Thermo Scientific Nicolet iN10 MX Infrared Imaging Microscope

The breakthrough in infrared imaging – beyond automation, simplicity and imaging

The Thermo Scientific™ Nicolet™ iN™10 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 FT-IR chemical imaging microscope features an efficient optical design for optimum performance. Its integrated design allows the analysis of microscope samples without the need for an FT-IR spectrometer.

With its intuitive Thermo Scientific™ OMNIC™ Picta™ user interface, 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 providing the speed, sensitivity and resolution of traditional infrared microscopy.

Nicolet iN10 MX Imaging Microscope Benefits

The Nicolet iN10 MX is an integrated infrared imaging microscope, where all the optical components work in harmony, providing you tangible benefits and cost savings, with no need for a separate FT-IR spectrometer.

- The Nicolet iN10 MX allows you to analyze samples as small as 50 micron with no need for liquid nitrogen, anytime, safely and at the lowest possible cost.
- Since there is no need for a complete system with a spectrometer, you can save valuable laboratory 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 comes standard with Ultra Fast Mapping, but if you need more analytical power, just upgrade to imaging. The Nicolet iN10 MX grows with you.
- You can also add the Thermo Scientific™ Nicolet™ iZ™10 FT-IR external module to get full spectrometer capabilities, with minimal cost.

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, time and focusing on your tasks.

Configure Your Nicolet iN10 MX to Meet Your Requirements

- Direct contact sampling with MicroTip ATR
- Sensitivity enhancement by liquid nitrogen cooled detector
- From Ultra-Fast mapping to MX Imaging
- Best viewing comfort by dual monitor operation
- Enhanced viewing by motorized visible polarizer

	Nicolet iN10 Mapping	Nicolet iN10 MX UltraFast 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		

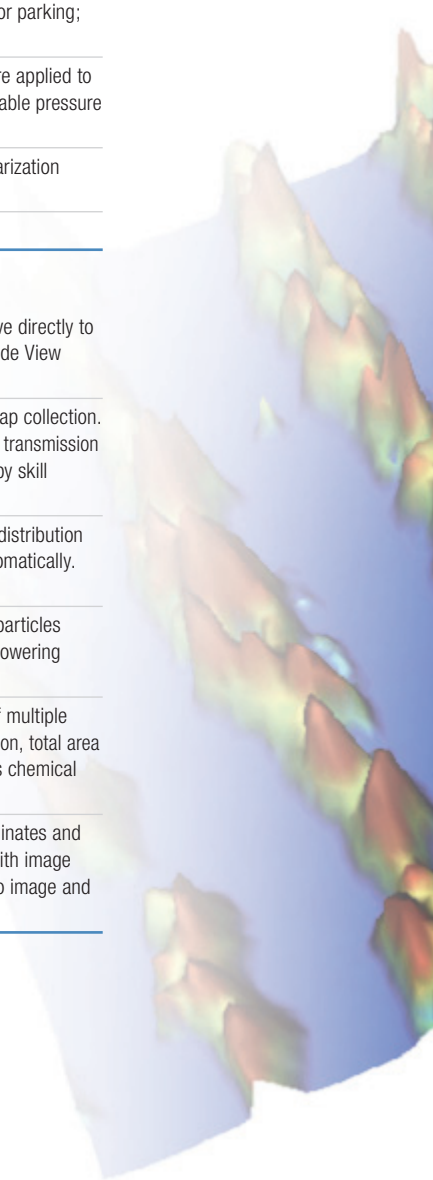
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	Specification	Benefit
Sample Viewing		
Illumination	Independent reflection and transmission electronic LED illuminators, software controlled. Separate LED illumination for aperture.	Uniformly illuminated wide field of view. Allows viewing in reflection and collection of non transparent materials in transmission. Separate illumination for the aperture allows error-free operation.
Video Image	High resolution 1/3" color digital camera USB2 with 1024 × 768 XGA low-noise CCD. Real-time 500 micron field of view.	Crisp, vivid color, high definition video imaging and mosaic acquisition. Image can be exported to a second monitor for best 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		
Spacial Resolution Modes	Patented variable system employing continuously variable, 25/6.25 micron fixed, and 6.25/1.6 micron fixed ATR pixel sizes.[1]	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.[2]	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 15×, 0.7 N.A. (half angle range 20° to 43.5°). Objective with built-in purge collar ring and dovetail mount for SlideOn ATR crystal. Working distance 16 mm.	High numerical aperture provides best performance with light scattering samples. No need for X-Y condenser centering automatic focus adjustment 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 with no need 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° average angle.	Precise mounting allows ease of cleaning and accurate targeting. Enables sampling of 5 microns, or less sample-size.[3]
Integrated FT-IR Optics		
Interferometer	Dynamically aligned high-speed interferometer. High speed collection up to 10 scans per second @ 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. Ultrafast collection of data.
Beamsplitter	Multi-coated 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	Dessicants 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 liquid nitrogen 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 liquid nitrogen 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. Proprietary, long vacuum life liquid nitrogen dewar for long shifts or large area mapping.

	Specification	Benefit
Automations		
Aperture	Standard	Fully automated, computer controlled
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 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 2.75"× 5" motorized stage and virtual joystick software control provide precision and ergonomic design. Includes slide plate holder with built-in gold mirror and void position for automatic background collection in reflection and transmission. Quick-release mount 2.75" × 5" X-Y stage (hardware joystick optionally available).
Visible Polarizer	Optional	Fully automated, computer controlled
Performance Features Signal-to-noise @ 2100–2000 cm^{-1}, 4 cm^{-1} Resolution, 2 minutes	**Single Element Detector** Better than 25,000:1 with cooled detector	Most samples require just few seconds of collection time. Superior sensitivity for challenging samples and smallest particles
Ultra-fast Mapping	Up to 10 stage steps of 25 microns per second, single scan per step @ 16 cm^{-1}, spectral range 4000–650 cm^{-1}	Impressive mapping speed allows the collection of 1.2 × 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 Signal to noise @ 25 µm Spatial Resolution, 2100–2000 cm^{-1}, 16 cm^{-1} Resolution, (4 scans)	**Linear Array Detector** Better than 500:1	**(Optional for MX Imaging)** High sensitivity allows collection of single scan spectra up to a rate of 160 per second
Signal to Noise @ 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 @ 16 cm^{-1}, spectral range 4000–715 cm^{-1}	Impressive imaging speed allows the collection of 1.2 × 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 × 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 ASTM Method	Transmission, Reflection and ATR	Ensures confidence in results, in any sampling mode in compliance to internationally accepted FT-IR performance verification method
European, Pharmacopoeia Methods	Transmission, Reflection and ATR	Ensures confidence in results, in any sampling mode in compliance to European Pharmacopoeia FT-IR 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		
Real Time Spectral Preview	Preview sample spectrum, sample image and aperture, while scanning	Survey 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[3]		
Sample Locater	Slide View navigator automatically moves sample to the focus point	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 particles extraction from bulk improves microscope usability lowering skills requirement
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	Provides thickness and material identification of laminates and paint chips by chemical properties. In conjunction with image analysis, provides dual thickness confirmation (video image and chemical image).
Other		
Power Requirements	100–240 V AC 47–63 Hz 3.2 amp.	
Regulatory Approvals	CE, ETL	
Dimensions	622 mm × 653 mm × 533 mm (W x D x H)	
Warranty	12 month, full warranty, complete system	

1. U.S. Patent No. 7,456,950
2. U.S. Patent No. 7,440,095
3. U.S. Patent No. 7,496,220



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