



## 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 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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# Research Grade Pro Spectrometer

**Unlock the Low-Frequency Raman and explore what standard Raman spectrometers cannot see**



- Reveal intermolecular dynamics invisible to standard Raman
- Distinguish polymorphic and crystalline phases
- Perform non-destructive, fast measurements
- Compact and reliable for both laboratory and OEM integration

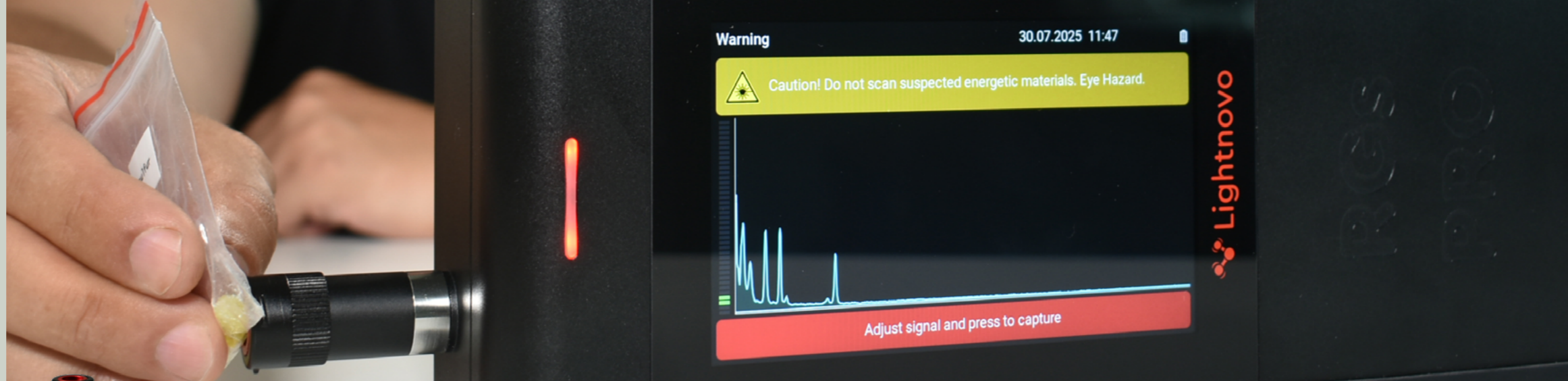
# Miraspec

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

<b>Data acquisition</b>	<ul style="list-style-type: none"> <li>Laser power control</li> <li>Exposure time control</li> <li>Sensor gain control</li> <li>Number of repetitions control</li> <li>Spectral range control</li> </ul>
<b>Data preprocessing options</b>	<ul style="list-style-type: none"> <li>Spike correction (Whittaker-Hayes, moving window)</li> <li>Spectral smoothing (Whittaker, asymmetric least squares, Savitzky-Golay)</li> <li>Baseline correction (rolling circle, rubberband, least squares, asymmetrically reweighted penalized)</li> <li>Spectrum normalization (Z-score, mean, Mean centre, MinMax, Unit Norm L1, Unit Norm L2)</li> <li>Spectral super resolution*</li> </ul>
<b>Data Exploration</b>	<ul style="list-style-type: none"> <li>Principal component analysis</li> <li>Non-negative matrix factorization (SIMPLISMA-NNLS, MCR-ALS)</li> </ul>
<b>Qualitative analysis</b>	<ul style="list-style-type: none"> <li>Material identification (Pearson correlation, square Euclidean cosine, square first difference Euclidean cosine)</li> <li>Compatible libraries (&gt;20,000 spectra)**</li> <li>Creation of spectral libraries</li> </ul>
<b>Quantitative analysis</b>	<ul style="list-style-type: none"> <li>Principal component regression</li> <li>Raman peak height/peak area calibration</li> <li>Partial Least Squares (PLS) calibration</li> </ul>
<b>Classification</b>	<ul style="list-style-type: none"> <li>Random Forest, Linear SVM, AdaBoost, Decision Tree, Hoefding Tree, Naïve Bayes, Perceptron, Softmax Regression</li> </ul>

\*patented feature  
\*\*various library options available upon request

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



## Accessories

- Short/Middle distance probe variable (NA = 0.2, WD = 0-10 mm)
- Long distance probe variable (NA = 0.1, WD = 0-25 mm)
- Contact probe variable (NA = 0.6, WD = 0-200 um)
- Contact probe fixed (NA = 0.6, WD = 10, 50, 100 um, PSF = 10, 15, 20 μm)
- Sample holders
- Axial focusing accessories
- Light protection sample cover
- Power bank

## Applications

- Pharmaceuticals:** crystallinity & polymorphism of APIs and excipients
- Biomedical diagnostics:** biomolecular interactions and tissue organization
- Semiconductors and Nanomaterials:** organic & 2D materials, quantum-dot phonon analysis
- Industrial and Petrochemical:** monitor crystallization or structural transformation during formulation of chemicals and polymers

## Technology

The **RG PRO** extends Lightnovo's Raman range below 70 cm<sup>-1</sup> - reaching the low frequency (**THz -terahertz**) range that reveals *intermolecular and lattice vibrations*. This means direct insight into **crystal structure, phase transitions, and polymorphism** - all within one compact, high-performance instrument.

### Why Low-Frequency Raman Matters

Below 200 cm<sup>-1</sup> lies the **structural fingerprint** of materials - lattice vibrations, phonon modes, and weak intermolecular forces that determine **stability, crystallinity, and phase behavior**.

The RG PRO opens this region, delivering a **complete vibrational picture** from 25 to 4000 cm<sup>-1</sup> in one scan.

## RG PRO vs RG Spectrometer

Feature	RG Spectrometer	RG PRO Spectrometer
<b>Spectral range</b>	70 – 4000 cm <sup>-1</sup> *	25 – 4000 cm <sup>-1</sup> *
<b>Laser wavelength</b>	532 / 638 / 785 / 830	532 / 785 / 830
<b>Low-frequency capability</b>	Limited	THz-optimized filters
<b>Information</b>	Molecular fingerprint	Fingerprint + intermolecular / lattice modes
<b>Applications</b>	Standard Raman analysis	Advanced R&D: polymorphs, 2D materials, phonons
<b>Form factor</b>	Handheld/Portable / OEM integration	Handheld/Portable / OEM integration
<b>Size</b>	257 x 110 x 61 mm	350 x 110 x 61 mm
<b>Weight</b>	1,5 kg	1,65 kg

\* The exact range depends on excitation wavelength, please check datasheets

## Extra Features

- **Ultra-low-frequency detection to 25 cm<sup>-1</sup>** for THz-Raman studies
- Simultaneous access to **low frequency** (below 70 cm<sup>-1</sup>) and fingerprint regions
- **High spectral resolution** and excellent signal-to-noise ratio
- **Multiple laser options:** 532 / 785 / 830 nm
- **Compact and portable** for research or OEM use
- **Compatible with RG microscope**

