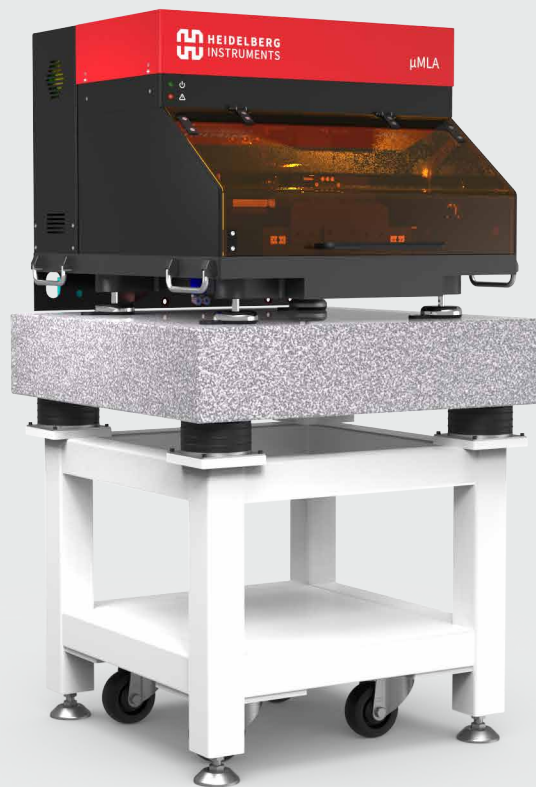


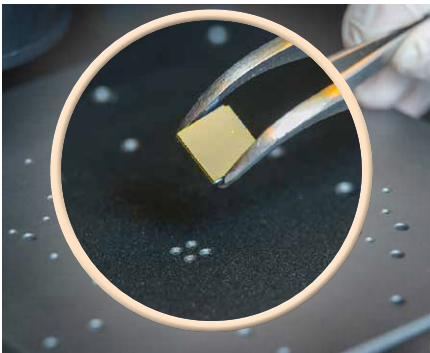
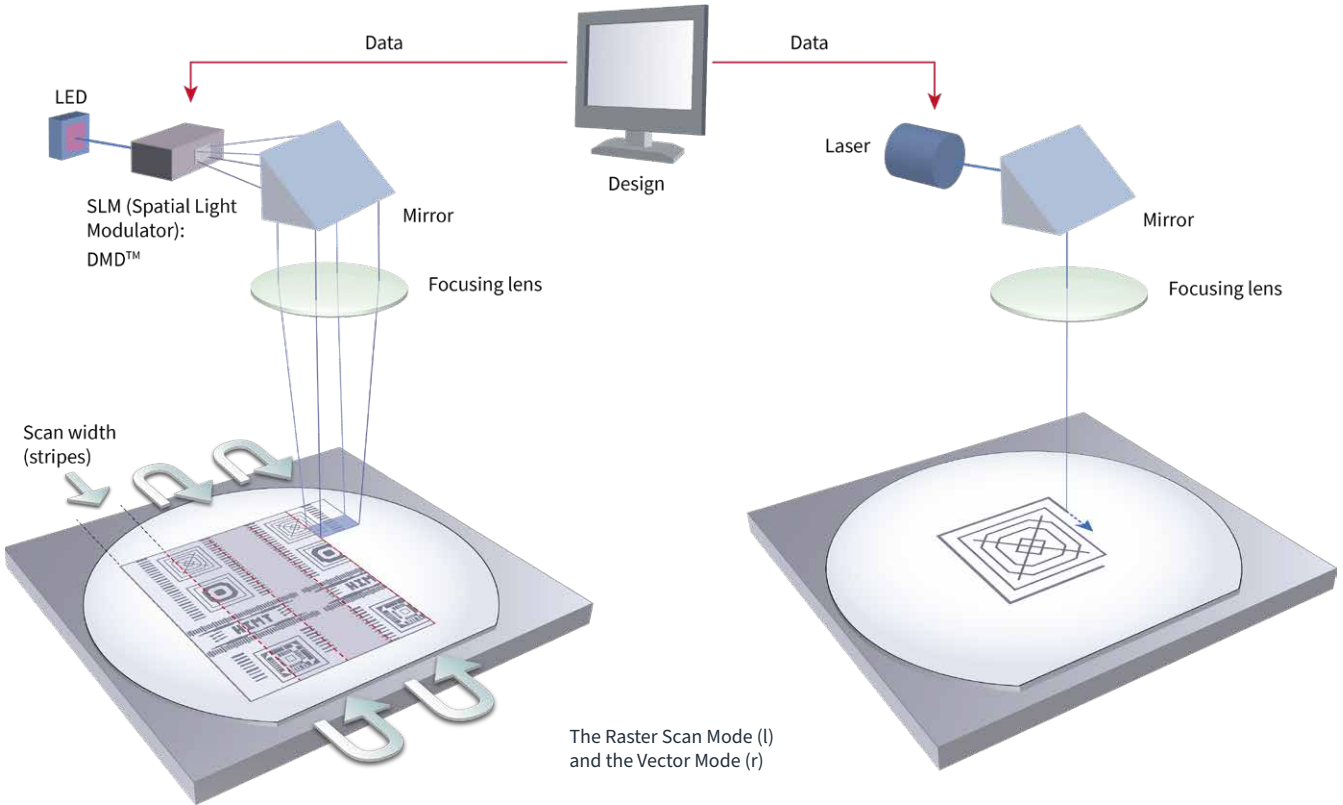
μMLA

THE TABLETOP MASKLESS ALIGNER



THE TABLETOP MASKLESS ALIGNER

The revolutionary, state-of-the-art maskless laser lithography technology has become firmly established ever since our Maskless Aligner (MLA) family was first introduced in 2015. The μMLA represents the state-of-the-art, highly customizable table-top Maskless Aligner. The set-up can be configured precisely to your needs, with Raster Scan or Vector Scan Mode (or both) and a variable resolution write head.



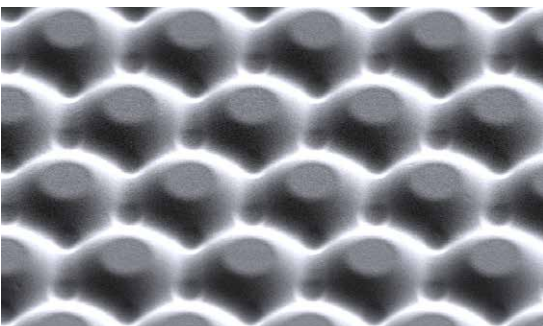
Small sample handling

In many applications, the traditional photomask has become a thing of the past. Maskless lithography means that your design file is exposed directly onto the resist-coated wafer via a 2-dimensional Spatial Light Modulator (SLM). The μMLA is the highly successful table-top system within our MLA family. It is „little brother“ to our Advanced Maskless Aligner MLA 150 – an indispensable workhorse in many multi-user facilities, nanofabrication labs, and national institutes – and our industrial Maskless Aligner, the

MLA 300. The entry-level system μMLA offers new features such as variable resolution. We created a table-top system that is flexible and highly customizable. And of course small sample handling is straightforward.

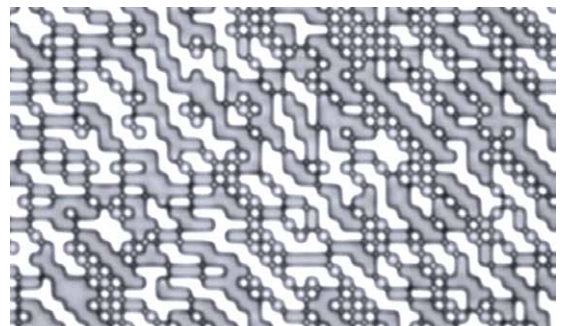
Applications include Research & Development in areas such as MEMS, micro-fluidics, micro-optics and all other fields where an affordable, compact, and powerful pattern generator for microstructures is required.

APPLICATIONS

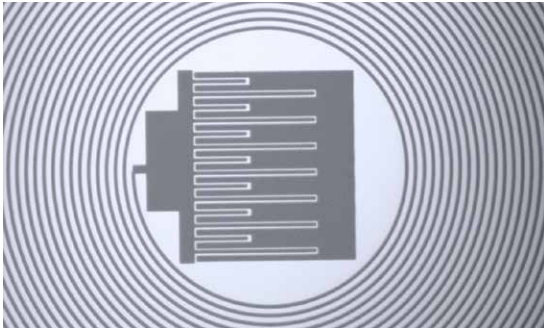


The μMLA offers a standard Grayscale mode, which allows the creation of micro-lenses. Resist: 15 μm thick AZ4562. Pitch 30 μm, radius of curvature 16 μm (l).

Micro-Optics: Binary diffractive optical element (DOE). The design is made up of 1 μm² squares (r).

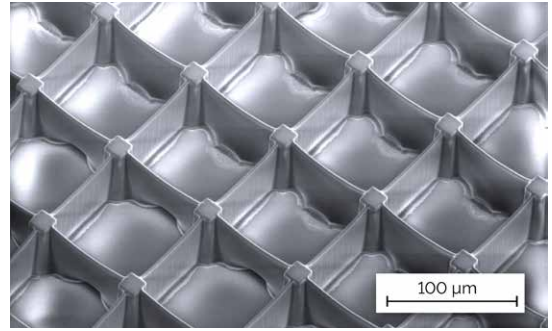


APPLICATIONS



Microfluidics (l).

Cage structures made of circa 50 μm thick SU-8. The structures are used in biological applications to trap and grow cells (r).



Courtesy of the University of Hamburg

CUSTOMIZE YOUR μMLA

Two Exposure Modes

The μMLA allows you to either choose between Raster Scan Exposure Mode and Vector Mode, or to even run both exposure modes on one and the same system! The Raster Scan Exposure mode is fast and provides excellent image quality and fidelity, while the write time is independent of structure size or pattern density. The Vector Scan Mode can generate curved lines (e.g. waveguides) with minimal edge roughness. While Vector Mode creates similar image quality as the Raster Scan exposure mode, it cannot achieve the same write speed, especially for patterns with high fill factor.

A Choice of Wavelengths

You can use up to three different wavelengths (LED and/or laser diodes) on one system.

Variable Resolution

The variable resolution function allows you to choose up to three (raster mode) or five (vector mode) different resolutions for a particular write mode.

Simply select the resolution of choice in the software menu and optimize the parameters for your application.

Options offered by the Raster Scan Exposure Mode (gray circle) and by the Vector Exposure Mode (blue circle)

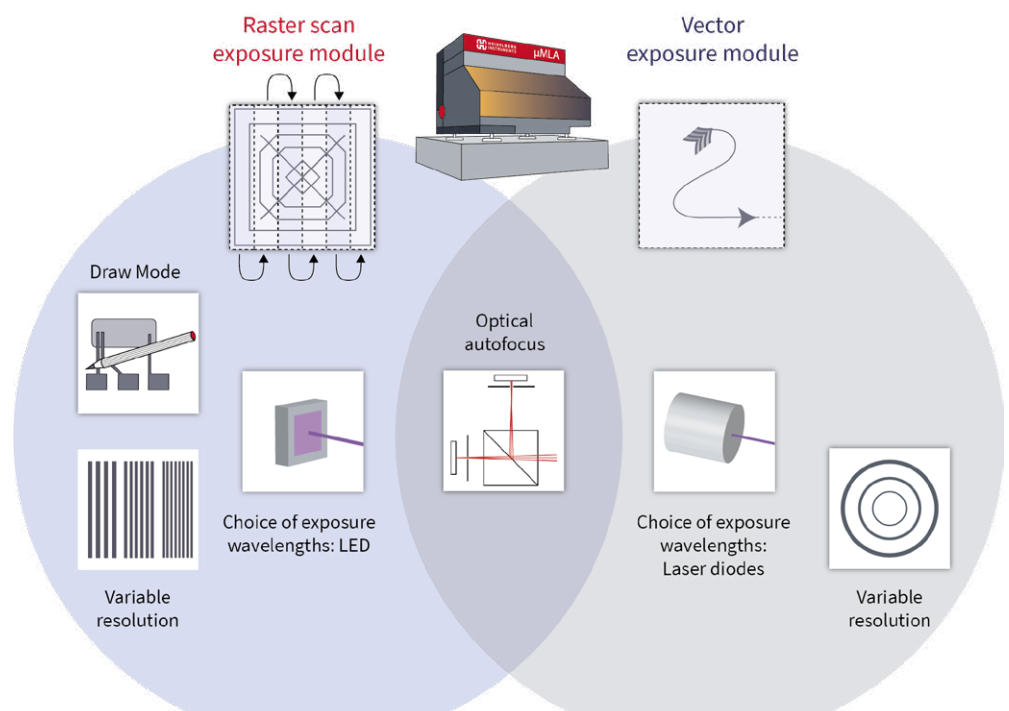
Overlap: Options available for both modes

The Surface at a Glance

The overview camera with a field of view of 13 mm x 10 mm provides an easy way to locate alignment marks or other features of interest on your substrate.

Small Sample Handling

Small sample handling is straightforward with the μMLA : The optical autofocus option allows accurate exposure right up to the edges of a sample.



	Write Mode I*	Write Mode II*	Write Mode III*	
Writing performance (Raster Scan Exposure Module)				
Minimum feature size [μm]	0.6	1	3	
Minimum lines and spaces [μm]	0.8	1.5	3	
Address grid [nm]	20	50	100	
CD uniformity [3σ, nm]	200	300	400	
2nd layer alignment over 5x5mm ² [nm]	500	500	1000	
2nd layer alignment over 50x50mm ² [nm]	1000	1000	2000	
Write speed	with 390 nm LED / 365 nm LED		with 365 nm LED	
Write speed	10mm ² /min at 0.6μm	40mm ² /min at 1μm	100mm ² /min at 3μm	
Optional write speeds at different minimum structure sizes with "Variable Resolution for Raster Scan Exposure Module"	18 mm ² /min at 1 μm	60 mm ² /min at 2 μm	120 mm ² /min at 4 μm	
	25 mm ² /min at 2 μm	90 mm ² /min at 4 μm	240 mm ² /min at 6 μm	
Writing performance (Vector Mode Exposure Module)				
Minimum feature Size [μm]	0.6	1	3	
Address grid [nm]	20	20	20	
2nd layer alignment over 5 x 5 mm ² [nm]	500	500	1000	
2nd layer alignment over 50 x 50 mm ² [nm]	1000	1000	2000	
Maximum linear write speed in Vector Mode	200 mm/s	200 mm/s	200 mm/s	
Available spot sizes in Vector Mode [μm]	0.6 / 1 / 2 / 5 / 10	1 / 2 / 5 / 10 / 25	3 / 5 / 10 / 25 / 50	
System specifications				
Maximum substrate size	6" x 6"			
Minimum substrate size	5 mm x 5 mm			
Substrate thickness	0.1 to 12 mm			
Maximum write area	150 mm x 150 mm			
Light source	Raster scan exposure module		Vector exposure module	
	LED; 390 nm or 365 nm		Laser; 405 nm and/or 375 nm	
System dimensions (lithography unit)				
Main system housing	Width	Depth	Height	Weight
	640 mm (25")	840 mm (33")	530 mm (21")	130 kg (285 lbs)
Installation requirements				
Electrical	230 VAC / 6A or 110 VAC / 12A (±5%, 50/60 Hz)			
Compressed air	6 - 10 bar			
Cleanroom	ISO 6 recommended			
Temperature stability	±1°C			

*Only one write mode can be installed on the system

Please note: Specifications depend on individual process conditions and may vary according to equipment configuration. Write speed depends on exposure area. Design and specifications are subject to change without prior notice.

Visit product website for
more information



To contact your local representative,
please consult our website
heidelberg-instruments.com