



# INVENIO®

- The productive FT-IR spectrometer



INVENIO stands for productivity, precision and smart connectivity.

Your application is the measure of things, whether it is routine infrared analysis, teaching, research or development.

The INVENIO is your reliable partner in all your analytical efforts.

The INVENIO is perfectly prepared for the use in almost any application field and any industry. From basic QC/QA to analysis of demanding samples, no matter if utilizing a standard ATR unit, a special multi-angle reflection unit or an imaging microscope:

The INVENIO will be your productive partner in routine or contract laboratories as well as in R&D departments.

It is Bruker's creed to provide scientific instruments you can rely on in terms of spectroscopic performance, as well as durability. Extended warranties on all central spectrometer components guarantee continuous availability, low cost of ownership, and best performance for years to come.

### Quality Control in Industrial Manufacturing

- Verification of incoming goods
- Quality assessment
- Failure analysis
- Troubleshooting product defects

### Materials Characterization

- Identification of chemical compounds
- Characterization of complex materials
- Determination of coatings
- Characterization of optical materials

### Analysis of Surfaces

- Examination of thin layers and monolayers
- Characterization of corrosion processes

### Environmental

- Monitoring of pollution (i.e. microplastics)
- Characterization of soils

### Life Science

- Protein conformation and concentration
- Microorganism identification

**Reaction Monitoring** under laboratory conditions

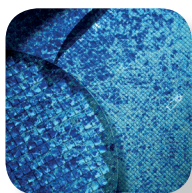
Pharma



Polymer & Chemical



Material Science



Surfaces



Life Science



Building Materials



# • INVENIO® - Your Spectrometer

ADAPT IT. ADVANCE IT.

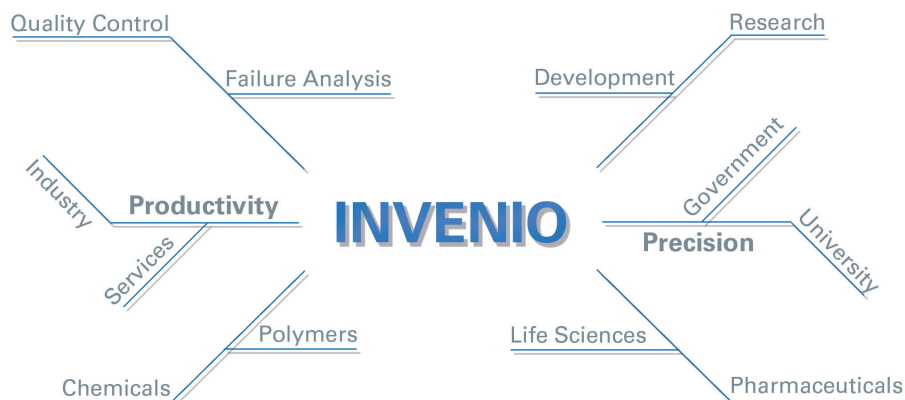
## Requirements Change, INVENIO Adapts, Productivity Remains.

The INVENIO is designed and dedicated to provide FT-IR excellence in every application. A multitude of accessories stands ready for a fast setup of standard experiments. Match the INVENIO to almost any sample type, form or shape with the push of a button, and analyze solids, liquids, solutions, pastes and gases.

More profound changes are needed? Quickly change detectors for a new experimental setup, while switching between sources and spectral ranges is just as easy. INVENIO enables you to use time resolved methods like Step Scan, Rapid Scan and Bruker's superior, exclusive interleaved TRS.

Paired with OPUS, one of the most powerful software solutions for IR analysis, the INVENIO is ideally prepared to be your reliable partner in IR analysis, regardless of application.

You want faster, easier IR analysis? OPUS TOUCH is the means to achieve that. Predefined workflows minimize operator effort to a few screen taps, while functionality is kept uncompromised. Thanks to the touch PC, the INVENIO can be seamlessly integrated into any laboratory IT infrastructure. Measure in the lab, evaluate your data from your office – all without cables or manual data transfer.



## Exceptionally Intelligent, Lasting Trust

PermaSure™ monitors device configuration at all times and performs rapid self-tests to ensure proper functionality, while the PerformanceGuard™ always ensures device performance through continuous monitoring of all mechanical and electronic components.

The INVENIO is composed of reliable, long-life materials. The RockSolid™ interferometer and Platinum ATR have a guaranteed lifetime of at least 10 years, while the CenterGlow™ IR source is suitable for at least 5 years of use.



# YOUR APPLICATION IS THE CHALLENGE. THE INVENIO WILL ACCEPT IT.

## Less Effort, More Analysis.

Productivity is key, whether workload is high, deadlines must be met, or research is done between teaching classes. That's where the INVENIO comes in.

It is always calibrated and always ensures optimal measurement parameters. Even if measurement time is kept short, the INVENIO lets you observe small spectral details. Thanks to its exceptional IR performance and measurement sensitivity you will catch tiny specifics as well as the big picture.

In addition to an amazing, intuitive user interface, the touch PC offers state-of-the-art connectivity capabilities, so it can be entirely integrated into any laboratory IT structure.

## Quality Control Meets Highest Demands

INVENIO features short analysis time, reliable substance verification and a clear assessment of product quality. It is ideal to characterize bulk raw material as well as a single faulty batch.

The touch PC allows even untrained personnel to quickly evaluate samples, thus perfectly preparing the INVENIO for a multitude of quality control tasks, users and working environments.

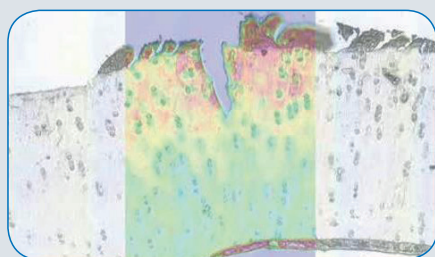
## Dedicated Workflows

for quality control and routine analysis.



## FT-IR Microscopy and Imaging

Featuring fully automated infrared chemical imaging, crystal-clear sample viewing and a wide variety of IR and visible objectives, the HYPERION series microscopes provide all you need to conduct most sensitive microanalysis easily and efficiently.

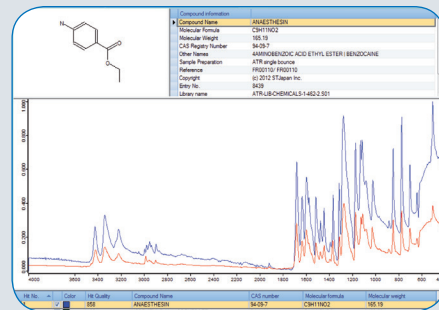


By combining HYPERION and INVENIO microscopic ATR, transmission, reflexion and even emission measurement of tiny samples with outstanding spatial resolution can be achieved. Large sampling areas can be analyzed at high lateral resolution with minimum recording time by using a modern Focal-Plane-Array (FPA) detector.



## Identify and Analyze

contaminants or your competitors products.





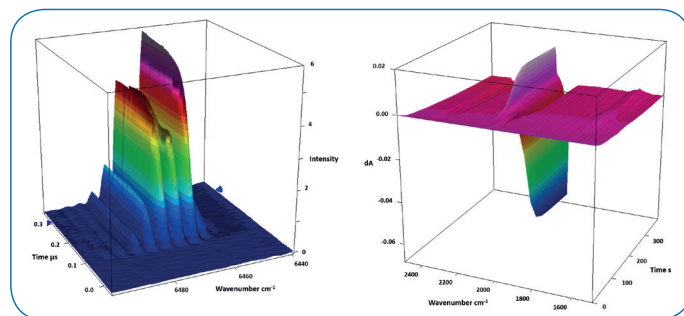
# • Dedicated to Your Applications

FT-IR SPECTROSCOPY COVERS NUMEROUS APPLICATIONS RANGING FROM STANDARD EXPERIMENTS TO COMPLEX RESEARCH SET-UPS. THE INVENIO IS ALWAYS PREPARED TO ADAPT TO YOUR NEEDS AND DELIVERS OUTSTANDING PERFORMANCE.

## Regulations and Compliance

INVENIO helps to reduce the cost of compliance by being fully validated, providing completely automated performance tests (OQ/PQ) and supporting you with a detailed global audit trail. You can sort the archive according to date, user or event and even look for specific keywords to swiftly analyze large amounts of electronic data recordings. Instrument and software fully comply to 21 CFR P11, cGMP and GLP as well as United States, Japanese and European Pharmacopeias.

## Time Resolved Spectroscopy

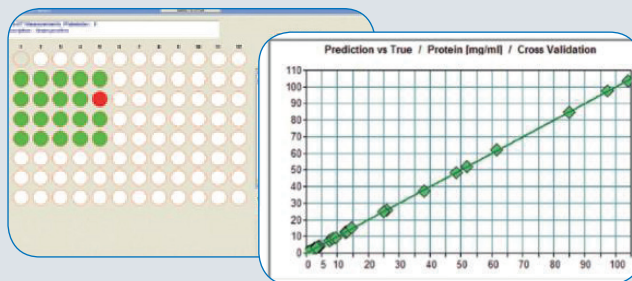


Time-resolved spectroscopy offers you new opportunities to understand your chemical reactions and physical or biological processes. Take it a step further with advanced techniques like spectro-electrochemistry to leave no analytical question unanswered.



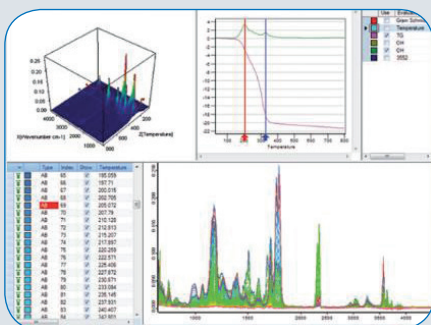
## High-Throughput Screening and Quantification

The microplate extension HTS-Xt allows the application of FT-IR spectroscopy as method for high-throughput screening. Samples are loaded on 96-, 384- or even 1536 well plates to be analyzed in transmission or diffuse reflection. Easily develop calibration methods to setup your own quantification experiments and further extend your analytical capabilities.



## Determine

the thermal decomposition behaviour of materials and follow reaction processes



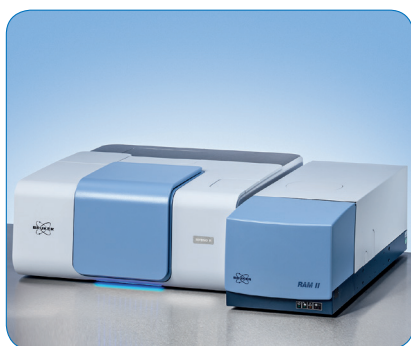
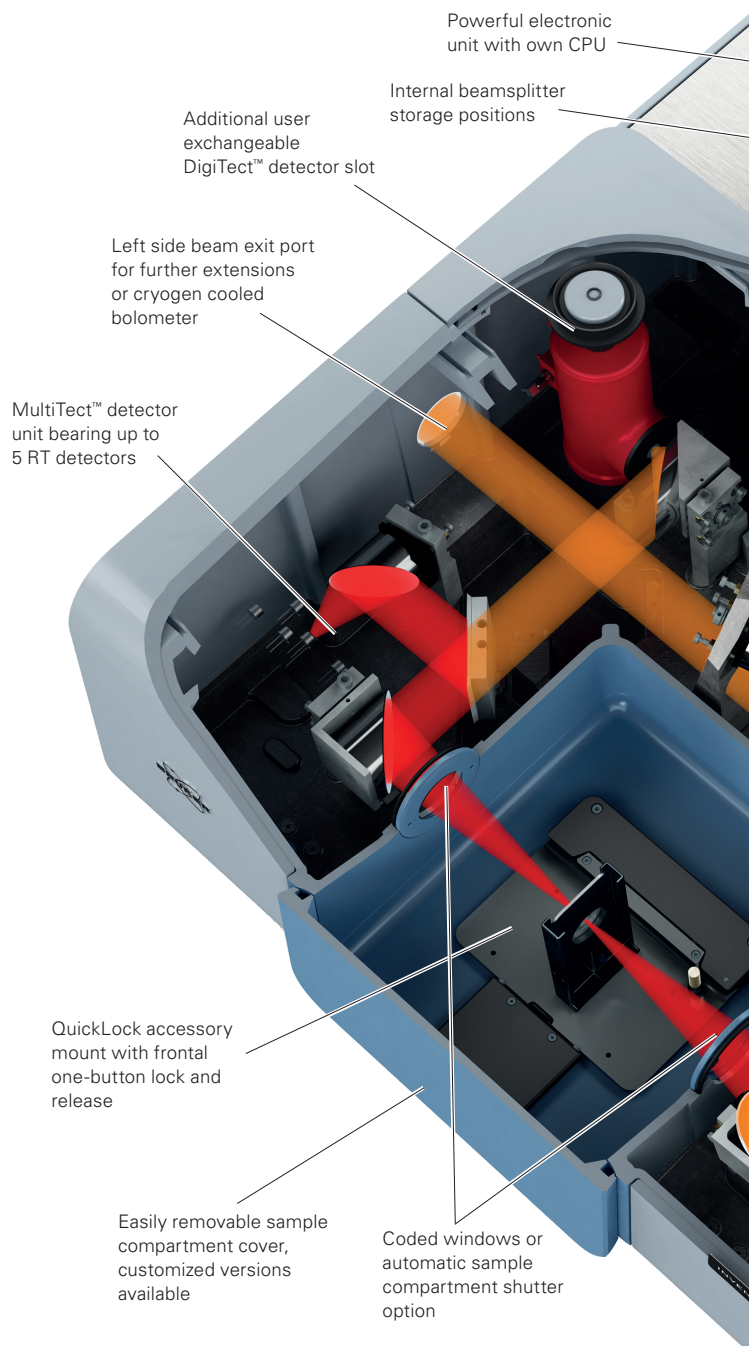
## Sampling Flexibility and Extensions

A broad spectrum of special sampling accessories are available to adapt the INVENIO to any sample. From ATR to IRRAS to integration sphere, you are always able to setup your instrument perfectly. Not enough? No problem. The INVENIO features up to 3 output and 2 input beam ports for external accessories. Enable IRRAS, VCD, TGA, Raman measurements and other techniques to give the INVENIO the power to deal with almost any analytical task.



## • Lots of Features

- Permanently aligned and wear-free RockSolid™ interferometer
- Integrated Touch-PC option with dedicated OPUS-TOUCH software for productive IR-analysis
- OPUS is the ideal software solution for vibrational spectroscopy - precise, structured, secure
- Integrated ATR accessory for easy cleaning (optional)
- Transit™ channel: Second sample compartment for the parallel availability of two experimental setups
- Electronic recognition and monitoring of all accessories and central components
- Automated instrument tests (OQ/PQ) and complete compliance to pharma regulations
- Innovative 5x MultiTect™ detector technology
- User exchangeable DigiTect™ detector slot
- In-field upgrade for near IR, far IR and UV/VIS spectral ranges
- Sealed and desiccated optics bench, optionally purgeable
- BRUKER FM technology covering 6000 to 80 cm<sup>-1</sup> in one single measurement
- Superior Rapid Scan, Slow Scan and Step Scan performance for modulated and time resolved spectroscopy
- 3 exit and 2 input beam ports software selectable
- Footprint optimized for laboratory benches



External accessories like the RAM II extend the INVENIO's already vast application possibilities even to FT-Raman spectroscopy.

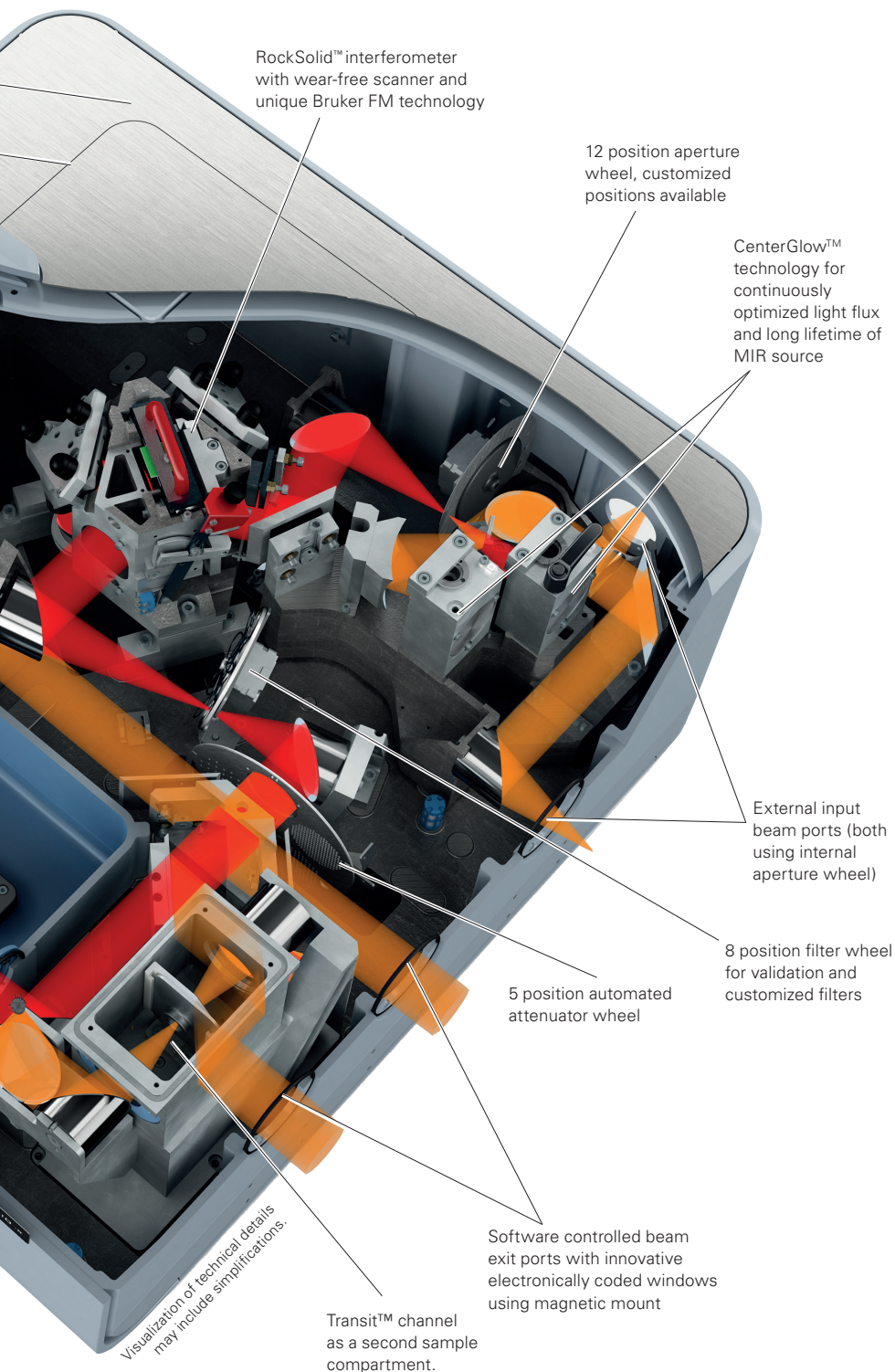


The Transit™ channel allows a parallel availability of two experiment setups, in this case ATR and transmission.



Additional DigiTect™ detector slot for liquid N<sub>2</sub> cooled, fast, high gain and other detectors.





## Absolute Accuracy, Excellent Sensitivity

The INVENIO presents a novel, outstandingly efficient beam path to maximize infrared light throughput and deliver exceptional spectral performance.

An extraordinarily precise optical bench, premium components and modern SoC electronics allow you to resolve the tiniest spectral features to analyze weak bands, complex mixtures or compounds in low concentrations.

## Smart Connectivity, Intuitive Touch

The INVENIO's touch-PC reduces the effort involved in measuring spectra to a few easy-to-learn touches, and the software offers a variety of optimized workflows to get you there even faster. Additionally, it allows you to perfectly integrate the instrument into your laboratory IT structure. Use WIFI or cable to connect it to your network and access data in other labs, at your desk or on the go. Review, sign and release spectra simultaneously around the world while keeping the device available at all times for measurements.

## Spectral Range and Resolution

The INVENIO can be equipped with a variety of light sources, beamsplitters and detectors to cover the entire spectral range from 15 to 28.000  $\text{cm}^{-1}$ . Additionally, the INVENIO's spectral resolution of optionally better than 0.16  $\text{cm}^{-1}$  fulfills the requirements of almost any measurement.

Bruker's innovative and exclusive FM technology allows collecting far and mid IR spectra in one go, you are ideally prepared for any analytical challenge.



The touch-PC offers an incredibly fast workflow as well as modern and state-of-the-art connectivity features.



The optional, integrated ATR facilitates cleaning and prevents dust or dirt from entering the beam path.



MultiTect™ detector unit with up to 5 software controlled RT or TE stabilized detectors.



## Application and Support

The application possibilities of IR spectroscopy are almost endless and range from analysis of powders, granules, liquids, particles, coatings, microplastics, laminates, composite materials, tissue samples, fibres, paints, pigments, and pharmaceuticals to food safety.

We want to make your application a complete success. For this reason, Bruker is mainly staffed by scientists and engineers with practical experience and in-depth knowledge.

Therefore, you can trust us at all times when it comes to questions regarding the selection of the best equipment or if you face difficult analytical problems. Bruker's FT-IR devices ensure consistent performance over many years. However, if an unforeseen problem should occur, you can count on a network of Bruker employees ready to deal with these issues as quickly as possible.

## Part of the Family

The INVENIO fits right into Bruker's goal to make FT-IR spectroscopy more productive for experts and accessible for beginners.

INVENIO's purpose comes from its name: to innovate, discover and pioneer with the help of FT-IR spectroscopy. This effort may start at quality control and end at advanced time-resolved methods, yet no matter where you find yourself in this broad spectrum of applications.

The INVENIO is at your side, always providing analytical excellence.

Technologies used are protected by one or more of the following patents:  
US 7034944

**Bruker Optics is ISO 9001  
and ISO 13485 certified.**

Laser class 1 product.

[www.bruker.com/optics](http://www.bruker.com/optics)

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