attoAFM/CFM

1008309

Technical Specifications

General Specifications	
type of instrument	combined confocal (CFM) and atomic force microscope (AFM)
sensor head specifics	AFM: Akiyama probe (quartz tuning fork combined with a mircomachined cantilever); CFM: attoCFM I external optics head and low temperature apochromatic objective
Modes of Operation	
imaging modes	optically detected magnetic resonance (ODMR), AFM, CFM
slope compensation	2 axis scan plane correction
z feedback	AFM: PI feedback loop for amplitude modulation (AM), phase modulation (PM) or frequency modulation (FM) using included PLL
Resolution	
z bit resolution @ 4 K	7.6 pm at 2 µm scan range
Confocal Unit	
configuration	compact and modular design, two or more optical channels; standard configuration: one excitation and one detection channel
key benefits	quick and reliable alignment of each channel, steering mirror for combined beams long-term stability
quick-exchange of optical components	beamsplitters, filter mounts for up to 4 filters/polarizers, (1" diameter); optional piezoelectric rotator with filter mount
pinhole configuration	two pinholes (fiber apertures), different illumination and collection wavelength possible
pinhole size	dependent on fibers, typically 3 .. 9 µm mode field diameter
compatible LT-objective	LT-APO/VIS, LT-APO/VISIR, LT-APO/NIR (see accessory section for more information)
inspection unit	sample imaging with large field of view: ~54 µm (attoDRY)
Illumination	
excitation wavelength range	400 .. 1000 nm, default 650 nm (others on request)
illumination port specification	FC/ APC-connector for single mode fibers or free-beam configuration
Detection	
detection mode	e.g. optically detected magnetic resonance (ODMR), luminescence, fluorescence
detection wavelength range	detector upon user`s choice, typically Si detector (coupling of the light to other detectors)
detection port specification	FC/ APC-connector for single mode fibers or free-beam configuration
Sample Positioning	
total travel range	independent degrees of freedom for tip and sample of 2 mm x 3 mm x 2.5 mm (closed loop)
step size	0.05..3 µm @ 300 K, 10..500 nm @ 4 K
fine scan range	30 x 30 x 4.3 μm^3 @ 300 K, 12 x 12 x 2 μm^3 @ 4 K (open loop)
closed loop scanning	optional
sample holder	Ti plate with integrated heater and calibrated temperature sensor
Suitable Operating Conditions	
temperature range	1.5 K..300 K (dependent on cryostat); mK compatible setup available on request
magnetic field range	0..15 T+ (dependent on magnet)
operating pressure	designed for He exchange gas (vacuum compatible version down to 1E-6 mbar on request)
Suitable Cooling Systems	
titanium housing diameter	48 mm
bore size requirement	designed for a 2" (50.8 mm) cryostat/magnet bore
compatible cryostats	attoDRY1000/1100/2100
Compatibility with Electronics	
scan controller and software	ASC500 (for detailed specifications please see attoCONTROL section)
Options and Upgrades	
closed loop scanning & global sample coordinates	interferometric encoders for scan linearization and closed loop sample navigation
in-situ inspection optics	resolution approx. 20 µm (depending on cryostat, distance top-flange to field center)
closed loop upgrade for coarse positioners	resistive encoder, range 3 mm, sensor resolution approx. 200 nm, repeatability 1-2 µm