

User Instructions

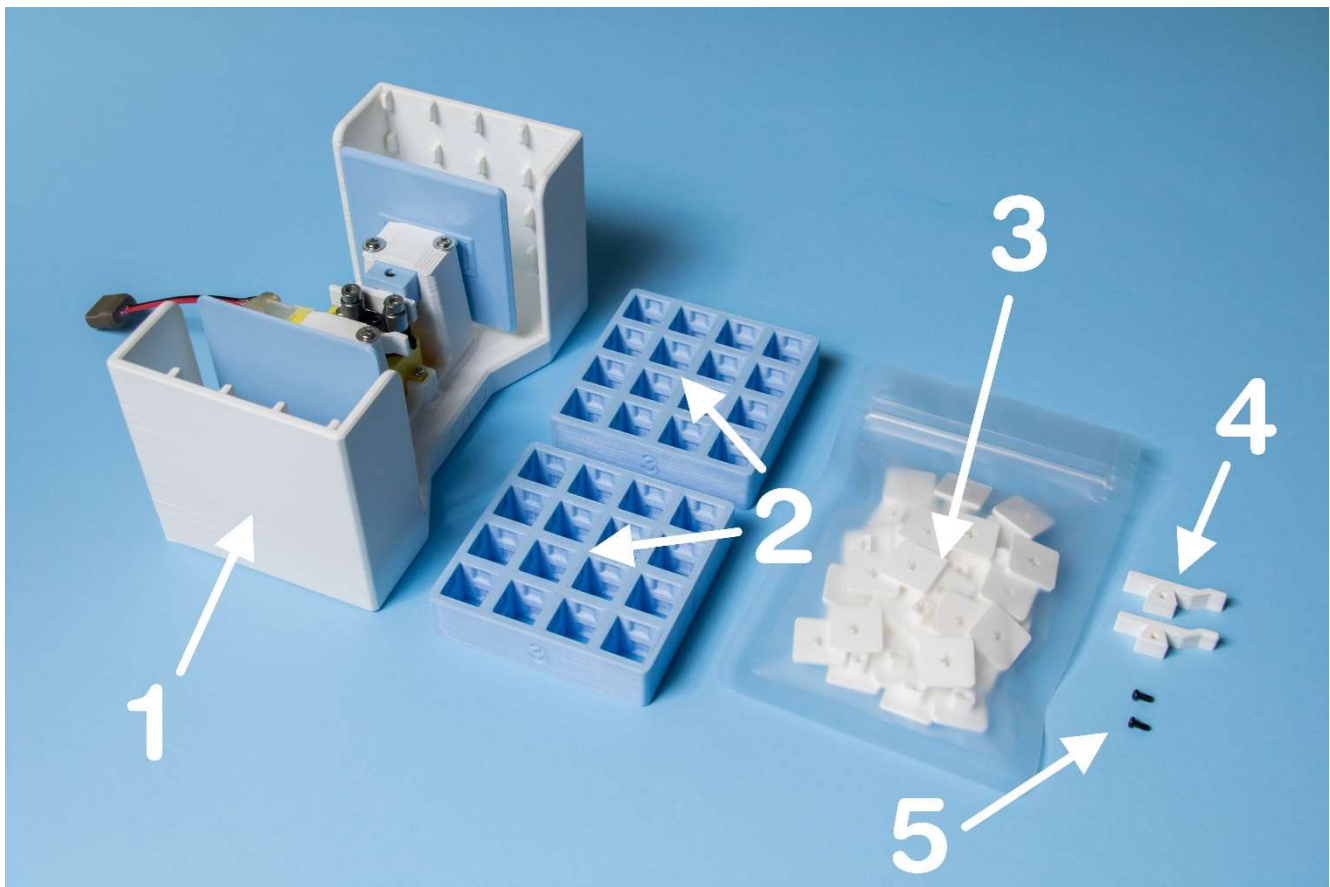


Switch Break-in Machine 4x4 v1.3

Feng Studio

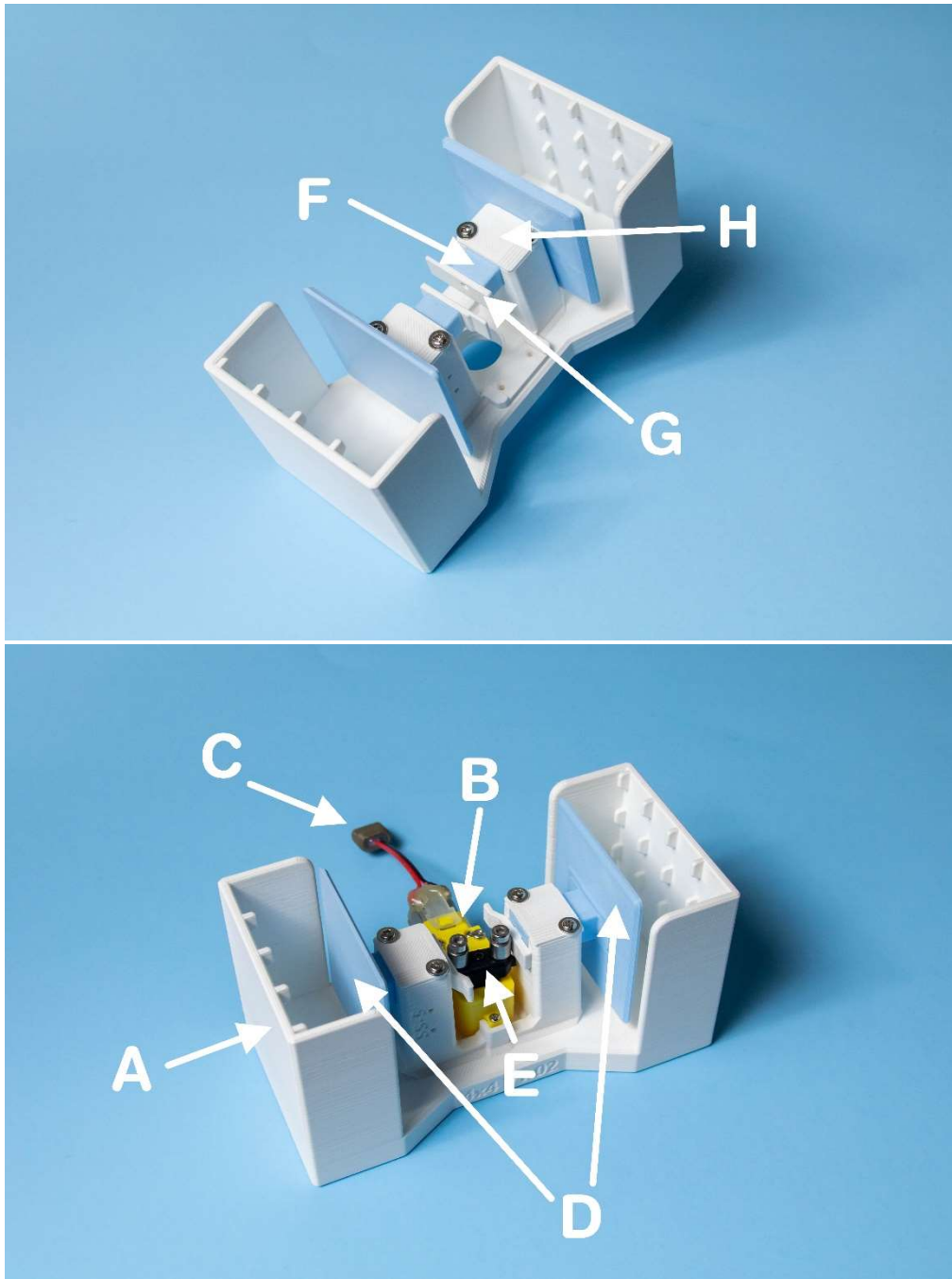
Below are the user instructions for assembling and operating this product. Some variations are to be expected between the provided images and the product on hand.

Section 1: Parts List



1 - Pre-assembled main body	2 - Plates * 2
3 - Keycaps * ~35	4 - Spare bearing-pusher buffer pieces * 2
5 - Spare buffer piece screws * 2	

Section 2: Parts Diagram



A: Main body

B: Gear box

C: Female USB type-c port

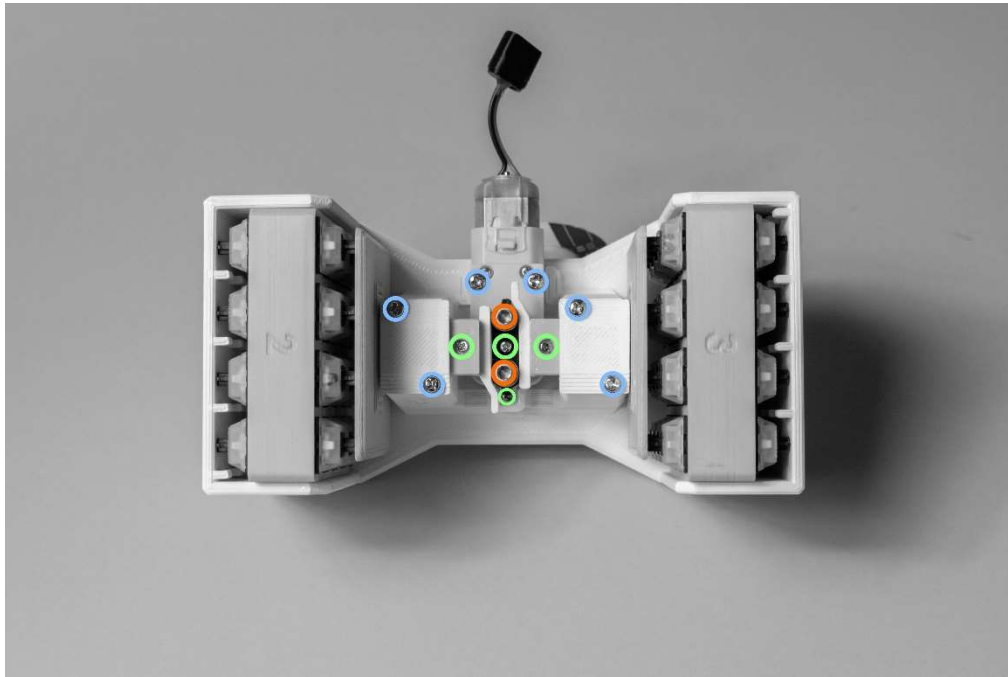
D: Pusher plate

E: Wheel

F: Pusher

G: Bearing-pusher buffer piece

H: Pusher cover



Blue: PH2

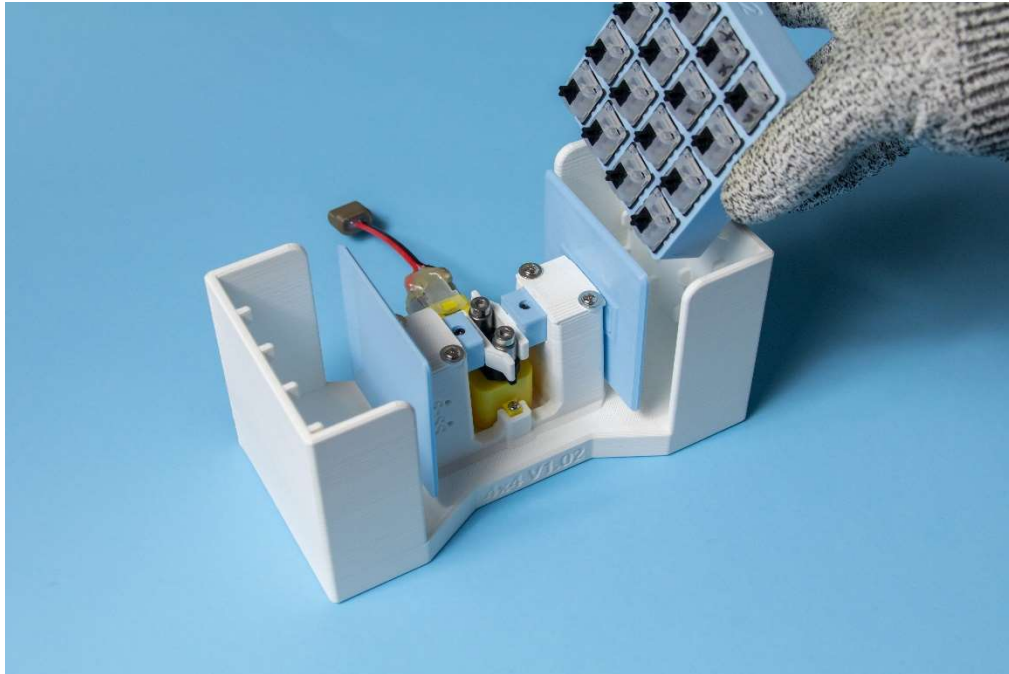
Green: PH1

Orange: H3.0

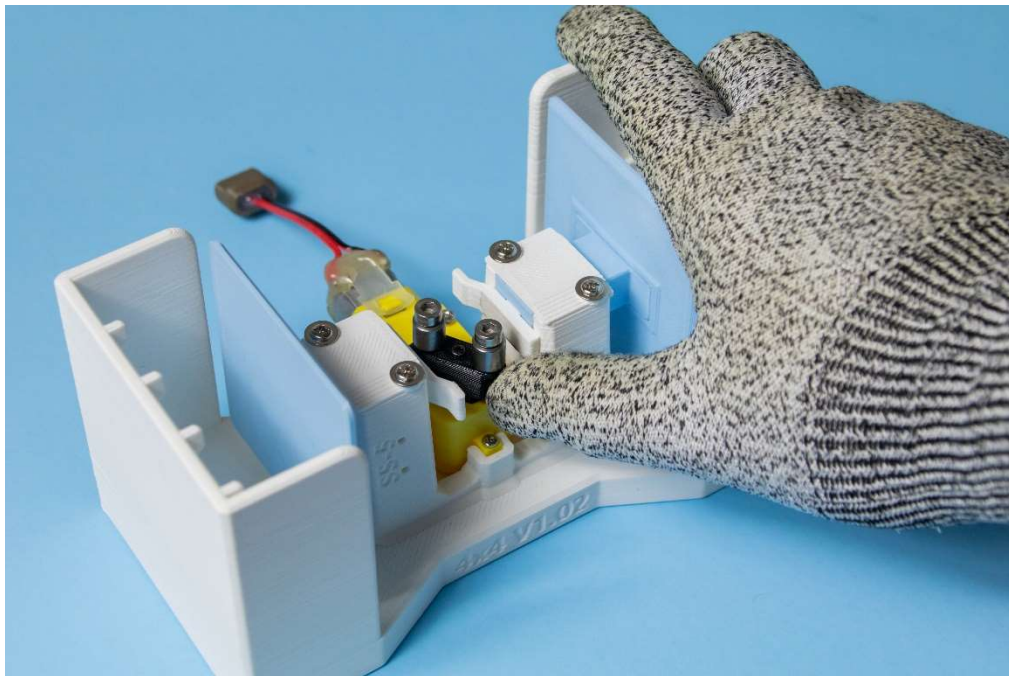
In addition to using the correct sized screwdriver, please also avoid overtightening the screws. They only need to be tight enough to hold down the components securely. Overtightening can cause issues or permanent damage to the device. I will not be responsible for damages caused by overtightened screws.

Non-US international orders will receive a parts bag labeled "Free" for free. If the original motor malfunctions, **do not unseal the backup motor and try to replace it yourself**. Contact me via email to get instructions for replacing the motor if needed. I will not be responsible for any damages if you choose to unseal the motor without receiving my permissions first.

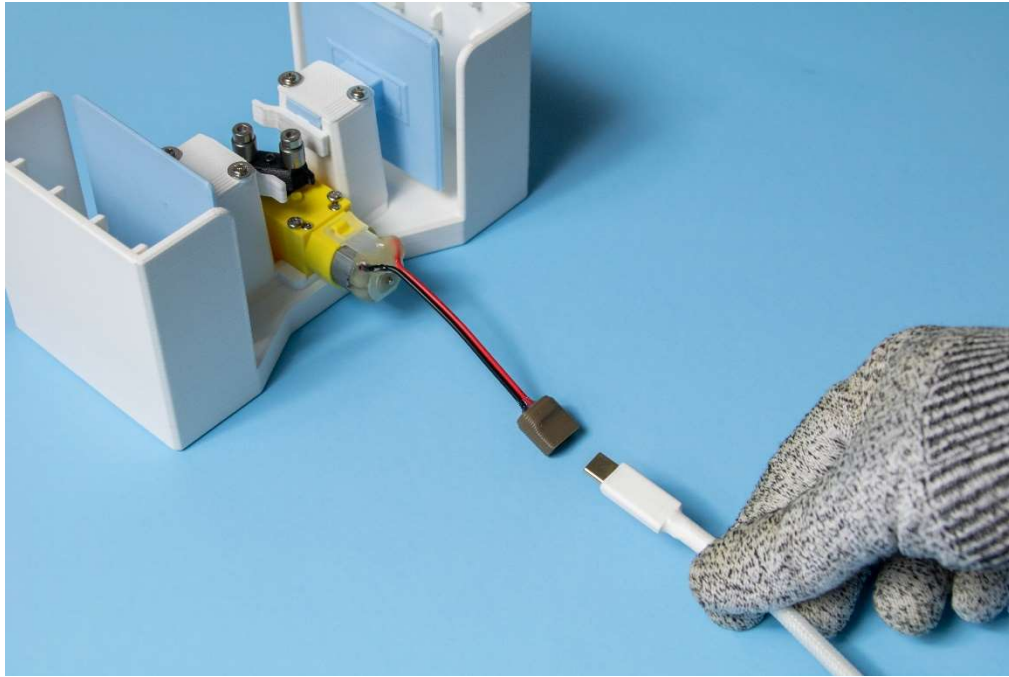
Section 3: General Operation (applies for both mode A and B)



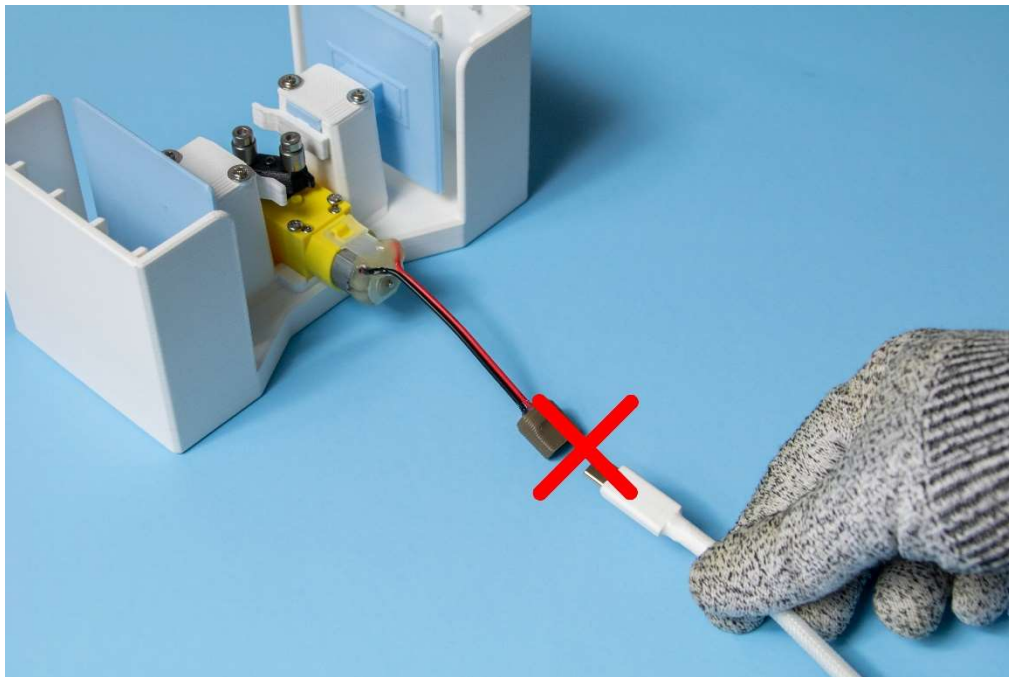
The switch plate is inserted through the top of the machine. The product will function with 1 or 2 plates, but operation with 2 plates is highly recommended (also make sure the 2 plates have the same amount of switches).



The wheel can be rotated when inserting the switch plates. Rotate the wheel **SLOWLY** and **ONLY WHEN NEEDED** to avoid breaking the gears. If the wheel can't be rotated in one direction, try the other. If both directions don't work, turn it on/off briefly and try again.



A standard 5V USB wall plug is recommended, along with any USB type-c cable. Simply plug or unplug the cable into the connector to turn the machine on or off. The user can also choose to use power banks or computer USB ports to provide power.



Check for wear on the bearing assembly and the bearing-pusher buffer piece periodically. Any wear on the plastic will be very obvious. Black residue from the lubricant on the wheel or buffer piece is normal, wipe it off from the wheel if it bothers you but I do not suggest wiping the lube off from the buffer piece. The machine do not need to be shut down periodically to prevent overheating.

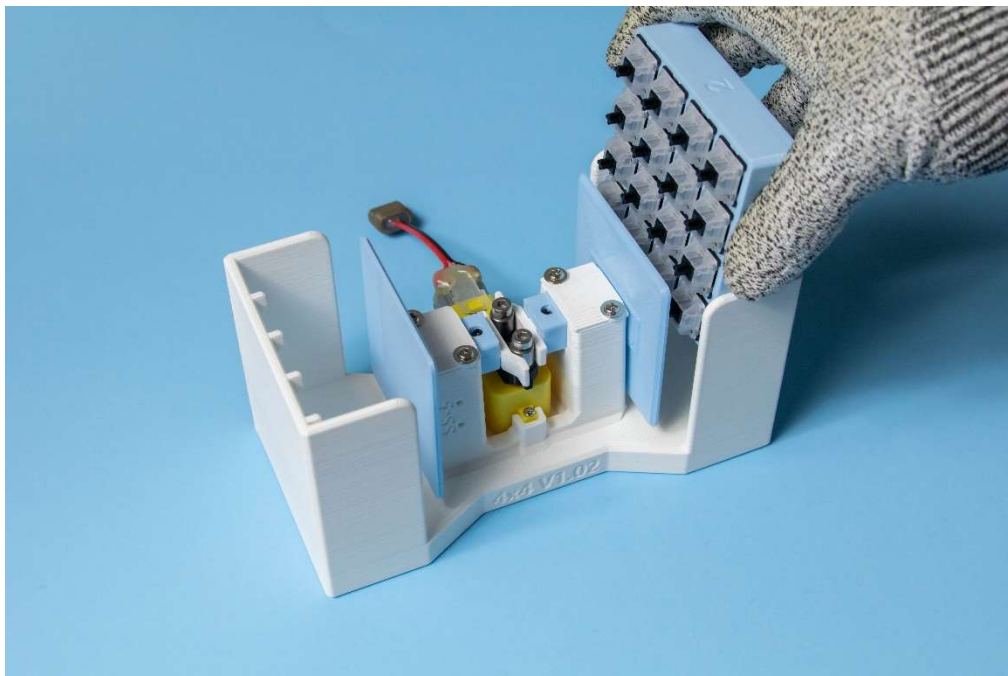


Make sure to space out the switches evenly if you are not planning on filling the entire plate. If you are filling the entire plates with switches, ~70g max bottom out switches is recommended.

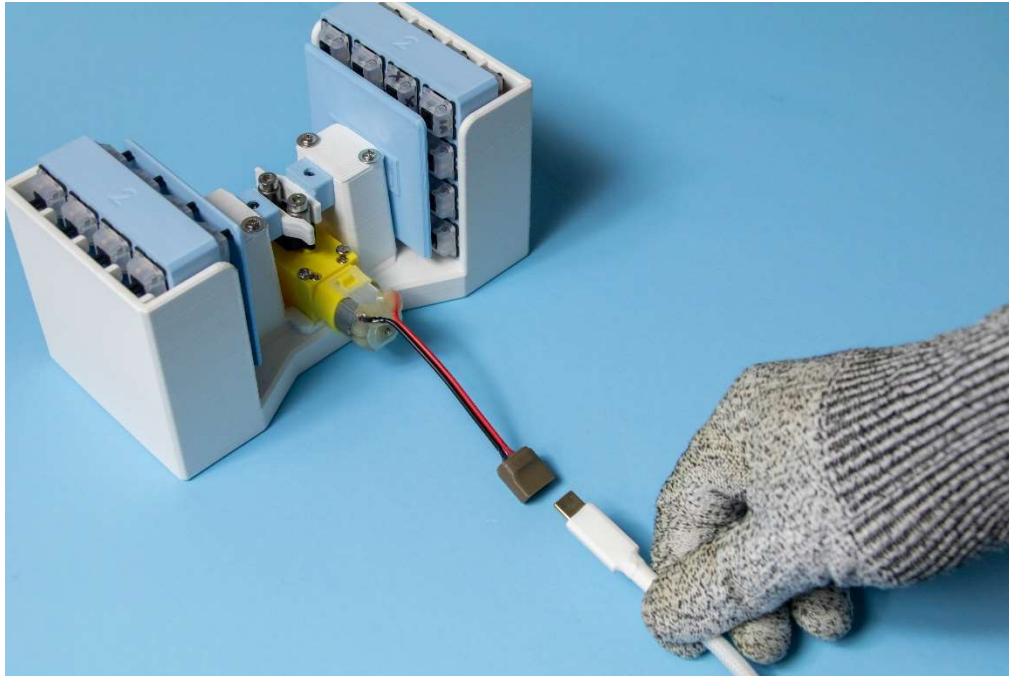
Section 4: Mode A – Centered Actuations



Step 1: Install switches into both sides of the switch plates (32 max on each).

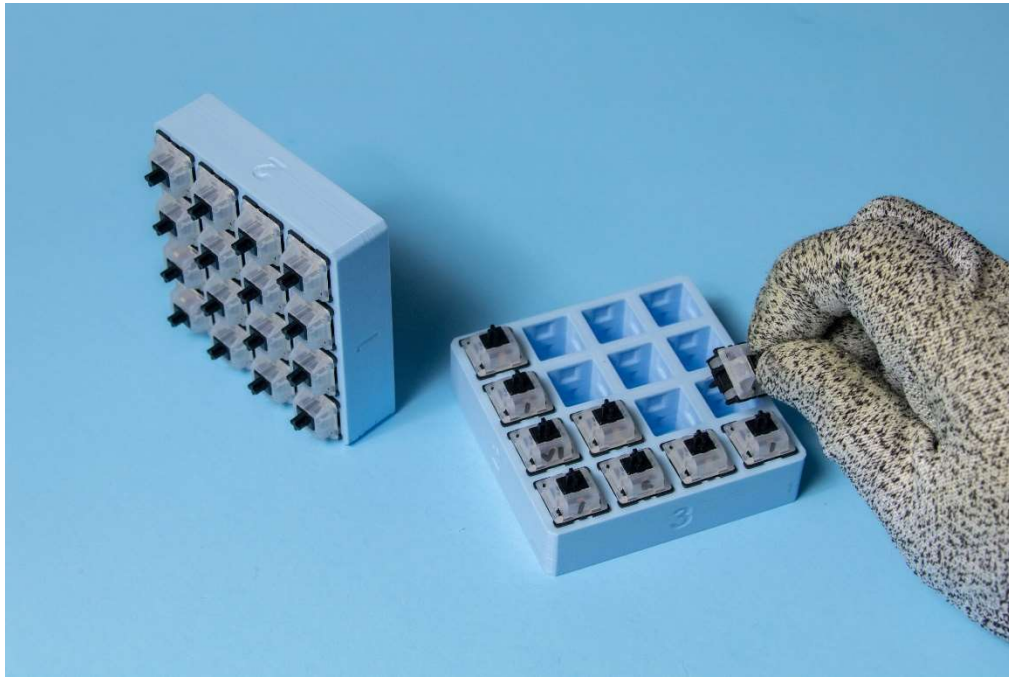


Step 2: Insert switch plates in any orientation. Switch plate orientation does not affect break-in process in Mode A.



Step 3: Simply plug in the machine to start. To achieve consistency, it is recommended to break in switches by amount of time (min, hrs, etc).

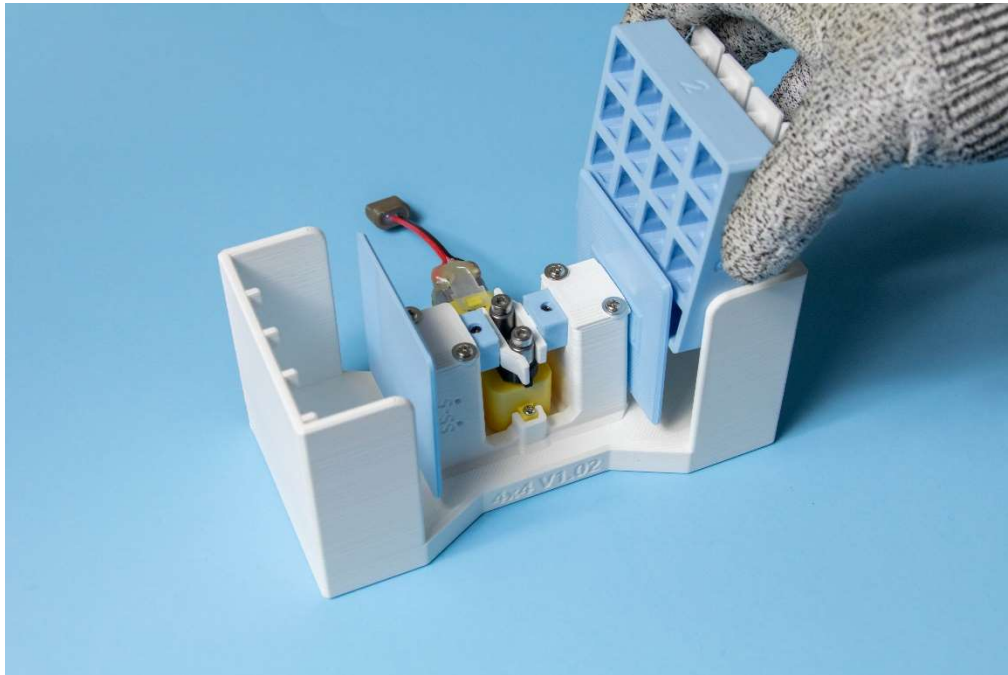
Section 5: Mode B – Off-center Actuations



Step 1: Insert switches into only one side of the switch plate (16 max on each).



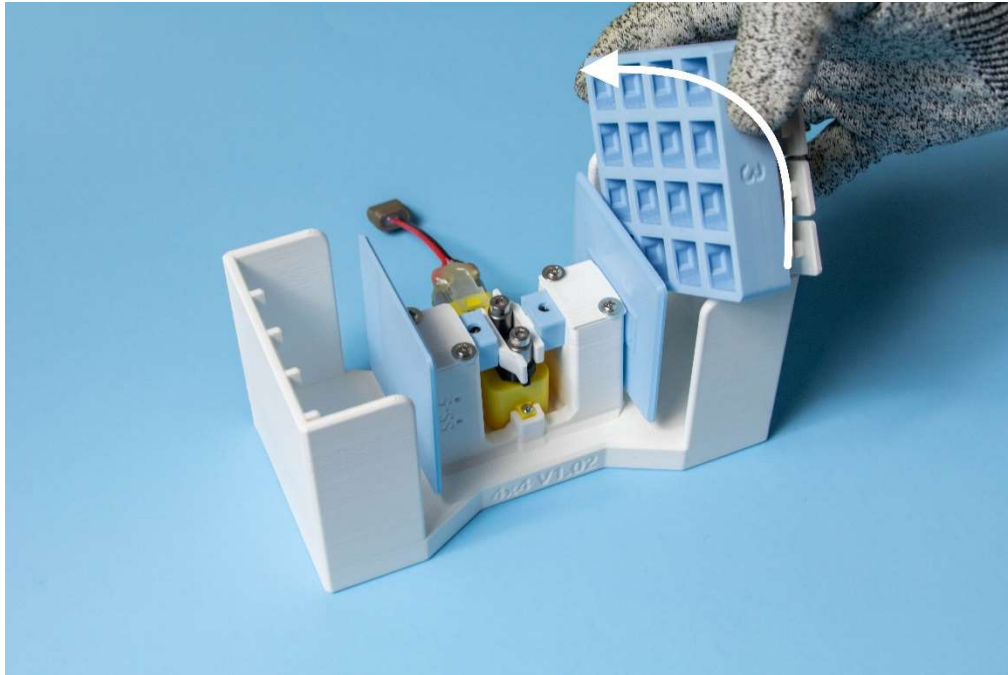
Step 2: Insert keycaps onto all switches.



Step 3: Insert switch plates with the keycaps facing away from the pusher, the off-center nibs should line up with the edge of the keycaps.



At this point, the user's machine should look like the image above. Once turned on, the nibs will apply a force to the side of the keycaps, resulting in more friction towards the side.

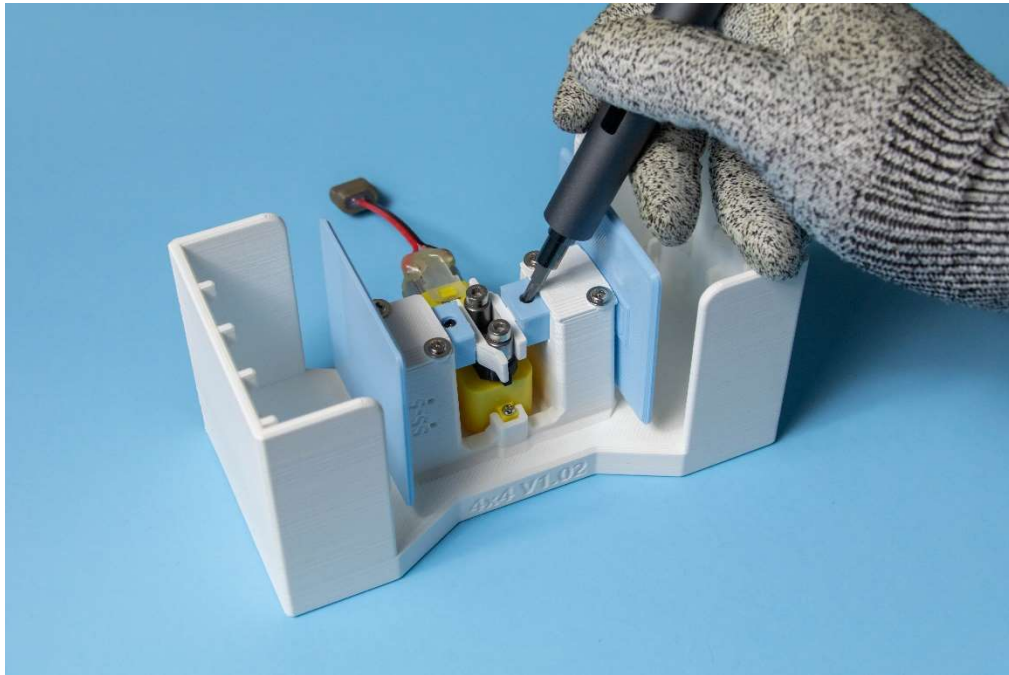


Step 4: Turn on the machine, the pusher will break in only one side of the switch. In order to break in the other three sides, rotate the switch plate 90 degrees after one side is finished. Please take notes on which side(s) has been broken in. 4 sides are labeled with numbers. For consistent results, break in each side for the same amounts of time.

The following sections 6A and 6B contains instructions to replace the bearing-pusher buffer piece. Section 6 is separated into 2 parts because there are 2 versions of the buffer piece. Compare your unit with the one pictured and use the section (A/B) that corresponds to your version.

Section A uses a buffer piece that is curved on one end. Section B uses one that is completely straight.

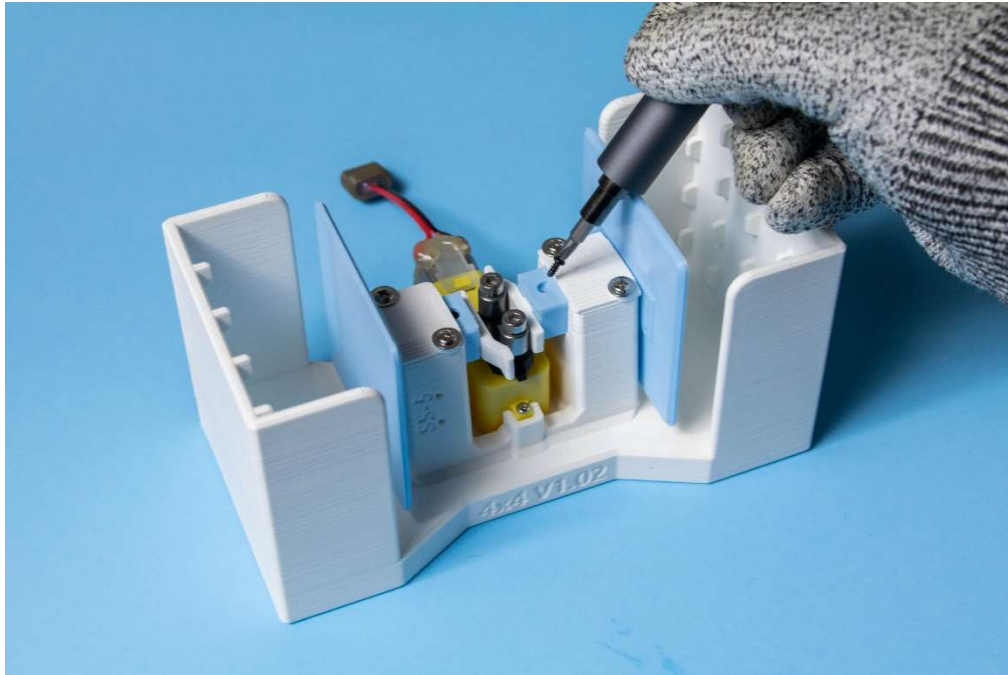
Section 6A: Replacing the Bearing-Pusher Buffer Pieces (Version A)



Step 1: Unscrew the screw holding in the buffer piece. The screw hole is designed to be at an angle, please angle the screwdriver as shown when removing the screw.

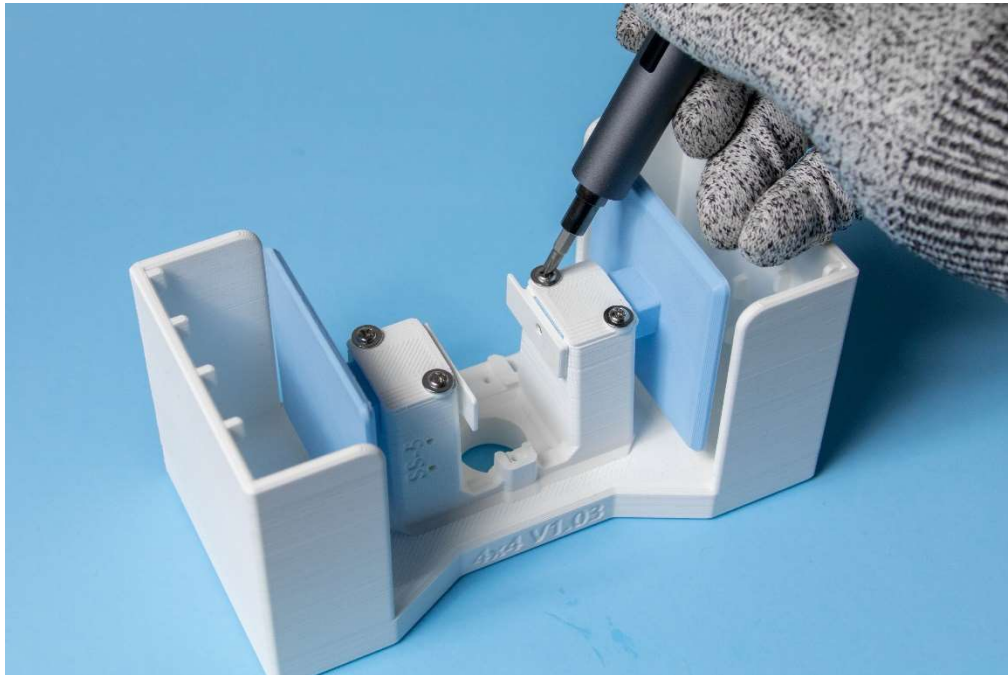


Step 2: Slide the worn out buffer piece downwards to remove it. Then replace it with a new one, make sure to lubricate the surface where the bearings touch the buffer piece with any grease.



Step 3: Reattach screw. Again, the screwdriver needs to be at an angle as shown. If you find this difficult, feel free to remove the wheel before replacing the buffer pieces.

Section 6B: Replacing the Bearing-Pusher Buffer Pieces (Version B)



Step 1: Remove the pusher cover piece by unscrewing the top screws.



Step 2: Remove the screw holding the buffer piece in place. Replace the worn out buffer piece with a new one, and reattach the screw. Make sure to lubricate the surface where the bearings touch the buffer piece. Do not overtighten, the screw only needs to be tight enough so the buffer piece does not wobble or rotate.



Step 3: reattach the cover piece. After tightening the screws, make sure the pusher assembly is able to move back and forth smoothly. If you experience increased friction than before, loosen the screws a bit and try again.

Section 6C: Long Pole Switches

When using long pole switches/switches with a travel distance less than 4mm. Consider switching to the low height buffer pieces.

These buffer pieces are thinner than the ones which are preinstalled. Installing them will decrease the travel distance of the pusher plate by ~0.9mm.

These low height buffers will come with a black sharpie mark on the back for easy identification.

Step 1: Rotate the wheel manually so that the pusher plates are bottomed out, the wheel should be parallel with the pushers.

Step 2: If you feel resistance when rotating the wheel pass the bottom out point, this indicates you will need to replace the buffer pieces with the low height variation. If the wheel rotates smoothly, that means you do not need to replace the buffers.

Step 2.5: If the wheel decreases in speed around the bottom out point when it is plugged in, this is also an indication of the need to replace the buffers. Use common sense, if the switches bottom out before the wheel fully rotates, then you will need to replace the buffers. Also see video here (<https://imgur.com/a/uwPZCL8>)

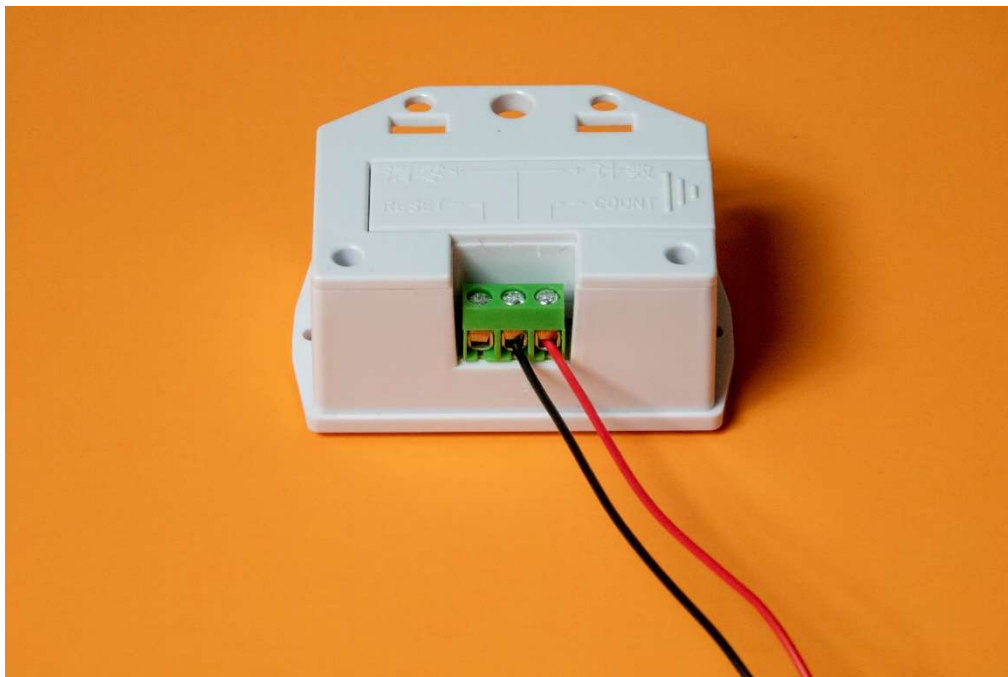
Step 3: Repeat step 1-2.5 for every batch of switches/every new switch you try. Tolerances are different between different manufacturers and different batches of the switch. Different machines have different tolerances as well. Some long pole switches might not even need the low height buffer pieces. Unfortunately, I am not able to provide different buffers for every single switch out there, if the switches fail to bottom out with the low height buffers, you can put layers of masking tape on the pusher plate to make up for the lost travel distance of the pusher.

Step 4: Follow section 6B and replace the buffer pieces normally.

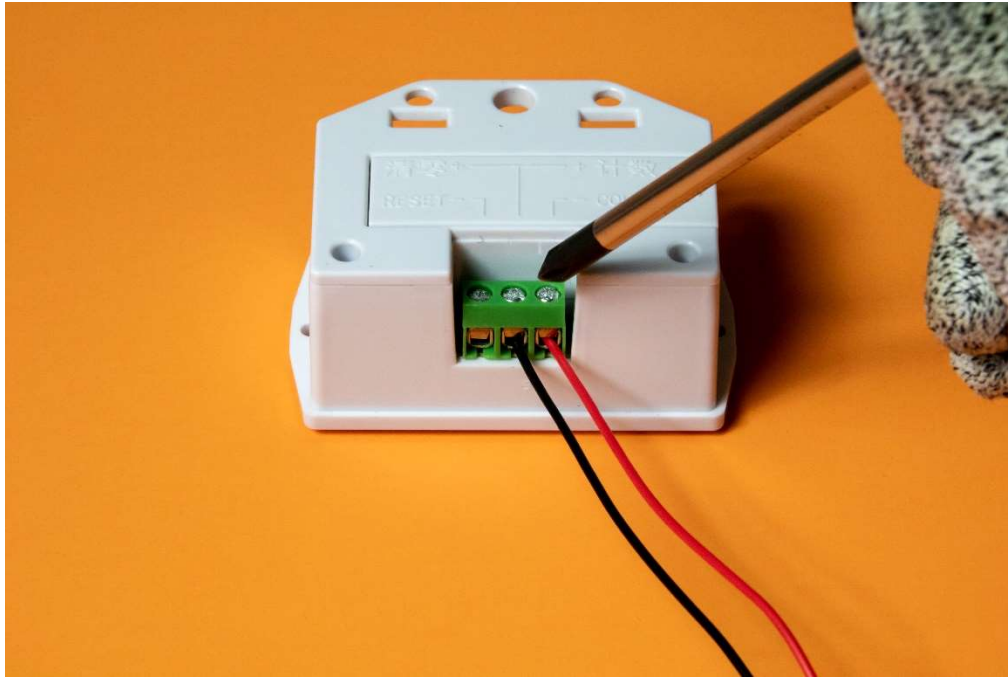
Section 7: Actuation Counter



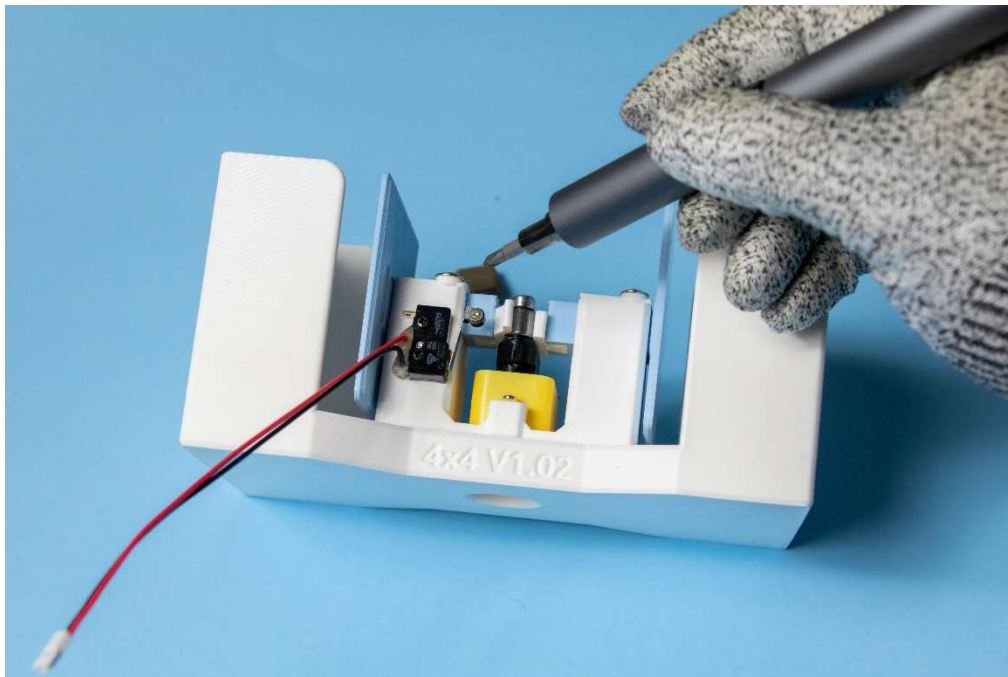
Step 1: Flip the counter so the back side is facing up.



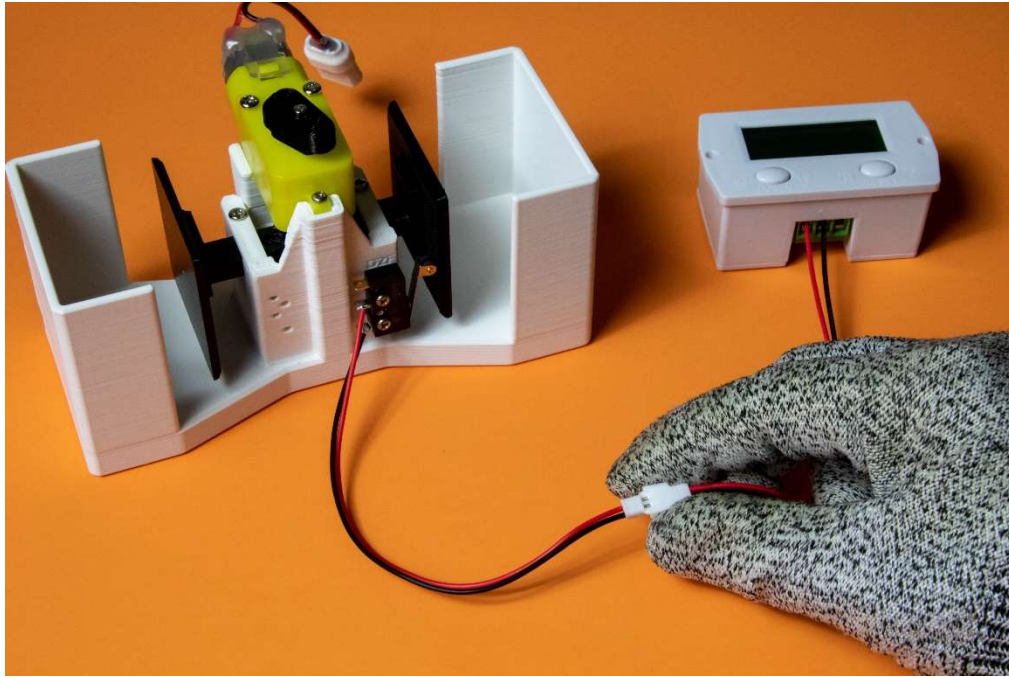
Step 2: Insert the 2 wires into the right and middle slots, the order of the wires does not matter. Make sure the screws are loose if you are unable to insert the wires.



Step 3: Tighten the two screws and make sure the wires are secure.



Step 4: Hold the switch onto the main body of the machine so that the holes line up and that the wheel is facing up and towards the buffer piece. Screw in the two screws.



Step 5: Connect the two wires with the white connector, the pins only go in one way.



Step 6: Remove the battery compartment cover.



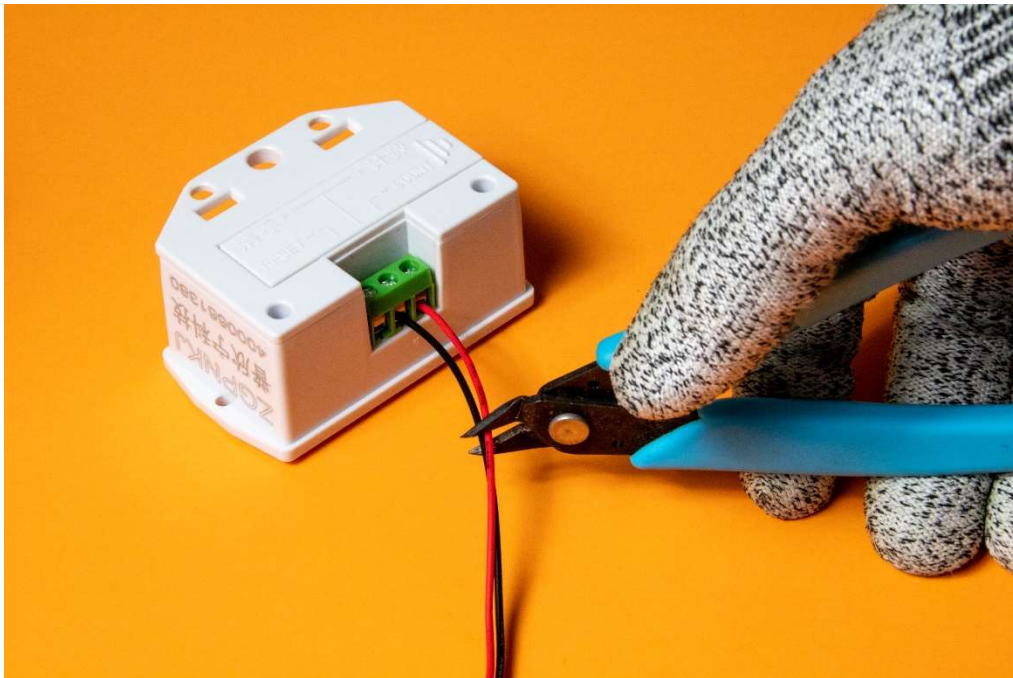
Step 7: Insert a AA battery (1.5v) and put the cover back in place.



Step 8: Long press the POWER button (left) to turn on/off the counter. The current count will be saved when the counter is shut off.



Step 9: Long press the RESET button to reset the counter, the counter resets itself after the count reaches 1,000,000.



Step 10 (OPTIONAL): Cut the wire if you feel the wire is too long, please note this process is not reversible unless you choose to solder on another section.

Changelog

V1.1

- Fixed underlining mistake in Section 4, step 1
- Fixed punctuations

V1.2

- Added section about free accessories bag on page 3
- Added more clarification about buffer pieces A and B on page 11

V1.3

- Added Section 6C