

# Zyvex S200 Nanomanipulator

The Premier Choice for Nanomanipulation Inside a High-Resolution Imaging Tool

## Features and Benefits

Patent Pending

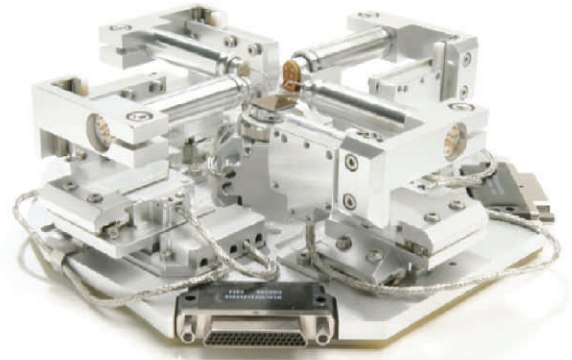
The Zyvex S200, part of the NanoWorks® Tools product line, is a manipulation and testing tool used with a scanning electron microscope (SEM) or a focused ion beam (FIB) system for micro-and nanoscale research and development applications.

The system consists of a state-of-the-art Zyvex Nanomanipulator, a control cabinet, PC, a joystick, and Windows based software to control the system.

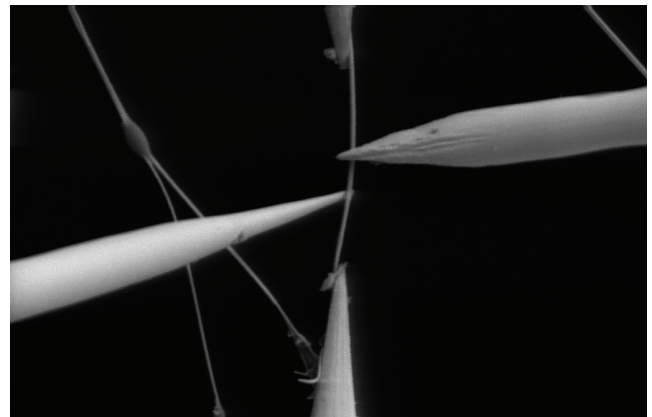
The S200 is specifically designed for research and development labs in universities, national facilities, and industry. The system is easily installed and removed by the user allowing the SEM/FIB to be quickly converted between imaging only and nanoscale manipulation applications. The system is also flexible enough to work with a wide range of electrical, mechanical, and other test equipment through the patch panel on its control cabinet.

The S200 has a coarse mode which provides controlled Cartesian motion over large distances (12 mm of travel with 50 nm resolution) and a fine mode for extremely smooth and precise motion (70 microns of travel with 2 nm resolution). Zyvex NanoEffector® Probes have a tip radius of 50 nm or better and a smooth taper to tip that allows multiple probes within a small area. Each positioner contains 5 I/O channels, for a total of 20 independent electrical connections inside the SEM.

The S200 is a versatile tool that is designed to provide the best possible nanomanipulation platform for a multitude of applications. Researchers on a budget can design their own characterization packages to integrate with the S200 or purchase specific characterization packages from Zyvex. Our Applications Group is constantly working on new enhancements for the system in the area of mechanical, electrical, and thermal characterization.



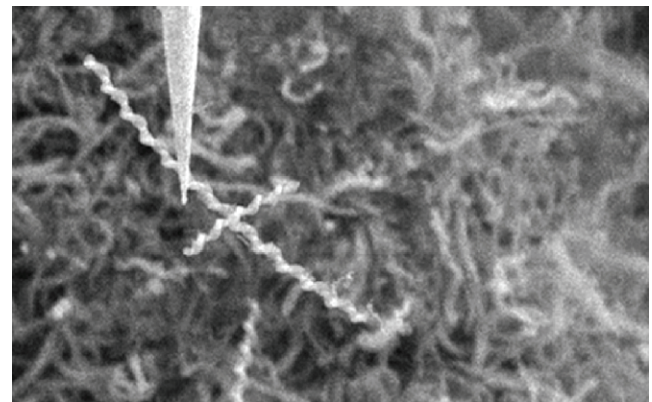
One of many S200 head designs configured with three NanoEffector® Probes for probing a variety of nanostructures.



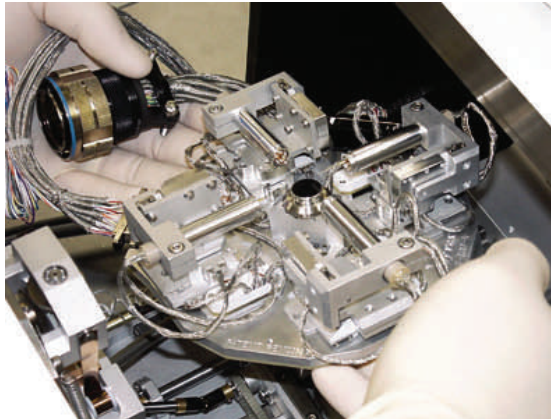
Four Zyvex NanoEffector® Probes manipulating and characterizing a 20 nm germanium nanowire.

## Applications

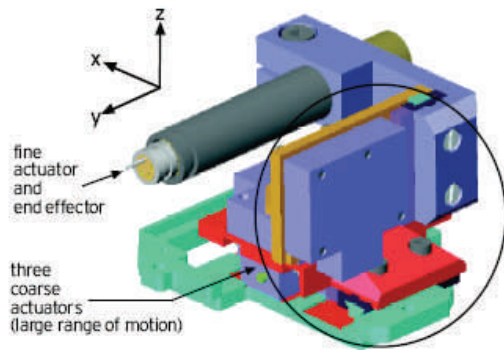
- Electrical characterization of nanostructures (Additional equipment needed)
- Mechanical characterization of nanostructures (Additional equipment needed)
- Micro- and nanoassembly
- Sample preparation for TEM, Raman, and other characterization tools
- Surface science experiments
- Nano-interconnect R&D
- *In-situ* nanoscale sample positioning



A NanoEffector® Probe isolating and removing a coiled carbon nanotube for further characterization.



Zyx's S200 head unit installs quickly and efficiently in an SEM chamber.



Close-up of a 3 degree-of-freedom positioner.



The S200 control cabinet is compact, versatile, and suited to any lab environment.

## Zyx S200 Technical Specifications

### Positioners

- Number of positioners: 1 to 4
- Open Loop
- X, Y, Z course resolution: 50 nm
- X, Y, Z fine resolution: 2 nm
- X, Y, Z range of motion: 12 mm
- Degrees of freedom: 3
- I/O per positioner: 5
- Top speed: 3 mm/s

### Sample Holder

- Max sample size: 12 mm X 12 mm X 4 mm

### Software and Control

- Windows-based operating system
- PC controller software
- Joystick
- 5 BNC I/O Channels per positioner

### SEM Mounting

- User installable and removable
- Custom mount design on SEM stage
- Single electrical feedthrough

### Ultra Sharp NanoEffector Probes

- Better than 50 nm tip radius
- Smooth taper to tip
- 99.9% pure tungsten

### Optional Z Center Stage

- Range of motion: 12 mm
- Resolution: 50 nm
- Compatible with load lock integration package
- Max sample size: 12 mm X 12 mm X 4 mm

### System: Prober

- Operating voltage: 240V AC

## Additional Accessories

- Zyx NanoEffector ultra sharp probes
- Z Center Stage Sample Holder
- Load Lock Integration Package (only available at order)
- Advanced anti-contamination system (Optimizer)

## Applications Packages

- DC Electrical Characterization Package
- CV Characterization Package
- Force Characterization Package
- EBC Characterization Package
- Low Noise Characterization Package
- Temperature Characterization
- Microgripper Package

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