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[>>Hexapods / Motorized Micropositioning Stages & Actuators Catalog Download Site](#)

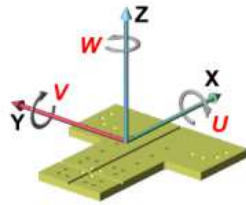
[>>Micropositioning Stages and Hexapods](#) [>>Motion Controllers](#) [>>Piezo Linear Motors](#) [>>Piezo Nanopositioning Systems](#) [>>Precision Actuators](#) [>>6 Axis Positioners](#)

## 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 PIF-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  $\mu\text{m}$  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

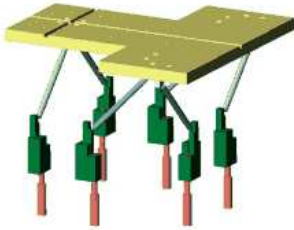
- Compact, Low-Profile Six-Axis Micro-Robot
- 0.1  $\mu\text{m}$  Linear Resolution, 2  $\mu\text{rad}$  Angular Resolution – Ideal for Demanding Applications
- Automatic Path Planning
- Fully Virtualized Center-of-Rotation – Pivot About any Point in Space:
  - *Fiber Endface*
  - *Lens Focal Point*
  - *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 constant length struts. This concept provides the following 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.



Principle Design of F-206 Parallel Kinematics

## Virtualized Rotation Capability

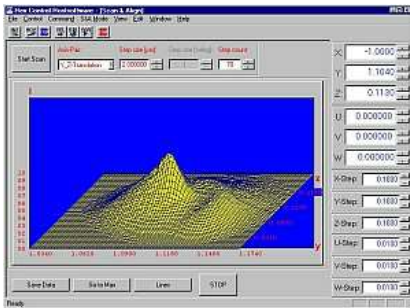
A highly useful feature is the F-206's fully virtualized rotation capability. Since its motion is not defined by fixed bearings but rather by sophisticated real-time 6-space control algorithms, you can define any point in space to be the center of rotation with a single software command. This is ideal 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,  $\Theta_X$ ,  $\Theta_Y$ ,  $\Theta_Z$ ). 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:

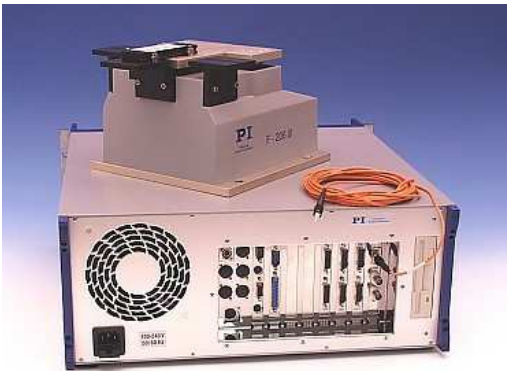
- Integrated Scan & Automatic Alignment Functions
- LabView (TM) Drivers and DLL Libraries
- Simulation Tools Terminal Software



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.

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.



[New Micropositioning Systems Selection Guide: Click Here](#)

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