

Atomic Force Microscope (AFM)

Atomic Force microscope is one of the most versatile and powerful microscopy technologies for studying samples at nanoscale which makes it applicable in the field of nanoscience and nano-based industries. These microscopes are designed with the latest known AFM-Modes and most developed hardware and software.

Features

- Different Data Channels Including Amplitude, Phase, Topography
- High Sampling Rate and Digital Filtering Implementation
- High Bandwidth Sensors and High Quality Nano Scanner
- Disturbance and Noise Rejection through Closed Loop Operation

Some of the adjustable parameters are as below:

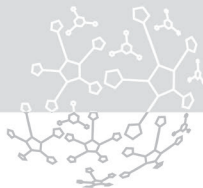
- Scanning speed & range
- Angle of scanning
- Reference force
- Proportional & Integration coefficients of PID control
- Dithering amplitude and frequency in dynamic mode
- Scanning selected zoomed area on previously obtained images
- Slope coefficient

Advantages:

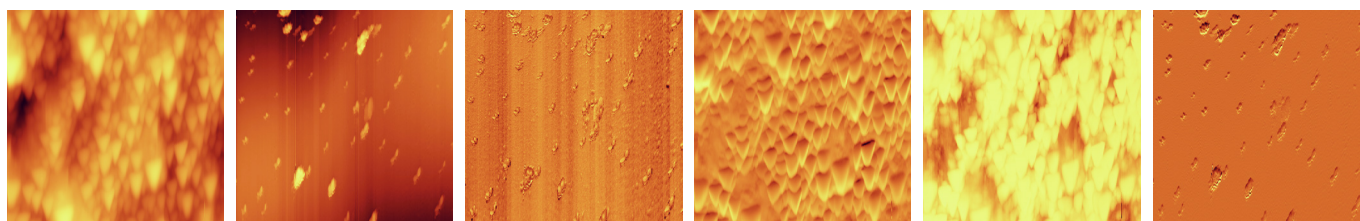
- Operation under non-vacuum conditions
- No need of sample preparation
- Reasonable cost, low energy consumption
- Not limited to specific kind of samples in comparison with TEM, STM and SEM
- Being a right-size laboratory equipment
- Proper imaging technique of biological samples

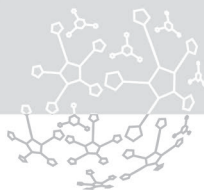
Application

- **Quality Control**
Inspection of microelectronic products
Quality control of coated surfaces
- **Environment and Food Sciences**
Nano filter evaluation
- **Polymers and Coatings**
Surface morphology of polymeric films
Evaluation of polymerization process
- **Physics**
Smoothness evaluation of optical surfaces in optic industry
Magnetic and Electrical properties of materials
- **Material Science**
Morphological evaluation of different specimens
Measuring the average particle size of powders
Creep crack analysis
Surface roughness analysis
- **Specific Application**
Nano lithography
Nano machining of hard ceramic surfaces
- **Medical and Biological Sciences**
pharmaceutical manufacturing
Imaging of DNA, RNA, chromosome, cell membrane, bacteria and ...



Specification					
Model	Multi-Mode AFM	Bio-AFM	Nano Vac	High speed AFM	Educational AFM
Head	H-M11	H-M21	H-A11	H-M11	H-M11
Scanner	S-C2	S-NC2	S-C2	S-C2	S-C1
Controller	C-2MS C-2MA C-2MF C-2MFP	C-2BFP	C-2NFP	C-2HFP	C-2ES
Option	High speed module, Motorized head H-A11, S-C3, S-C4, S-C5	High speed module	High speed module, Motorized head H-A11, S-C3, S-C4, S-C5	Motorized head H-A11, S-C3, S-C4, S-C5	Motorized head H-A11
Optical microscope		Included inverted microscope			
Vacuum pump			Compatible with well-known pump e.g. Leybold TriVac		
Vacuum gauge			Compatible with well-known gauge e.g. Leybold Pirani gauge		





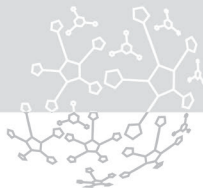
Head:

Model	H-M11	H-A11	H-M21
Optical Adjustment	Manual	Auto	Manual
Approach method	Auto/Manual	Auto/Manual	Auto/Manual
Top view camera	20X up to 200X zoom	20X up to 200X zoom	20X up to 200X zoom

Scanner:

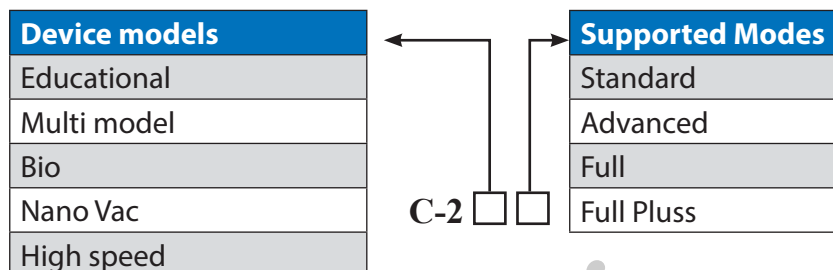
Model	S-C1	S-C2/S-NC2	S-NC3	S-C4	S-C5
Scan range XY	30 μm	50 μm	80 μm	50 μm	80 μm
Scan range Z	3.5 μm	3.5 μm	3.5 μm	7 μm	7 μm
Resolution XY	2 nm	1 nm	1 nm	1 nm	1 nm
Resolution Z	0.3 nm	0.1 nm	0.1 nm	0.1 nm	0.1 nm
XY sample movement	6.5 mm	6.5 mm	6.5 mm	6.5 mm	6.5 mm
Max sample thickness	7 mm	7 mm	7 mm	7 mm	7 mm





Controller:

The features of various models of controller are as follows:



Software:

Number of scanning channels	Up to 8
Number of points per image	Up to 1024×1024
Number of points per spectrum	Up to 1024
Angular scanning	Available
Resume scan	Available
Oxidation lithography	Available
Multi-scan	Available
Operating system	Microsoft windows XP, Windows 7, Windows 8, Windows 10

AFM working modes:

Functional Modes	Standard	Advanced	Full	Full Plus
Contact (Static, DC)	✓	✓	✓	✓
Non-Contact (Dynamic, AC)	✓	✓	✓	✓
Tapping (Semi-Contact, Intermittent-Contact)	✓	✓	✓	✓
Lateral Force Microscopy (LFM)	✓	✓	✓	✓
Magnetic Force Microscopy (MFM)		✓	✓	✓
Electric Force Microscopy (EFM)		✓	✓	✓
Force Spectroscopy		✓	✓	✓
Chemical Nano-Lithography			✓	✓
Mechanical Nano-Lithography			✓	✓
Force Modulation Microscopy (FMM)			✓	✓
Kelvin Probe Force Microscopy (KPFM)				✓
Conductive AFM (CAFM)				✓
Piezoresponse Force Microscopy (PFM)				✓
Frequency Modulation (FM)*	*Only available in NanoVac			