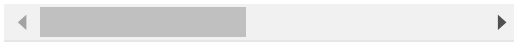


multiplying by a scale-factor  
adjustment value for each axis. –  
[Dave Tweed](#) ♦ Sep 7 '12 at 11:43

The link to the datasheet has broken.  
Do you happen to know the new  
location of that document? –  
[Right leg](#) Jul 3 '17 at 15:58



10 ▲ A Gyroscope gives the values of Angular Velocity (degrees/sec) in the three respective axis (Yaw, Pitch and Roll axes respectively). ▼

But whatever **raw** value given first by these sensors should be converted to sensible acceleration or angular velocity values by scaling.

InvenSense Data Sheet of MPU-6050 says that we have to use different scaling factors for different ranges of gyro values. **I shall explain how to use these scaling factors in the end.**

Angular Velocity Limit	Sensitivity
250°/s	131
500°/s	65.5
1000°/s	32.8
2000°/s	16.4

Similarly , for Accelerometer (which gives x,y,z axes acceleration including gravity) the unit used is g (  $9.81 \frac{m}{s^2}$  ).

Scaling factors for accelerometer values :

Acceleration Limit	Sensitivity
2g	16,384
4g	8,192
8g	4,096
16g	2,048

Converting the raw data :

$$\text{required\_value} = \frac{\text{raw}}{\text{proper\_value}}$$

For example , in the first data , you got

accel x,y,z: 1944, 368, 15608  
gyro x,y,z : -34, -204, -247

Acceleration seems to be in the limit of 2g. So, scaling factor = 16384

$$\text{implies } ax = \frac{1944}{16384} g$$

Gyro seems to be in the limit of  $\frac{250^\circ}{s}$ . So, scaling factor or sensitivity = 131

implies

$$\text{gyro\_value} = \frac{-34}{131} \frac{\text{degrees}}{\text{sec}}$$

Hope that helps. :)

edited Jun 22 '15 at 19:25



**Bence Kaulics**

5,756 10 24 52

answered Jun 22 '15 at 10:11



**sasebot**

101 1 5

- 1 I feel this answer provides a much better explanation compared to the accepted one. – [chutsu](#) Aug 4 '15 at 7:02

@ajmal I understand the sensor values upto the point you described. I also understand that gyro by default has a slight drift. But I dont understand how to visualize the data in the real world positioning. I read a lot regarding euler angles,

quaternions, but i dont understand the tradeoffs between the representations, and the math behind it. Any suggestion where to start. – [seetharaman](#) Sep 4 '16 at 16:22



**protected by Community ♦** May 18 '16 at 11:55

Thank you for your interest in this question. Because it has attracted low-quality or spam answers that had to be removed, posting an answer now requires 10 [reputation](#) on this site (the [association bonus does not count](#)).

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