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 LM386 amplifier and an electret microphone. This module's output is analog and can be easily sampled and tested by a Seeeduino.

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	3.⅗ V
Operating Current(Vcc=5V)	4~5 mA
Voltage Gain(V=6V, f=1kHz)	26 dB
Microphone sensitivity(1kHz)	52-48 dB
Microphone Impedance	2.2k Ohm
Microphone Frequency	16-20 kHz
Microphone S/N Radio	54 dB

Tip

More details about Grove modules please refer to Grove System

Platforms Supported

Arduino	Raspberry Pi	BeagleBone	Wio	LinkIt ONE

Caution

The platforms mentioned above as supported is/are an indication of the module's software or theoritical 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

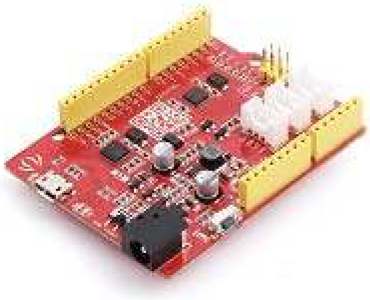
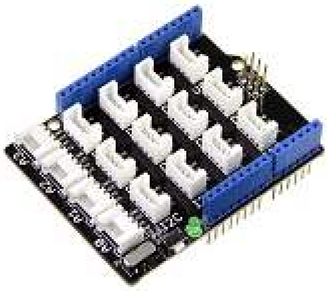
Note

If this is the first time you work with Arduino, we firmly recommend you to see Getting Started with Arduino before the start.

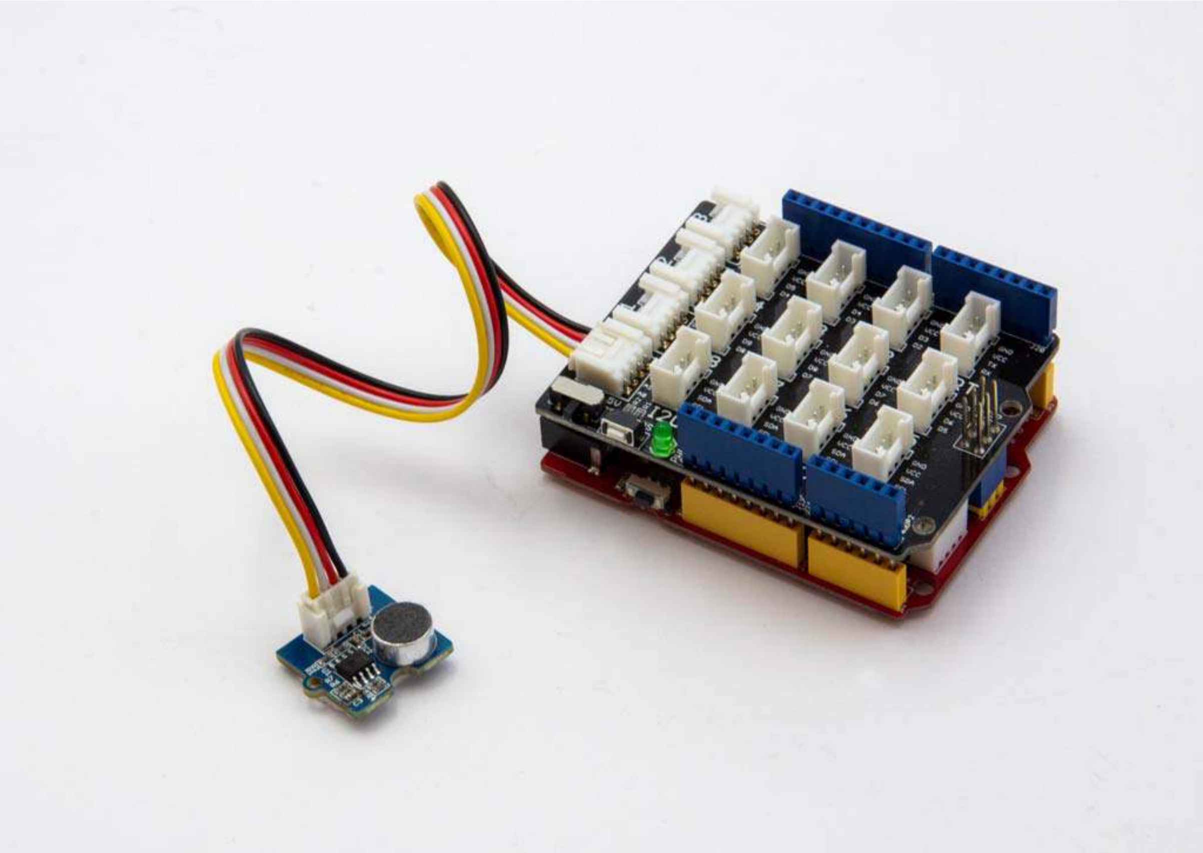
Play With Arduino

Hardware

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

Seeeduino V4.2	Base Shield	Grove-Sound Sensor
		

- **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.

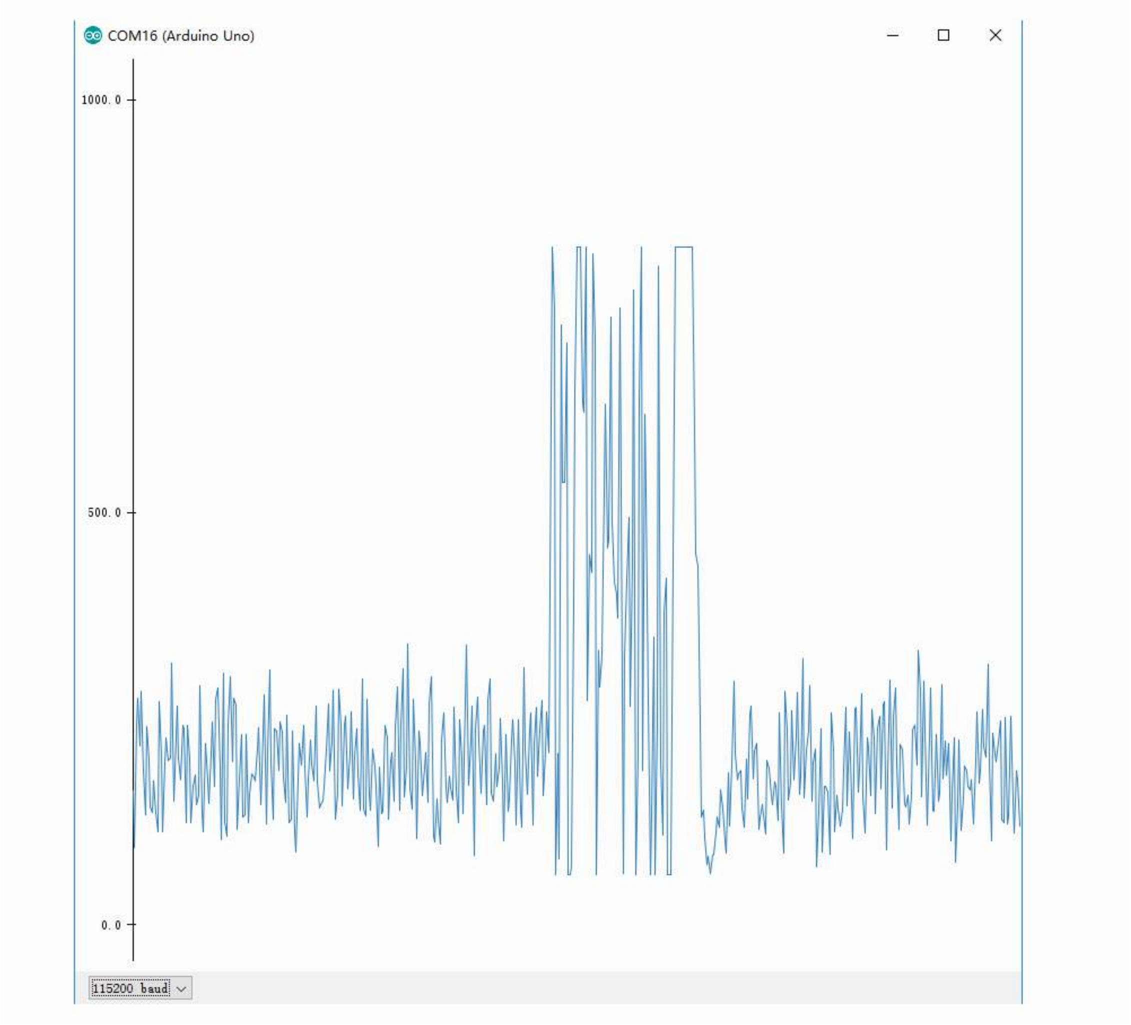
Seeeduino	Grove-Sound Sensor
5V	Red
GND	Black
A1	White
A0	Yellow

Software

- **Step 1.** Please copy below code to Arduio IDE and upload to arduino. If you do not know how to upload the code, please check how to upload code.

```
// test code for Grove - Sound Sensor
// loovee @ 2016-8-30

const int pinAdc = A0;

void setup()
{
    Serial.begin(115200);
    //Serial.println("Grove - Sound Sensor Test...");
}

void loop()
{
    long sum = 0;
    for(int i=0; i<32; i++)
    {
        sum += analogRead(pinAdc);
    }

    sum >>= 5;

    Serial.println(sum);
    delay(10);
}
```

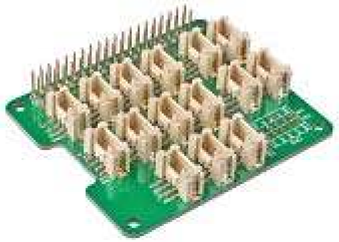
- **Step 2.** Click on **Serial > Plotter** to get the changing curve of the sensor. Please make a noise to view the change of the value.



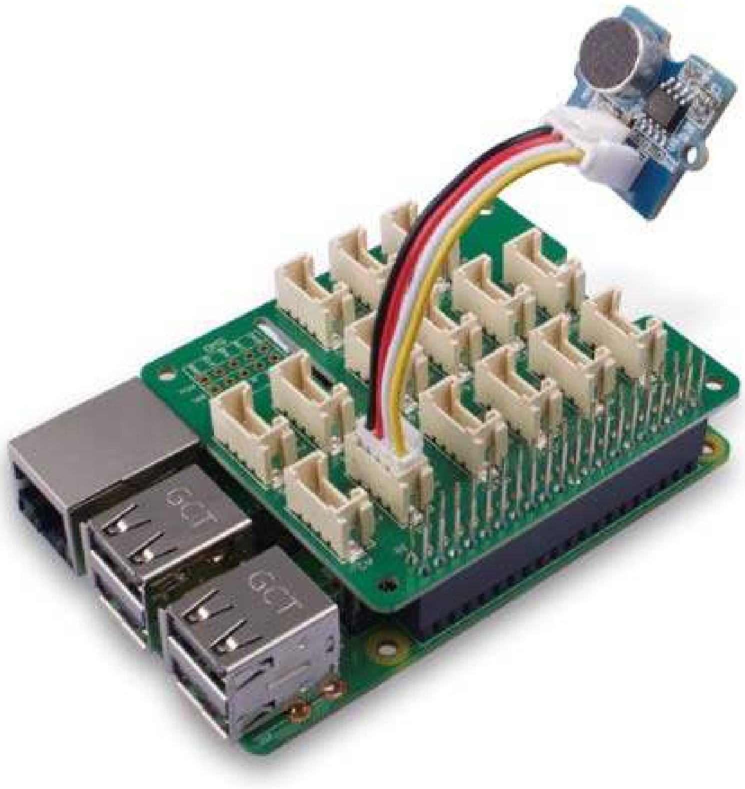
Play With Raspberry Pi (With Grove Base Hat for Raspberry Pi)

Hardware

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

Raspberry pi	Grove Base Hat for RasPi	Grove - Sound Sensor
		

- **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

- **Step 1**. Follow Setting Software to configure the development environment.
- **Step 2**. Download the source file by cloning the grove.py library.

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

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

```
cd grove.py/grove
python grove_sound_sensor.py 0
```

Following is the grove_sound_sensor.py code.

```python
import math
import sys
import time
from grove.adc import ADC


class GroveSoundSensor:

    def __init__(self, channel):
        self.channel = channel
        self.adc = ADC()

    @property
    def sound(self):
        value = self.adc.read(self.channel)
        return value

Grove = GroveSoundSensor


def main():
    if len(sys.argv) < 2:
        print('Usage: {} adc_channel'.format(sys.argv[0]))
        sys.exit(1)

    sensor = GroveSoundSensor(int(sys.argv[1]))

    print('Detecting sound...')
    while True:
        print('Sound value: {0}'.format(sensor.sound))
        time.sleep(.3)

if __name__ == '__main__':
    main()
```

Success

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

```
pi@raspberrypi:~/grove.py/grove $ python grove_sound_sensor.py 0
Detecting sound...
Sound value: 499
Sound value: 525
Sound value: 529
Sound value: 493
Sound value: 457
Sound value: 457
Sound value: 503
Sound value: 537
Sound value: 606
Sound value: 614
Sound value: 661
```

```
^CTraceback (most recent call last):
  File "grove_sound_sensor.py", line 67, in <module>
    main()
  File "grove_sound_sensor.py", line 64, in main
    time.sleep(.3)
KeyboardInterrupt
```

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

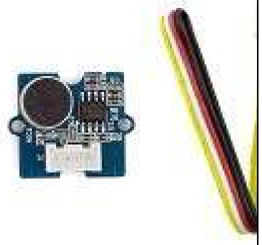
Notice

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.

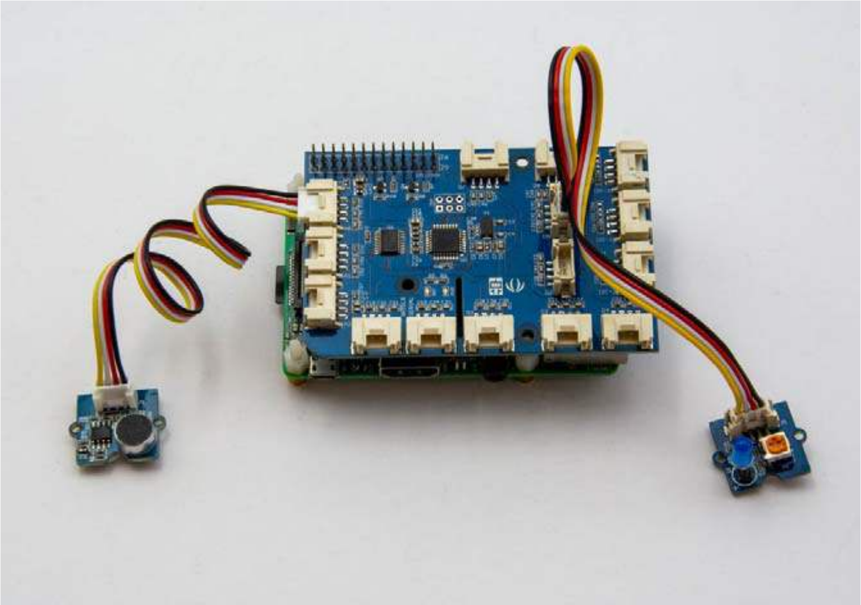
Play With Raspberry Pi (with GrovePi_Plus)

Hardware

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

Raspberry pi	GrovePi_Plus	Grove-Sound Sensor	Grove-Blue LED
			

- **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 to configure the development environment.
- **Step 2.** Follow Updating the Firmware to update the newest firmware of GrovePi.

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.

```
cd ~
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.

```
#!/usr/bin/env python
#
# GrovePi Example for using the Grove Sound Sensor and the Grove LED
#

```

```
# The GrovePi connects the Raspberry Pi and Grove sensors.  You can learn
more about GrovePi here:  http://www.dexterindustries.com/GrovePi
#
# Modules:
#    http://www.seeedstudio.com/wiki/Grove_-_Sound_Sensor
#    http://www.seeedstudio.com/wiki/Grove_-_LED_Socket_Kit
#
# Have a question about this example?  Ask on the forums here:
http://forum.dexterindustries.com/c/grovepi
#
'''
## License
The MIT License (MIT)
GrovePi for the Raspberry Pi: an open source platform for connecting Grove
Sensors to the Raspberry Pi.
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FROM,
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THE SOFTWARE.
'''

import time
import grovepi

# Connect the Grove Sound Sensor to analog port A0
# SIG,NC,VCC,GND
sound_sensor = 0

# Connect the Grove LED to digital port D5
# SIG,NC,VCC,GND
led = 5

grovepi.pinMode(sound_sensor,"INPUT")
grovepi.pinMode(led,"OUTPUT")

# The threshold to turn the led on 400.00 * 5 / 1024 = 1.95v
threshold_value = 400

while True:
    try:
        # Read the sound level
        sensor_value = grovepi.analogRead(sound_sensor)

        # If loud, illuminate LED, otherwise dim
        if sensor_value > threshold_value:
            grovepi.digitalWrite(led,1)
        else:
            grovepi.digitalWrite(led,0)

        print("sensor_value = %d" %sensor_value)
        time.sleep(.5)

    except IOError:
        print ("Error")
```

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

```
sudo python grove_sound_sensor.py
```

Resources

- [**Eagle**]Schematic and PCB in Eagle format
- [**PDF**]Schematic in PDF format
- [**PDF**]PCB in PDF format
- [**Datasheet**]LM386.PDF

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.

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:

Tech Support

Please submit any technical issue into our forum.