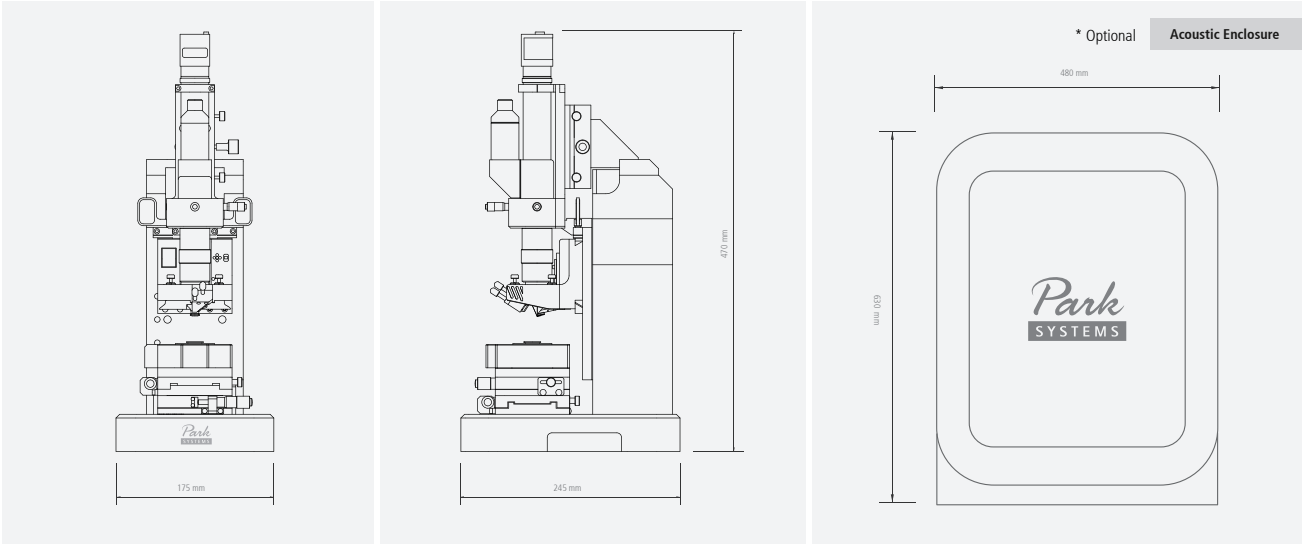| Scanner	Z scanner		XY scanner			Stage	
	Flexure guided high-force scanner Scan range: 12 µm (optional 25 µm)		Single module flexure XY-scanner with closed-loop control Scan range: 50 µm × 50 µm (optional 10 µm × 10 µm or 100 µm × 100 µm)			XY stage travel range: 13 mm x 13 mm Z stage travel range: 29.5 mm	

Vision			Sample Mount		Electronics	Signal processing		Integrated functions
Direct on-axis vision of sample surface and cantilever 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)			Sample size: Up to 100 mm Thickness: Up to 20 mm			ADC: 20 channels 16-bit ADCs for X, Y, and Z scanner position sensor DAC: 21 channels 16-bit DACs for X, Y, and Z scanner positioning		Active Q control (optional) Cantilever spring constant calibration (optional) Signal Access Module (optional)

Options/Modes	Topography Imaging	Magnetic Properties	Dielectric/Piezoelectric Properties	Electrical Properties	Mechanical Properties
	• Non-Contact • Contact • Tapping	• Magnetic Force Microscopy (MFM) • Tunable Magnetic Field MFM	• Piezoresponse Force Microscopy (PFM) • PFM with High Voltage • Piezoresponse Spectroscopy	• 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) • Electrostatic Force Microscopy (EFM)	• 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		Chemical Properties		
	• Scanning Thermal Microscopy (SThM)		• Chemical Force Microscopy wit h Functionalized Tip • EC-AFM		

Software	Park SmartScan™		XEI		Accessories	
	• AFM system control and data acquisition software • Auto mode for quick setup and easy imaging • Manual mode for advanced use and finer scan control		• AFM data analysis software • Stand-alone design—can install and analyze data away from AFM • Capable of producing 3D renders of acquired data		Electrochemistry Cell Universal Liquid Cell with Temperature Control Temperature Controlled Stages	Glove Box Magnetic Field Generator

* Optional | Acoustic Enclosure

480 mm

410 mm

650 mm

175 mm

245 mm

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

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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Park Systems China: +86-10-6254-4360
Park Systems SE Asia: +65-66347470

parksystems.com

Park XE7

The most affordable research grade AFM with flexible sample handling

Park XE7
The economical choice for innovative research

Park XE7 has all the state-of-the-art technology you have come to expect from Park Systems, at a price your lab can afford. Designed with the same attention to detail as our more advanced models, XE7 allows you to do your research on time and within budget.

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

The Most Extensible AFM Solution

- The most comprehensive range of SPM modes
- The largest number of sample measurement options
- The best option compatibility and upgradeability in the industry

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 versatile enough to empower both novices and power users alike toward great nanoscale research

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Park XE7
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.
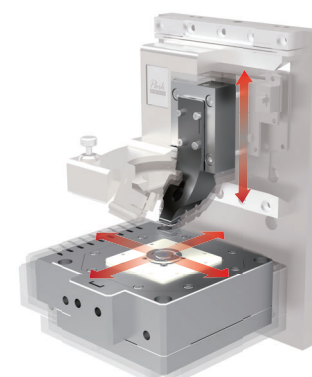
Decoupled XY and Z Scanners

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.
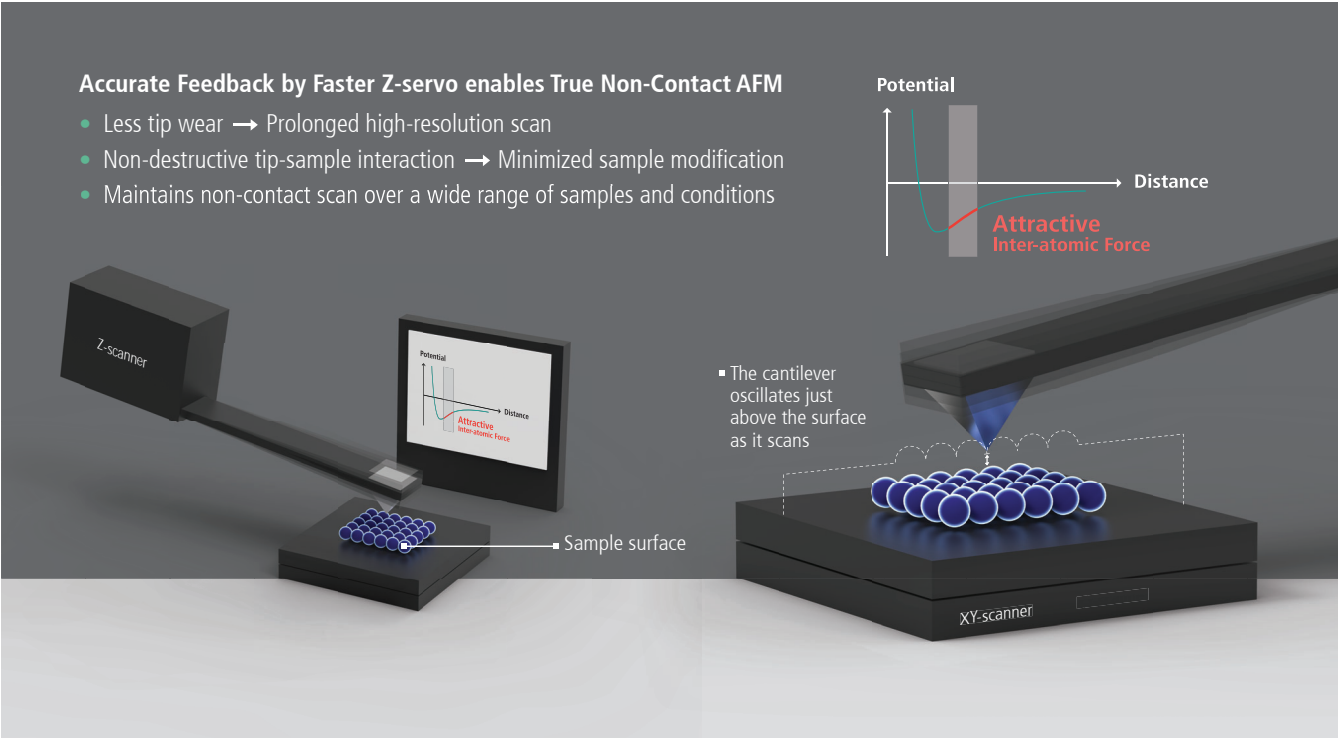
Unprocessed raw data

Less than 2 nm
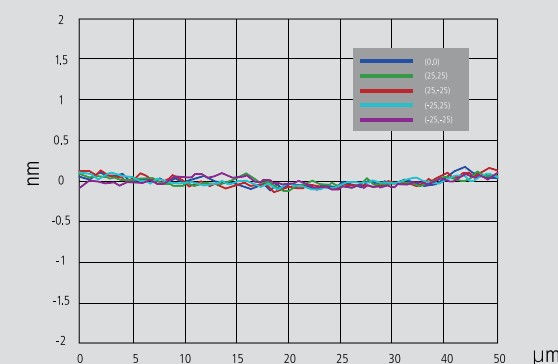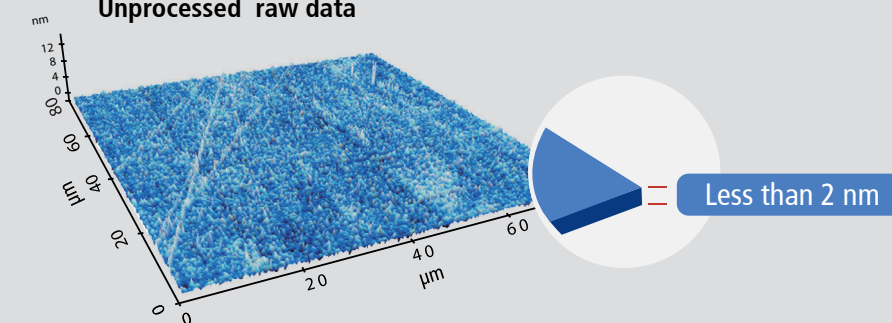
Accurate Surface Measurement

"Flat" sample surface as it is!

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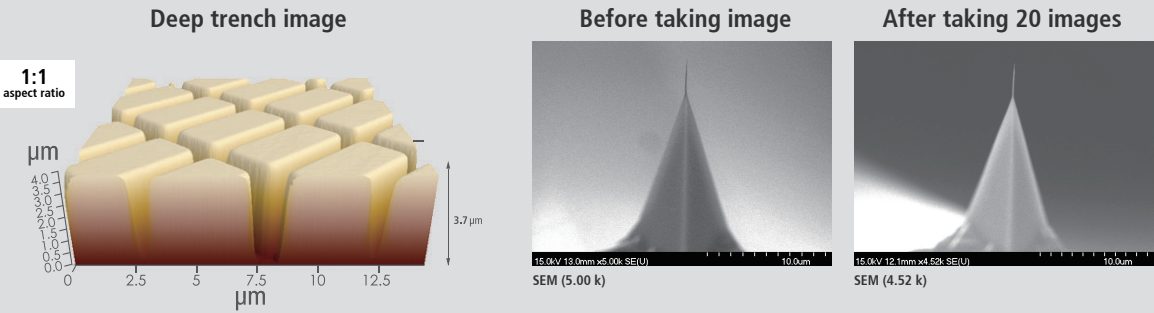- Accurate results independent of scan location

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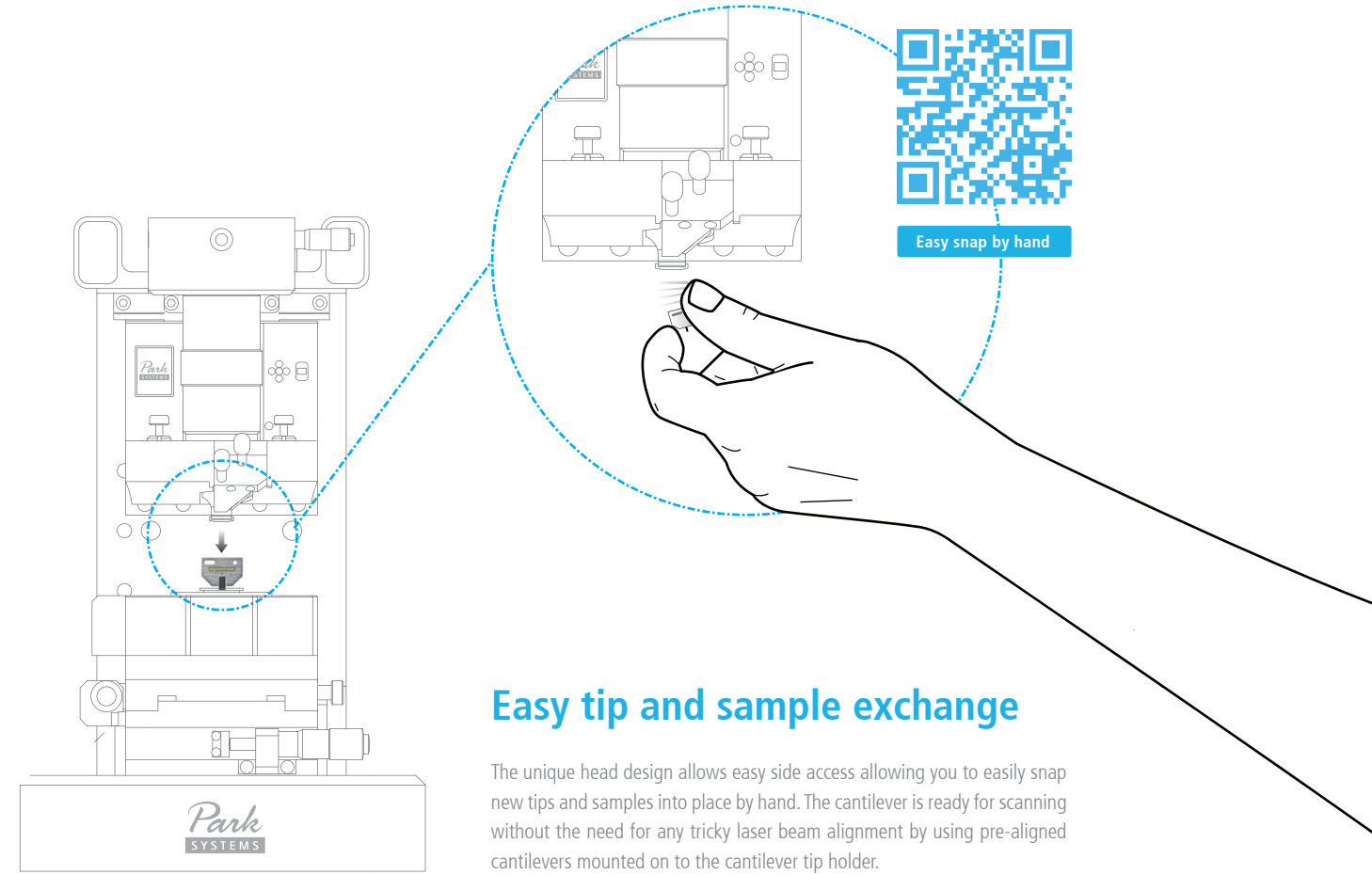
Accurate Feedback by Faster Z-servo enables True Non-Contact AFM

- 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

Potential

Distance

Attractive Inter-atomic Force

Z-scanner

Potential
Distance
Attractive Inter-atomic Force

▪ The cantilever oscillates just above the surface as it scans

Sample surface

XY-scanner

True Non-Contact™ Mode Preserves Tip Sharpness

AFM tips are so brittle that touching a sample will instantly reduce the resolution and quality of the image they produce. For soft and delicate samples, the tip will also damage the sample and result in inaccurate sample height measurements, something that can cost you valuable time and money. True Non-Contact™ mode, a scan mode unique to Park AFMs, consistently produces high resolution and accurate data while maintaining the integrity of the sample.

Deep trench image

1:1 aspect ratio

μm

4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

0   2.5   5   7.5   10   12.5

μm

3.7 μm

Before taking image

15.0kV 13.0mm x5.00k SE(U)   10.0um

SEM (5.00 k)

After taking 20 images

15.0kV 12.1mm x4.52k SE(U)   10.0um

SEM (4.52 k)

Park XE7
Why the world's most accurate small sample AFM is also the easiest to use

Easy snap by hand

Park
SYSTEMS

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 mounted on to the cantilever tip holder.
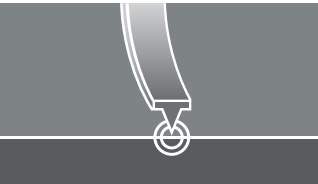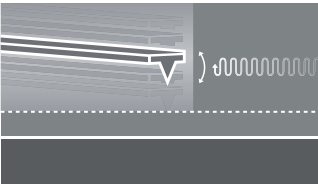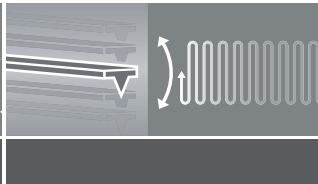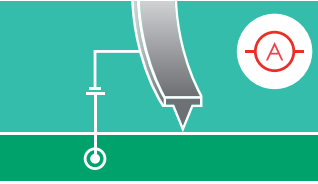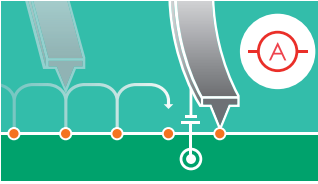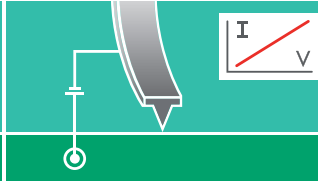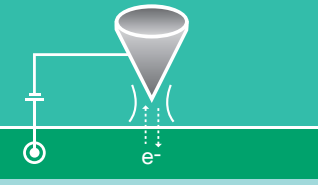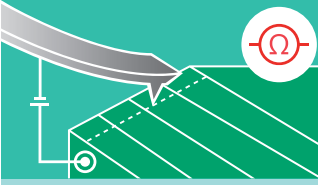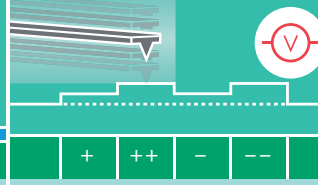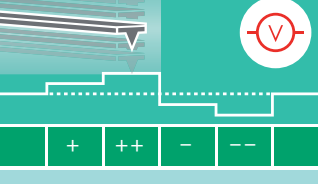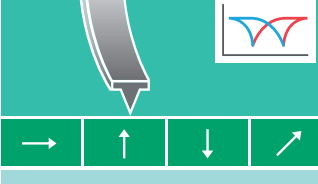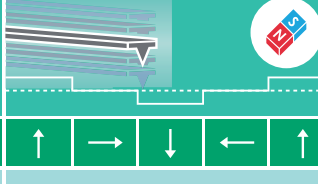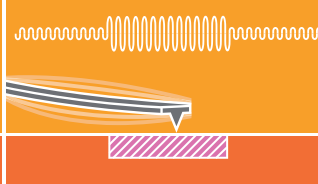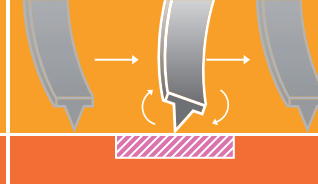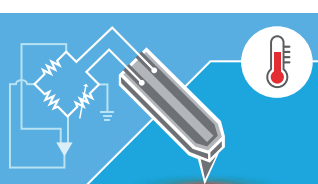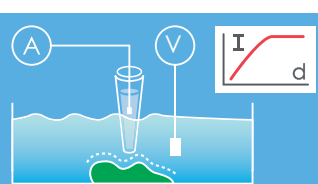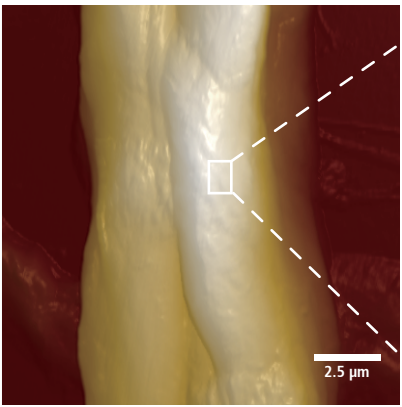
Easy, intuitive laser beam alignment

With our advanced pre-aligned cantilever holder, the laser beam is focused on the cantilever upon placement. Furthermore, the natural on-axis, top-down view allows you to easily find the laser spot. Since the laser beam falls vertically onto the cantilever, you can intuitively move the laser spot along the X- and Y-axis by rotating two positioning knobs. As a result, you can easily find the laser and position it onto the position-sensitive photodiode using our operation software's beam alignment user interface. From there, all you will need is a minor adjustment to maximize the signal prior to starting data acquisition.
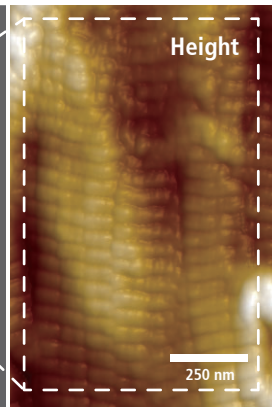
The Laser beam is always focused on the cantilever upon replacement
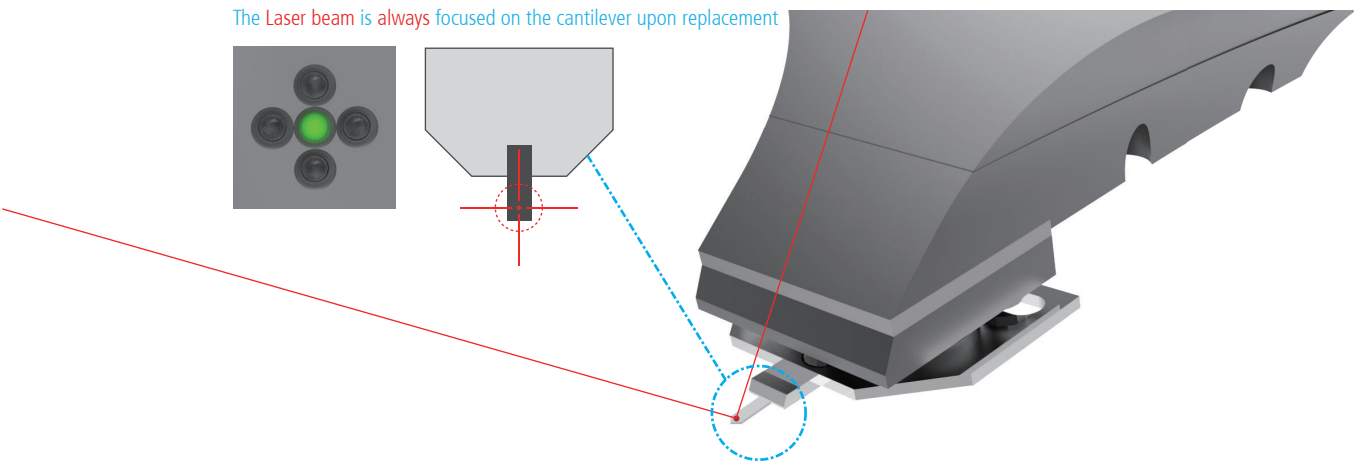
Park Atomic Force Microscopy Modes

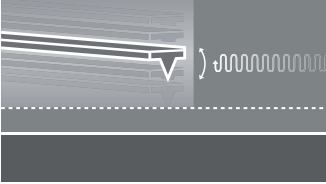## Get the data you need with Park's selection of scanning modes

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 ● | | |

● NOT AVAILABLE FOR THIS PRODUCT
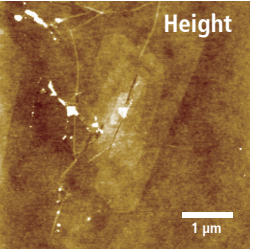

Animal Hair with Skin

Height

Scanning conditions
Scan Mode: Non-Contact
Cantilever: AR5T-NCHR
(k=42N/m, f=330kHz)

2.5 μm
250 nm
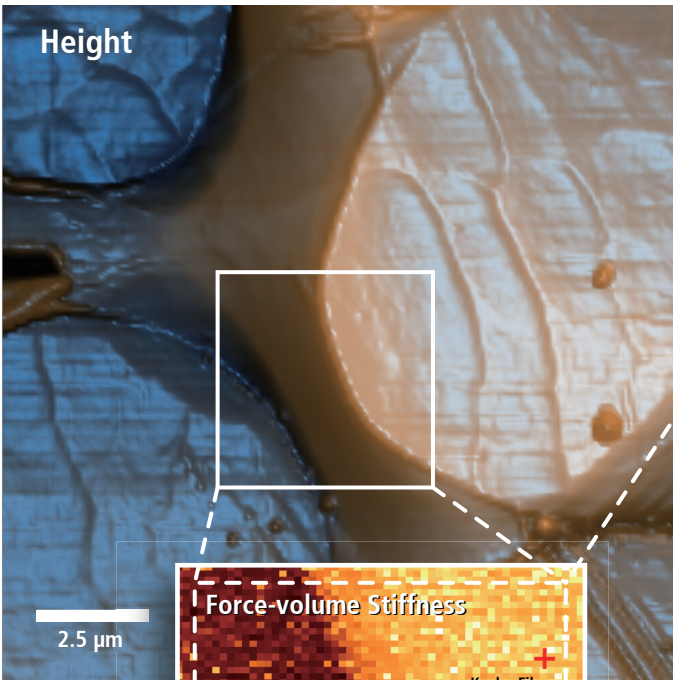
Current

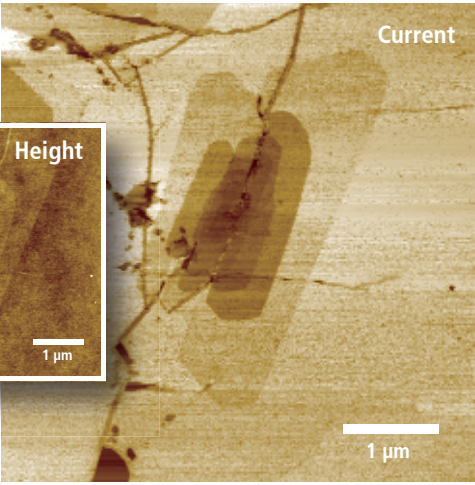## Graphene

Height

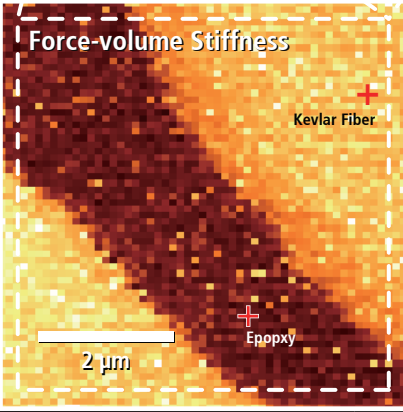**Scanning conditions**
Scan Mode: Conductive AFM
Cantilever: NSC36C Cr-Au
(k=0.6N/m, f=65kHz)

1 μm
1 μm

Height

2.5 μm

F/d spectroscopy

6
4
2
0
nN

1.36   1.4   1.44   1.48   1.52   1.56
μm

F/d mapping Conditions

- Mapping points: 64×64
- F/d curve pixel: 1024
- Force limit: 6V
- Approach speed: 1μm/sec
- Retract speed: 1μm/sec
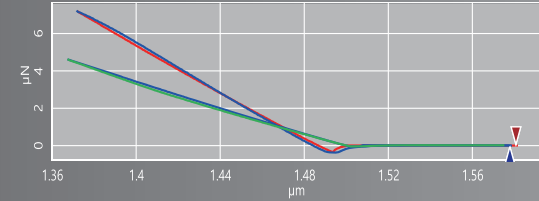
Kevlar fiber
Epoxy

Force-volume Stiffness

Kevlar Fiber
Epopxy

2 μm

Kevlar Fiber

Scanning conditions
Scan Mode: Non-Contact, F/d Mapping
Cantilever: Diamond probe
(k=151N/m, f=50kHz)