

Technical Specifications

General Specifications	
type of instrument	confocal Raman microscope for low temperatures and high magnetic fields
compatibility	for a toplayer cryostat or integrated into an optical table
objectives/lenses	high NA cryogenic objectives: LT-APO/532-Raman, LT-APO/633-Raman, LT-APO/NIR, others upon request
key features	detection of Raman peaks down to < 10 rel. cm ⁻¹ ; many upgrades including polarization control
Modes of Operation	
imaging modes	single point measurements or imaging (mapping) of Raman, photoluminescence or fluorescence
optional upgrades	polarization control and analysis
Resolution	
lateral resolution	< 400nm (for 532nm excitation)
vertical resolution	< 2µm (for 532nm excitation)
Detection	
spectrometer	mirror-free high throughput spectrometer with f=300; others upon request
filters	< 90cm ⁻¹ (RayLine Coupler), < 10cm ⁻¹ (RayShield Coupler) Raman cut-off (optional)
gratings	for 532nm excitation: 600/mm and 1800/mm (BLZ 500nm) on automated triple grating turret; others upon request
spectral resolution	< 1cm ⁻¹ /pixel (1800/mm grating)
CCD camera	high-sensitivity back-illuminated CCD detector, peltier-cooled to -60 °C at 20 °C room temperature, 1024x127 pixels, 90% quantum efficiency at 532 nm, 100 kHz readout; FI, DD, EMCCD upon request
Sample Positioning	
total travel range	5 x 5 x 4.8 mm ³ (open loop)
step size	0.05 .. 3 µm @ 300 K, 10 .. 500 nm @ 4 K
fine scan range	50 x 50 µm ² @ 300 K, 30 x 30 µm ² @ 4 K (open loop)
sample holder	ASH/QE/8/CFM or ASH/QE/4CX
Suitable Operating Conditions	
temperature range	1.8K..300K (attoDRY2100)
magnetic field range	up to 12T (depending on magnet)
Excitation	
excitation wavelength	532nm, 633nm, 785nm, others upon request
Scan Controller and Software	
scan controller	WITec USB 3.0 FPGA based scan controller providing open loop control of the cryogenic piezo-scanners, spectrometer control and full automation control (if chosen)
software	powerful WITec software package for video & data acquisition and analysis
Inspection optics	
field of view	> 40µm diagonal
type of camera	color video image, good contrast for i.e. 2D materials
Options and Upgrades	
automation	TruePower (calibrated laser power), automated shutters, automated switching between white light and Raman, automated calibration
additional feedthroughs	DC and high-frequency lines & optical fiber feedthroughs
add ons	additional optical breadboards for home-built optics experiments (attoDRY2100)
software upgrade	TrueMatch: software for spectra analysis and for building up a spectral library
programming upgrade	LabVIEW package: building blocks for writing your own integrated control of temperature, magnet and Raman software

