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)	Sample size: Open space up to 100 mm x 100 mm, thickness up to 20 mm XY stage travel range: 20 mm x 20 mm Z stage travel range: 25 mm Focus stage travel range: 15 mm

Vision	Direct on-axis vision of sample surface and cantilever	Objective lens	Electronics	Integrated functions
	Field-of-view: 480 µm × 360 µm (with 10× objective lens) CCD: 1.2 M pixel (default), 5 M pixel (optional; Field-of-view: 840 µm x 630 µm)	10 x ultra-long working distance lens 20 x high-resolution, long working distance lens		4 channels of flexible digital lock-in amplifier Spring constant calibration (Thermal method) Digital Q control

Options/Modes

Topography Imaging
- True Non-Contact
- Contact
- Tapping

Magnetic Properties
- Magnetic Force Microscopy (MFM)

Dielectric/Piezoelectric Properties
- Piezoresponse Force Microscopy (PFM)
- PFM with High Voltage
- Piezoresponse Spectroscopy

Electrical Properties
- Conductive AFM (C-AFM)
- I/V Spectroscopy
- Kelvin Probe Force Microscopy (KPFM)
- KPFM with High Voltage
- Scanning Capacitance Microscopy (SCM)
- Scanning Spreading-Resistance Microscopy (SSRM)
- Scanning Tunneling Microscopy (STM)
- Photo Current Mapping (PCM)
- Current-Distance (I/d) Spectroscopy (with SICM)
- Electrostatic Force Microscopy (EFM)

Mechanical Properties
- PinPoint Nanomechanical Mode
- Force Modulation Microscopy (FMM)
- Nanoindentation
- Nanolithography
- Nanolithography with High Voltage
- Nanomanipulation
- Lateral Force Microscopy (LFM)
- Force Distance (F/d) Spectroscopy
- Force Volume Imaging

Thermal Properties
- Scanning Thermal Microscopy (SThM)

Chemical Properties
- Chemical Force Microscopy with Functionalized Tip
- EC-AFM

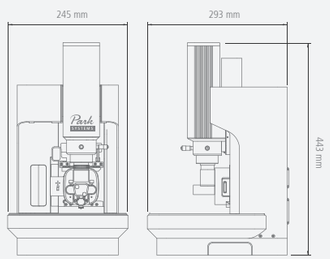
Software

Park SmartScan™
- AFM system control and data acquisition software
- Auto mode for quick setup and easy imaging
- Manual mode for advanced use and finer scan control

XEI
- AFM data analysis software
- Stand-alone design—can install and analyze data away from AFM
- Capable of producing 3D renders of acquired data

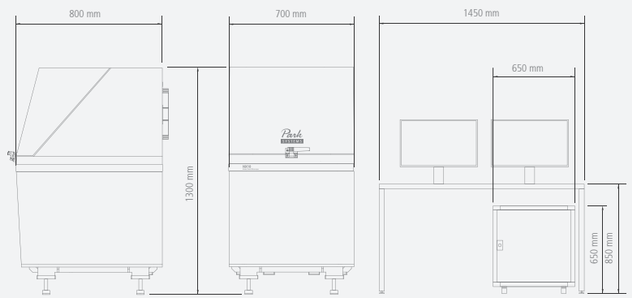
Accessories
- Universal Liquid Cell with Temperature Control
- Temperature Controlled Stages
- Electrochemistry Cell
- Glove Box
- Magnetic Field Generator
- Tilting Sample Chuck

Park NX10



* Optional

Park NX10 Full System with Acoustic Enclosure



ⓘ **Note: All specifications are subject to change without notice. Please visit our website for the most up-to-date specifications.**

Committed to Contribute to Impactful Science and Technological Development

More than 25 years ago, the foundations of Park Systems were laid at Stanford University, where Park Systems' founder, Dr. Sang-il Park, worked in Prof. Calvin Quate's group; the group that invented the world's first AFM. After years of development, Dr. Park introduced the first commercial AFM to the world, thus starting the successful path of Park Systems. With good foresight, a superior product and keen business acumen, Park has positioned themselves as the dominant industry leader in AFM Nanoscale Metrology and in 2020, Park Systems will roll out their most exciting line of AFM products in their history.

Park Systems continuously strives to live up to the innovative spirit of its origin. Throughout its long journey, the company has been committed to provide advanced, accurate, and reliable AFM instrumentation, with revolutionary features such as True Non-Contact™ mode and PinPoint™ Nanomechanical AFM. Cutting-edge AFM automation features, like SmartScan™, make Park Systems AFMs not only extremely easy to use, but they also enable users to obtain outstanding results faster, more efficiently, and more accurately.

Park Systems

Enabling Nanoscale Advances

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ATOMIC FORCE MICROSCOPE

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

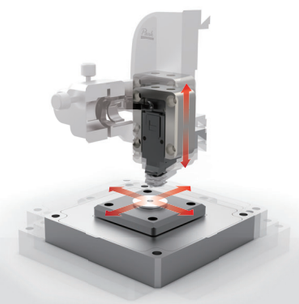
- Open side access for easy sample or tip exchange
- Easy, intuitive laser alignment with pre-aligned tip mount
- Park SmartScan™- AFM operating software for empowering both novices and power users towards versatile nanoscale research

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.



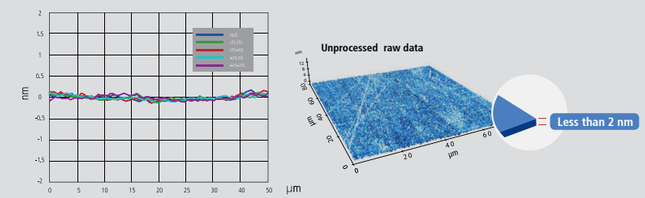
Decoupled XY and Z Scanners

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 in the industry.

Accurate Surface Measurement

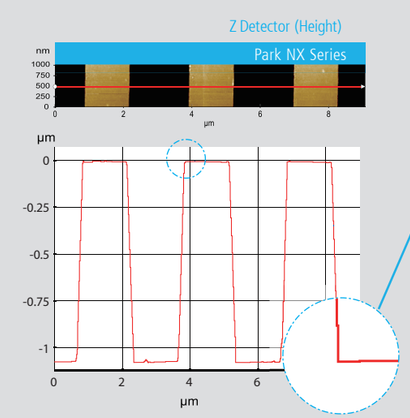
"Flat" sample surface as it is!

- Low residual bow
- No need for software processing
- Accurate results independent of scan location



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 NX10 saves you time and gives you better data.



No creep effect

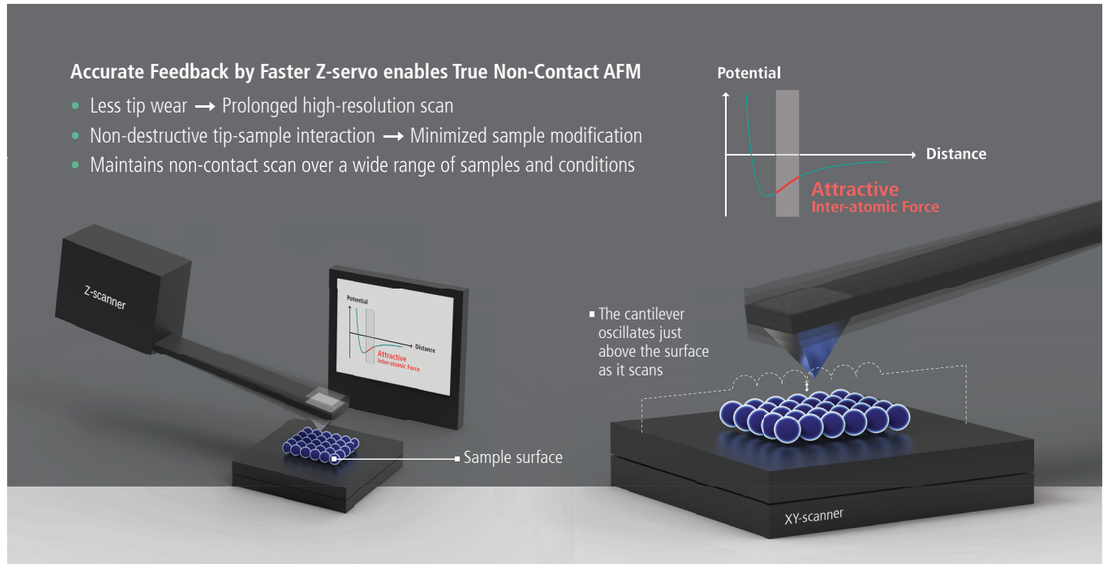
Accurate Sample Topography Measured by Low Noise Z Detector

- 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

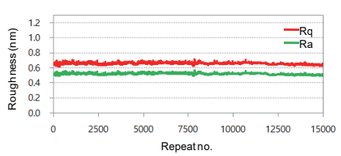
Sample: 1.2 µm Nominal Step Height
(9 µm x 1 µm, 2048 pixels x 128 lines)

True Non-Contact™ Mode

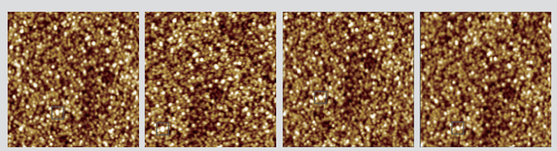
True Non-Contact™ Mode is a scan mode unique to Park AFM systems that produces high resolution and accurate data by preventing destructive tip-sample interaction during a scan.



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.



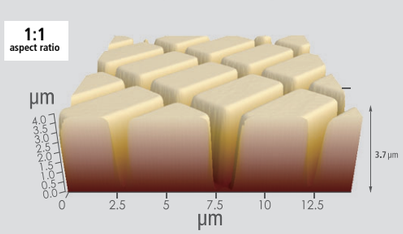
Repeat	1st	…	5000th	… 10000th	… 15000th	Total Avg.	1σ (%)
Rq(nm)	0.669		0.674	0.665	0.642	0.662	0.011 (1.720%)
Ra(nm)	0.527		0.535	0.525	0.508	0.524	0.010 (1.835%)



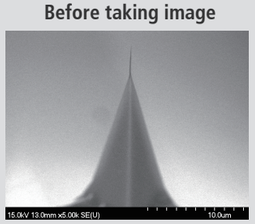
1st image 5,000th 10,000th 15,000th

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.

Deep trench image

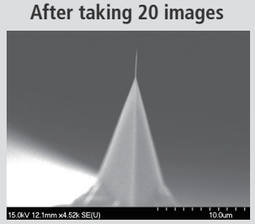


Before taking image



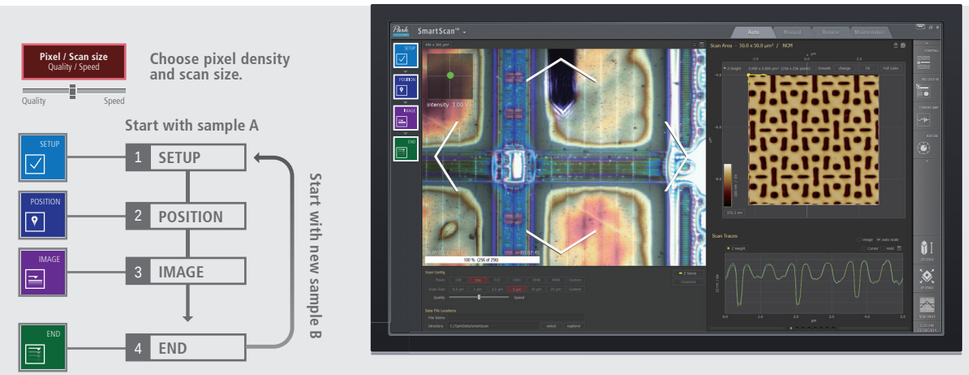
SEM (5.00 k)

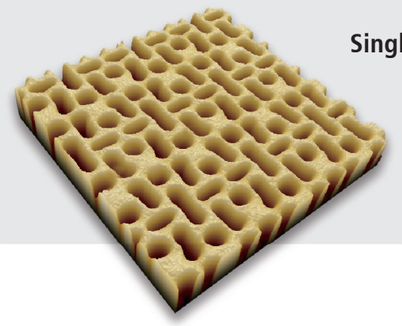
After taking 20 images



SEM (4.52 k)

Park SmartScan™





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.

An AFM operation software for everyone, from amateurs to experts

Whether your AFM needs are focused on academic research, industrial metrology or failure analysis, SmartScan's Auto mode offers a streamlined system to generate publishable, high quality AFM data. Moreover, SmartScan™ promises productive sessions with an AFM even for beginners to obtain quality data as good as an expert's, in much shorter time.

FastApproach™

Click the Position button, and the Z scanner approaches the sample automatically and at a much higher speed than the typical manual approach. Park's FastApproach™ safely takes the cantilever down to the sample surface at full speed without the user's intervention and engages in just 10 seconds after loading the cantilever.

Easy to find an area of interest

After tip-to-sample engagement, the optical camera will automatically focus on the sample to find your area of interest (AOI). The UX of SmartScan™ easily enables intuitive navigation of the sample by controlling the motorized stages in the integrated optical window. You can move the AOI of the sample directly by clicking the desired position in the optical window.

Speeds up imaging with AdaptiveScan™

Park's innovative AdaptiveScan™ controls the scan speed automatically based on the peaks and valleys of the sample surface. AdaptiveScan™ adjusts the optimum scan speed dynamically to acquire a quality image of an unknown morphology at a higher speed. This effectually shortens the imaging time while retaining top image quality comparable to that obtained by a well-trained expert manually. When moving to neighboring locations or zooming-in to a target, AdaptiveScan™ automatically applies a new optimal condition.

Park Atomic Force Microscopy Modes

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

TOPOGRAPHY IMAGING

- Contact
- Non-Contact
- Tapping

ELECTRICAL / MAGNETIC PROPERTIES

- 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

NANOMECHANICAL PROPERTIES

- Force Distance Spectroscopy
- PinPoint Nanomechanical
- Force Modulation Microscopy
- Lateral Force Microscopy
- Nanoindentation
- Nanolithography
- Nanomanipulation

OTHER PROPERTIES

- Scanning Thermal Microscopy
- Scanning Ion Conductance Microscopy