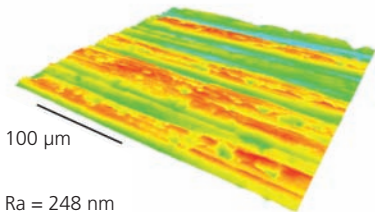
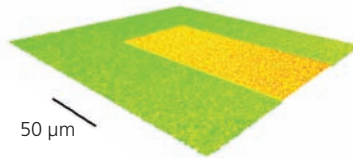


DHM® R1000 series

The evolutive cost-effective optical profiler with real-time full-field sub-nanometer resolution



Ra = 248 nm
Rt = 1.55 µm



Height: 8.9 nm

Lyncée Tec's DHM R1001 is a reflection configured high precision optical profiler based on Digital Holographic Microscopy technology. Its contactless full-field 3D optical surface topography measurements performed at video rate makes it an ideal tool for sub-nanometer quantitative dynamic and static measurements. The DHM principle ensures:

- quick and reliable results for surface analysis
- roughness measurements
- critical dimension determination

The digital approach to holography allows the application of computer based procedures at a level hitherto unreached in video-microscopy. In particular the software allows:

- simultaneous intensity and phase maps of your sample
- numerical compensation for sample tilt and environmental disturbances
- digital image focusing

Digital Holographic Microscopes are thus robust and reliable instruments for routine inspections, quality control and research.

Additionally, ease-of-use and productivity are maximized by DHM's unique features:

- widest available choice of microscope objectives: DHM can be configured with any standard microscope objectives. This versatility allows you to work with the objectives best adapted for your application (high NA, long working distance, oil or water immersion...)

- internal motorized illumination module: it ensures an optimal illumination of your sample. No objective change is needed when working with different sample reflectivities
- automatic coherence compensation: DHM allows measurements of immersed samples and samples covered by glass plates as well as in air. Optimal and precise compensation is performed for any thickness and refractive index
- optional motorized stages enabling automatic focusing, stitching and measurement automation over large areas
- vertical calibration only determined by wavelength, no mechanical movements to be calibrated

The DHM R1001 is a cost-effective and evolutive instrument that can be upgraded to R1100 series. It is compatible with motorized stages.



Technical specifications

System	
Measurement technique:	single wavelength digital holographic microscopy in reflection
Image types:	intensity and quantitative phase contrast image (DHM mode)
Light source:	monochromatic laser source
Sample stage:	manual or automated XYZ stages up to 150 mm × 150 mm × 12.5 mm travel range
Camera:	1392 × 1040 pixels, 8 bits
Available objectives:	standard, high NA, long working distance, water/oil immersion microscope objectives
Objective mounting:	4-position turret
Computer:	Dell workstation with latest Intel® processor, optimized and configured for DHM, with 19" SXGA monitor
Software:	Lyncée Tec proprietary Koala classic software based on C++ and .NET

Performance	
Accuracy ¹ :	0.1 nm
Vertical resolution ² :	0.2 nm
Repeatability ³ :	< 0.01 nm
Vertical calibration:	determined by the wavelength, no mechanical movement calibration
Vertical measuring range:	up to depth of field for smooth samples, up to 340 nm for sharp edge samples
Lateral resolution:	objective dependent, down to 300 nm with oil immersion objectives (1.4 NA)
Field of view:	objective dependent, up to 4.4 mm
Working distance:	objective dependent, from 0.3 to 18 mm
Digital focusing range:	up to 50× depth of field (objective dependent)
Grabbing time (1 hologram):	down to 1 μs in a single image grab (no scanning mechanism, insensitive to vibrations)
Spatial sampling:	1024 × 1024 pixels (hologram)
Acquisition rate:	15 fps (1024 × 1024 pixels) (optional up to 300 fps)
Reconstruction rate:	15 fps (512 × 512 pixels), 4 fps (1024 × 1024 pixels)
Min. sample reflectivity:	less than 1%
Sample illumination:	down to 1 μW/cm ²
Maximum sample size:	L × W: ∞ × 415 mm

Power requirements	
Input voltage:	85-260 VAC - 50/60 Hz
Power requirements (w/o computer):	max. 480 W

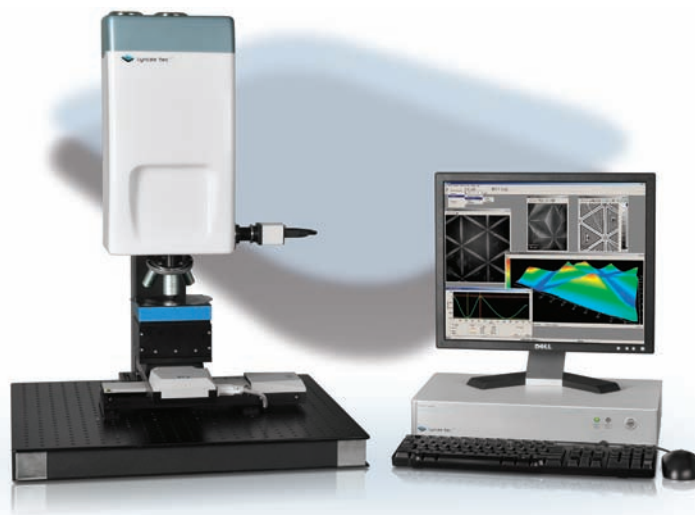
Dimensions & weight	
Dimensions (L × W × H):	600 × 600 × 800 mm
Weight:	45 kg

¹ As demonstrated by taking the temporal standard deviation on 1 pixel over 30 measurements*.

² Defined as twice the accuracy.

³ As demonstrated by taking the one sigma Rq value of 30 repeatability measurements* on SiC reference mirror.

* 1 measurement is the average of 10 acquisitions.



DHM R1000 system with optional 150 × 150 × 12.5 mm motorized stage