

# PARTS

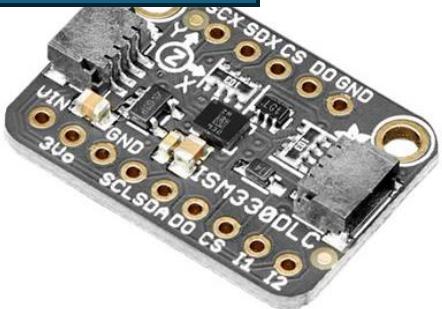
# PARTS

Need: 1  
Contained in Kit: no



ROBOTIS DYNAMIXEL ARDUINO MKR SHIELD  
SKU TPX00054 Barcode 8809677570425

Need: 1  
Contained in Kit: no



Adafruit ISM330DHCX - 6 DoF IMU  
Accelerometer and Gyroscope  
Product ID: 4502

Need: 1  
Contained in Kit: no



Arduino MKR WiFi 1010  
SKU ABX00023 Barcode 7630049200258

Need: 1  
Contained in Kit: no



XB24CAUIT-001

Need: 1  
Contained in Kit: no

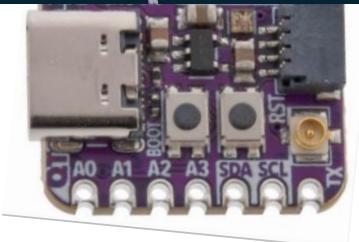


TPA3110 15W+15W 2X15W  
Dual 15W 3A Digital Audio Stereo  
Amplifier Module Board

Need: 1  
Contained in Kit: no

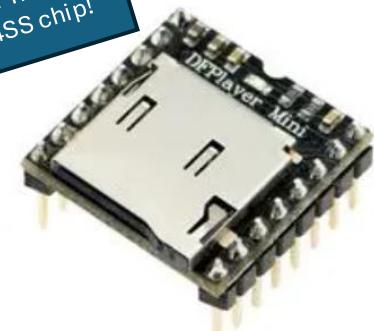
Need: 1  
Contained in Kit: no

Only needed if using  
movable aerials



Adafruit QT Py ESP32-S2 WiFi (Part nr 4508)  
Dev Board with uFL Antenna Port - STEMMA QT

Use a board  
with YX5200-  
24SS chip!



DFPlayer-Modul, Mini MP3-Player  
MP3/WAV/WMA, UART, 3.3V/5V

# PARTS

Need: 2  
Contained in Kit: no



The image shows a blue printed circuit board (PCB) for the Adafruit DRV8871 DC Motor Driver. It features two green terminal blocks for power input, a blue integrated circuit (IC) labeled 'DRV8871', and several other components like resistors and capacitors. A small circular component is labeled '250kV'. The board is labeled with 'MOTOR @POWER' and 'DRV8871'.

Adafruit DRV8871 DC Motor Driver  
Breakout Board - 3.6A Max  
Product ID: 3190

Need: 2  
Contained in Kit: no

### 20.4:1 Metal Gearmotor 25Dx65L mm MP 12V with 48 CPR Encoder



The image shows a metal gearmotor with a black plastic housing and a silver cylindrical motor shaft. It has four colored wires (red, yellow, blue, and black) and a black ribbon cable with a 6-pin header. The text 'www.pololu.com' is visible at the bottom of the image.

Pololu item #: 4863    73 in stock  
Brand: [Pololu](#)    [supply outlook](#)  
Status: Active and Preferred ?  
 ✓ RoHS3  
 Free shipping in USA over \$100 ?

Price break	Unit price (US\$)
1	45.95
5	42.27
25	38.89
100	35.78

Quantity:  Add to cart  
[backorders allowed](#) [Add to wish list](#)

# PARTS

Need: 1  
Contained in Kit: no



New XL430-W250 (Released in 2018)

Neck servo Dynamixel XL430-W250

Manual [here](#).

Need: 3  
Contained in Kit: no



Head servos Dynamixel XL330-M288-T

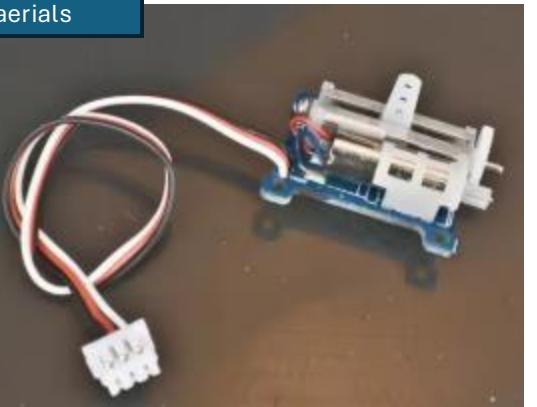
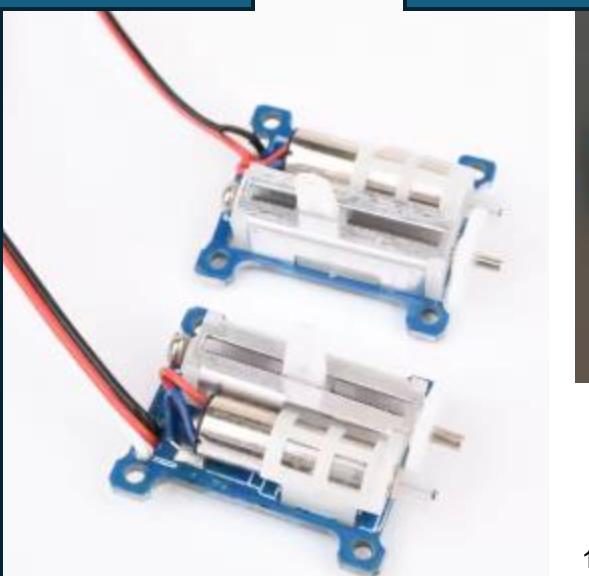
Manual [here](#).

Need: 1  
Contained in Kit: no



Need: 3  
Contained in Kit: no

Only needed if using  
movable aerials



1.5g Digital Ultra Micro Linear Servo V-Tail Function GS-1502

Need: 1  
Contained in Kit: no



# PARTS

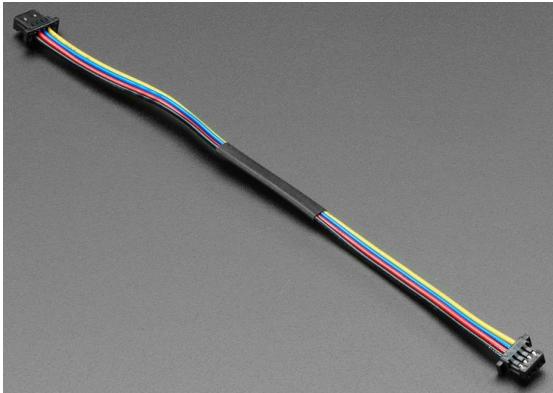


Batteri Li-Ion 18650 3.7V 3500mAh  
INR18650-35E



# PARTS

Contained in Kit: no



STEMMA QT / Qwiic  
JST SH 4-pin Cable -  
100mm Long

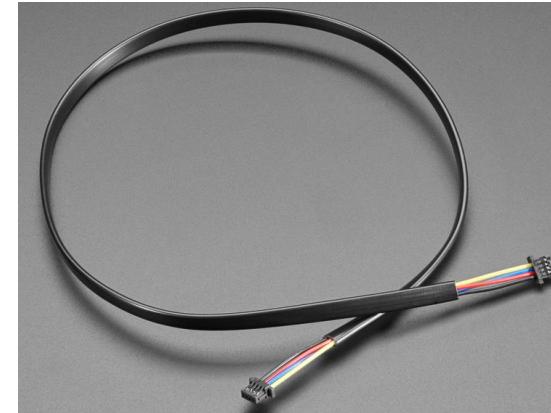
Product ID: 4210

Adafruit



STEMMA QT / Qwiic  
JST SH 4-Pin Cable -  
300mm long

Product ID: 5384



STEMMA QT / Qwiic  
JST SH 4-Pin Cable -  
400mm long

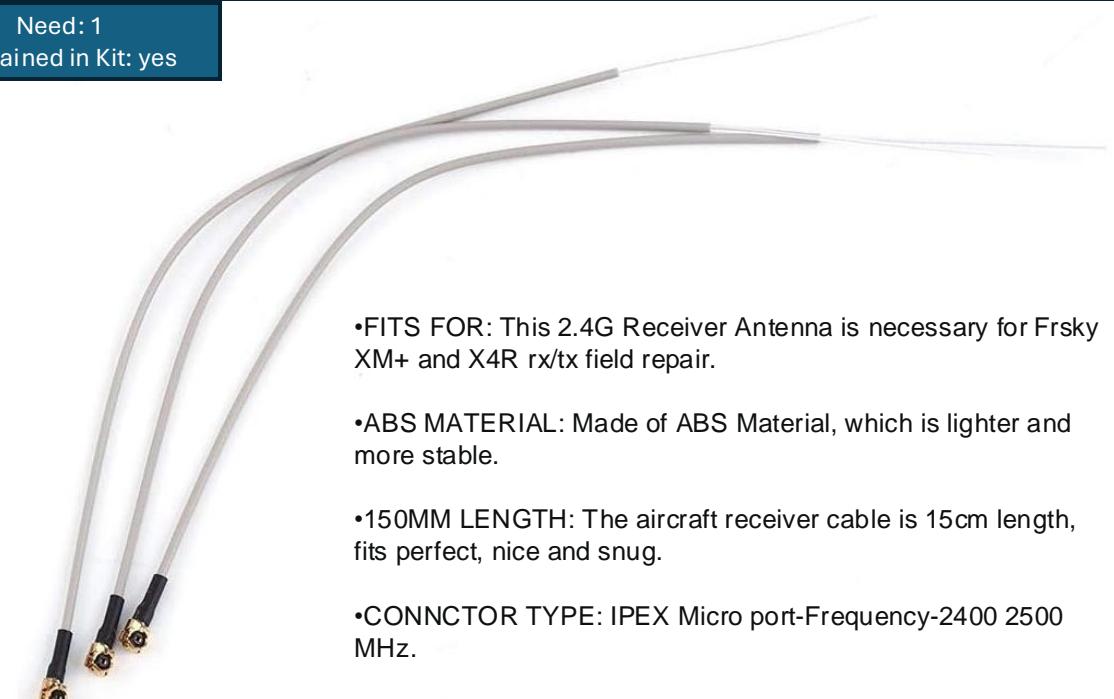
Product ID: 5385

Bundled with servos



ROBOTIS DYNAMIXEL CABLE 3P

Need: 1  
Contained in Kit: yes



- FITS FOR: This 2.4G Receiver Antenna is necessary for Frsky XM+ and X4R rx/tx field repair.

- ABS MATERIAL: Made of ABS Material, which is lighter and more stable.

- 150MM LENGTH: The aircraft receiver cable is 15cm length, fits perfect, nice and snug.

- CONNECTOR TYPE: IPEX Micro port-Frequency-2400 2500 MHz.

# BUILD

## D-Ov2Evo HeadBox

### Modified PrintFiles:

[HeadBoxA.stl](#)  
[HeadBoxB.stl](#)  
[NeckBottomDynamixel.stl](#)  
[HeadplateDynamixel.stl](#)  
[NeckTopDynamixel.stl](#)  
[TiltMountDynamixelUnified.stl](#)  
[RubberGrommet.stl](#)

### Original files:

Use these files from MrBaddeley's original D-Ov2 OneDrive:

[HeadBoxBar.stl](#)  
[HeadGreeble.stl](#)  
or  
[HeadGreebleresin.stl](#)

### Material

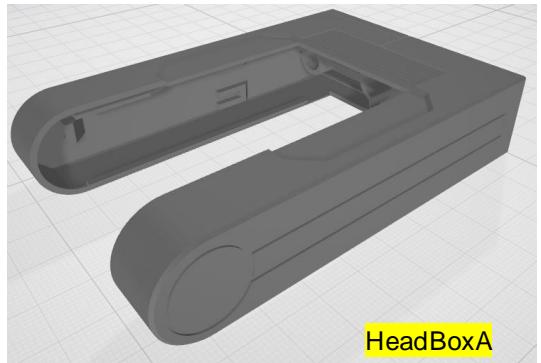
Print these out of [LW-PLA](#) for weight reduction:

[HeadBoxA.stl](#)  
[HeadBoxB.stl](#)  
[NeckBottomDynamixel.stl](#)

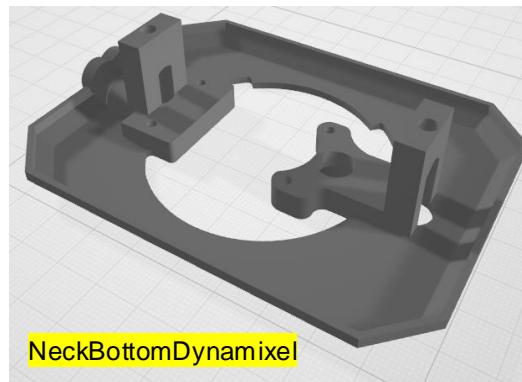
Print these out of [ABS, ASA, or PLA+](#) for strength, but regular 2-wall profile works fine, strength profile with many walls would be too heavy:

[HeadplateDynamixel.stl](#)  
[HeadBoxBar.stl](#)  
[NeckTopDynamixel.stl](#)  
[TiltMountDynamixelUnified.stl](#)  
[HeadGreeble.stl](#) (or print [HeadGreebleresin.stl](#) out of resin)

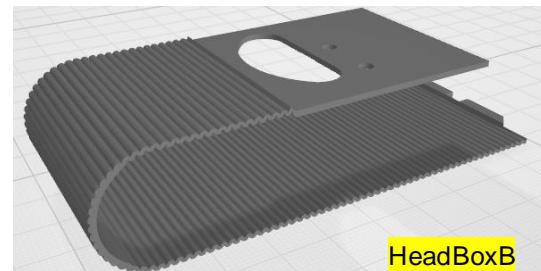
Print this one out of [TPU](#) (use black filament, paint tends to crack on TPU after a while due to its flexibility). We print this in 1-wall vase mode for weight reduction, which does cause problems with layer adhesion on our printers giving a bit of a "flayed" look. YMMV - try it out:  
[RubberGrommet.stl](#)



HeadBoxA



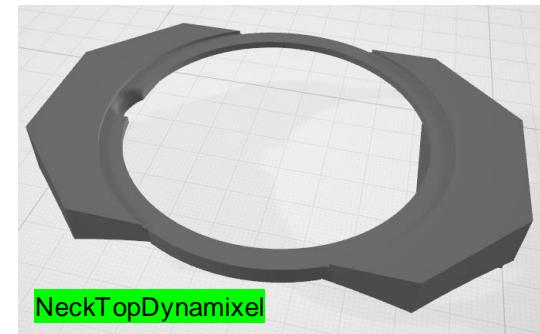
NeckBottomDynamixel



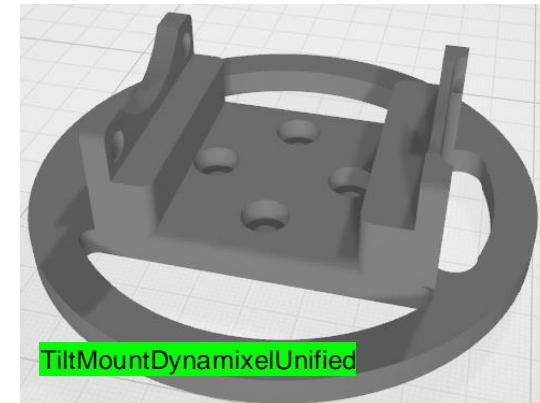
HeadBoxB



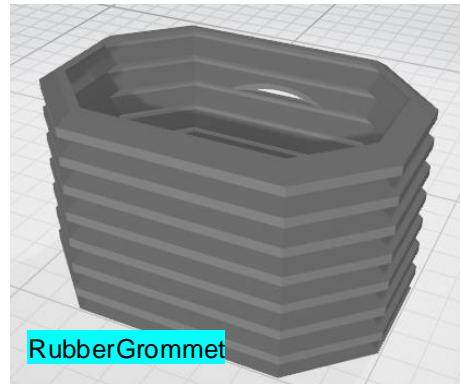
HeadplateDynamixel  
Use the one in "Head (Moveable Antennas)"



NeckTopDynamixel



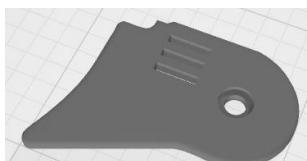
TiltMountDynamixelUnified



RubberGrommet



HeadBoxBar



HeadGreeble

# D-Ov2Evo HeadBar

**Modified PrintFiles :**

[HeadFrame Dynamixel.stl](#)

[ServoCouple Dynamixel.stl](#)

[MainBarHolderB\\_Connector\\_Cutout.stl](#)

[MainBar\\_Counterweight\\_10Pin\\_Socket\\_Connector.stl](#)

**Original Files:**

Use these files from MrBaddeley's original D-Ov2 OneDrive:

[MainBarCap.stl](#)

[MainBarHolderA.stl](#)

[NodArmLever.stl](#)

[TopBarPaintMask.stl](#)

[TopBar.stl](#)

[Barskin.stl](#)

[HeadBar.stl](#)

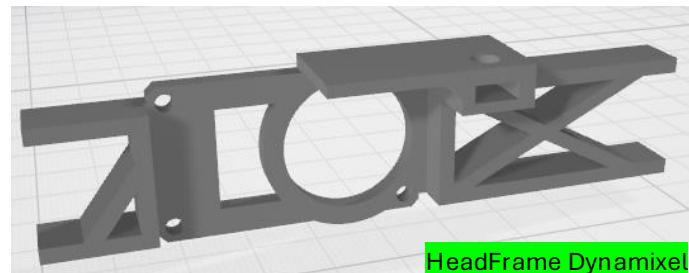
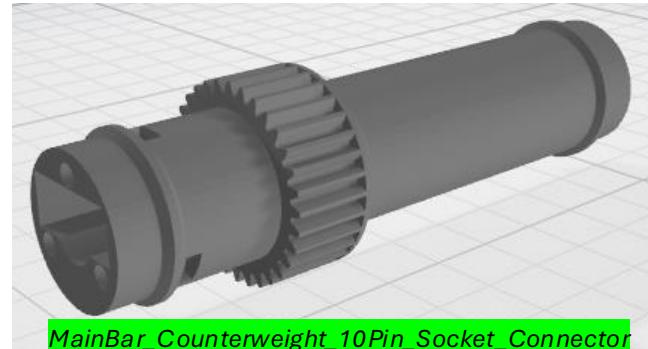
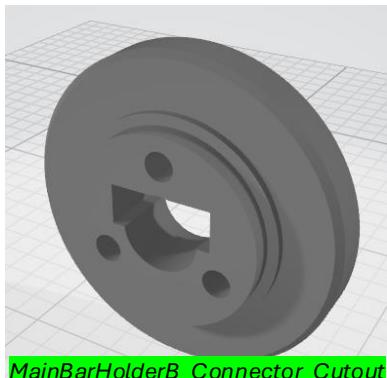
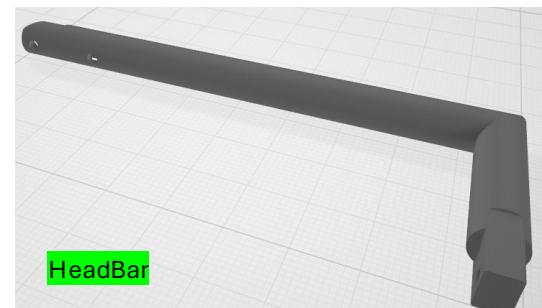
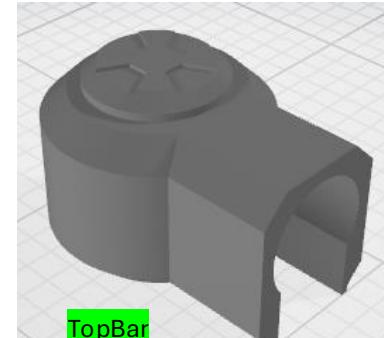
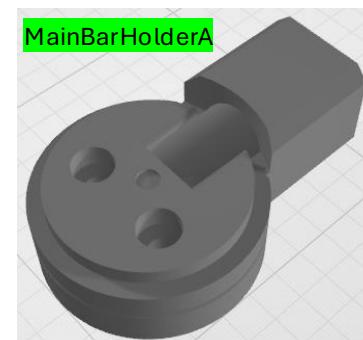
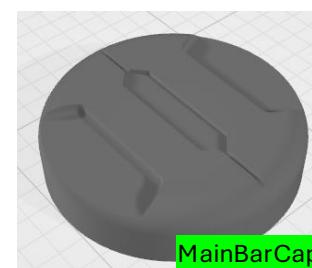
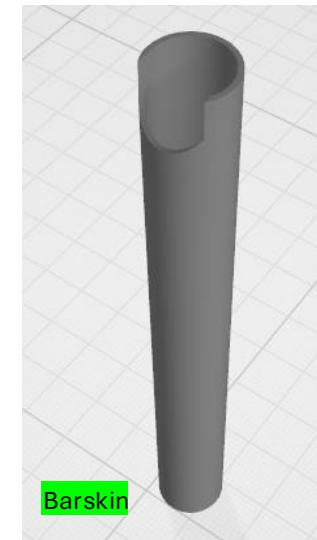
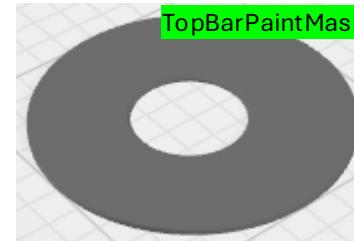
**Material:**

**ASA or PLA+** for everything. If you don't use a carbon tube but go with the standard printed Barskin, the main bar should definitely not be printed in PETG, it's too flexible and will wobble.

The **MainBar** should be printed in your printer's strength profile, or if it doesn't have one, with the following settings:

- Layer height: .2mm
- Perimeters: 6 or more
- Bottom layers: 6 or more
- Top layers: 6 or more

All other parts can be printed any way you please.



# # D-Ov2Evo Head (Moveable Antennas)

## Modified PrintFiles :

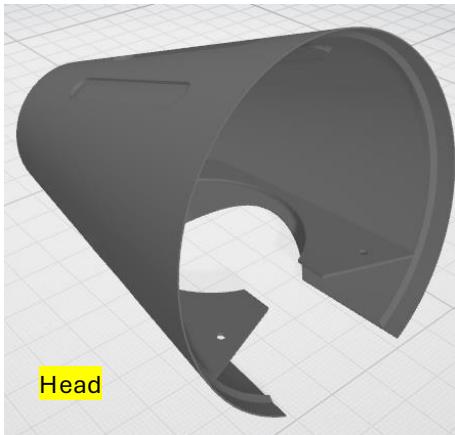
Head.stl  
AerialArmx3.stl  
RearPanel.stl  
HeadplateDynamixel.stl  
RearPanelPlate.stl  
ServoLinkRodx3.stl  
AerialArmBracketx3.stl  
ServoFramex3.stl

HeadPlateDynamixel.stl` replaces the one in the `HeadBox` directory.

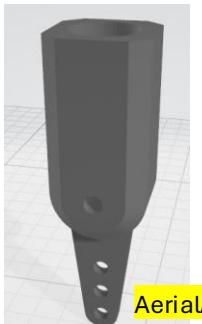
## Original Files:

Use these files from MrBaddeley's original D-Ov2 OneDrive:

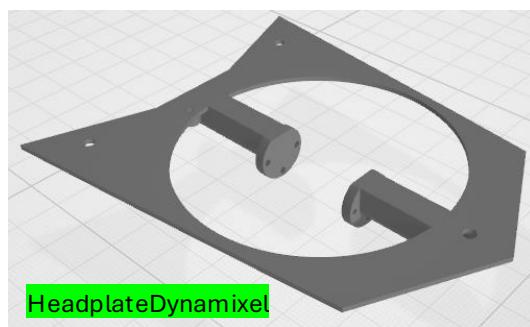
Nose.stl  
AerialTipx3.stl  
AerialBasex3.stl (see note1)



Head



AerialArmx3



HeadplateDynamixel



RearPanel

## Material:

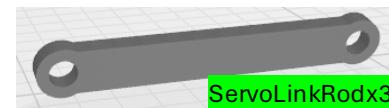
Use LW-PLA (lightweight, the foaming kind) for :

Head.stl  
RearPanel.stl  
AerialArmBracketx3.stl  
Nose.stl  
AerialTipx3.stl

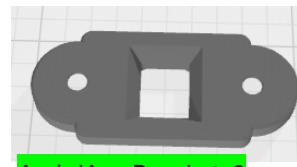
Print the head and nose with a single wall, as lightweight as you possibly can. If you want you can also print `AerialBasex3.stl` in LW-PLA, unless you go to conventions, in which case it's probably a better idea to print it in TPU for flexibility should some kid grab your droid by the aerial. (Note 1)

Use TPU for `ServoFramex3.stl` and print 3 of them. The reason for using TPU is to decouple the servo vibrations. If you can't print TPU you can also print these out of some other material, you'll hear a bit more servo noise, no big deal.

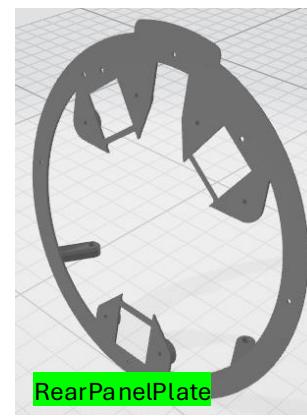
ASA or PLA+ for everything else.



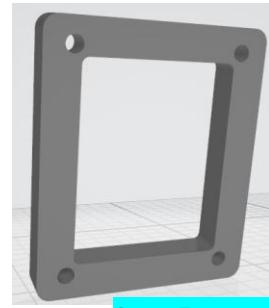
ServoLinkRodx3



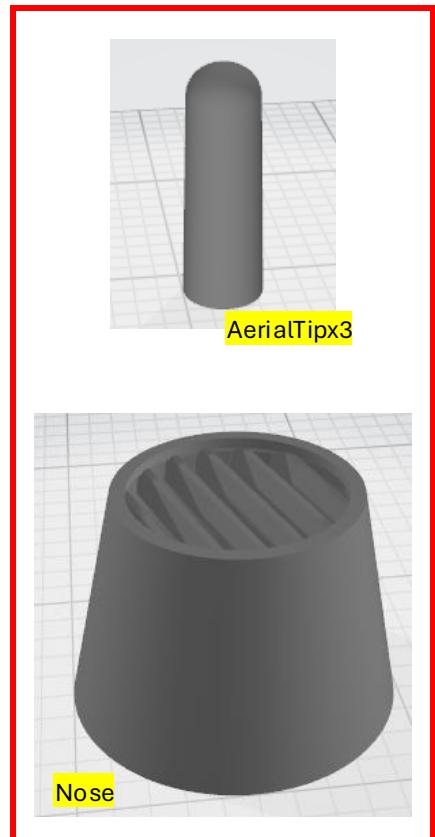
AerialArmBracketx3



RearPanelPlate

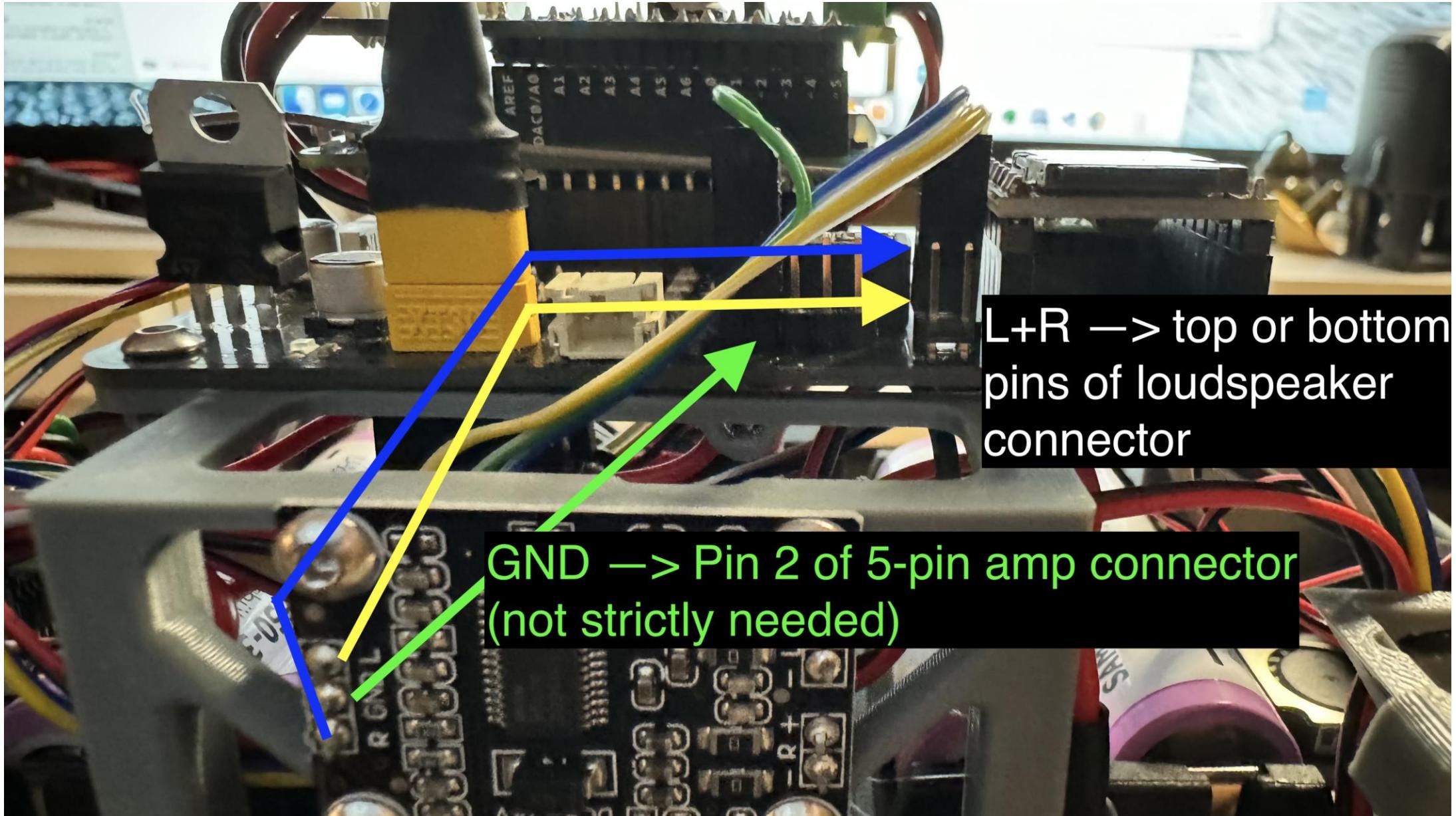


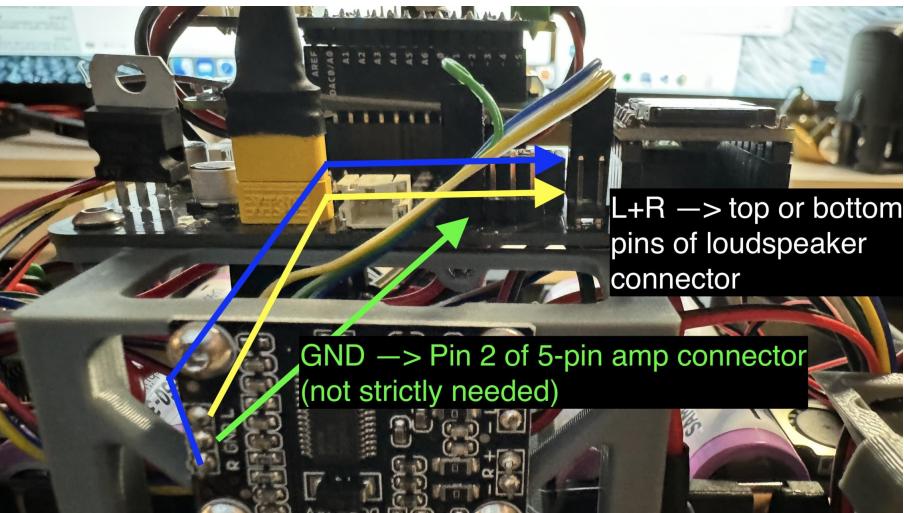
ServoFramex3



Nose

# DROID ELECTRONICS (BODY)

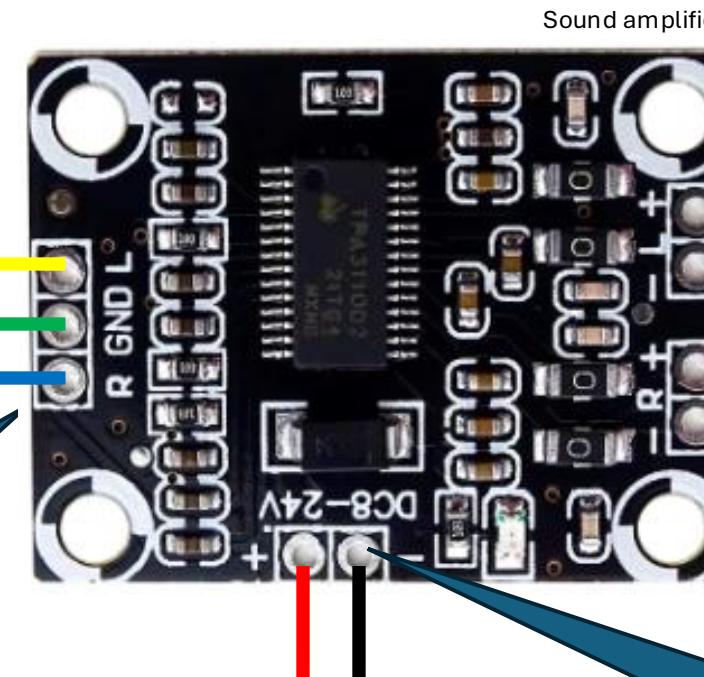




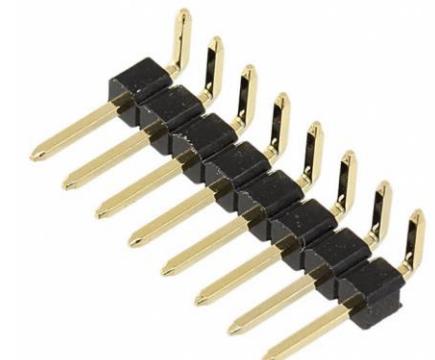
L+R → top or bottom  
pins of loudspeaker  
connector

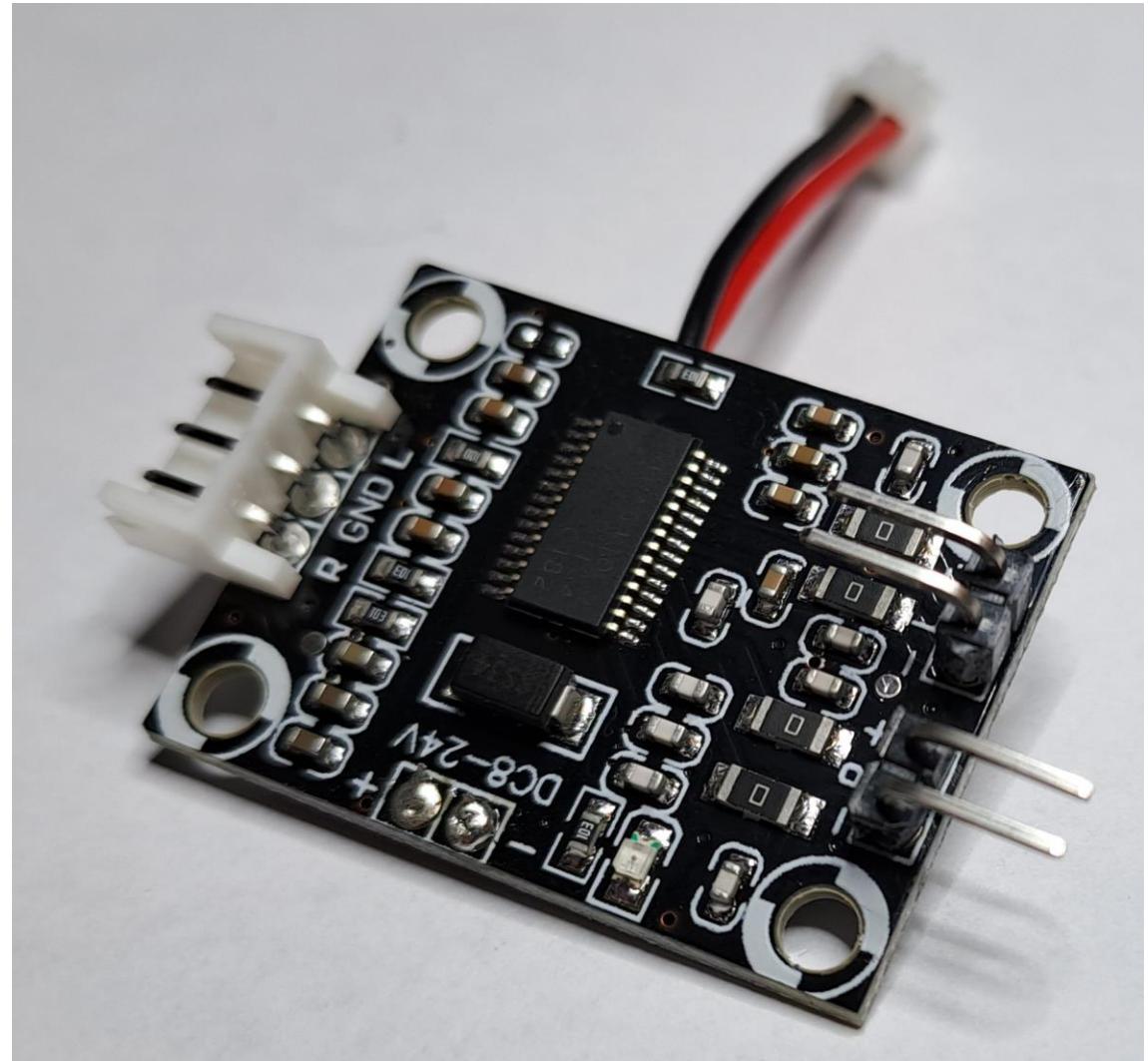
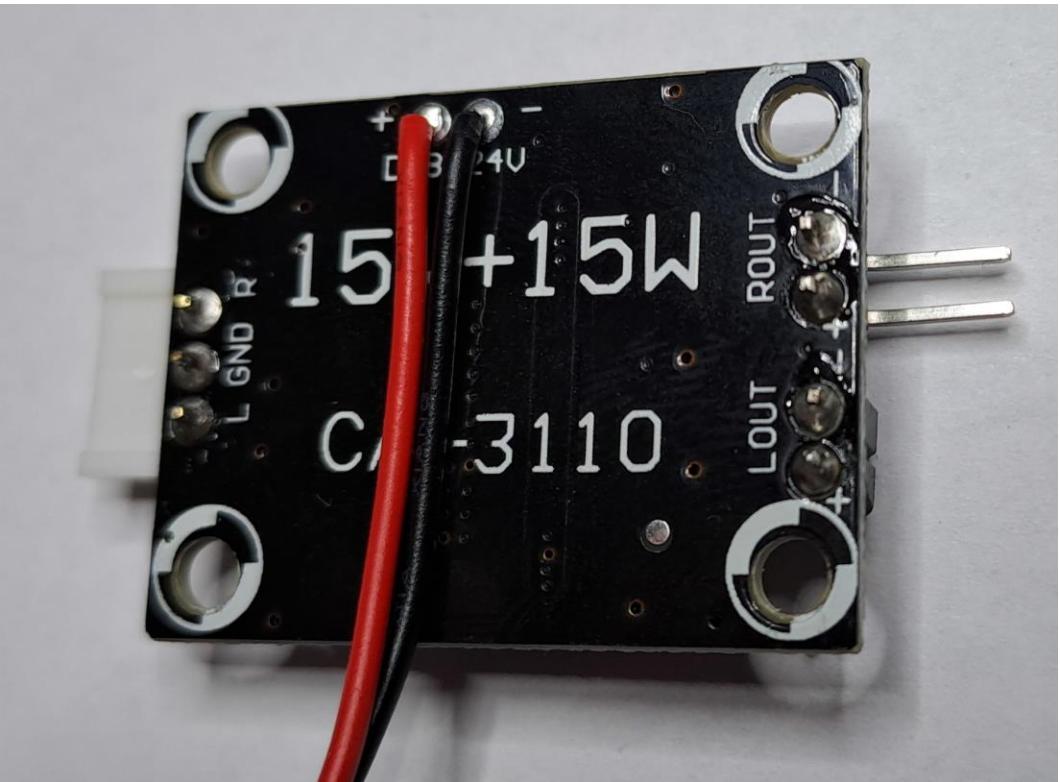
GND → Pin 2 of 5-pin amp connector  
(not strictly needed)

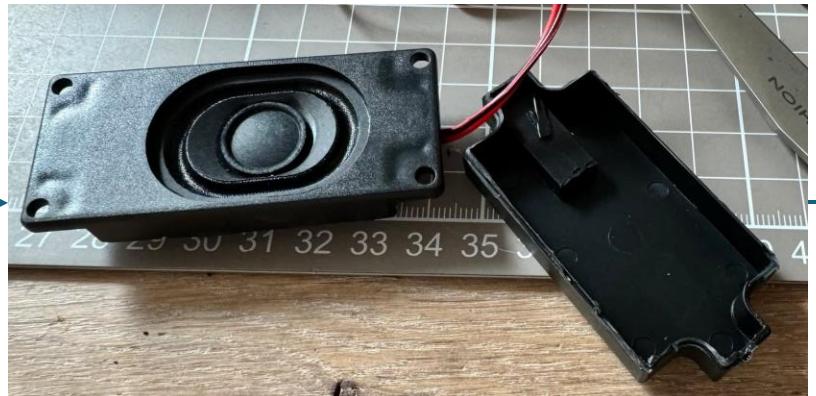
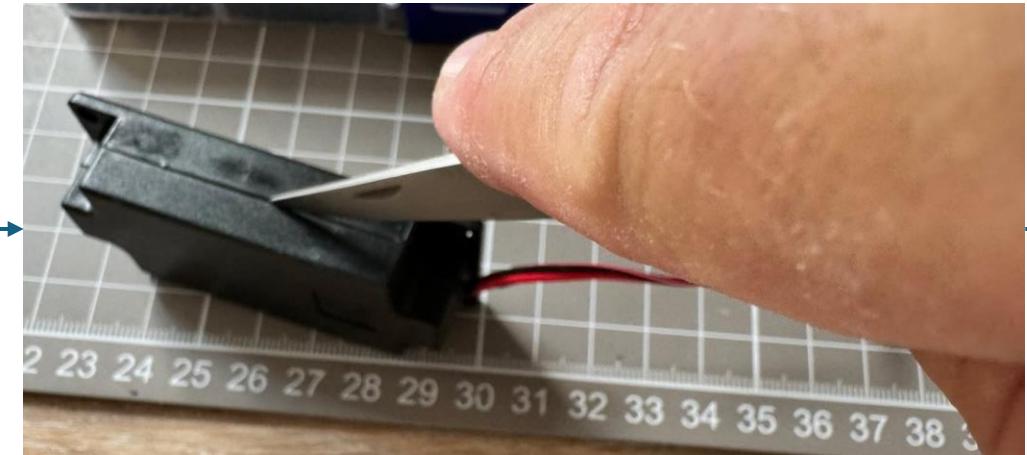
Contact type is free  
choice since the cable is  
not included.

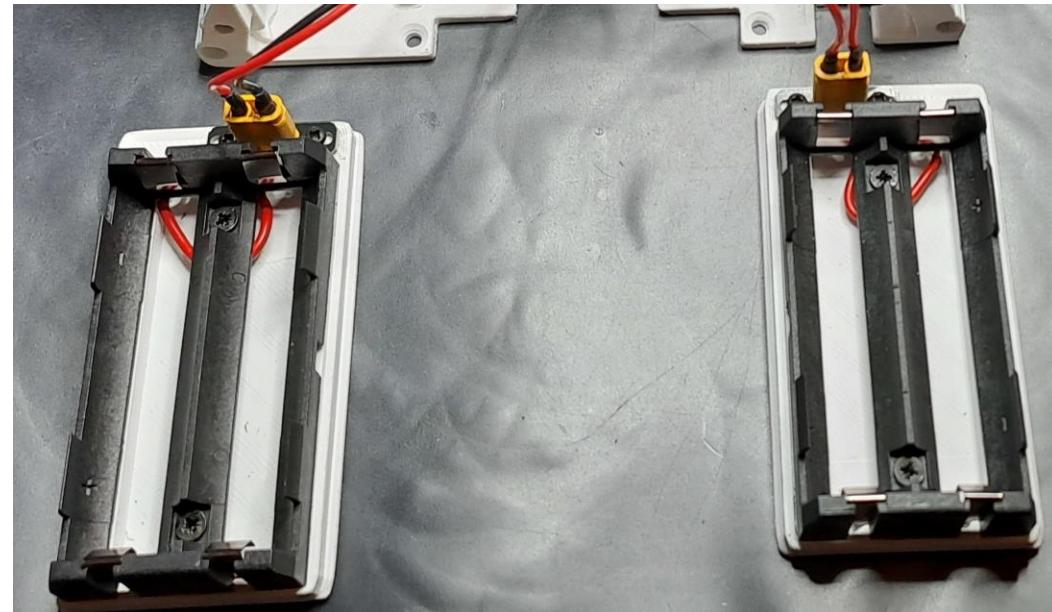
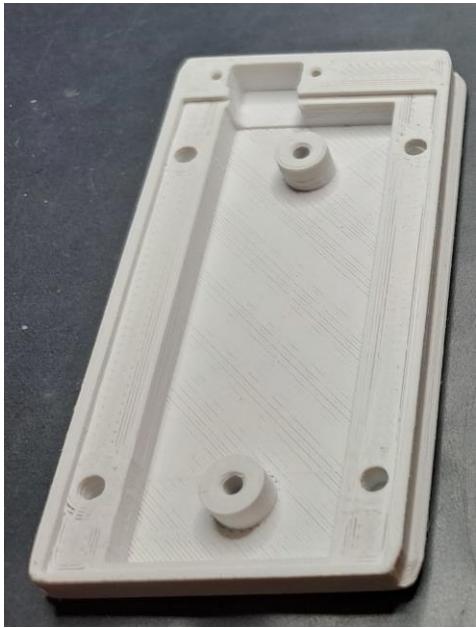
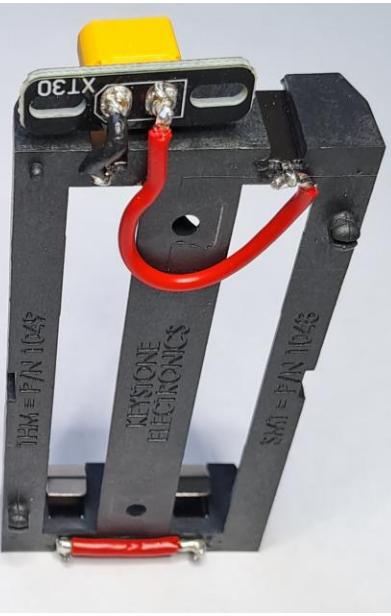
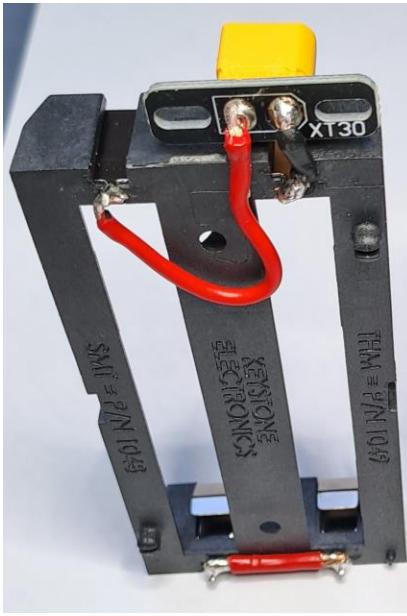


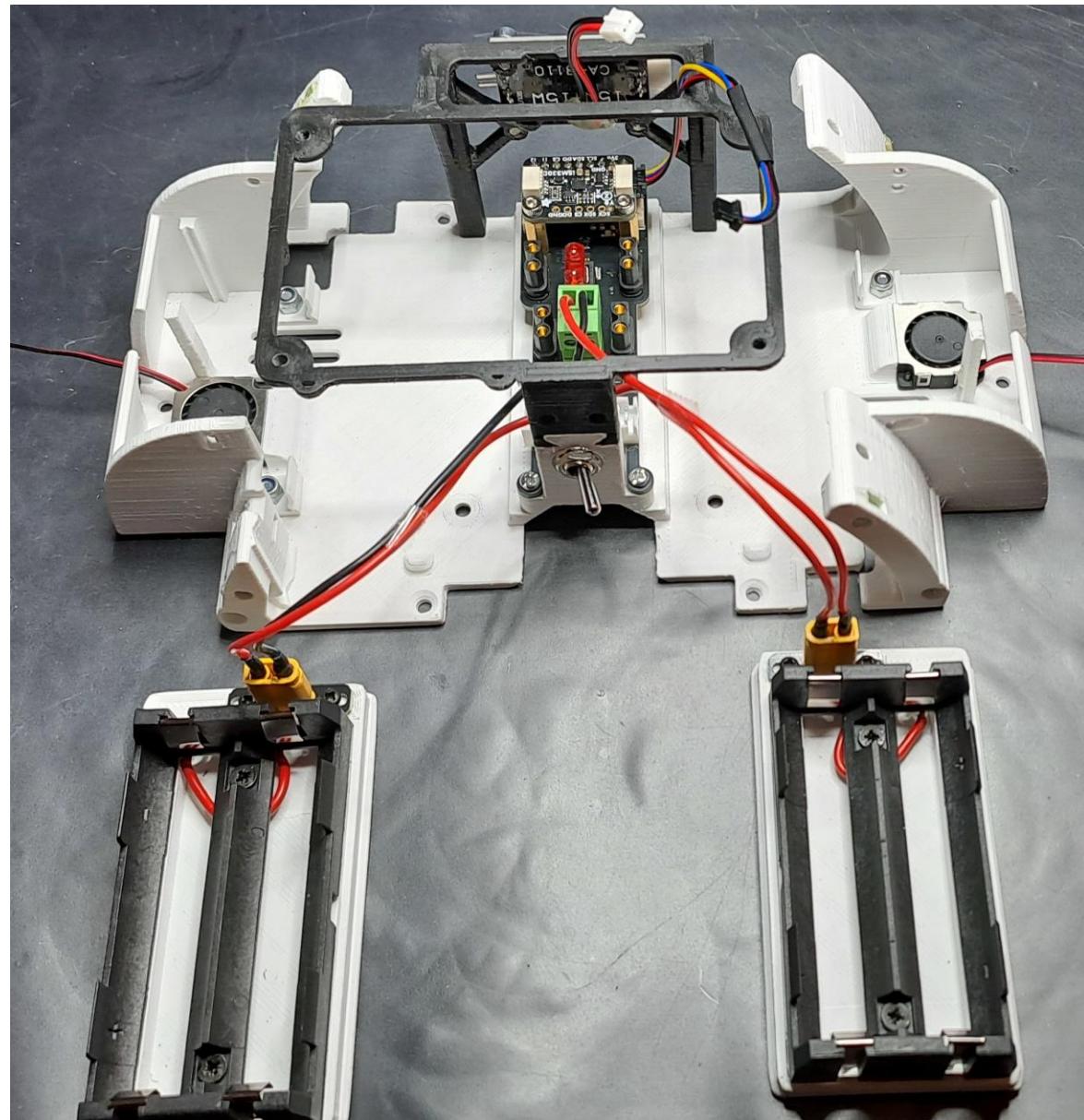
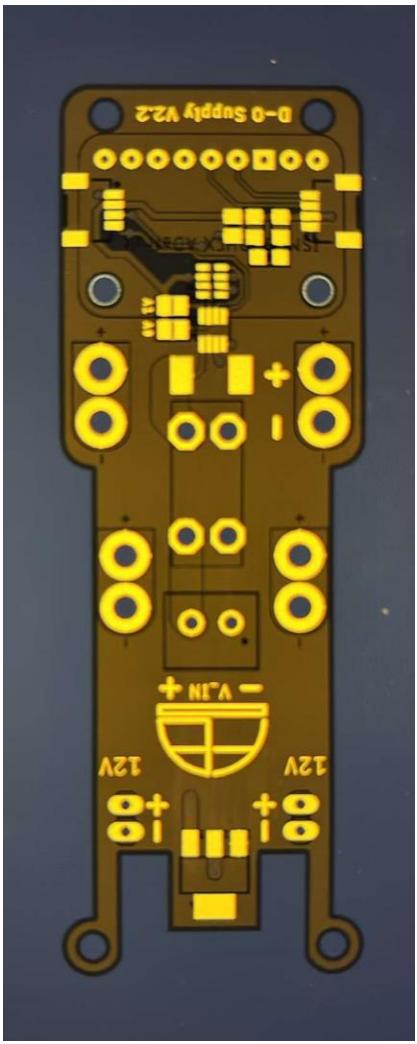
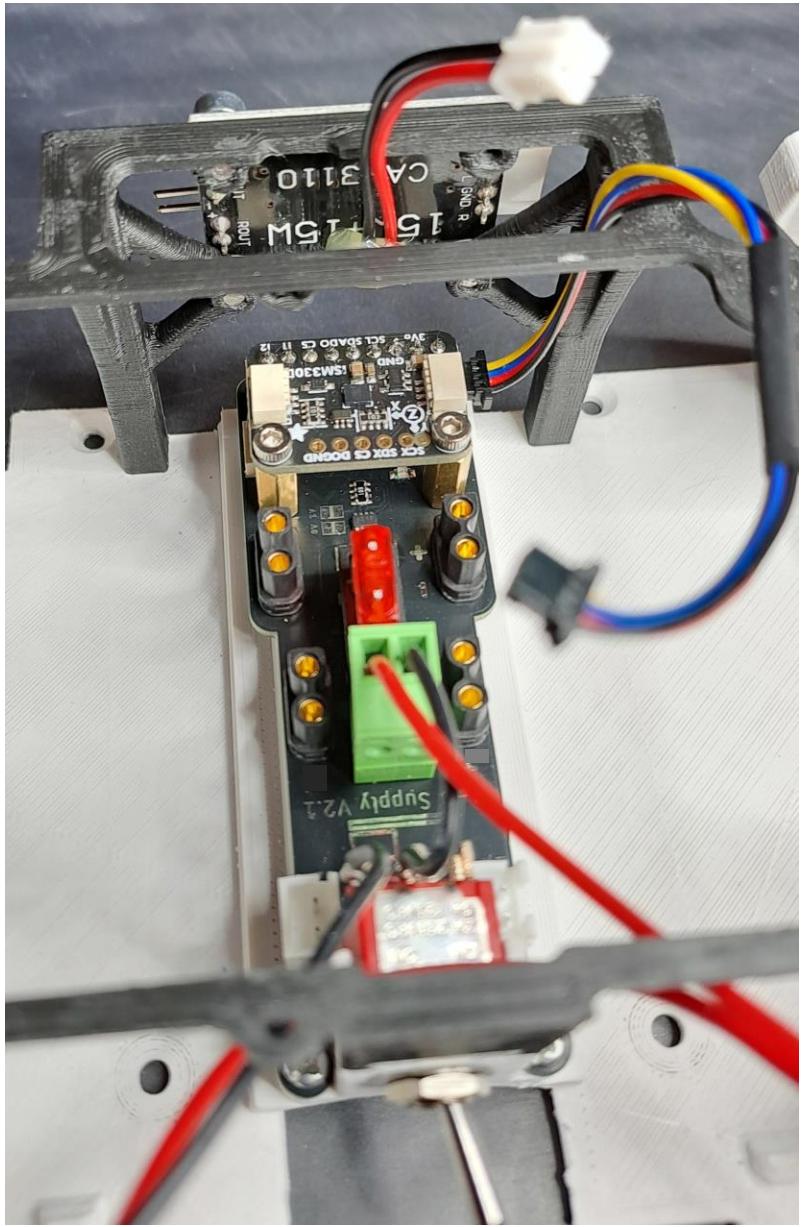
Cable included with the Mainboard.  
Amplifier side of the cable don't have  
any contact. Can be soldered directly  
onto the amplifier.





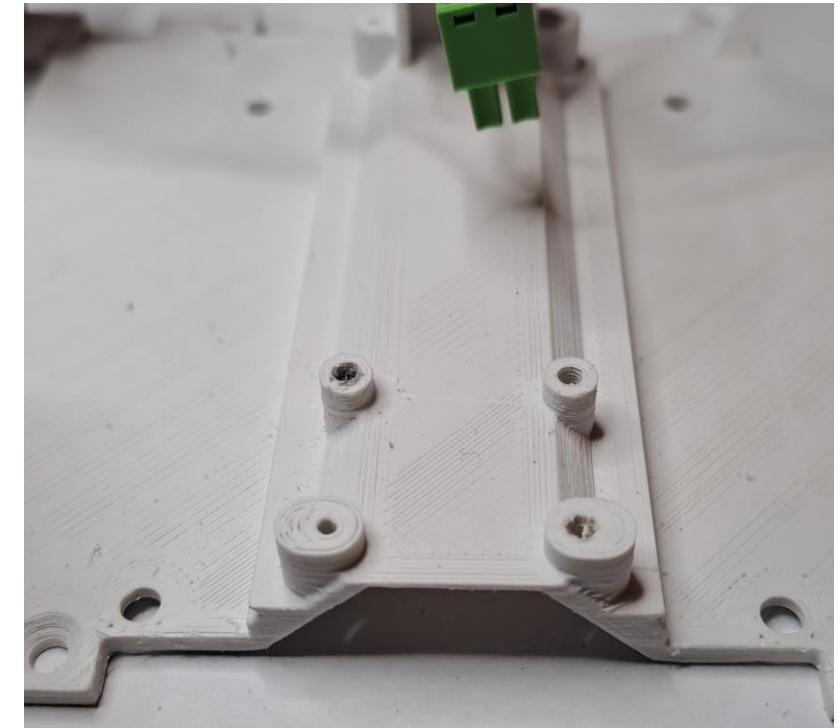


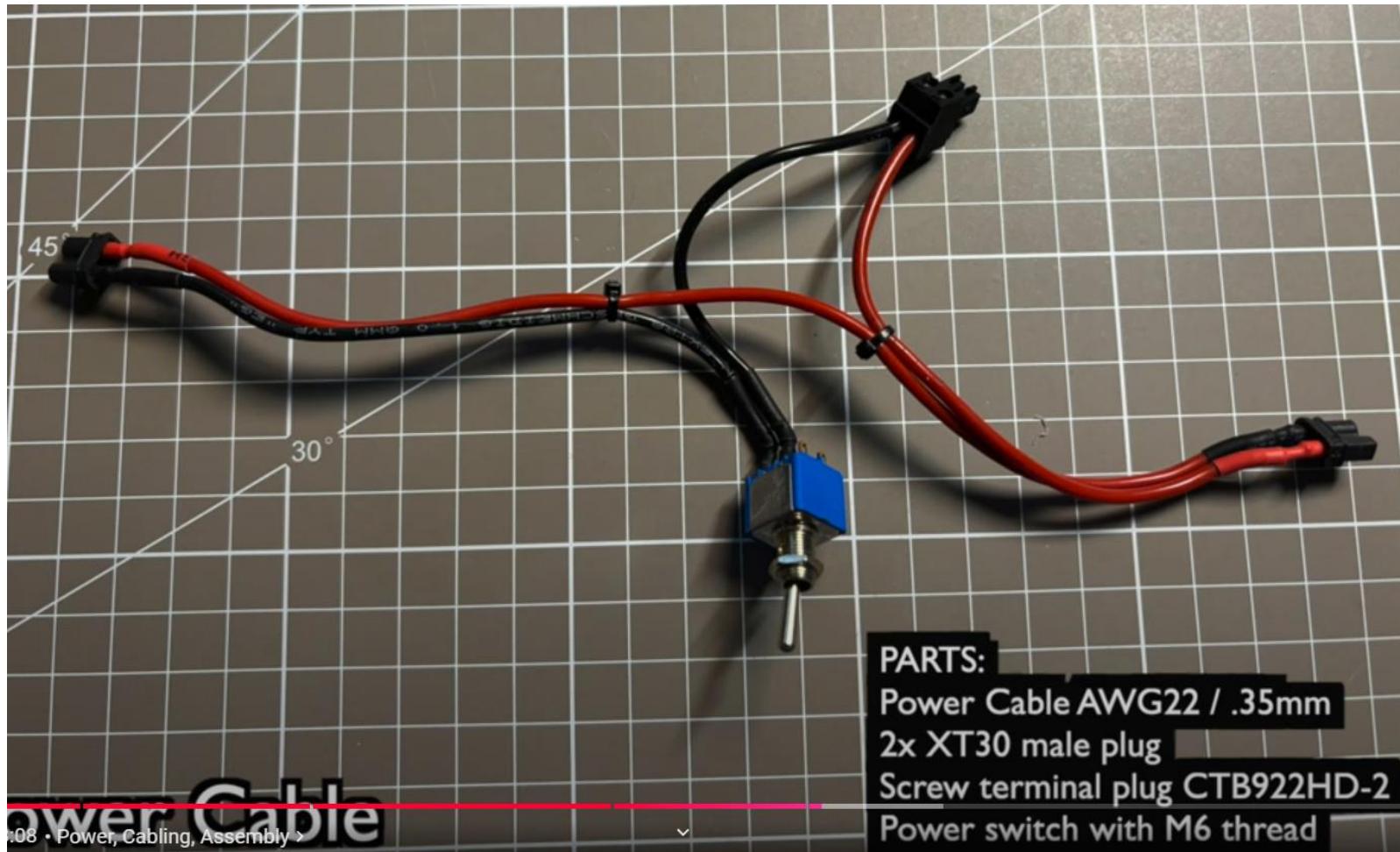




Make sure that the hole is 2,0mm before you make the threads.  
If not the printed towers might break. Ask me have I know this....  
I used a 2,0 drill first to ensure this.

You can use the M2,5 screw directly to make the threads or a threading tool.





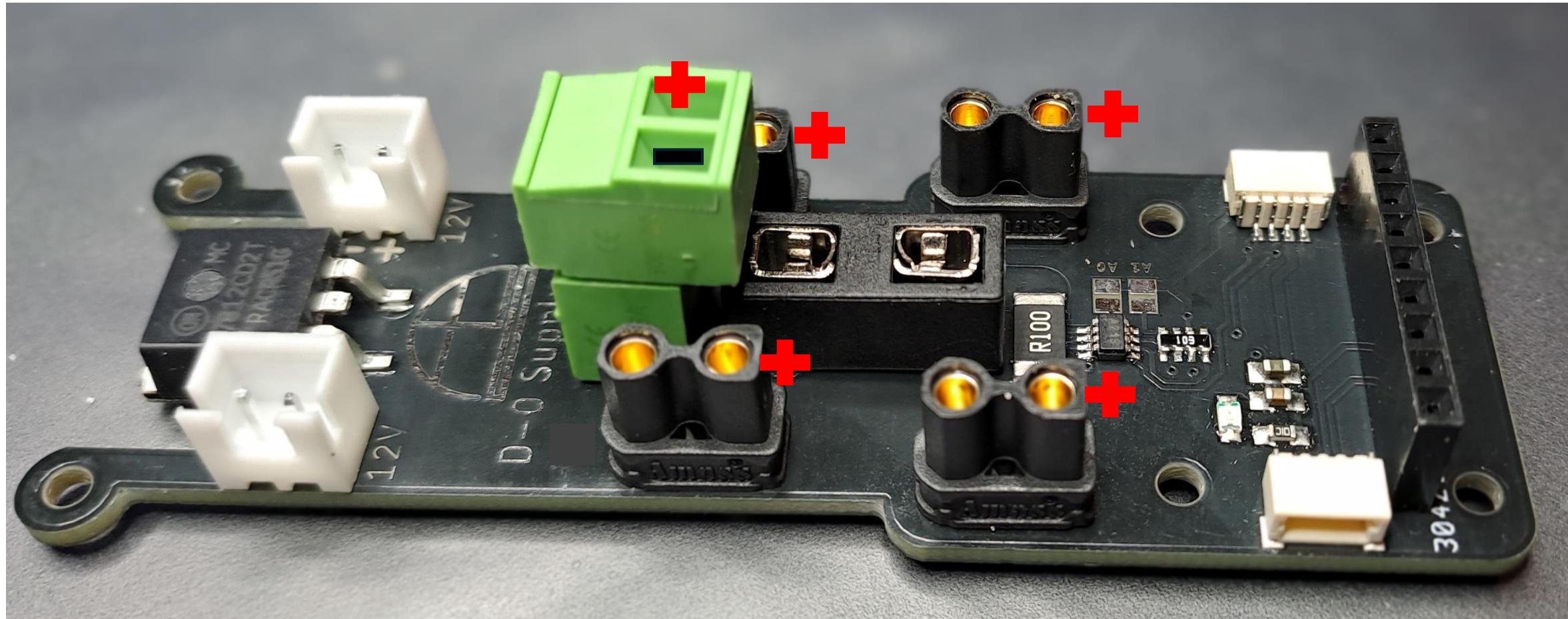
**PARTS:**

Power Cable AWG22 / .35mm

2x XT30 male plug

Screw terminal plug CTB922HD-2

Power switch with M6 thread



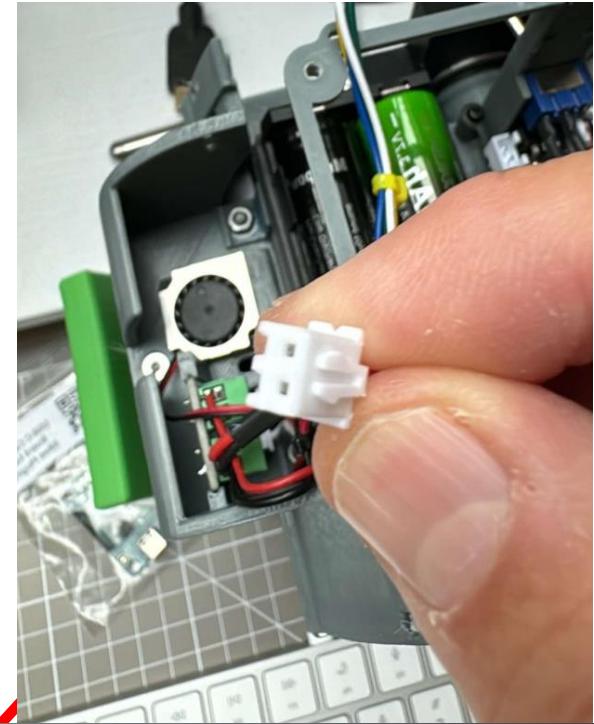
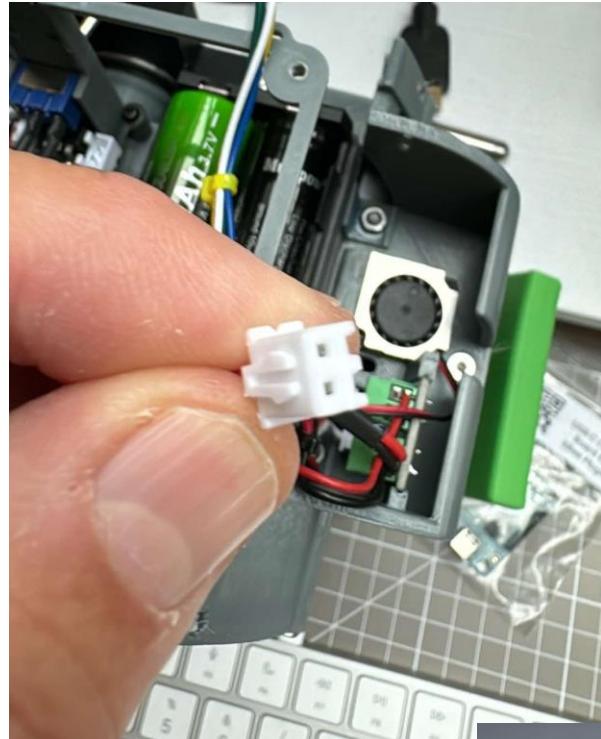
All XT-30 connectors are unregulated ~13 – 17volt from the batteries.  
Supplied through the green VIN.

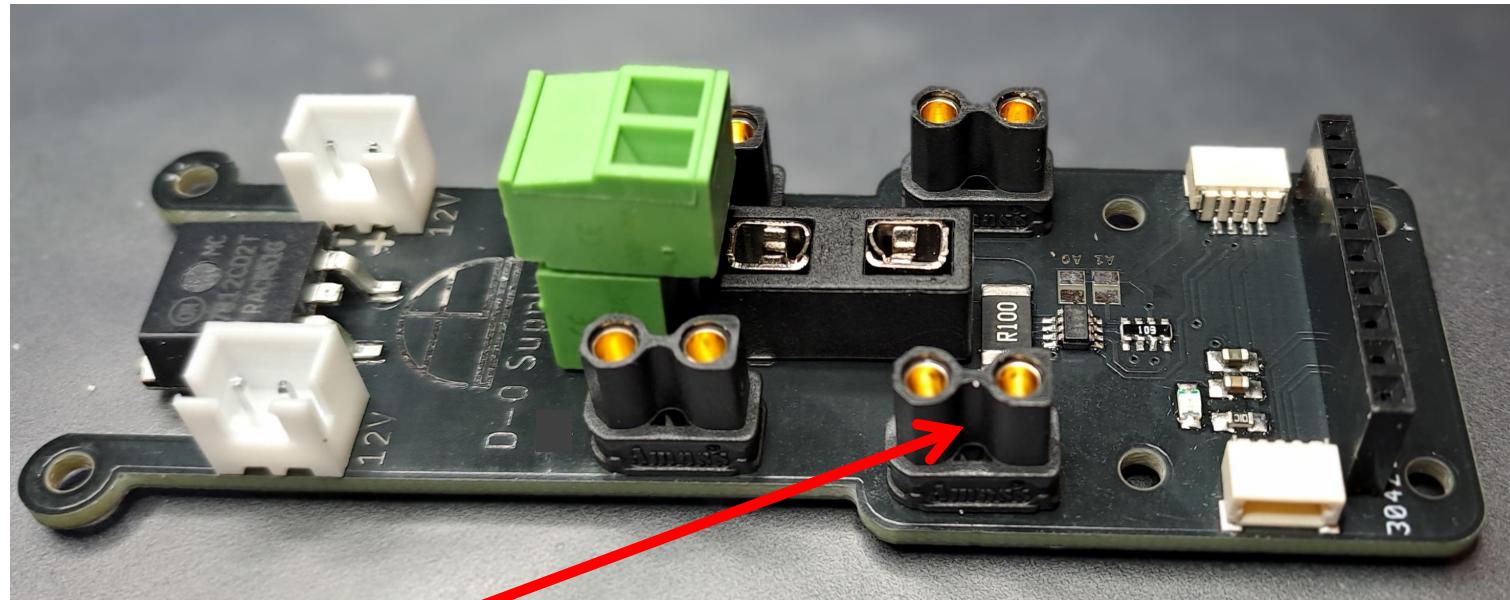
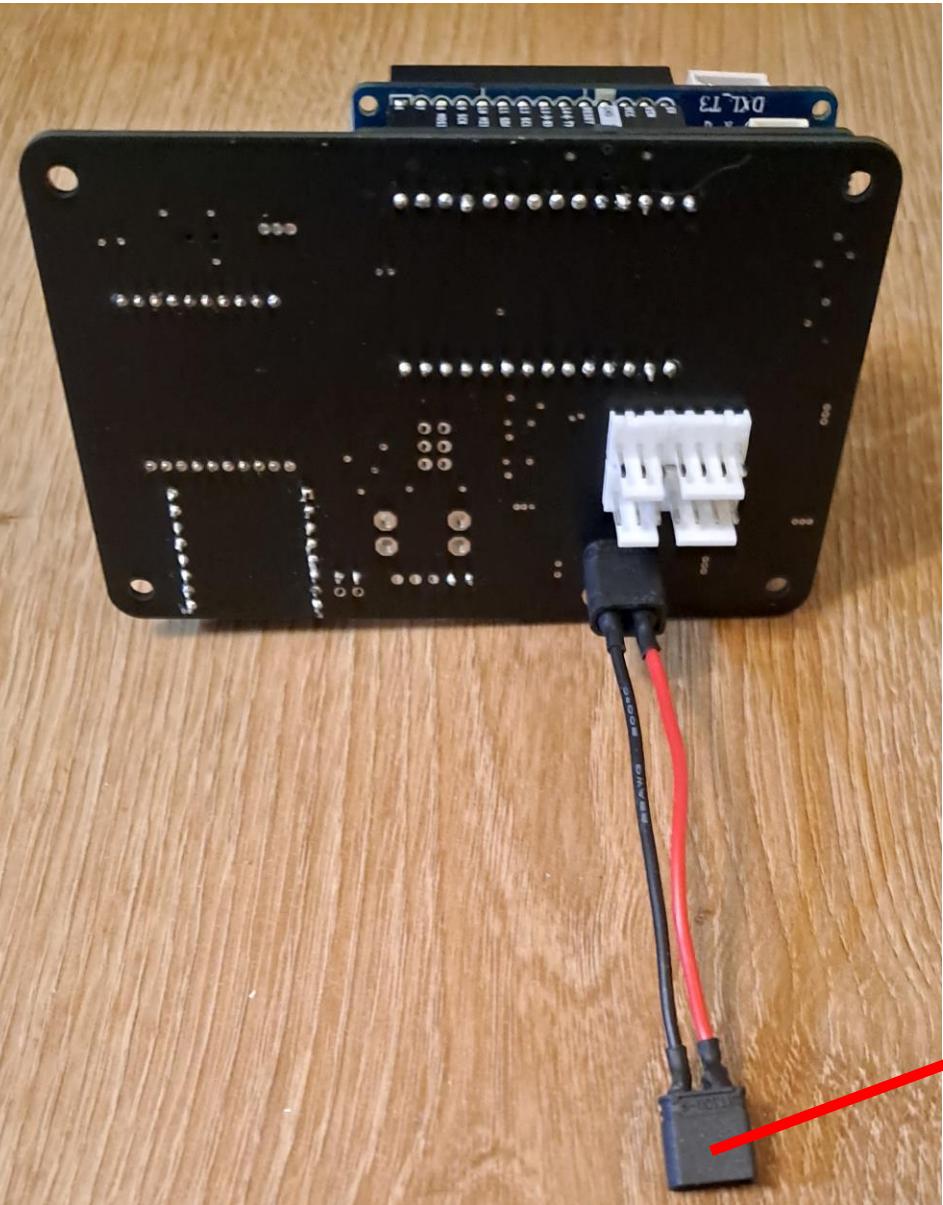


- DC 12V
- 12000RPM
- Hydraulic
- 2PIN-XH2.54

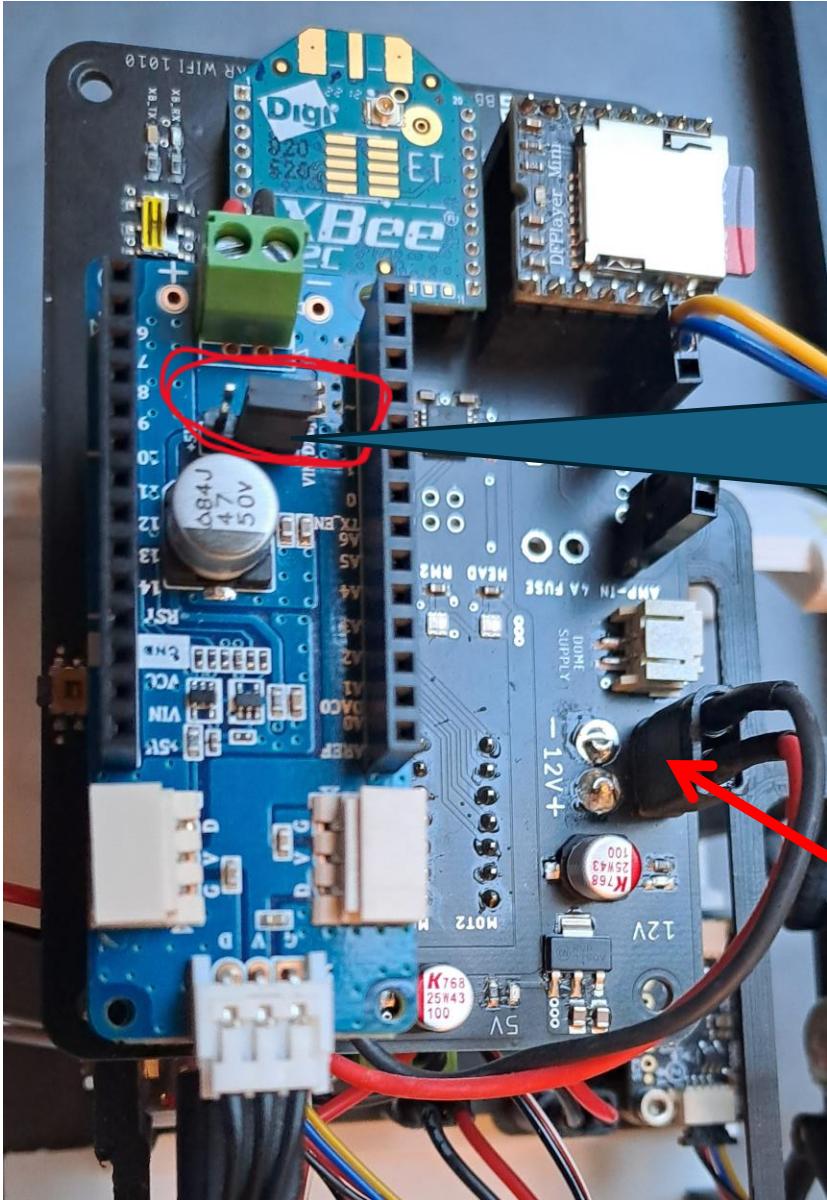
SIZE	VOLTAGE	BEARING	CURRENT	SPEED	CONNECTOR
20x20x6mm	12V	Hydraulic	0.1A	12000RPM	2PIN-XH2.54

AIR FLOW	NOISE	AIR PRESSURE	CABLE LENGTH	WEIGHT	LIFE
0.33CFM	28.8dBA	0.41InH <sub>2</sub> O	15cm	4G/PCS	40000hrs





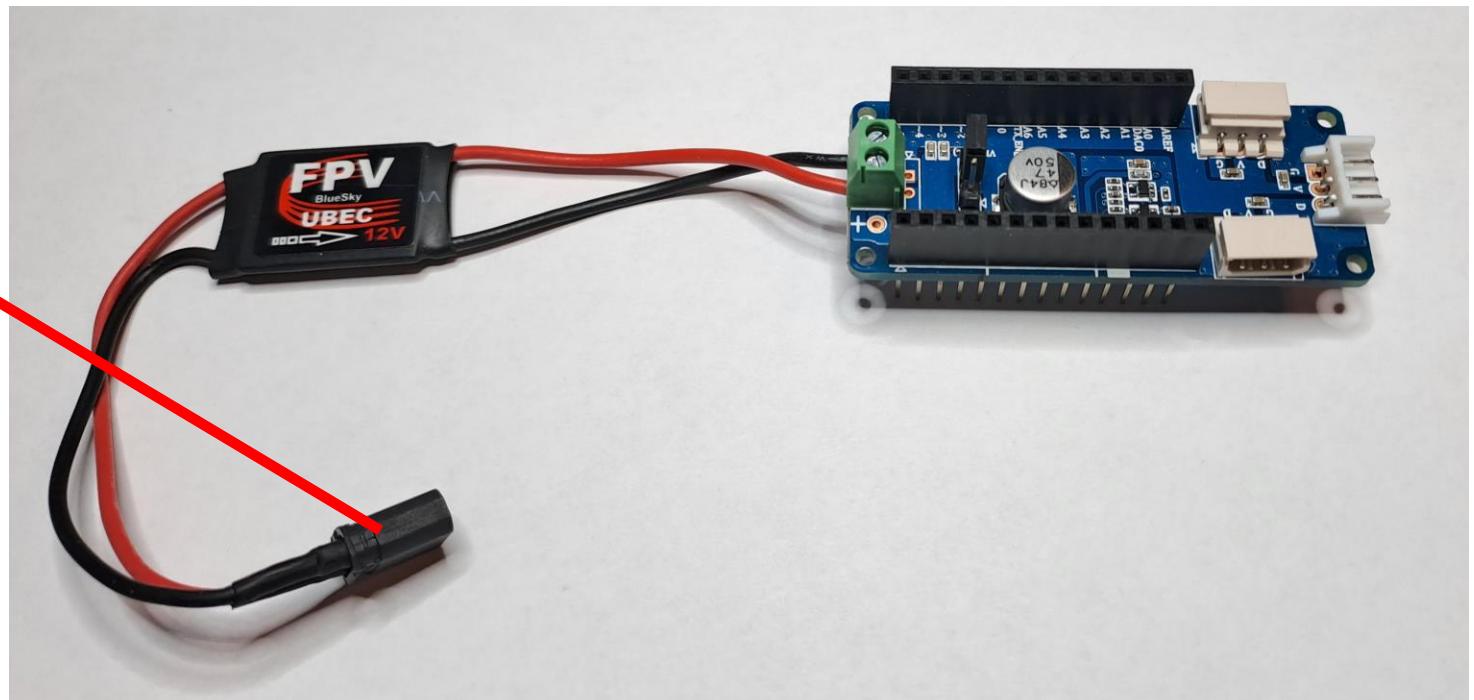
All XT-30 connectors are unregulated ~13 – 17volt from the batteries.  
You can use **any** XT-30 connector to power the main board.

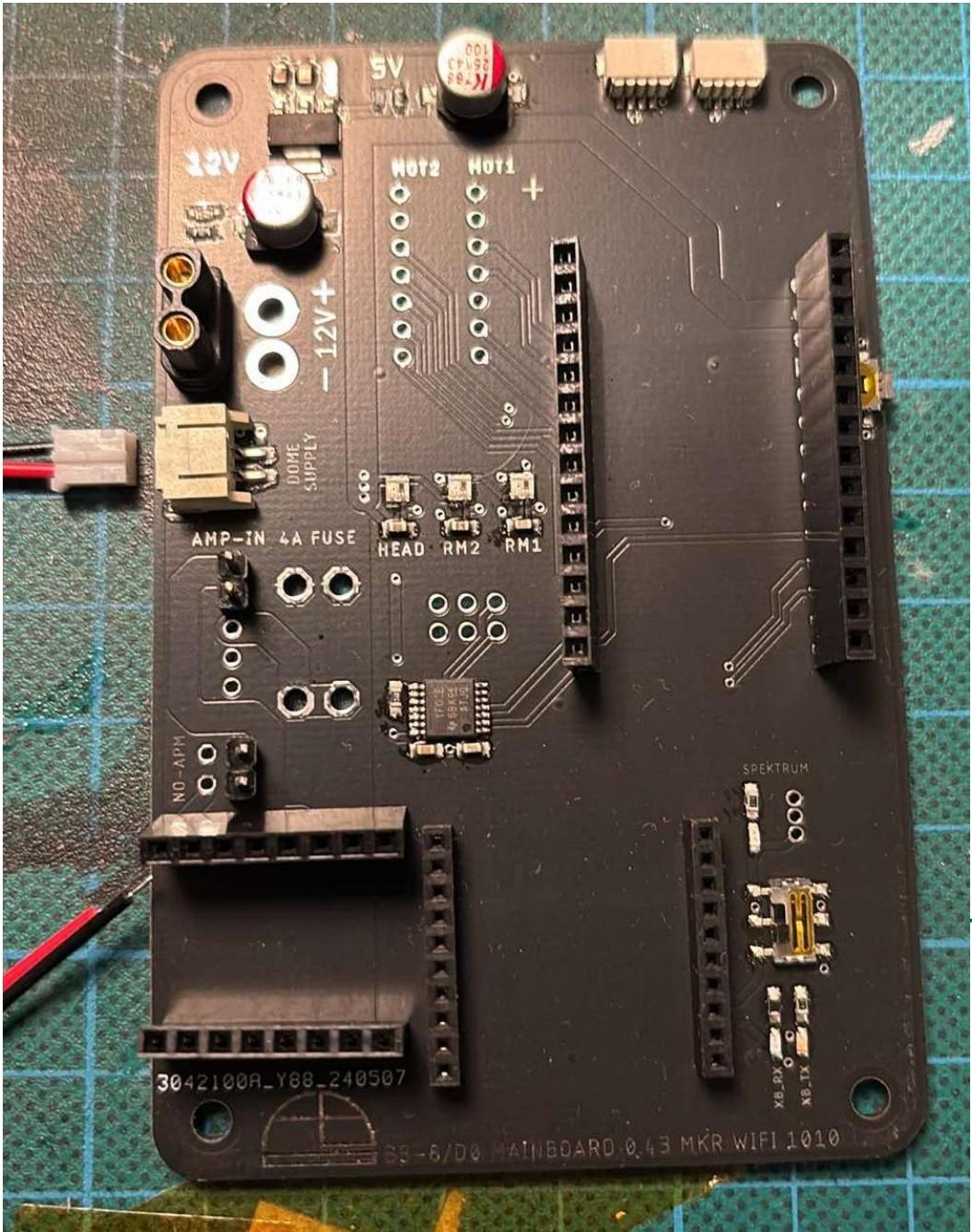


Use the "VIN" position to power the servos.

**ATTENTION**

Make sure you connect the Dynamixel Shield through the 12v DC DC converter, not directly!

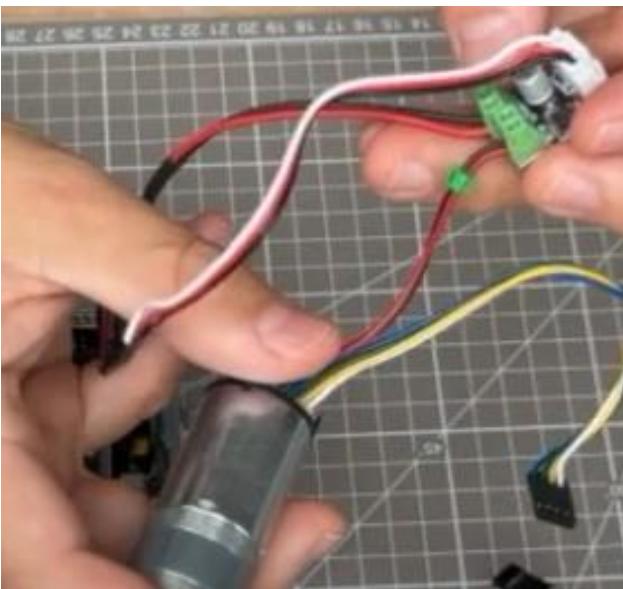




Main board

Towards the 1 LED is for  
Spektrum.

Towards the 2 LED's is  
for Xbee.

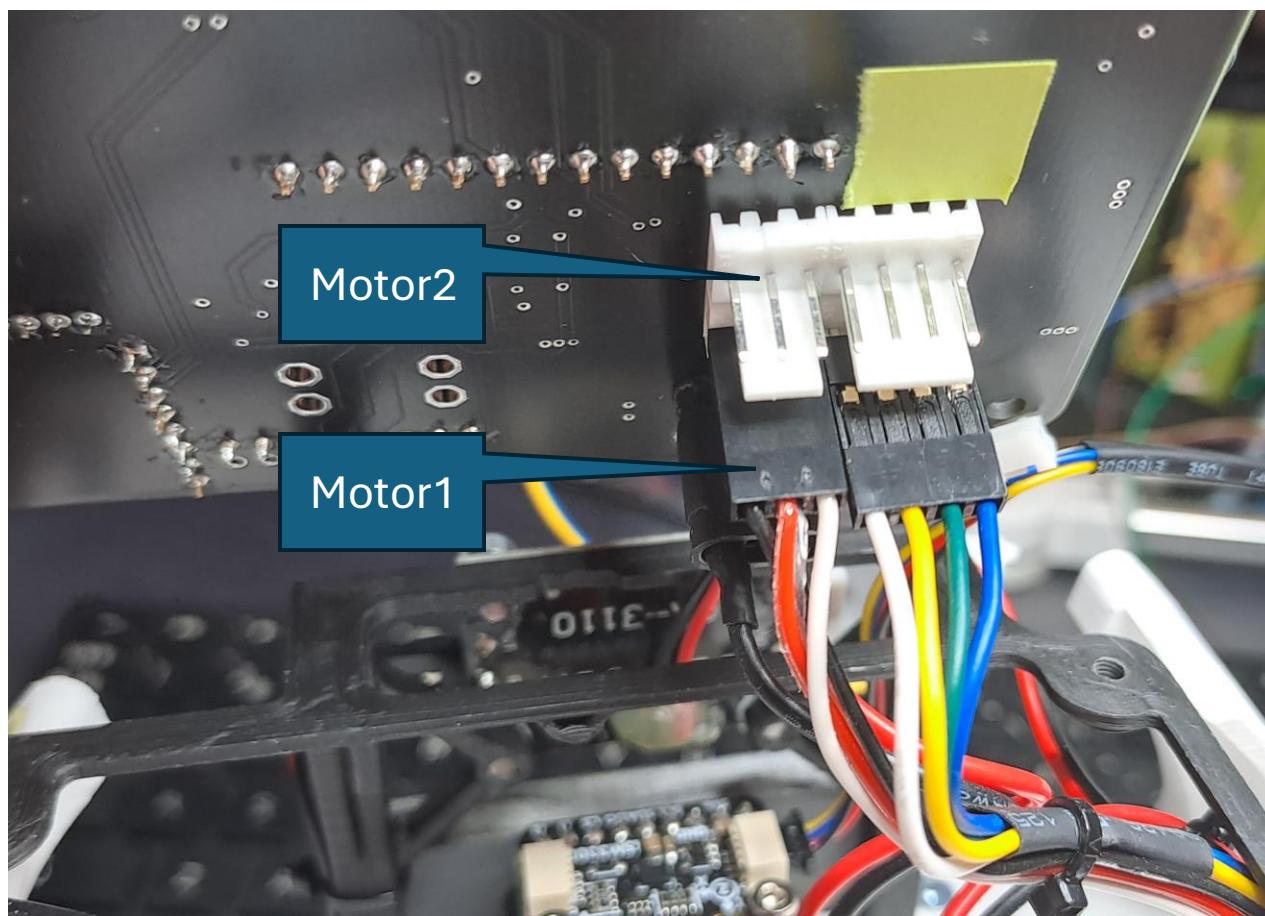


20.4:1 Metal Gearmotor 25Dx65L mm MP 12V with 48 CPR Encoder

Pololu item #: 4863



Main board



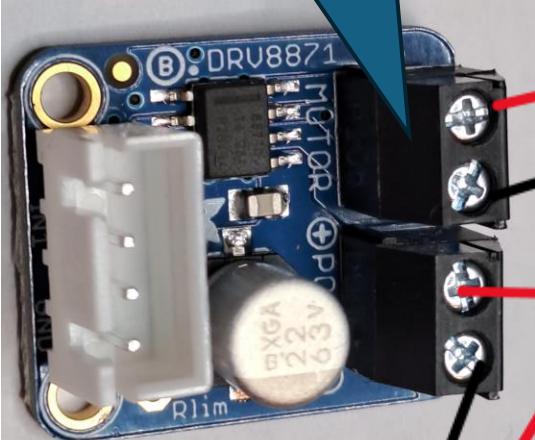
From left to right:

Black, red and white are new wires from the motor controller.  
White, yellow, green and blue are original wires from the Pololu motor encoder.

Same order applies for both motors.

Position may be changed to get the correct direction on each motor.

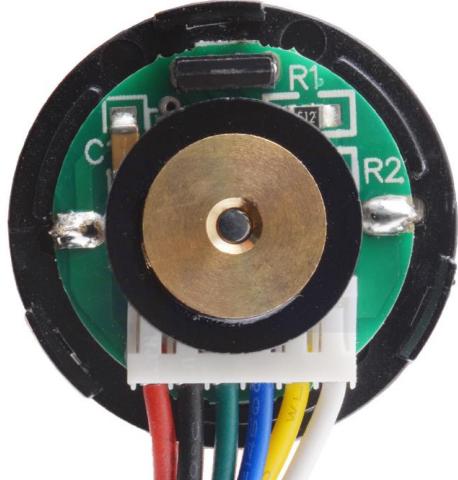
Motor controller



Power distribution board

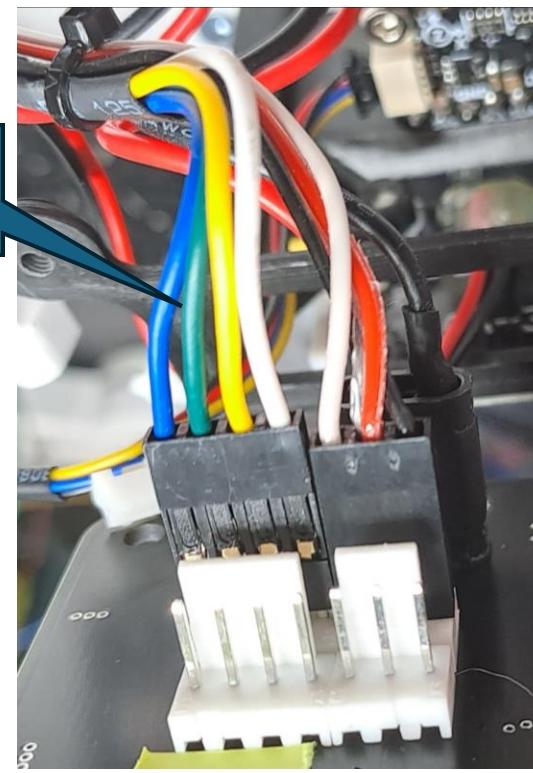


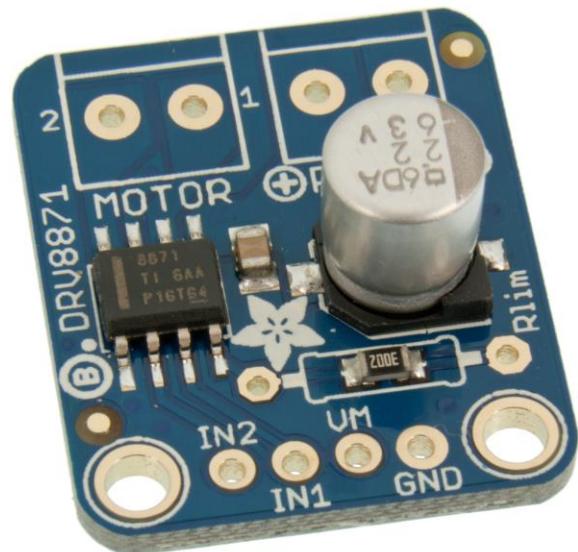
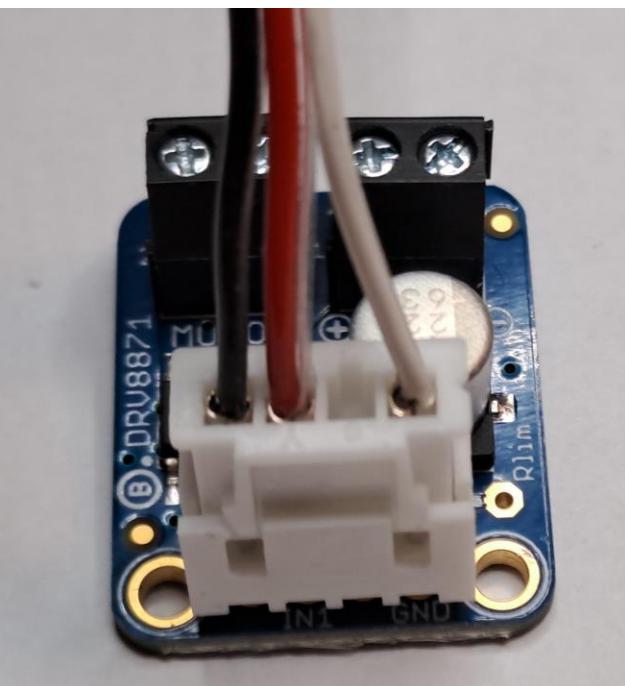
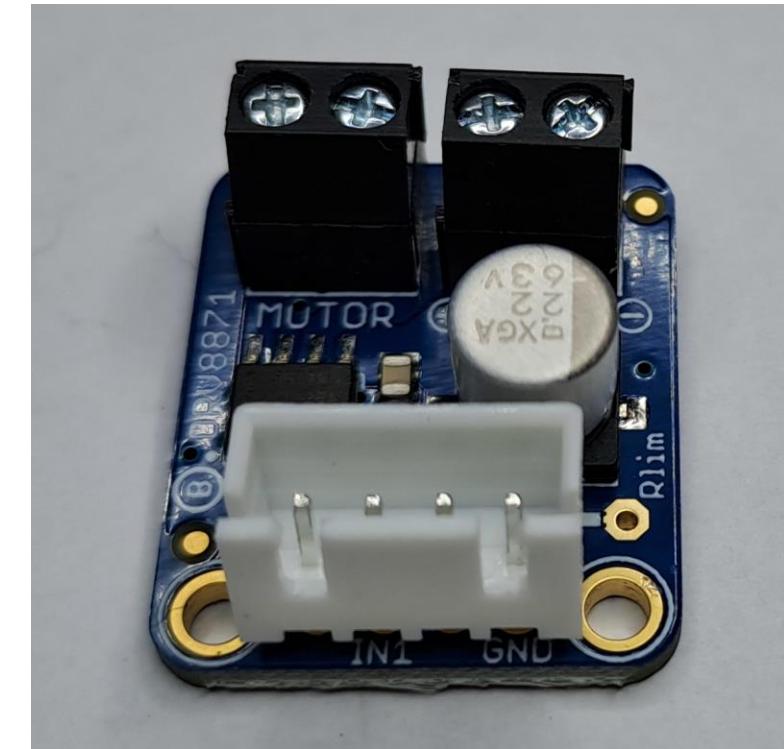
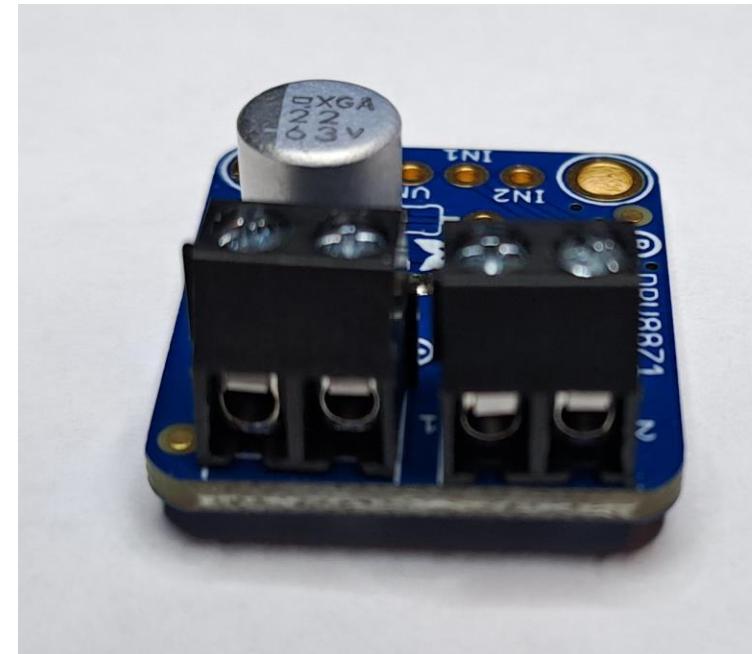
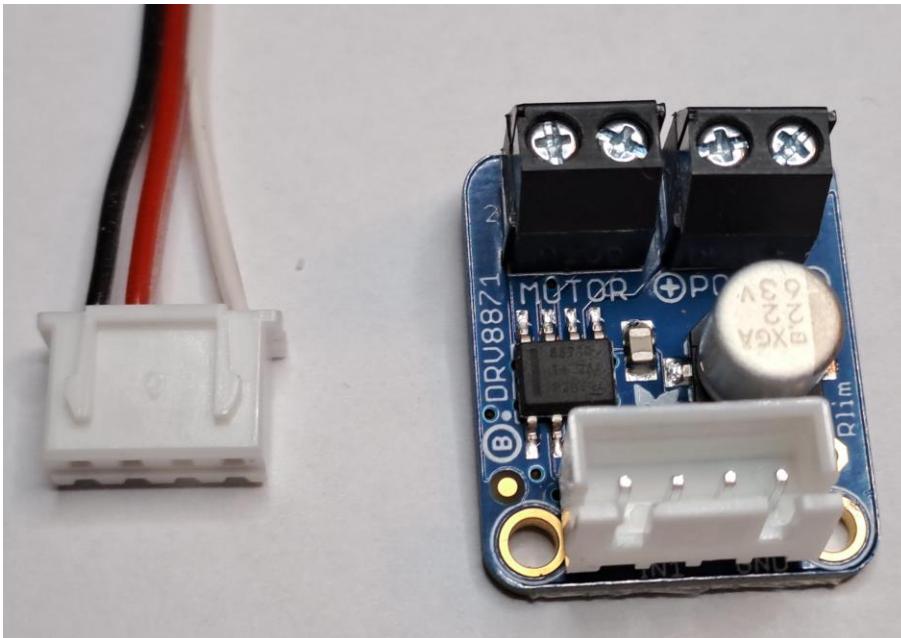
All XT-30 connectors are unregulated ~13 – 17volt from the batteries.  
You can use **any** XT-30 connector to power the motor controllers.



Yes, blue and green should be shifted like this.

Main board





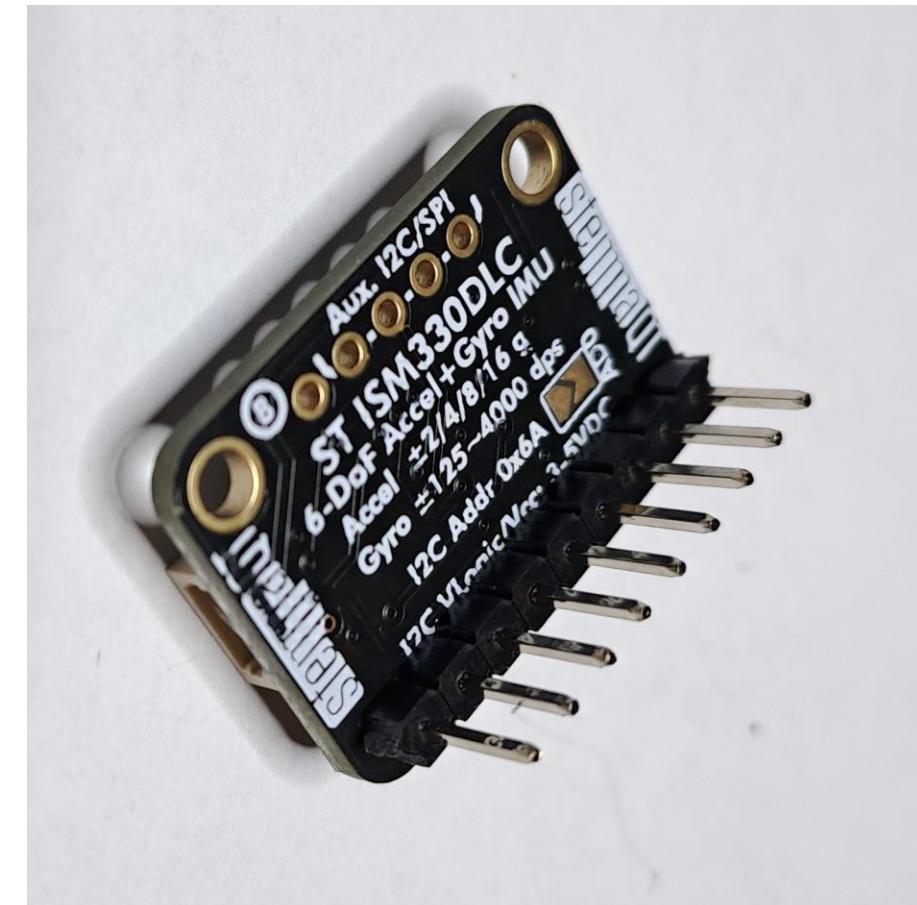
Adafruit DRV8871 DC Motor Driver  
Breakout Board - 3.6A Max  
Product ID: 3190

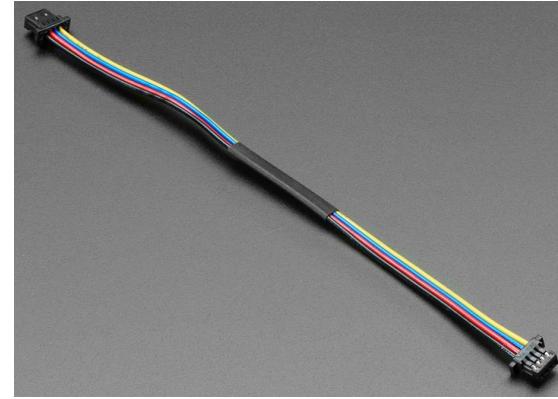
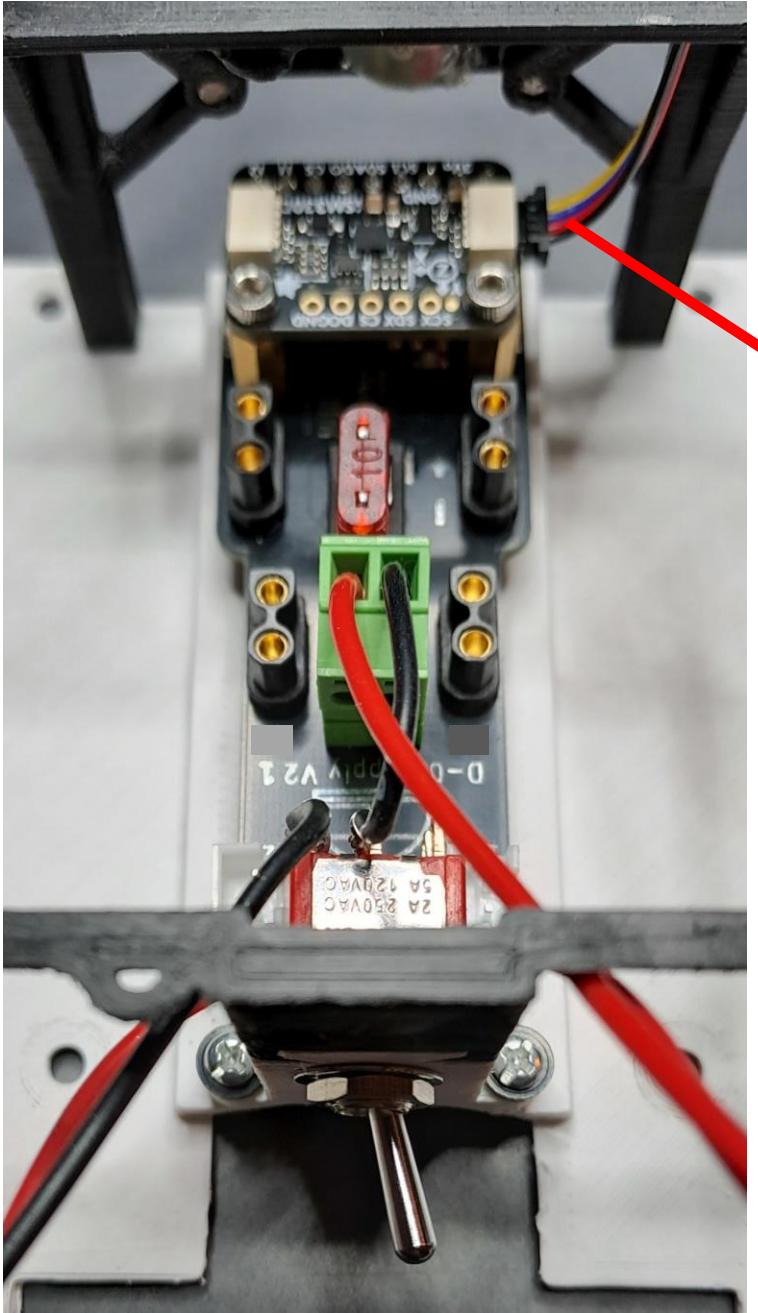




Adafruit  
ISM330DHCX  
6DoF IMU

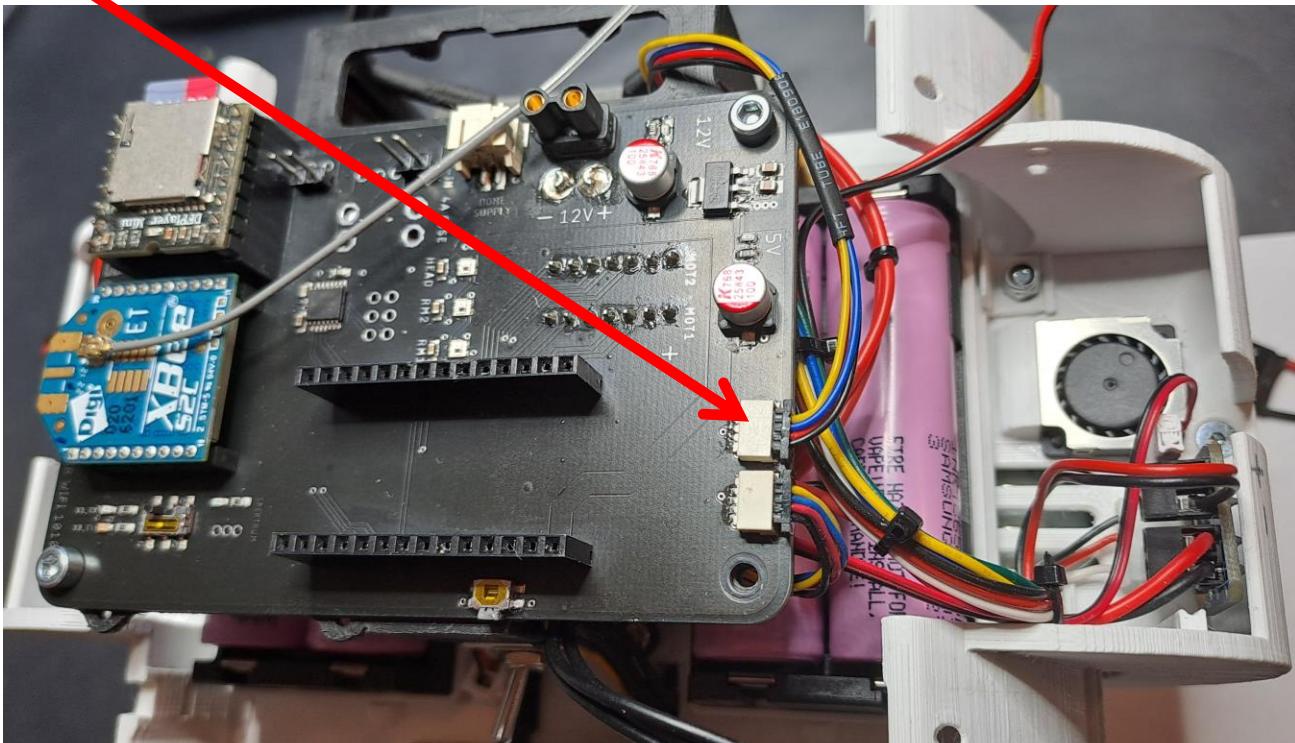
You don't need to solder the upper row of pins.  
They are not used.



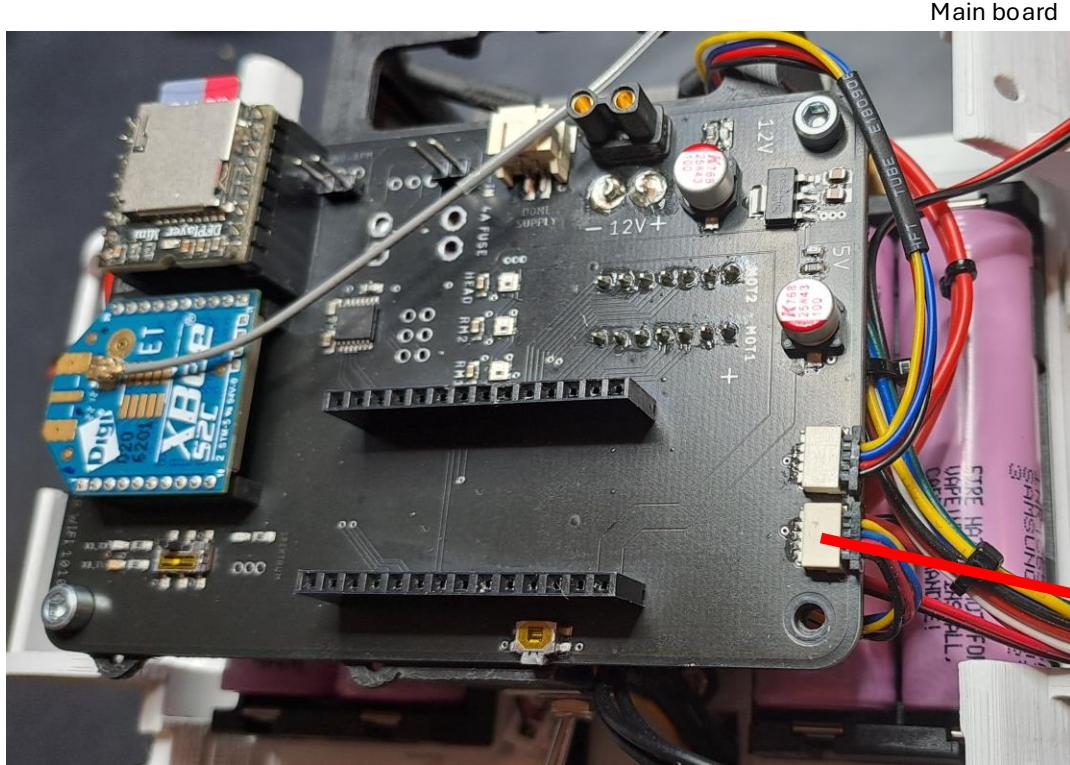


STEMMA QT / Qwiic  
JST SH 4-pin Cable -  
100mm Long

Product ID: 4210



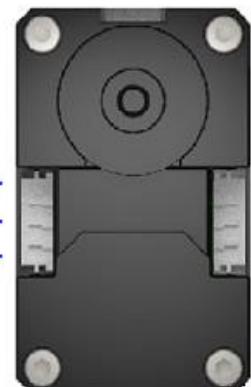
Main board



I2C - From the main board down through the main bar and to the neck connector. (preferably 30 cm). You will solder one end of this cable to the male neck connector (right picture) and you need to cut off one of the cable connectors for this.

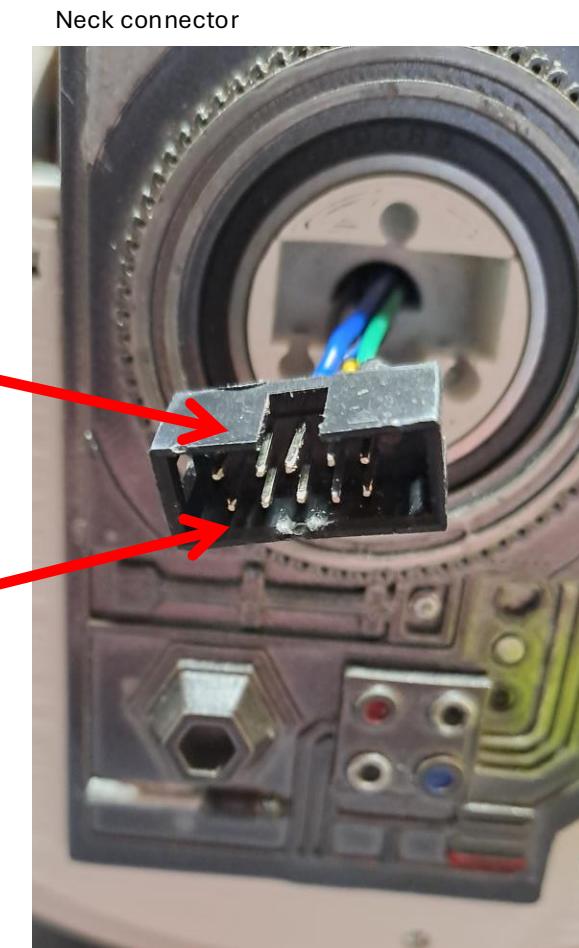
**ROBOTIS** e-Manual

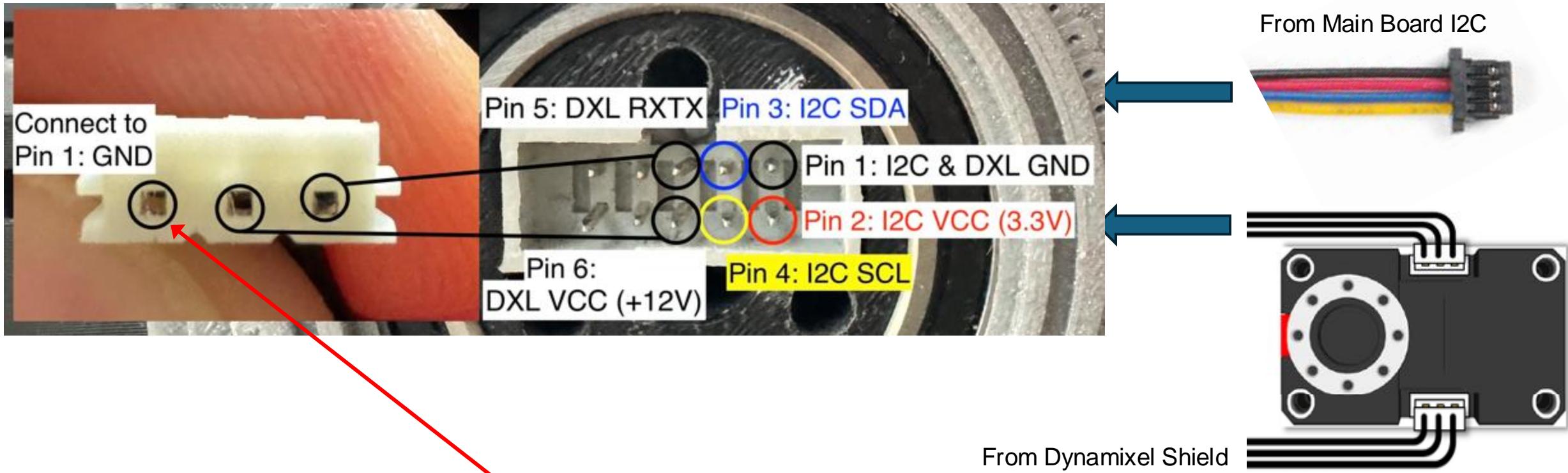
[XL430-W250-T](#)



PIN1 : GND ←  
PIN2 : VDD ←  
PIN3 : Data ←

→ PIN3 : Data  
→ PIN2 : VDD  
→ PIN1 : GND



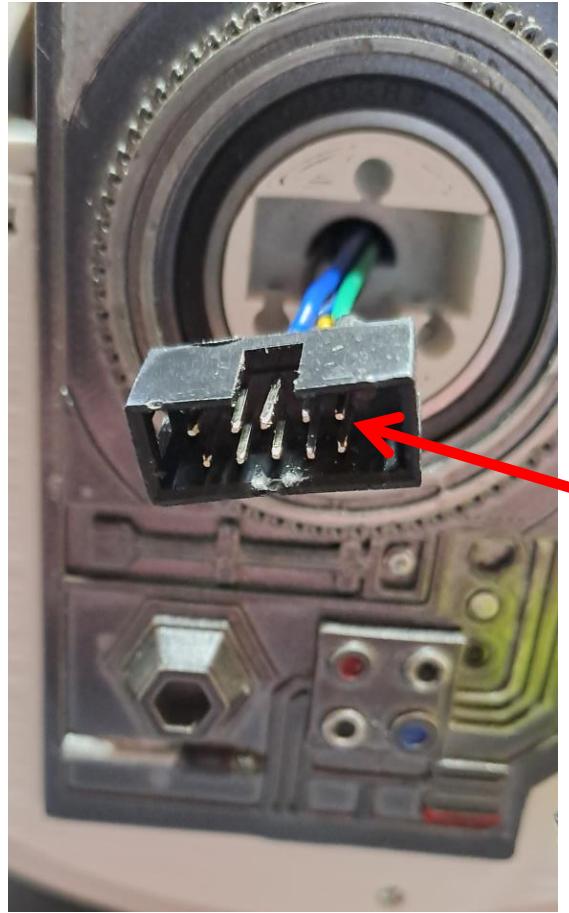


Connect **both** the GND from the Dynamixel cable (leftmost here) and from the i2c cable (black) to pin 1.

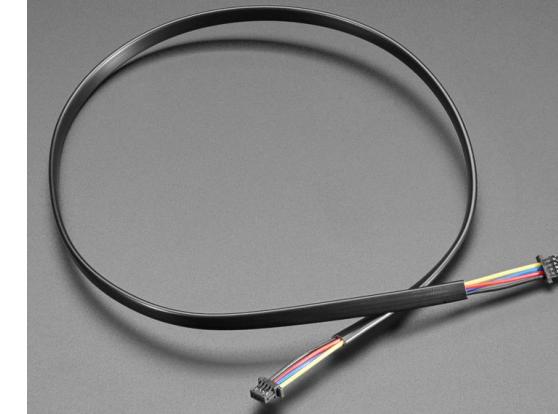
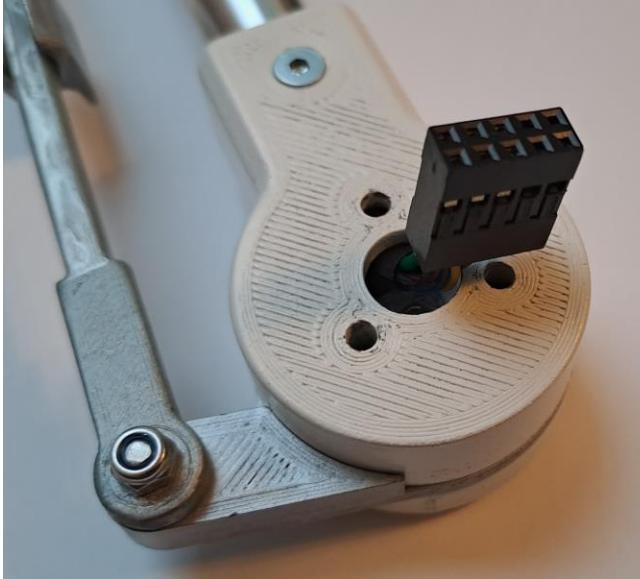
Connect the red, yellow, and blue cables from the i2c cable to pin 2, 3, 4 as shown.

Dynamixel center cable to pin 6 and the last remaining Dynamixel cable to pin 5.

# DROID ELECTRONICS (NECK AND HEAD)

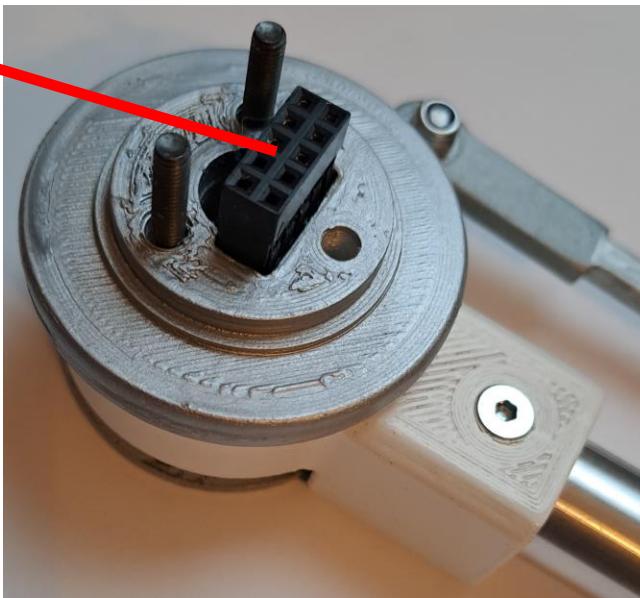


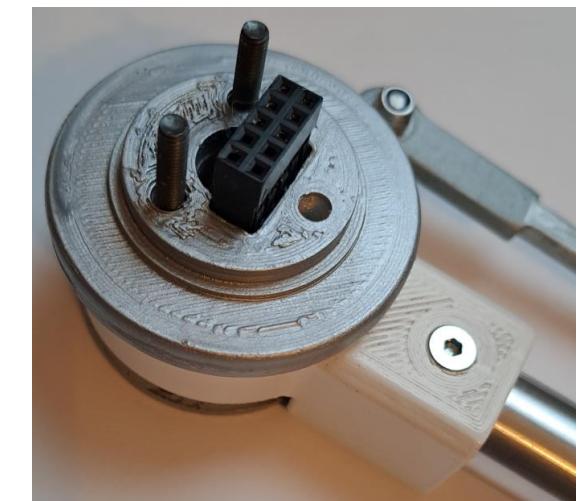
Neck connector



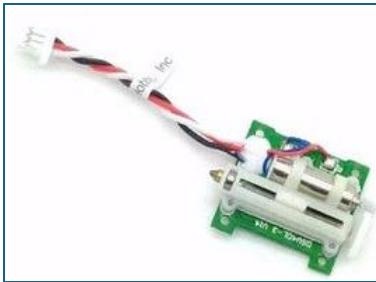
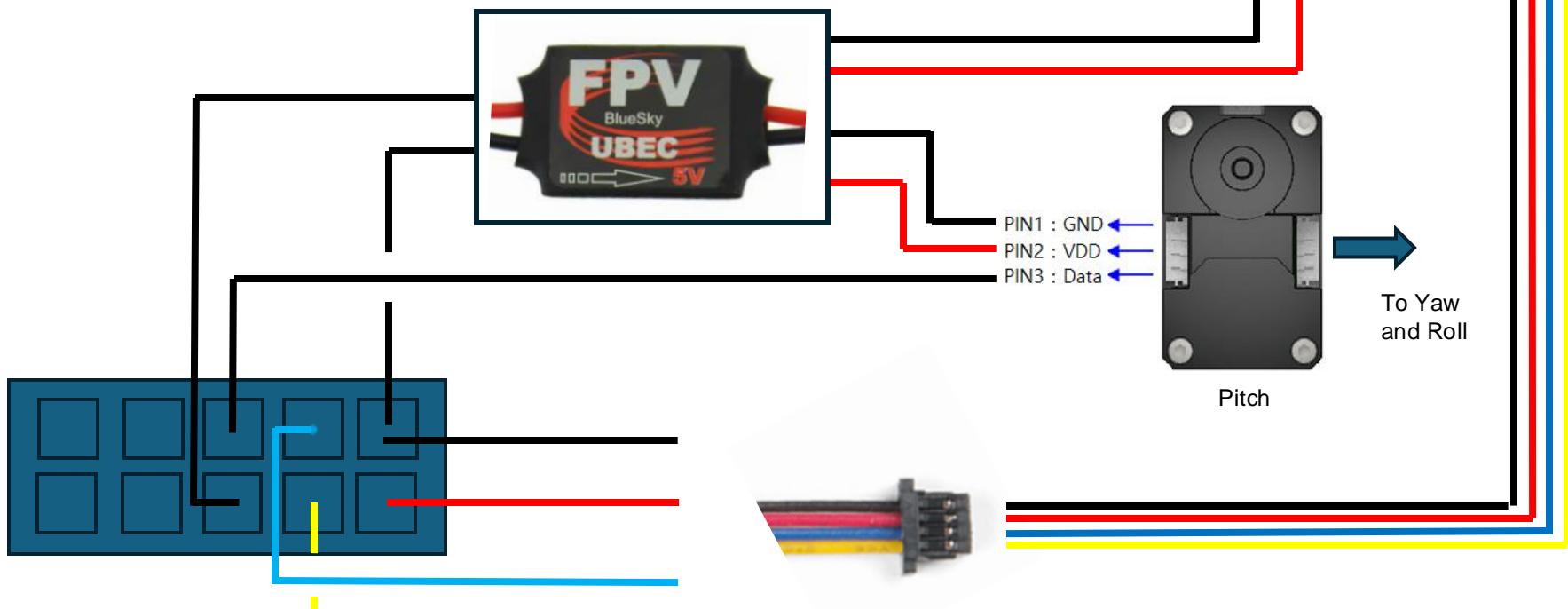
STEMMA QT / Qwiic  
JST SH 4-Pin Cable -  
400mm long

Product ID: 5385

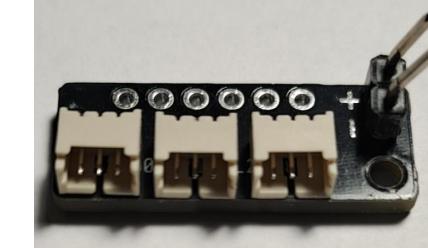
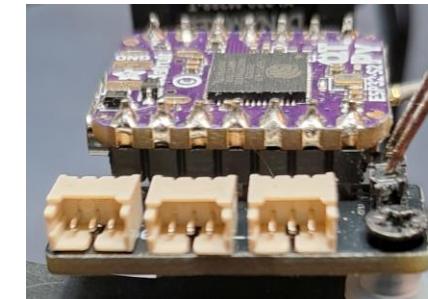




Dupont 2x8 seen from behind.



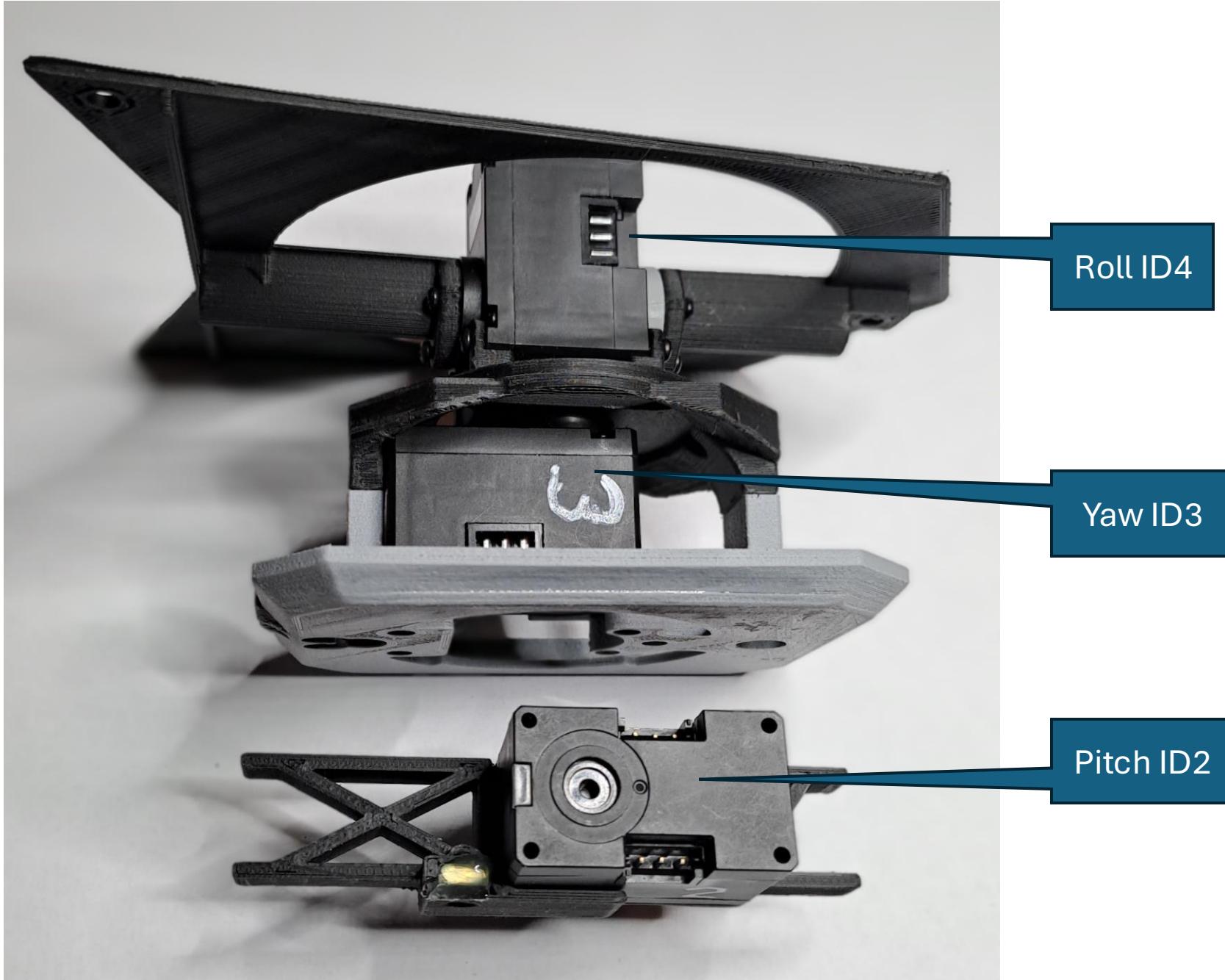
3 x Antenna servos

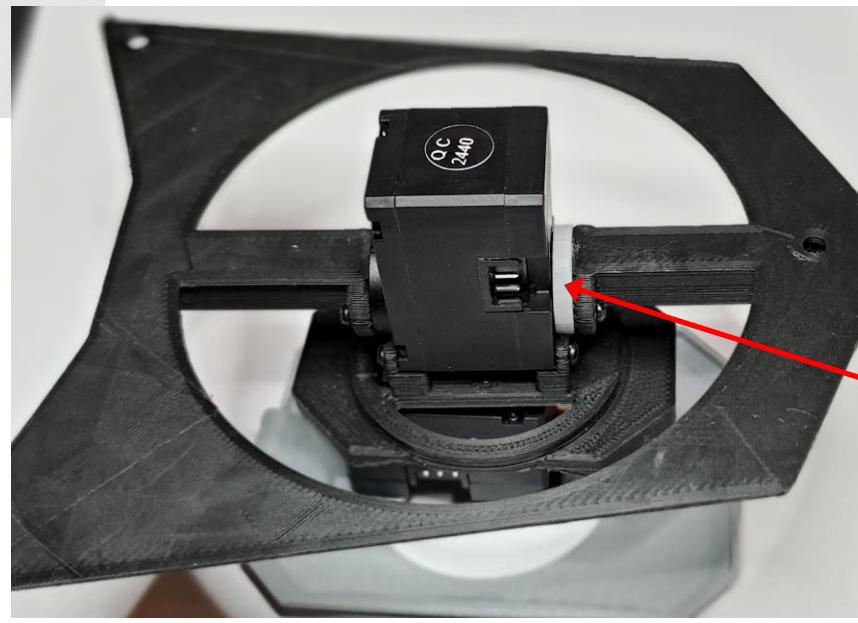
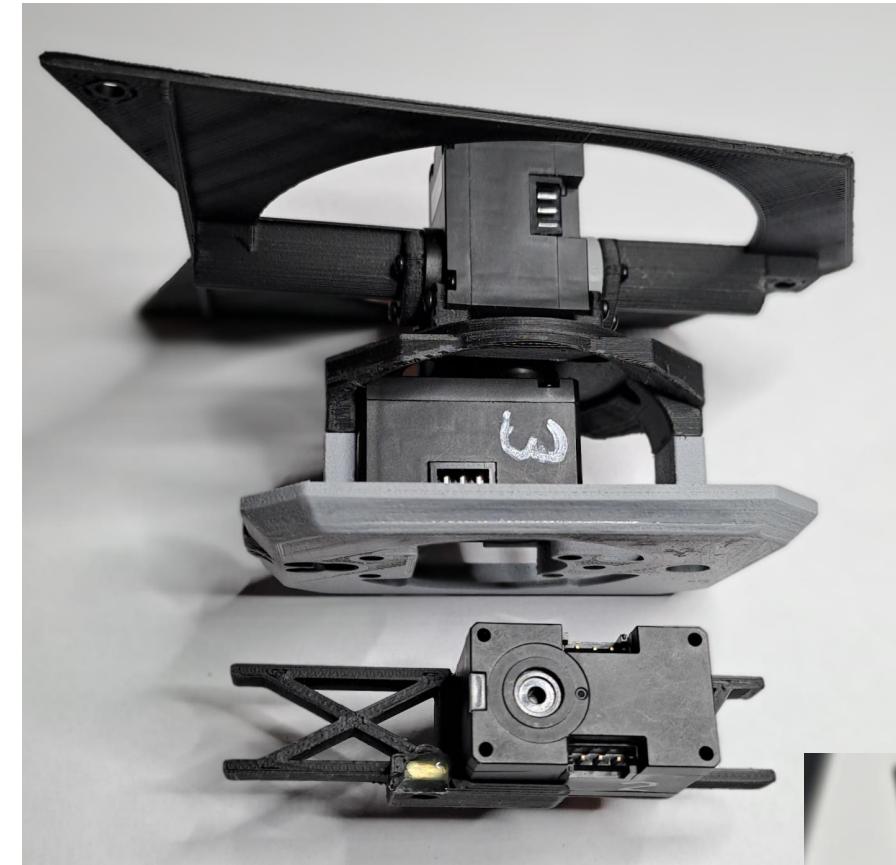


To Yaw  
and Roll

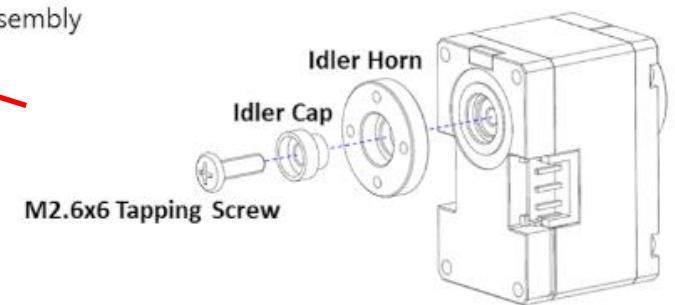
Pitch

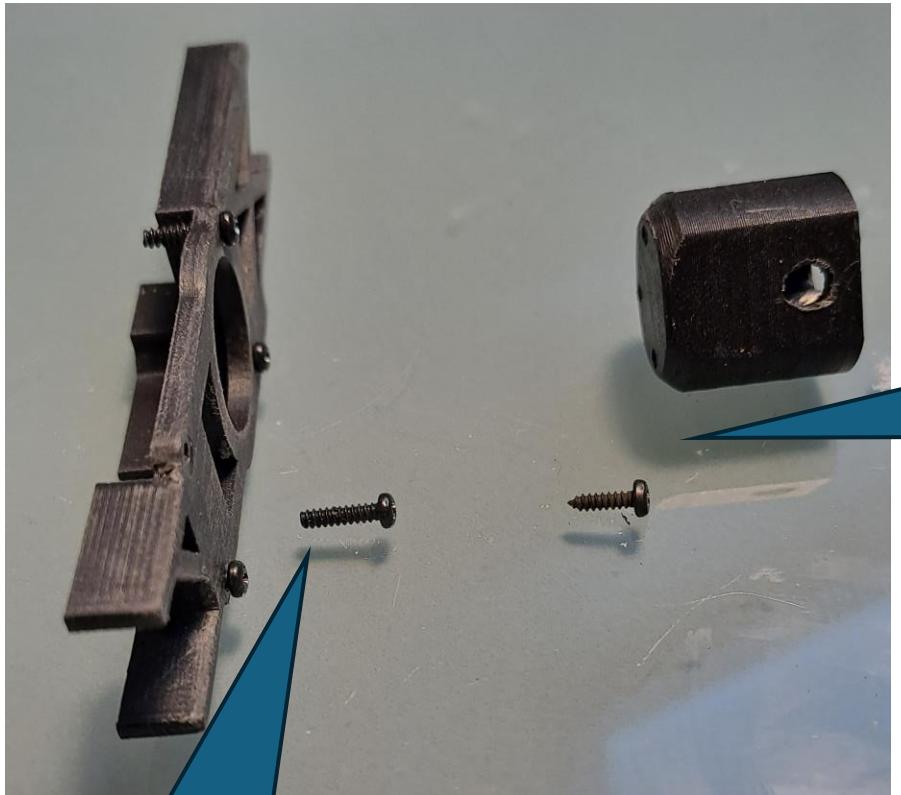
XL330-M288-T





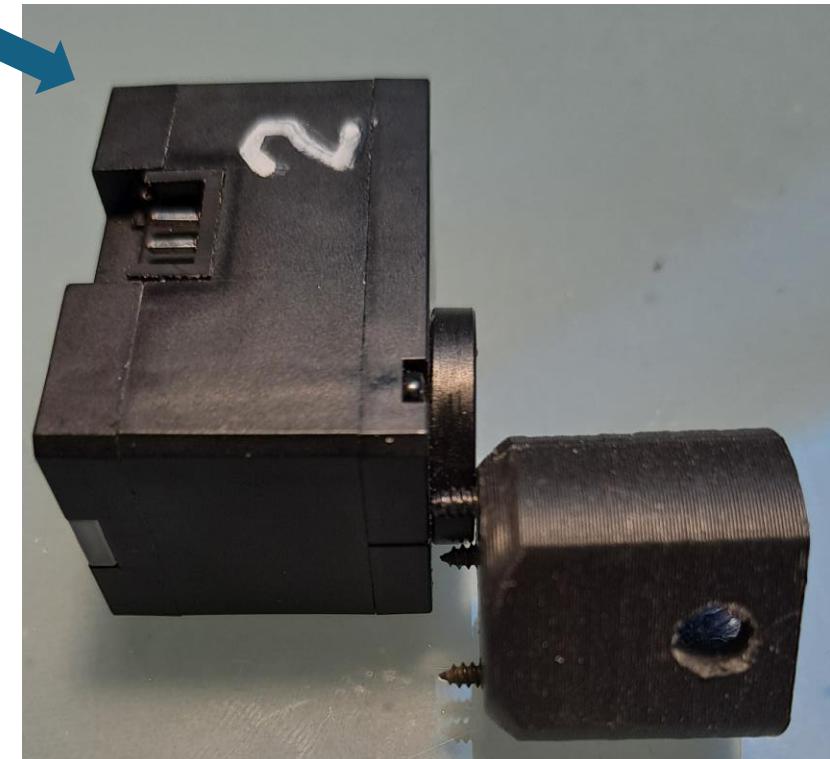
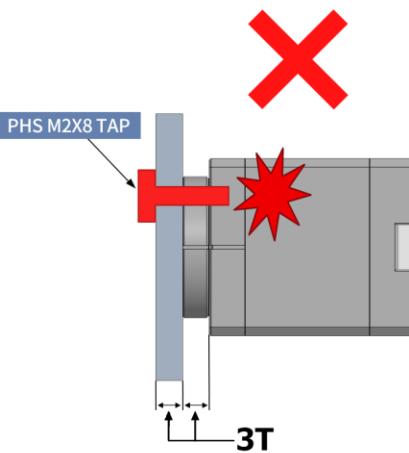
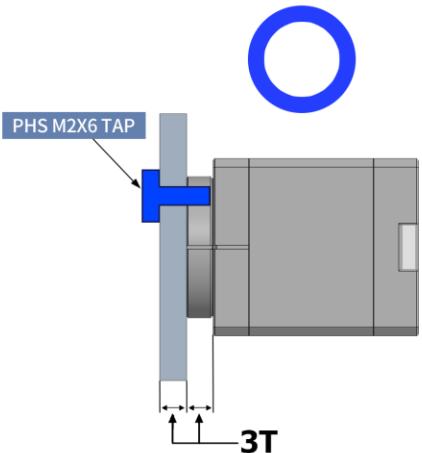
Idler Assembly

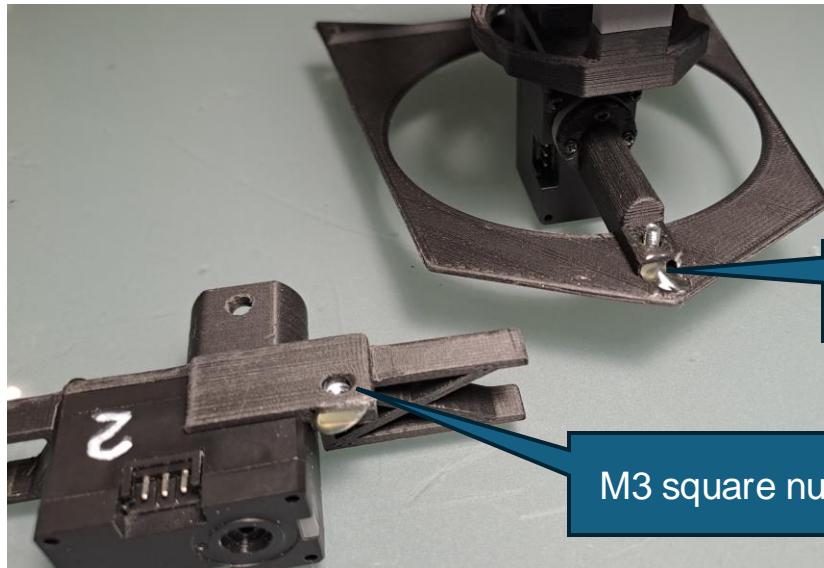
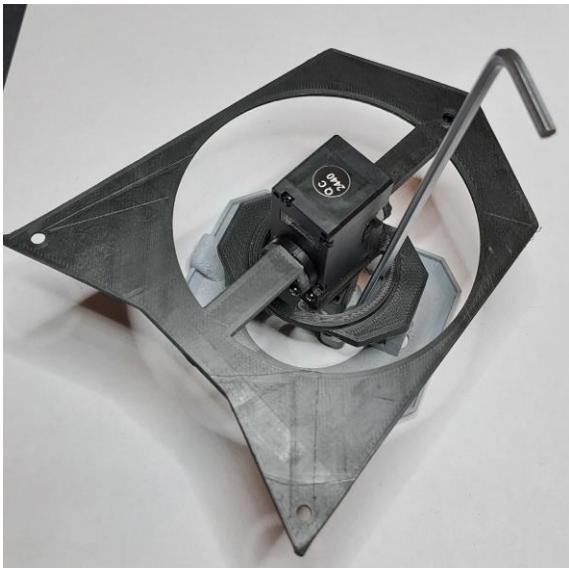
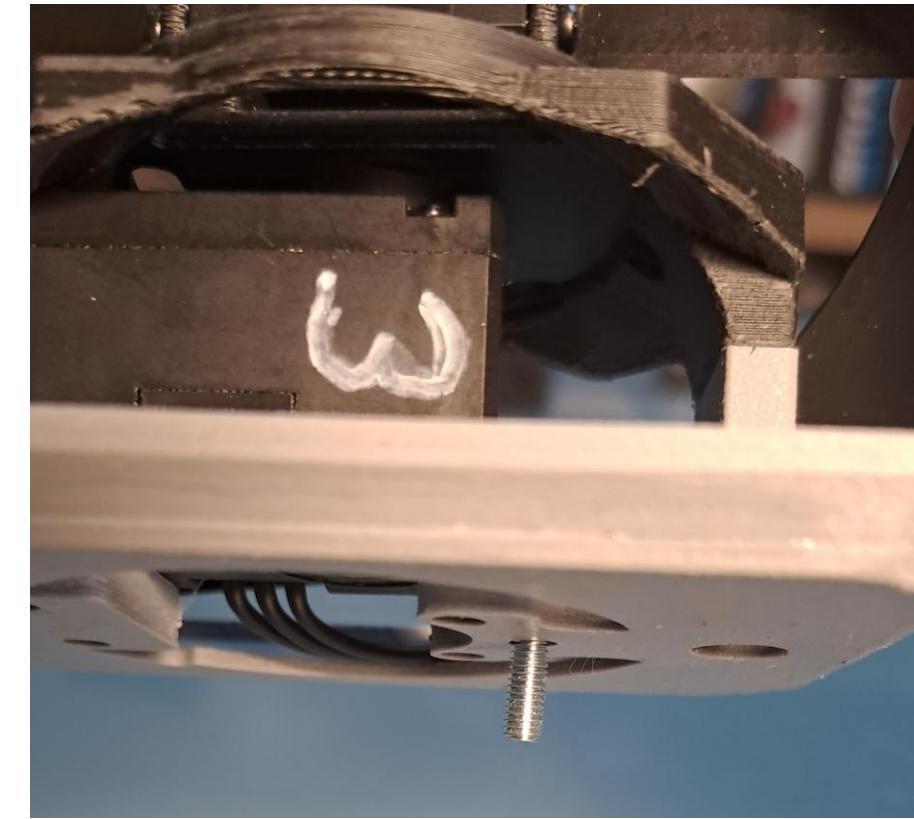
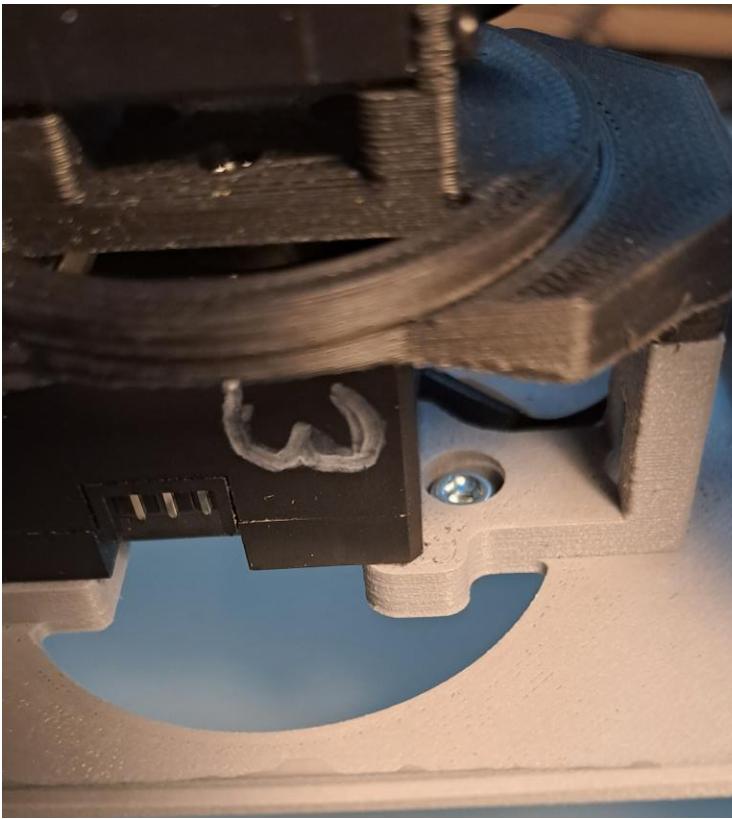




Make sure you use the short screws (from the Dynamixel servo kit) to attach the "ServoCouple Dynamixel" to the servo.

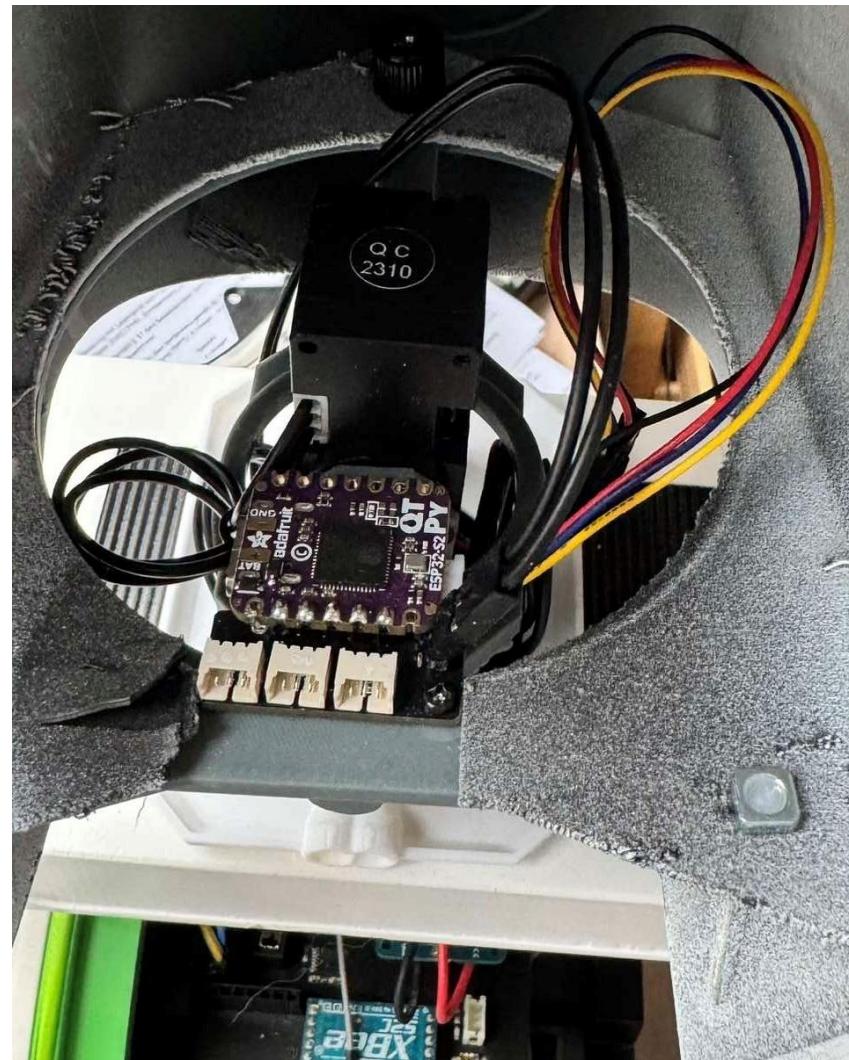
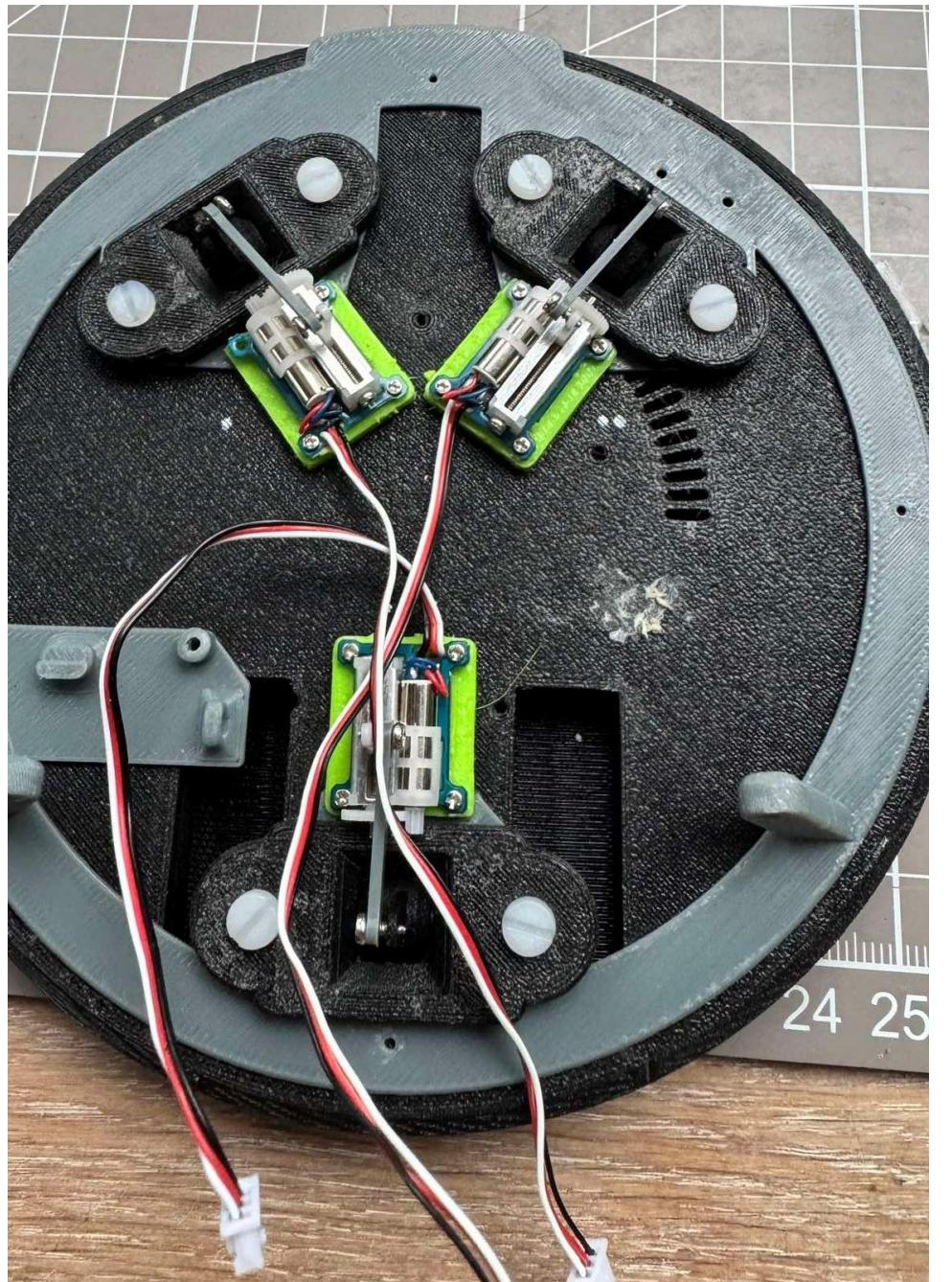
The longer screws are used to attach the servo to "HeadFrame Dynamixel"

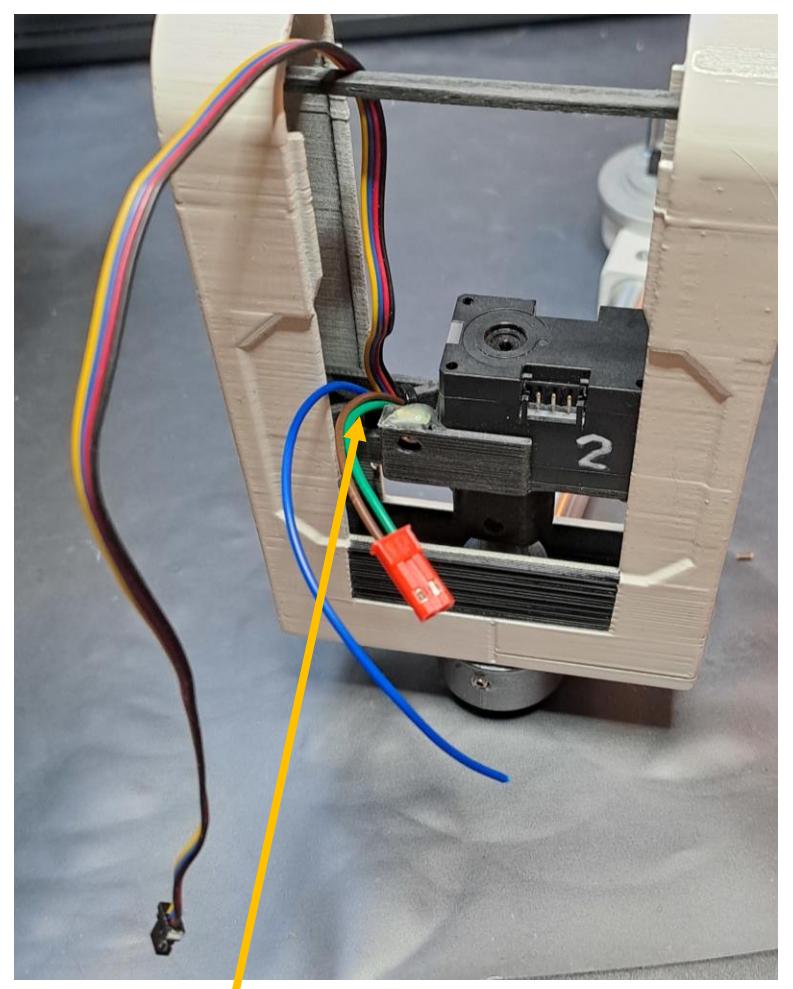




M3 square nut

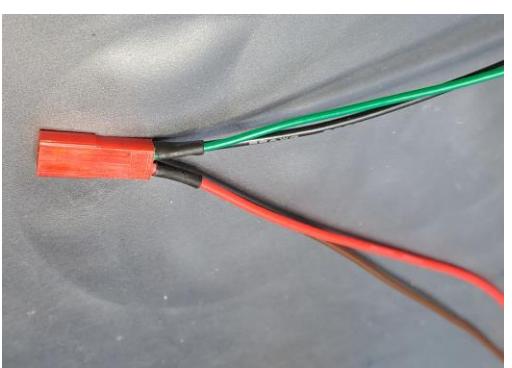
M3 square nut



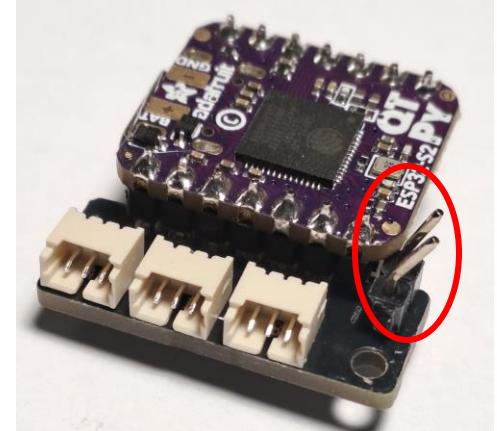
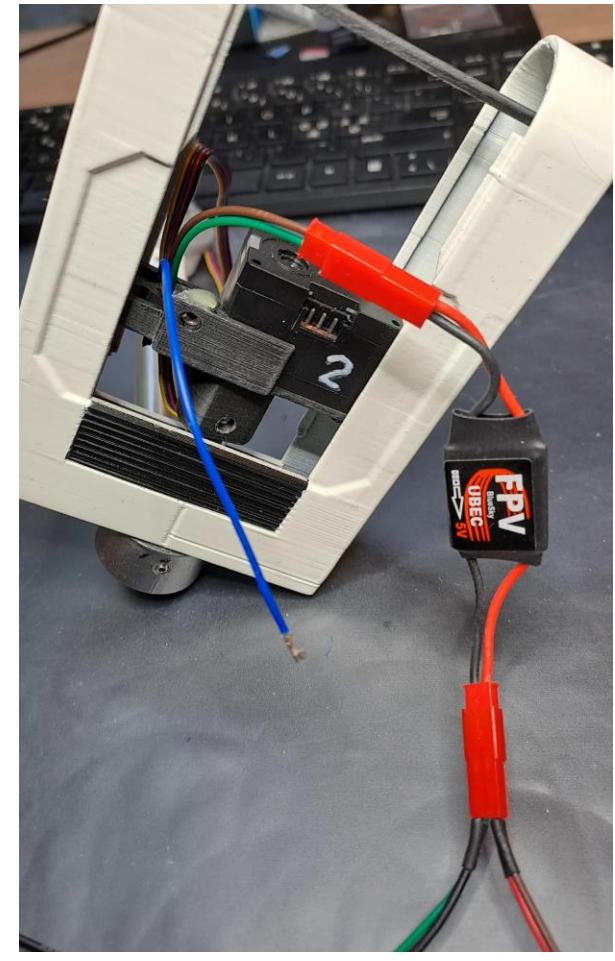
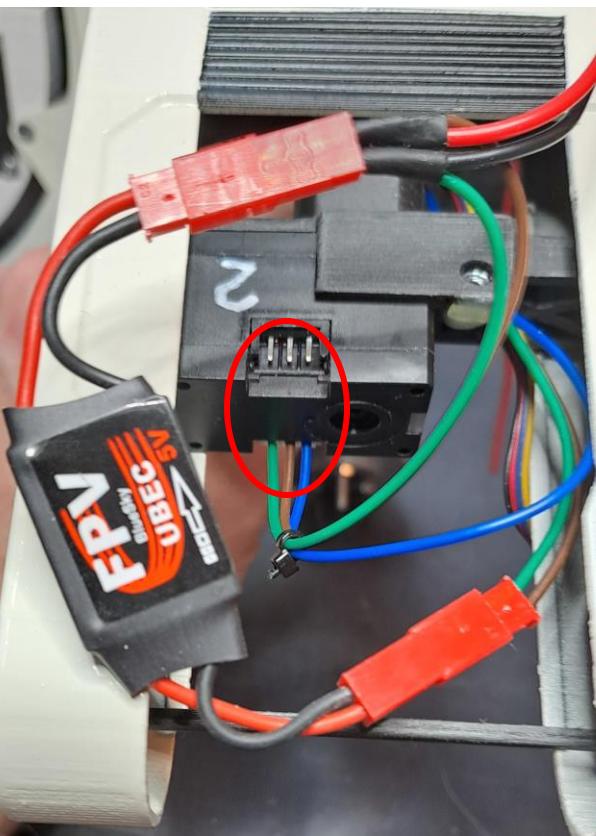


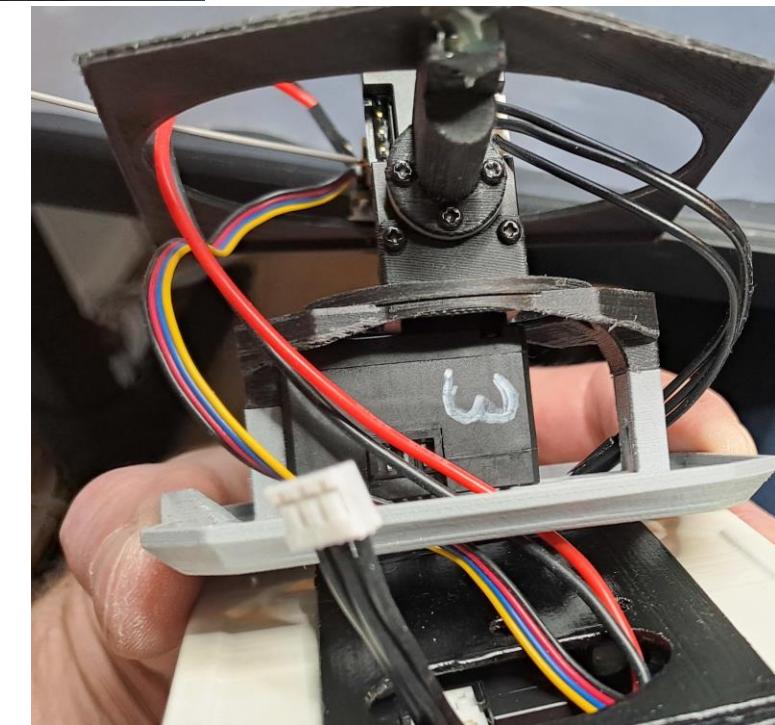
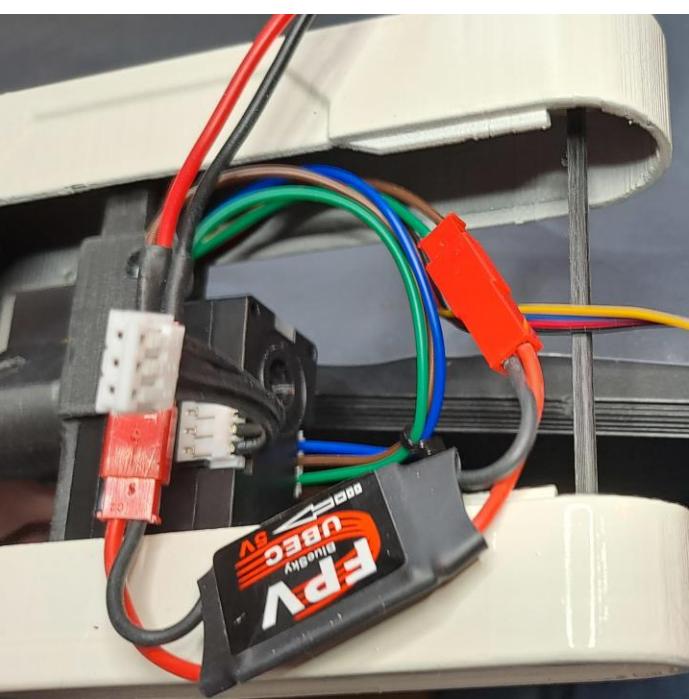
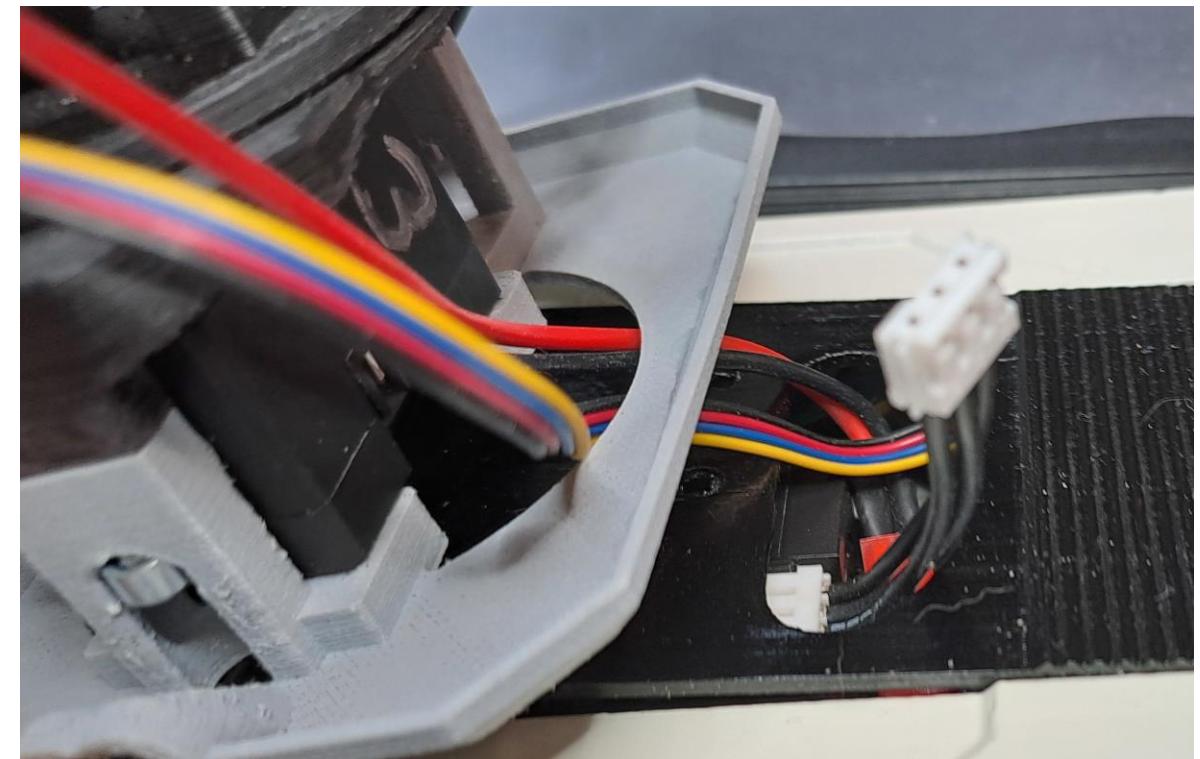
This is an example how to ensure the correct connection from the main body servo up to the head.

If you have the possibility to crimp the Dynamixel contacts you can use different colored cables instead of the 3 black cables as supplied standard from Dynamixel.

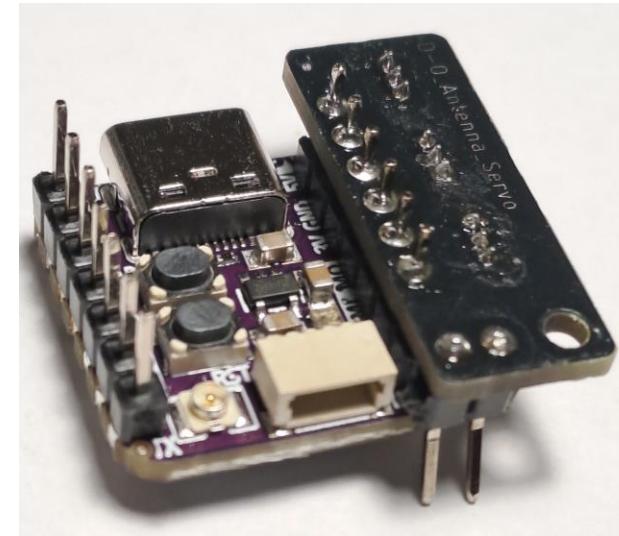
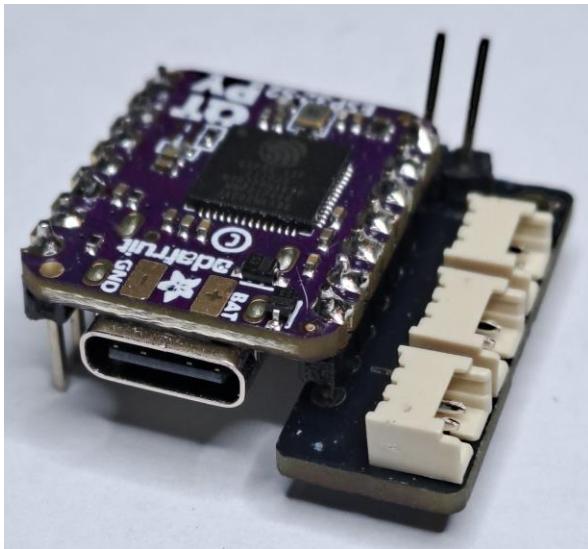
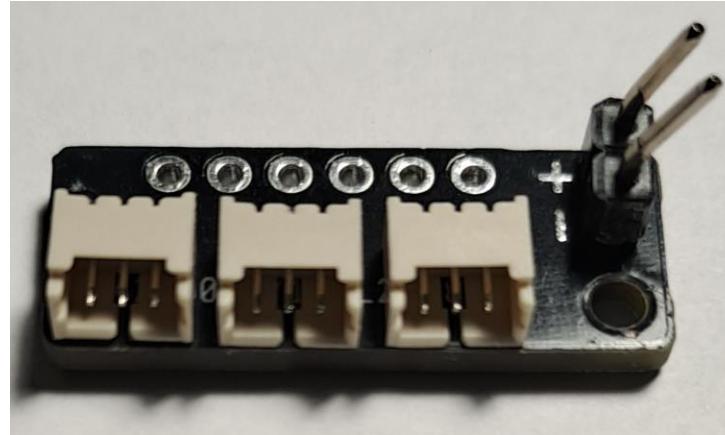
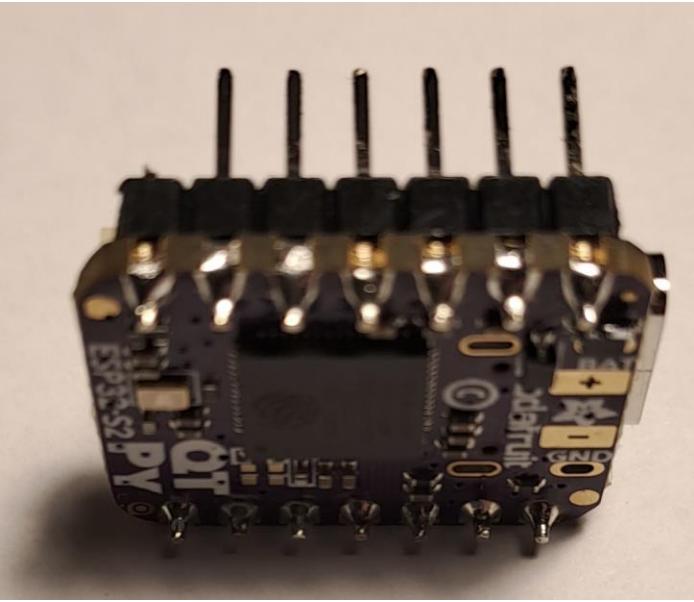


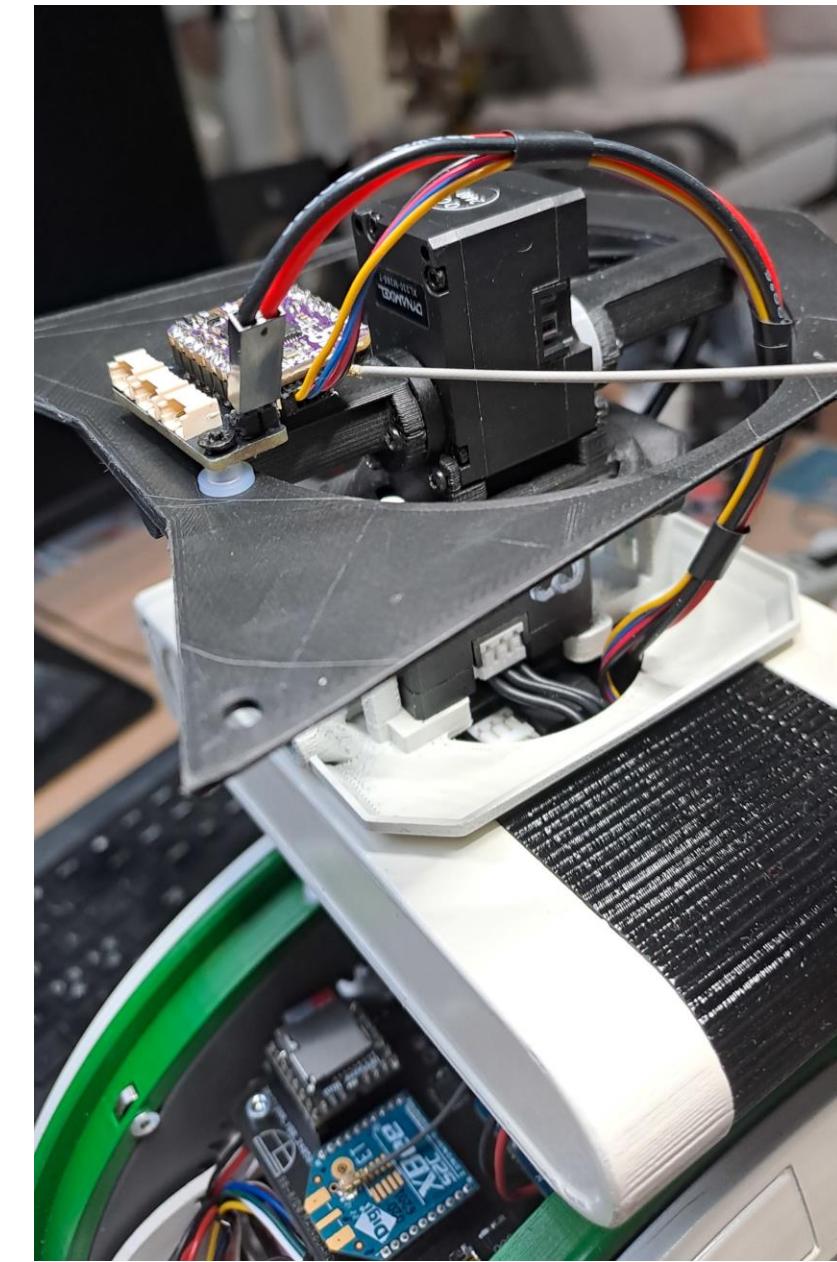
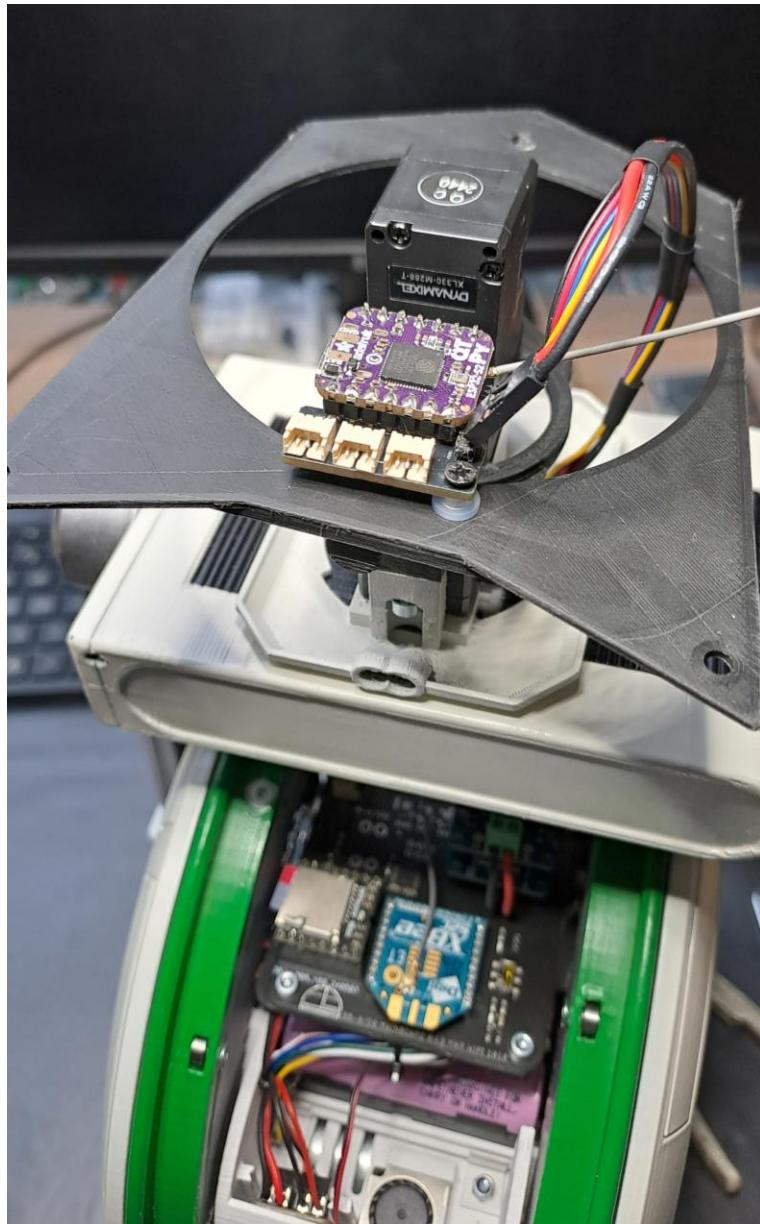
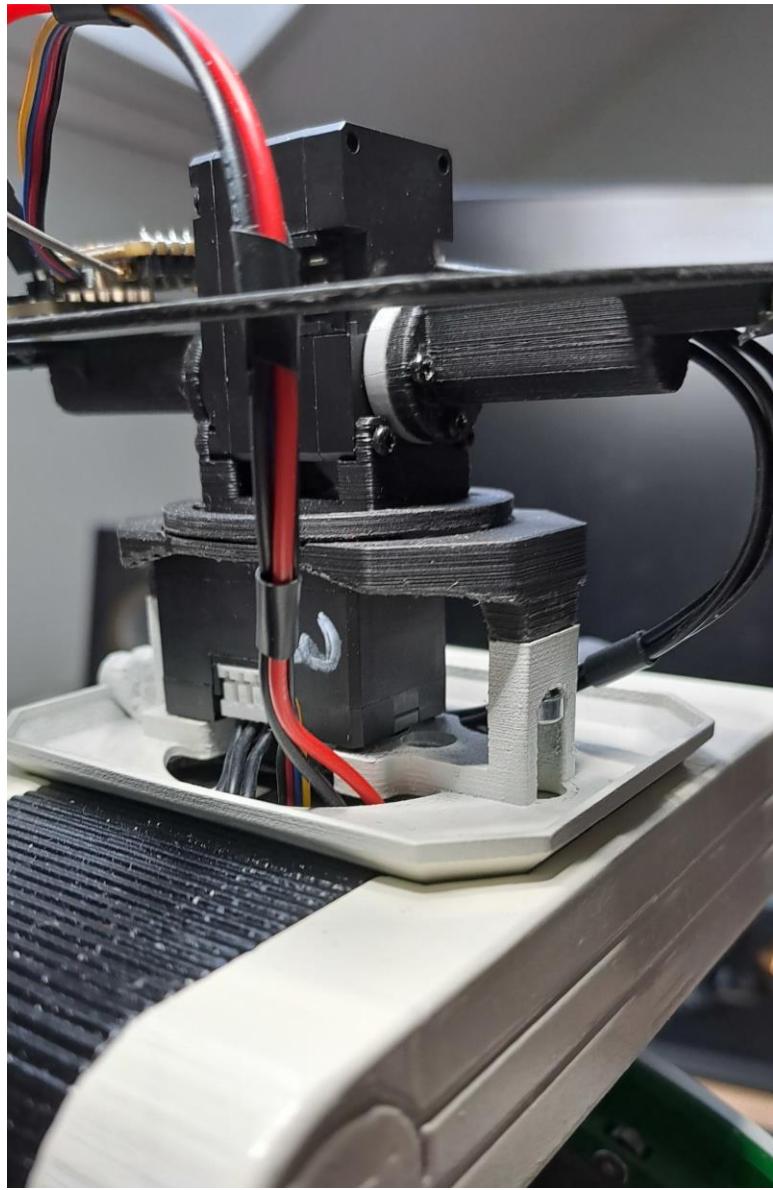
Split the 5v and GND from the UBEC. One pair goes to the Pitch Dynamixel servo and the second pair to the PCB soldered onto the QT PY.





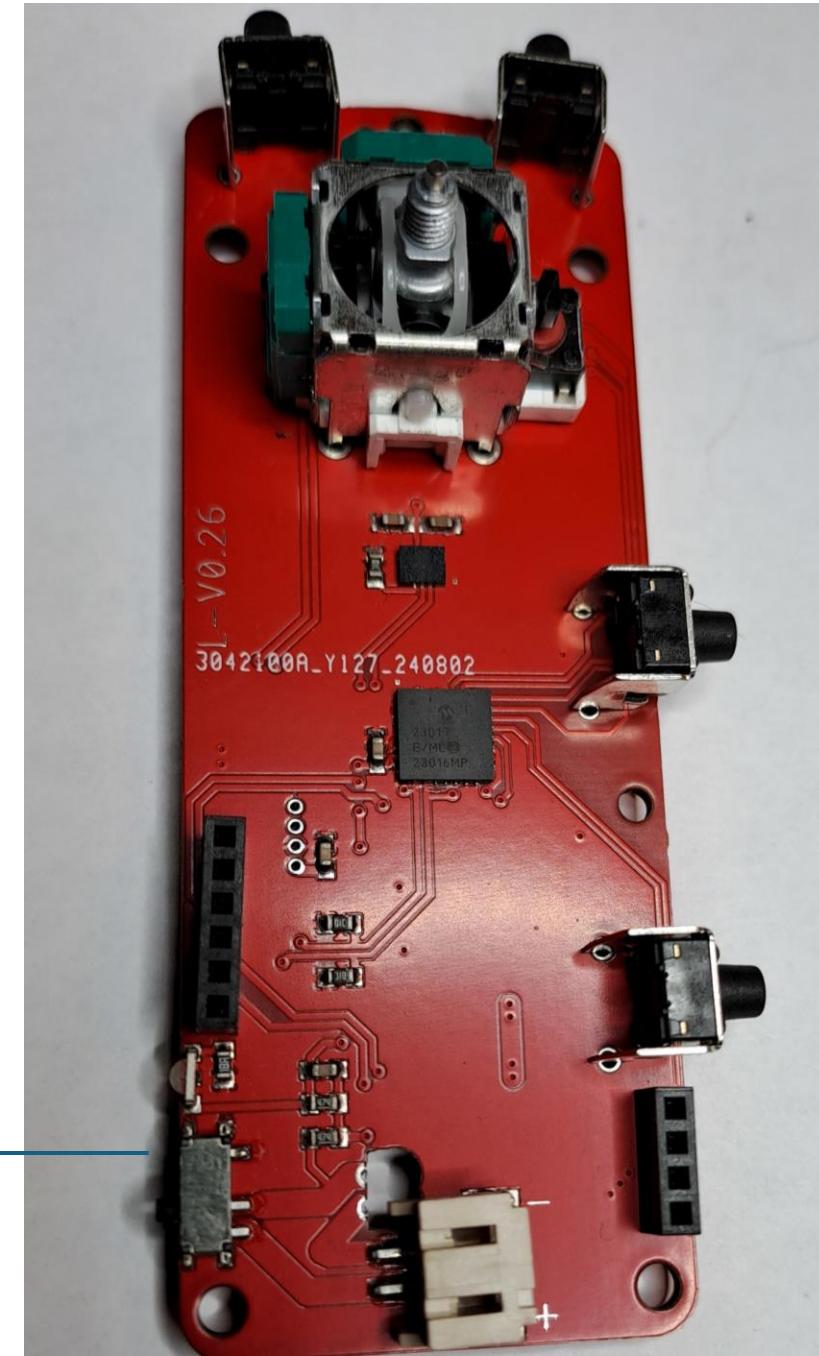
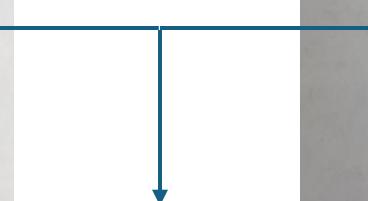
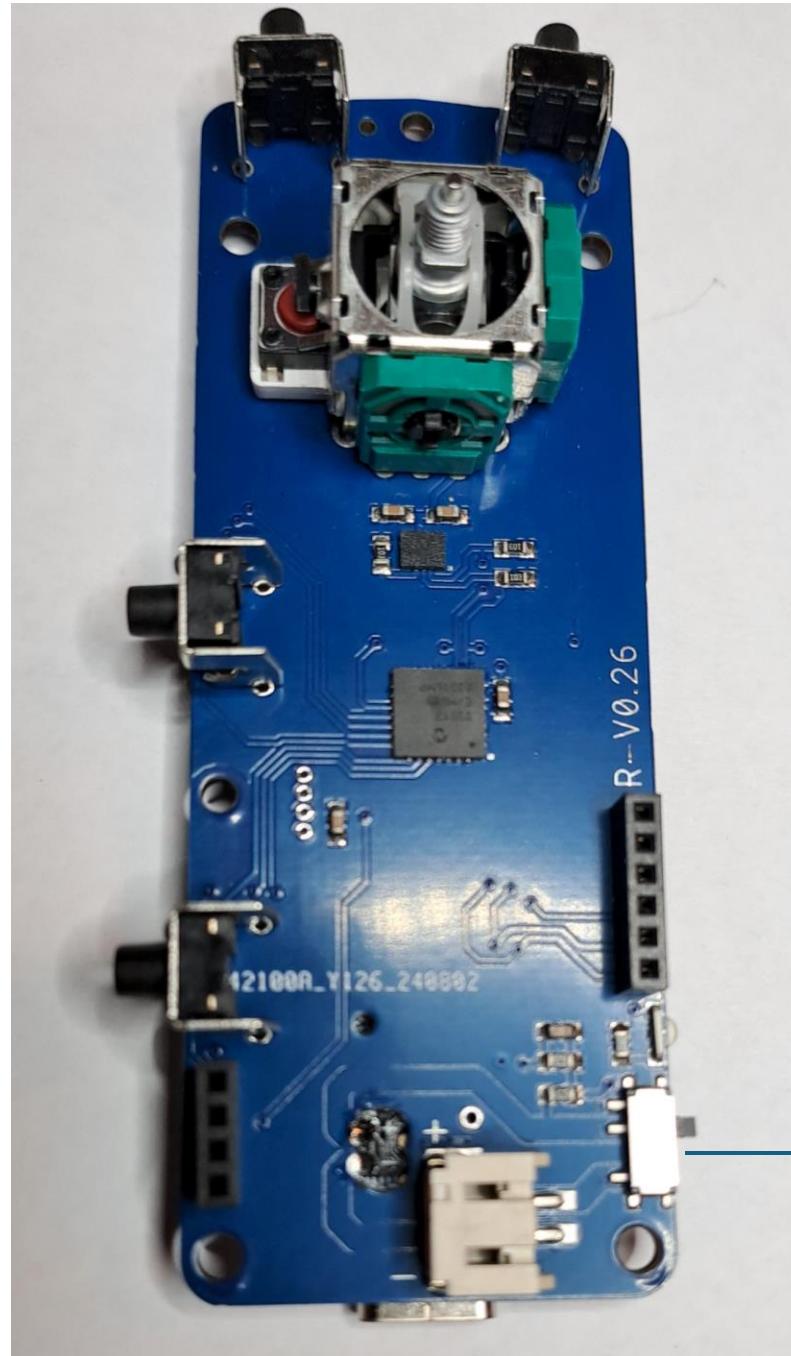
# DROID ELECTRONICS (AERIALS)

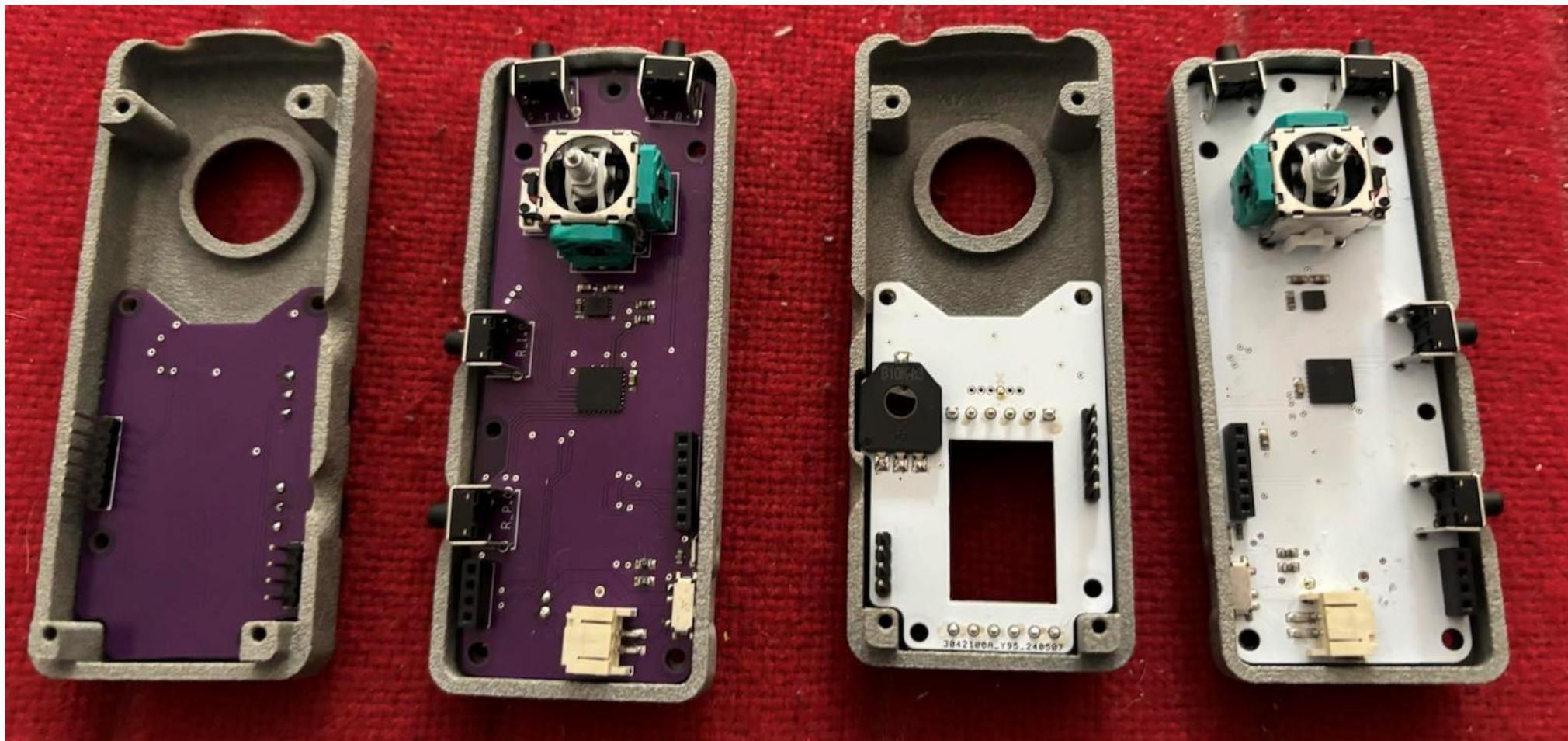




# REMOTES

The joystick click (push the joystick downwards) toggles the drive system on and off.  
When it's off you can safely pick up the droid.



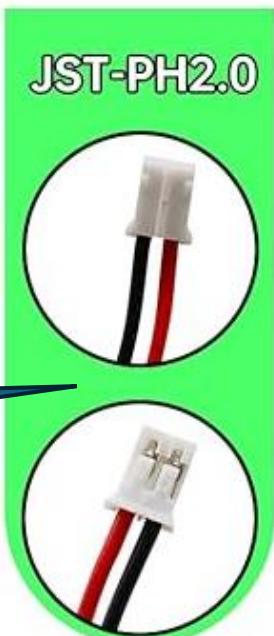


Maximum battery size are 45mm x 22mm x 6.9mm.

Depending on which battery you buy, the leads may need to be reversed !!!

**Doublecheck** the polarity on the board and on the battery connector !!!

This is not  
correct polarity



Roll over image to zoom in

