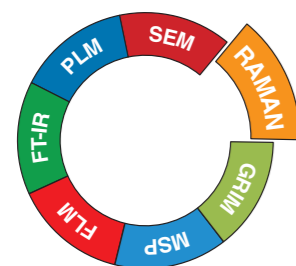


# inVia™ InSpect confocal Raman microscope

The perfect addition for trace analysis  
in your forensic laboratory



## Raman microscopy and your laboratory



### Where does Raman fit in your laboratory?

You use a range of microscopic techniques in your trace analysis laboratory, each with its own strengths and weaknesses.

Raman microscopy may be new to you. See how the inVia™ InSpect confocal Raman microscope can add value to your laboratory and work alongside your current microscopes.



### Scanning electron microscopy

SEM gives you higher resolution images than optical techniques. Plus additional capabilities—such as X-ray fluorescence (XRF)—give elemental analysis, enabling you to generate maps of elemental composition but not of chemical composition.



### Fluorescence light microscopy

FLM generates images based on fluorescence emission. It can be used to search rapidly for a class of target materials but is not specific enough to identify them. Additional sample preparation may be needed if the target material is not fluorescent.



### Polarised light microscopy

This powerful and widely used optical technique generates contrast based on differences in the optical properties of materials, without chemically identifying them.



### Microspectrophotometry

This technique measures the reflection and transmission characteristics of a sample across the VIS/NIR wavelength range. It is useful for comparing colours, without chemically identifying the pigment or dye.



### FT-IR Fourier-transform infra-red microscopy

An IR microscope is a powerful routine tool. With it you can rapidly identify many materials but often this requires sample preparation or direct contact, and doesn't have the spatial resolution of optical microscopes.



### Glass refractive index measurement

This specialist technique determines the refractive indices of glasses. It enables you to infer possible identities by comparison with reference materials, but it cannot chemically identify them.



### Add Raman microscopy to your laboratory

Add Raman spectroscopy to your laboratory and gain further powerful capabilities which complement your existing techniques:

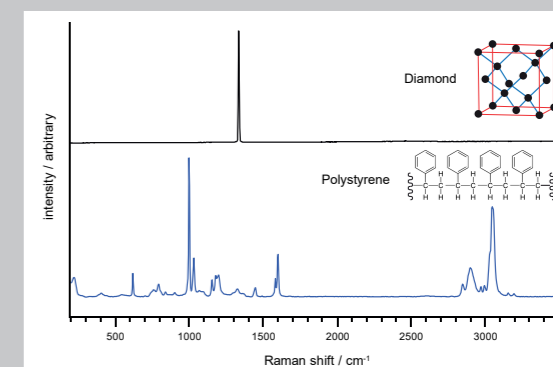
- **See the fine detail**  
Pinpoint your Raman analyses using a research-grade optical microscope.
- **Focus on the evidence**  
Discriminate between your targets and their surroundings using EasyConfocal™ analysis.
- **Highly specific identification**  
Raman microscopy can differentiate chemical structures, even closely related ones.
- **Analysis is non-contacting and non-destructive**  
You can analyse your sample multiple times without damaging or tainting it.
- **Sample preparation is minimal**  
If you can focus on the sample with an optical microscope, you can collect its Raman spectrum.

## Raman microscopy

### What is Raman microscopy?

Raman spectroscopy is an optical analysis technique used to identify materials. It measures the fundamental molecular vibrations of materials, rather than relying on tagging or marking.

A Raman microscope illuminates a tiny region of the sample with a laser. Most of the scattered light is unchanged, however some loses or gains energy and changes frequency. This is known as Raman scattering. This light forms a spectrum which is unique to the structure of the molecule; a chemical fingerprint that enables you to identify the material, typically using a library of known spectra.



The very different Raman spectra of diamond and polystyrene.

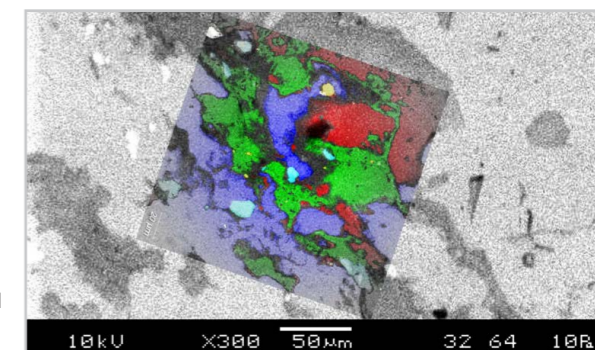
### Why choose an inVia InSpect confocal Raman microscope?

- Its high optical efficiency gives you high quality data in the minimum possible time.
- It has—unlike handheld Raman systems—high spatial resolution, compatible with your other microscopic techniques.
- Renishaw has optimised it for trace material analysis:
  - It supports, as standard, the contrast techniques you expect (brightfield, darkfield, and polarisation).
  - It supports both reflected and transmitted light illumination.
  - You can view the sample in high resolution detail (it has a high-performance 5MP 2/3" USB 3.0 video camera as standard).
  - It has a high-precision motorised stage as standard, that is suitable for analysing microscopic particles.
- Easy to use:
  - You can easily switch between lasers in software, and still analyse the same point on your sample.
  - Optimisation of alignment is automated. You do not need an expert to keep the system operating at peak performance.
  - Calibration checks are in-built.
  - It is a Class 1 laser product you can use safely in normal open laboratories.
- Renishaw has tailored it for trace analysis:
  - It is a high-performance affordable solution for forensic scientists.

### A complementary technique

Get more out of your microscopes using the Correlate™ software module. This powerful tool enables the comparison of Raman results with many microscopy systems including SEM, fluorescence, AFM, FT-IR and optical microscopes. Import sample coordinates from your first microscope to the InSpect microscope and use the Image Alignment Tool to overlay images and get a better picture of the sample.

Find more information at [www.renishaw.com/correlate](http://www.renishaw.com/correlate).



A combined image of a mineral. It consists of a SEM image and a Raman image. The latter reveals the varied chemical composition.

## inVia InSpect confocal Raman microscope

- **Binocular eyepieces and a high performance video camera**  
5MP 2/3" format camera for a large field of view.  
You can choose the best method of viewing your sample: by eyepieces or video.
- **Independent transmitted and reflected light paths**  
Giving you a full range of options for illuminating your samples. With easy external control of both light sources.
- **Multiple contrast techniques to swiftly locate regions of interest**  
Brightfield (BF), darkfield (DF), and polarisation (POL).
- **Objective lenses to suit large area surveying and high resolution work on small features**  
5x, 20x long-working distance, 100x long-working distance.
- **High-resolution motorised stage for high precision positioning**  
Precise stage positioning under computer control for data acquisition, seamlessly combined with manual positioning for easy sample loading (using EasyMove™ technology).
- **Full automation**  
Fully automated alignment, calibration and control from software, so that you do not have to manually adjust any optics within the inVia InSpect confocal Raman microscope.



**The perfect addition for trace analysis  
in your forensic laboratory**



## inVia InSpect confocal Raman microscope key features



Renishaw MS30 encoded microscope stage. At the forefront of the precision measurement industry for over 40 years our components ensure precise reliable operation.

### MS30 high-speed encoded microscope stage

MS30 is a high spatial resolution stage, ideal for analysing and mapping complex samples and small particles.

### EasyMove™ stage system

The EasyMove system gives a seamless transition between manual sample loading and automated measurements. It makes sample changing and stage setup easy. You can move the stage by hand, with it keeping track of coordinates to micrometre accuracy. Sample loading is rapid and easy, saving you time when processing large numbers of samples.



At the heart of all inVia confocal Raman microscopes, Centrus is more than just a detector. It is the cornerstone of the technologies that make inVia InSpect confocal Raman microscope so powerful.

### Correlate™ software module

The Correlate software module maintains your positional information when you transfer a sample between microscopes. You can take measurements from the same positions on the sample using multiple microscopes, and then superimpose the results to get a fuller understanding of your sample.

### Centrus™ CCD detector

InSpect's high performance detector, electrically cooled to ensure low noise levels, gives you the highest quality data in the shortest possible time.

### Particle Analysis module

A powerful tool that delivers combined particle metrics and chemical identification. It automates the optical analysis of multiple particles in an intuitive and highly automated workflow. It can target particles using different microscope contrast modes or images imported via Correlate, then guides Raman data collection from those particles.

### Full automation

You can control alignment, calibration, and configurations all from software. For example, you can rapidly switch—with a click of a button—between sample viewing and Raman analysis.

### SynchroScan™ technology

SynchroScan technology enables you to collect data across the whole spectral range in high resolution, so you can differentiate similar materials with confidence.

### StreamHR™ mapping

StreamHR mapping harmonises the operation of the Centrus detector and MS30 microscope stage. It greatly increases the speed of data collection, and saves you time generating images.

### EasyConfocal™ technology

You can effortlessly switch between high spatial resolution—to isolate regions for trace analysis—and sampling larger areas, whilst always maintaining maximum sensitivity.

### Empty Modelling™ software

Empty Modelling software uses a multivariate analysis technique to resolve complex data into its constituents. Use this, with library searching, to successfully analyse data from samples that contain unknown materials.

### Surface™ and FocusTrack™ technologies

These technologies enable you to analyse samples that are tilted, and to maintain focus when you move across your sample. You can look at your whole range of samples, from tiny particles on an uneven substrate, to large heterogeneous samples.

## Support

### Raman Assist

We offer a comprehensive support package to ensure you realise the full potential of your inVia InSpect confocal Raman microscope and make use of all its features and capabilities.

This package is available to all users, following their purchase of a Raman instrument from Renishaw. The programme gives you access to our specialist Raman team and the following benefits:

- Access to a global network of highly qualified professional Raman applications scientists who can help you optimise your data collection and interpret your results.
- Access to our extensive database of on-line user training modules and videos to help you optimise your data collection and processing.
- Online remote-access support and diagnostic checks.
- Preferential access to Renishaw's Raman Revealed training sessions.
- Updates on new capabilities and software at worldwide Inside Raman seminars.
- Free updates to your current software version.



### Choose Renishaw

Renishaw is a recognised leader in Raman spectroscopy, our systems offer the highest levels of performance and flexibility. Customers worldwide rely upon them to provide superior analytical information across a diverse range of fields and applications. By choosing Renishaw products you can be confident you have made an excellent investment. Your Raman system will be easy to use and will produce repeatable, reliable data, even from challenging samples. And it will last.

Renishaw is a partner you can rely on. Founded in 1973, Renishaw is an award-winning world leader in advanced measurement and manufacturing. With over 4,000 employees and a global network of offices, we will be your long term partner backed up by responsive, expert, technical and commercial support.

We launched our first Raman spectroscopy product in 1992, and have been continuously developing our Raman instrumentation ever since. Decades of experience ensure you can trust our products to deliver the results you need. Customers worldwide rely on our products.



System performance depends on individual configuration and options.

This information is given as a guide to performance because of the range of options and configurations of the inVia confocal Raman microscope.

For more detailed and specific performance and specifications please contact your local Renishaw representative.

### Laser safety

- Class 1 laser product in standard InSpect configuration.
- Fully interlocked with interlock self-test features.
- Some non-InSpect inVia systems are Class 3B or, when using deep UV ( $\leq 315$  nm) or high power ( $> 500$  mW) CW visible/NIR lasers, Class 4.

### Laser safety labels



Please visit [www.renishaw.com/inspect](http://www.renishaw.com/inspect) for more information about the inVia InSpect confocal Raman microscope.

### Renishaw. The Raman innovators.

Renishaw manufactures a wide range of Raman spectroscopy products which offer the highest levels of performance, sensitivity, and reliability across a diverse range of applications. With them you can tackle even the most challenging analytical problems with confidence.

We are confident the inVia InSpect confocal Raman microscope can help you with your trace analysis investigations. Please contact us via the link below and tell us your specific requirements, and we will help you choose the ideal configuration.

Our worldwide network of subsidiary companies and distributors supplies exceptional service and support for customers.

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

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