OLYMPUS®

Your Vision, Our Future

CONFOCAL LASER SCANNING MICROSCOPE

LEXT™

OLS3000

Welcome to the LEXT Generation

The name "LEXT" is formed from the words "Laser" and "Next," and means "next-generation 3D confocal laser microscopes".

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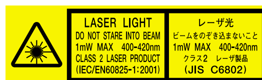

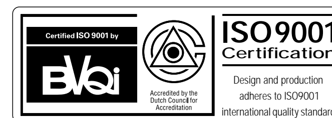

Specifications are subject to change without any obligation on the part of the manufacturer.

OLYMPUS®

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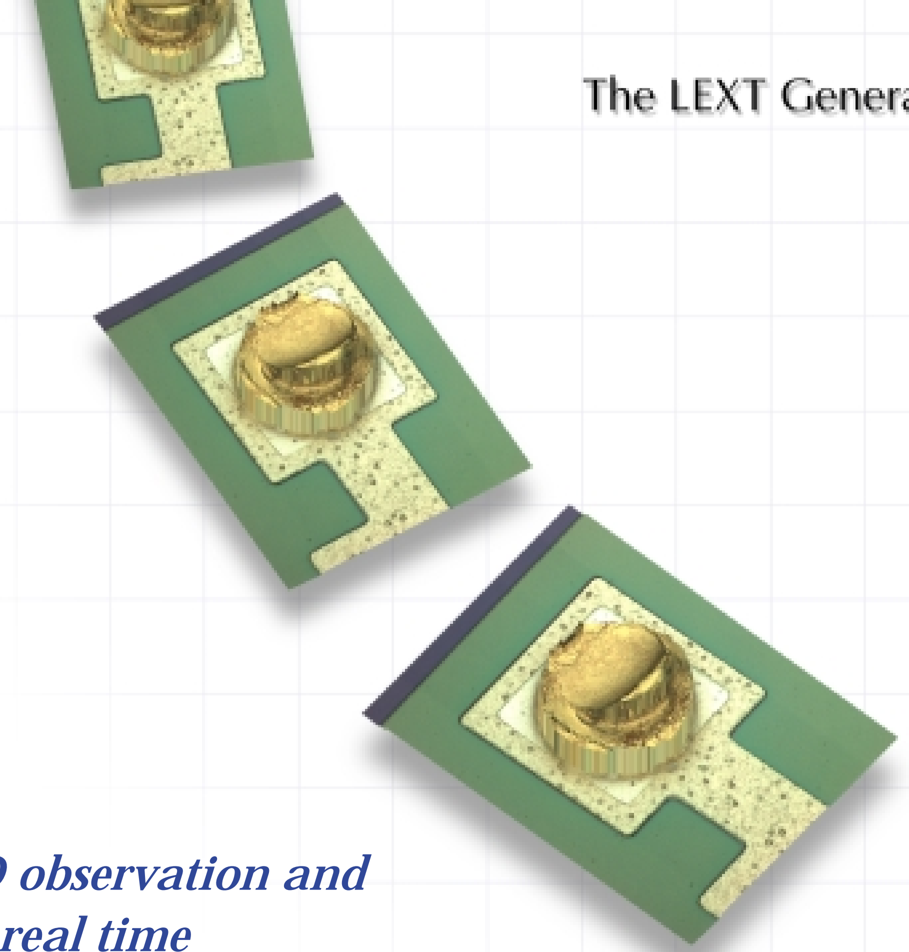
Fast, Easy Operation

- *No sample preparation required*
- *Accepts a wide array of sample*
- *Real-time observation*
- *Sophisticated technologies provide easy operation*

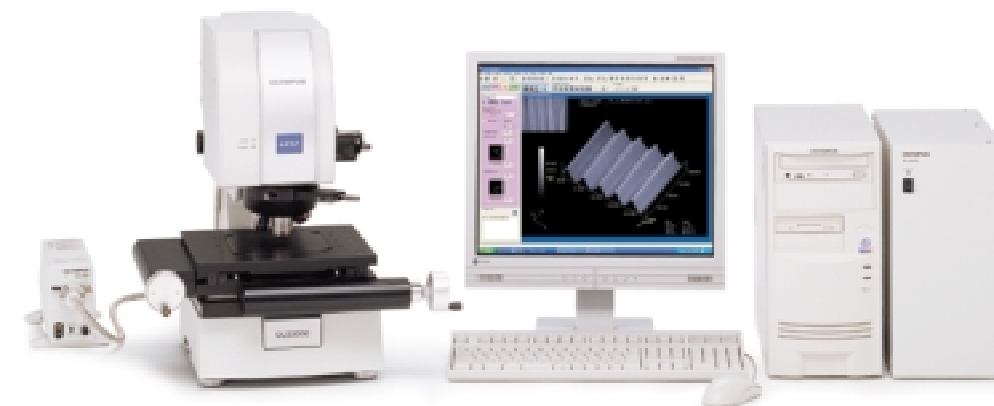
Reliability

- *Superb 3D measurement precision*
- *Higher resolving power than any conventional optical instrument*
- *Reliable traceability system*
- *Versatile 3D observation modes*



High-resolution 3D observation and measurement…in real time

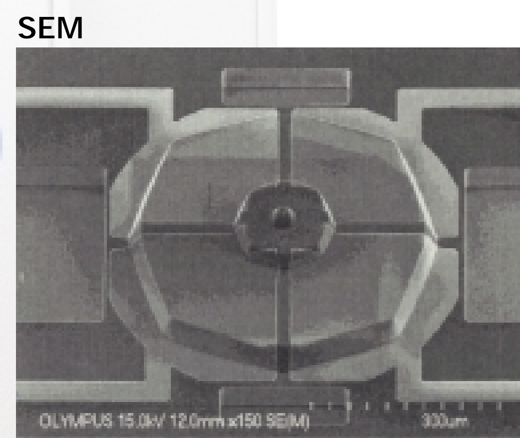
For fine surface profile measurement, are you really satisfied with the amount of time required for observation and measurement?
With current standards of operability, measurement precision and image resolution?
To meet our customers' demands for faster performance, easier operation and greater accuracy, Olympus has developed LEXT — a new confocal laser scanning microscope for ultra-precise measurement and observation with the highest levels of reliability. No vacuum pumpdown or sample preparation are required, and sample can be placed directly on the microscope stage as they are. Both 3D observation and high-precision 3D measurement are possible in real time. With much higher resolution than conventional optical devices but just as many different observation methods, every user can make quicker, more accurate specimen analyses all based on a strict traceability system.
LEXT, as a next-generation analysis device, is ideally suited for the ultra-fine surface observation and measurements required for micro fabrication devices like MEMS (Micro Electro Mechanical System), for new materials development, and for today's thinner devices, with more compact surface mounting requirements.



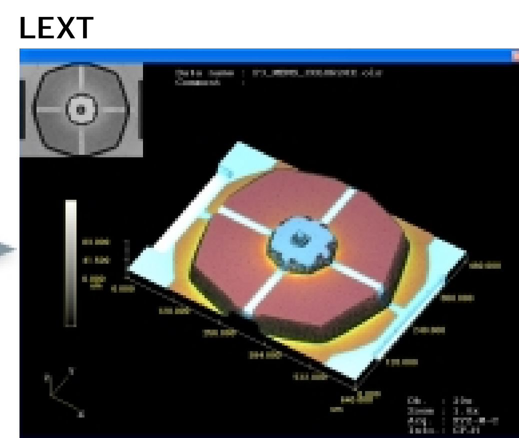
Highly reliable fine surface profile measurement.

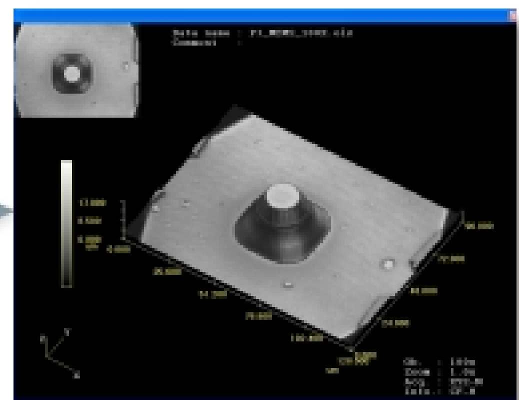
MEMS

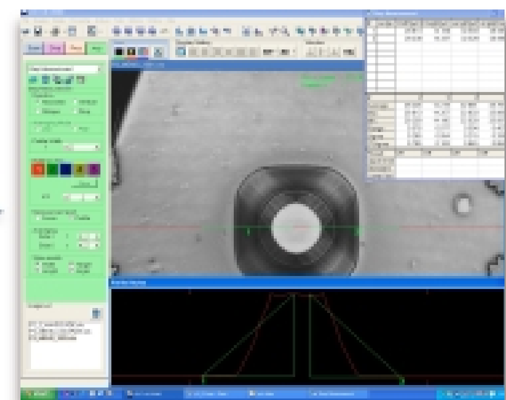
SEM



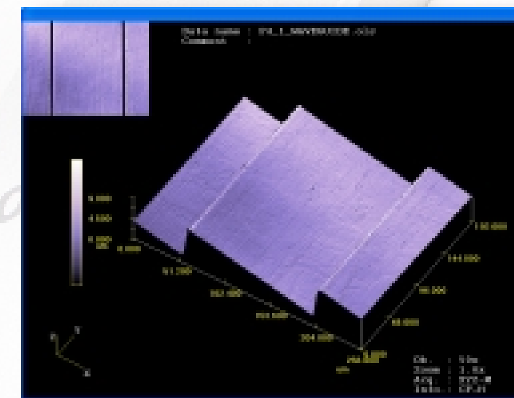
LEXT

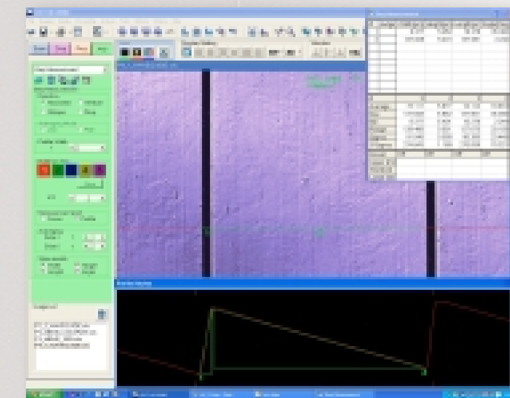

Color 3D display (480x)


Magnified center area

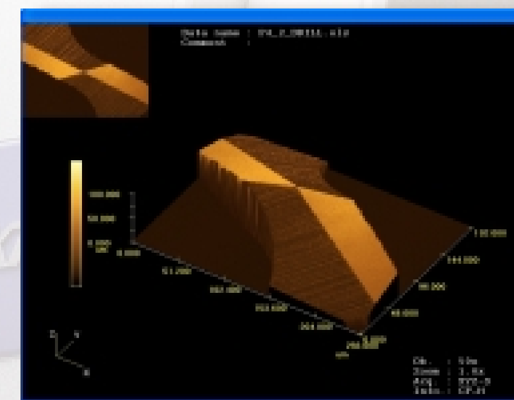


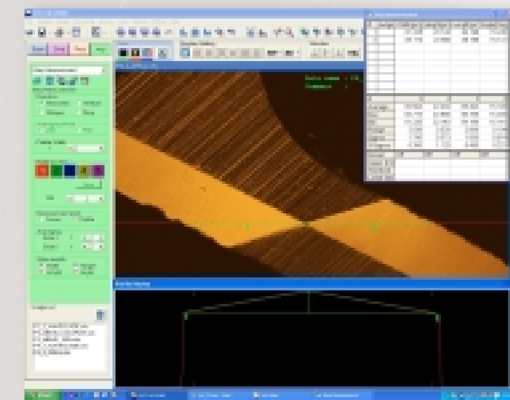
Optical wave guide


Laser DIC 3D display (1200x)

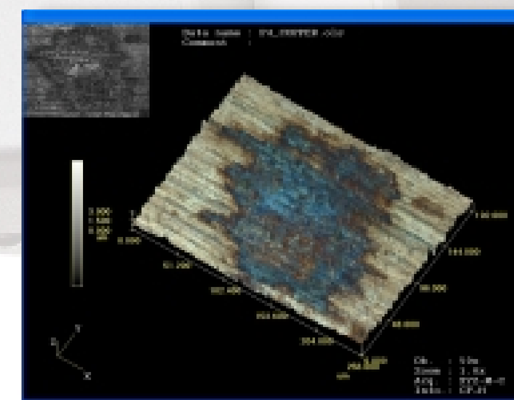

Depth and angle measurement

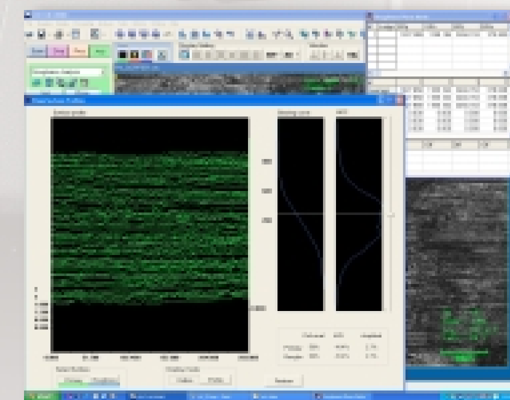
Ultra-precise drill


High-resolution 3D display (1200x)


Depth and angle measurement

Copper corrosion


Color 3D display


Roughness analysis

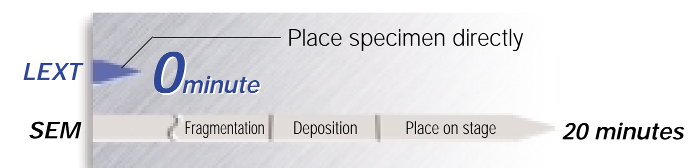
Fast, Easy Operation

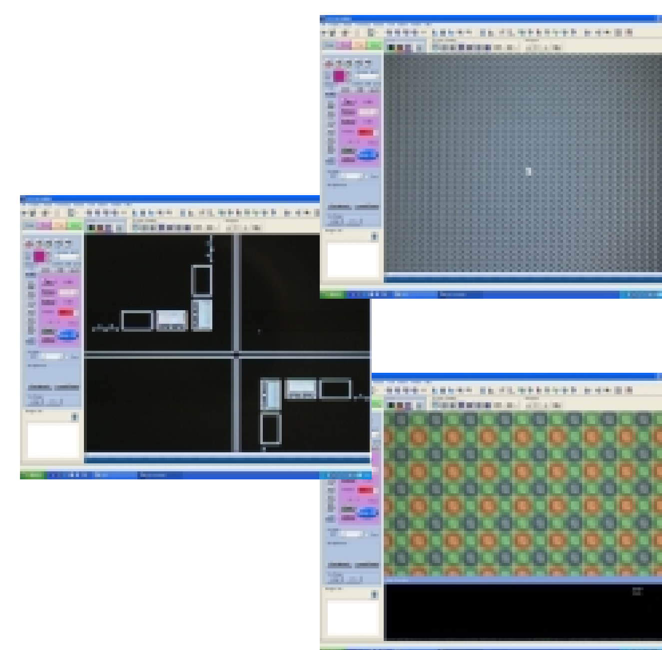
Superb ease-of-use makes inspections faster and more efficient.

No dicing, cleaving, deposition or any other sample preparation

In order for specimens to be studied with an electron microscope, they must fit into the chamber. They are therefore often fragmented and coated by vacuum-deposition. These operations can take as long as 20 minutes.
The LEXT, however, allows observation and measurement without any of these preliminary steps.
The maximum specimen load and accommodation height on the stage are up to 10kg and 100mm respectively. In addition, the standard manual stage can travel over a 100 x 100mm area, allowing precise location of the required observation spot.
Since the observation method used is non-destructive, observation and measurement can be more efficiently performed whenever you want.

Preparation





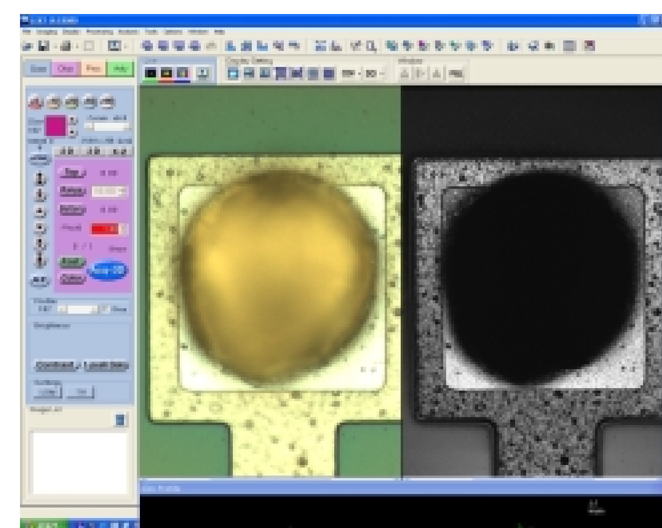
Sophisticated technologies make operations much easier

Like optical microscopes, operating LEXT requires no special knowledge — the image is visible as soon as the specimen is in place, allowing anyone to perform observation and measurement quickly and easily. Familiar optical microscope capabilities such as darkfield and Nomarski DIC observation are provided, so even the slightest damage or defect can be detected instantly. And LEXT is the world's first laser microscope to be equipped with 2-channel simultaneous display of color and laser images. LEXT can handle everything from detection of defects to comprehensive measurement analysis, all in a single model.

Fast identification of the measurement area

The microscope stage's X and Y guides employ a ball race for smooth, reliable performance. With coaxial coarse and fine focusing knobs, which enable fine positioning, the target point can be approached quickly and accurately.

Coaxial coarse and fine X/Y-axis movement knob



2-channel display

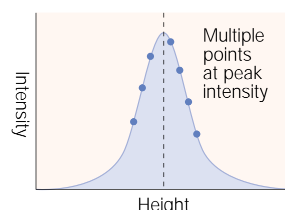
Reliability

Reliable, high-precision 3D measurement with no sample damage.

Focus on repeatability

LEXT's high repeatability applies not only to plane measurement, but to every other aspect of 3D measurement and analysis as well, including depth, volume, surface area and roughness, which cannot be performed by an electron microscope. Of critical value to height measurement, Z-axis scanning is precisely controlled by the use of a linear scale with 5nm increments, while the built-in Calculated Focus Operation (CFO) search function uses a sophisticated formula to calculate height information. In addition, measurement involves no contact with the specimen, so there is no danger of damaging it. LEXT meets the most demanding requirements of many different fields with exceptional reliability.

The repeatability figures speak for themselves: $3\sigma_{n-1} = 0.02\mu m$ and $3\sigma_{n-1} = 0.05 + 0.002L\mu m$ (L=measurement length)

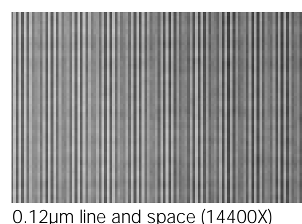


Focus on traceability

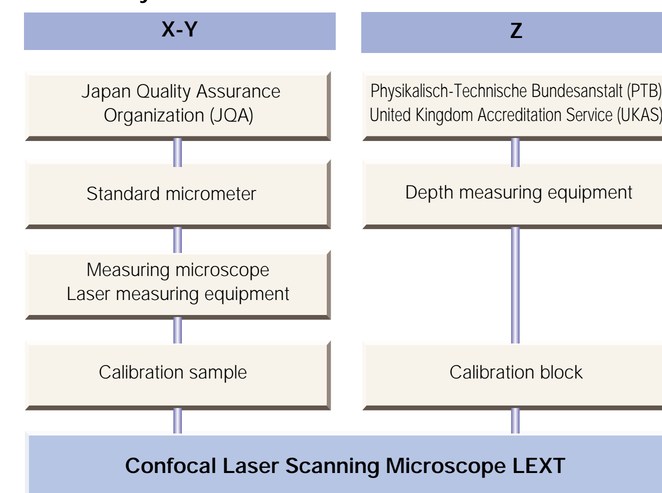
The reliability of measured data is based on a strict traceability system that conforms to the standards of the Japan Quality Assurance Organization, the Physikalisch-Technische Bundesanstalt, Germany and the United Kingdom Accreditation Service.

Focus on resolution

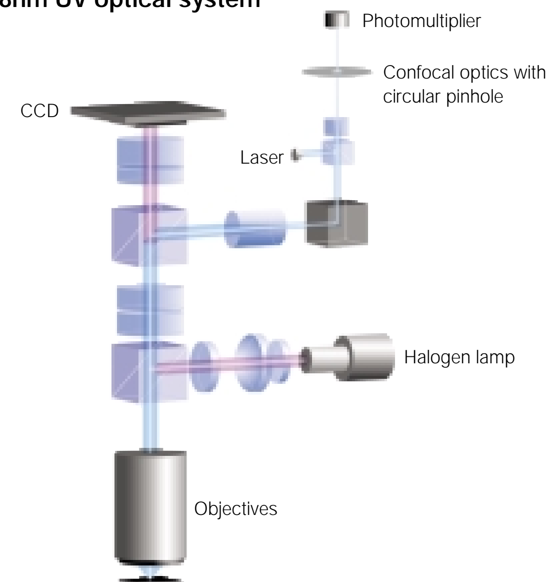
The sophisticated optical system specially-developed by Olympus for operation at 408nm provides outstanding image resolution by minimizing the aberrations associated with short wavelength illumination and maximizing the 408nm light source performance. Resolving power is enhanced by confocal optics featuring an additional, optimized circular pinhole and a high-speed XY scanner developed from Olympus MEMS technology. The result is world-leading plane resolution which clearly resolves 0.12μm line and space patterns of 0.01μm height, for ultra-precise measurements of micro fabrication surfaces.


0.12μm line and space (14400X)

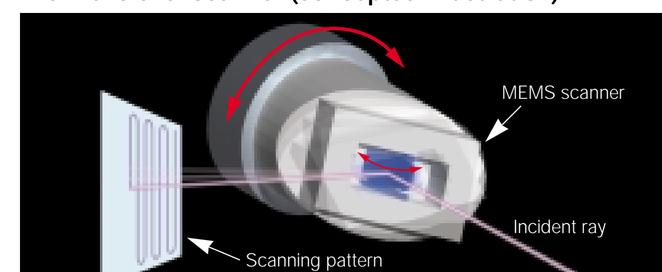
Traceability chart



408nm UV optical system



2-dimensional scanner (conceptual illustration)



Reliability

A wide variety of observation methods, especially valuable in multiphase analysis.

3D color images for clear analysis of the sample condition

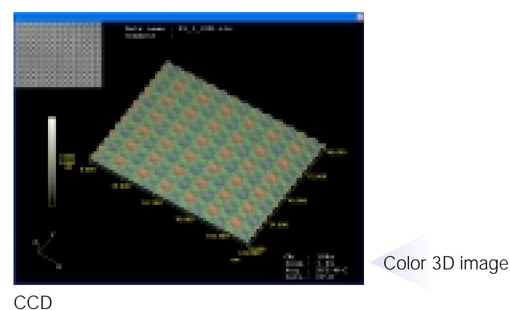
Defects in a color filter or metal corrosion that can not be shown by monochrome observation are displayed by LEXT in clear 3D color images, enabling much more comprehensive analysis than is possible by Scanning Electron Microscopy (SEM).

Laser DIC function for more detailed surface observation

The laser DIC observation function makes it possible to observe extremely small surface features in real 3D images, which is beyond the capabilities of conventional laser microscopes. By enabling surface observation equal to SEM, LEXT opens up new possibilities in observation and analysis.

Enhanced mode for clear images of specimens with regions of different reflection characteristics

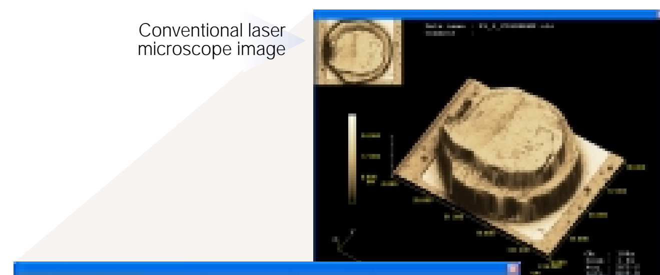
Conventional laser microscopes cannot produce usable images of specimens with different reflectivities, such as the substrate surface and copper wiring surface of a printed circuit. LEXT offers an enhanced mode by which these kinds of specimens can be imaged clearly. This same feature can also detect slanted samples, which interfere with the laser reflection, and are also problematic on conventional equipment.

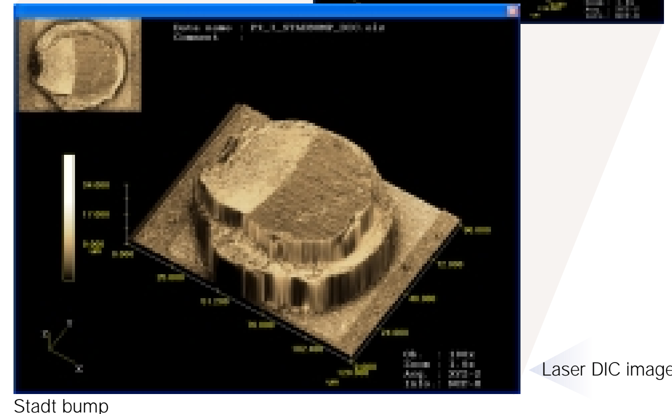


Color 3D image

CCD

Conventional laser microscope image

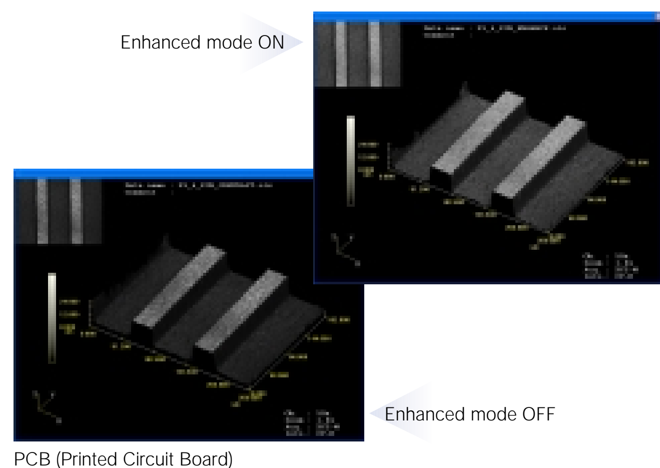




Laser DIC image

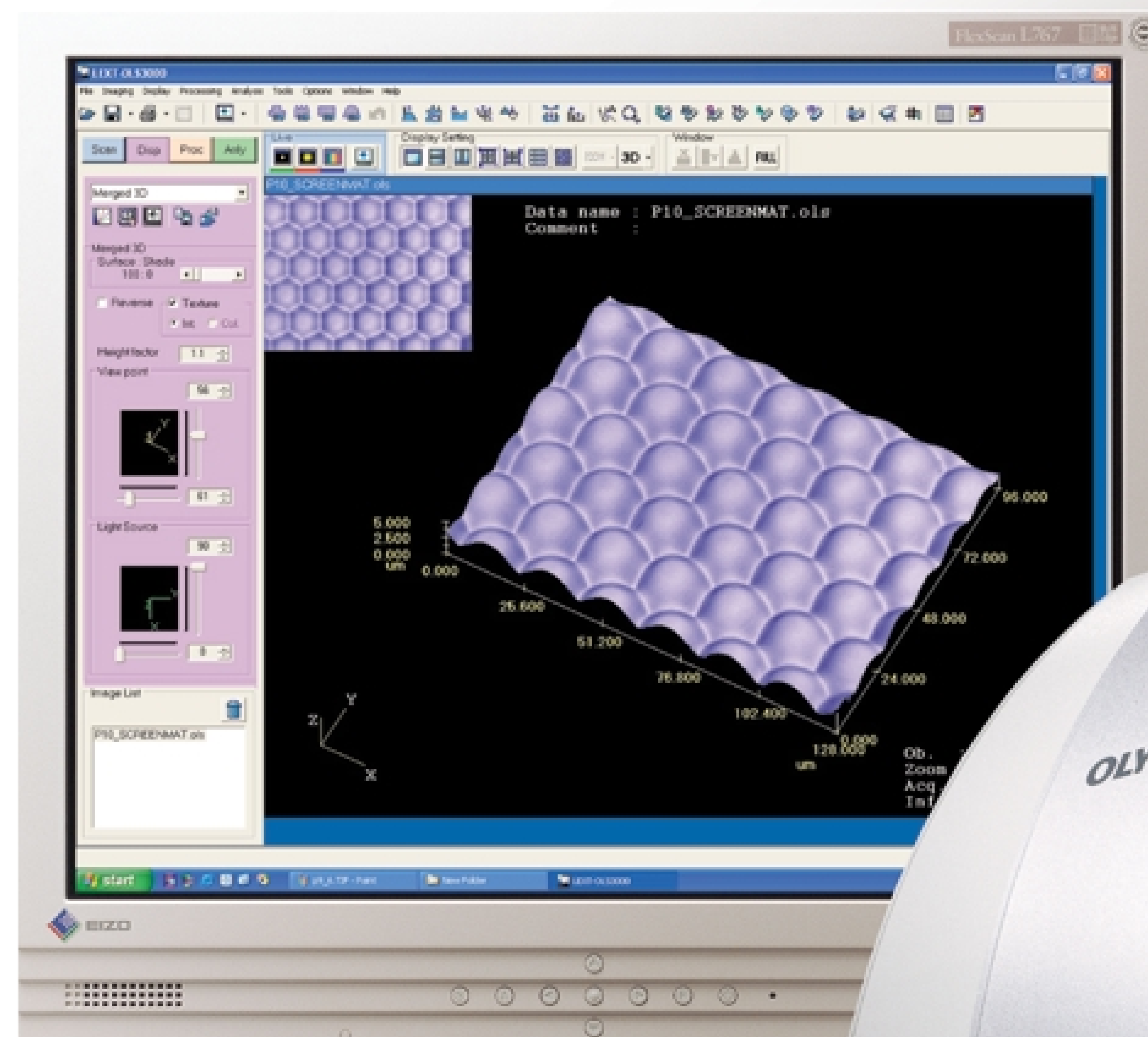
Stadt bump

Enhanced mode ON



Enhanced mode OFF

PCB (Printed Circuit Board)



LEXT Flow Chart

Real time observation

- Brightfield observation
- Darkfield observation
- DIC observation
- Laser confocal observation

Capture

- 2D capture
- 3D capture

Data storage

- OLS (Olympus) format
- TIFF
- BMP
- JPEG
- CSV

Processing

- Noise filtering
- Curvature and tilt compensation
- Edge enhancement

Analysis

- In-plane measurement
- Depth measurement
- Volume/surface area measurement
- Line width measurement
- Geometrical measurement
- Particle analysis
- Thickness measurement (Option)

Data transfer

- Excel data

Data storage

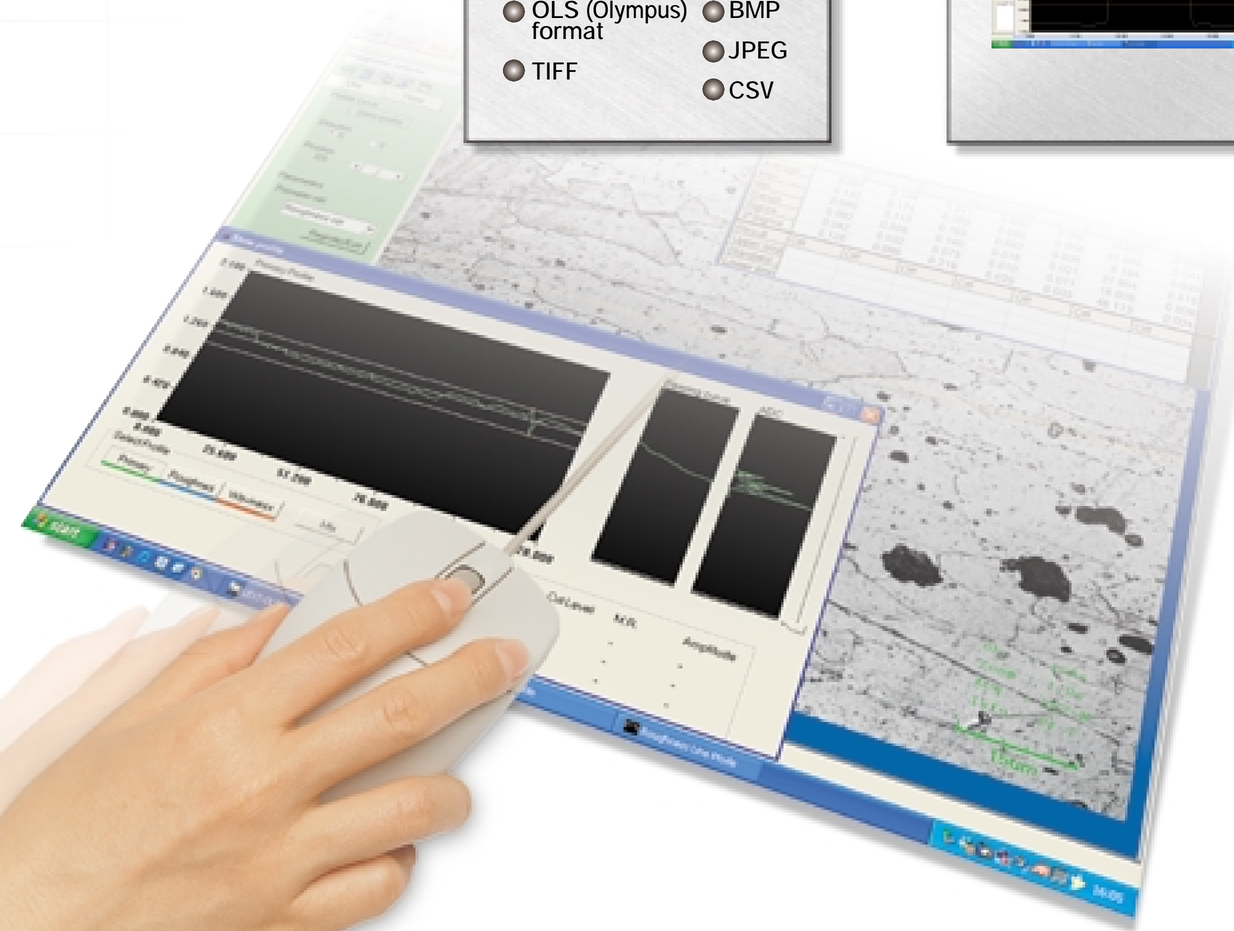
- CSV

3D display

- High resolution 2D/3D
- Color 2D/3D
- Surface
- Wire/mesh
- Contour line

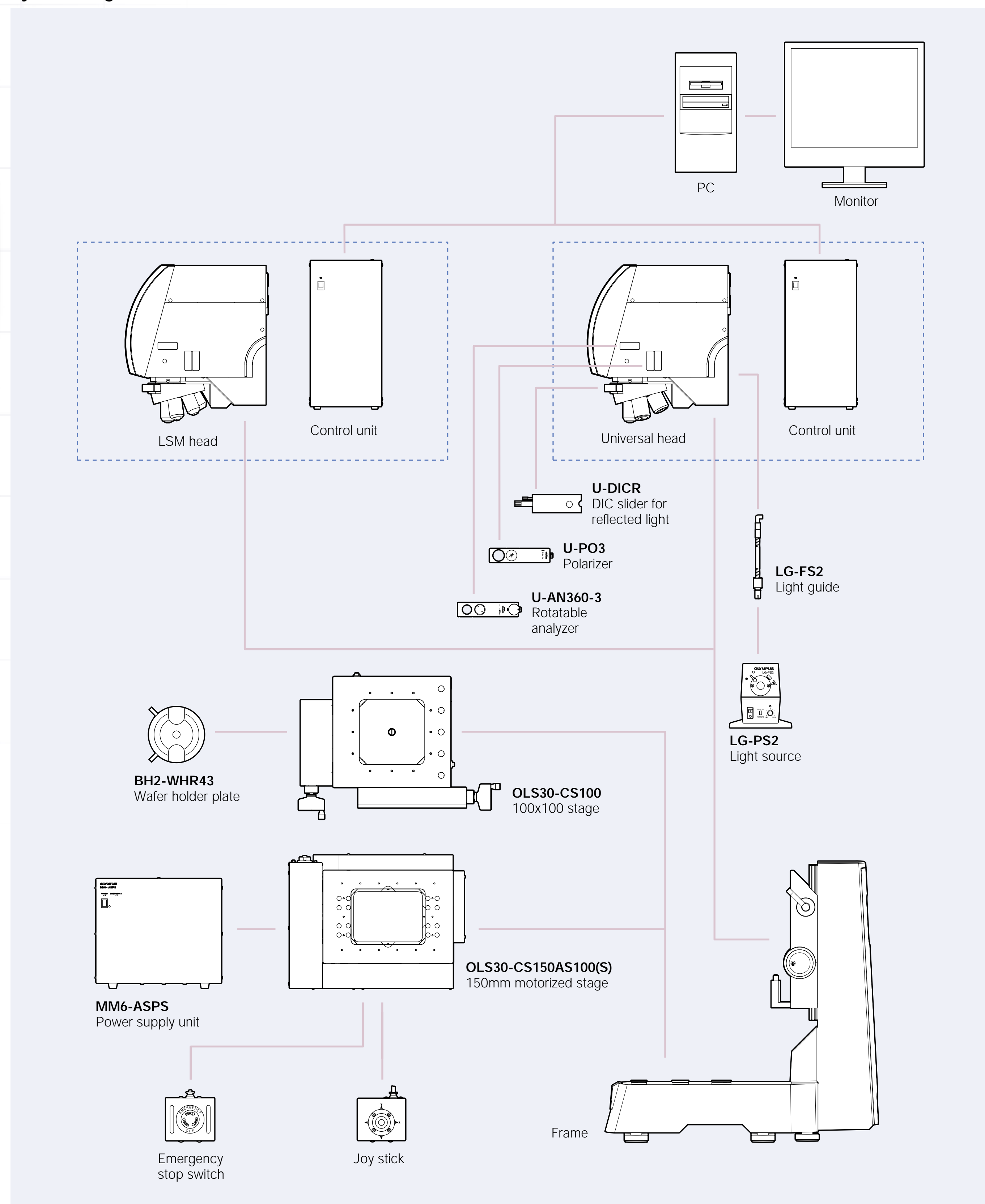
Data storage

- BMP
- JPEG



Technical Data

System Diagram

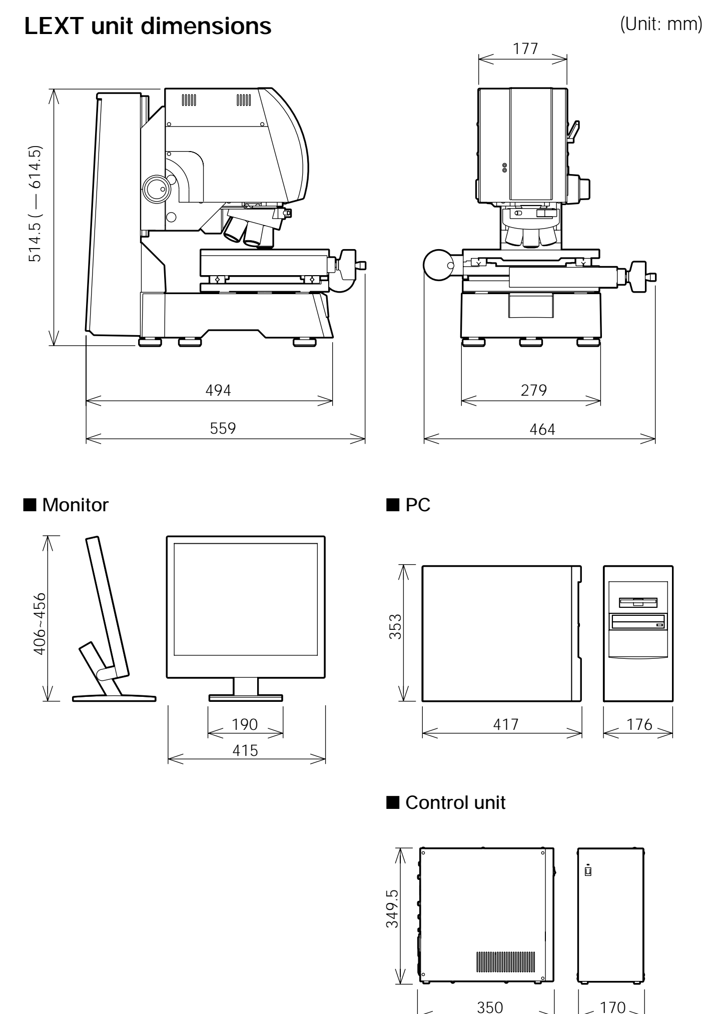


Specifications

			Laser scan	Universal
Observation method			Laser	Laser, brightfield, darkfield, DIC
Main body	Illumination	Laser	408nm LD laser	
			Class 2	
		Brightfield	—	12V100W Halogen lamp
	Z stage	Vertical movement	70mm	
		Maximum height of specimen	100mm	
	Z revolving nosepiece	Stroke	10mm	
		Resolution	0.01μm	
Objective			5x, 10x, 20x, 50x, 100x	
Optical zoom			1x-6x	
Total magnification			120x-14400x	
Field of view			2560x2560-21x21μm	
Stage		Manual stage	100x100mm	
		Motorized stage	150x100mm	
Frame memory		Intensity	1024x1024x12bit	
		Height	1024x1024x16bit	
AF			Laser reflection type	
Dimensions			464(W)x559(D)x614.5(H)mm	
Weight			56.9kg	57.5kg

LEXT unit dimensions

(Unit: mm)



LEXT configuration dimensions

(Unit: mm)