

SPATIAL LIGHT MODULATORS

—Reflective Linear Series

Phase and Amplitude – 1x12,288

A Spatial Light Modulator (SLM) is a 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-only, phase-only or the combination (phase-amplitude).

Meadowlark Optics (Meadowlark) manufactures and sells liquid crystal based Spatial Light Modulators for a variety of applications. Meadowlark SLMs operate in both reflection, (liquid crystal on silicon (LCoS)) and transmissive (glass-on-glass) modes. The 1x12,288 is based on our reflective LCoS technology.

Key features of our SLMs include high speed phase or amplitude modulation, high efficiency operation, and a complete, user-friendly graphical software interface.

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.

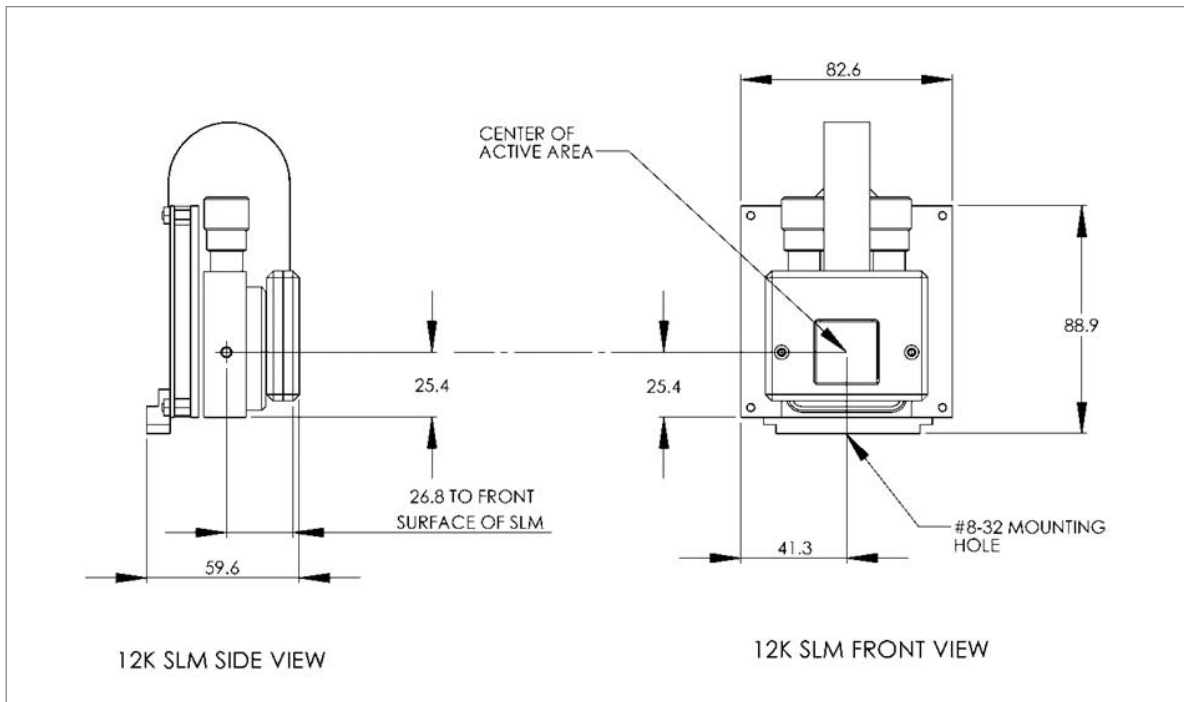


Applications

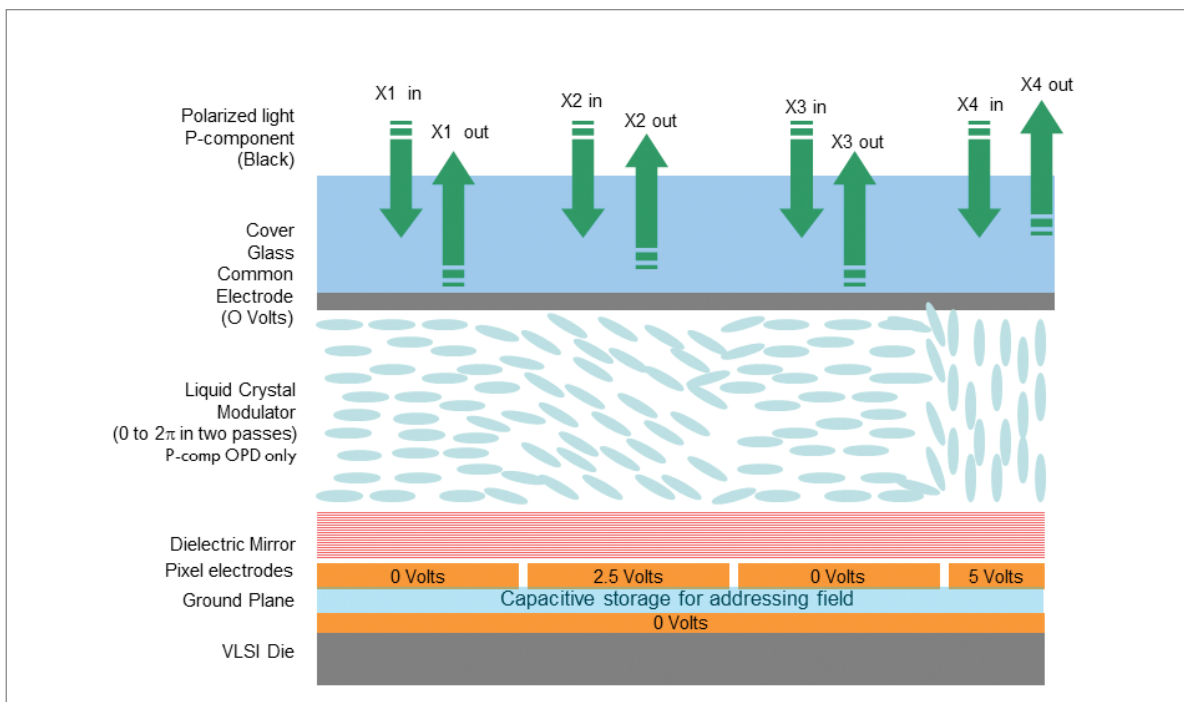
- Beam steering
- Diffractive optics
- Ultra-fast pulse shaping
- Spectral tuning / processing
- Programmable phase gratings
- Programmable amplitude gratings

Key Features

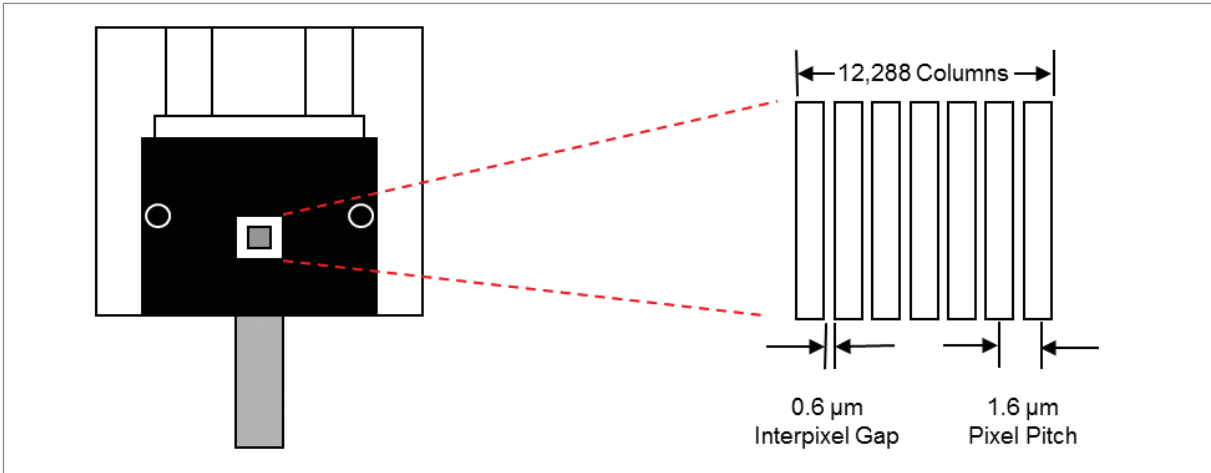
- High optical efficiency
- No mechanical motion
- High speed phase control
- Safe, low voltage operation
- User-friendly graphical interface



Outline drawing showing front and side views of 1x12,288 Optical Head. Dimensions in millimeters.



Cross Section of Optically-efficient Phase Only LCoS SLM



Interpixel gap describes the edge-to-edge spacing between adjacent pixels. The chart below illustrates basic specifications used to describe our reflective SLM products.

1 x 12,288 SLM SPECIFICATIONS	
	Model P12,288— λ (nm)—PT
Array Size	19.66 x 19.66 mm
Design Wavelength (nominal)	532—1550 nm (specify wavelength, λ in nm when ordering)
Diffraction Efficiency (zero-order)	80-95% (maximum)
Duty Cycle	Up to 100%
External Window ¹	Broadband antireflection coated for $R_{avg} < 1\%$ (450-865 nm, 600-1300 nm or 850-1650 nm).
Fill Factor	100%
Format	1 x 12,288
Mode	(12,288 active pixels)
Steering Angle	Reflective
Modulation	$\pm 4-7^\circ$
Phase Levels (resolvable)	Controllable index of refraction
Phase Stroke (double-pass)	50 - 100 linear levels (minimum) for 2π phase stroke
Pixel Pitch	Typically 2π at user-specified laser line (up to 6π available)
Reflected Wavefront Distortion (rms) ²	1.6 μm
Response Time ³	5-30 ms
Spatial Resolution	TBD
Switching Frequency ³	30-200 Hz

Above specifications are subject to change without notice. Please contact Meadowlark Optics for additional updates.

¹ Custom antireflection coating options are also available, including V-type for optimum optical efficiency at a single laser wavelength.

² At nominal wavelength.

³ Phase stroke, temperature, and wavelength dependent.

Meadowlark Optics has provided world-class liquid crystal solutions and polarization optics from a state-of-the-art manufacturing facility since 1998. To ensure precision and top quality, our 20,000-square-foot headquarters boasts the latest in clean rooms, optical fabrication, metrology facilities and a breath-taking view of Colorado's Front Range.

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