

Keysight 7500 ILM

AFM Imaging on an Inverted Light Microscope



Overview

The 7500 inverted light microscope (ILM) system combines the power of a high-resolution atomic force microscope (AFM) with the direct optical viewing capability of an ILM.

The Keysight ILM offers unparalleled performance and ease of use for imaging in fluids. It extends AFM utility in order to encompass studies of single molecules, polymers, cell membranes, whole cells, and much more. Atomic force and optical fluorescence, FRET, darkfield and brightfield microscopy data can be obtained simultaneously.

The ILM's patented mounting design incorporates a rigid structure that provides the low noise floor needed to obtain sub-nanometer resolution. Furthermore, the advanced design allows the AFM to sit on top of an inverted microscope and under the illumination pillar, resulting in superior optical contrast for the images.

Keysight's QuickSlide sample-loading mechanism and a flexible sample-handling plate make sample preparation easy. The AFM is mounted on the QuickSlide assembly, allowing the user to change samples and/or solutions without affecting the alignment of the AFM or the optical microscope.

Features and Benefits

- High-resolution atomic force microscope on an inverted optical microscope allows simultaneous AFM and fluorescence imaging
- Top down, tip scanning design enables intuitive, effortless setup and imaging
- Patented, rigid stage mounting provides low noise floor for sub-nanometer resolution
- MAC Mode option provides gentlest, nondestructive AFM imaging of delicate samples in fluid
- PicoTREC option delivers real-time, simultaneous topography and molecular recognition imaging
- Sample-handling plates available to facilitate easy imaging in fluids or ambient air
- Applications include DNA, cell biology, proteins, polymers and thin films

Imaging Options

Optimized for use with Keysight's 7500 AFM the ILM allows researchers to take advantage of the many powerful features that are available only with Keysight's AFM instruments. For instance, Keysight's patented MAC Mode, the most gentle imaging mode available for any AFM platform, provides unparalleled performance in fluids. Flow-through liquid cells and precise temperature control options allow users to image soft biological samples under controlled physiological conditions. Keysight's proprietary sample plate stability further supports high-resolution AFM. Additionally, the unique PicoTREC option delivers real-time, simultaneous topography and recognition imaging.



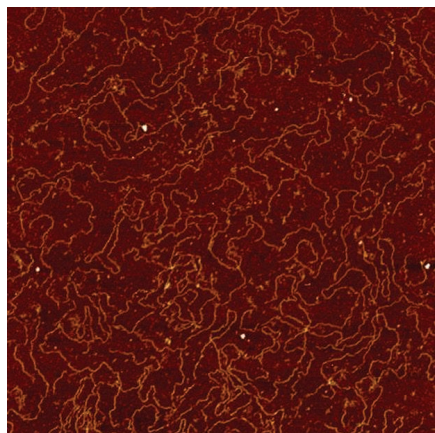
QuickSlide sample-loading mechanism.



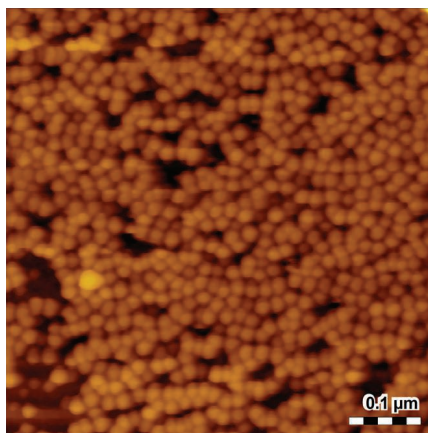
Sample plates.

Multiple Use Platform and Industry-Standard Compatibility

The Keysight ILM is a modular, multiple-user platform. The open-architecture design permits easy access, manipulation, setup, and modification of samples while experiments are being performed. Convenient access to the sample plate and familiar sample preparation techniques make the ILM ideal for life science and other applications that require intensive sample preparation. A variety of sample plates are available including, glass slide, petri dishes and liquid cell.



Topography image of DNA in MAC Mode in liquid with a top MAC nose cone.
Scan size: 2 μm x 2 μm .



Topography image of protein ferritin in MAC Mode in liquid with a top MAC nose cone.
Scan size: 600 nm x 600 nm.

7500ILM Specifications*

Scanner

Scan range:	90 μm x 90 μm
Z range:	>12 μm

Sample Size

Max sample diameter:	~ 25 mm
Max sample height:	~ 8 mm

Microscopes Supported

Zeiss AXIO Observer series

- Only every other turret can be populated (limited to 3 objectives)
- Condenser needs to have a 70 mm working distance or larger (0.3NA or 0.4NA)

Nikon TE2000/Ti Eclipse series

- All turret positions can be filled (all 6)
- Condenser needs to have at least a 70 mm working distance

Olympus IX series (53/73/83)

- All turret positions can be filled (all 6)
- Condenser needs to have at least a 70 mm working distance

* Please refer to the 7500 AFM data sheet for full specifications.

AFM Instrumentation from Keysight Technologies

Keysight Technologies offers high precision, modular AFM solutions for research, industry, and education. Exceptional worldwide support is provided by experienced application scientists and technical service personnel. Keysight's leading-edge R&D laboratories are dedicated to the timely introduction and optimization of innovative, easy-to-use AFM technologies.

www.keysight.com/find/afm

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