

## attoRAMAN

low temperature confocal Raman microscope



Microscope Configuration	
confocal unit	modular beam splitter microscope module outside of the cryostat, excitation and detection port fully adjustable, free beam optics
pinhole configuration	two pinholes (fiber apertures), adjustable in x-, y-, z-direction,
Illumination	
excitation wavelength range	532 nm, others on request
light source	dedicated Raman laser, single mode fiber coupled
light power on the sample	typically 1 pW .. 10 mW
port specification	FC/APC-connector for single mode fibers
optical filter	laser line filter
Raman Signal Detection	
Spectrometer	ultra-high transmission spectrometer, f=300 mm
total optical transmission	greater 60% at 532 nm
filters	Dichroic mirror and edge/notch filter for signal detection as close as 100 cm <sup>-1</sup> to the laser line
gratings	typ. 600/mm and 1800/mm, others on request
pixel resolution	1 cm <sup>-1</sup> at 1800/mm grating
CCD camera	back-illuminated CCD, peltier-cooled to -60°C at 20°C room temperature, 1024x127 pixels, 90% quantum efficiency at 532 nm, 100 kHz readout converter
Optical Parameters	
pinhole size	dependent on fibers, typically 3 .. 9 μm mode field diameter
spot size	diffraction limited
compatible objective systems	systems A, B, or C (for details please refer to the objective systems table)
lateral resolution	see specifications of the objectives
Imaging Modes	
Raman	2D and 3D Raman images time and single point Raman spectra
Confocal	2D confocal images in reflection mode
Sample Positioning	
positioners and scanners	coarse positioners ANPxyz101 with piezo scanner ANSxyz100
step size	0.05 .. 3 μm @ 300 K, 10 .. 500 nm @ 4 K
coarse range	5 x 5 x 5 mm <sup>3</sup>
step scan range	any size: e.g.: 200 x 200 μm <sup>2</sup>
fine scan range	40 x 40 μm <sup>2</sup> @ 300 K, 30 x 30 μm <sup>2</sup> @ 4 K
sample monitoring	sample / tip monitoring via CCD camera and mirror (optional)
Operating Conditions	
temperature range	mK .. 300 K (dependent on cryostat)
magnetic field range	0 .. 15T+ (dependent on magnet)
operating pressure range	1E-6 mbar .. 1 bar (designed for exchange gas atmosphere)
Cooling Specifications	
bore size	designed for a 2" (50.8 mm) cryostat/magnet bore
cryostat	attoLIQUID1000, attoDRY1000
Scan Controller and Software	
	Dedicated FPGA-based RAMAN controller providing coarse positioning and scanning signals for sample positioning and scanning in x, y, and, z direction. Control Software for extensive Raman signal data acquisition and post processing.

