



RHK Technology
Imaging the Future of Nanoscience

2008 RHK PRODUCT LINE

integrated surface science solutions

uhv VT afm/stm
uhv LT QuadraProbe™
uhv afm/stm/SEM
specialty systems
universal spm controls
lifetime support



RHK HISTORY

Everyday, in university and government labs around the globe, RHK research platforms lead to new discoveries in nanotechnology. Founded in 1981, RHK Technology brings over 25 years of experience to the design and manufacture of advanced UHV SPM instruments. Our installed base continues to grow and now includes over 130 systems and 1000 controllers.



RHK's surface science systems integrate only the best analytical and preparation instruments from top industry suppliers. To further advance products and performance, we consult top scientists in our Technical Advisory Board as well as customers confronting new research challenges.

RHK is **highly respected** for powerful SPM controls, thoughtful **hardware design**, and intensive service and **lifetime support**

RHK delivers compelling value and proven quality to broaden the frontiers of atomic scale research. We stand ready to meet your specifications and exceed your expectations.

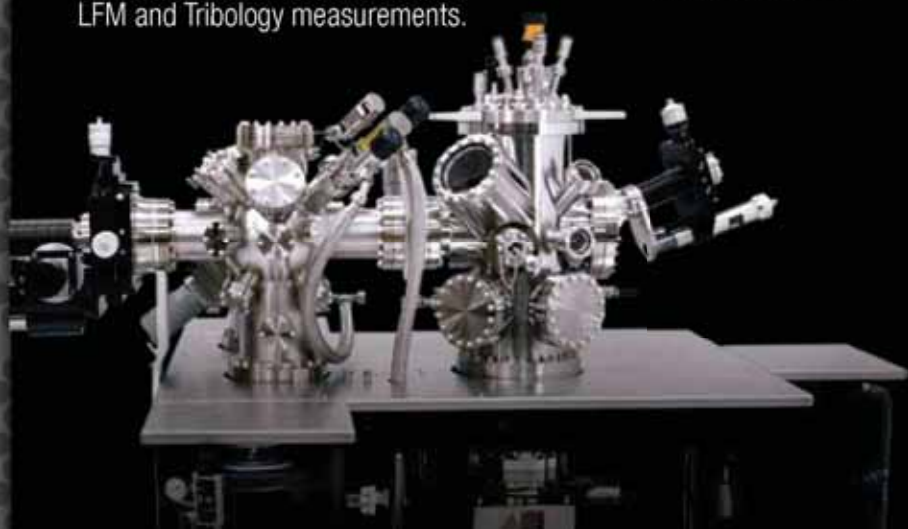
PRODUCT OVERVIEW

[uhv VT afm/stm]

RHK systems are carefully configured for your specific research requirements: STM or AFM/STM, VT from 25K to 1500K, specialized chamber designs, and sophisticated surface prep and analytical instruments. The full potential of your system is unleashed with our SPM 1000-XPMP control platform.

Key design Advantages:

- Inherently rigid, symmetrical Beetle Scanhead provides maximum stability and lowest drift.
- Thermocouple in direct contact with sample delivers accurate temperature measurement.
- AFM head and its alignment optics scan as a unit for true quantitative LFM and Tribology measurements.



[uhv afm/stm/SEM]

RHK unites the speed and convenience of SEM-guided probe placement with uncompromised VT-AFM/STM performance and resolution.

Enjoy more results in less time: With both particle and probe in the SEM's outstanding field of view, navigating tip to feature is fast and sure.



Image of STM Probe

SEM image of STM probe and gold grid.
Z. Wang, S. Pryadkin RHK Technology, Inc.





[research driven modularity]

Forethought in engineering is an ongoing achievement at RHK. Our building block design allows customers to fully upgrade their instruments at a fraction of the price of a new system.

Easily integrate new, powerful capabilities without obsoleting current equipment. Modular upgrades for your SPM provide a fast, economical path to expand the scope of your research.

RHK's history of affordable modular upgrades reflects a special commitment to protecting your investment over a lifetime.

[universal spm controls]



SPM 1000 featuring XPMP Software provides real-time data acquisition, analysis, and image processing.

- XYZ Drift Correction with pattern matching
- Automatic atom tracking across surface
- Nanolithography routines for atomic manipulation.
- Advanced spectroscopy techniques
- DataSAFE protects each line and image
- Hardware slope correction

PLLPro™ NC-AFM Control System: Universal connectivity and control for any AFM scan head and AFM mode.

- Contact, non-contact, intermittent contact, and lock-in.
- Fully digital AFM control
- User scripting for advanced routines

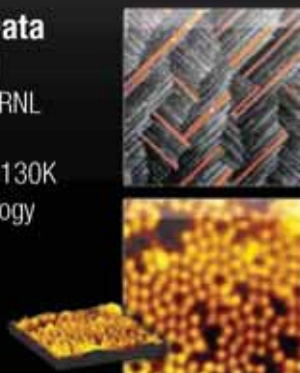


QuadraProbe™ Data

Top: Yttrium on Si(100)
Kim, Li, Wendelken - ORNL

Bottom: Si (111) 7x7 - 130K
Z. Wang - RHK Technology

More data at:
www.rhk-tech.com



[uhv LT QuadraProbe™]

RHK brings you an advanced nanotechnology platform ideal for device level research. Our QuadraProbe features four independent, cryogenic, atomic resolution probes, plus a high resolution SEM and true 10K LT capabilities. Tying everything together is RHK's unified control interface.



QuadraProbe™ Control System

Unified Controls: A single, intuitive user interface controls coarse positioning and scanning for each of the four probes.

Modular Probe Design

RHK's unique platform enables a single probe be expanded up to four probes as your research needs evolve. In addition the QuadraProbe readily integrates advanced surface preparation and analytical instruments.



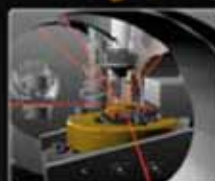
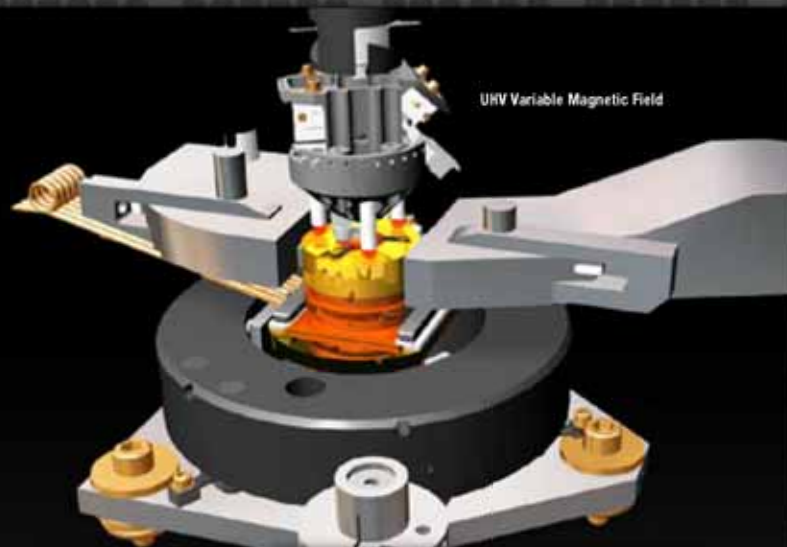
[specialty applications]

Optical and Visual Access

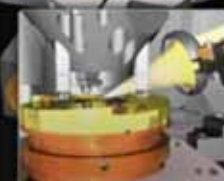
Direct line-of-sight access from multiple SPM viewports and angles makes RHK ideal for combined SPM-optical studies. RHK chambers readily accommodate beam incidence-reflection techniques, in situ lenses to focus beams at tip-sample junction, and inverted viewports to bring optical fiber closer to samples.

Variable Magnetic Field (VMF)

RHK's unique electromagnet design delivers a reversible and continuously variable field up to 3000 Gauss in plane with a sample size of 1 cm. No compromise is made in resolution, drift, stability, or vibration isolation. The field can be varied real-time while imaging without retracting the probe from the sample.



Multiple, Direct Lines-of-Sight

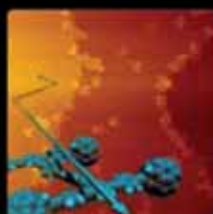


In Situ Lens



Inverted Viewport

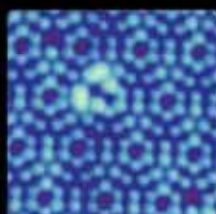
[research results]



RHK UHV 3000 STM

Single-molecule "nanocar" containing chassis, axles and four Buckyball wheels.

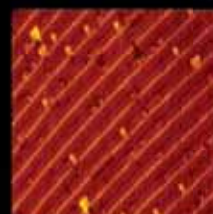
K. Kelly, Y. Shira, A. Bigood, Y. Zhao, J. Tour (Rice University)



RHK UHV 7000 STM

Chlorodecane on Si(111)-(7x7): Self-assembling nanocrystals show spontaneous reactions that alter surface electrical properties.

J. Palanyi, S. Datta, K. Rajanna Marikumar, P. Sloan (University of Toronto)

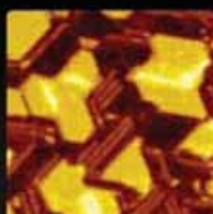


Omicon STM1

w/RHK SPM 1000 Controller

Si(111): Etching with Cl₂, flashed to 650K. Dark row portions at top reveal preferential removal of monomer units.

J. Weaver, R. Butera, (University of Illinois at Urbana-Champaign)



RHK UHV 3000 STM

Sulfite and Sulfate on Ag(111) The sulfite and sulfate intermediates on Ag(111) after reacting sulfur dioxide with the Ag(111)-p(4x4)-O surface at 300 K.

L. Zhou, W. Gao, R. Madix (Harvard University)

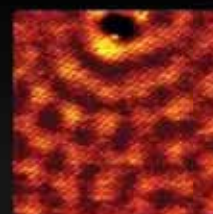


Homebuilt Confocal

w/RHK SPM 1000 Controller

Fluorescence image of DNA deposited on glass using green and red channels with 1 µm pixels.

A. Brackbauer, K. Rodolfo, D. Zhou, Y. Korchev, D. Klenerman (University of Cambridge, Imperial College London)



Homebuilt LT

w/RHK SPM 1000 Controller

Cu(111) imaged with V=20 mV and I=0.3 nA. A defect at the top part of the image produces a standing charge wave with 10 nm corrugation.

B. Aberts, U. Schwarz (CRISP, Yale University)

[lifetime support]

RHK's intensive, personalized service starts in the earliest design consultations. It extends through hands-on training with an RHK scientist at your site. Our expert technical support then continues for the life of the product at no charge. With over two decades of UHV SPM hardware, electronics, and software experience, RHK delivers the outstanding products and deep continual support crucial to achieving your research objectives.



Online Resource: Software, manuals, and product literature are all available for download in the support section of our website.

Our monthly newsletter features the top Image of the Month as well as useful tips. Email News@rhk-tech.com to sign up.