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>>Hexapods / Motorized Micropositioning Stages & Actuators Catalog Download Site

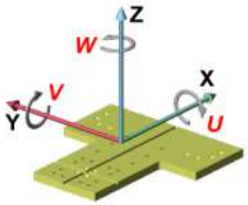
>>Micropositioning Stages and Hexapods >>Motion Controllers >>Piezo Linear Motors >>Piezo Nanopositioning Systems >>Precision Actuators >>6 Axis Positioners

F-206 Six-Axis Parallel Kinematics Positioning System

The The Latest Information on 6-Axis Hexapod Systems is Available Here



F-206 Six Axis Alignment & Positioning System



F-206 Platform is controlled in all six Degrees of Freedom

Applications

- Photonic Packaging
- Optical Device Testing
- MEMS Positioning/Alignment
- Fiber Alignment
- Micromachining
- Micro-Manipulation (Life Sciences)
- Semiconductor Handling Systems
- Microsurgery

The PI F-206 Six Axis MicroPositioning System is the result of almost 10 years of experience with design and manufacture of hexapod micropositioning systems. It provides six degrees of freedom, 0.1 µm resolution and allows the user to define the pivot-point anywhere inside or outside the F-206 envelope. Rotation about that pivot point can be specified for any axis of rotation.

The F-206 is considerably more compact and accurate than conventional multi-axis stage stacks. Its novel parallel kinematics design (see Principles of Operation) and powerful all-digital controller auto-matically compensate for unwanted and parasitic motions. It is immune to orthogonality and crosstalk issues that are a formidable assembly and service concern for stacked units.

There are none of the servo-tuning and dynamical setup procedures necessitated by the widely varying effective loads of stages in a stacked assembly, so the F-206 is truly a plug-and-play motion system that requires no servo adjustment or tuning. Its operation is fast and crisp, with identical dynamics regardless of the direction of motion.

Features

- Compact, Low-Profile Six-Axis Micro-Robot
- 0.1 µm Linear Resolution, 2 µrad Angular Resolution – Ideal for Demanding Applications
- Automatic Path Planning
- Fully Virtualized Center-of-Rotation – Pivot About any Point in Space:
  - *Fiber Endface*
  - *Lens Focal Point*
  - *Laser Beam Waist…*
- Automatic Alignment (Transverse and Angular)
- High-Speed and Fast Settling
- Digital Controller with Built-in Photometer, or Compatible with External Metrology
- LabView(TM) Drivers, DLL Libraries...

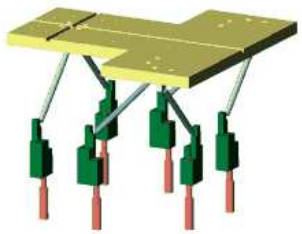
Principles of Operation

The basic operating principle of the F-206 is related to the hexapod principle. Unlike hexapods with variable length struts ("legs") the F-206 features con-stant length struts. This concept provides the follow-ing advantages over "classical" variable strut length hexapods:

- Reduced size
- Reduced inertia for further improved dynamic performance
- Independent, modular, identical drive/strut units simplifies assembly and service

All six struts are driven by individual industrial class servo motors **and encoders,** situated in one plane.

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Principle Design of F-206 Parallel Kinematics

Virtualized Rotation Capability

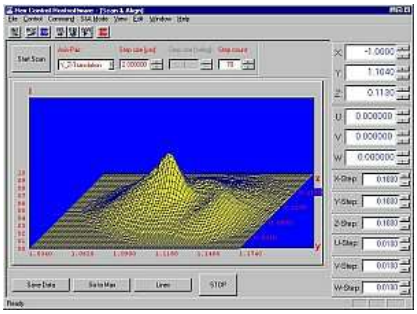
A highly useful feature is the F-206's fully virtualized rotation capability. Since its motion is not defined by fixed bearings but rather by sophisticated real-time 6-space control algorithms, you can define any point in space to be the center of rotation with a single software command. This is ideal for angular alignment of fibers since it is easy to set the pivot point to prevent "walking" of the fiber as its tip/tilt orientation is optimized.

All commands and operations are high-level using human-readable units (mm, degrees) and coordinates (X, Y, Z, Θ_X, Θ_Y, Θ_Z). The F-206 automatically manages its path planning and coordination of its six motors. An integrated photometer and built-in automatic alignment procedures add to its power in photonic packaging applications.

Software

Control of the F-206 is facilitated by the controller's open software architecture providing a variety of high level commands for minimized communication overhead & bandwidth. Other F-206 features are:

- Integrated Scan & Automatic Alignment Functions
- LabView (TM) Drivers and DLL Libraries
- Simulation Tools Terminal Software



HexControl Software showing Optical Device Scan

Controller

- Digital Multi-Axis Servo Controller
- Built-in Photometer
- Built-In 12-bit Analog Input Port
- Wide Range Power Supply (100-240 V, 50/60 Hz)
- Optional Manual Controls (Keyboard/Monitor)
- Easy Firmware Update Function
- Well Documented Compact RS-232 High Level Command Set



Manual Control Option

The F-206.MC6 option is a useful addition for simplifying test and setup procedures. It consists of a board that plugs into the F-206 controller and a control pad with six digital "potentiometer" knobs (one for each degree of freedom). The control pad allows manual step-by-step operation of the platform with a programmable step size.

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External positioning input (via the RS-232 interface) can be mixed with manual positioning input. Both operate on the same position registers of the F-206 controller.



Technical Data Technical Drawings

New Micropositioning Systems Selection Guide: Click Here

Hexapods Piezo Nanopositioning Catalog Capacitive Sensors Nanopositioning Micropositioning PI USA German Site
Piezo Linear Actuator Capacitive Sensor Micropositioning Hexapod Fiber Alignment Motion Control High Speed Steering Mirror Nanopositioning System Piezo Design Piezo Driver Micropositioning

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