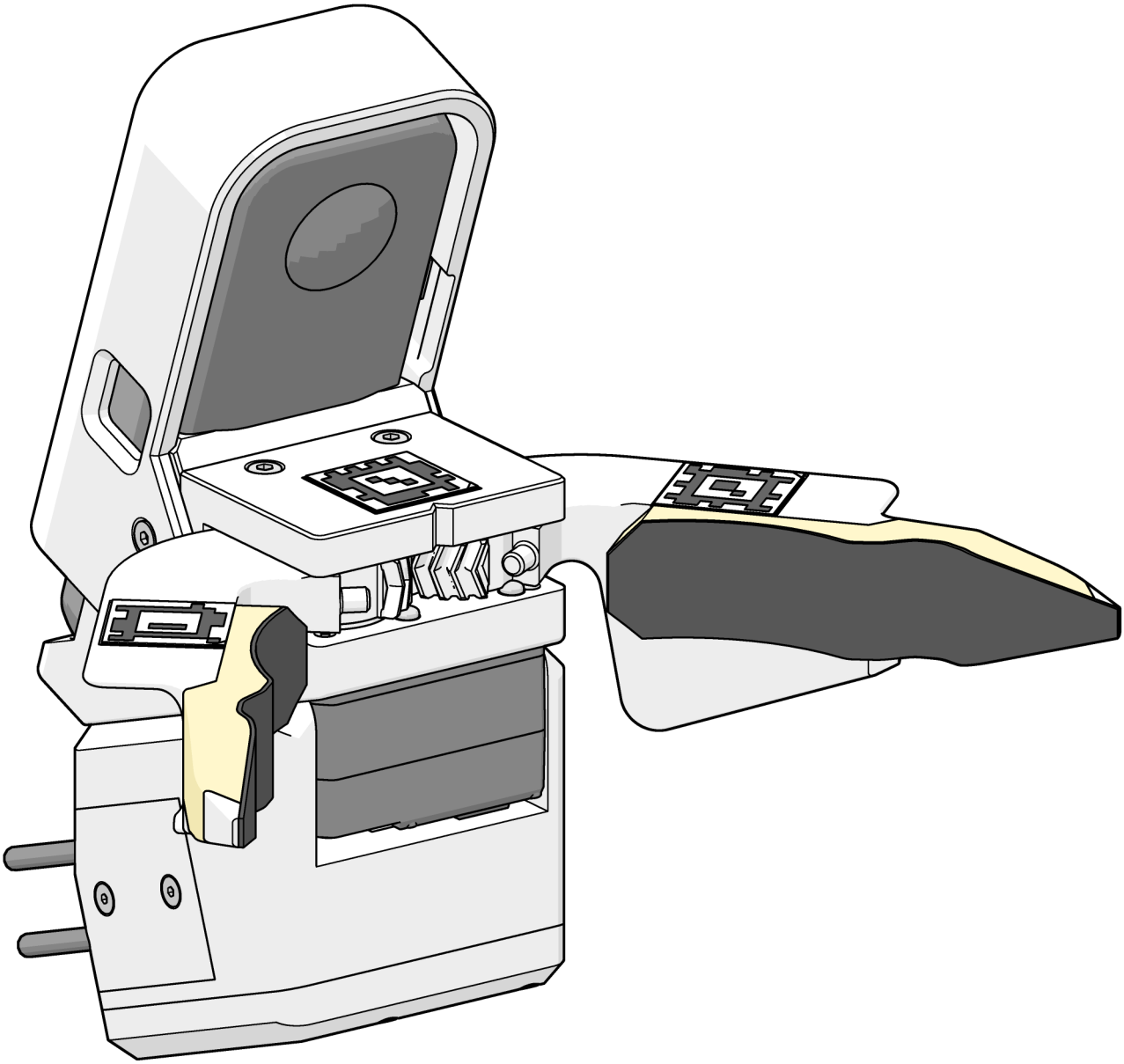
SPECIALIST

Actuated gripper



Print and assembly

specialist_actuated

Tools



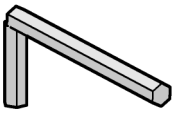
PLA · TPU 95A



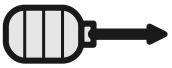
1.5 mm



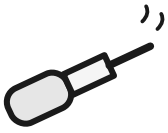
2.0 mm



2.5 mm



PH



solder

≈ 7.5 h print

≈ 20 min assembly

Soft tips

The tip nuts sit in soft TPU.
Tighten the M3×10 screws until the tip does not move. Do not tighten them more.

Servo first

Before you attach the horn, set the servo ID and center the servo (step 4).

Power

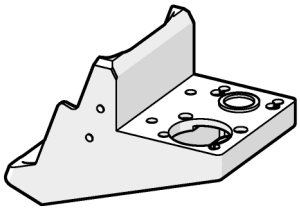
The driver board supplies 12 V to the servo. The computer supplies power to the hub and the camera.

Tags

Left-hand gripper: 2000 base, 2001 left finger, 2002 right finger.
Right-hand gripper: 2003 base, 2004 left finger, 2005 right finger.
Print the tags from the tag sheet at the end. Before you cut them, check their size.

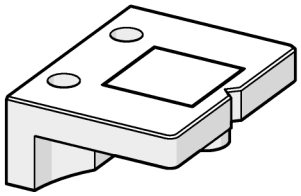
Print

A 1x



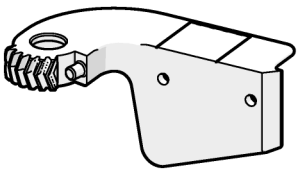
PLA

B 1x



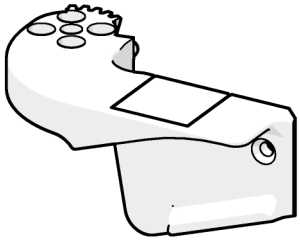
PLA

C 1x



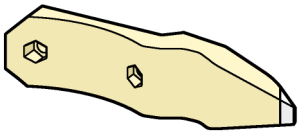
PLA

D 1x



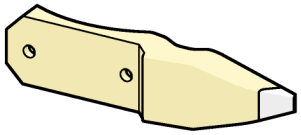
PLA

E 1x



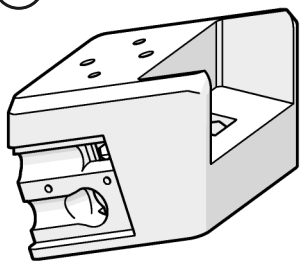
TPU 95A + PLA

F 1x



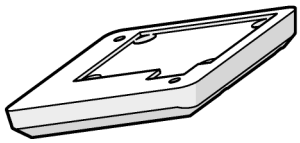
TPU 95A + PLA

G 1x



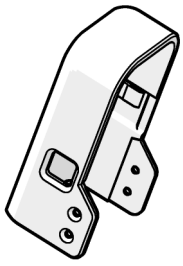
PLA

H 1x



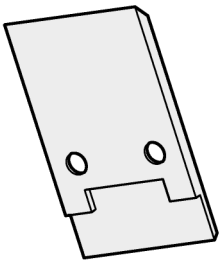
PLA

I 1x



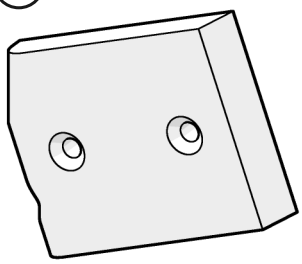
PLA

J 1x



PLA

K 1x



PLA

Two-material tips

Tips E and F each have a PLA nail at the front end and a TPU 95A body.
In the slicer, import each tip as one object with two parts.
Assign PLA to the nail and TPU 95A to the body.
Set the infill of the body to 100 %.

CAD · Onshape

Print plates · MakerWorld

Hardware

1:1

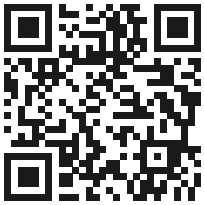
4x		**M3×25** ISO 4762
4x		**M3×12** ISO 4762
4x		**M3×10** ISO 10642
4x		**M3×8** ISO 10642
6x		**M2.5×16** ISO 10642
4x		**M2.5×8** ISO 10642
8x		**M3** ISO 4032
4x		**2×6 self-tapping** in the STS3215 box · for the base
1x		**M3×6 pan head** in the STS3215 box · for the horn

Buy



1x

Feetech STS3215 servo, 12 V



1x

Serial Bus Servo Driver Board



1x

Adafruit CH334F Mini 2-Port USB Hub



2x

USB-C socket to PH2.0 4-pin lead



1x

Slim angled USB-C to USB-C, 20 cm
(camera)



1x

Slim angled USB-C to USB-C, short
(hub to board)



1x

Right-angle USB-C cable, 2 m
(computer)



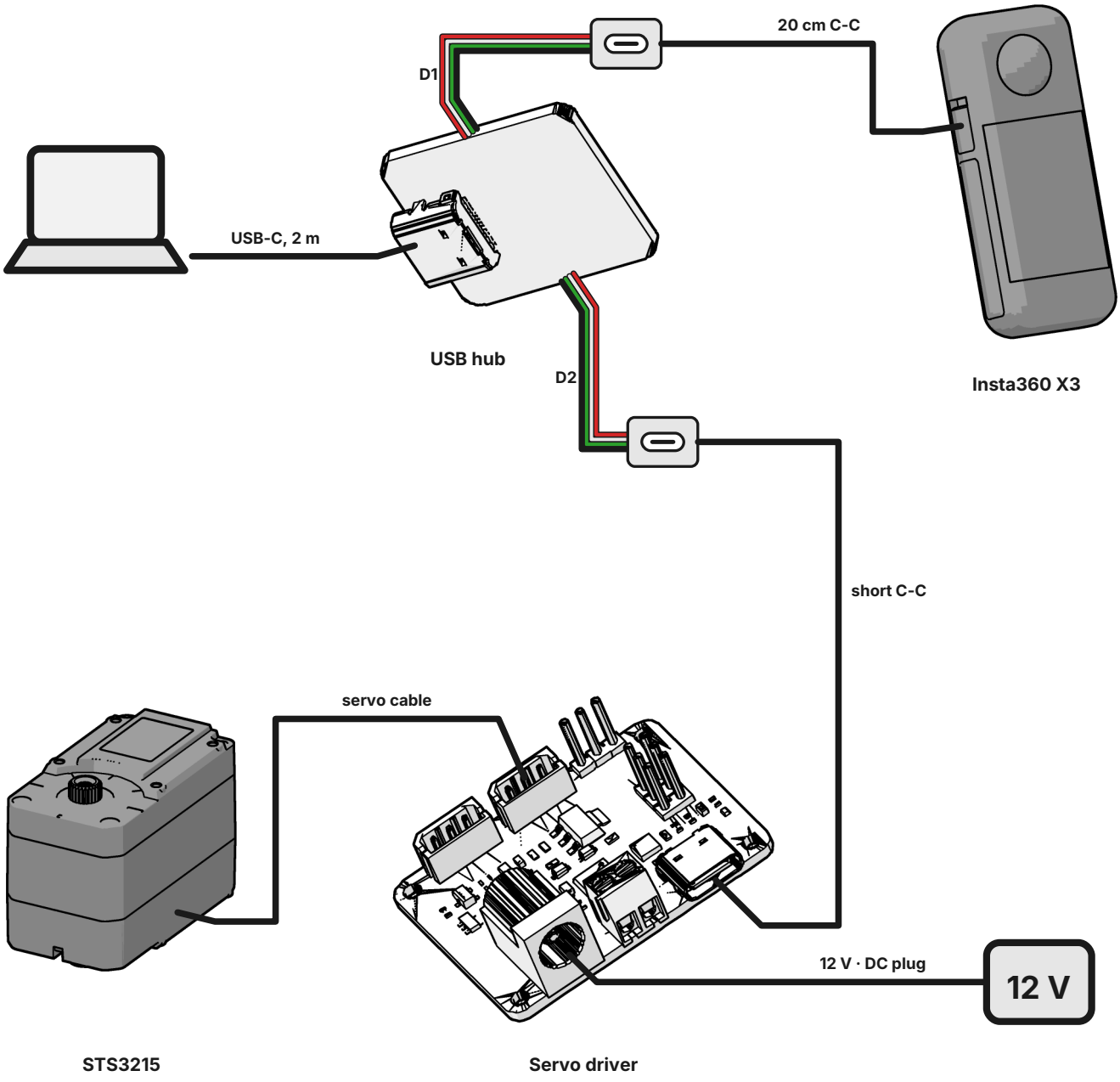
1x

Right-angle DC plug 5.5 × 2.1 mm,
bare wire (12 V)

You also need

Insta360 X3 · 3M TB641 grip tape · a 12 V supply with bare-wire output

Wiring

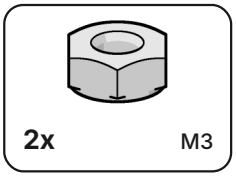


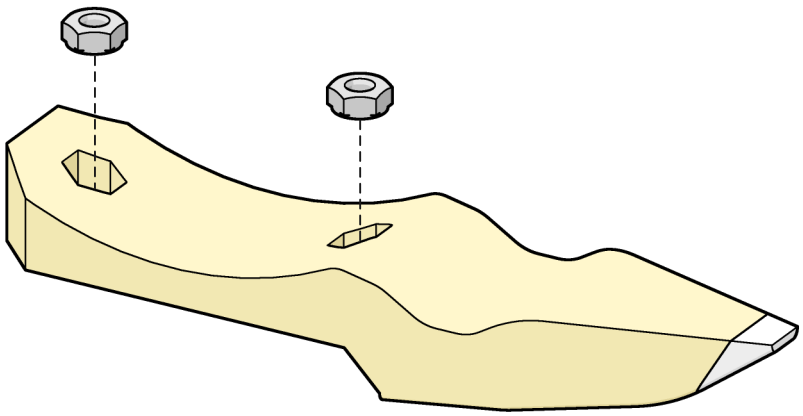
Solder each USB-C socket lead to one downstream port of the hub.
Connect each wire to the pad with the same name, not the same position:

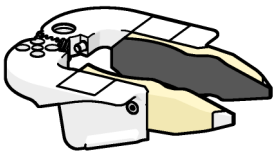
5V	D–	D+	GND

These are the usual USB 2.0 wire colors. If your lead has other colors, use its seller's pinout.

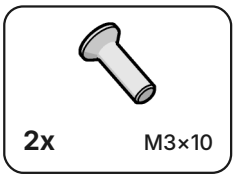
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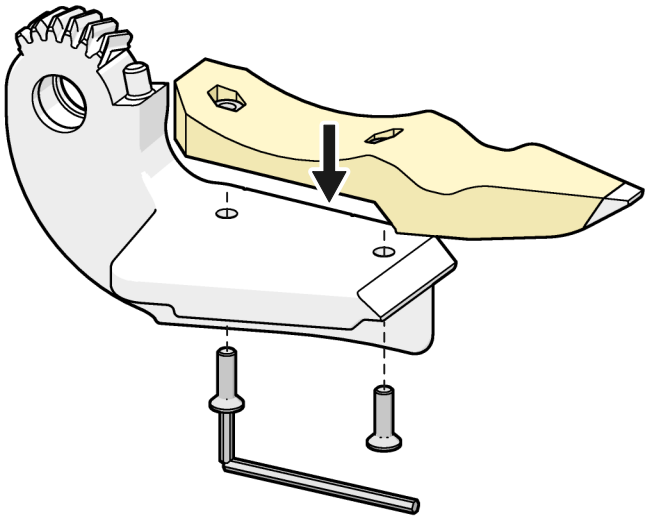




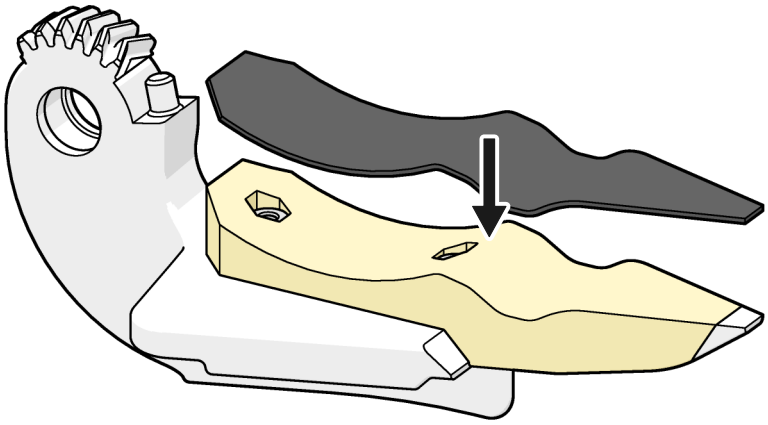


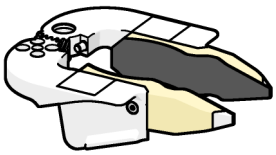
2





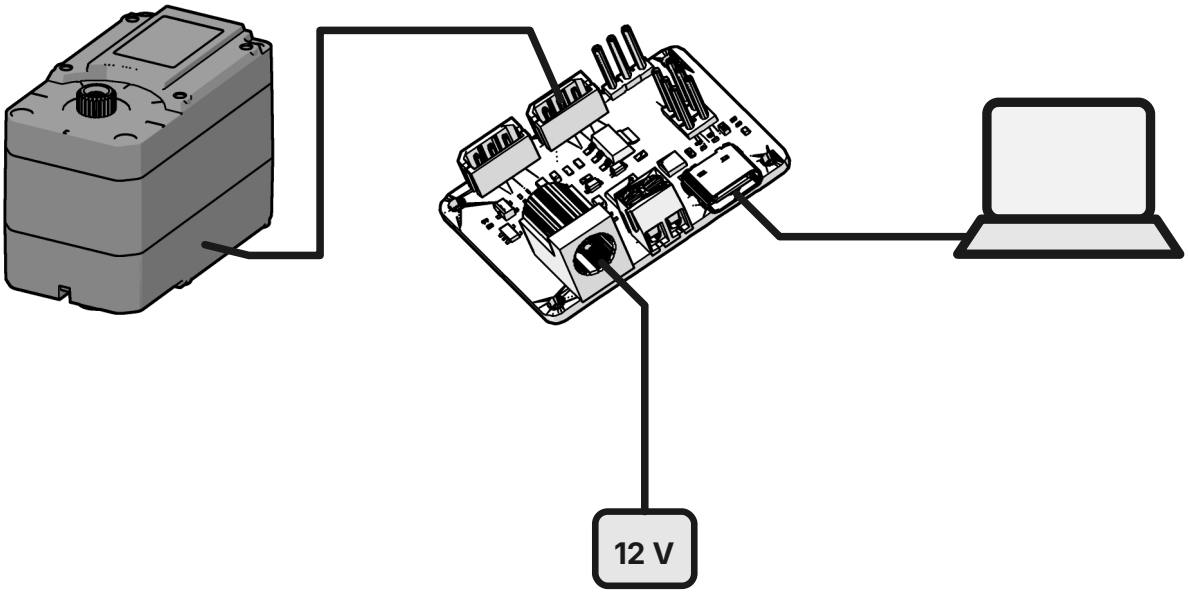
3





2x

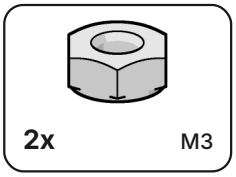
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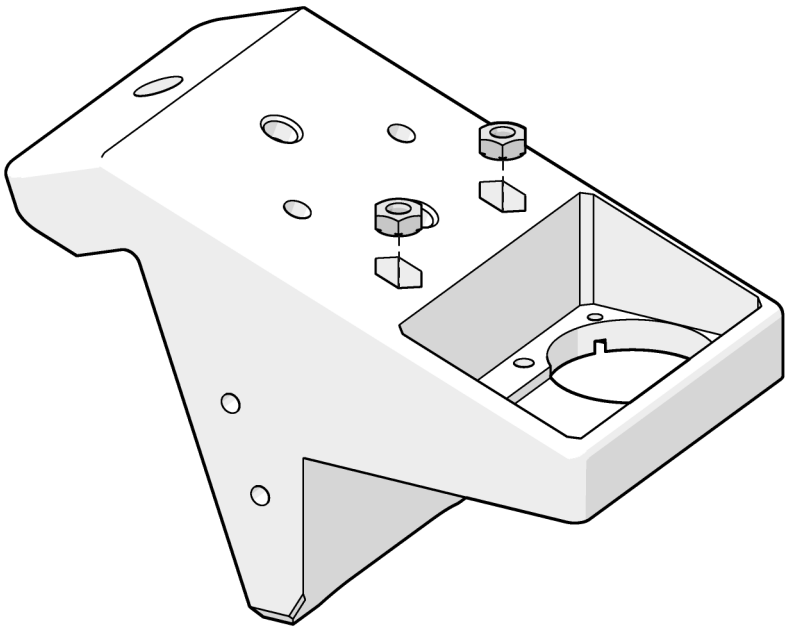


Set the servo ID and center the servo.

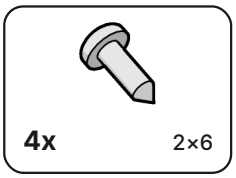
For the instructions, see the documentation website.

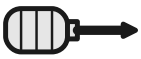
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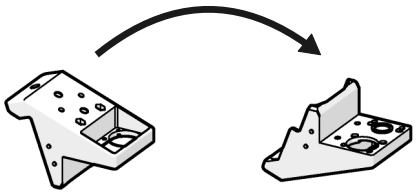


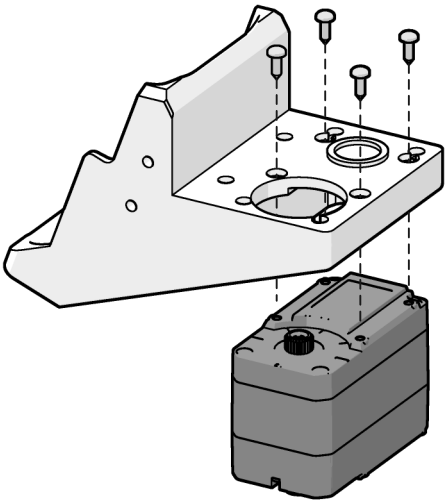


6



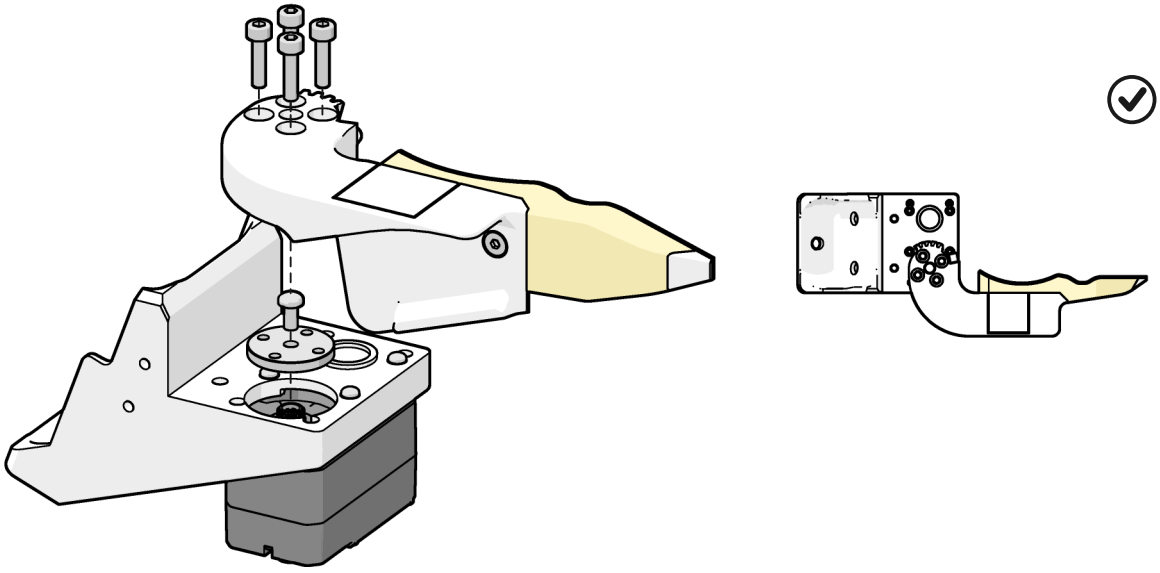




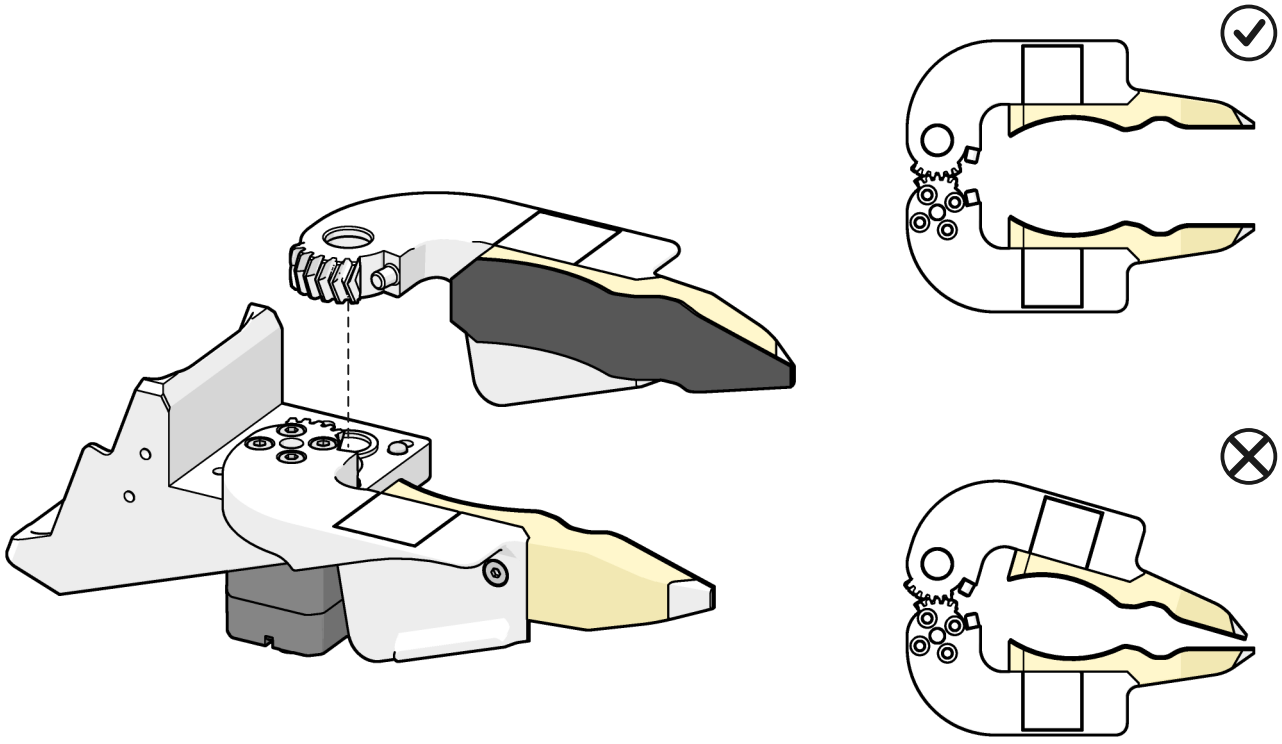


7

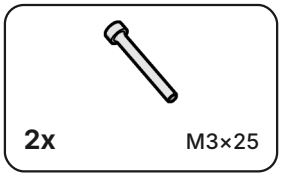


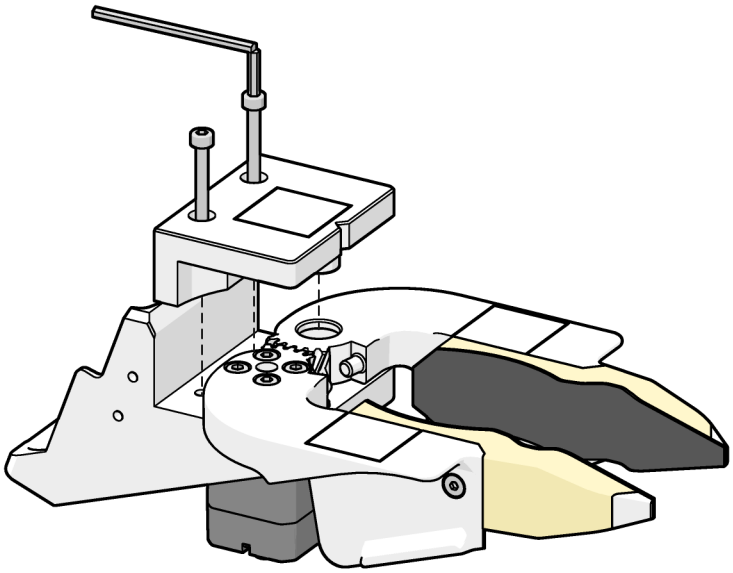


8

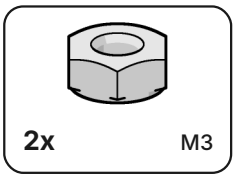


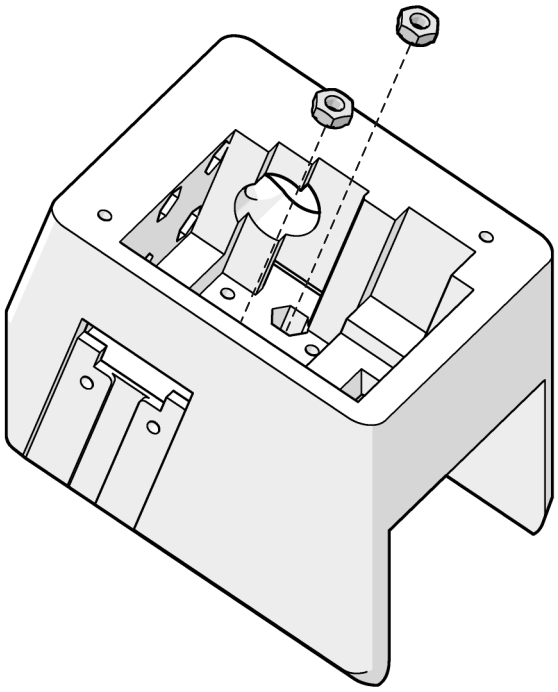
9



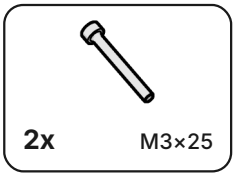


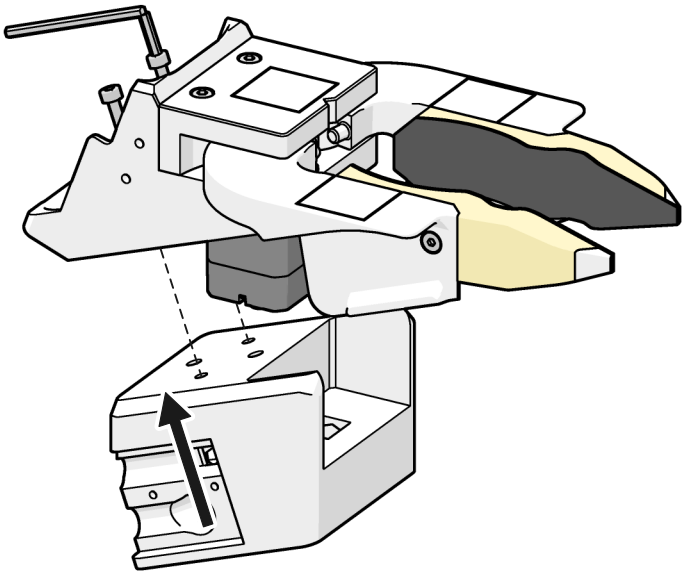
10



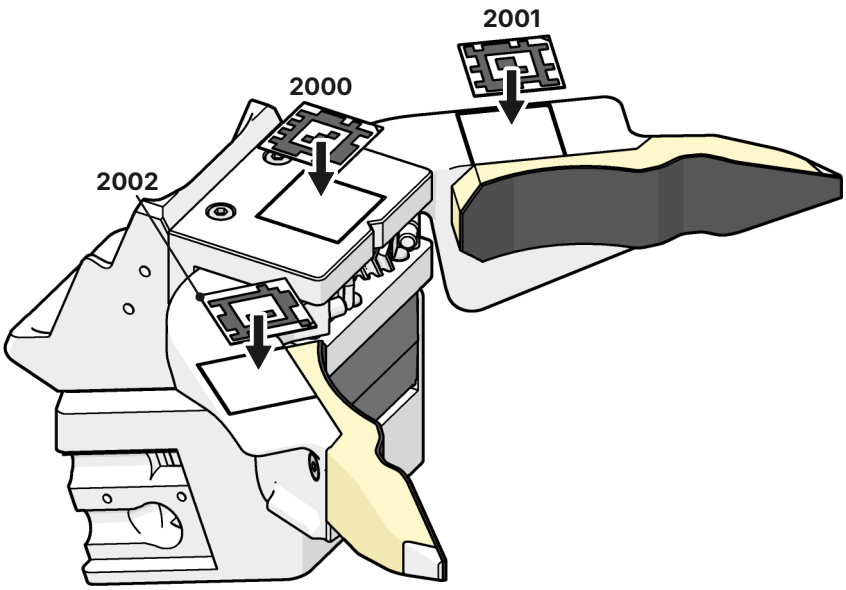


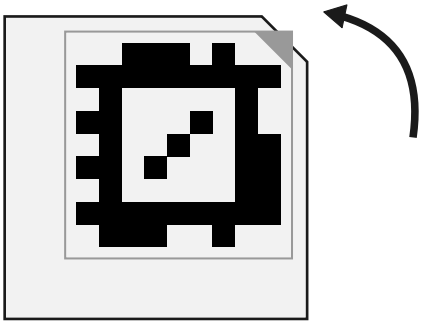
11





12

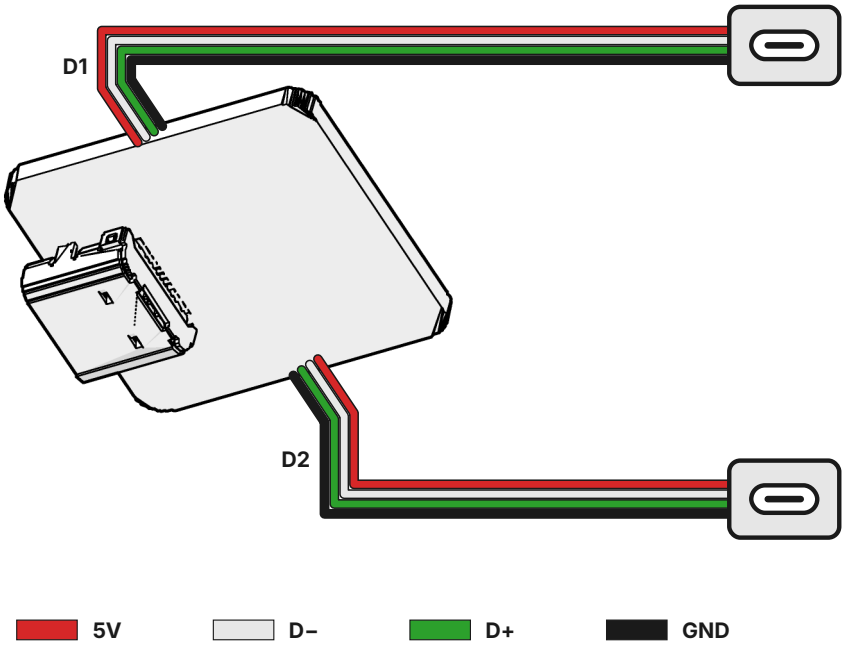




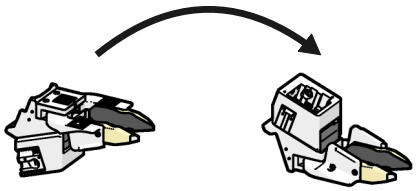
2003 · 2004 · 2005
on the right-hand gripper

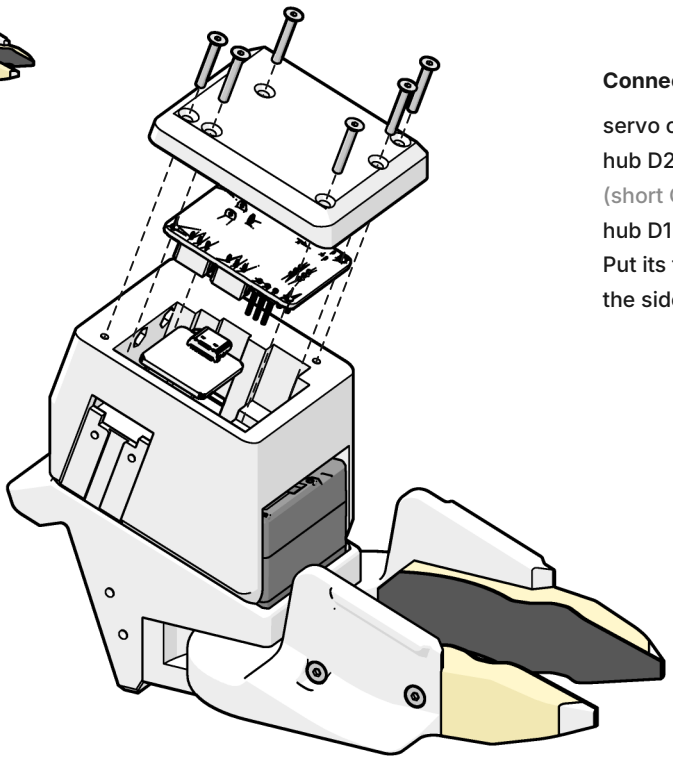
13

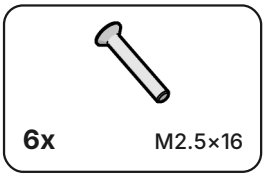




14







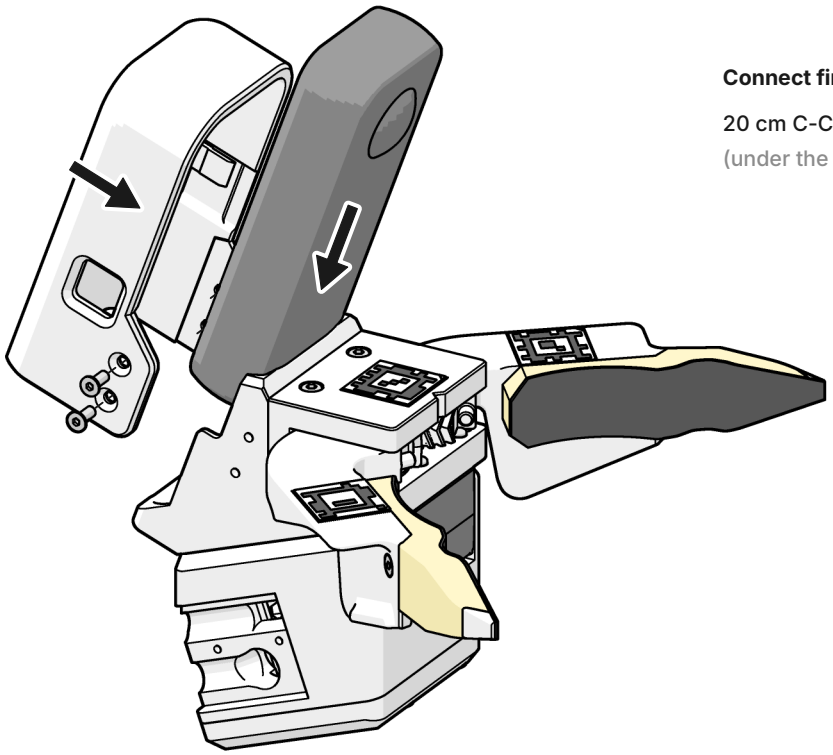
Connect first:

servo cable → 3-pin
hub D2 → board USB-C
(short C-C cable)
hub D1 → 20 cm C-C cable
Put its free end out through the side opening.

15



4x M3×8



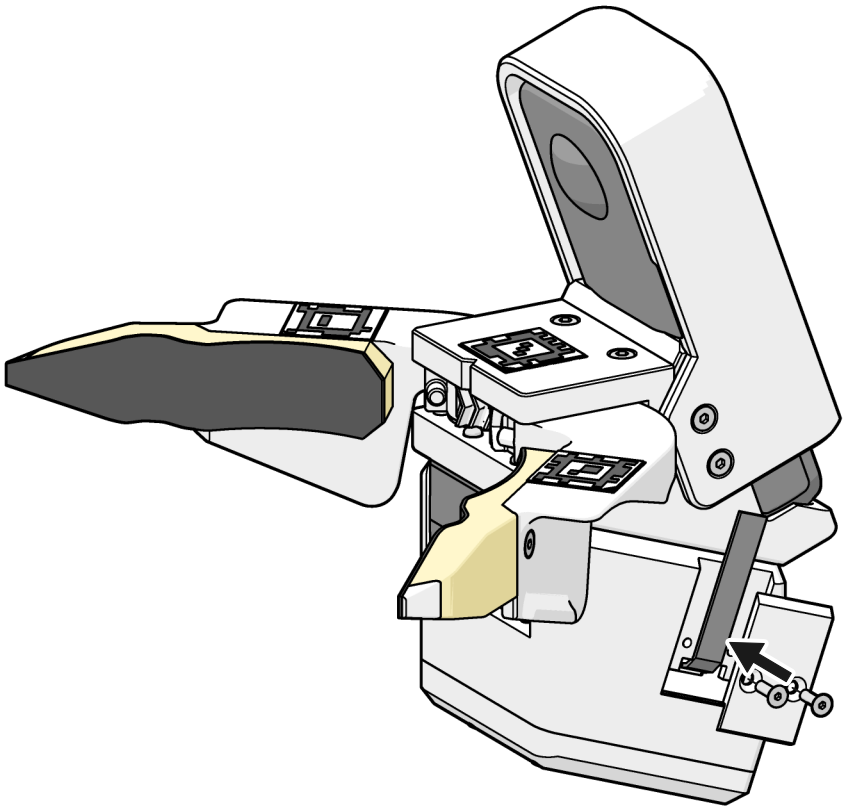
Connect first:

20 cm C-C → camera USB-C
(under the upper side panel)

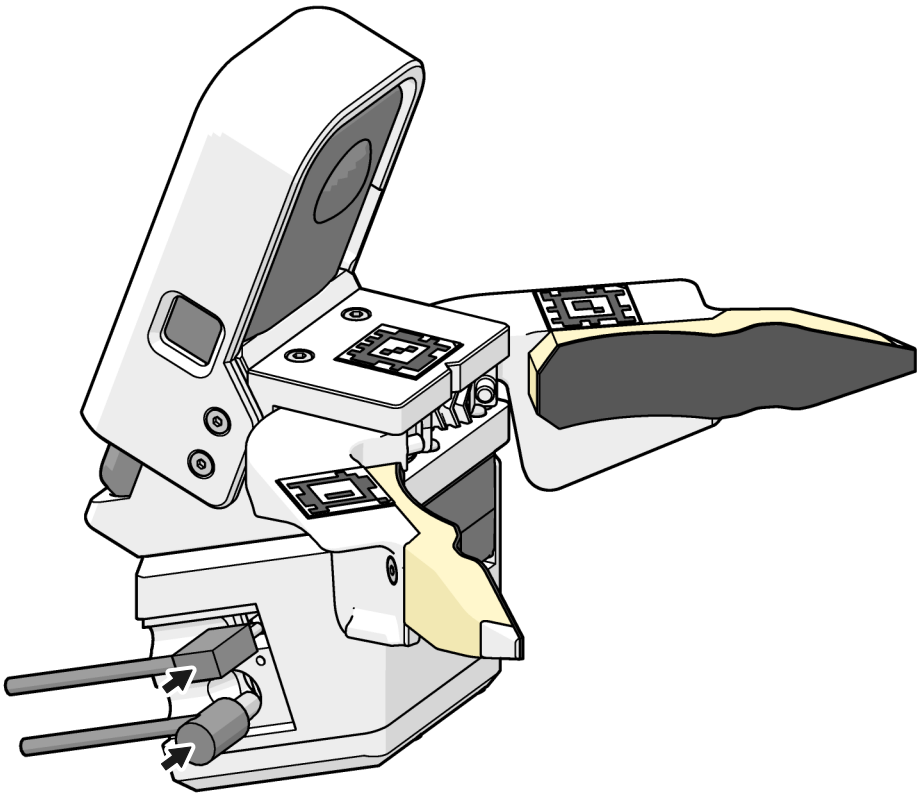
16



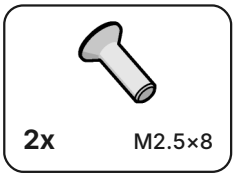
2x M2.5×8

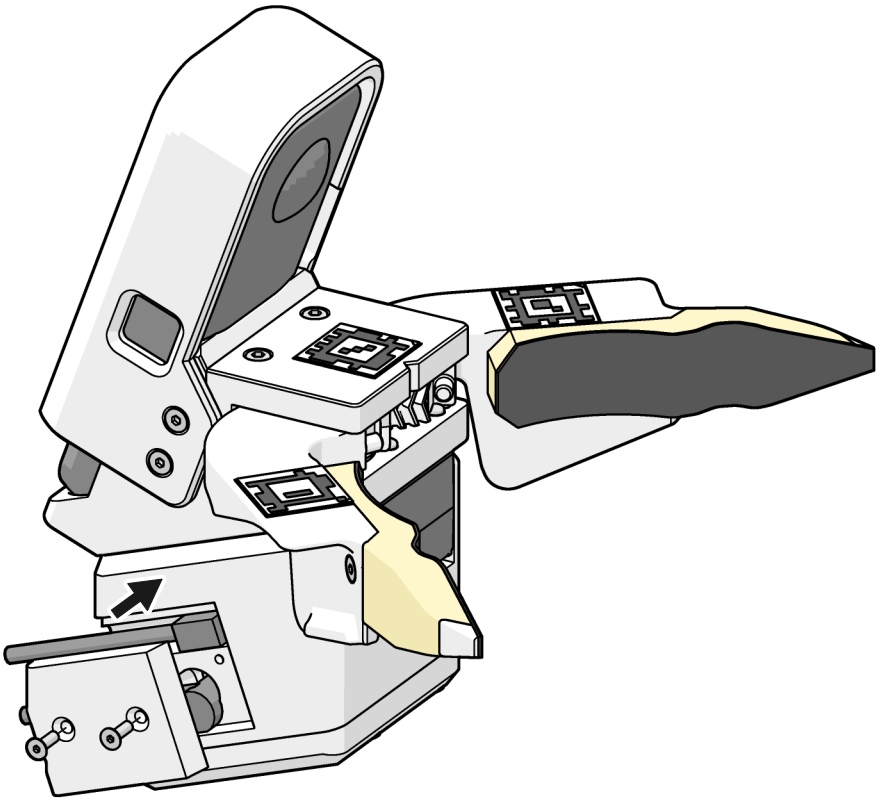


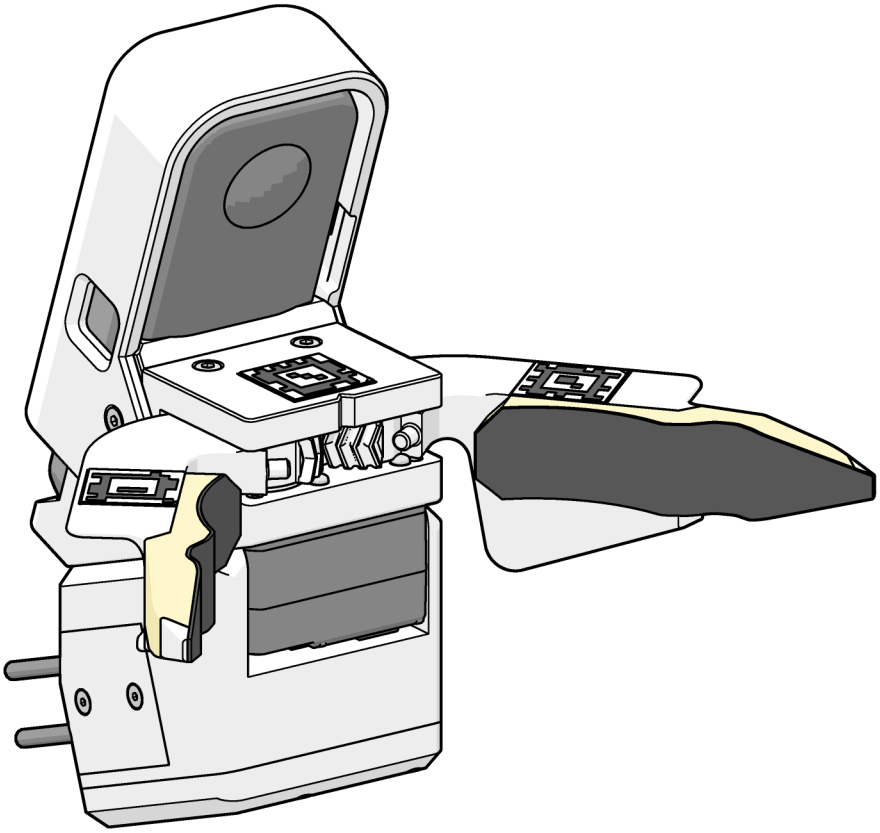
17



18





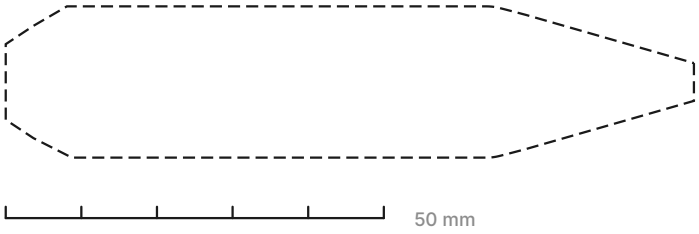


Grip tape

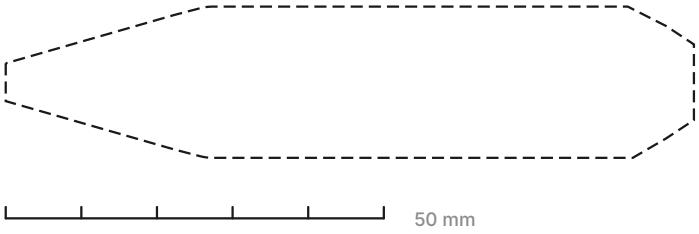
1:1

Print this page at 100 %. Cut the 3M TB641 tape along the dashed lines.
Outline F is the mirror image of outline E.

E



F

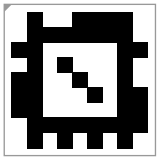


AprilTags

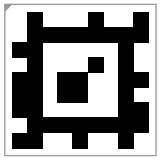
1:1

Print this page at 100 %. Check the tag size on the next page. Then cut along the gray lines.

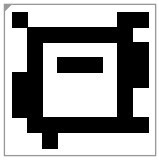
Left-hand gripper



2000
base

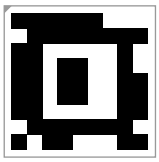


2001
left finger

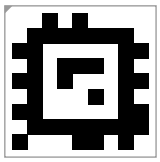


2002
right finger

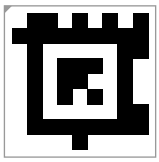
Right-hand gripper



2003
base



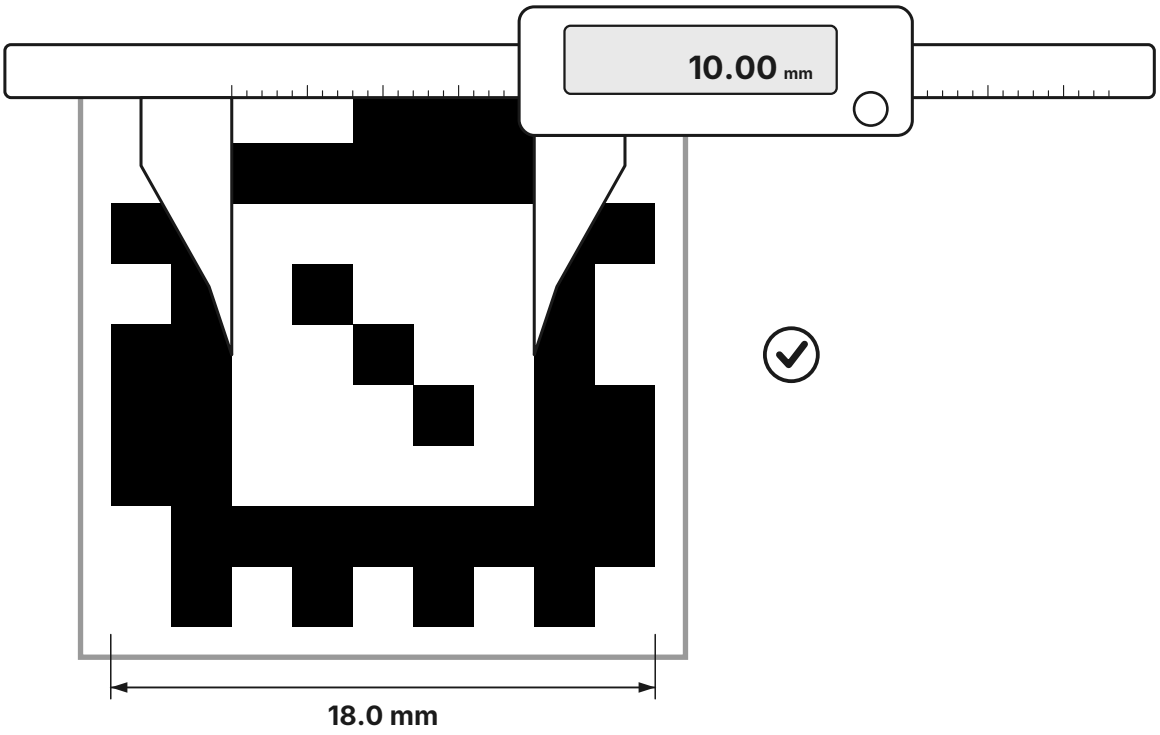
2004
left finger



2005
right finger

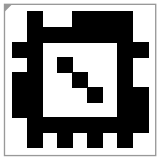
Check the tag size

4:1



Measured anything else?

Your printer changed the scale. Print the tag sheet again at 100 % (Actual size). Do not use Fit to page.



10.0 mm



9.4 mm