

SLM

Spatial Light Modulators



Pioneers in Photonic Technology

Spatial Light Modulators

HOLOEYE's Spatial Light Modulator (SLM) systems are based on translucent or reflective liquid crystal microdisplays. These devices can modulate light spatially in amplitude and phase, so they act as a dynamic optical element. The optical function or information to be displayed can be taken directly from the optic design software or an image source and can be transferred by a computer interface.

Implementation is accomplished using the VGA or DVI port of a standard PC graphics card. The SLM can be used just like an external plug & play monitor. In many cases no additional optics are necessary. The SLM can be incorporated in existing optical setups and devices. To guarantee the best performance, optical characterization measurements (e.g. phase modulation) are performed by HOLOEYE for each individual device.

Driver Software and Application Software

All HOLOEYE Spatial Light Modulators are controlled by a HOLOEYE driver software which runs on all Windows platforms. This software gives the opportunity to control all relevant image parameters and provides a very easy gamma control to configure the Spatial Light Modulator for different applications and wavelengths.

Furthermore, a tailored Spatial Light Modulator application software allows the simple generation of diverse dynamic optical functions like gratings, lenses, axicons and apertures as well as the calculation of diffractive optical elements (DOE) from user defined images.



LC-R 1080: High Resolution Spatial Light Modulator



The LC-R 1080 is an easy-to-use Spatial Light Modulator system based on a reflective LCoS (Liquid Crystal on Silicon) microdisplay. The LC-R 1080 Spatial Light Modulator supports

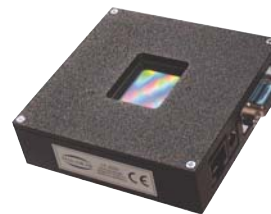
DVI-signals with a WUXGA/HDTV resolution of 1920 x 1200 pixel. Due to the special Brilliant high contrast mode, the display features high intensity ratios even for IR wavelengths.

Special Optical Features

- Amplitude or Phase Modulation
- Above 1.2π Phase Shift (in the Visible)
- Intensity Ratio of 2000:1 @ 633 nm
- Fully Analog Driven

Display Type	Reflective LCOS
Resolution	1920 x 1200 Pixel
Pixel Pitch	8.1 μm
Fill Factor	90 %
Addressing	8 Bit
Frame Rate	60 Hz
Signal Format	DVI - WUXGA Res.

LC 2002 Translucent Spatial Light Modulator



The LC 2002 is an easy-to-use Spatial Light Modulator system based on a translucent liquid crystal microdisplay with a max. resolution of 800 x 600 pixel. It can be used for phase and amplitude modulation. The

compact design and the transmissive display make implementation into your setup very easy. Versions with higher resolution (e.g. XGA) are available on board level.

Special Optical Features

- Amplitude or Phase Modulation
- 2π Phase Shift @ 532 nm
- Intensity Ratio of 1000:1 @ 633 nm Coherent Light Source
- Translucent

Display Type	Translucent LC
Resolution	800 x 600 Pixel
Pixel Pitch	32 μm
Fill Factor	55 %
Addressing	8 Bit
Frame Rate	60 Hz
Signal Format	VGA - SVGA Res.

PLUTO - Phase Only Spatial Light Modulator Series



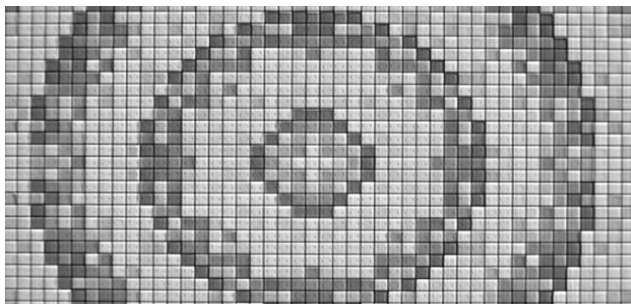
The PLUTO phase modulator models are based on reflective LCOS microdisplays with 1920 x 1080 pixel resolution. The PLUTO devices are packaged in a very small housing to ensure

an easy integration into optical setups and applications. The PLUTO phase modulator series includes 4 versions, optimized for the visible, a version optimized for a broad wavelength band centered at 850 nm, a version for the near infrared around 1064 nm and a version optimized for typical telecommunication wavelengths around 1550 nm to ensure optimal results for specific requirements.

Special Optical Features

- Phase Only Modulation
- 2 π Phase Shift up to 1550 nm
- 8.0 μm Small Pixel Size
- Optimized for 4 Wavelengths Ranges
- High Light Efficiency / High Fill Factor

Display Type	Reflective LCOS
Resolution	1920 x 1080 Pixel
Pixel Pitch	8.0 μm
Fill Factor	87 %
Addressing	8 Bit
Frame Rate	60 Hz
Signal Format	DVI - HDTV Res.



Spatial Light Modulator Applications

- Display Application
- Imaging & Projection
- Beam Splitting
- Laser Beam Shaping
- Coherent Wavefront Modulation
- Phase Shifting
- Optical Tweezers
- Holographic Projection
- Laser Pulse Modulation

Application fields range from bio-photonics, optical metrology, holography, optical interconnection such as switching and information encoding, interferometry to material processing.

LC-R 720: High Speed Spatial Light Modulator



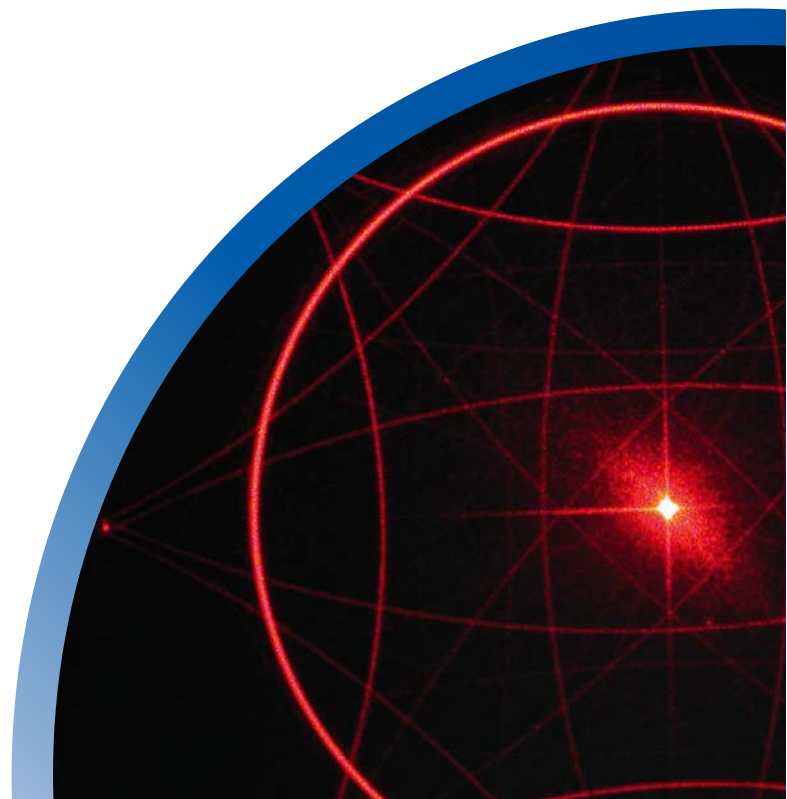
The LC-R 720 Spatial Light Modulator is based on a reflective LCOS microdisplay with a resolution of 1280 x 768 pixel. Due to the high image frame rate of 180 Hz and the short response time (< 3 ms) the highest potential of the

LC-R 720 Spatial Light Modulator are high speed applications such as one panel color sequential projection.

Special Optical Features

- Amplitude or Phase Modulation
- 180 Hz Frame Rate
- Above 1 π Phase Shift (in the Visible)
- Intensity Ratio of 1000:1 Typical
- Phase Modulation Mode
- High Light Efficiency / High Fill Factor
- Response Time < 3 ms
- Trigger Sync

Display Type	Reflective LCOS
Resolution	1280 x 768 Pixel
Pixel Pitch	20 μm
Fill Factor	92 %
Addressing	8 Bit
Frame Rate	180 Hz
Signal Format	DVI - WXGA Res.



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