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RealLight

Spatial Light Modulator

RealLight's Spatial Light Modulators (RL-SLM) use both translucent and reflective liquid crystal micro-display technology to dynamically modify the amplitude or phase of incident light. These are extremely powerful new optical devices which individually manipulate each pixel in real-time. Not only is it possible to directly connect PC video/graphics to RL-SLMs in the same way as plug-and-play projectors, but users can also program these dynamic optical elements to behave like gratings, lenses, diffractive optical elements, apertures, masks, information processors & encryptors. RealLight's SLMs are truly revolutionary devices whose range of applications is only just starting to be explored.

RealLight's Features:

- A variety of modulation options:
  - Phase Only
  - Amplitude Only
  - Combined Phase and Amplitude
- Patented technology for eliminating the Black-matrix effect and phase calibration
- Software base for design of diffractive optical elements (DOE)
- Extensive customization available
- Compact
- Plug-and-play

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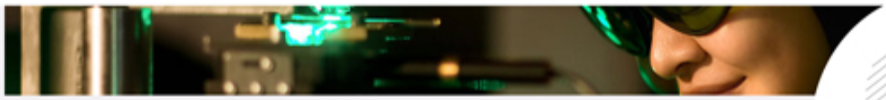


RL-SLM-T Series

The RL-SLM-T Series modulates the phase of incident light using translucent liquid-crystal micro-display technology. It finds applications throughout the optics industry because of its high phase modulating accuracy, compact footprint and fast response time.

Unique Features:

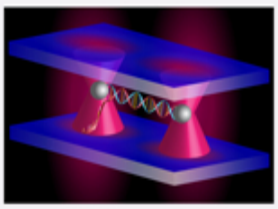
- **Phase-only** - 0 to 2π (or greater) of optical path difference using a twisted nematic liquid crystal.
- **Ease-of-use** - The compact design and the transmissive display enable easy integration into optical systems.

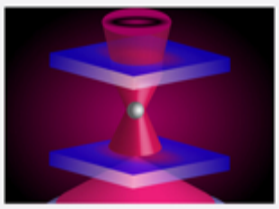
Specifications:

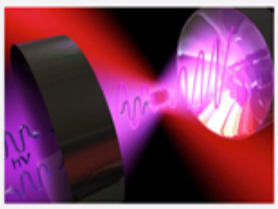
Type	RL-SLM-T1	RL-SLM-T2
Mode	Transmission	Transmission
Array Size	1.3inch	0.9inch
Pixel Pitch	26um×26um	18um×18um
Resolution	1024×768	1024×768
Fill Factor	67%	54%
Phase Modulation	0～2π@532nm	0～2π@532nm
Transmittance	55%	55%
Image Frame Rate	60Hz	60Hz
Wavelength Range	400nm-700nm	400nm-700nm
Signal Format	VGA	VGA
Addressing	8 bit	8 bit

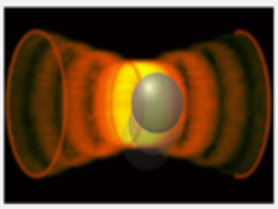
Applications:

- Diffractive optical elements
- Optical pulse shaping
- Optical tweezers
- Holography
- Reconfigurable optical interconnects









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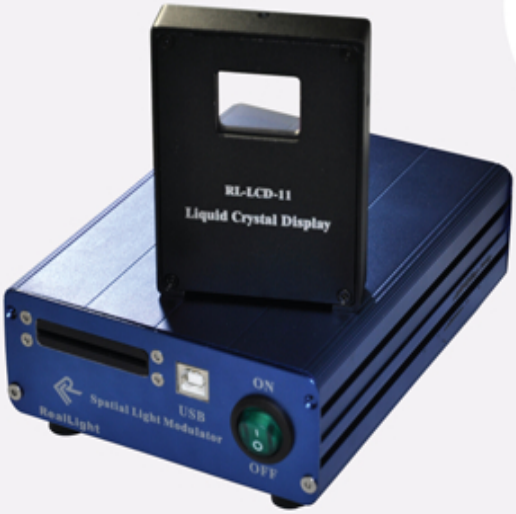
RL-SLM-E

Designed specifically to meet the needs of the educational market, the RL-SLM-E is an economically-priced version with external, benchtop driver which modulates both the amplitude and phase (up to 1.5πonly) of transmitted (polarized) light. Many colleges, universities and technical institutes use this affordable model in their teaching labs to demonstrate the various applications of SLM technology.



Specifications:

Type	RL-SLM-E
Mode	Transmission
Array Size	1.3inch
Pixel Pitch	26um×26um
Resolution	1024×768
Fill Factor	67%
Phase Modulation	0～1.5π@532nm
Transmittance	55%
Image Frame Rate	60Hz
Wavelength Range	400nm-700nm
Signal Format	VGA
Addressing	8 bit

Unique Features:

- Complex amplitude generation- the degree of amplitude and phase produced by a nematic LC modulator is selectively controlled through polarization
- High performance-price ratio

Applications:

- Laboratory courses in optical physics
- Holography
- Interferometry
- Aberration compensation
- Adaptive optics

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RL-SLM-R

The RL-SLM-R series is based on reflective LCoS (liquid crystal on Silicon) 9μm pixel pitch micro-display technology, allowing reflected light to be manipulated with very high spatial resolution. LCoS technology allows the incident light to be randomly-polarized.

Unique Features:

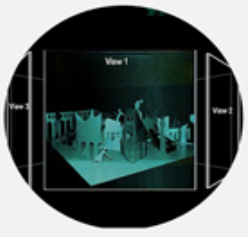
- **High fill factor** - Less dead space between pixels increases light throughput and improves image quality
- **Fine pixel pitch** - High contrast performance with high spatial resolution

Specifications:

Type	RL-SLM-R
Mode	Reflection
Array Size	0.45inch
Pixel Pitch	9um×9um
Resolution	1024×768
Fill Factor	89%
Phase Modulation	0～1.2π@532nm
Reflectance	72%
Image Frame Rate	60Hz
Wavelength Range	400nm-700nm
Signal Format	VGA
Addressing	8 bit

Applications:

- Pattern recognition
- Optical metrology
- Fringe projection
- Holography
- Dynamic displays



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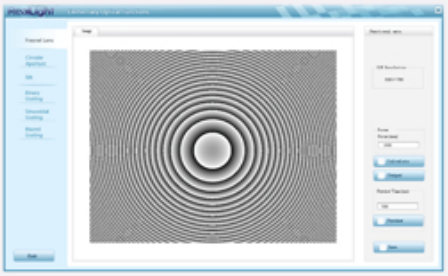
Software

Phase calculation software

1.1 Simulation of diffractive optical elements

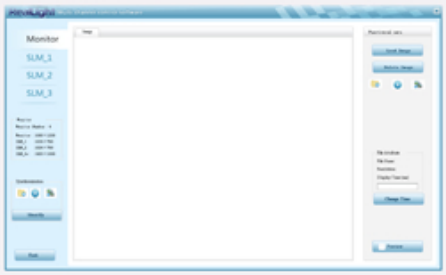
1.2 A. phase compensating available, eliminating the Black-matrix effect perfectly.
B. With our lens-less diffraction function, optical components are not needed anymore for imaging.
C. Our software generates basic optical components such as including apertures, arrays, Fresnel lenses, axicons as well as different kinds of gratings.



1.3 Our software is capable of running most brands of spatial light modulators, resolution-adjustable.

Multi-channel control software

Powerful software that is not only capable of controlling other brands of SLM's, but which also can control up to six independent SLM's simultaneously from one PC.



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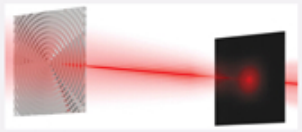
RealLight's Capabilties

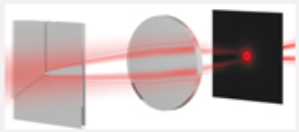
Besides offering standard SLM products, RealLight offers additional sales & application support services:

1. Because RL-SLM products allow optical engineers to test proposed diffractive optical element (DOE) designs, RealLight's applications team DOE simulation services to interested OEM customers.

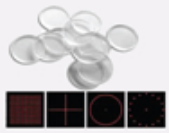


Bessel beam

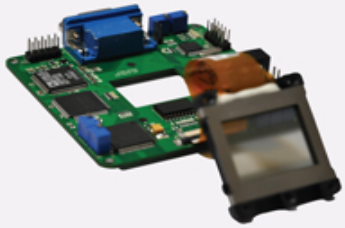
Airy beam



LAguerre-Gaussian beam



2. Customization and modification of RL-SLM's according to customer-specific requirements.



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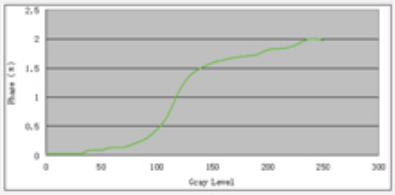
3. Providing accurate gray-level vs. phase look-up tables.



4. Integrating many of the components that work together with RL-SLM's, such as polarizers, collimators, filters and mechanical hardware.

5. Offering design and optimization of customer-specific solution according to customer needs.