



Shown: TRIO MPC-165-2 with Sutter IPA headstage (not included)

TRIO™ MPC-165 System 3-axis / Narrow-Format Micromanipulator System

The MPC-165 System consists of the MPC-100 controller and an MP-865 narrow-format micromanipulator.

Our new MP-865 "narrow format" mechanical is designed specifically for patch-slice work that require multiple pipettes, as well as for other setups where space is limited. We designed the MP-865 to minimize the width, allowing as many manipulators to be grouped together as possible. Travel in the Y-axis is shortened (12.5 mm) because radially oriented manipulators do not require long travel in the traverse axis. Travel in the X-axis has been increased to 50 mm to facilitate fast and easy pipette exchange. Built with the same precision cross-roller bearings and lead-screw as the MP-845 design.

The optional narrow-format tower with linear slide, or rotating base, can be added for mounting the MP-865 mechanical. With the 150 mm throw of the linear slide, the manipulator can be quickly and smoothly retracted out to a location where there is easy access to the pipette for replacement. A rotating base can be used for mounting to large platform stages like the Sutter MT 78, or smaller Sutter MD Series platforms.

The compact design of the TRIO MPC-100 integrated Rotary Optical Encoder (ROE) controller requires minimal bench space; provides quiet, fan-free operation; and is easy to use. No rack mounted controller is required. Position coordinates, in relative or absolute values, are displayed directly on the ROE. The TRIO manipulators use a logarithmic acceleration algorithm that eliminates the need for speed selection. As the knobs on the ROE are turned faster, acceleration ramps up. This allows for smooth and intuitive motion control of electrode position without the need to stop and change speeds or lift your hand from the knobs. A Y-axis lockout function (accessible by DIP switch) is also available, allowing X/Z-only axial movement during HOME and WORK repositioning. Each MPC-100 can control up to two MP-865 manipulators

Five conveniently located buttons control all the functions you will need in normal operation. Press and hold the [WORK] button to quickly store a work position; pressing [WORK] after this will return the manipulator to the same location. [HOME] sends the manipulator to a second position, often set for a point furthest from the microscope, which is useful for rapid pipette exchange. Pressing [SPEED] allows the selection of one of

4 speed ranges. With practice, there is no need to ever change speeds, however, we have included three low speed ranges for those who work at very high magnification. Holding [SPEED] for three-seconds will lock the knobs out, to prevent accidental movement. Display coordinates can toggle between relative and absolute by pressing the [RELATIVE] button; holding the button down will zero the relative coordinates. Finally, [PULSE] activates a pulse movement mode that produces small, rapid bursts of motion that can be advantageous for cell penetration with sharp electrodes. Hold [PULSE] for three-seconds to set or modify the 4th axis angle between 0 and 90 degrees.

Designed with maximum flexibility in mind, a DIP switch on the controller changes the directional movement of the ROE knobs to accommodate the preference of the user. The TRIO comes standard with a universal mounting system suitable for the most popular headstages or pipette holders.

FEATURES: TRIO MPC-100 Controller

- Controls one or two manipulators
- Sub-micron (less than 100 nm) resolution
- User selectable angle from 0 - 90 degrees via ROE input
- Fast movement with a top speed of 3 mm/sec (while homing)
- Compact, fanless, user-friendly ROE controller preserves bench and rack space
- Push button control of multiple functions - WORK, HOME, LOCK, PULSE and RELATIVE
- DIP switches on ROE select direction of movement produced by turn of ROE knob
- USB interface for computer control

FEATURES: MP-865 Mechanical

- Mechanically robust construction for high stability
- Precision cross-roller bearings
- Three independent axes - 50 mm travel in X, 12.5 mm in Y and 25 mm in Z
- Carries up to a kilogram
- Suited for *in vitro* and *in vivo* electrophysiological recording
- Universal mounting system for headstage or pipette holder
- Optional MT-73 narrow stand with linear slide and built in rotating base

TECHNICAL SPECIFICATIONS

Resolution and Full Travel

Minimal microstep size is 46.88 nanometers per microstep

Display has single micron resolution

Full travel is 50 mm in X, 25 mm in Z and 12.5 mm in Y

Maximum Speed

3 mm/second

Long Term Stability

< 0.5 micron in 24 hours

TRIO MPC-100 Control Box

6.25 in x 8 in x 5.9 in | 15.9 cm x 20.3 cm x 10.2 cm

Manipulator Weight

MP-865 (aluminum)

3.5 lbs | 1.6 kg

TRIO MPC-100 Controller

2.3 lbs | 1.04 kg

Electrical

115/230 Volts

50/60 Hertz power line