

# inVia Raman microscopes

## Upgradeable, automated Raman microscopes



### The proven performance

Renishaw's Raman microscopes made even more flexible and easy to use



### You choose

the functionality and level of automation that you need



### Add modules

match your changing requirements



## Key benefits

### Proven performance

The introduction of the RM Raman microscope by Renishaw in 1992 heralded a new age in Raman spectroscopy.

Renishaw's Raman microscopes have become the instruments of choice for users requiring the highest levels of flexibility, sensitivity, and reliability.

Ten years later, Renishaw's RM Series Raman microscopes still offered more flexibility than any other Raman instrument on the market.

So why did we change them?

At Renishaw, apply innovation is not just a slogan, it's our practice. By applying innovation to every aspect of our engineering, we introduce even more flexibility and more automation for greater ease-of-use.

### Unparalleled flexibility and sensitivity

You choose the functionality and level of automation that you need and add to it as your requirements change.

Whichever configuration of inVia Raman microscope you choose, you will have the most flexible and sensitive Raman system on the market.

All configurations:

- can support multiple lasers, and provide full optical path optimisation
- are compatible with the whole range of Renishaw's spectrometer, microscope, and sampling accessories

The top level inVia Raman microscope configuration, inVia Reflex, offers all the above with the added benefit of full automation; all other inVia Raman microscope configurations can be upgraded step-wise through to the inVia Reflex at any time.

Exceptional sensitivity comes as standard in all inVia Raman microscopes, offering ultra-low signal detection with minimum noise.

No other Raman microscope manufacturer offers the same levels of flexibility and sensitivity in one instrument.

### Ease-of-use without compromise

Renishaw's inVia Raman microscopes add simplicity of operation to the high performance for which Renishaw Raman systems are renowned.

All inVia Raman microscopes are supplied with Renishaw's:

- powerful WiRE™ software for intuitive operation and easy data manipulation
- high sensitivity ultra-low noise RenCam CCD detector
- high stability honeycomb baseplate with precision kinematic mounts for easy laser swapping

In addition, inVia Reflex configurations provide:

- automatic instrument re-configuration and validation when excitation wavelengths are switched
- automatic switching between white light sample viewing and Raman acquisition modes
- automatic switching to confocal operation
- automatic alignment optimisation with built-in system performance validation



### Unrivalled global network of support and service

Renishaw prides itself in its global network of subsidiaries and agents, providing a level of support and service second to none.

We offer complete customer focus at every stage.

Our teams of highly qualified engineers and scientists, and our fully equipped Raman demonstration laboratory, are available to

provide you with rapid and comprehensive product, technical, and application support. This includes:

- global after sales service
- sample analysis
- "hands-on" technical training
- method development
- seminars and lectures (on and off-site)

# Standard configurations

## inVia Raman microscope configurations

inVia Raman microscopes are available in two standard configurations, inVia and inVia Reflex.

Intermediate configurations can be matched to satisfy customer's needs fully, without compromising the ability to upgrade later to a fully automated inVia Reflex Raman microscope.



The inVia Reflex Raman microscope has all the proven performance of Renishaw's renowned RM Series Raman microscope, with the addition of full automation



The inVia Raman microscope is ideal for those who want an entry-level system with the ability to upgrade to a fully automated inVia Reflex Raman microscope at a later date (Model illustrated includes optional eyepieces)

	inVia	inVia Reflex
<b>Detector</b>		
High sensitivity ultra-low noise CCD	✓	✓
<b>Sample viewing</b>		
Sample video viewer	✓	✓
Binocular eyepieces	⚙️	✓
Reflected light illumination	✓	✓
Illumination iris control	👉	🖨️
Illumination brightness control	👉	🖨️
Viewing/Raman changeover	👉	🖨️
<b>Excitation rejection filters</b>		
Filter change system	⚙️	🖨️
<b>Diffraction system</b>		
Holographic diffraction grating(s)	✓	✓
Motorized grating mount	✓	✓
Confocality control	👉	🖨️
<b>Lasers</b>		
Laser(s) on integral base plate	✓	✓
Laser conditioning aperture	⚙️	🖨️
Alignment optimisation	👉	🖨️
<b>Laser power control</b>		
Attenuating filter steps	16	16
Attenuating filter control	🖨️	🖨️
<b>Software</b>		
WiRE™ instrument control software	✓	✓
<b>Calibration</b>		
Internal Raman calibration source	-	✓
Internal wavelength calibration source	-	✓
Instrument response calibration source	-	✓
Calibration	👉	🖨️
Validation	👉	🖨️

### Legend

Included	✓
Not included	-
Not included (available as option)	⚙️
Manual control	👉
Computer control	🖨️

## Features and options tailored to satisfy all your Raman needs

### Features common to inVia and inVia Reflex Raman microscopes

#### Research grade microscope

Renishaw has selected Leica microscopes for incorporation within inVia Raman systems, ensuring inVia Raman microscopes have the high optical efficiency and high stability necessary for rapid, reliable operation.

#### Precision grating stage

inVia Raman microscopes' ultra-high precision diffraction grating stages and SynchroScan spectrum acquisition technology ensure your spectra are accurate and reproducible.

#### True imaging

inVia Raman microscopes' Raman and photo-luminescence imaging option allows you to determine the spatial distribution of materials rapidly.

#### Near-excitation Raman

inVia Raman microscopes' NEXt filter option makes the study of near-excitation Raman bands easy. Now you can have the tuneability and near-excitation performance of a traditional triple grating system, without sacrificing the high optical efficiency you need for routine samples.

#### Honeycomb baseplate

inVia Raman microscopes' rigid lightweight baseplate with precision kinematic mounts results in a highly stable system that allows lasers to be exchanged with ease.

#### Flexible sampling

inVia Raman microscopes support many sampling accessories (fibre-optic probes, temperature control stages, etc.), maximizing the range of samples that can be examined.

#### UV excitation

inVia Raman microscopes' multiple optical path design enables UV lasers to be used easily and efficiently, without compromising the performance of any visible or near-infrared lasers.

#### Sensitivity

Renishaw's RenCam CCD detector, with its ultra-low noise, high sensitivity detector chip options, and low noise level electronics, is ideal for the most demanding Raman spectroscopy applications.

#### Fibre optic probes

Renishaw's fibre optic probes extend the range of measurement possibilities into applications where the sample cannot conveniently be brought to the instrument. inVia Raman microscopes' integral optics permit fibre optic probes to be used easily, and with high optical efficiency.



## Features exclusive to inVia Reflex Raman microscopes

### Alignment optimisation and system validation

The inVia Reflex microscope automatically optimises the optical alignment of each beam path, whether ultraviolet, visible, or near-infrared, and then validates system performance.

### Automatic calibration

The inVia Reflex Raman microscopes' internal reference sources ensure that users know their Raman systems are calibrated and giving peak performance.

### Excitation switching

One mouse click and the inVia Reflex Raman microscope can not only switch between lasers and automatically reconfigure itself, but also optimise its optical alignment to give maximum efficiency.

### Confocality control

The inVia Reflex Raman microscope automatically switches between non-confocal and confocal (high spatial resolution) Raman modes, and then optimises alignment.

### Class 1 enclosure

The inVia Reflex Raman microscope's optional Class 1 laser safe microscope enclosure means inVia can be used in open laboratories.

### View/Raman changeover

The inVia Reflex microscope's motorized optics make everyday operation easy by switching automatically between sample viewing and spectrum acquisition modes.

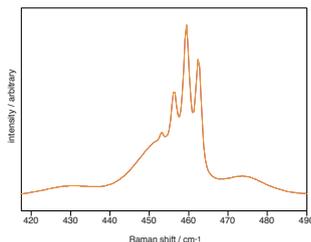


## Solutions

### EasyConfocal and mapping

inVia Raman microscopes give you high spatial resolution, and the capability to map your samples.

The inVia Raman microscope's EasyConfocal optical system offers high spatial resolution (< 1  $\mu\text{m}$  lateral) without compromising ease-of-use, stability, and optical efficiency. This capability can be used with the optional encoded sample stage to create maps of chemical composition and physical condition from lines, areas and volumes of samples.



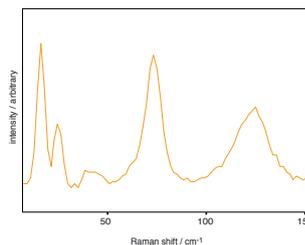
High resolution spectrum of CCl<sub>4</sub>



### True Imaging

Get the whole picture...fast! inVia Raman microscopes' True Imaging option allows you to survey large areas of sample rapidly.

Renishaw's True Imaging option illuminates a circular area on the sample and uses a tuneable filter to image light from a selected Raman or photoluminescence band directly onto the detector in a single step. The high speed of this method makes it ideally suited for the rapid surveying of larger areas in applications such as contaminant detection.



Near-excitation spectrum of HgCl<sub>2</sub>



### Resolution

inVia Raman microscopes can be fitted with one or more diffraction gratings to satisfy all your requirements for spectral resolution, spectral coverage and optimised sensitivity.

The wide choice of gratings, coupled with Renishaw's SynchroScan method for acquiring wide range artefact-free spectra, make inVia Raman microscopes ideally suited for both Raman and photoluminescence measurements.

### Lasers

inVia Raman microscopes' flexible optical solutions support laser wavelengths from the near-infrared to the deep ultraviolet, without sacrificing efficiency.

inVia Raman microscopes' multiple laser baseplates and multiple optical paths allow users to switch rapidly between lasers, with the semi-automatic changing of optical components ensuring optimum system performance is maintained at each wavelength.

inVia Raman microscopes are compatible with a wide range of laser sources.

### Near-excitation

Now you can have rapid spectrum acquisition and near-excitation Raman data from one instrument.

Renishaw's NEXt filter technology enables users to study features close to the laser line (as close as 10 cm<sup>-1</sup> in some configurations). inVia Raman microscopes can be equipped with a NEXt filter for use alongside notch or edge filters, giving optimum optical efficiency for all measurement types.

### Versatility

The versatility of the inVia Raman microscopes enable them to be used for a wide variety of spectroscopic studies. Accessories include:

- Fibre optic probes
- Macro sampling
- Temperature control cells
- Spectral databases
- Polarization viewing kits
- Polarization Raman kits
- Electrochemical cells
- High pressure cells
- Multiple detectors

## Combined techniques

Combined analytical systems enable users to perform two or more analytical techniques on the same sample region, under the same conditions, in a single instrument.

Time and money are saved by eliminating the need to transfer samples between instruments and relocate the same sampling point. One or more of these techniques can be integrated with any Renishaw Raman microscope either at the time of purchase, or later in the field, as the user's requirements change.



### Structural and chemical analyser for SEM

Renishaw's structural and chemical analyser (SCA) combines the imaging capabilities of scanning electron microscopy (SEM) with the investigative power of Raman, photoluminescence (PL), and cathodoluminescence (CL) spectroscopies, in a single instrument.



### Combined FT-IR/Raman microscopy

Fourier transform infrared spectroscopy can be combined with Renishaw's Raman microscopes to offer confocal Raman microscopy and infrared microscopy in a single instrument.



### Award winning AFM-Raman

The award winning NSOM/AFM Raman microscope from Nanonics and Renishaw brings together, in one commercial system, Raman, AFM and NSOM imaging techniques.

## Safety and further information

### Safety features

- Optional Class 1 laser safe enclosure
- Fully enclosed laser paths for multiple lasers
- Fully interlocked with interlock self-test features



Deep UV use requires Class 4 laser safety precautions

### For more information on inVia Raman microscopes

Please contact your local Renishaw supplier for further information about any of the products you see here, or to discuss any special requirements you may have.

[www.renishaw.com](http://www.renishaw.com)

Renishaw is continually improving its products and reserves the right to change specifications without notice.

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**RENISHAW**   
apply innovation™

## Renishaw applies innovation to provide solutions to your problems

Renishaw is an established world leader in metrology, providing high performance, cost-effective solutions for measurement and increased productivity. A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

Renishaw designs, develops and manufactures products which conform to ISO 9001 standards.

Renishaw provides innovative solutions using the following products:

- Probe systems for inspection on CMMs (co-ordinate measuring machines).
- Systems for job set-up, tool setting and inspection on machine tools.
- Scanning, digitising and dental systems.
- Laser and automated ballbar systems for performance measurement and calibration of machines.
- Encoder systems for high accuracy position feedback.
- Spectroscopy systems for non-destructive material analysis in laboratory and process environments.
- Styli for inspection and tool setting probes.
- Customised solutions for your applications.

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