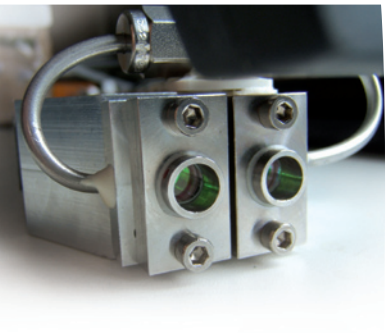
ProCeas EXCEPTIONAL ANALYSIS

Highest spectral resolution ever reached using a laser.
Response time less than 1 second.
Sampling guaranteed without condensation without using a heated line.



OFCEAS TECHNOLOGY

The **ProCeas** product line relies on OFCEAS (Optical Feedback Cavity Enhanced Absorption Spectroscopy) technology developed and patented by the Université Joseph Fourier of Grenoble (France).

- OFCEAS technology is a ***laser spectroscopy***; it uses a laser as a source of light to probe a sample. The laser can be tuned to cover a spectral region for the identification and quantitative analysis of a samples contents.
- OFCEAS relies on a ***continuous laser*** (not a pulsed laser), with a major improvement of wavelengh accuracy and reproducibility for increased reliability of the measurement.
- OFCEAS most unique feature is its principle of "**FEEDBACK**". Proprietary controlled laser feedback technology yields extremely narrow emission rays of light at specific wavelength.
Extremely high spectral result from this unique technology.

ProCeas ADVANTAGES

ProCeas is the fastest, most selective and highest spectral resolution product on the market today.
ProCeas is robust, easy to install and use; it doesn't require routine maintenance, resulting in lowered operation costs. **ProCeas**' patented low pressure sampling system eliminates the need for a heated gas transfer line between the sampling point and the analyzer.

The **ProCeas** product line has numerous advantages:

- Lower purchase cost
- Excellent compositional representativity of the sample
- Reduced maintenance - Reduced operating costs
- Predictable maintenance
- Response Time < 1 second
- No false positive responses
- High selectivity
- Enables measuring range from the ppt to the ppm using a single calibration
- Simultaneous measurement of several gases using the same laser spectrometer
- Robustness
- Easy to install

LASER SPECTROMETER COMPARISON CHART

	TDLAS*	CRDS**	OFCEAS
LEVEL OF DETECTION	POOR (typical pathlength <2 m)	BEST (Set pathlength between 1,000 and 10,000 m)	BEST (Set pathlength between 1,000 and 10,000 m)
RESPONSE TIME	Dual band measurement required (reference and analyte)	Dual band measurement required (reference and analyte)	Single band measurement required (analyte only) < 1 second
SPECTRAL RESOLUTION	POOR (1 MHz bandwidth)	POOR (1 MHx bandwidth)	HIGH (10 KHz bandwidth)
SENSITIVITY TO INTERFERING COMPOUNDS	Possible False Positive Response	No False Positive Response	No False Positive Response
CALIBRATION	Complex Chemometrics	Simple	Simple
SPECTRAL REFERENCING	Manual	Manual	Built-In

**TDLAS : Tunable Diode Laser Absorption Spectroscopy / **CRDS : Cavity Ring Down Spectroscopy*

TECHNICAL SPECIFICATIONS

Sampling Specifications:

- Flow rate: 3 - 9 liter/hour (50-150 CCM)
- Maximum temperature: 600°C (1,112F)
- Maximum humidity: 30 % (absolute)

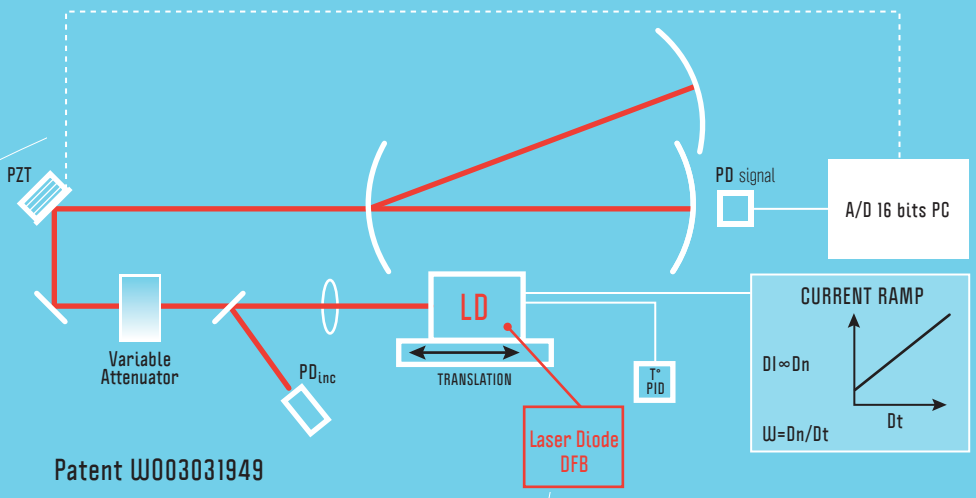
Analytical Specifications:

- Gases analyzed: NO, CO, NH_3, HCl, H_2S, SO_2, C_nH_m...
- Concentration ranges: ppt - ppm
- Response time: < 1 second

APPLICATIONS

- Detection and quantification of trace concentration of gases (wet or dry gases)
- Industrial gases analysis
- Emission and process gases analysis
- Quality control of ultra-pure gases
- Custom applications

SCHEMATIC



Patent WO03031949

EUREKA

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