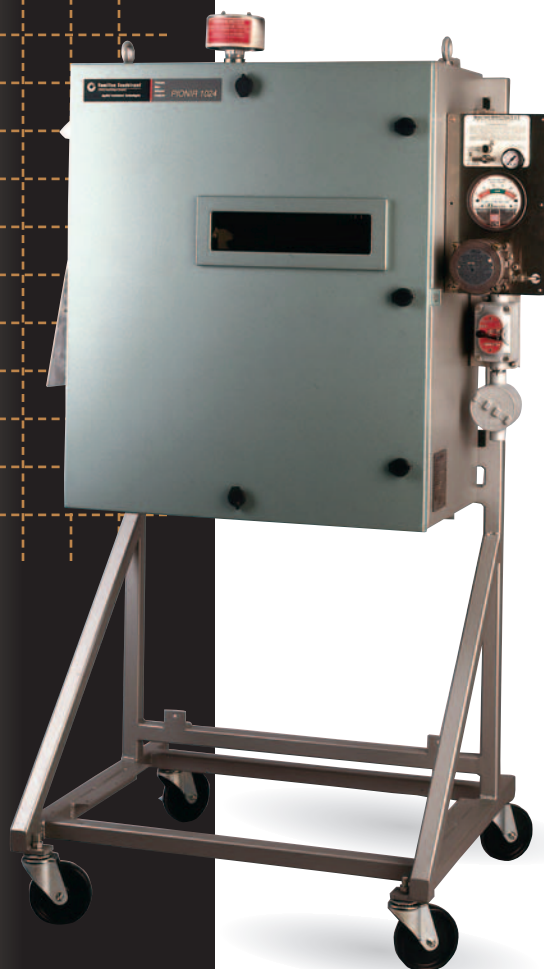


Near-Infrared Analyzers

The **PIONIR Series** of analyzers are designed for operation in on-line and process development environments utilizing patented and licensed BP technology. These on-line analyzers provide real-time, multi-point analysis of refinery and petrochemical processes. Features on the analyzer include:

- Diode array detector and fixed holographic grating, with no moving parts, results in maximum stability.
- Industrially hardened fiber optic cables.
- Dual-beam probe design with continual background correction eliminates fiber variation.
- Large database of calibration models for faster commissioning.
- Full chemometric modeling capability including PLS and PCR.
- Communications options including Modbus®, OPC®, Ethernet and analog protocols.

AIT | Worldwide
Leader in Process Analytics



PIONIR 1024

PIONIR APPLICATIONS

| Gasoline Properties | Diesel Properties | Component Streams | Petrochemical Processes |
|---------------------|----------------------|---------------------|----------------------------|
| RON, MON | Cetane Number | FCC | Xylene |
| Distillation Points | Cetane Index | Reformate | Para-Xylene |
| E200, E300 | Density | Alkylate | Purified Teraphthalic Acid |
| RVP | Gravity | Isomate | Toluene |
| Aromatics, Benzene | Polycyclic Aromatics | MTBE | Solvent Composition |
| Olefins | E360 | Straight Run Naptha | Alkylation Unit |
| Oxygenates | Aromatics | Pentanes | |
| Gravity | Kinematic Viscosity | Raffinate | |
| V/L Ratio* | Distillation Points | Pyrolysis Gasoline | |
| Drivability Index | Flash point | Heavy Aromatic | |

*Vapor to Liquid Ratio

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

AVI™ Absolute Virtual Instrument

- Proprietary, patented instrument standardization protocol licensed from PerkinElmer
- Assures that any one PIONIR is optically identical to any other PIONIR
- Provides seamless calibration transferability between PIONIR systems
- Minimizes downtime during maintenance as PIONIR does not need calibration updates when components are changed



Hamilton Sundstrand

A United Technologies Company

PIONIR 1024 & MVP

The PIONIR has a record of reliable performance due to its rugged design. Its proven stability allows you to continually improve product quality and meet production targets at reduced costs. The PIONIR is recognized in the industry as the NIR system with the lowest total cost of ownership.

HAZARDOUS ENVIRONMENT

- The **PIONIR 1024** can withstand temperatures from -40°C to +50°C and requires no shelter.
- Built-in executive processor for stand-alone operation. External PC required for model and script maintenance.
- Available for use in general purpose areas.
- An integrated panel PC in touchscreen format is offered as an option.



Industrially Hardened Fiber Optic Cable

- Set in thixotropic gel for vibration resistance.
- Helically wound, single-filament, low OH fiber.
- Encased in durable layers of Kevlar® yarn for linear strength.
- Black nylon outer jacket for environmental protection.



Dual Beam Slip-Stream Probe

The PIONIR's innovative dual beam, self-referencing probe design eliminates instrument variations resulting from the source, fiber optics, or any other component by taking a new background scan with each sample scan.

- 10 cm pathlength minimizes variations from window fouling.
- Rugged design withstands temperatures and pressures up to 100°C & 3450 KPa (212°F and 500 psi).
- Can be located up to one kilometer from the analyzer placement.



GENERAL PURPOSE

The **PIONIR MVP Rackmount** is an on-line analyzer designed for the control room. Utilizing fiber optics, probes can be located in general purpose or hazardous areas. The MVP Rackmount is an economical way to implement NIR technology.



LABORATORY

The **PIONIR MVP Benchtop** is designed for the lab to support the on-line systems, or perform measurements for process development applications and routine samples.



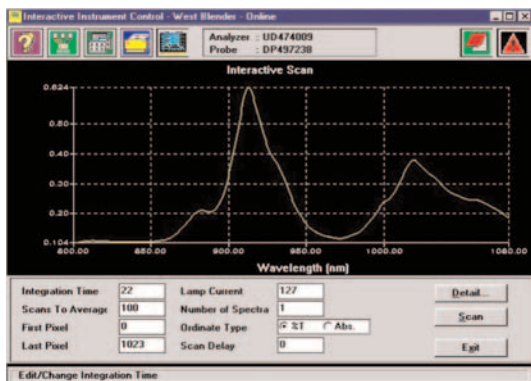
Multiplexing

One PIONIR 1024 or MVP Rackmount Analyzer can be optically multiplexed for up to eight slip-stream probes to reduce the system cost per sample point.

Grating & Diode Array Assembly

The optical bench, heart of the **PIONIR** system, utilizes a fixed holographic grating and a 1024 element diode array assembly. Mounted in an Invar™ fixture, the entire assembly is designed to minimize the effects of thermal variation. This results in stable and reliable measurements day after day, and year after year.

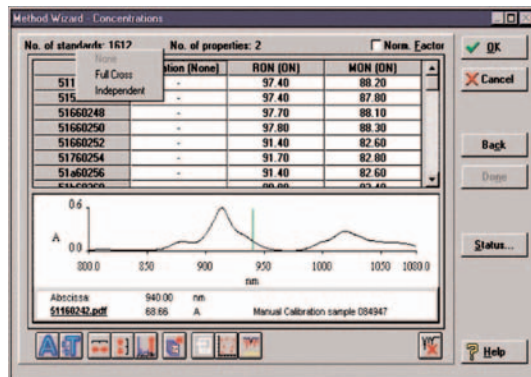




RMS™ Remote Management System

Windows® based interface for set-up and control of analyzer, sample system, and DCS communications.

- Extensive system diagnostics.
- Open script platform to easily implement or change operational programs.
- Remote modem support.



Spectrum Quant+

- Windows based model development software.
- Full chemometric modeling capability including PLS and PCR.
- Expert Tool Box simplifies your modeling process with logical, easy-to-use, step-by-step instructions.
- Features licensed PerkinElmer technology.



Communications

- Analyzer Gateway Ethernet Server, OPC.
- Modbus RTU protocol, Modicon and floating point standards.
- Simultaneous Modbus and OPC capability provides seamless migration path.
- Bi-directional ASCII serial interface.
- Fully configurable analog and digital I/O, 4-20mA outputs, data multiplexing.

Some of Our Satisfied Customers

- Abu Dhabi Oil Refining**
- BP**
- Chevron**
- Citgo**
- ConocoPhillips**
- Flying J**
- Hindustan Petroleum (HPCL)**
- Indian Oil (IOCL)**
- Lyondell-Citgo**
- Paramount Petroleum**
- PDVSA**
- PEMEX**
- ROMPETROL**
- Shell**
- Sibneft**
- Statoil**
- Sunoco**

Sample Conditioning Systems

To achieve the optimum performance it is critical that a well-designed extractive sampling system is utilized.

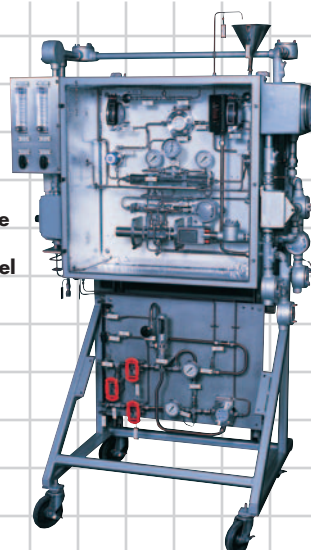
AIT can provide turnkey systems including:

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

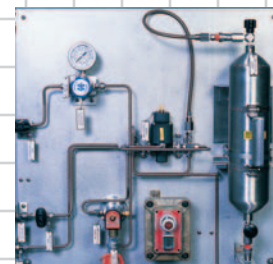
Additional customized systems that can be provided:

- Sample recovery system.
- Fast loop pumping system.

Analyzer loop thermal enclosure with fast loop conditioning panel



Single Point Sample System



Automated sample collection system

AIT Applied Instrument Technologies • PIONIR 1024 & MVP

Specifications

Spectrometer:

- Fixed holographic grating with photodiode array detector, features no moving parts

Operating Range:

- 800–1080 nm (third overtone)

Analysis Time:

- 30–60 seconds for multiple property predictions

Optical Fiber:

- Proprietary design and manufacture. 200 micron fiber diameter; low OH silica core and clad in environmentally jacketed cable

Spectral Performance:

- Spectral Resolution: 3.3 nm over full range, Absolute Virtual Instrument standard
- Dynamic Range: 25,000:1 at 850 nm (15 second measurement)
- Wavelength Repeatability: ± 0.004 nm scan to scan
- Wavelength Accuracy: ± 0.01 nm long term (AVI Corrected)

Sample Probe (Slip Stream):

- Fiber optically coupled to analyzer
- Modular design for easy maintenance
- Self-referencing design features dual sample and reference paths for background correction
- 1/8 inch NPT (female) threaded ports—2 input, 2 output
- Silica window material, 316 stainless steel sample cell body
- Pressure rating to 3450 KPa (500 psi)
- Sample flow: 200 to 800 mL per minute
- Temperature rating to 100°C (212°F)

Process Control Interface:

- Control Output: 4 digital AC inputs and 4 outputs standard, up to 16 total AC inputs or outputs (optional)
- Optional 4–20 mA analog output to interface to process control computer with external accessory
- Optional OPC or Modbus™ interface allows bi-directional information exchange between the PIONIR and the process control computer
- Sensor input: 4 digital AC inputs standard, up to 16 total AC inputs or outputs (optional). Two 4–20 mA analog inputs standard

Area Classification:

- PIONIR MVP: General Purpose - Non Hazardous
- PIONIR 1024: General Purpose - Non Hazardous
- PIONIR 1024P: Purged X-Type-NEC Class I, Div 1 and ATEX Zone 1
Purged Z-Type-NEC Class I, Div 2 and ATEX Zone 2

Environmental Conditions:

- PIONIR MVP: Temperature: 10°C to 35°C (50°F to 95°F)
Humidity: Non-Condensing
- PIONIR 1024/P: Temperature: 10°C to 35°C (50°F to 95°F)
Humidity: 0 to 100%

Utility Requirements:

- Electrical Power:
PIONIR MVP: 110/120 Vac, 50/60 Hz
220/240 Vac, 50/60 Hz
PIONIR 1024/P: 110/120 Vac, 50/60 Hz
220/240 Vac, 50/60 Hz
- Cooling Water:
PIONIR 1024/P: Water cooled systems only
– Pressure: 15 psi minimum differential across inlet outlet
– Flow: Up to 1.9 Liters/minute (0.5 gal/min)
– Temperature: 32°C (90°F) Maximum
– Particulates: 500 micron Maximum
– Connections: 3/8 inch NPT Male (Flow and Return)
- Instrument Air:
PIONIR 1024P: Purged systems only
– Pressure: 200 kPa (30 psig) at stated flow
– Flow: 425 Liters/minute (15 cfm) Rapid Exchange
55 Liters/minute (2 cfm) Running
– Contaminants: Free from oils, mists and water
– Connections: 1/2 inch Swagelok Tube connector

Instrument Dimensions:

- PIONIR 1024:
– 107x99x43 cm (42x39x17 inches)—Without shipping stand
– 173x109x74 cm (68x43x29 inches)—With shipping stand
– Weight: 204 kg (450 lb)—Uncrated
- PIONIR MVP:
– 61x48x34 cm (24x19x14 inches)
– Weight: 27 kg (60 lb)—Uncrated

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 2771 N. Garey Avenue, Pomona, CA 91767

tel: (909)593-3581 fax: (909)392-3207 e-mail: ait@hs.utc.com www.hs-ait.com

For international locations, see our website for your authorized representative.



Hamilton Sundstrand
A United Technologies Company

PIONIR 1024 and PIONIR MVP are trademarks of Hamilton Sundstrand Corp. AVI and Spectrum Quant+ are trademarks of PerkinElmer Corp. Windows is a registered trademark of Microsoft Corp. Modbus is a registered trademark of Modicon Corp. Kevlar is a registered trademark of Dupont. All other trademarks are properties of their respective companies.