The ProbeWorkstation is a powerful, dedicated system for electrical characterization of semiconductor devices and advanced materials in SEM and FIB.

The optimal combination of our market-leading nanomanipulation and probing products provide you with a versatile, integrated solution for failure analysis and R&D applications requiring stable, low-current measurements.

The system is optimized for electrical measurements on semiconductor technologies down to 7 nm and beyond. It offers unsurpassed stability, extreme precision, and the flexibility to allow you to configure your setup to meet your specific needs.

**APPLICATIONS**

- Failure analysis
- Qualifying high-k gate materials
- Low-current transistor testing
- Four-point probing
- EBIC, EBAC, RCI, EBIV, EBIRCH, and Active Potential Contrast analysis
- Current Imaging
- Characterization of advanced materials and structures e.g. nanowires, ultra-thin films
- Nanoscale assembly and manipulation

**COMPONENTS**

- Up to eight micromanipulators with low-current measurement capability
- Precision substage with three axes for independent sample positioning
- Shuttle load-lock platform
- EBIC Characterization System
- Advanced Probing Tools GUI:
  - An advanced software suite for maximum probing efficiency - including the following modules:
    - iProbe
    - Live Contact Tester
    - Tip 2 Tip Tester
    - Transistor Test
    - Safe Tip Approach
    - EBIC control
    - Current Imaging module
    - Keithley Remote access
    - Tip Cleaning
- Electronics rack

Next generation technology has allowed us to dramatically reduce the size of our micromanipulators. This innovation, coupled with our new Shuttle platform, has enabled the creation of the world's smallest load-lock compatible probing system.

A load-lockable system offers the advantages of higher throughput, fast probe tip exchange, reduced sample contamination and unrestricted access to the microscope when the probe system is not required.

Contact us at info@kleindiek.com or find your local agent at www.kleindiek.com
The Current Imaging system is used to generate current maps - similar to pico-current cAFM. The APT wizard provides detailed, animated step-by-step instructions for a number of tasks. Probe needles:
- Tungsten needles with tip radii down to 5 nm
- Individually packaged in protective atmosphere and ready for use without further processing
- Pre-bent tips available upon request
- Easy tip exchange outside the microscope

SEM and FIB load-lock compatibility – for fast cycle times and increased chamber cleanliness.

Simple integration into your existing SEM or FIB/SEM tool.

Streamlined, low-leakage triax cabling between 19" electronics rack and SEM flange.

Software controlled signal switching matrix, no rewiring necessary.

Completely nonmagnetic materials: compatible with any SEM/FIB (including "immersion lens" type columns).

Low profile design allows for small working distances down to 2 mm - enabling low-kv imaging.

Probing at FIB tilt for in-situ circuit edit applications.

Compact, extremely stable design guarantees < 1 nm/min drift: ready for 7 nm and beyond.

Live Contact Tester provides real time IV-traces: quickly optimize contact resistance.

Integrated Scanning Probe Microscope: Current Imaging module can be used to scan a probe or the substrate using well-defined current paths.

Electrical Fault Isolation using EBIC, EBAC, EBIV, RCI, EBIRCH, etc. Easy integration using the microscope’s auxiliary video input, EBIC image acquisition by SEM software.

Tip Clean module provides a means for decontaminating tips in-situ.

Single unified software interface (APT) for driving the probe tips and controlling all measurement functions (incl. Keithley 4200 operation).

Vacuum side hardware compatible with in chamber plasma cleaning (Evactron, IBSS, FEI, ...)

TÜV and SEMI certified system.

Keithley recipe builder for custom recipes and batch processing.

Air side hardware housed in 19" electronics rack that can be parked out of the operator’s sight - thus contributing to a tidy work environment as well as making it easy to move the nanoprober from one tool to the next.

**Current Imaging System**
- Similar to cAFM and pico-current imaging
- Generate map of current flow
- Arbitrary current paths configurable
- Quickly navigate to ROI in SEM
- Generate images in a manner of seconds
- Quickly locate opens/shorts/leakages in scanned area

**Probe needles**
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**EBIC Characterization System**
- Detect opens in integrated circuits
- Visualization of p-n junctions
- Localize resistivity changes in via chains
- Adjustable video output level
- Gain 10⁴ to 10¹⁰ V/A