Lightnovo

- HIGH SPECTRAL RESOLUTION
- LONG MAPPING RANGE
- UP-RIGHT AND INVERTED OPERATION
- MODULAR DESIGN
- WIDE RANGE OF LASERS

RG Raman microscope

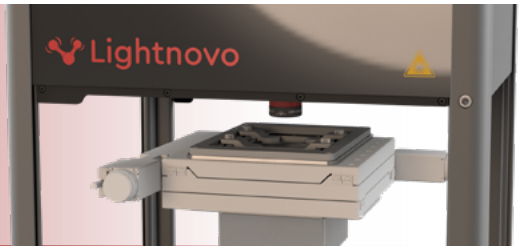
Premium research-grade confocal Raman microscope
for chemical and structural analysis

TECHNOLOGY

RG Raman microscope perfectly suits for any kind of demanding Raman spectroscopy applications that require high spectral and spatial resolution, long mapping range, extremely stable laser power, high sensitivity and broad spectral range (from low frequency to high frequency Raman shift).

Technology is based on high throughput transmittance diffraction optics with up to 85% efficiency from sample to detector.

Four different lasers:
405 nm, 532 nm, 633 nm and 785 nm.
Extremely stable laser wavelength and laser power (0.02% fluctuation during 8 hours of operation).



RG Raman microscope provides diffraction limited spatial resolution, extremely high throughput and additionally equipped with transmitted visible light microscopy on a separate camera sensor. RG Raman microscope can be used in upright microscopy and inverted microscopy configurations. All what is need for switching between modes – flip the device from top to bottom.

This instrumental setup allows for both sample viewing using the optical microscopy capabilities and performing measurements by Raman spectroscopy simultaneously.

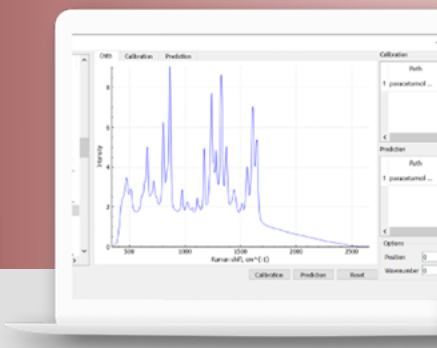
The visual observation reveals morphological details of a sample (e.g. color, size, shape), whereas the spectroscopic measurement reveals information about the molecular structure and chemical composition of a sample.

ACCESSORIES

- long working distance probe, f=30 mm
- middle working distance probe, f=15 mm
- short working distance probe, f=6.25 mm
- objective covers
- adapters for standard microscopy objectives
- microscope objectives with magnification 10x, 20x, 50x, 100x
- custom microscope objectives available upon request

APPLICATIONS

- Surface Enhanced Raman Scattering
- Materials science
- Pharmaceuticals
- Life science
- Polymers
- Nano-materials
- Semiconductors
- Cosmetics
- Forensics
- Art & museum
- Geology



SOFTWARE

Miraspec for PC (Windows 7, 10, 11) Software controlled by USB cable.

Data acquisition allows:

- to see white light microscopy image simultaneously with the laser spot on the sample
- to navigate over the microscopy image with XYZ sample manipulation
- to set up Raman mapping parameters (mapping area, step size, exposure time, laser power, etc.)
- to measure the Raman map with required dimensions in X, Y, Z
- to set up kinetic mapping
- to avoid surface morphology impact on the Raman spectrum quality during mapping under high NA microscope objective – sample surface curvature compensation

Data analysis allows:

- to represent Raman map at peak intensity, peak area with and without background correction
- to create Raman spectral library from the Raman map
- to decompose hyperspectral Raman map into the chemical maps using PCA, MCR and NNLS

SPECIFICATIONS *(when equipped with RG Raman spectrometer)*

Feature versus model*	405 / 405 HR•	532 / 532 HR	633 / 633 HR	785 / 785 HR
Laser wavelength	405 nm	532 nm	633 nm	785 nm
Power range on a sample**	from 0.1 to 30 mW	from 0.1 to 75 mW	from 0.1 to 50 mW	from 0.1 to 65 mW
Spectral Range	80-3750 cm^{-1} (405) 80-1900 cm^{-1} (405 HR)	60-3750 cm^{-1} (532) 60-1900 cm^{-1} (532 HR)	80-3750 cm^{-1} (633) 450-1800 cm^{-1} (633 HR)	90-2500 cm^{-1} (785) 450-1800 cm^{-1} (785 HR)
Spectral Resolution	4-6 cm^{-1} (405) 2-4 cm^{-1} (405 HR)	4-6 cm^{-1} (532) 2-4 cm^{-1} (532 HR)	4-6 cm^{-1} (633) 2-4 cm^{-1} (633 HR)	3-5 cm^{-1} (785) 1.5-3 cm^{-1} (785 HR)
Signal-to-noise ratio at***:	1000:1	1200:1	900:1	900:1
Lateral resolution****	280 nm	320 nm	500 nm	600 nm
Axial resolution or confocality****	600 nm	750 nm	1000 nm	1500 nm
White light microscopy	Reflected with simultaneous visualization of laser spot and Raman acquisition			
Microscopy configuration	up-right and inverted			
Mapping travel range in XYZ	102 x 102 x 25 mm			
Lateral step size	100 nm			
Axial step size	100 nm			
Physical dimensions (LxWxH)	430 mm x 340 mm x 480 mm			
Weight	20 kg			

• *HR - high resolution model*

SPECIFICATIONS *(when equipped with miniRaman spectrometer)*

Feature versus model*	Standard	Power	SERS	Power Dual	Standard Dual
Laser wavelength	785 nm			660/675 nm and 785 nm	
Power range on a sample**	5-50 mW	10-90 mW	0,5-15 mW	5-40 mW (660) 5-75 mW (675) 10-90 mW (785)	5-40 mW (660) 5-75 mW (675) 5-50 mW (785)
Spectral Range	400-2700 cm^{-1}			2700-4000 cm-1 (660) 2550-4000 cm-1 (675) 400-2700 cm-1 (785)	
Spectral Resolution	7-15 cm^{-1} (slit size dependent; slit size can be customized)				
Signal-to-noise ratio at***:	500:1	1000:1	100:1	600:1 (660) 800:1 (675) 800:1 (785)	600:1 (660) 800:1 (675) 440:1 (785)
Lateral resolution****	900 nm			800 nm (660) 900 nm (785)	
Axial resolution or confocality****	3 µm			2.5 µm (660) 3 µm (785)	
White light microscopy	Reflected with simultaneous visualization of laser spot and Raman acquisition				
Microscopy configuration	up-right and inverted				
Mapping travel range in XYZ	102 x 102 x25 mm				
Lateral step size	100nm				
Axial step size	100nm				
Physical dimensions	430 mm x 340 mm x 480 mm (LxWxH)				
Weight	20 kg				

* *Each model is based on the same microscope body; only the RG Raman / miniRaman spectrometer is different. RG Raman / miniRaman spectrometer can be replaced by the user if necessary.*

** *Actual laser power range can differ +- 2% per device. Please contact us if you need specific laser power range values.*

*** *Determined as peak signal-to-noise ratio of polystyrene spectrum at maximal laser power, integration time 0.3s, number of repetitions 10.*

**** *Determined at microscope objective NA=0.95 (magnification 100x)*

Harness the power of Raman spectroscopy and make it widely accessible for the benefit of mankind.

- Lightnovo's mission

Lightnovo has been founded in 2019 by a team united by the belief in making a difference with innovative Raman spectroscopy solutions.

Our goal is to provide premium performance Raman spectrometers and microscopes with the world's smallest form factor at a price that democratizes access and opens new application areas.

It is our vision to become the recognized leader in providing the highest value Raman spectroscopy and Raman microscopy solutions for research, industry and healthcare.

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