



## • TANGO FT-NIR Spectrometers

Faster, simpler, more secure - with TANGO your NIR analysis speeds up. TANGO has exactly what users require of an FT-NIR spectrometer suitable for industrial use: Robustness, high precision and straightforward operator guidance.

- Proven FT-NIR technology by Bruker
- Easy-to-use touch screen operation
- Automated background management
- Small footprint
- Robust and precise optics
- 10 years of warranty on the moving parts of the interferometer
- Direct calibration transfer to and from all existing Bruker Optics NIR spectrometers
- Data exchange via network
- Complies with 21 CFR Part 11 requirements

Forget tedious training courses or specialized knowledge. TANGO makes it simple for you: with its intuitive user interface it guides the operators quickly and securely through the work flow. Also untrained staff can operate the spectrometer securely and error free. Good to know: the user interface is available in 17 languages.

### **Logical: Sample handling the easy way**

When it comes to sample handling, TANGO saves time and prevents operating errors. No sample preparation is necessary, no chemicals, no additional reagents. The sample is simply filled into the measuring cup or vial with the measurement being done through glass.

### **Automatic: Background measurements**

Contributing to the high precision of FT-NIR spectrometers is the exact alignment with the background. TANGO goes one step further: The background measurements are performed automatically without user intervention. This alignment can even take place if a sample is located in the sampling position. The perfect prerequisite for optimal and secure measurements at any time – without (human) errors.



The results can be easily read from the clearly structured graphical interface.



TANGO is also available without integrated PC and touchscreen monitor for a seamless integration into existing IT periphery.



Personal consultation and customer service guarantee a sustainable and efficient solution.

**Ergonomic:  
User comfort in all ways.**

Nowadays, with laboratory space being at a premium, it is difficult to locate a the new analyzer in the lab. This isn't an issue with TANGO due to its small footprint and ability to be positioned in any orientation - it can be operated from all three sides. The monitor swivels in all directions and can even be tilted in various positions to enable an optimum view. Alternatively, it can be placed flat on top of the spectrometer for a perfect viewing from above.

**Practical:  
Efficiency in every detail.**

TANGO demonstrates how easy NIR analysis can be, not just during measurements. The housing and touch-screen monitor are rugged and easy to clean – ideal for lab and at-line environments. The exchange of the light source, if required, can be done in a few seconds. Also the desiccant cartridge, which keeps the inside low on humidity can be changed easily.

**Transmission measurements:  
highest precision for liquids.**

TANGO for measuring liquids comes equipped with an active sample heater/cooler as standard. The temperature of the sample can be selected between +20°C and +80°C. A sensor is permanently checking the temperature of the sample vial. This allows for a fast temperature control of the sample and therefore quick and reliable results.

**Reflection measurements:  
analyze solids efficiently.**

TANGO for measuring solids contains a gold coated integrating sphere for analysis by diffuse reflection. This sphere ensures highly reproducible measurements of inhomogeneous samples. The diameter of the measurement spot is around 10 mm; the measured sample surface can be enlarged by using sample rotators.

**TANGO for all applications**

The TANGO offers an efficient and cost-effective analysis for material identification and quantification of constituents in a wide variety of application fields.

The most important areas of application cover:



Food and Beverage Industry



Feed Manufacturing



Pharma and Biotechnology



Chemical and Petrochemical



Polymer Industry

Covered by one or more of the following patents: DE102004025448; DE19940981. Additional patents pending.

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

Laser class 1 product.

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

● **Bruker Optics Inc.**

Billerica, MA · USA  
Phone +1 (978) 439-9899  
Fax +1 (978) 663-9177  
info.bopt.us@bruker.com

**Bruker Optik GmbH**

Ettlingen · Germany  
Phone +49 (7243) 504-2000  
Fax +49 (7243) 504-2050  
info.bopt.de@bruker.com

**Bruker Shanghai Ltd.**

Shanghai · China  
Phone +86 21 51720-890  
Fax +86 21 51720-899  
info.bopt.cn@bruker.com



## ● **MATRIX-F** FT-NIR Spectrometer

The award winning MATRIX-F is the next generation of FT-NIR spectrometers for process applications.

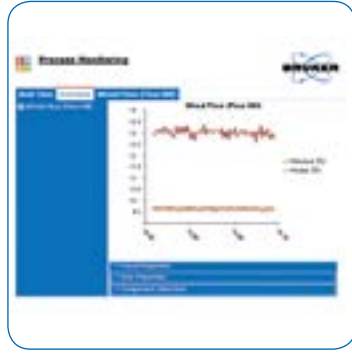
- Accurate in-line results in seconds
- Multiple components per measurement
- Non-destructive analysis
- Built-in 6-port multiplexer
- Direct method transfer
- Rugged design
- Ethernet connectivity and industry standard communication protocols

The award winning MATRIX-F is a dedicated Fourier Transform Near Infrared (FT-NIR) process spectrometer. It is the first industry hardened FT-NIR system that can directly withstand harsh environments. The spectrometer has 10 years warranty on the moving parts of the interferometer. This instrument incorporates state-of-the-art optics for outstanding sensitivity and stability in a compact module. Its innovative design provides consistent high quality results, less downtime, direct methods transfer and the possibility of new applications that less sensitive and precise instruments are incapable of. Full support of industry standard communication protocols makes the integration simple.

The MATRIX-F is an ideal process instrument, which can also be installed in the laboratory as a stand-alone system for method development and then move directly into your process application. The MATRIX-F is available as a free-standing unit with NEMA 4/ IP66 (splashproof) housing. It can also be mounted in a standard 19 inch rack in a temperature controlled cabinet. The MATRIX-F can be equipped with a 6 port fiber optic multiplexer. External multiplexers for additional measurement points are also available. The MATRIX-F is the future of FT-NIR technology for process control.



MATRIX-F FT-NIR spectrometer is ideal for in-line and on-line process monitoring.



CMET, the dedicated tool for process monitoring.



MATRIX-F duplex with fiber optic probe and measurement head.

### Maximum Utility

The MATRIX-F is the only FT-NIR spectrometer which can measure liquids and solids in transmission and reflection with just one instrument using light fiber technology:

- **Fiber Optic Probes:**  
Classic diffuse reflectance, transmittance or transmission probes with various path lengths can be adopted as well as process flow cells or pilot plant assemblies. Various probe materials are available, like stainless steel or Hastelloy.
- **Heads for Contactless Measurements:**  
The fiber optic NIR illumination and detection head contains tungsten sources which illuminate the sample. The scattered light is collected and guided via a fiber optic cable to the spectrometer. This way, a contactless measurement can be performed remotely, opening a whole array of new applications. Up to six heads can be connected to one MATRIX-F emission or MATRIX-F duplex spectrometer.

While the MATRIX-F *emission* is a dedicated instrument for the operation of up to six fiber optic NIR illumination and detection heads, the MATRIX-F *duplex* spectrometer can operate both fiber optic heads and the classic fiber optic probes.

Technologies used are protected by one or more of the following patents:  
US 7034944; US 5923422; DE 19704598

[www.bruker.com/optics](http://www.bruker.com/optics) ● **Bruker Optics Inc.**

Billerica, MA · USA  
Phone +1 (978) 439-9899  
Fax +1 (978) 663-9177  
info.bruker.com@bruker.com

**Bruker Optik GmbH**

Ettlingen · Germany  
Phone +49 (7243) 504-2000  
Fax +49 (7243) 504-2050  
info.bruker.de@bruker.com

**Bruker Shanghai Ltd.**

Shanghai · China  
Phone +86 21 51720-890  
Fax +86 21 51720-899  
info.bopt.cn@bruker.com

### FT-NIR Process Monitoring

Today many manufacturers are striving not only to produce the highest quality final product but also to improve manufacturing efficiency by taking analysis technology from the laboratory and applying it in their plants. By gaining tighter control over the manufacturing process, it is possible to optimize the use of materials and reduce or eliminate the production of off-specification material, thus avoiding reprocessing or disposal costs. Common process control applications include direct monitoring of chemical reactions and quality of intermediate and final products:

- Direct measurement in process reactors or pipelines, over webs or conveyor belts.
- Remote measurements over long distances.
- Improved process understanding and control.
- Ideal tool for determination of homogeneity of blending processes, concentrations of constituent chemicals and state of polymerization processes in various industries.

FT-NIR is an ideally suited spectroscopic technique for process measurements because of its ability to rapidly perform remote measurements via high efficiency quartz fiber optics. The attenuation of the signal inside such fibers is very small and NIR fiber optic cables and probes are robust, relatively inexpensive, and widely available. Process probes may be located directly in process streams at a distance of hundreds of meters from the spectrometer, and multiple probes may be attached to a single spectrometer.

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

Laser class 1 product.



## ● **MPA II** The new Multi Purpose Analyzer

The FT-NIR spectrometer MPA II is designed to meet the demands of today's and tomorrow's quality control. It combines outstanding flexibility and high performance with an easy-to-operate interface.

- Full line of sample presentation options for all NIR applications
- Software-controlled module selection, no manual exchange required
- Low cost of ownership thanks to high quality components with long life time
- Easy calibration transfer to other Bruker lab, at-line or process spectrometers
- Fully cGMP and 21 CFR Part 11 compliant, supports validation according to USP <1119> and Ph.Eur 2.2.40

### **Maximum Flexibility**

The MPA II offers everything you need for the analysis of liquids, semi-solids, solids, powders and tablets:

- Sample compartment
- Integrating sphere
- Fiber optic probes
- Transmission unit

With powerful accessories like the automated 30-position sample wheel for vials and tablets, the sample rotator for the integrating sphere and many different fiber probes, you will achieve high sample throughput with excellent precision.

### **High Performance FT-NIR**

The MPA II incorporates state-of-the-art optics for outstanding sensitivity and stability. The heart of the instrument is Bruker's permanently aligned RockSolid™ interferometer with gold-coated optics for maximum efficiency and sensitivity. The permanent alignment provides consistent high quality results, less downtime and outstanding stability; a precondition for reliable results and successful calibration transfer.





The MPA II and OPUS/LAB are so easy to use that even untrained staff can measure from day one.



Open sampling positions at all measurement channels with no need to open covers or drawers.



Automatic test routines for OQ and PQ ensure the system is operating at its best at all times.

### Built to Last

Made from robust components, using state-of-the-art solid state laser technology: the MPA II is a future-proof investment. This is why it comes with 10-year warranty on the moving parts of the interferometer as well as on the laser.

### Hassle-Free Maintenance

The MPA II spectrometer is designed to be easily maintained by the user, decreasing downtime and maintenance costs. Light source and desiccant cartridge are easily interchangeable and permanent online diagnostics monitor the instrument and advise the user of any problems.

### Service and Support

If you need us, we are here to help! Bruker Optics is staffed with a large group of scientists and engineers to respond to your needs:

- Applications support
- Comprehensive training courses
- Worldwide service

### Easy Operation

Customizable workspaces as well as easy measurement modes which guide you through the setup of analytical methods are

standard in the OPUS spectroscopy software. Measurements can be started with a mouse click or at the touch of a button.

### Software

The OPUS measurement software with integrated database support and additional OPUS packages make the MPA II easy to operate:

- OPUS/NIRLAB: Dedicated QA/QC software combining OPUS/LAB with qualitative and quantitative evaluation routines
- ONET: Web based application to setup, administrate and control a network of FT-NIR instruments from anywhere in the world
- OPUS/IDENT: Setup of identification methods with hierarchical libraries
- OPUS/CONFO: Setup of conformity test methods
- OPUS/QUANT: Setup of self-optimizing chemometric quantification methods

### Validation

Trust your results with Bruker Optics' OPUS/VALIDATION package and the OPUS spectroscopy software:

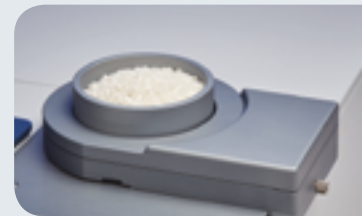
- Full 21 CFR Part 11 compliance
- Full GMP compliance
- IQ/OQ/PQ support



**Sample Compartment** for temperature-controlled transmission measurements of vials and cuvettes.



**Fiber Optic Probes** for transmission and reflectance measurements directly inside the sample containers.



**Integrating Sphere** for measuring solids, semi-solids and heterogeneous materials in diffuse reflection.



**Transmission Unit** with optional sample wheel for the automated analysis of tablets in transmission.

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

Laser class 1 product.

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

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

● **Bruker Optics Inc.**

Billerica, MA · USA  
Phone +1 (978) 439-9899  
Fax +1 (978) 663-9177  
info.bopt.us@bruker.com

**Bruker Optik GmbH**

Ettlingen · Germany  
Phone +49 (7243) 504-2000  
Fax +49 (7243) 504-2050  
info.bopt.de@bruker.com

**Bruker Shanghai Ltd.**

Shanghai · China  
Phone +86 21 51720-800  
Fax +86 21 51720-899  
info.bopt.cn@bruker.com