

CoreAFM

The best value research AFM



CoreAFM



Integrated functional design

Integrating a modern flexure-guided tip scanner, XYZ sample stage, camera, active vibration isolation table, and air-flow protection in an all-in-one unit makes the CoreAFM a complete system with an unparalleled compact footprint. All the essential functions are integral components of the CoreAFM. Thus, connecting the controller, power and USB is all that is needed to get started with this research AFM.

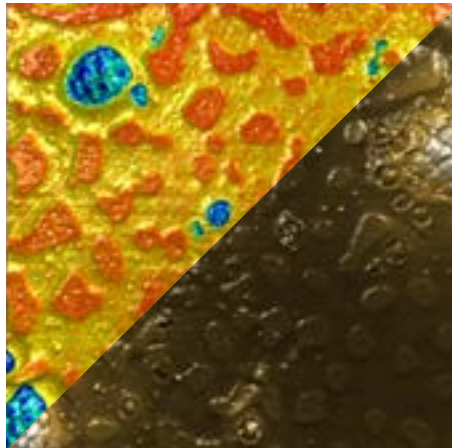
Versatility and performance

33 possible modes and functions make the CoreAFM the tool of choice for applications ranging from materials research to life science and electrochemistry. State of the art electronics with 24-bit ADC and DAC enables high-resolution XYZ driving of the 100 μm \times 100 μm \times 12 μm scanner and allows for low-noise force detection.

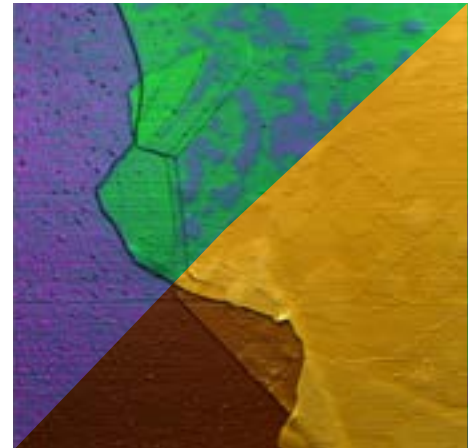
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The integrated design approach means every component fulfils an essential function, maximizing capabilities while minimizing system complexity. The CoreAFM provides the best value for your research projects.

“The CoreAFM purposefully combines the essential components of the atomic force microscope for maximum versatility and user-friendliness.”



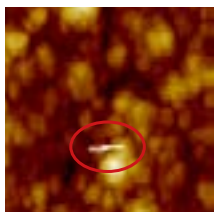
Amplitude and topography on SBR-PMMA



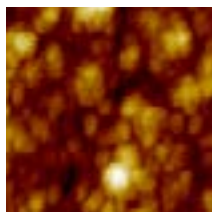
KPFM and topography on graphene

Spike-Guard

A deeper system integration of the Isostage is reflected in the unique Spike-Guard feature, which eliminates glitches during imaging. Although the Isostage is an active vibration isolation system, glitches can still occur when distortions are too severe. Spike-Guard detects such anomalies and signals the AFM to rescan the line for a distortion-free image.



Spike-Guard OFF



Spike-Guard ON



DIMO

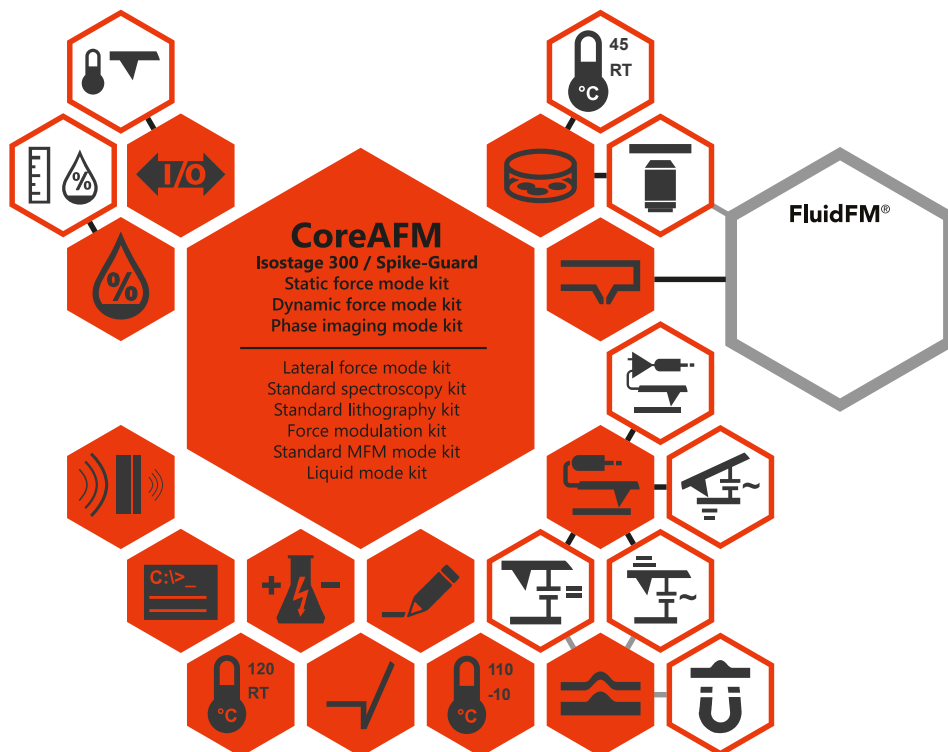
The Digital Inverted Microscope Option enables you to conduct advanced experiments that require viewing your sample from below. It enhances your capabilities when using accessories like the petri dish holder, and does not obstruct any standard accessories that fit your CoreAFM (with the exception of the variable magnetic field sample holder).

FluidFM® functionality

A bottom view of your petri dish is essential for FluidFM experiments - the powerful digital microscope allows you to easily view cells, maneuver the cantilever, and carry out your single cell procedures, and observe spotting and nanolithography progress.

Add-on functionality overview

The base CoreAFM system's functionality can be seamlessly extended with a wide range of add-ons. The base system can be seamlessly extended with functional add-on groups. Enhance your CoreAFM system's functionality flexibly, according to your needs.



The center hexagon shows the base system's functionality. Many options can be added to directly extend the functionality of your system (filled hexagons); these primary add-ons can be further enhanced by the secondary mode options (framed white hexagons).

- Signal I/O option
- Scanning thermal
- Environmental control
- Relative humidity option
- Petri dish option
- Petri dish heating option
- Digital inverted microscope
- Cantilever holder FluidFM®
- FluidFM® SICM option
- FluidFM® nanolithography
- FluidFM® spotting
- FluidFM® colloidal spectr.
- Conductive AFM mode
- Advanced conductive AFM
- PFM mode option
- EFM mode kit
- KPFM mode option
- Contour following option
- Variable magnetic field option
- Scripting interface
- Acoustic enclosure 150
- Heater/cooler option
- Advanced lithography
- Advanced spectroscopy
- Electrochemistry option
- Sample heating option

Standard CoreAFM operating modes

Static force, dynamic force, lateral force, phase imaging, liquid imaging, force modulation, standard MFM, standard spectroscopy, standard lithography
Kits for static force, dynamic force, and phase imaging included with each system

CoreAFM features

| | |
|----------------------------|--|
| General design | Tip scanner, sample stage, and scan protection in a single housing. Flexure XY-scanner with piezo Z-scanner. |
| Sample observation | Integrated camera for top/side view in air and liquid. 5 MP color CCD, switchable, adj. focus |
| Sample illumination | White LEDs (brightness 0–100%) for top and side view, with axial illumination for top view |
| Sample approach | Automated, parallel approach by integrated, motorized sample Z-stage (range: 5 mm) |
| Sample stage | Integrated XY-sample stage (range: 20 × 20 mm) |
| Sample size | Standard <50 mm (extended <100 mm) |
| Sample height | Standard <5 mm (ext. <10 mm / max. <40 mm) |
| Weight / dimensions | 30.5 kg / 350 × 395 × 242 mm (WDH) |
| Power | 100–240 VAC, 50/60 Hz, 50 W |

Scanner

| | | |
|-------------------------------|-------------|-----------------|
| Maximum scan range | 100 μm | < 5 nm flatness |
| Maximum Z-range | 12 μm | closed loop |
| Detector noise (RMS) | typ. 60 pm | max. 100 pm |
| Sensor noise (Z, RMS) | typ. 180 pm | max. 250 pm |
| Dynamic noise (Z, RMS) | typ. 40 pm | max. 70 pm |
| Static noise (Z, RMS) | typ. 100 pm | |

Controller

| | | |
|-----------------------------------|---------------------------|-------------|
| Scan control and inputs | 24-bit ADC/DAC | 200 kHz |
| Digital lock-in (2×) | 16-bit ADC/DAC | 20 MHz |
| User in/out, excitation in | 24-bit ADC/DAC | 5 MHz, 10 V |
| Digital sync | 2-bit line/frame sync out | 5 V, TTL |
| Thermal tuning | 10 Hz – 2 MHz | |



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