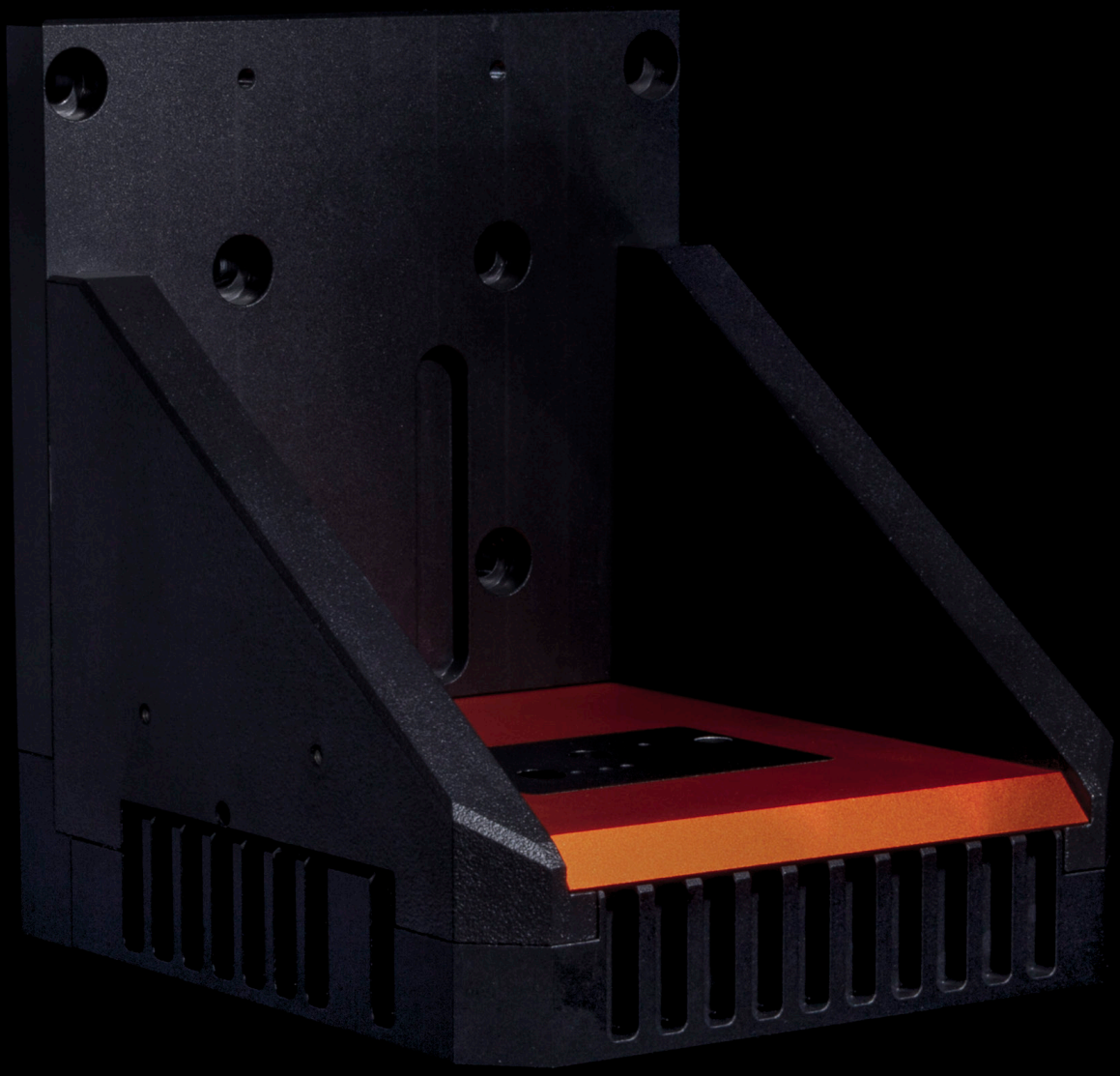
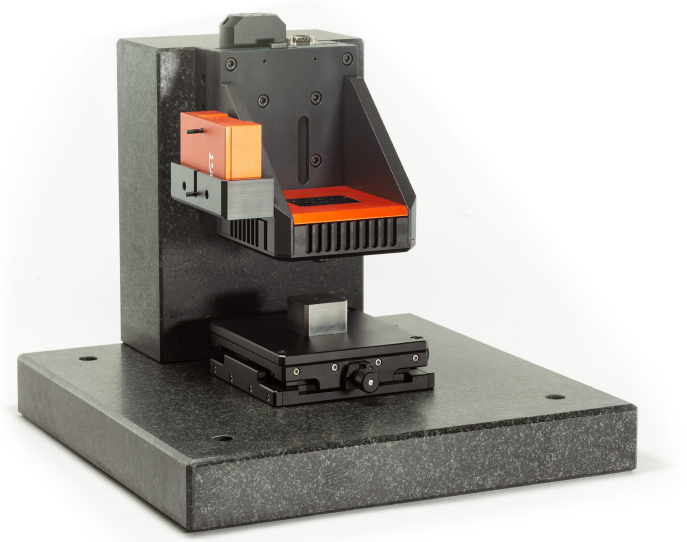
Flex-Mount

Industrial integration redefined



nanosurf



Example setup: Flex-Mount on standard 400 mm XYZ-stage

Flex-Mount: FlexAFM precision in a mountable format

The Flex-Mount solution combines the superior resolution and performance of the Nanosurf FlexAFM scan head with the mountability of the Nanosurf NaniteAFM.

The result is an AFM that can easily be attached to one of Nanosurf's large or custom-built automated translation stages, and is thus able to characterize the surface of samples with weights and dimensions virtually no other AFM system can handle.

It is the ultimate quality control instrument to acquire high-resolution information on large and demanding samples.

Scan head specifications

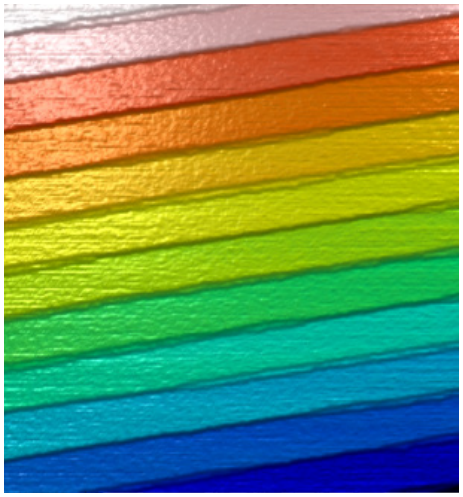
Flex-Mount scan head features

General design	Mountable scan head with tip scanner; Flexure-based electro-magnetically actuated XY-scanner with superb linearity; Piezo-based Z-actuator; Optical Z-position sensor; Closed loop Z-control
Laser / detector	High-speed, low-noise 4-quadrant photodiode detector; near-infrared SLD; laser on/off through software and scan head tilting; optical filters for use with optical microscope phase contrast and fluorescence
Approach	50 mm z-stage with step-by-step approach; software-driven motorized coarse movement and automated final approach
Cantilever holder	Automatic self-alignment for cantilevers with alignment grooves. Manual laser adjustment possible for special cantilevers.
Sample observation	Top and side view in air and liquid; White LEDs (brightness 0–100%); Axial illumination for top view
Operating modes	Static Force, Lateral Force, Dynamic Force, Phase Contrast, MFM, EFM, KPFM, Piezo Force, Force Modulation, Scanning Thermal, Spreading Resistance, Multiple Spectroscopy modes, Lithography and Manipulation modes. Some modes may require additional hardware and/or activating of the respective C3000 controller options.
Security out option (for stage controllers)	Security mechanism to prevent severe scan head crash and to protect the sample. Includes table-top operating unit with emergency kill switch and manual security override for 3rd party stage control units by LSTEP or SmarAct.

Flex-Mount scan head with C3000i controller

Scan head type	100-µm
Sample size	Stage-dependent
Motorized approach range (at tip position with standard z-stage)	50 mm
Maximum scan range	100 µm (1)
Maximum Z-range	10 µm (2)
XY-linearity mean error	< 0.1%
XY-flatness at maximum scan range	typ. 5 nm
Detector bandwith	DC – 4 MHz
Detector noise level	typ. 60 pm / max. 100 pm (3,4)
Z-sensor noise level (RMS)	typ. 180 pm / max. 200 pm (3)
Z-measurement noise level (RMS, static mode in air)	typ. 100 pm / max. 200 pm
Z-measurement noise level (RMS, dynamic mode in air)	typ. 35 pm / max. 50 pm
Scan head dimensions incl. z-stage	181 mm × 130 mm × 171 mm ±25 mm
Scan head weight incl. z-stage	4.7 kg

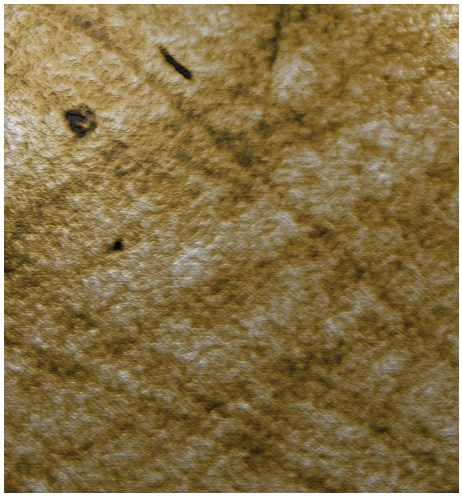
(1) Manufacturing tolerances ± 5%
(2) Manufacturing tolerances ± 10%
(3) Measured at 2 kHz
(4) Measured with XYContr cantilever



SiC steps

Scan size:
1.5 µm x 1.5 µm

The scan shows step heights of 1.5 nm between the large terraces, and 0.75 nm between the large and small terraces' half-steps.



Glass

Scan size:
5 µm x 5 µm

Surface roughness:
0.112 nm RMS
(0.087 nm Ra)