

M3-HEX-1.8, 6-DOF, Hexapod Parallel-Kinematic Positioning System with "All-in-One" Embedded Controller

Preliminary design features

- Approximate stroke at platform center with other axes at midpoint of travel:
 - X and Y ± 3 mm
 - Z ± 2 mm
 - θ_x, θ_y and θ_z ± 15 degrees
- 25 mm diameter housing
- 60 mm length from base to moving platform
- 0.5 μ m linear resolution of moving pivots
- 10 mm/sec speed of moving pivots
- 180 Hz 1st resonant frequency (payload ~ 1 gram)
- 60 Hz closed-loop bandwidth (small signal)
- Maximum payload mass/force (50 grams/0.5 N)
- 10 μ m RMS accuracy over full work space
- Holds position without power
- "Plug-and-play" embedded closed-loop controller
- 5 VDC input
- CAN Bus digital interface

World's Smallest Hexapod

Fundamental design available as a launch point for further development and customization

The M3-HEX-1.8 is the world's smallest 6 degree-of-freedom (DOF) motion system with integral controller. It was developed in 2016 as part of a project funded by the National Eye Institute of the NIH to create a "clinically-compatible, hand-held micromanipulator for hand tremor cancellation in microsurgical systems."

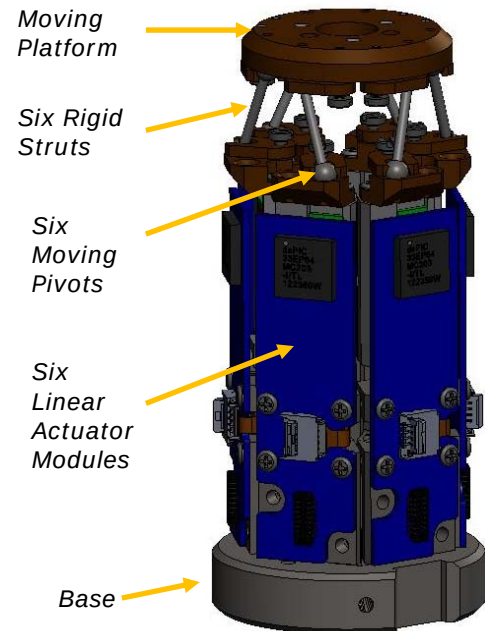
The system uses a hexapod configuration based on parallel-kinematic principles to move a single platform in X, Y, Z, θ_x , θ_y and θ_z . The design uses rigid struts with moving pivots to minimize the system diameter while maximizing the lateral force and stability of the platform.

This tiny hexapod is just one example of how New Scale Technologies enables our customers to create innovative and highly competitive products in less time. The fundamental design is available as a launch point for further development and customization in additional applications.

Learn more

Contact us to discuss a custom development program or visit <http://www.newscaletech.com/technology/custom-engineering.php>.

Preliminary



M3-HEX-1.8, 6-DOF, Hexapod
Housing is removed

Applications

- Hand tremor reduction for surgical instruments
- Automation of precision assembly and testing
- Active alignment of optical fiber waveguides



M3-HEX-1.8 in a surgical instrument
See <http://www.newscaletech.com/press-releases/pr160411.php>