

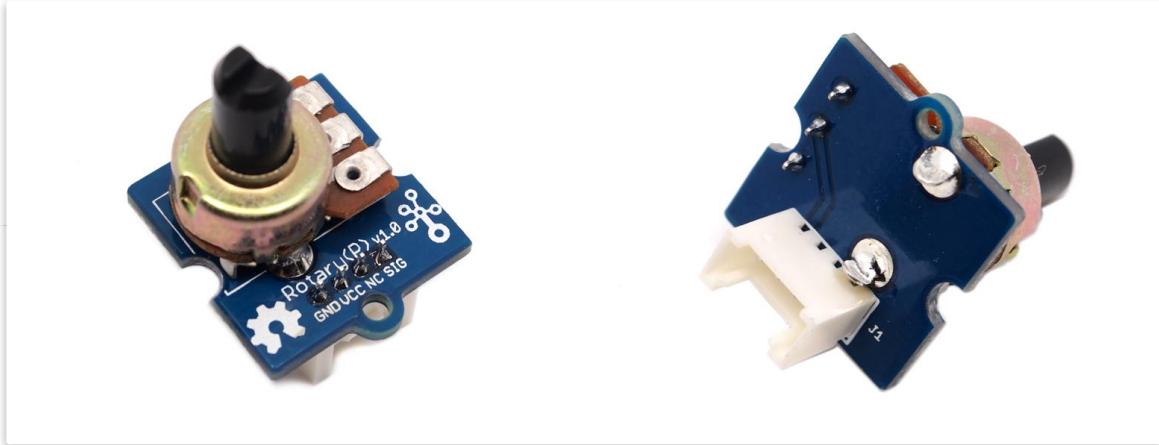
The rotary angle sensor produces analog output between 0 and Vcc (5V DC with Seeeduino) on its D1 connector. The D2 connector is not used. The angular range is 300 degrees with a linear change in value. The resistance value is 10k ohms, perfect for Arduino use. This may also be known as a "potentiometer".

Get One Now

[<https://www.seeedstudio.com/Grove-Rotary-Angle-Sensor-p-770.html>]

There is another product, Grove - Rotary Angle Sensor(P). What does "P" mean? "P" is for

“panel mount” in this product. It is the sister version of Grove - Rotary Angle Sensor. They are identical except the Grove connector is moved to the back so that you can easily use it as a neat and wire-free human interface device.



Get One Now

[<https://www.seeedstudio.com/depot/grove-rotary-angle-sensor-p-1242.html>]

Version

Product Version	Changes	Released Date
Grove-Rotary Angle Sensor(P) V1.1	Initial	Jan 2013
Grove-Rotary Angle Sensor V1.2	Initial	May 2014

Features

- Grove Interface
- Easy to Use
- Grove Base Module



Tip

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

Specifications

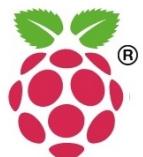
Item	Min	Typical	Max	Unit
Voltage	4.75	5.0	5.25	VDC
Rotary Angle	0	/	300	Deg
Dimension	/	19x19x30.1	/	mm

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/] before the start.

Play With Arduino

Hardware

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

Seeeduino V4.2



Base Shield



Grove-Rotary Angle Sensor



Grove-L

[Get One Now](#)

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

[Get One Now](#)

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

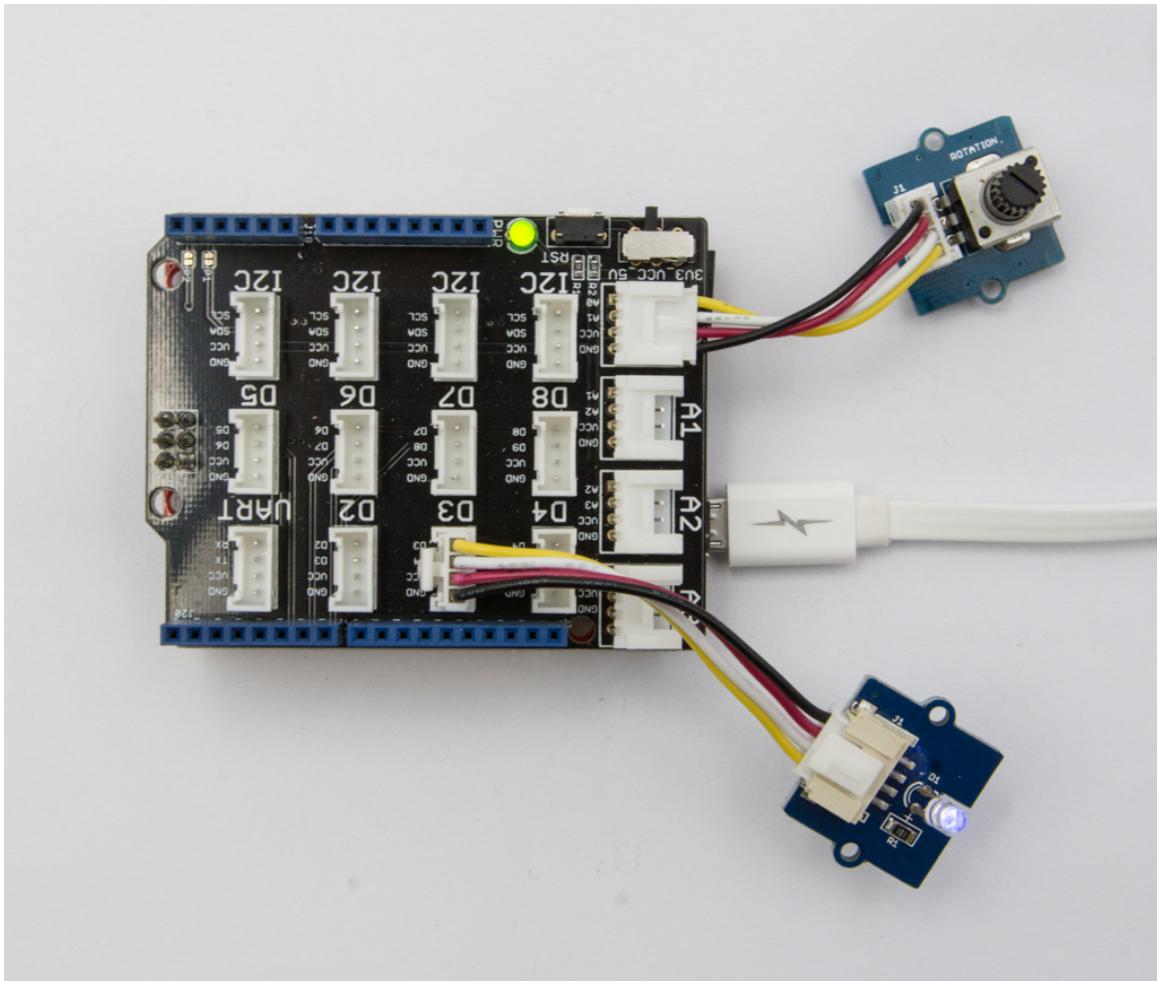
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[<https://www.seeedstudio.com/Grove-Rotary-Angle-Sensor-p-770.html>]

[Get One Now](#)

[<https://www.seeedstudio.com/Grove-LED-p-771.html>]

- **Step 2.** Connect Grove-Rotary Angle Sensor to **A0** port of Grove-Base Shield.
- **Step 3.** Connect Grove-LED to **D3** port of Grove-Base Shield.
- **Step 4.** Plug Grove - Base Shield into Seeeduino.
- **Step 5.** Connect Seeeduino to PC via a USB cable.

**Note**

If we don't have Grove Base Shield, We also can directly connect Grove-Rotary Angle Sensor and Grove-Led to Seeeduino as below. Grove-Led must be connected to PWM port. For Seeeduino, they are D3,5,6,9,10,11.

Seeeduino	Grove-Rotary Angle Sensor	Seeeduino	Grove-LED
5V	Red	5V	Red
GND	Black	GND	Black
NC	White	NC	White
A0	Yellow	D3	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/Upload_Code/].

```
1  /*macro definitions of Rotary angle sensor and LED pin*/
2
3  #define ROTARY_ANGLE_SENSOR A0
4  #define LED 3 //the Grove - LED is connected to PWM pin D3 of Arduino
5  #define ADC_REF 5 //reference voltage of ADC is 5v.If the Vcc switch on t
6          //board switches to 3V3, the ADC_REF should be 3.3
7  #define GROVE_VCC 5 //VCC of the grove interface is normally 5v
8  #define FULL_ANGLE 300 //full value of the rotary angle is 300 degrees
9
10 void setup()
11 {
12     Serial.begin(9600);
13     pinMode(ROTARY_ANGLE_SENSOR, INPUT);
14     pinMode(LED,OUTPUT);
15 }
16
17 void loop()
18 {
19     float voltage;
20     int sensor_value = analogRead(ROTARY_ANGLE_SENSOR);
21     voltage = (float)sensor_value*ADC_REF/1023;
22     float degrees = (voltage*FULL_ANGLE)/GROVE_VCC;
23     Serial.println("The angle between the mark and the starting position:");
24     Serial.println(degrees);
25
26     int brightness;
27     brightness = map(degrees, 0, FULL_ANGLE, 0, 255);
28     analogWrite(LED,brightness);
29     delay(500);
30 }
```

- **Step 2.** Adjust Grove-Rotary Angle Sensor and we will see the Grove-LED changes the brightness.

Play with Codecraft

Hardware

Step 1. Connect a Grove - Rotary Angle Sensor to port A0, and connect a Grove - Red LED to port D3 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

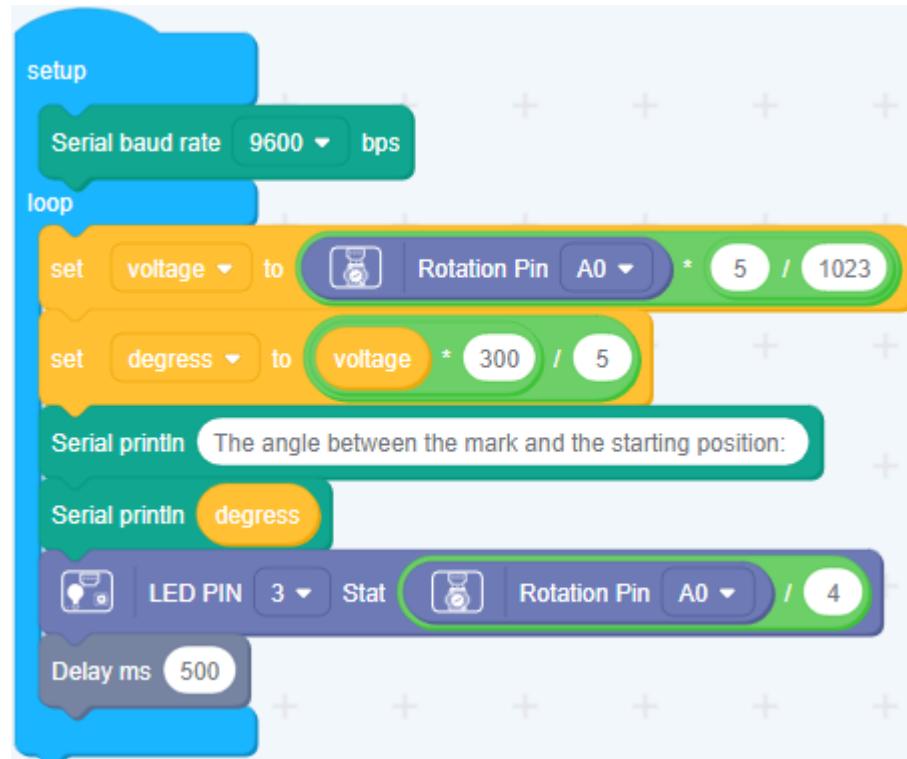
Step 1. Open [Codecraft](https://ide.chmakered.com/) [<https://ide.chmakered.com/>], add Arduino support, and drag a main procedure to working area.



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, the brightness of the LED will vary depending on the angle of the sensor, and the angle value displayed in the Serial Monitor.

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

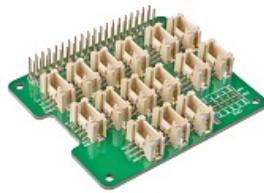
Hardware

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

Raspberry pi



Grove Base Hat for RasPi



Grove - Rotary Angle Sensor



[Get ONE Now](#)

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

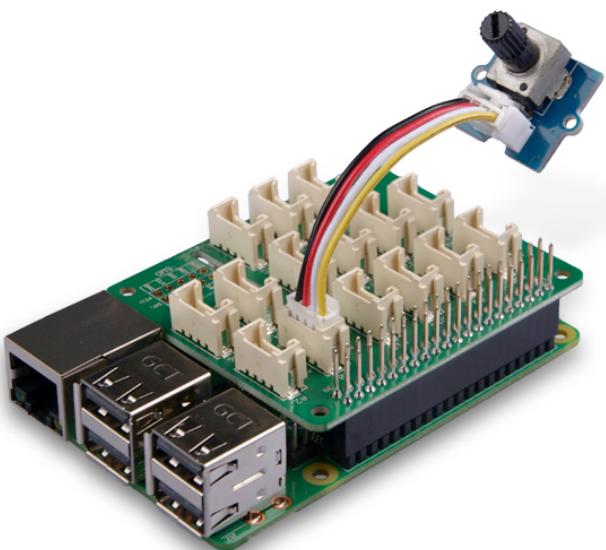
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[<https://www.seeedstudio.com/Grove-Base-Hat-for-Raspberry-Pi-p-3186.html>]

[Get ONE Now](#)

[<https://www.seeedstudio.com/Grove-Rotary-Angle-Sensor-p-1242.html>]

- **Step 2.** Plug the Grove Base Hat into Raspberry.
- **Step 3.** Connect the rotary 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 rotary angle 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] 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.** Execute below commands to run the code.

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

Following is the grove_rotary_angle_sensor.py code.

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



Success

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

```
1 pi@raspberrypi:~/grove.py/grove $ python3 grove_rotary_angle_sensor.py
2 Rotary Value: 932
3 Rotary Value: 931
4 Rotary Value: 931
5 Rotary Value: 931
6 Rotary Value: 933
7 Rotary Value: 931
8 Rotary Value: 742
9 Rotary Value: 666
10 Rotary Value: 666
11 Rotary Value: 549
12 Rotary Value: 520
13 Rotary Value: 499
14 Rotary Value: 430
15 Rotary Value: 430
16 Rotary Value: 321
17 Rotary Value: 286
18 Rotary Value: 205
19 Rotary Value: 127
20 Rotary Value: 88
21 Rotary Value: 0
22 Rotary Value: 0
23 Rotary Value: 0
24 Rotary Value: 0
25 Rotary Value: 0
26 Rotary Value: 0
27 Rotary Value: 0
28 ^CTraceback (most recent call last):
29   File "grove_rotary_angle_sensor.py", line 66, in <module>
30     main()
31   File "grove_rotary_angle_sensor.py", line 62, in main
32     time.sleep(.2)
33 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 **A0, A1**, 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-Rotary Angle Sensor



Grove-L

[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>]

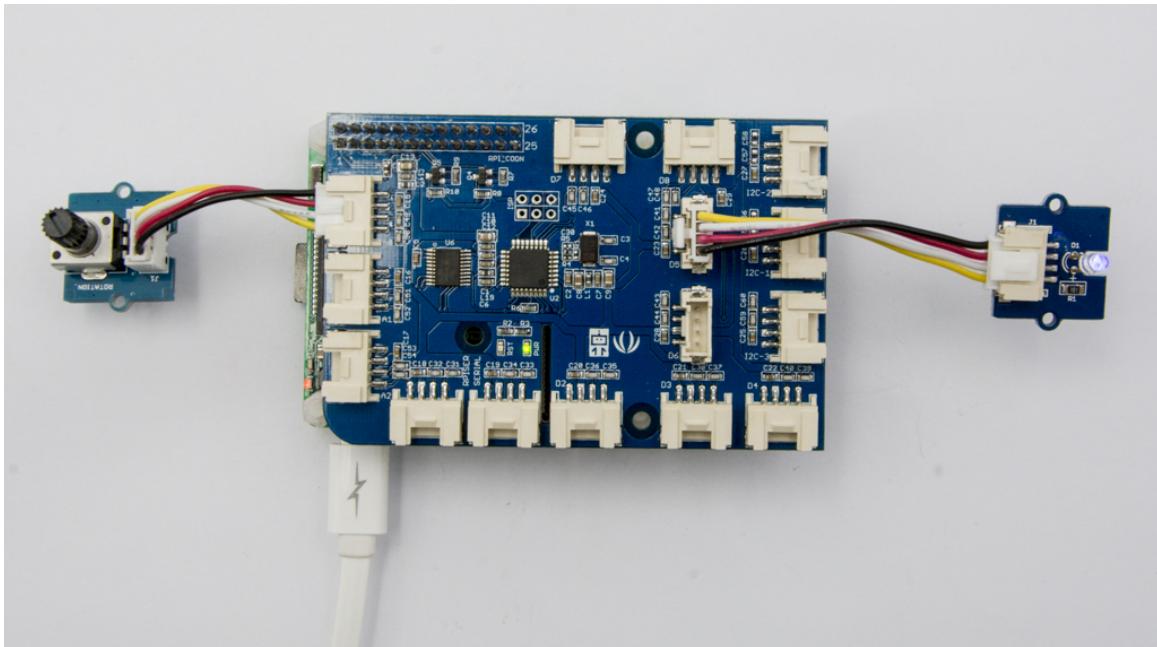
[Get One Now](#)

[<https://www.seeedstudio.com/Grove-Rotary-Angle-Sensor-p-770.html>]

[Get One Now](#)

[<https://www.seeedstudio.com/Grove-LED-p-1000.html>]

- **Step 2.** Plug the GrovePi_Plus into Raspberry.
- **Step 3.** Connect Grove-Rotary Angle Sensor to **A0** port of GrovePi_Plus.
- **Step 4.** Connect Grove-LED to **D5** port of GrovePi_Plus.
- **Step 5.** Connect the Raspberry to PC through USB cable.



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://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.** Git clone the Github repository.

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

- **Step 3.** Execute below commands to monitor the loudness.

```
1 cd ~/GrovePi/Software/Python  
2 python3 grove_rotary_angle_sensor.py
```

Here is the `grove_rotary_angle_sensor.py` code.

```
1 import time
```

```
2 import grovepi
3
4 # Connect the Grove Rotary Angle Sensor to analog port A0
5 # SIG,NC,VCC,GND
6 potentiometer = 0
7
8 # Connect the LED to digital port D5
9 # SIG,NC,VCC,GND
10 led = 5
11
12 grovepi.pinMode(potentiometer,"INPUT")
13 grovepi.pinMode(led,"OUTPUT")
14 time.sleep(1)
15
16 # Reference voltage of ADC is 5v
17 adc_ref = 5
18
19 # Vcc of the grove interface is normally 5v
20 grove_vcc = 5
21
22 # Full value of the rotary angle is 300 degrees, as per it's specs (0 to
23 full_angle = 300
24
25 while True:
26     try:
27         # Read sensor value from potentiometer
28         sensor_value = grovepi.analogRead(potentiometer)
29
30         # Calculate voltage
31         voltage = round((float)(sensor_value) * adc_ref / 1023, 2)
32
33         # Calculate rotation in degrees (0 to 300)
34         degrees = round((voltage * full_angle) / grove_vcc, 2)
35
36         # Calculate LED brightness (0 to 255) from degrees (0 to 300)
37         brightness = int(degrees / full_angle * 255)
38
39         # Give PWM output to LED
40         grovepi.analogWrite(led,brightness)
41
42         print("sensor_value = %d voltage = %.2f degrees = %.1f brightness"
43 except KeyboardInterrupt:
44     grovepi.analogWrite(led,0)
45     break
46 except IOError:
47     print ("Error")
```

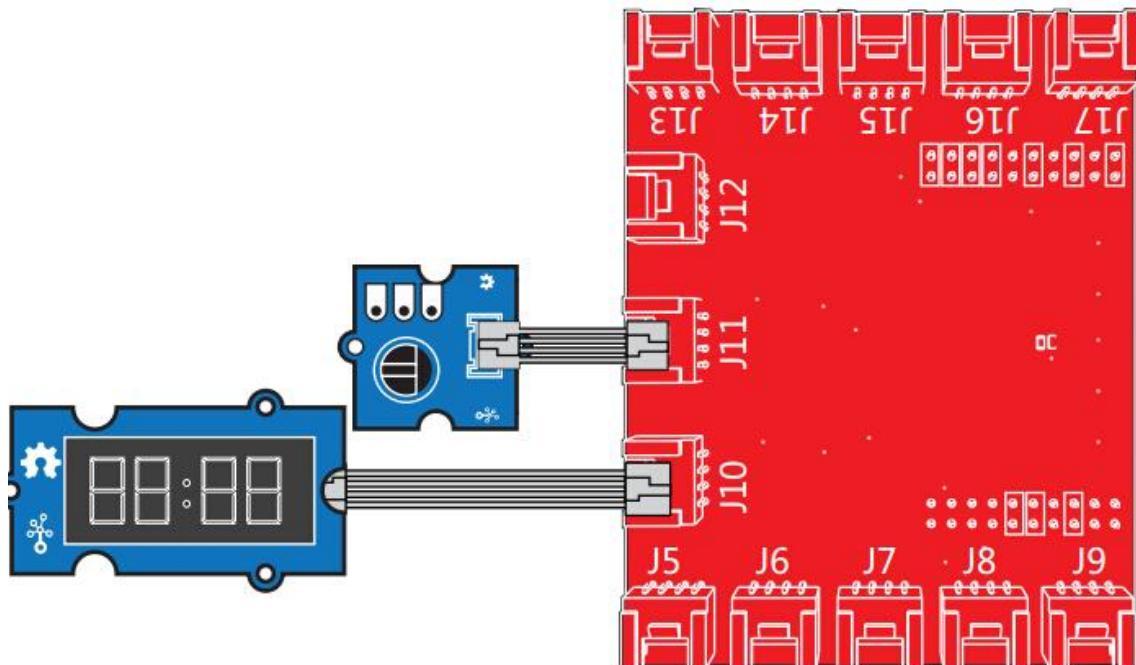
- **Step 4.** Adjust Grove-Rotary Angle Sensor and we will see the Grove-LED changes the

brightness.

Play with TI LaunchPad

Reading the Potentiometer (Rotary Angle Sensor)

This example shows how to read the analog output coming from the Grove potentiometer module. We will be combining a few Grove modules in this example! By turning the potentiometer knob, we will display the analog reading value on the Grove 4-digit display.



```
1  /*
2   *      Rotary Angle Sensor
3   *      Demonstrates analog input by reading an analog sensor on J16 of the G
4
5   *      The circuit:
6   *      * Potentiometer attached to pin 24 (J6 on Grove Base BoosterPack)
7   *      * center pin of the potentiometer to the analog pin
8   *      * one side pin (either one) to ground
9   *      * the other side pin to VCC (3.3V)
10
11  *      Note: Because of unstable of the voltage, the value of the rotary a
12      varies slightly from run to run even you don't touch it.
13
14  Created by Oliver Wang
```

```
15
16     This example code is in the public domain.
17
18     https://www.seeedstudio.com/wiki/GROVE_-_Starter_Kit_v1.1b#Grove_-_Ro
19     /*
20
21 #include "TM1637.h"
22
23 /* Macro Define */
24 #define CLK          39           /* 4-digital display clock
25 #define DIO          38           /* 4-digital display data pin
26 #define ROTARY_ANGLE_P 24           /* pin of rotary angle sensor
27
28 /* Global Variables */
29 TM1637 tm1637(CLK, DIO);           /* 4-digital display object */
30 int analog_value = 0;                /* variable to store the value
31
32 int8_t bits[4] = {0};               /* array to store the single bi
33
34 /* the setup() method runs once, when the sketch starts */
35 void setup() {
36
37     /* Initialize 4-digital display */
38     tm1637.init();
39     tm1637.set(BRIGHT_TYPICAL);
40
41 }
42
43 /* the loop() method runs over and over again */
44 void loop() {
45
46     analog_value = analogRead(ROTARY_ANGLE_P);           /* read the value fro
47     memset(bits, 0, 4);                                /* reset array when w
48     for(int i = 3; i >= 0; i--) {
49         /* get single bits of the analog value */
50         bits[i] = analog_value % 10;
51         analog_value = analog_value / 10;
52         tm1637.display(i, bits[i]);                     /* display by 4-digit
53     }
54     delay(100);
55 }
```

Grove - Rotary Angle Sensor(P) v1.1 Schematic File



Grove-Rotary Angle Sensor v1.2 Schematic File

Resources

- **[Eagle&PDF]** [Grove-Rotary Angle Sensor v1.2 Schematic File](#)
[https://files.seeedstudio.com/wiki/Grove-Rotary_Angle_Sensor/res/Grove%20-%20Rotary%20Angle%20Sensor%20v1.2.zip]
- **[Eagle&PDF]** [Grove - Rotary Angle Sensor\(P\) v1.1 Schematic File](#)
[[https://files.seeedstudio.com/wiki/Grove-Rotary_Angle_Sensor/res/Grove%20-%20Rotary%20Angle%20Sensor\(P\)%20v1.1.zip](https://files.seeedstudio.com/wiki/Grove-Rotary_Angle_Sensor/res/Grove%20-%20Rotary%20Angle%20Sensor(P)%20v1.1.zip)]
- **[Library]** [Github repository for Rotary Angle Sensor](#) [https://github.com/Seeed-Studio/Grove_Rotary_Angle_Sensor]
- **[Codecraft]** [CDC File](#) [https://files.seeedstudio.com/wiki/Grove-Rotary_Angle_Sensor/res/Grove_Rotary_Angle_Sensor_CDC_File.zip]

Projects

Using Grove-Rotary Angle Sensor(P) to Control Grove LED: Using Arduino/Genuino 101 to control the brightness of an LED through Grove-Rotary Angle Sensor(P).

(<https://www.hackster.io/user50338573/using-grove-rotary-angle-sensor-p-to-control-grove-led-725e221>)

Rotary Angle Grove module:

Lesson 9 : Potentiometer Grove module.



Lección 9 : Módulo potenciómetro de Grove



Tech Support

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



The banner features the Seeed logo and slogan "The IoT Hardware Enabler". Below the logo, the text "New Products" is displayed. To the right of the text, there are seven different Seeed hardware products arranged in two rows: a large white computer case, a black tablet-like device, a red rectangular device, a green Raspberry Pi board, a blue breadboard, a white microcontroller board, and a small blue sensor module.

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