

Park Systems

Leading innovation in emerging nanoscale microscopy
and metrology technology



www.parkAFM.com

Park
SYSTEMS

Park Systems

Enabling Nanoscale Advances

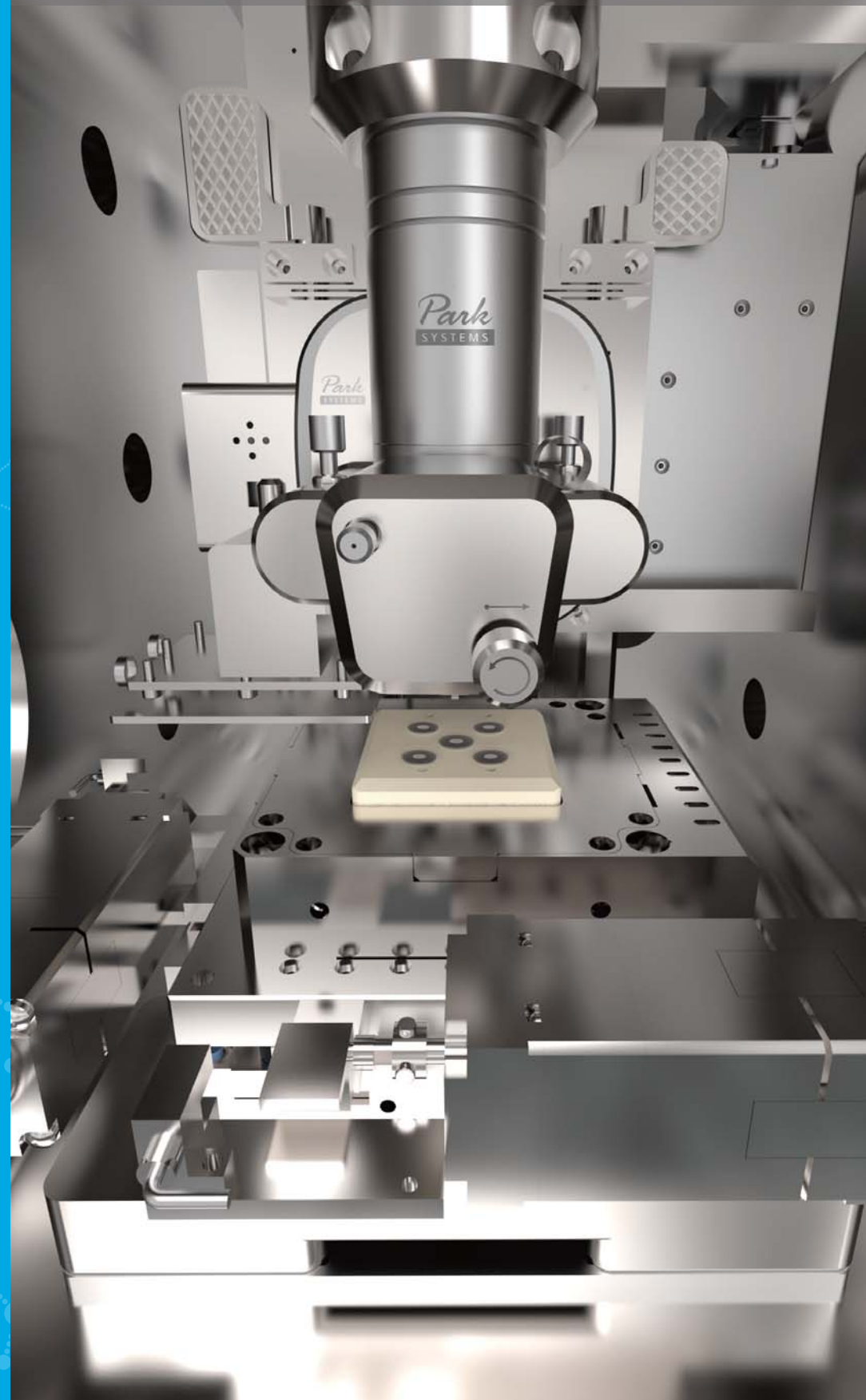


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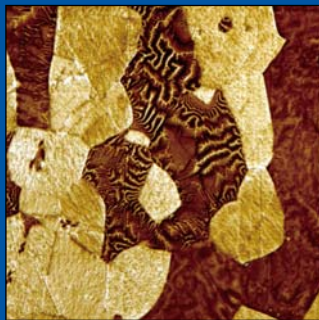
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Park Systems at a glance

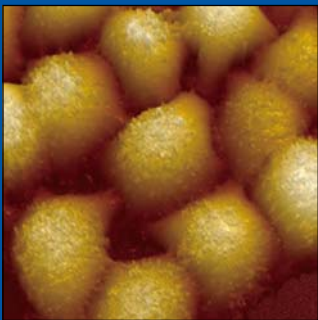
Playing a critical role in the development of AFM technology, Park Systems has remained the leading innovator in nanoscale microscopy and metrology throughout its long history and continues to invest in the development of new emerging technologies. With headquarters in Korea, the US, Japan, and Singapore, we create some of the world’s most accurate and most effective AFMs for research and industry. Our team is constantly striving to continue meeting the needs of scientists and engineers worldwide. As the global microscopy market grows rapidly, we will continue to innovate and develop new systems and features that make our products the most effective and most efficient nanoscale microscopy there is.

We are who we serve: Our customers and their applications

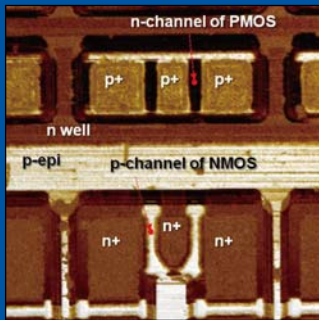
Products from Park Systems are used by some of the most notable researchers and corporations across the globe. We strive to meet the needs of our clients by constantly working to create the most accurate, easy to use nanoscale microscopy technology available.



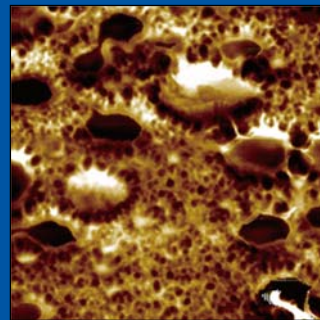
Materials, Chemisty
Stainless steel
MFM
Scan size: 5 μm x 5 μm



Life Science, Medicine
HeLa cell
SICM
Scan size: 80 μm x 80 μm



Electrical, Semiconductor
SRAM device
SCM
Scan size: 15 μm x 15 μm



Fusion research
Silica/Polymer
Adhesion
Scan size: 3 μm x 3 μm



All product names, logos, and brands are property of their respective owners. All of their company, product and service names used in this brochure are for identification purposes only.

We are proven

Park Systems was founded by one of the original developers of atomic force microscopy with a mission to bring the world's most accurate nanoscale metrology and imaging instruments to a broad market. Today, our products are used by leaders in both science and industry, allowing them to make revolutionary breakthroughs, develop incredible products, and increase their productivity.

In December 2015, Park Systems held its IPO, joining the KOSDAQ Composite Index. We hold several unique distinctions such as being the first company listed on the KOSDAQ to receive multiple "AA" ratings on technical evaluations of our technologies. We are also proud to currently be the only Atomic Force Microscopy manufacturer to have gone public. All other manufacturers have stayed private or became part of public companies via mergers and acquisitions.

1997

The AFM Technology Innovator

1982

The Birthplace of AFM

1988

The First AFM Company



Prof. C.F. Quate

Dr. Sang-il Park



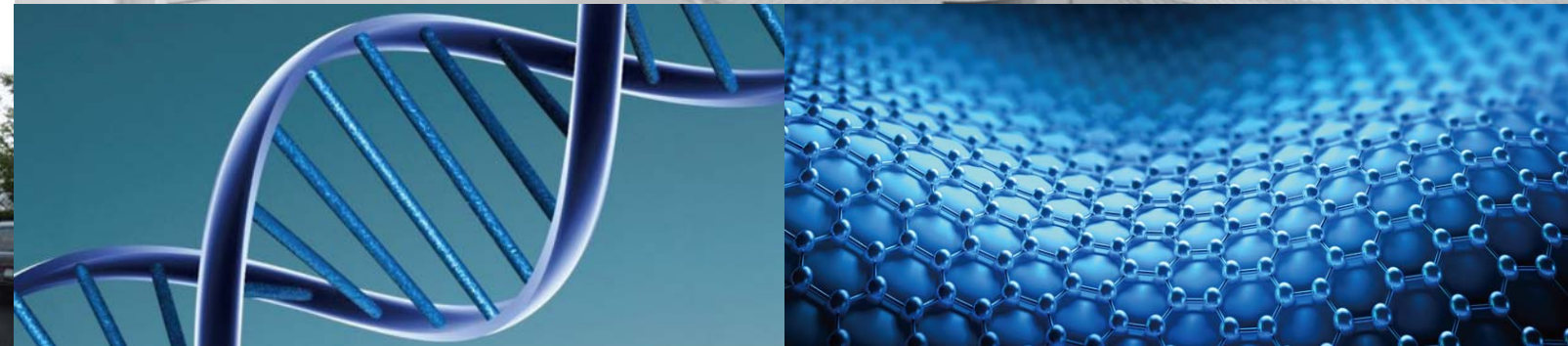
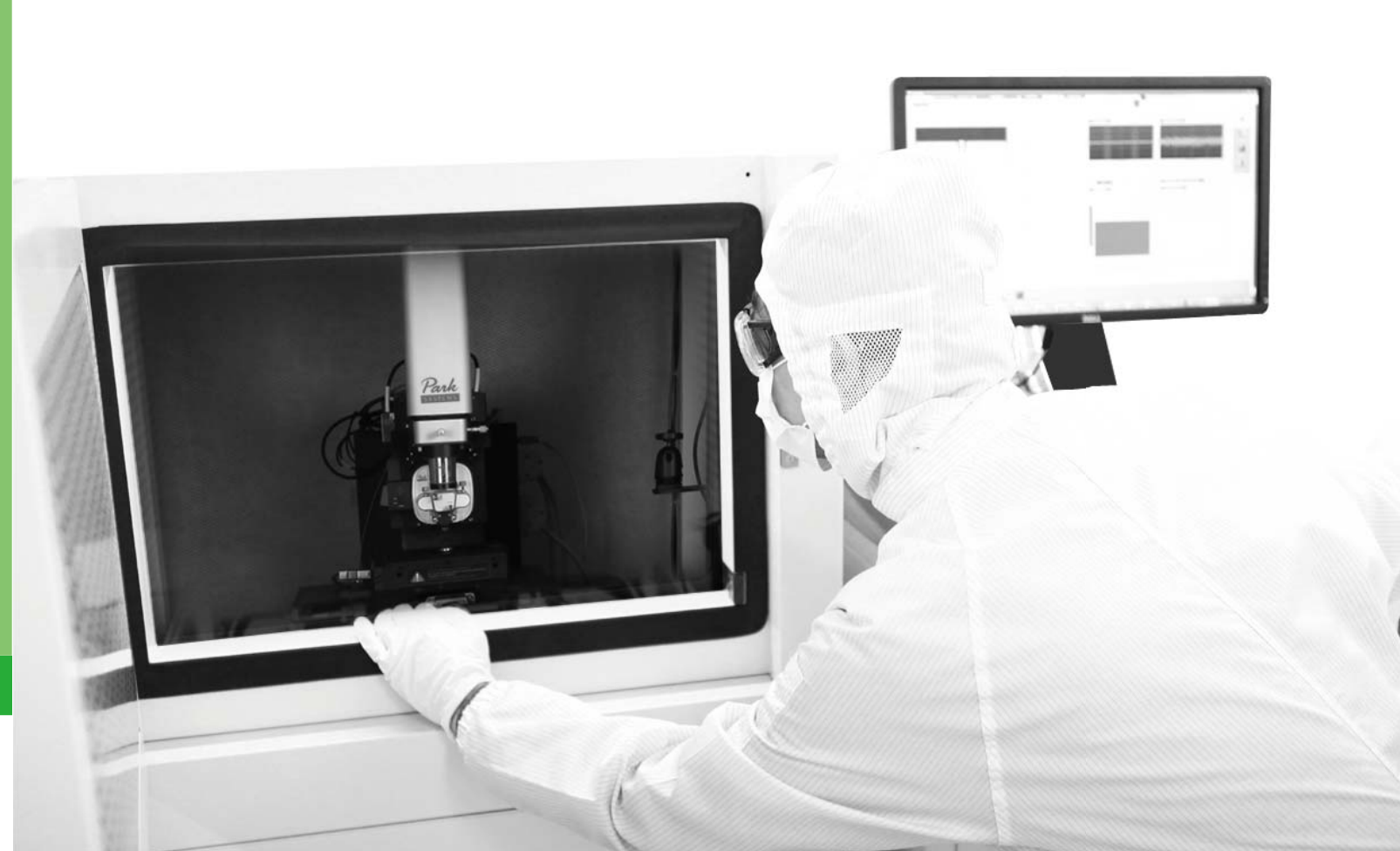
Park Scientific Instruments



Park Systems Headquarters

Where we come from

Park Systems has long been an innovative force in emerging nanoscale microscopy and metrology solutions. CEO and founder Dr. Sang-il Park was part of the original Stanford University team that developed AFM technology in the early 1980s and paved the way for the systems available today. As AFM technology progressed, Park began to recognize the potential of AFM technology in a wide range of fields. In 1997, he brought this new sophisticated nanoscale imaging and metrology technology to a broader market by founding Park Scientific Instruments, the world's first commercial AFM company, and later Park Systems.



Where we are headed

As nanoscale research in the semiconductor and hard disk industries grows, the global market for emerging nanoscale microscopy and metrology technology grows with it. Today, researchers and engineers continue to demand better and more effective AFM technology to increase their productivity and the quality of their work. The worldwide microscopy industry is expected to reach a value of \$6.2 billion by 2018 and grow by nearly 28% annually, with atomic force microscopy as one of the leading growth factors. [1]

The people at Park Systems work each day to live up to the innovative spirit of the company's origins. Although our history in AFM technology is illustrious, we have never stopped innovating, revising, and developing new technology. Our products are built with today's most innovative features and technologies, and we are constantly at work developing new functionality that will allow engineers and researchers to be more precise and more efficient. At Park, we create best-in-class tools that allow our customers to focus on doing incredible work, knowing that their measurements are accurate, repeatable, and easy to make.

References:

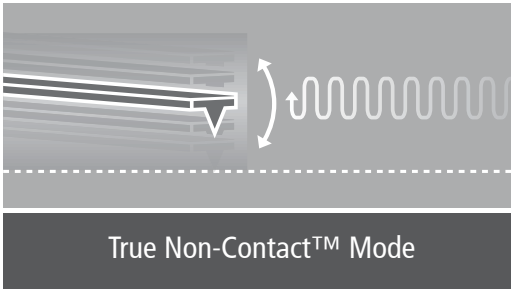
[1] Microscopy Devices Market (Optical, Electron and Scanning Probe Microscopes, Semiconductor, Life Sciences, Nanotechnology, Material Sciences) – Global Industry Analysis, Size, Share, Growth, Trends and Forecast, 2012-2018, by Transparency Market Research.

Innovative technology

Our comprehensive line of AFMs offers users unparalleled accuracy and ease of use. With AFMs designed specifically to be used in materials science, electronics, life science, nanotechnology, and other areas of research and industry, our tools are trusted to deliver ultra-high resolution with extremely precise measurements quickly and easily.

The world's only true Non-Contact AFM

Park AFMs are the only ones to feature True Non-Contact™ mode, allowing users to both take repeated measurements while preserving tip sharpness and not damage the sample surface. This provides better, more accurate scans and reduces required maintenance.



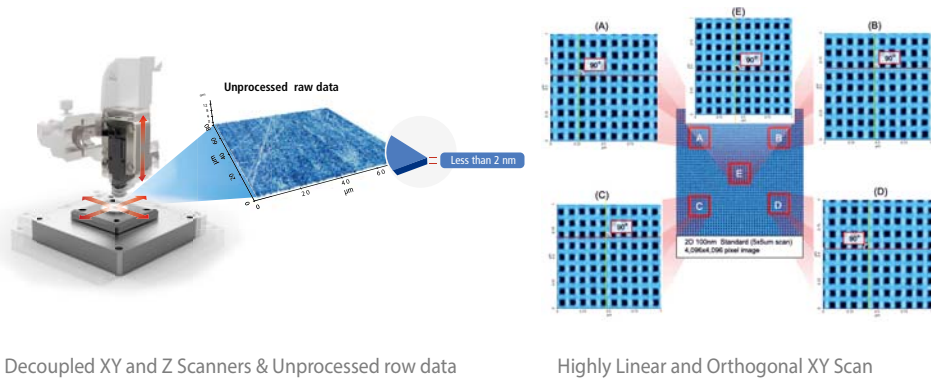
When True Non-Contact™ mode is activated, a piezoelectric modulator vibrates a cantilever at a small amplitude and fixed frequency near the intrinsic resonance of the cantilever. As the tip is brought closer to the sample, the van der Waals attractive force between tip and sample influences the amplitude and phase of the cantilever's vibration. These amplitude and phase changes are monitored by the Z-servo feedback system in the Park AFM, which maintains a tip-surface distance of just a few nanometers without damaging the sample surface or tip.

Benefits:

- Less tip wear allows for longer high-resolution scanning
- Non-destructive tip-sample interaction means less sample damage
- Results are less dependent on parameters

Superior Architecture

Park AFMs feature decoupled XY and Z architecture, flexure-guidance, and fast Z scanner movements. This allows for flat scans free from distortion as well as non-contact technology, a dynamically controlled Z stage for advanced force-distance spectroscopy, and the world's only rotatable head for 3D metrology.



Higher linearity for more accurate scans

Many factors can compromise scanner accuracy like creep, hysteresis, temperature dependence, and aging. That's why all of our XY scanners are controlled by a closed-loop circuit, which detects the real position of the scanner and corrects any nonlinear behavior, giving an integral linearity of less than 0.5%

Separate XY and Z scanners with no background curvature to control out-of-plane motion

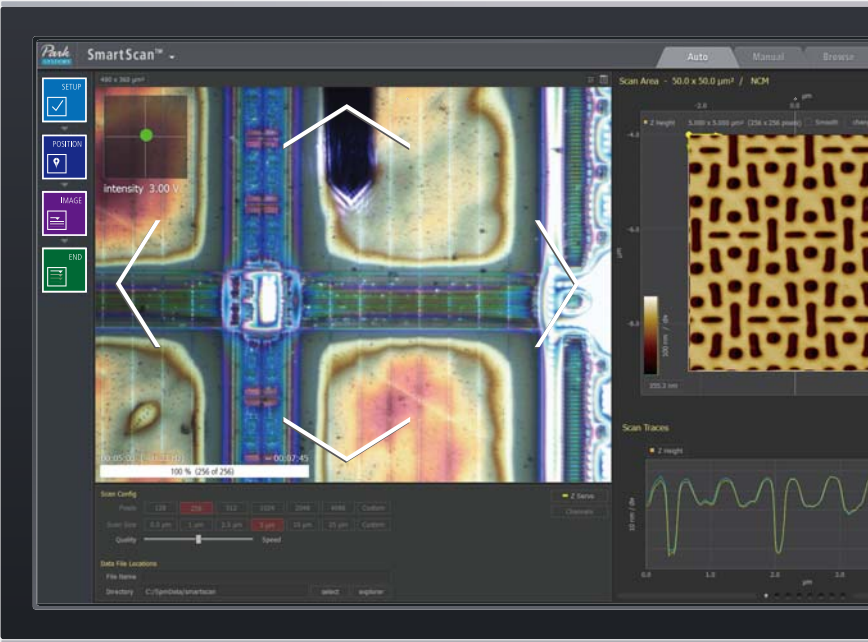
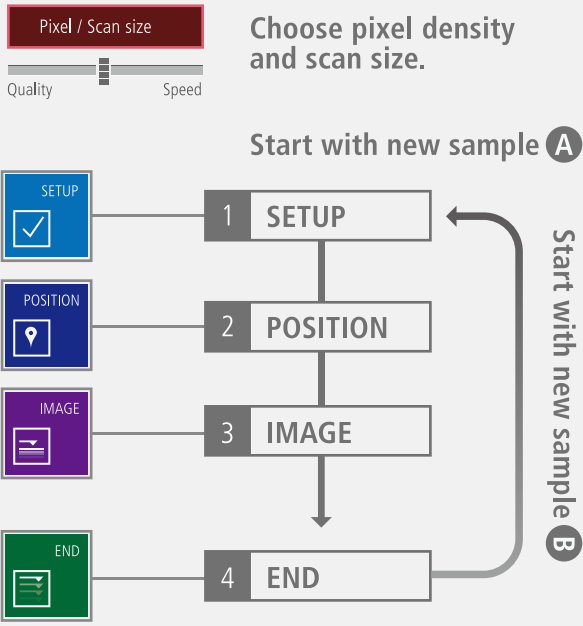
Park AFMs feature separated XY and Z scanner structure, with no background curvature to reduce out-of-plane motion to less than 2 nm per 100 μm of movement.

Better responsiveness so you can see more

Our XY scanners all have independent driving axes for each direction giving better responsiveness than piezoelectric tube scanners so you can see every detail.

Park SmartScan

The easiest to use and yet the most powerful operating software



1, 2, 3 Click Imaging with Park SmartScan

In an industry dominated by complicated and poorly designed user interfaces, Park Systems prides itself on creating systems that are both powerful and surprisingly easy to use. Our Park SmartScan OS was designed to be highly effective by automating many of the processes that researchers and engineers perform every day. This can drastically improve efficiency in lab and industrial settings and allow more senior technicians to offload some of their work to less experienced users.

Park SmartScan automates and guides the user through every step of the imaging process. All the user needs to do is place the sample on the stage, choose the area of interest, and specify the scan size desired. The rest is done by the software at a click of a button.

The system will automatically do the frequency sweep for the cantilever, move the Z stage to the sample, and auto-focus on the sample allowing the user to see and navigate the area of interest for imaging. It will also adjust all the necessary parameters for optimum settings, engage the cantilever, and start scanning the sample. The scan will continue with no additional input from the user until the image is acquired and completed.

Powerful Integrated Software Tools

Park Systems is constantly working to make our tools more powerful and useful to users in research and industry. Our new integrated software tools will allow for significant advancements in accuracy and efficiency in nanoscale spectroscopy and metrology.

Below is a partial list of innovations we've developed:

- PinPoint Nanomechanical
- QuickStep SCM
- One pass EFM
- Recipe based automated scanning
- Automatic Defect Review
- 3D Scanning
- Scanning ion conductance microscopy with AFM

Our products and solutions

Park Systems creates the world’s most accurate line of nanoscale microscopy and metrology tools for research and industrial applications. Our innovative features, such as True-Non Contact™ mode and cutting-edge automation, set our products apart from the competition and make Park Systems AFMs the easiest to use and most advanced AFMs available.

General AFMs

Park Systems provides a range of popular AFMs for general research and industrial applications. Designed to be extremely versatile while still providing the accuracy and functionality necessary to do high quality work, our line of general AFMs offer researchers and engineers alike the ability to get extremely accurate results quickly and easily.

Applications:

- Biological Science
- Materials Science
- Failure Analysis
- Semiconductor Analysis
- Hard Disk Media Analysis



Park NX10
The world's most accurate easy-to-use research AFM



Park NX20
Power, versatility, ease of use, brilliantly combined for large sample AFM



Park NX-Hivac
The most advanced high vacuum AFM for failure analysis and sensitive materials research



Park XE7
True research-grade AFM for the practical budget



Park XE15
Capable, adaptable, and affordable the best value large sample AFM

Bio AFM and SICM

Biological research is one of the fastest growing fields of the 20th century. Park AFMs have played critical roles in this sector, giving researchers the tools they need to develop novel insights into the vast and complicated processes and structures of biology.



Park NX10 SICM
Cutting-edge nanoscale imaging in aqueous environments



Park NX-Bio
Three compelling nanoscale microscopies in one innovative platform

Industrial AFMs

Park Systems is dedicated not just to advancing research, but industry as well. That's why our designers have worked to build a line of the most effective AFMs for FA engineers and industrial applications. Allowing users to take highly accurate measurements and complete their work more quickly, these tools can improve efficiency in the workplace and reduce errors, leading to a more profitable, more consistent development and production process.

Applications:

- Failure Analysis
- Semiconductor Analysis
- Hard Disk Media Analysis



Park NX-HDM
The most innovative AFM for automated defect review and surface roughness measurement



Park NX-PTR
Fully automated AFM for accurate inline metrology of hard disk head sliders



Park NX-Wafer
Low noise, high throughput atomic force profiler with automatic defect review



Park NX-3DM
Innovation and efficiency for 3D metrology

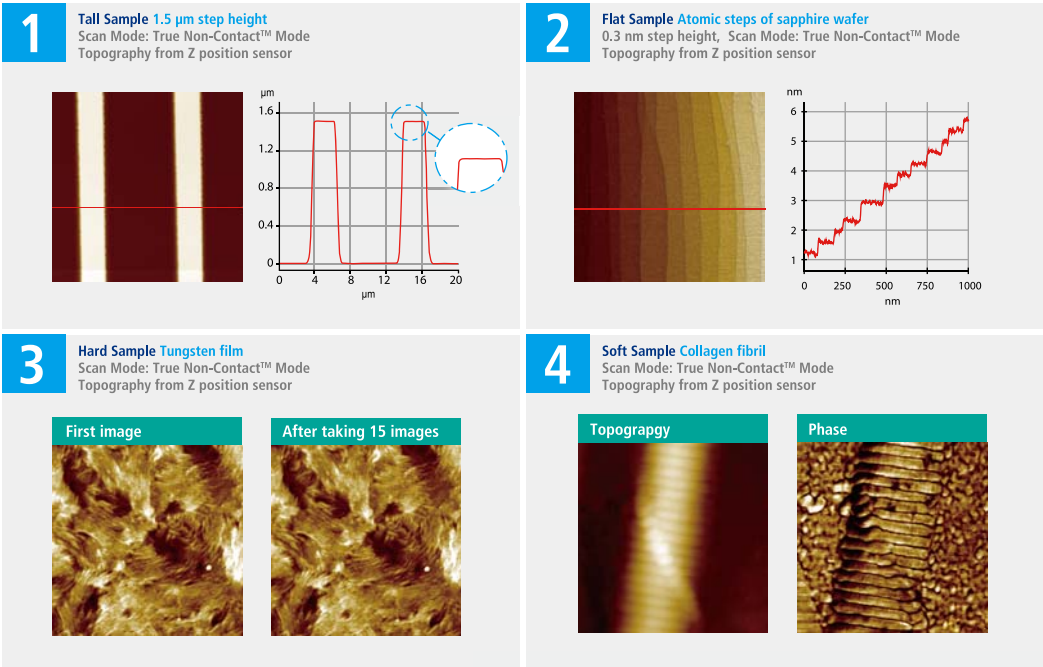
Park NX10

The world's most accurate easy-to-use research AFM

At Park Systems, we understand that in today’s highly competitive world, researchers can’t afford to worry about the precision of their instruments. That’s why we developed the Park NX10, the world’s most accurate and easy-to-use AFM.

High accuracy for nanoscale research

- Independent Z scanner and low noise Z detector for better readings
- XY stage flexure base to eliminate the bowing effect found in other AFMs
- The world’s only true non-contact AFM to keep tips accurate longer
- Accurate imaging, user friendly interface, automatic tip approach and 10 times rapid scan setting



SPECIFICATION

Scanner	Optics
XY scanner: 50 μm \times 50 μm (optional 10 μm \times 10 μm or 100 μm \times 100 μm) Z scanner: 15 μm , 30 μm (optional) Topography noise: < 0.03 nm (0.02 nm typical)	Objective lens: 10 \times (20 \times optional)
Electronics	
ADC: 18 channels 4 high-speed ADC channels (50 MSPS) 24-bit ADCs for X, Y, and Z position sensor	DAC: 12 channels 2 high-speed DAC channels (50 MSPS) 20-bit DACs for X, Y, and Z positioning 3 channels of integrated lock-in amplifier
Sample Stage	Physical Information
XY stage travel: 20 mm \times 20 mm Z stage travel: 22 mm Focus stage travel: 15 mm Sample size: up to 50 mm \times 50 mm, up to 20 mm thickness	Dimension (enhanced acoustic enclosure): 700 mm (W) \times 800 mm (D) \times 1300 mm (H),



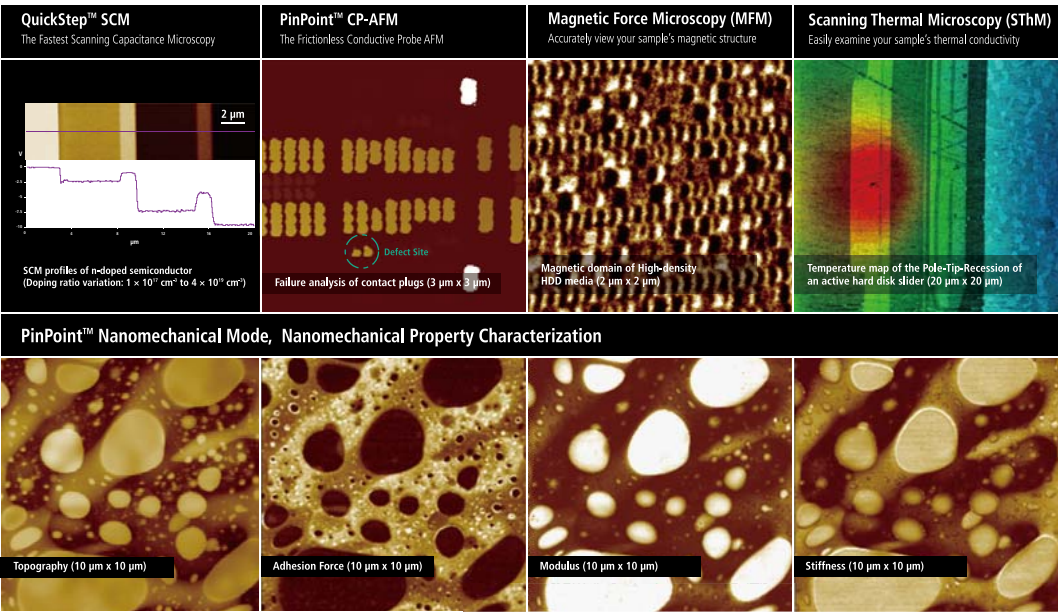
Park NX20

Power, versatility, ease of use, brilliantly combined for large sample AFM

General and industrial researchers as well as FA engineers are all expected to deliver results. There’s no room for error in the data provided by their instruments. That’s why the Park NX20, with its reputation as the world’s most accurate large sample AFM, is rated highly by researchers and FA professionals around the world.

Accurate large sample AFM solution for research and FA laboratories

- Surface roughness measurements for media and substrates
- Defect review imaging and analysis
- High resolution electrical scan mode
- Sidewall measurements for 3D structure study
- Accurate AFM topography with low noise Z detector



PinPoint™ Nanomechanical Mode, Nanomechanical Property Characterization

Topography (10 μm \times 10 μm)



Adhesion Force (10 μm \times 10 μm)



Modulus (10 μm \times 10 μm)



Stiffness (10 μm \times 10 μm)



SPECIFICATION

Scanner		Optics	
XY scanner: 100 μm \times 100 μm		Objective lens: 10 \times (20 \times optional)	
Z scanner: 15 μm , 30 μm (optional)			
Topography noise: < 0.03 nm (0.02 nm typical)			
Electronics			
ADC: 18 channels 4 high-speed ADC channels (50 MSPS) 24-bit ADCs for X, Y, and Z position sensor		DAC: 12 channels 2 high-speed DAC channels (50 MSPS) 20-bit DACs for X, Y, and Z positioning 3 channels of integrated lock-in amplifier	
Sample Stage		Physical Information	
XY stage travel: 150 mm x 150 mm, 200 mm x 200 mm		Dimension (enhanced acoustic enclosure):	
Z stage travel: 25 mm		820 mm (W) \times 920 mm (D) \times 1280 mm (H)	
Focus stage travel: 15 mm			
Sample size: up to 150 mm or 200 mm in diameter, up to 20 mm thickness			



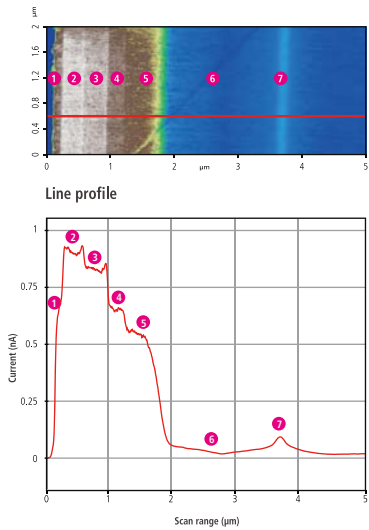
Park NX-Hivac

The most advanced high vacuum AFM for failure analysis and sensitive materials research

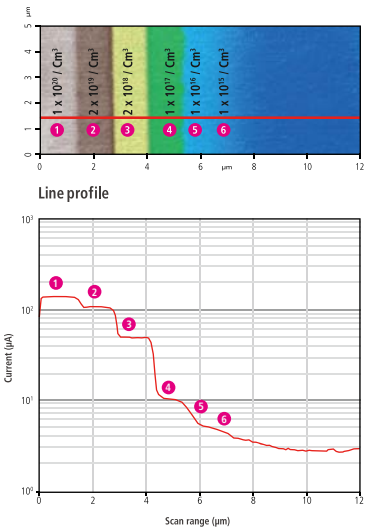
The Park NX-Hivac is a cutting-edge high vacuum AFM, designed to provide accurate performance for failure analysis on highly doped semiconductors. Using Park's signature technology, the Park NX-Hivac is a true high vacuum AFM that can provide high-resolution, low-noise measurements that are repeatable and easy to acquire. This makes it the perfect choice for labs looking to increase their throughput and accuracy.

High vacuum scanning for failure analysis applications

- Advanced StepScan automation and laser alignment for faster scanning
- Multi-sample chuck
- Easy tip exchange with signature Park technology
- Large 300 mm X 420 mm X 320 mm vacuum chamber
- On-axis optics with ultra-long viewing distance
- High Vacuum SSRM for improved sensitivity



SSRM image of calibration stair sample (N type)



SSRM image of calibration stair sample (P type)

SPECIFICATION

Scanner	Optics	Physical Information
XY scanner: 50 μm × 50 μm (100 μm x 100 μm optional) Z scanner: 15 μm	Objective lens: 10 x 5M pixel CCD	Vacuum chamber (inner): 300 mm x 420 mm x 320 mm Vacuum chamber (outer including granite & pump): 800 mm x 950 mm x 730 mm
Sample Stage		
XY stage travel: 22 mm x 22 mm Sample size: 50 mm x 50 mm, up to 20 mm thickness		
Software	Electronics	
SmartScan: Park AFM operating software XEI: AFM data analysis software Hivac Manager: Auto vacuum control software	ADC: 18 channels 4 high-speed ADC channels (50 MSPS) 24-bit ADCs for X, Y, and Z position sensor	
High Vacuum	DAC: 12 channels 2 high-speed DAC channels (50 MSPS) 20-bit DACs for X, Y, and Z positioning 3 channels of integrated lock-in amplifier	
Vacuum level: Typically less than 1 x 10 ⁻⁵ Torr Pumping speed: Reach to 10 ⁻⁵ Torr within 5 min.		



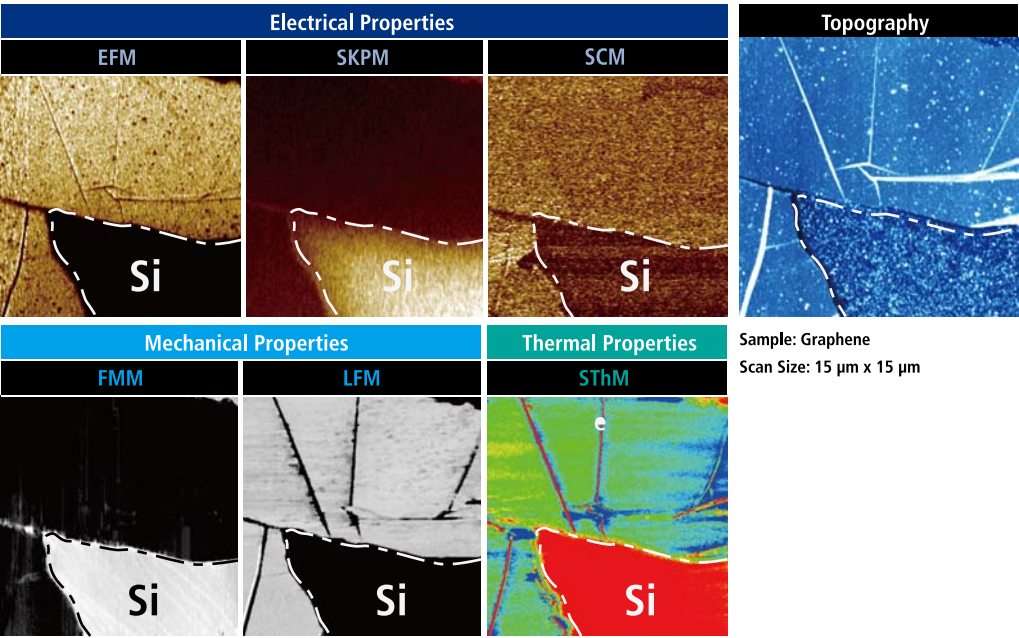
Park XE7

True research-grade AFM for the practical budget

The Park XE7 is one of the most affordable research grade AFMs available, both in terms of initial price and total cost of ownership. That makes it perfect for departments that need a powerful research AFM or teaching tool, but are on a tight budget. It features Park's True Non-Contact™ mode, so you can save money on probe tips. It's also built to last and highly upgradeable, so you'll be able to use it in your lab much longer than many competing AFMs.

High accuracy and performance for budget minded research

- Crosstalk Elimination gives more accurate XY scans
- Accurate height measurements without software processing
- The largest number of sample measurement options
- Comprehensive range of SPM modes
- The best selection of options and upgrades in the industry



SPECIFICATION

Scanner	Optics
XY scanner: 10 μm × 10 μm (optional 50 μm x 50 μm or 100 μm x 100 μm) Z scanner: 12 μm, 25 μm (optional) Topography noise: < 0.03 nm (0.02 nm typical)	Objective lens: 10x (20x optional)
Electronics	
High performance DSP: 600 MHz with 4800 MIPS ADC: 20 channels of 16 bit ADC at 500 kHz sampling DAC: 21 channels of 16 bit DAC at 500 kHz settling	
Sample Stage	
XY stage travel: 13 mm x 13 mm Z stage travel: 29.5 mm Focus stage travel: 70 mm Sample size: up to 100 mm x 100 mm, up to 20 mm thickness	



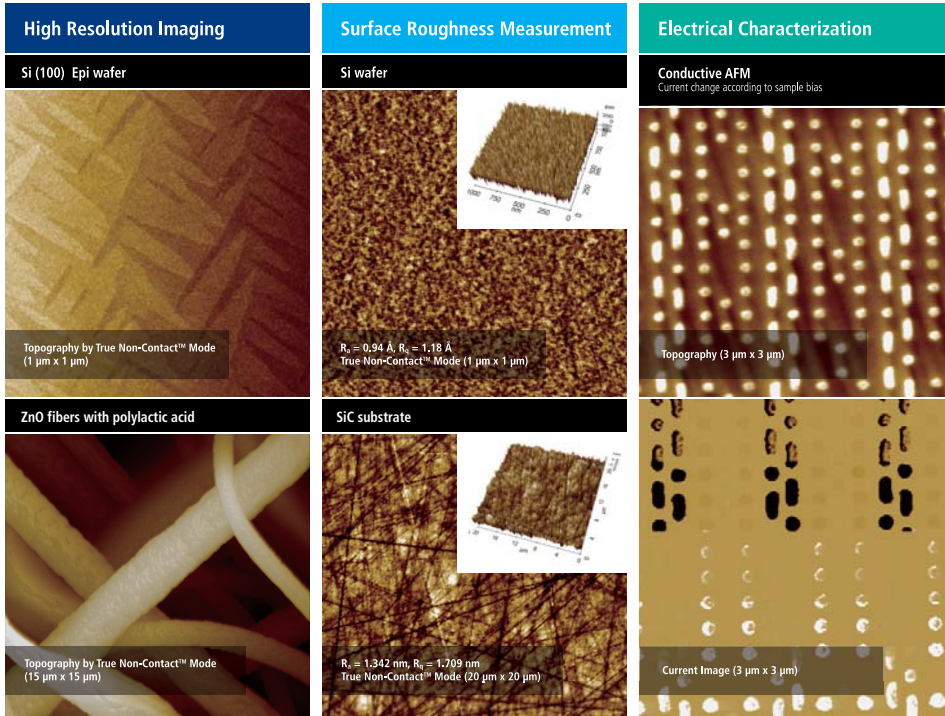
Park XE15

Capable, adaptable, and affordable-the best value large sample AFM

The Park XE15 includes many unique capabilities that make it ideal for labs and research centers that process a large volume and need an AFM that can handle a diverse range of samples. Its reasonable price and robust set of features also make it one of the best value AFMs available.

Versatility and power for nanoscale research and FA

- Unique multi sample scan reduces downtime
- Large 200 mm X 200 mm sample size increases possibilities
- Our most inclusive set of scan modes for adaptability to any need
- Perfect for shared labs and user facilities



SPECIFICATION

Scanner

XY scanner: 100 μm × 100 μm

Z scanner: 12 μm, 25 μm (optional)

Topography noise: < 0.05 nm

Electronics

High performance DSP: 600 MHz with 4800 MIPS

ADC: 20 channels of 16 bit ADC at 500 kHz sampling

DAC: 21 channels of 16 bit DAC at 500 kHz settling

Sample Stage

XY stage travel: 150 mm x 150 mm

Z stage travel: 27.5 mm

Focus stage travel: 20 mm

Sample size: 150 mm, up to 20 mm thickness

Optics

Objective lens: 10× (20× optional)

Physical Information

Dimension (Acoustic Enclosure 201):
820 mm (W) × 920 mm (D) × 1280 mm (H)

Park NX10 SICM

Cutting-edge nanoscale imaging in aqueous environments

Park NX10 Scanning Ion Conductance Microscope (SICM) allows researchers to acquire accurate measurements of samples in aqueous environments. Electrochemistry studies using SICM can now pair their investigations of reaction mechanisms related to redox chemistry and other phenomena with the ability to map their sample's topography. Correlating these sets of data has huge implications for applications such as next-generation battery development where SICM can measure a battery's performance versus its degradation at the nanoscale. Park NX10 SICM can also be of considerable benefit for work in cell biology. Unlike in AFM, SICM applies no force to samples meaning cell biologists can study living cells without disturbing them, opening new doors of inquiry into how these units of life work. Park NX10 SICM Module can also be purchased as an option to your existing Park NX10 AFM allowing for an easy transition between the two techniques, creating an even more comprehensive tool for specimen analysis.

High-precision non-invasive nanoscale imaging tool based on SICM & AFM

- Non-invasive morphology imaging in liquids for greater project sample integrity
- Nanometer resolution positioning of nano/micropipette and pipette/probe-sample distance control in nanoscale gives the ability to make finer adjustments
- Current-distance spectroscopy and mapping allows researchers to take more accurate readings
- Our open platform allows for easy integration with other systems so users can expand their capabilities

Park NX10 SICM provides nanoscale imaging for a wide range of applications:

- 1 Analytical Chemistry**
Electrochemical reaction imaging by integration of scanning electrochemical microscopy
- 2 Electrophysiology**
Ion channel detection together with patch clamping
- 3 Neuroscience**
High resolution imaging of single neuron integrated with patch clamping
- 4 Cell Biology**
Cell morphology imaging, nano biopsy and injection



Our dedicated auto-imaging software makes scanning easier and more accurate

a Automation for easier scanning

Streamline research and increase productivity with ARS (approach- retract- scan) free from parameter controls, so you have less to worry about while scanning.

b Steady pipette probe-sample distance control in nanoscale

By automatically refreshing its reference value before approaching each pixel, the stopping height of the pipette near the sample surface is not influenced by set-point drift.

Park NX10 SICM Module

The integration of the SICM and Park NX10 AFM system from Park Systems allows researchers to expand the depth of their research and easily perform nanoscale imaging in aqueous environments.

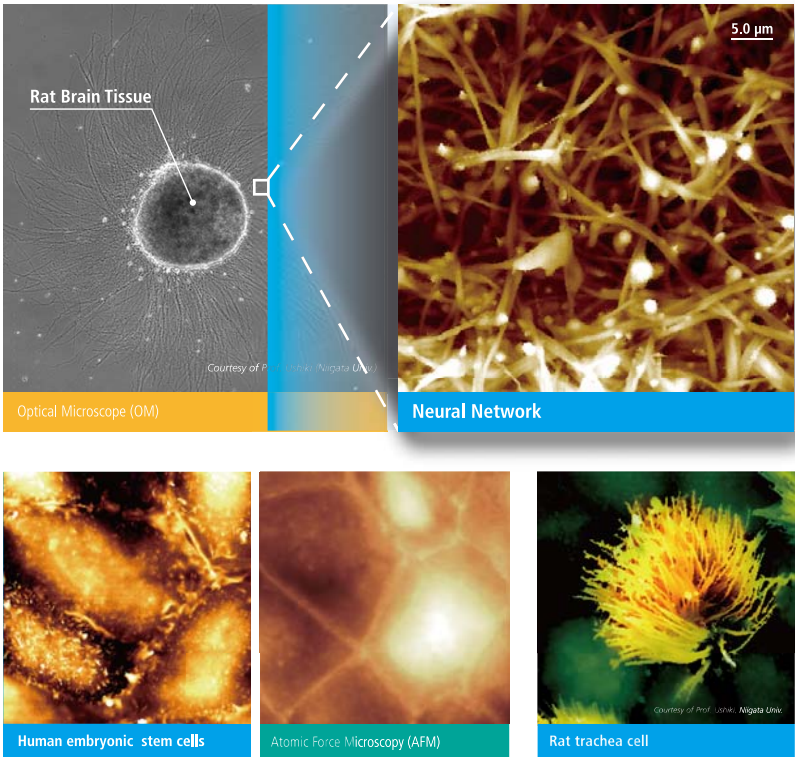
Park NX-Bio

Three compelling nanoscale microscopies in one innovative platform

We understand that as a nanoscale biology researcher, you need versatile, powerful tools to do innovative research efficiently. That’s why we created the Park NX-Bio, which combines an Scanning Ion Conductance Microscope (SICM), a True Non-Contact Mode™ Atomic Force Microscope (AFM) and an Inverted Optical Microscope into one powerful imaging tool.

Comprehensive solution for nanoscale biology researchers

- Highly accurate Park NX AFM with independent Z scanner, XY flexure base, and the world's only True Non-Contact™ technology
- Ultra high resolution optical imaging with integrated inverted microscope
- High definition live cell imaging with integrated Scanning Ion Conductance Microscope (SICM)



Park SICM is able to visualize delicate and tiny micro-villi structures on cellular membrane that can not be detected by AFM

Park SICM does not damage or remove cell's delicate hair-like structures

SPECIFICATION

Scanner	Optical Configuration
XY scanner: 100 μm × 100 μm Z scanner: 25 μm	Compatible with inverted microscopes from <ul style="list-style-type: none">• Zeiss (Axio Observer Z.1)• Nikon (Ti-S, Ti-U, Ti-E)• Compatible with confocal microscopes and fluorescence technique such as TIRF, STORM Topview Optics (upright optics) with CCD camera for opaque samples
Sample Stage	Physical Information
XY stage travel: 14 mm Stage travel step: 0.1 μm Working range of Z stage: -14 mm, motorized movement Sample size: <ul style="list-style-type: none">• 50 mm × 50 mm, 20 mm thick, and up to 500 g• Petri dish (38 mm)	Dimension: 1,000 (w) × 1,030 (d) × 1,460 (h) mm (enhanced acoustic enclosure)



Park NX-HDM

The most innovative AFM for automated defect review and surface roughness measurement

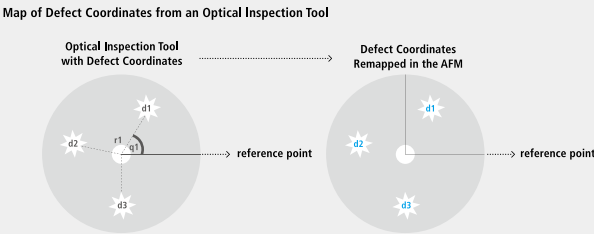
Identifying nanoscale defects is a very time consuming process for engineers working with media and flat substrates. Park NX-HDM is an atomic force microscopy system that speeds up the defect review process by an order of magnitude through automated defect identification, scanning and analysis. Park NX-HDM links directly with a wide range of optical inspection tools, thus significantly increasing the automatic defect review throughput. With its industry's lowest noise floor, and its unique True Non-Contact™ technology, the NX-HDM is the most accurate AFM for surface roughness measurement on the market.

Powerful automated AFM for industry

- Higher throughput with advanced automation technology
- Automatic defect identification, scanning, and analysis
- Sub-angstrom surface roughness measurement
- Industry leading low noise floor

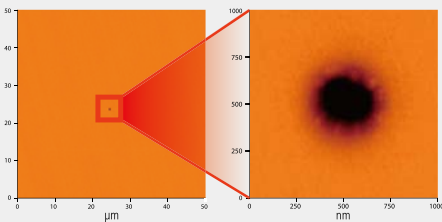
Automatic Transfer and Alignment of Defect Maps to AFM

Utilizing an advanced proprietary mapping algorithm, the defect map obtained from automated optical inspection (AOI) tool is accurately transferred and mapped onto Park NX-HDM. This technology allows full automation for high throughput defect imaging.



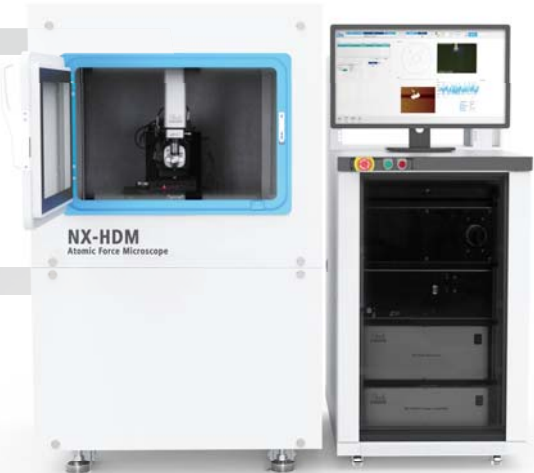
Automated Search Scan & Zoom-in Scan

Optimized scan parameters enable a fast two step scan: (1) a quick, low resolution search scan to locate the defect, then (2) a high resolution zoom-in scan to obtain defect details. The scan size and scan speed parameters are adjustable to match the user's need.



SPECIFICATION

Scanner	Optics
XY scanner: 100 μm × 100 μm Z scanner: 15 μm, 30 μm (optional) Topography noise: < 0.03 nm (0.02 nm typical)	Objective lens: 10× (20× optional)
Electronics	
ADC: 18 channels 4 high-speed ADC channels (50 MSPS) 24-bit ADCs for X, Y, and Z position sensor	DAC: 12 channels 2 high-speed DAC channels (50 MSPS) 20-bit DACs for X, Y, and Z positioning 3 channels of integrated lock-in amplifier
Sample Stage	Physical Information
XY stage travel: 150 mm x 150 mm , 200 mm x 200 mm Z stage travel: 25 mm Focus stage travel: 15 mm Sample size: up to 150 mm or 200 mm in diameter, up to 20 mm thickness	Acoustic Enclosure 880 (w) × 980 (d) × 1460 (h) 620 kg approx. (incl. basic NX-HDM System) Control Cabinet 600 (w) × 900 (d) × 1330 (h) 170 kg approx. (incl. controllers)



Park NX-PTR

Fully Automated AFM for Accurate Inline Metrology of Hard Disk Head Sliders

The Park NX-PTR is a fully automatic industrial in-line AFM solution for, but not limited to, automatic Pole Tip Recession measurements on Rowbar-level, individual Slider-level, and HGA-level sliders. With sub-nano scale accuracy, repeatability, and throughput, the Park NX-PTR is the metrology tool of choice for Slider manufacturers to improve their overall production yield.

Powerful features for high throughput inline PTR measurements

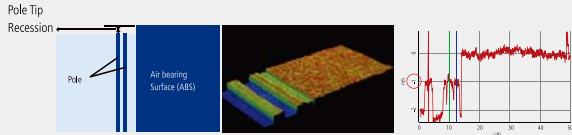
- Be more productive with Fully Automated AFM for Inline Hard Disk Slider Metrology
- Accurate and Repeatable Measurements for Improved Production Yield
- Accurate Height Measurements with Low Noise Z Detector
- Best Tip Life and Scan Resolution by True Non-Contact™ Mode

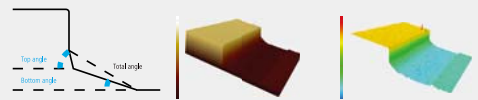
Automated Inline Measurements of Hard Disk Sliders

The key to improving the production yield of hard disk sliders with shrinking dimensions and increasing complexity is accuracy at the nanoscale. Park NX-PTR provides accurate, automatic measurements for hard disk sliders.

Automatic PTR Measurement and Analysis

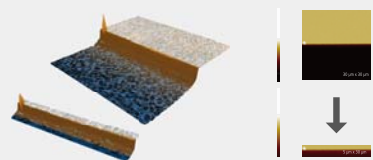
Pole Tip Recession measurements are fully automated with the NX-PTR system, giving you higher throughput capability, both at the carrier, rowbar, and slider level.





Automatic Wall Angle Measurement & Analysis

Automatically get measurement and analysis of the various wall angle applications.



Automatic Defect Measurement and Analysis

Measurement and analysis of various defects such as edge spikes are fully automated.

SPECIFICATION

Scanner	Electronics
XY scanner: 100 μm × 100 μm Z scanner: 15 μm Topography noise: < 0.05 nm	High performance DSP: 600 MHz with 4800 MIPS ADC: 20 channels of 16 bit ADC at 500 kHz sampling DAC: 21 channels of 16 bit DAC at 500 kHz settling
Sample Stage	
XY stage travel: travels up to 200 mm × 200 mm 2 μm repeatability Z stage travel: 25 mm	Motroized focus stage: 15 mm Z travel distance for on-axis optics
Physical Information	
Acoustic Enclosure 880 (w) × 980 (d) × 1460 (h) 620 kg approx. (incl. basic NX-PTR System)	Control Cabinet 600 (w) × 900 (d) × 1330 (h) 170 kg approx. (incl. controllers)



Park NX-Wafer

Low noise, high throughput atomic force profiler with automatic defect review

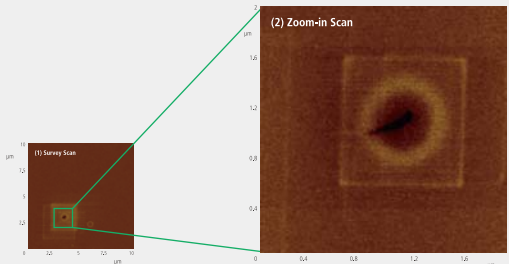
The Park NX-Wafer is the only wafer fabrication AFM with automatic defect review. This gives it the power to increase the throughput of your lab by up to 1000% while ensuring a high level of accuracy and quality control when scanning wafers up to 300 mm in size.

Accurate, high-throughput atomic force profiling

- Fully automated AFM solution for defect imaging and analysis
- Capable of scanning 300 mm wafers
- Can improve defect review productivity by up to 1000%
- Low noise atomic force profiler for more accurate CMP profile measurements
- Sub-angstrom surface roughness measurements
- Minimal tip-to-tip variation

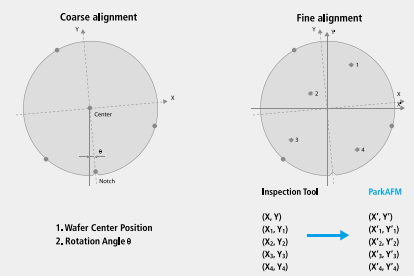
Automated Search & Zoom-in Scan

The defects are imaged in two steps; (1) a survey imaging, either by AFM or enhanced optical vision, to refine the defect location, then (2) a zoom-in AFM scan to obtain a detailed image of the defect, presenting automatic analysis of the defect type and the subsequent defect dimensions.



Automatic Transfer and Alignment of Defect Maps with Enhanced Vision

By utilizing Park's proprietary coordinate translation technique, the new Park ADR AFM can accurately transfer the defect maps obtained from a Laser-scattering defect inspection tool to a 300 mm Park AFM system. This technology does not require any separate step to calibrate the stage of the targeted defect inspection system and allows full automation for high throughput defect imaging.



SPECIFICATION

Scanner	Electronics
XY scanner: 100 μm × 100 μm Z scanner: 15 μm Topography noise: < 0.05 nm	High performance DSP: 600 MHz with 4800 MIPS ADC: 20 channels of 16 bit ADC at 500 kHz sampling DAC: 21 channels of 16 bit DAC at 500 kHz settling
Sample Stage	
XY stage travel: travels up to 275 mm × 200 mm 0.5 μm resolution (200 mm system) travels up to 400 × 300 (mm), 0.5 μm resolution < 1 μm repeatability (300 mm system) Z stage travel: 27 mm	Focus stage travel: 9 mm Sample size: 200 mm, up to 20 mm thickness (200 mm system) 300 mm, up to 20 mm thickness (200 mm system)
Physical Information	
200 mm System 1480 mm (w) x 980 mm (d) x 2024 mm (h) w/o EFEM, 750 kg approx. (incl. Control Cabinet) 2420 mm (w) x 1000 mm (d) x 2024 mm (h) w/ EFEM, 1230 kg approx. (incl. Control Cabinet)	300 mm System 1820 mm (w) x 1170 mm (d) x 2024 mm (h) w/o EFEM, 1320 kg approx. (incl. Control Cabinet) 3170 mm (w) x 1350 mm (d) x 2024 mm (h) w/ EFEM, 1670 kg approx. (incl. Control Cabinet)



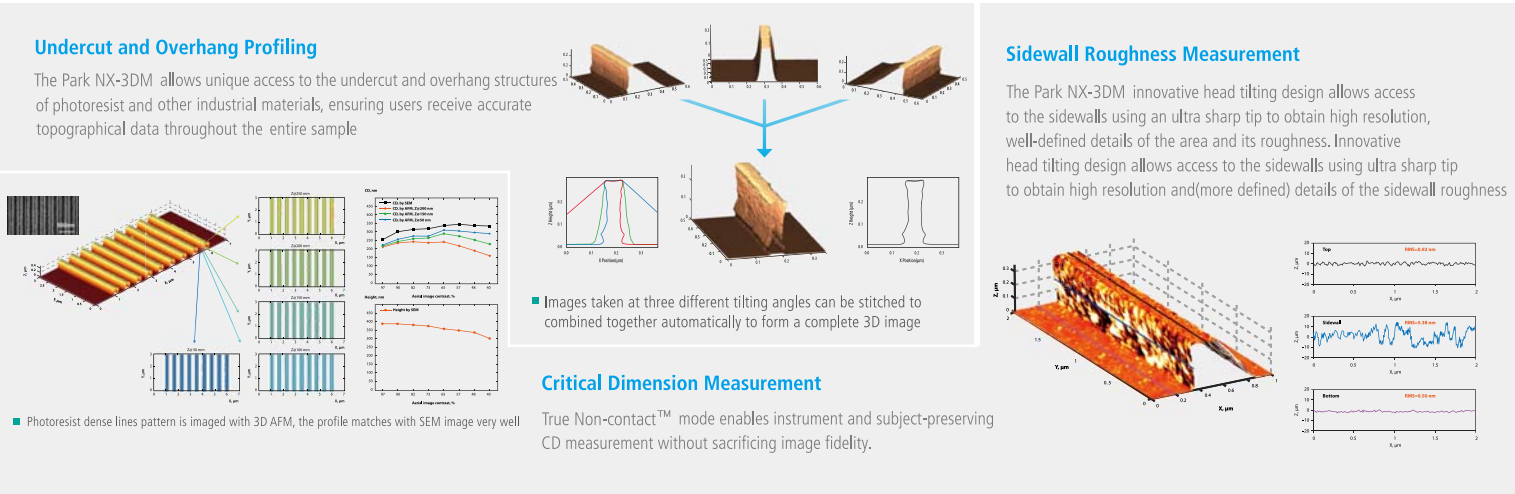
Park NX-3DM

Innovation and efficiency for 3D metrology

Park Systems has introduced the revolutionary Park 3DM Series, the completely automated AFM system designed for overhang profiles, high-resolution sidewall imaging, and critical angle measurements. With the decoupled XY and Z scanning system with tilted Z-scanner, it overcomes the challenges of the normal and flare tip methods in accurate sidewall analysis. In utilizing our True Non-Contact Mode™, the Park 3DM Series enables non-destructive measurement of soft photoresist surfaces with high aspect ratio tips.

An indispensable tool for fabrication of wafers up to 300 mm in size

- Fully automated industrial AFM using highly accurate Park NX technology
- Capable of scanning 300 mm wafers
- Innovative head design for undercut and overhang structure scanning
- No sample preparation is necessary to obtain accurate sidewall roughness measurements
- True Non-Contact™ mode allows instrument and sample preservation without sacrificing image fidelity



SPECIFICATION	
Scanner	Electronics
XY scanner: 100 μm × 100 μm	High performance DSP: 600 MHz with 4800 MIPS
Z scanner: 15 μm	ADC: 20 channels of 16 bit ADC at 500 kHz sampling
Topography noise: < 0.05 nm	DAC: 21 channels of 16 bit DAC at 500 kHz settling
Sample Stage	
XY stage travel: travels up to 275 mm × 200 mm 0.5 μm resolution (200 mm system) travels up to 400 × 300 (mm), 0.5 μm resolution < 1 μm repeatability (300 mm system)	Focus stage travel: 9 mm
	Sample size: 200 mm, up to 20 mm thickness (200 mm system) 300 mm, up to 20 mm thickness (200 mm system)
Z stage travel: 27 mm	
Physical Information	
200 mm System	300 mm System
1480 mm (w) x 980 mm (d) x 2024 mm (h) w/o EFEM, 750 kg approx. (incl. Control Cabinet) 2420 mm (w) x 1000 mm (d) x 2024 mm (h) w/ EFEM, 1230 kg approx. (incl. Control Cabinet)	1820 mm (w) x 1170 mm (d) x 2024 mm (h) w/o EFEM, 1320 kg approx. (incl. Control Cabinet) 3170 mm (w) x 1350 mm (d) x 2024 mm (h) w/ EFEM, 1670 kg approx. (incl. Control Cabinet)

Path for Growth: Options, accessories, and consumables

Park AFMs are designed for modularity, making them highly versatile for a wide range of research and industry environments. From our low-noise acoustic enclosures, to our array of scanners, heads, and accessories, Park Systems creates some of the most advanced and most customizable nanometrology and imaging tools available. Customers can tailor AFMs to their unique needs by outfitting them with our diverse range of accessories and options.

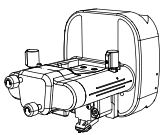
Our Options & Accessories:



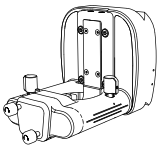
Park NX10 SICM Module
Park's Scanning Ion Conductance Microscope (SICM) module is offered as an add-on accessory for the Park NX10 AFM providing biology researchers with the ability to take accurate measurements of samples in aqueous environments. Unlike with AFM technology, this device applies no force to samples so researchers can study live cell membranes without disturbing them, opening new doors into biological research.

Z Scanner Heads

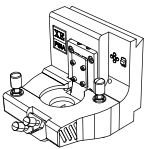
Park Systems has developed a range of Z scanner heads that help to make Park AFMs the world's most accurate. Our current lineup of heads includes:



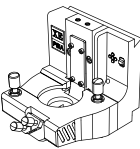
Standard NX AFM Head
The standard NX AFM head has a high speed Z scanner with 15 μm scan range. It is our default head for all of the NX series AFMs.



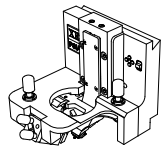
Long Travel NX AFM Head
The long travel NX AFM head gives extended Z scan range capability to the NX series of AFMs.



Standard XE Head
Our standard XE head is the ideal for most uses and works with all standard and advanced modes for XE series AFMs.

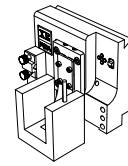


25 μm XE Head
Give your XE series AFM an extended scanning range with this head featuring a 25 μm Z scanner. This head is perfect for high aspect ratio samples such as optical lenses and MEMS devices. The head is fully compatible with all basic and advanced modes and options.



XE Optical Head

The XE Optical Head lets you use the cantilever of the AFM for light amplification when combined with Raman spectroscopy, enhancing the optical response of the sample.

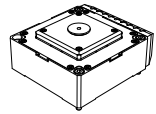


Hysitron Triboscope Adaptor Head

This adaptor head lets you integrate the Triboscope nanoindenter by Hysitron, Inc. with our XE series of AFMs. The high feedback performance of the Z scanner enables precise nanoindentation measurements.

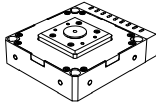
XY Scanners

Park XY scanners offer a wide range of features that make them extremely accurate and easy to use:



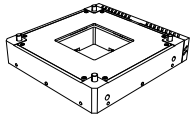
5 µm x 5 µm XY Scanner

For the highest resolution AFM/STM imaging, choose the Park 5 µm XY scanner.



50 µm x 50 µm XY Scanner

The standard scanner for Park XE7 and Park NX10, the 50 µm XY scanner offers high precision scanning and stable imaging conditions with no background curvature, giving you more accurate data.

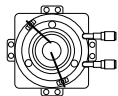


100 µm x 100 µm XY Scanner

The 100 µm XY scanner provides a larger, but still extremely precise measurable area.

Liquid Cells

Our selection of liquid cells provides an extensive array of options for biological researchers that need to measure samples immersed in a controlled liquid environment.



Universal Liquid Cell

Our universal liquid cell is the most flexible and powerful option for biological researchers. The cell can be used as an open or closed liquid cell while constantly controlling for temperature. The cell features three outlets for liquid, gas, and/or reference and counter electrodes.



Electrochemistry Cell

This cell is ideal for biological researchers that need to take electrochemical measurements. It features corrosion resistant PCTFE construction so that it can hold up under heavy use.



Open Liquid Cell

Our open liquid cell is the ideal choice for those conducting research in an open environment.

Environmental Control

Our selection of liquid cells provides an extensive array of options for biological researchers that need to measure samples immersed in a controlled liquid environment.



EnviroChamber

Our environmental chamber provides a controlled atmosphere for samples sensitive to oxygen and water vapor. The atmosphere of the chamber is carefully controlled for humidity and oxygen concentration.

Acoustic Enclosures

AFMs measure properties at the nanometer scale, so every small factor can have a large effect on accuracy. That's why Park has developed some of the best acoustic enclosures on the market, isolating the instrument from noise and helping to make Park AFMs the world's most accurate.



Acoustic Enclosure 101

Our easiest to handle enclosure, the Acoustic Enclosure 101 weighs just 40 kg, while still effectively isolating your AFM from unwanted noise.



Acoustic Enclosure 201

Designed exclusively for the XE series, the Acoustic Enclosure 201 isolates the AFM from external acoustic and light noise for exact precision. The unit can also be equipped with an active vibration isolation table for even better performance.



Acoustic Enclosure 202

This ergonomically-designed enclosure comes standard with the Park NX20 and is environmentally sealed to block external acoustic and light noise from affecting system performance. A temperature stabilization option is available for this enclosure to significantly reduce the effect of thermal drift on the AFM body.



Acoustic Enclosure 203

The Acoustic Enclosure 203 is designed for use with the Park NX10. It features an ergonomic design which makes it one of the most effective and easy to use acoustic enclosures on the market. Thermal drift can be further mitigated through a temperature stabilization option that can be integrated with this unit.



Acoustic Enclosure 301

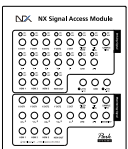
Designed exclusively for the Park NX-Bio, this acoustic enclosure isolates the systems from acoustic and light noise for better accuracy. The included active vibration isolation table further increases vibration isolation performance. A temperature stabilization option is also available to minimize thermal drift, making the unit even more effective.

Accessories

To make sure you can conduct more varied and specific research and tests, Park offers an array of additional accessories to further customize your AFM.

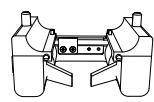
Active Q Control

During non-contact and tapping imaging, the kinetic energy of the cantilever is decreased, especially in liquid. This reduces accuracy and resolution. Active Q Control combats this by actively compensating the energy loss, enhancing the quality of your topographic data.



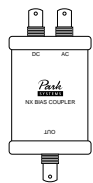
Signal Access Module

Access all the input/output signals for your AFM with the Signal Access Module. The unit provides an easy way to get scanner position, cantilever deflection, driving signal, bias, and other data to use to improve the quality of your work.



Magnetic Field Generator

The magnetic field generator lets you apply an external magnetic field to the sample. The field can be changed from -300 gauss to 300 gauss, and is parallel to the sample surface. You can then easily observe changes in the magnetic structure using one of our magnetic force microscopy (MFM) options.



External High Voltage Kit

This accessory provides an applied external bias of up to 2 kV.

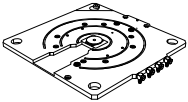


Chip Carriers

Our chip carriers come in several types depending on your needs. We currently offer standard chip carriers, clip-type chip carriers, ceramic chip carriers, Teflon-backed chip carriers for Conductive AFM, and more.

Vacuum Chuck

Our vacuum chuck is the most secure option for loading samples. The standard chucks can hold 2-inch, 4-inch, and 6-inch wafers but we can also create a custom chucks for different wafer sizes.



Non-magnetic Sample Holder

Ideal for taking delicate MFM measurements, usage of the non-magnetic sample holder prevents interference experienced from the magnetic field produced by the standard sample holder.



Easy Snap by Hand

Easy Tip and Sample Exchange

The unique head design allows easy side access allowing you to easily snap new tips and samples into place by hand. The cantilever is ready for scanning without the need for any tricky laser beam alignment by using pre-aligned cantilevers onto the cantilever tip holder.

Backed by industry leading service and technical support

Park AFMs are built to be easy to use and foolproof. But even the most reliable technology can have technical problems. That's why we also offer the best service and support in the nanoscale imaging and metrology industry. With a highly trained staff of AFM and nanotechnology experts, our team is always on hand when you need them so you can get back to your work faster.

Best technical support in the industry

As the only publicly traded company that specializes solely on AFM and SPM technology, we have cultivated a global network of highly-trained service engineers with expertise in the AFM products you rely on to complete your work. With Park Systems you can be assured, around-the-clock, that even your most complex technical questions will rapidly receive solid answers from actual AFM experts each and every time. We aim to develop a long-term support relationship with you and your nanoscale work and commit to providing nothing less than the best service possible.



LIVE CHAT
Click here to talk

9 to 9 Live Support

Sometimes problems can't wait, and you need expert help immediately. That's why Park offers 9 a.m. to 9 p.m. live support on our website, giving customers access to the resources and professional assistance they need to fix their problems fast.

Customer Support Forum

Leverage the crowdsourced knowledge found in our customers-only technical forum. The online message board is frequented by leading experts on Park technology and regularly reviewed by Park staff for hard to answer questions. Visit www.parkafm.com/support



Park Analytical Services

Park Systems offers cutting-edge AFM technology on an as-needed basis in the North American market. This allows those that don't have a budget to purchase an AFM to establish AFM protocols and have samples analyzed using the world's most accurate AFMs. This brings the high precision equipment and unmatched expertise of Park Systems to more researchers, engineers, and innovators than ever before.

Contact Us

Park Systems is dedicated to helping science and industry by providing the most accurate and easiest to use nanoscale imaging tools available.

- Regional headquarters
- Distribution partners



Our history of providing incredibly powerful and versatile systems since the inception of the commercial AFM makes us one of the most trusted names in the industry.

Want to find out more about our world class nanoscale microscopy and metrology technology?

Contact one of our representatives today:

HEADQUARTERS

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JAPAN HEADQUARTERS: +81-3-3219-1001
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