

Infrared Microscope

IRT-1000X



Performance
Innovation
Reliability



X
Open

Y
Open

Pre
BKG

Pre
Smp.

ATOS



X
Close

Y
Close

BKG

Smp.

Stop



The IRT-1000X is an advanced microscopy accessory designed for high-performance analysis of microscopic samples. Engineered for seamless integration, it is fully compatible with JASCO FT/IR-4X, 6X, and 8X spectrometers, installing directly into the sample compartment in seconds—no optical alignment required.

Combining cutting-edge optical design with user-friendly functionality, the IRT-1000X delivers exceptional sensitivity and throughput, enabling reliable measurement of samples as small as 20 μm . It brings the power of an external FTIR microscope into a compact, cost-effective format ideal for both routine and advanced IR microspectroscopy.

The IRT-1000X is a compact, lightweight, and cost-effective infrared microscope designed for precise measurement of small and trace samples. It easily mounts to the sample compartment of JASCO FTIR spectrometers, just like any standard accessory, enabling quick installation and removal without complex setup.

A high-resolution built-in CCD camera provides clear, real-time images of the sample, displayed through dedicated PC software. Users can navigate the motorized stage while viewing the live monitor feed, making the system intuitive even for those with minimal microscopy

experience. High-luminance white LEDs offer bright, long-lasting illumination for enhanced sample visibility.

Aperture control is fully electronic and can be adjusted either from the IRT-1000X control panel or via the software. The ATOS (Aperture Through Optical System) feature enables users to observe the specific area defined by the aperture,

enhancing targeting accuracy. Additionally, the SmartMonitor function allows continuous visual observation of the sample during measurement. Users can simultaneously view spectral data and the sample image in real time, ensuring precise alignment and confident selection of the measurement area.



Features

- **Compact and lightweight design** – Space-saving FTIR sample compartment microscopy system
- **ATOS (Aperture Through Optical System)** – Simultaneous viewing of the sample image and the aperture-defined sampling area
- **SmartMonitor functionality** – Real-time observation of the sample during spectral data acquisition
- **Versatile objective options** – Supports a range of ATR objectives for diverse sampling needs
- **Intuitive operation** – Direct control available from the IRT-1000X main unit
- **Comprehensive software package** – Dedicated PC software included for simultaneous storage of spectral data and microscope images



Easy Installation

Weighing only approximately 7 kg, the IRT-1000X is lightweight and easy to attach or remove. Its slide-guide mounting system enables quick installation onto the FTIR sample compartment without the need for optical alignment.



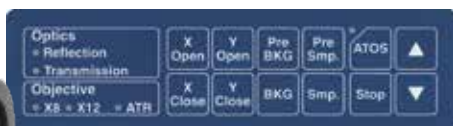
Effortless Objective Lens Replacement

The IRT-1000X features a convenient slide-in system for objective lens replacement, eliminating the need for the traditional screw-in method. This design allows for quick and easy lens exchange. Additionally, the built-in objective lens recognition mechanism automatically identifies the installed lens, displays its type on the operation panel, and records the information as part of the spectral data for comprehensive measurement traceability.

Condenser Lens Adjustment Mechanism

In transmission measurements using an infrared microscopy system, variations in sample thickness and refractive index can cause a focal point shift of the infrared beam, potentially degrading data quality. To address this, the IRT-1000X is equipped with a condenser lens height adjustment mechanism, allowing precise focus correction and ensuring optimal measurement accuracy across a wide range of sample types.





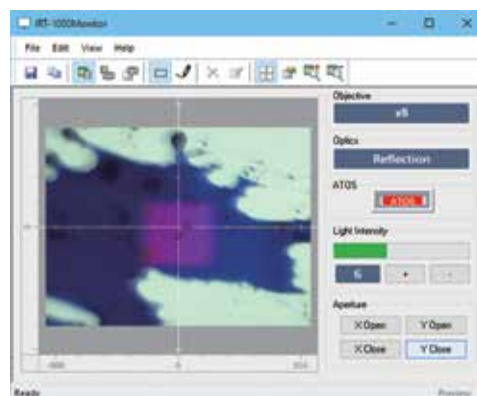
Operation Panel

The IRT-1000X features an intuitive operation panel that allows users to perform key functions without the need for a PC, including:

- Displaying the selected measurement mode (transmission, reflection, or ATR)
- Displaying the type of objective lens currently in use
- Opening and closing the motorized aperture
- Switching the ATOS illumination ON or OFF
- Adjusting the brightness of the sample observation illumination
- Starting and stopping measurements directly

PC Software

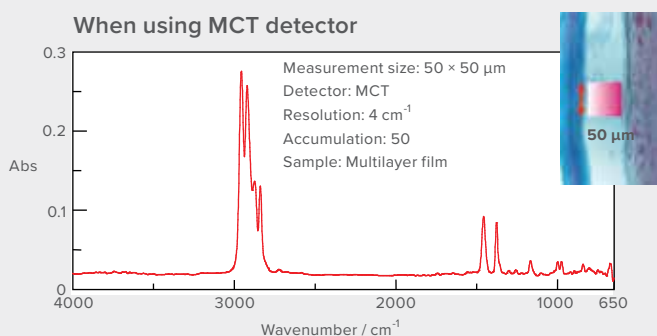
The standard dedicated PC software provides comprehensive control and visualization features for the IRT-1000X. Users can view high-resolution observation images with up to 5 $\times$ digital zoom, operate the motorized aperture, and monitor the status of the microscope's optical system in real time. Additional functions include scale display, length measurement, and ATOS overlay on the observation image. All image data can be saved alongside the corresponding spectral measurement data for complete and traceable documentation.



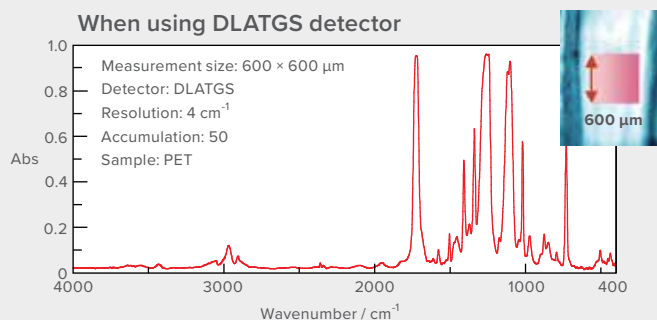
Measurement Example

The IRT-1000X utilizes the detector built into the FTIR main unit for spectral measurements. When equipped with a standard DLATGS detector, it supports measurements down to a wavenumber range of 400 cm^{-1} . For applications requiring higher sensitivity—such as the analysis of small or trace samples—an optional MCT detector is available.

When using MCT detector



When using DLATGS detector



Furthermore, when paired with an FTIR system capable of near-infrared (NIR) measurements, the IRT-1000X can function as a near-infrared microscope by using a high-sensitivity NIR detector, such as InGaAs. This flexibility allows the system to adapt to a wide range of analytical needs.

Optional Accessories

ATR

The ATR objectives for the IRT-1000X can be easily and precisely exchanged using the convenient slide-in method. JASCO offers the following ATR objectives to suit various measurement needs:

- **ATR-1000-VG (Ge) and ATR-1000-VZ (ZnSe)** These objectives allow seamless switching between sample observation and ATR measurements by adjusting the crystal position up and down.
- **ATR-1000-SS (ZnS) and ATR-1000-SD (diamond)** These models enable direct contact between the sample and crystal for sample observation during measurement.

*Pressure sensor is required.



Pressure Sensor

The state of contact between the ATR crystal and the sample can be easily monitored, helping to prevent any potential damage to the prism. The indicator section features a digital LCD display, and when the set pressure is reached, the LED blinks and a sensor is triggered.

*Required when using ATR



Purge Case

For microscopic measurements, purging with nitrogen or dry air ensures clean and accurate data. The IRT-1000X is compatible with the Smart Purge mechanism*, which effortlessly purges the inside of the microscope housing by simply placing it in the sample chamber. Additionally, the optional purge case enables purging around the stage, enhancing the effectiveness of the measurement.

*FTIR with Smart Purge only is available.



Demountable Cell for Transmission Measurement

The DLC-1000 demountable cell for transmission measurements comes with three standard spacers, offering path lengths of 0.1, 0.05, and 0.025 mm, making it ideal for liquid sample analysis.



Powder Measurement Holder

The DRH-1000 powder measurement holder is designed for diffuse reflectance measurements of powdered samples mixed with KBr. It allows for the loading of up to five samples at a time, enabling efficient analysis.



Specifications

IRT-1000X main unit

Photometric system	Transmission or reflection
Objective lens	x8 Cassegrain lens
Condenser lens	x8 Cassegrain lens
Condenser lens adjustment mechanism	Standard
Replacement of objective lens	Interchangeable, slide-in type
Detector	Detector of the FT/IR main unit is used.
Observation area	1.1 × 0.8 mm
Sample observation system	USB3 Vision camera, ATOS system, SmartMonitor (simultaneous observation)
Minimum measurement area	20 x 20 μm (when MCT detector is used), 100 x 100 μm (when DLATGS detector is used)
Measurement wavenumber range	13000 to 300 cm ⁻¹ *depends on the specifications of the FT/IR main unit
Sample stage	X-Y and Z manual stage X axis movable range: 45 mm Y axis movable range: 20 mm Z axis movable range: 12 mm Dead weight: 1kg
Aperture	2 axes are variable independently (motor driven)
Purge	Smart purge system
Illumination for observation	High-intensity white LED (with intensity adjustment)
Operation panel	Aperture size setting, measurement (sample, background, stop), ATOS illumination ON/OFF, intensity control, transmission/reflection ATR indicator, Cassegrain lens indicator

PC software

Applicable OS	Windows 11 Pro
Instrument control	Aperture 2 axes independently variable, intensity adjustment, ATOS illumination ON/OFF
Microscopic image monitor	Digital zoom (maximum x5), simultaneous saving of both image and spectrum data
Indicator	Transmission/reflection/ATR display, display of Cassegrain lens used
Length measuring function	Measurement of distance between 2 specified points

***When IRT-1000X is used with FT/IR-4X, FT/IR-4X extended sample chamber (ESC-4X) is required.**

Options

ATR-1000-VG	Observation type ATR objective (Ge crystal)
ATR-1000-VZ	Observation type ATR objective (ZnSe crystal)
ATR-1000-SS	Observation type ATR objective (ZnS crystal)
ATR-1000-SD	Observation type ATR objective (Diamond crystal)
PRS-1000	Pressure sensor (with LCD pressure monitor)
DLC-1000	Demountable cell for transmission measurement
DRH-1000	Powder measurement holder
SPC-1000	Purge case



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