

PROCESS CONTROL AND LABORATORY RAMAN INSTRUMENTATION

PI-200-L BENCHTOP CONFIGURATION WITH AUTO SAMPLER ACCESSORY



PATENT NUMBERS: 6,028,667, 6,100,975, 6,859,581 B1 & 7,973,926 B1

Technology Specifications: PI-200-L or PI-200-I

Spectrograph Aperture	F/2.0.
Resolution @ 785 nm excitation	~ 4 cm ⁻¹ .
CCD Camera	Andor (Various models available).
Spectral Coverage (Adjustable)	~250 to 2650 cm ⁻¹ (785 nm excitation).
Camera Cooling	4-stage TE-cooling -60° to -80° C.
Calibration	Automatic both X and Y axis.
Fiber Coupling with Slit Array	100 μm x 3.3 mm tall.
Laser (Power > 450 mW)	785 nm standard, other wavelengths available upon request.
Temperature Control	Laser and Spectrograph.
Raman Probe	InPhotonics with 10 ⁻⁸ Rayleigh filtering.
Fiber Optic Probe Lengths	Up to 1100 ft (350 m).
Packaging Options	Benchtop, Control room 19" rack, & NRTL certified purged enclosure.
Hazardous Locations of Probes	ATEX certified for Zone 0 II 1 G, Ex op sh IIC T4 Ga Using Safe-Laser Interlock™.
Multiplexing	High throughput 9 and 18 channels.
Computer Requirements	Windows, PC or Laptop.
Power Requirements	115-230 VAC, 47-63 Hz Lab 4 A, On-line 10 A.
Outputs Available	4-20 mA analog Digital modbus & OPC.
Laser life expectancy	> 6 years.
On-line System Backup Features	Backup laser with AUTO Swap and backup computer.

Featuring:

- Little or no sample conditioning required.
- Automatic multipoint neon lamp wavelength calibration.
- Broad spectrum white light normalization to ensure chemometric model transfer.
- Wavelength tracking of every spectrum.
- System stability: ~0.010 cm⁻¹ per month.
- Real-time chemometrics with multiple parameter predictions.
- GRAMS and PLSplus/IQ compatible.
- Laser power up to 1500 mW even in ATEX applications.
- Warranty: 2 year standard

Lasers CE and CDRH Certified





ON-LINE FIBER-COUPLED RAMAN ANALYZER with REAL-TIME CHEMOMETRICS



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Process Instruments specializes in the complete development of Raman applications including collecting spectra from customers' samples, building chemometric models, and training customers in model maintenance. We determine the optimum laser excitation wavelength, sample configuration, and CCD detector required for your specific applications. Modeling included for the 1st year of use, and model training included.

We manufacture a robust, compact, optically fast (f/2.0) spectrograph and our own frequency-stabilized, narrow linewidth, and long life laser (estimated life >6 years). Our multiplexing is sequential (not on chip) so maximum laser power reaches each channel and the acquisition time for each channel can be individually optimized.

Our Raman probes with built-in laser rejection filtering of $> 10^{-8}$ and with bandpass filtering built into the tip can be used with long (350 m) fiber optic cables and in direct process immersion up to 350^o C and up to 3000 psi. We offer very efficient multiplexing capabilities allowing up to 18 individual sample streams to be monitored with one Raman instrument. Our Software automatically loads the appropriate models for each channel and sample stream configuration and can be readily customized for specific applications.

Our PROspect Raman software is GRAMS compatible and can be used for both our laboratory and process-control models. Software features include automatic X- and Y-axis calibration, real-time chemometrics, and continuous laser-wavelength tracking to ensure stable chemometric model operation. All spectra are throughput corrected to ensure ease of model transfer from one Raman instrument to another. Our industrial systems (Model PI-200-I) include a backup computer and a backup laser with an AUTO SWAP feature to automatically switch in a backup laser source within seconds should the primary laser fail. A new laser can be inserted into the system by simply reattaching the fiber optic coupling. This backup feature along with auto calibration ensure that there is minimal downtime (typically <2 hours/year/channel). All of our Raman instruments come with a 24-month warranty including the laser diode source. Digital output to a DCS is compatible with standard MODBUS or OPC protocols using RS 232, RS 485, or TCP connections.

