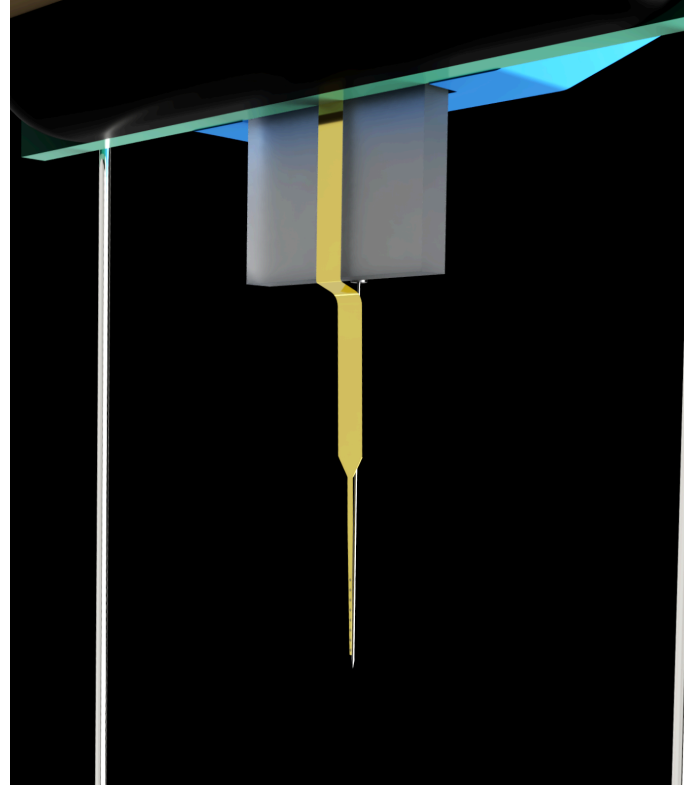
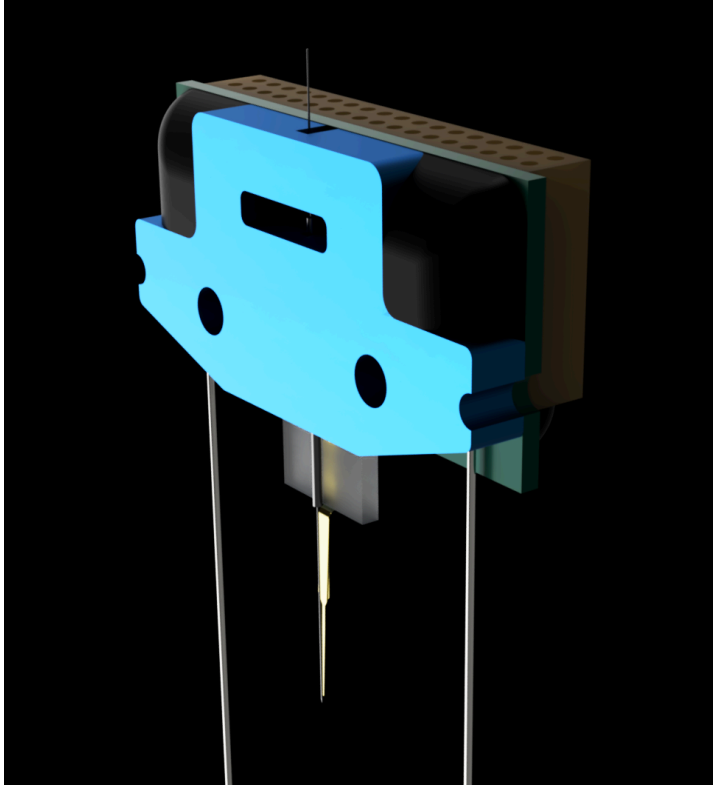


# NEURALTHREAD<sup>®</sup>



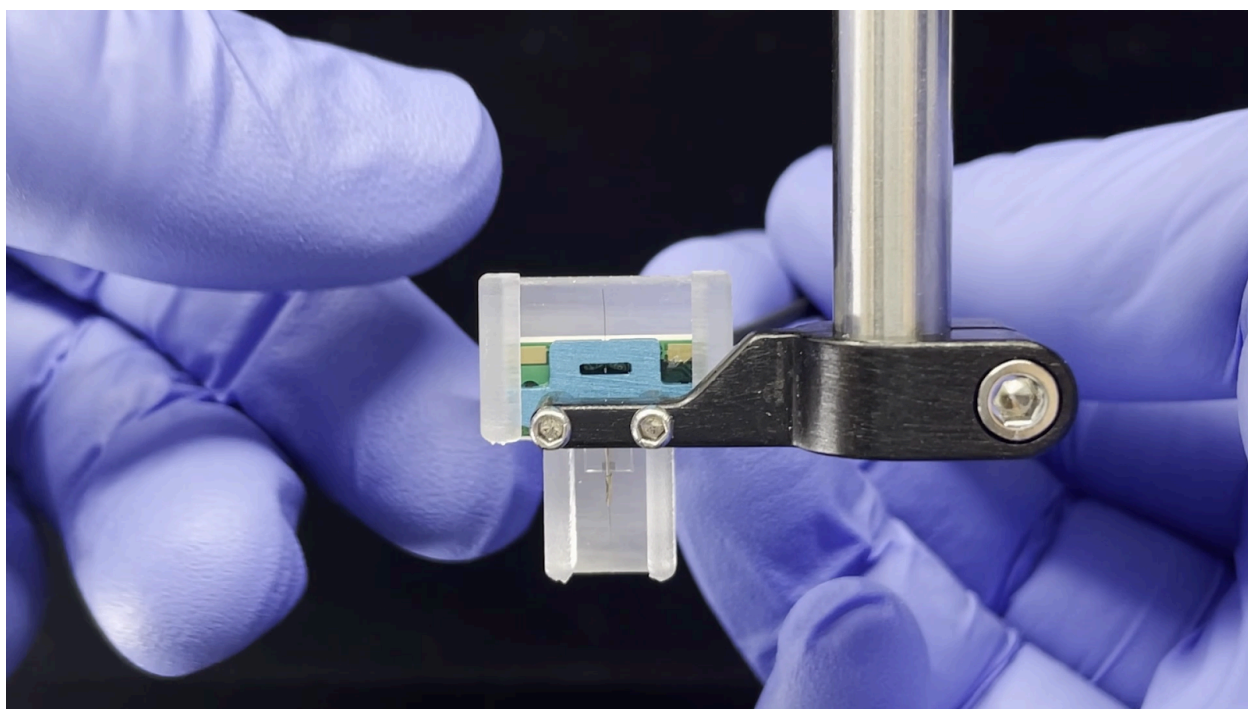
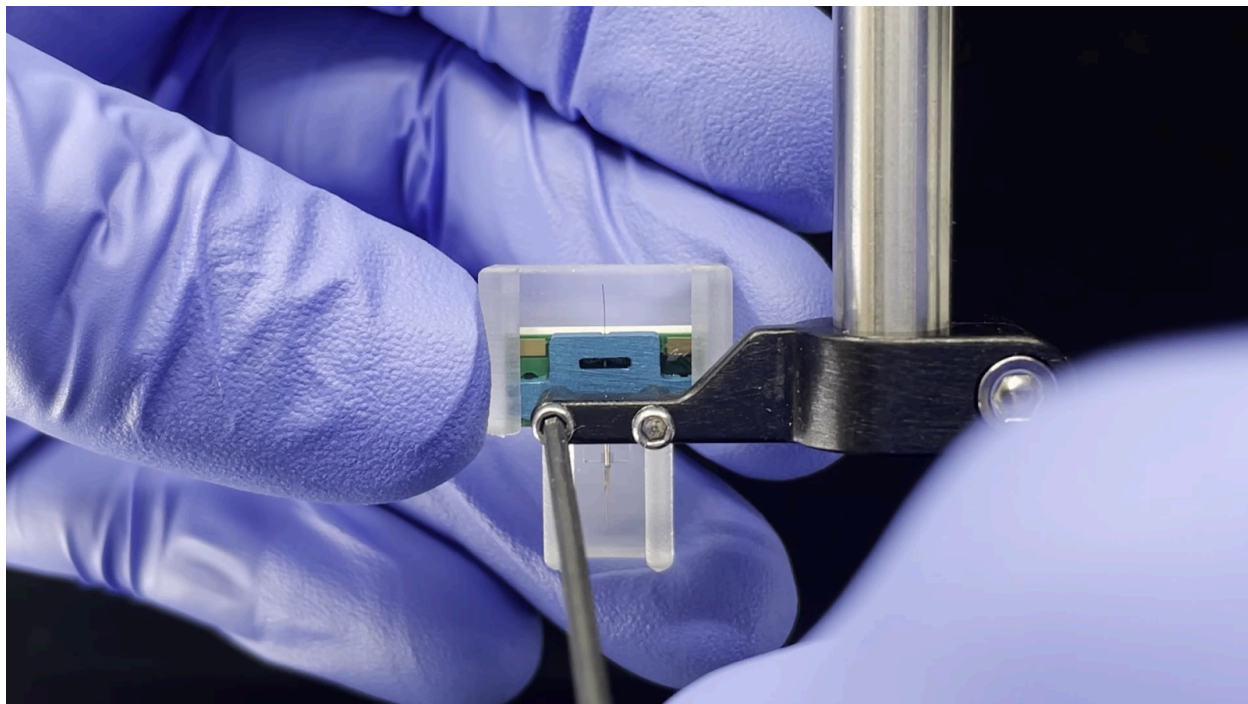
## Implantation Protocol:

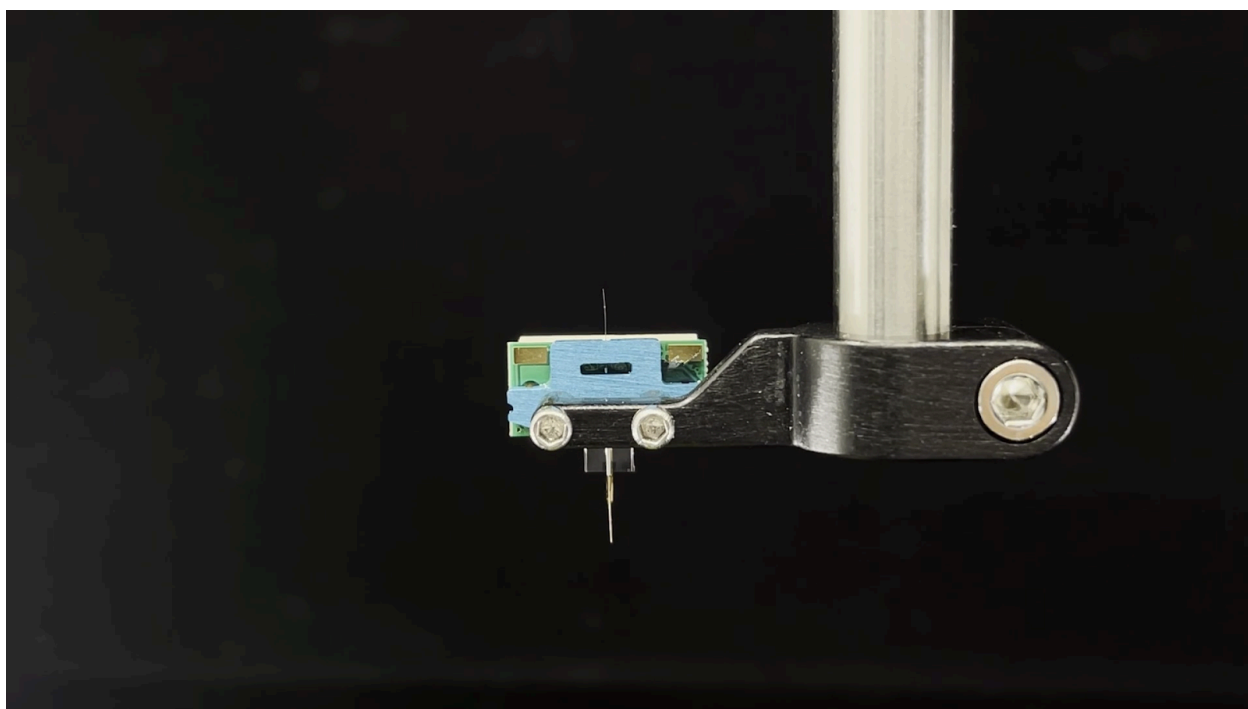
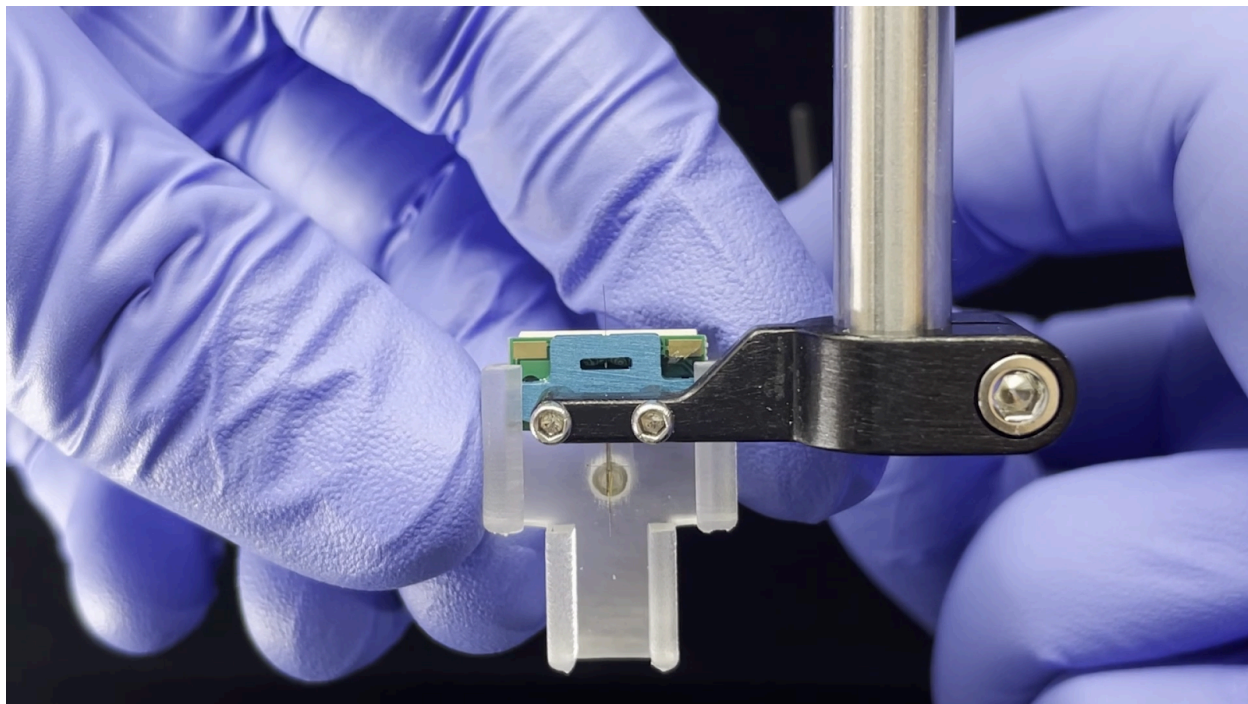
1. Attach mount to stereotax or manipulator of choice  
NOTE: In some cases it's preferred to attach the mount to the stereotax after mounting the probe
2. Remove probe from sterile packaging (probes are shipped sterile)  
NOTE: Ethylene oxide is the validated method of sterilization
3. Hold the device by its shield and align it with the mount.
4. Advance the two screws into the probe until snug, DO NOT OVER TIGHTEN.
5. Hold the shield while loosening the screw on the back of the shield  
CAUTION: needles and probes are sharp and delicate.
6. Slide the shield down and away from the probe.  
NOTE: Do not bump the probe during shield removal
7. Needle is now exposed
  - a. CRITICAL NOTE: The high moisture environment around the surgical site can cause the thread to disengage from the shuttle/needle prematurely. Try to keep the time that the device is in proximity to the tissue pre insertion to a minimum.

8. Insert the needle into tissue of interest
  - a. Probe insertion has been validated at 1mm/s however there is a range of speeds that can lead to successful insertions.
  - b. A guideline for surgeons insertion manually is to drive the probe into the tissue as quickly as possible without causing excessive vibration.
  - c. Probes can be inserted to a maximum depth of approx 3mm from the needle tip. Probes do not need to be inserted to max depth however at shallower depths there is a greater potential for probes to be pulled out by mistake.
  - d. Probes should not be inserted past the point where the array ribbon begins to fan out.
9. Add PBS or ACSF to the tissue surface to ensure disengagement with the needle  
NOTE: It's a best practice to visually verify that the thread is floating on fluid and no longer laying along the needle. This helps prevent thread pull-outs during needle retraction.
10. Allow 10 minutes for adhesive to dissolve and complete needle/thread disengagement
11. Pull the needle straight up out of the device using forceps
  - a. This is a critical step, try to minimize any vibration or other disruption of the tissue or probe during this process
  - b. Needles can be disposed of as medical sharps
12. Device can now be mounted to the skull  
NOTE: There is an increased device failure risk if rigid adhesives or cements come in contact with the thin film due to mechanical abrasion. It is advised that only soft materials (silicones, dural sealants, etc) contact the thin film. There is evidence that devices can perform nominally despite contact with rigid cements. If you have questions about the compatibility of your closure materials or methods please let us know and we will be happy to go over some options.

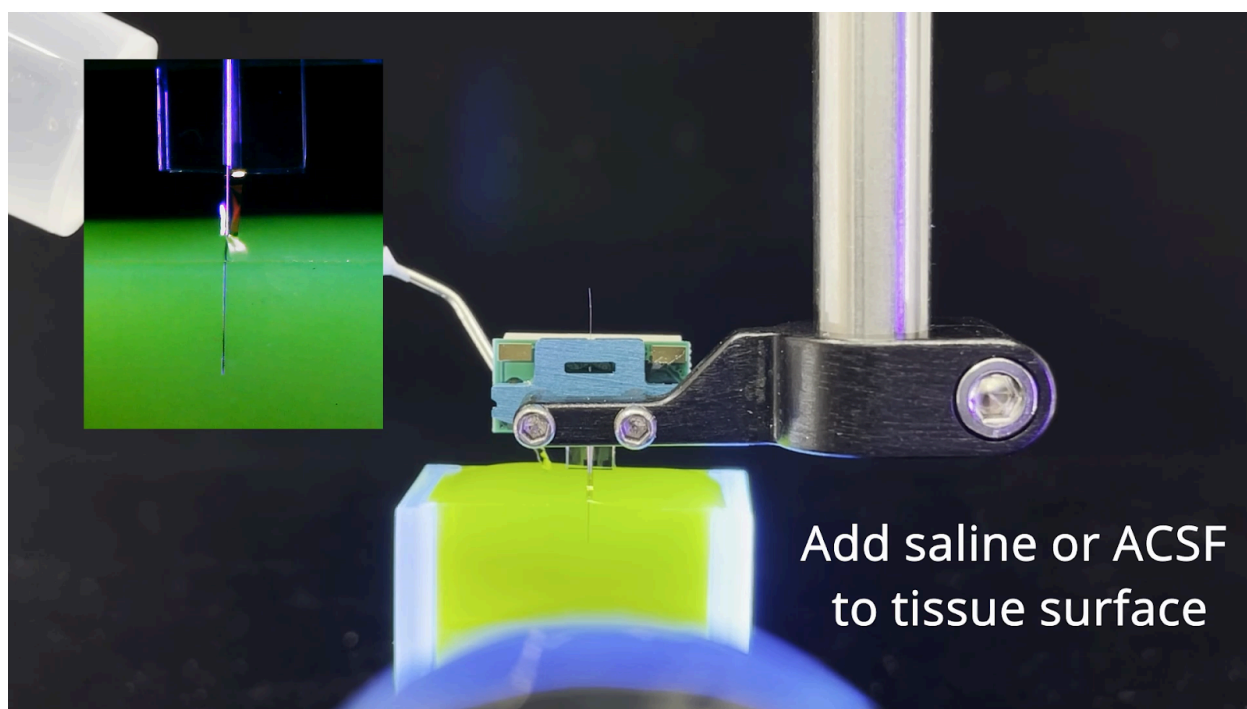
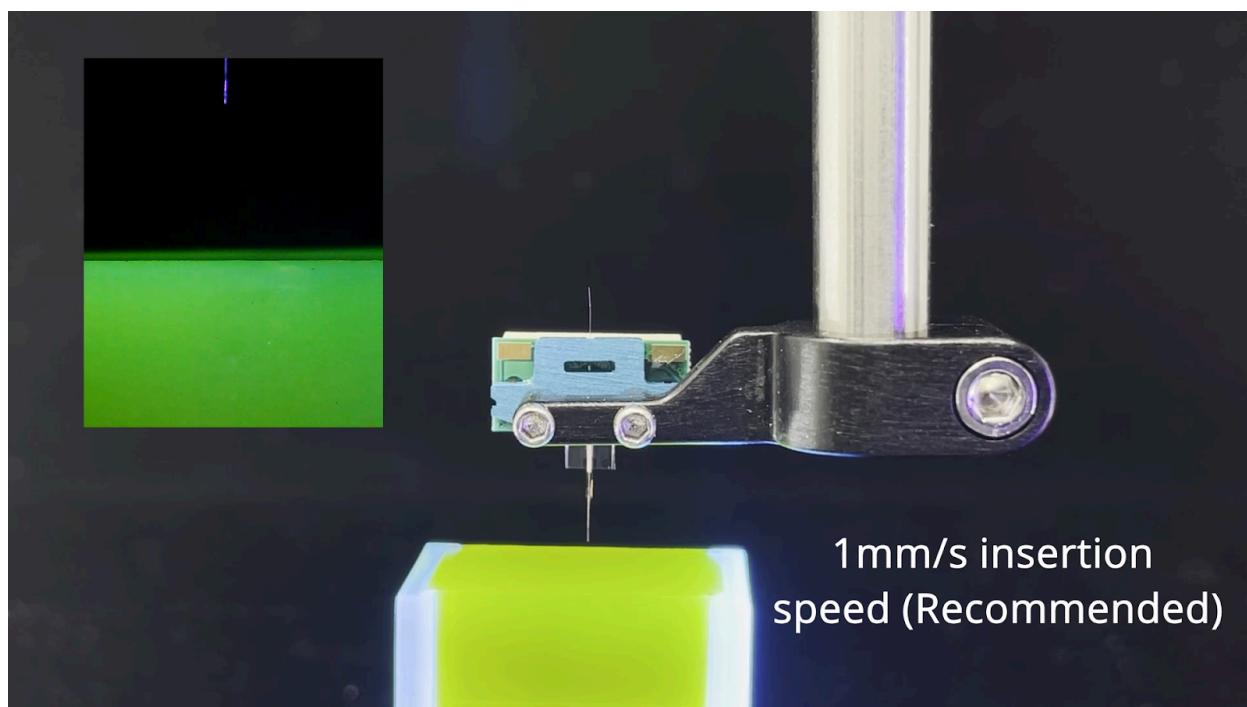
#### Grounding:

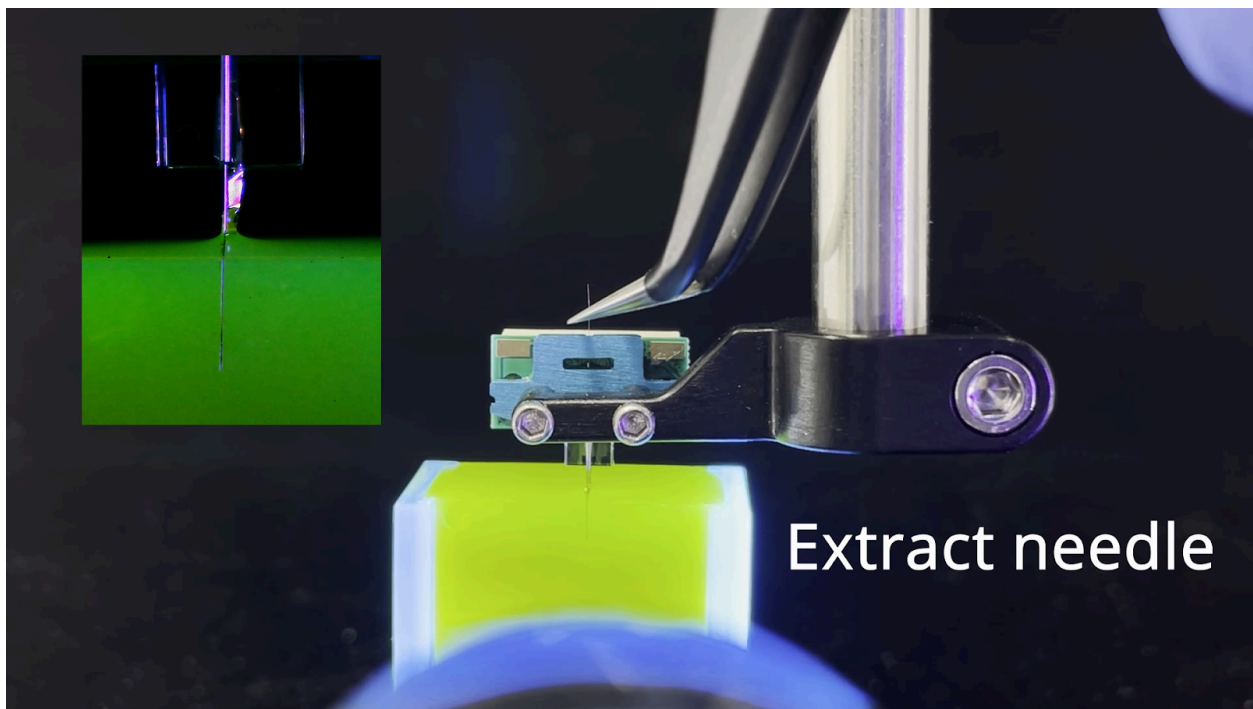
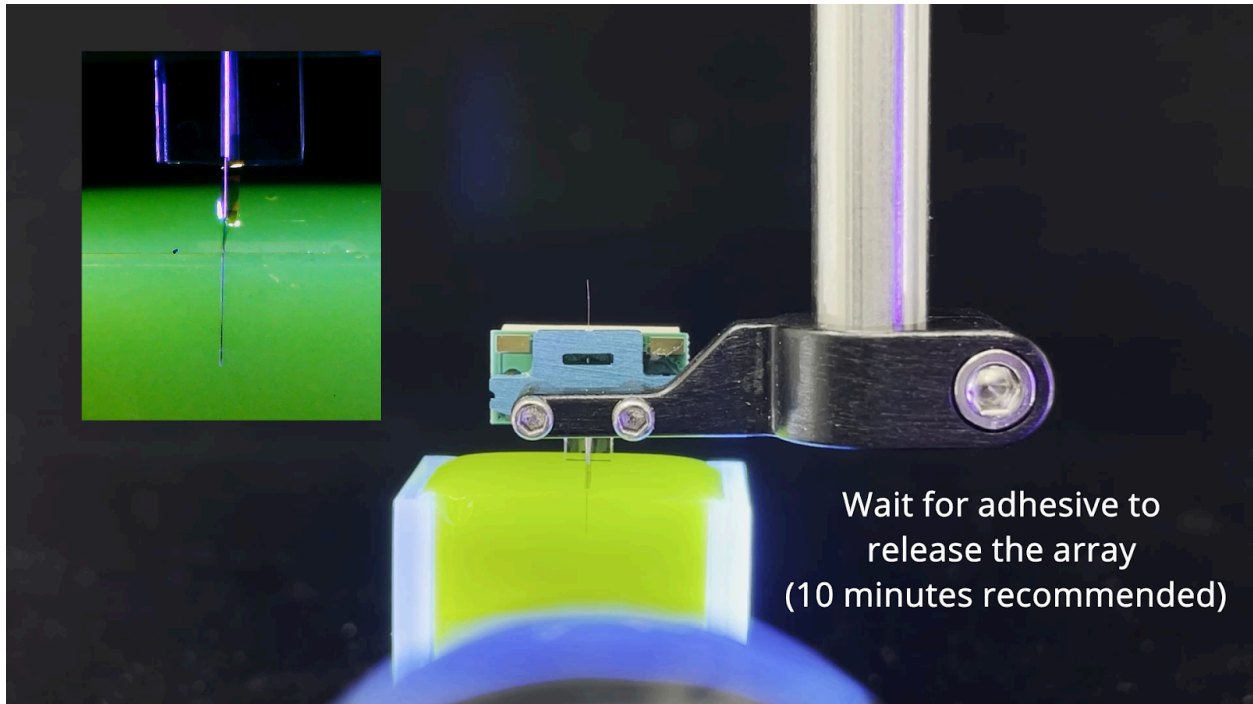
There are bare silver ground and reference wires attached to each device (not pictured below). Most commonly, one of the silver wires is attached to a ground screw with interstitial fluid contact. If you have questions about grounding best practices for your experiment or have specific referencing requirements, let us know and we can work through some solutions.

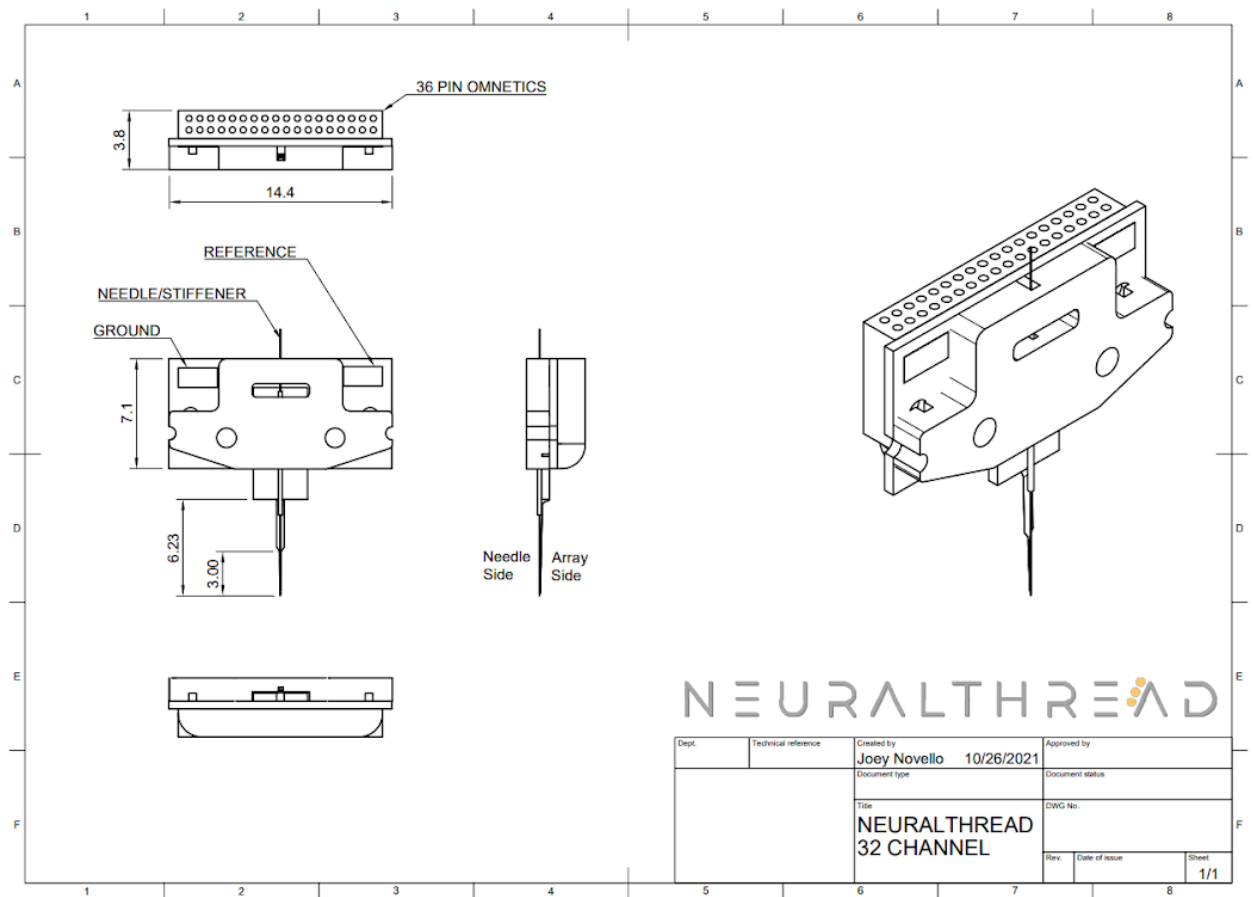
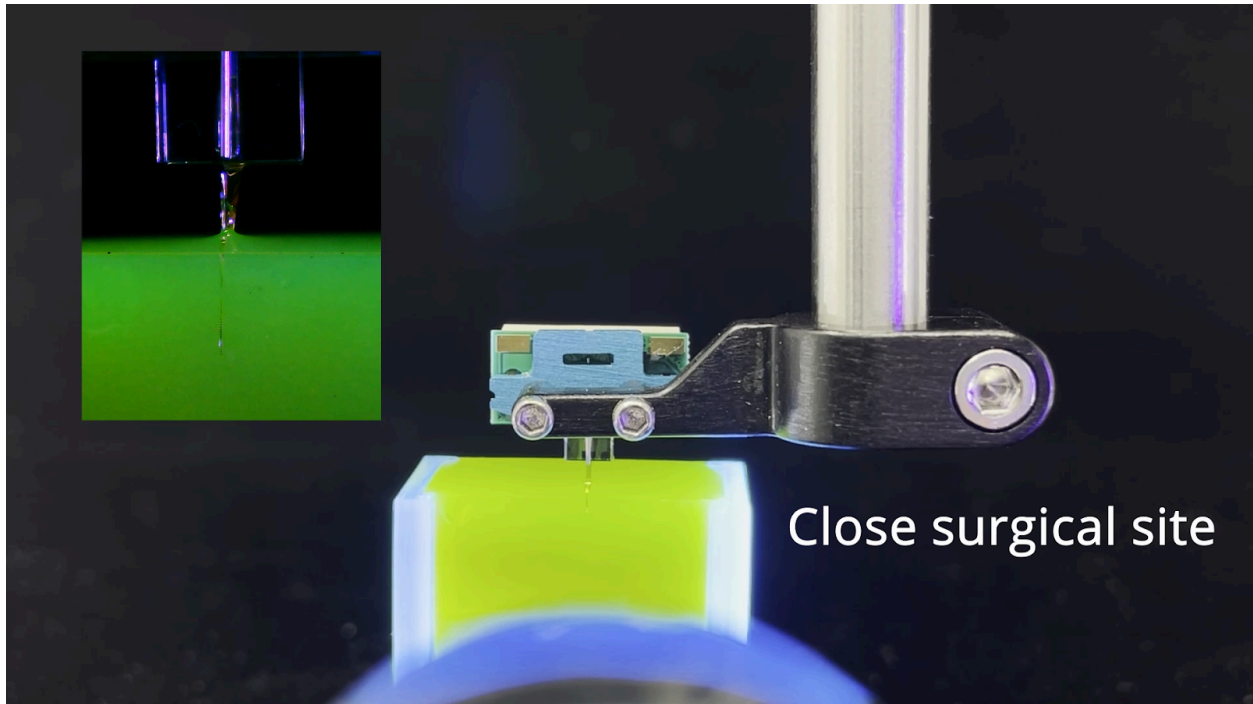




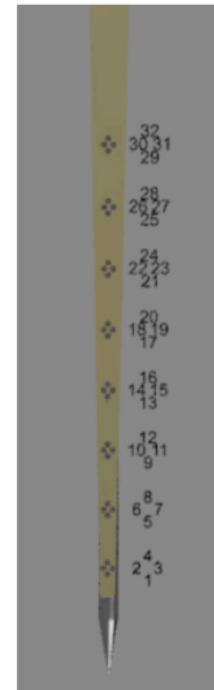
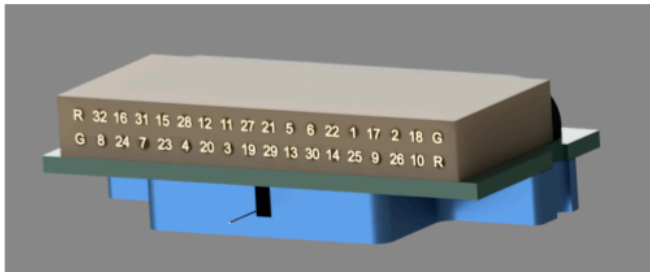






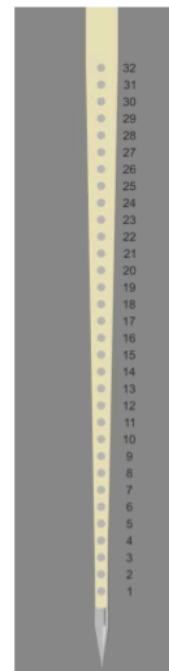
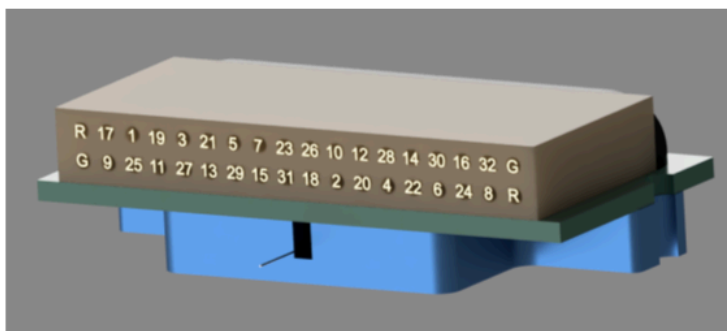


## Tetrode



#	X, um	Y, um
1	0	0
2	-14.28	14.28
3	14.28	14.28
4	0	28.56
5	0	150
6	-14.28	164.28
7	14.28	164.28
8	0	178.56
9	0	300
10	-14.28	314.28
11	14.28	314.28
12	0	328.56
13	0	450
14	-14.28	464.28
15	14.28	464.28
16	0	478.56
17	0	600
18	-14.28	614.28
19	14.28	614.28
20	0	628.56
21	0	750
22	-14.28	764.28
23	14.28	764.28
24	0	778.56
25	0	900
26	-14.28	914.28
27	14.28	914.28
28	0	928.56
29	0	1050
30	-14.28	1064.28
31	14.28	1064.28
32	0	1078.56

## Linear



#	X, um	Y, um
1	0	0
2	0	60
3	0	120
4	0	180
5	0	240
6	0	300
7	0	360
8	0	420
9	0	480
10	0	540
11	0	600
12	0	660
13	0	720
14	0	780
15	0	840
16	0	900
17	0	960
18	0	1020
19	0	1080
20	0	1140
21	0	1200
22	0	1260
23	0	1320
24	0	1380
25	0	1440
26	0	1500
27	0	1560
28	0	1620
29	0	1680
30	0	1740
31	0	1800
32	0	1860