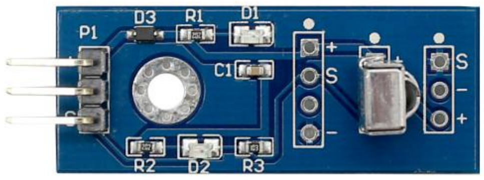
15.IR_Receiver

Introduction

Each button of an IR remote control (as shown below) has a string of specific encoding. When a button is pressed, the IR transmitter in the remote control will send out the corresponding IR encoding signals. On the other side, when the IR receiver receives certain encoding signals, it will decode them to identify which button is pressed.

Hardware Required

- ✓ 1 * Raspberry Pi
- ✓ 1 * Breadboard
- ✓ 1 * Network cable (or USB wireless network adapter)
- ✓ 1 * IR Receiver module
- ✓ 1 * IR Remote
- ✓ Several Jumper Wires



Principle

IR Receiver Module

Infrared (IR) communication is a widely used and easy to implement wireless technology that has many useful applications. The most prominent examples in day to day life are TV/video remote controls, motion sensors, and infrared thermometers.

There are plenty of interesting Arduino projects that use IR communication too. With a simple IR transmitter and receiver, you can make remote controlled robots, distance sensors, heart rate monitors, DSLR camera remote controls, TV remote controls, and lots more Infrared radiation is a form of light similar to the light we see all around us. The only difference between IR light and visible light is the frequency and wavelength. Infrared radiation lies outside the range of visible light, so humans can't see it:

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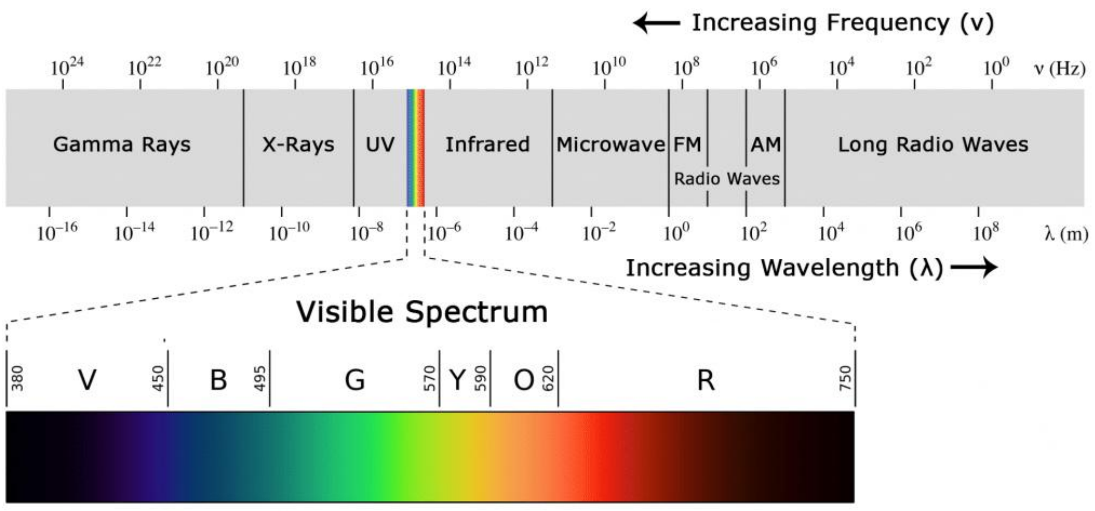
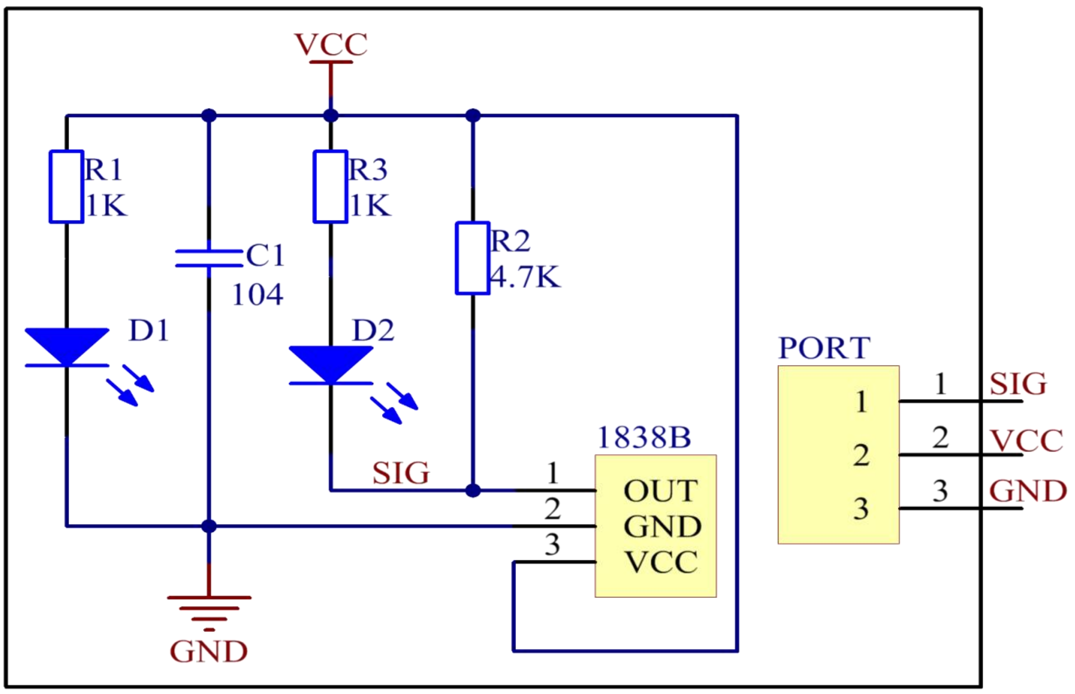


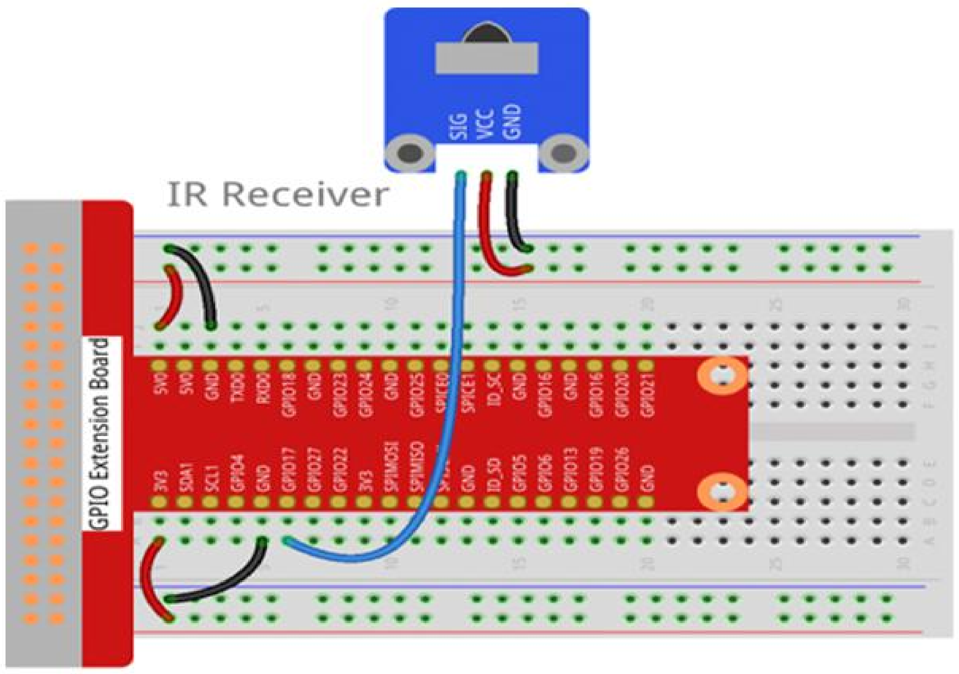
Schematic Diagram



Experimental Procedures

Raspberry Pi	T-Cobbler	IR Receiver Module
GPIO0	GPIO17	SIG
5V	5V0	VCC
GND	GND	GND

Step 1: Build the circuit



For C Language Users

Step 2:Open the code file.

```
cd /home/pi/REXQualis_Raspberry_Pi_Complete_Starter_Kit/C/15.IR_Receiver
```

Note: Change directory to the path of the code in this experiment via cd.

Step 3: Compile the code.

```
gcc 15.IR_Receiver.c -o IR_Receiver.out -lwiringPi
```

Step 4: Run the executable file .

```
sudo ./IR_Receiver.out
```

Here you can see the LED on the module blinking, and "Received infrared. cnt = xxx" will be printed on the screen.

Code

```
#include <wiringPi.h>

#include <stdio.h>

#define       IR       0

int cnt = 0;
```

```
void myISR(void)
{
	printf("Received infrared. cnt = %d\n", ++cnt);
}

int main(void)
{
	if(wiringPiSetup() == -1){ //when initialize wiring failed,print messageto screen
		printf("setup wiringPi failed !");
		return 1;
	}

	if(wiringPiISR(IR, INT_EDGE_FALLING, &myISR) == -1){
		printf("setup ISR failed !");
		return 1;
	}

	//pinMode(IR, INPUT);

	while(1);

	return 0;
}
```

For Python Language Users

Step 2: Open the code file.

```
cd /home/pi/REXQualis_Raspberry_Pi_Complete_Starter_Kit/Python
```

Step 3: Run the code.

```
sudo python3 15.IR_Receiver.py
```

Code

The code here is for Python3, if you need for Python2, please open the code with the suffix py2 in the attachment.

```
#!/usr/bin/env python3
import RPi.GPIO as GPIO

IrPin    = 11
count = 0

def setup():
	GPIO.setmode(GPIO.BOARD)		# Numbers GPIOs by physical location
	GPIO.setup(IrPin, GPIO.IN, pull_up_down=GPIO.PUD_UP)

def cnt(ev=None):
	global count
	count += 1
	print ('Received infrared. cnt = ', count)

def loop():
	GPIO.add_event_detect(IrPin, GPIO.FALLING, callback=cnt) # wait for falling
	while True:
		pass	# Don't do anything

def destroy():
	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()
```

Phenomenon Picture