

Grove - Sound Sensor



Grove - Sound Sensor can detect the sound intensity of the environment. The main component of the module is a simple microphone, which is based on the L358 amplifier and an electret microphone. This module's output is analog and can be easily sampled and tested by a Seeeduino.

Christmas tree



Get One Now 

[<https://www.seeedstudio.com/Grove-Sound-Sensor-p-752.html>]

Features

- Easy to use
- Provides analog output signal
- Easily integrates with Logic modules on the input side of Grove circuits



Warning

This sound sensor is used to detect whether there's sound surround or not, please don't use the module to collect sound signal. For example, you can use it to make a sound control lamp, but not as a recording device.

Specifications

Item	Value
Operating Voltage Range	5 V
Operating Current(Vcc=5V)	4~5 mA
Voltage Gain(V=6V, f=1kHz)	26 dB
Microphone sensitivity(1kHz)	-60~-56dBV/Pa
Microphone Impedance	2.2k Ohm
Microphone Frequency	16-20 kHz
Microphone S/N Ratio	54 dB



Tip

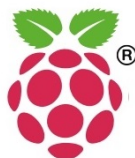
More details about Grove modules please refer to [Grove System](https://wiki.seeedstudio.com/Grove_System/) [https://wiki.seeedstudio.com/Grove_System/]

Platforms Supported

Arduino



Raspberry Pi



**Caution**

The platforms mentioned above as supported is/are an indication of the module's software or theoretical compatibility. We only provide software library or code examples for Arduino platform in most cases. It is not possible to provide software library / demo code for all possible MCU platforms. Hence, users have to write their own software library.

Getting Started

**Note**

If this is the first time you work with Arduino, we firmly recommend you to see [Getting Started with Arduino](https://wiki.seeedstudio.com/Getting_Started_with_Arduino/) [https://wiki.seeedstudio.com/Getting_Started_with_Arduino/] before the start.

Play With Arduino

Hardware

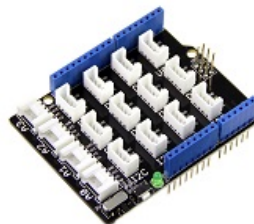
- **Step 1.** Prepare the below stuffs:

Seeeduino V4.2

[Get One Now](https://www.seeedstudio.com/Seeeduino-V4.2-p-2517.html)

[<https://www.seeedstudio.com/Seeeduino-V4.2-p-2517.html>]

Base Shield

[Get One Now](https://www.seeedstudio.com/Base-Shield-V2-p-1378.html)

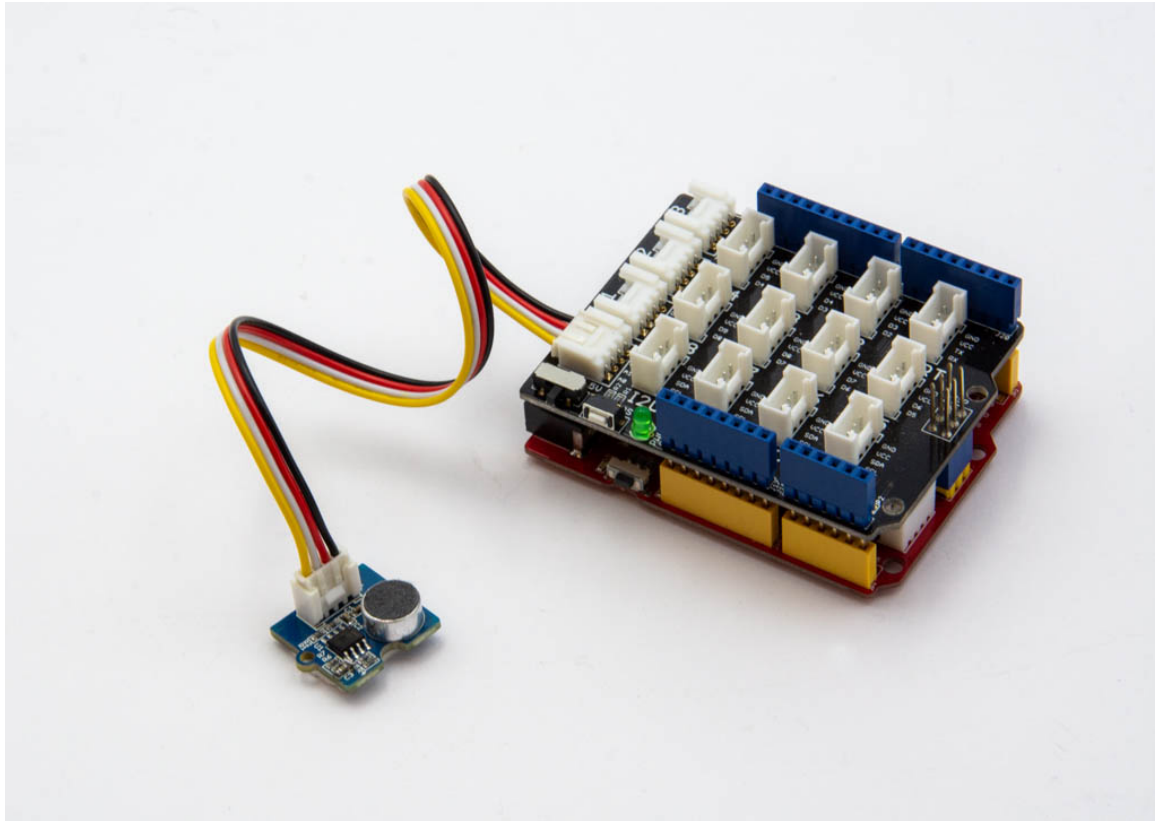
[<https://www.seeedstudio.com/Base-Shield-V2-p-1378.html>]

Grove-Sound Sensor

[Get One Now](https://www.seeedstudio.com/Grove-Sound-Sensor-p-752.html)

[<https://www.seeedstudio.com/Grove-Sound-Sensor-p-752.html>]

- **Step 2.** Connect Grove-Sound Sensor to port **A0** of Grove-Base Shield.
- **Step 3.** Plug Grove - Base Shield into Seeeduino.
- **Step 4.** Connect Seeeduino to PC via a USB cable.

**Note**

If we don't have Grove Base Shield, We also can directly connect Grove-Sound Sensor to Seeeduino as below.

Seeeduino	Grove-Sound Sensor
5V	Red
GND	Black
A1	White
A0	Yellow

Software

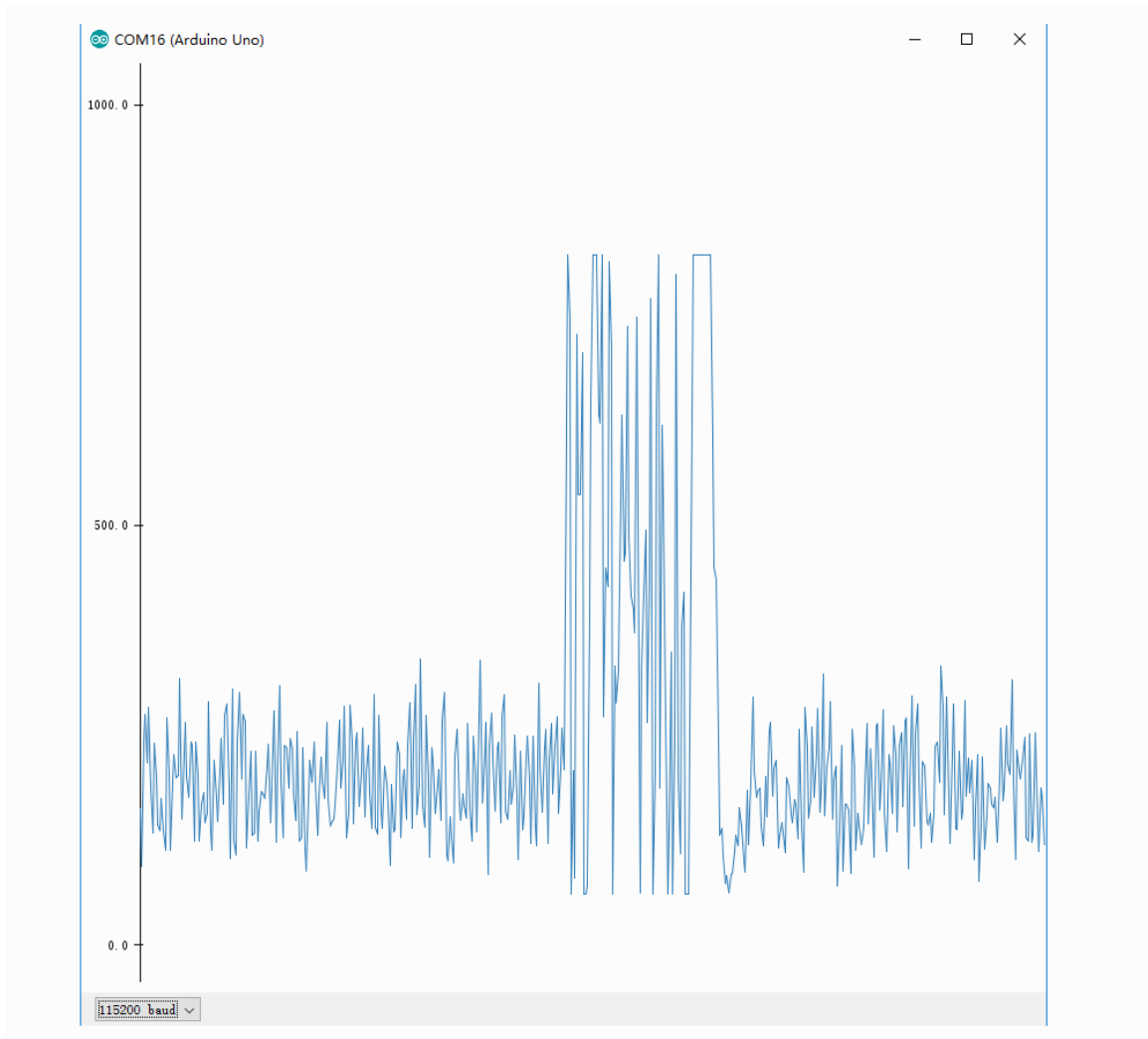
- **Step 1.** Please copy below code to Arduino IDE and upload to arduino. If you do not know how to upload the code, please check [how to upload code](https://wiki.seeedstudio.com/how-to-upload-code/) [<https://wiki.seeedstudio.com/how-to-upload-code/>]

/Upload_Code/].

```
1 // test code for Grove - Sound Sensor
2 // loovee @ 2016-8-30
3
4 const int pinAdc = A0;
5
6 void setup()
7 {
8     Serial.begin(115200);
9     //Serial.println("Grove - Sound Sensor Test...");
10 }
11
12 void loop()
13 {
14     long sum = 0;
15     for(int i=0; i<32; i++)
16     {
17         sum += analogRead(pinAdc);
18     }
19
20     sum >>= 5;
21
22     Serial.println(sum);
23     delay(10);
24 }
```



- **Step 2.** Click on **Serial > Plotter** to get the changing curve of the sensor. Please make a noise to view the change of the value.



Play with Codecraft

Hardware

Step 1. Connect a Grove - Sound Sensor to port A0 of a Base Shield.

Step 2. Plug the Base Shield to your Seeeduino/Arduino.

Step 3. Link Seeeduino/Arduino to your PC via an USB cable.

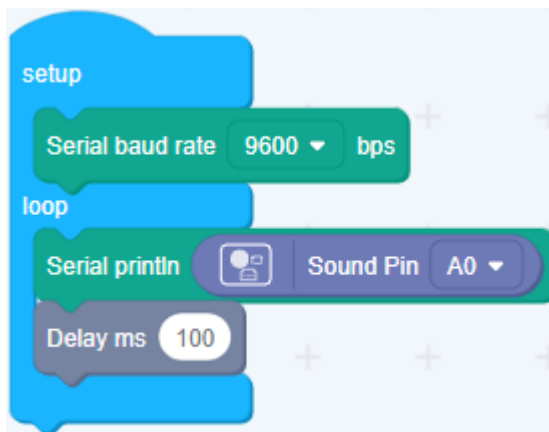
Software

Step 1. Open [Codecraft](https://ide.chmakered.com/) [https://ide.chmakered.com/], add Arduino support, and drag a main procedure to working area.

**Note**

If this is your first time using Codecraft, see also [Guide for Codecraft using Arduino](https://wiki.seeedstudio.com/Guide_for_Codecraft_using_Arduino/) [https://wiki.seeedstudio.com/Guide_for_Codecraft_using_Arduino/].

Step 2. Drag blocks as picture below or open the cdc file which can be downloaded at the end of this page.



Upload the program to your Arduino/Seeeduino.

**Success**

When the code finishes uploaded, you will see the sound value displayed in the Serial Monitor.

Play With Raspberry Pi (With Grove Base Hat for Raspberry Pi)

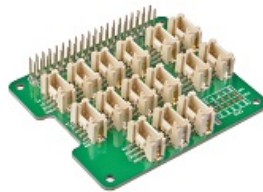
Hardware

- **Step 1.** Things used in this project:

Raspberry pi



Grove Base Hat for RasPi



Grove - Sound Sensor



Get ONE Now

[<https://www.seeedstudio.com/Raspberry-Pi-3-Model-B-p-2625.html>]

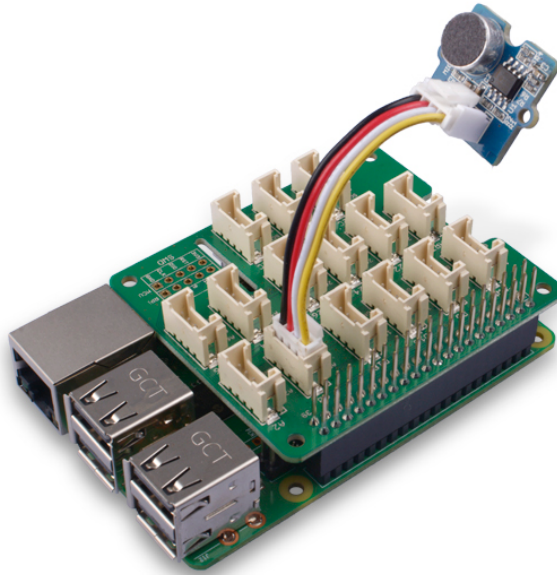
Get ONE Now

[<https://www.seeedstudio.com/Grove-Base-Hat-for-Raspberry-Pi-p-3186.html>]

Get ONE Now

[<https://www.seeedstudio.com/Grove-Sound-Sensor-p-752.html>]

- **Step 2.** Plug the Grove Base Hat into Raspberry.
- **Step 3.** Connect the Grove - Sound Sensor to port A0 of the Base Hat.
- **Step 4.** Connect the Raspberry Pi to PC through USB cable.

**Note**

For step 3 you are able to connect the sound sensor to **any Analog Port** but make sure you change the command with the corresponding port number.

Software**Attention**

If you are using **Raspberry Pi with Raspberrypi OS >= Bullseye**, you have to use this command line **only with Python3**.

- **Step 1.** Follow [Setting Software](https://wiki.seeedstudio.com/Grove_Base_Hat_for_Raspberry_Pi/#installation) [https://wiki.seeedstudio.com/Grove_Base_Hat_for_Raspberry_Pi/#installation] to configure the development environment.
- **Step 2.** Download the source file by cloning the grove.py library.

```
1 cd ~
2 git clone https://github.com/Seeed-Studio/grove.py
```



- **Step 3.** Excute below commands to run the code.

```
1 cd grove.py/grove
2 python3 grove_sound_sensor.py 0
```



Following is the grove_sound_sensor.py code.

```
1 import math
2 import sys
3 import time
4 from grove.adc import ADC
5
6
7 class GroveSoundSensor:
8
9     def __init__(self, channel):
10         self.channel = channel
11         self.adc = ADC()
12
13     @property
14     def sound(self):
15         value = self.adc.read(self.channel)
16         return value
17
18 Grove = GroveSoundSensor
19
20
21 def main():
22     if len(sys.argv) < 2:
23         print('Usage: {} adc_channel'.format(sys.argv[0]))
24         sys.exit(1)
25
26     sensor = GroveSoundSensor(int(sys.argv[1]))
27
28     print('Detecting sound...')
29     while True:
30         print('Sound value: {}'.format(sensor.sound))
31         time.sleep(.3)
32
33 if __name__ == '__main__':
34     main()
```



**Success**

If everything goes well, you will be able to see the following result

```
1 pi@raspberrypi:~/grove.py/grove $ python3 grove_sound_sensor.py 0
2 Detecting sound...
3 Sound value: 499
4 Sound value: 525
5 Sound value: 529
6 Sound value: 493
7 Sound value: 457
8 Sound value: 457
9 Sound value: 503
10 Sound value: 537
11 Sound value: 606
12 Sound value: 614
13 Sound value: 661
14 ^CTraceback (most recent call last):
15   File "grove_sound_sensor.py", line 67, in <module>
16     main()
17   File "grove_sound_sensor.py", line 64, in main
18     time.sleep(.3)
19 KeyboardInterrupt
```



You can quit this program by simply press `Ctrl+C`.





**Notice**

You may have noticed that for the analog port, the silkscreen pin number is something like **A1**, **A0**, however in the command we use parameter **0** and **1**, just the same as digital port. So please make sure you plug the module into the correct port, otherwise there may be pin conflicts.

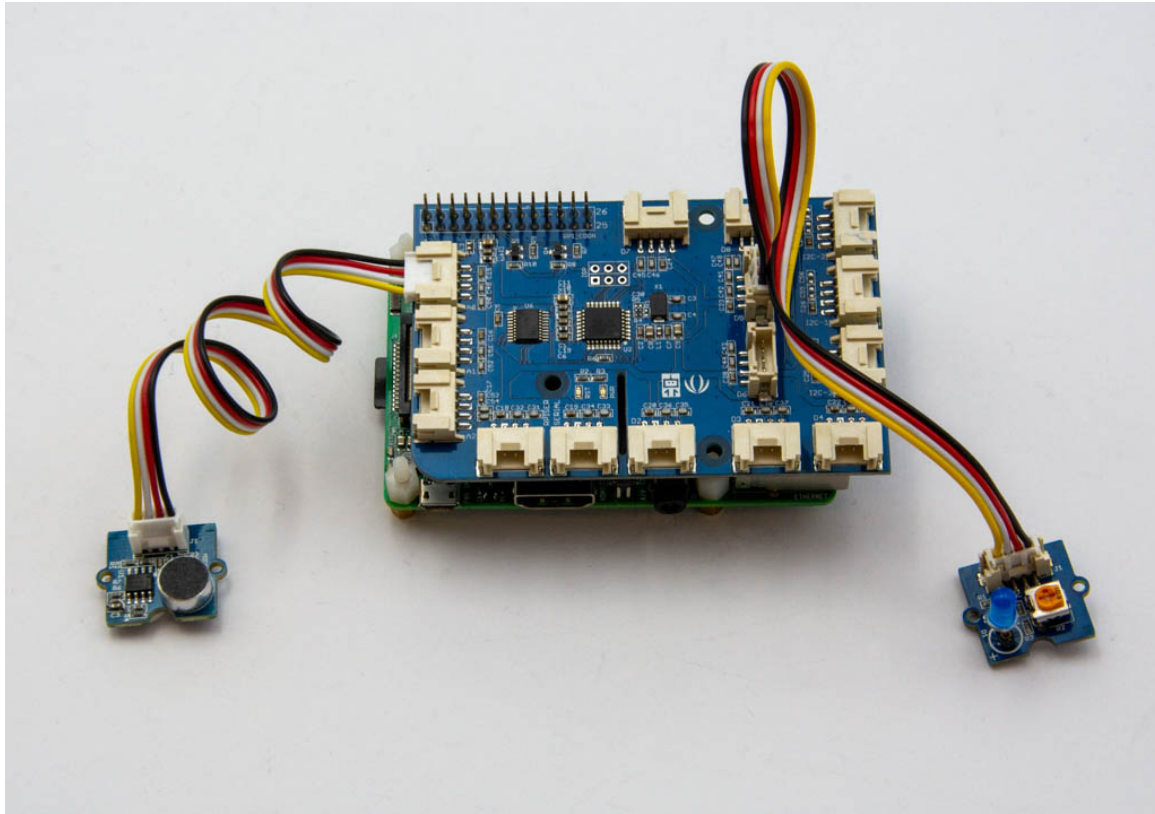
Play With Raspberry Pi (with GrovePi_Plus)

Hardware

- **Step 1.** Prepare the below stuffs:

Raspberry pi	GrovePi_Plus	Grove-Sound Sensor	Grove-E
			
Get One Now [https://www.seeedstudio.com/Raspberry-Pi-3-Model-B-p-2625.html]	Get One Now [https://www.seeedstudio.com/GrovePi%2B-p-2241.html]	Get One Now [https://www.seeedstudio.com/Grove-Sound-Sensor-p-752.html]	Get One Now [https://www.seeedstudio.com/Grove-E-p-1139.html]

- **Step 2.** Plug the GrovePi_Plus into Raspberry.
- **Step 3.** Connect Grove-Sound Sensor to **A0** port of GrovePi_Plus , and connect Grove-Blue LED to **D5** port of GrovePi_Plus
- **Step 4.** Connect the Raspberry to PC through USB cable.



Software

- **Step 1.** Follow [Setting Software](https://www.dexterindustries.com/GrovePi/get-started-with-the-grovepi/setting-software/) [https://www.dexterindustries.com/GrovePi/get-started-with-the-grovepi/setting-software/] to configure the development environment.
- **Step 2.** Follow [Updating the Firmware](https://www.dexterindustries.com/GrovePi/get-started-with-the-grovepi/updating-firmware/) [https://www.dexterindustries.com/GrovePi/get-started-with-the-grovepi/updating-firmware/] to update the newest firmware of GrovePi.



Attention

If you are using **Raspberry Pi with Raspberrypi OS >= Bullseye**, you have to use this command line **only with Python3**.



Tip

In this wiki we use the path `~/GrovePi/` instead of `/home/pi/Desktop/GrovePi`, you need to make sure Step 2 and Step 3 use the same path.



Note

We firmly suggest you to update the firmware, or for some sensors you may get errors.

- **Step 3.** Git clone the Github repository.

```
1 cd ~
2 git clone https://github.com/DexterInd/GrovePi.git
```



- **Step 4.** Navigate to the demos' directory:

```
cd yourpath/GrovePi/Software/Python/
```



Here is the grove_sound_sensor.py code.

```
1  #!/usr/bin/env python
2  #
3  # GrovePi Example for using the Grove Sound Sensor and the Grove LED
4  #
5  # The GrovePi connects the Raspberry Pi and Grove sensors. You can learn
6  #
7  # Modules:
8  #   https://www.seeedstudio.com/wiki/Grove_-_Sound_Sensor
9  #   https://www.seeedstudio.com/wiki/Grove_-_LED_Socket_Kit
10 #
11 # Have a question about this example? Ask on the forums here: http://fo
12 #
13 '''
14 ## License
15 The MIT License (MIT)
16 GrovePi for the Raspberry Pi: an open source platform for connecting Grov
17 Copyright (C) 2017 Dexter Industries
18 Permission is hereby granted, free of charge, to any person obtaining a c
19 of this software and associated documentation files (the "Software"), to
20 in the Software without restriction, including without limitation the rig
21 to use, copy, modify, merge, publish, distribute, sublicense, and/or sell
22 copies of the Software, and to permit persons to whom the Software is
23 furnished to do so, subject to the following conditions:
24 The above copyright notice and this permission notice shall be included i
25 all copies or substantial portions of the Software.
26 THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS O
27 IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY,
28 FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL T
29 AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER
30 LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING F
31 OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN
32 THE SOFTWARE.
33 '''
```



```
34
35 import time
36 import grovepi
37
38 # Connect the Grove Sound Sensor to analog port A0
39 # SIG,NC,VCC,GND
40 sound_sensor = 0
41
42 # Connect the Grove LED to digital port D5
43 # SIG,NC,VCC,GND
44 led = 5
45
46 grovepi.pinMode(sound_sensor,"INPUT")
47 grovepi.pinMode(led,"OUTPUT")
48
49 # The threshold to turn the led on  $400.00 * 5 / 1024 = 1.95v$ 
50 threshold_value = 400
51
52 while True:
53     try:
54         # Read the sound level
55         sensor_value = grovepi.analogRead(sound_sensor)
56
57         # If loud, illuminate LED, otherwise dim
58         if sensor_value > threshold_value:
59             grovepi.digitalWrite(led,1)
60         else:
61             grovepi.digitalWrite(led,0)
62
63         print("sensor_value = %d" %sensor_value)
64         time.sleep(.5)
65
66     except IOError:
67         print ("Error")
```

- **Step 5.** Run the demo.

```
sudo python3 grove_sound_sensor.py
```



Schematic Online Viewer



Resources

- **[Eagle]**[Schematic and PCB in Eagle format](https://files.seeedstudio.com/wiki/Grove_Sound_Sensor/resources/Grove%20-%20Sound%20Sensor.zip) [https://files.seeedstudio.com/wiki/Grove_Sound_Sensor/resources/Grove%20-%20Sound%20Sensor.zip]
- **[PDF]**[Schematic in PDF format](https://files.seeedstudio.com/wiki/Grove_Sound_Sensor/res/Grove%20-%20Sound%20Sensor%20v1.6%20Schematic.pdf) [https://files.seeedstudio.com/wiki/Grove_Sound_Sensor/res/Grove%20-%20Sound%20Sensor%20v1.6%20Schematic.pdf]
- **[PDF]**[PCB in PDF format](https://files.seeedstudio.com/wiki/Grove_Sound_Sensor/res/Grove%20-%20Sound%20Sensor%20v1.6%20PCB.pdf) [https://files.seeedstudio.com/wiki/Grove_Sound_Sensor/res/Grove%20-%20Sound%20Sensor%20v1.6%20PCB.pdf]
- **[Datasheet]**[LM358.PDF](https://files.seeedstudio.com/wiki/Grove_Sound_Sensor/res/LM358.pdf) [https://files.seeedstudio.com/wiki/Grove_Sound_Sensor/res/LM358.pdf]
- **[Codecraft]**[CDC File](https://files.seeedstudio.com/wiki/Grove_Sound_Sensor) [https://files.seeedstudio.com/wiki/Grove_Sound_Sensor]

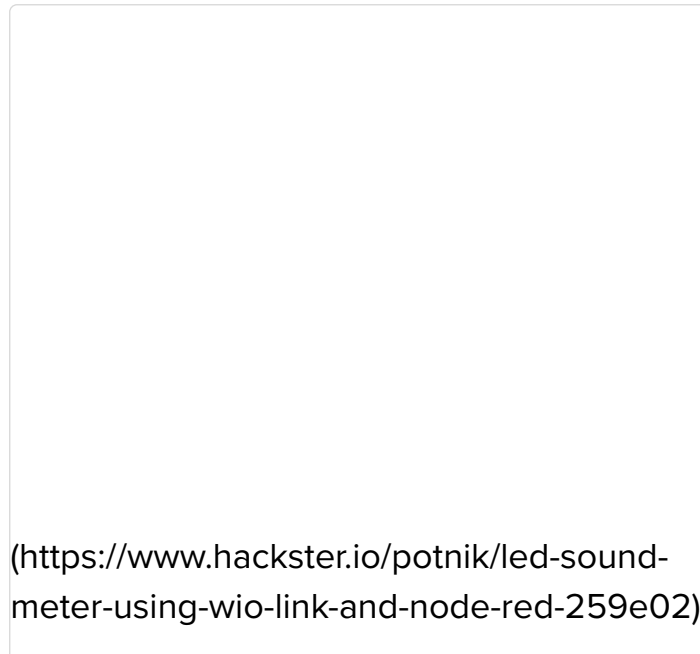
/res/Grove_Sound_Sensor_CDC_File.zip]

Projects

Create a multi-tasking IoT Wi-Fi sensor: This tutorial showcases how to make an internet-connected sensor, while leveraging unique multi-tasking features of Energia & TI LaunchPad.

(<https://www.hackster.io/adrianf/create-a-multi-tasking-iot-wi-fi-sensor-9d7fdf>)

LED Sound Meter using Wio-Link and Node-Red: SeeedStudio Grove sound sensor and LED strip attached to Wio-Link being driven by a Node-Red flow.



Sound sensor Grove module:

Lesson 10 : Sound sensor Grove module.



Lección 10 : Módulo sensor de sonido de Grove.



Tech Support

Please submit any technical issue into our [forum](https://forum.seeedstudio.com/) [https://forum.seeedstudio.com/].



[https://www.seeedstudio.com/act-4.html?utm_source=wiki&utm_medium=wikibanner&utm_campaign=newproducts]