Product Specifications

The Antaris™ MX FT-NIR process analyzer, from Thermo Electron Corporation, offers point-of-use routine testing or on-line process analysis with value-chain connectivity into information and control systems.

Antaris MX FT-NIR Process Analyzer

Optimized QC testing and remote process monitoring

The Antaris process line extends the award-winning Antaris FT-NIR analyzer platform into the process environment. It matches the power of near-infrared, fiber-optic-based sampling with manufacturing-based materials testing, monitoring, and control applications. The Antaris MX process analyzer provides a complete, fit-for-purpose solution for point-of-use materials analysis and online process monitoring applications.

The New Standard for Design

The Antaris FT-NIR analyzer defines the new standard for the design and manufacture of full-range, near infrared analyzers including:

- High performance combined with rugged design
- Reproducible, regardless of configuration, user, or environment
- Regulatory traceability incorporated into every element of design from the ground up
- Suitable platform for each point in the NIR lifecycle, facilitating method development, deployment, transfer, and routine operation

System Advantages

- True simultaneous multi-channel collection
- Multi-channel collection with no moving parts
- Internal, automatic background handling (no background collection necessary)
- Dynamically aligned interferometer provides excellent reproducibility
- Factory-aligned, pinned-in-place components for long-term stability
- User-replaceable parts that maintain calibration performance
- Integrated computing option
- Compliant, workflow-based operation that is easy to administer and control
- Automated process monitoring and control operation
- Calibration transfer from system-to-system and from Antaris and Antaris II systems
- Analog and digital I/O
- OPC server communication
- Real-time diagnostics
- Small footprint for convenient mobile analysis

Process Monitoring and Control

The Antaris MX Process analyzer is available in two or four channels for online process analysis. It is the only near-infrared featuring true simultaneous measurements of up to four points. This patent-pending system is also simultaneously self referenced, so stability is unequalled and background collections do not require a dedicated channel or probe disengagement.

Antaris MX Process Analyzer Specifications

Number of Channels	2 or 4 sampling channels, plus one dedicated internal reference channel
Data Collection	True simultaneous multi-channel collection
	Internal NIST-traceable and serialized standards for wavelength accuracy and photometric linearity while system is online
Fiber Optic Connection	Industry standard SMA 905
Fiber Optic Cables Supported	300 µm – 600 µm ultra low OH single fiber cables (600 µm recommended)
	Ultra low OH fiber bundle cables
Background Options	Internal and automatic; interval based or simultaneous with sample (real-time)
Channel Selection Mechanism	Simultaneous; no moving parts
Channel Switching Speed	Simultaneous, no switching necessary
Detection	High sensitivity, high stability matched InGaAs
Interferometer	Proven, frictionless, stable, long-life Michelson
Instrument Dimensions	40.6 cm (width) x 48.2 cm (depth) x 24.7 cm (height)
Weight	25.8 kg
Source	Long-life, high-intensity halogen NIR source; spare source included with system, guaranteed filament image alignment
System Status Indicators	Indicator lights report scan, laser, power, and source status continuously
Operator Communication Indicators	Red, yellow and green LED indicators communicate pass/fail/prompt
Sealed and Desiccated	Yes
Purge	Optional
Operating Temperature Range	15 – 35 °C
Power Requirements	90 – 264 VAC
Integrated Computing	Optional
Communications	Plug and Play USB communications to PC, no addressing or administration required
	USB extension available
Network and Control System Communications	Direct PC to Ethernet allows file system and OPC communications
Regulatory Approvals	CE

System Performance

Spectral Range	12000 – 4000 cm^{-1} (833 – 2500 nm)
Resolution	4 cm^{-1} across spectral range (.6 nm at 1250 nm)
Wavenumber Accuracy	± 0.1 cm^{-1} (.02 nm at 1250 nm)
Photometric Linearity (USP)	Slope 1.0 ± 0.05 and an intercept of 0.0 ± 0.05

Antaris MX configured for process monitoring applications

Antaris MX configured with dual probes for dedicated at-line checking of different sample types

At-Line or Point-of-Use Applications

Near-infrared sampling by fiber optics allows rapid point-of-use QC for raw material identification, quality measurements and sample component analysis. Methods can be developed on the Antaris MX process analyzer or transferred from Antaris or Antaris II MDS systems for optimized at-line material testing or online analysis via fiber optic probes.

The Antaris MX analyzer can be used with the SabIR hand-held diffuse reflectance probe that can analyze samples directly or indirectly through packaging materials. The system can be configured with one or two trigger-based sampling probes for optimized switching between multiple sample types in a manufacturing setting.

Antaris MX At-Line SabIR Probe Specifications

Spectral Range of SabIR Probe	12000 – 4000 cm^{-1} (833 – 2500 nm)
Probe Shaft	Stainless steel shaft 15.8 cm (length) x 1.6 cm (diameter)
Fiber Optic Cable	High throughput low OH silica fiber bundle – two or three meter length
Window Material	High quality, chemical-resistant sapphire
Probe Weight	0.7 kg
Operating Temperature Range	15 – 35 °C
Remote Start Capabilities	Handheld trigger
Background Handling	Dedicated internal channel, no background or reference standard necessary; Automatic background in holster also available
Operator Communication Indicators	Red, yellow and green LED indicators on probe communicate pass/fail/prompt
Probe Holder	Holder with built in Spectralon® reference
Fiber Optic Connection	Standard SMA connection allows Thermo's complete line of industrial probes to be connected
	Up to two trigger probe connections
Rapid Liquid/Solid Switching	Optional transflectance sleeves allow fixed or multiple pathlength settings, avoids primary probe window contamination

RESULT Operation provides push button analysis using workflow controlled data collection, report generation, and data archival. Error-free operation and quality system integration are possible at-line for the first time.

Process Fiber Optic Options

Thermo offers a complete line of proven, industrial fiber-optic probe solutions. Our probes provide rugged, reliable, long-term performance through a proprietary sapphire window-to-metal seal capability. The probes are available in 316L stainless steel. Other materials are available based on specific requirements. Probes are available for operation at up to 300 °C and 3000 or 5000 PSI. Thermo also offers a series of specialty probes designed and proven for specific applications such as drying and fermentation.

Process Probes

Standard Probes	Series 400 – Diffuse Reflectance Probe Series 500 – Fixed Pathlength, Single Pass Transmission Probe Series 600 – Variable Pathlength, Transflectance Immersion Probe Series 625 – Single Fiber Transflectance Immersion Probe Series 650 – Transflectance Immersion Probe Series 750 – Transmission Flow Cell
Specialty Probes	Dual mode reflectance and transflectance probe for sample mode switching as sample turbidity increases; simultaneous transmission and reflectance sampling with Antaris MX and EX process analyzers
	Retractable Dryer Probe system with cleaning and wash options
Probe Construction	316L Stainless Steel, Hastelloy
	Proprietary window sealing
	300 °C and 3000 or 5000 PSI
	Probe lengths and diameters per requirements
Probe Interfacing	Triclamp, ingold, or custom
Fibers	300 µm – 600 µm ultra low OH single fiber cables (600 µm recommended)
	Ultra low OH fiber bundle cables
	Stainless jacketed with Viton/Silicone sheathing

RESULT Software

From the method developer or chemometrician to routine operator or automated process operation, the Antaris software line matches the unique needs of each point in the analyzer life cycle. For quality control and process applications in manufacturing environments, RESULT™ software provides the controlled operation, feedback, and control outputs necessary to seamlessly integrate near infrared into your operations.

RESULT Operation runs predeveloped workflows leaving nothing to chance in production environments.

RESULT workflows can run continuously for process monitoring applications, controlling data acquisition, reporting, archival, and communications with control systems.

Antaris MX Process Analyzer Control and Communications

Software Options	RESULT software suite includes RESULT Integration, RESULT Operation, and TQ Analyst™ Method Developer Software*
	Camo's The Unscrambler® software
	OMNIC spectroscopy software
Software Input/Output Options	OPC server
	Spreadsheet and text output
	Barcode
	RFID
	HTML
	Spectral data formats including OMNIC software and Camo's The Unscrambler software
	True digital signature record authentication
PC Input/Output Options	Wireless Ethernet data transmission
	Ethernet data transmissons
	USB analyzer communications
	RESULT OPC-PLC bridge to industrial I/O
Antaris Process MX I/O Communications Controller Options	8 channel digital (4 in, 4 out) base configuration
	RESULT OPC server standard
	Optional additional I/O: – 4 channel 4-20 mA output – 4 channel 4-20 mA input/output – 8 channel 4-20 mA input/output – 8 channel 4-20 mA input/output + 4 channel digital input/output
	Supports programmable control
	Panel mount or DIN rail mount

** RESULT software directly reads calibration files from TQ Analyst, Camo's The Unscrambler, Infometrix's Pirouette®, and GRAMS PLS/IQ software.*

The optional Antaris MX communications controller can be configured for a wide range of analog and digital I/O signals

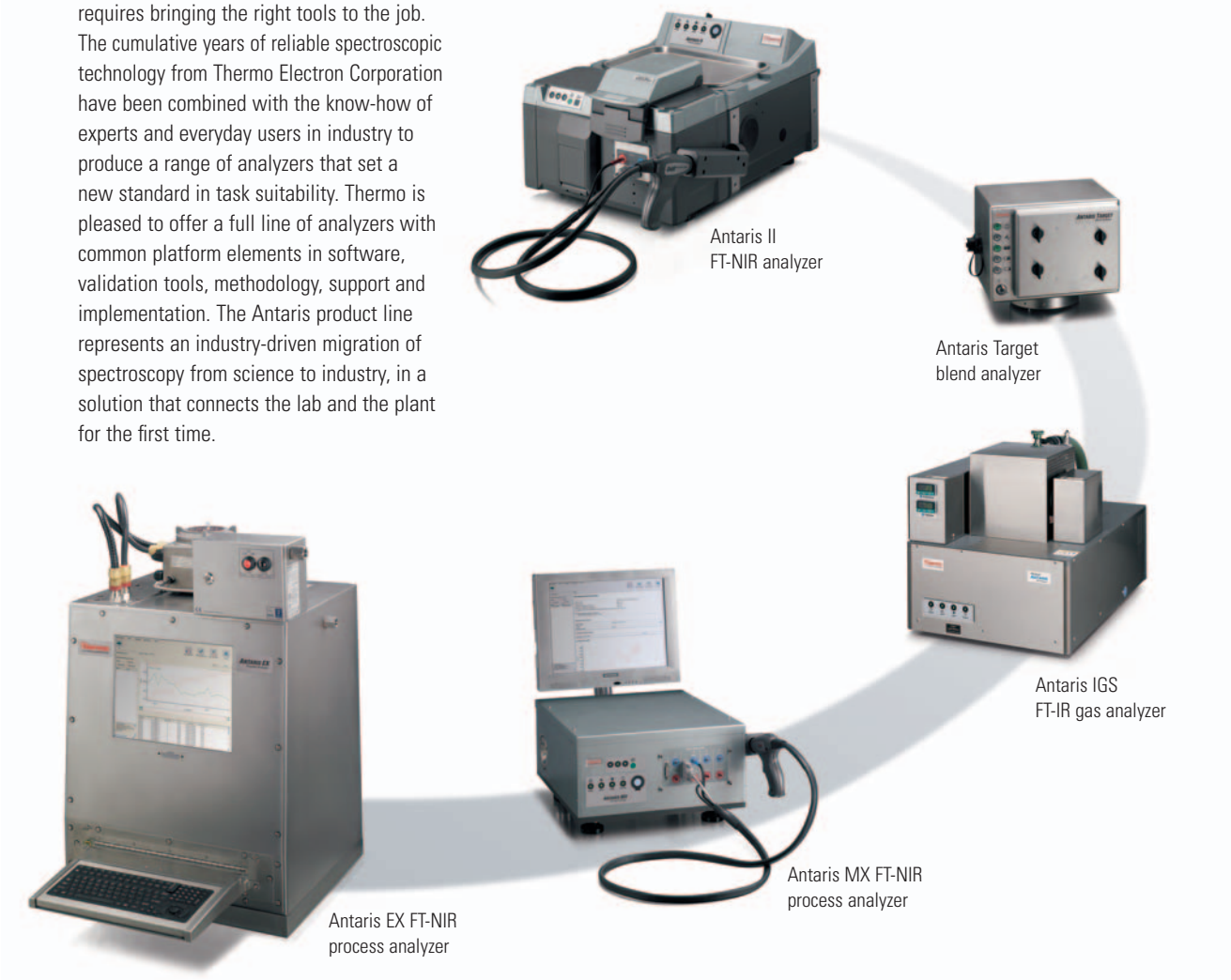
Qualification and Regulatory Compliance

The Antaris MX process analyzer uses the ValPro™ system qualification package. This package includes:

- DQ, IQ, OQ, PQ documentation
- Real-time USP-based qualification and performance testing while all channels are online
- Internal validation wheel with NIST-traceable, calibrated and serialized standards
- Qualification services by certified engineers
- Tools to achieve 21 CFR Part 11 compliance

About the Antaris Line of Analyzers and Sensors

Solving industrial analytical challenges requires bringing the right tools to the job. The cumulative years of reliable spectroscopic technology from Thermo Electron Corporation have been combined with the know-how of experts and everyday users in industry to produce a range of analyzers that set a new standard in task suitability. Thermo is pleased to offer a full line of analyzers with common platform elements in software, validation tools, methodology, support and implementation. The Antaris product line represents an industry-driven migration of spectroscopy from science to industry, in a solution that connects the lab and the plant for the first time.



Antaris II
FT-NIR analyzer

Antaris Target
blend analyzer

Antaris IGS
FT-IR gas analyzer

Antaris MX FT-NIR
process analyzer

Antaris EX FT-NIR
process analyzer

Our Technology

Fourier transform (FT) spectroscopy is only one of the near-infrared (NIR) technologies used in the Antaris analyzer line. While FT-NIR is proving to be one of the most reliable, repeatable and broadly capable technologies for routine or process analyzers today, every application is different. Thermo carefully matches technology to task, while ensuring a connectivity between platforms that facilitates implementation, validation, and overall cost of ownership. From interferometry to miniature MEMS technology, the Antaris series can match the right mix of size, performance, and reliability to each critical point along your operational processes.

PS51019_E 02/06M

Thermo Electron Scientific Instruments LLC, Madison, WI USA is ISO Certified.

Australia +61 2 8844 9500
Austria +43 1 333 50340
Belgium +32 2 482 30 30
Canada +1 800 532 4752
China +86 10 5850 3588
France +33 1 60 92 48 00
Germany +49 6103 4080
India +91 22 2778 1101
Italy +39 02 950 591
Japan +81 45 453 9100
Netherlands +31 76 587 98 88
Scandinavia +46 8 556 468 00
South Africa +27 11 570 1840
Spain +34 91 657 4930
Switzerland +41 61 48784 00
UK +44 1442 233555
USA +1 800 532 4752

www.thermo.com

Thermo
ELECTRON CORPORATION