

# Grove - Thumb Joystick



Grove - Thumb Joystick is a Grove compatible module which is very similar to the 'analog' joystick on PS2 (PlayStation 2) controllers. The X and Y axes are two ~10k potentiometers which control 2D movement by generating analog signals. The joystick also has a push button that could be used for special applications. When the module is in working mode, it will output two analog values, representing two directions. Compared to a normal joystick, its output values are restricted to a smaller range (i.e. 200~800), only when being pressed that the X value will be set to 1023 and the MCU can detect the action of pressing.

## Version


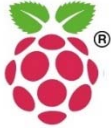



## Specifications

Item	Min	Typical	Max	Unit
Working Voltage	4.75	5.0	5.25	V
Output Analog Value (X coordinate)	206	516	798	\
Output Analog Value (Y coordinate)	203	507	797	\

## 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 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](#) before the start.

## Play With Arduino

### Demonstration

The Grove - Thumb Joystick is an analog device that outputs analog signal ranging from 0 to 1023. That requires us to use the analog port of Arduino to take the readings.

### Hardware

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

Seeeduino V4.2	Base Shield	Grove - Thumb Joystick
		

- **Step 2.** Connect the module to the **A0/A1** of Grove - Base Shield by using the 4-pin grove cable.
- **Step 3.** Plug Grove - Base Shield into Seedeuino.
- **Step 4.** Connect Seedeuino to PC via a USB cable.



**Note**  
 If we don't have Grove Base Shield, We also can directly connect Grove-Thumb Joystick to Seedeuino as below.

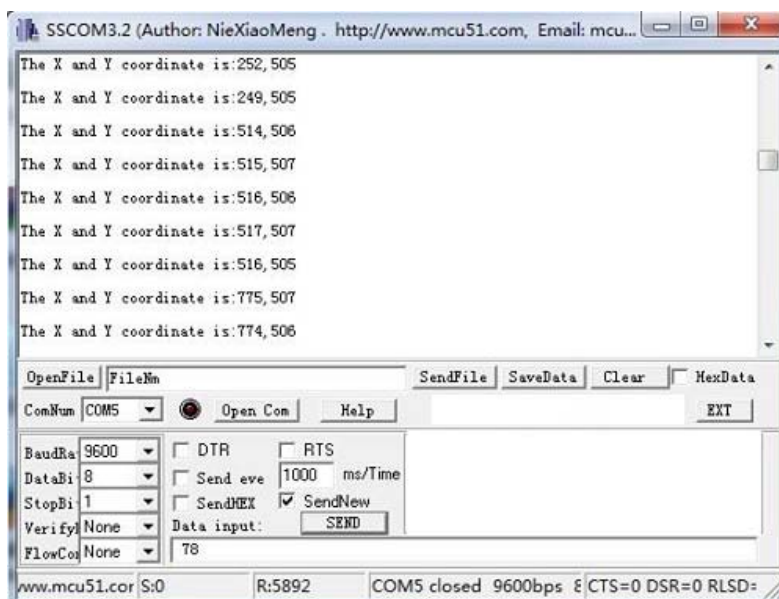
Seedeuino	Grove - Thumb Joystick
5V	Red
GND	Black
A1	White
A0	Yellow

## Software

- **Step 1.** Copy and paste code below to a new Arduino sketch.

```
1/*
2 Thumb Joystick demo v1.0
3 by:http://www.seeedstudio.com
4 connect the module to A0&A1 for using;
5*/
6
7void setup()
8{
9   Serial.begin(9600);
10}
11
12void loop()
13{
14   int sensorValue1 = analogRead(A0);
15   int sensorValue2 = analogRead(A1);
16
17   Serial.print("The X and Y coordinate is:");
18   Serial.print(sensorValue1, DEC);
19   Serial.print(",");
20   Serial.println(sensorValue2, DEC);
21   Serial.println(" ");
22   delay(200);
23}
```

- **Step 2.** You can check the values of the output analog signals by opening the Serial Monitor.



The output value from the analog port of Arduino can be converted to the corresponding resistance by using the formula:  $R = (\text{float})(1023 - \text{sensorValue}) * 10 / \text{sensorValue}$ .

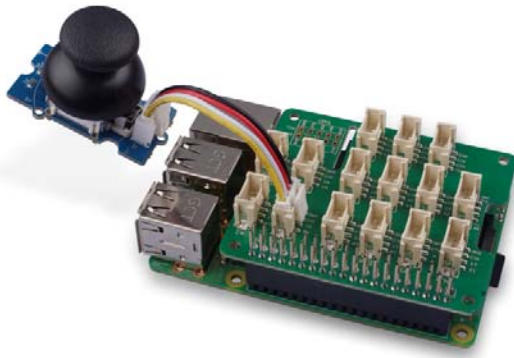
## Play With Raspberry Pi (With Grove Base Hat for Raspberry Pi)

### Hardware

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

Raspberry pi	Grove Base Hat for RasPi	Grove - Thumb Joystick
		

- **Step 2.** Plug the Grove Base Hat into Raspberry.
- **Step 3.** Connect the Thumb Joystick 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 the thumb joystick 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.

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

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

### Note

you can execute the program with `python grove_thumb_joystick.py pin++`, where pin could be one of {0, 2, 4, 6} in the ADC group and connect the device to the corresponding slot {A0, A2, A4, A6}.

Following is the `grove_thumb_joystick.py` code.

```
1import math
2import sys
3import time
4from grove.adc import ADC
5
6
7class GroveThumbJoystick:
8
9    def __init__(self, channelX, channelY):
10        self.channelX = channelX
11        self.channelY = channelY
12        self.adc = ADC()
13
14    @property
15    def value(self):
16        return self.adc.read(self.channelX), self.adc.read(self.channelY)
17
18Grove = GroveThumbJoystick
19
20
21def main():
22    from grove.helper import SlotHelper
23    sh = SlotHelper(SlotHelper.ADC)
24    pin = sh.argv2pin()
25
26    sensor = GroveThumbJoystick(int(pin), int(pin + 1))
27
28    while True:
29        x, y = sensor.value
30        if x > 900:
31            print('Joystick Pressed')
32            print("X, Y = {0} {1}".format(x, y))
33            time.sleep(.2)
34
35if __name__ == '__main__':
36    main()
```

### Success

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

```
lpi@raspberrypi:~/grove.py/grove $ python grove_thumb_joystick.py 0
2Hat Name = 'Grove Base Hat RPi'
3X, Y = 506 484
```

```

4X, Y = 484 484
5X, Y = 506 484
6X, Y = 506 487
7Joystick Pressed
8X, Y = 999 485
9X, Y = 310 736
10X, Y = 681 484
11Joystick Pressed
12X, Y = 999 277
13Joystick Pressed
14X, Y = 999 487
15X, Y = 506 484
16X, Y = 501 486
17X, Y = 509 484
18X, Y = 511 486
19X, Y = 510 485
20^CTraceback (most recent call last):
21  File "grove_thumb_joystick.py", line 69, in <module>
22    main()
23  File "grove_thumb_joystick.py", line 66, in main
24    time.sleep(.2)
25KeyboardInterrupt

```

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.

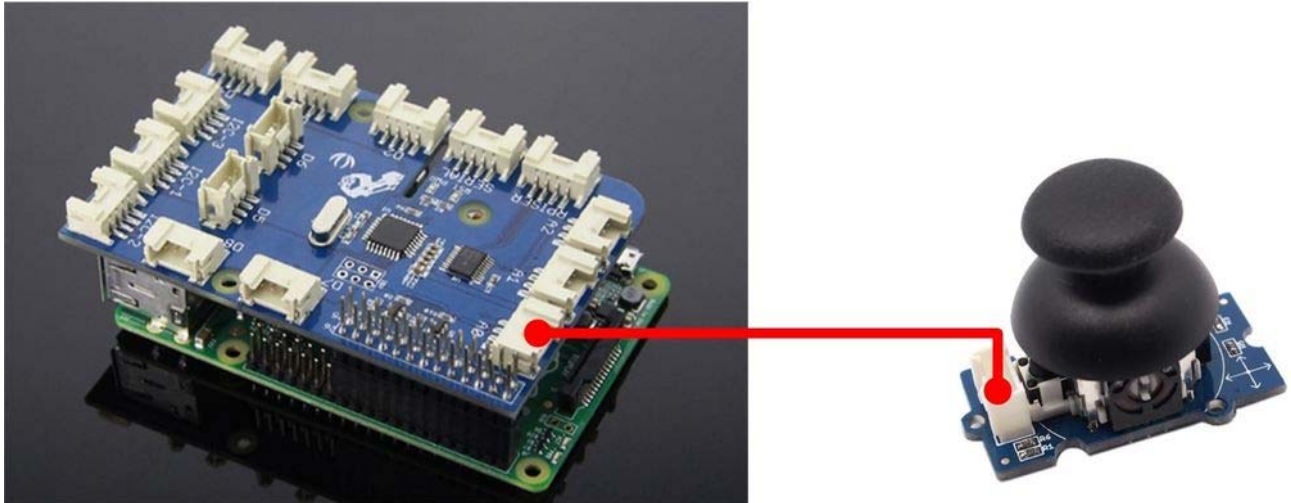
## Play With Raspberry Pi (with GrovePi\_Plus)

### Hardware

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

Raspberry pi	GrovePi_Plus	Grove - Thumb Joystick
		

- **Step 2.** Plug the GrovePi\_Plus into Raspberry.
- **Step 3.** Connect Grove-Thumb Joystick ranger to **A0** port of GrovePi\_Plus.
- **Step 4.** Connect the Raspberry to PC through USB cable.



## Software

- **Step 1.** Navigate to the demos' directory:

```
lcd yourpath/GrovePi/Software/Python/
```

- **Step 2.** To see the code

```
lnano grove_thumb_joystick.py # "Ctrl+x" to exit #
```

```
1import time
2import grovepi
3
4# Connect the Grove Thumb Joystick to analog port A0
5
6# GrovePi Port A0 uses Arduino pins 0 and 1
7# GrovePi Port A1 uses Arduino pins 1 and 2
8# Don't plug anything into port A1 that uses pin 1
9# Most Grove sensors only use 3 of their 4 pins, which is why the GrovePi
10shares Arduino pins between adjacent ports
11# If the sensor has a pin definition SIG,NC,VCC,GND, the second (white) pin
12is not connected to anything
13
14# If you wish to connect two joysticks, use ports A0 and A2 (skip A1)
15
16# Uses two pins - one for the X axis and one for the Y axis
17# This configuration means you are using port A0
18xPin = 0
19yPin = 1
20grovepi.pinMode(xPin,"INPUT")
21grovepi.pinMode(yPin,"INPUT")
```



```

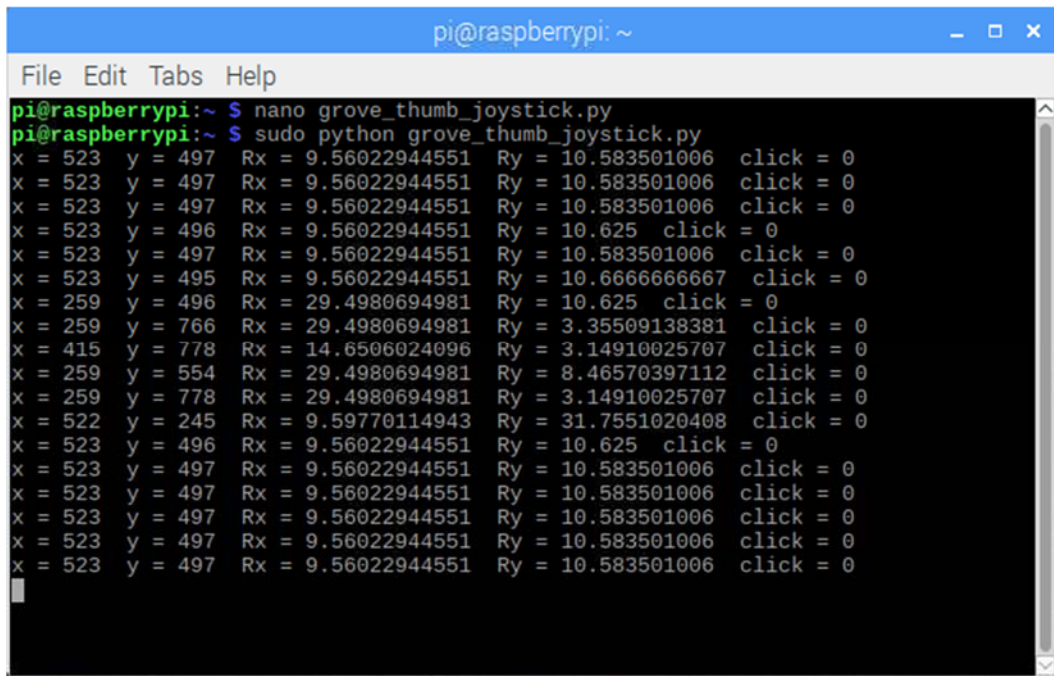
22
23# The Grove Thumb Joystick is an analog device that outputs analog signal
24ranging from 0 to 1023
25# The X and Y axes are two ~10k potentiometers and a momentary push button
26which shorts the x axis
27
28# My joystick produces slightly different results to the specifications
29found on the url above
30# I've listed both here:
31
32# Specifications
33#   Min  Typ  Max  Click
34# X  206  516  798  1023
35# Y  203  507  797
36
37# My Joystick
38#   Min  Typ  Max  Click
39# X  253  513  766  1020-1023
40# Y  250  505  769
41while True:
42    try:
43        # Get X/Y coordinates
44        x = grovepi.analogRead(xPin)
45        y = grovepi.analogRead(yPin)
46
47        # Calculate X/Y resistance
48        Rx = (float)(1023 - x) * 10 / x
49        Ry = (float)(1023 - y) * 10 / y
50
51        # Was a click detected on the X axis?
52        click = 1 if x >= 1020 else 0
53
54        print "x =", x, " y =", y, " Rx =", Rx, " Ry =", Ry, " click =",
click
55        time.sleep(.5)
56
57    except IOError:
58        print "Error"

```

- **Step 3.** Run the demo.

```
lsudo python grove_thumb_joystick.py
```

- **Step 4.** We will see the output display on terminal as below.



```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberrypi:~$ nano grove_thumb_joystick.py  
pi@raspberrypi:~$ sudo python grove_thumb_joystick.py  
x = 523 y = 497 Rx = 9.56022944551 Ry = 10.583501006 click = 0  
x = 523 y = 497 Rx = 9.56022944551 Ry = 10.583501006 click = 0  
x = 523 y = 497 Rx = 9.56022944551 Ry = 10.583501006 click = 0  
x = 523 y = 496 Rx = 9.56022944551 Ry = 10.625 click = 0  
x = 523 y = 497 Rx = 9.56022944551 Ry = 10.583501006 click = 0  
x = 523 y = 495 Rx = 9.56022944551 Ry = 10.6666666667 click = 0  
x = 259 y = 496 Rx = 29.4980694981 Ry = 10.625 click = 0  
x = 259 y = 766 Rx = 29.4980694981 Ry = 3.35509138381 click = 0  
x = 415 y = 778 Rx = 14.6506024096 Ry = 3.14910025707 click = 0  
x = 259 y = 554 Rx = 29.4980694981 Ry = 8.46570397112 click = 0  
x = 259 y = 778 Rx = 29.4980694981 Ry = 3.14910025707 click = 0  
x = 522 y = 245 Rx = 9.59770114943 Ry = 31.7551020408 click = 0  
x = 523 y = 496 Rx = 9.56022944551 Ry = 10.625 click = 0  
x = 523 y = 497 Rx = 9.56022944551 Ry = 10.583501006 click = 0  
x = 523 y = 497 Rx = 9.56022944551 Ry = 10.583501006 click = 0  
x = 523 y = 497 Rx = 9.56022944551 Ry = 10.583501006 click = 0  
x = 523 y = 497 Rx = 9.56022944551 Ry = 10.583501006 click = 0  
x = 523 y = 497 Rx = 9.56022944551 Ry = 10.583501006 click = 0
```

## Resources

**[Eagle]** [Grove-Thumb Joystick Schematic](https://raw.githubusercontent.com/SeedDocument/Grove-Thumb_Joystick/master/res/Eagle_Design_Files.zip)

[https://raw.githubusercontent.com/SeedDocument/Grove-Thumb\\_Joystick/master/res/Eagle\\_Design\\_Files.zip](https://raw.githubusercontent.com/SeedDocument/Grove-Thumb_Joystick/master/res/Eagle_Design_Files.zip)

**[Datasheet]** [Analog Joystick Datasheet](https://raw.githubusercontent.com/SeedDocument/Grove-Thumb_Joystick/master/res/Analog_Joystick_Datasheet.jpg)

[https://raw.githubusercontent.com/SeedDocument/Grove-Thumb\\_Joystick/master/res/Analog\\_Joystick\\_Datasheet.jpg](https://raw.githubusercontent.com/SeedDocument/Grove-Thumb_Joystick/master/res/Analog_Joystick_Datasheet.jpg)

**[PDF]** [Joystick Schematic PDF File](https://github.com/SeedDocument/Grove-Thumb_Joystick/raw/master/res/Joystick.pdf) [https://github.com/SeedDocument/Grove-Thumb\\_Joystick/raw/master/res/Joystick.pdf](https://github.com/SeedDocument/Grove-Thumb_Joystick/raw/master/res/Joystick.pdf)

## Projects

**Raspberry pi music server:** A first step to Raspberry Pi project.

**Build a Custom Minecraft Controller:** Build a Custom Minecraft Controller With the GrovePi.

## Tech Support

Please submit any technical issue into our [forum](#).

[http://wiki.seeedstudio.com/Grove-Thumb\\_Joystick/3-4-19](http://wiki.seeedstudio.com/Grove-Thumb_Joystick/3-4-19)