# PZ-2000FT Series Automated Stage with Piezo Z-Axis Top Plate

The PZ-2000FT XYZ stage has been specifically designed to provide a high resolution, and highly repeatable, means of controlling the X, Y, and Z position of the microscope stage. The XY axes derive their precise control through the use of closed-loop DC servomotors employing high resolution rotary encoders for positioning feedback. By using closed-loop control for stage position, there is not chance that the stage will become lost, as can occur with open-loop microstepped stages after a number of moves and direction changes. The XY stage utilizes crossed-roller slides, high precision lead screws, and zero backlash miniature geared DC servomotors for smooth and accurate motion. The top plate of the stage accepts standard K-size slide inserts that are available for any sample, i.e., slides Petri dishes, multi-well plates, etc... The slide insert is moved in the Z-Axis via a piezo element with a range of 150 μm with nanometer accuracy (300 μm & 500 μm range is also available). By moving the sample in the Z-Plane, any objective can be used, eliminating twisting wires or needed spacers as required when a piezo element is put onto a single objective. The microprocessor-controlled MS-2000 control unit provides for RS-232 and USB communication with a host computer for control of the XYZ axis.
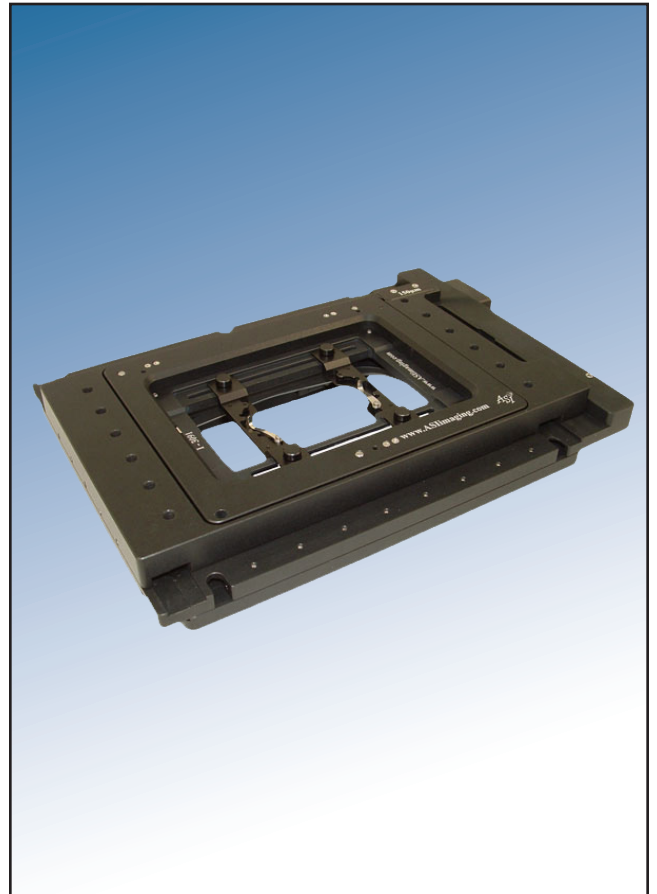
Features

- Flat stage top allows easy placement of micromanipulators on either side
- Closed-loop control of the X, Y, and Z-axes for precise positioning and highly repeatable focusing
- Wide dynamic speed range with adjustable trapezoidal move profiles
- Smooth Adjustable dual-range joystick control
- Backlit LCD display shows X, Y, and Z coordinates
- "Zero" and "Home" buttons for simple stand-alone operations
- Compact ergonomic tabletop control unit size is 6"D x 9"W x 3"H (9 x 23 x 16.5 cm). Rack mount controller with stand-alone joystick is also available
- Travel Range will scan full well plate in most circumstances
- Proven operation with many software packages

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PZ-2000FT Options

- XY axes Linear Encoders for high-accuracy positioning. Linear encoder resolution is 10 nm, with a scale accuracy of 0.3 µm per 10mm and 3 µm per 100mm. Positioning resolution at sample is < 50 nm.
- Auto Focus (requires NTSC or PAL composite video signal).
- ASI's proven line of Z-axis drives can also be added to the fine focus shaft of the microscope to provide Z-axis positioning with a resolution of 50 nm throughout the range of the microscope's travel. The piezo unit can then be used for fast and accurate Z-axis positioning to any point within the range of travel.
- Other lead screw pitches are available for faster XY translation, or for more precise positioning when using standard rotary encoders.

Product Compatibility

- Leica – DMI3000, DMI4000, DMI5000, DMI6000, DMIRB, DMIRBE, DMIRE, DMIRE2
- Nikon – Diaphot Eclipse TE2000, Eclipse Ti
- Olympus – BX50WI, BX51WI, BX61WI, IX70, IX71, IX81
- Zeiss – Axiovert 200, Axio Observer

ADEPT Piezo Controller Specifications

Specification	PZ-2150FT	PZ-2300FT	PZ-2500FT
Piezo Travel Range (+/- 5%)	150 µm	300 µm	500 µm
Piezo smallest move / resolution*	2.2 nm	4.5 nm	7.6 nm
Maximum Load for full range travel	2Kg	1Kg	1Kg
Transient Response time**	11 – 15 ms		
External Analog input (BNC)	0 to 10 Volts		
Maximum Input Frequency	20 Hz		
Maximum Continuous Output Current	13mA		

**Time taken to travel 10%-90% for moves below 30% travel range with 600 grams load.*

Specifications for Standard Configuration

XY axis range of travel	120 mm x 110 mm
XY axis resolution (encoder step)	0.088 µm
XY axis lead screw accuracy	0.25 µ/mm
XY axis RMS repeatability	< 0.7 µm
XY axis maximum velocity	7 mm/sec

In external input mode, use of a higher bit DAC will increase resolution. For example a 0-10 analog voltage from the DAC results in the following:

PZ-2150FT

External Analog input	Steps	Resolution
16 Bit DAC	65536	2.2 nm
17 Bit DAC	131075	1.1 nm
18 Bit DAC	262144	0.55 nm