

M-840 HexaLight 6-Axis Positioning System

High-Speed Parallel-Kinematics Micropositioner with Controller, to 50 mm/s



M-840 HexaLight 6D-Micropositioning System

- Six Degrees of Freedom, Travel Ranges to 100 mm/ 60°
- Rapid Response
- No Moving Cables for Improved Reliability and Precision
- Self-Locking Version M-840.DG3: Load Capacity up to 30 kg
- Direct-Drive Version M-840.5PD: Velocity up to 50 mm/s
- Repeatability up to $\pm 2 \mu\text{m}$
- Encoder Resolution up to 0.016 μm
- Significantly Smaller and Stiffer than Serial-Kinematics Systems, Better Dynamics
- Vacuum-Compatible Versions Available
- Virtual Pivot Point
- Sophisticated Controller Using Vector Algorithms
- MTBF 20,000 h

The M-840 is the ideal micropositioning system for all complex positioning tasks which rely on

Application Examples

- Biotechnology
- Semiconductor technology
- Micromachining
- Micromanipulation
- X-ray diffraction measurements
- Tool control

high accuracy and speed in six independent axes. In addition to positioning all axes, it allows the user to define the center of rotation (pivot point) anywhere inside or outside the system envelope by one simple software command.

Fast Positioning in All Six Axes

Two models of the M-840 Hexapod are available. The M-840.5PD Hexapod, which features a higher speed and direct-drive actuators, positions loads

of up to 10 kg in horizontal and up to 3 kg in random orientation at up to 50 mm/s and 600 mrad/s with micron accuracy. The DC-motor-version, M-840.DG3, is basically self-locking. It positions loads of up to 30 kg in horizontal and up to 10 kg in random orientation, and offers smallest sub-micron step sizes.

Hexapod vs. Serial Kinematics Systems

The Hexapod is driven by six high-resolution actuators all connected directly to the same moving platform. This design provides a high system stiffness and a large clear aperture. Because of the low mass of the moving platform, positioning operations can be performed with far lower settling times than with conventional, stacked multi-axis systems. In such systems, runout, guiding errors, and the friction and inertia of moving cables all accumulate to limit accuracy and repeatability—problems which do not affect parallel kinematic systems like the Hexapod.

Fixed Virtual Pivot Point

For optics and other alignment tasks, it is important to be able to define a fixed pivot point. The sophisticated Hexapod controller allows choosing any point in space as the pivot point for the rotation axes by software command. The pivot point remains fixed relative to the platform.

Target positions in 6-space are entered in user-friendly coordinates and reached by smooth vectorized motion.

Open Architecture

Control of the hexapod is facilitated by the controller's open interface architecture, which provides a variety of high-level commands and includes a

Ordering Information

M-840.5PD

Hexapod Microrobot with Controller, Direct Drive, 10 kg Load

M-840.DG3

Hexapod Microrobot with Controller, DC Motor Gearhead, 30 kg Load

Optional Photometer

F-206.iU

Photometer Card, IR Range, 2 Channels

F-206.VVU

Photometer Card, Visible Range, 2 Channels

F-361.10

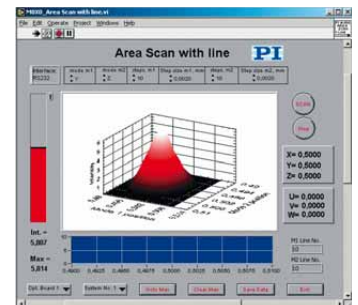
Absolute-Measuring Optical Power Meter, 1000 bis 1600 nm Wavelength

More Hexapod-Models:

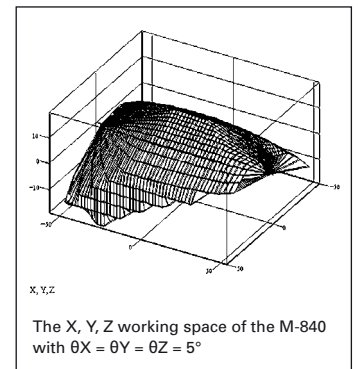
M-850 High-Load Hexapod s.p. 4-6

M-824 Vacuum Compatible Hexapod s.p. 4-10

F-206 Micropositioning System for Maximum Accuracy s.p. 4-12



HexControl software showing scan of a fiber optics component


 The X, Y, Z working space of the M-840 with $\theta X = \theta Y = \theta Z = 5^\circ$

