

# Zyvex dProber™

The Door-Mountable Solution for the Semiconductor Failure Analysis Industry

## Features and Benefits

The Zyvex dProber™, part of the NanoWorks® Tools product line, is designed and optimized to electrically probe sub-100nm features on semiconductor devices with increased throughput and ease of use.

The system consists of a state-of-the-art, six positioner Zyvex Nanomanipulator and XYZ sample stage, a parametric analyzer, an advanced anti-contamination system, an industrial grade load lock, and custom software to control and integrate each component.

The dProber is a standard system mounted on a custom door designed to replace the door of the customer's Scanning Electron Microscope (SEM) or Focused Ion Beam (FIB) System. The dProber can be coupled with a new SEM/FIB or with an existing SEM/FIB to reduce the total cost to the customer.

The system has six positioners with 5 nm resolution of movement. The user manipulates the probes and positioners using a high precision Hall Effect joystick. The software provides accurate control by tuning the motors and joystick to each user's preference.

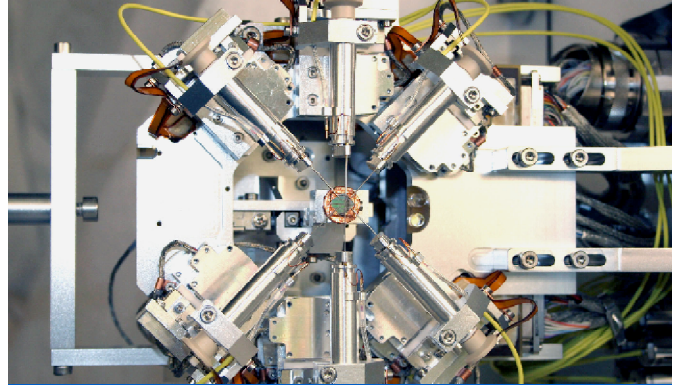
The center sample stage moves independently of the probes in the XYZ directions for higher throughput and easier site-to-site navigation. This greatly reduces the amount of probe movements and consequently increases probe lifetime. The load lock is mounted on the Zyvex door and is designed for quick transfer of samples in an ultra-clean environment.

An easy-to-use Windows-based software platform seamlessly integrates all of the components of the dProber. The software also provides instant feedback to the user and a powerful scripting engine.

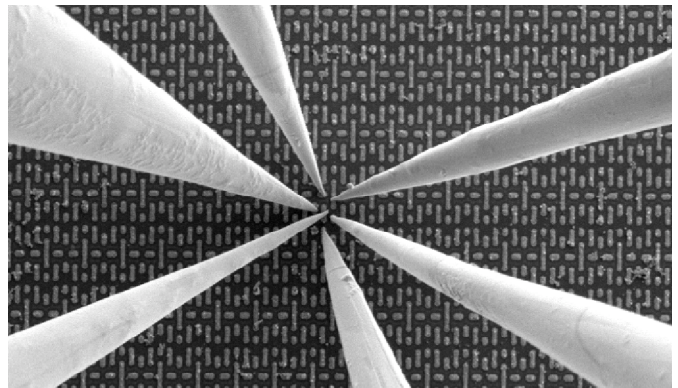
The dProber's electrical characterization system is specifically designed for low-noise measurements. Our most advanced anti-contamination system rigorously cleans the SEM/FIB, enabling the user to achieve superior ohmic contact. The dProber increases throughput and provides for more applications than the usual four-positioner system.

## Applications

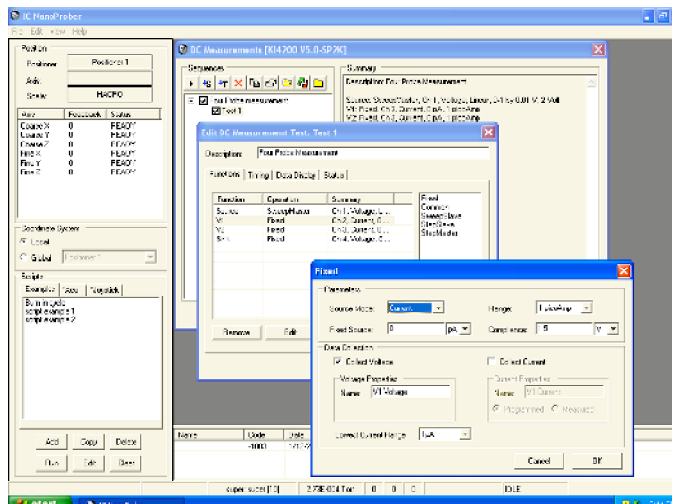
- Electrical characterization for device quality or failure analysis
  - 6-point probing
  - 4-point probing
  - Butterfly curves
  - Kelvin probing
  - Contact-level probing
  - Metal 1-level probing
- Nanostructure/nanomaterial/nanointerconnect R&D
- Surface science experiments
- Assembly and basic manipulation at the nanoscale



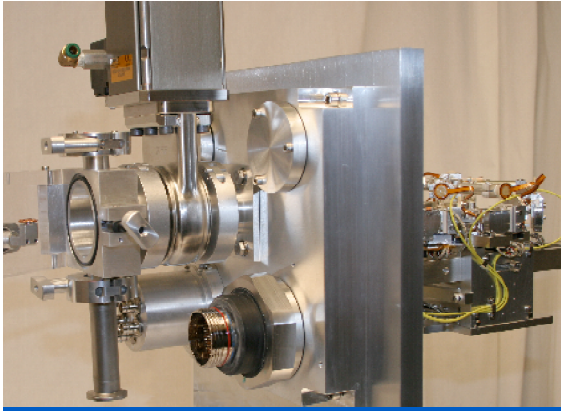
The dProber Head Unit with six positioners and an independent XYZ sample stage.



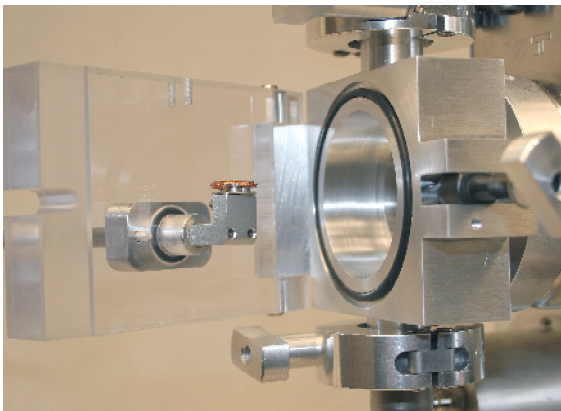
Using six probes to obtain butterfly curves on 65 nm geometry at Metal 1.



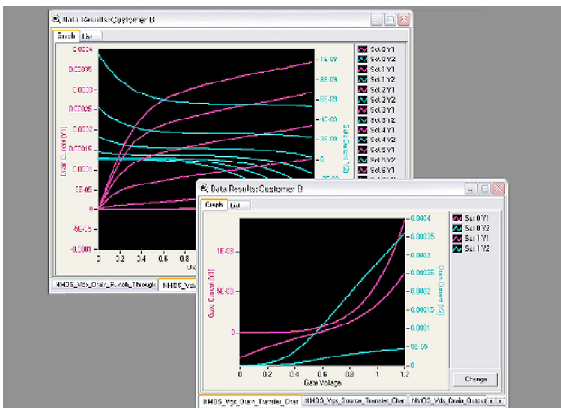
Zyvex's software provides complete control of the system. The DC measurement module (shown here) controls the Keithley 4200.



Zyvox dProber door assembly includes nanomanipulator head, load lock, low-noise, and two open ports.



Zyvox dProber load lock with sample and sample exchange piece loaded.



Zyvox's DataViewer software displays transistor characteristics from 90 nm node technology (probed at the contact level).

## Zyvox dProber Technical Specifications

### Positioners

- Number of Positioners: 6
- X, Y, Z coarse resolution: 100 nm open loop
- X, Y, Z fine resolution: 5 nm open loop
- X, Y, Z range of motion: 10 mm
- Degrees of Freedom: 3
- I/O per positioner: 5

### Center Stage

- X, Y Range of motion: 25 mm
- Z Range of motion: 12 mm
- X, Y, Z resolution: 100 nm open loop
- Max Sample Size: 12 mm X 12 mm X 4 mm

### Electrical Measurement Capabilities

- 0.1 fA resolution
- Better than 200 fA accuracy
- Max Voltage per positioner: 100 V
- Max Current per positioner: 200 ma

### Software and Control

- Windows-based operating system
- Joystick movement
- DC measurement module
- Anti-contamination system module
- Load lock module
- Scripting engine
- Data archiving module (DataViewer)

### Load Lock

- Industrial grade UHV load lock
- Custom sample holder and exchange piece
- Scripted procedure (if required)
- Pneumatic gate valve

### System

- Operating Voltage: 220V and 115V
- Facilities: Air/Nitrogen: Nitrogen and 80%Oxygen/20%Argon mix

## Additional Accessories

- Zyvox NanoEffector® ultra-sharp tungsten Probes
- Temperature characterization package
- Image capture package

To place an order, call us toll-free at 1.877.ZYVEX99 (1.877.998.3999) ext. 271 or direct at 972.792.1671. For the most up-to-date information, please visit our web site at [www.zyvox.com](http://www.zyvox.com) or email [sales@zyvox.com](mailto:sales@zyvox.com).

