

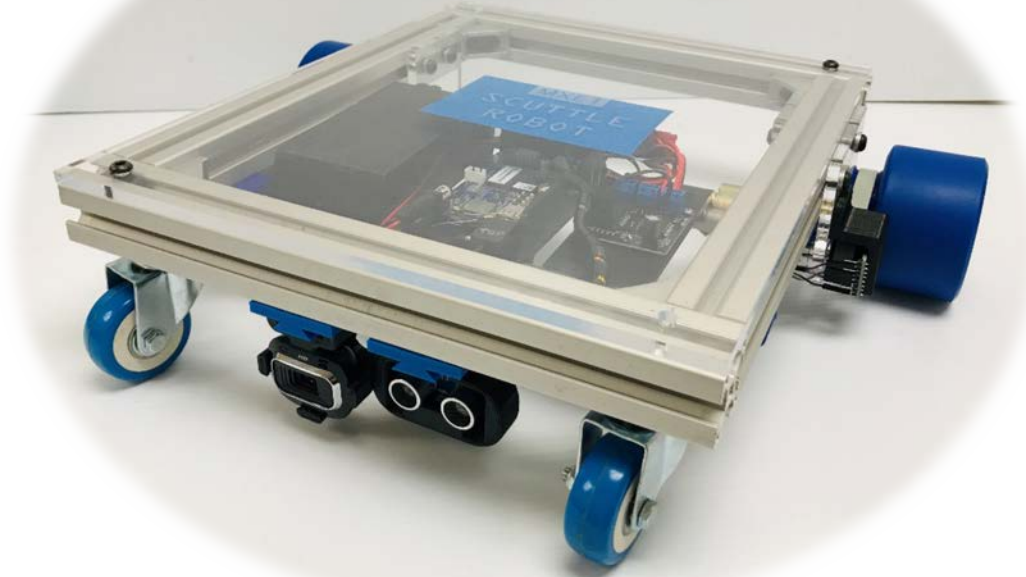
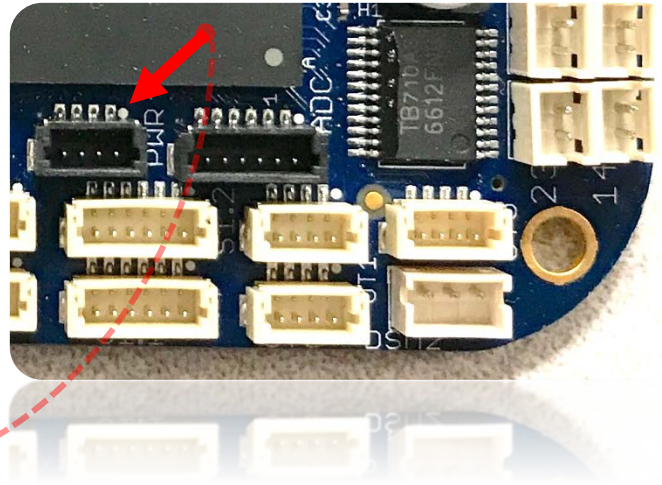
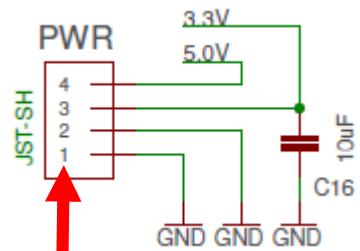
# Scuttle robot Wiring Guide (rev 2019.09.17)

## Important Info:

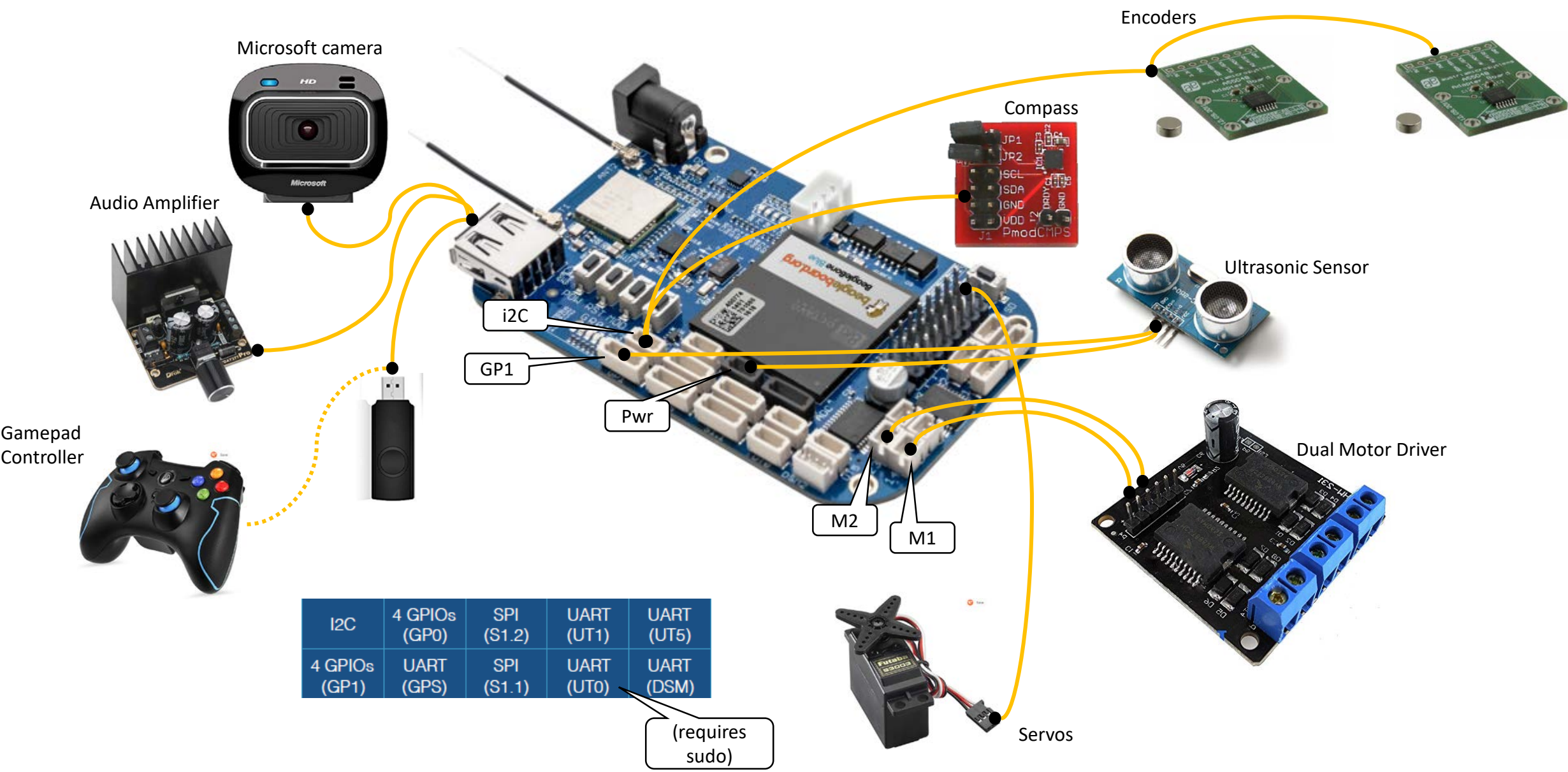
To match the beaglebone pins to the pin numbers on the diagram:

The tiny white circle on the silkscreen at each connector indicates "pin1"

*All images of this style are copied directly from the beaglebone schematic*



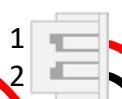
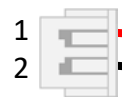
# All Sensors & Actuators



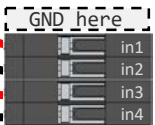
# Motor Driver Signal Cables

M2 controls  
Right motor

M1 controls  
Left motor

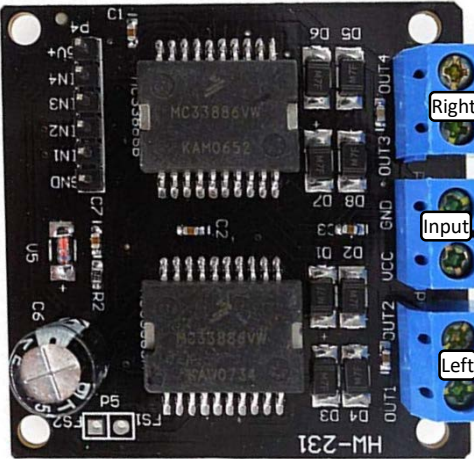


in1 on DuPont connector  
goes to in1 on driver



Ground is not connected  
because the BBB has a  
common ground to the  
battery pack.

Motor Driver Top View  
HW-231 Motor Driver



Power wires  
are 18 AWG

Right Motor drives CW  
on positive command

(29cm)

(26cm)

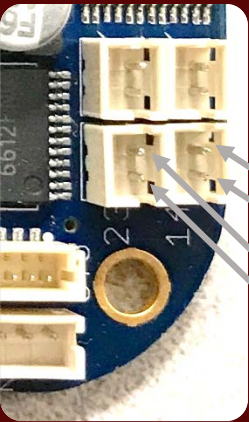
(20cm)

Power  
Supply

(Strip 6mm &  
tin this end)

Solder & heat  
shrink this end

Left Motor drives CCW  
on positive command

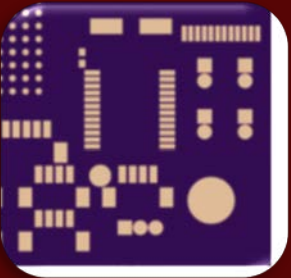


Pin 1 should be HIGH  
when motor is driven  
FORWARD

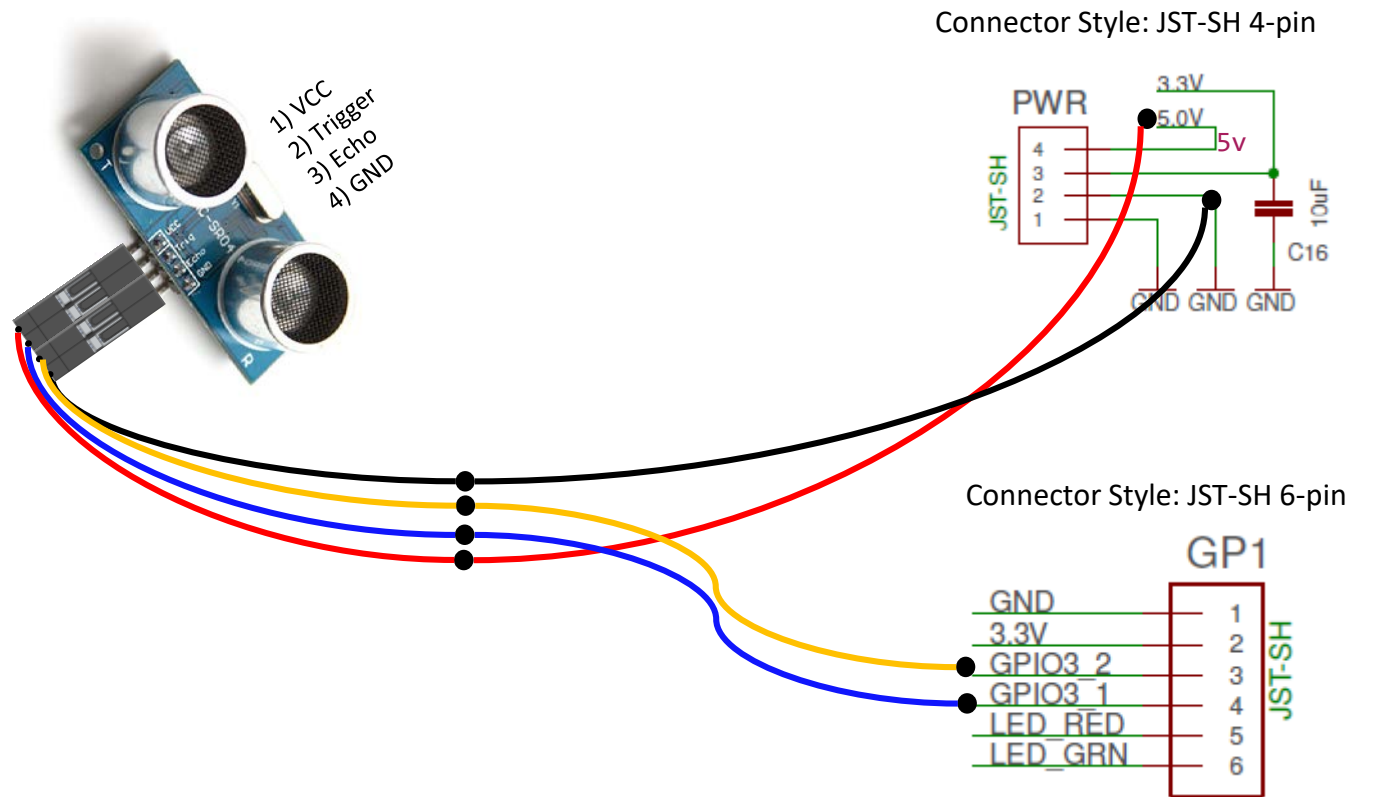
Motor1 Pin1  
Motor1 Pin2

Motor2 Pin1  
Motor2 Pin2

The hardware design convention is  
pin 1 gets the square solder pad.



# Ultrasonic Distance Sensor (GPIO)

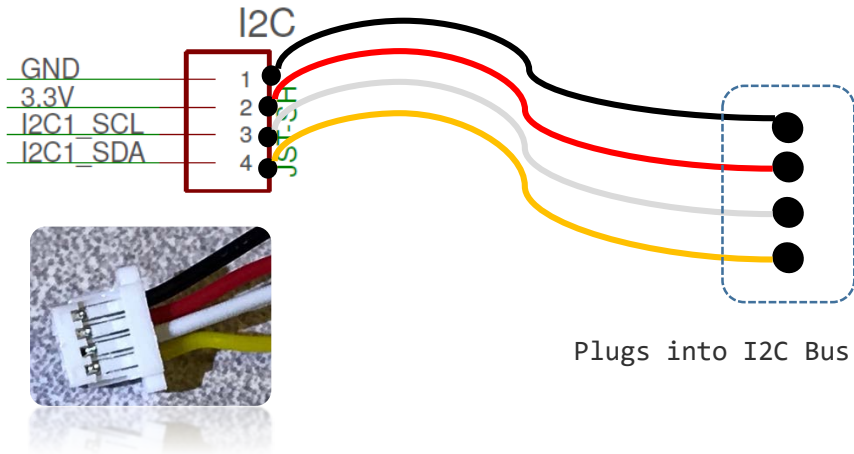




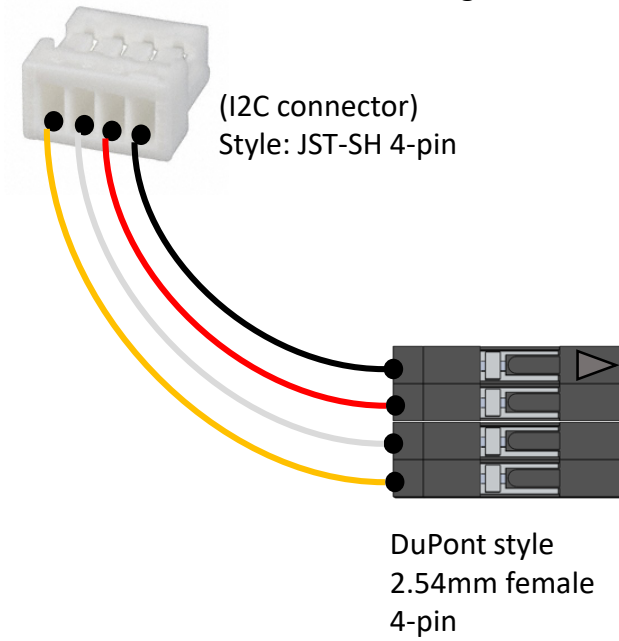
# Beaglebone to I2C bus cable

Diagram

BeagleBone I2C Connector  
Style: JST-SH 4-pin

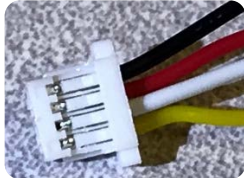
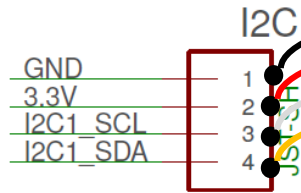


Cable Design

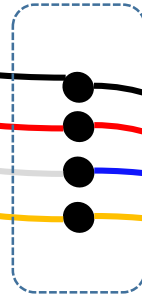


# Compass CMPS or CMPS2 (I2C)

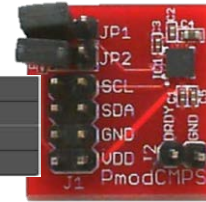
BeagleBone I2C Connector  
Style: JST-SH 4-pin



Nodes on the I2C bus  
board are indicated here



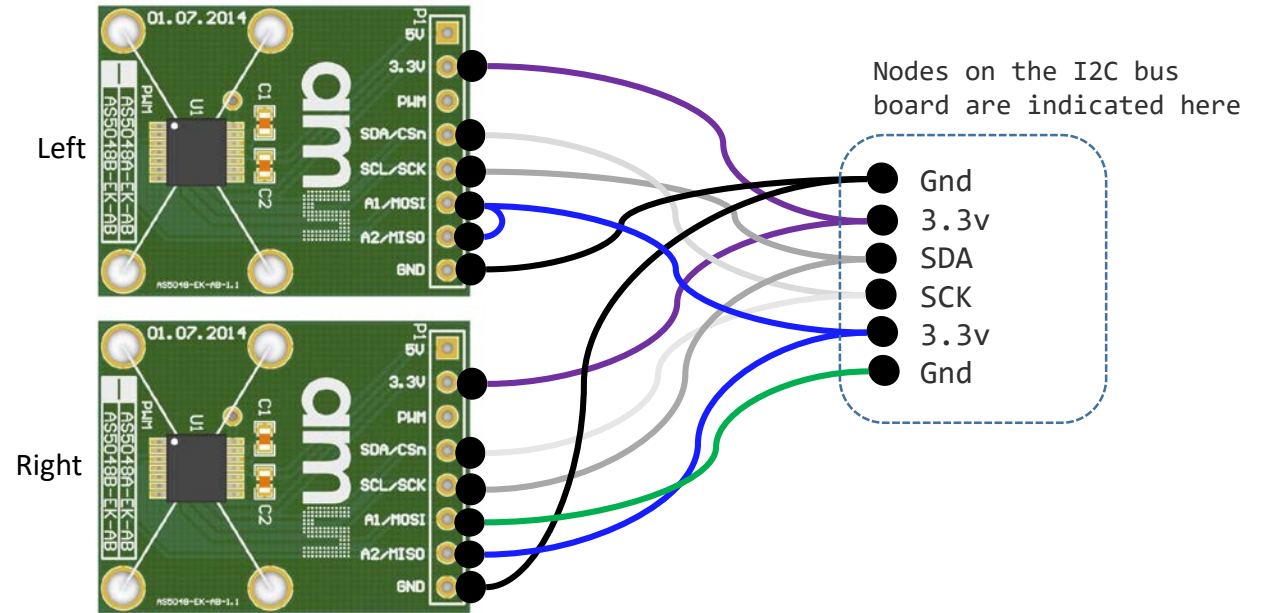
Compass



# Encoder AS5048 (I2C)

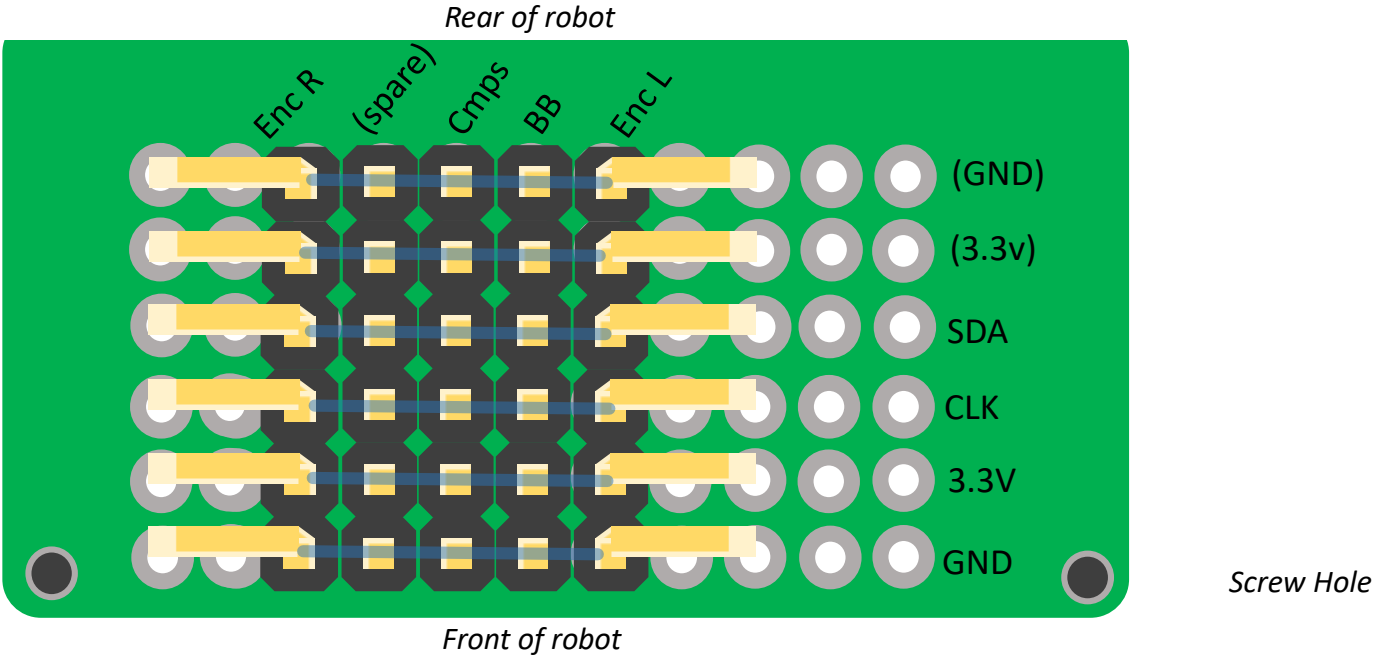
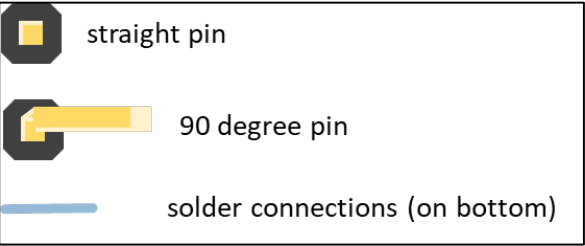
Left Hand Encoder  
A1 is pulled **down** to GND  
I2C address is 0x40

Right Hand Encoder  
A1 is pulled **up** to 3.3v  
I2C address is 0x41



# I2C Bus Board

The board is made from a breadboard and soldered manually. The board can be cut between rows J & K



Left	Left	Right
A1	0	1
A2	0	0
Addresses	0x40	0x41

On the Left Hand Encoder PCB, bridge the pins A1 and A2 using solder.



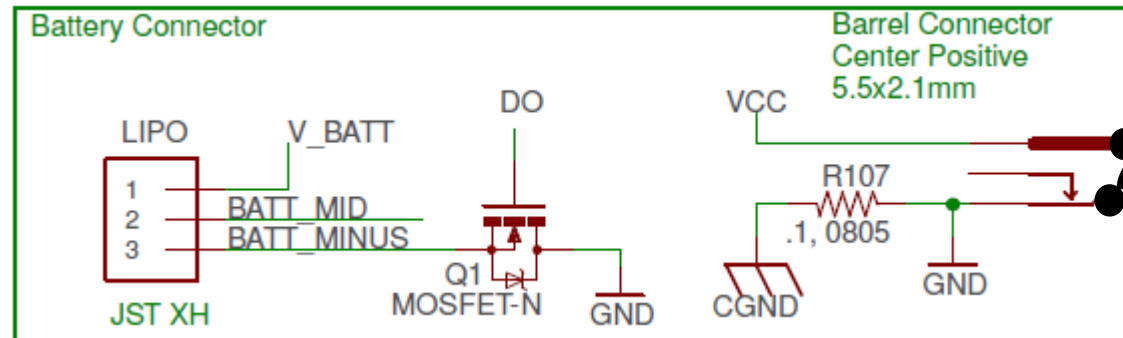
# Encoder Cables



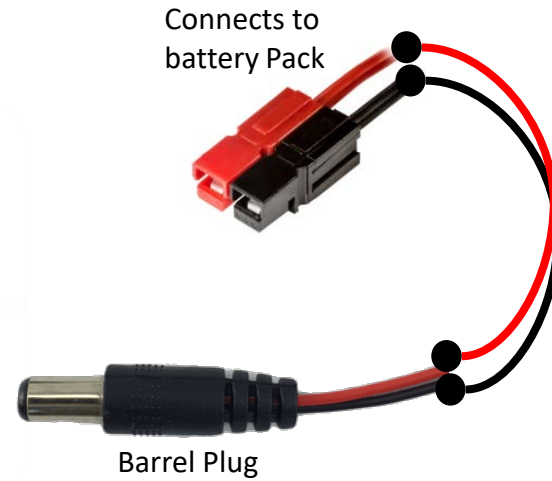
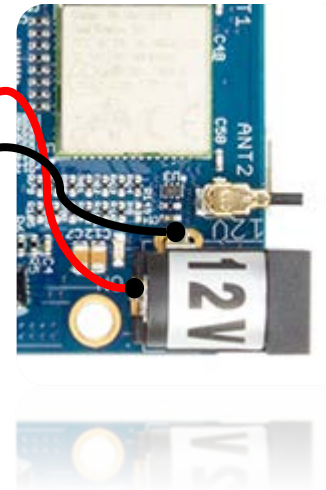
Left	Left	Right
A1	0	1
A2	0	0
Addresses	0x40	0x41

On the Left Hand Encoder PCB, bridge the pins A1 and A2 using solder.

# Battery



*The "Battery Connector" is disconnected. Actual battery uses Barrel Connector.*



# LIDAR

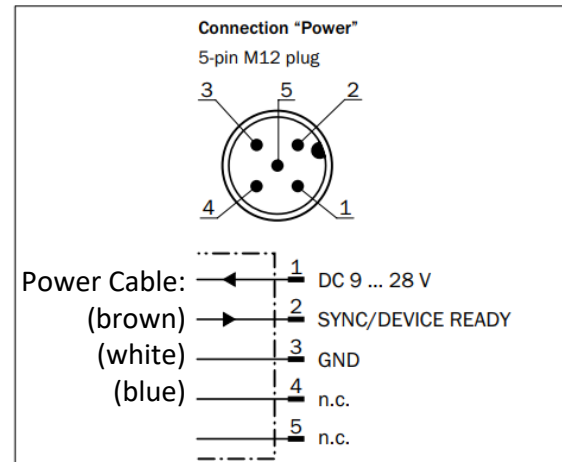
## Lidar Device



TiM 561

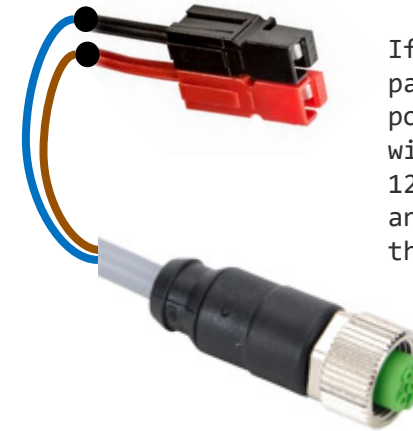
## Connector Diagram (lidar side)

### POWER connection (supply voltage)



*LIDAR-side connector (male pins)*

## Power Wire Diagram (plugs into lidar)



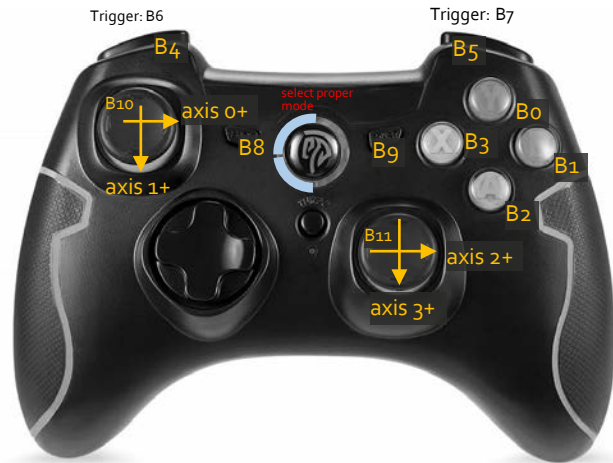
If the indicated cable part number is used for power to the lidar, brown will be crimped into the 12v positive APP terminal and blue is crimped into the negative.

[Cable: 7000-12241-2150300](#)

*Cable-side connector (female pins)*

# GamePad

## Gamepad Controls Mapping



Button Behavior:

- not pressed: 0
- Pressed: 1

Axis behavior:

- Right returns positive values
- down returns positive values

```
# Get Button States
x_button = joystick.get_button( 3 )
l_button = joystick.get_button( 6 )
r_button = joystick.get_button( 7 )

l_joy_x = joystick.get_axis( 0 )
l_joy_y = joystick.get_axis( 1 )
```

# RFID reader

