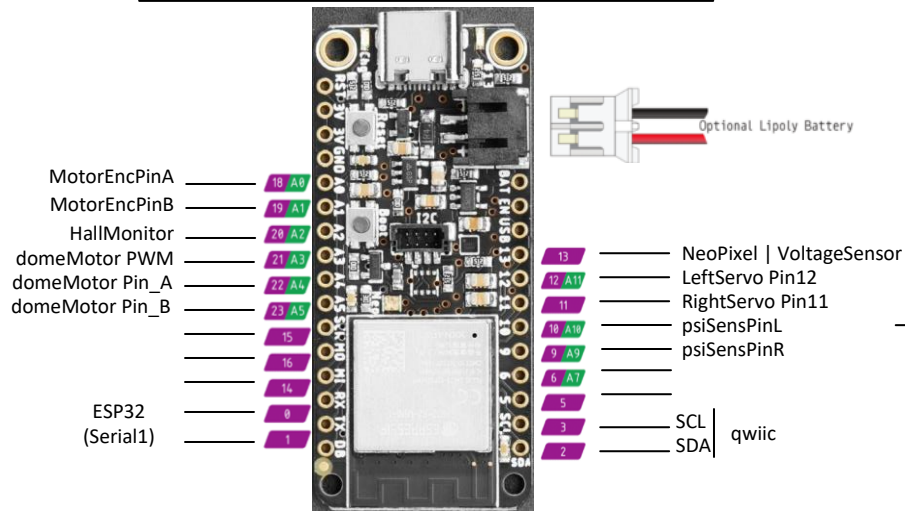


The Solution consists of 3 PCB boards

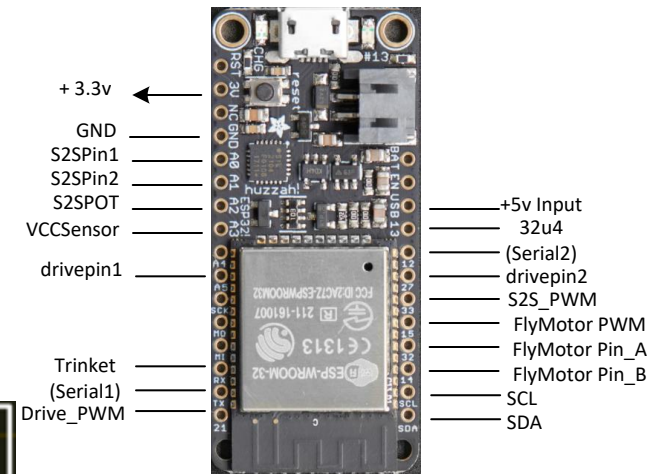
1. Main Board – this regulates power from a single 24v or higher battery to 5v, 6v or 9v outputs, it has all the necessary connectors to quickly wire to DFRobot H Bridge motor controllers and all required sensors.
2. IMU/MPU Board – this connects via Serial and consists of dedicated CPU (trinket m0) as well as MPU6050 series that regulates Pitch, Tilt and yaw movement on the system.
3. Dome board – this communicates via ESP32NOW to the Main Board and controls LEDs in the dome only. Future adaption of motion sensor and distance sensors.

Adafruit Feather ESP32-S2 with qwiic (BB8 Secondary)



<https://www.adafruit.com/product/5000>

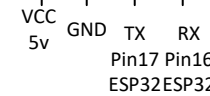
Adafruit ESP32 HUZZAH32 Feather (BB8 Main)



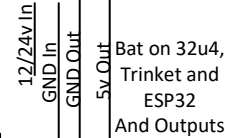
Serial



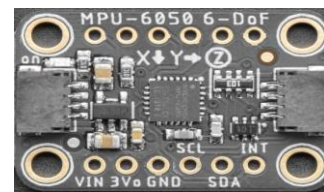
To Trinket (MPU)



5v Pololu

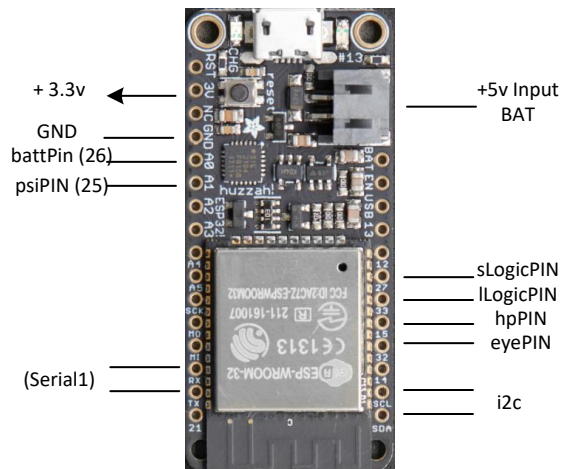


MPU6050

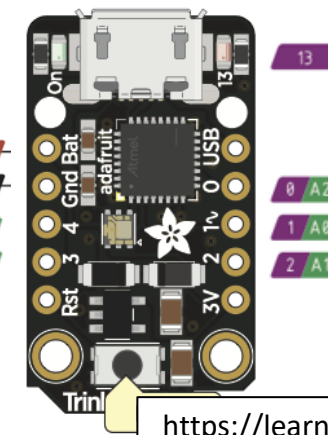


<https://learn.adafruit.com/mpu6050-6-dof-accelerometer-and-gyro/pinouts>

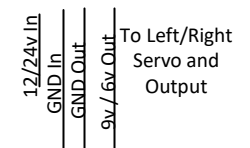
Adafruit ESP32 HUZZAH32 Feather (BB8 Dome)



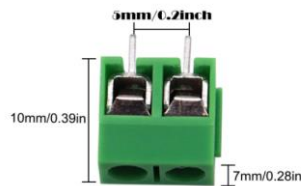
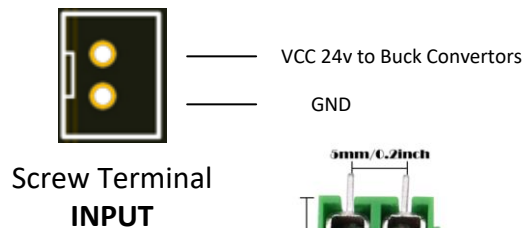
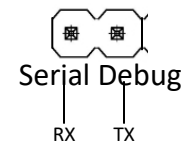
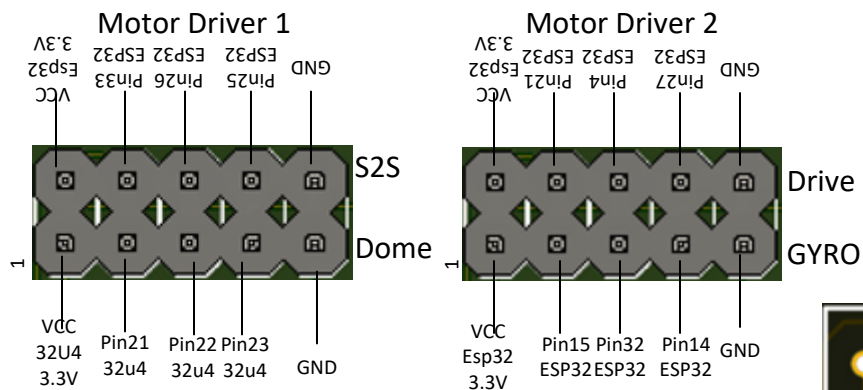
Adafruit Trinket M0



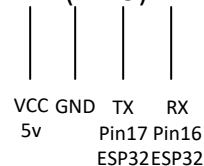
9v/6v Pololu



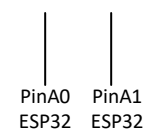
<https://learn.adafruit.com/adafruit-trinket-m0-circuitpython-arduino/pinouts>



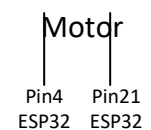
To Trinket (MPU)



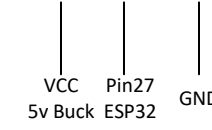
S2S Motor



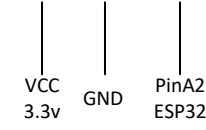
Drive Motor



NEOPIX



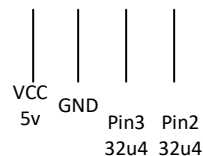
S2S POT



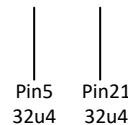
JST-XH 2.54mm



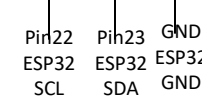
To DomeSpin



Future



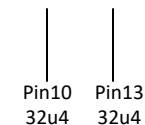
i2c ESP32



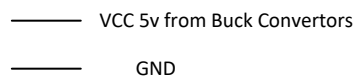
Gyro / Fly



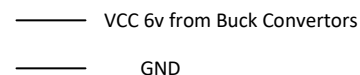
Dome Motor



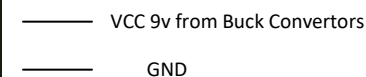
Screw Terminal 5v Output



Screw Terminal 6v Output



Screw Terminal 9v Output



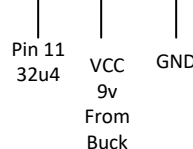
https://www.amazon.com/s?k=2+Pin+5mm+32u4+Pin+5mm+2F0.2inch+Pitch+PCB+Mount&i=industrial&ref=nb_sb_noss



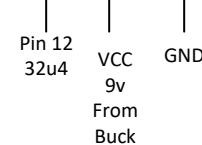
VCC Sensor



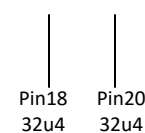
Right Servo



Left Servo

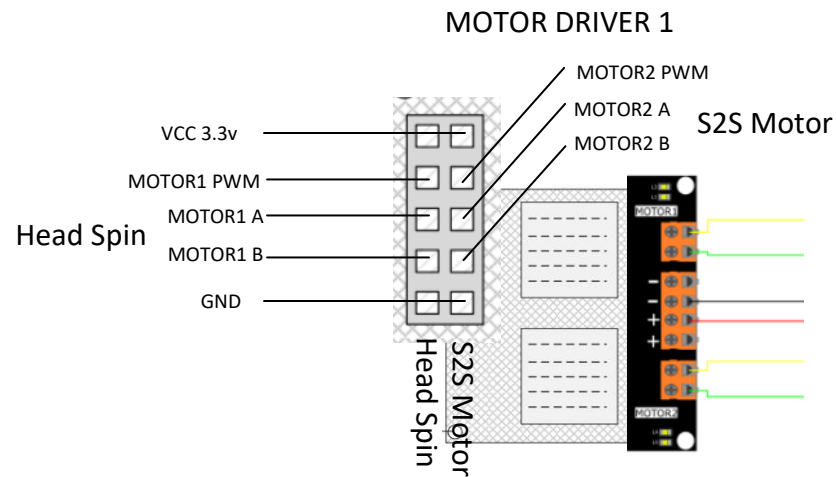


PSI Sensor



Hall Sensor





Head Spin

VCC 12/24v



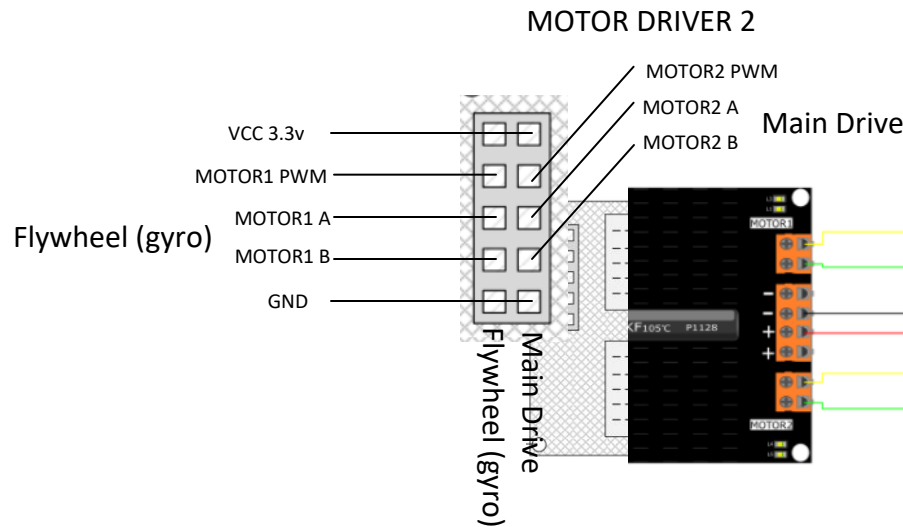
S2S Motor

32u4

```
#define domeMotor_pwm 21
#define domeMotor_pin_A 22
#define domeMotor_pin_B 23
```

ESP32

```
#define S2S_pwm 33 // SCL 22 and SDA 23
#define S2S_pin_1 26 //A0
#define S2S_pin_2 25 //A1
```



Flywheel (gyro)

VCC 12/24v



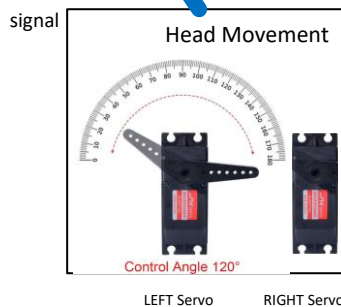
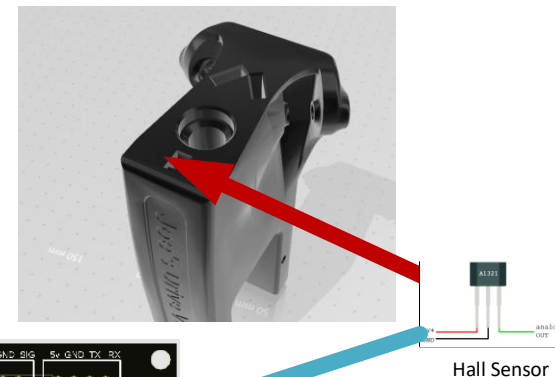
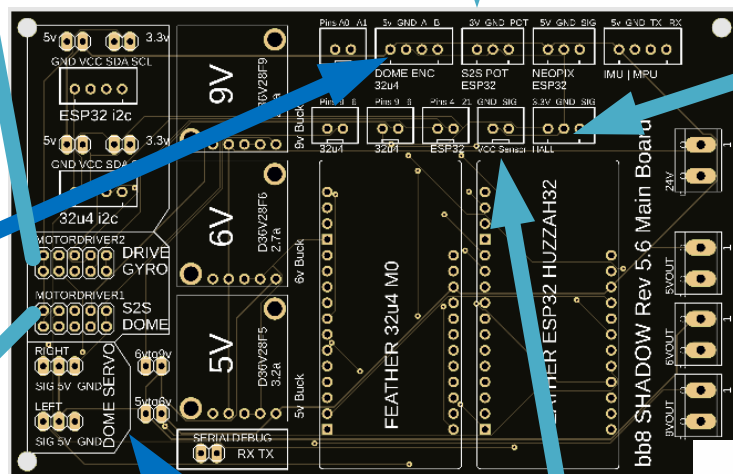
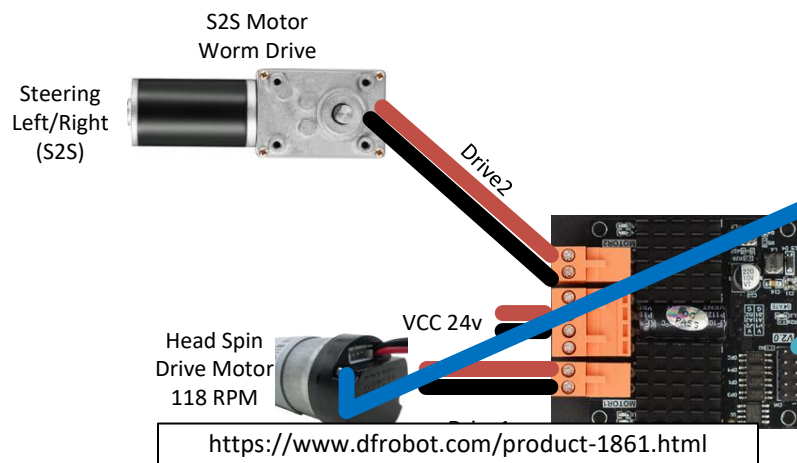
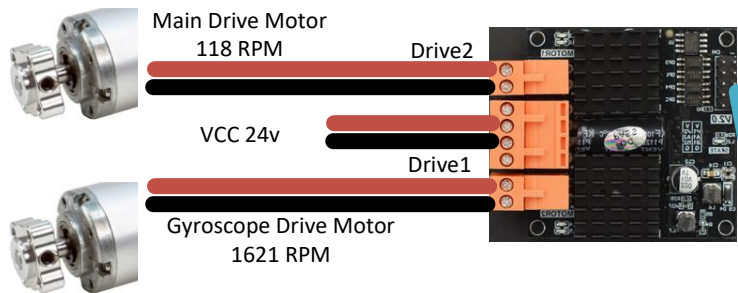
Main Drive

ESP32

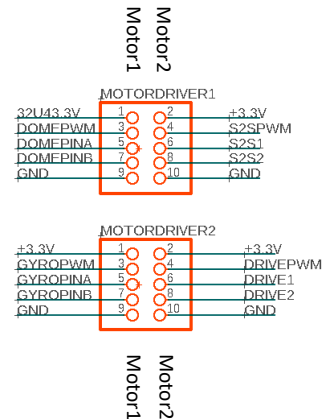
```
#define flyWheelMotor_pwm 15
#define flyWheelMotor_pin_A 32
#define flyWheelMotor_pin_B 14
```

ESP32

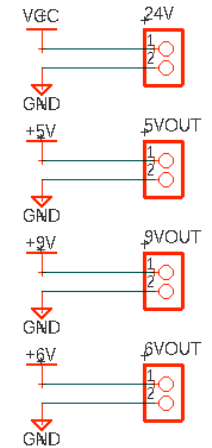
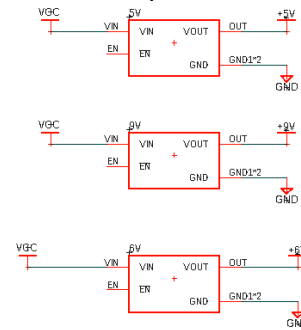
```
#define Drive_pwm 21 // SCL 22 and SDA 23
#define Drive_pin_1 4
#define Drive_pin_2 27
```



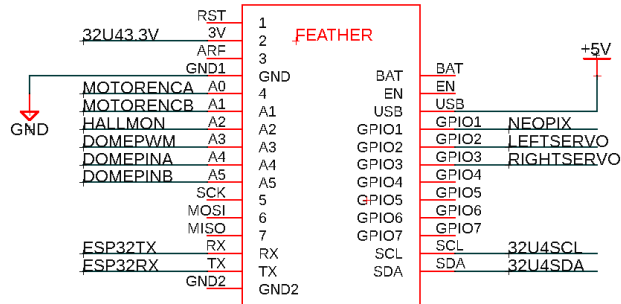
MAIN BOARD 5.5



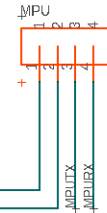
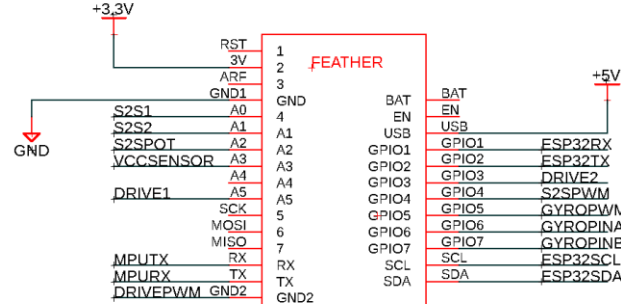
StepDowns



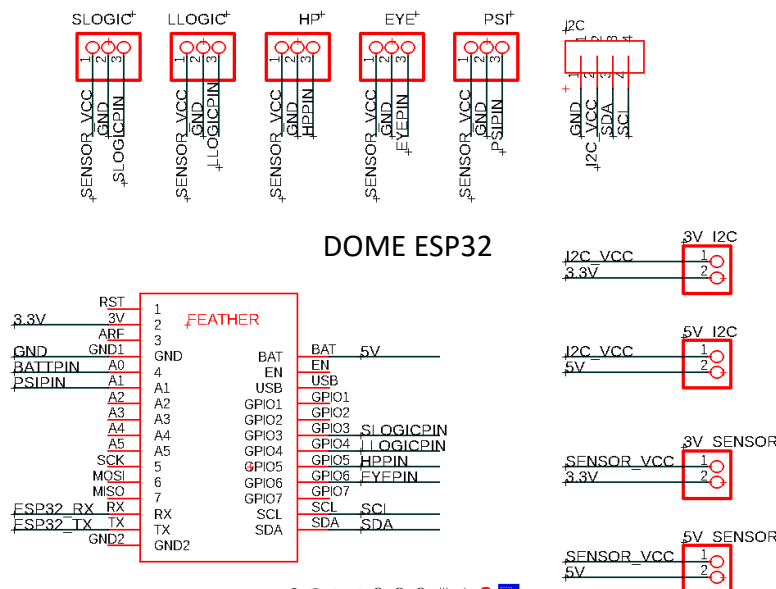
32u4 Proto M0



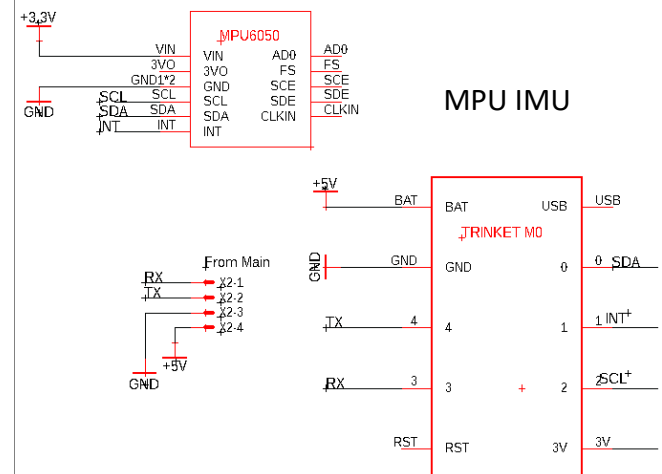
ESP32 HUZAZH32



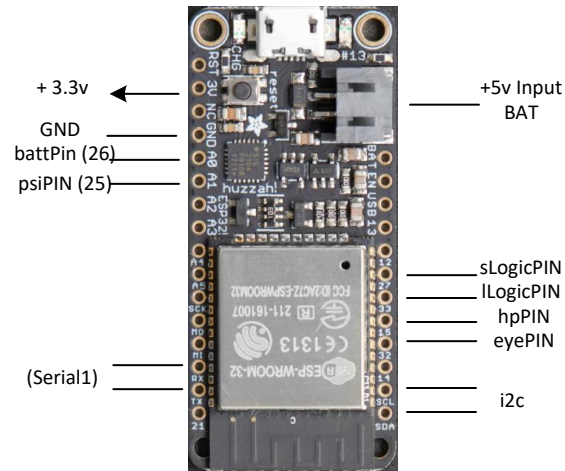
DOMESP32



MPU IMU

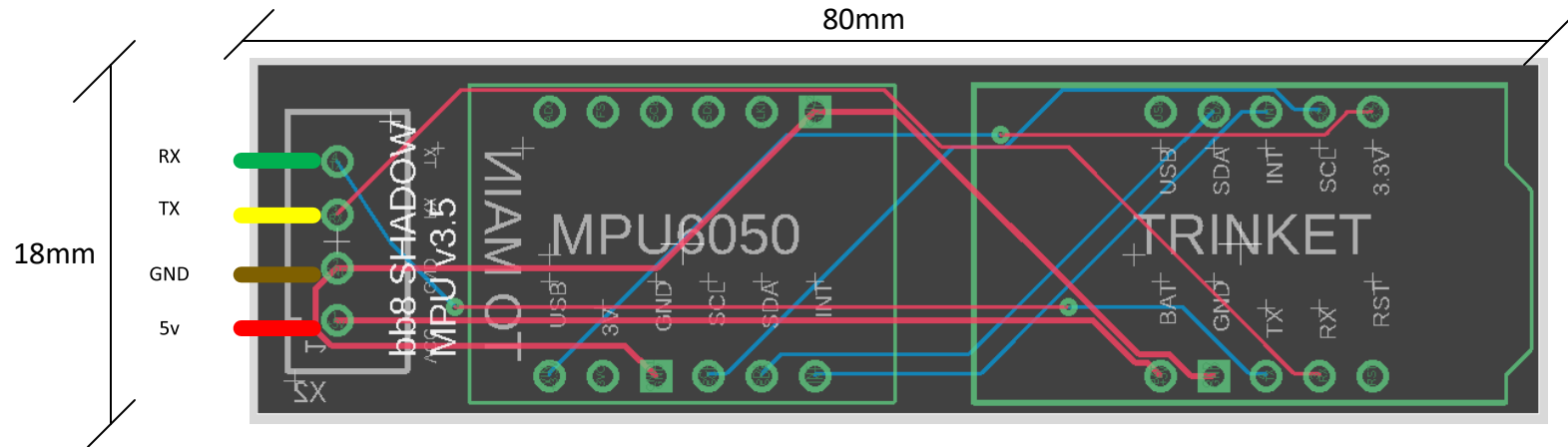


Adafruit ESP32 HUZZAH Feather (BB8 Dome)



sLogicPIN
sLOGIC
3 lights

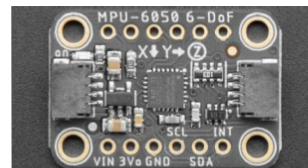




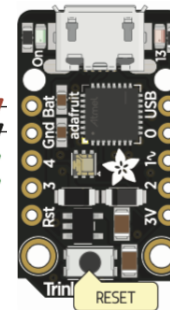
<https://learn.adafruit.com/mpu6050-6-dof-accelerometer-and-gyro/pinouts>

<https://learn.adafruit.com/adafruit-trinket-m0-circuitpython-arduino/pinouts>

MPU6050



Adafruit Trinket M0



5v
GND
ESP32 (Serial1)
TX
RX

i2C

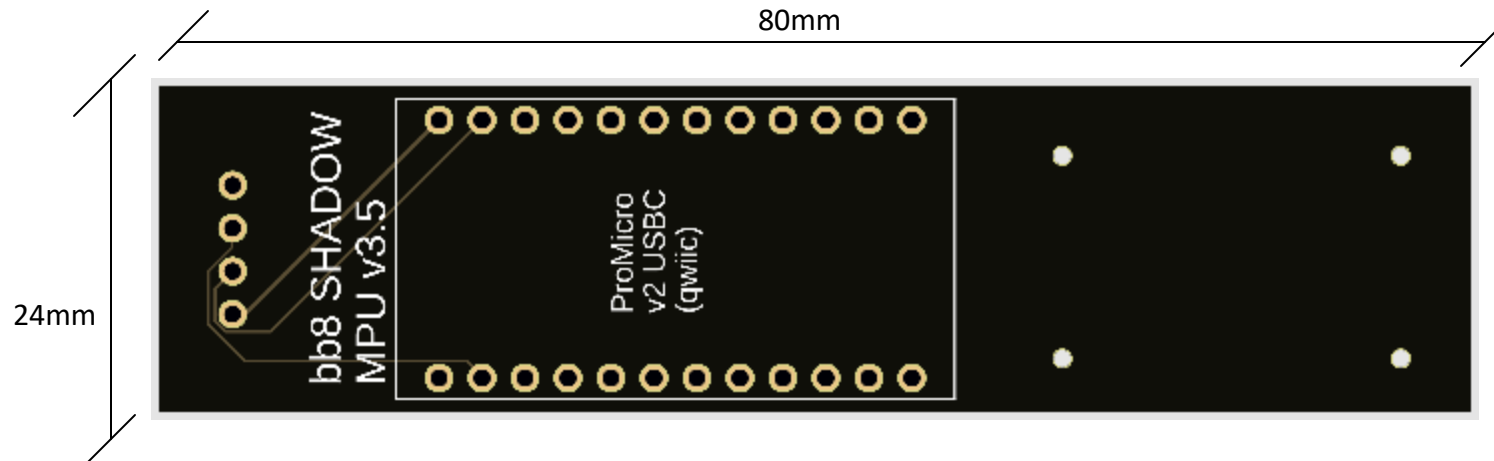


To ESP32
VCC
5v
GND
RX
TX
Pin3pin4

SDA to SDA on MPU
INT to INT on MPU
SCL to SCL on MPU
3v to Vin on MPU

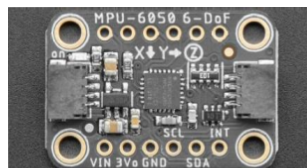
Sensor: MPU6050_A
Type: Acceleration (m/s²)
Driver Ver: 1
Unique ID: 1617
Min Value: -156.91
Max Value: 156.91
Resolution: 0.06

Sensor: MPU6050_G
Type: Gyroscopic (rad/s)
Driver Ver: 1
Unique ID: 1618
Min Value: -34.91
Max Value: 34.91
Resolution: 0.00



<https://learn.adafruit.com/mpu6050-6-dof-accelerometer-and-gyro/pinouts>

MPU6050



3V GND SCL SDA INT

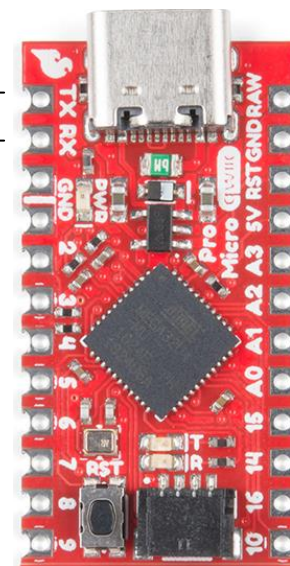
—i2C via qwiic—



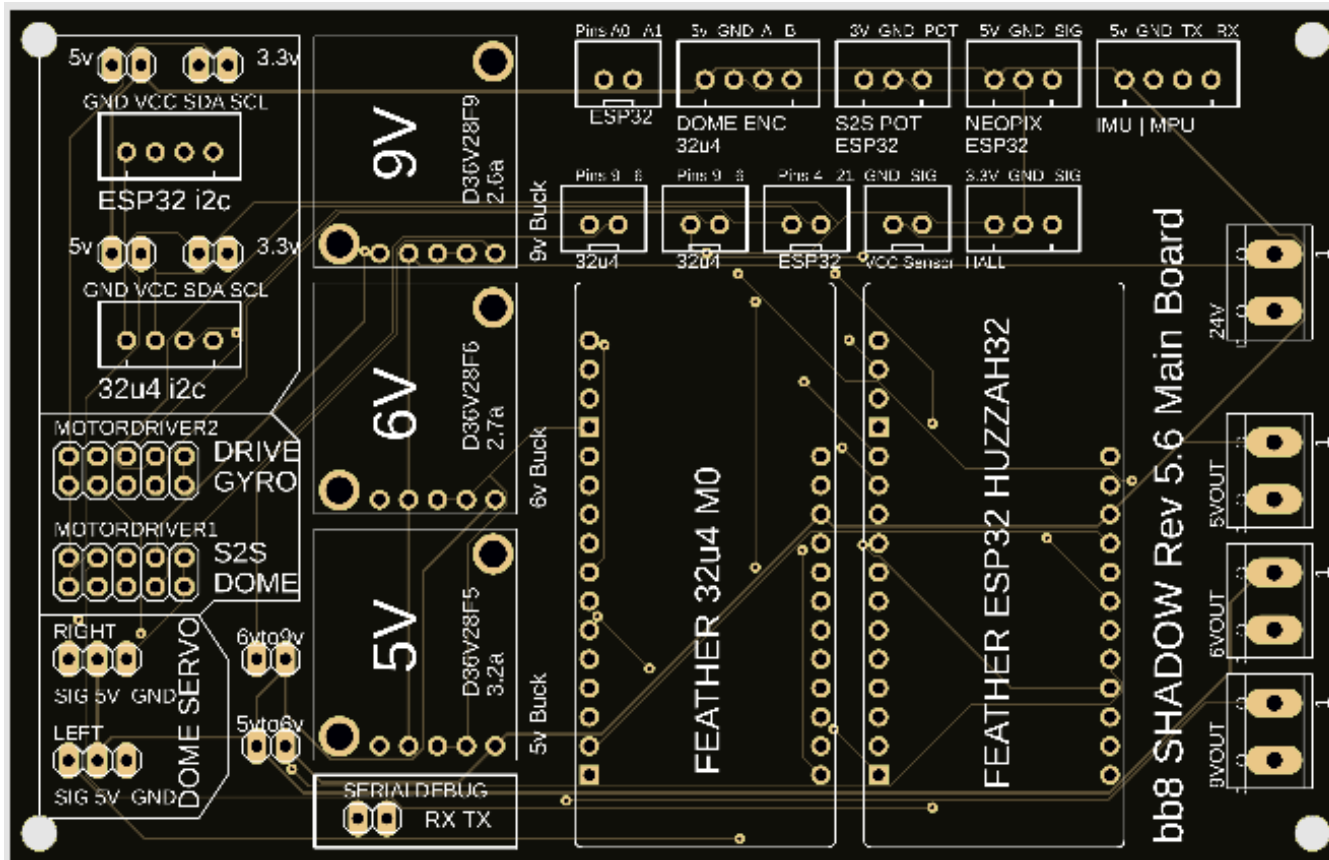
To ESP32
VCC GND RX TX
5v Pin3 pin4

TX
RX

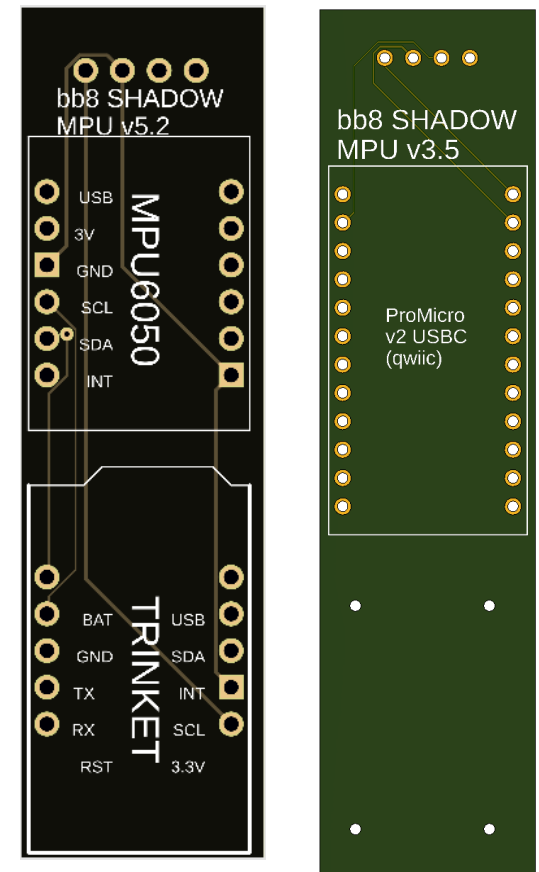
5V
GND



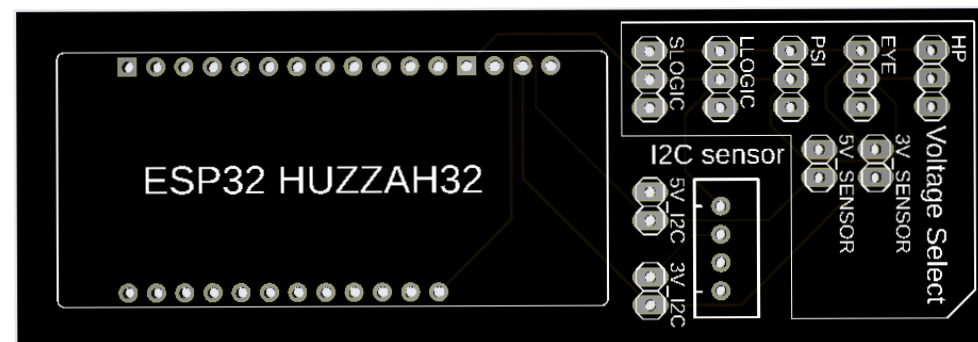
i2C via
qwiic



Main Board



IMU/MPU Board(s)



Dome Board