

Nicolet iN10 MX Infrared Imaging Microscope

The breakthrough in infrared imaging beyond automation, simplicity and imaging

The Thermo Scientific™ Nicolet™ iN10 MX Infrared Imaging Microscope enables your laboratory to obtain chemical, physical, and distribution information effortlessly, with the speed and the confidence you need to provide reliable answers. Innovative software simplifies user operation, while the efficiency of integrated optics provides new levels of performance to microscopy and chemical imaging.

The Nicolet iN10 MX Infrared Imaging Microscope features efficient Fourier transform infrared (FTIR) chemical imaging for optimum performance. Its integrated design allows the analysis of microscope samples without the need for an FTIR spectrometer.

Due to its intuitive Thermo Scientific OMNIC™ Picta™ User Interface (UI), users with little prior experience in microscopy or spectroscopy are able to quickly and effectively collect sample data to characterize compound distributions and physical properties from materials in complex matrices, while it provides the speed, sensitivity and resolution of traditional infrared (IR) microscopy.

Nicolet iN10 MX Imaging Microscope benefits

The Nicolet iN10 MX Imaging Microscope is integrated, so that all the optical components work in harmony, providing you tangible benefits and cost savings, without the need for a separate FTIR spectrometer.

- The Nicolet iN10 MX Imaging Microscope allows you to analyze samples as small as 50 micron without liquid nitrogen (LN), anytime, safely and at the lowest possible cost.

- Laboratories do not need a separate FTIR, saving valuable space and budget.
- Built-in intelligence minimizes the learning process, automates instrument validation, and provides chemical, physical and distribution information through seamless procedures, letting you save time and focus on the answers.
- The Nicolet iN10 MX Imaging Microscope comes standard with ultra-fast mapping, but if you need more analytical power, just upgrade to imaging. The Nicolet iN10 MX Imaging Microscope grows with you.
- You can also add the Thermo Scientific Nicolet™ iZ10 FTIR External Module to get full spectrometer capabilities, with minimal cost.

The imaging microscope's superior video capturing technology, computer controlled automation, and dual monitor operation, allow you to access all system settings from the computer. Even the joystick for the motorized stage is controlled by software, letting you save space and time to focus on your tasks.

Configured to meet your requirements


- Direct contact sampling with MicroTip ATR
- Sensitivity enhancement with LN- cooled detector
- From ultra-fast mapping to MX imaging
- Best viewing comfort with dual monitor operation
- Enhanced viewing with motorized visible polarizer

	Thermo Scientific Nicolet iN10 mapping	Nicolet iN10 ultra-fast mapping	Nicolet iN10 MX imaging
1.2 × 1.2 mm Area	45 minutes	4.5 minutes	20 seconds
Stage speed	1 step/sec	10 steps/sec	10 steps/sec
Interferometer speed	1 spectrum/sec	10 spectra/sec	150 spectra/sec
Collection parameters (all instruments)	Spatial resolution 25 μm Spectral resolution 16 cm ⁻¹ Single scan collection		



	Specification	Benefit
Sample viewing Illumination	Independent reflection and transmission electronic LED illuminators controlled by software; separate LED illumination for aperture	Uniformly illuminated wide field of view. Allows viewing in reflection and collection of nontransparent materials in transmission. Separate illumination for the aperture allows error-free operation
Video image	High-resolution 1/3 inch color digital camera USB2 with 1024 x 768 XGA low-noise CCD; real-time 500 micron field of view	Crisp, vivid color, high definition video imaging and mosaic acquisition; can be exported to a second monitor for viewing comfort
Real-time IR spectrum	Thermo Scientific TruView—simultaneous view of sample while collecting data; full view of the sample area with aperture positioned, even during collection	Observe sample and spectrum in real-time without obscuration from masking aperture for total confidence in results
Microscope optics Spatial resolution modes	Patented variable system employing continuously variable, 25/6.25 micron fixed, and 6.25/1.6 micron fixed ATR pixel sizes.*	Optimize mapping time, sensitivity, and spatial resolving power to best suit your sample size and chemical information requirements
Gold coated optics	Gold coating of infrared beam conditioning, reflection/transmission, detectors and aperture mirrors	Superior sensitivity and maximum efficiency in any infrared sampling mode allows room temperature liquid-nitrogen free analysis
Gold coated imaging optics	Gold coating of infrared imaging beam conditioning and focusing mirrors. Patented vignetting-controlled design for optimal infrared uniformity.**	Ultra fast imaging collection, high sensitivity and optimal spatial resolution
Aperture	Off-axis, rotating, motorized knife edge aperture	Computer controlled and separately illuminated, for aperture visualization before and during acquisition of data
IR/Visible objective and condenser	Permanently aligned 15x, 0.7 N.A. (half angle range 20 to 43.5 degrees). Objective with built-in purge collar ring and dovetail mount for SlideOn ATR crystal with 16 mm working distance.	High numerical aperture provides best performance with light scattering samples. X-Y condenser centering automatic focus adjustment is not needed for transmission analysis and auto park.
Sample thickness	Up to 20 mm with standard sample holders	Allows the analysis in reflection and ATR of samples as thick as 20 mm without needing to remove condenser. Over 20 mm samples can be measured, depending on the overall size.
ATR option	SlideOn MicroTip Ge ATR crystal. Microscopy optimized multi-coated crystal design (throughput >50%), 27 degree average angle.	Precise mounting allows ease of cleaning and accurate targeting. Enables sampling of 5 microns, or smaller sample sizes.†
Integrated FTIR optics Interferometer	Dynamically aligned high speed interferometer. High-speed collection up to 10 scans per second at 16 cm ⁻¹ . 0.4 cm ⁻¹ maximum resolution (with Nicolet iZ10 external module).	Provides best short and long-term stability, moving mirror tilt and share errors-free. High throughput for best sensitivity in any sampling mode and detector. Ultra-fast collection of data.
Beamsplitter	Multicoated KBr/germanium	Spectral range 7600–375 cm ⁻¹
Infrared source	EverGlo air-cooled long lasting source, externally mounted	High throughput, and easy to replace
Optics	Sealed and desiccated, optionally purged	Desiccants and humidity indicator side panel, for easy user replacement. System can be optionally purged.
Calibration laser	HeNe with built-in power supply	Best wavelength calibration and lifetime
External beam	Right side external beam	Allows connection to the Nicolet iZ10 Module with flexible, full-size macro sampling compartment
Detectors Standard	Microscopy optimized room temperature DTGS Spectral range 7600–450 cm ⁻¹	Specifically designed for infrared microscopy, allows collection of data in any sampling mode (transmission, reflection and ATR), with no need for LN and samples as small as 50 microns. Extended range allows inorganics and fillers analysis
Optional	Liquid nitrogen cooled MCT-A spectral range 7800–650 cm ⁻¹	Long lasting vacuum lifetime, 16 hours LN hold time provides overnight acquisition of area maps
Optional	Liquid nitrogen cooled MCT-A linear array spectral range 7800–720 cm ⁻¹	High sensitivity and speed for challenging samples with a proprietary, long vacuum life LN dewar for long shifts or large area mapping

	Specification	Benefit
Automations	Standard	Fully automated, computer controlled
Aperture		
Condenser focus/park	Standard	Automatic adjustment in transmission, auto park in reflection, and ATR modes to enable up to 20 mm sample thickness analysis and to simplify system setup
Sample focus	Standard	Fully automated, computer controlled
Reflection/transmission	Standard	Fully automated, computer controlled
ATR contact alert	Standard	Integrated, with digital display readout of applied pressure and custom selectable threshold for highest ATR mapping uniformity
Infrared/visible	Not required	Simultaneous view and collection through dichroic mirrors does not require automation and user selection
Detector selection	Standard	Fully automated, computer controlled
Motorized stage	Standard. Ultra-fast mapping/imaging	High-speed, 2.75x5" motorized stage and virtual joystick software control for precision and ergonomic design; slide plate holder with built-in gold mirror and void position for automatic background collection in reflection and transmission; quick-release mount 2.75x5" X-Y stage with optional hardware joystick available
Visible polarizer	Optional	Fully automated, computer controlled
Performance features	Single element detector	Most samples require just few seconds of collection time. Superior sensitivity for challenging samples and smallest particles
Signal-to-noise at 2100–2000 cm ⁻¹ , 4 cm ⁻¹ Resolution, 2 minutes	Better than 25,000:1 with cooled detector	
Ultra-fast mapping	Up to 10 stage steps of 25 microns per second, single scan per step at 16 cm ⁻¹ , spectral range 4000–650 cm ⁻¹	Impressive mapping speed allows the collection of 1.2 x 1.2 mm in 4.5 minutes instead of 45 minutes of standard mapping
Spectral range	7600–650 cm ⁻¹	Mid-band MCT-A detector allows superior sensitivity in any sampling mode, and optimal spectral range
Performance features	Linear array detector	(Optional for MX Imaging)
Signal to noise at 25 μm spatial resolution, 2100–2000 cm ⁻¹ , 16 cm ⁻¹ resolution, (4 scans)	Better than 500:1	High sensitivity allows collection of single scan spectra up to a rate of 160 per second
Signal to noise at 10 μm spatial resolution (6.25 micron pixel size), 2100–2000 cm ⁻¹ , 16 cm ⁻¹ resolution (4 scans)	Better than 160:1	High sensitivity and zoom design allow collection of high spatial resolution images
Ultra-fast imaging	Up to 10 stage steps per second single scan per step at 16 cm ⁻¹ , spectral range 4000–715 cm ⁻¹	Impressive imaging speed allows the collection of 1.2 x 1.2 mm image in as low as 20 seconds instead of 4.5 minutes of ultra-fast mapping
Maximum image size	Up to 10 x 10 mm or better depending on spectral range, spatial resolution, spectral resolution and computer speed/memory	Allows collection of large areas, at specific frequency ranges where information is needed
Spectral range	7600–715 cm ⁻¹	Mid-band photoconductive MCT array allows superior sensitivity in any sampling mode, optimal spectral range, and extraordinary reliability
Validation and performance qualifications	Transmission, reflection, and ATR	Ensures confidence that results, in any sampling mode are in compliance with internationally accepted FTIR performance verification method
ASTM Method		
European, pharmacopoeia methods	Transmission, reflection, and ATR	Ensures confidence that results, in any sampling mode are in compliance with European Pharmacopoeia FTIR performance verification method
Reference standards	NIST Traceable polystyrene standards; standards plate in protective case and traceability documentation	Ensure traceability to internationally accepted references
Validation mode	Fully automated	Validation kit and procedure for transmission and reflection operation; if ATR test is included, requires manual displacement of crystal in place and removal for background acquisition.

	Specification	Benefit
OMNIC Picta UI Real-time spectral preview	Preview sample spectrum, sample image, and aperture, while scanning	Surveys sample to find best location to collect final data; ensures results and location consistency; allows continuous sample screening while moving the stage
Real-time preview and search	Dynamic library searching of preview spectra	Enables real-time identification of samples, while in preview mode
Automations	Focus, condenser focus and park, dual detector, reflection/transmission, aperture, external beam, illuminations	Total control of the microscope from workstation PC
Autofocus and autoillumination	Adjusts focus and illumination for best viewing	Lowers optimal sample viewing setting skills, increases speed
Dual screen operation	Allows exporting of the video image or the mosaic image to a second monitor. Detachable joystick interface can be exported as well.	Improves comfort in viewing and magnifies sample for easier observation of details
Infrared energy optimizer	Adjusts optics for infrared reflection or transmission analysis	Eliminates the need for user condenser adjustment or parking; lowers infrared microscopy skills requirement
ATR contact control	Built-in pressure monitoring sensor device with custom adjustable maximum pressure	Eliminates crystal damage; standardizes the pressure applied to multiple points increasing spectral uniformity; adjustable pressure to fit wide range of samples
Polarizer control	Motorized polarizer and motorized rotatable analyzer	(Optional) Allows insertion and control of visible polarization viewing enhancement from workstation PC
Operating system	Windows® XP or Windows 7	
Patented OMNIC Picta Wizards† Sample Locator	Slide view navigator automatically moves sample	Greatly simplifies loading and locating samples. Move directly to sample locations on common slide formats using Slide View Graphical interface.
Mapping Controls	Discrete, line, and map scans	Multiple random points, cross sections and areas map collection. No need to specify reference location for reflection or transmission background collection; minimizes infrared microscopy skill requirements.
Particle Wizard	Measures particle(s) size, sets best fit aperture, collects spectrum and background, search spectrum against library	Provides material identification, size, percentage of distribution and chemical image of particles within an area, automatically. Simplifies particle analysis for any type of use.
Inclusions Wizard	Similar to particle analyzer but designed to remove spectral contribution from embedding material	Minimizes or removes the need for delamination or extraction of particles from bulk; improves microscope usability lowering skills requirements
Random Mixtures Wizard	Extracts multiple chemical maps from a raw map	Provides self extraction of distribution information of multiple materials within an area. Displays material identification, total area and distribution, for each material identified. Enables chemical mapping usability to any type of user.
Laminates Wizard	Applicable to line maps, identifies layers and calculates thicknesses by spectral match	Allows collection of large areas, at specific frequency ranges where information is needed
Other		
Power requirements	100–240 V AC 47–63 Hz 3.2 amp.	
Regulatory approvals		
Dimensions	622 × 653 × 533 mm (W x D x H)	
Warranty	12 month, full warranty, complete system	

* U.S. Patent No. 7,456,950.

** U.S. Patent No. 7,440,095.

† U.S. Patent No. 7,496,220.

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