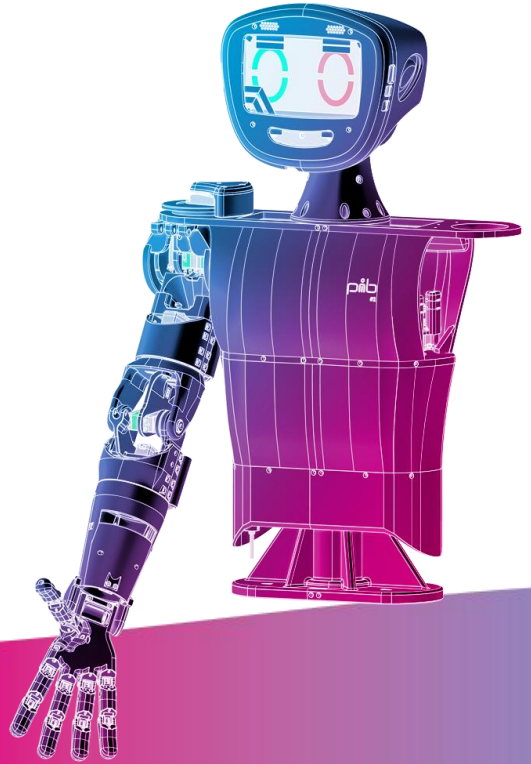
How to build your robot

www.pib.rocks/build

assembly instructions for:

pib



You
Print
Build
Develop

your own robot!

Printable and pre-assembled parts

In order to assemble pib´s arm to pib´s body you need to have completed **all the past tutorials**, as this is the final one.

You can find all our tutorials on pib.rocks/build

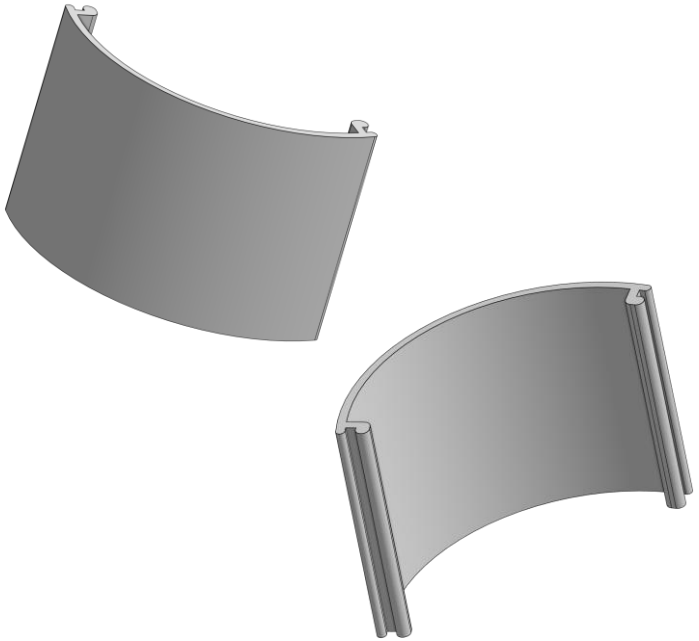
You will also need the following non-printable parts from our pib.Box Master.

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

Printable parts
2 x **B14**-Tube_holder
2 x **B15**-Tube_holder_top
2 x **C31**-Wire_cover_upper_arm
2 x **C50**-Wrist_joint_connector

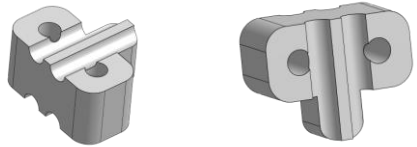
Printable parts - Overview

C31-Wire_cover_upper_arm

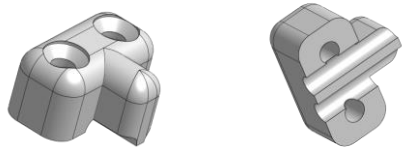


C50-Wirst_joint_connector

B14-Tube_holder



B15-Tube_holder_top



Non-printable parts

You will also need the following non-printable parts from our pib.Box Master.

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

Non-printable parts
17 x **S01** M3 nuts
1 x **M08** metal rod
6 x **S06** 16mm screws
10 x **S08** 20 mm screws
2 x **S09** 22 mm screws
4 x **S10** 25 mm screws
4 x **S13** 40 mm screws
2 x Bricklet cable
1 x Power Adapter
1 x USB-C power supply for Raspberry Pi

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

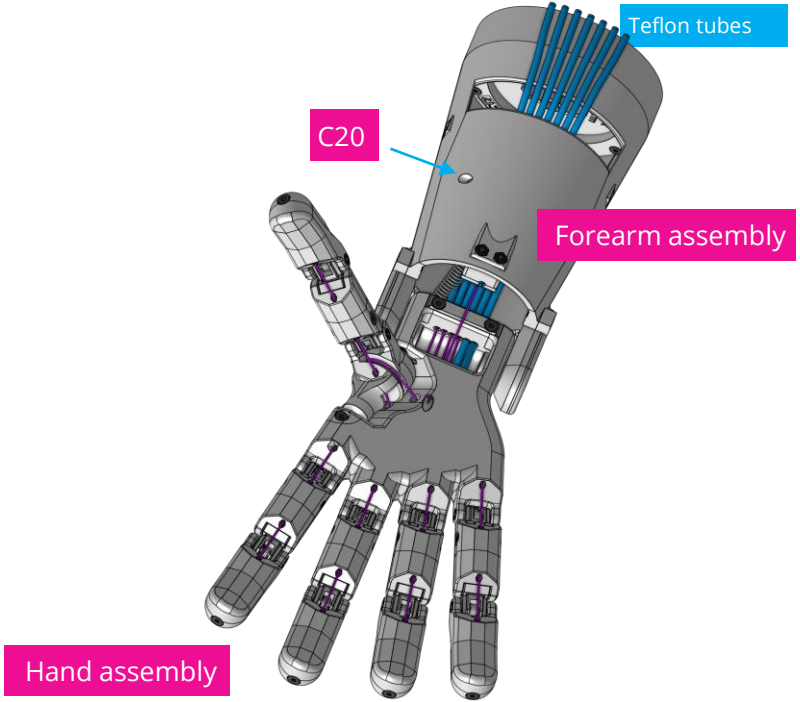
We have categorized each step according to its **difficulty** - from **1-5** (1 being the easiest, 5 the hardest)

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

Step 1a

First, we will assembly pib´s hand to its forearm.

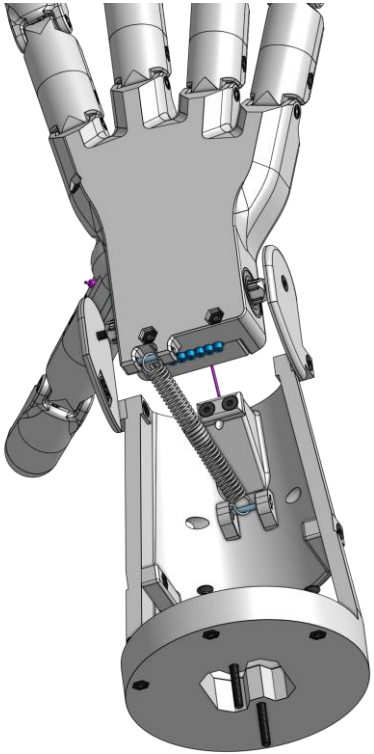
Guide the **teflon tubes** coming out of the hand through the shown part of the forearm (**C20**).

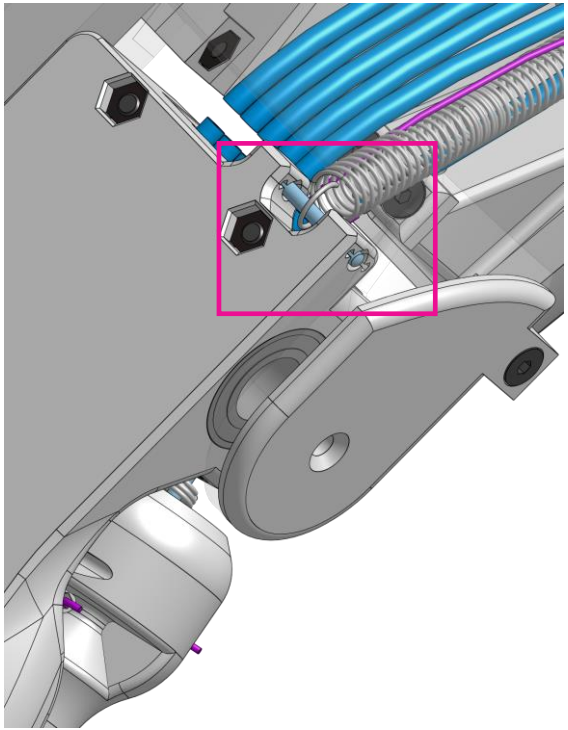


Step 1b

2 1x

Attach the **spring** in the forearm to the hand using **1 x M08 rod**.



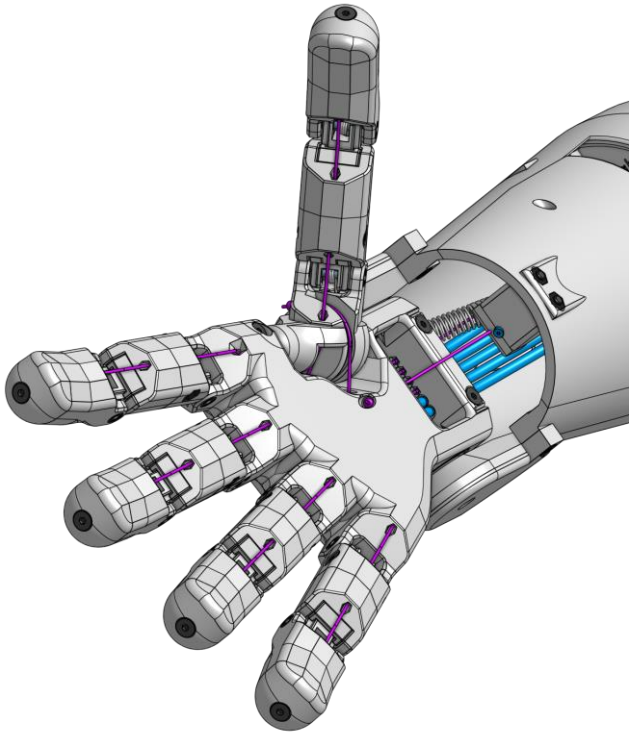


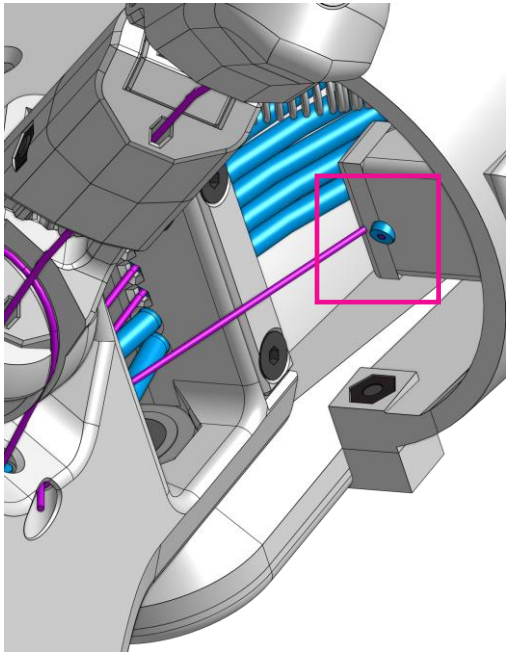
Pull strongly on the spring to attach it in the shown place of the hand.
For clarity C19 and the teflon tubes are hidden in the pictures.

Step 1c

1

Insert the loose **fluorocarbon string** coming out of hand into the **teflon tube** fixed in forearm.

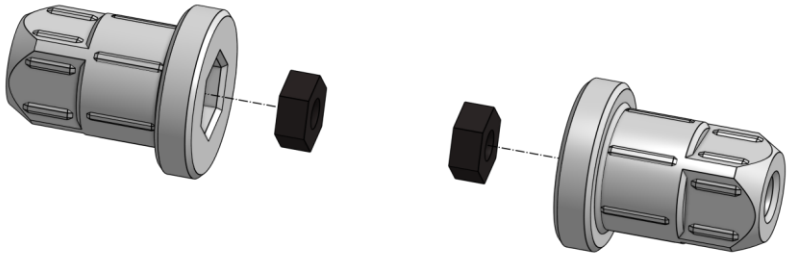




Step 1d

1 2x

Insert **2 x nuts** in both **C50**.

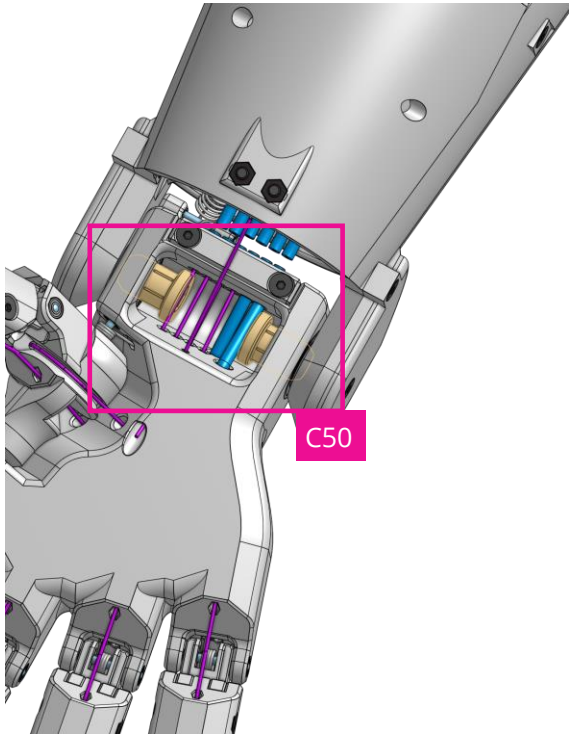


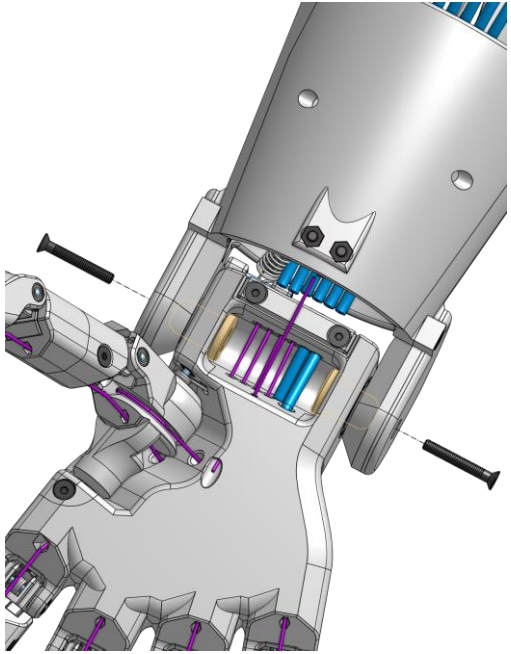
Step 1e

5 2x

Use both **C50** to connect hand and forearm and fix them in place using **2 x 22mm screws**.

This step is really tricky.
Try to carefully push the teflon tubes aside so that you can push both C50 in. You should use a lot of force when pushing it in.





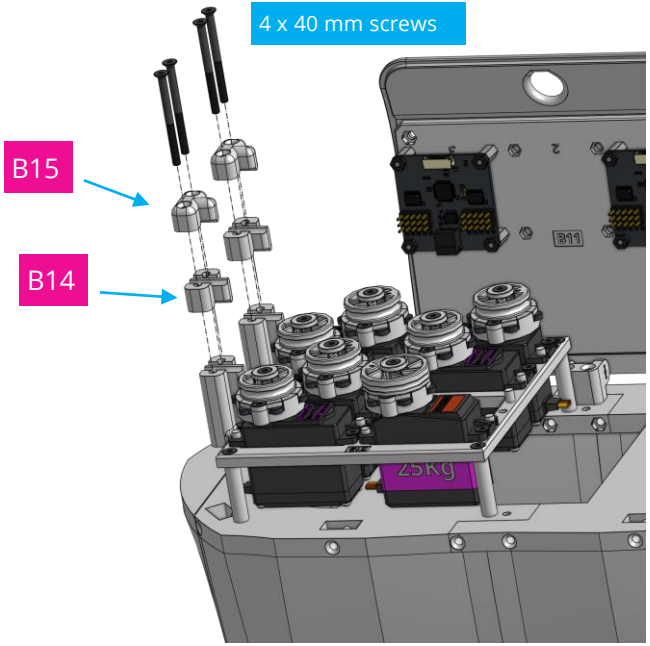
Step 2a

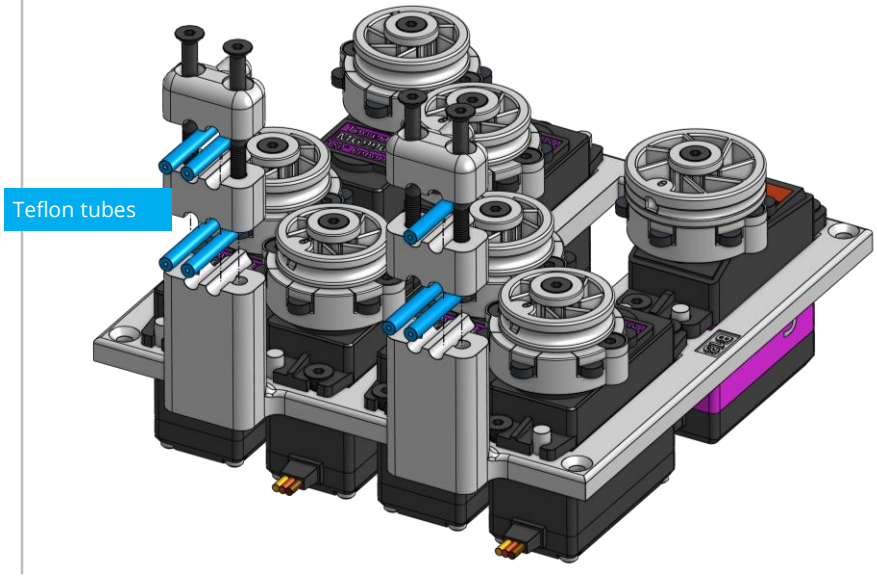
2 4x

Now we need to assemble the strings from the forearm to the internal body.

Insert the teflon tubes from forearm through the shown spots and use **2 x B14, 2 x B15** and **4 x 40 mm screws** to fix them.

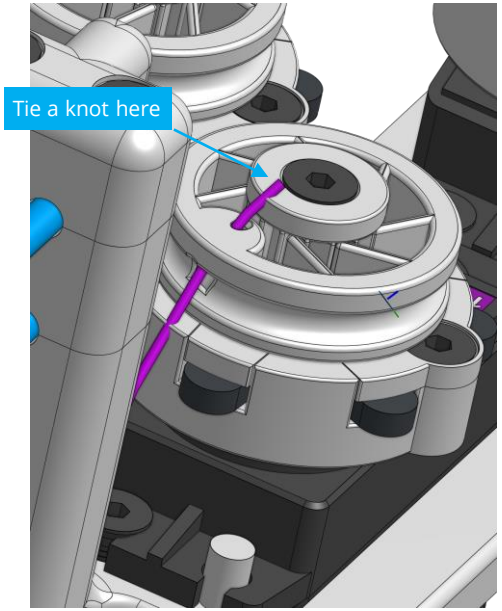
(Tipp: Wrap 2 x pieces of tape around each end of the tube before fixing them to have better grip.)

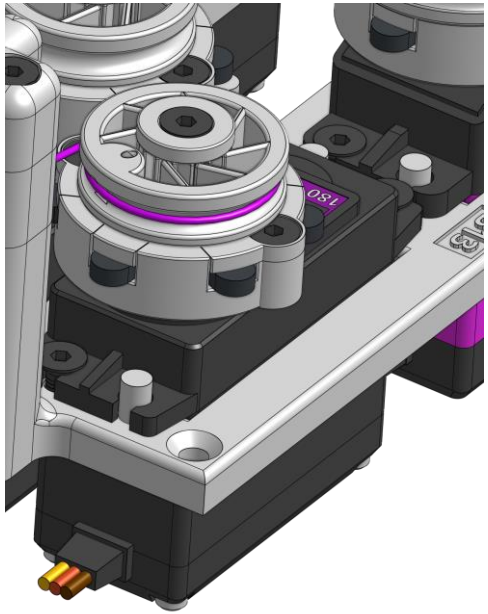


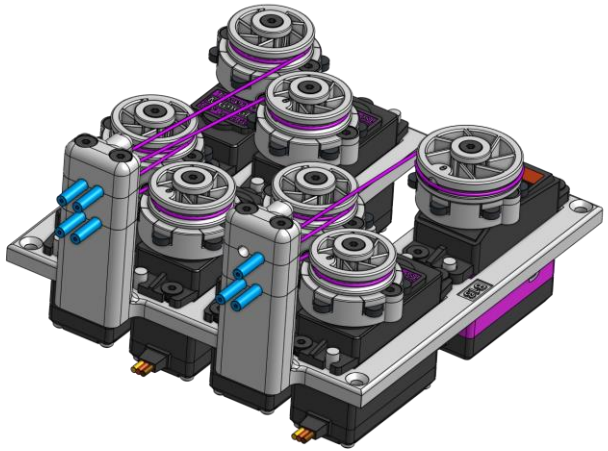


Step 2b

Insert fluorocarbon wires coming out of tubes in shown holes in connectors and tigh a knot at the end to fix them.







Step 3 - note

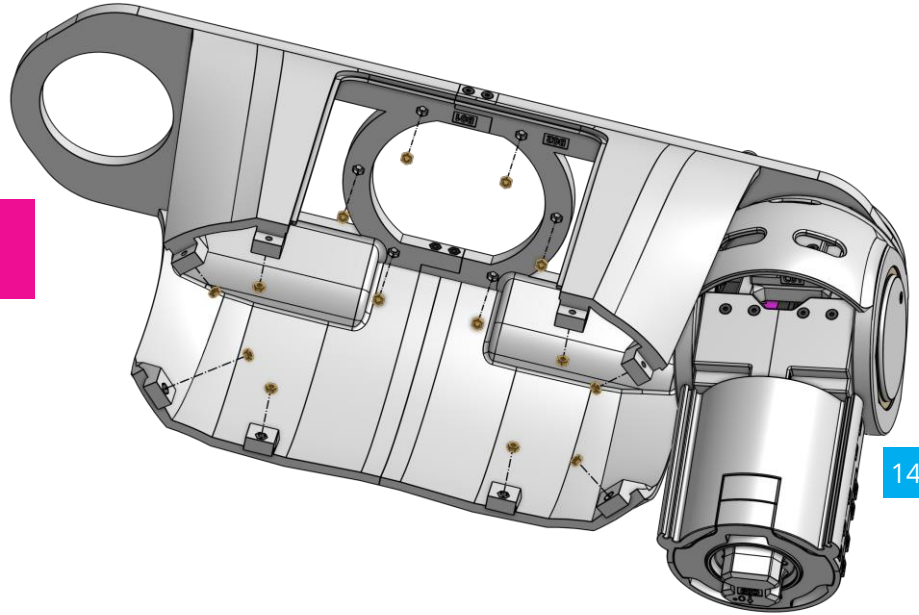
Now, we connect the **shoulder joint assembly** to the **upper and internal body assembly**.

Step 3a

2 14x

Place **14 x nuts** in shown spots in **B01** and **B02** of the **shoulder joint**.

Shoulder joint assembly

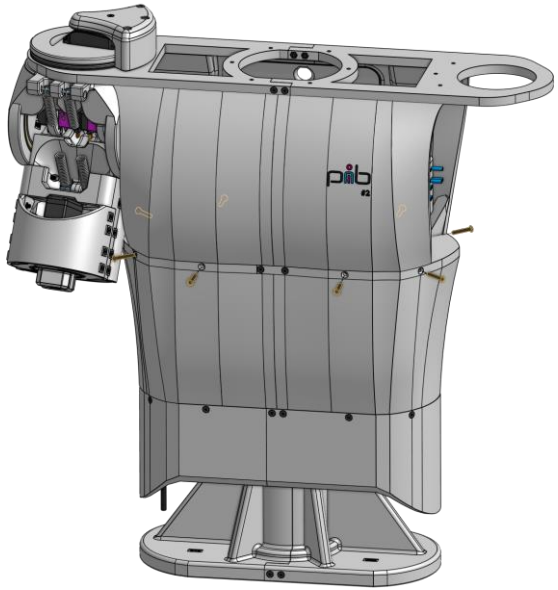


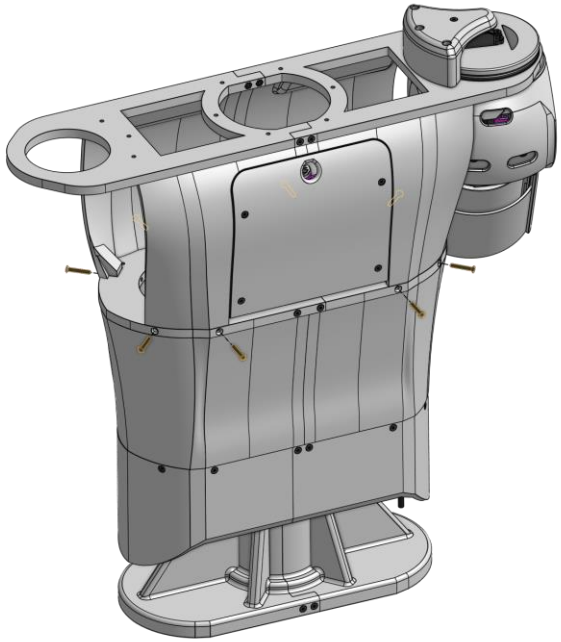
14 x nuts

Step 3b

2 10x

Connect the shoulder joint to upper body assembly using **10 x 20 mm screws**.

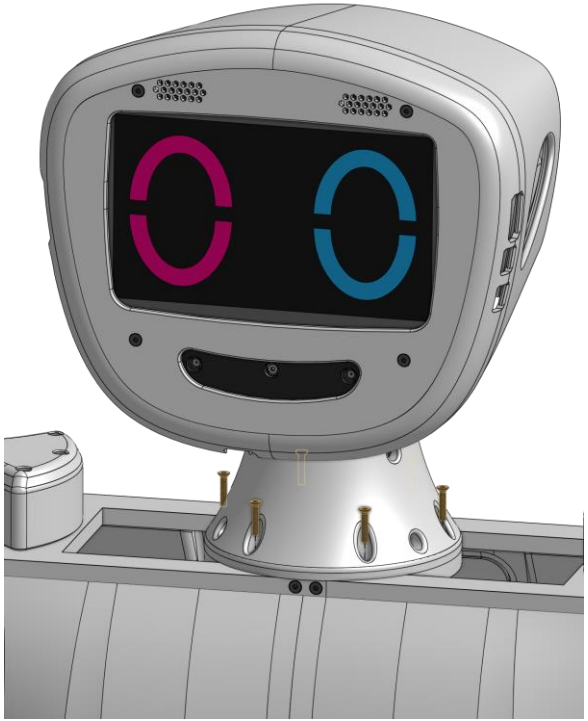




Step 3c

2 6x

Use **6 x 16 mm screws** to connect head-neck-assembly to the previous assembly from step 2.

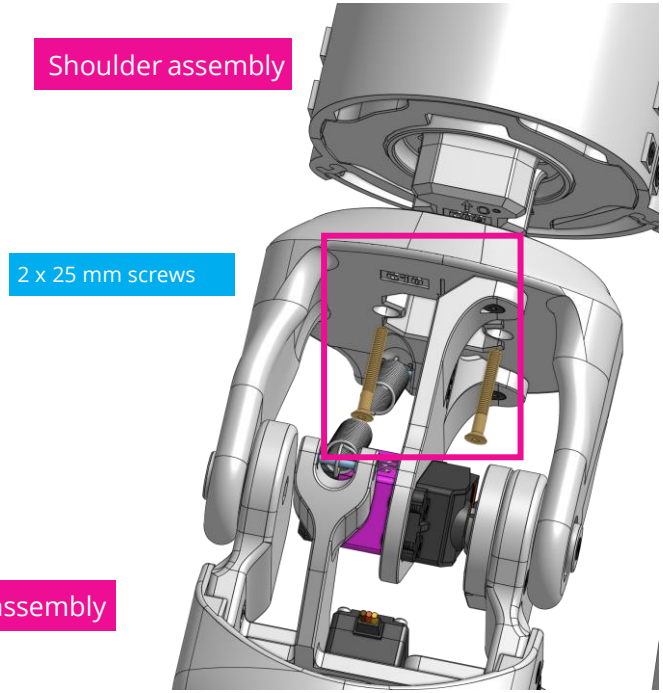


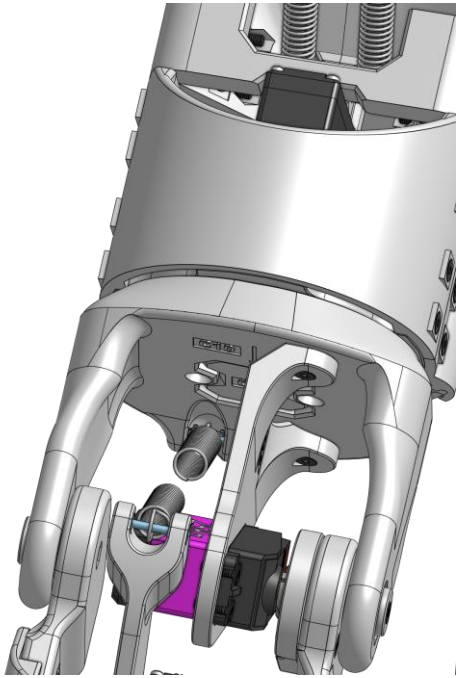
Step 4a

2 2x

Connect the preassembled **elbow** to **shoulder** using **2 x 25 mm screws.**

Note: use the printed arrows to have the right orientation).



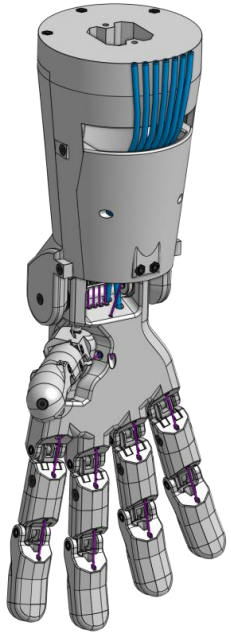


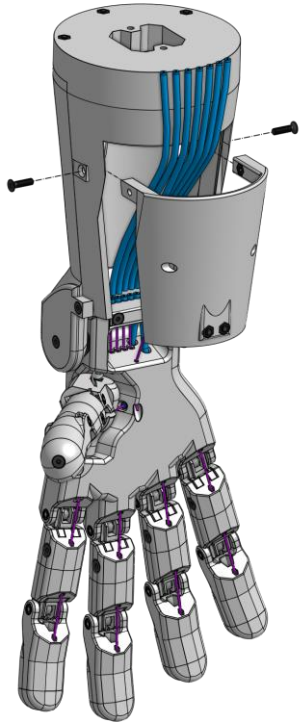
Step 4b

1

Disassemble **C20** on the f**orearm** to easily connect hand and forearm with elbow and shoulder.

This step is needed for a simplified assembly in the next steps.

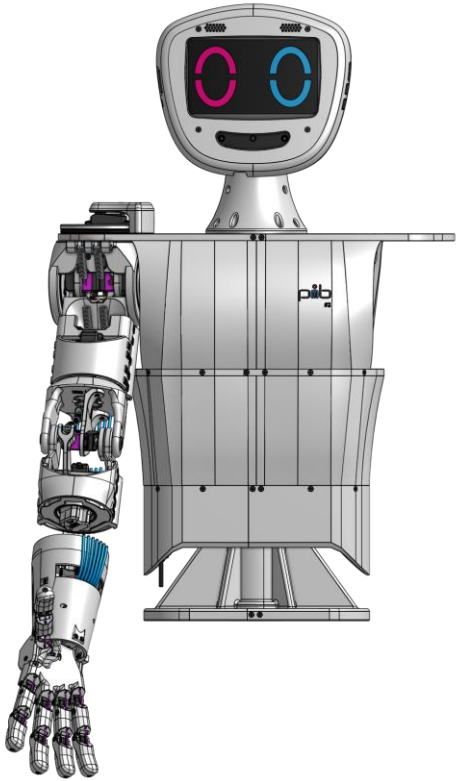


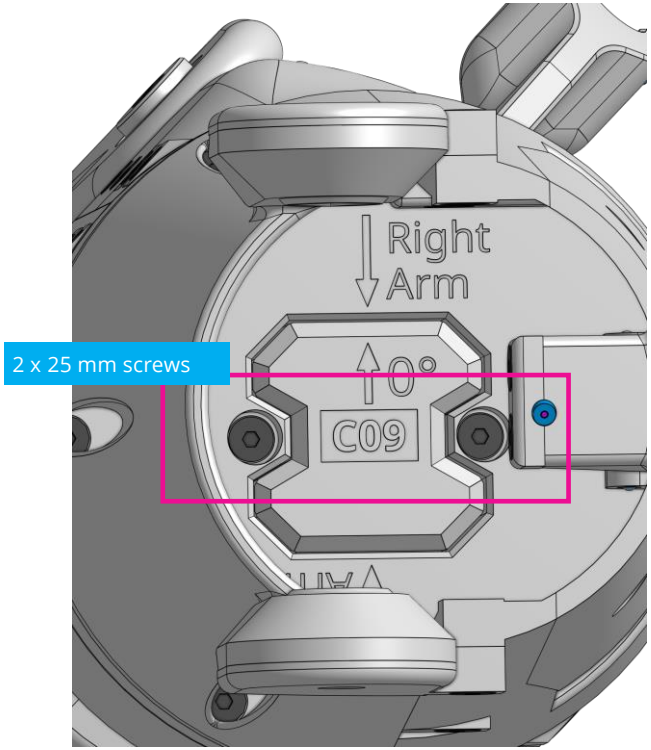


Step 4c

2 2x

Connect hand and forearm to elbow by using **2 x 25 mm screws.**

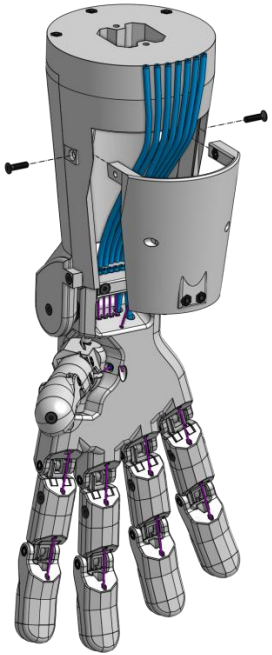


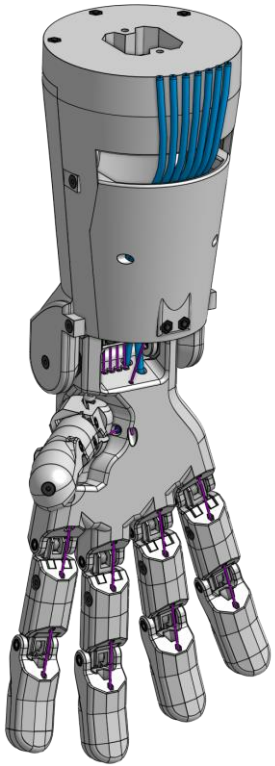


Step 4d

1 2x

Re-assemble **C20** on the forearm with the screws you removed in step 2.



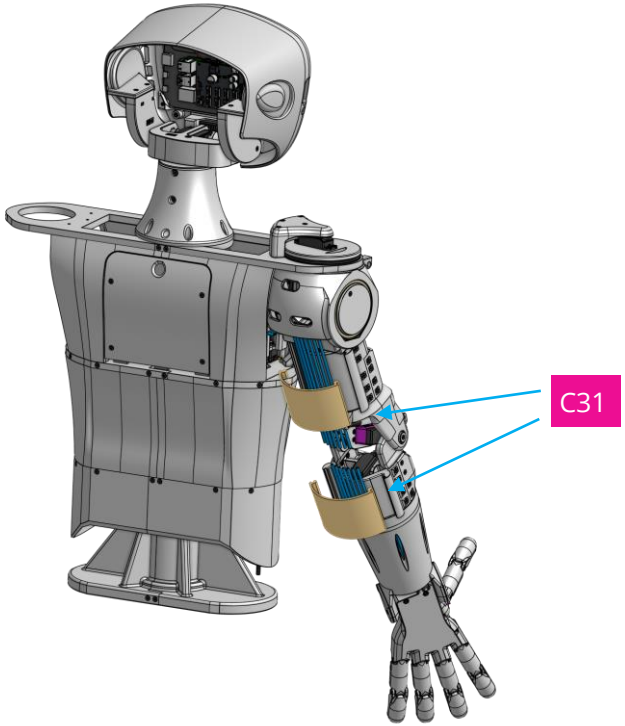


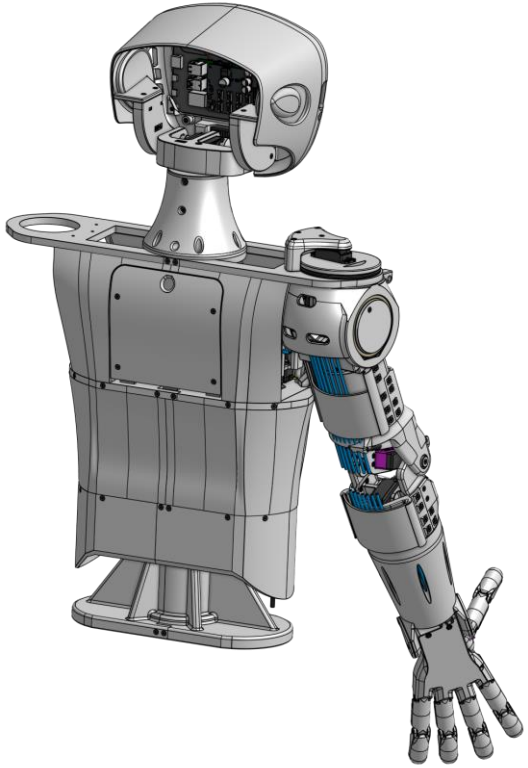
Step 4e

1

Enclose teflon tubes coming out of the forearm with **2 x C31**.

You don´t need any tool for this.

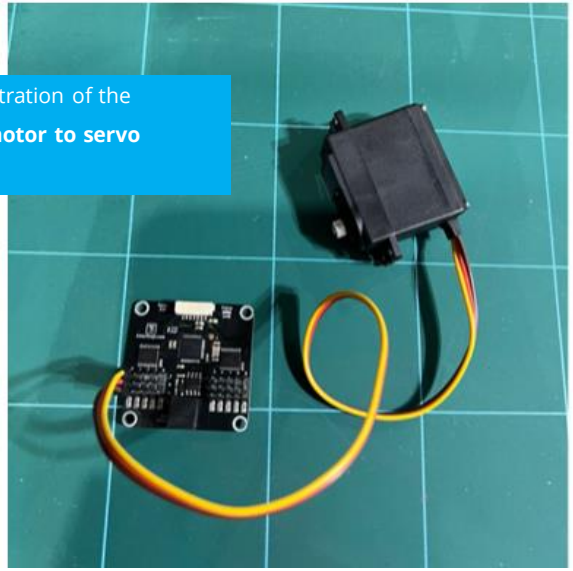


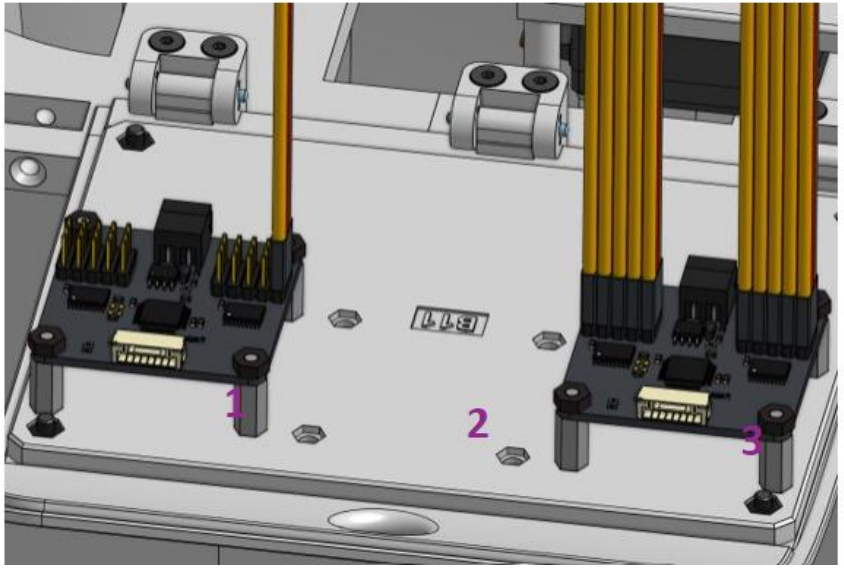


Step 5a

Connect the motors in fingers, arm and head to both 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 5a – Table (1)

Please use the information which are highlighted in the table.

Ignore any joint name with „left“ in it or connected to bricklet 2 if you are assembling pib with just one arm (=right arm).

Motor name (joint connected to motor like thumb rotator)	Bricklet number(When assembled bricklet 1 will be the left and 3 is the right, bricklet 2 is the extra one for 2 arms pib model)	Bricklet pin (pin on bricklet that servo will be connected to, 0 to 9)
"upper_arm_left_rotation"	2	5
"elbow_left"	2	6
"lower_arm_left_rotation"	2	7
"shoulder_vertical_left"	3	Uses 2 motors one connected to pin 7 and the other connected to pin 9
"shoulder_horizontal_left"	3	0
"upper_arm_right_rotation"	3	1
"elbow_right"	3	2
"lower_arm_right_rotation"	3	3
"shoulder_vertical_right"	3	Uses 2 motors one connected to pin 5 and the other connected to pin 8
"shoulder_horizontal_right"	3	6
"turn_head_motor"	1	0
"tilt_forward_motor"	1	1

Step 5a – Table (2)

Please use the information which are highlighted in the table.

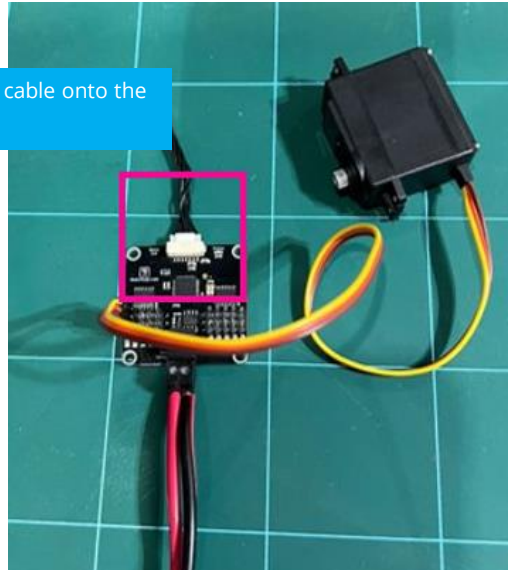
Ignore any joint name with „left“ in it or connected to bricklet 2 if you are assembling pib with just one arm (=right arm).

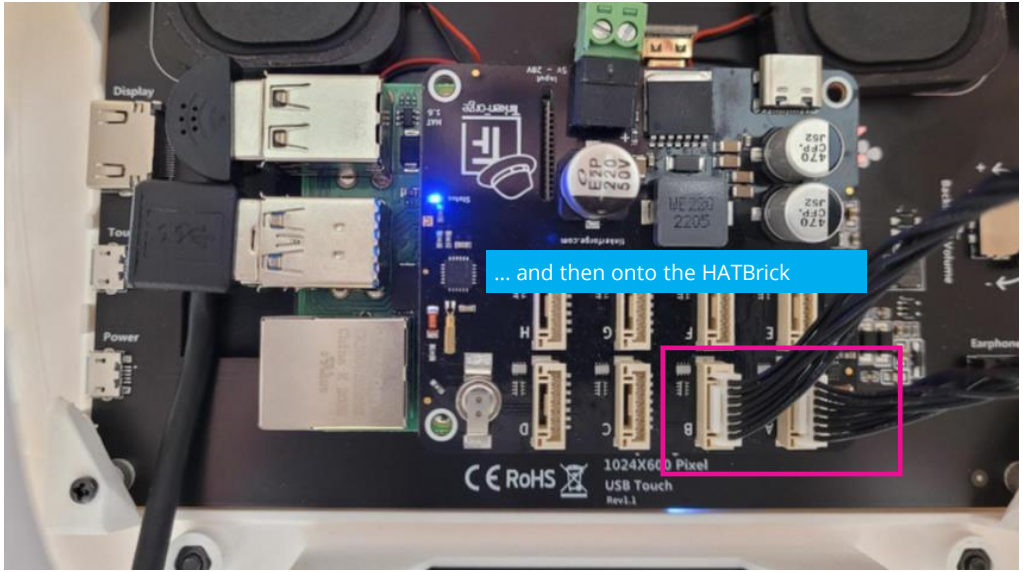
Motor name (joint connected to motor like thumb rotator)	Bricklet number(When assembled bricklet 1 will be the left and 3 is the right, bricklet 2 is the extra one for 2 arms pib model)	Bricklet pin (pin on bricklet that servo will be connected to, 0 to 9)
"thumb_right_opposition"	1	3
"thumb_right_stretch"	1	4
"index_right_stretch"	1	5
"middle_right_stretch"	1	6
"ring_right_stretch"	1	7
"pinky_right_stretch"	1	8
"thumb_left_opposition"	1	9
"thumb_left_stretch"	2	0
"index_left_stretch"	2	1
"middle_left_stretch"	2	2
"ring_left_stretch"	2	3
"pinky_left_stretch"	2	4
"wrist_left"	1	2
"wrist_right"	3	4

Step 5b

Connect both E03 **servo bricklets** (located in the upper body) to E02 **TinkerForge HATBrick** (located in the head) using 2 x bricklet cables. Please use the **spots A and B** on the HATBrick to connect the cables.

Connect the bricklet cable onto the servo bricklet ...

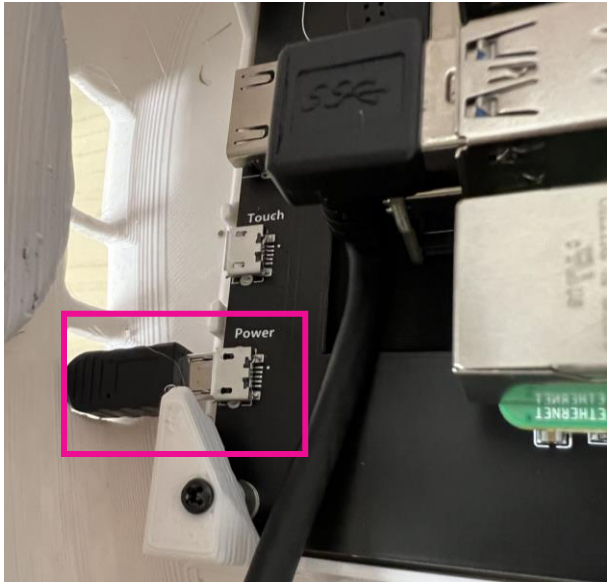




Step 5c

Lastly, your pib needs some power.

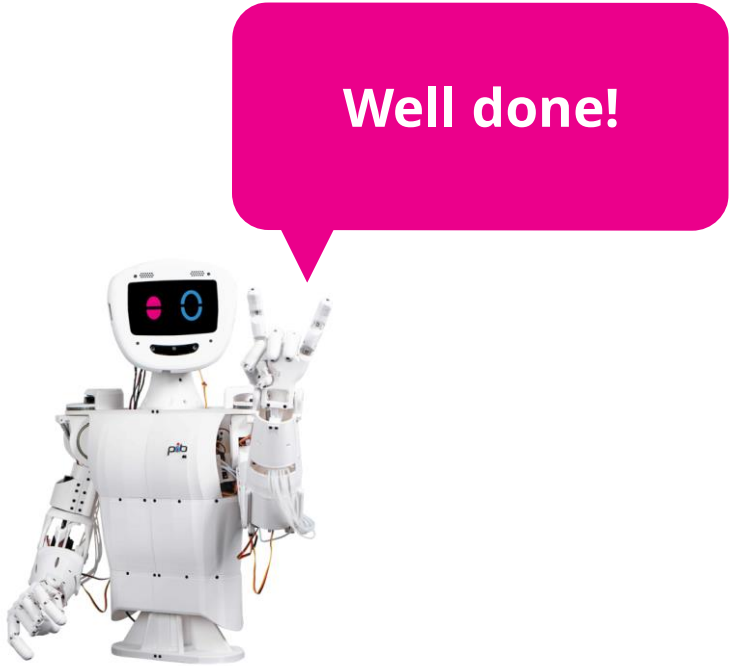
Therefore connect the power adapter to the shown spot of the screen (in the head

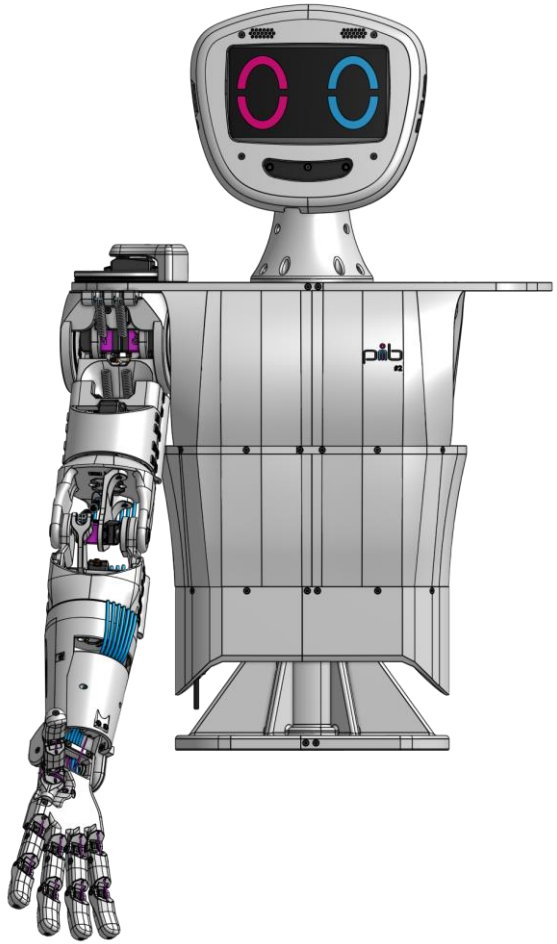


Congratulations

You did a great job, pib is assembled!

Plug both power supplies to the power distributor and your pib is ready for all kind of fun stuff.





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.

team@pib.rocks
Send us an email.

discord.com/invite/GRdpyeDu7P
Join us on Discord.

shop.pib.rocks
Order non-printable parts for pib.