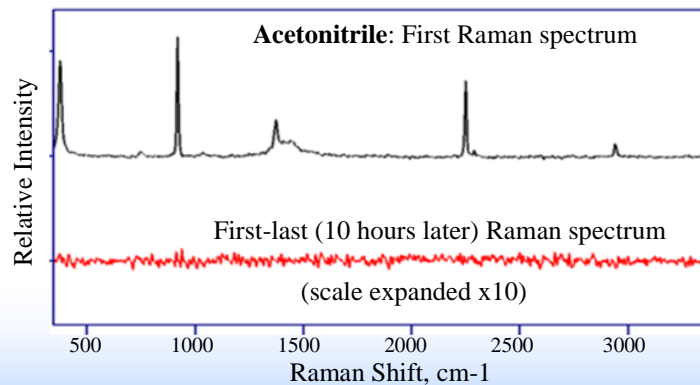
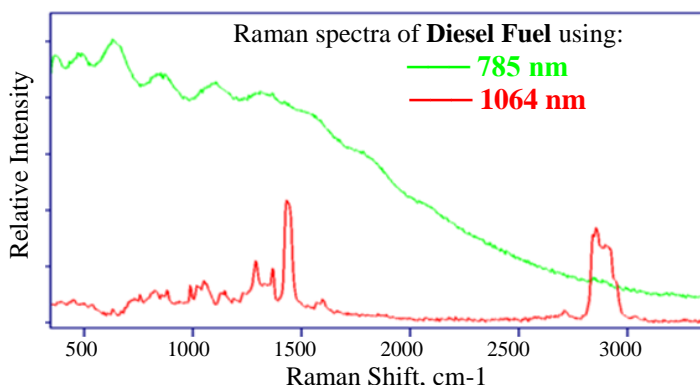
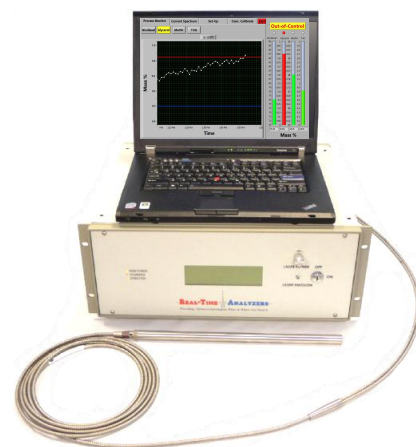


Real-Time Analyzer's **RamanPro** is a Process Analytical Technology (PAT) designed to measure chemicals in the most demanding production environments, while maintaining the high-end performance and data quality of a laboratory spectrometer. It employs a 1064 nm laser to eliminate fluorescence interference and an interferometer to assure long term stability.

## Process Measurements

Today's manufacturing industries, such as chemical, petrochemical, pharmaceutical, polymer, and semiconductor, must continuously assure product quality. This includes confirming the identity of all the raw materials used, monitoring the chemical composition within batch and continuous reactors, distillation columns, fermentors, molding devices, and qualifying final product quality. The **RamanPro** is ideal for these applications through the use of fiber optic probes (with 5-25 meter cables). A simple rod-shaped ball probe can be inserted into 55 gallon drums, liquids or powders, and confirm the chemical identity of the contents. Similarly, probes can be mounted on final product inspection points and determine product performance properties based on the Raman spectrum and appropriate chemometric models. Most importantly, high pressure, high temperature, chemical resistant probes can be inserted directly into reactor vessels, feed, transfer, recycle, and exit lines, or most conveniently into standardized NeSSI interfaces, so that continuous process monitoring and control can be performed.

The **RamanPro** employs a laser emitting at 1064 nm to provide the highest level of fluorescence avoidance available. All other Raman analyzers employ shorter wavelengths (e.g. 785 nm), which very frequently generate fluorescence in the sample and the Raman spectrum is completely obscured (lost), which makes analysis impossible (see diesel fuel spectrum below). The **RamanPro** avoids this problem and gives you the flexibility to perform the greatest number of successful applications. Another key design feature is a rugged and extremely precise interferometer that provides complete spectral coverage with constant resolution every scan. The invariant wavenumber axis means that reproducible quantitative analysis using **peak height**, **area**, or **chemometric relationships** is easily achieved without the need to recalibrate the instrument (see acetone spectrum below). This unsurpassed stability and reproducibility also means that concentration models can be transferred from lab to pilot plant to production seamlessly.



## Advantages and Features

- Monitor up to 10 chemicals in real-time (in reactor), continuously.
- Avoid fluorescence interference
- No analyzer calibration required
- Use the same analyzer for lab, pilot-plant and production
- Use the same concentration model for all analyzers
- Integrate into any process through in-situ, high pressure and temperature probes or a standard NeSSI interface
- Easy-to-use software for both continuous feed and batch reactors
- Industrial hardened shock absorbing system
- 5-hour battery back-up
- Transmit data wirelessly

Specification	RamanPro
<b>Operation</b>	
Warm-up Time	1 minute
Measurement Time	Typically, < 1 minute
Sampling	Various fiber optic probes (high T & P available)
Calibration	Factory set using NIST standard
Safety	Laser goggles supplied (wear if beam is uncontained)
<b>Analyzer</b>	
Measurement Principle	FT-Raman Spectroscopy
Light Source	1064 nm, 500 mW, 0.1 nm linewidth (Class 3b Laser Product)
Detector	InGaAs (thermo-electrically cooled)
Spectral Resolution	User selectable at 8, 16, or 32 $\text{cm}^{-1}$
Spectral Range	150 - 3350 $\text{cm}^{-1}$
<b>Data System</b>	
Laptop or embedded computer	Processor Speed >1 GHz, 1GB or > RAM
Operation System	Windows 2000/XP/Vista/Windows 7
Software	Raman Vista Suite, Process Controller
Data Export	Ethernet/USB/WiFi
<b>Environment</b>	
Dimensions	19.78 x 15.77 x 7.41" (502 x 400 x 188 mm)
Weight	30 lbs (13.6kg)
Power	Battery (5 hours- rechargeable) / Electric (120/240 VAC 50/60Hz)
Operating Temperature Range	Analyzer 35 - 100 °F (0-110 °C), Probe up to 390 °F (200 °C)

Custom software and probes are also available.

