

lyncée tec^{DHM}

DIGITAL HOLOGRAPHIC MICROSCOPY

DHM[®] 1000 Family

A new generation of patented microscopes for 3D real-time optical topography



The ultimate solution in high precision microscopy combining simultaneously:

3D high resolution

Sub-nanometer vertical resolution
Powerful software for surface topography analysis

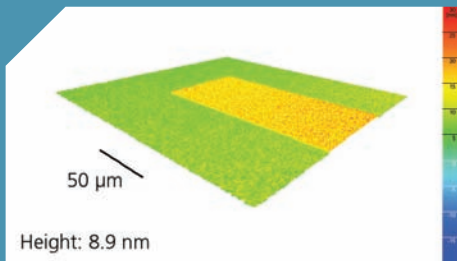
Real-time imaging

Very fast screening of your sample
Dynamic measurements

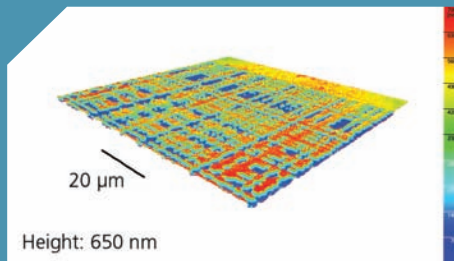
Robust, stable and easy to use

For harsh conditions on factory floor
For demanding R&D applications
and routine inspections

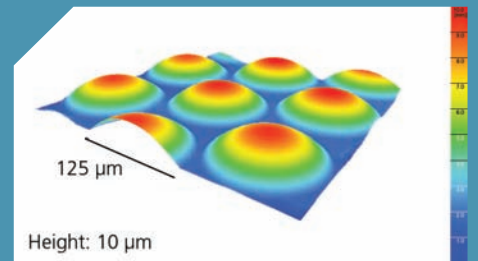




Optical topography at nanometer scale



Full wafer quality control



Optical properties and defect analysis

Applications

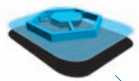
The DHM 1000 family enables contactless measurements without sample preparation for a wide range of materials and shapes down to the nanoscale.

Life Science

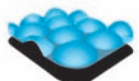


→ Cellular Biology
Bio Chips
Bio Sensors

Material Science



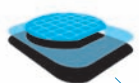
→ MEMS / MOEMS



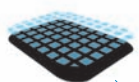
→ Micro Optics



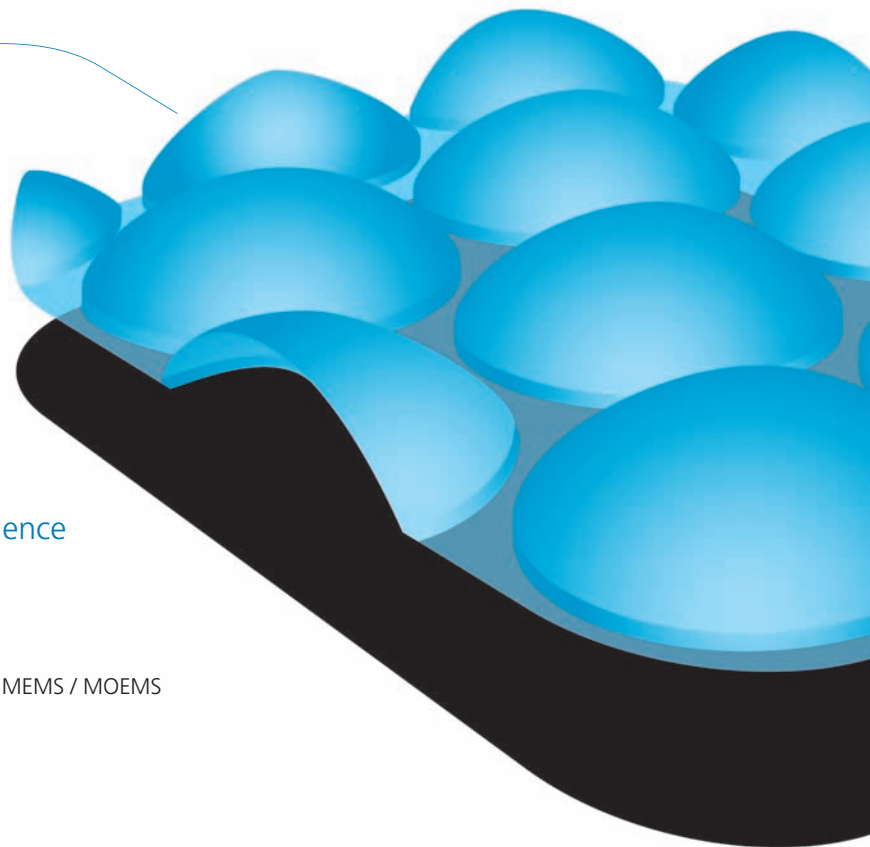
→ Micro Technology

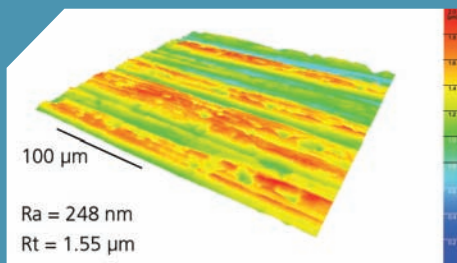


→ Semi Conductor

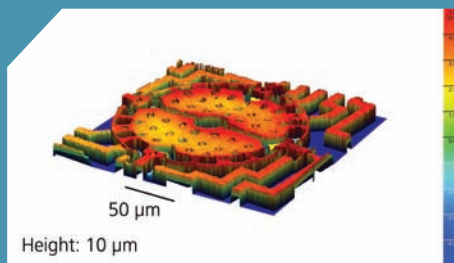


→ Nano Technology

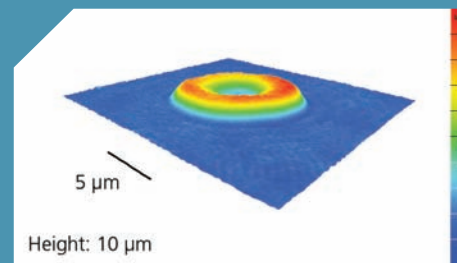




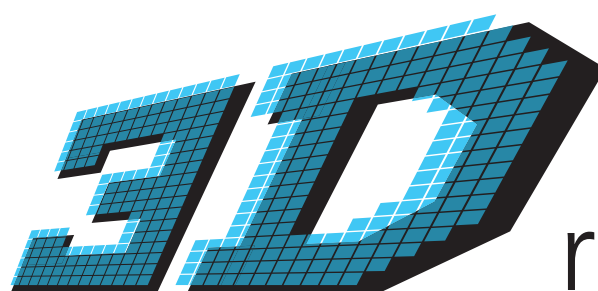
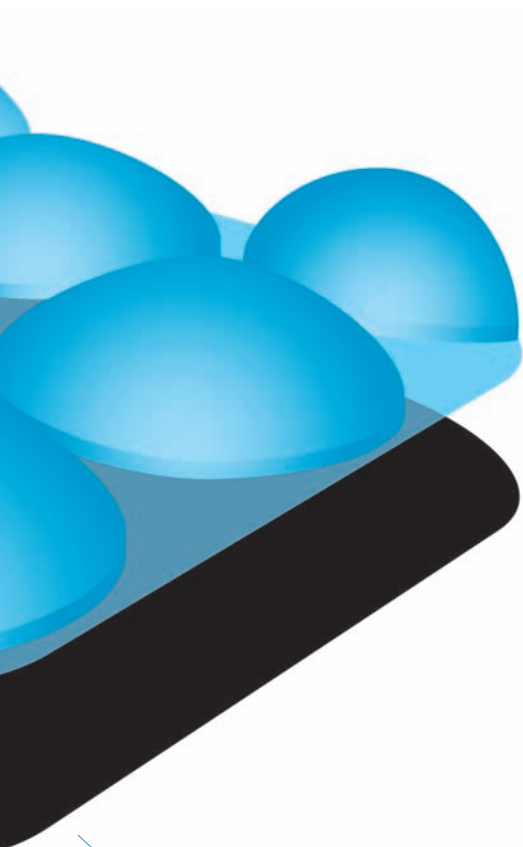
Roughness surface measurements



Extended step height measurement range



Cellular morphology monitoring



real-time optical topography

DHM combines advantages that make it an unrivaled technology

→ Real-time imaging

Video rate acquisition and fast digital reconstruction allow real-time imaging. Dynamic event viewing and active interaction with the observed phenomena are therefore possible.

→ Robust & stable

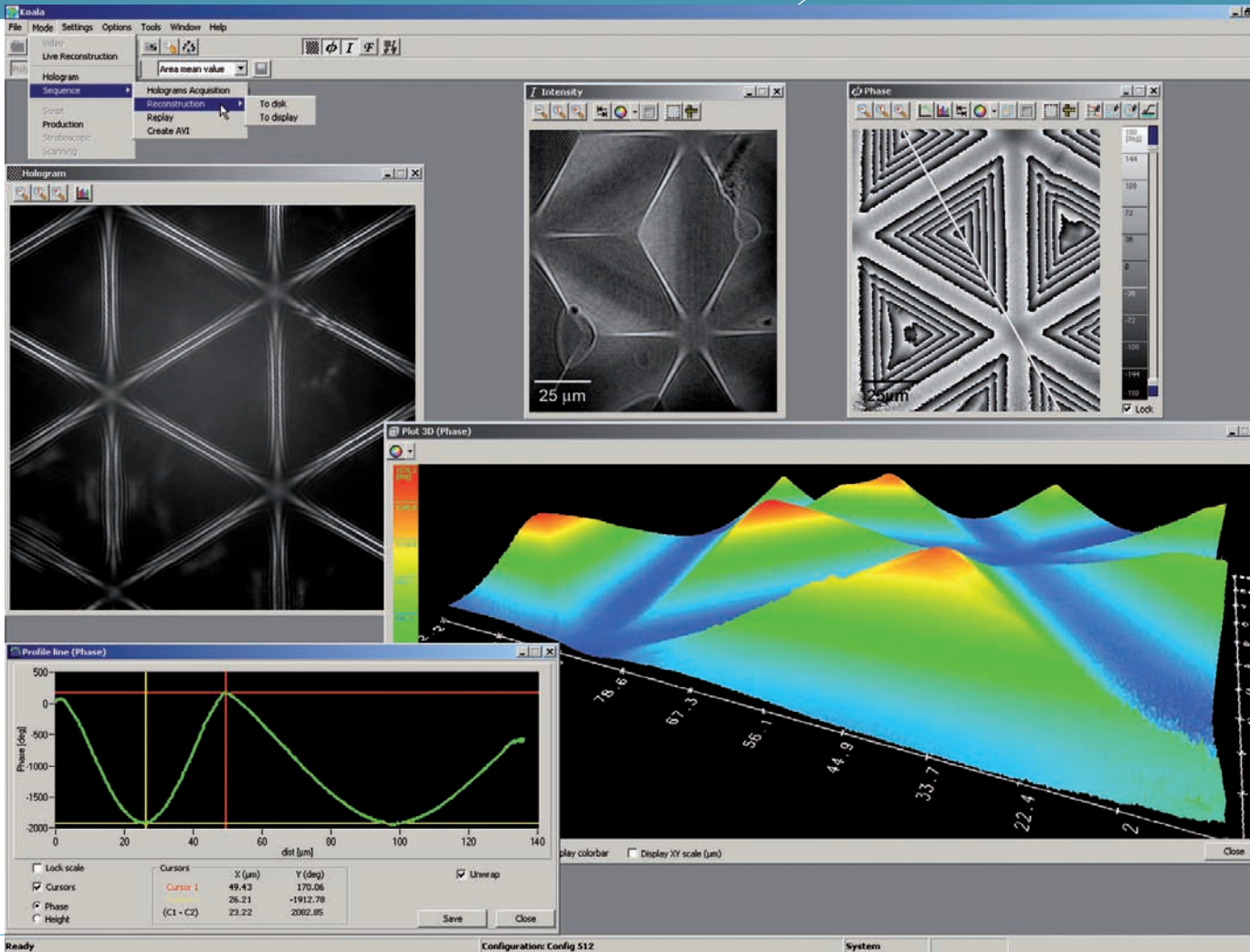
The short acquisition time (a few microseconds) makes the method insensitive to external vibrations and avoids the need for a vibration isolation table. Its stability permits prolonged examination sequences.

→ Contactless & non-invasive

The technique uses low-power light to illuminate the sample and form the image. The sample surface is never in physical contact with the DHM, thus ensuring the preservation of the sample characteristics. Biological specimens can be observed without contrast agent.

DHM 1000 Family

Software interface



↳ Cost effective solution

The DHM has low installation and operating costs. Adaptability and flexibility make it very competitive in the high resolution microscopy domain. All these features make the DHM a cost effective tool for R&D and quality control in production.

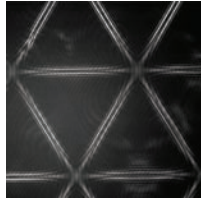
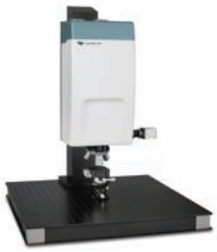
↳ User-friendly

No sample preparation, no specific environments (temperature, vacuum...), no high precision positioning or orientation of the sample, the simplicity of DHM makes it a user-friendly tool for quick and reliable measurements. The digital focusing technique, while increasing the depth of field, simplifies the fine tuning of image sharpness.

↳ Powerful 3D software

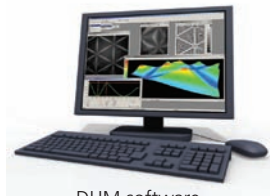
The software has a convivial, user-friendly graphical interface combined with the power to make a complete analysis of the surface. The sample can be represented in a large variety of 2D and 3D plots and movie (AVI) formats. Interaction with external software or hardware is possible. An option permits synchronization of the camera for stroboscopic observation of periodic high frequency movements.

The Holographic Microscope

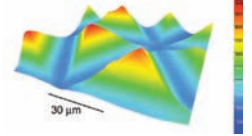


Hologram

The DHM Software



DHM software



3D optical topography

DHM 1000 Family

Operating modes

↳ Live mode

The acquisition and digital reconstruction are performed in real-time using a single illumination wavelength. Step heights up to half the wavelength can be resolved.*

↳ Alternate dual wavelength mode

The measurements are performed by the alternate acquisition of holograms at two different wavelengths. It allows resolution of step heights up to several micrometers.*

↳ Vertical scanning mode

A coherence scan is performed over the sample height. Heights up to several millimeters can be measured.*

↳ Time-averaging mode

Several acquisitions in time are averaged in one measurement for ultimate vertical resolution.

↳ Sequence mode

Allows the recording of a time sequence that can be turned into an .avi file.

↳ Offline reconstruction mode

Allows postponed reconstruction of stored holograms for additional measurements, focus correction, post-treatment...

↳ Stitching mode (optional)

Automatic procedure to attach images side by side in X/Y direction to increase the field of view.

↳ Stroboscopic mode (optional)

Drives the device to be measured (MEMS, MOEMS...) and synchronizes the acquisitions to fully characterize the sample's movement over its cycle.

↳ Production mode (optional)

Customized interfaces are integrated into the software for specific applications.

* reflection configuration in air



DHM 1000 Family

Instruments

Digital Holographic Microscopy (DHM) generates, in real-time, high resolution 3D digital images of a sample using the principle of holography. This digital approach to holography allows the application of computer based procedures at a level unreached in video-microscopy. In particular the DHM principle features software compensation for optical aberrations, digital image focusing and digital compensation for sample tilt and environmental disturbances, making DHM a robust and easy to use method for routine inspection in the nanometer to millimeter scale.

Additionally, ease-of-use and productivity is maximized by the large choice of standard microscope objectives (LWD, immersion, high NA...), automatic compensation for coverslips and optional motorized stages.

↳ DHM R1100 series

[A sub-nanometer resolution with an extended vertical measurement range](#)

The R1101 & R1102 are reflection configured instruments that not only allow real-time measurements of the sample with sub-nanometer resolution, but also permit characterization of samples that exceed the vertical measurement range of single wavelength DHM. Alternate dual wavelength and vertical scanning extend the range to several millimeters. The R1102 is specially designed for receiving larger motorized stages. The R1101 can be upgraded to the R1102.

↳ DHM R1000 series

[Cost-effective sub-nanometer resolution in real-time](#)

The R1001 is a cost-effective reflection configured instrument providing the same high resolution measurements as the R1100 series over a vertical range of half the wavelength.

The R1001 instrument can be upgraded to R1101 or R1102 to meet any budget requirements.

↳ DHM T1000 series

[The unique transmission configured interferometer](#)

The T1001 & T1002 with their transmission configuration are ideal instruments for transparent or semi-transparent samples such as micro-lenses and biological materials. The phase contrast image provides information on the sample's shape and also on its material and internal structure or defects. Polarization measurements are also possible for birefringent samples. Both instruments are compatible with the fluorescence module. DHM T1001 is furthermore compatible with the stroboscopic module.