

# miniRaman Microscope

The world's smallest confocal and  
modular Raman Microscope



- Extremely compact
- High mapping resolution
- Up-right and inverted operation
- Modular design

# Miraspec

Software for PC (Windows 11)  
and smartphone (Android)

<b>Data acquisition</b>	<p>Laser power control</p> <p>Exposure time control</p> <p>Sensor gain control</p> <p>Number of repetitions control</p> <p>Spectral range control</p>
<b>Data preprocessing options</b>	<p><b>Spike correction</b> (Whittaker-Hayes, moving window)</p> <p><b>Spectral smoothing</b> (Whittaker, asymmetric least squares, Savitzky-Golay)</p> <p><b>Baseline correction</b> (rolling circle, rubberband, least squares, asymmetrically reweighted penalized)</p> <p><b>Spectrum normalization</b> (Z-score, mean, Mean centre, MinMax, Unit Norm L1, Unit Norm L2)</p> <p><b>Intensity normalization*</b></p> <p><b>Laser mode-hop correction*</b></p> <p><b>Spectral super resolution*</b></p>
<b>Visual microscopy</b>	<p>Simultaneous image acquisition</p> <p>Visualization of laser spot position</p> <p>Panorama sample imaging</p>
<b>Mapping</b>	<p>X, Y and/or Z spatial mapping</p> <p>Time mapping</p> <p>Curvature compensation</p>
<b>Map analysis</b>	<p><b>Peak intensity map using 2 dimensions</b> (X, Y, Z, time or Raman shift)</p> <p><b>Peak area map using 2 dimensions</b> (X, Y, Z, time or Raman shift)</p>
<b>Chemical mapping methods</b>	<p>Principal component regression</p> <p>Non-negative matrix factorization (SIMPLISMA-NNLS, MCR-ALS)</p>

\*patented feature

Spectrometer system controlled by smartphone or PC via Bluetooth or USB-C cable.



## Accessories

- Microscope objectives with magnification 10x, 20x, 50x, 100x
- Custom microscope objectives available upon request
- Objective covers
- Magnetic objective adaptors for quick switching
- Adaptors for standard microscopy objective threads (RMS, M25)
- 96 well plate holder
- Microscopy slide holder

## Applications

For researchers, industries, universities and general consumers



### Life Sciences & Health:

Biosciences, pharmaceuticals, skin diagnostics, cosmetics



### Materials & Nanotechnology:

Polymers, nano-materials, semiconductors, surface enhanced Raman scattering (SERS)



### Industrial & Chemical Analysis:

Chemicals, geology, forensics

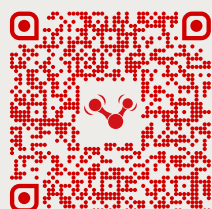


### Quality Control & Authentication:

Alcohol quality, counterfeit product detection



## Unique Technology



The **miniRaman microscope** is an innovative confocal equipment based on the miniRaman spectrometer, with a patented, integrated **reference channel**. This innovative technology ensures **automatic calibration** by correcting for laser wavelength drift delivering accurate and reliable results. Due to the **unique, patented technology** miniRaman microscope has very high throughput, perfect wavenumber accuracy and Raman intensity calibration via in-built reference channel.

## Specification

Feature versus model	miniRaman microscopy platform motorized	miniRaman microscopy platform manual	miniRaman microscopy platform focusing stage
Compatible spectrometers	miniRaman spectrometers miniRaman Pro spectrometers		
Lateral resolution*	800 - 900 nm		
Axial resolution or confocality*	2.5 - 3 $\mu$ m		
White light microscopy	Reflected with simultaneous visualization of laser spot and Raman acquisition		Not included
Microscopy configuration	up-right and inverted		
Mapping travel range in XYZ	30 x 30 x 30 mm	10 x 10 x 13 mm	
Minimum step size	500 nm	5 $\mu$ m	

\* Resolution depends on the laser wavelength and spectrometer used. Values represent the use of miniRaman spectrometers, all wavelengths with microscope objective NA = 0.95, 100x magnification

## Extra Features

- Small size (175 mm x 180 mm x 410 mm)
- Lightweight (9.5 - 11.5 kg)
- White light microscopy reflected with simultaneous visualization of laser spot and Raman acquisition
- Microscopy configuration up-right and inverted
- Lateral step size 500 nm
- Axial step size 500 nm



## Contact Details

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## About Lightnovo

A spin-off from the Technical University of Denmark, Lightnovo was founded in 2019 by an enthusiastic team united by the goal of revolutionizing the field of Raman spectroscopy through innovative, high-performance solutions. Our mission is to develop and commercialize **“Raman for all: democratize the power of high-end Raman spectroscopy for the benefit of mankind”**.

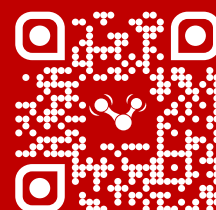
**We aim to provide premium performance Raman spectrometers and microscopes with the world’s smallest form factors without compromising the performance. With this innovation, Lightnovo addresses the need for portable, reliable field instruments at an affordable price.**

### RMI, s.r.o.

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