

## Understanding the sensor

MPU 6050

↳ 6 degrees of freedom

3-axis MEMS  
accelerometer

+ 3-axis  
gyroscope

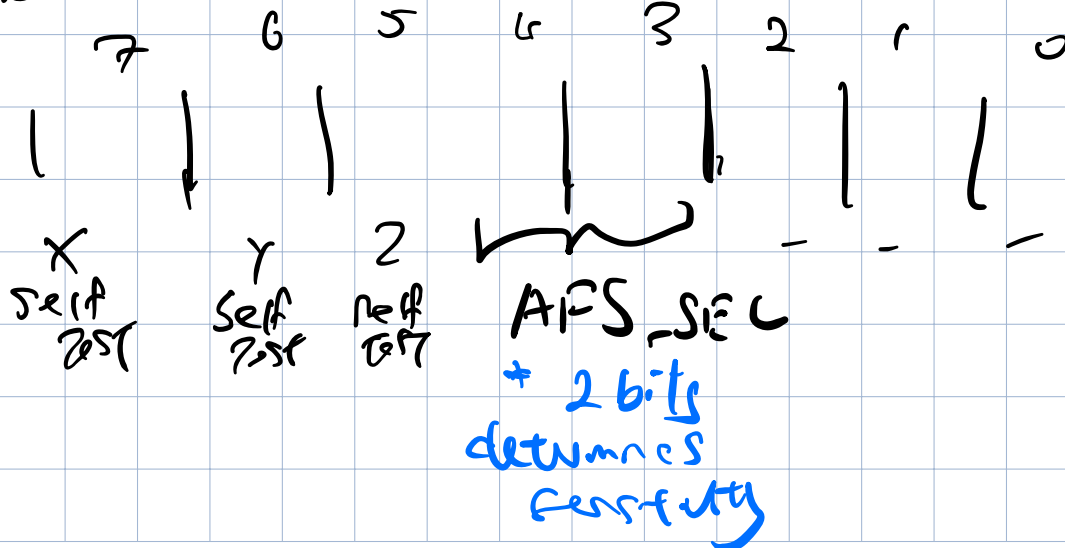
↳  $\pm 2g$  to  $\pm 16g$

How sensitivity works/how g's are calculated:

- Determined by register 1C (ACCEL\_CONFIG)

8 bits

ACCEL\_CONFIG



## AFS - SEL

→ 2 bits

Dec	BZN	Sensitivity
0	00	$\pm 2$
1	01	$\pm 4$
2	10	$\pm 8$
3	11	$\pm 16$

\* need to get  $\pm 16$  sense

ACCEL\_CONFIG (1C)  
needs to be

0 0 0 1 1 0 0 0 = 0x18 Hex  
          └──┘  
          AFS-SELECT

Sensitivity	LSB/g
$\pm 16$	<del>2048</del> 1024

old datasheet  
new datasheet

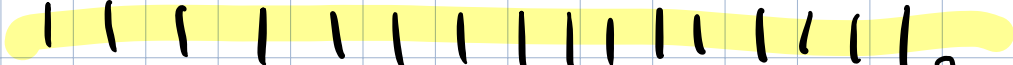
## How Lsb works

↳ least significant bit

↓

Sensor outputs raw values  
as 16 bits

16 bits highest possible value

=  <sub>2</sub>

↳ also equal to 65535

∴ 65535 possible readings

for  $-2g$  to  $2g = 4000 \text{ mG}$

$$4000 / 65535 = 0.061$$

for  $-16g$  to  $16g \approx 16000$

$$16000 / 65535 = 0.244 \text{ mG}$$

$\therefore$  Each '1' unit of raw  
values =  $0.244 \text{ mG}$  change