

Enabling Nanoscale Advances



Park NX10

The most accurate and easiest to use
Atomic Force Microscope





Park NX10

The premiere choice for nanotechnology research

Accurate XY Scan by Crosstalk Elimination

- Two independent, closed-loop XY and Z flexure scanners
- Flat and orthogonal XY scan with low residual bow
- Accurate height measurements without any need for software processing

Accurate AFM Topography with Low Noise Z Detector

- True sample topography without edge overshoot or piezo creep error
- Accurate surface height recording, even during high-speed scanning

Best Tip Life, Resolution and Sample Preservation by True Non-Contact™ Mode

- Fast Z-servo speed enabling True Non-Contact™ Mode
- Minimum tip wear for prolonged high-quality and high-resolution imaging

User Experience-Driven Software and Hardware Features

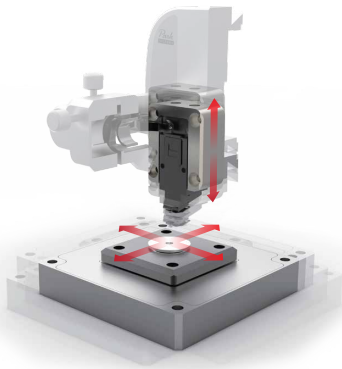
- Open side access for easy sample or tip exchange
- Easy, intuitive laser alignment with pre-aligned tip mount
- Park SmartScan™ - AFM operating software for empowering both novices and power users towards versatile nanoscale research

Park NX10

AFM Technology

Flat Orthogonal XY Scanning without Scanner Bow

Park's Crosstalk Elimination scanner structure removes scanner bow, allowing flat orthogonal XY scanning regardless of scan location, scan rate, and scan size. It shows no background curvature even on flattest samples, such as an optical flat, and with various scan offsets. This provides you with a very accurate height measurement and precision nanometrology for the most challenging problems in research and engineering.



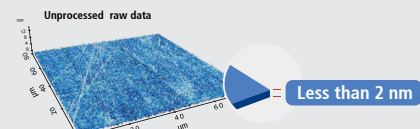
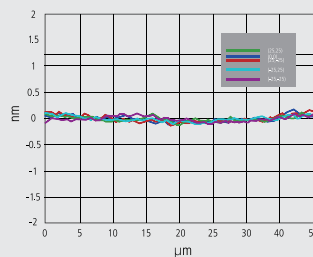
Decoupled XY and Z Scanners

The fundamental difference between Park and its closest competitor is in the scanner architecture. Park's unique flexure based independent XY scanner and Z scanner design allows unmatched data accuracy in nano resolution further improved with NX AFM Head (Z scanner) powered by NX AFM electronic controller.

Accurate Surface Measurement

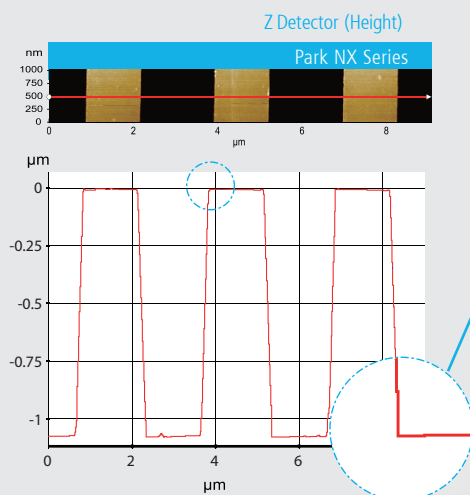
"Flat" sample surface as it is!

- Low residual bow
- No need for software processing
- Accurate results independent of scan location
- Less than 2 nm of out-of-plane motion with the NX electronic controller



Industry Leading Low Noise Z Detector

Park AFMs are equipped with the most effective low noise Z detectors in the field, with a noise of 0.02 nm over large bandwidth. This produces highly accurate sample topography and no edge overshoot. Just one of the many ways Park NX series saves you time and gives you better data.



No creep effect

Accurate Sample Topography Measured by Low Noise Z Detector

- Uses low noise Z detector signal for topography
- Has low Z detector noise of 0.02 nm over large bandwidth
- Has no edge overshoot at the leading and trailing edges
- Needs calibration done only once at the factory

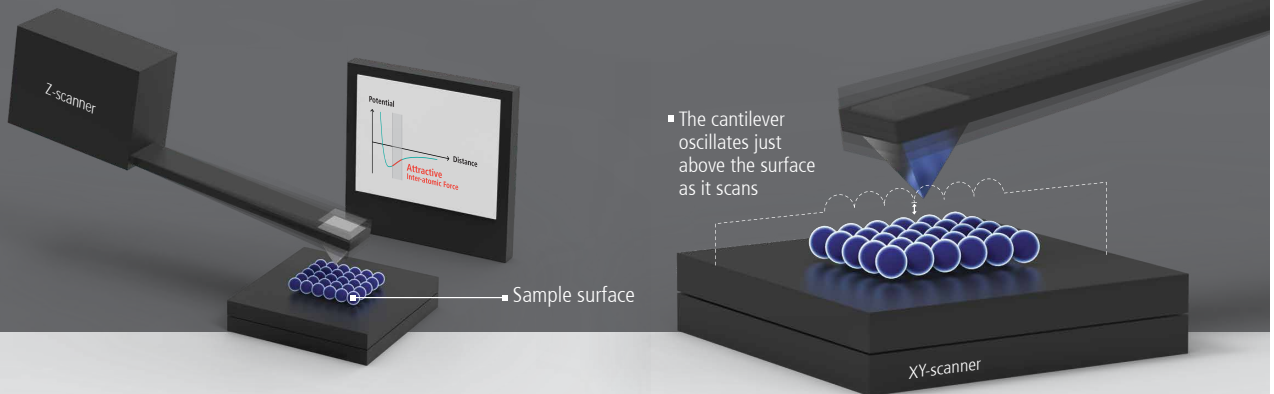
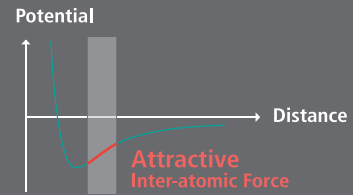
Sample: 1.2 μm Nominal Step Height
(9 μm x 1 μm , 2048 pixels x 128 lines)

True Non-Contact™ Mode

True Non-Contact™ Mode is a scan mode unique to Park AFM systems that produces high resolution and accurate data by preventing destructive tip-sample interaction during a scan.

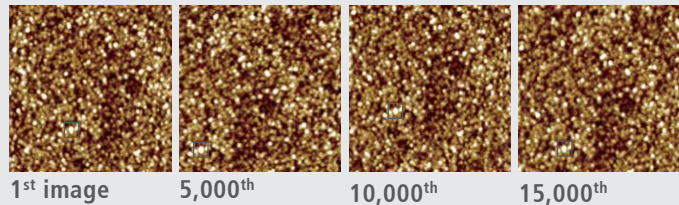
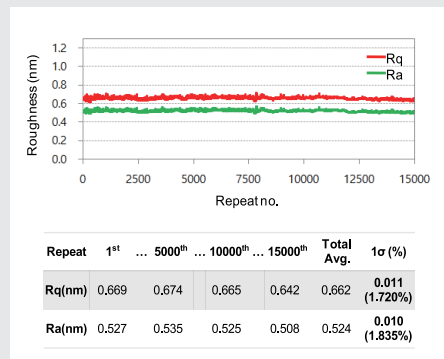
Accurate Feedback by Faster Z-servo enables True Non-Contact AFM

- Less tip wear → Prolonged high-resolution scan
- Non-destructive tip-sample interaction → Minimized sample modification
- Maintains non-contact scan over a wide range of samples and conditions

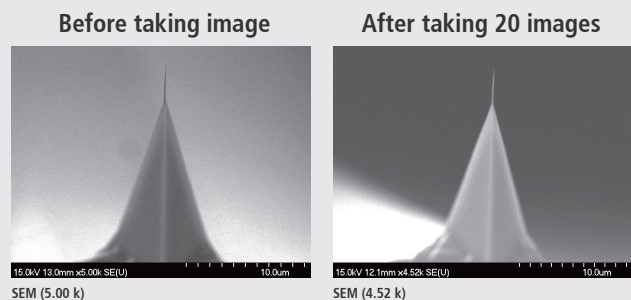
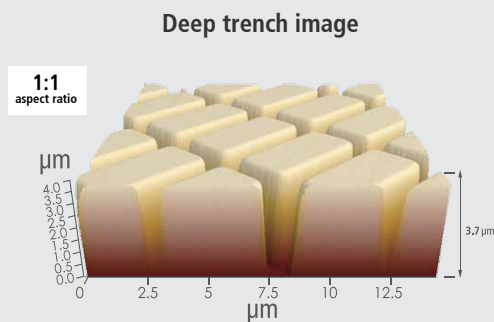


Unlike in contact mode, where the tip contacts the sample continuously during a scan, or in tapping mode, where the tip touches the sample periodically, a tip used in non-contact mode does not touch the sample.

Because of this, use of non-contact mode has several key advantages. Scanning at the highest resolution throughout imaging is now possible as the tip's sharpness is maintained. Non-contact mode avoids damaging soft samples as the tip and sample surface avoid direct contact.



Furthermore, non-contact mode senses tip-sample interactions occurring all around the tip. Forces occurring laterally to tip approach to the sample are detected. Therefore, tips used in non-contact mode can avoid crashing into tall structures that may suddenly appear on a sample surface. Contact and tapping modes only detect the force coming from below the tip and are vulnerable to such crashes.



Park SmartScan™

Park AFM Operating Software



Pixel / Scan size
Quality / Speed

Choose pixel density and scan size.

Start with sample A

1 SETUP

2 POSITION

3 IMAGE

4 END

Start with new sample B

Single-click Imaging with SmartScan™ Auto Mode

All you need to specify for AFM imaging are quality-speed preference, pixel density and scan size. Outside of those factors, you can leave all sophisticated AFM parameters up to the Auto mode of SmartScan™. The system will start a measurement with optimized conditions for imaging automatically at the click of a button.

Park SmartAnalysis™

The Park AFM Image Analytics Software



Park SmartAnalysis™ is an atomic force microscopy image processing and data analysis software for Park AFM. It is the next generation image analytics software with powerful features and newly added automated functions. Park SmartAnalysis enables users to swiftly prepare, analyze and publish their AFM acquired images and measurements.

Line	Min(nm)	Rp(nm)	Rq(nm)	Ra(nm)
Top layer	10.265	6.825	0.795	0.667
Bottom layer	8.661	2.837	0.152	0.115
Substrate	-0.235	1.291	0.057	0.044

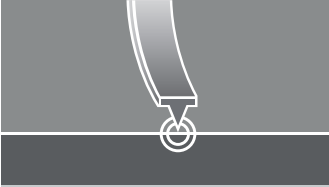
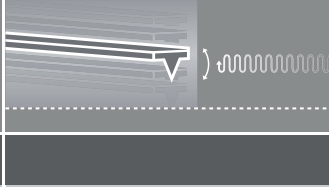
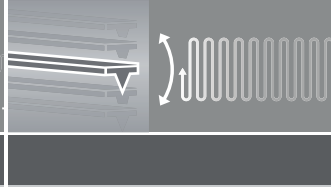
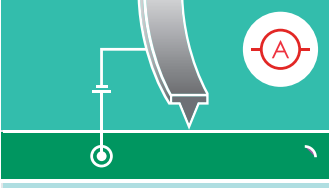
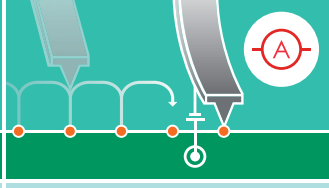
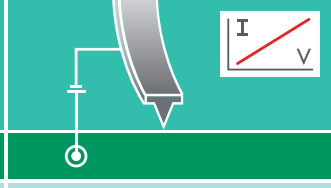

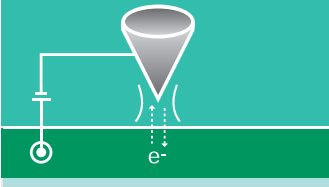
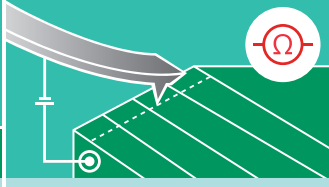


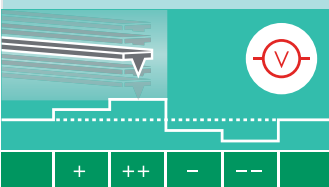
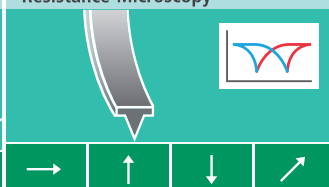
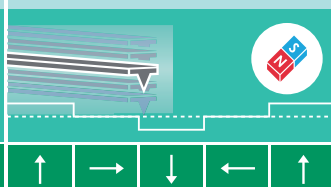
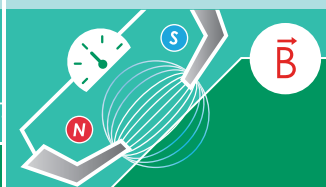


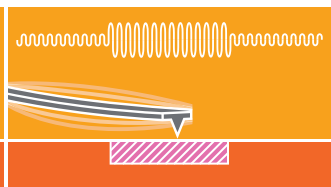
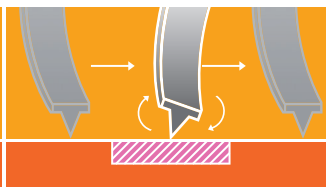



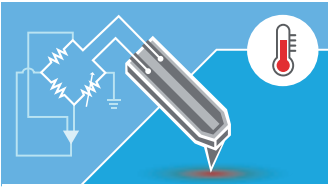
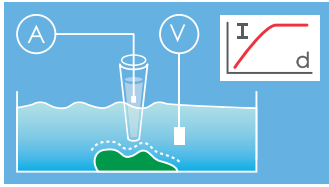
Before EZ Flatten

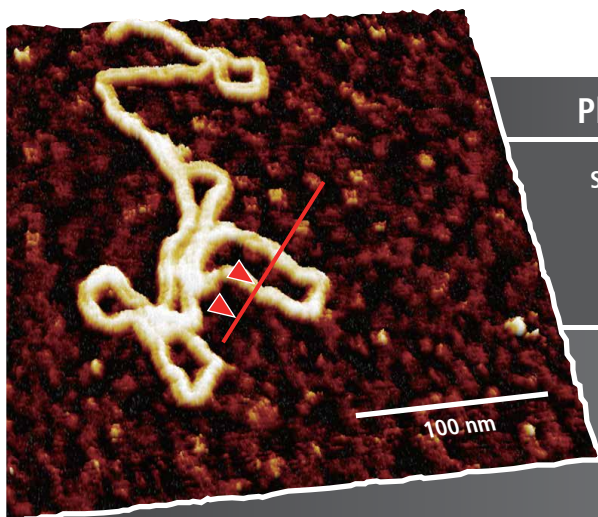
After EZ Flatten

Excute

Park Atomic Force Microscopy Modes

Get the data you need with Park's selection of scanning modes

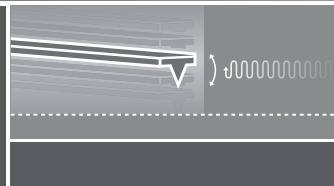
			
Contact	Non-Contact	Tapping	
			
Conductive AFM	PinPoint Conductive AFM	IV Spectroscopy	Photocurrent Mapping
			
Scanning Tunneling Microscopy	Scanning Spreading Resistance Microscopy	Scanning Capacitance Microscopy	Electrostatic Force Microscopy
			
Kelvin Probe Force Microscopy	Piezoresponse Force Microscopy	Magnetic Force Microscopy	Tunable Magnetic Field MFM
			
Force Distance Spectroscopy	PinPoint Nanomechanical	Force Modulation Microscopy	Lateral Force Microscopy
			
Nanoindentation	Nanolithography	Nanomanipulation	
			
Scanning Thermal Microscopy	Scanning Ion Conductance Microscopy		



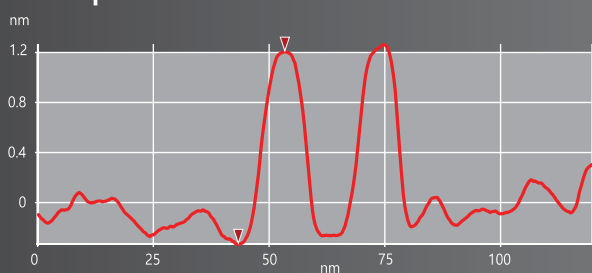
Plasmid DNA in Liquid

Scanning conditions

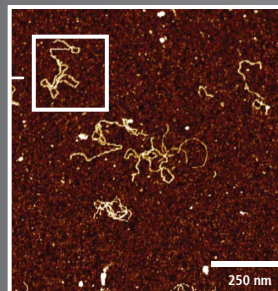
Scan Mode: Non-Contact
Cantilever: BL-AC40TS ($k = 0.09$ N/m, $f = 110$ kHz)
Option: liquid probehead and liquid cell



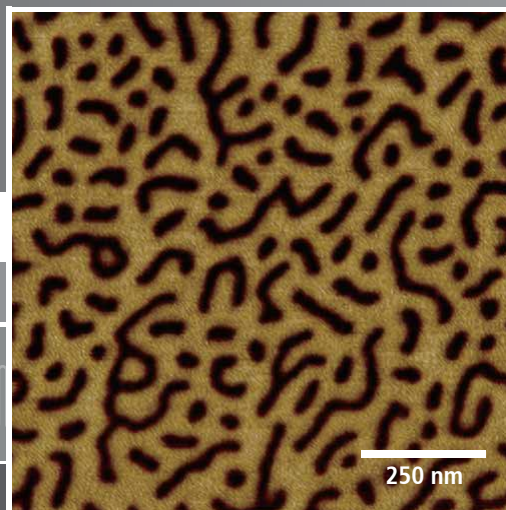
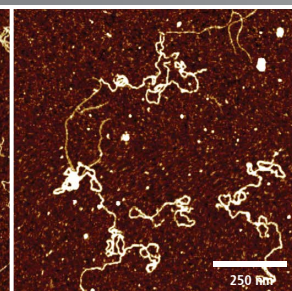
Line profile



Position 2



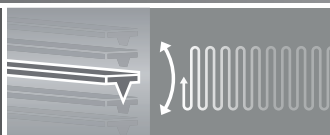
Position 1



Polymer on Si

Scanning conditions

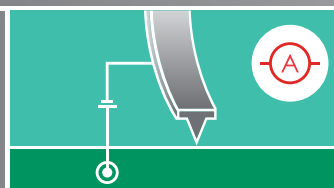
Scan Mode: Tapping
Cantilever: AC160TS ($k = 26$ N/m, $f = 300$ kHz)



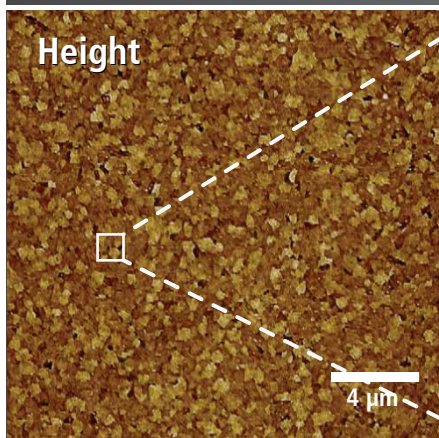
ITO Glass

Scanning conditions

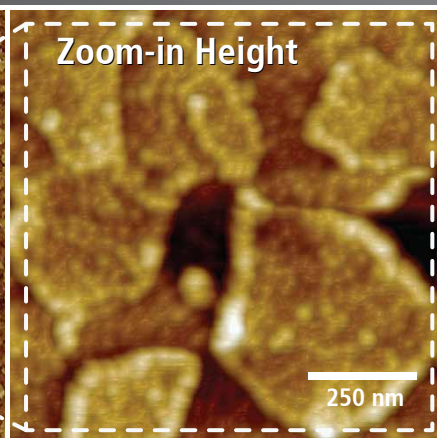
Scan Mode: Conductive AFM
Cantilever: CDT-Contr ($k = 0.5$ N/m, $f = 20$ kHz)



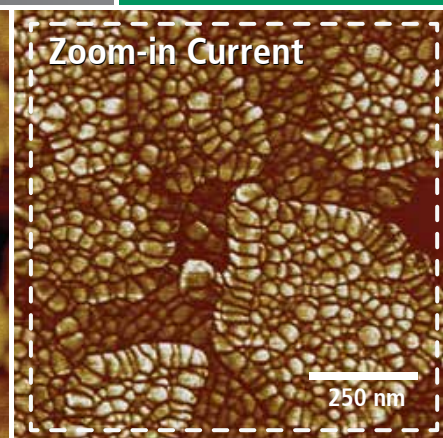
Height



Zoom-in Height

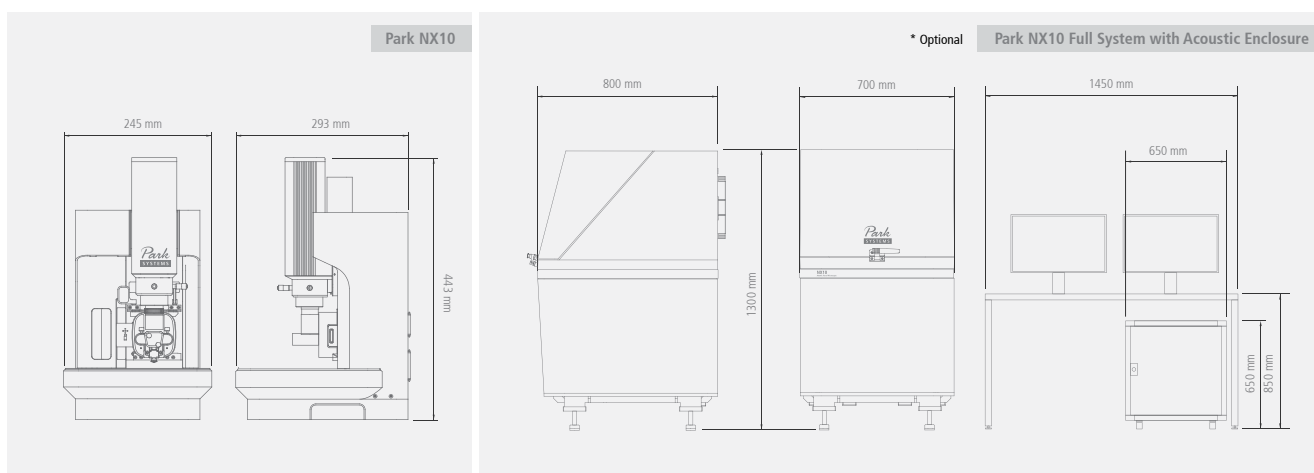


Zoom-in Current



* optional

Scanner	Z scanner	XY scanner	Stage		
	AFM Head Flexure-guided high-force scanner Scan range: 15 μm (optional 30 μm)	SICM Head Flexure-guided structure driven by multiply-stacked piezoelectric stacks Z scan range: 15 μm (optional 30 μm)	Single module flexure XY-scanner with closed-loop control Scan range: 50 μm × 50 μm (optional 10 μm × 10 μm or 100 μm × 100 μm)		
			XY stage travel range: 20 mm × 20 mm (Motorized) Z stage travel range: 25 mm (Motorized) Focus stage travel range: 15 mm (Motorized)		
Sample Mount	On-Axis Optics	Electronics	Integrated functions		
Sample size: Open space up to 100 mm x 100 mm, thickness up to 20 mm	10x (0.21 N.A.) ultra-long working distance lens (1μm resolution) Direct on-axis vision of sample surface and cantilever Field-of-view : 480 × 360 μm (with 10× objective lens) CCD : 1.2 M pixel, 5 M pixel (optional) (optional; Field-of-view: 840 μm × 630 μm)		4 channels of flexible digital lock-in amplifier Spring constant calibration (Thermal method) Digital Q control		
Options/Modes	Standard imaging	Dielectric/Piezoelectric properties	Electrical properties	Mechanical properties	
	<ul style="list-style-type: none">• True Non-Contact• Contact• Tapping• PinPoint™	<ul style="list-style-type: none">• Lateral Force Microscopy (LFM)• Phase Imaging• Scanning Ion Conductance Microscopy (SICM)	<ul style="list-style-type: none">• Electric Force Microscopy (EFM)• Piezoresponse Force Microscopy (PFM)• PFM with High Voltage*• Contact Resonance PFM (CR-PFM)*	<ul style="list-style-type: none">• Conductive AFM (C-AFM)*• IV Spectroscopy*• Kelvin Probe Force Microscopy (KPFM)• Sideband FM-KPFM• Scanning Capacitance Microscopy (SCM)*• Scanning Spreading-Resistance Microscopy (SSRM)*• Scanning Tunneling Microscopy (STM)*• Photo Current Mapping (PCM)*	<ul style="list-style-type: none">• Force Modulation Microscopy (FMM)• Nanoindentation• Nanolithography*• Nanolithography with High Voltage*• Nanomanipulation*
	Magnetic properties	Thermal properties*	Force measurement		
	<ul style="list-style-type: none">• Magnetic Force Microscopy (MFM)• Tunable Magnetic Field MFM*	<ul style="list-style-type: none">• Scanning Thermal Microscopy (SThM)	<ul style="list-style-type: none">• Force Distance (F/d) Spectroscopy• Force Volume Imaging		
	Chemical properties*				
	<ul style="list-style-type: none">• Chemical Force Microscopy with Functionalized Tip• Electrochemical Microscopy (EC-AFM)	<ul style="list-style-type: none">• Scanning Ion Conductance Microscopy (SICM)• Scanning Electrochemical Cell Microscopy Single Barrel (SECCM Single Barrel)	<ul style="list-style-type: none">• Scanning Ion Conductance Microscopy-Scanning Electrochemical Microscopy (SICM-SECM)• Current-Distance (I/d) Spectroscopy (with SICM)		
Software	Park SmartScan™	Park SmartAnalysis™	Accessories*		
	<ul style="list-style-type: none">• AFM system control and data acquisition software• Auto mode for quick setup and easy imaging• Manual mode for advanced use and finer scan control	<ul style="list-style-type: none">• AFM data analysis software• Stand-alone design—can install and analyze data away from AFM• Capable of producing 3D renders of acquired data	<ul style="list-style-type: none">• Universal Liquid Cell with Temperature Control• Temperature Controlled Stages• Electrochemistry Cell	<ul style="list-style-type: none">• Glove Box• Magnetic Field Generator• Tilting Sample Chuck	



Committed to contributing to impactful science and technology

Park Systems Corporation is a leading manufacturer of nanoscale microscopy and metrology solutions that encompasses the atomic force microscopy, white light interferometry, infrared spectroscopy and ellipsometry systems. Its products are widely used for scientific research, nanoscale engineering, and semiconductor fabrication and quality assurance. Park Systems provides a full range of AFM products from desktop to fully automated systems with integrated robotic arms. Furthermore, its product line includes WLI AFM, Photo-induced Force Microscopy spectroscopy and ellipsometry systems for those in the chemistry, materials, physics, life sciences, and semiconductor industries. In 2022, Park Systems acquired and merged Accurion GmbH, a leader in high-end ellipsometry and active vibration isolation, to form Park Systems GmbH, Accurion Division.

Park Systems is a publicly traded corporation on the Korea Stock Exchange (KOSDAQ) with corporate headquarters in Suwon, Korea, and regional headquarters in Santa Clara, California, Mannheim, Germany, Paris, France, Beijing, China, Tokyo, Japan, Singapore, India, and Mexico. To learn more, please visit www.parksystems.com.

Park Systems Americas

+1-408-986-1110 (USA)
+52-55-7100-2354 (Mexico)

Park Systems Europe

+49 (0)-621-490896-50 (Germany)
+33 (0)-6-07-10-87-36 (France)
+44 (0)-115-784-0046 (UK&Ireland)

Park Systems GmbH - Accurion

+49-551-999600 (Germany)

Park Systems Japan

+81-3-3219-1001 (Japan)

Park Systems China

+86-400-878-6829 (Beijing, Shanghai, Guangzhou)
+886-3-5601189 (Taiwan)

Park Systems SE Asia

+65-6634-7470 (Singapore)

Park Systems Korea

+82-31-546-6800 (Republic of Korea)

Park Systems India

+91-96869 51464 (India)

Park Systems Corporate Headquarters

To learn more about Park Systems, please visit www.parksystems.com or e-mail inquiry@parksystems.com

KANC 15F, Gwanggyo-ro 109, Suwon 16229, Korea Tel.+82-31-546-6800

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