

CAMBRIDGE NeuroTech

Advanced Electrophysiology Systems

MPM

Multi-Probe Micromanipulator System

Maximize your productivity and precision during acute in-vivo recording

Automated probe positioning for electrophysiology & optogenetics

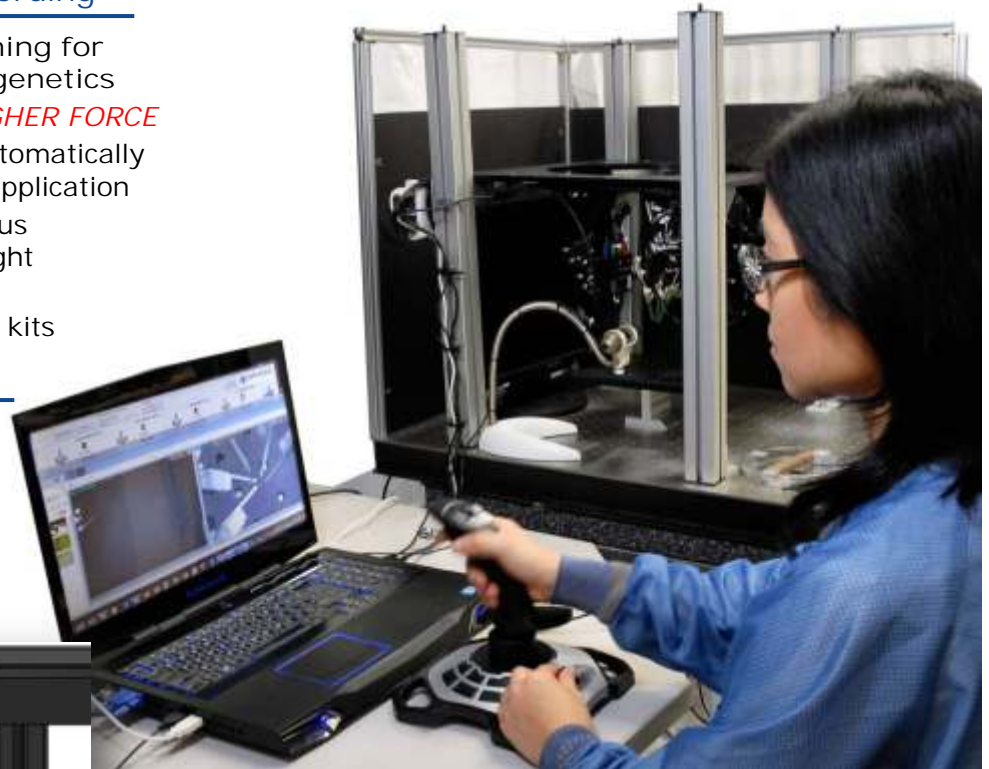
NEW: LONGER TRAVEL, HIGHER FORCE

Five probes (15 axes) automatically positioned from one PC application

Fully engineered apparatus space-optimized for upright or inverted experiments

Optional probe mounting kits

Optional joystick control



Created with Scientists, for Scientists

The MPM Multi-Probe Micromanipulator System provides convenient, automated positioning of multiple neural probes for acute in-vivo recording. It is the first micromanipulator designed specifically for use with silicon probes. **Now with 15 mm travel and higher force!**

The MPM System is simple to set up and operate. The compact design allows for independent positioning of up to five probes in the smallest space, with ample clear area for a virtual task environment.

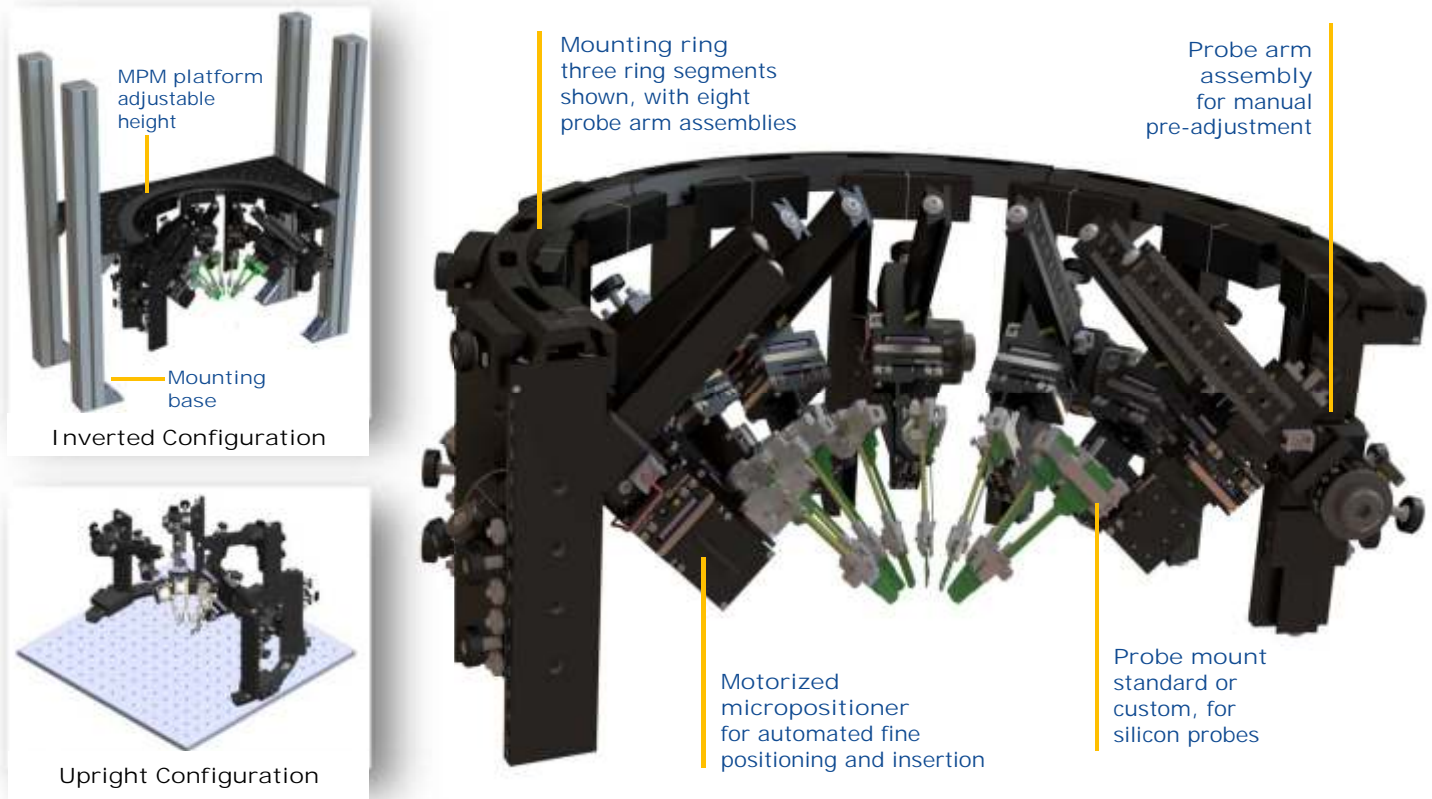
Each probe arm has four degrees of freedom for initial pre-adjustment, along with three axes of motion for automated positioning. The motorized positioners allow precise control of x-y location and z insertion depth, automatically and independently moving each probe to the optimum location in the brain.

All five micropositioners – a total of 15 axes of automated motion – are controlled from a single PC screen using the fully-integrated motion control software included with the system.

In addition to silicon probes with hundreds of channels, the MPM System is compatible with tetrodes and other probes. It can be used to simultaneously position optical waveguides or optical fibers for research combining electrophysiology with optogenetic stimulation.

Rapid and Accurate Positioning of Multiple Neural Probes

A mounting ring allows multiple probe arm assemblies to be positioned around the target. A typical setup has up to eight probes on a 216° arc. A rig can support more probes around a full 360° ring. The ring sections mount to standard laboratory tables. Alternatively, they can be mounted to the underside of an elevated platform to maximize space below the probes for animal interaction with a virtual task environment.



Intuitive PC Control Application

A single USB connects all manipulators to a PC. New Scale software allows up to eight motorized micromanipulators to be independently controlled from one window. Open additional instances of the software to control more than eight probes, on one or more rigs.

Control the fine positioning stages with a mouse, joystick or other USB input device. Choose from coarse, fine and insertion step modes. See the display of absolute axis positions as well as configurable relative axis positions. The automated probe insertion mode provides very slow z-axis motion, letting you set the speed and distance, while disabling motion for the x and y axes.

A single PC window displays up to five probe controls at once (and up to eight with horizontal scrolling).

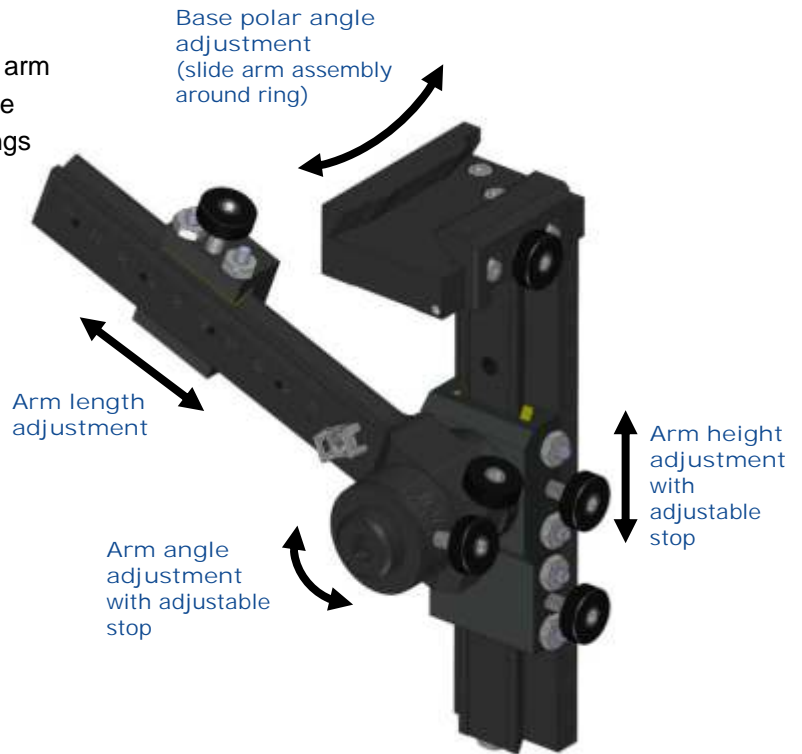
Open additional windows to control more than eight probes on one PC.



4-DOF Manual Pre-Adjustment plus 3-Axis Motorized Positioning

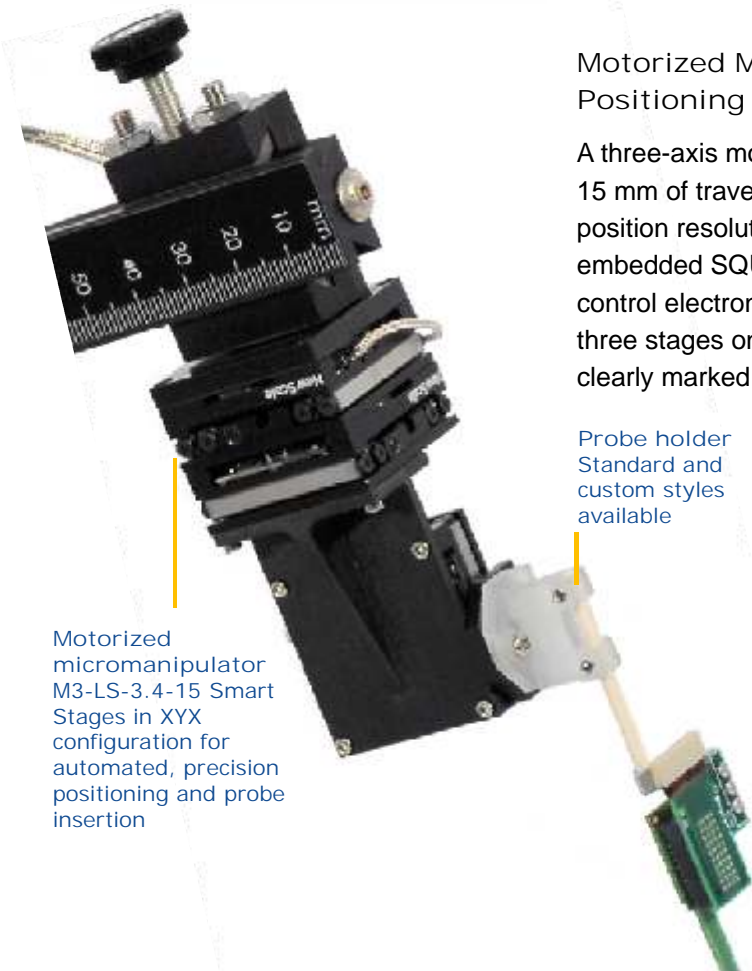
Probe Arm Assembly for Manual Pre-Adjustment (MPM-4 DOF ARM)

The polar angle, arm length, arm height and arm angle are adjustable. Adjustable stops enable repeatable positioning. Displacement markings allow registration of each probe location in stereotaxic coordinates to simplify approach angle calculations.



Motorized Micromanipulator for Automated Positioning (NEW: M3-LS-3.4-15-XYZ)

A three-axis motorized stage assembly on each arm provides 15 mm of travel along each axis with 0.5 micron closed-loop position resolution. New Scale's M3-LS Linear Smart Stages have embedded SQUIGGLE piezoelectric motors along with all drive and control electronics, eliminating the bulk of separate controllers. The three stages on each arm connect to a 3:1 USB adapter using clearly marked connectors.



Motorized micromanipulator M3-LS-3.4-15 Smart Stages in XYX configuration for automated, precision positioning and probe insertion

Probe holder Standard and custom styles available

3:1 USB adapter

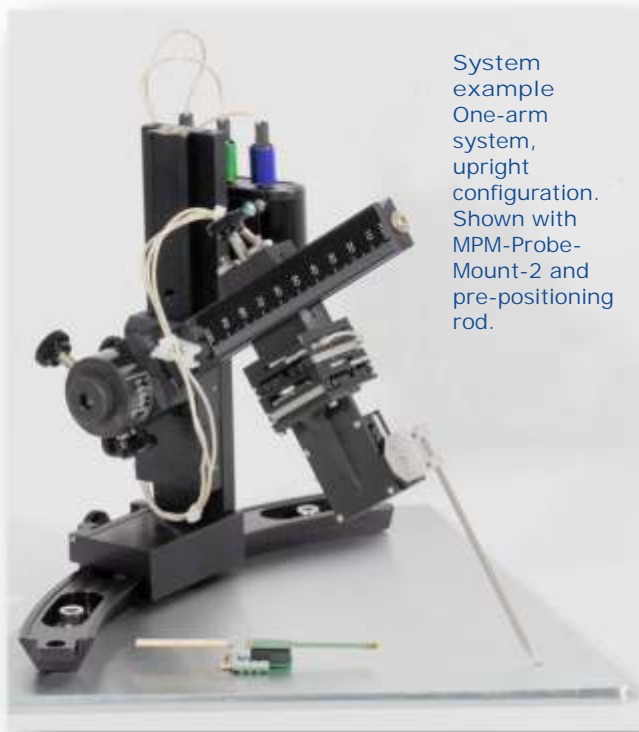


Fully Configurable, Fully Integrated

MPM Systems are fully configurable for number of probe arms, inverted or upright position, and type of probe holders.

Each system is complete and easy to assemble with the tools and hardware provided. All cables and connectors are labeled including standard USB cables to the PC. The MPM software installs on your Windows PC in minutes.

The innovative probe mounting and pre-positioning solution (see tech note) reduces setup time, minimizes risk of damage to silicon probes during setup, and maximizes data collection time.



System example One-arm system, upright configuration. Shown with MPM-Probe-Mount-2 and pre-positioning rod.

Additional information

Visit the website for videos and more information, or call us to configure an integrated MPM system for your research lab.



Specifications for motorized stages

M3-LS-3.4-15-XYZ	
Travel Range (stroke)	15 mm each axis
Payload	100 grams (recommended) 200 grams (maximum)
Linear Slide Features	Crossed roller bearings with highest stiffness
Dimensions	32 x 32 x 11 mm with embedded controller (each axis)
Speed	4 mm/s
Resolution	0.5 µm
Bi-directional Repeatability	< 5 µm
Accuracy	< 20 µm

Ordering information

Components	Description
Items Needed for Each MPM System	
MPM-System Kit	Includes mechanical hardware, instructions, USB Hub, USB cables, and MPM Software.
MPM-Ring-72-DEG	Mounting Ring Section, 72° Arc One per probe recommended. Order five for full 360° positioning flexibility.
MPM-Platform (Optional)	Platform for mounting MPM rings and manipulators in inverted configuration.
Items Needed for Each Probe	
MPM-4 DOF ARM-X	MPM Four-DOF manual positioner <i>Specify inverted or upright configuration</i> <i>X = UPRIGHT or X=INVERTED</i>
M3-LS-3.4-15-XYZ-MPM-X	Three-axis motorized micro-manipulator. Includes: (3) M3-LS-3.4-15 Linear Smart Stages assembled into XYZ configuration (1) M3-USB-3:1 Adapter <i>Specify inverted or upright configuration</i> <i>X = UPRIGHT or X=INVERTED</i>
MPM-Probe Mount-X (Optional)	Mounting bracket and kit for specific probes - contact us for standard and custom options.

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