MEA Creator Kit Datasheet

Your MEA. Our System.

The MEA Creator Kit lets you record from custom MEAs on Maestro MEA systems. The kit features an adapter plate to connect custom MEAs and integrate additional features.

With the tools provided by this kit, engineering-minded biologists can open up the capabilities of their Maestro MEA platform to test and explore biology in new and exciting ways.

MEA design specifications:

Channels per MEA	64*
MEA outer dimension	49 mm
MEA thickness	0.5-1.3 mm
Well outer diameter	27 mm
Well max height	10 mm

What will you create?

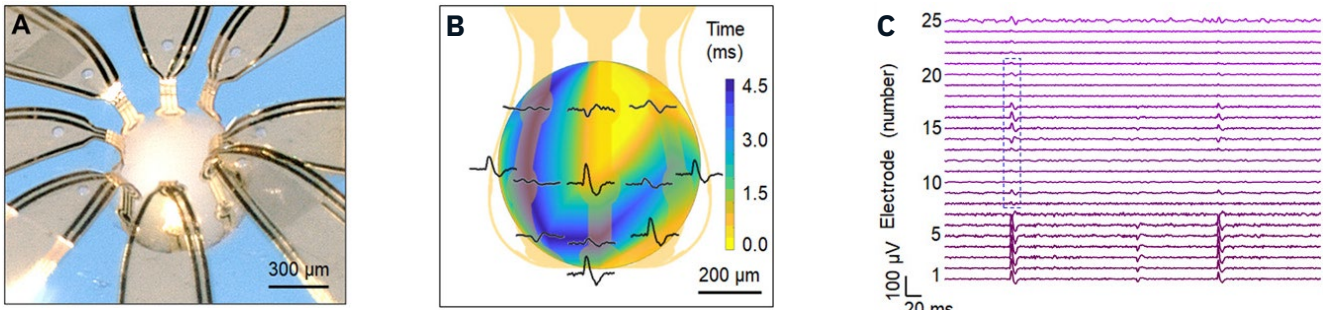
The MEA Creator Kit gives you the freedom to experiment with electrode designs and layouts, and integrate other components (sensors, external stimulation, etc.) through the auxiliary port.

* 128 channels total – optimally split into 2 sets of 64 to dock into Maestro but can be used flexibly with other designs if docking is not required. Contact support@axionbio.com for more details.

"Our 3D interfaces worked great on our Maestro Pro MEA"

"The MEA Creator Kit enabled us to integrate a custom 3D neural interface for studying spheroids, organoids, and assembloids into our workflow. Our 3D interfaces worked great on our Maestro Pro MEA system to study coordinated bursting across the surface of cortical spheroids"

–Colin Franz, Shirley Ryan Ability Lab



A 3D neural interface (A) records from electrodes all around the cortical spheroid (B). Coordinated neural activity was measured on the Maestro Pro (C). Figures from Park et al. 2021

MEA Fabrication Guidelines

Below is a list of commonly used materials and design parameters for fabricating MEAs. These guidelines are not inclusive and meant to serve as a starting point for reference.

» **Electrode Size:** The typical size for electrodes ranges from 10-50µm.

- The “Ground Electrode” should have an exposed area which is ~200x larger than a standard electrode.
- The “Pseudo-Differential Reference Electrode” should have an exposed area which is ~750x larger than a standard electrode.

» **Substrate:** The underlying substrate should be mechanically robust, insulating, and, in cases where imaging is required, optically transparent.

- Typical material choices include, but are not limited to: Glass, Silicon, Polyethylene terephthalate (PET)

» **Electrode Materials:** Routing of the electrodes should be done with a low resistivity, electrically conductive material.

- Typical material choices include, but are not limited to: Gold, Platinum, Titanium, Titanium Nitride, Indium-Tin-Oxide.

» **Insulating Layer:** The insulating layer is a biocompatible surface that serves multiple purposes, including defining the electrode area, facilitating attachment, and insulating the conductive layer.

- Typical material choices include, but are not limited to: SU8, Parylene, Polydimethylsiloxane (PDMS), Polyimide.

» **Electrode Coating:** Coatings are typically employed to improve the signal-to-noise ratio and lower the electrochemical impedance of electrodes.

- Typical material choices include, but are not limited to: Platinum black, poly(3,4-ethylenedioxythiophene):poly (styrene sulfonate) (PEDOT:PSS), Iridium Oxide, Glassy Carbon.