



InPhotote™

Portable Raman Spectrometer

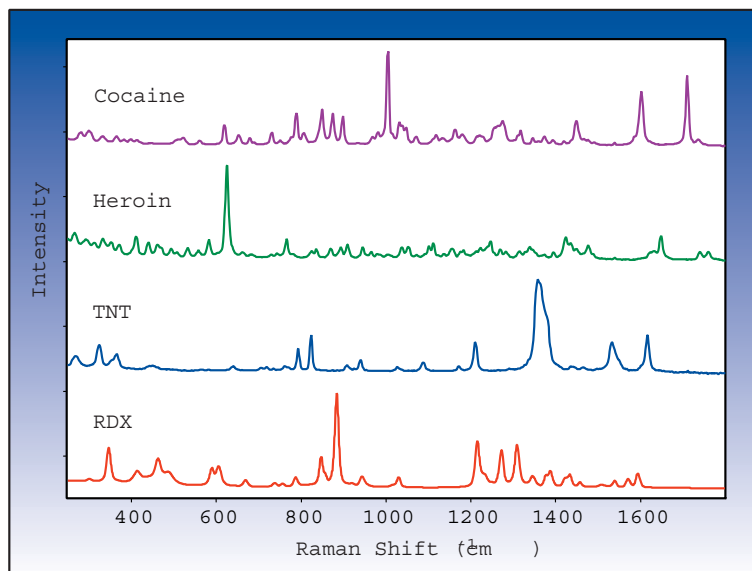
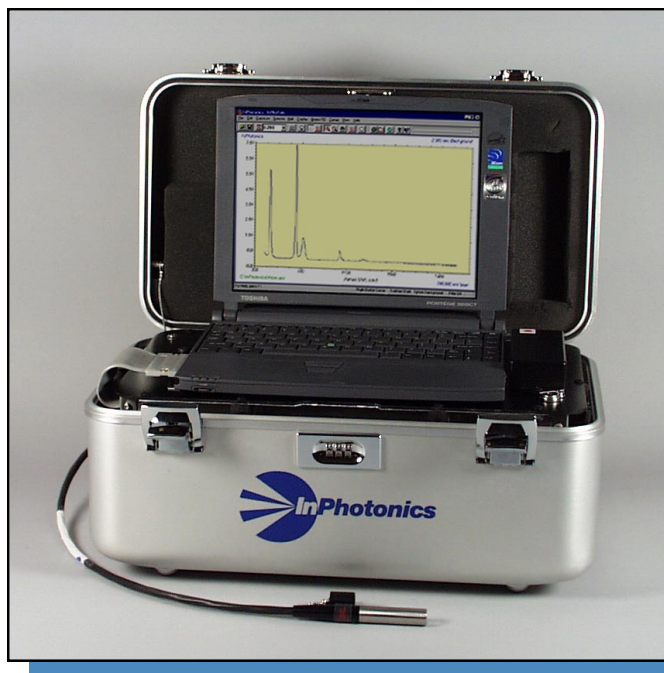
The Solution for On-Site Identification

Identification of chemicals in remote locations can be extremely labor and time intensive. Samples need to be collected, transported to the laboratory, and usually require preparation prior to analysis. In addition, precautionary measures must be followed when dealing with unknown and potentially hazardous materials. Raman spectroscopy offers many advantages for field analysis. Measurements can typically be made directly through glass and plastic containers. For field work, this ease of sampling results in a simple and rapid measurement technique that limits exposure of personnel to hazardous substances. Point-and-click software control enables proper system operation without extensive training and experience.

The InPhotote™ is a complete Raman spectrometer system in a rugged, portable package. A frequency-stabilized laser, spectrograph, and TE-cooled CCD detector are integrated into the protective case. The system

can be operated with a 110 - 240V-AC, a 12 V-DC power supply (e.g. car battery) or an optional battery pack. No moving optics or shutters are used; optical components can withstand elevated temperatures and are shock-mounted for routine transportation and usage. The 22 lb. system is

easily carried by a single operator. With 4 cm^{-1} spectral resolution over a 1600 cm^{-1} range, the InPhotote has the optical specifications to accurately discriminate solids as well as liquids. Since Raman bands of solids are often less than 4 cm^{-1} wide, high resolution can be critical for making a positive ID.



Raman spectra measured on the InPhotote can easily differentiate explosives and narcotics.

Database Options

Identification of unknowns is facilitated with optional spectral databases and search modules. InPhotonics offers a forensic spectral database originally developed in collaboration with federal authorities. Intended for the identification of explosives and narcotics, the forensic database assists in providing the user with rapid identification of illicit substances. Other third-party databases are available for broader needs and users can create custom spectral libraries tailored to individual applications. For example, a database can be compiled for QC monitoring of incoming materials or outgoing products.

Versatile Sampling with the RamanProbe™

One of the many advantages of Raman spectroscopy is that measurements can be made without extensive sample preparation. The InPhotote is compatible with InPhotonics' innovative RamanProbe™ line of versatile fiber optic sampling probes up to 200 m in length. The standard hand-held probe enables measurement of solids and liquids through packaging materials, avoiding direct contact with potentially harmful substances. Probes can be extended by up to 200 m such that the InPhotote can remain in a "safe" area with only the probe exposed to potential hazardous substances. Immersible probes can be routinely decontaminated when necessary.

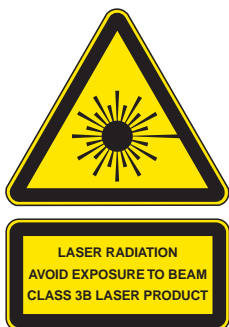


Focussed optics enable the RamanProbe to "see" through glass and plastic.

Specifications

Optical Design	High-throughput, slitless spectrograph with no moving optical or mechanical parts. Two spectrograph models: short-range (SR) and long-range (LR).
Spectral Range	SR version: 250 - 1800 cm^{-1} (Stokes) LR version: 250 - 2350 cm^{-1} (Stokes)
Spectral Resolution	SR version: 4 - 5 cm^{-1} (FWHM) LR version: 6 - 8 cm^{-1} (FWHM)
Excitation Source	Stabilized 785 nm diode laser with 0.1 nm linewidth, 300 mW output. Other excitation wavelengths available upon request.
Detector	Vacuum-sealed, TE-cooled CCD array, 1024 x 128 pixels, operating at 45° below ambient (-25° C at 20°C ambient temperature)
Sampling Arrangement	Standard RamanProbe™ with 5 m cable length can be used to measure unknowns through transparent and semi-transparent containers (glass, plastic). Options: probe extension cables (up to 200 m), immersible probe capable of withstanding chemical decontamination. Contact InPhotonics regarding surface enhanced Raman (SERS) substrates for trace-level detection.
Sample Holders	Various sizes of Class I sample holders available as options.
Physical Specifications	Optical components are shock-mounted in a rugged, water-resistant case. Outer dimensions 16" x 10" x 9" (406 x 254 x 229 mm), 22 lbs. (10 kg). Spectrometer can be operated at ambient temperatures up to 30°C.
PC Hardware and Software	InPhoTote acquisition software, GRAMS AI manipulation software (from Thermo Electron) operating under Windows XP on an ultra-thin notebook computer.
Optional Software	Chemical identification software, quantitative analysis software, and Forensic Raman Spectral Library of 243 materials.
Power Requirements	110-240V AC using external AC/DC adapter (included), 12V DC, or external battery pack.

At InPhotonics, solving problems with spectroscopy is our speciality. We have a fully-equipped facility to develop and manufacture spectrometers and sampling devices for laboratory, plant, and field use. Behind InPhotonics are over 25 years of research and development experience in multiple disciplines of chemistry and engineering. Look to InPhotonics to meet your spectroscopic requirements.



111 Downey Street
Norwood, Massachusetts 02062
Tel. (781) 440-0202
Fax (781) 551-0283
www.inphotonics.com