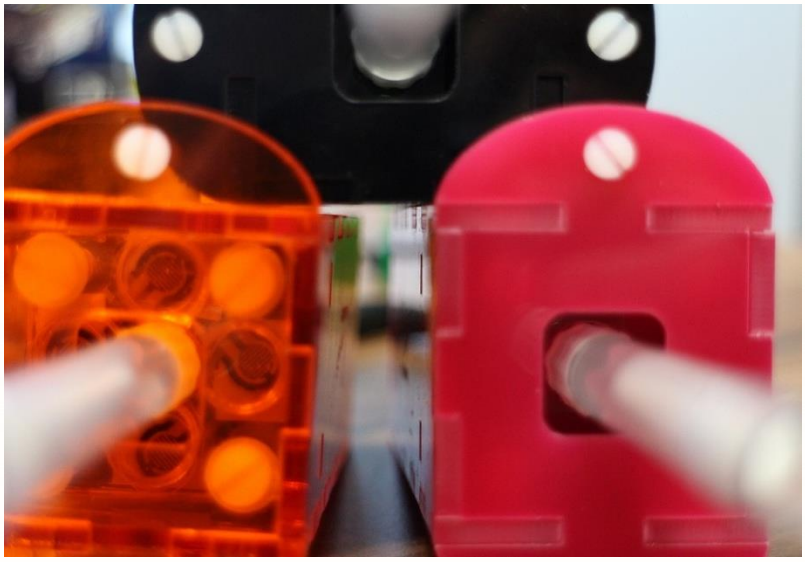
FLipMouse

Construction Manual



Written by:

Philipp Hauswirth, Raffael Šala, Jakob Wastl

Wien, 18.01.2016

FH University of Applied Sciences TECHNIKUM WIEN

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ANMERKUNG: Dieses Inhaltverzeichnis generiert sich selbst.

1 Partlist

Device	Package	Parts	Description	Qty	Farnell
					FLIpmouse Mainboard
31-XX	B3F-31XX	S1	OMRON SWITCH	1	959704
31-XX	B3F-31XX	S2	OMRON SWITCH, long Button	1	2079506
FE05-1	FE05-1	SV1	MALE HEADER, 90°, 1x5	1	2356179
LED3MM	LED3MM	LED3	LED green	1	1581130
LED3MM	LED3MM	LED2	LED yellow	1	1581131
LED3MM	LED3MM	LED1	LED red	1	1581128
MA05-2	MA05-2	AUX	MALE HEADER, 1x2	1	1022236
R-EU_0309/V	0309V	R11	120R	1	9342516
R-EU_0309/V	0309V	R1,R2	10k	2	9342419
RN04	RN-5	RN1	Resistor network, 220R	1	2333623
RN04	RN-5	RN2	Resistor network, 10k	1	9356061
TEENSYLC	TEENSY_3.1_BAS	TEENSYLC	TeensyLC	1	
MPXV7007GP	SMP_MX3V7007	U$2	5V pressure sensor	1	
TeensyLC – pin header / ext.	--	-- / I2C	male header Teensy + extension 1x33+1x2	1	1841236
C-EU025-025X050	C025-025X050	C1,C2	100nF capacitor	2	2112751
1503_02	1503_02	X1,X2	Jack plugs JISC 6560	2	1216979
24LC256P	24LC256P	IC1	I2C EEPROM	1	9757970
Flipmouse Teensy, PCB	--	--	--	1	
Piezo buzzer	EFBAA40D101	SG1	piezo buzzer	1	1300026
R-EU_0309/V	0309V	R3	4k7	1	9339540
					FLIpmouse feature: IR RX
LED5MM	LED5MM	LED5	LED	1	3152856
R-EU_0309/V	0309V	R12	22R, min 0.25W	1	9338586
TSOP4838	TSOP2XXX	U3	TSOP4838	1	4913190
BS170	TO-92	Q1	N-CHANNEL MOS FET	1	2453831
					Daughterboard FSR, Cas
header 5pol	FE05-1	SV1	FEMALE HEADER, 1x5	1	9728910
FSR	--	--	FSR Sensor	4	
M4x25 screw	--	--		4	7070706
M4 plate	--	--		4	7047496
Spring	--	--	eBay...	4	
M3x06 screw	--	--		4	7070585
Plastic pipe 5cm, 4/2mm dia	--	--	--	1	
Hot shoe adapter (mounting)	--	--	--	1	
LuerLock	--	--	--	1	
2side adhesive tape	--	--	--	4	
Mouthpiece	--	--	--	1	
Daughterboard PCB	--	--	--	1	
Acrylic glass case set	--	--	--	1	
Rubber pads	--	--	--	4	1165074

2 Required tools

- Acrylic-glue
- Super-glue
- Soldering iron (small tip recommended)
- Wire-cutter
- Tweezers
- Flat-blade screwdriver
- Tapper/Thread cutter for M3 and M4

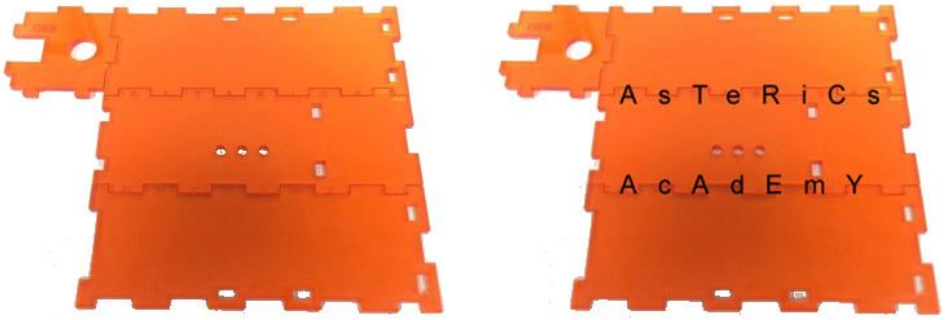
3 Building the FLipMouse

In the next section you will find a step for step instruction to build the FLipMouse. It is recommended to hold on the correct order of these steps, to avoid any mistakes.

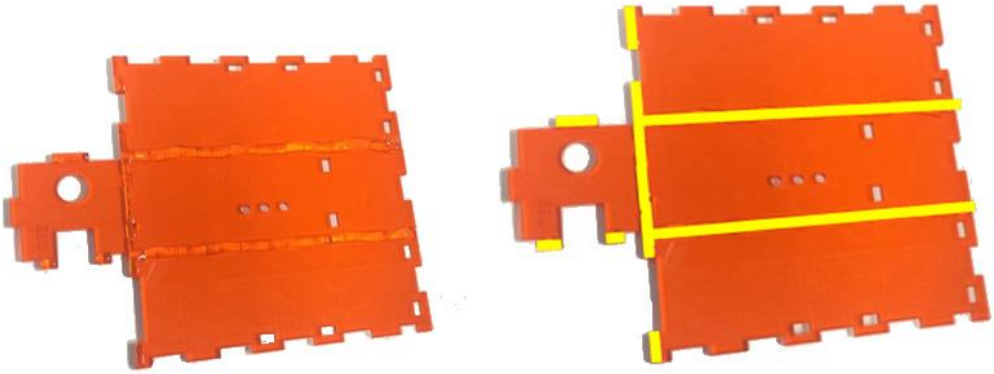
3.1 Gluing the acrylic case

Parts needed for this step:
- 1x Acryl: backplane
- 2x Acryl: side cover
- 1x Acryl: bottom cover
- 2x Acryl: mounting parts top cover
- 2x Acryl: mounting parts front cover

At first you have to position everything, like it is shown in the picture below. If done right, you can read the text “AsTeRiCs AcAdEmY” on the edges. The engrave should be on the top, except for the bottom piece.

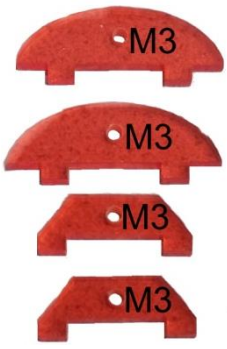


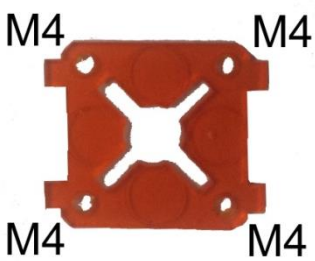
Now you can apply some glue to the yellow lines shown on the next picture. Take care for the “glue-strings”, because once the glue is on the acrylic plate, it is very hard to remove.



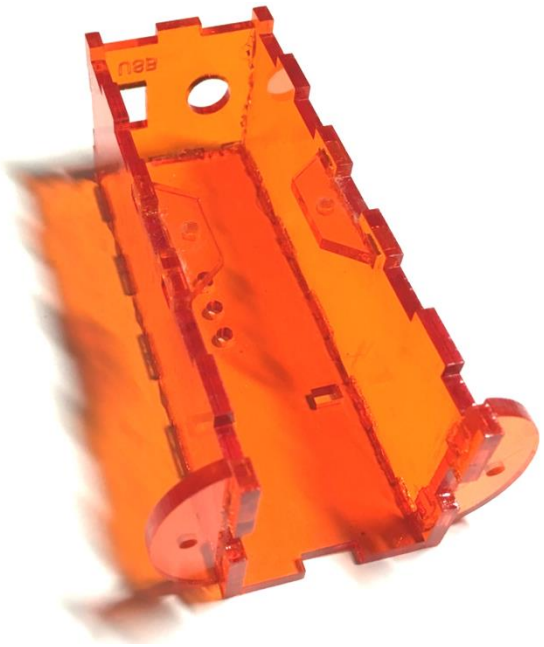
Fold and press the parts together and it is recommended to use the top cover as a distance keeper.

At next it is time to cut the M3 and M4 threads.

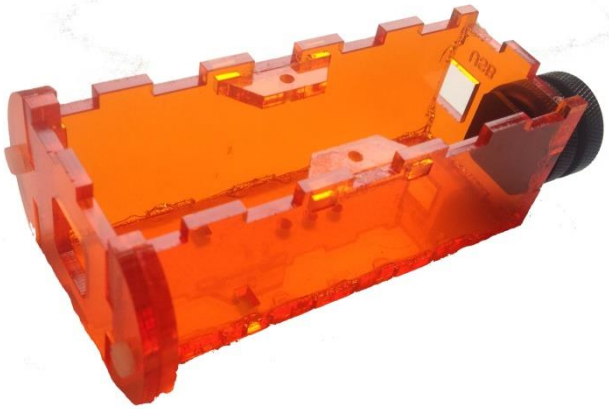




Now you can attach the 4 mounting parts with the M3 threads.
This time you don’t have to look for the correct side.

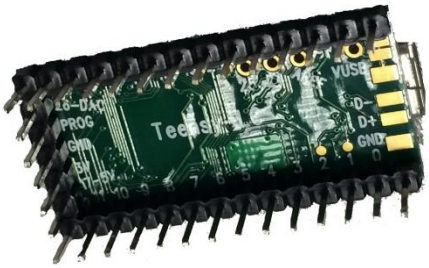


Let the glue dry for at least 1 hour. Afterwards you can install the front panel and the mouse mount.

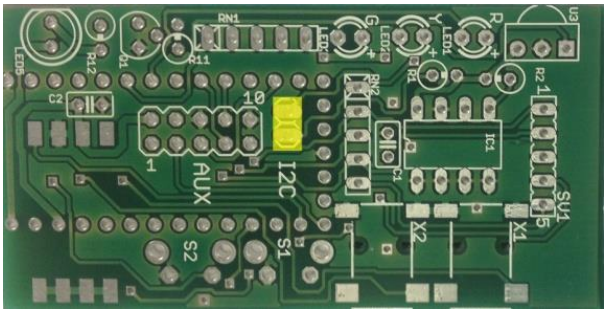


3.2 Soldering the PCB

The first step is to solder all pins to the Teensy.



Here you have two pictures for reference where you can see how it should look like but follow the correct order below!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LED2
LED1
R3
R2
R1
U3
LED5
D1
R12
R11
C2
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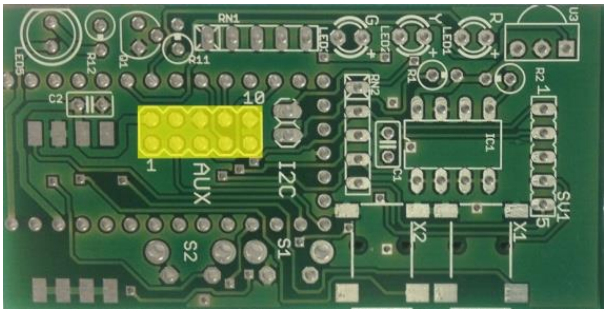
IC1
C1
SV1
X2
X1
S2
S1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LED3
LED2
LED1
R3
R2
R1
U3
LED5
D1
R12
R11
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C1
SV1
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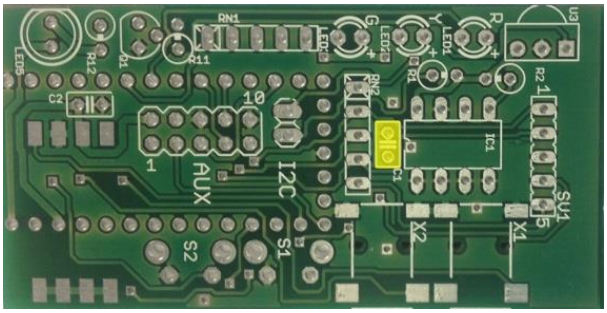
S2
S1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LED1
R3
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R1
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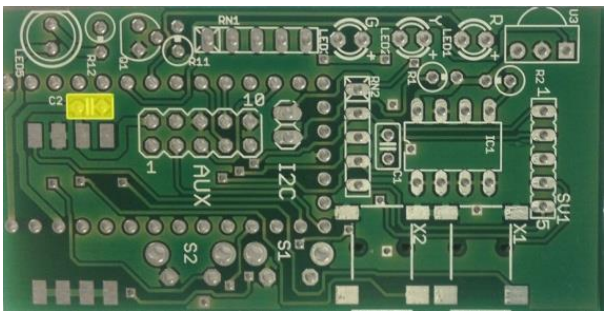
S2
S1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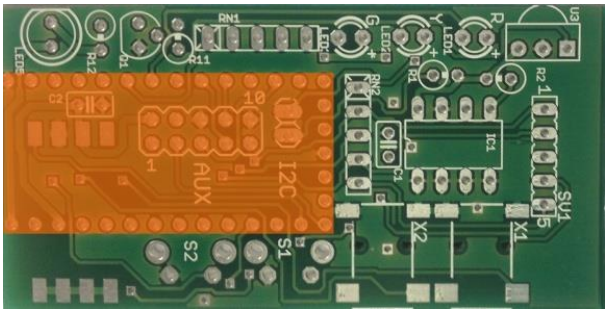
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LED5
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R11
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IC1
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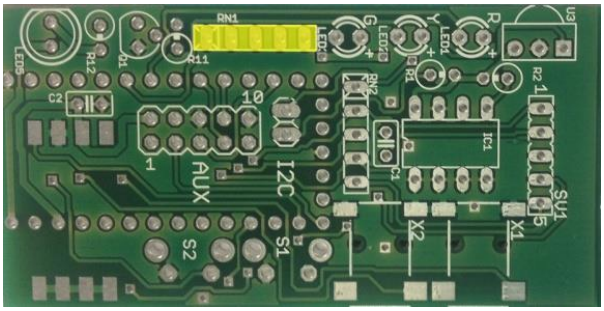
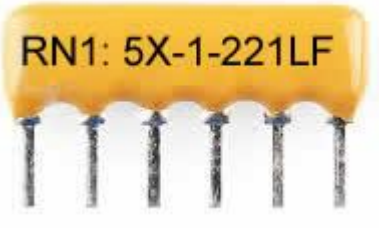
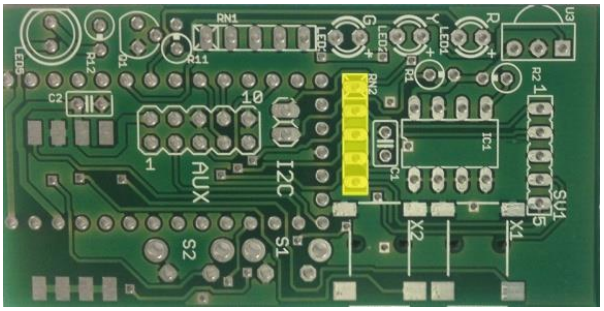
X1
S2
S1


GND
D-
D+
VUSB



ATTENTION!
Watch out for a little point.
This side should be mounted
to the x ont the PCB





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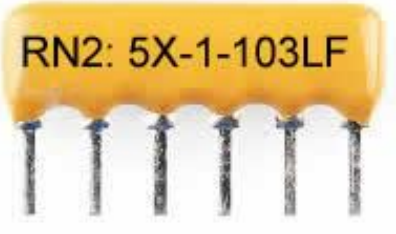

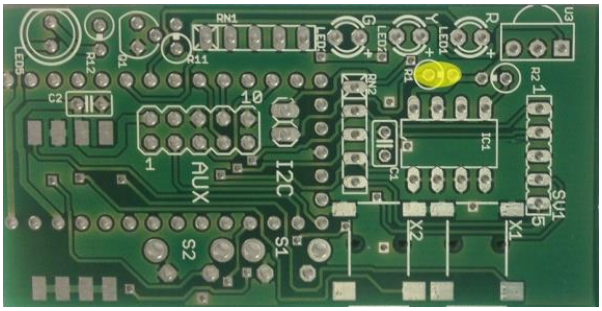

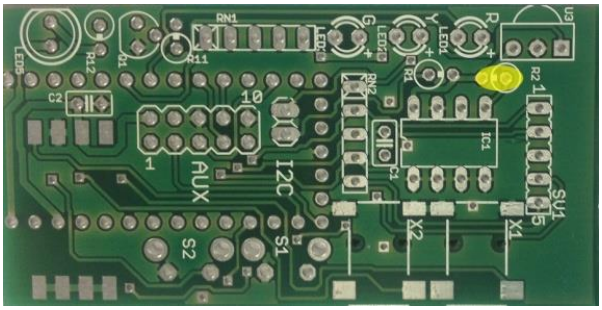

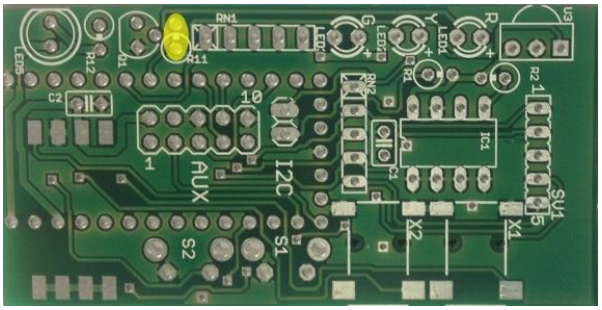

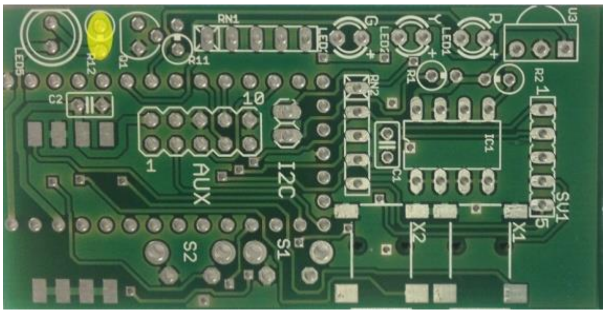
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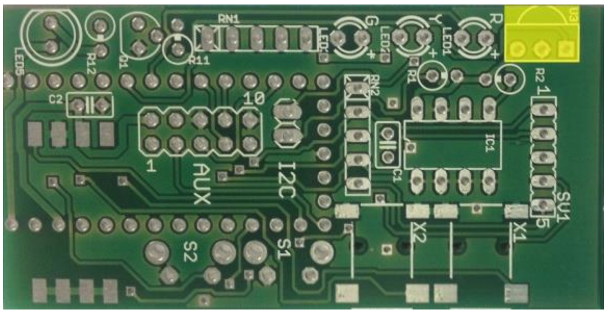
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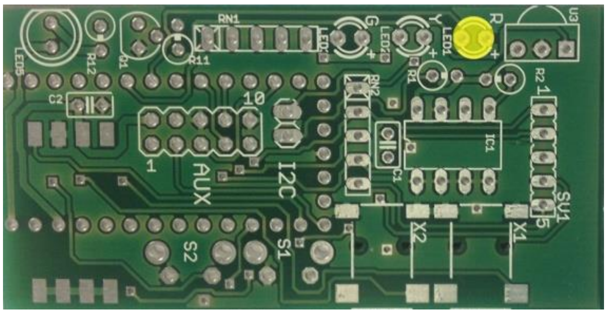
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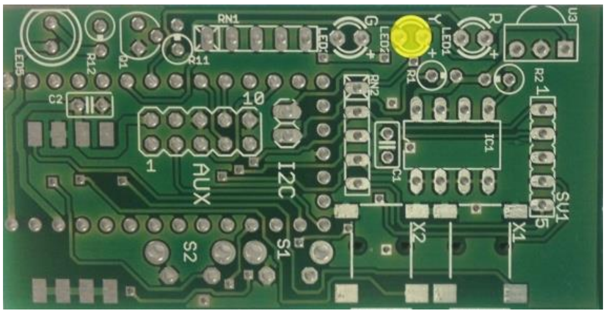
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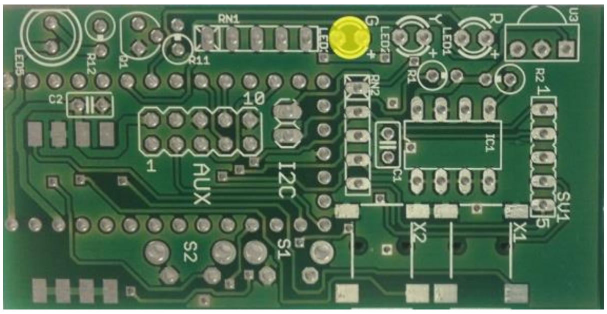
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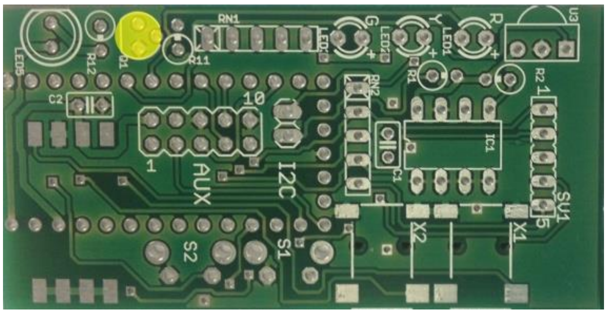
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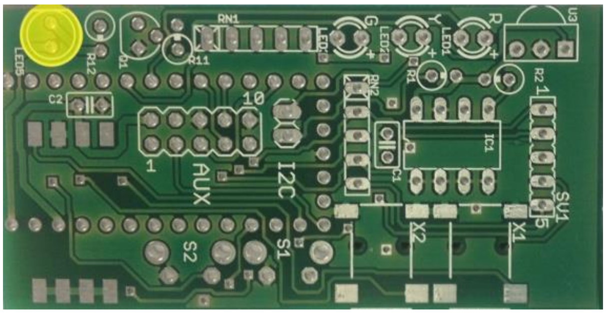
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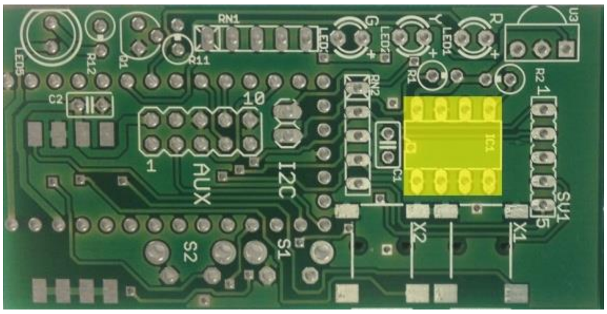
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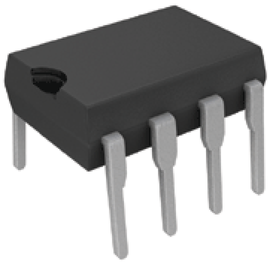

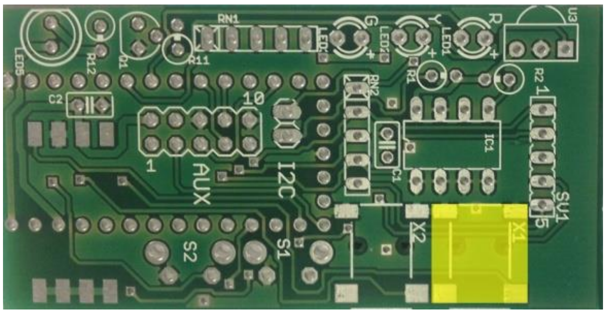
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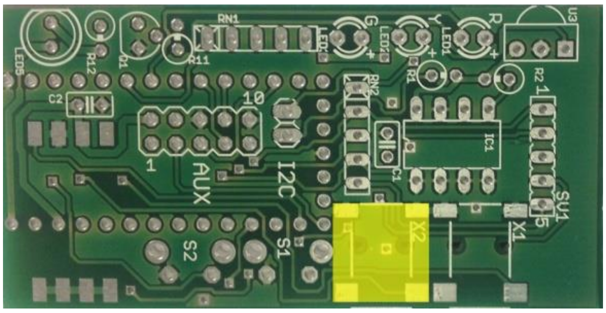
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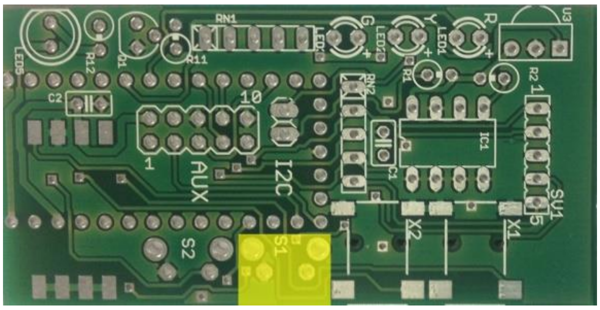
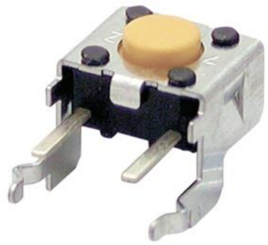
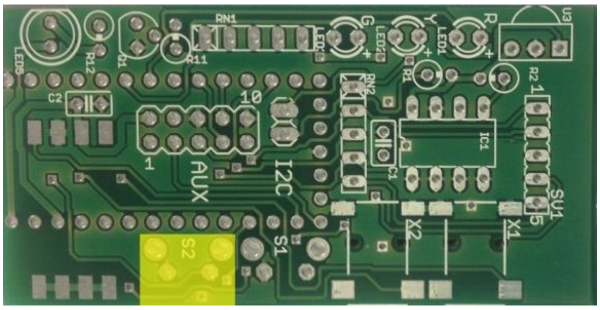
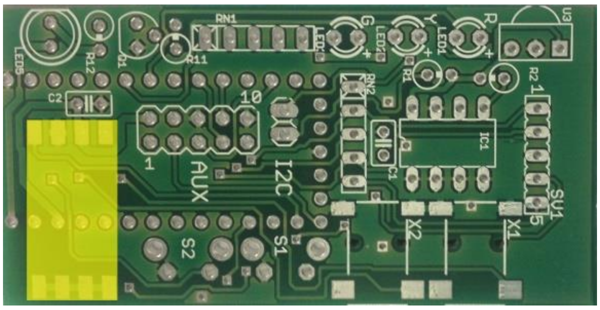
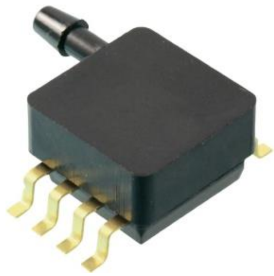
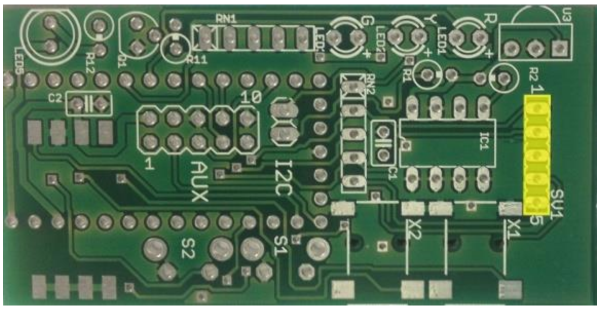






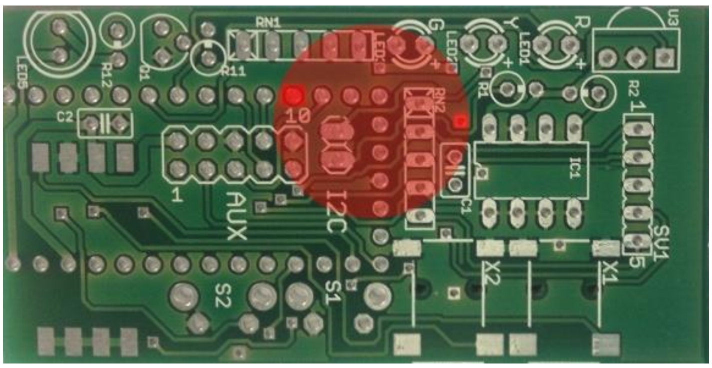






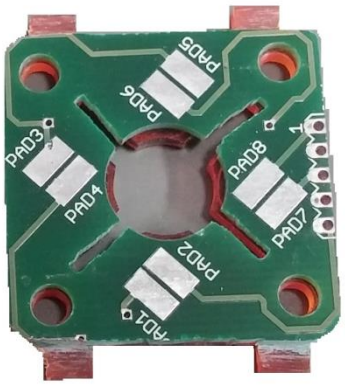
If you put the PCB on a desk, there should be enough space for the reset button

OPTIONAL: If you want acustic Feedback

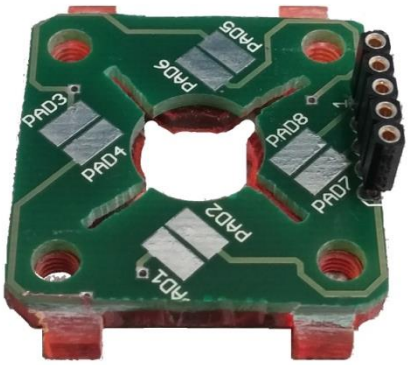


3.3 Assembly of the FSR/mouthpiece-carrier

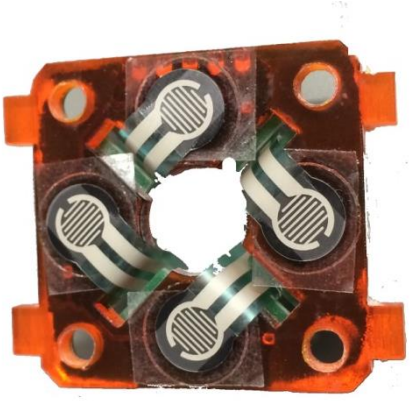
Glue the PCB on the acrylic plate with the X, so that solder points and the engraving is on the outside.



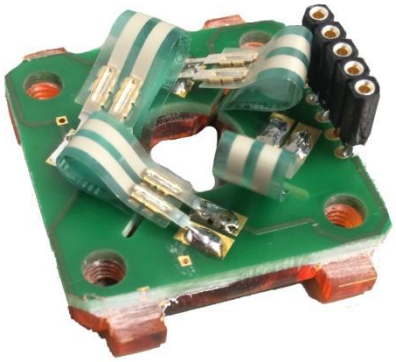
Solder the female headers as following



Now you can mount the FSR. You can use a double sided tape, but take care sometimes there is already a tape on the FSR.



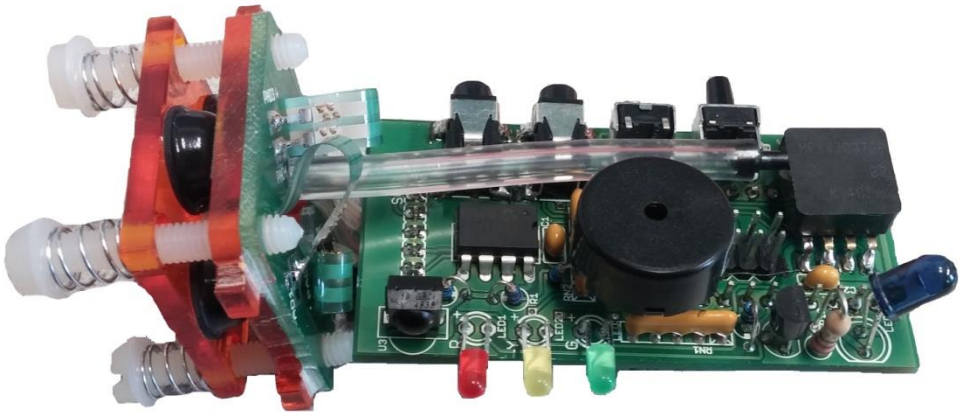
Solder the connections of the FSR on the solder-points of the PCB with care. The FSR should not get bend.

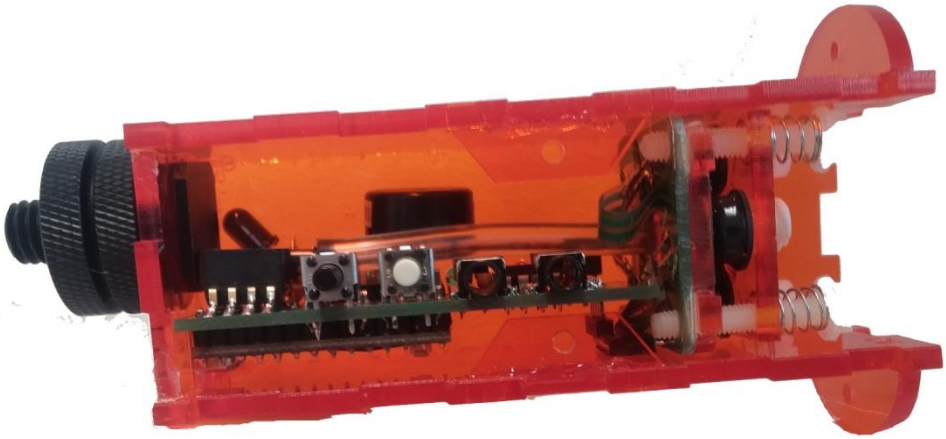


Glue the rubber pads on the other acryl front plate with the single hole on the engraved area and add the other parts

3.4 Put all together

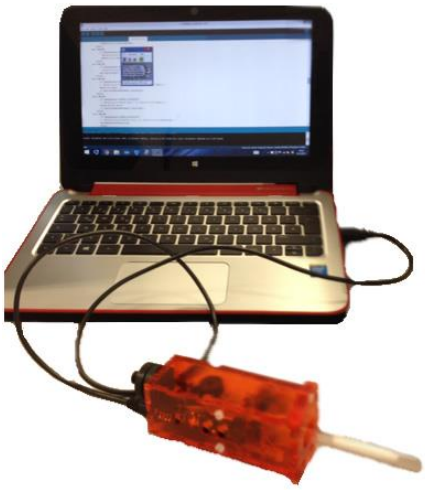
At least mount the sip/puff hose, adjust the screws and put all together.



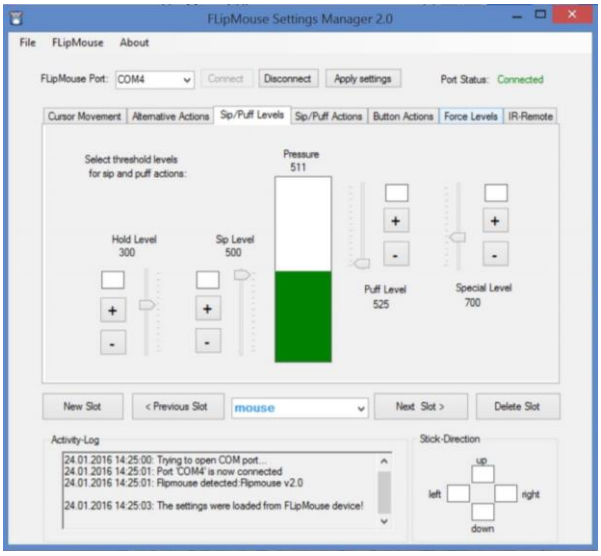


4 Testing

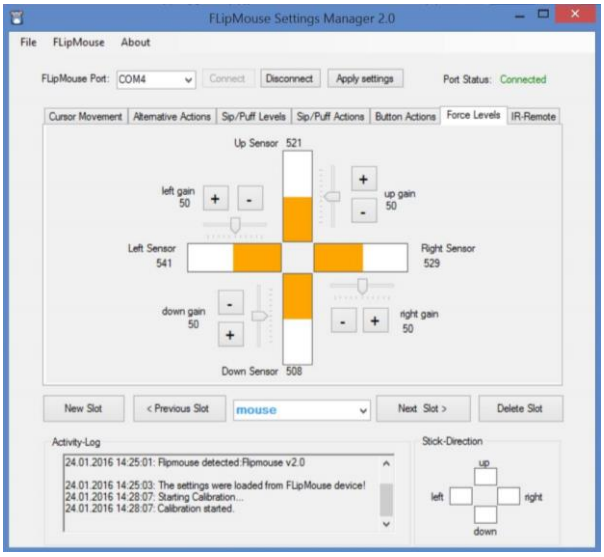
Now it’s time to test it out. Connect the FLipMouse to the Arduino IDE and flash the Firmware. (FLipWare)



Now you could start the FLipMouseGUI.exe to check the Sensor Values. For the pressure sensor go to the Tab
“Sip Puff Levels”. The value should be in about that range as it is shown on the pictures. If you get strange values double check the pins on the pressure sensor maybe there is to less solder.



At least also check the FSR values in “Force Levels”.
For fine adjustment change the position of the mounting screws on the FSR daughter board.



HAVE FUN!