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	Sensitivi
250º/s	131
500º/s	65.5
1000º/s	32.8
2000º/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 :

$$\text{required\_value} = \frac{\text{ra}}{\text{prope}}$$

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

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

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

implies

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

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,

quarternions, 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).

Would you like to answer one of these unanswered questions instead?