Grove - Single Axis Analog Gyro

Release date： 9/20/2015

Version： 1.0

Wiki: http://www.seeedstudio.com/wiki/Grove_-_Single_Axis_Analog_Gyro

Bazaar: http://www.seeedstudio.com/depot/Grove-Single-Axis-Analog-Gyro-p-1451.html

Document Revision History

Revision	Date	Author	Description
1.0	Sep 21, 2015	Victor.He	Create file

Contents

Disclaimer

For physical injuries and possessions loss caused by those reasons which are not related to product quality, such as operating without following manual guide, natural disasters or force majeure, we take no responsibility for that.

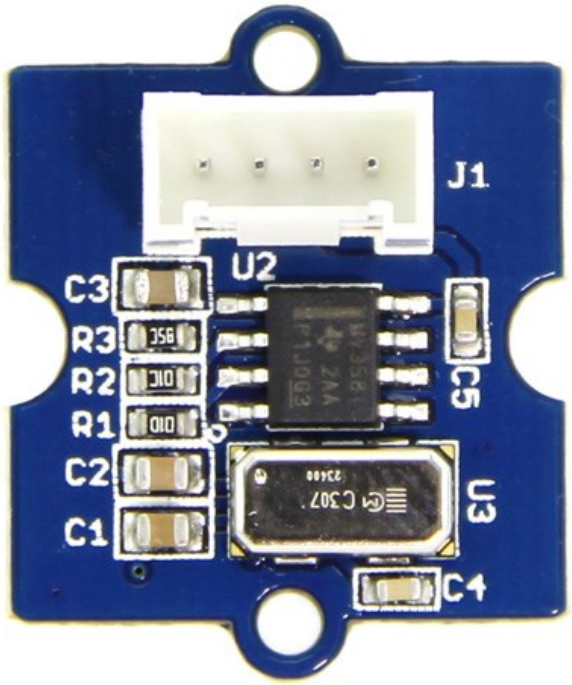
Under the supervision of Seeed Technology Inc., this manual has been compiled and published which covered the latest product description and specification. The content of this manual is subject to change without notice.

Copyright

The design of this product (including software) and its accessories is under tutelage of laws. Any action to violate relevant right of our product will be penalized through law. Please consciously observe relevant local laws in the use of this product.

1. Introduction

The Grove – Signal Axis Analog Gyro is based on an angular velocity sensor (Murata-ENC-03R) that uses the phenomenon of Coriolis force. It can only measure the X-axis angular velocity, which is different from other 3-Axis gyro, but with a higher speed. It can be used for the position control and attitude control like the self-balanced 2WD.



2. Feature

- Input Voltage: 3.3V/5V
- Standard Grove Interface
- Light Weight
- High Speed
- Measure X-axis Angular Velocity

3. Demonstration

3.1 With Arduino

The module detects one-axis rotation with analog signal.

High-pass filter and low-pass filter circuit are applied to reduce the temperature drift and suppress the output noise.

Before the measurement of the angular velocity, a reference value(the sensor output at Angular Velocity=0) is required.

This value is 1.35V in default. But in order to get more accurate reference values, before the measurement, a calibration is necessary.

In this calibration, the output voltage when angular velocity =0 been sampled 200 times,

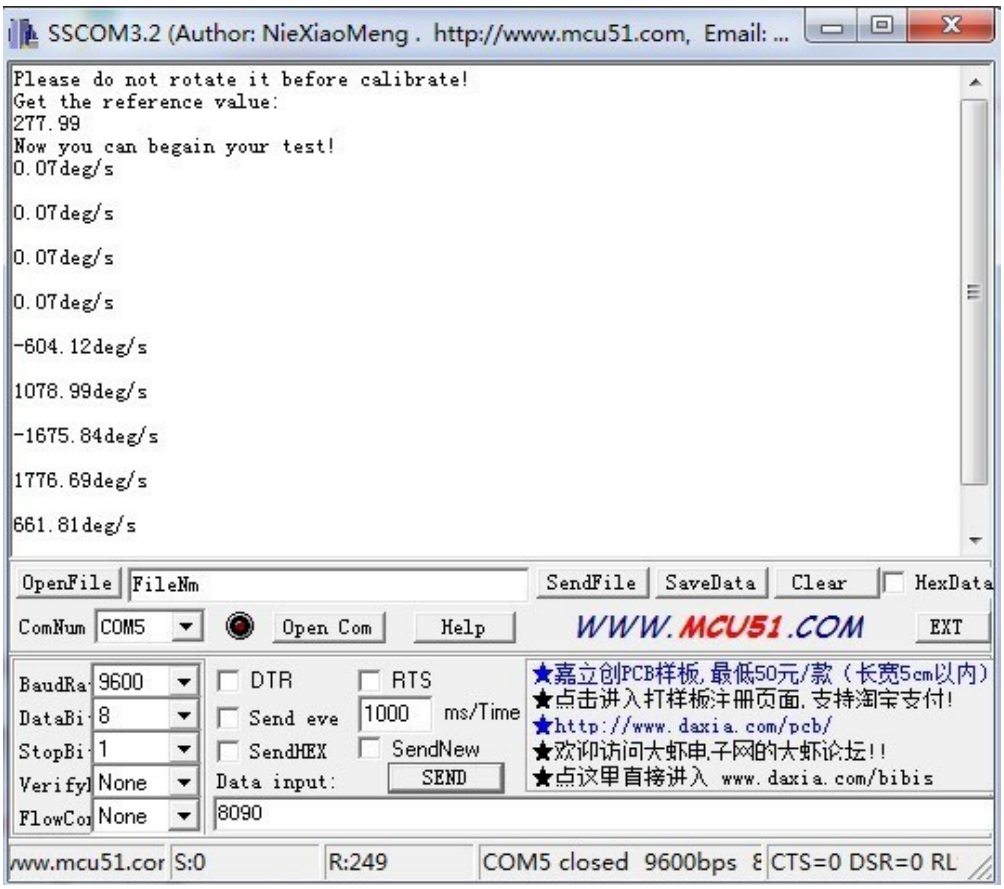
and then the average of these data will be treated as the reference value.

1. Connect it to A0 port of Grove - Base Shield, of cause any pin of the analog pins would be OK.
2. Plug the Grove - Base Shield into Arduino/Seeeduino and connect them to PC using a USB cable.
3. Upload the below code. Please click here if you do not know how to upload.

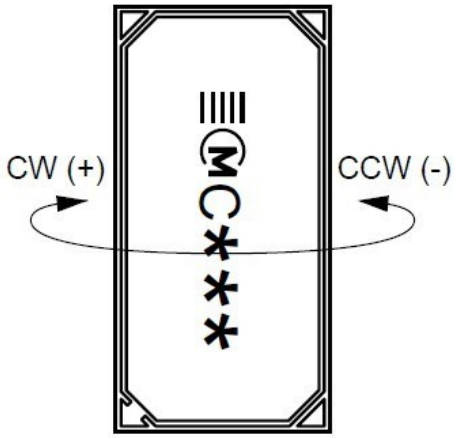
```
int sensorPin = A0;           // select the input pin for the sensor

float reference_Value=0;

int sensorValue = 0;          // variable to store the value coming from
the sensor

void setup() {

    int i;
    float sum=0;
    pinMode(sensorPin, INPUT);
    Serial.begin(9600);
    Serial.println("Please do not rotate it before calibrate!");
    Serial.println("Get the reference value:");

    for(i=0;i<1000;i++)
    {
        // read the value from the sensor:
        sensorValue = analogRead(sensorPin);
        sum += sensorValue;
```

```
        delay(5);
    }
    reference_Value = sum/1000.0;
    Serial.println(reference_Value);
    Serial.println("Now you can begin your test!");
}

void loop()
{

    double angularVelocity;
    sensorValue = analogRead(sensorPin);
    angularVelocity =((double)(sensorValue-
reference_Value)*4930.0)/1023.0/0.67; //get the angular velocity
    Serial.print(angularVelocity);
    Serial.println("deg/s");
    Serial.println(" ");
    delay(10);
}
```

4. Now, it is time to the calibration. Put the sensor on your desk horizontally, and then press the Reset button on the Seeeduino, and then open the serial tool:



5. As you see the "Now you can begin your test", that means the calibration done. You can use the sensor now. Rotating direction can reference the following picture:



3.2 With Raspberry Pi

1. You should have got a raspberry pi and a grovepi or grovepi+.
2. You should have completed configuring the development environment, otherwise follow here.
3. Connection. Plug the sensor to grovepi socket A0 by using a grove cable.
4. Navigate to the demos' directory:

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

To see the code

```
nano grove_single_axis_analog_gyro.py      # "Ctrl+x" to exit #
```

```
import time
import grovepi

# Connect the Grove Single Axis Analog Gyro to analog port A0
# SIG,NC,VCC,GND
sensor = 0

grovepi.pinMode(sensor,"INPUT")

# calibration
print "calibrating..."
```

```
sum = 0
errors = 0
for x in range(0, 100):
    try:
        # Get sensor value
        v = grovepi.analogRead(sensor)
        sum += v
        #time.sleep(.05)
    except IOError:
        print "Error"
        errors += 1

if errors == 100:
    print "unable to calibrate"
    raise SystemExit

reference_value = sum / (100 - errors)

print "finished calibrating"
print "reference_value =", reference_value

# ready
while True:
    try:
        # Get sensor value
        sensor_value = grovepi.analogRead(sensor)

        # Calculate angular velocity (deg/s)
        velocity = ((float)(sensor_value - reference_value) * 4930.0) /
1023.0 / 0.67

        print "sensor_value =", sensor_value, " velocity =", velocity
        time.sleep(.5)

    except IOError:
        print "Error"
```

5. Run the demo.

```
sudo python grove_single_axis_analog_gyro.py
```

4. Resource

Grove - Signal Axis Analog Gyro Eagle File

Signal Axis Analog Gyro datasheet

Demo code on github

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Position Sensor Development Tools ***category:***

Click to view products by Seeed Studio ***manufacturer:***

Other Similar products are found below :

AS5115 PB AS5215 AB STEVAL-MKI043V1 EVB90340-LDC-200-Rev1.0 STEVAL-STWINMAV1 1032 178 DPP401Z000 EVAL-ADXRS453Z-M EVAL-ADXRS453Z-V 1007214-3 STEVAL-MKI045V1 STEVAL-MKI042V1 STEVAL-MKI037V1 IMX-070 164 EVAL-KIT DMU381ZA-400 OpenIMU300RI EVK OpenIMU330BI EVK 3595 AS5200L-MF_EK_AB AS5215 DB AS5600L-SO_EK_AB AS5600L-WL_EK_AB AS5715-TS_EK_AB AS5X47D-TO_EK_ST TRK-1T02-E ADIS16265/PCBZ ADIS16260/PCBZ ADIS16477-1/PCBZ ADIS16477-3/PCBZ EVAL-ADIS2Z EVAL-ADXRS450Z-S EVAL-ADXRS453Z EVAL-ADXRS453Z-S EVAL-ADXRS646Z EVAL-ADXRS800Z-EY EVAL-ADXRS800Z-M EVAL-ADXRS800Z-RG EVAL-CN0341-SDPZ ATBNO055-XPRO DFR0027 DFR0053 DPP401A000 EVB90365-Rev1.0 EVB90371-GDC-100-Rev1.0 EVB90371-GDC-200-Rev1.0 EVB90371-GDC-300-Rev1.0 EVB90371-GGO-100-Rev1.0 EVB90371-GGO-200-Rev1.0