Drone gyroscope

Interface: SPI
Device: I3G4250? I think its the L3GD20

1. How do we setup SPI?
2. How do I know which spi to use?
3. How does SPI work?

3.

- Synchronous (SCLK)
- MOSI (Master out slave in)
- MISO (master in slave out)
- SS (slave select) (active low)

So master slave protocol where you can have multiple slaves. You just need a slave select for each. SS is instead of an address.

2. User Manual
SPI 1

PA5 - SCK
PA6 - MISO
PA7 - MOSI

* don't get SS?
* PA4 is NSS which I think is the same.

* I think the sensor is configured for SPI so we don't have to do it.

3.

Its alternative function 5 on all pins.
APB2 - Is the Bus

RCC.APB2ENR.SPI1EN = 1 to enable clock
.. APB2RSTR.SPI1RST = 1 to reset

Reference Manual 30.5.7 show how to configure.
We can use the hal SPI interface

What Device

~~GD8I~~ need a way to log the
~~2001~~ value.
~~E24~~

So the device is giving us garbage.
1. We should check the WHO AM I.

2. We should also check hertz.

3. then ask someone for help.

2. Seems fine according to data sheet

1. Should get back 0b1101_0100
i get 0b1111_1111 which means it am
probably doing something wrong
I think they are compatible.

Day 3:

1. Do we have the right chip select pin?
2. Is the NSS pin mean its inverted?
   if so our impl is wrong.

1. Fuck me, wrong pin.
   PE3

2. Nope

3. Freezing the clock panics. why?

   Little Math: (lots of asserts in code)

   HSE: 8 Mhz
   sysclk: 48 Mhz
   pclk1: 12MHz ← switch to 24 Mhz

   Who am i: 0b110100011
   so the sensor is 13642500
   this is true for both boards.

4. Okay we need an allocator now. I don't want to write it.
   Using alloc-cortex-m but not compiling.

Day 4:

Making sense of the values.

I think dps is degrees per second.
yes (quick reference)

Okay it worked (MUP and circuit code)
now for the other sensor.

So it could be a LSM303DLHC or LSM5C3AGR.
I guess the second.

Pin PB7 - SDA Time to go learn I²C.
Pin PB6 - SCL

* Alternative func 4 for both pins

SCL - clock
SDA - bi-directional data

Accelerometer addr: 0b0011001 0x19
(3 | 4)

Magnometer addr: 0b0011110 0x1E
(3 | 4)

Day 5:

Goal: read data out of accelerometer

* made an enum of all the registers.
* okay so something is wrong.
* breaks when reading who-am-i-a

Maybe we have to setup something?

Not writing to correct addr!
was writing to reg not slave addr.

accelerometer who_am_i_a works (51)
magnometer who_am_i_m works (64)

!. What the default accel mode?
1. Off (oops)
2. How does i16::from_le_bytes work?

2. it works the way i thought.

3. 0's ret from accel, prob need enable?

3. DS sect. 8.6
we have to enable and select rates
in ctrl_reg1_a
0b0100_0_111

Works! Tommorrow is magnometer.

Day 6: Magnetometer

Okay so turning it on is pretty simple.

multiply by 1.5 to get value in mG

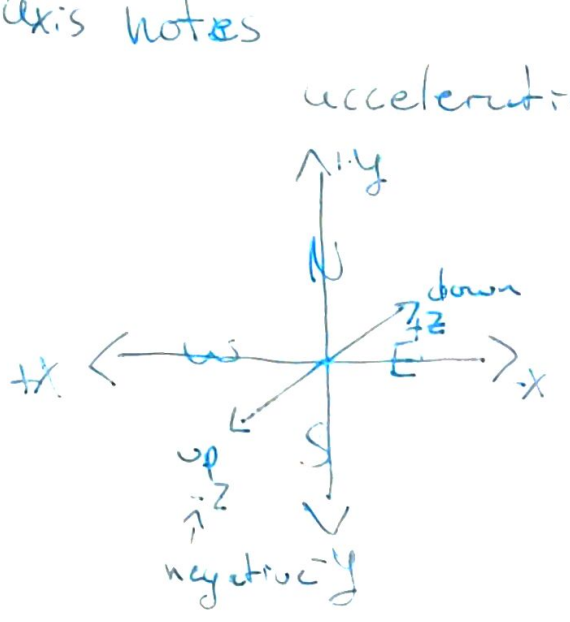
1. We need to put everything in the right units.
2. We need to add a delay.
3. We also need to ensure we handle crashes eventully.

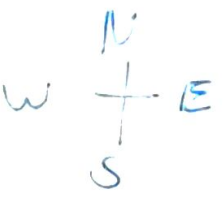
2. Done, we can adjust values later.

1. Fuck this right now
3. On a rewrite sure.

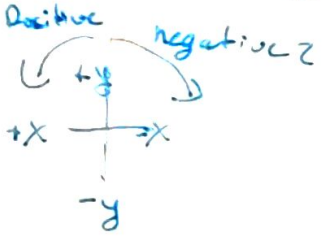
Updated the ground station to handle serial communication and its working well.

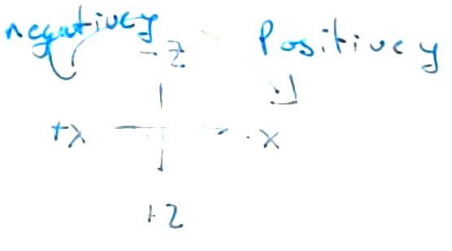
Axis notes

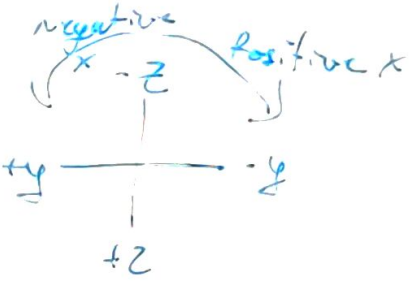




Rotation:







Haven't figured out magnetometer yet.