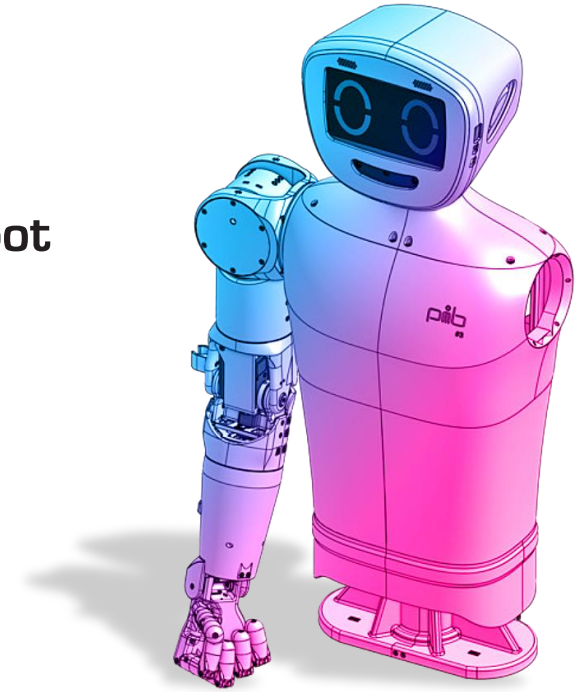
How to build your robot

www.pib.rocks/build

instructions for:

Assembly

pib#4



PRINT
BUILD
DEVELOP
YOUR OWN ROBOT

printable parts

You will need the following printable parts from our pib.Box Master/School.

If you do not have it yet, you can buy it in our shop https//shop.pib.rocks.

printable parts
C18 - Forearm_distal_lock

Non-printable parts

You will need the following non-printable parts from our pib.Box Master/School.
If you do not have it yet, you can buy it in our shop https//shop.pib.rocks.

Non-printable parts - Electronics
1 x **E13-**SPL-82
1 x **E14**-Power_Supply-cable
USB C extension cable

Non-printable parts
4 x **S01** M3 nuts
4 x **S13** M3 40 mm screws
Servo extension cables
E23 – Cable_sheath
E20 power jack
E27 Inline power regulator

Build it better: our suggestion for assembling pib

We recommend **tools** for each step. These are a suggestion, you can of course also use other tools.

1-5

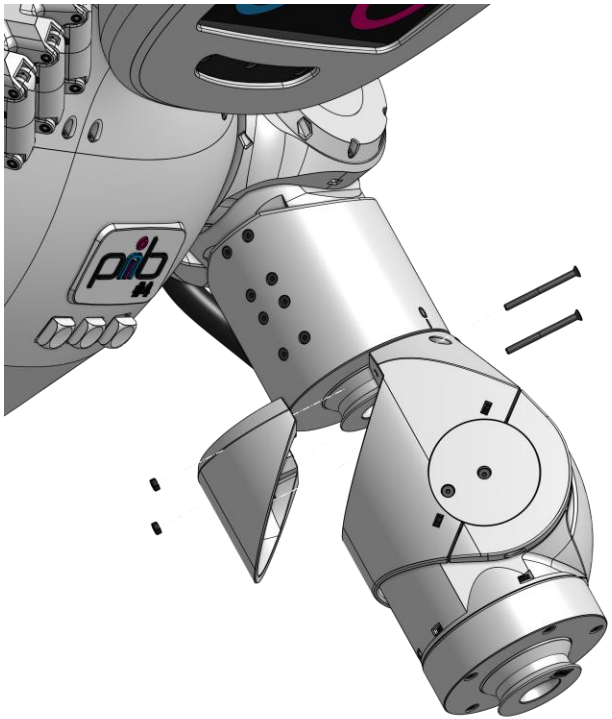
We have categorized each step according to its **difficulty** - from **1-5** (1 being the easiest, 5 the hardest)

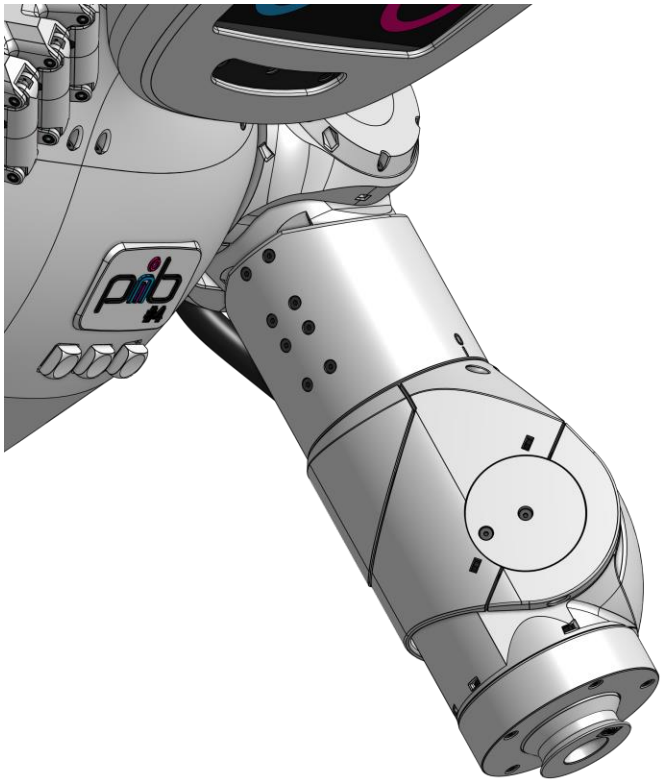
We also show you which **non-printable parts** you need for each step

Step 1a

1 2x 2x

Connect elbow to shoulder using **C39**, **2 x M3 nuts** and **2 x M3 40mm** screws

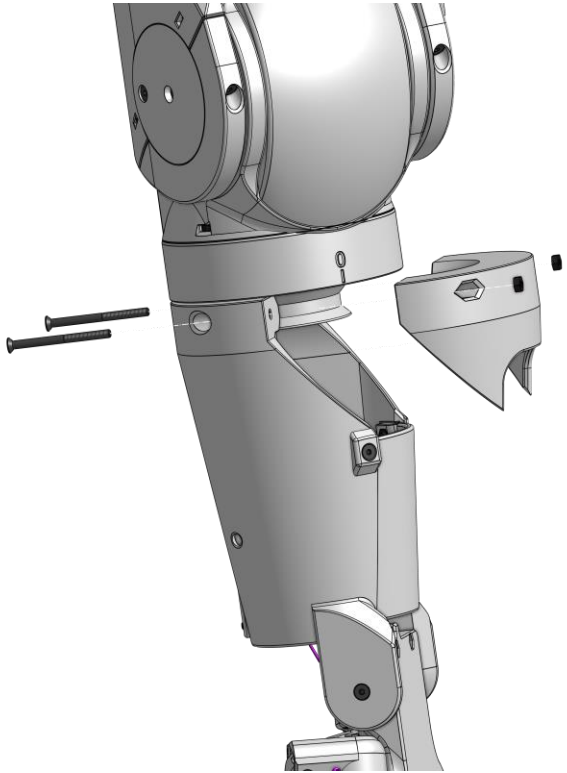


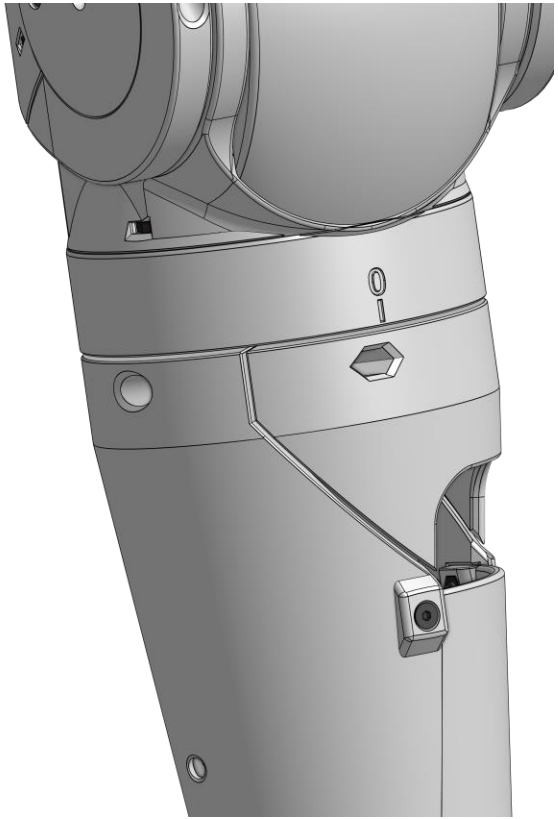


Step 1b

1 2x 2x

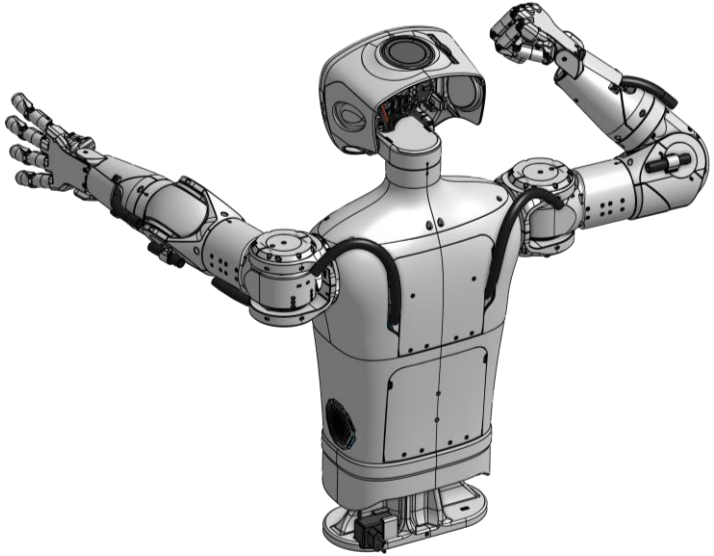
Connect forearm to elbow using **C18, 2 x M3 nuts** and **2 x M3 40mm** screws

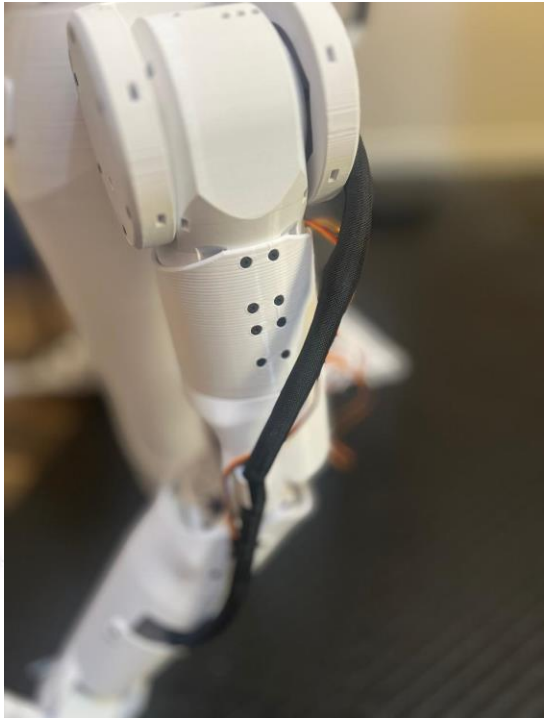




Step 2a

Guide all the wires through the black **E23-Cable_sheath** and place it in the **2 C74** in elbow and shoulder. Make sure to extend servo cables that are short with **servo extension cables**.





Step 2b

For the upper arm rotation motors use **E27**-Inline_voltage_regulator in line with servo extension cable. *This is needed to drop 7.5 voltage to 5v that is suitable with this motor*

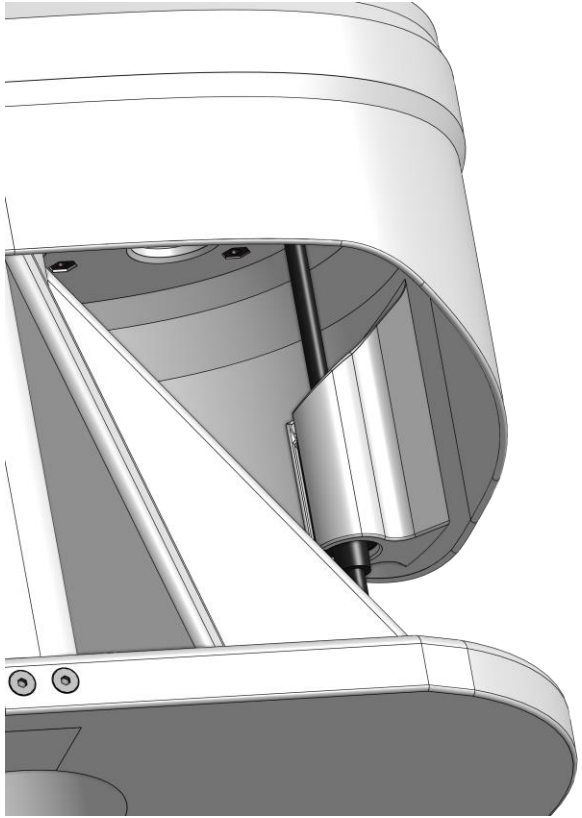
Step 3

2

Connect output jack of **E14 power supply** into **E20 power jack**, strip both ends and insert **2 wires** on the other side of the jack (the wires should be ~ 10cm)

Step 4a

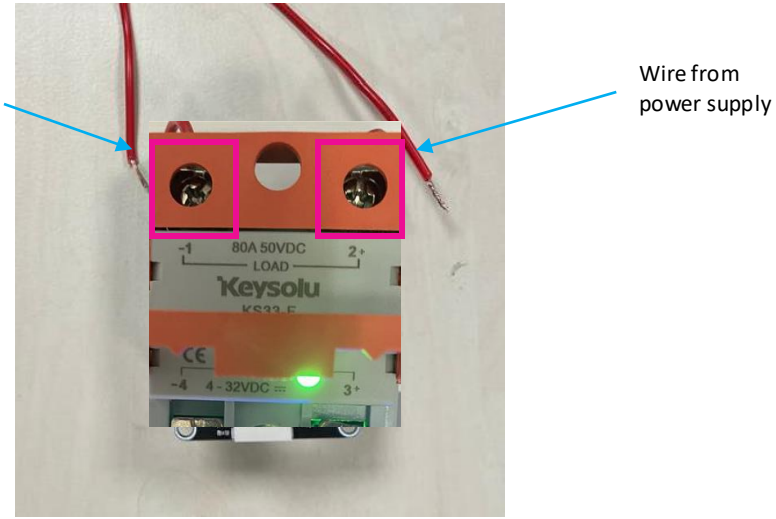
Place **E14's output wire** in the shown orientation and spot in **B43-L**.



Step 4b

2

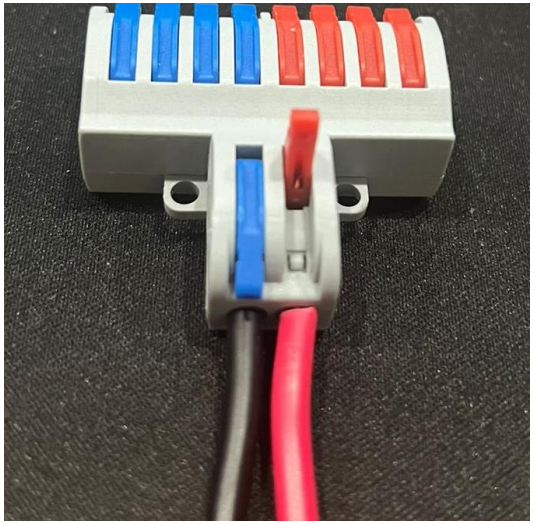
Connect the **red wire** coming out of the **power supply** to the + side of the **relay** and cut a small piece of the **red cables** you have and connect it to the other side. Unscrew terminals, insert **wires** and then screw them back.

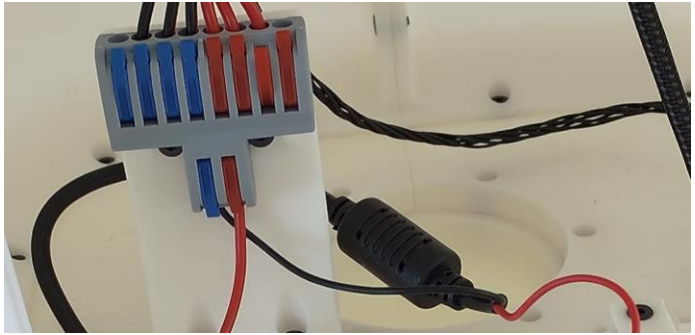


Step 4c

1

Pull the red and blue switches in **E13**, insert the **red wire** coming out of the relay and the **black wire** coming out of the power supply.





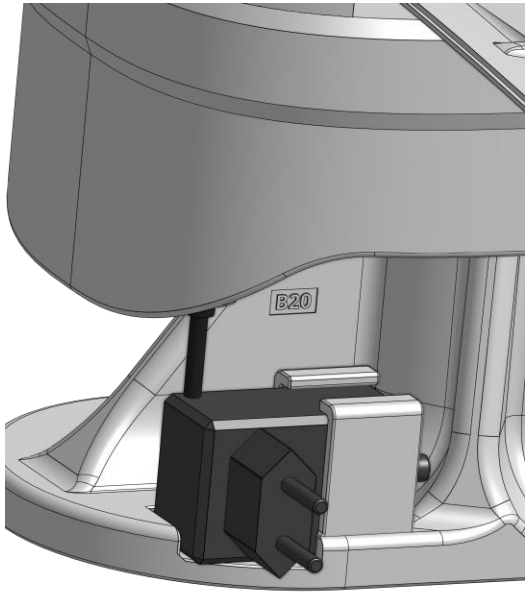
Make sure to place the wires in the correct switches:

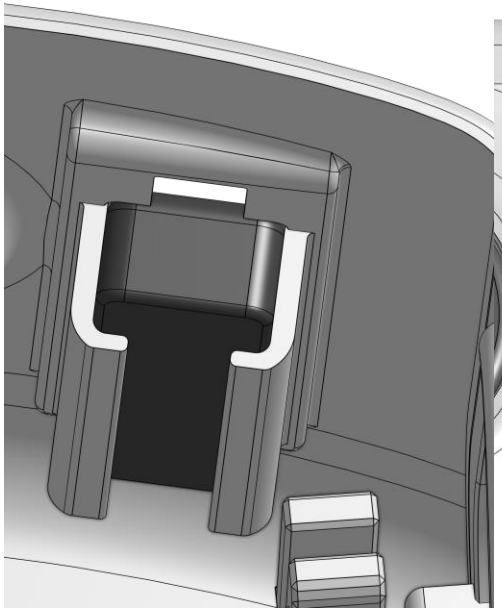
- ✓ **Red** wire to **red** switch
- ✓ **Black** wire to **blue** switch

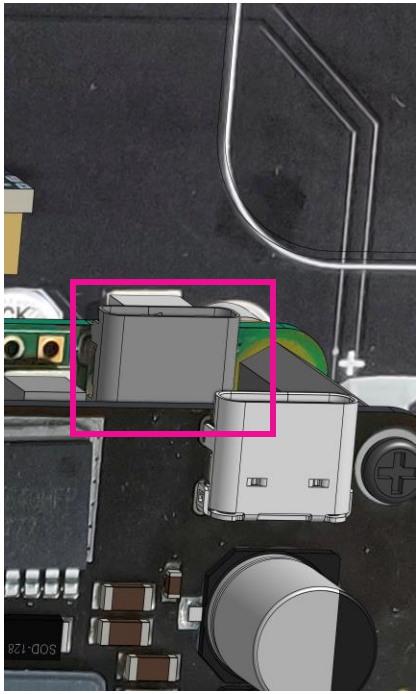
Step 4d

2

Pass **E16 RPi power supply** from **B20** through the holes in the upper body to the shown spot in **A01** and connect it to **Raspberry Pi**.

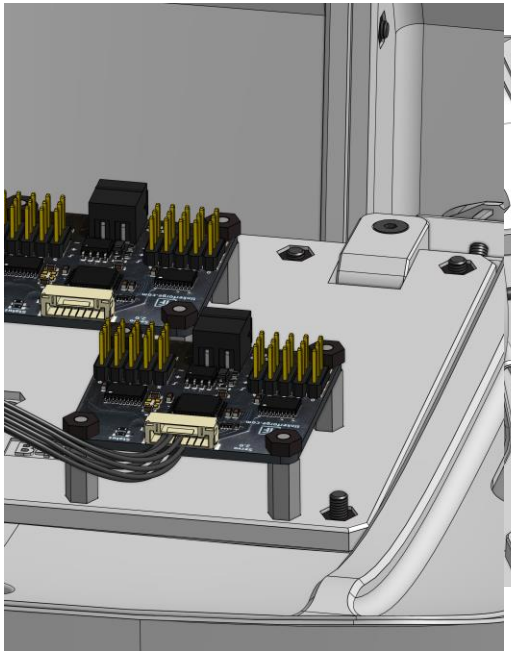


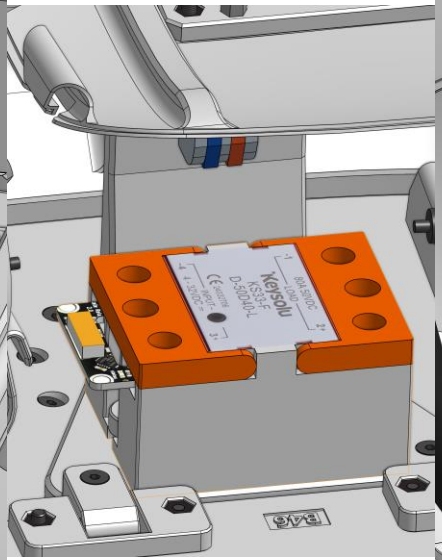


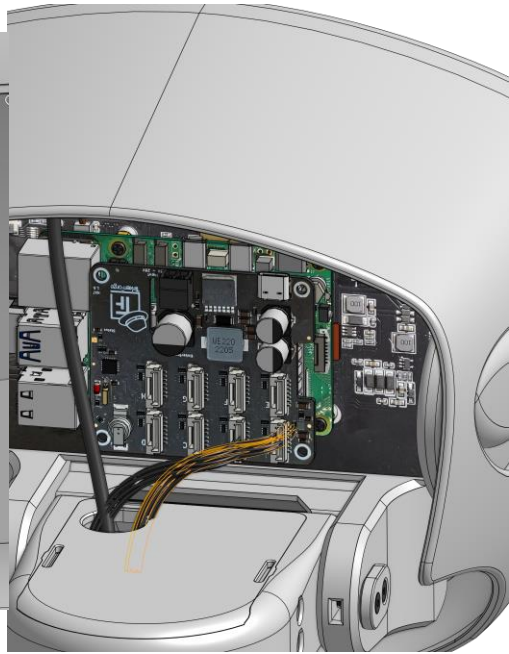


Step 4e

Connect all **E19 bricklet cables** coming out of electronics (servo bricklets, RGB buttons and relay) to **E02 brick hat.** Correct ports are mentioned in next slide. Relay should use 1 meter bricklet cable and all others use 50cm bricklet cables



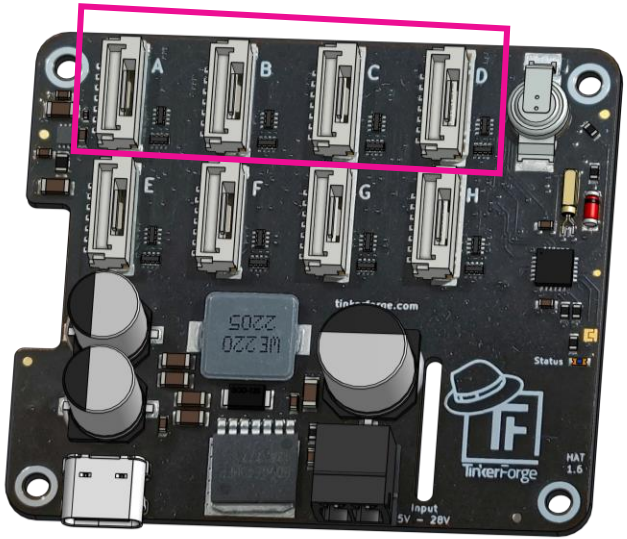




Note

Electronics should be connected according to this table

	Port in brick hat (inscribed on the hat)
Servo bricklet 1 (connected to right arm)	A
Servo bricklet 2 (to be connected to neck and shoulders)	B
Servo bricklet 3 (to be connected left arm)	C
Relay	E
RGB button 1	F
RGB button 2	G
RGB button 3	H



Step 5

Connect the **motors** in fingers, arm and head to **E03 servo bricklets** in the upper body according to the table in the next slide.

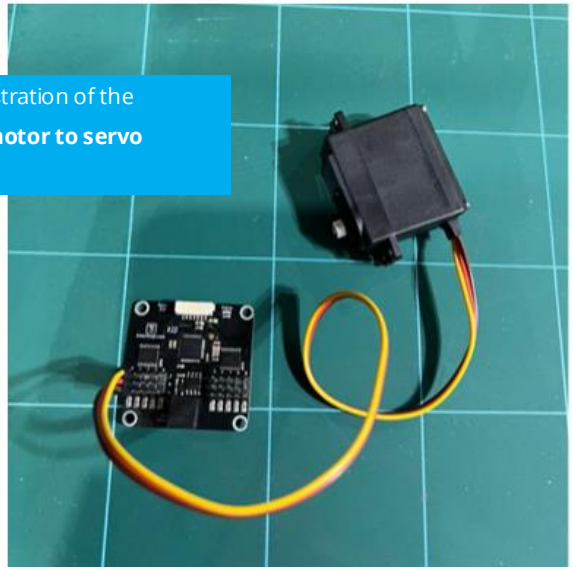
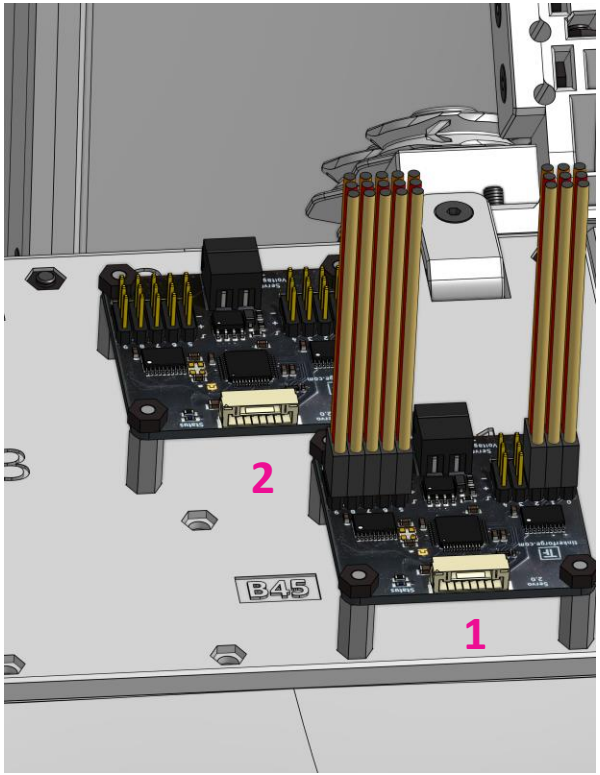


Image for illustration of the connection „**motor to servo bricklets**“



Step 5 – Table (1)

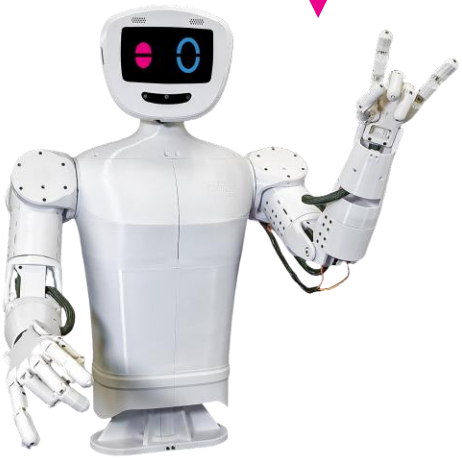
Motor name (joint connected to motor like thumb rotator)	Bricklet number (when assembled, bricklet 1 will be the right and 2 is the middle. Bricklet 3 is the extra one for 2 arms pib)	Bricklet pin (pin on bricklet that servo will be connected to, 0 to 9)
thumb_right_opposition	1	0
thumb_right_stretch	1	1
index_right_stretch	1	2
middle_right_stretch	1	3
ring_right_stretch	1	4
pinky_right_stretch	1	5
wrist_right	1	6
lower_arm_right_rotation	1	7
elbow_right	1	8
upper_arm_right_rotation	1	9
shoulder_horizontal_right	2	0
shoulder_vertical_right	2	1
Free replacement for burned pins	2	2
Free replacement for burned pins	2	3
turn_head_motor	2	4
tilt_forward_motor	2	5

Step 5 – Table (2)

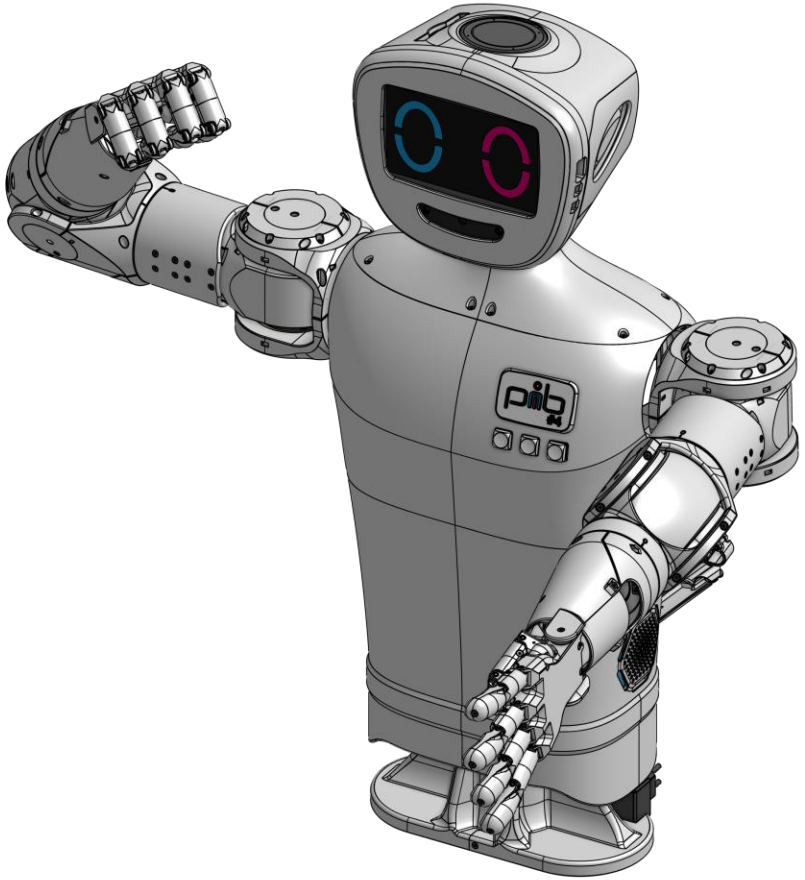
Motor name (joint connected to motor like thumb rotator)	Bricklet number(When assembled bricklet 1 will be the right and 2 is the middle, bricklet 3 is the extra one for 2 arms pib)	Bricklet pin (pin on bricklet that servo will be connected to, 0 to 9)
Free replacement for burned pins	2	6
Free replacement for burned pins	2	7
shoulder_horizontal_left	2	8
shoulder_vertical_left	2	9
thumb_left_opposition	3	0
thumb_left_stretch	3	1
index_left_stretch	3	2
middle_left_stretch	3	3
ring_left_stretch	3	4
pinky_left_stretch	3	5
wrist_left	3	6
lower_arm_left_rotation	3	7
elbow_left	3	8
upper_arm_left_rotation	3	9

Congratulations

You did a great job, pib is assembled!



Well done!



Do you need support?

Or do you need our pib.Box with all non-printable parts?

Or maybe you have some new ideas and improvements?

Please contact us.

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