E-Series Spatial Light Modulator

A Spatial Light Modulator (SLM) is an electrically programmable device that modulates light according to a fixed spatial (pixel) pattern. SLMs have an expanding role in several optical areas where light control on a pixel-by-pixel basis is critical for optimum system performance. SLMs are typically used to control incident light in amplitude, phase, or the combination of both.

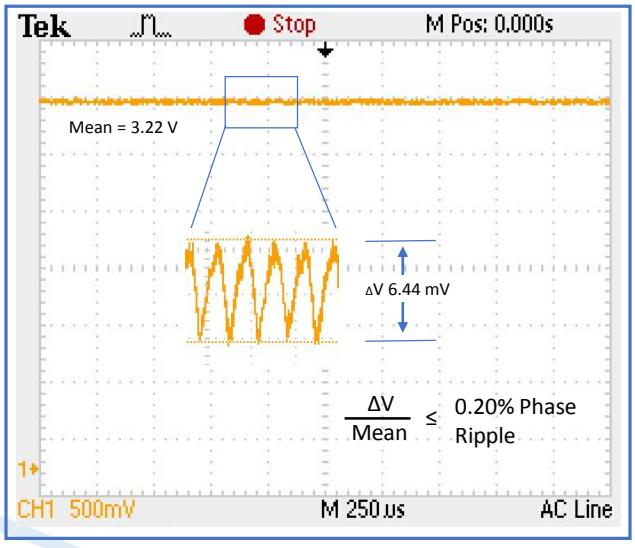
The new E-series 512 x 512 Liquid Crystal on Silicon (LCoS) SLM is ideally suited for labs with a limited budget or researchers who do not require the high speed features of our premium SLMs, yet still demand high performance. This entry-level SLM is affordably priced without sacrificing quality.

Optically Flat

All Meadowlark SLMs, including the E-Series, are designed and fabricated to be optically flat. Native flatness can be as low as λ/8. Using the SLMs wavefront correction capabilities, the compensated flatness can be better than λ /12.

High Phase Stability

The E512 is designed with a backplane refresh rate of 6 kHz, and a direct analog drive scheme which provides unsurpassed phase stability. By refreshing each pixel at rates far surpassing the response time of the liquid crystal, we are able to offer a SLM with phase ripple as low as 0.20%.



1st order intensity when writing a phase ramp to the SLM

Model: E512-λ-DVI

- Entry-Level
- 512 x 512 SLM
- Pure Analog Phase Control
- High Phase Stability
- 16-bit DVI controller

16-bit DVI Controller

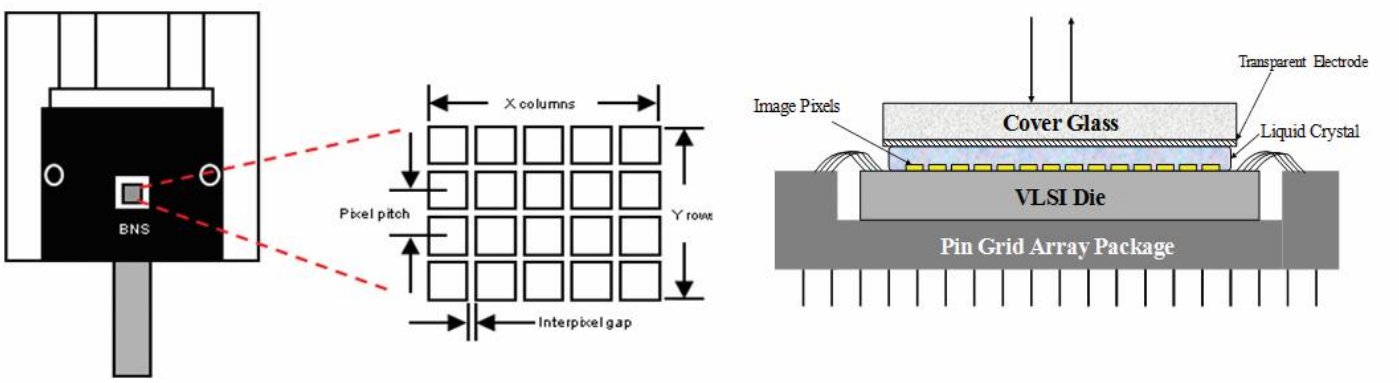
16-bit images can be transferred across the DVI interface at a rate supported by the graphics card used (60 – 200 Hz). With 16-bits of analog voltage resolution, the SLM can be used to easily obtain more than 1000 linear resolvable phase levels. This λ/1000 phase resolution can be maintained over a broad wavelength range by tuning the look-up-tables / calibrations for your incident wavelength.

E512 LCoS SLM System Contents

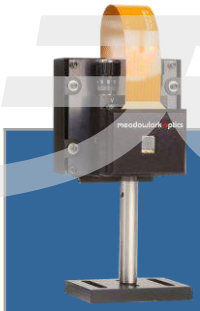
Entry-level • Educational • Economical

SLM Device Construction

Several parameters help define SLM characteristics. Pixel pitch is defined as the center-to-center spacing between adjacent pixels. Interpixel gap describes the edge-to-edge spacing between adjacent pixels.



Polarized light enters the device from the top, passes through the cover glass, transparent electrode and liquid crystal layer, is reflected off the aluminum pixel electrodes, and returns on the same path. Drive signals travel through the pins on the bottom of the pin-grid array package, through the bond wires, and into the silicon die circuitry. The voltage induced on each electrode (pixel) produces an electric field between that electrode and the transparent electrode on the cover glass. This field produces a change in the optical properties of the LC layer. Because each pixel is independently controlled, a phase pattern may be generated by loading different voltages onto each pixel.



other models available

	Entry Level E512-λ-DVI					High Efficiency - PDM512 - HSPDM512 - ODPDM512	High Speed - HSP512L - HSP512 - HSPDM512 - ODP512 - ODPDM512	High Resolution - P1920
Pixel Format	**512 x 512**					512 x 512	512 x 512	1920 x 1152
Pixel Pitch (µm)	**15**					15	15 or 25	9.2
Wavelength (nm)	**405**	**532**	**635**	**1064**	**1550**	405 – 1550	488 – 1550	405 – 1550
Liquid Crystal Response Time (ms)	**25.0**	**33.3**	**33.3**	**66.7**	**100**	4 – 130	1.2 – 28.5	6 – 33
Zero Order Diffraction Efficiency (%)	**up to 61**					up to 95	up to 95	up to 84
Phase Stroke	**≥ 3π radians**					≥ 3π radians	≥ 3π radians	≥ 3π radians
Controller	**DVI**					DVI, PCIe 8-bit, PCIe 16-bit	PCIe 8-bit	HDMI
Array Size (mm x mm)	**7.68 x 7.68**					7.68 x 7.68	7.68 x 7.68 or 12.8 x 12.8	17.6 x 10.7
Fill Factor (%)	**83.4**					96 – 100	83.4 – 100	96