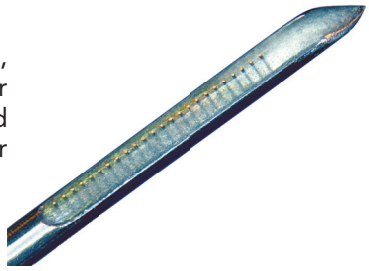
PLEXON®
Neurotechnology Research Systems

Specialty Electrodes, Probes and Arrays

Plexon offers a suite of customizable specialty electrodes, probes and arrays for various research needs with our most popular and innovative ones listed below.

U-Probe

Plexon's very popular robust, multi-use, multi-site linear electrode most often used for acute studies with larger animals such as primates.



Features

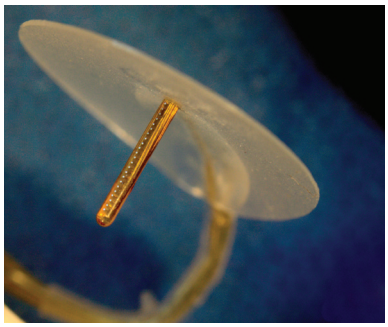
- 8, 16 or 24 channels
- Single, stereotrode and tetrode configurations available
- Optional fluid delivery channels for precise drug delivery or fiber optic lines for optogenetic stimulation intermixed within the recording sites
- Highly robust and reusable stainless steel construction
- Unique electrode etching process results in low impedances without significantly changing the surface area: suitable for resolving single units with a better single-to-noise ratio
- Precise linear electrode arrangement enables current source density analysis of the field potential signals

Technical Specifications

U-Probe Features	Specifications and Options
Application	*In vivo;* acute
Channel counts	8, 16 or 24
Stimulation options	Fluid capillaries and optic fibers
Probe length	1 to 130mm
Probe OD	185 to 500µm
Electrode construction	15µm Pt/Ir electrode site diameter, circular shape, HML insulated (polyimide), and secured in medical-grade epoxy
Electrode configurations	Single, stereotrode or tetrode
Electrode impedance	275 (+/-50) kΩ at 1kHz
Inter-electrode spacing	50 to 500µm along length of probe; 50µm within stereotrode or tetrode group
Distance from tip to first electrode	185 to 5,000µm
Tip shape	Sharpened or rounded
Fluid capillary	40µm ID, 60µm OD (max of 4)
Optic fiber OD	60µm (max of 4)
Connector interfaces	8 channel: CON/8o50m-10P 16 channel: 2 CON/8o50m-10P, CON/16m-V or CON/16o25m-18P 24 channel: 3 CON/8o50, or CON/32m-V
Lifespan	Robust and reusable with a minimum of 30 penetrations, likely many more

Thumbtack Probe

One of Plexon's newest probes – a chronic, linear probe designed to span cortical layers running parallel to the surface of the brain that is effective for both field potential and single unit recordings.



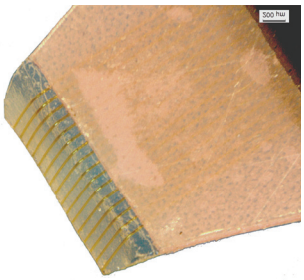
Features

- 24 channels
- Designed for chronic as well as acute applications
- Unique electrode etching process results in low impedances without significantly changing the surface area: suitable for resolving single units with a better single-to-noise ratio
- Effective for both field potential and single unit recordings
- Rounded profile tip to minimize the chance of blood vessel perforation
- Often used in medium to large animals such as primates

Technical Specifications

Thumbtack Probe Features	Specifications and Options
Applications	*In vivo;* chronic and acute
Electrode channels	24
Probe length	3mm
Shaft diameter	500µm
Electrode sites	40µm diameter, Pt/Ir
Tip profile	Rounded, dome-shaped
Electrode impedance	150 (+/- 50) kΩ at 1kHz
Inter-electrode spacing	50 to 500µm
Distance from tip to first electrode	450µm
Silicone tube length between connector and probe	10cm
Silicone disk dimensions	8mm diameter disk, 0.15mm thick
Connector interface	CON/32m-V

Brain Slice Probe



Another innovative addition to the Plexon probe family – a flexible, multi-site, linear electrode array designed to capture neural activity from a tissue slice when positioned across the slice's surface, then advanced into the tissue.

The tip of the Brain Slice Probe is fabricated by embedding individual electrode wires within bio-compatible, non-toxic epoxy. The comb-like construction of the tip is curved to enable viewing of the tip with a microscope while advancing the probe into tissue.

Features

- 16, 24 or 32 channels
- Curved, comb-like construction of the tip enables viewing of the tip with a microscope while advancing the probe into tissue
- Optional fluid delivery channels for precise drug delivery or fiber optic lines for optogenetic stimulation intermixed within the recording sites
- 15µm sites for specificity and single unit isolation
- 40µm sites for lower noise local field potential recordings

Technical Specifications

Brain Slice Probe Features	Specifications and Options
Application	*In vitro;* tissue slices
Channels	16, 24, or 32
Electrode site diameters	15 or 40µm
Edge thickness at tip	15µm site: 60µm 40µm site: 100µm
Tip angle	60° or 75°
Probe shaft material	Silicon/microwire composite, shielded
Probe shaft dimensions (L x W x D)	16 channel: 100 x 4 x 2mm 24 channel: 100 x 4 x 3mm 32 channel: 100 x 4 x 4mm
Electrode material	Pt/Ir, HML insulated (polyimide), secured in biocompatible, non-toxic epoxy
Electrode impedance (at 1kHz)	15µm site: 275 (+/- 50) kΩ 40µm site: 150 (+/- 50) kΩ
Inter-electrode spacing	50 to 500µm along the linear span of the probe
Fluid capillary ID	40 or 100µm
Optic fiber OD	60 or 100µm
Connector interfaces	16 channel: 2 CON/8o50m-10P or CON/16o25m-18P 24 or 36 channel: CON/32m-V
Lifespan	Robust and reusable

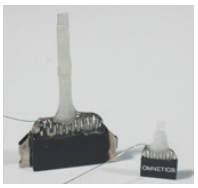
Floating Microelectrode Arrays

Unique arrays especially designed for long-term chronic applications that enable simultaneous recording from different depths of cortical layers and sub-cortical regions.

Technical Specifications

FMA Features	Specifications and Options
Application	*In vivo;* chronic
Electrode material	Pt/Ir, Pure Ir, or Activated Pure Ir
Tip diameter	1 to 6µm
Impedance	10kΩ to 5MΩ
Electrode count	4 to 32
Electrode length	up to 10mm
Inter-electrode spacing	400µm
Array dimensions	16 channel array: 1.95 x 2.45 x 0.50mm 32-channel array: 1.80 x 4.00 x 0.50mm
Wire bundle/cable length	1.5 to 20cm
Wire bundle/cable material	Gold wires covered in a silicone elastomer
Wire diameter	25µm
Connector count	Single or double
Connector type	CON/16o25m-18P, CON/16m-V, CON/32m-V, CON/32o25m-36P

Microwire Arrays



A popular array due to both recording reliability and cost efficiency. MWAs are equipped with dissolvable polyethylene glycol to secure the wires' spatial arrangement when being advanced into the tissue – important when targeting deep brain structures.

Technical Specifications

MWA Features	Specifications and Options
Applications	*In vivo;* chronic or acute
Wire material	Stainless steel or Pt/Ir
Wire insulation	Polyimide or Teflon
Wire diameter	25 or 50µm
Impedance	Stainless steel wire: 25µm is 0.6 to 0.9MΩ 50µm is 0.4 to 0.6MΩ Platinum/iridium wire: 25µm is 0.4 to 0.8MΩ 50µm is 0.2 to 0.4MΩ
Electrodes	4 to 32
Electrode spacing	Available in increments of 250µm
Electrode configurations	2x4, 4x4, 2x8, 4x8, etc.
Rows	1 to 12
Row spacing	Available in increments of 250µm
Connectors	1 to 6
Connector interface	Any Plexon headstage-compatible connector
Epoxy length	3 to 5mm
Wire enveloped in PEG	1 to 23mm
Wire exposed beyond PEG	1 to 10mm