

Process Products and Capabilities



On-line, Real-time Chemical Analysis
for Industrial and Process Automation



The QuasIR™ Series of FT-NIR Instruments



Why On-line FT-NIR?

Near-infrared spectroscopy has become the ideal technology for online process monitoring and optimization. With the development of fiber-coupled probes, FT-NIR allows for continuous analysis at key points throughout your process. It has the best spectral resolution and widest optical range of any near-infrared product, meaning results will be accurate and cover multiple parameters with one measurement.

Key benefits of FT-NIR:

- Provides a wide range of chemical information about in-process materials and finished products
- Rapid Non-destructive multi-parameter measurement
- Wide applicability to a multitude of production processes
- Measurement is easy and adaptable; fiber optic connections are robust, easy to install, and allows analyzer to be remote from sampling points
- Multiple sampling points per analyzer
- Low cost of ownership

Process Monitoring and Control

- Improves process efficiency
- Reduce labor and material costs
- Improve safety
- Regulatory compliance
- Improved product quality & Consistency

Industries Best Suited for FT-NIR Process:

Chemical Production

Food and Agricultural Processing

Pharmaceutical

Fuels and Refining

Mining & Aggregate

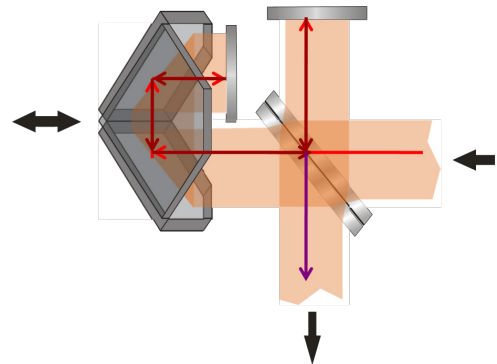
Why Galaxy Scientific?

Galaxy Scientific's FT-NIR spectrometers deliver the most repeatable and accurate real-time results. Our rugged PermAlign™ interferometer optics deliver results in environments where other interferometers fail. Complete compatibility with popular process control and chemometric software means the QuasIR™ 2000 and 2000E can be integrated into almost any process environment.

The heart of the QuasIR is our PermAlign™ optics technology, an innovative optical design that maintains alignment and performance under conditions from the routine to the extreme. Because the QuasIR is designed for portability, it is engineered to achieve high performance, even in harsh conditions such as temperature extremes common in field use or in the presence of vibrations often experienced in plant conditions.

The many advantages of Galaxy's FT-NIR solutions include:

- Rapid, nondestructive analysis
- Rugged & Compact
- Instrument-to-instrument consistency
- Easy to operate
- Direct calibration transfer
- Online or point-of-need
- Flexible, easy-to-use software
- EX rated - suitable for harsh, hazardous environments
- Rugged design that's insensitive to vibration
- Low cost of ownership and maintenance
- High Performance



Galaxy Scientific's Process Solutions

QuasIR™ 2000 Fiber Optic FT-NIR

Many available process probes
Industry standard SMA connections
Transmission, transreflectance, or reflectance measurements

QuasIR™ 2000E Fiber Optic FT-NIR

Large area standoff diffuse reflectance measurements
Inhomogeneous samples such as material on conveyor belts

QuasIR 2000 Fiber Optic FT-NIR

The QuasIR 2000 is designed for continuous measurement of the chemical composition of liquids and solids.

- ✦ *Multi-purpose capability with many available process probes*
- ✦ *Industry standard SMA connections*
- ✦ *Transmission, transreflectance, or reflection measurements*



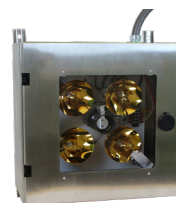
- Process hardened FT-NIR Spectrometer can handle harsh conditions, indoor or outdoor. Optional enclosure and industrial computer available
- Liquids or solids can be measured directly in pipelines or vessels, even at high pressures and temperatures
- Fiber optic connection provides a robust, economical way bring the measurement to the process
- Rugged stainless steel probes are available with brazed sapphire windows for safe contact with food materials and chemicals (other material options available)
- Multiplexer allows up to 10 sample points with a single analyzer.
- Several software options to interface to existing factory control / DCS systems

QuasIR 2000E Fiber Optic FT-NIR

The QuasIR 2000E is designed for continuous measurement of the chemical composition of material transported on a conveyor belt, through a pipe, or in a chute.

- ✦ *Large area standoff diffuse reflectance measurements*
- ✦ *Inhomogeneous samples such as material on conveyor belts*

- Working distance up to 30" from material
- Ideal for inhomogeneous materials and material on conveyor belts or chutes
- Several software options to interface to existing factory control / DCS systems
- Process hardened FT-NIR Spectrometer can handle harsh conditions, indoor or outdoor. Optional enclosure and industrial computer available
- Analysis spot size can be set as small as 3" and as large as 6" in diameter and can be custom tailored to applications' needs



Process Probes and Enclosures

Transmission Probes

- ✦ *Single pass (transmission)*
- ✦ *Double pass (transflectance)*
- ✦ *Flow cells*
- For liquid samples
- Pathlength customizable (typically 1 to 10mm)
- Available in stainless steel with brazed sapphire window
- 300°C / 5,000 PSI
- 600um single fiber, SMA connector
- Flange types



Reflectance Probes

- ✦ *Contact*
- ✦ *Non-contact (stand off)*
- For diffuse powders or slurries
- ~2mm diameter sampling area
- Stainless steel construction with brazed sapphire window
- 300°C / 5,000 PSI
- Fiber optic bundle



Fiber Optic Multiplexer

Allows a single spectrometer to automatically switch between up to ten different sampling devices enabling NIR measurements from multiple sampling points or multiple product streams

- 24V / 3A DC input with locking power connector
- USB (virtual serial port), RS-422/RS-485 interface with simple ASCII command set
- LED channel indicator
- High precision microstepping motor



Environmental Enclosures

A variety of environmental enclosures are available to meet the needs of your production process. Options include:

Optional indoor/outdoor (IP66) enclosures

- Industrial computer
- Power supplies
- Thermoelectric cooling system

Optional Hazardous area enclosures

- Class 1 Div 1 & 2
- Class 1 Zone 1 & 2 (ATEX)



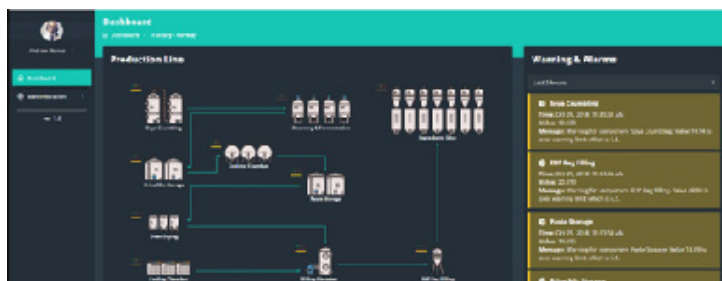
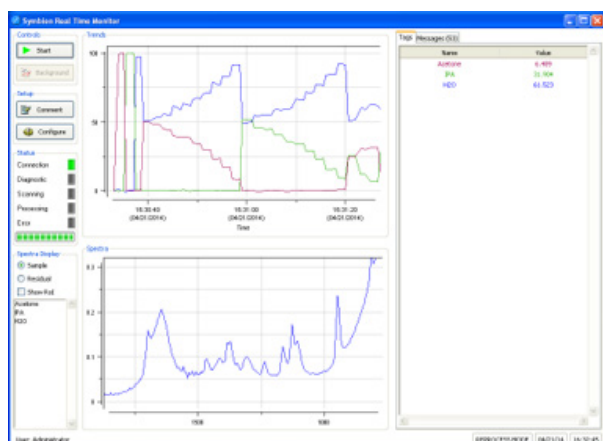
Process Software

Software Compatibility

Galaxy Scientific's process spectrometers offer full compatibility with popular software packages including Symbion and Camo's Process Pulse.

Features:

- Real time data collection and extraction of process variables
- Trend charts of any number of streams
- Alarm conditions
- Data archiving
- Regulatory compliance
- Remote communications via OPC, Modbus, TCP/IP, COM, DDE, etc.
- Flexible historical analysis
- System diagnostics and alarming
- Choice of file based or database storage
- Remote management features



Factory Communications

A variety of factory communications options are available to allow the spectrometer to interface with other parts of the production process such as valves, solenoids, and control systems.

Galaxy software supports communications with:

- OPC
- 4-20mA
- Modbus
- Other factory control systems



The Galaxy Difference:

We are committed to the success of your project.

Galaxy Scientific is specialized in the development and manufacturing of innovative high performance portable analytical instrumentation. Our passion is innovation, and our mission is to develop a new high-performance and portable platform of FT-NIR products to tackle critical analytical problems worldwide.

Our Technology

We have developed a new generation of high-performance, field-portable spectrometers which combine next-generation optics with advanced software algorithms providing breakthrough solutions to the most challenging point-of-need applications. Samples can then be analyzed in the field, rather than taken off-site to separate laboratories.

The many advantages of Galaxy's FT-NIR solutions include:

- Rapid non-destructive measurements
- Rugged, compact and portable
- Instrument-to-instrument consistency
- Easy-to-use
- Direct calibration transfer
- Online or point-of-need
- Flexible, easy-to-use software
- Suitable for lab, process and field
- PermAlign optics technology insensitive to vibration
- Low cost of ownership and maintenance
- High Performance



The Benefits of FT-NIR vs. Dispersive NIR:

Compared to dated dispersive NIR instruments, modern FT-NIR technology combines a precision laser reference with a high throughput optical interferometer to provide:

- Better wavelength stability
- Higher resolution spectra
- Superior sensitivity and signal-to-noise
- Direct calibration transfer

These benefits result in more accurate calibrations that are easier to build and transfer across instruments.



Contact Galaxy Scientific for your customized FT-NIR solution.



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