ROBOTONT

assembly instructions

Robotont version: 3.0
Date: 2024-03-21

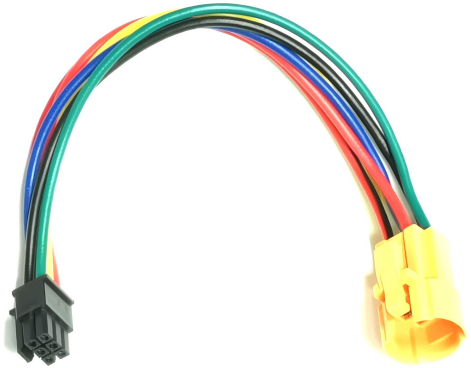
Table of contents

Cabling

All cables needed for Robotont

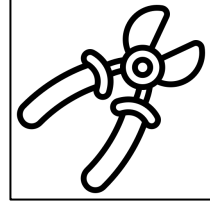
x1
on-board computer
power cable

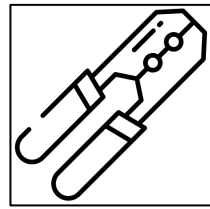
x1
STOP switch
cable



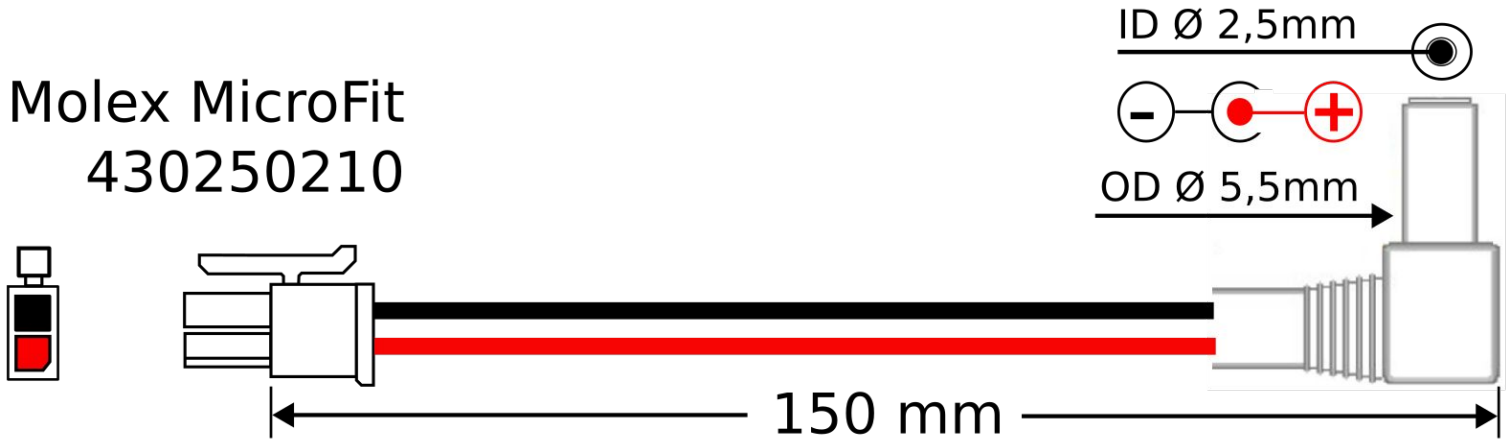
x2
USB Type C
data cables

Onboard computer power cable

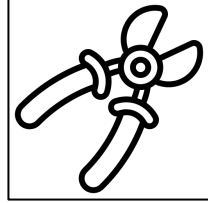


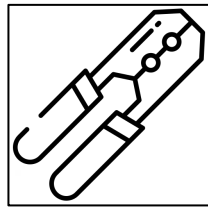


- Cut the cable to 150 mm from the right angled barrel plug
- Crimp Molex Micro-Fit terminals to the wires
- Insert terminated wires to 2x1 pos Micro-Fit 3.0 female connector
  - Black wire (GND) goes to the side next to the locking fastener



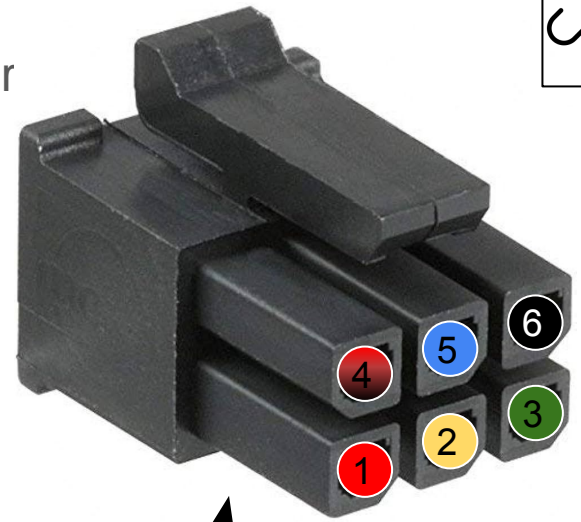
Stop switch cable

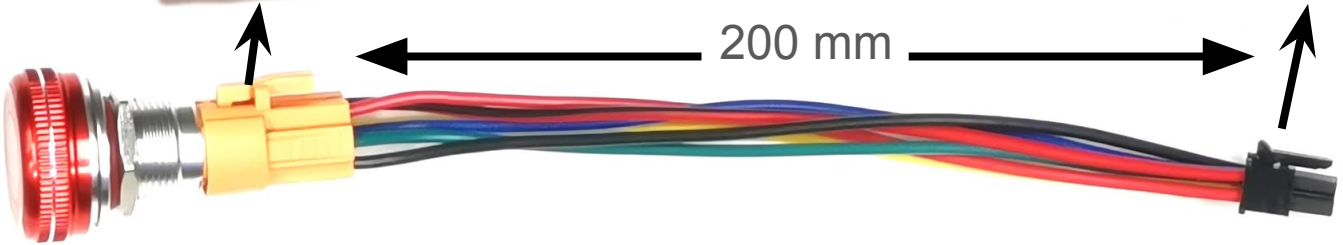




- Cut the stop switch wires to 200 mm length
- Crimp Molex Micro-Fit terminals to all wires
- Insert to 2x3 pos Micro-Fit 3.0 female connector
  - Follow the numbering below for the correct mapping

1 - LED Common (3.3 V)
2 - Switch Normally Closed
3 - Switch Common (3.3 V)
4 - LED Red -
5 - Switch Normally Open (not used)
6 - LED Green -



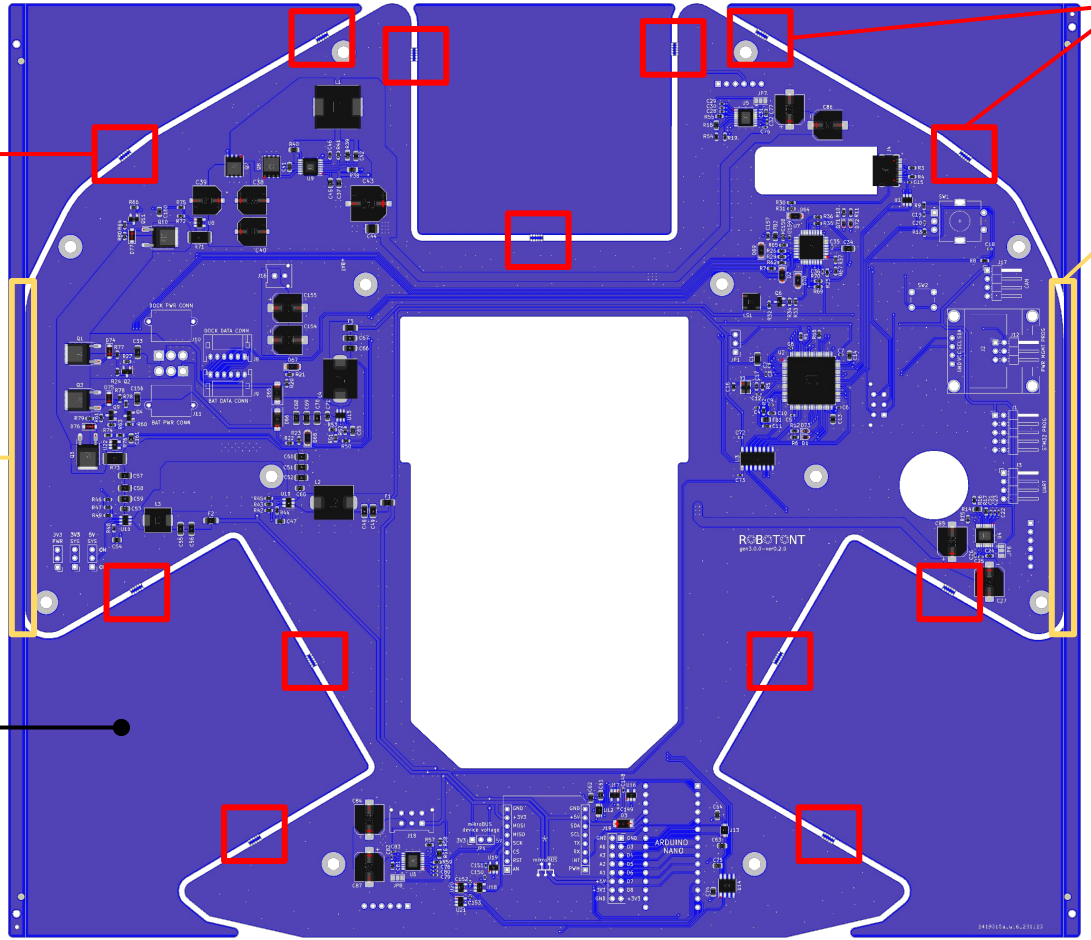


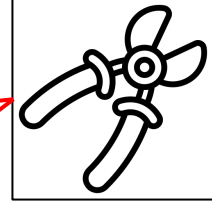
PCB assembly

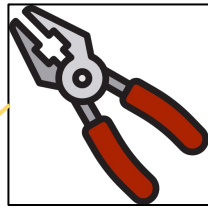
Cut the mouse bites

Bend the sides

Remove the outer manufacturing panel

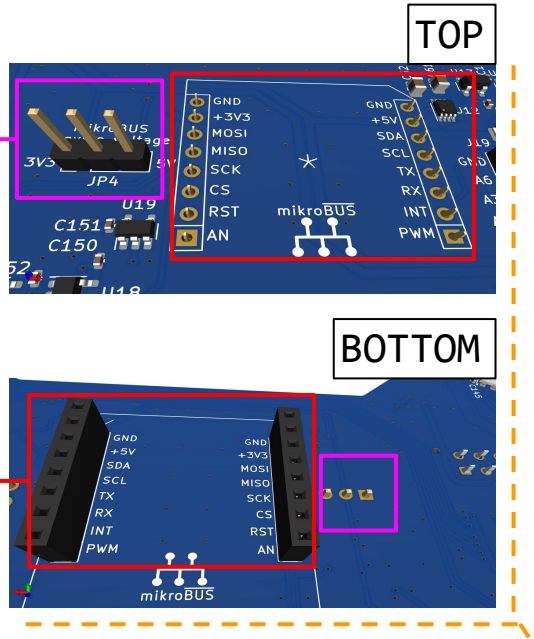


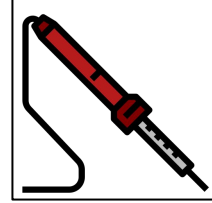


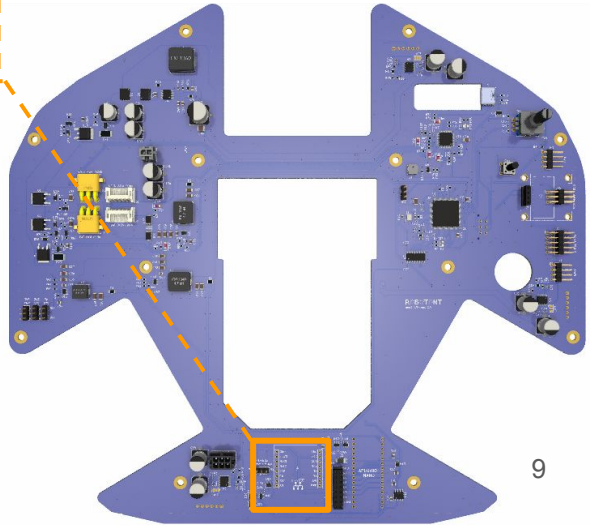


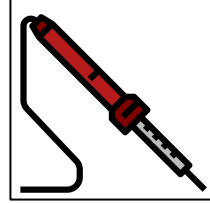
Solder 1x3 pinheader for MikroBUS voltage selection

Solder MikroBUS dedicated socket (alternatively two 1x8 pinsockets)



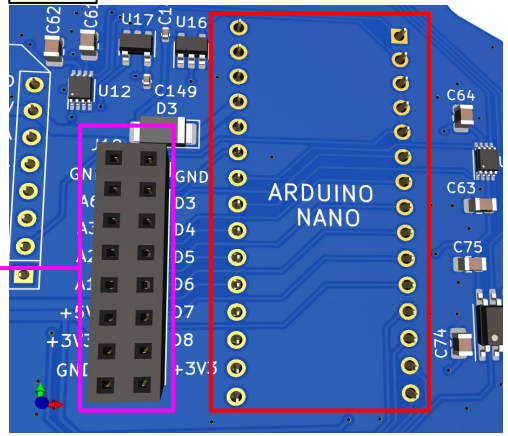






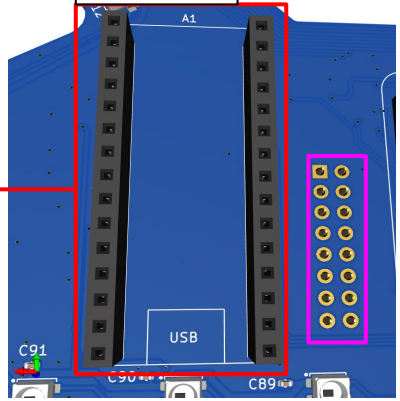
Solder 2x3 pinsocket for accessing unused pins

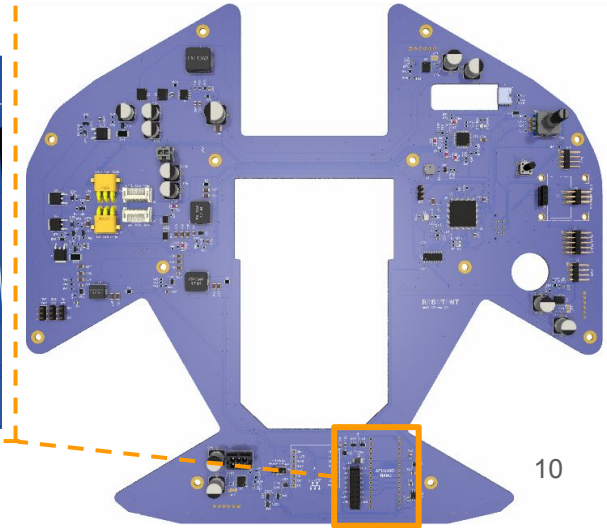
TOP

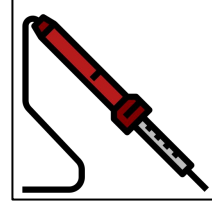


Solder two 1x15 pinsockets for Arduino

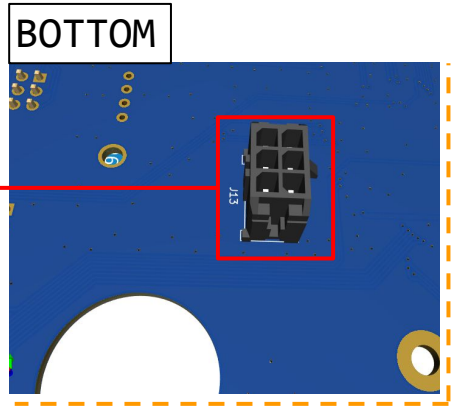
BOTTOM



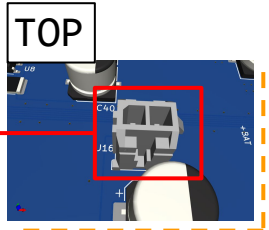




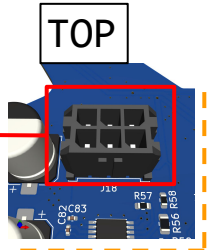
Solder 2x3 Micro-Fit socket
for the stop switch

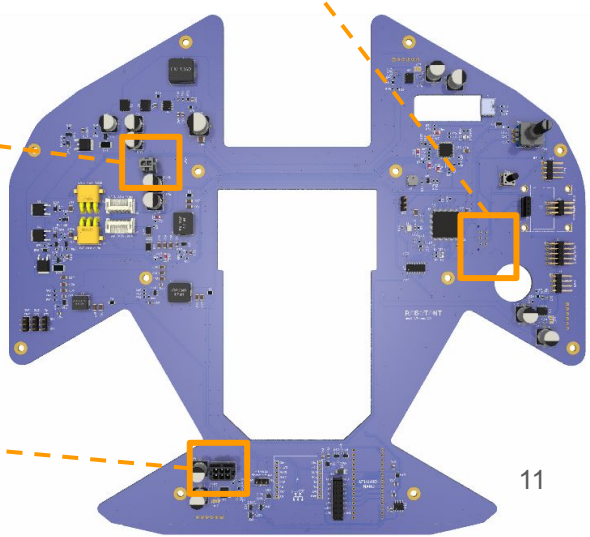


Solder 2x1 Micro-Fit socket for
onboard computer power supply



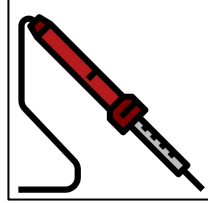
Solder 2x3 Micro-Fit socket
for external power

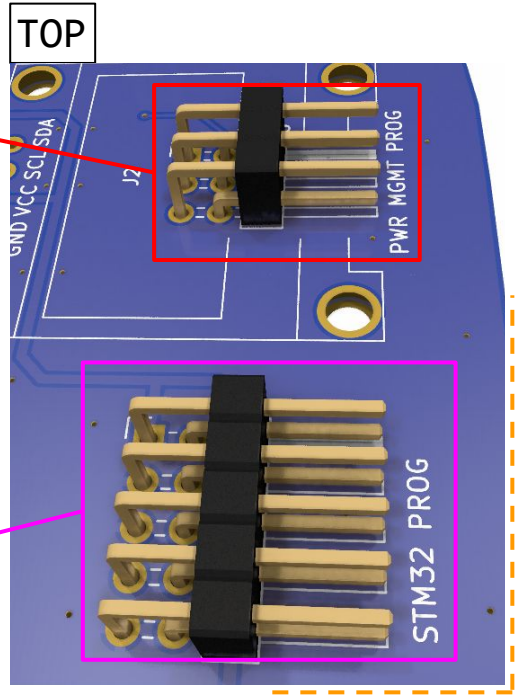


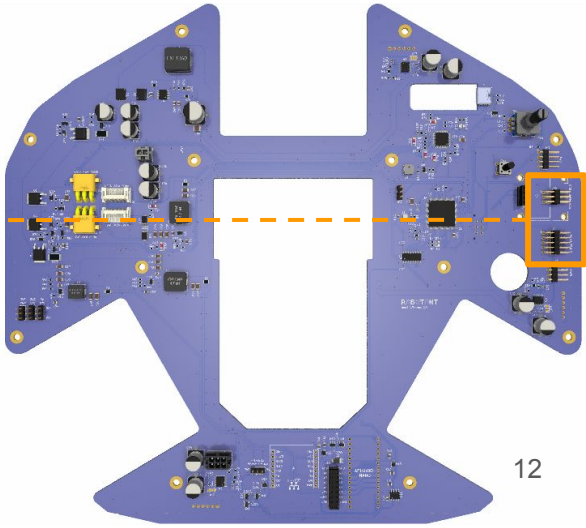


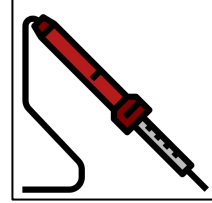
Solder 2x3 right-angled pinheader for the power management MCU programming

Solder 2x5 right-angled pinheader for the main MCU programming

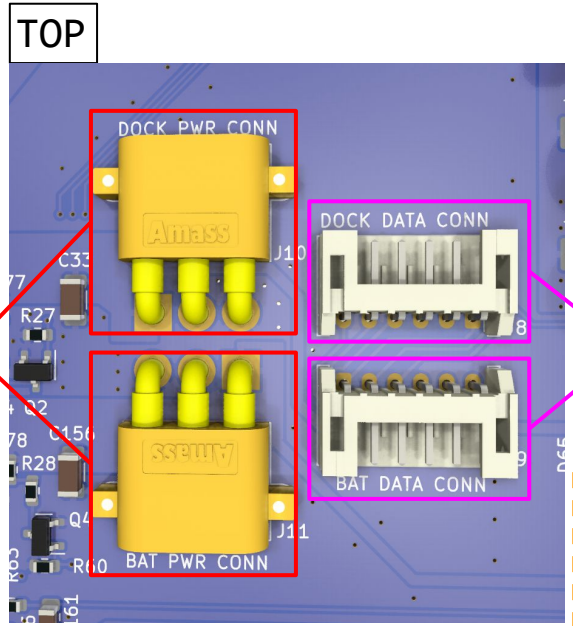




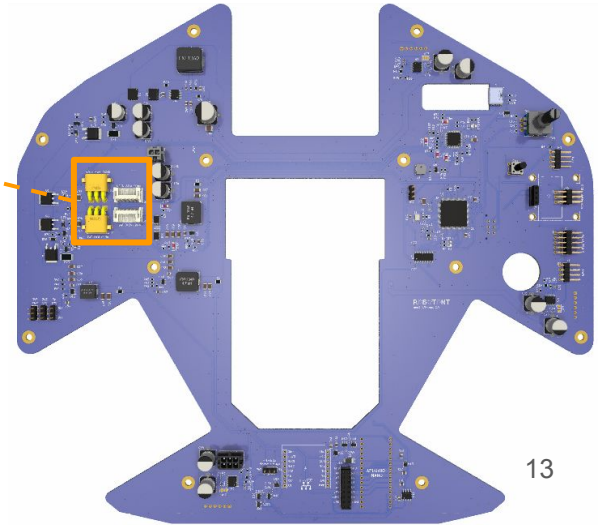




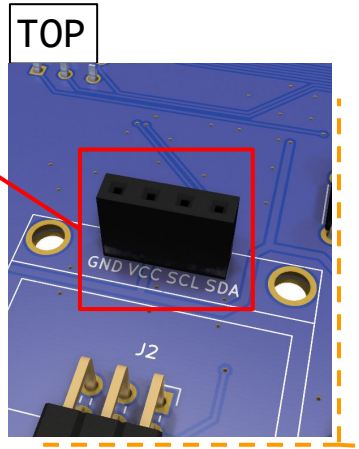
Solder two MR30PW
male power connectors

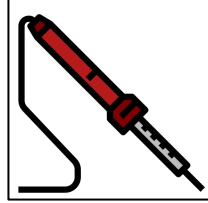


Solder two JST-PH-6
male data connectors

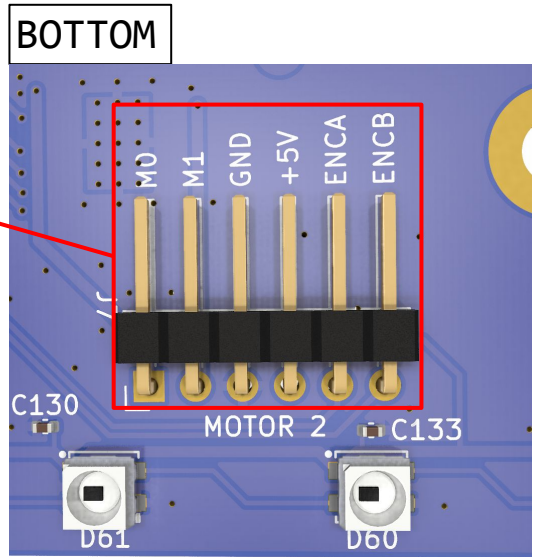


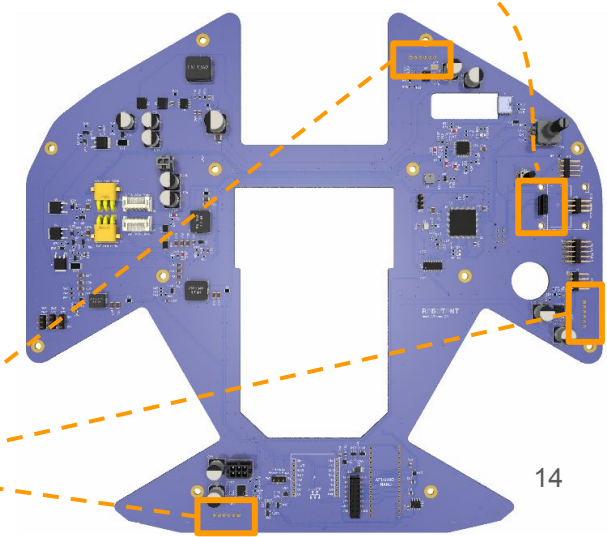
Solder 1x4 pinsocket
for the OLED display

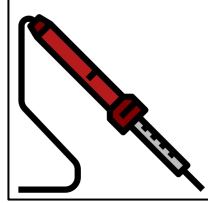




Solder three 1x6 angled
pinheaders for the motors

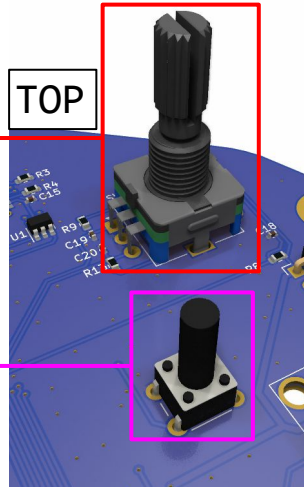


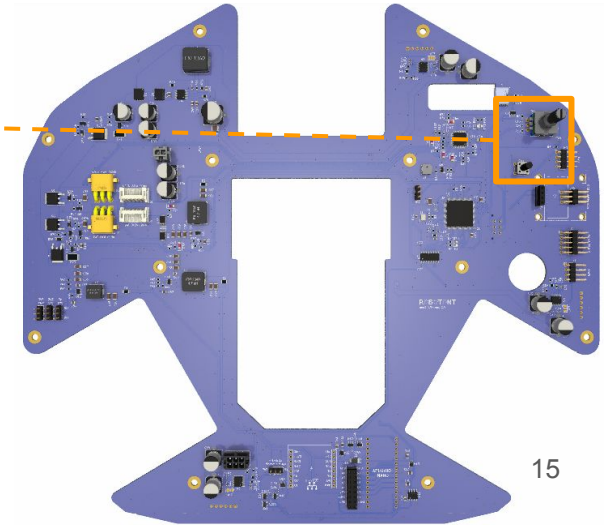




Solder the rotary encoder

Solder the power switch





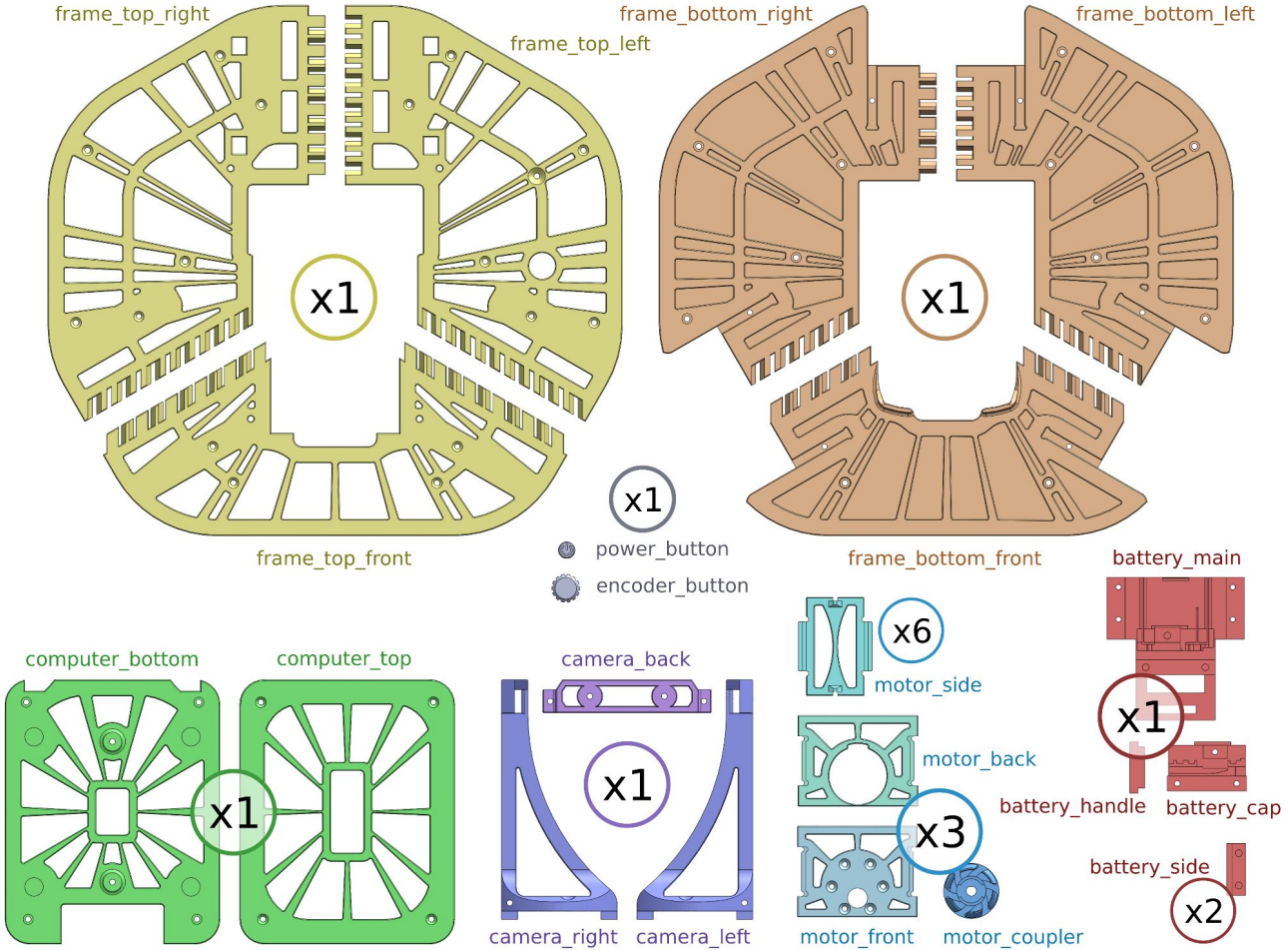
3D printing

3D printing

Print every detail in the amount shown.

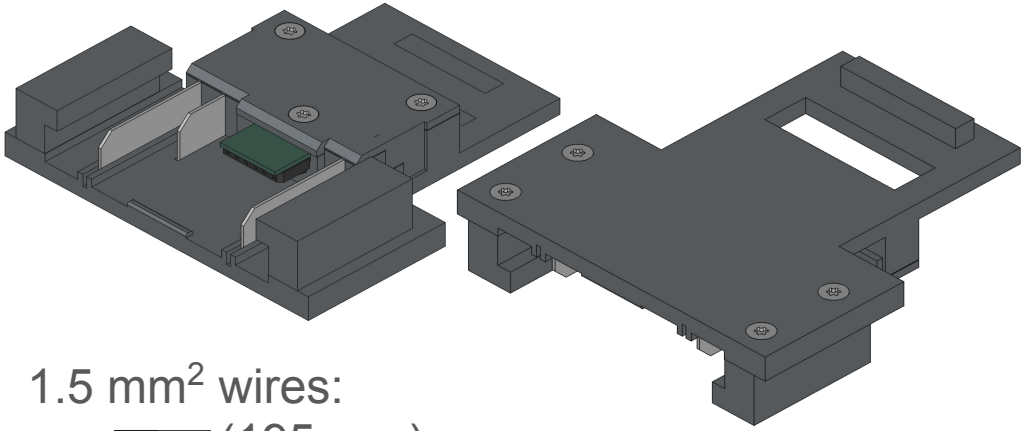
Material suggestion:

- PETG for motor modules
- PLA for everything else



Battery module assembly

Battery module part list



1.5 mm^2 wires:

- (195 mm)
- (170 mm)
- (160 mm)

0.13 mm^2 wires (x6):

- (180 mm)

AMASS MR30-FB connector (x1)

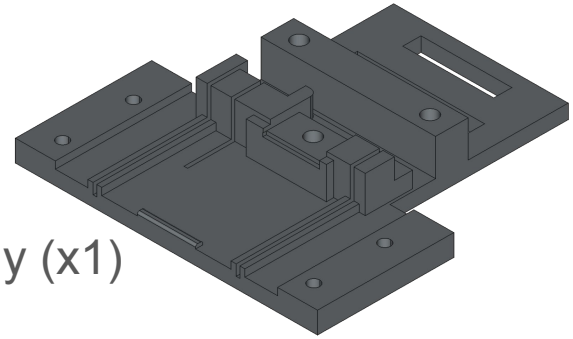
M3x8 bolts (x7)

M3x5.9 heat-set inserts (x7)

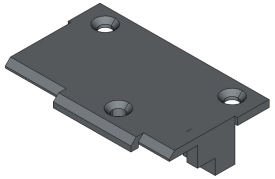
JST-PH-6

- terminals (x6)
- connector (x1)

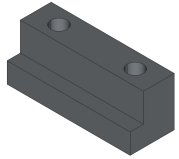
main body (x1)



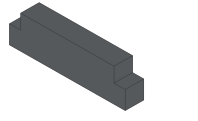
cap (x1)



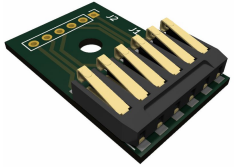
side (x2)



handle (x1)

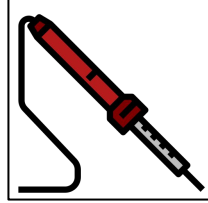


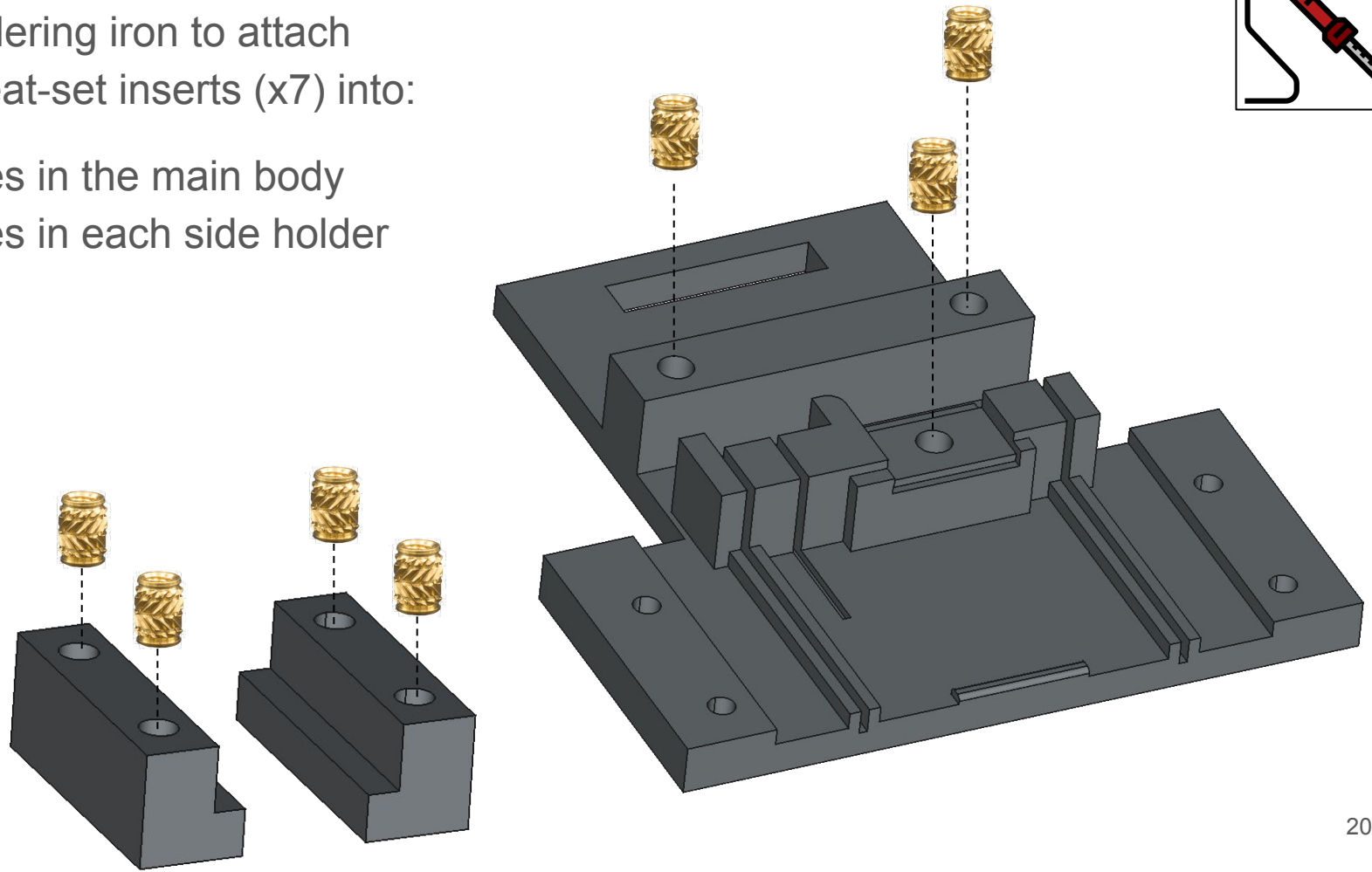
PCB + spring contacts (x1)



Use a soldering iron to attach M3x5.9 heat-set inserts (x7) into:

- 3 holes in the main body
- 2 holes in each side holder



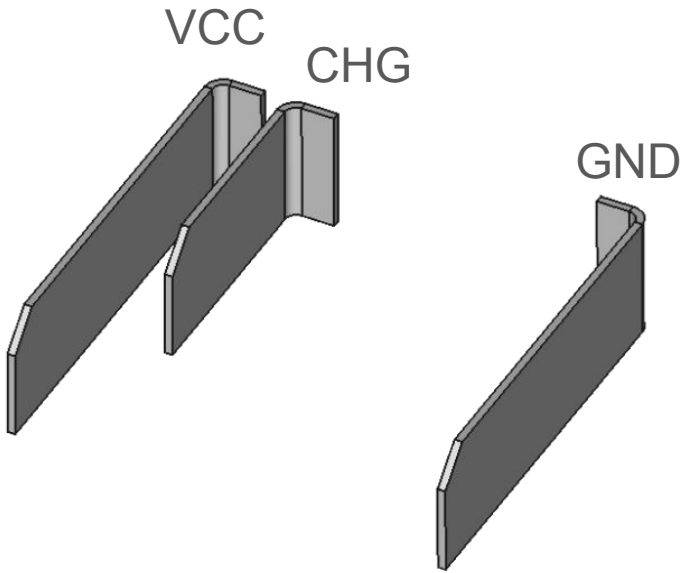


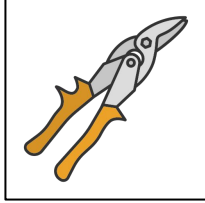
Cut contact strips from
0.7 mm thick sheet metal:

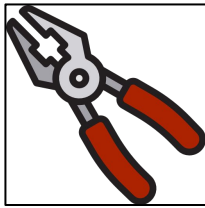
- GND: 11x40 mm
- CHG: 11x25 mm
- VCC: 11x40 mm

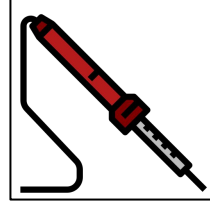
Bend one end of each strip by
90 degrees at 4 mm.

File or cut the corners for
smoother insertion to the
battery.







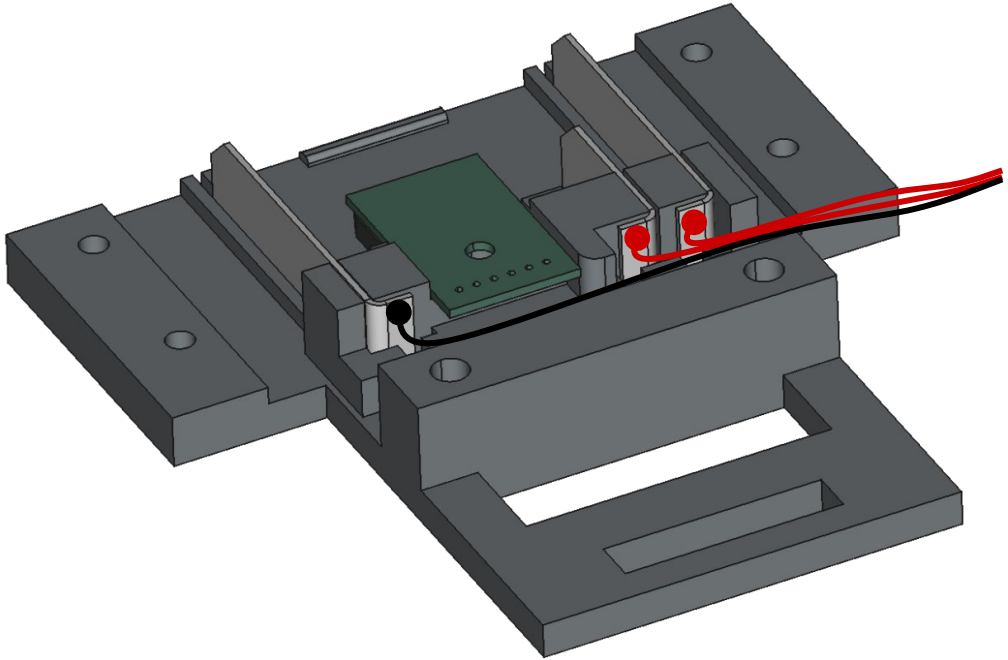


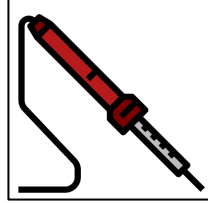
Insert the bent metal sheet contacts to the 3D-printed body

Cut and strip three cables (1.5 mm^2):

- GND (black): 195 mm
- CHG (red): 170 mm
- VCC (red): 160 mm

Solder the cables to the top of the bent area



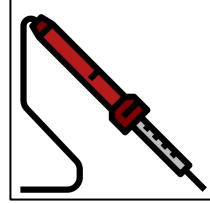


- Attach a rubber cover to the three wires
- Solder the wires to the MR30-FB female connector.
  - You will most likely need to trim the wires a little to the correct length.
- Snap the rubber cover over the connector using pliers

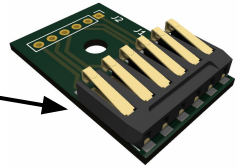
VCC

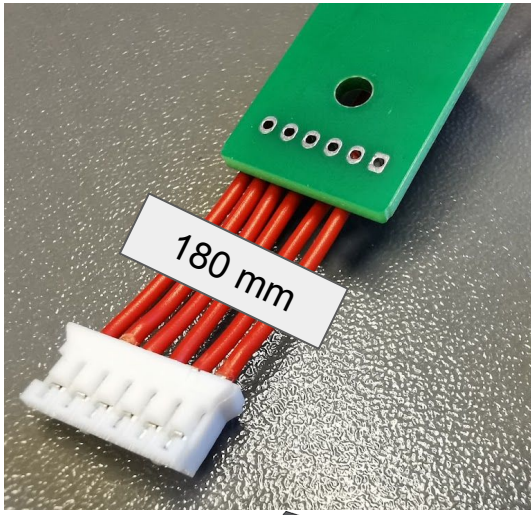
CHG

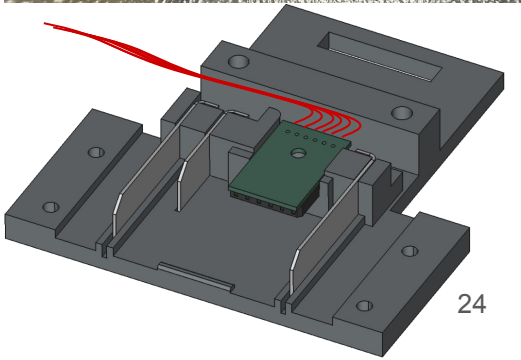
GND

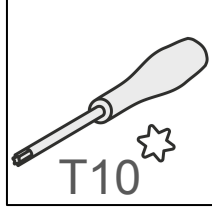


- Cut and strip six AWG 26 (0.13 mm2) cables
  - Length 180 mm
- Solder the spring contacts to the PCB
- Solder the cables to the PCB
- Crimp a JST-PH-6 terminal to the other end of the cables
  - It is a straight mapping from the PCB to the plug
- Position the PCB to its slot with spring contacts facing down
- Guide all wires through the channel to the side

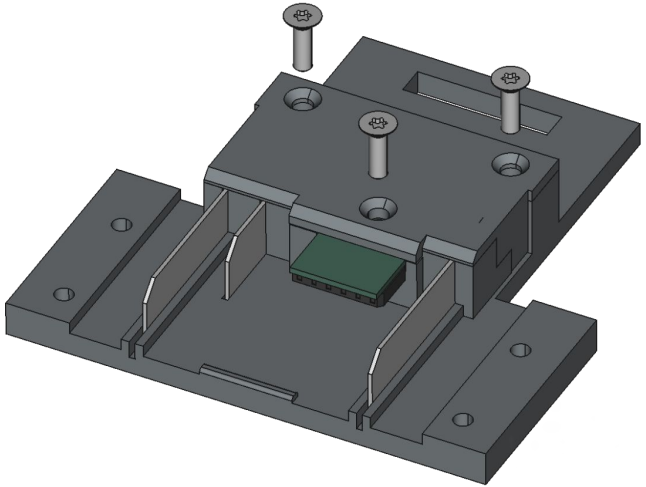


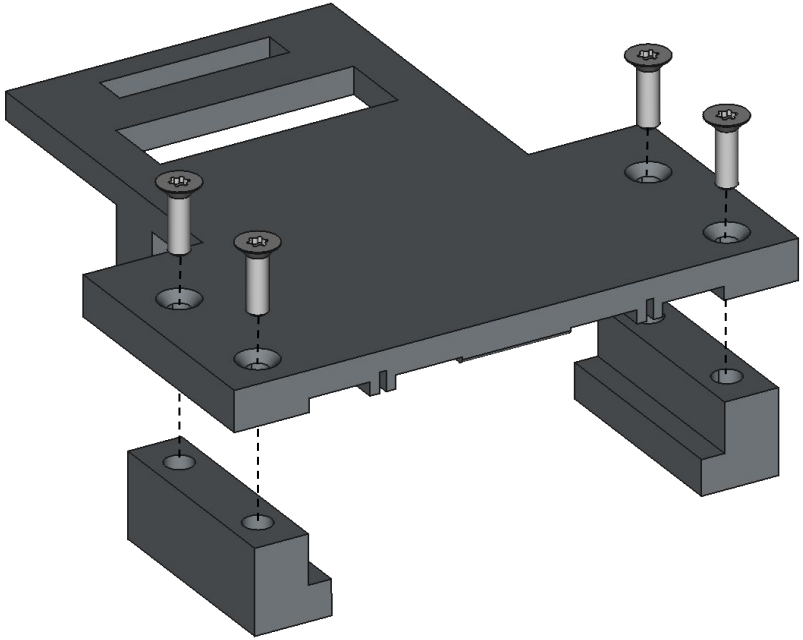


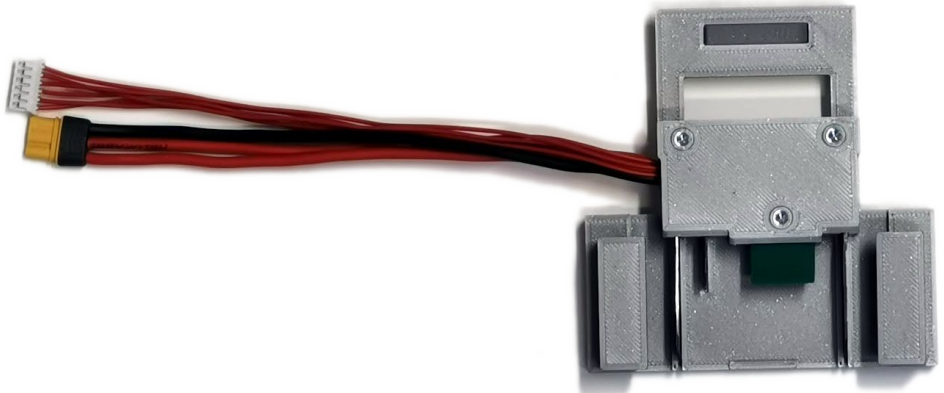




Attach the side holders and cap with M3x8 bolts (x7)

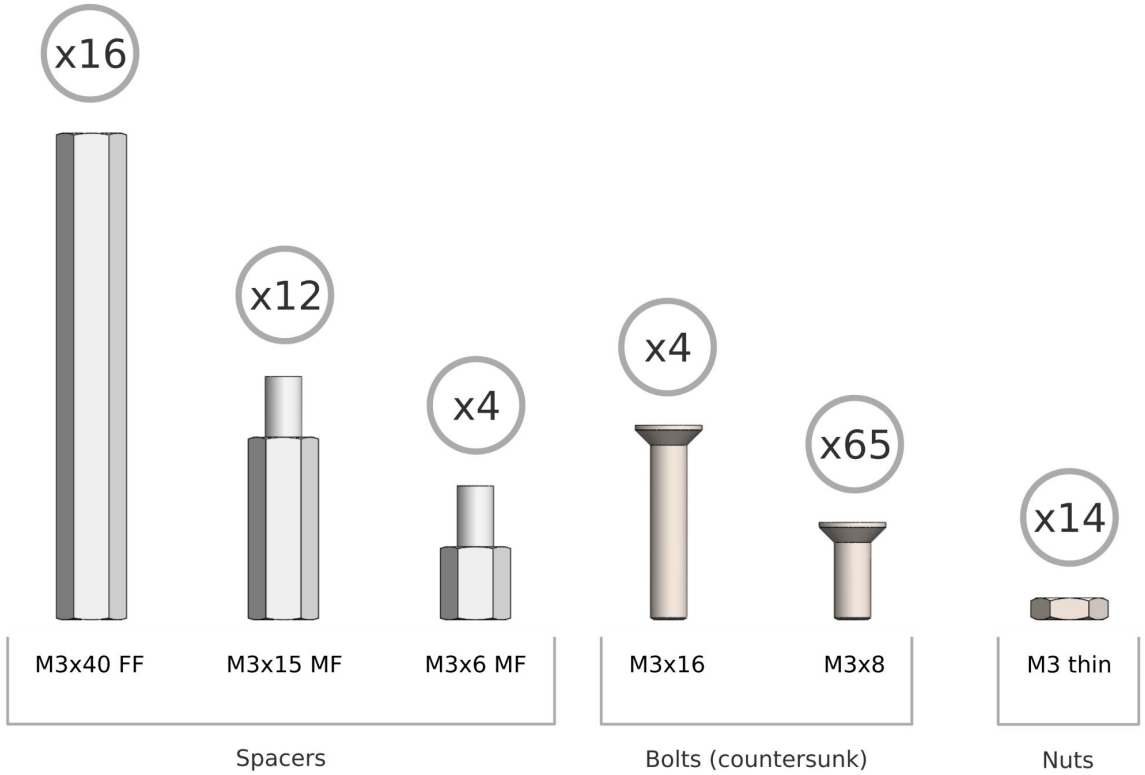




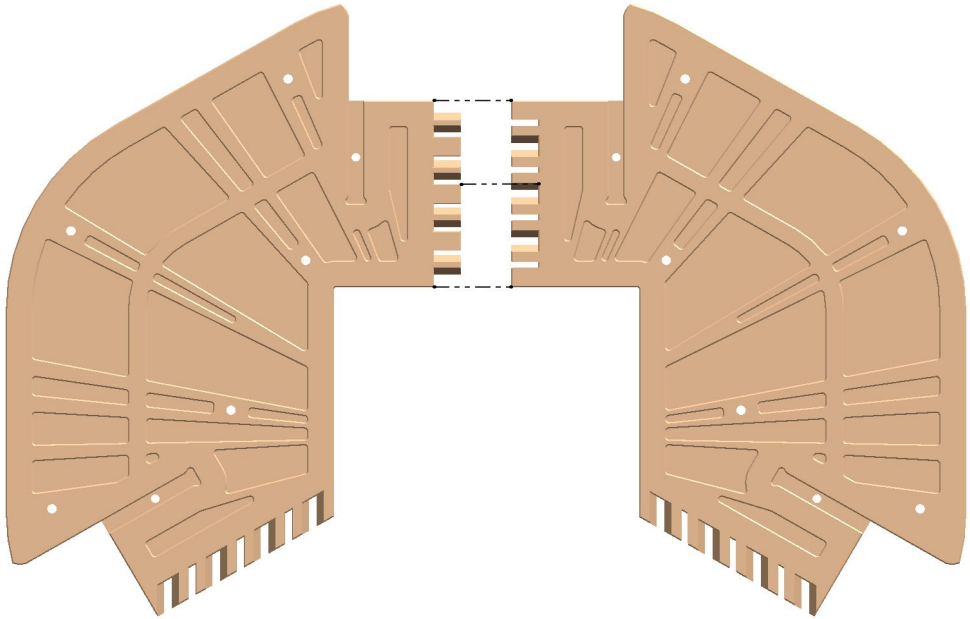


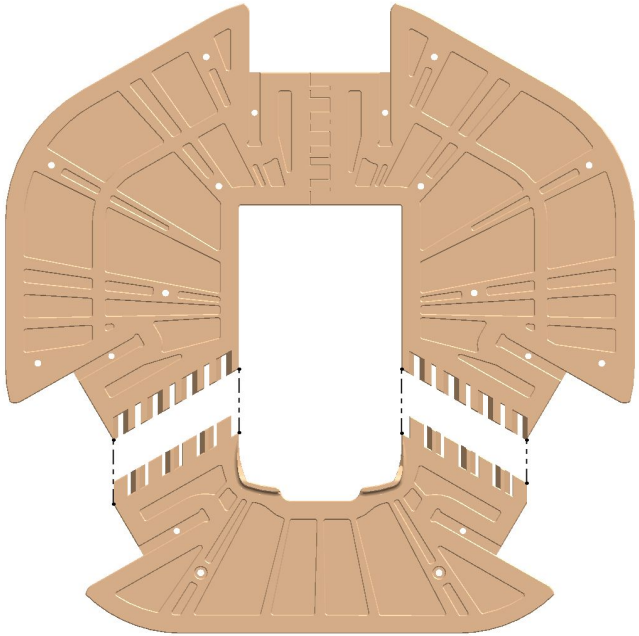
Robot assembly

Fastenings needed

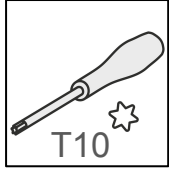


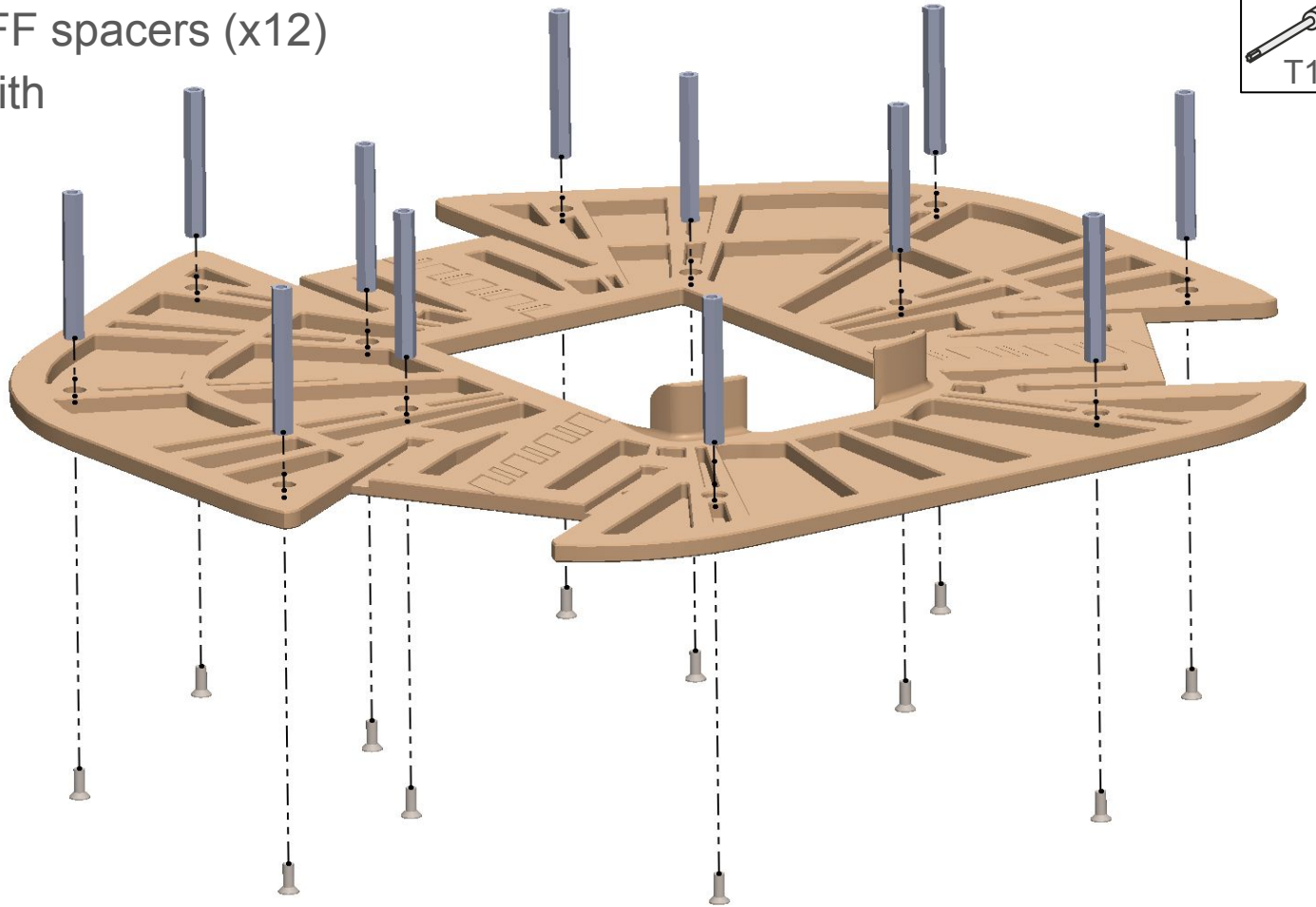
Bottom plate assembly



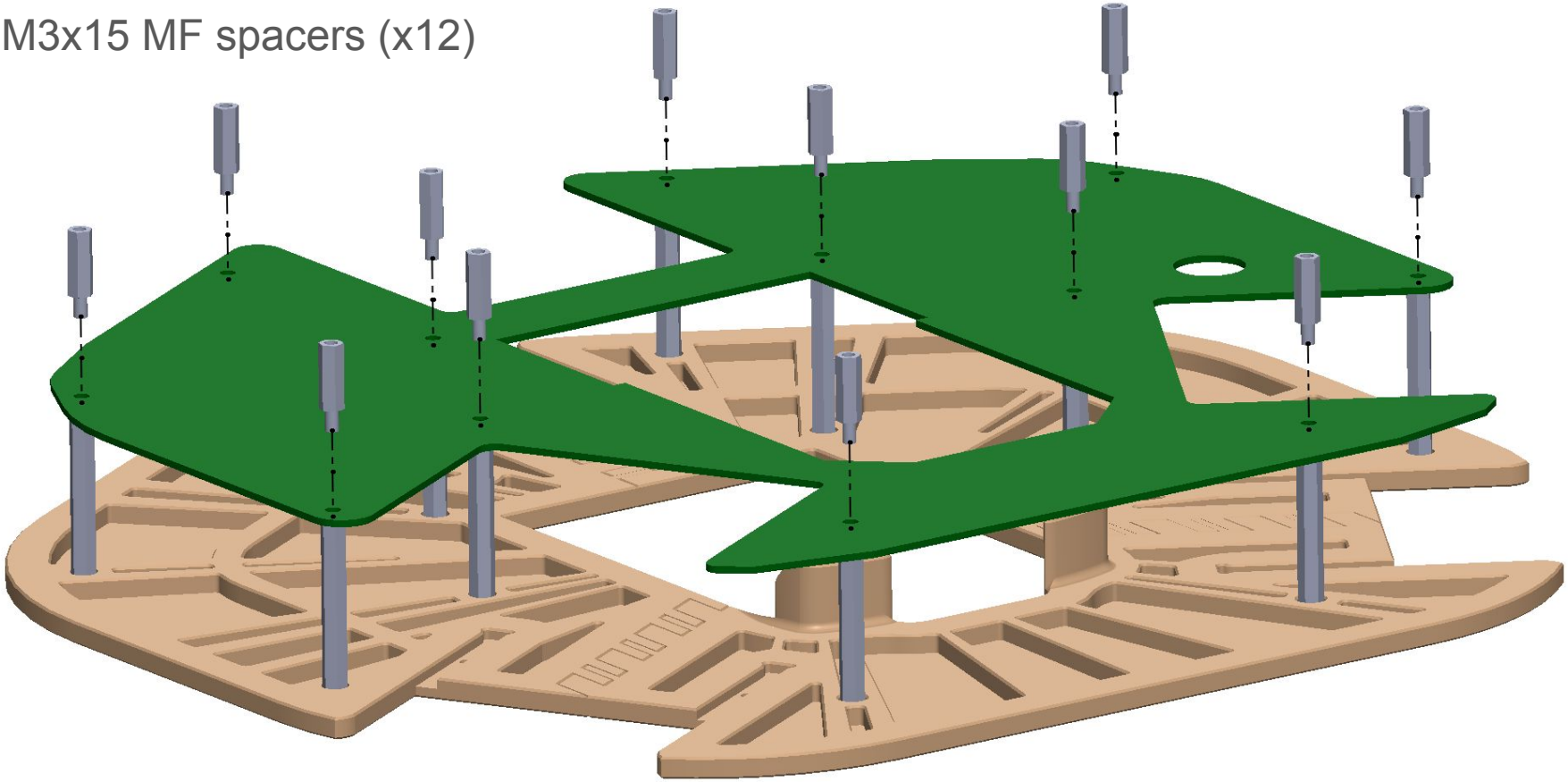


Connect M3x40 FF spacers (x12)
to bottom plate with
M3x8 bolts (x12)

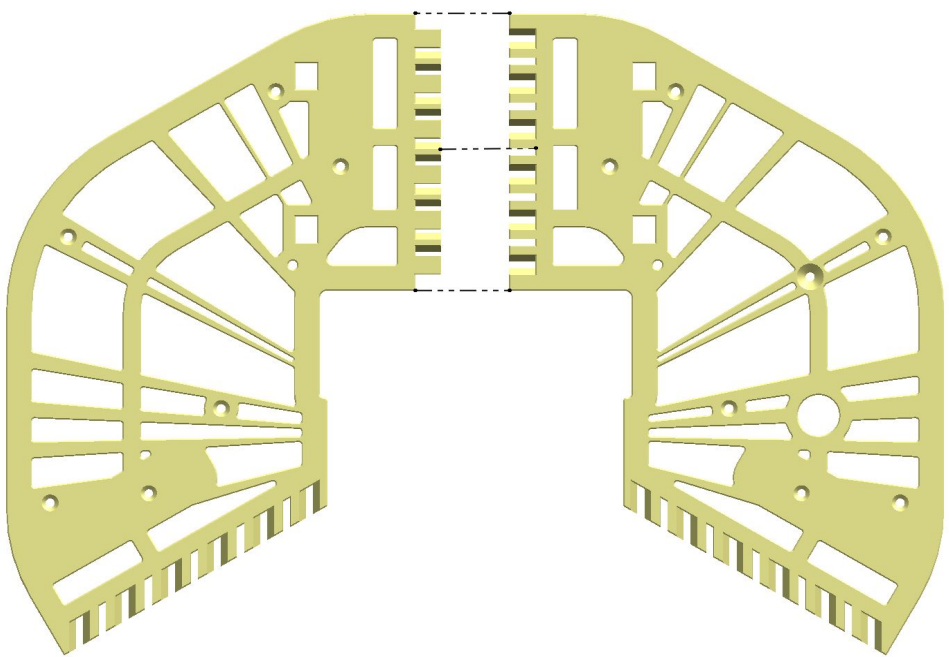


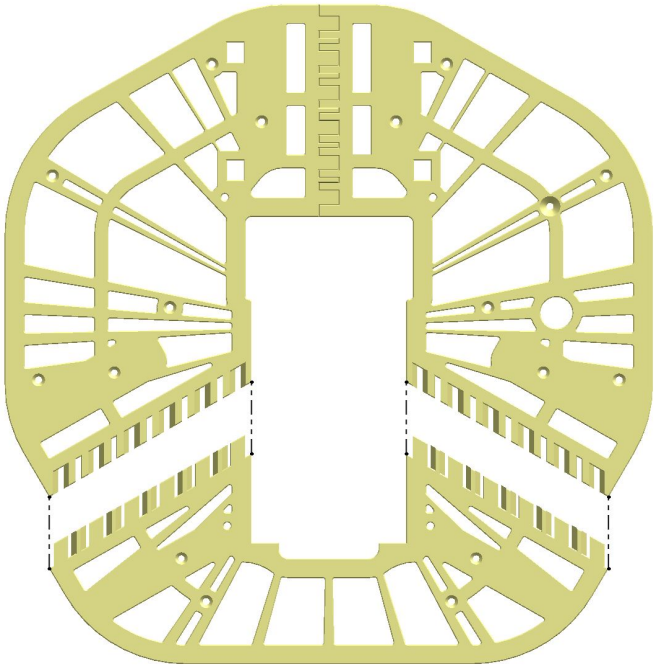


Secure PCB with
M3x15 MF spacers (x12)



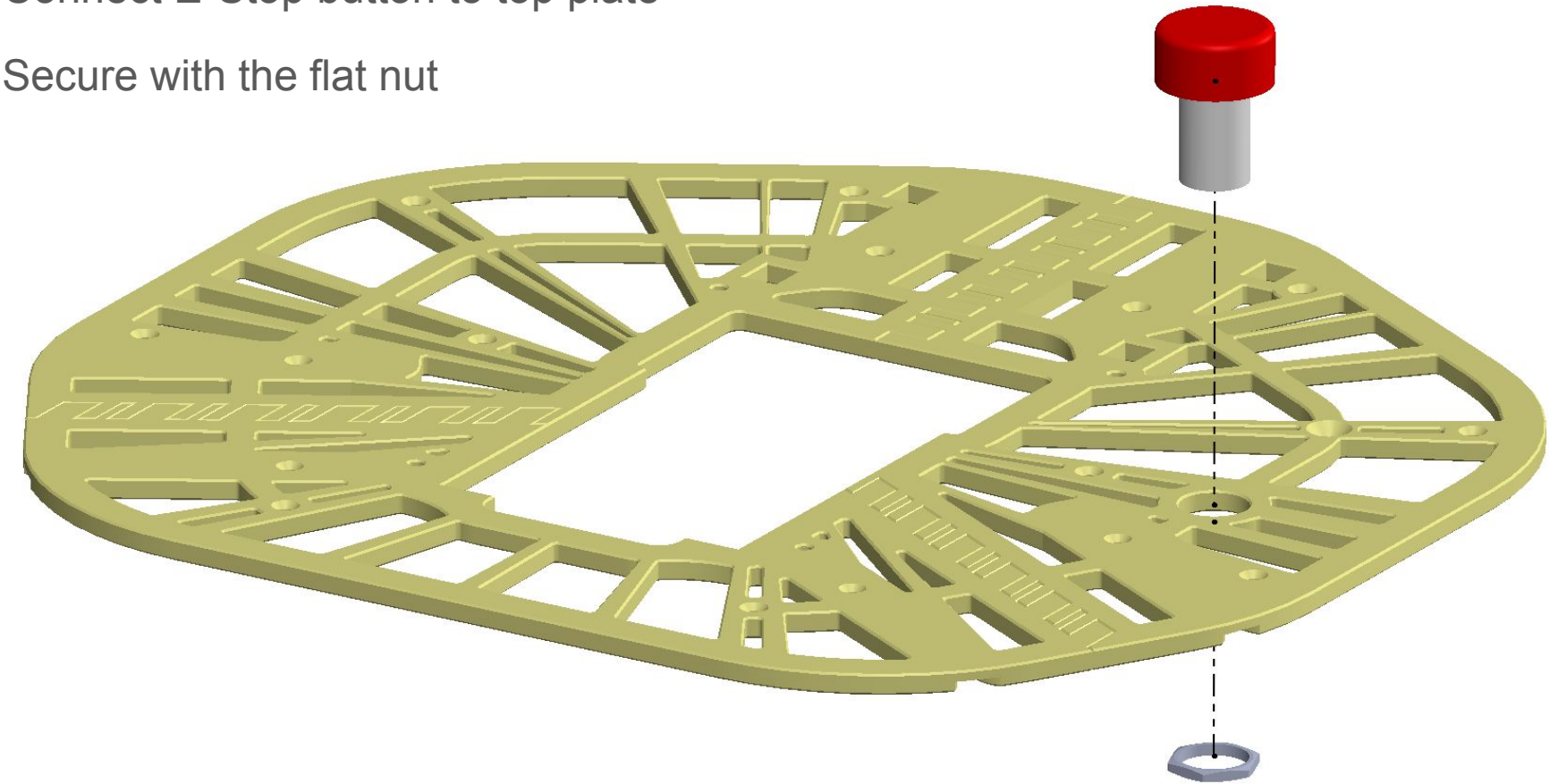
Top plate assembly





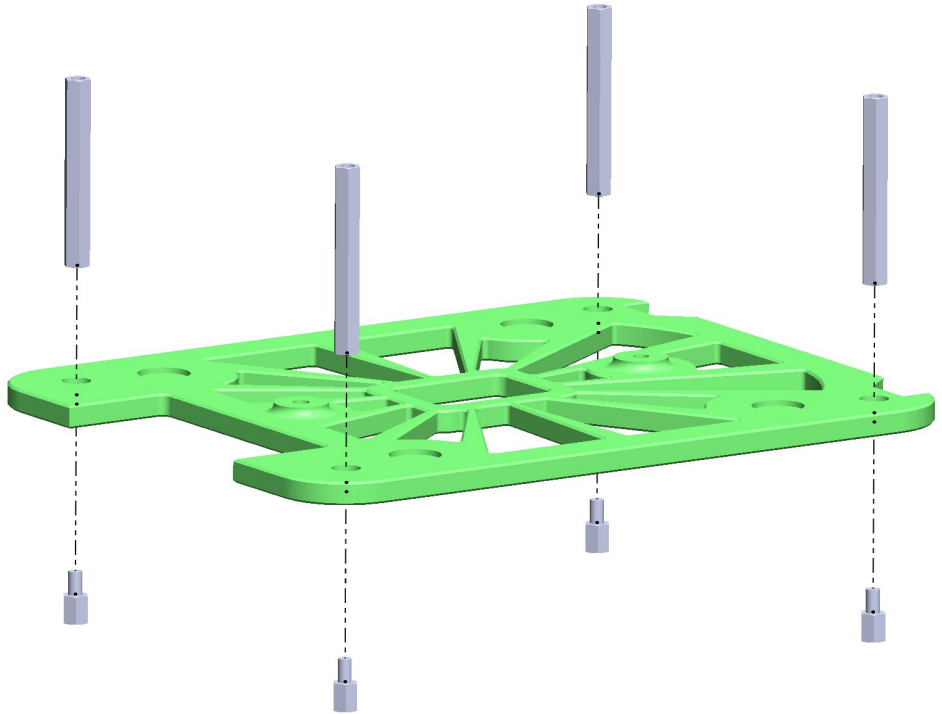
Connect E-Stop button to top plate

Secure with the flat nut



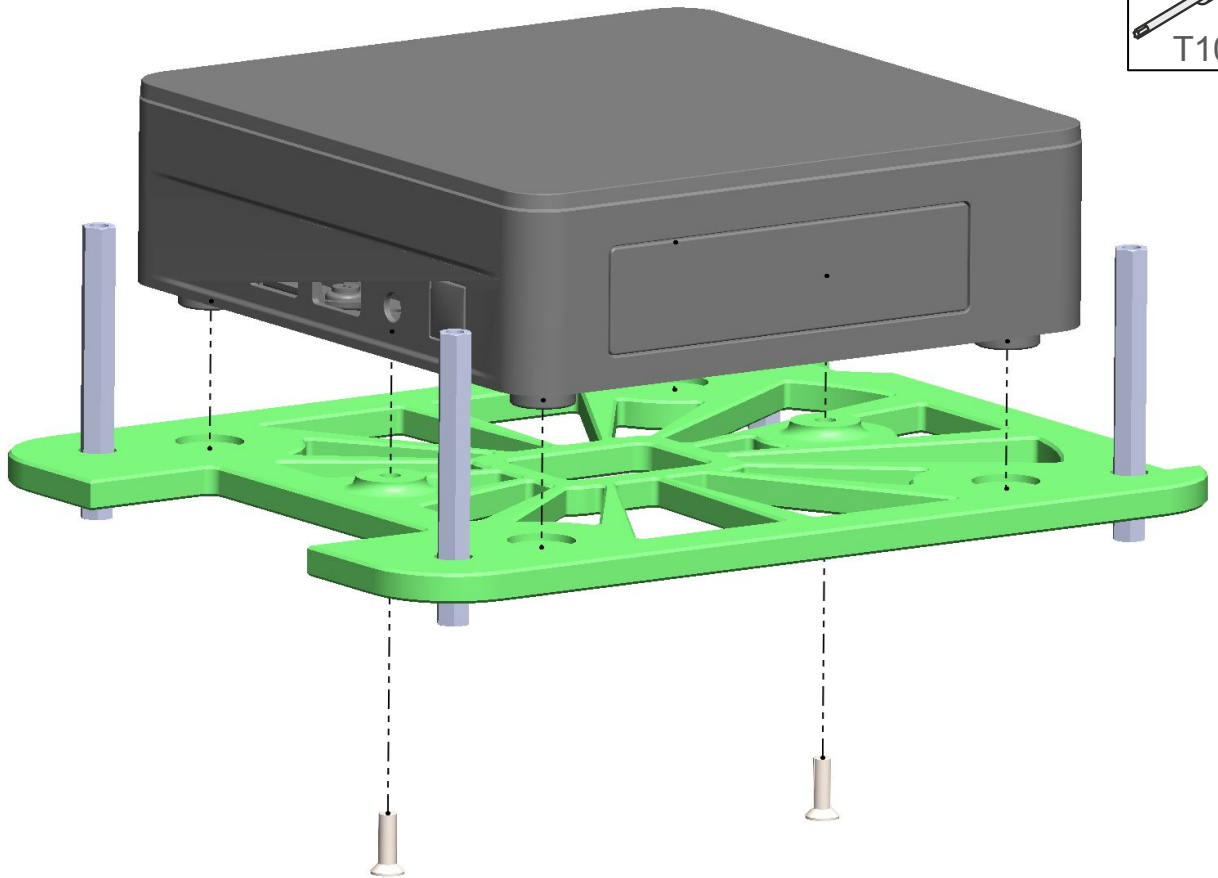
Computer module assembly

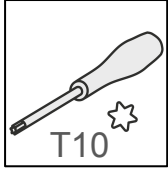
Join M3x6 MF spacers
with M3x40 FF spacers
in computer module
bottom plate corners (x4)



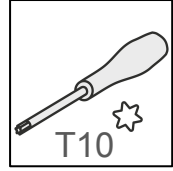
Align Intel NUC’s feet with their slots (x4)

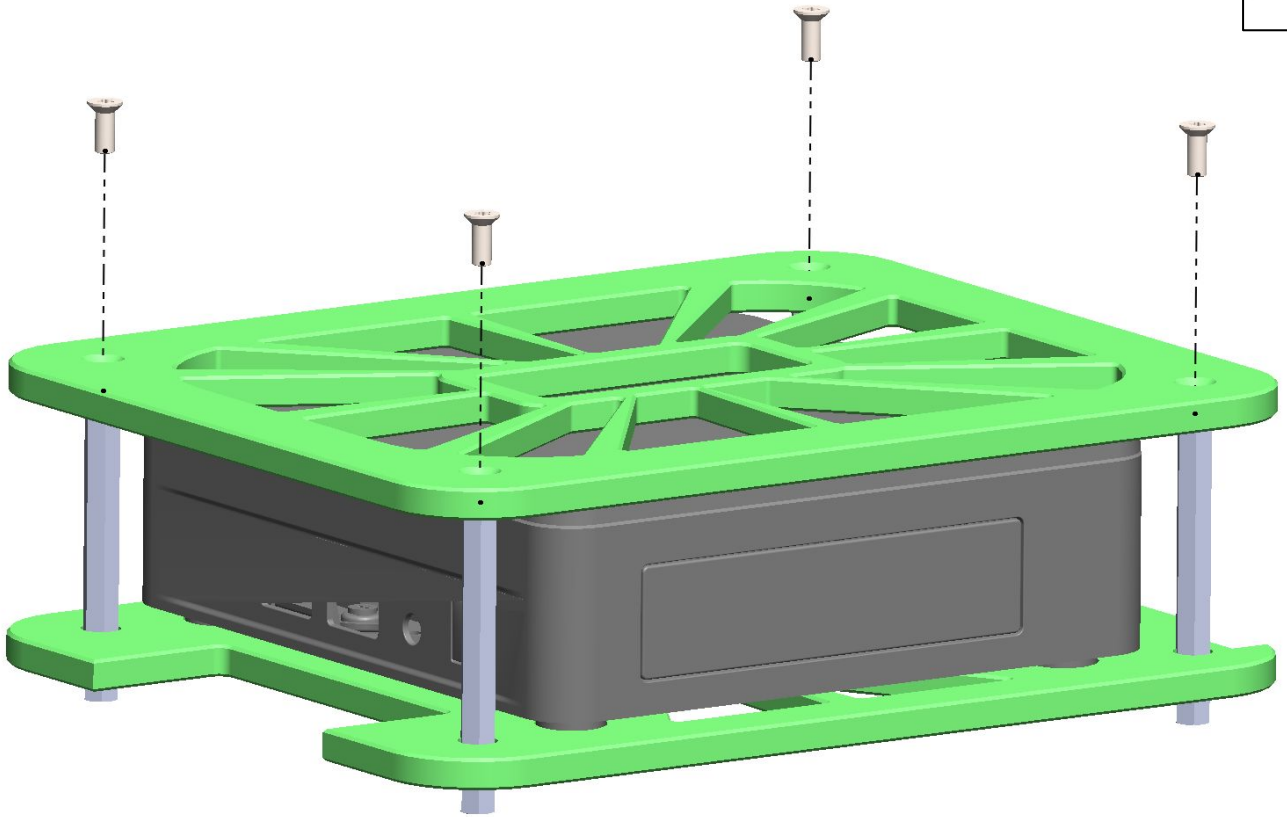
Secure Intel NUC with M3x8 bolts (x2)



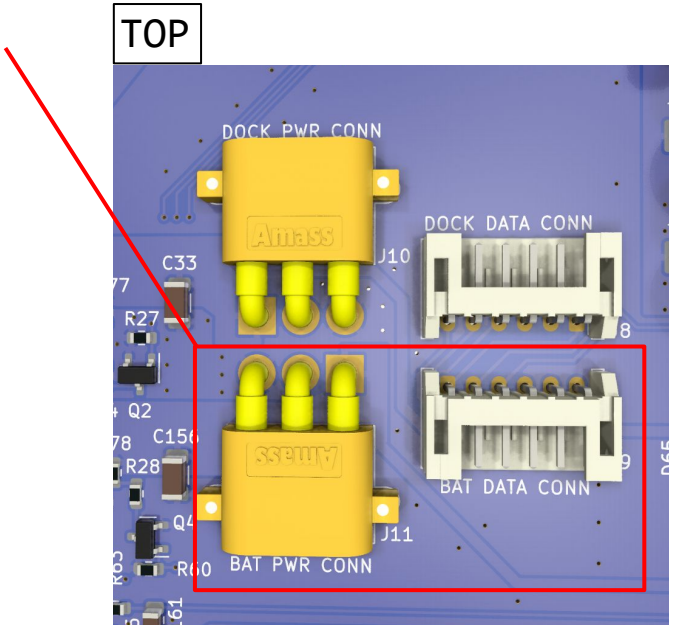


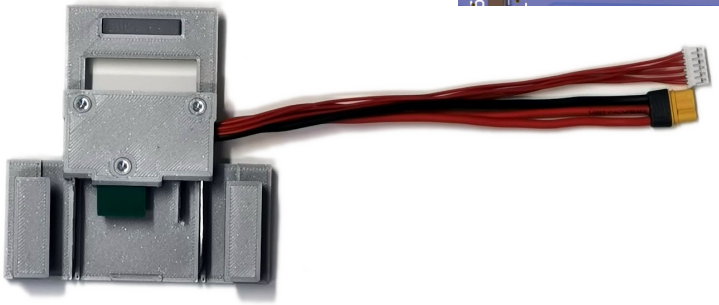
Connect computer module top plate with M3x8 bolts (x4)

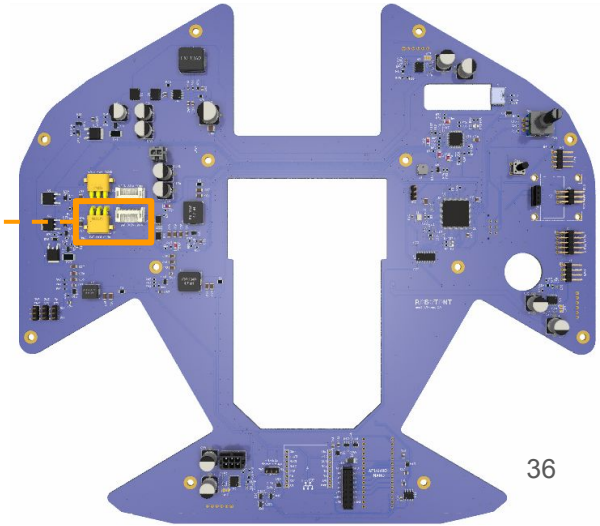


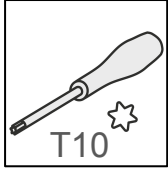


Connect the battery module to the mainboard



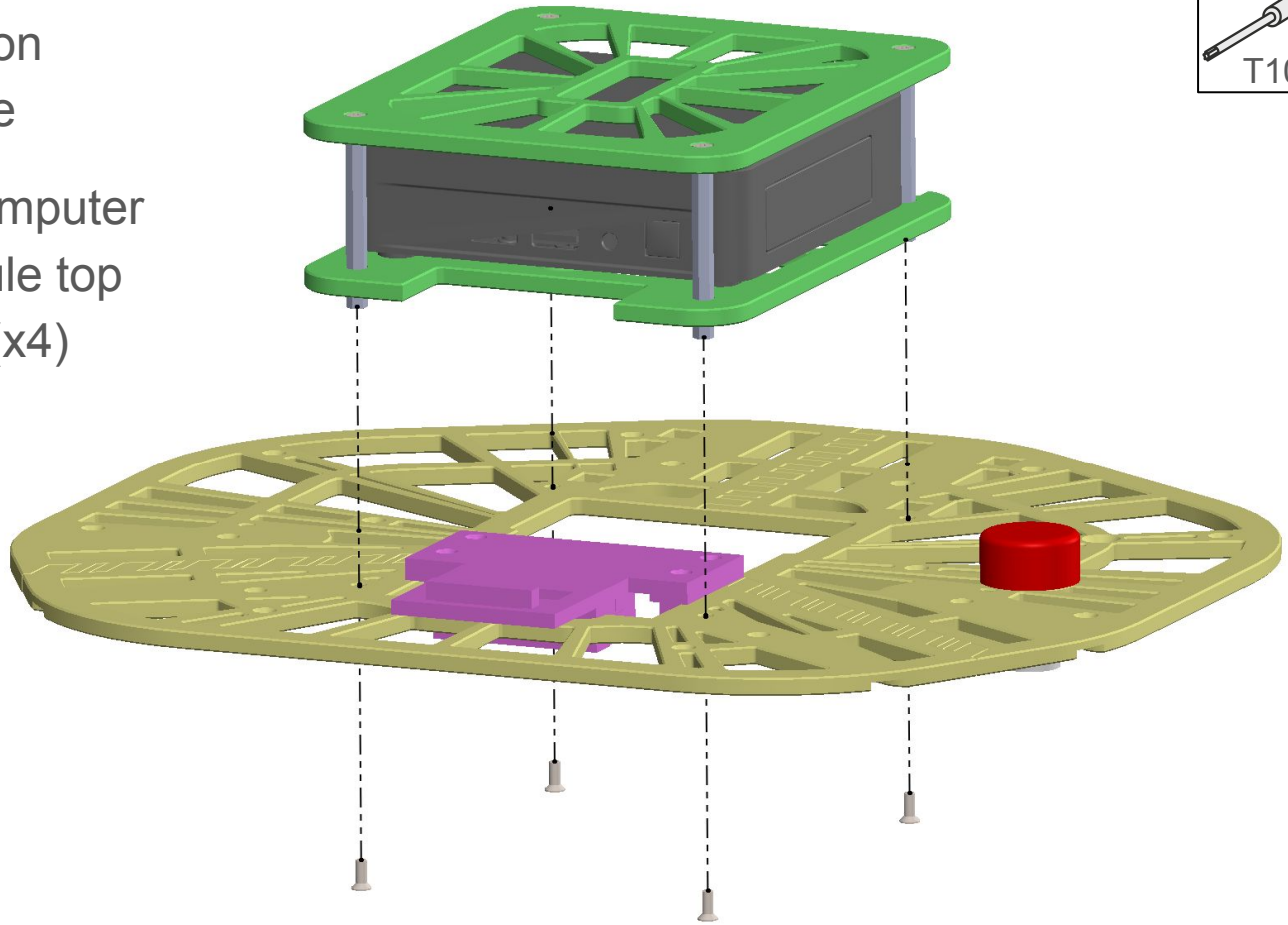




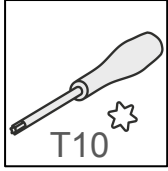


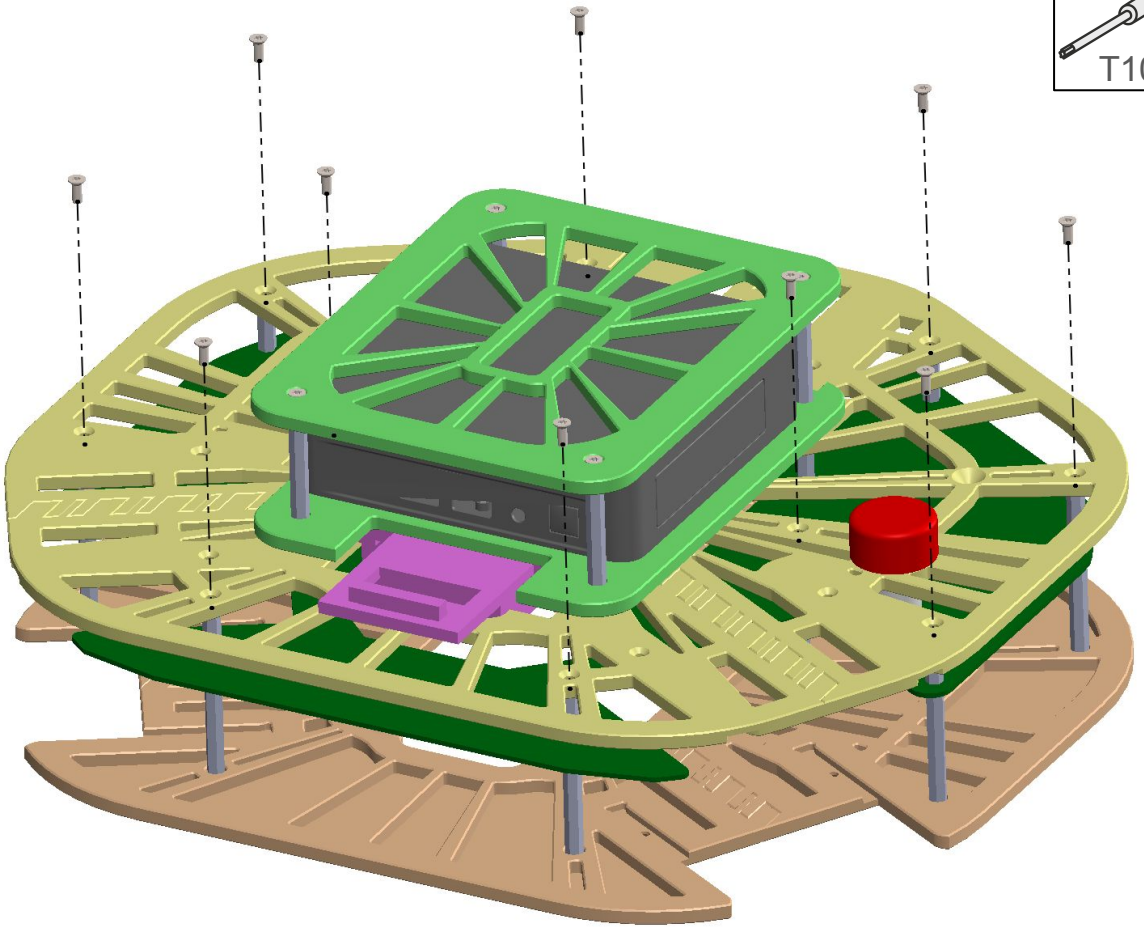
Place battery module on frame module top plate

Secure it by joining computer module to frame module top plate with M3x8 bolts (x4)



Connect bottom and top parts of frame module with M3x8 bolts (x10)





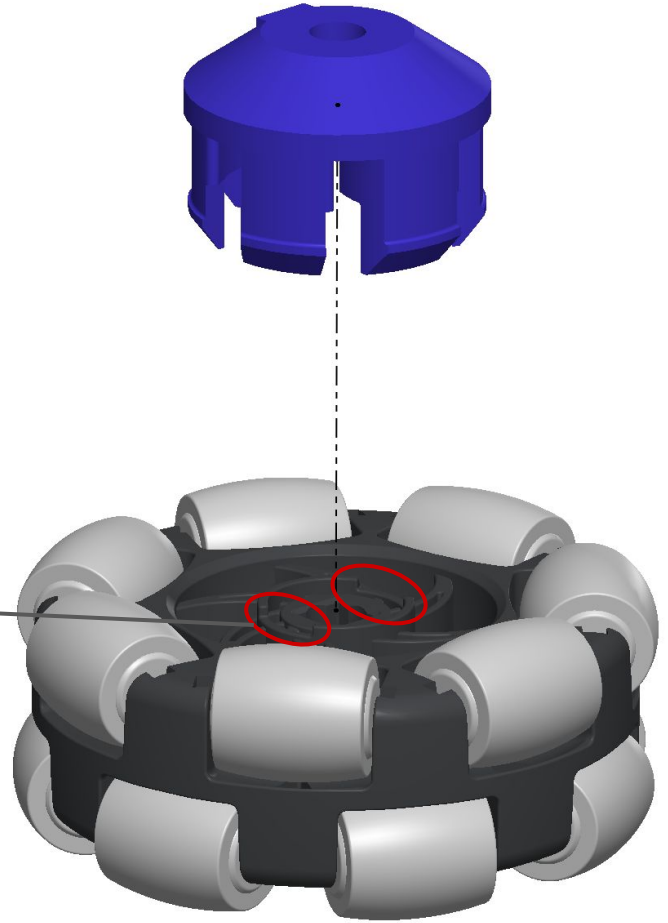
Motor module assembly (x3)

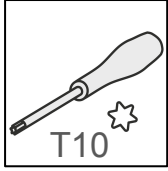
Press wheel coupler into omniwheel

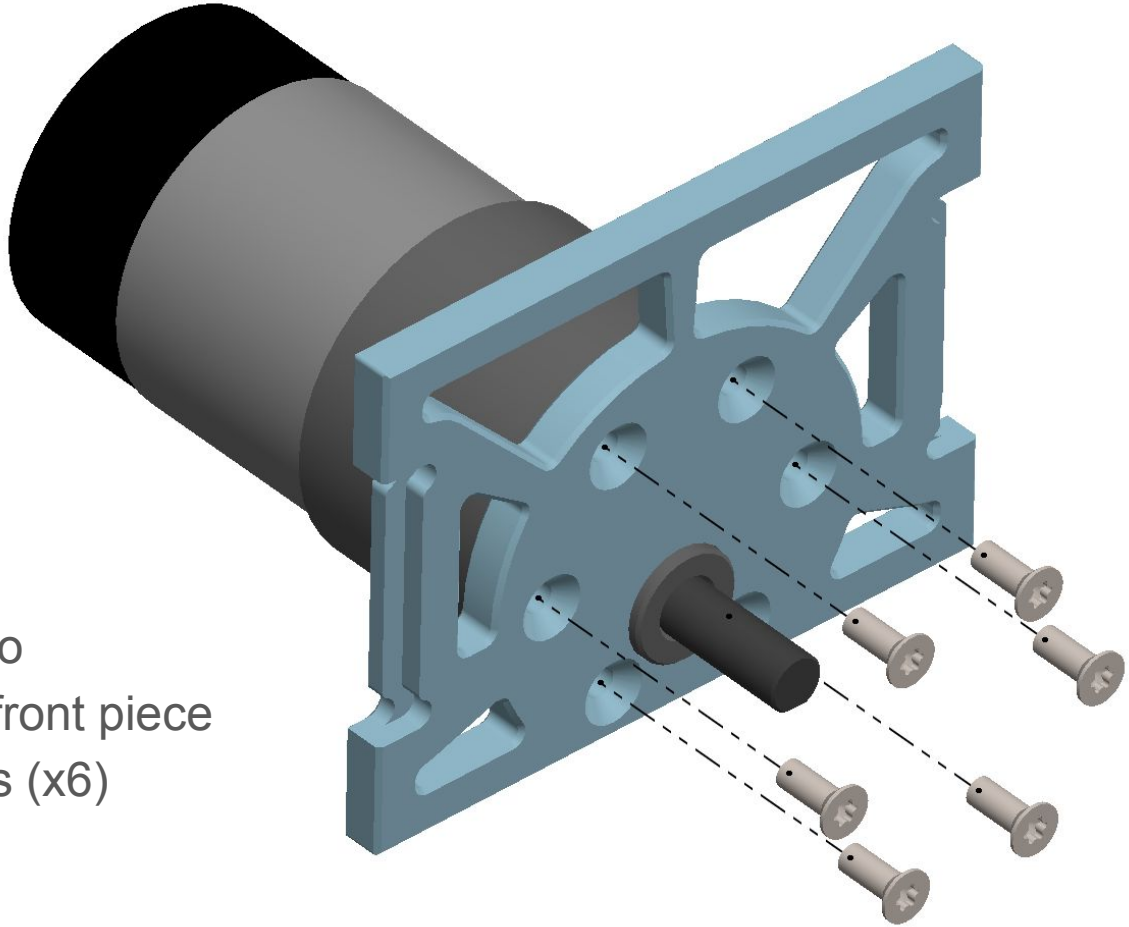
It will click once attached

It only goes in from one side

NB! Align the rim cutouts with the coupler

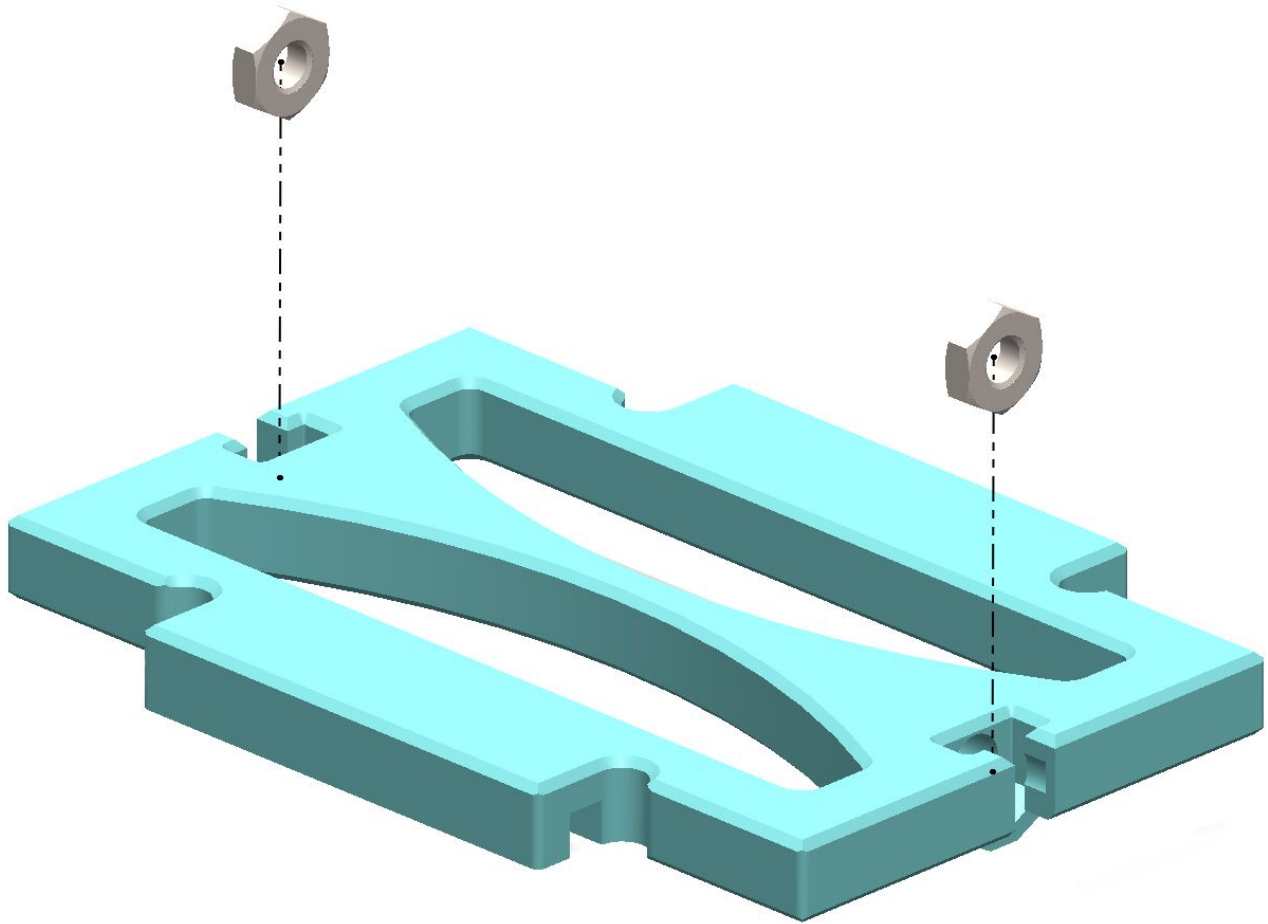




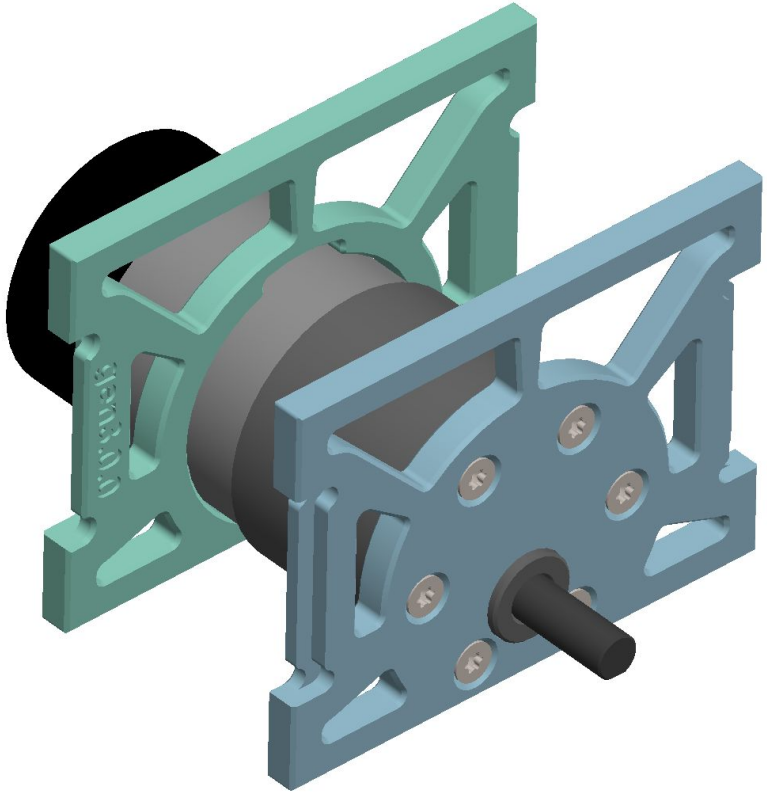


Secure motor to
motor module front piece
with M3x8 bolts (x6)

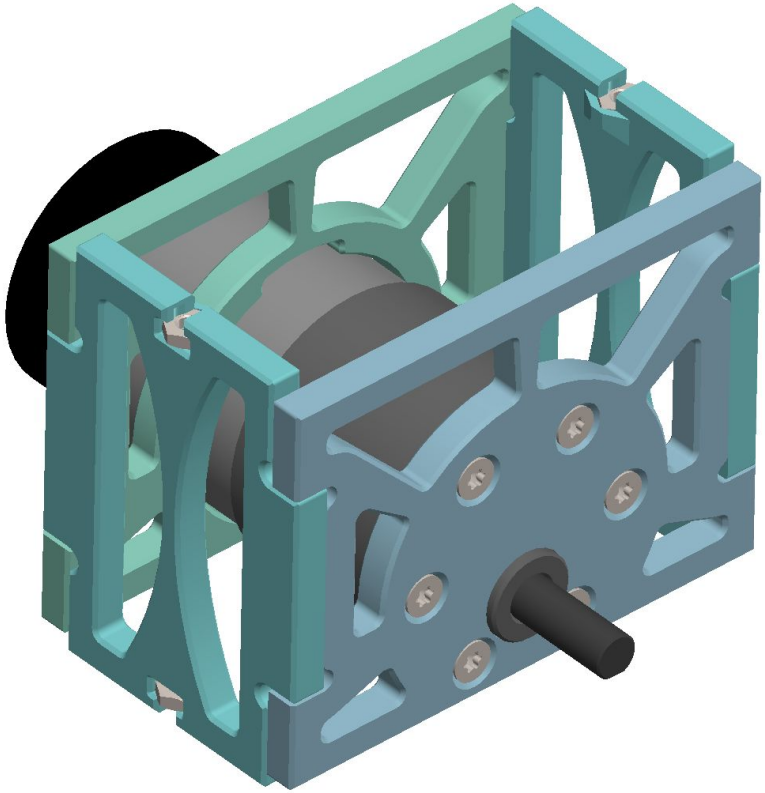
Press M3 nuts (x4) into motor module sides



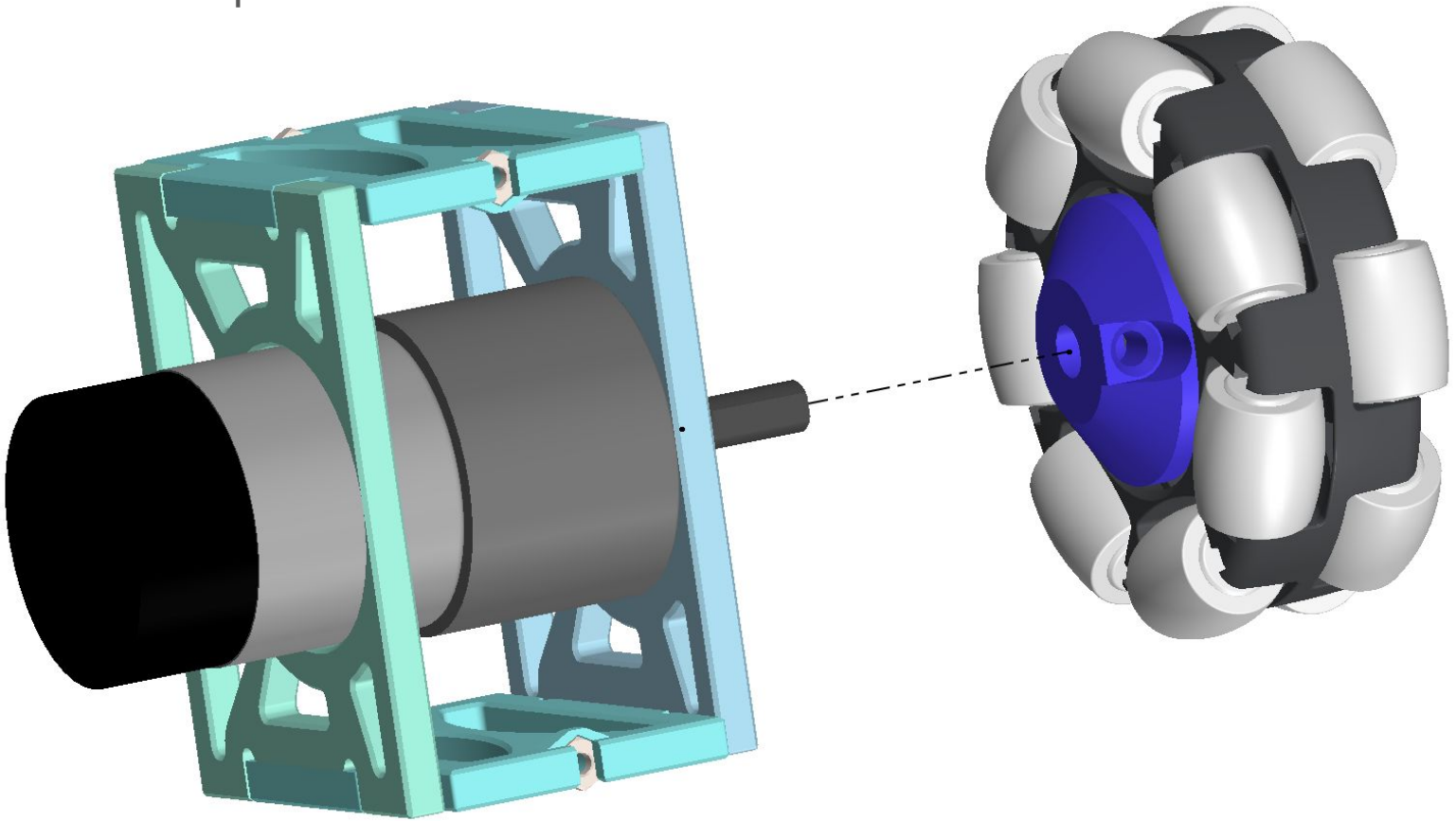
Add motor module back piece



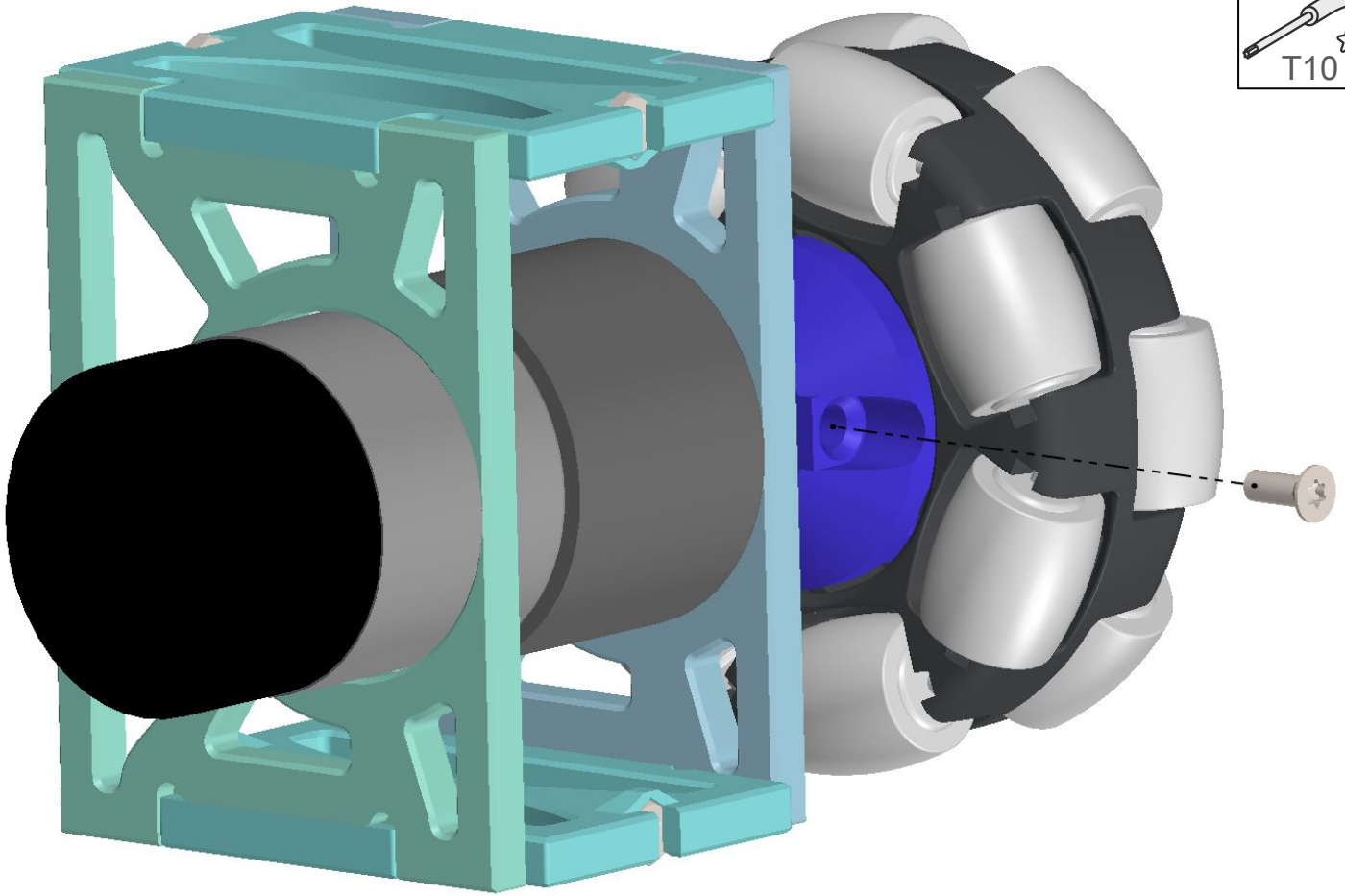
Add motor module sides

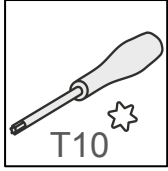


Push wheel coupler onto motor shaft



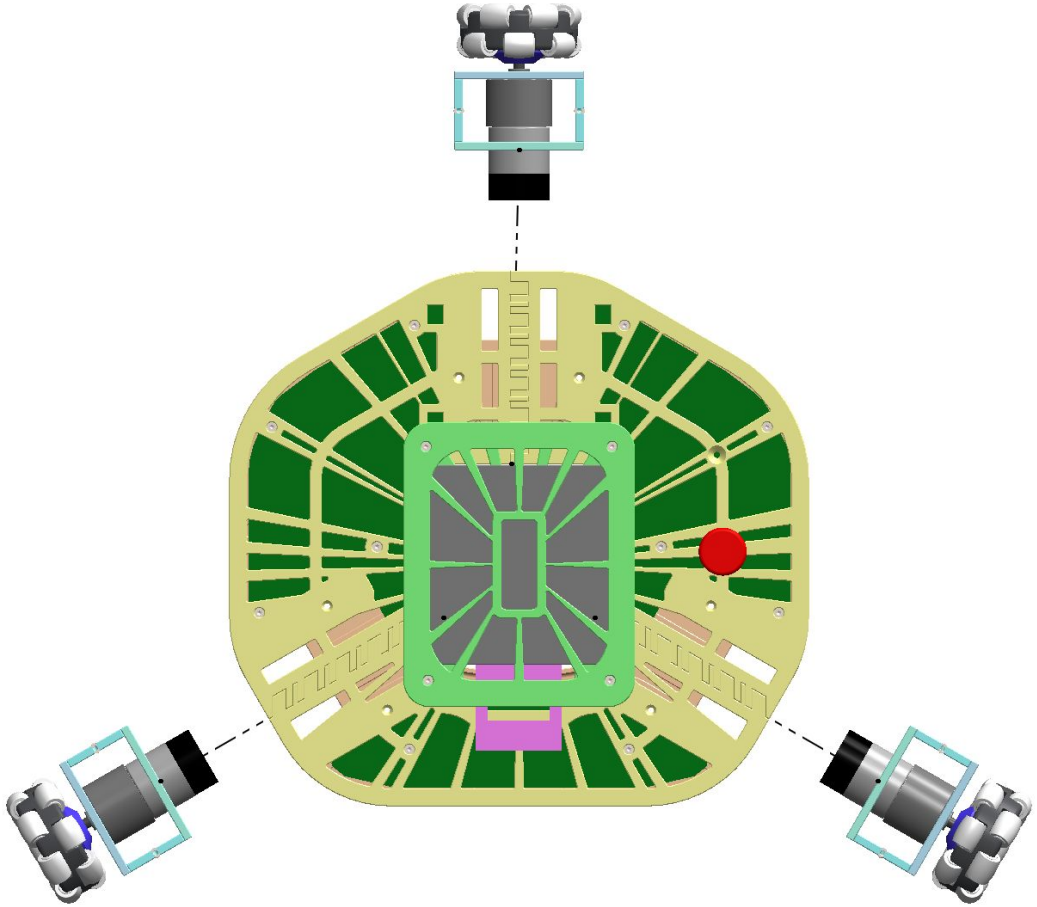
Secure motor to wheel coupler with an M3x8 bolt





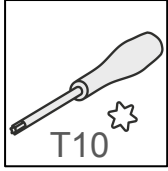
Push motor modules (x3) into frame module along grooves

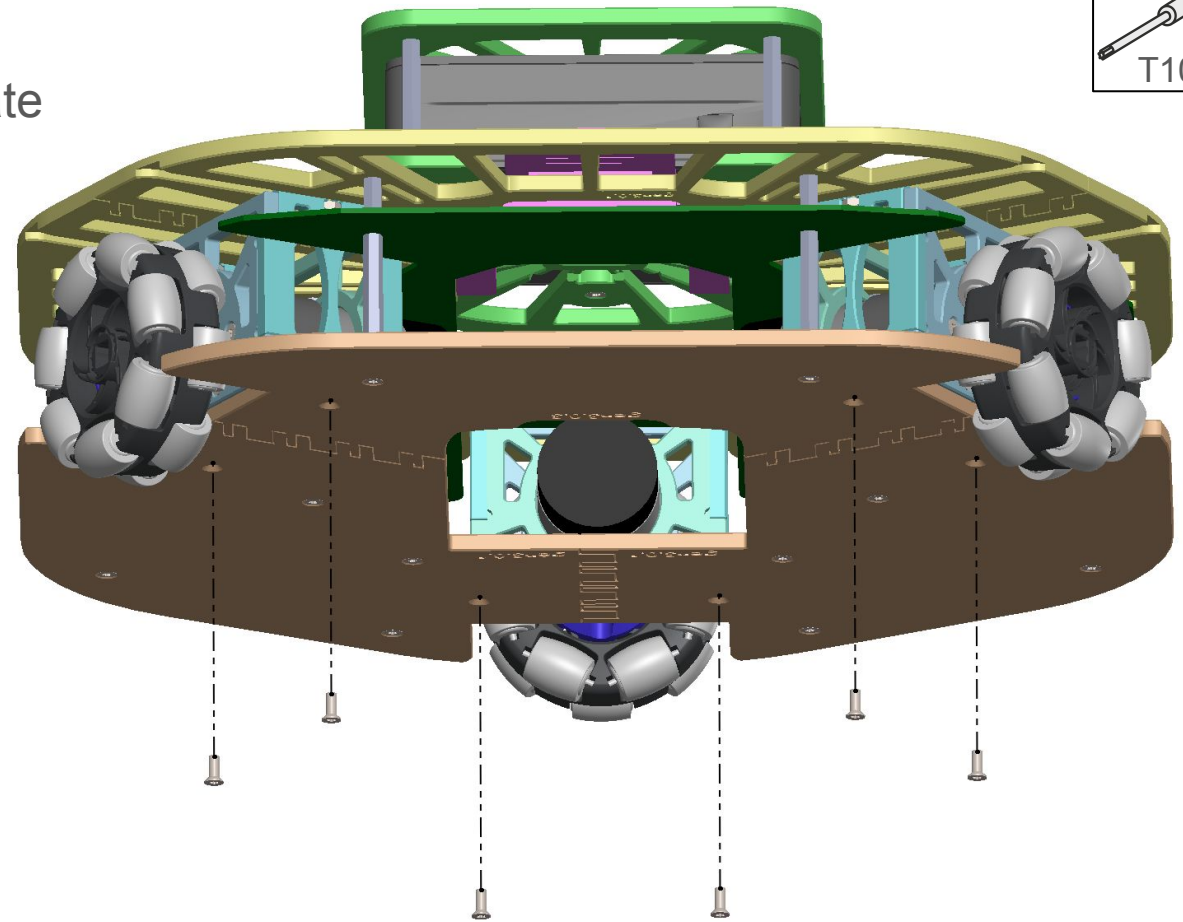
Avoid shaking to prevent the nuts dislodging



Secure motor modules (x3) to frame module bottom plate with M3x8 bolts (x6)

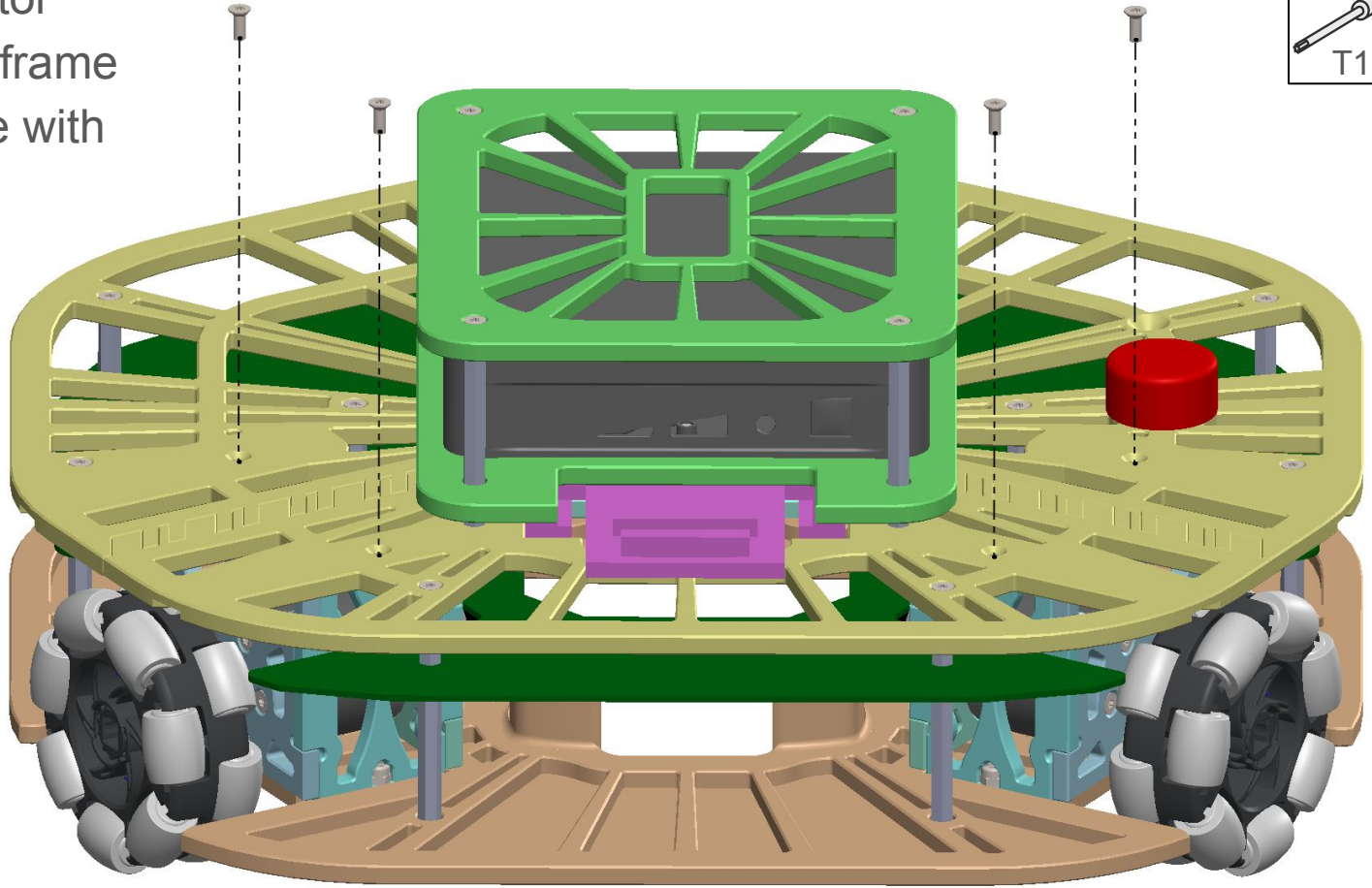
Avoid shaking to avoid dislodging nuts

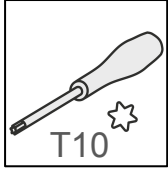




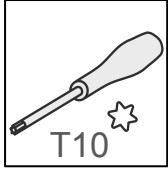
Secure front motor modules (x2) to frame module top plate with M3x8 bolts (x4)

Leave the back motor module unsecured for now

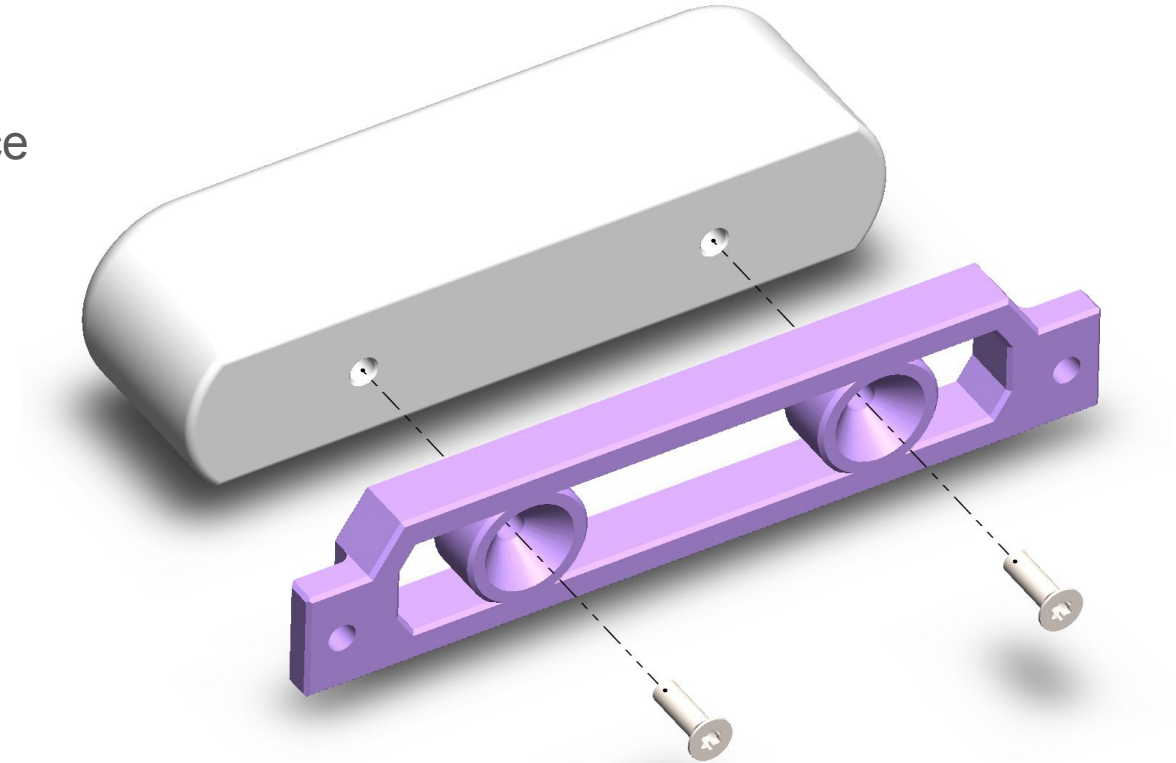




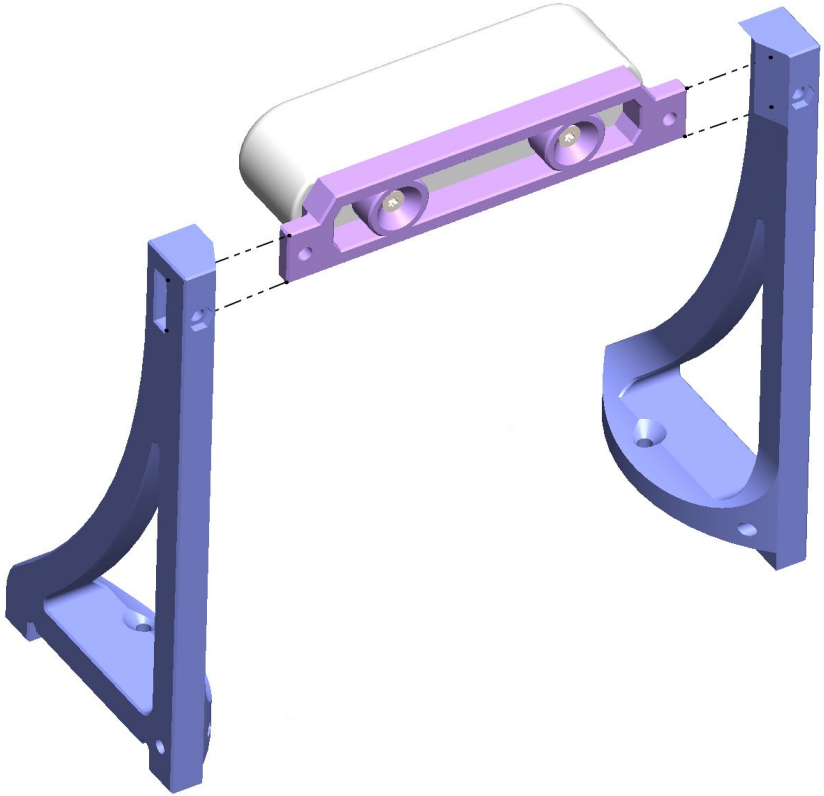
Camera module assembly



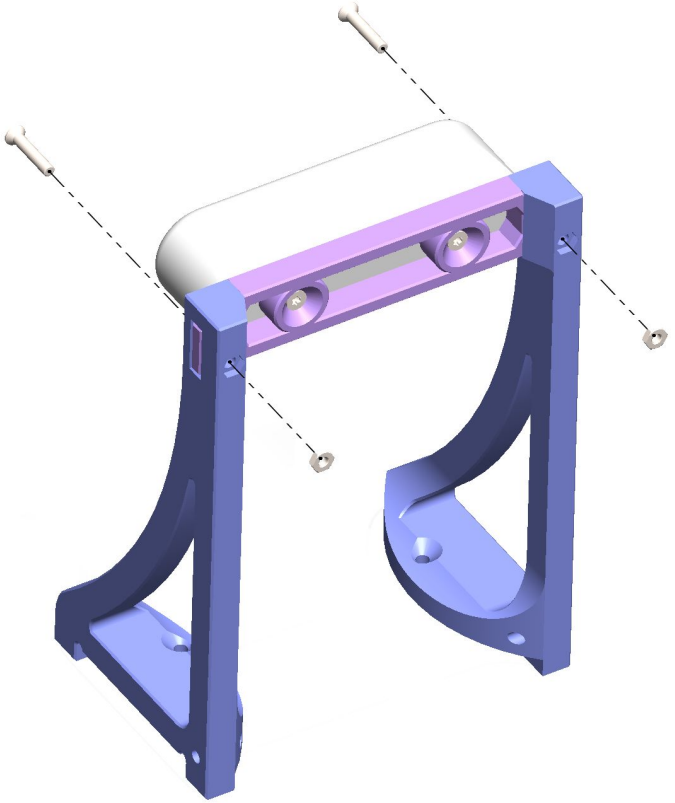
Connect RealSense camera
to camera module centerpiece
with M3x8 bolts (x2)

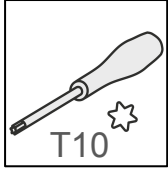


Press camera module sides onto centerpiece ends



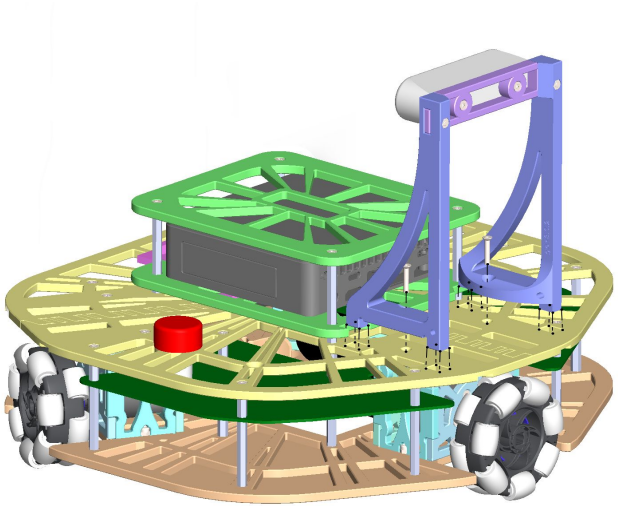
Secure with M3x16 bolts (x2) and M3 nuts (x2)

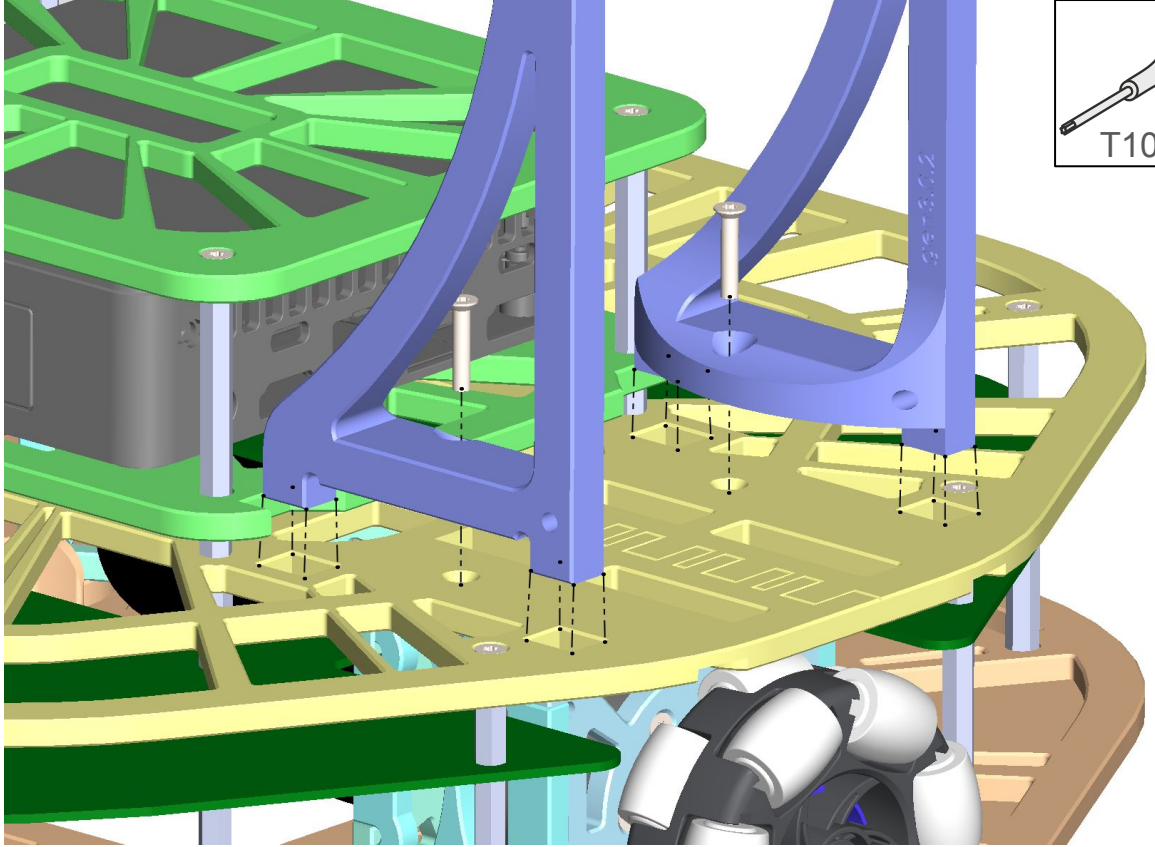


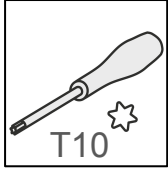


Press camera module into frame module top plate

Secure to back motor module with M3x16 bolts (x2) through holes in frame module top plate

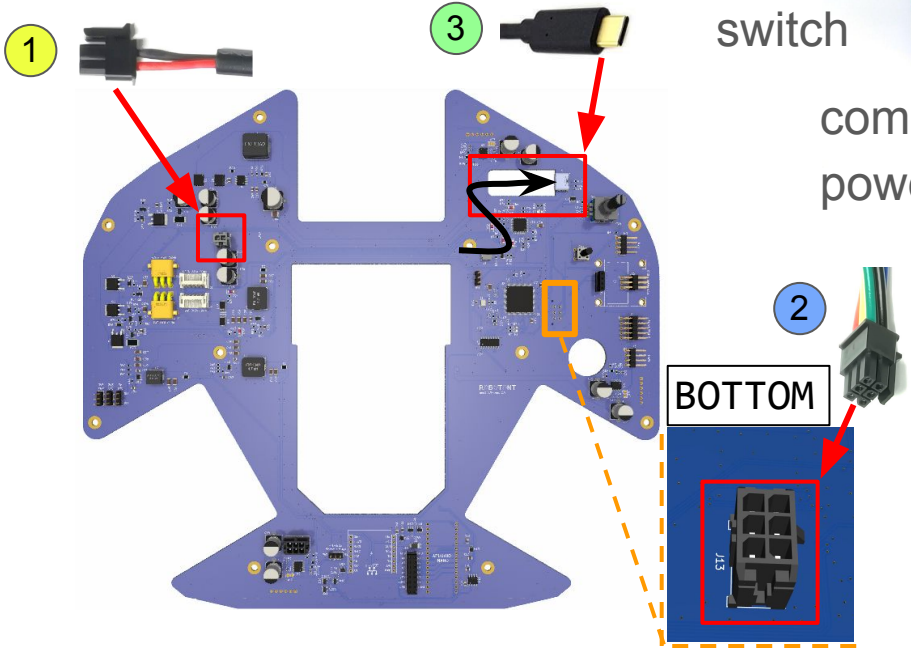


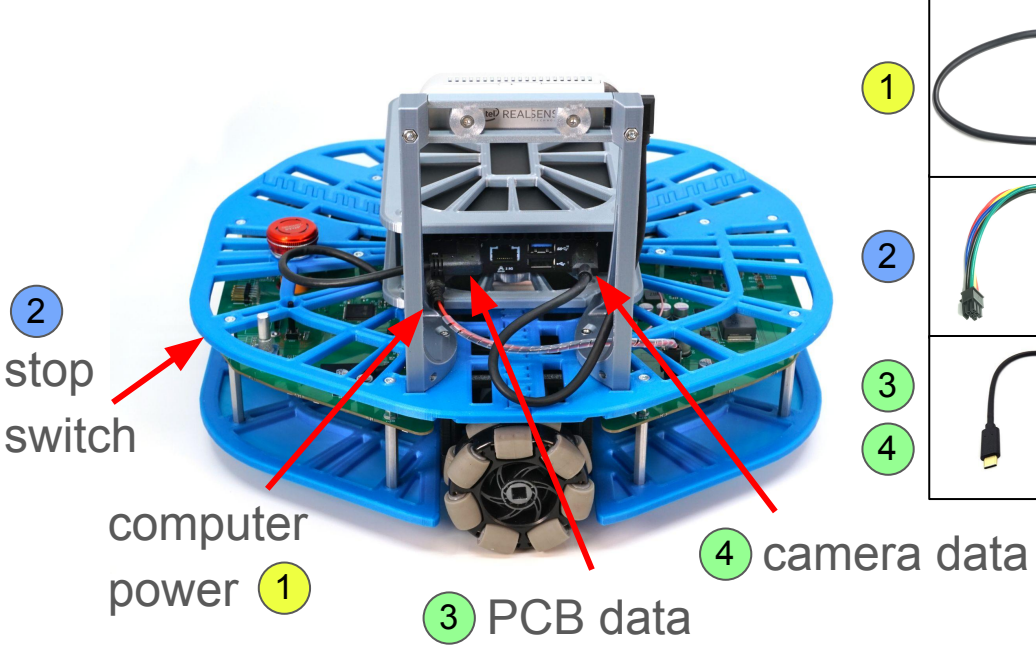


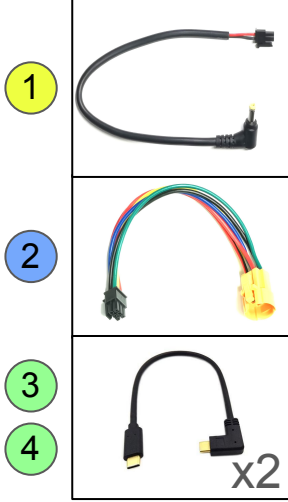


Connect

1. power cable
2. stop switch
3. 4. USB data cables



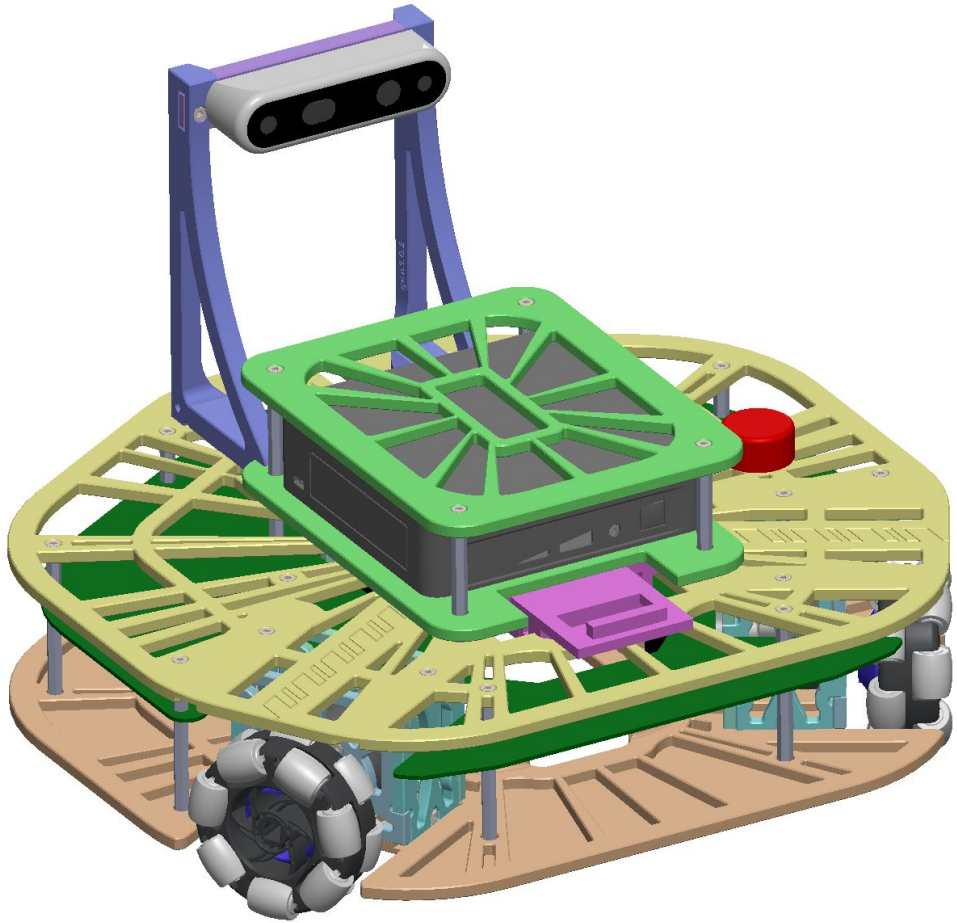




USB connector orientations:

3 computer	← - - - →	PCB
4 camera	← - - - →	computer

Full assembly



Find latest information about ROBOTONT on GitHub:

https://github.com/robotont