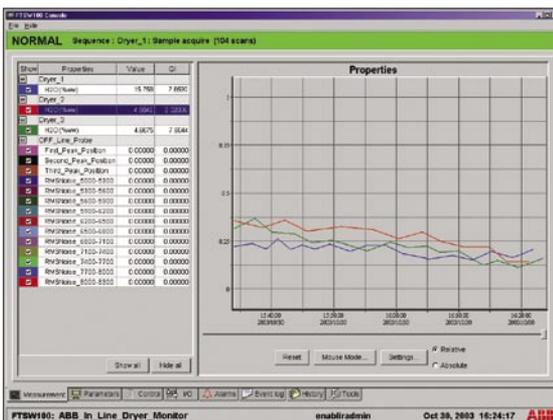


FTPA2000-260, Multi-Point Process Monitor



For more than 30 years, ABB Analytical has developed a wide range of advanced solutions and services to help the process industry improve performance, productivity, capacity and safety.



Profitability, quality and reliability are some of the challenges the process industry must cope with on a day-to-day basis. Precise and reliable on-line follow up of the on-line process is key to the success of modern industrial plants. Tighter control of industrial processes provides better yields, throughput and quality. Real-time monitoring of chemical and physical properties is the best way to monitor your processes and the FTPA2000-260 is the right tool for this job.

ABB's FTPA2000-260 is a multi-point, Fourier Transform Near Infrared (FTNIR) analyzer. It is designed for remote, real-time monitoring of continuous and batch processes. The FTPA2000-260 provides key information for process optimization in the refining, chemical, pharmaceutical, semiconductor and other industries. The FTPA2000-260 offers the best repeatability performance on the market: precise and reliable data is therefore acquired for optimal control of the process. Permanently aligned, ABB's FTNIR will require almost no maintenance. The FTPA2000-260 uses the best software for process monitoring on the market today. Designed to run unattended, 24/7, the FTSW100 software can monitor and control all aspects of the process environments.

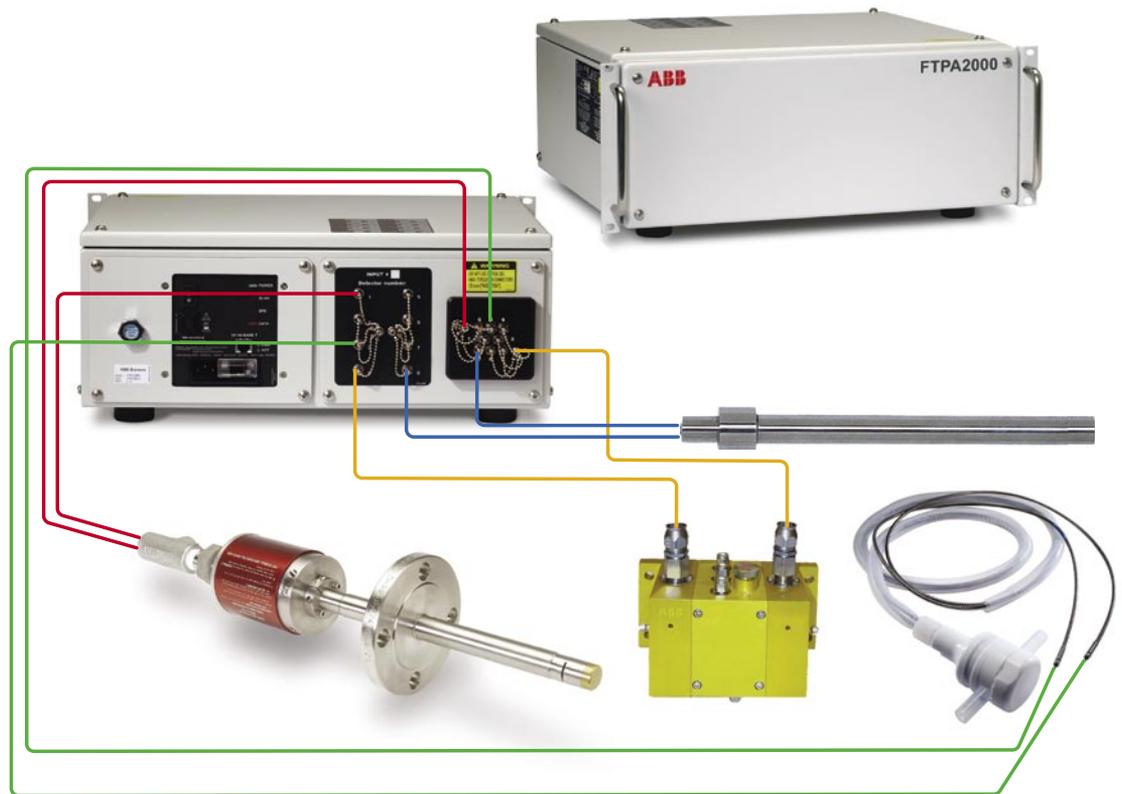
The FTPA2000-260 performs its analysis within the near-infrared (NIR) portion of the electromagnetic spectrum (4000 to 12 500 cm^{-1}). NIR is particularly well suited for the quantitative analysis of organic compounds, as well as inorganic aqueous solutions and salts.

Flexible Siting and Increased Security

Process environments are often harsh and hazardous. The FTPA2000-260's flexibility allows for installation in any general purpose environment and can be remotely connected to the process through optical fiber cables: each sampling point can be located up to several hundred meters away from the analyzer. The FTPA2000-260 includes a unique eight-channel multi-detector module and has sufficient throughput to simultaneously illuminate eight optical fiber cables. Therefore a single analyzer can simultaneously monitor up to eight (8) sampling points without the drawback of optomechanical multiplexing. The FTPA2000-260 is offered either as a stand alone model or with a NET-TE-BOX for environments where detectors need to be cooled.

Flexible Sampling: Connecting to Versatility

The FTPA2000-260 can be connected to a wide range of optional accessories. It is compatible with most popular probes and flow-through cells offered by ABB and third-party suppliers. The sampling accessory can be specifically selected according to the properties of the sample being analyzed and can differ from one stream to another. In fact, a different sampling system, spectral range and analytical method can be applied to each monitoring point. The process interface at each point can be a simple in-situ probe or a flow-through cell.



Flexible Multi-Detector Module

Each optical fiber which transmits the signal from a sampling point is connected to an individual detector. To optimize stability, sensitivity, and spectral range, the detector for each monitoring point can be selected from several different types of detectors presently available. Signals from the detector module are electronically multiplexed and use no moving parts. This translates into better analysis repeatability than with an optomechanical multiplexer before and after stream switching.

FTSW100: FTNIR Process Control Software

FTSW100 is a modular software suite that provides a complete solution to easily include ABB FTIR/FTNIR technology into the monitoring and process control of applications. The FTSW100 was specifically designed to meet the rigorous requirements of process environments. It supports appropriate data-processing algorithms for the hydrocarbon processing industry and is compliant with pharmaceutical PAT guidelines.

Fast and easy to use, the FTSW100 user interface was designed for all-levels of users. The complexity of the FTIR/FTNIR technology is completely hidden, therefore operators can work without requiring an advanced knowledge of the analyzer. The large color coded status display allows the operator to know at a glance whether the system is operating normally or not.

FTSW100 run-time is a Microsoft Windows™ service that allows for CFR21-P11 security implementation and provides reliability and uptime. It provides multi-level security features, from password protection to access level selection. Unauthorized users can not access advanced functionalities, thus providing increased protection against operator errors initiated by accident.

The FTSW100 software suite can control all aspects of integration into process environments and it is designed to run unattended 24/7. No DCS programming or separate PLC solutions are required. The FTSW100 supports the industry standard communication links like ModBus (with fully configurable addresses) and OPC to control systems.

State-of-the Art Data Communications

The computer can be equipped with industry-standard digital and analog I/O interfaces.

Unsurpassed Stability, Permanent Calibration

The analyzer is based on the double pendulum interferometer (USA patent no. 4,383,762) which provides unsurpassed stability and permanent alignment. The extreme stability of the system ensures that calibrations never require tuning, even after analyzer maintenance.

Guaranteed Method Transferability

ABB guarantees transferability of methods between instruments because the absorbance reproducibility is kept within a negligible margin. In fact, any part of the FTPA2000-260 system can be serviced or replaced, including the optical fiber cables and sampling stations, without having to modify the method and with no loss of accuracy. Precision and stability in the transferring of analytical methods are made possible by the ultra-high precision manufacturing methods used, and the extreme stability of the laser-controlled spectral encoding process. Transferring analytical methods between NIR analyzers of other manufacturers invariably results in some loss of precision, resulting in an increase in quantitative error

Quality makes the difference

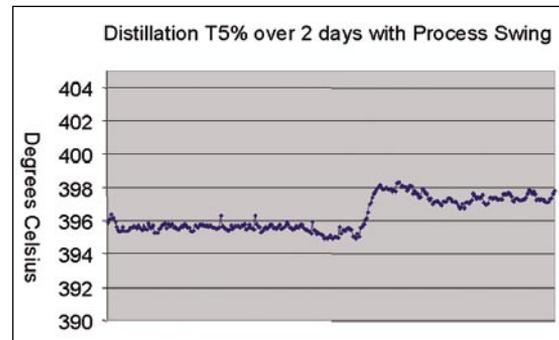
Thanks to superior design and manufacturing methods, the FTPA2000-260 offers better performance than any other multi-point NIR analyzer presently available.

Customer Support and Training

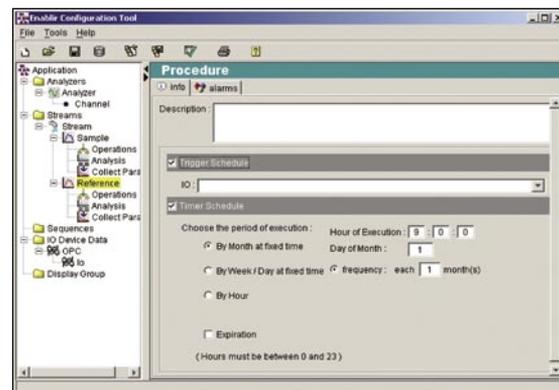
ABB will work closely with you to develop solutions to meet your specific needs. We offer a wide range of customer support services, including method development, in-house and on-site personnel training, on-site and remote application support and calibration training. We can also provide start-up, commissioning, system validation, preventive maintenance plans and after-sales service. Through extensive research and development activities, and through close partnership with its clients, ABB has developed unique expertise in quantitative analysis using FTIR and FTNIR technology. As a result, ABB is the world leader in FTIR process analyzers

Features Benefits

| Features | Benefits |
|---|--|
| Uses FTNIR (Fourier Transform Near Infrared) | Resolution, sensitivity, stability, and reliability superior to dispersive or filter NIR analyzers |
| Multi-point, multi-stream (8 channels) | Low cost of analysis per sampling point |
| Remote monitoring through optical fiber cables | Reduces installation cost and allows flexible siting |
| Thin single-strand optical fiber or small diameter fiber bundles | Less costly and more reliable than thicker cables |
| No moving parts in the detector module (signal electronically multiplexed) | More stable and reliable than an optical multiplexer gives 100% reproducibility on each channel |
| Customizable detector module: different detector for each different channel | Each channel can be optimized for sensitivity, one spectral range and stability. |
| Superior design and manufacturing methods | Repeatability, reproducibility, stability, low maintenance analytical method transferability. |
| FTSW100 modular software suite | Fast and easy to use |
| Industrial Process Analyser | Easy to transport and to install |



FTPA2000-260 Analyser output for on-line analysis of hydrocarbon distillation properties high quality analyser repeatability allows rapid detection of process upset.



FTSW100 software

Spectroscopic Specifications

- Stabilization time: approximately 4 hours after power up.
- Spectral range of internal optics: 3800 cm^{-1} to 14 000 cm^{-1} . Actual useable range is limited by optical fiber transmittance, detector response and source intensity.
- OPD scan speed: 1 cm/s .
- Selectable apodized resolution: from 1 cm^{-1} to 128 cm^{-1} in 2x increments.
- Wavenumber repeatability: 0.002 cm^{-1} RMS@ 7300 cm^{-1} .
- Wavenumber reproducibility: 0.04 cm^{-1} RMS@ 7300 cm^{-1} .
- Absorbance non-linearity: 0.1 % of peak energy response.
- Signal-to-RMS noise at peak response is typically 15 000:1 (29 μabs at 0 abs) in 1 scan, at 16 cm^{-1} with a room-temperature extended range InGaAs detector.
- 100% line long-term stability is affected only by temperature change. Temperature coefficient of change in 100 % line is 2% per 1 C in the region 4000 cm^{-1} to 10000 cm^{-1} .
- Beamsplitter material: BK7 optical glass.

Optical Characteristics

- Outputs: 8-port light launcher, NIR radiation.
- Inputs: Either up to 8 on-board room-temperature InGaAs detectors, or any combination of up to 8 thermo-electrically cooled InAs or InGaAs detectors with our optional, separate 4U mounting box for mixed detectors. Where required room-temperature InGaAs detectors can also be mounted in the same assembly for complete flexibility.
- Channel switching: Fast, all-electronic switches with no moving parts.
- Connections: SMA-905 standard.
- Optical fiber cables: In from 1 to 8 pairs. Use of spectroscopic grade ultra-low OH silica with 300 μm to 600 μm core, or 650 μm multi-fiber bundle, 0.22-0.28 numerical aperture. Maximum length: 100 m for powders and 300 m for liquids. Note that lower frequency cutoff depends on fiber length, for example, a 10 meter fiber has a spectral range of 14000 cm^{-1} to 4750 cm^{-1} . Bending radius for 300 μm FO cable is 18 cm (7 in) and for 600 μm FO cable is 36 cm (14 in).

Embedded Control

- Modular surface-mount electronics for reliable data acquisition and transfer.
- Automatic shock protection helps to insure that all acquired spectra are valid.
- 10/100 Mbps Ethernet interface to computer.
- Advanced instrument management via on-board web interface.

Physical & Electrical

- Weight: 19 Kg (42 lbs).
- Overall dimensions (WxDxH): 44 cm x 41 cm x 17 cm (17 in x 16 in x 7 in).
- Additional clearance required: 30 cm (12 in) in the back for optical fiber cables.
- Enclosure: painted NEMA12 (IP55) steel box with 19 inch standard rack-mount ears in front, 4U high. For industrial environments, shock absorbers are recommended.
- Optional purge inlet: use with nitrogen or oil-free dry instrumentation air, -30 °C dew point or better, 5 L per minute.
- Power requirement: 110-120 VAC or 220-240 VAC, 50-60 Hz, 150 Watts.

Environmental

- Ambient temperature: -15 °C to 50 °C non-operating, 10 °C to 30 °C operating. Specifications measured at 25 °C.
- Relative humidity: 5 % to 95 % non-condensing.

Consumables

- Light source: Quartz halogen bulb. Replace on a preventive maintenance schedule after 6 months of use (source ON).
- Laser: He-Ne, class I with instrument enclosure closed, class IIIa with enclosure opened. Should be replaced on a preventive maintenance schedule every 3-4 years, regardless of instrument use (ON or OFF).



ABB
Analytical Business Unit
585, boulevard Charest E., suite 300
Québec, Qc G1K 9H4
Canada
Phone: 418-877-2944
Fax: 418-877-2834
Email: ftir@ca.abb.com
www.abb.com/analytical

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