RAMOS RS120
Dual-channel automated Raman spectrometer

RAMOS RS120 compact Raman dual-channel spectrometer is a standalone research instrument designed to perform spectral measurements with capabilities at the level of high-end systems.

Spectrometer RAMOS RS120 has a rigid, moving parts free design that does not require adjustments, has both high sensitivity and high spectral resolution, and can be equipped with one or two single-mode lasers 488/633 nm or 532/785 nm simultaneously.
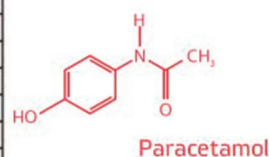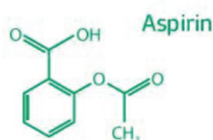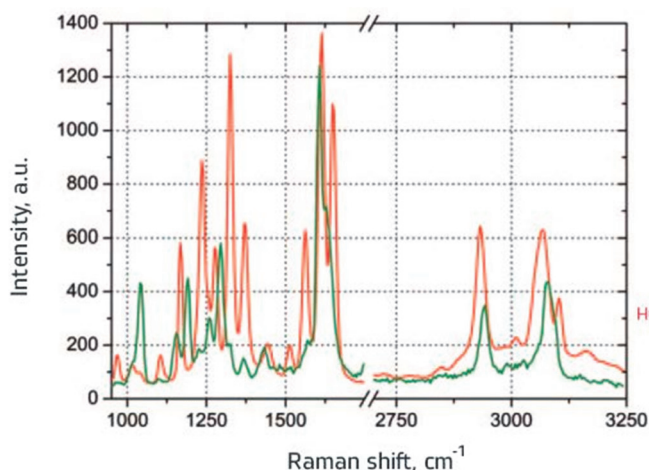
RAMOS RS120 can be equipped with Raman fiber optic probes.

Wide range of capabilities, high reliability and compact size allow using RAMOS RS120 for various scientific and industrial applications.

The objects for complex research can be semiconductors, minerals, polymers, pharmaceutical and biological substances, coatings and other materials.

Main features

- Research level Raman spectrometer with advanced measurement techniques
- One or two integrated single-mode lasers
- Fully automated change of lasers/gratings without additional system alignment
- No moving parts in the spectrometer except laser shutters
- Two non-switching spectral gratings (one for each laser)
- Compact
- Automatic adjustment of laser radiation power level
- Ability to connect fiber optic Raman probes

- Wide dynamic range and extremely high sensitivity of innovative sCMOS detector
- Edge or Notch Filters for Stokes and Anti-Stokes Spectroscopy
- Ultra-Low Frequency Raman (THz-Raman) from 10 cm^{-1}
- Advanced control software allows to perform various types of measurements
- Library of over 10,000 spectra
- Integration of third-party spectral databases
- **The most affordable price in the Research Class segment of instruments**

The characteristic spectra of aspirin and paracetamol.

The Raman spectrum of paracetamol has characteristic peaks near 1650 cm^{-1} (C=O stretching vibration) and 1612 cm^{-1} (N-H stretching vibration)

The Raman spectrum of aspirin has characteristic bands of 1606 cm^{-1} (C-C stretching vibration) and 1622 cm^{-1} (C-O vibration of carboxyl group)

Specification

	Laser 532 nm *		Laser 785 nm *	
Laser power	50 mW		130 mW	
Laser attenuation	1-100% with 1% step			
Focal length	120 mm			
Entrance aperture	40 μm			
Grating	1200 l/mm	1800 l/mm	600 l/mm	1200 l/mm
Spectral resolution	~7 cm^{-1}	~4 cm^{-1}	~7 cm^{-1}	~3 cm^{-1}
Spectral range				
• Edge/Notch filter	70 – 4 700 cm^{-1}	70 – 3 155 cm^{-1}	50 – 3 200 cm^{-1}	50 – 2 140 cm^{-1}
• Bragg filter	10 – 4 700 cm^{-1}	10 – 3 155 cm^{-1}	N/A	N/A

Detector	
Detector type	sCMOS
Pixel number	4096
Pixel size	7x200 μm
Readout noise	16 e- rms
Dark current	400 e-/pixel/s
Dynamic range	5000:1
Peak sensitivity wavelength	700 nm

Integration time	1 ms – 60 s
PC connection interface	USB 2.0
Power input	100 – 240 VAC, 50 –60 Hz
Dimensions (L x W x H)	140 x 235 x 56 mm
Weight	2.5 kg with two lasers, 2.2 kg with one laser

* – RAMOS RS120 spectrometer can be equipped with either built-in 532 nm or 785 nm laser or both lasers simultaneously. 488/633 nm lasers are available on request

Application fields

Biology
Visualization of cellular components with minimum perturbation

Pharmaceutics
Identification and distribution of chemical components and molecular conformers in various drugs

Polymers
Determination of polymer composition, including qualitative analysis of copolymers, determination of additives and fillers (plasticizers, pigments, colorants, etc.)

Kinetics research: polymerization, destruction processes (chemical or thermal)

Geology
Characterization of minerals, detection of components distribution and their phase transitions

Cosmetology
Researching the composition of skin care products as well as their penetration ability

Forensics
Identification of unknown substances, different types of fibers, glasses, paints, explosive materials, inks, narcotic and toxic substances, proof of authenticity of documents

and many more...

Material science
Investigation of various materials with high spectral resolution – superconductors, polymers, coatings, composites, carbon nanotubes, graphene, etc.

Heritage and Art, Gemology
Determination of pigments and binding agents used in painting

Spectroscopic analysis of archaeological samples (ceramics, glass, etc.) gives information on their origins and history

Rapid identification of precious and semi-precious stones, e.g., identification of natural and synthetic diamonds

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future's
in the making