

PRODUCT DATASHEET

Hydrocarbon SmartSystem®

Real-Time Refinery Process Analysis



Superior Reliability

Precise

High Performance

- An on-line real-time process analysis system
- Rugged vibration-resistant optical bench
- Improves plant efficiency
- Enhanced user-friendly operator interface
- Increase production and reliability

Hydrocarbon SmartSystem

NextGen Process FTIR Monitoring

Hydrocarbon SmartSystem® (HSS) analyzer is an on-line system that provides real-time, accurate and stable monitoring of physical properties and chemical compositions for refinery process streams. The HSS utilizes patented ExxonMobil™ technology. Featuring the new platform SpectraRTS™, the HSS analyzer offers unique simple tools for sample system control, model development and DCS communications. The 15" monitor provides easy access to the user-friendly HMI.

- Integrated system includes sample temperature conditioning, water removal and filtration. Automatic features including sample outlier collection, cell wash, and sample validation
- Rugged vibration-resistant optical bench provides superior stability
- Embedded PC option with SpectraRTS™ and SpectraQuant™ software provides a comprehensive analysis including outlier identification and capture, alarming functions, and detailed system diagnostics
- Full PCR/PCA chemometric capability with SpetraQuant
- Seamless connectivity with DCS and LAN systems through Modbus®, OPC®, Ethernet and other digital and analog protocols
- Global calibration database provides starter models for quick implementation
- Demonstrated uptime > 99%
- Remote access via modem or LAN



The System Advantage

- Extended Near-IR spectral range enables optimal light and heavy hydrocarbons analysis
- Analyzes up to 24 process streams
- Optional Dual and Triple Cell configuration for multi-stream analysis
- Optional heated sample system available to analyze heavy hydrocarbons
- Seamless calibration transfer between the Diamond 20™ lab system and the Hydrocarbon SmartSystem analyzer
- Rapid data collection, calibration, validation and modeling with the RefinIR™ laboratory system



Diamond 20
lab system



RefinIR
laboratory system



Hydrocarbon
SmartSystem

Customer Benefits

- Improved plant efficiency
- Enhanced user-friendly operator interface
- Increased production and reliability

Proven FTIR Applications

Gasoline Properties	Diesel Properties	Component Streams
RON, MON	Cetane Number	FCC/FCC Feed
Distillation Points	Cetane Index	Reformate
E200, E300	Cetane Additives	Alkylate
RVP	Benzene	Isomate
Benzene	Polycyclic Aromatics	MTBE
Aromatics	Density	Straight Run Naptha
Olefins	Aromatics	Pentanes
Oxygenates	Kinematic Viscosity	Raffinate
Gravity	Distillation Points	C5/C6 Splitter
U/L Ratio	Flash point	Heavy Aromatics
Drivability Index	Gravity	Crudes

For specific property performance, we require submittal of a User Specification Form detailing process composition and conditions.



ANALECT is a registered trademark of Process Insights, Inc. Diamond 20, Diamond MX, EVM, SpectraRTS, SpectraSuite Hydrocarbon SmartSystem, RefinIR, PCM 1000/5000, Optibus and Transept Interferometer are trademarks of Process Insights, Inc. Windows is a registered trademark of Microsoft Corp. All other trademarks are the properties of their respective companies.

Getting Started with Our Laboratory Analyzers:

Diamond 20 and RefinIR

The Diamond 20 lab system is the companion to the Hydrocarbon SmartSystem® on-line analyzer.

SpectraQ software allows for the easy collection of calibration spectra to performing routine analysis.

Calibrations developed in the laboratory on the Diamond 20 analyzer are seamlessly transferred to the on-line Hydrocarbon SmartSystem to provide real-time analysis.



Diamond 20



RefinIR

The all new RefinIR is a fully integrated laboratory auto-sampler and FTIR instrument. Designed to measure liquid hydrocarbons including gasoline, diesel and crude oils in a single auto-sampler.

The RefinIR features the Transept interferometer platform that uses the new DCM 600™ data acquisition electronics pack.

Sample Conditioning Systems

We have the expertise to design your extractive sampling system. Our turnkey system achieves optimum performance giving your analyzer consistently accurate and reliable measurements.

Our offerings include:

- Analyzer loop-thermal enclosure with temperature conditioning
- Fast loop conditioning panel
- Automated sample collection
- Automated ASTM validation and wash system

Additional customized systems can be provided:

- Sample recovery system
- Fast loop pumping system
- Stream switching

ASTM Compliant Analytical Systems

- ASTM D6122: Standard practice for validation of the performance of multivariate process infrared spectrometers
- ASTM E1655: Standard practice for infrared multivariate for quantitative analysis



Validation Skid

SpectraSuite Software Delivers Power to Your Process



SpectraQ

SpectraQ enables the effective use of the Diamond 20 for laboratory analysis and instrument validation.

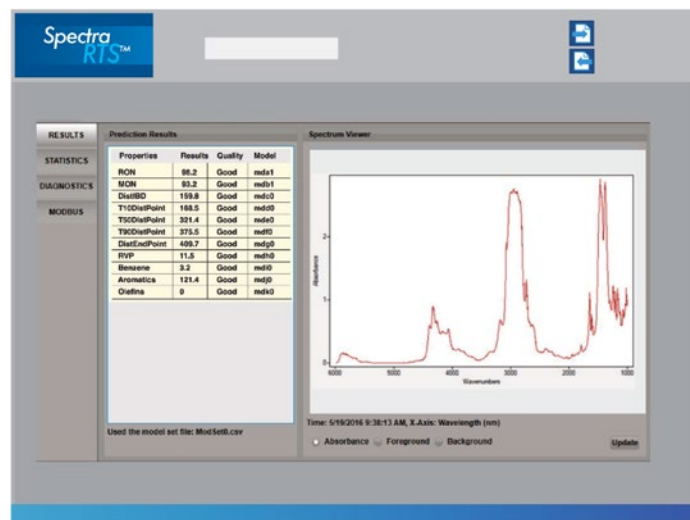
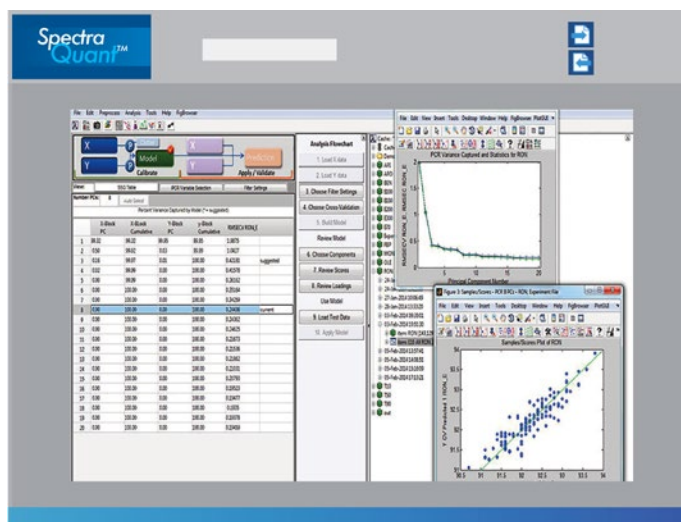
Collect calibration spectra and perform routine quantitative analysis on samples.

Designed to integrate seamlessly with our SpectraSuite™ process spectroscopy software.

Spectra Quant

SpectraQuant chemometric software is a dynamic Windows® based tool that utilizes Principal Component Analysis/Principal Component Regression (PCA/PCR).

It consolidates today's best features for modeling complex multi-components for any refining process.



SpectraRTS

SpectraRTS delivers flexible set-up and control of your system, extensive diagnostics, easy-to-use scripting and robust DCS communications.

Interactive communications allow model sets to be switched automatically when changing blend types thereby maximizing blended measurement efficiency.

Specifications:

Spectrometer		Utility Requirements - Analyzer and Cell Enclosure	
Interferometer: Transept IV™ hermetically sealed interferometer with refractively scanned design		Mains power 115/230 VAC 50/60Hz single phase 1500 watts max	
Operating Range		Sample cooling water flow 1 liter/min (16 GPH)	
7000 - 450 cm ⁻¹		Sample cooling water temperature 0 - 20°C (32 - 68°F)	
Detector		Instrument air pressure 5.6 - 8.4kg/cm ² (80 - 120 PSIG)	
DTGS Pyroelectric		Instrument air flow 700 liter/min (25CFM) at STP maximum	
Analysis Time		Instrument air dewpoint -40°C maximum	
30 - 60 sec. for multiple property predictions Ambient Environment Conditions		Sample recovery of 200cc/min (3 GPH) at atmospheric pressure	
0 - 38°C standard ambient temperature		Validation Skid:	
Sample System Design Specifications		Nitrogen for solvent and toluene tank pressurization 4.2 - 8.4kg/cm ² (60 - 120 PSIG) very low average flow Instrument Dimensions: Optical head and sample box Environment Conditions	
Sample	Light or heavy hydrocarbons (i.e. gasoline, diesel, crude)	220 cm (h) x 97 cm (w) x 46 cm (d) (87 x 38 x 18 inches)	
Number of streams	Up to 3 sample cells, 24 streams	Weight: 270 kg (600 lb). Automated Zero, Validation and Stream Selection	
Filtration	Sample must be pre-filtered to < 5 microns < 5 microns	High-reliability, double block-and-bleed valves. Stable Analysis Conditions	
Pressure	2.1 - 21 kg/cm ² (30 - 300 PSIG)	Final moisture, particulate, pressure, flow and temperature conditioning	
Pressure drop required	21 kg/cm ² (30 PSIG)	Efficient Automated Sample Capture:	
Sample temperature	0 - 100°C (32 - 212 °F)	Software captures only those samples most important for the upgrade of the currently running model	
Flow requirements	Total: 700 ml/min (11 GPH)	Up to 4 streams, each stream has a dedicated sample capture cylinder with quick-disconnects for easy removal and replacement	
Sample capture loop	500 ml/min (8 GPH)	Spectral data and statistics are automatically saved for each capture sample	
Cell loop:	200 ml/min (3 GPH)	System Validation to ASTM D 6122:	
Wetted materials	Stainless Steel, Teflon, Kalrez (no Viton)	Validated automatically at regular intervals or on-demand from operator or DCS command from operator or DCS command.	
Area Classification		Manual validation sample introduction	
ATEX Zone 1 and 2		Validation skid with tanks for validation and wash solvents	
NFPA Class I, Division 1 and 2			
NEC 505 Touch screen only available for certain classifications			
Process Control Interface			
Modbus, OPC and analog protocols			
Fiber optic Ethernet and serial communications options			

For heavy hydrocarbons, the sample cabinet can be heated up to 100°C.

Experience

Our staff of applications experts provide feasibility and calibration services that set the worldwide standard. We also provide system integration and post-installation support to ensure your success. we offer annual hardware maintenance and calibration modeling service support contracts.

GAIN REAL-TIME INSIGHT INTO YOUR PROCESS

Process Insights delivers premium analytical sensors, analyzers, instrumentation, software and solutions that are mission-critical to keep your operations, personnel, and the environment safe. Our commitment to customer satisfaction is evident through our diverse range of products, programs, and services, designed to accommodate various budgets and application needs.

CENTERS OF EXCELLENCE | PROVIDING PROVEN SOLUTIONS

Process Insights – The Americas

14400 Hollister Street, Suite 800B, Houston, TX 77066, USA +1 713 947 9591

Process Insights – EMEA

ATRICOM, Lyoner Strasse 15, 60528 Frankfurt, Germany +49 69 20436910

Process Insights – APAC

Wujiang Economic and Technology, Development Zone, No. 258 Yi He Road, 215200 Suzhou, Jiangsu Province, China +86 400 086 0106

For a complete range of products, applications, systems, and service options, please contact us at:
info@process-insights.com

For a complete list of sales & manufacturing sites, please visit:
<https://www.process-insights.com/about-us/locations/>

