

SciAps ApNotes

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A series of how-to's and best practices for field and laboratory analytical measurement. More ApNotes available at sciaps.com/apnotes

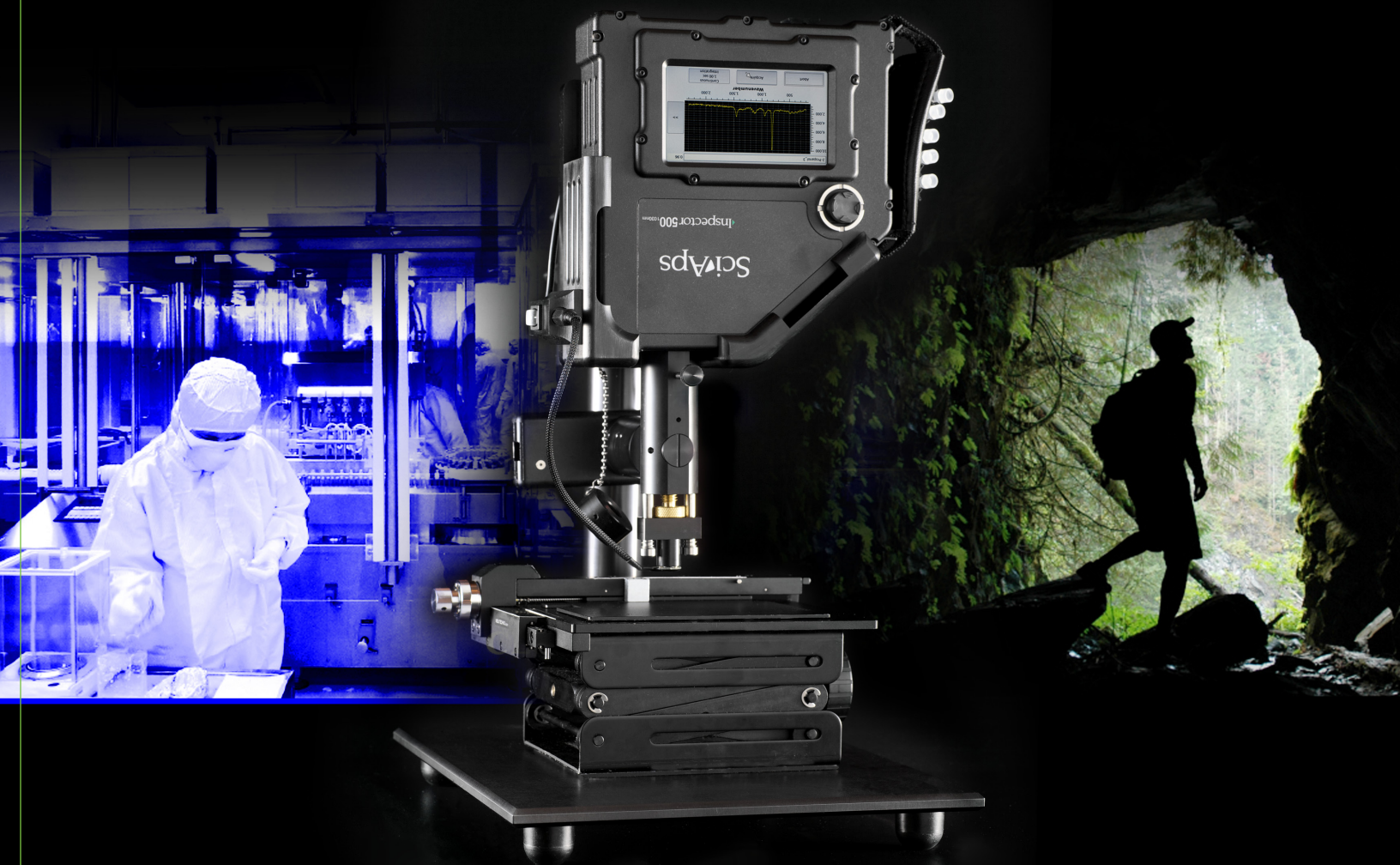
Raman Microscope

Inspector Scope for Academic, Laboratory & Research

Inspector Scope

The Only In-Field, At the Bench,
and In-Lab Raman System

All in a Single Package

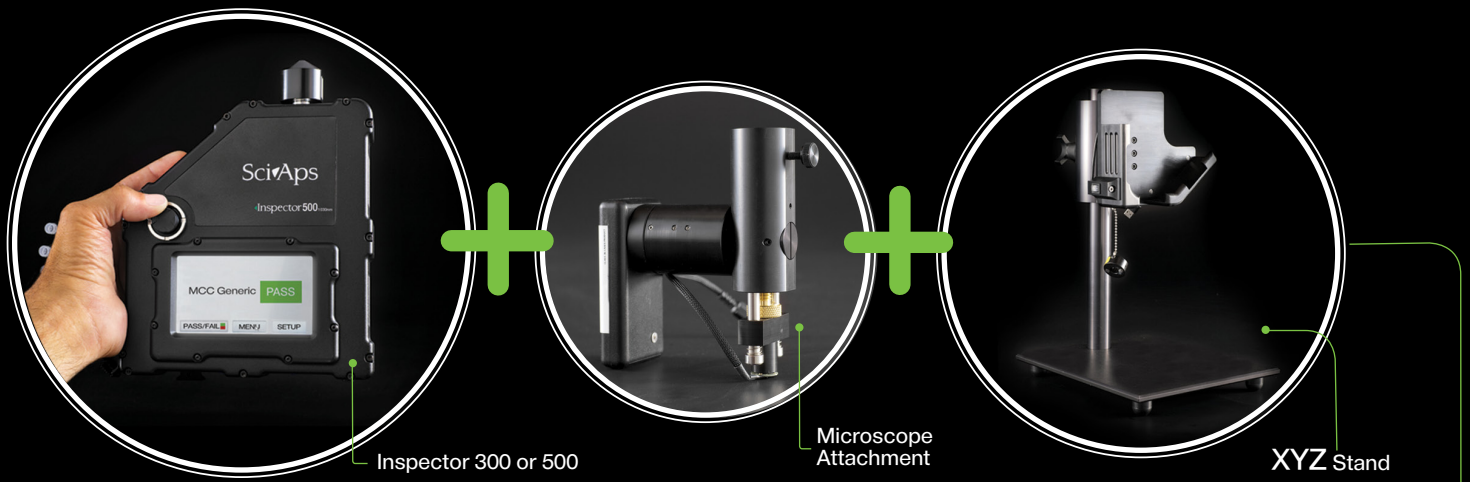


In the Lab

It docks instantly to our microscope + digital camera package for viewing and analyzing micron-sized samples and interrogating multiple locations in heterogeneous sample types.

In the Field

It undocks from the microscope and stand for a purpose-built handheld Raman analyzer. It's complete with on-board or PC-driven analysis tools including PCA, PLS chemo-metric techniques.



The Scope is the first ever combination of in-field handheld Raman (the Inspector 300 or 500) that docks seamlessly to a microscope and digital camera. It's the only Raman system delivering high performance materials analysis in the field, and microscopic sample analysis back at the lab.

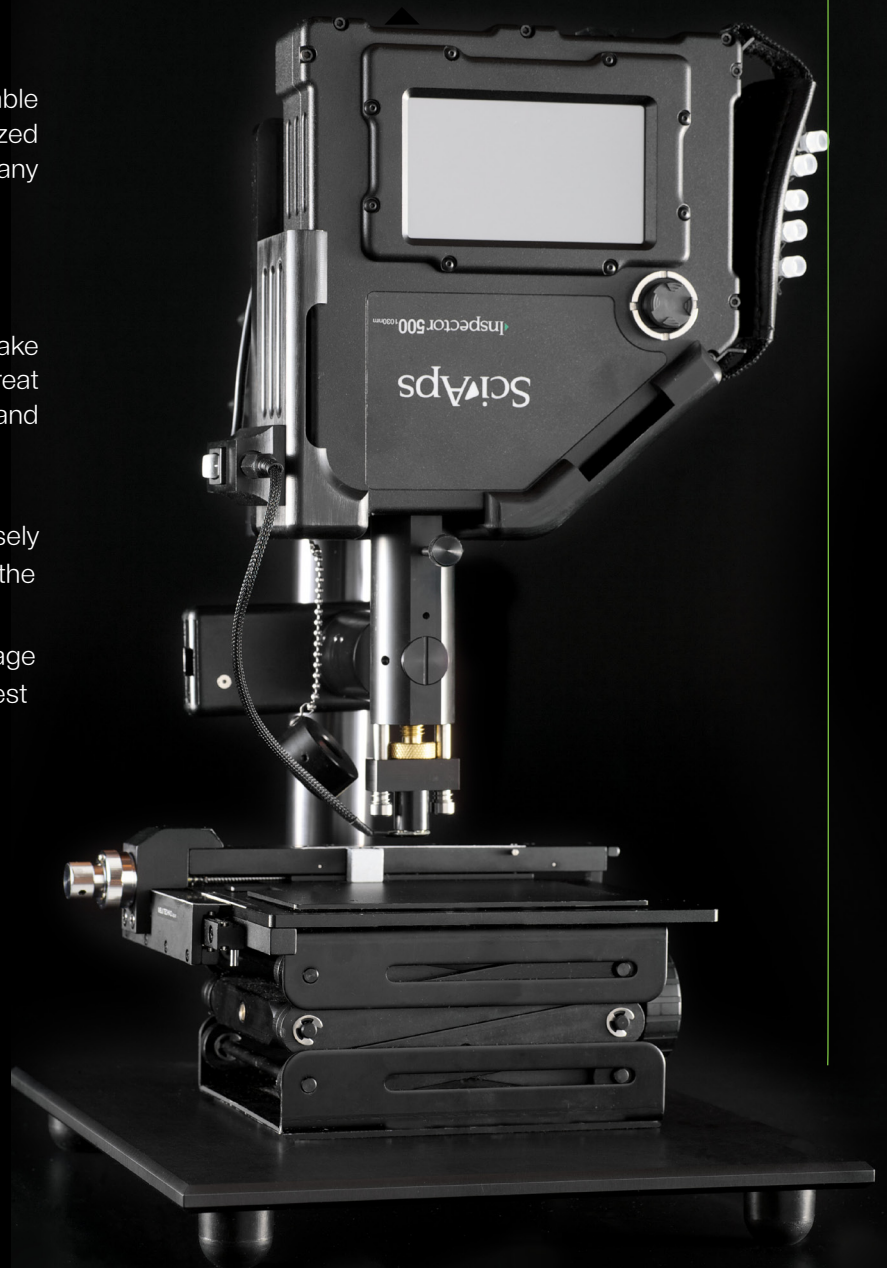
When the Scope is Docked...

It becomes a powerful, invaluable analytical tool, capable of compound and mineral analysis of micron-sized samples, fibers, inclusions, mineral veins - virtually any small or heterogeneous sample you can imagine.

In the Field...

It's a field-rugged, totally portable Raman analyzer. Take it anywhere in the world for instant results. It's a great teaching tool for universities that perform both lab and field-based research.

- Use the 100X magnifying power and video to closely examine and identify heterogeneous features on the sample, or identify a small sample to analyze.
- Position the laser on the target, taking full advantage of the 25 um spot size to interrogate even the finest heterogeneous points or smallest of samples.
- Fire away to get instant compound or mineral ID.
- Develop quantitative models using the on-board Pass/Fail, PCA (principle component analysis) or PLS (partial least squares) techniques.
- Monitor results through scope to verify you're not burning the sample, or easily reduce the laser power in the Inspector.
- Store Images, results for proof positive analysis.



Applications:

Heterogeneous or small samples

The Scope package is a great option for micron-sized contaminants in materials, fibers, soil particulate, glass and plastic fragments, residues, thin films - virtually any material.

Forensics, Crime Labs

Critical requirements include identification of narcotics, plastic explosives, fibers, particulate. When docked, the Scope can select one grain or particle for characterization and identification. Undock and it's off to the crime scene, illicit meth lab or other sites requiring instant sample identification.

Teaching Labs

In the lab, in the classroom or in the field -- university chemistry, earth sciences and life science programs all have applications for a range of materials analysis.

Spotlight Application

SERS

Target clustered or scaffolded regions of the substrate, or target concentrated regions of the sample surface.



Image Credit: Zubarev Lab/Rice University

The Scope package augments SERS application studies by visual characterization of surfaces and pinpointing the laser onto active regions. In randomly patterned substrates it is important to characterize and target clustered and scaffolded regions which may have high SERS activity or Raman signatures. Also SERS nanoparticles can be injected and embedded into tissues, membranes, and other types of polymeric or emulsified materials. The Scope aids in positioning the laser on various regions of the samples for targeting specific locations of interest.

"We are very happy with the Inspector Raman and Nuscope combination (i.e. the Scope) for our Raman imaging studies. We have found it easy to use and implement into our research and teaching labs. In particular, it has been used to interrogate the surfaces of our diamond films with much success. I am very pleased with the Inspector Raman and Nuscope and I look forward to using it for other research and teaching applications."

-Mark Prelas, University of Missouri

Spotlight Application

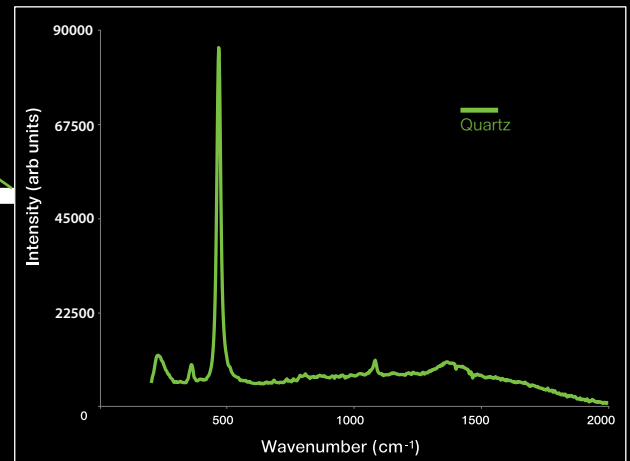
Economic Geology and Complex Mineral Studies

Quickly identify minerals from outlying strata and drill cuttings. Also identify minerals within individual crystals or veins within a complex rock.



Many minerals have small grains or veins of minerals embedded in their structure which are beyond the focusing power of the human eye. The Scope utilizes a 25 um Raman spot plus 100X magnifying microscope to incorporate fine mineral identification. The operator captures images of the mineral surface for reporting. One example is to distinguish hornblende and quartz (Raman spectrum at right). These are two of the minerals comprising hornblende biotite granite shown above. The laser is aimed at each region, as viewed under the microscope. Raman spectra are collected and viewed in real time to determine the mineral in each local region.

Contact us for a copy of our complete mineral library - a list of all minerals with preprogrammed Raman spectra for mineral ID

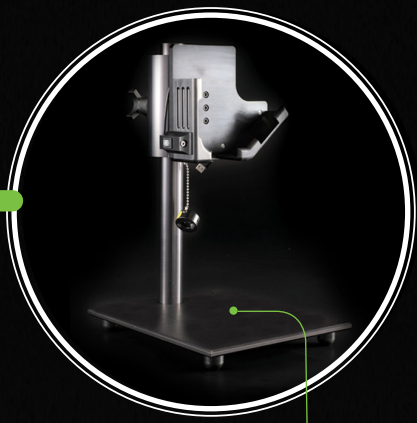




Your Inspector 300 or 500





Microscope Attachment



XYZ Stand

Specifications

Inspector Scope	Inspector 300 _{785nm}	Inspector 500 _{1030nm}
Magnification	100X	100X
Laser spot size	25 um	25 um
Video	Color, real time, screen capture	Same
Field of View	750 um x 1000 um	Same
Laser	300 mW 785 nm Class III B	300 mW 1030 nm Class III B
Detector	Cooled CCD array	Cooled Type III-IV semiconductor array
Spectral Range cm-1	175-2875	100-2500
Resolution across range cm-1	6-8	8-10
Dimensions (HH only)	7.5" x 6.9" x 1.7"	7.5" x 6.9" x 1.7"
Weight (HH only)	3.75 lbs (1.7 kg)	3.75 lbs (1.7 kg)
Battery lifetime	4 hours and removable	4 hours and removable
Operating Temperature °C	-20 to +40	-20 to +40
Software	Data or Data Advanced 	Data or Data Advanced 
Spectral Library Options	Same as Inspector	Same as Inspector



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