Thermo Scientific RESULT Software

Getting Answers at the Source Requires a New Way of Thinking About Software

Method Development

Workflow Development

Deployment & Support Methodology

Routine Analysis

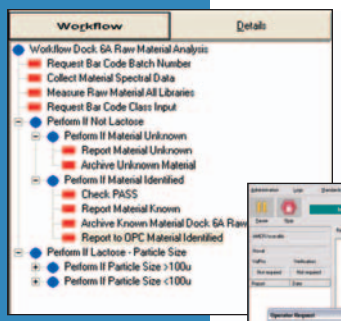
Process Analysis

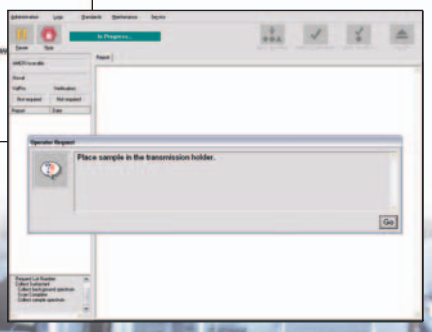
RESULT Software – from Method Development to De

Thinking of migrating technology from the lab to the plant floor or warehouse? Software developed for the laboratory doesn't leave the laboratory without a price. Imagine what would happen if an operator could change data collection parameters or manipulate data. Consider the control procedures, modification work, training requirements, and subsequent validation challenges associated with bringing analytical software into the manufacturing environment. Successfully using a spectrometer as a routine or process analyzer requires an approach very different from scientific instrument software.

Thermo Scientific RESULT software is a dedicated analysis package developed specifically for process instrumentation. Whether your application is at-line, on-line, in-line, or in development and support for these functions, RESULT™ software addresses your process needs for:

- Method Development and Transfer
- Operational Setup
- System Security
- Routine Analysis

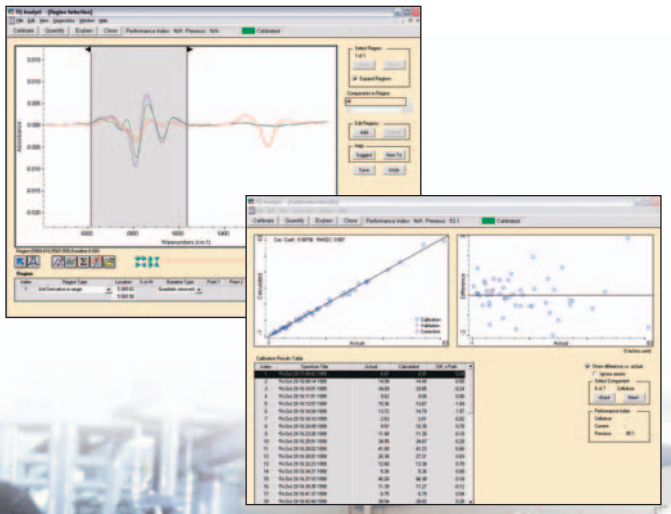




Method and Calibration Development

Sophisticated qualitative and quantitative tools are often incorporated into routine operations. RESULT's predictive modeling tool, Thermo Scientific TQ Analyst, allows method developers to create powerful calibrations in an easy interface optimized for the often overlooked predictive application side of chemometrics. TQ Analyst™ provides a host of tools to create predictive methods optimized for routine implementation, including:

- Spectral measurement techniques
- Qualitative model algorithms for confirming ID, predicting class membership and qualifying materials including Mahalanobis distance and principal component techniques, powerful correlation, and Euclidean based searching and matching
- Quantitative model algorithms for predicting concentrations and numerical conditions including SMLR, PCR, PLS, and SIMCA
- Modeling diagnostics
- Data pretreatments
- Statistical performance measurements
- Complete wizard-driven method development and optimization for non-experts
- Optional fully traceable algorithm documentation and validation kit for software and method validation
- Camo's The Unscrambler® software methods may also be used directly with RESULT



eployment

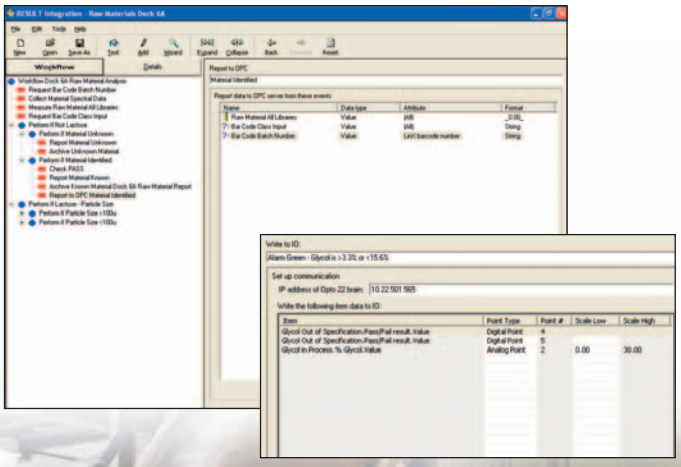
Workflow or SOP Development

Once predictive models are developed for an analyzer, they typically must be transferred to practical use in a routine application. Whether that end-use environment is a QC lab, a goods-in area, or a hazardous process zone without human presence, the RESULT Integration mode makes it easy to develop powerful, dependable, and secure workflows to run routine or online analysis. Workflow development requires no programming or macro sequences that chain together commands from spectroscopic software. It is a dedicated, fit-for-purpose SOP development environment that moves calibrations and predictive models into real-world applications.

Workflow Elements Include:

- Data collection
- Sample prediction or classification*
- Pass/fail results and notification
- Report generation
- Data archival
- Display
- Security and electronic record treatment
- Communication I/O (OPC, digital, and analog)
- Logic, loops, and decisions

** RESULT software allows chemists to incorporate methods from the most popular chemometric packages such as TQ Analyst, Grams PLSplus/IQ™, The Unscrambler, and Pirouette®.*

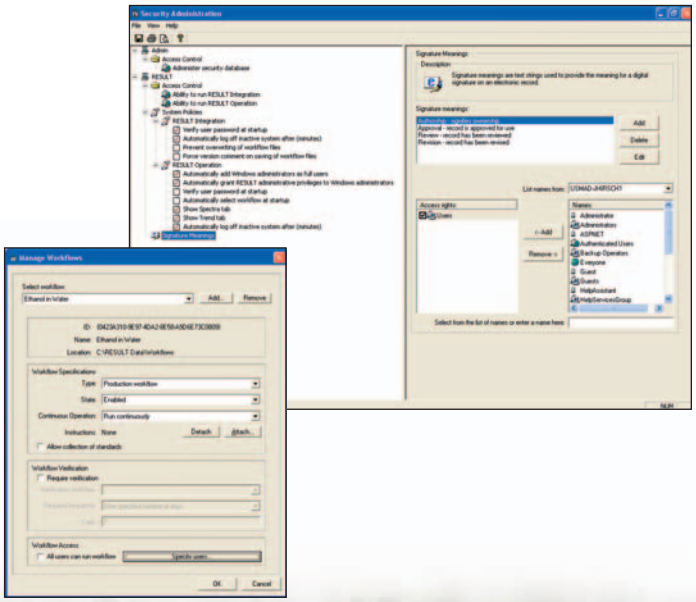


Deployment and Support of Methodology

Transferring methodology to end users is as simple as copying one file on a computer. Workflows and models completely control system use and output, making training requirements minimal and user support extremely simple. Workflow files are simply opened in the RESULT Operation mode; the Administration mode allows workflow assignment and access control. Software customization, lengthy file system setup, and the burden of lab software configuration are completely unnecessary.

Deployment and User Support Features:

- Privilege control and SOP assignment customized for each user
- File system based setup
- Routine user interface without customization or lockdown of software
- Audited reporting facilitates review and troubleshooting
- SOP's and instructions can be embedded into workflows
- Sampling technique and parameter enforcement by workflow



Routine Analysis

RESULT Operation was developed with the end user in mind. Near-line analyzers are typically run by operators who need the right information quickly with minimal training or expertise with the system. Supporting these users is easy with RESULT, because workflows do all the work at the push of a single button. Whether the goal is to provide rapid pass/fail information or to make operational decisions about materials, RESULT workflows can handle decision making, including comparing barcode information with spectral scans and instructing the operator what to do next pending a measurement outcome.

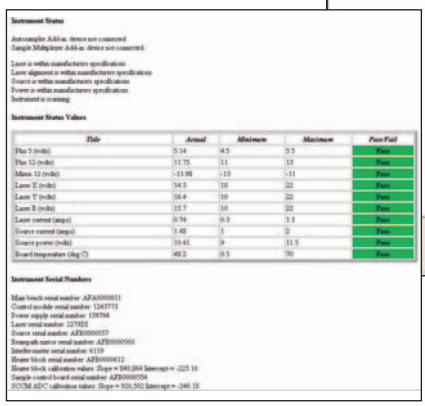
Routine Analysis Features:

- Push button analysis
- Workflow-defined reporting and data archival
- Communication via analyzer indicator lights (pass, fail, prompt)
- Automatic system use audit trail journaling
- Error detection
- Prompted or instructed use
- Design and use compliant with electronic records and signatures regulations

RESULT Workflows also control a wide range of automation tools for high volume sampling on our analyzers, including systems for analyzing materials in vials and solid dosage forms.

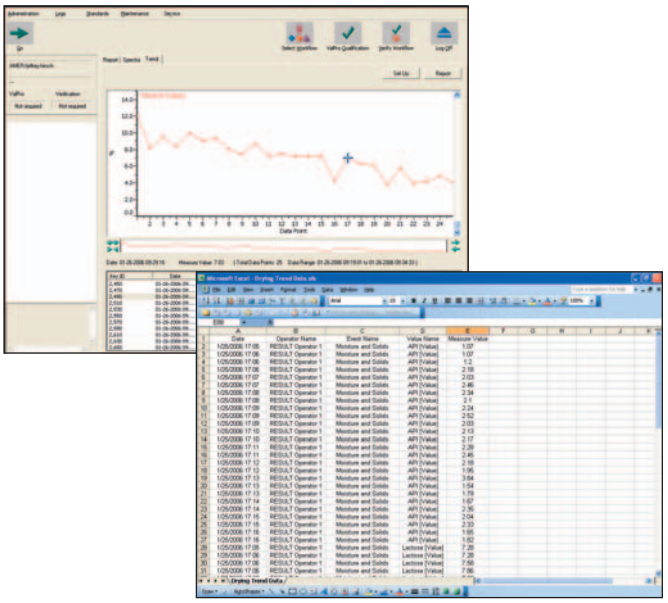
Process Analysis

Workflows can be run in automated mode for continuous and simultaneous, in-line monitoring of multiple components and multiple sampling points. For applications ranging from near-infrared reaction monitoring to FT-IR combustion gas analysis, RESULT provides all the tools needed for system control, data collection, reporting, control charting, and data archival in real-time. RESULT includes not only OPC server technology for real-time communication to and from manufacturing and process systems, it also provides direct output to our PLC I/O system, allowing analog and digital inputs and outputs of relevant information for closed-loop process control.



Trend Analysis and Data Review

RESULT's database provides a complete history of measurements and allows historical trend analysis and reporting.



System Suitability and Performance Checks

RESULT includes multi-level diagnostics and system checks to ensure proper function. RESULT also runs Thermo Scientific ValPro system qualification for Antaris analyzers, allowing powerful but routine assurance for regulated environments.

I/O and Data Integration

RESULT comes complete with the following tools for moving data to and from the analyzer system:

COMMUNICATION FORMAT	TYPICAL USE
Text List Input	Sample lists for automation; LIMS ID number input
Text and Spreadsheet Output	Report export for LIMS parser; customized reporting and spreadsheet-based tracking; ERP integration
HTML Output	Universally viewable report archive format
Barcode	ID input from labels on containers of materials; automatic verification of ID without operator input
RFID	ID and inventory information coordinated with data for integration with LIMS, QMS, and ERP systems
OPC Server for I/O	Direct real-time output of analyzer measurement data to control or other data systems via Ethernet
Communications controller for complete setup of analog and digital outputs	Direct real-time output of analyzer measurement data to control or other data systems via setup Antaris I/O system
Spectral data in OMNIC .spa, JCAMP, and CSV ASCII Formats	Data available for review or use using a wide range of statistical, spectroscopic, chemometric or data management software and database packages

Data Security and Integrity

From inception, RESULT was developed in accordance with cGMP and other quality standards including the FDA's Code of Federal Regulations for off-the-shelf software packages. Designed under Thermo Fisher Scientific's Product Development procedures, you are ensured a software package that consistently provides reproducible and accurate results that will stand up to the most stringent regulatory audits. In addition, RESULT contains unique tools to assist you with regulatory compliance such as:

- Electronic SOPs – templates that allow detailed work instructions to be created
- Digital signatures for authenticity of workflows, reports, SOPs, and data
- Secure, detailed, tamper-proof analysis reports
- Validation and service histories – tamper-proof service and validation reports that detail the performance history of the instrument
- Network security
- System log-ins and password protection
- Installation and software verification tools
- Automatic audit trail generation
- Report files viewable to auditors via any standard web browser

Antaris Analyzers: Choosing the Right Package for the Job

From 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.

Thermo Scientific OMNIC Software

OMNIC™ software has been the industry benchmark for molecular spectroscopy work for over ten years. It provides a work environment for even the most demanding raw data analysis, and provides seamless data portability to any of the four chemometric packages available for sample prediction.

RESULT Software

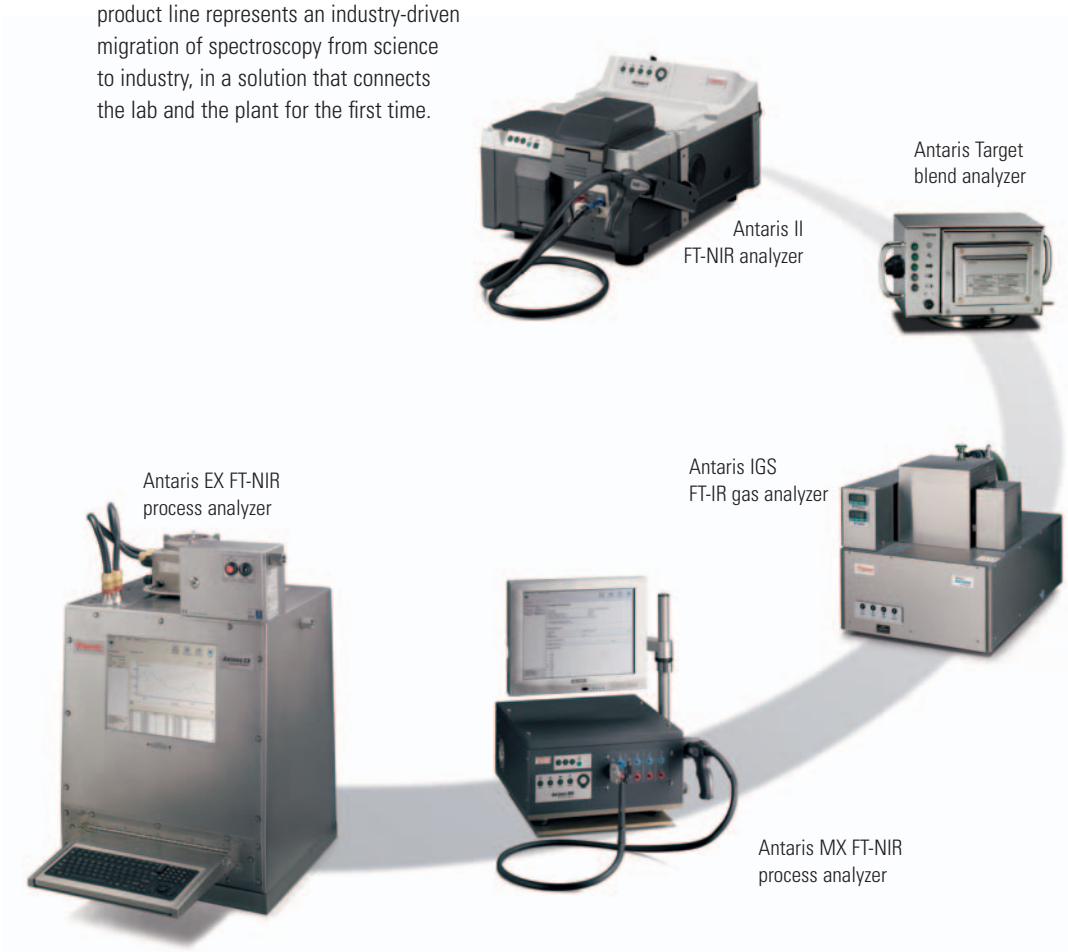
Software specified, designed, and validated from first principles for controlled use in pharmaceutical cGMP environments, RESULT provides the first and only environment for the development of routine or automated analysis workflows and their deployment, without programming or software customization. It also provides the interface that has set the standard for controlled routine operation and automated spectroscopic process monitoring. RESULT allows interactivity with external programs, LIMS and data system connectivity, OPC and PLC outputs and the broadest chemometric capability in the industry. Calibration models from TQ Analyst (included with the RESULT software suite), Camo's The Unscrambler, Infometrix's Pirouette, and GRAMS PLS/IQ can all be used for real-time prediction.

The Unscrambler Software

We offer Camo's The Unscrambler software for analyzer users performing extensive investigation and modeling. The Unscrambler is the standard in chemometric software for near-infrared spectroscopy and can be used to discover, understand, and capitalize on complex sample relationships. In today's race for process understanding, this software tool provides a powerful component to applying analytics to operational problems in industry.

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 Fisher Scientific 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. We are 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.



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. We carefully match 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.

In addition to these offices, Thermo Fisher Scientific maintains a network of representative organizations throughout the world.

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