# Pi PIR Motion Sensor Tutorial

## Contents

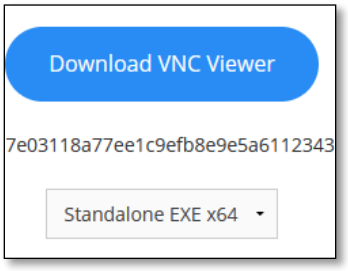


## Grove PIR Motion Sensor Sensor Documentation

Grove PIR sensor documentation: https://wiki.seeedstudio.com/Grove-PIR_Motion_Sensor

## RealVNC Viewer

RealVNC viewer allows us to remotely control the Raspberry Pi in headless mode.




1. Go to https://www.realvnc.com/en/connect/download/viewer/
2. Download the VNC Viewer Standalone EXE anywhere you want to run the program from. You don't have to install it.
3. Double Click **VNC Viewer**.
4. Type in the IP address of your robot → Click **Connect**.

## Tutorial 1: Install the Grove Library

1. Shutdown the Pi. (Do not connect sensors when the Pi has power.)
2. Plug the PIR Motion Sensor into Digital Port 5.
3. Mount the sensor on a sensor mount.
4. Powerup the Pi.

5. Open a terminal.

6. Install the Grove Library.

```
# Change to the pi user home directory
cd ~
# Clone the grove.py code
git clone https://github.com/Seeed-Studio/grove.py
cd grove.py
# Python3 install grove library
sudo pip3 install .
# Install tof library
sudo pip3 install rpi-vl53l0x
```

## Tutorial 2: Hello PIR Motion Sensor

1. Open a terminal. Type in the following commands.

```
# Change to your home folder
cd ~
# Run the sample program that came with the grove library
python3 grove_mini_pir_motion_sensor.py 5
```

2. Move closer to the sensor. You should see Motion detected printed on the terminal.

## Tutorial 3: PIR Motion Sensor Alert!

Let's turn our Pi into an intruder alert system!

1. Copy the pir example program to our home folder.

```
# Change to your home folder
cd ~
# Copy the example program file to intruder_alert.py
cp grove.py/grove/grove_mini_pir_motion_sensor.py intruder_alert.py
# Edit intruder alert
geany intruder_alert.py
```

2. Chromium has an issue in a Pi. Let's install Firefox.

```
sudo apt install firefox-esr
```

Let's add some code to the original program to play an alarm sound.

First, we need a sound file. Go to [www.freesound.org](http://www.freesound.org) to find a nice alarm sound.

Let’s add the pygame code needed to play a sound.

```
36  import time
37  # Play sounds
38  import pygame
39  pygame.init()
40  from grove.gpio import GPIO
```

**import pygame** - imports the pygame library so we can play sounds.

**pygame.init()** – initialize the pygame library.

```
70  def main():
71      # Load the alarm sound
72      alarm = pygame.mixer.Sound("buzzer_x.wav")
73
74      from grove.helper import SlotHelper
75      sh = SlotHelper(SlotHelper.GPIO)
76      pin = sh.argv2pin()
77
78      pir = GroveMiniPIRMotionSensor(pin)
79
80      def callback():
81          print('Motion detected.')
82          alarm.play()
83          alarm.set_volume(0.8)
84
85      # The motion sensor detects movement
86      pir.on_detect = callback
87
88      while True:
89          time.sleep(1)
90
91
92  if __name__ == '__main__':
93      main()
```

Change the name of the buzzer_x.wav to the name of the file you downloaded.

Run the program: **python3 intruder_alert.py**

Move anywhere in the proximity of the sensor. Intruder Alert!!