Voltage	/	/	30/250	VDC/VAC
Switching Current	/	/	15	A
Frequency	/	1	/	HZ
Switching Power	/	/	2770VA/240	W
Relay Life	100,000	/	/	Cycle
Dimensions	91.20 * 56.15 * 32			mm

Caution

Place 2 layers of electrical tape on the top of the Arduino's usb connector. This will prevent the relay shield from making contact. Do not operate voltage more than 35V DC.

Hardware Overview



Usage

Here we can use serial console to change the state of each the relay or all relays.

Hardware Installation

- Raspberry Pi B & Raspberry Pi Motor Driver Board v1.0
- Hardware connection as shown

We can select the fixed I2C-bus address by **SW1**.

Software Part

1.Copy the code below;

```
import time
import smbus
import signal
import sys
```

```
bus = smbus.SMBus(1)    # 0 = /dev/i2c-0 (port I2C0), 1 = /dev/i2c-1 (port I2C1)
```

```
class Relay():
    global bus
```

```
        def __init__(self):
        self.DEVICE_ADDRESS = 0x20      #7 bit address (will be left shifted to add the read write
bit)
        self.DEVICE_REG_MODE1 = 0x06
        self.DEVICE_REG_DATA = 0xff
        bus.write_byte_data(self.DEVICE_ADDRESS, self.DEVICE_REG_MODE1, self.DEVICE_REG_DATA)

        def ON_1(self):
            print 'ON_1...'
            self.DEVICE_REG_DATA &= ~(0x1<<0)
            bus.write_byte_data(self.DEVICE_ADDRESS, self.DEVICE_REG_MODE1, self.DEVICE_REG_DATA)
        def ON_2(self):
            print 'ON_2...'
            self.DEVICE_REG_DATA &= ~(0x1<<1)
            bus.write_byte_data(self.DEVICE_ADDRESS, self.DEVICE_REG_MODE1, self.DEVICE_REG_DATA)
        def ON_3(self):
            print 'ON_3...'
            self.DEVICE_REG_DATA &= ~(0x1<<2)
            bus.write_byte_data(self.DEVICE_ADDRESS, self.DEVICE_REG_MODE1, self.DEVICE_REG_DATA)
        def ON_4(self):
            print 'ON_4...'
            self.DEVICE_REG_DATA &= ~(0x1<<3)
            bus.write_byte_data(self.DEVICE_ADDRESS, self.DEVICE_REG_MODE1, self.DEVICE_REG_DATA)

        def OFF_1(self):
            print 'OFF_1...'
            self.DEVICE_REG_DATA |= (0x1<<0)
            bus.write_byte_data(self.DEVICE_ADDRESS, self.DEVICE_REG_MODE1, self.DEVICE_REG_DATA)

        def OFF_2(self):
            print 'OFF_2...'
            self.DEVICE_REG_DATA |= (0x1<<1)
            bus.write_byte_data(self.DEVICE_ADDRESS, self.DEVICE_REG_MODE1, self.DEVICE_REG_DATA)
```

```
    def OFF_3(self):
        print 'OFF_3...'
        self.DEVICE_REG_DATA |= (0x1<<2)
        bus.write_byte_data(self.DEVICE_ADDRESS, self.DEVICE_REG_MODE1, self.DEVICE_REG_DATA)

    def OFF_4(self):
        print 'OFF_4...'
        self.DEVICE_REG_DATA |= (0x1<<3)
        bus.write_byte_data(self.DEVICE_ADDRESS, self.DEVICE_REG_MODE1, self.DEVICE_REG_DATA)

    def ALLON(self):
        print 'ALLON...'
        self.DEVICE_REG_DATA &= ~(0xf<<0)
        bus.write_byte_data(self.DEVICE_ADDRESS, self.DEVICE_REG_MODE1, self.DEVICE_REG_DATA)

    def ALLOFF(self):
        print 'ALLOFF...'
        self.DEVICE_REG_DATA |= (0xf<<0)
        bus.write_byte_data(self.DEVICE_ADDRESS, self.DEVICE_REG_MODE1, self.DEVICE_REG_DATA)

if __name__=="__main__":
    relay = Relay()
    # Called on process interruption. Set all pins to "Input" default mode.
    def endProcess(signalnum = None, handler = None):
        relay.ALLOFF()
        sys.exit()

    signal.signal(signal.SIGINT, endProcess)

    while True:
        ct = raw_input("input: ")
        if ct == '1on':
            relay.ON_1()
```

```
            elif ct == '2on':
                relay.ON_2()
            elif ct == '3on':
                relay.ON_3()
            elif ct == '4on':
                relay.ON_4()
            elif ct == '1off':
                relay.OFF_1()
            elif ct == '2off':
                relay.OFF_2()
            elif ct == '3off':
                relay.OFF_3()
            elif ct == '4off':
                relay.OFF_4()
            elif ct == 'allon':
                relay.ALLON()
            elif ct == 'alloff':
                relay.ALLOFF()
```

2.Saved in the Raspberry Pi, according to your own path.

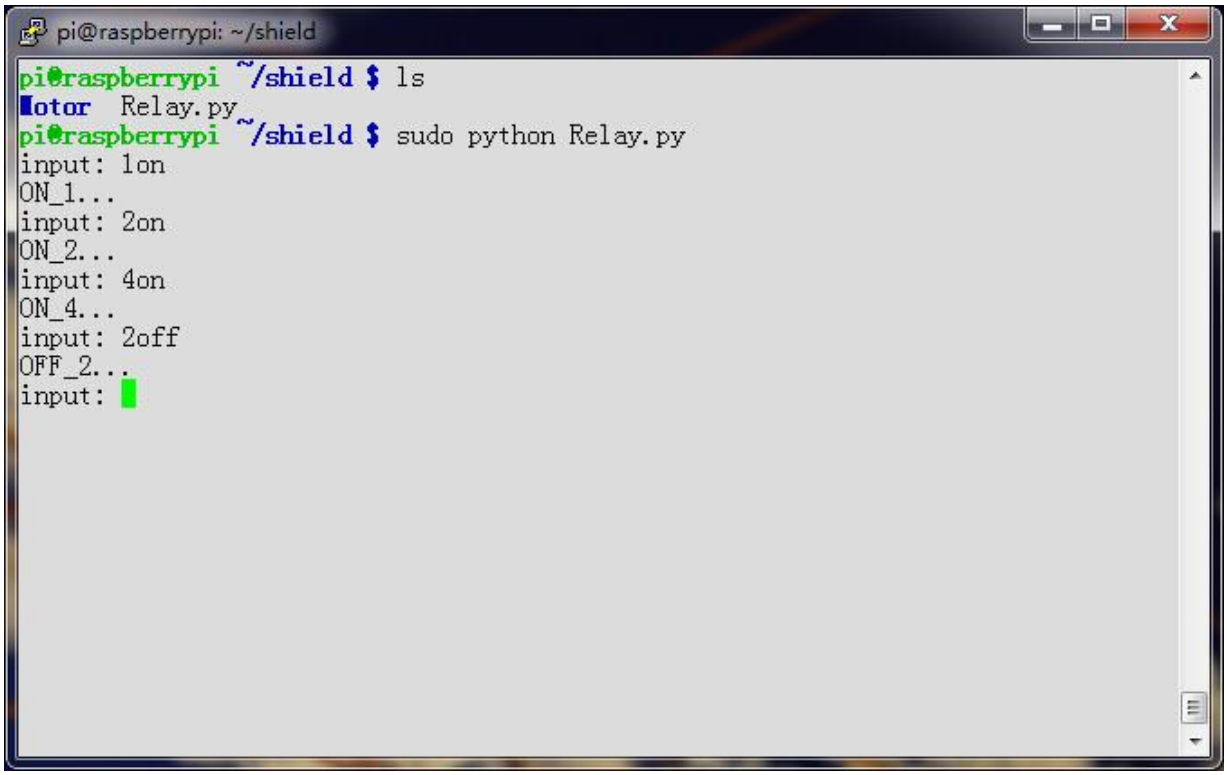
3.Run this program.

The terminal will print “input:”,then you can change the state of each the relay or all relays. You should type input like **“1on”**,**“2on”**,**“3on”** or **“1off”**,**“allon”**,**“alloff”**

4.Note that you should select set the correct I2C-bus address.

You can see :

Terminal:



Raspberry Pi Relay Board v1.0: Whichever relay is turned on, the corresponding LED will turn on.