

TITANIUM

A revolutionary step in AFM design



Specifications

Measuring heads

Revolution Cartridge for Multi-probe Cartridges. Enables Automated Cantilever Replacement with Full Tuning.
Standard AFM Head for traditional single chip probes for traditional AFM cantilevers. Enables operation with majority of commercial probes.
AFM Head for Liquid Studies
STM Head for Scanning Tunneling Microscopy/Spectroscopy

Scanner

Type: Tube Scanner with Closed Loop Sensors, Scanning by Sample
Scanning range, XYZ:
100×100×10 or 2×2×0.2 in Low Voltage Mode
Closed loop: Available for all Directions: XYZ
Noise: <300pm in XY and <30pm in Z for Closed Loop, <30pm in XYZ for Opened Loop
Drive electronics noise < 5uV/√Hz (within 600V range)

Tip-Sample Positioning

Type: Motorized Sample positioning in XYZ
XYZ Thermal Drift: <0.2 nm/min
Moving Range: 5×5 mm in XY, 10 mm in Z
Navigation: Place of Interest Saving, Navigation by Mouse Click on Video Image, 3D Mouse Compatible, Automated Multiple Scanning
Approach: Smart Soft Approach Algorithm

View Module

Type: Motorized Focus, Zoom and XY positioning. Calibrated with Sample and Laser Position
Resolution: 2µm
Field of View: up to 2×2mm (1 Mpixel), up to 7×7mm using automated panoramic optical view (50 MPixel)
Autofocus: on Cantilever, on Sample
Video Recognition: Cantilever Position
Zoom: Motorized Continuous Optical Zoom

Accessories

AFM Liquid Head: Contact mode, AC mode, Hybrid mode, Spectroscopy
STM Measuring Head: Constant Height and Constant Current Topography, Barrier Height, States Density, I(V) Curves, I(Z) Curves
Nanoindenter Measuring Head: Sclerometry, Indenting, Measuring Approach Curves. Range of Measured quantities: 1 - 80 GPa for Hardness, 1 - 1000 GPa for Elasticity modulus
Heating Stage: from RT to 150 C
Signal Assecc Module
+/- 50 V Voltage Extender
AFM tips: Variety of Single Chip AFM Cantilevers
Multi-probe Cartridges with 38 cantilevers of different types and coatings.

Electronics & Software

Number of scan channels: virtually unlimited. More than 16 independent simultaneous scan channels supported
Signal Processing: 512 Mb Buffer Size, 3x 340 MHz FPGA, 320 MHz DSP
Lock-in Amplifiers: 2x Analog Lock-in Amplifiers, 3x Digital Lock-in Amplifiers (Supporting many Multifrequency AFM modes)
Generators: 6x 32 bit Digital Generators, 4x for Lock-in
BV: +/- 10 V AC and DC (Independent Sample and Tip Voltage Supply), +/- 50 V AC and DC (Optional)
Self-testing: automated performance check
Maximum Scan Points: 8000×8000 Points
Scanning Parameters Auto Adjustment: Driving Amplitude, Lock-in Gain, Setpoint, Feedback Gain, Scanning Rate, Advanced Modes Configuration
Automation Features: Optical System Adjustment, Multiple Scanning on 5×5 mm Range with Scan Stitching, Overlay of Optical and AFM images, Panoramic Optical View, Place of Interest Saving, Autofocus on Cantilever, Autofocus on Sample
Programming tools: Nova PowerScript Language, LabView Integration

Optical Sensor

Light source: 850nm
Optical System Adjustment: Automated in Air and Liquid
Optical Beam Deflection Sensor Noise:
<25 fm/√Hz above 100kHz

Instrument Isolation

Thermal Stabilization: Temperature Control in Acoustic Enclosure
Acoustic Isolation: Acoustic Enclosure, Motorized Build-in Protective Cover.
Seismic Isolation: Active Vibration Isolation Table
Routine Atomic Resolution: in air and liquid

Basic Set of Modes

Contact mode: Topography, Contact Resonance Microscopy, Lateral Force, Force modulation, Spreading Resistance, Multifrequency Piezo Force Microscopy.
Amplitude modulation mode: Topography, Phase Imaging, Single and Double Pass Kelvin Probe Force Microscopy with Phase and Amplitude Modulation, Double Pass and Lift Magnetic Force Microscopy, Single and Double Pass Electrostatic Force Microscopy, Single and Double Pass dC/dZ and dC/dV microscopy.
Hybrid mode: Topography, Elasticity modulus, Lift and Land Adhesion, Work of Adhesion, Current, Viscoelasticity
Nanolithography: Voltage, Current, Force (All Vector and Raster), Nanomanipulation
Spectroscopy: Force-, Amplitude-, Phase-, Frequency-, Current-Distance, I(V), Piezopulse, Custom mode.



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