

FTIR Analyzers

The **▲Analect™ Hydrocarbon SmartSystem™** analyzer is an on-line system that provides real-time, accurate and stable monitoring of physical properties and chemical compositions for refinery process streams.

It utilizes licensed and patented ExxonMobil technology.

- Integrated system includes sample temperature conditioning, water removal, filtration, and 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 chemometric modeling capability including SpectraQuant,™ Unscrambler®, MATLAB® and Pirouette®.
- Seamless connectivity with DCS and LAN systems through Modbus®, OPC®, Ethernet and analog protocols.
- Global calibration database provides starter models for quick implementation
- Demonstrated uptime greater than 99%
- Remote access via modem or LAN Analect Advantage



The Analect Advantage

- Extended Mid-IR spectral range allows analysis of light and heavy hydrocarbons
- Analyzes up to four process streams
- Optional Duel Cell configuration for blend plus components or dissimilar streams
- Optional heated sample system to analyze heavy hydrocarbons
- Seamless calibration transfer between Diamond 20™ lab analyzer and Hydrocarbon SmartSystem
- RefinIR™ and RefinIR 100i™ automated lab sampling accessories available for rapid calibration data collection

SpectraRTS

SpectraRTS™ Software

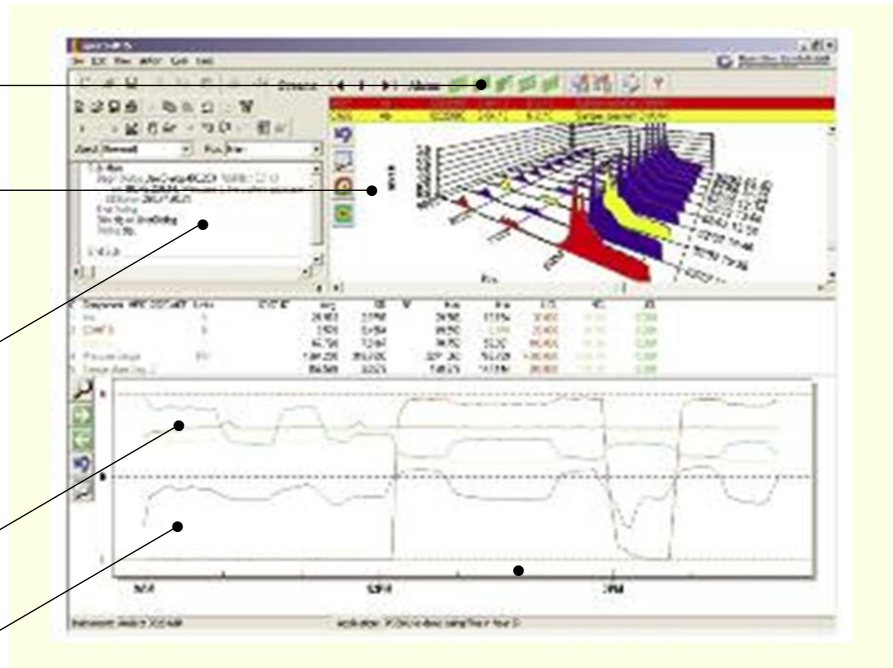
Alarm Indicator

Display of the Current, Past or Reference Spectrum

VBA Script Dialog Box

Properties and Measurements Limits

Trendline Displays



Automate many aspects of your process

- Control I/O to switch valves and monitor a variety of sample system conditions.
- Collect spectra and apply quantitative analysis routines.
- Transmit product properties, instrument QC data, and alarms via versatile communication protocols.

Implement programming flexibility

- Utilize VBA™- Compatible Scripting Language – to achieve total programming flexibility.
- Operate the system remotely by using pcANYWHERE™ or Timbuktu® software.
- Enable multi-level passwords.

Validate and diagnose your system with SpectraRTS

- Implement on-line validation methods, such as ASTM D 6122.
- Automatically monitor and trend the system's "health" with RemoteRx™ software for preventative maintenance scheduling.
- Access the on-line help system for quick reference.

FTIR datastation included

- Embedded or remote FTIR datastation.

Proven HSS Applications

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

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

Analect Hydrocarbon SmartSystem

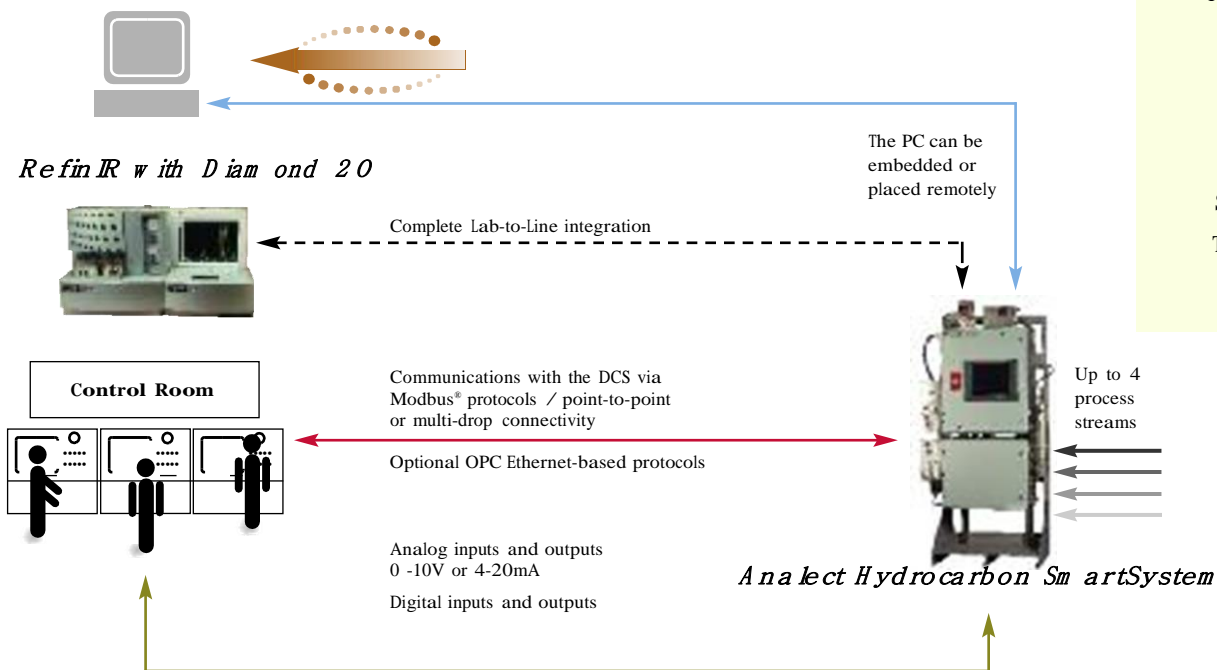
Connectivity

The Hydrocarbon SmartSystem analyzer is engineered for closed-loop process control. Designed with a flexible system architecture, it can communicate to the DCS in a variety of protocols. With the power of SpectraRTS software, the Hydrocarbon SmartSystem analyzer can be configured to meet your operating requirements with functions like:

- Stream selection and validation by DCS command.
- Model selection and run/idle selection mode by DCS command.

Some of Our Satisfied Customers

Abu Dhabi Nat'l Oil
BP
CPC
ConocoPhillips
Eni Agip
ExxonMobil
Kyokuto
Mozyr Refinery
Nansei
OMV AG
Petrom SA
Saras
Saudi Aramco
Tonen General
Valero



Automating Refinery Lab Analysis

The Analect Diamond 20™ FTIR analyzer is specifically designed for operation in laboratory and process development environments. When combined with the RefinIR™ and RefinIR 100T™ sampling accessories, these systems automate calibration data collection in support of the HSS analyzer. Calibrations created on Windows-based PQ80™ software can be seamlessly transferred to your Hydrocarbon SmartSystem on-line analyzer.

The RefinIR accessory delivers automatic data analysis of multiple liquid samples of light hydrocarbons at ambient temperatures. The RefinIR 100T accessory is used for semi-automated analysis of heavy hydrocarbons.



AIT Applied Instrument Technologies • Analect HSS

Specifications

Spectrometer

Interferometer: Transept IV™ hermetically sealed interferometer with refractively scanned design

- Optical range 7000 - 450 cm⁻¹

Detector:

- DTGS Pyroelectric

Analysis Time

- 30 - 60 sec. for multiple property predictions

Ambient Environment Conditions

- 0 - 38°C standard ambient temperature

Sample System Design Specifications

- **Sample** Light or heavy hydrocarbons (i.e. gasoline, diesel, crude)
- **Number of streams:** Up to 4 sample streams
- **Filtration:** Sample must be pre-filtered to < 5 microns
- **Pressure:** 2.1 - 21 kg/cm² (30 - 300 PSIG)
- **Pressure drop required:** 21 kg/cm² (30 PSIG)
- **Sample temperature:** 0 - 100°C (32 - 212°F)
- **Flow requirements:** Total: 700 ml/min (11 GPH)
- **Bomb loop:** 500 ml/min (8 GPH)
- **Cell loop:** 200 ml/min (3 GPH)
- **Wetted materials:** Stainless Steel, Teflon, Kalrez (no Viton)

Area Classification

- ATEX Zone1 and 2
- NFPA Class I, Division 1 and 2

Touch screen only available for certain classifications

Process Control Interface

- Modbus, OPC and analog protocols
- Fiber optic Ethernet and serial communications options

Utility Requirements - Analyzer and Cell Enclosure

- Mains power 115/230 VAC 50/60Hz single phase 1500 watts max.
- Sample cooling water flow 1 liter/min (16 GPH)
- Sample cooling water temperature 0 - 20°C (32 - 68°F)
- Instrument air pressure 5.6 - 8.4kg/cm² (80 - 120 PSIG)
- Instrument air flow 700 liter/min (25CFM) at STP maximum
- Instrument air dewpoint -40°C maximum
- Sample recovery of 200cc/min (3 GPH) at atmospheric pressure

Validation Skid:

- Nitrogen for solvent and toluene tank pressurization.
4.2 - 8.4kg/cm² (60 - 120 PSIG) very low average flow

Instrument Dimensions: Optical head and sample box

- 220 cm (h) x 97 cm (w) x 46 cm (d) (87 x 38 x 18 inches)
- Weight: 270 kg (600 lb)

Smart Sampling Technology

Provides the means to keep the HSS analyzer delivering accurate results with the least amount of maintenance and the highest degree of confidence.



Automated zero, validation and stream selection

- High-reliability, double block-and-bleed valves

Stable analysis conditions

- Final moisture, particulate, pressure, flow and temperature conditioning

Efficient automated sample capture

- Software captures only those samples most important for the upgrade of the currently running model
- Up to 4 streams, each stream has a dedicated sample capture cylinder with quick-disconnects for easy removal and replacement
- Spectral data and statistics are automatically saved for each capture sample

System validation to ASTM D 6122

- Validated automatically at regular intervals or on-demand from operator or DCS command
- Manual validation sample introduction
- Validation skid with tanks for validation and wash solvents

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

Experience

Our staff of applications experts provide you feasibility and calibration services that set the worldwide standard. We also provide system integration and post-installation support to ensure your success.

Contact Us:

AIT offers annual hardware maintenance and calibration modeling service support contracts.



Contact our Marketing Dept. AIT Applied Instrument Technologies 2121 Aviation Drive, Upland, CA 91786

(909)204-3700 T • (909)204-3701 F • ait@AITanalyzers.com • www.AITanalyzers.com

International locations—see our website for your authorized representative  Applied Instrument Technologies, Inc.

Analect, Hydrocarbon SmartSystem, SpectraRTS, PQ 80, RefinIR, RefinIR 100i, RemoteRX, Diamond 20 and Transept are trademarks of Applied Instrument Technologies, Inc. Windows, OPC and Modbus are registered trademarks. All other trademarks are properties of their respective companies.