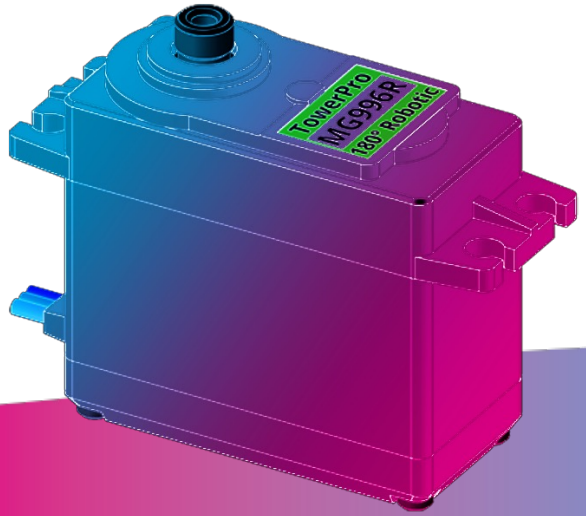
How to build your robot

www.pib.rocks/build

Instructions for:

MOTOR CALIBRATION



You
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Develop

your own robot!

Important note

In order to use the motors for pib´s movement it is important to **calibrate** them before building them into pib.

Pib has two different motors build in, in total **14** and **25** if 2 arms. They can be calibrated in the same way.

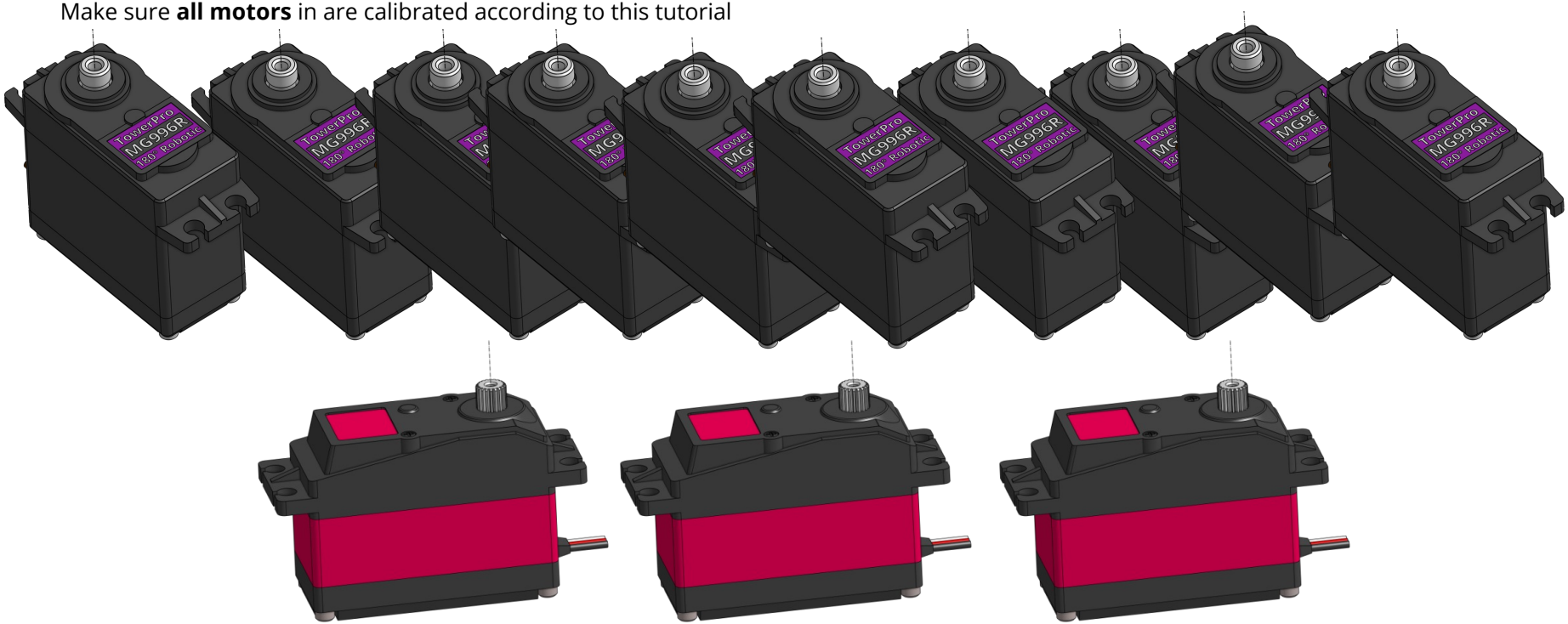
For this tutorial you will need the shown parts from the table. Additionally, we suggest to first build **pib´s head** and install the **software to the Raspberry Pi** as you will need to use this for the calibration.

You can find the tutorials here:
https://pib.rocks/build/how-to-build-pibs-head/
https://pib.rocks/build/how-to-install-raspberry-pi/

Non-printable parts
10 x **E07**-MG996R
2 x **E09**-DS225
3 x **E15**-DS5180SSG
1 x **E13-**SPL-82
1 x **E14**-Power_Supply-cable
1 x **E03**-TinkerForge ServoBricklet 2.0
1 x **Bricklet cable**
10 cm (red-black) **power cable**

Step 0

Make sure **all motors** in are calibrated according to this tutorial



Step 1a

1

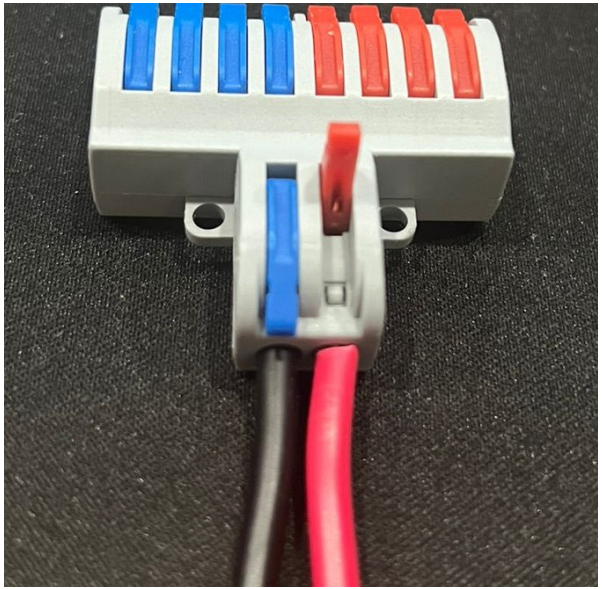
Connect output jack of **E14 power supply** into **E20 power jack**, Cut 10 cms from red and black wires, strip both ends insert **wires** on the other side of the jack

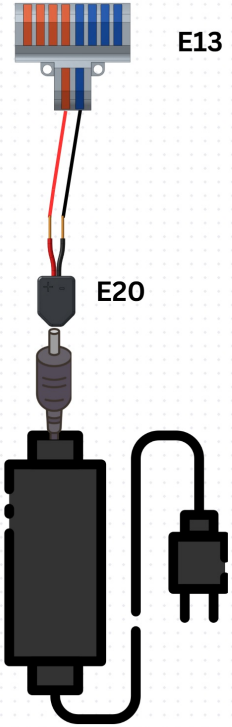
Step 1b

Pull the red and blue switches in **E13** (T-Connector), insert wires coming out of power supply jack and then close them.

Make sure to place the wires in the correct switches:

- ✓ **Red** wire to **red** switch
- ✓ **Black** wire to **blue** switch

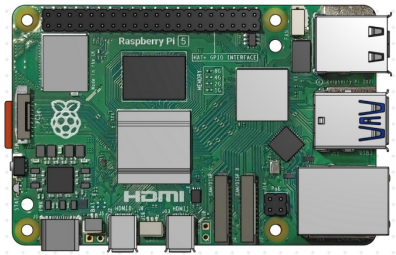


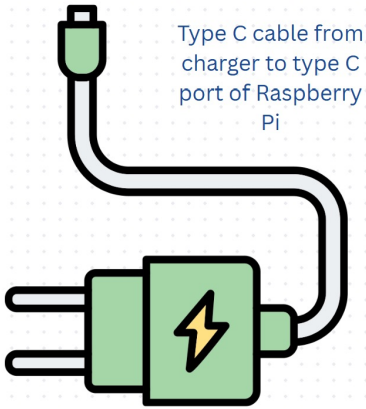


Step 2

Connect the raspberry pi power supply with the type-C connector to the extension cable to type-C port in raspberry Pi

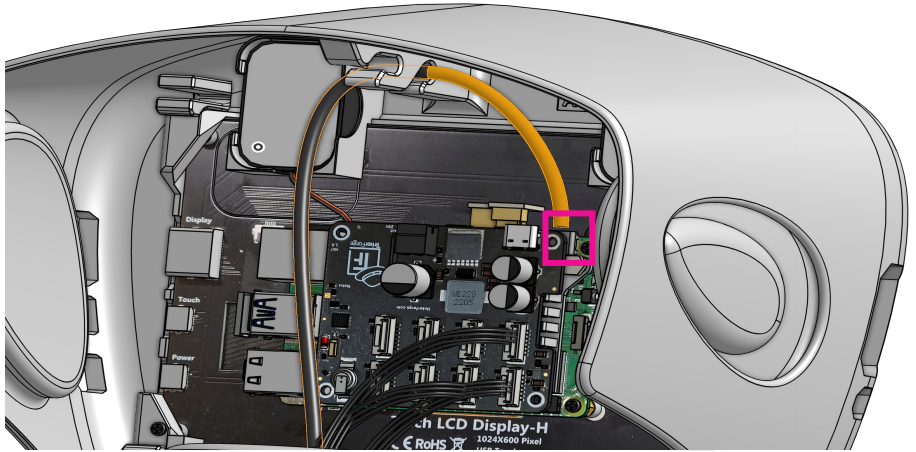
E01 - Raspberry Pi 5





Type C cable from charger to type C port of Raspberry Pi

E16 - Raspberry Pi power brick 5V



Wire is highlighted in **yellow** but its original color is **black**

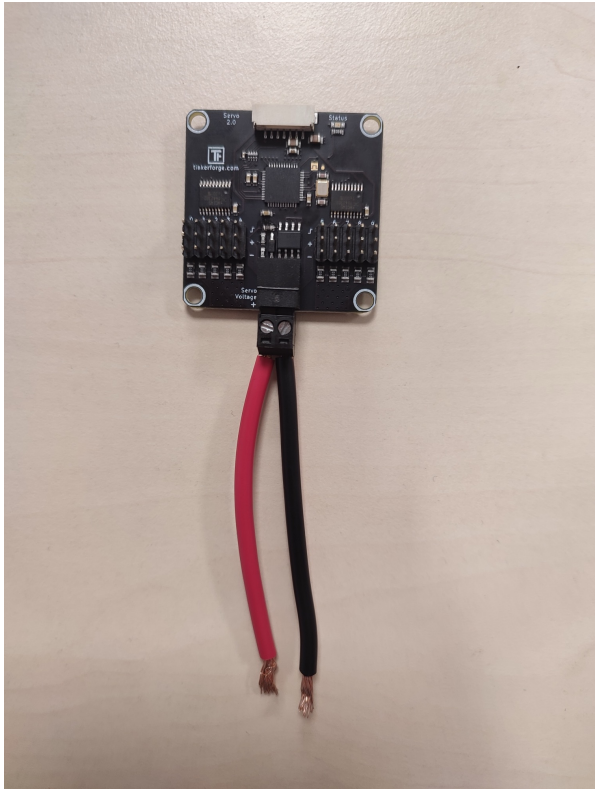
Step 3a

1

Cut **10 cm** of the red-black **power cable** and insert them to the **E03** TinkerForge **ServoBricklet.**

Make sure to place the wires in the correct switches:

- ✓ **Red** wire to **+ Symbol** (left spot)
- ✓ **Black** wire to **– Symbol** (right spot)

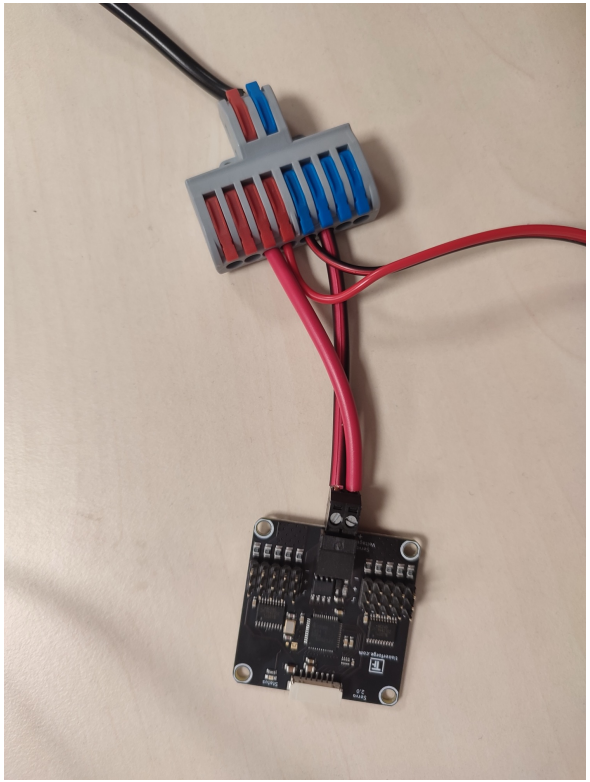


Step 3b

Now you can insert the cables to the T-Connector.

Make sure to place the wires in the correct switches:

- ✓ **Red** wire to **red** switch
- ✓ **Black** wire to **blue** switch



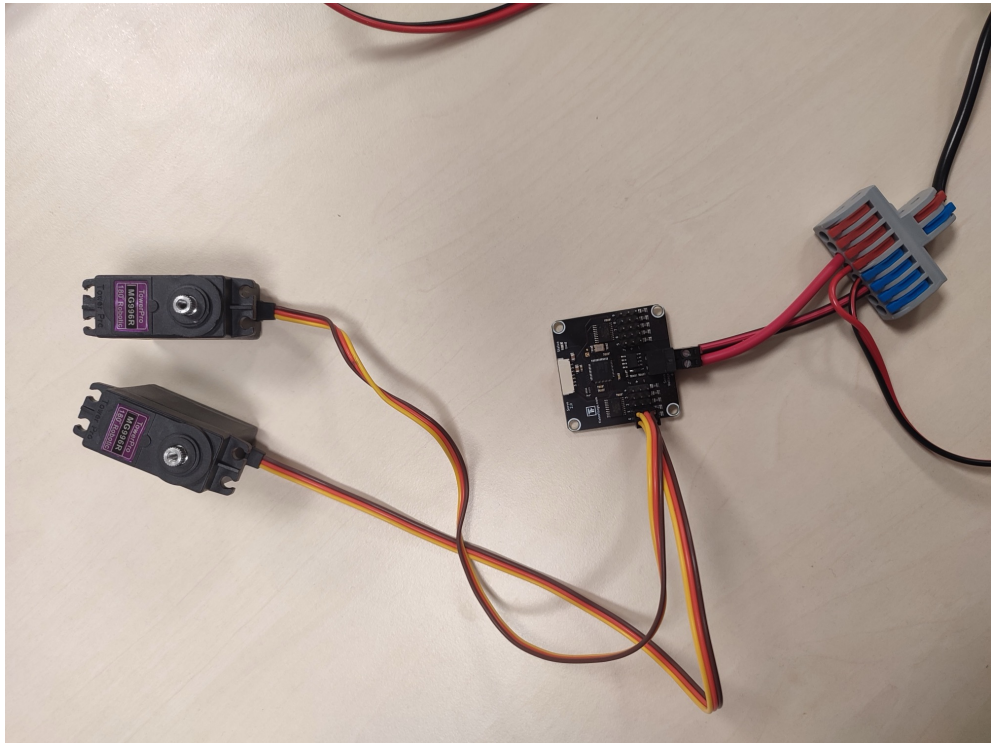
Step 4

Now, we can connect the motors to the ServoBricklet.

Please note that only 2 motors are connected for illustration but you should calibrate all motors, You can add 10 motors at the same time – there are 10 slots for motors on the ServoBricklet

It is also important to have the correct orientation here:

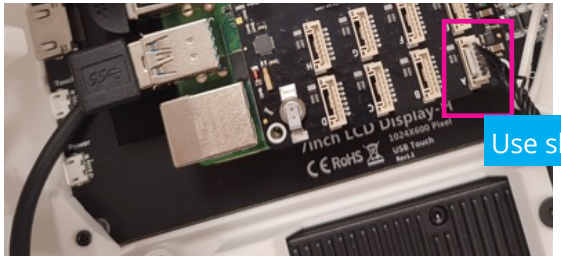
- ✓ **Yellow** cable to **S Symbol**
- ✓ **Orange** cable to **+ Symbol**
- ✓ **Brown** cable to **- Symbol**

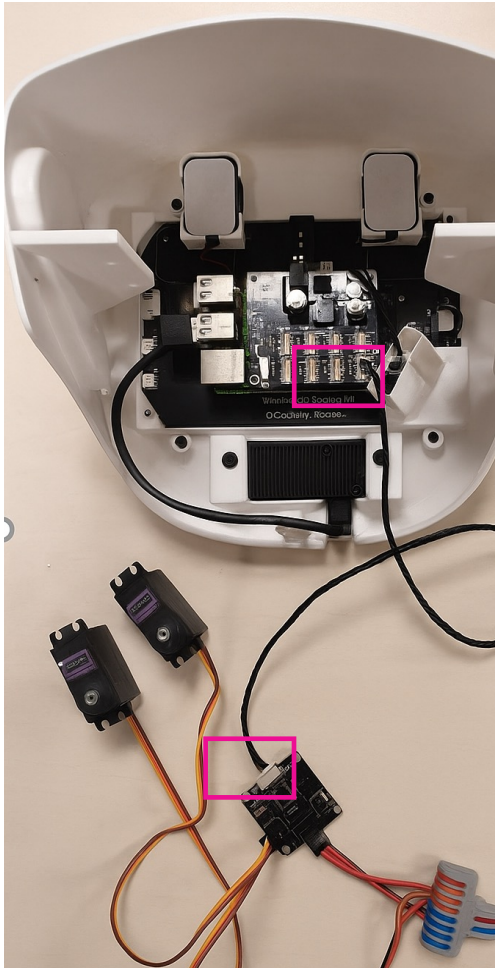


Step 5

Connect the **bricklet cable** to the **TinkerForge HAT** in the head and then to the **TinkerForge ServoBricklet**.

Please note that the Tinkerforge Hat doesn't need extra power connection it is only connected via GPIO as in head tutorial

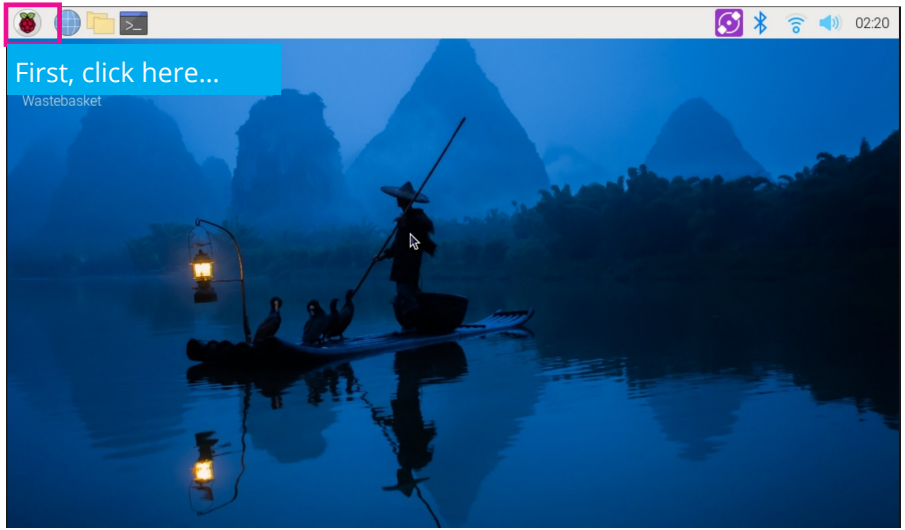


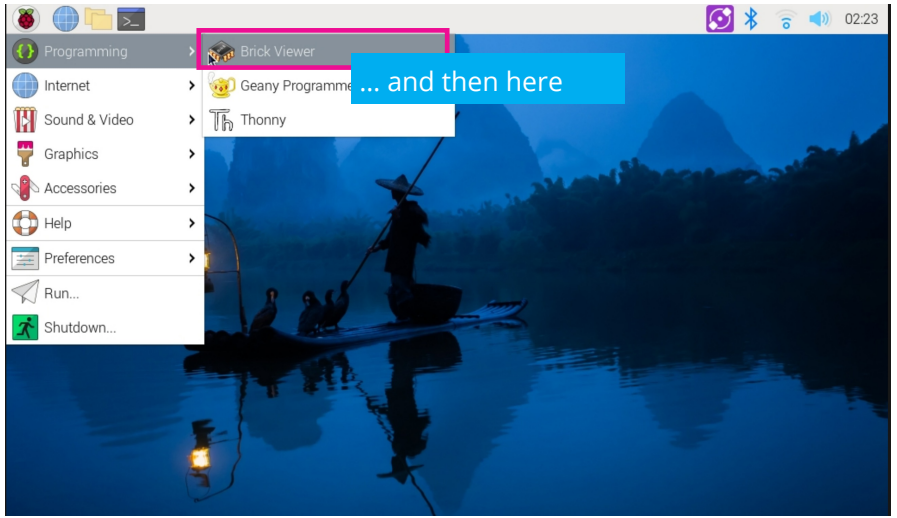


Step 6

Plug the power cable into the power supply and start Raspberry Pi OS. - **turn on pi**

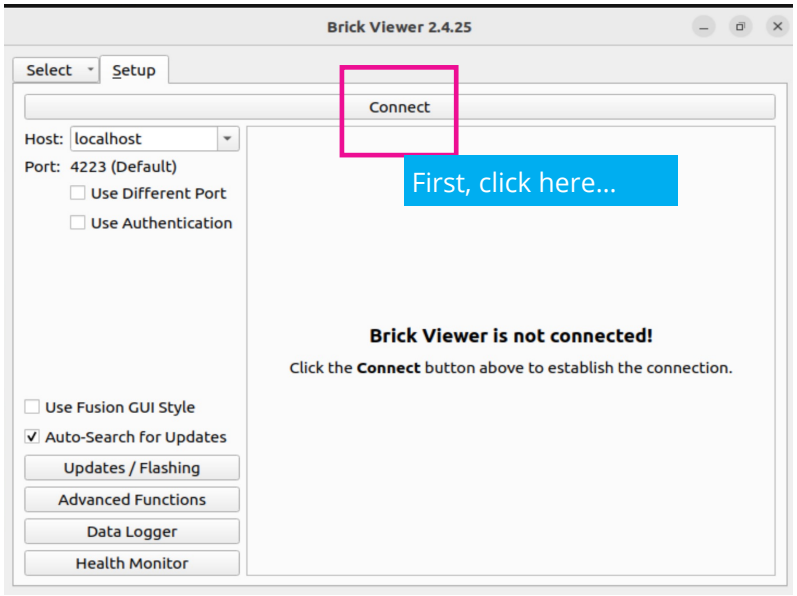
Open the **Brick viewer** application.

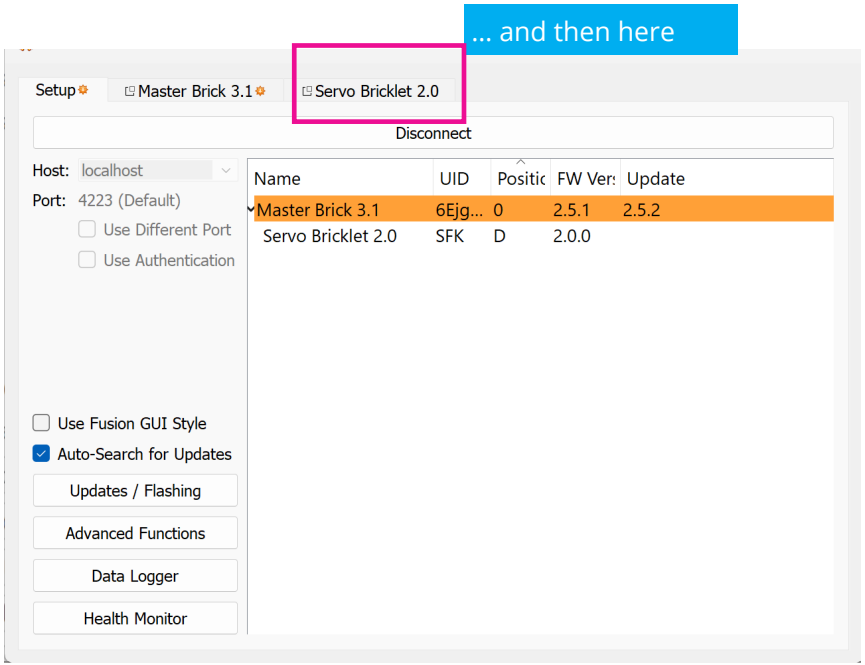




Step 7

Click "**Connect**" and navigate to the tab "**Servo Bricklet 2.0**"



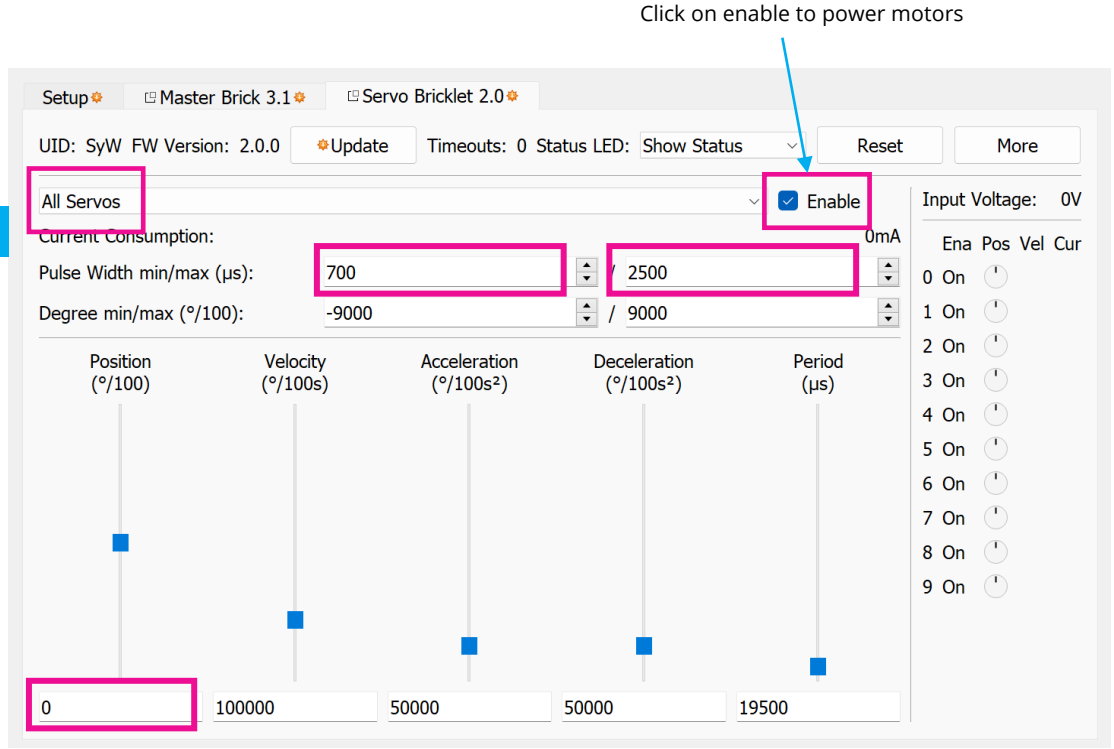


Step 8

Select "**All Servos**“ and change the values as shown.

Other values are not important and do not need to be changed.

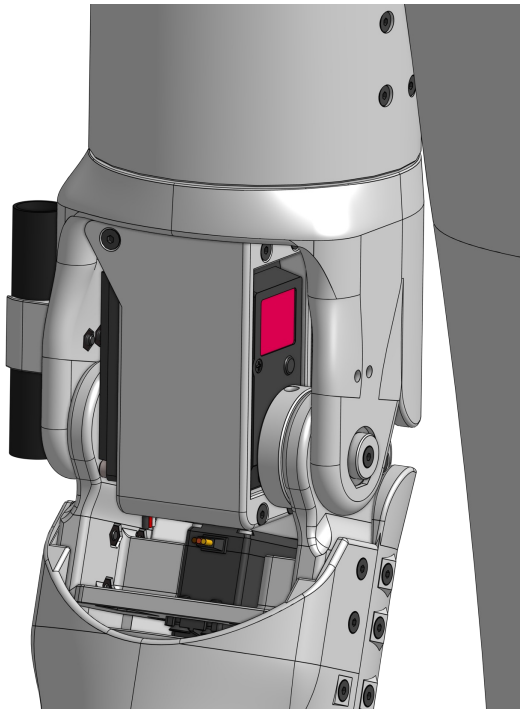
You will hear a sound from the motors once you changed the values – that is the calibration! The motors have switched to a 0-Position!



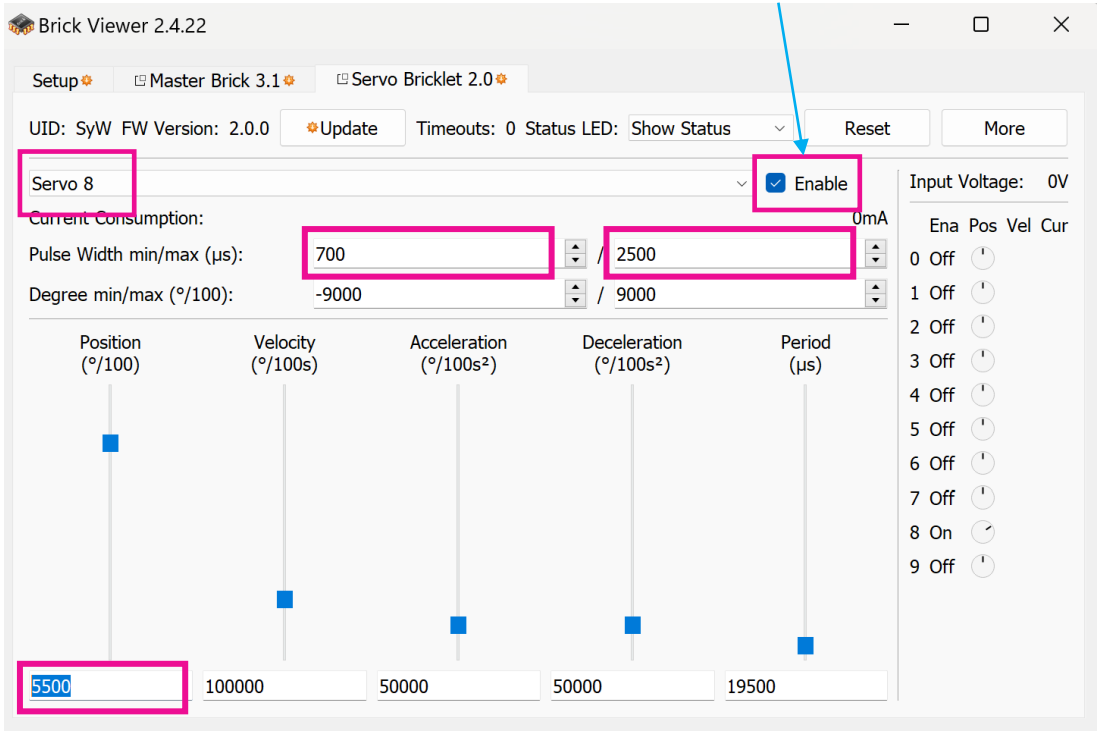
Step 8

For 1 **E15-DS5180SSG** that will be used in elbow, set it to **5500** not to **0** position

(if you are using a 2 arm pib you will need to calibrate 2 of these motors)



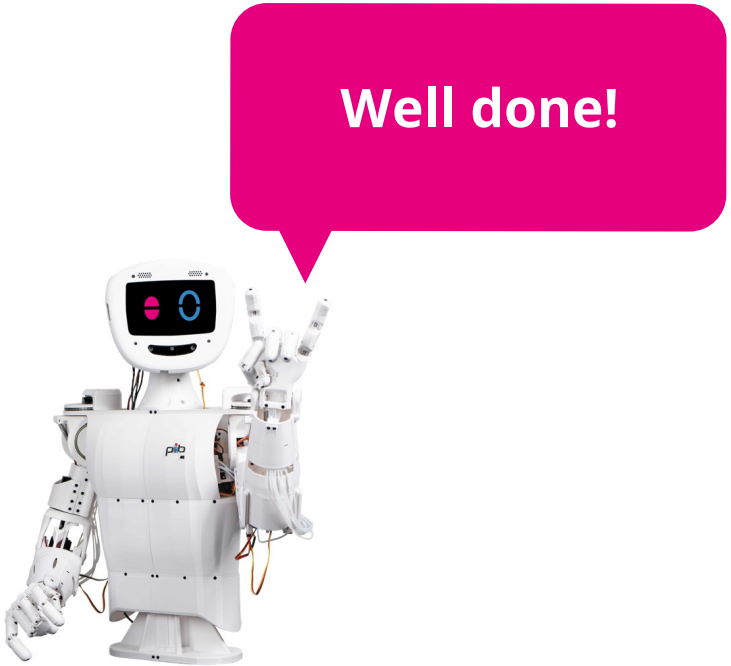
Click on enable to power motors



Congratulations

Remove the calibrated motors, connect the remaining motors and repeat step 6-8, until you have calibrated **all motors**

Once finished, you can disassemble most parts as you will need the T-Connector, bricklet cable, motors and so on in the other tutorials.



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