

atmosFIR^A

Multi-component FTIR gas analyser, measuring ppb-levels online and in the laboratory

AtmosFIR is the latest generation of FTIR gas analyser technology from Protea. The atmosFIR system improves upon previous FTIR technology and represents one of the most cost-effective and flexible analytical products on the market today. At the heart of atmosFIR is a high-resolution, robust and proven FTIR spectrometer offering high signal throughput, low-noise and long lifetime of components. AtmosFIR has been developed to incorporate the latest improvements and advantages in technology, including:

- * Low cost of ownership
- * Low maintenance cost
- * Robust and light, including the latest in fabrication materials
- * AtmosFIR combines an FTIR analyser with a in-built sampling system and is designed for ppb measurement as a bench-top or 19" rack mounted unit.

These advantages come with the benefit of improved performance over existing products, due to the new small, robust, high resolution interferometer with low noise measurement. AtmosFIR is fitted with either a sensitive DTGS detector, operating at ambient temperature, or a Liquid Nitrogen Cooled MCT detector, for very low ppb measurements. The unique high-pass, high-pathlength and high pressure gas cell enables very low detection in a compact analyser. Protea continues to offer our powerful PAS software suite, training and support, so that the user is able to achieve the best performance out of the product.



Multi-component, multi-range FTIR gas analyser

Measure 1000's of gases with single unit

PAS software offers no-limit on number of gas measurements at once, using powerful PLS algorithms

Data can be downloaded and re-analysed offline for new gases

Specific Applications for atmosFIR^A:

- * Ambient air monitoring <1000ppb
- * Siloxane Measurements to ppb level
- * Hydrogen Gas Testing

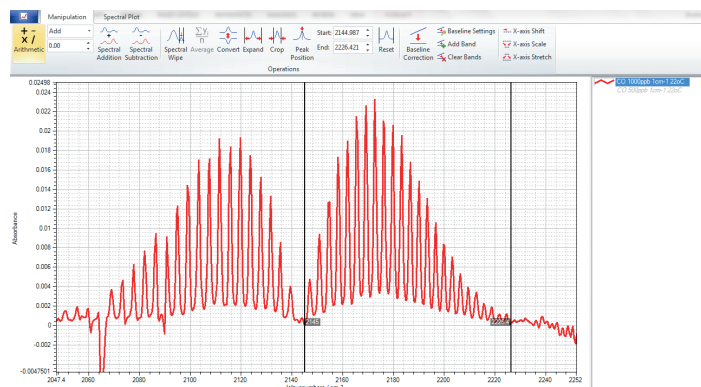
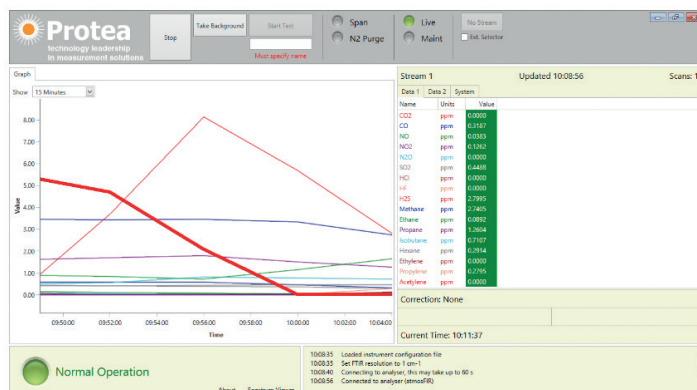
FTIR Specifications

Double-pivot interferometer with increased robustness. Permanently aligned optics, giving repeatable measurements and high light throughput. The scanning mechanism has a lifetime guarantee.

Resolution	1cm ⁻¹ , 2cm ⁻¹ , 4cm ⁻¹ , 8cm ⁻¹ variable resolutions. 1cm ⁻¹ for standard emissions monitoring	
Optics:	Zinc Selenide beamsplitter (non-hygroscopic)	
Spectral Range:	485 - 8500cm ⁻¹	
Reference laser:	Solid state laser (no scheduled maintenance required). Long lifespan (10 years) compared with HeNe laser	
Source:	Mid-IR source, with electronic stabilization for long lifespan	
Detector(s):	DTGS with signal sampling at 24-bit ADC For detection limits <100ppb	
	Liquid N2-cooled MCT For detection limits <50ppb	
Sample Cell	Materials:	Coated Al cell. Proprietary alloy mirror substrate with multi-layer coating.
	Volume:	4.7litres
	Pathlength:	20m standard pathlength. Adjustable
	Temperature:	Ambient
	Flow Rate:	6l/min
Sample Pressure	Two operating pressures: Ambient Pressure: For detection limits <100ppb 4 bar sample pressure: For detection limits <50ppb	
Sampling system:	Automated Purge Valve Digital and Analogue I/O built-in	
Power	100 - 250 V / 50-60 Hz 100W	

atmosFIR analysers are available as stand-alone gas monitoring units or can be customised for specific applications as portable or fixed systems. They are flexible and can be set-up according to the needs of the user; from fully automated systems through to a feature rich analyser for the expert user. As always, the user is fully supported by Protea's in-house technical support team.

atmosFIR is the successor to Protea's previous FTIR systems, keeping all the features that users found valuable in achieving their measurement results, but offering the benefits of the new atmosFIR platform with increased portability, lower ownership costs and increased measurement performance. With long-lifetime VCSEL reference laser diode, unique cell design, and air cooled DTGS detector with 24-bit ADC or LN2-cooled MCT, atmosFIR is a step-change in value and service lifetime for FTIR gas analysis.



atmosFIR can be considered a simple multi-gas analyser; indeed for some users that is all it will be and as such it provides a cost-effective and complete measurement system. However, for the expert user atmosFIR will offer all the benefits of FTIR, with hundreds of gas measurements, multiple analytical ranges, in-depth chemometric result diagnoses and dedicated on-board sampling system. With Protea's in-house chemometrics application support and 15+ year history of emission monitoring projects, atmosFIRs offers the user the complete package for their monitoring needs.

Typical Measurements for atmosFIR

atmosFIR^A can be provided with core atmosFIR FTIR gas analyser set-up for any number of different applications, achieving different detection levels.

Detection limit improved with choice of DTGS or MCT detector

Detection limit improved with ability to sample under high pressure (for example, for Hydrogen gas testing and other pressurized gas purity analysis)

Contact Protea for specific gas analysis requirements.

The following are example of typical applications and ranges for the atmosFIRA analyser.

Typical detection limit	10-50ppb (gas and hardware choice dependent)		
Linearity	<2% range	Repeatability (σ)	<1% range

Gases Measured

Protea has a library of 400 IR spectra that can be applied to atmosFIRA measurements

Standard Ranges: 0 – 1000ppb

A short list of example gases is given below:

CO	SO ₂	HCN	C ₃ H ₈	HCHO	C ₂ H ₄ O	C ₈ H ₁₀
NO	HCl	HBr	C ₄ H ₁₀	CH ₄ O	C ₄ H ₈	H ₂ O ₂
NO ₂	NH ₃	CH ₄	C ₂ H ₄	C ₂ H ₆ O	C ₆ H ₆	O ₃
N ₂ O	HF	C ₂ H ₆	C ₂ H ₂	CH ₂ O ₂	C ₇ H ₈	CCl ₄

Communication	OPC Server and Client Modbus Serial and Modbus TCP/IP
Mass Spectrometer	Connection to Protea's ProMass Quadrupole Mass Spectrometer allows for parallel measurement of: O ₂ , N ₂ , H ₂ , He, Ar, Cl ₂ and more diatomic and inert gases