MyGamepad

ASSEMBLY INSTRUCTIONS AND USER MANUAL

October 2024
Version 3.00

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https://www.mygamepad.de

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1 Preface

1.1 Conventions used in this manual

The following style conventions are used in this document:

Bold

- Names of product elements, commands, options, programs, processes, services, and utilities
- Names of interface elements (such windows, dialog boxes, buttons, fields, and menus)
- Interface elements the user selects, clicks, presses, or types

Italic

- Publication titles referenced in text
- Emphasis (for example a new term)
- Variables

`Courier`

- System input/output, such as an error message or script
- URLs, complete paths, filenames, prompts, and syntax

User input variables:

- < > Angle brackets surround user-supplied values.
- [ ] Square brackets surround optional items.
- | Vertical bar indicates alternate selections – the bar means "or".

1.2 Explanation of safety instructions

DANGER! Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

WARNING! Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

CAUTION! Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

NOTICE Indicates information considered a hint, but not hazard-related.

1.3 Retaining instructions

Read and understand this manual and its safety instructions before assembling and using this product. Failure to do so can result in serious injury or product failure.

Follow all the instructions. This will avoid fire, electric shocks or other hazards that may result in damage to property and/or severe or fatal injuries.

Keep all safety information and instructions for future reference and pass them on to subsequent users of the product.

1.4 Obtaining documentations and information

1.4.1 Internet

The latest version of the documentation is available on our website at the following address: https://www.mygamepad.de/downloads

1.4.2 Documentation feedback

Feedback is always welcome. Any comments can be submitted on the Forum website: https://www.mygamepad.de/forum. Comments can also be sent to info@mygampad.de. We appreciate your feedback.

2 Description of the product

2.1 Purpose of the device

MyGamepad is a do-it-yourself (DIY) input device designed for gaming that is especially optimized for FPS games. It is a combination of different input devices, including keyboard, mouse, and controller. The device supports:

1. 25 functional keys:
   – Finger 1 with 6 keys.
   – Finger 2 with 5 keys.
   – Finger 3 with 5 keys.
   – Finger 4 with 6 keys.
   – Thumb with 3 keys.
2. 5-way digital stick (DPAD) with center button.
3. Analog stick with 12-bit A/D precision and center button.

Each key and stick direction can be assigned a function of the different types of input devices. The assignments can be modified through a web-interface and are stored in the internal memory of the device. The internal memory can store up to 20 profiles. Furthermore, it's also possible to transfer configurations through the web-interface to PC or Mac.

It is possible to adjust the hardware configuration to support individual hand sizes and preferred handling positions. The device is designed to be used with the left hand in combination with a mouse operated with the right hand.

MyGamepad is connected to the computer or console via a free USB 2.0 port. No drivers or software need to be installed on the PC, Mac or console. However, functionality may be limited for certain devices and games. For example, the controller functions analog movement or typical X/Y buttons cannot be used on consoles because the device is recognized as a keyboard. But therefore, the analog stick input can be used in games with keyboard support to emulate the WASD key mappings.

The web-interface for configuration requires a modern web browser such as Safari, Chrome, Edge or mobile device browser.

2.2 Building the device

Building the device requires or having access to a 3D printer. Furthermore, some other tools like a soldering iron, screw drivers, and pliers are required. Details can be found in the tool section of this document (see **Table 2** on page 14).

The level of difficulty of the build is medium, with a strong focus on soldering. While the printing time of the plastic parts is approximately 30 hours, the assembly time is around 5 – 8 hours depending on your soldering skill. This document describes the entire process step by step.

2.3 Technical data

Table 1: Technical data

Parameter	Unit
Power	1.2 W
Voltage	5 V provided through USB port
Weight	535 g
Software version	V1.00
Operating temperature	5 to 40 °C
Humidity range	30 to 80 % relative humidity (RH)

2.4 Description of the device parts and components

In **Figures 2-1** to **2-9** you will find an overview of the main components of the fully assembled device and their position.

Description of the parts and components

1. Hand rest
2. Finger keys
3. 5-way digital stick (DPAD)
4. Analog thumb stick
5. Display
6. Select key
7. Finger base
8. Joint finger base
9. Base strain relief
10. Finger keys 360° adjustment
11. Display angle adjustment
12. Display 360° adjustment
13. Communication cable
14. Joint thumb base cap
15. Thumb base
16. Thumb key 360° adjustment
17. Thumb keys
18. Thumb stick angle adjustment
19. Thumb stick 360° adjustment
20. Key strain relief
21. Display horizontal adjustment
22. Thumb key horizontal adjustment
23. Thumb stick horizontal adjustment
24. USB cable strain relief
25. Rubber feet
26. Finger key horizontal adjustment
27. USB hub
28. USB hub mount
29. Arduino Nano ESP32 micro controller
30. Teensy 4.0 micro controller
31. Reset button Teensy 4.0

Figure 2-1: MyGamepad top front view.

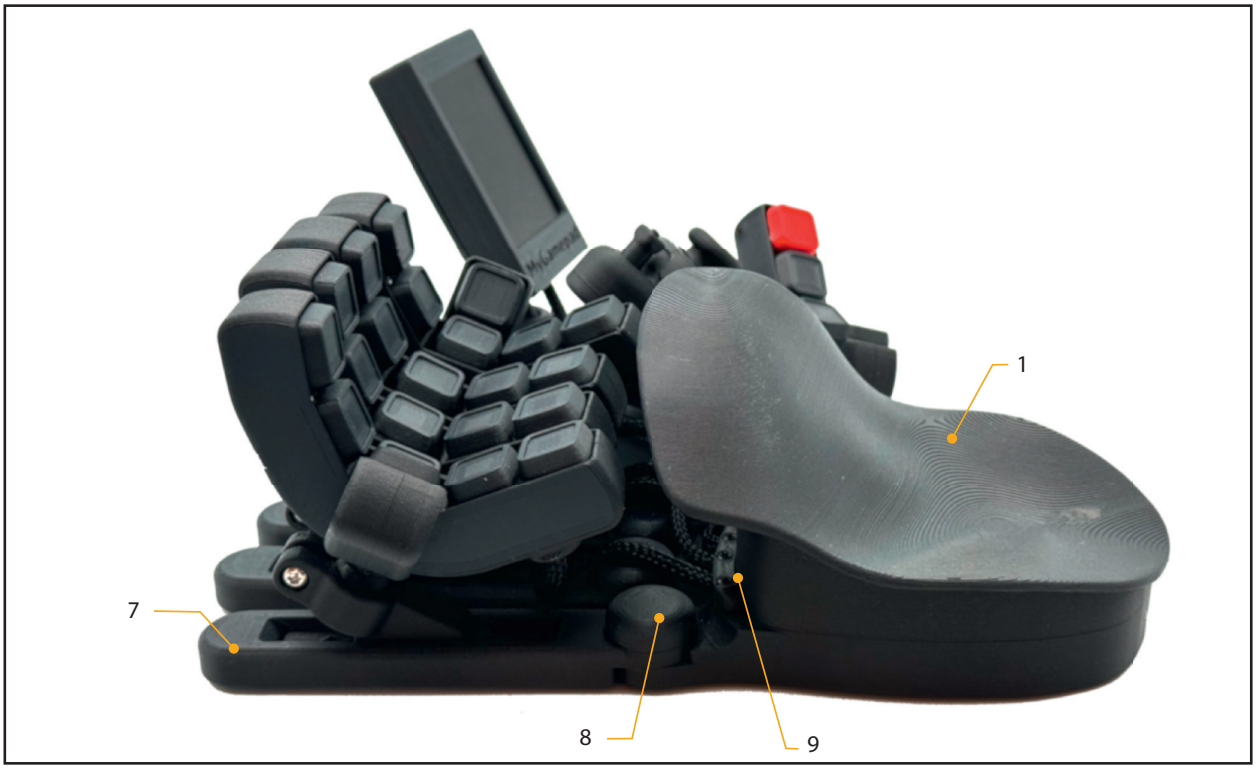


Figure 2-2: MyGamepad side view.

Figure 2-3: MyGamepad finger keys rear view.

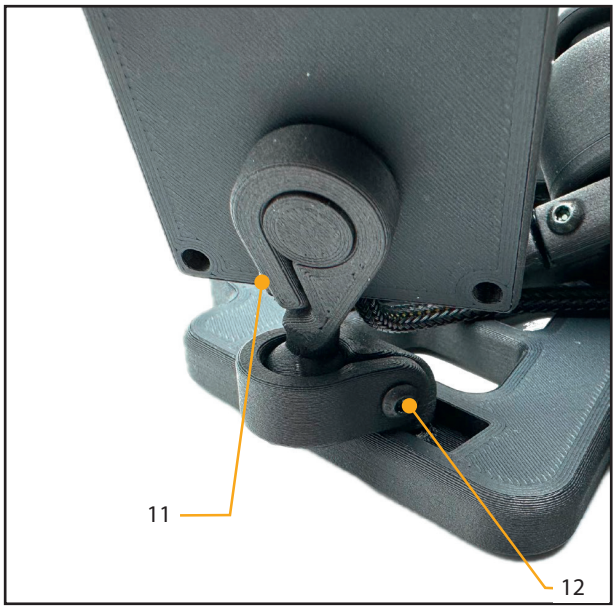


Figure 2-4: MyGamepad display rear view.

Figure 2-5: MyGamepad thumb stick side view.

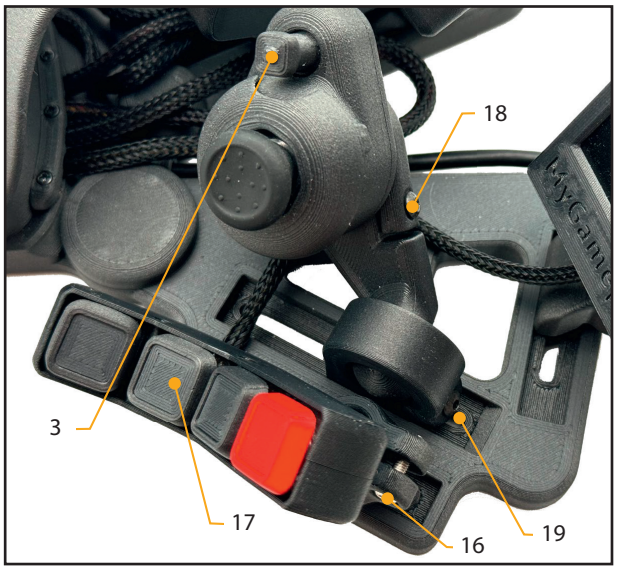


Figure 2-6: MyGamepad thumb stick top view.

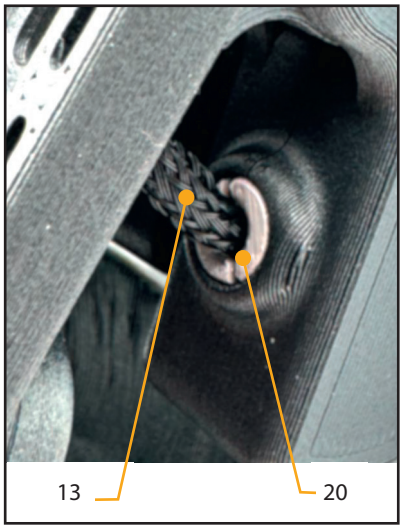


Figure 2-7: MyGamepad key shell bottom view.

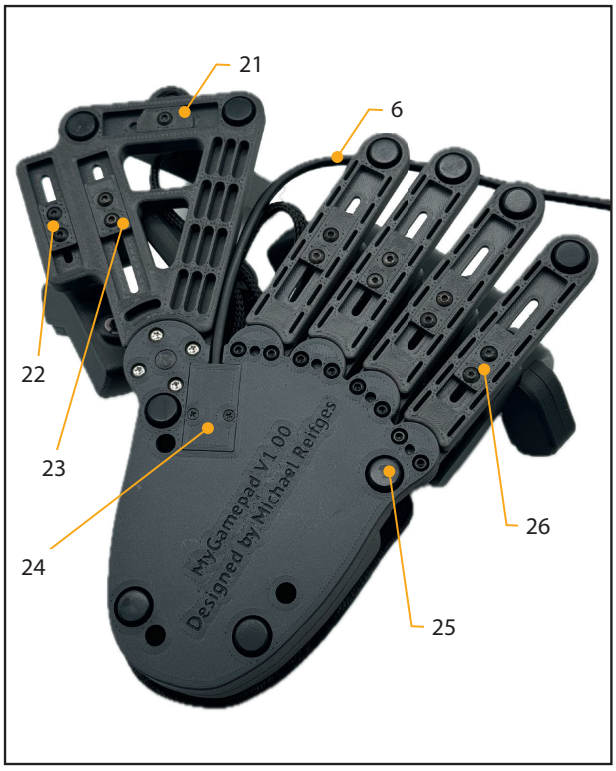


Figure 2-8: MyGamepad bottom view.

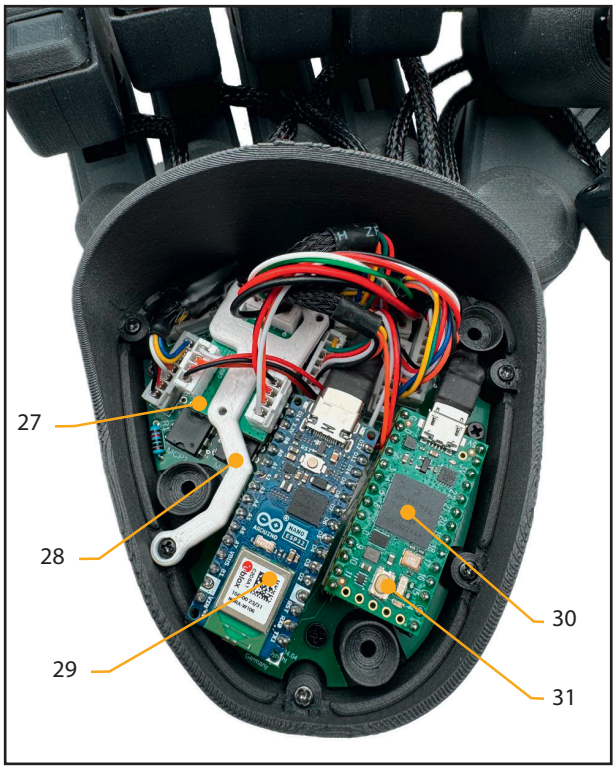


Figure 2-9: MyGamepad inside main body view.

2.5 Understanding the user interface

For a complete description of the user interface of the device, please visit our documentation website at: www.mygamepad.de/device-user-interface.

3 Safety instructions and advice

3.1 Personal safety

- Drink enough water to remain alert and avoid dehydration.
- Ensure sufficient air ventilation (6 – 12 air changes/ hour).
- Taking regular breaks allows your body to recover from the tasks at hand.

3.2 Work area safety

- Keep your workplace clear from clutter.
- Always wear the necessary safety equipment.
- Make sure that the tools used are working well and are in good condition.
- Use ergonomic desks or workbenches to avoid straining your wrists and arms.

3.3 Soldering safety

- Do not use soldering irons with obvious damage to the housing, cable, or plug.
- Work on a fire-proof or fire-resistant surface.
- Wear eye protection. Solder can spit!
- Fumes should be extracted using an enclosed hood (preferred) or tip extraction. Ideally, these should vent to the outside.
- Hold the wires to be heated with tweezers, pliers, or clamps to avoid burns. Keep the cleaning sponge wet during use. If possible, conduct soldering on a firm, level surface and always return the soldering iron to its stand when not in use.

4 Assembly

4.1 Required tools

Before starting the assembly process, it is recommended that you read the entire document first. Please visit our Support website for a detailed list of required tools at: www.mygamepad.de/required-tools.

4.2 Bill of materials

Besides the 3D-printed parts, further components such as microcontrollers, keys, a display, wires, connectors, screws, etc. are required.

We tried to use commonly available standard components at a reasonable cost without compromising on the overall quality and performance.

However, some components are not available to purchase as single parts (mainly due to the low value per piece). Others offer significant discounts of up to 20 % on larger or bulk orders.

Due to popular demand, we are now offering hardware part kits with the right quantity of the required components while passing on the discounts in our shop at: www.mygamepad.de/shop.

This might also help to save on transport/shipping costs and is more environmentally friendly.

4.2.1 3D-printed parts

All parts can be ordered and downloaded on Printables.com.

We recommend printing the parts in PETG. However, the best look and feel can be archived with Prusament PETG Carbon Fiber and Prusament PC Blend Carbon Fiber. The model used in the photos is printed in PC Blend Carbon Fiber.

Printing all parts requires approximately 450 g of filament. Total print time on a Prusa XL with having all parts on one plate is approximately 30 hours.

Please visit our Support website for an overview of all printable design files, the quantities needed for the build, and individual printing settings and tips at: www.mygamepad.de/items.

4.2.2 Further components

Please visit our Support website for detailed information about the microcontroller, USB hub, PCBs, electronic parts, screws, and other materials at: www.mygamepad.de/bill-of-material.

4.2.2.1 Microcontroller/USB hub

For the minimum configuration you will need one Arduino Nana ESP32 microcontroller. An additional Teensy 4.0 is required for the full range of features including Xbox controller buttons and analog controller movement. We strongly recommend using original devices from trusted sources. In case of a 2-microcontroller setup, it is recommended to use an internal USB hub. The bestep® USB-Hub is a good choice and used for this build, because it comes without connectors and has a very good availability.

4.2.2.2 Printed circuit boards (PCBs)

The PCBs can be ordered with the provided Gerber-files through PCBway.

4.2.2.3 Electronic parts

Most of the electronic parts are mainstream and can be ordered online from eBay, Amazon or electronic stores.

4.2.2.4 Screws and other materials

All materials can be found on eBay or Amazon. Sometimes, e.g. for screws, it might be cheaper to buy a set.

4.3 Printing and preparation of 3D parts

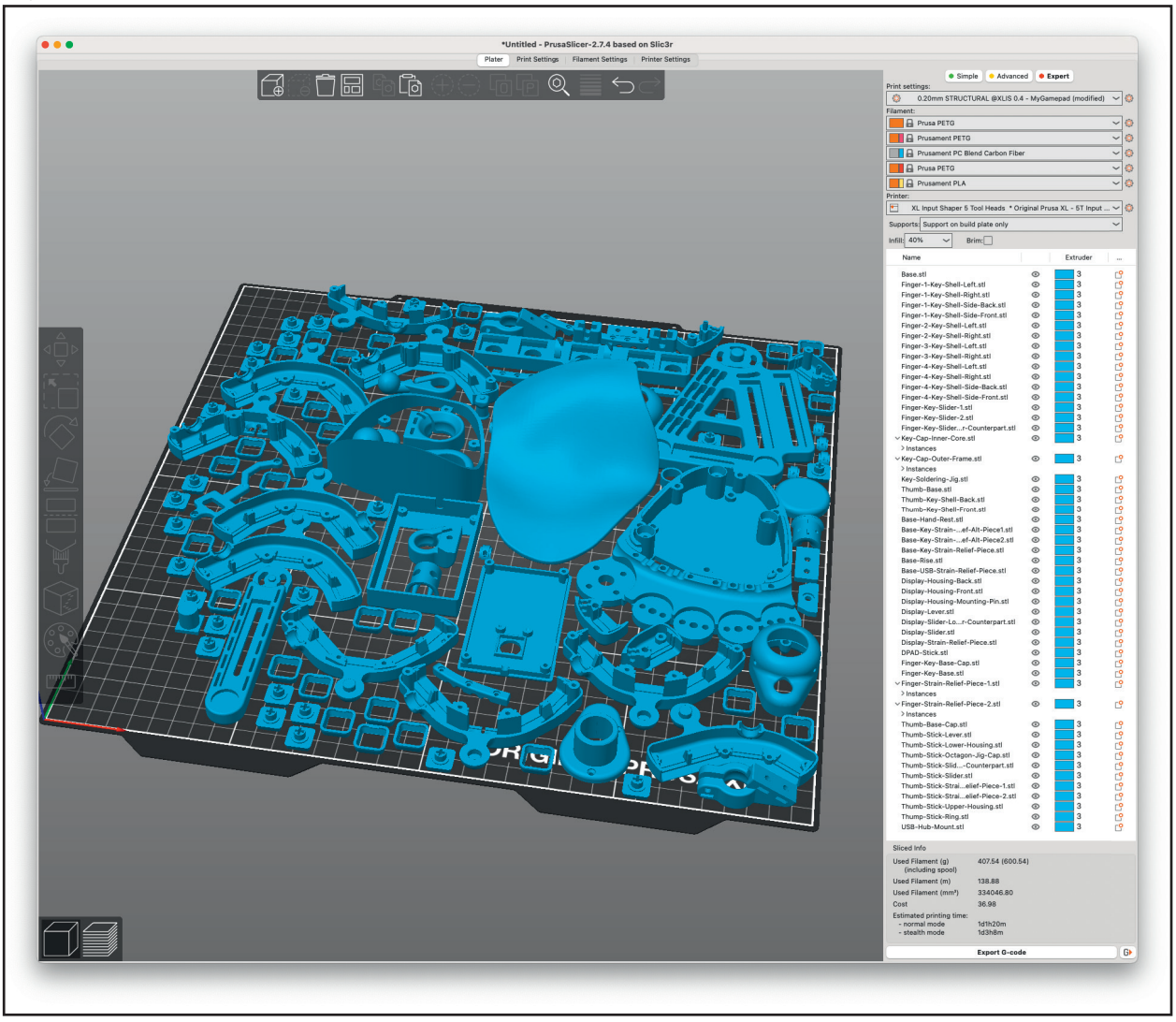
4.3.1 Printing the parts

General print setting:

- Layer height: 0.2 mm
- Perimeters: 4
- Infill: 25 %
- Support on build plate only
- XY separation between an object and its support: 1 mm
- Support pattern: Rectilinear grid

Although all parts would fit on one Prusa XL plate, we strongly recommend splitting the print into several batches (see **Figure 4-1).**

Figure 4-1: All parts on one Prusa XL plate.



4.3.2 Threaded inserts

Threaded inserts are used for some of the screws to ensure a long-term reliable and strong assembly (see **Figures 4-2** to **4-4).**

Figure 4-2: Placements of threaded inserts on base.

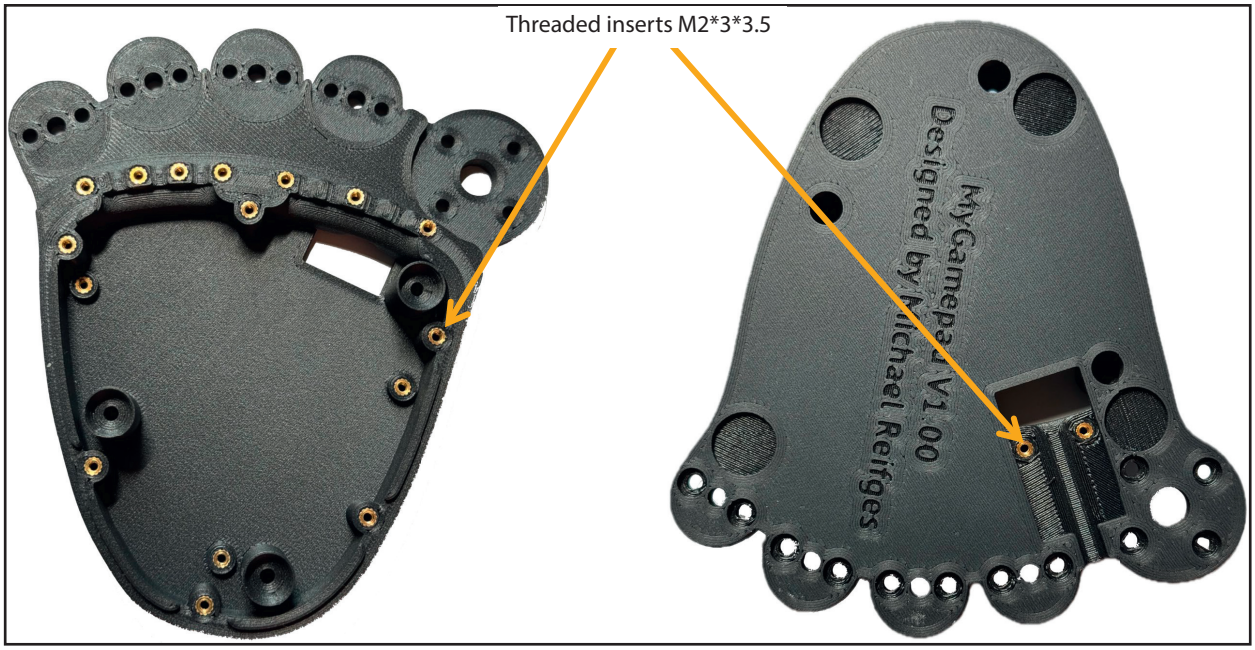


Figure 4-3: Placements of threaded inserts on Thumb-Stick-Upper-Housing.

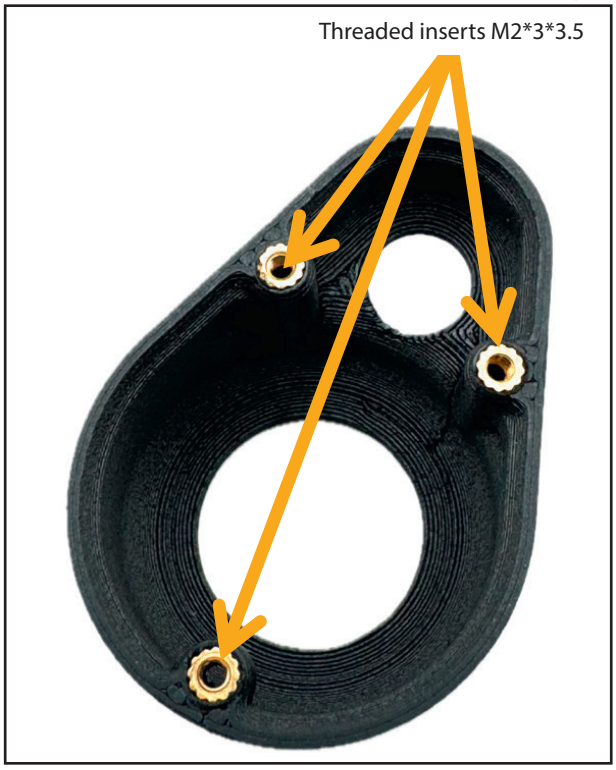
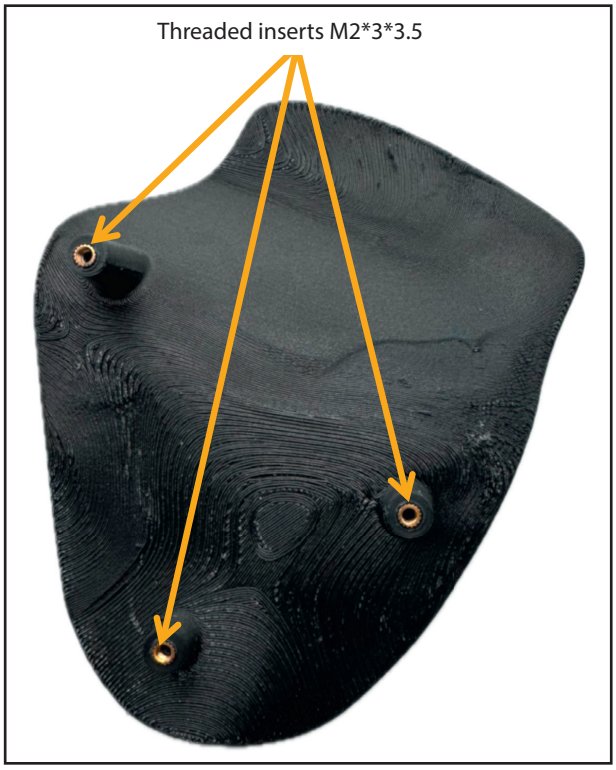


Figure 4-4: Placements of threaded inserts on Base-Hand-Rest.



4.3.3 Square nuts

The following parts are using M3 square thin nuts **(M10)**.

- Finger-Key-Slider-1 **(P26)**
- Finger-Key-Slider-2 **(P39)**
- Thumb-Stick-Slider **(P30)**
- Thumb-Stick-Lever **(P32)**
- Display-Slider **(P41)**
- Display-Lever **(P43)**
- Finger-Key-Base-Cap **(P25)**
- Thumb-Base-Cap **(P29)**

Figures 4-5 to **4-10** show their positions in the parts.

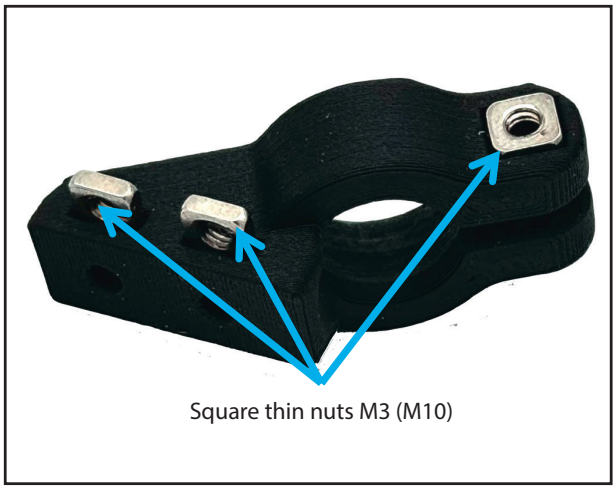


Figure 4-5: Square nut positions Finger-Key-Slider-1 **(P26)** / Finger-Key-Slider-2 **(P39)**

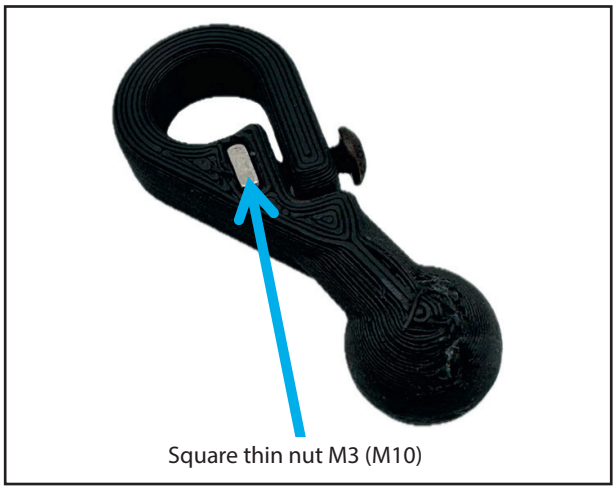


Figure 4-6: Square nut position Display-Lever **(P43)**.

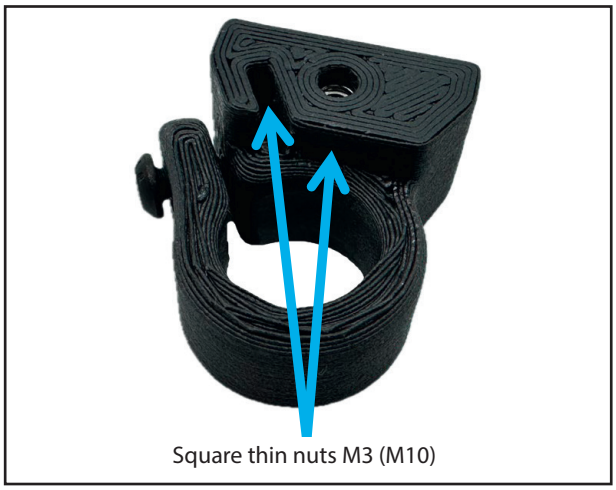


Figure 4-7: Square nut positions Display-Slider **(P41)**.

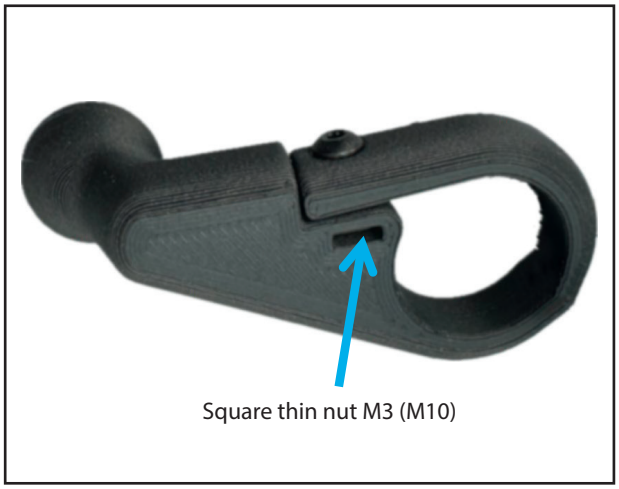


Figure 4-8: Square nut position Thumb-Stick-Lever **(P32)**.

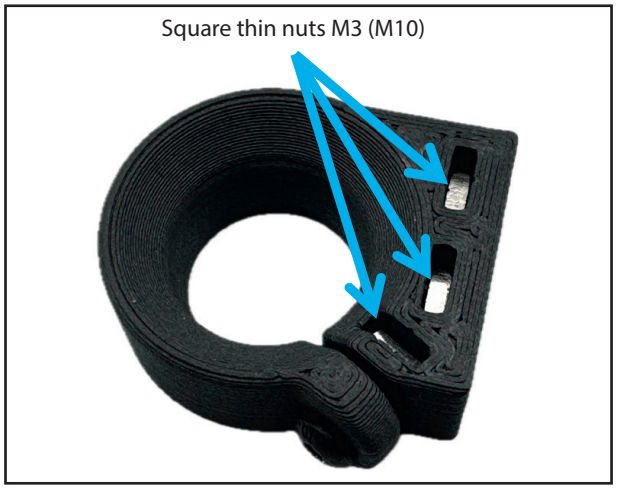


Figure 4-9: Square nut positions Thumb-Stick-Slider **(P30)**.

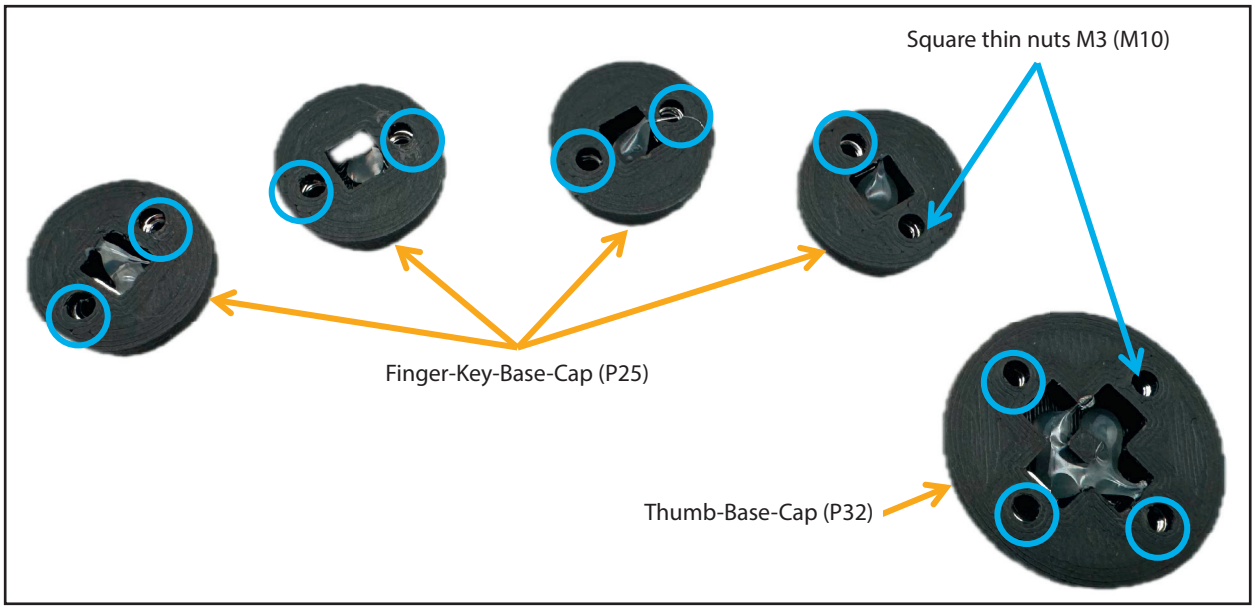


Figure 4-10: Square nut positions Finger-Key-Base-Cap **(P25)** and Thumb-Base-Cap **(P29)**.

To prevent the square nut from falling out of the caps during assembly, you can apply a little bit of hot glue into the insertion slot.

4.3.4 Pre-assembly of printed parts

You can now already pre-assemble some parts to reduce the number of individual parts on the table.

4.3.4.1 Connecting the mounting pin to the display housing

Insert the Display-Housing-Mounting-Pin **(P46)** from the inside into the hole of the Display-Housing-Back **(P45)** and press-snap them together (see **Figure 4-11).**

If it is too tight, you can scratch the edges of the pin a little bit with a knife.

It is a good practice to place it on a small tape roll (see **Figure 4-12)** to apply enough pressure. In the end, it should look as shown in **Figure 4-13.**

Figure 4-11:
Inserting the mounting pin into the display housing.

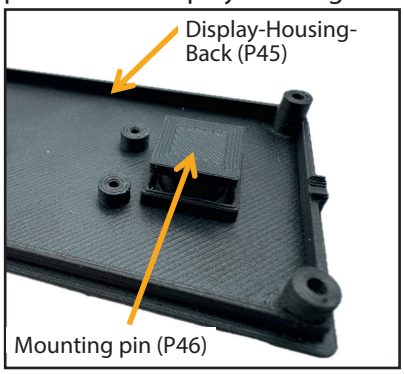
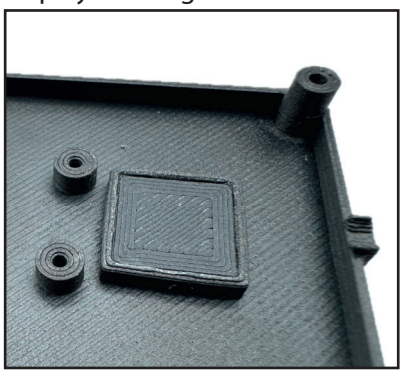


Figure 4-12:
Display housing on tape roll.

Figure 4-13:
Mounting pin and display housing connected.



4.3.4.2 Assembly of the keys

Insert the inner core of the key into the outer frame (see **Figure 4-14)** and press them together. By using a 6 mm nut as shown in **Figure 4-15** and pressing against a flat surface, like a table, this is very easy to do. Repeat this process for all 25 keys so that they all look as shown in **Figure 4-16.**

Figure 4-14:
Connecting the inner core and outer frame of the keys.

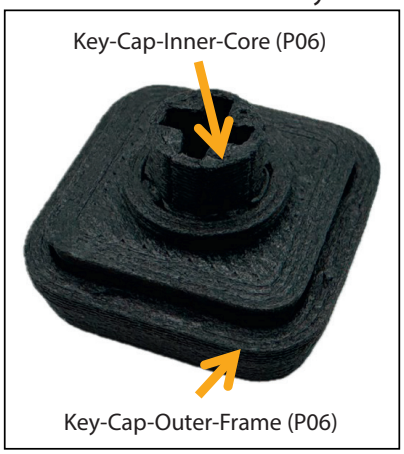


Figure 4-15:
Using a 6 mm nut to press the key parts together.

Figure 4-16:
Properly connected key parts.

4.4 Electronics

4.4.1 Main printed circuit board (Main-PCB)

4.4.1.1 Step 1

Start with soldering in the two MCP23017 **(E08)** and the two 10K resistors **(E09)** onto the main PCB **(C01)** as shown in **Figure 4-17.**

NOTICE: Look for the right direction of the MCP23017. There is a small mark on the PCB indicating the right direction of the notch.

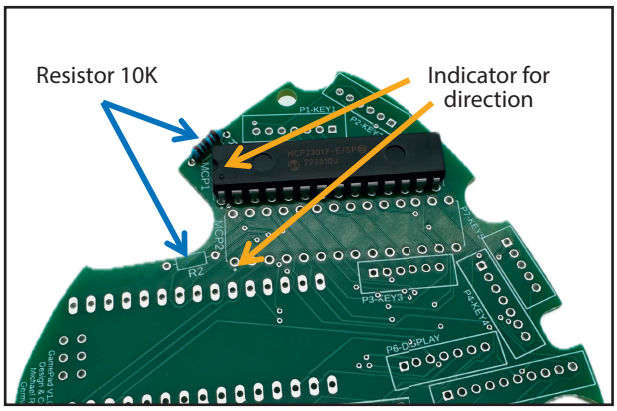


Figure 4-17: Resistor and MCP23017 placement on main PCB **(C01)**.

4.4.1.2 Step 2

In this step we will solder in the 7 JST PH2.0 connectors:

- 1 x 5 pins **(E15)**
- 2 x 6 pins **(E16)**
- 2 x 7 pins **(E17)**
- 1 x 8 pins **(E25)**
- 1 x 10 pins **(E18)**

Pay attention to the correct direction, the connector should fit into the frame printed on the PCB (see **Figure 4-18).**

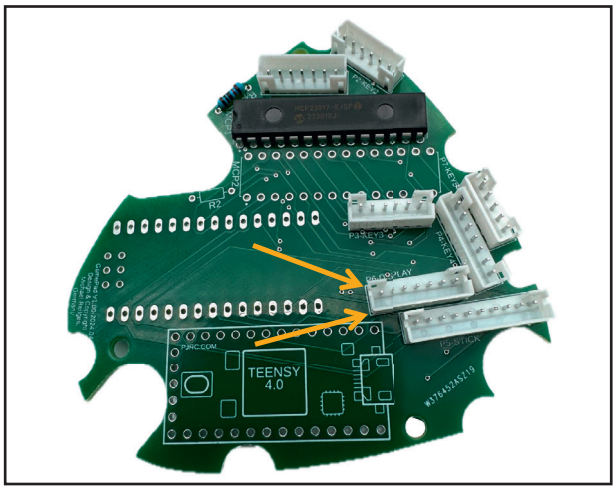


Figure 4-18: Placement of the JST PH2.0 connectors on main PCB **(C01)**.

4.4.1.3 Step 3

In the last step, we focus on the microcontrollers. You can solder them directly onto the board with male pin connectors. However, it is strongly recommended to use female headers to make them exchangeable (see **Figure 4-19).** First cut the female headers **(E08)** to the required length. We need pieces with 2 x 15 pins and 2 x 14 pins.

NOTICE: Make sure the headers are mounted perpendicular to the PCB surface for easy fit of the microcontrollers.

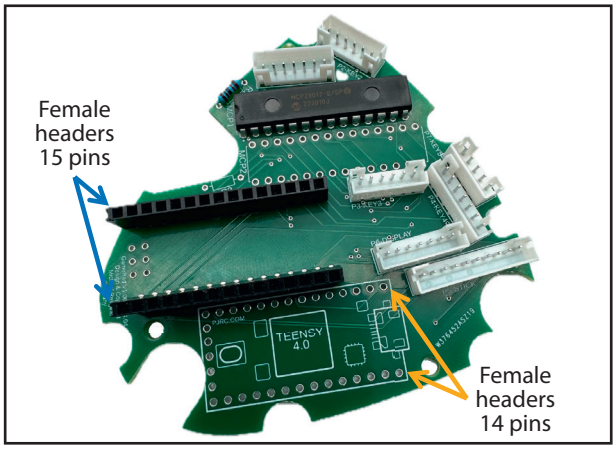


Figure 4-19: Installation of the female headers for microcontrollers.

4.4.2 Preparation of the cable connectors

The preparation of the cable connectors for the keys is always the same, just with changing measurements. For the stick and display, it is basically the same cable, but with some minor differences (see **Figure 4-20** and **Table 2).**

Figure 4-20: Measurements and items used for the cable connectors.

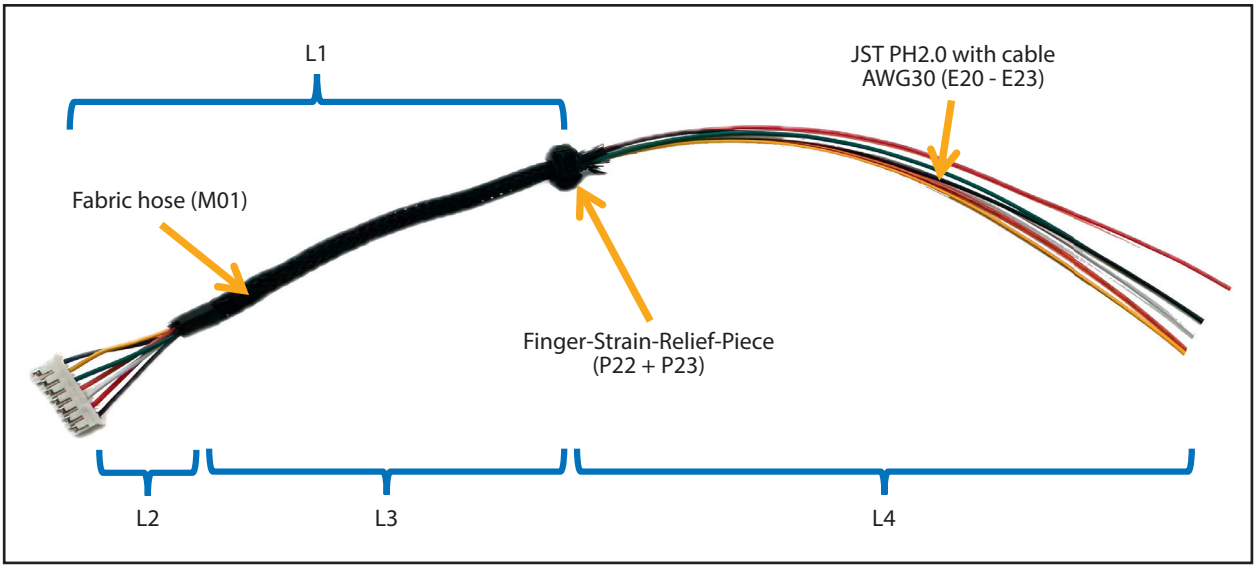


Table 2: Detailed measurements for the cable connectors.

#	Part	Connector/cable	L1	L2	L3	L4
1	Finger 1	7-pin JST PH2.0 with cable AWG28 30 cm **(E22)**	110 mm	20 mm	90 mm	See chapter 4.4.3 on page 38.
2	Finger 2	6-pin JST PH2.0 with cable AWG28 30 cm **(E21)**	120 mm	20 mm	100 mm	See chapter 4.4.3 on page 38.
3	Finger 3	6-pin JST PH2.0 with cable AWG28 30 cm **(E21)**	150 mm	20 mm	130 mm	See chapter 4.4.3 on page 38.
4	Finger 4	7-pin JST PH2.0 with cable AWG28 30 cm **(E22)**	150 mm	20 mm	130 mm	See chapter 4.4.3 on page 38.
5	Finger 5	5-pin JST PH2.0 with cable AWG28 20 cm **(E20)**	140 mm	25 mm	115 mm	See chapter 4.4.3 on page 38.
6	Stick	10-pin JST PH2.0 with cable AWG28 30 cm **(E23)**	n/a	30 mm	140 mm	80 mm
7	Display	8-pin JST PH2.0 with cable AWG28 30 cm **(E26)**	n/a	30 mm	160 mm	25 mm

4.4.2.1 Step 1 – Fabric hose

Cut the fabric hose **(M01)** into the right length **(L3)** and push the cable cores through. Keep the gap **(L2)** to the connector. You can fasten it with a 10 mm heat-shrink tube or insulation tape to avoid unwrapping of the fabric hose (see **Table 2).**

4.4.2.2 Step 2 – Strain relief for finger key connectors

For the finger key connectors (item #1 – 5 in **Table 2)** install the strain relief at the distance **(L1)**. For the stain relief you need:

- 2 x Screw M1.4 x 4 mm **(M11)**
- 1 x Finger-Strain-Relief-Piece-1 **(P22)**
- 1 x Finger-Strain-Relief-Piece-2 **(P23)**

Tighten the screws until the strain relief can no longer move.

Use adhesive tape for the stick and display connectors to temporarily prevent the fabric hose from unwrapping and cut the cable to the correct length **(L4)** as listed in **Table 2**. Remove approximately 3 – 4 mm of the isolation and tin the endings with the soldering iron.

4.4.3 Finger key holders

There are 3 different finger key holders: 2 with 6 keys, 2 with 5 keys and one for the thumb with 3 keys. The Key-Soldering-Jig **(P49)** helps to deal with the assembly of all three types.

Besides the number of keys, the steps are always the same.

NOTICE: Please pay extra attention on the right orientation of the keys and pins in the jig for the different types. This is very import for the fitting in the shell.

4.4.3.1 Step 1 – Ground connection

First use the blank wire and solder it to one pin of each switch. This is the common ground (GND). Due to the limited space in the key shell, the recommended path of the cable is shown in **Figure 4-21.**

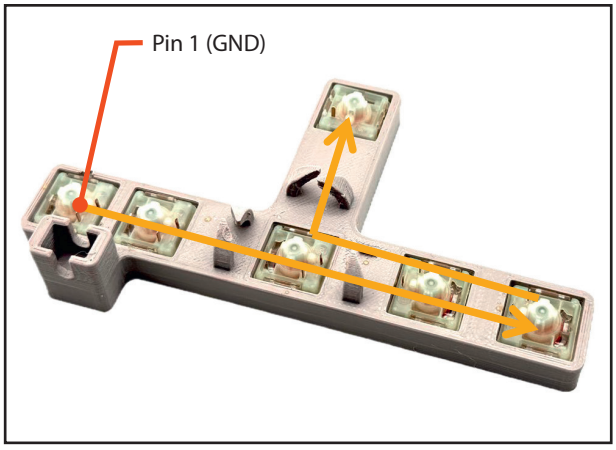


Figure 4-21: GND connection path for finger keys.

4.4.3.2 Step 2 – Signal wires

In this step, we attach the connector wires prepared in chapter 4.4.2 to the second pin of each key. Pin 1 represents the common ground and needs to be soldered to the ground pin of the key in the first position of the jig after cutting it to the right length (see **Figure 4-21).**

To cut all wires to the right length, insert the connector cable with the strain relief into the jig as shown in **Figure 4-28.** Pull the wire to the pin of the foreseen key using the guard rails. Give some extra 5 mm to the wire before cutting it off.

Remove the insulation by 2 – 3 mm and tin coat it. Before soldering the wire to the pin, cut a 3 – 4 mm piece from the 3 mm heat-shrink tube **(M02)** and pull the wire through it. Repeat this for all keys based on the pin assignments shown in **Figures 4-22** to **4-30**.

4.4.3.3 Setup of the 6-key finger

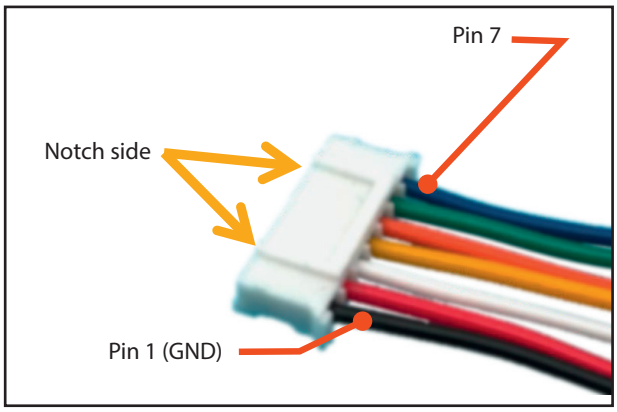


Figure 4-22: JST PH2.0 connector with 7 pins **(E22)**.

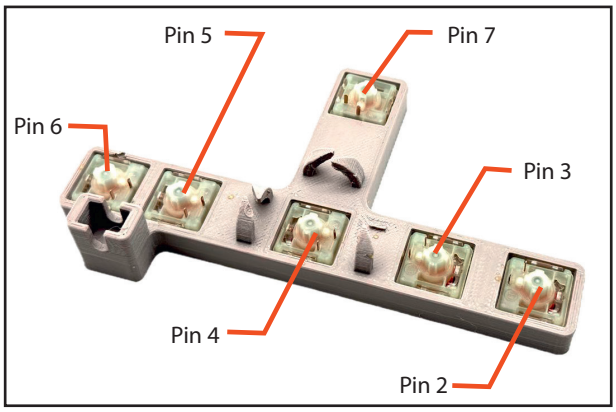


Figure 4-23: Setup in Key-Soldering-Jig for 6 keys.

4.4.3.4 Setup of the 5-key finger

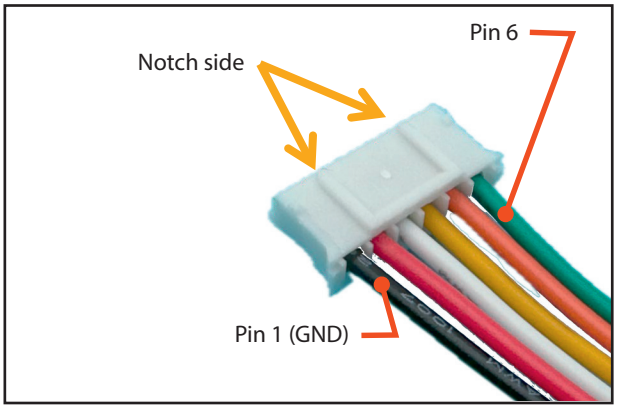


Figure 4-24: JST PH2.0 connector with 6 pins **(E21)**.

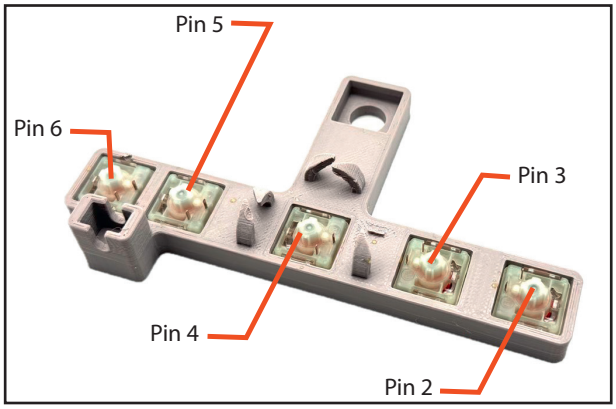


Figure 4-25: Setup in Key-Soldering-Jig for 5 keys.

4.4.3.5 Setup of the 4-key finger

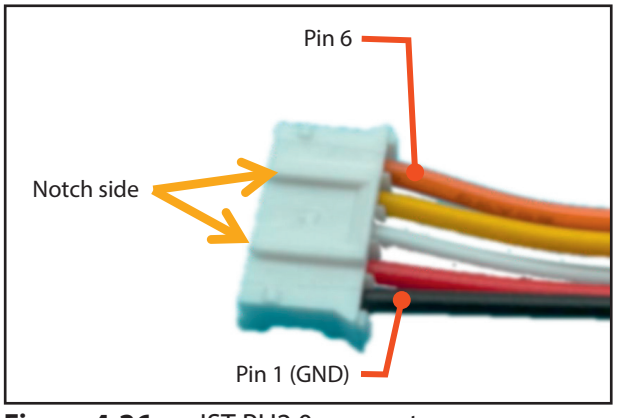


Figure 4-26: JST PH2.0 connector with 5 pins **(E20)**.

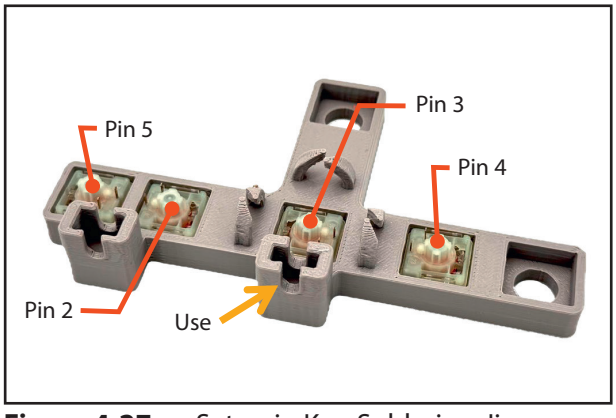


Figure 4-27: Setup in Key-Soldering-Jig for 4 keys.

4.4.3.6 Step 3

Slide the heat-shrink tube over the pin and carefully use the heat gun to shrink it. The result should look as shown in **Figure 4-28.**

Take the finished connector string carefully out of the jig and place it in the prepared Finger-Key-Shell as shown in **Figure 4-29.**

For the 6-key version pull the cables into the slot to the side after you have put the side key into its housing. Make sure that they are in the correct position and fit into the designated gap in the side shells. Before inserting the middle key of the main row, mount the side shell and fasten it with two countersink screws M3 x 4 mm **(M16)**.

Before closing the shell, put the strain relief into the special recess and make sure that all wires are inside the shell.

Use the M2 x 12 mm countersink screws **(M12)** to finish the assembly of the key housing.

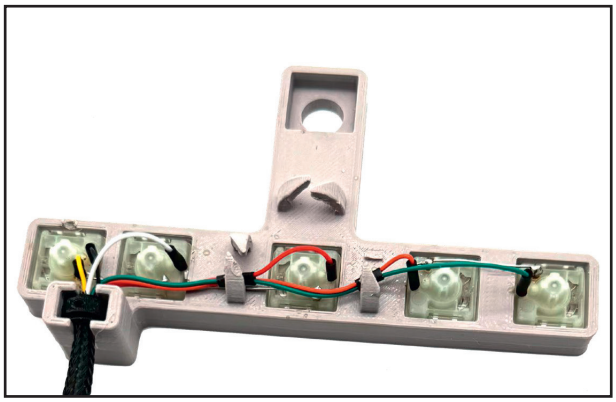


Figure 4-28: Finished connector in Key-Soldering-Jig.

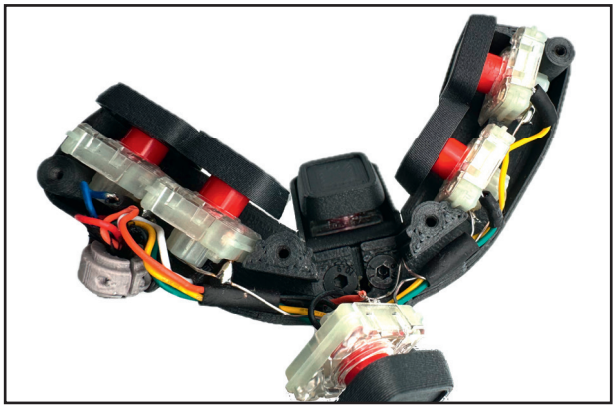


Figure 4-29: Placement of keys with wires in key shells.

4.4.4 Thumb stick PCB

For the assembly of the thumb stick we need the Thumb-Stick-PCB **(C03)**, the 10-pin JST PH2.0 with cable AWG28 30 cm (prepared in chapter 4.4.2, see item 6 in **Table 2),** the five-way-Switch **(E13)**, and the PS4 analog stick **(E12)**.

4.4.4.1 Step 1 – Wires

We start with the soldering of the wires to the PCB from the bottom. **Figure 4-30** shows how to identify the pins. In **Figure 4-31** you can see where to connect them on the bottom side of the PCB.

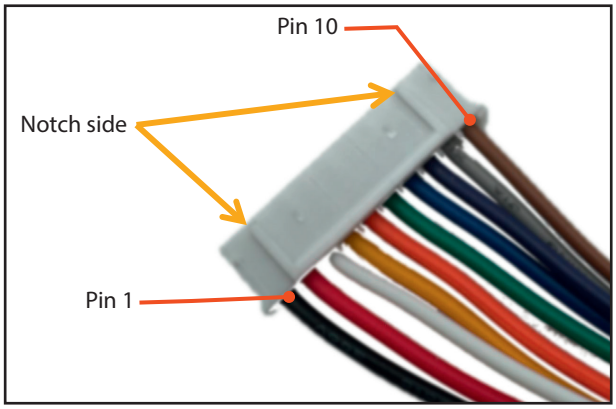


Figure 4-30: JST PH2.0 connector with 10 pins **(E23)**.

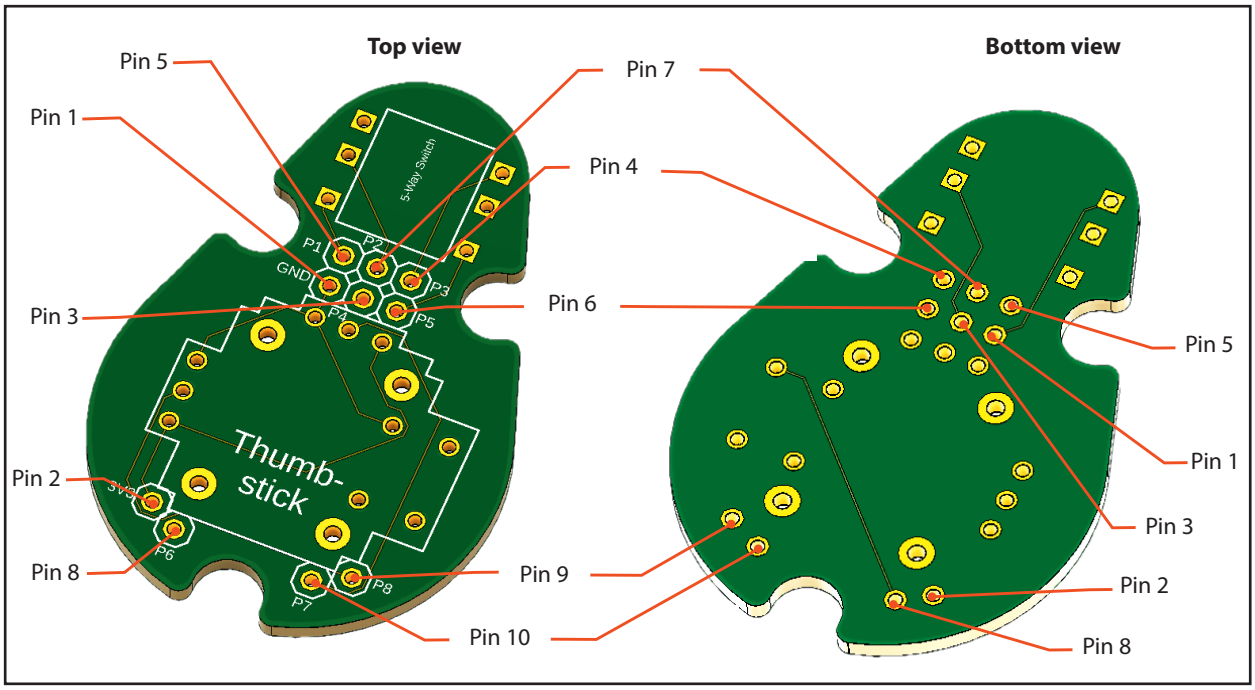


Figure 4-31: Pin assignment of the Thumb-Stick-PCB.

4.4.4.2 Step 2 – Adding the components

In this step, we are position and soldering the two components on the top side of the Thumb-Stick-PCB, as shown in **Figure 4-32.**

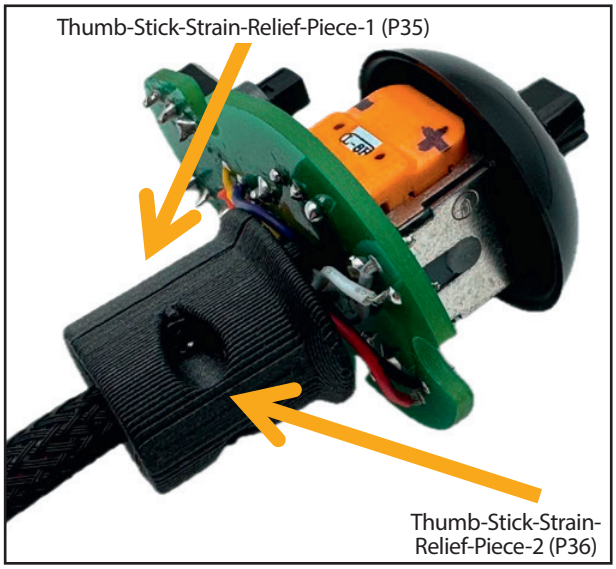
Make sure that they are mounted 100 % flat on the surface, as this affects their position in the housing.

Figure 4-32: Placement of components on the Thumb-Stick-PCB.

4.4.4.3 Step 3 – Installing the strain relief

Fasten the two strain relief pieces P35 and P36 with two M2 x 6 mm screws next to the PCB around the wires (see **Figure 4-33).** Tighten the screws before adding the thumb stick housing and make sure you installed the PS4 thumb stick cap. You can also add the DPAD stick **(P38)** to the 5-way switch.

Figure 4-33: Adding the strain relief.



Pay attention to the small notch and make sure that it points towards the 5-way switch (see **Figure 4-34).**

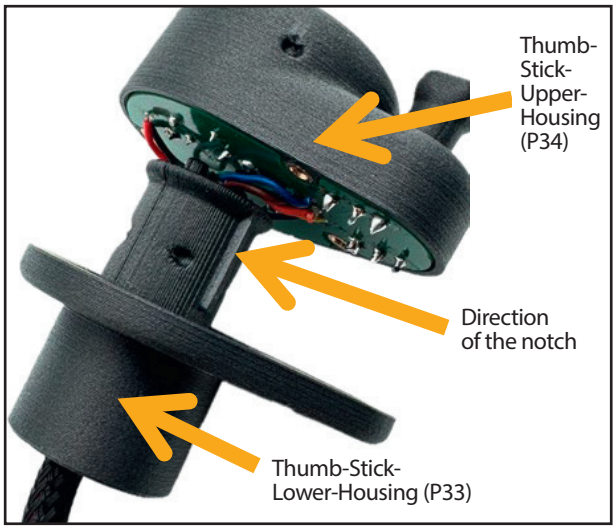


Figure 4-34: Notch position on strain relief.

4.4.4.4 Step 4 – Closing the thumb stick housing

Slide the two housing parts together and insert three M2 x 6 mm screws **(M14)** from the bottom (see **Figure 4-35** and **Figure 4-36).**

NOTICE: Apply pressure carefully and make sure that no wire is clamped under the strain relief.

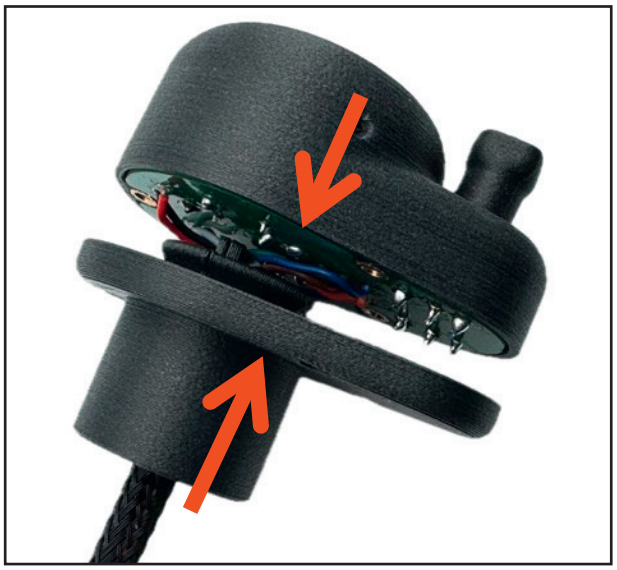


Figure 4-35: Sliding the thumb stick housing together.

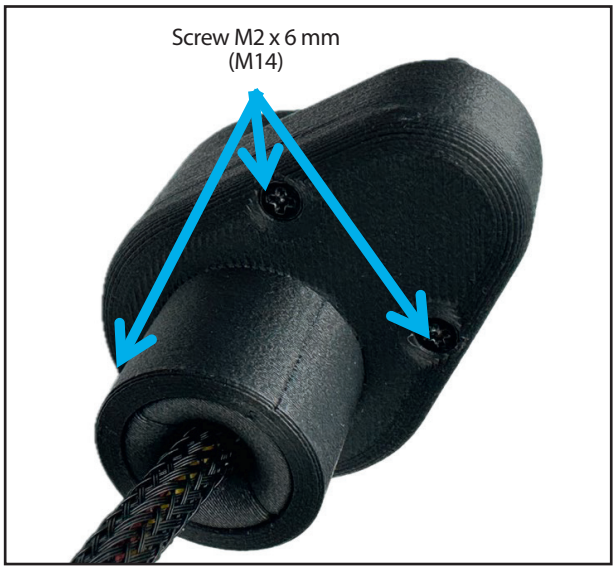


Figure 4-36: Inserting screws from the bottom side.

4.4.5 Display

4.4.5.1 Step 1 – Soldering the wires to the PCB

For the display we need the WaveShare 2.4 inch LCD display module 240 x 320 pixels with ILI9341 controller **(E01)** and the 8-pin JST PH2.0 with Cable AWG28 30 cm **(E26)** without strain relief (prepared in chapter 4.4.2, see item 7 in **Table 2).** The wires are soldered from the bottom side of the display PCB. **Figure 4-37** shows how to identify the pins and in **Figure 4-38** you can see where to connect them on the bottom side of the PCB. In case your display is delivered with fasteners or screws as shown, please remove them before installation into the housing.

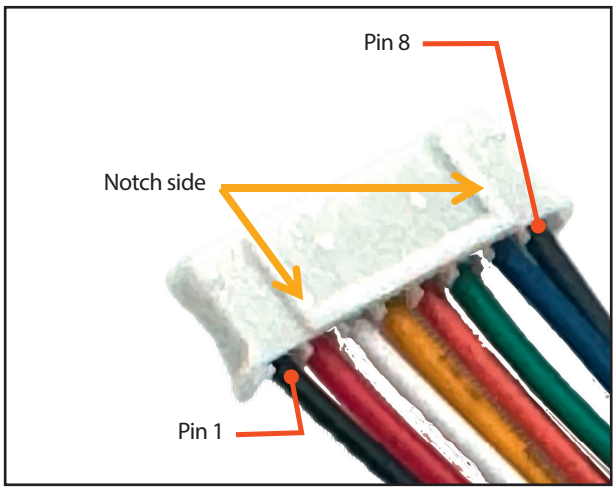
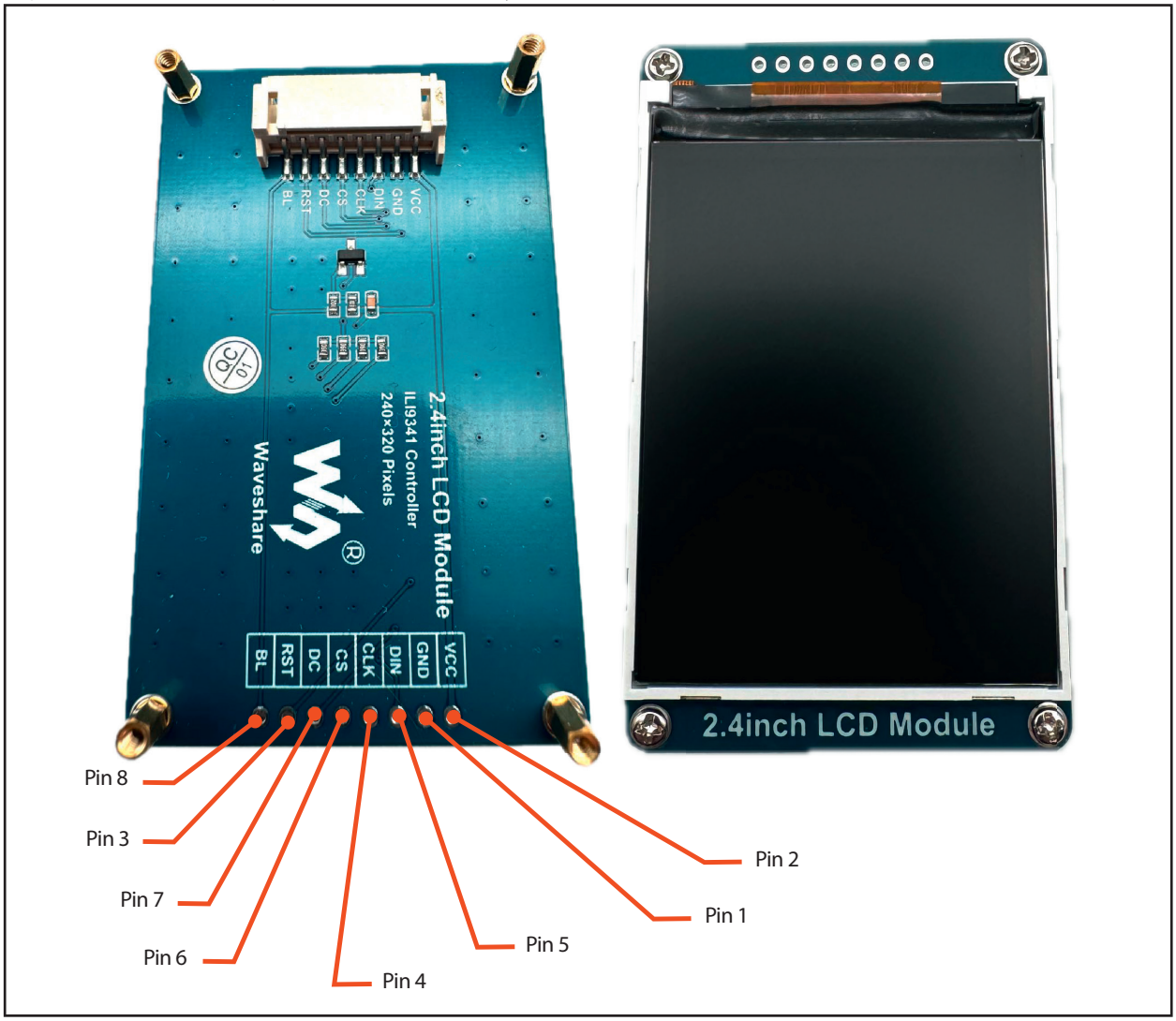


Figure 4-37: JST PH2.0 connector with 8 pins **(E26)**.

Figure 4-38: Pin assignment of the display module.



4.4.5.2 Step 2 – Adding the strain relief

Insert the connector into the strain relief and fasten it with the two screws M2 x 6 mm **(M14)** using the strain relief piece **(P47)** as shown in **Figure 4-39.**

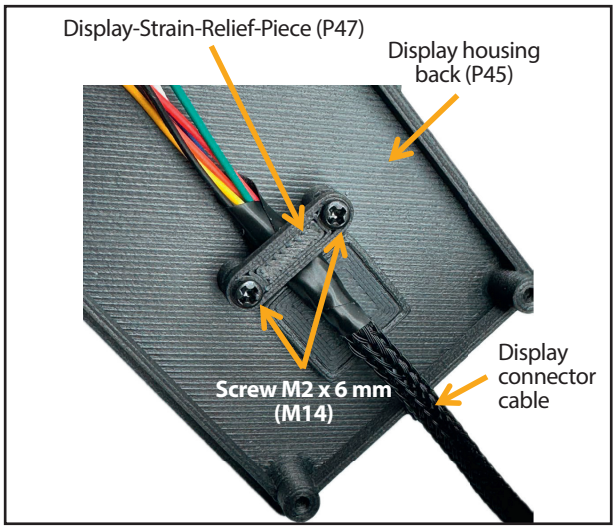


Figure 4-39: Installation of the display strain relief.

4.4.5.3 Step 3 – Closing the display housing

Slide the back part of the display housing into the front part. Make sure that the display connector cable is inserted into the designated slot (see **Figure 4-40).** Finally, insert four screws M2 x 6 mm **(M14)** from the rear (see **Figure 4-41).**

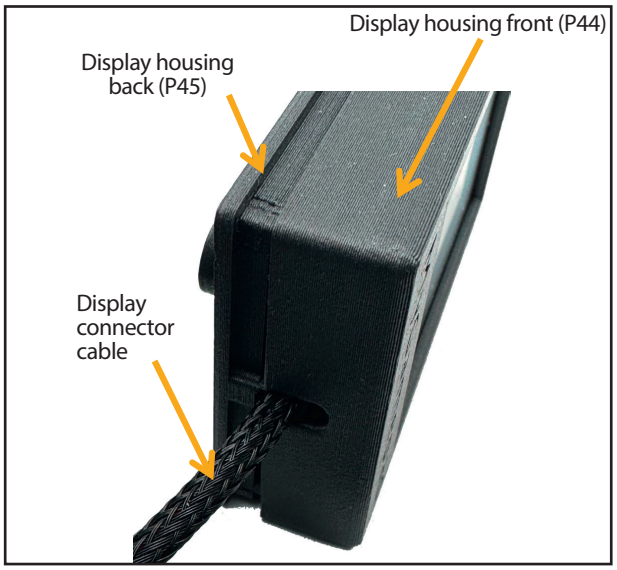


Figure 4-40: Closing the display housing.

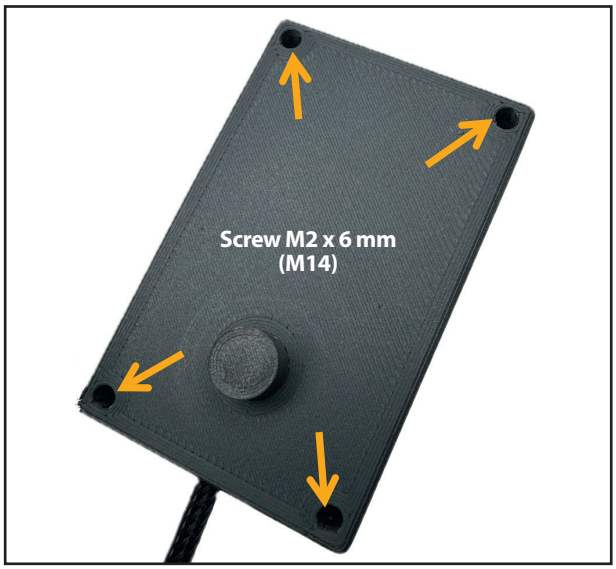


Figure 4-41: Inserting the screws into the display housing.

4.4.6 USB connectors for the microcontroller

4.4.6.1 Step 1 – Connecting the cables to the USB connectors

Use the pin assignment of the USB hub connector as shown in Figure 442 when soldering the wires of the 4-pin JST PH2.0 with cable AWG28 10 cm to the USB-C (see **Figure 4-43)** and Micro-USB (see **Figure 4-44)** connectors. In case the cables are longer, cut them to **8-10** cm first.

The same pin assignment shown in **Figure 4-42** is used for the connection to the USB-A cable. Read more details in chapter 4.4.7 on page 45.

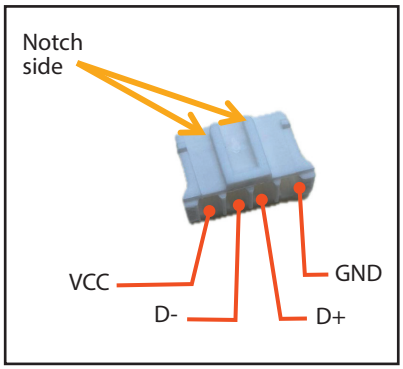


Figure 4-42:
Pin out JST PH2.0 for the USB hub.

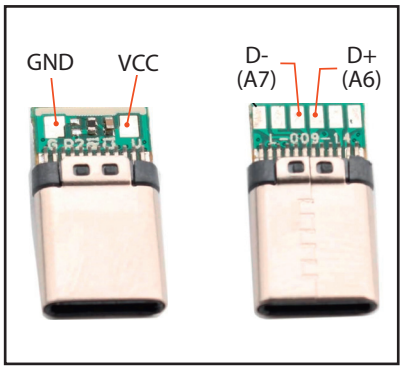


Figure 4-43:
Pin assignment of the USB-C male connector.

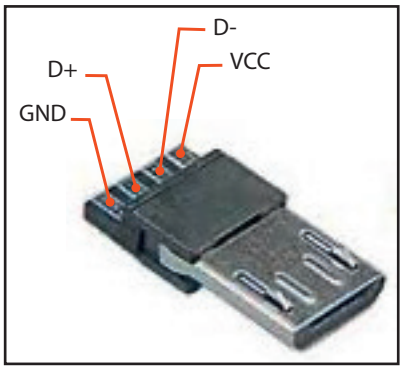


Figure 4-44:
Pin assignment of the Micro-USB connector.

4.4.6.2 Step 2 – Adding heat-shrink tube

To provide more stability to the connectors, it is strongly recommended to place a 10 mm heat-shrink tube over the soldering area of the connectors, as shown in **Figure 4-45** and **Figure 4-46.**

Figure 4-45:
Finalized USB-C connector cable.

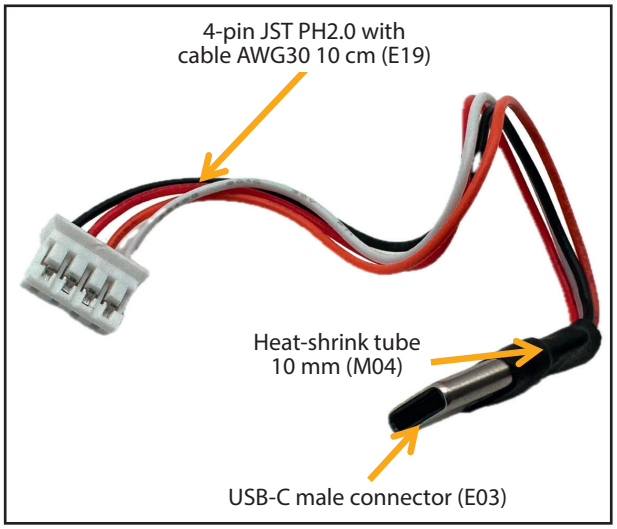
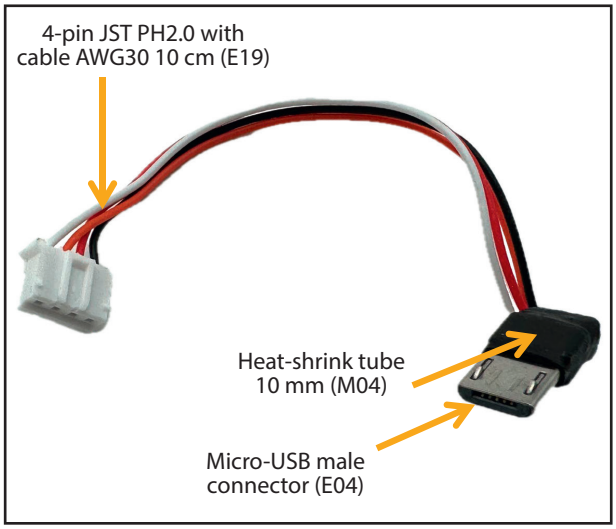


Figure 4-46:
Finalized Micro-USB connector cable.



4.4.7 USB hub

You have two options for connecting the USB-A cable to the USB hub:

1. Soldering directly on the PCB from the top.
2. Using the JST PH2.0 connector.

This needs to be considered when ordering the material. For option 2, you need an additional 4-pin JST PH2.0 cable **(E19)** and a connector **(E14)**.

The specification of the USB-A cable, the plug and the wire colors can be found in **Figure 4-47** and **Figure 4-48.** They have been taken from Wikipedia: https://en.wikipedia.org/wiki/USB_hardware.

Type-A and -B pinout

Pin	Name	Wire color[a]		Description
1	V_{BUS}	Red or	Orange	+5 V
2	D–	White or	Gold	Data–
3	D+	Green		Data+
4	GND	Black or	Blue	Ground

Figure 4-47:
USB-A connector pinout and wire colors.

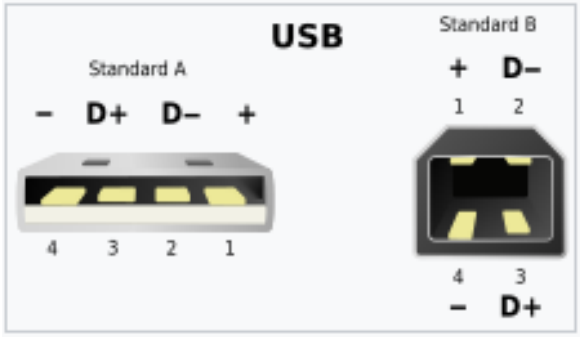


Figure 4-48:
USB-A plug pin configuration.

NOTICE: For option 1, it is important to solder the USB-A cable onto the PCB from the top (side with the crystal) to allow installation with the USB-Hub-Mount (P48) and fitting the cable into the base.

4.4.7.1 Step 1 – Placing the JST connectors on the USB hub PCB

Add the JST connectors to the bottom side (the side without components) as shown in **Figure 4-49.** Solder the pins from the top. In case you want to connect the USB-A cable directly to the PCB, use the alternative pins on the edge of the PCB next to the host connector area and solder them in from the top side (the one with the crystal, see **Figure 4-50).**

Figure 4-49: Placement of the JST PH2.0 connectors on the USB hub.

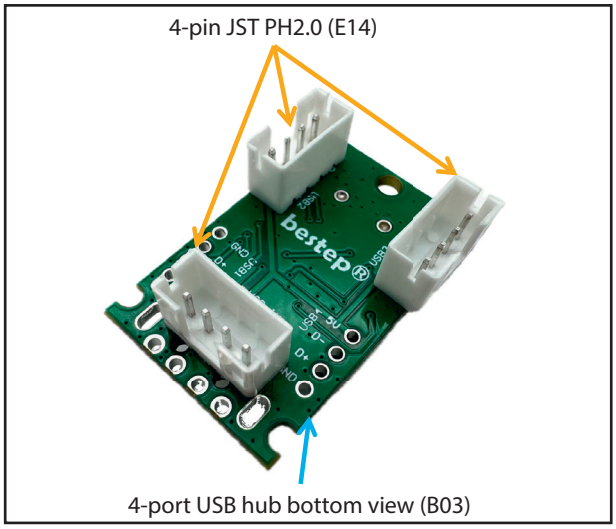
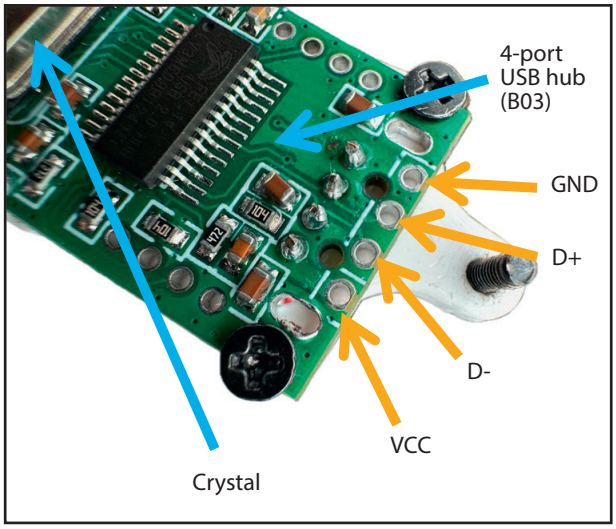


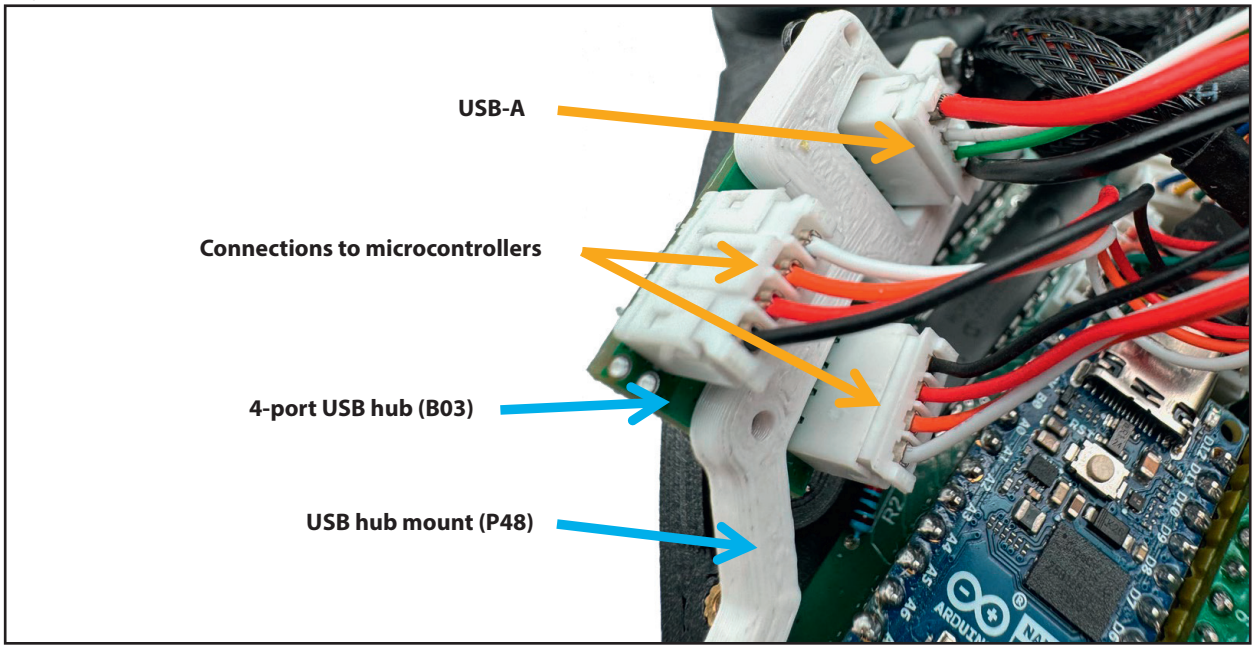
Figure 4-50: Alternative pins to connect USB-A cable to the USB hub.



4.4.7.2 Step 2 – Finishing the USB hub

Insert the previously prepared USB cable connectors into the connectors. For the two connectors to the microcontrollers, you can freely choose if the cables are long enough. Add the USB mount piece **(P48)** and fasten it with three screws M2 x 6 mm **(M14)** as shown in **Figure 4-51.**

Figure 4-51: Finished USB hub.



4.5 Final assembly

Now it is time to put the individual components together. First prepare the lower slider counterparts (P27, P31 and P42) with M3 x 10 mm **(M18)** screws (see **Figure 4-52).**

4.5.1 Finger key

Insert the Finger-Key-Slider-1 **(P26)** and Finger-Key-Slider-2 **(P39)** of the already prepared finger key elements into the slot in the Finger-Key-Base **(P24)** from the top side (see **Figure 4-53).** From the bottom side, add the prepared Finger-Key-Slider-Lower-Counterpart **(P27)** as shown in **Figure 4-54** and tighten the screws. Use screw M3 x 12 mm **(M19)** to clamp the key shell 360° mount.

Now we install the finger elements on the base. Insert two screws M3 x 12 mm **(M19)** from the bottom side into the base (see **Figure 4-55).**

Figure 4-52: Preparing the lower slider counterparts.

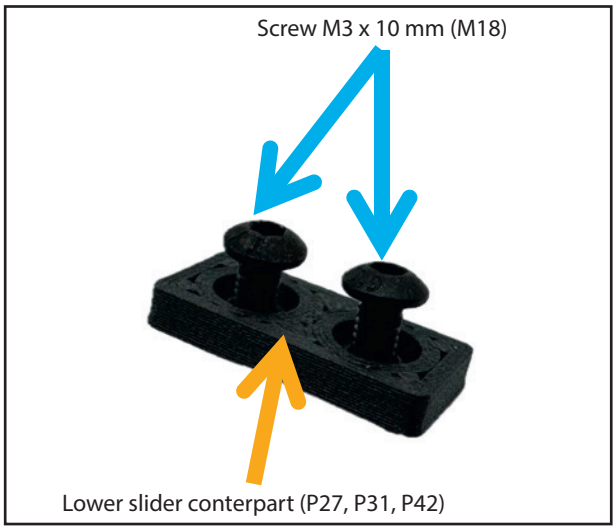


Figure 4-53: Adding the finger key slider to the base.

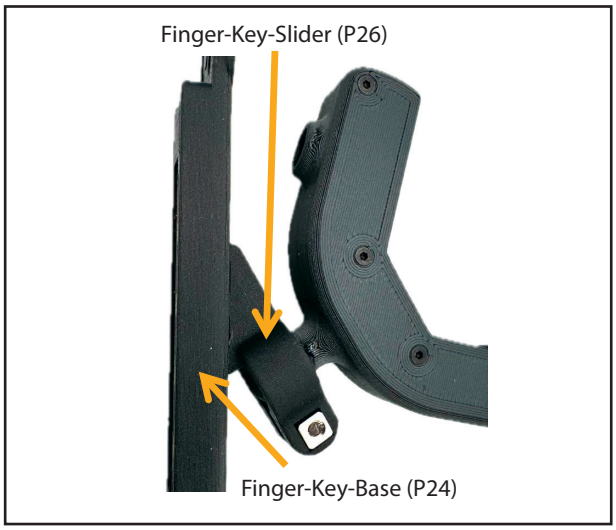


Figure 4-54: Adding the lower counterpart to the finger base.

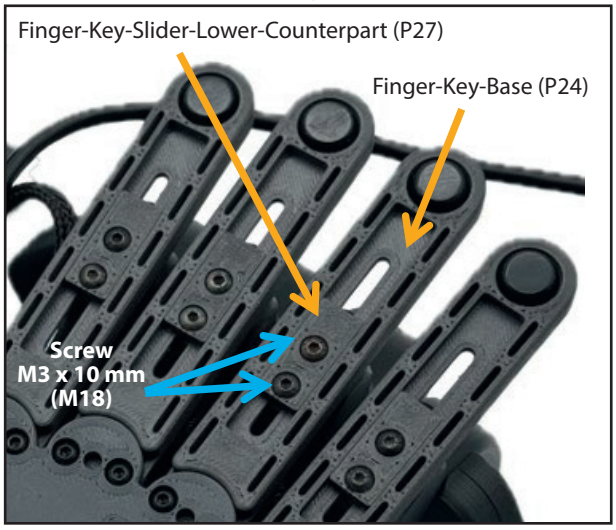
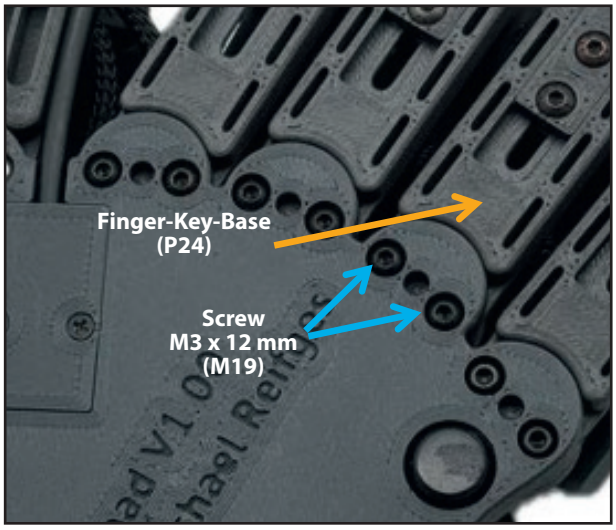


Figure 4-55: Bottom view: Adding finger elements to the base.



Put the respective finger elements from the top into place.

Add the Finger-Key-Base-Cap **(P25)** prepared with square nuts to the top as shown in **Figure 4-56.**

After tightening the screws, continue with the next finger elements until all are done.

4.5.2 Thumb

The thumb base features three slider areas for installing the thumb stick, the thumb keys and the display (see **Figure 4-57).** The thumb base is connected to the base with four M3 x 12 mm screws **(M19)** topped with Thumb-Base-Cap **(P29)**, which holds four square nuts as shown in **Figure 4-58** and **Figure 4-59.**

Figure 4-56: Side view: Adding finger elements to the base.

Figure 4-57: The thumb base has three slider areas.

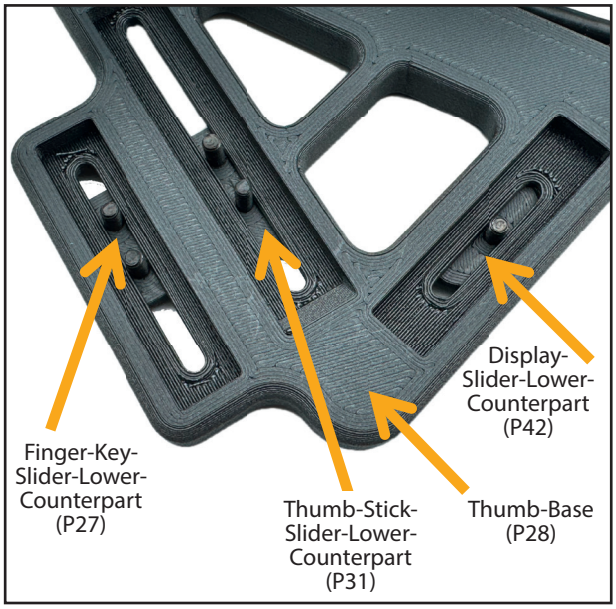


Figure 4-58: Screw position for the thumb base.

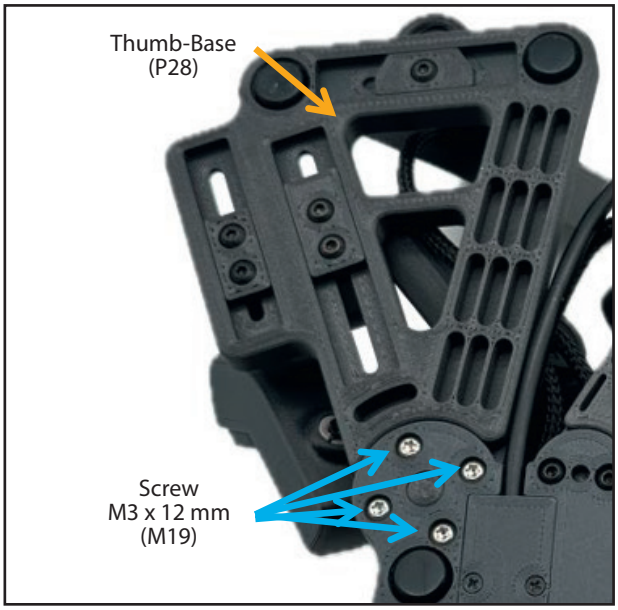
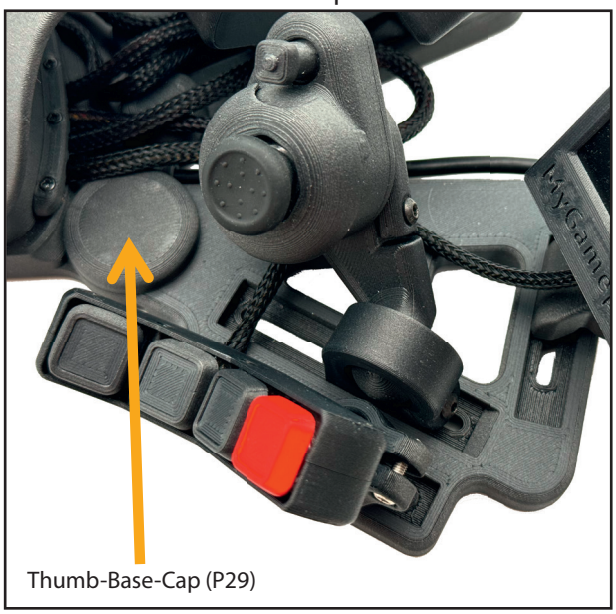


Figure 4-59: The thumb base cap is installed from the top.



4.5.2.1 Thumb stick

Add the thumb stick to the lever and connect them to the thumb stick slider as shown in **Figure 4-60.** Place this element on the thumb base and tighten the screws for the slider.

4.5.2.2 Thumb key

Snap the thumb key shell into the thumb key slider **(P39)** and mount this element on the thumb stick base (see **Figure 4-61).**

4.5.2.3 Display

Connect the display housing with the lever to the display slider as shown in **Figure 4-62.**

Add it to the thumb base.

4.5.3 Base

Before installing the main PCB into the base, you need to insert the USB-A cable (see **Figure 4-63).**

Figure 4-60: Complete thumb stick element.

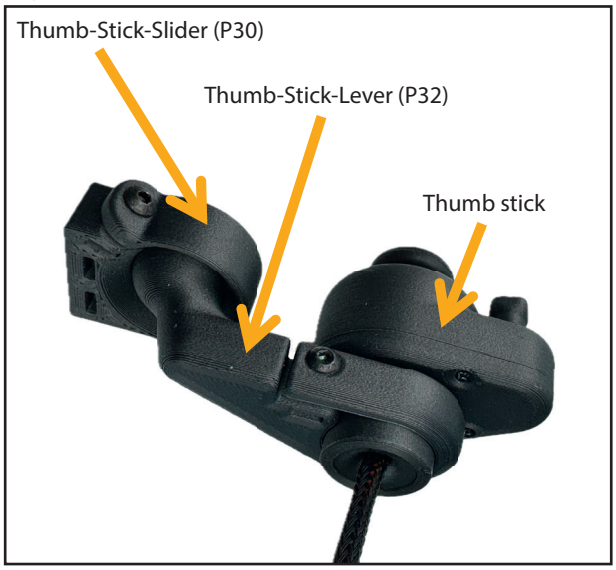


Figure 4-61: Thumb key element.

Figure 4-62: Display element.

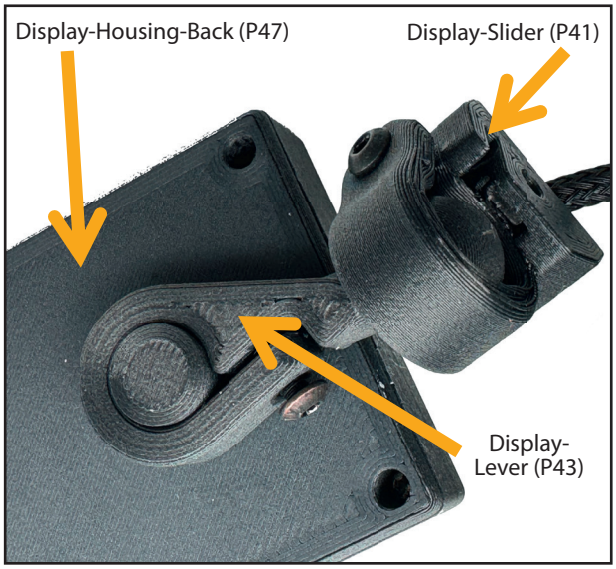
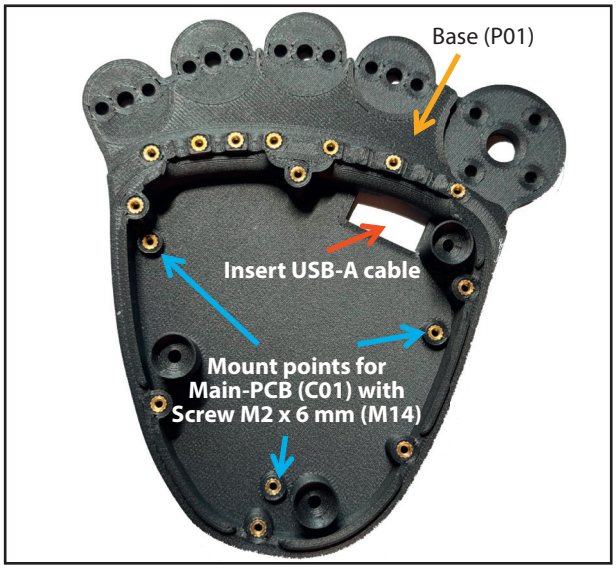


Figure 4-63: Mounting points for main PCB and USB-A cable outlet in base element.



4.5.3.1 Step 1 – USB-A cable

The USB-A cable can be inserted into the hole in the base from the inside (see **Figure 4-64).** Put the strain relief into place and position the USB-A cable as shown in **Figure 4-65.** Insert two M2 x 6 mm **(M14)** screws from the bottom side and tighten them to secure the strain relief (see **Figure 4-66).**

Figure 4-64: Inserting the UBS-A connector through the hole.

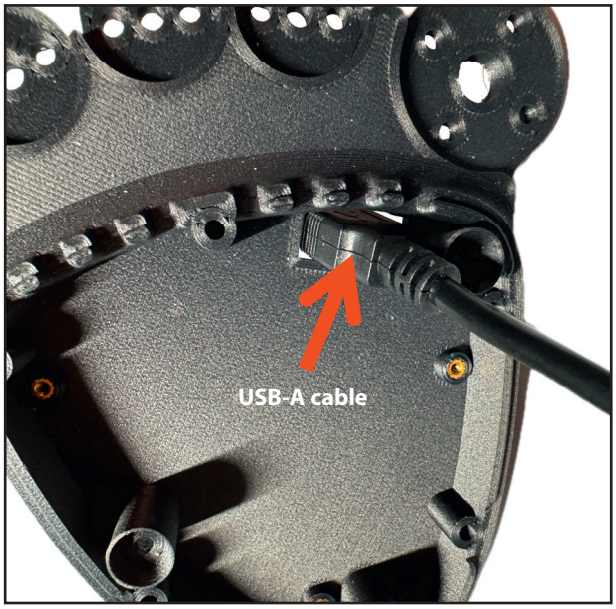
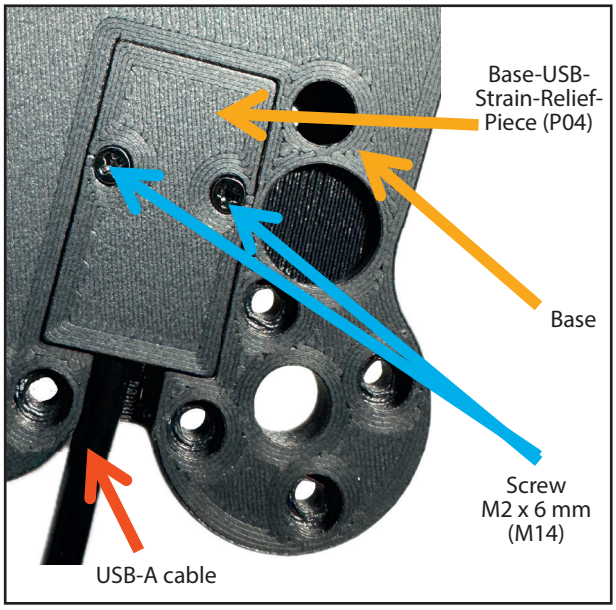


Figure 4-66: Bottom view: USB-A strain relief in base.



4.5.3.2 Step 2 – Inserting main PCB into the base

Insert the pre-assembled main PCB into the base and secure it with three screws M2 x 6 mm **(M14)**.

Then insert the connectors of all outside elements as shown in **Figure 4-67.**

Figure 4-65: Inside view: Base area with strain relief for USB-A cable.

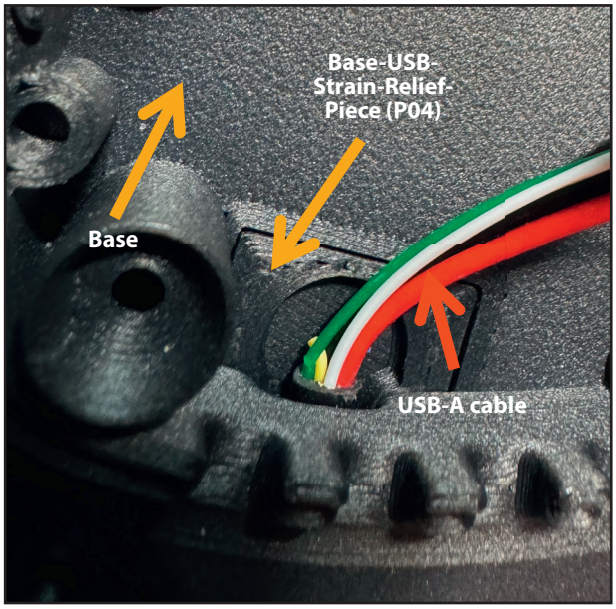
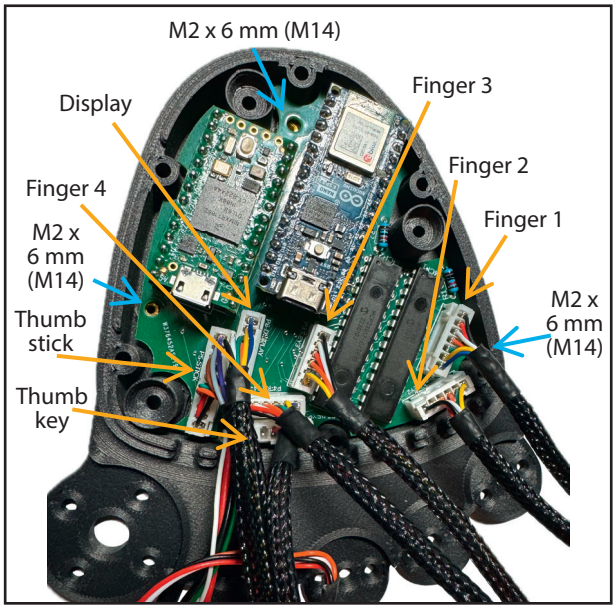


Figure 4-67: Main PCB mount in base and position of connectors.



Prepare the Base-Key-Strain-Relief-Piece **(P03)** with 8 screws M2 x 8 mm as shown in **Figure 4-68.** You can also use the two-piece alternative with P51 and P52 which may be easier to handle. Place the connecter cables in the correct position as shown in **Figure 4-69** and tighten the 8 screws. Put four screws M2 x 6 mm **(M14)** into the Base-Rise **(P02)** as shown in **Figure 4-70.**

The last two screws are used to fasten the USB Hub Mount **(P48)** as shown in **Figure 4-71.**

Figure 4-68: Preparation of the base key strain relief.

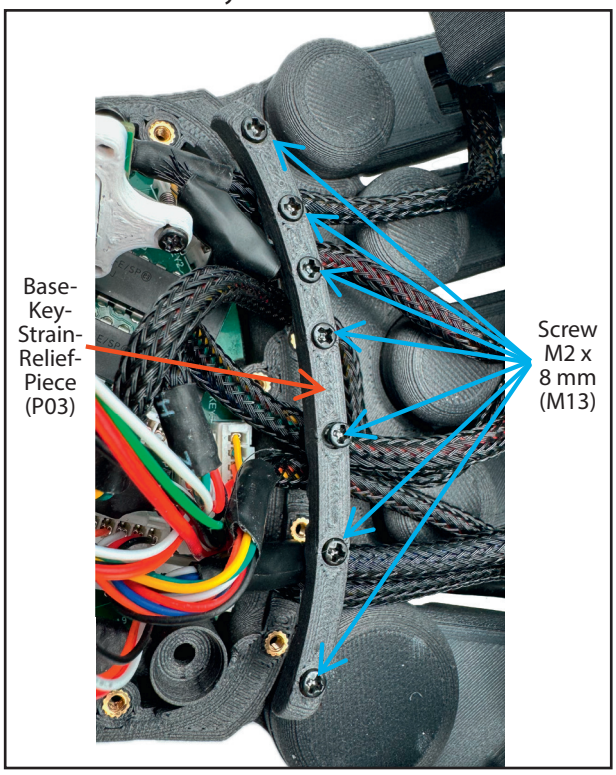


Figure 4-69: Cable positions in base key strain relief.

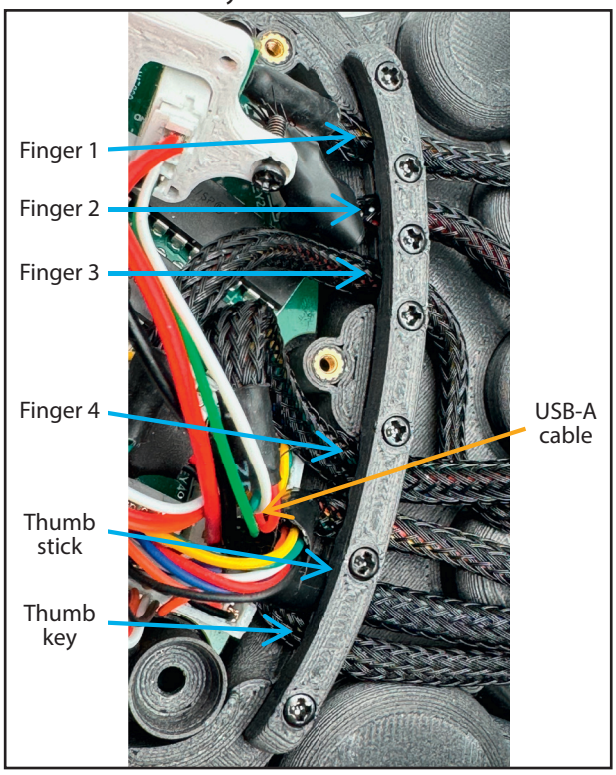


Figure 4-70: Screw positions in base rise.

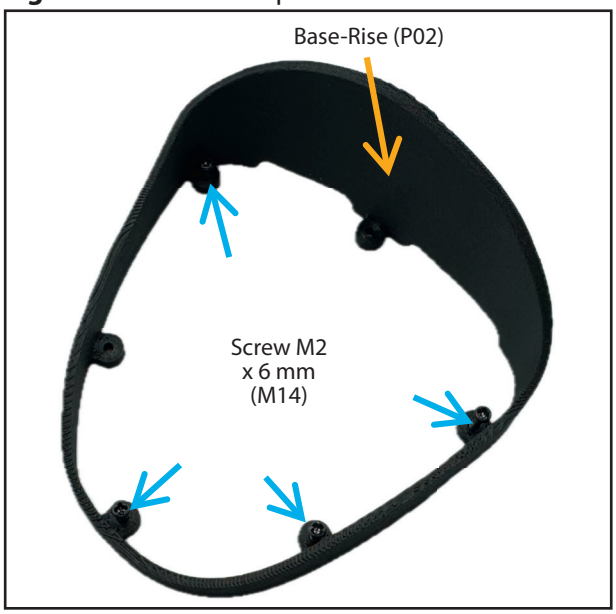
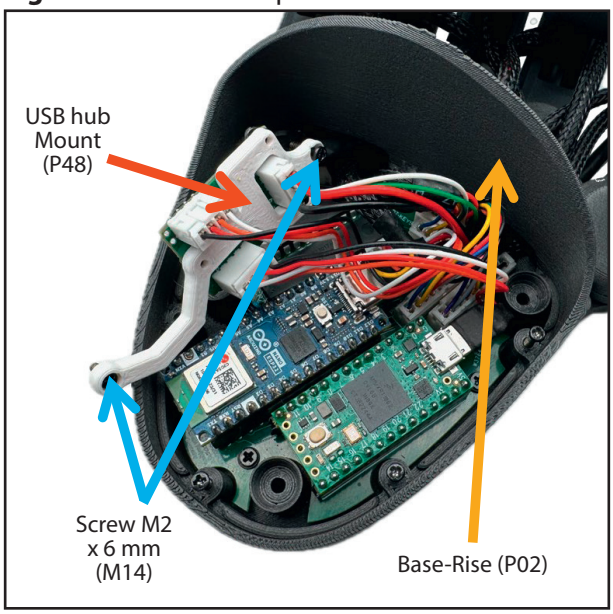


Figure 4-71: Screw positions in USB mount.



Put the USB hub mount into place as shown in **Figure 4-72** and tighten all screws.

Check that your assembly looks similar as shown in **Figure 4-73.**

If you have not already done so, connect the USB hub to the microcontrollers (see **Figure 4-74).**

4.5.3.3 Step 3 – Rubber feet

Now it is time to insert the 10 rubber feet into the designated holes on the bottom side (see **Figure 4-75).**

4.5.3.4 Step 3 – Hand rest

To close the base housing, add the hand rest from the top. The 3 feet of the hand rest shall fit into the screw ankers.

Insert three screws M2 x 6 mm **(M14)** from the bottom side as shown in **Figure 4-76** and tighten them.

Figure 4-72: Mounting points for the USB Hub.

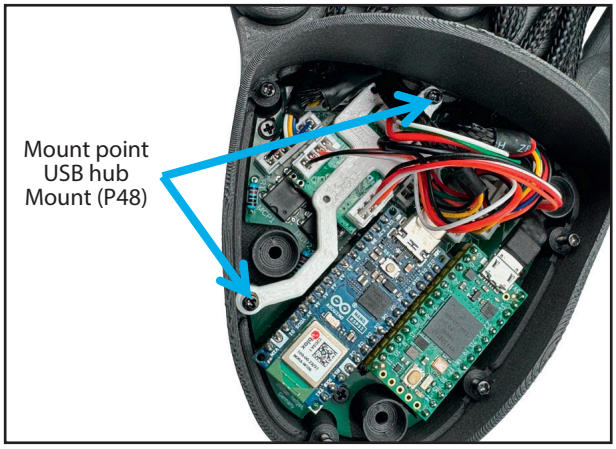


Figure 4-73: Final result of installed base rise and key strain relief.

Figure 4-74:
USB hub connections to microcontrollers.

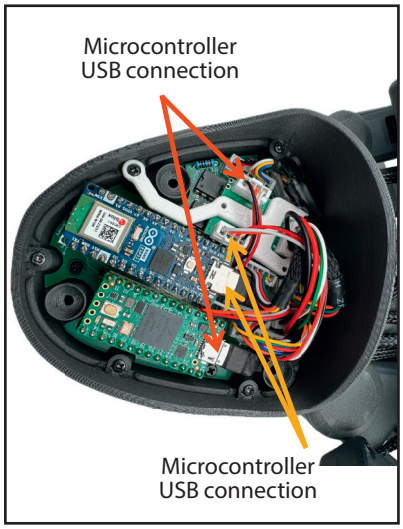


Figure 4-75:
Position of the 10 rubber feet.

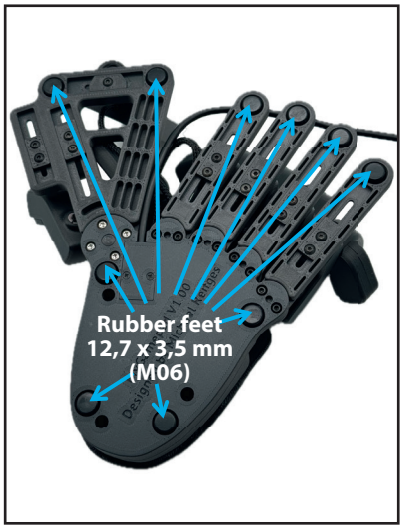
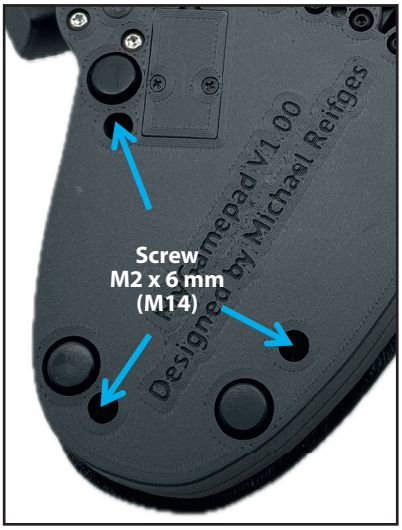


Figure 4-76:
Screw holes on the bottom side for the hand rest.



5 Programming the microcontrollers

For detailed information on programming the microcontrollers for MyGamepad, please visit our website. There, you will find a comprehensive guide on the following topics:

1. Libraries and software components used
2. Preparing the software environment on your computer
3. Flashing the firmware

To access this guide and start programming your microcontrollers, please visit: www.mygamepad.de/microcontroller-programming

6 Setup and configuration of the assembled device

6.1 Hardware setup and adjustment

To ensure MyGamepad is tailored to your individual needs, we provide a detailed guide on hardware setup and adjustment on our website. There, you will find instructions on the following topics:

1. Individual adjustment options for the finger keys
2. Individual adjustment options for the thumb

This guide will help you optimize your gamepad's ergonomics and performance for your specific requirements. To access the instructions, please visit: www.mygamepad.de/hardware-setup-and-adjustment.

6.2 Software setup and operation

6.2.1 Setting up the WIFI connection

For a complete description of how to set up the device's WIFI connection, visit our documentation web site at: www.mygamepad.de/setting-up-the-wifi-connection.

6.2.2 Configuration through web interface

For a complete description of the device's web configuration interface, visit our documentation web site at: www.mygamepad.de/web-configuration-interface.

7 Troubleshooting

7.1 Frequently Asked Questions (FAQ)

For quick answers to common questions and issues, please visit our comprehensive FAQ page. This resource covers a wide range of topics related to assembly, operation, and maintenance of MyGamepad. Visit our FAQ at: https://www.mygamepad.de/faq.

7.2 Community Support Forum

For more specific issues or to engage with other users, our community forum is an excellent resource. Here, you can ask questions, share experiences, and get help from both experienced users and our support team. Join the discussion at: https://www.mygamepad.de/forum.

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Published by:

Michael Reifges
Marie-Curie-Strasse 6
91448 Emskirchen
Germany

Telephone: +49 09104 8260131
E-mail: info@mygamepad.de
Internet: www.mygamepad.de

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Proofreading, Editing and Layout:

Markus Linden
Engelbertstraße 1
47053 Duisburg
Germany

E-mail: markus.linden@mail.de