

FTS 7000

An advanced FTIR research spectrometer, the FTS 7000 provides the highest optical throughput available in the market, without compromising sensitivity or functionality. Featuring Digital Signal Processing Software (DSP₃[™]), the FTS 7000 allows for efficient data acquisition and analysis in polarization modulation studies. Nanosecond TRS capabilities, fast kinetic scan rates and spectral coverage from the far-IR to the UV make this uniquely versatile spectrometer ideal for research in polymers, materials, biological compounds or gases.

Other applications for the FTS 7000 include gas analyses, infrared emission studies, Kinetics, low energy experiments, hyphenated techniques - FTIR microscopy, FT-Raman, GC-IR, TGA-IR - and UV/Visible measurements.

General Standard Features

Source	125 W Ceramic Mid-IR; water cooled*
Interferometer Clear Aperture	60° Michelson air bearing** 50 mm (2 in)
Dynamic Alignment	Piezoelectric actuators phase locking on reference laser
IR Power at Sample Focus	>160 mW
Signal to Noise Ratio ¹	30,000:1 p-p with 25% beam throughput
Resolution	0.10 cm ⁻¹ optical 0.075 cm ⁻¹ unapodized
Spectrometer Interface	PCI interface card
Software	Win-IR Pro with DSP ₁ [™] , DSP ₂ [™] , DSP ₃ [™]
Operating System	Windows 2000
Spectral Range (without aliasing) ²	10 cm ⁻¹ to 50,000 cm ⁻¹
Kinetic Scan Rates	90 spectra/second at 16 cm ⁻¹ spectral resolution (8 cm ⁻¹ data point resolution)

Dimensions

Sample Compartment W x D x H	22.9 x 25.4 x 19.1 cm 9 x 10 x 7-1/2 in
Spectrometer W x D x H	80.6 x 67.0 x 32.8 cm 31-3/4 x 26-3/8 x 12-15/16 in
Weight	93 Kg 205 pounds

Software Capabilities

Digital Signal Processing	Application
DSP ₁ [™]	Photoacoustic spectroscopy Collection of in-phase and quadrature channels for 5 frequencies simultaneously
DSP ₂ [™]	Polymer stretching
DSP ₃ [™]	Polarization Modulation Dynamic Infrared Linear Dichroism (DIRLD) Infrared Reflection Absorption Spectroscopy (IRRAS) Vibrational Circular Dichroism (VCD)

Step Scan Specifications

Step Rates	0.004 Hz to 800 Hz
Phase Modulation	
Waveform	Square Wave
Frequency	5 Hz to 1000 Hz (to 9000 Hz with DSP)
Amplitude	0.0 to 2.0 Lambda (HeNe wavelength)

*requires 1 liter/min flow at 20°C

**requires 13 liters/min dry, CO₂-free air

Benefits

With the highest optical throughput available in a commercial system, the FTS 7000 provides unsurpassed speed and sensitivity.

Embedded DSP₃ software replaces cumbersome electronics, dramatically improving efficiency and ease of operation in polarization modulation studies.

The ability to oversample the He-Ne laser, in combination with available sources, beamsplitters, and detectors, results in spectral coverage from the far-IR to the UV without aliasing.



High speed kinetic scan rates permit direct recording of fast kinetic events taking place within a fraction of a second.

Step scan capabilities allow the measurement of dynamic phenomena occurring faster than the time it would take for a traditional spectrometer to complete its scanning.

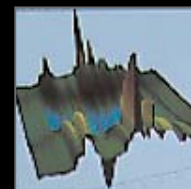
Power and ease of use result in increased versatility and accessibility, greatly expanding the value of your instrument.

The time-resolved spectroscopy option provides a window into the domain of rapid processes to as low as a few nanoseconds.

Non-destructive analysis of heterogeneous samples is facilitated by the FTS 7000's uniform probing depth across the entire spectrum when used with a photoacoustic detector and DSP₁ software.

IR spectrochemical imaging allows for macro and micro sample analysis of chemical composition without sample preparation.

DSP₃ software eliminates the problem of signal-to-noise ratio degradation that typically occurs with the use of conventional lock-in amplifiers.



Step Settling Time <100 microseconds

Simultaneous Data Channels
Multi-Channel Spectroscopy 5 channels
DSP3 10 channels

Standard Time Resolved Spectroscopy
Time resolution 5 microseconds
Digitizer 16 bits

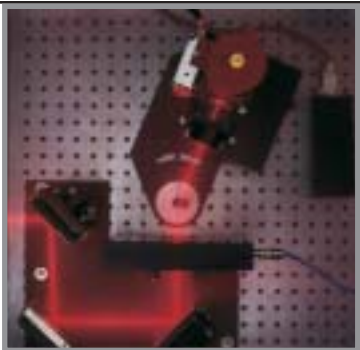
Fast Time Resolved Spectroscopy Specifications on request

Sources

Standard Ceramic 50 cm⁻¹ to 9,600 cm⁻¹
Options Mercury Arc 10 cm⁻¹ to 600 cm⁻¹
Tungsten Halogen 2,800 cm⁻¹ to 25,000 cm⁻¹
Xenon 10,000 cm⁻¹ to 40,000 cm⁻¹
Deuterium 25,000 cm⁻¹ to 50,000 cm⁻¹

Beamsplitters
Set of 5 Mylar (6, 12.5, 25, 50 and 125 micron) 10 cm⁻¹ to 600 cm⁻¹
Metal mesh 10 cm⁻¹ to 600 cm⁻¹
Cesium Iodide (CsI) 200 cm⁻¹ to 4,000 cm⁻¹
Potassium Bromide (KBr) 400 cm⁻¹ to 6,000 cm⁻¹
Extended Range KBR 400 cm⁻¹ to 7,500 cm⁻¹
Calcium Fluoride (CaF₂) 1,200 cm⁻¹ to 10,000 cm⁻¹
Near-IR Quartz 2,800 cm⁻¹ to 20,000 cm⁻¹
UV Quartz 10,000 cm⁻¹ to 50,000 cm⁻¹

Detectors
Far-IR DTGS 20 cm⁻¹ to 600 cm⁻¹
Liquid helium-cooled Si Bolometer 10 cm⁻¹ to 600 cm⁻¹
Peltier-cooled DTGS 150 cm⁻¹ to 10,000 cm⁻¹
Ambient DTGS 150 cm⁻¹ to 10,000 cm⁻¹
Liquid nitrogen-cooled Broad-band MCT 450 cm⁻¹ to 8,000 cm⁻¹
Liquid nitrogen-cooled High Sensitivity MCT 700 cm⁻¹ to 10,000 cm⁻¹
Linearized liquid nitrogen-cooled Broad-band MCT 450 cm⁻¹ to 8,000 cm⁻¹
Linearized liquid nitrogen-cooled High Sensitivity MCT 700 cm⁻¹ to 10,000 cm⁻¹
DC-coupled liquid nitrogen-cooled Broad-band MCT 450 cm⁻¹ to 8,000 cm⁻¹
DC-coupled liquid nitrogen-cooled High Sensitivity MCT 700 cm⁻¹ to 10,000 cm⁻¹
Liquid nitrogen-cooled Indium Antimonide (InSb) 1,800 cm⁻¹ to 10,000 cm⁻¹
Lead Selenide (PbSe) 2,000 cm⁻¹ to 11,000 cm⁻¹
Silicon (Si) 8,600 cm⁻¹ to 25,000 cm⁻¹
Photomultiplier Tubes (PMT)
R446 11,500 cm⁻¹ to 54,000 cm⁻¹
IP28 15,400 cm⁻¹ to 54,000 cm⁻¹
R166 31,250 cm⁻¹ to 62,500 cm⁻¹



1 Computed from an open beam scan using two metal mesh filters to attenuate the beam to 25% of total beam energy, for a 1 minute measurement time at 4 cm⁻¹ resolution, with a Peltier-cooled DTGS detector, measured between 2,200 and 2,000 cm⁻¹.

2 Spectral range coverage is achieved with proper selection of sources, beamsplitters and detectors.



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