

# WaveRunIR™-EXT

Spectrum Environmental Solutions' Extractive Fourier Transform Infrared (FTIR) Monitoring System, WaveRunIR™-EXT, is a multi-gas analyzer capable of part per billion to percent level sensitivity for virtually any gas (sans homonuclear diatomic species such as N<sub>2</sub>, O<sub>2</sub>, H<sub>2</sub>, Cl<sub>2</sub>, I<sub>2</sub>, and F<sub>2</sub>). The Spectrum WaveRunIR-EXT can serve a variety of applications including continuous emissions monitoring (CEM), process monitoring, ambient air analysis, industrial hygiene monitoring, source testing, and monitoring of various combustion sources.

## Taking FTIR From the Research Lab to the Field

As a company dedicated to optical sensing measurements, WaveRunIR-EXT can be customized to your particular needs with respect to analytes of interest and sensitivity.

At the heart of our FTIR is the Thermo-Fisher interferometer, a research grade interferometer with superior stability due to its dynamic alignment feature. Our scientists have used various FTIR's over our years in the industry and have chosen the quietest interferometer in the marketplace to integrate into the Spectrum FTIRs. A listing of the various options are as follows:



### Detector Options

- Liquid nitrogen cooled
  - Mercury Cadmium Telluride (MCT)
  - Indium Antimony (InSb)
  - 2-color (MCT and InSb)
- Non-liquid nitrogen cooled
  - Stirling cooled MCT or InSb
  - Thermoelectric (TE)-cooled MCT
  - Deuterated triglycine sulfate (DTGS)
  - Cesium Iodide
  - Indium Gallium Arsenide (InGaAs)

### Beamsplitter Options

- Potassium Bromide (KBr)
- Zinc Selenide (ZnSe)
- Quartz
- CsI
- CaF<sub>2</sub>

### Resolution Options

- 0.125 cm<sup>-1</sup>, 0.25 cm<sup>-1</sup>, 0.5 cm<sup>-1</sup>, 1 cm<sup>-1</sup>, 2 cm<sup>-1</sup>, 4 cm<sup>-1</sup>, 8 cm<sup>-1</sup>, 16 cm<sup>-1</sup>, and 32 cm<sup>-1</sup>

# Key Features

## About WaveRunIR™EXT

- Designed to couple to analysis cells of differing fixed pathlengths (1m and 10m pathlengths currently available)
- Analysis cells can be operated at room temperature up to 185°C or higher for special applications
- Rack-mountable design provides for easy transport and integration into standard 19" instrument racks
- Thermo Scientific iG50 Interferometer
  - Quietest-In-Class
  - Rugged, Proven Reliability
  - Real-Time Dynamic Alignment
  - Variable Scan Velocities
  - 1/8 or Greater Wavenumber Resolution
  - State-of-the-Art Polaris IR Source
- 5-Year Warranty on Interferometer, Laser, and IR Source
- 1-Year Limited Warranty on parts
- Custom Light Sources, Optical Coatings/Materials, Detector Configurations

## NuWAVE™ Software

Nuwave™ is the Spectrum-developed state-of-the-art software package that powers WaveRunIR-EXT.

NuWave's powerful, real-time, dynamic features include:

- Background generation algorithms
- Spectral shifting
- Convolution optimization
- Meteorological integration
- Simultaneous Multi-Temporal Spectral averaging
- SmartPath™ Machine Learning

Additionally, post-collection spectral utilities include:

- Straight-forward visual data validation
- Visual method optimization and data reprocessing

## Specifications

- FTIR Specifications:
  - Dynamic Range: part per billion to high percentage
  - Data Frequency: 10 seconds or greater
  - Output: 4-20 mA, RS-232, RS485, or cellular LAN link
  - Operating Temperature: 32° to 100°F
- Physical Specifications: FTIR Module
  - Base unit: 26.5" x 19" x 8.75" (5U) | Weight: 65lbs
  - Power: 2.5A at 120 VAC
- Physical Specifications: 1m/10m Cell Module
  - Base unit: 26.5" x 19" x 8.75" (5U) | Weight: 45lbs
  - Power: 110/220 VAC @ .25 amps (unheated) & 110 VAC @ 5 amps, 220 VAC @ 3amps (heated)

## Ongoing Operation and Maintenance

As a company who not only builds FTIR capabilities, but also uses them for short and longer-term projects, we can provide exceptional operation and routine maintenance for your FTIR systems. Whether it be custom software applications, performing specialty projects, or the general upkeep of the equipment, the team at Spectrum Environmental Solutions will provide a full-service product. Additionally, we carry an extensive inventory of spare parts should there be instrument issues and can return the instruments to service with very little down time.



## About Spectrum

From FTIR, RAMAN, UV-DOAS, and optical remote sensing instrumentation, to real-time measurements, software integration and complete environmental consulting, Spectrum Environmental Solutions is a leading full service environmental solutions provider.