LCD Spatial Light Modulator

Overview

Spatial Light Modulators that use both translucent and reflective liquid crystal micro-display technology to dynamically modify the amplitude and/or phase of incident light. A spatial light modulator (SLM) is a device that can control the intensity, phase, or polarization of light in. Thorlabs' Exulus® Spatial Light Modulators (SLMs) employ Liquid Crystal on Silicon (LCoS) technology to produce high-resolution, high-speed reflective phase modulation with individually addressable pixels. This phase control is highly stable with minimal fluctuations and minimal crosstalk with. The spatial light modulators developed at Fraunhofer IPMS consist of arrays of micromirrors on semiconductor chips, with the number of mirrors varying from a few hundred to several million depending on the application. Current SLM–based systems use either optical MEMS (microelectromechanical system,) or LCD technology.

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Article Content

Feb 24, 2026

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After passing the pulse energy controlling device and a beam expander, the laser illuminates a reflection type liquid crystal spatial light modulator (LC-R2500, Holoeye Photonics AG, Berlin, Germany).

Oct 31, 2025

LCOS Spatial Light Modulators: Trends and Applications

1.1 Introduction Spatial light modulator (SLM) is a general term describing devices that are used to modulate amplitude, phase, or polarization of light waves in space and time. Current SLM–based

Sep 28, 2025

Spatial Light Modulators in Laser Microprocessing

Digital Modulation - Dynamic Simulations — Pulse-width modulation is poor for phase applications — Pulse code modulation, with custom sequences for phase applications — High bandwidth, special

Sep 14, 2025

Spatial Light Modulators

Thorlabs'' Exulus® Spatial Light Modulators (SLMs) employ Liquid Crystal on Silicon (LCoS) technology to produce high-resolution, high-speed reflective phase

May 29, 2026

A review of liquid crystal spatial light modulators: devices and ...

In particular, liquid-crystal spatial light modulator (LC-SLM) technologies have been regarded as versatile tools for generating arbitrary optical fields and tailoring all degrees of freedom beyond just

Apr 15, 2026

Spatial Light Modulators

We develop custom spatial light modulators with segmented micromirror arrays and a high pixel count—tailored for demanding industrial applications. Our advanced

Apr 13, 2026

(PDF) Application of a Liquid Crystal Display Spatial

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The importance of spatial light modulators (SLMs) in optical systems is increasing. This paper presents our work on an SLM system based on Sony LCD.

May 20, 2026

High-resolution TFT-LCD for spatial light modulator

SLM with very fine pixel pitch is needed for the holographic display system. Among various kinds of SLMs, commercially available high resolution LCoS has been widely used as a spatial light

Feb 02, 2026

Implementation of Spatial Light Modulator(SLM) using a Commercial LCD ...

In this paper, a new high resolution XGA-SLM is implemented through modification of a commercial TFT-LCD beam projector and its optical modulation characteristics as a spatial light

Jan 06, 2026

Applications of Spatial Light Modulators in Raman

Advances in consumer display screen technologies have historically been adapted by researchers across the fields of optics as they can be used as

Nov 07, 2025

Spatial Light Modulators

Spatial Light Modulators that use both translucent and reflective liquid crystal micro-display technology to dynamically modify the amplitude and/or phase of incident

Jan 22, 2026

Fabrication of microscale medical devices by two-photon

Fabrication of microscale medical devices by two-photon polymerization with multiple foci via a spatial light modulator Discontinued Devices LC-R 2500 Spatial Light Modulators Digital-/ Computer

Feb 14, 2026

Spatial Light Modulators (SLM)

LASER COMPONENTS delivers Spatial Light Modulators (SLM) as adaptive optical elements that modulate light spatially in amplitude or phase. The available

Oct 28, 2025

LCOS Spatial Light Modulators: Trends and Applications

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In this chapter, we review trends and applications of SLMs with focus on liquid crystal on silicon (LCOS) technology. Most developments of liquid crystal (LC) microdisplays are driven by consumer

Apr 10, 2026

Complex spatial light modulation capability of a dual layer in-plane ...

This paper presents a flat panel complex spatial light modulator that consists of dual in-plane switching liquid crystal panels with double-degrees of freedom of voltage inputs.

Dec 30, 2025

High resolution multispectral spatial light modulators based ...

A spatial light modulator is demonstrated based on Fabry-Perot nanocavity resonances, enabling micrometer-sized pixels and efficient full phase control at multiple wavelengths

Nov 05, 2025

Spatial Light Modulator-based printing technologies for optical ...

Spatial Light Modulator (SLM)-based printing technologies, including Digital Light Processing (DLP) and Liquid Crystal Display (LCD), have emerged as transformative solutions for

Dec 11, 2025

A low-cost spatial light modulator for use in

Spatial light modulators (SLMs) are a versatile tool for teaching optics, but the cost associated with an SLM setup prevents its adoption in many

Nov 03, 2025

Spatial light modulator

OverviewApplication in ultrafast pulse measuring and shapingElectrically-addressed spatial light modulator (EASLM)Optically-addressed spatial light modulator (OASLM)External links

Multiphoton intrapulse interference phase scan (MIIPS) is a technique based on the computer-controlled phase scan of a linear-array spatial light modulator. Through the phase scan to an ultrashort pulse, MIIPS can not only characterize but also manipulate the ultrashort pulse to get the needed pulse shape at target spot (such as transform-limited pulse for optimized peak power, and other specific pulse shapes). This technique features with full calibration and control of the ultrashort pulse, with no movin

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An Introduction to Spatial Light Modulators

Spatial light modulators are used to spatially modify an optical wavefront in two dimensions. The most commonly used models are electrooptical with liquid

Feb 19, 2026

Spatial Light Modulators (SLMs)-JCOPTIX MALL

The reflective spatial light modulator provided by JCOPTIX adopts a new silicon-based liquid crystal display (LCOS-LCD) method, which has excellent optical characteristics such as high resolution,

Oct 29, 2025

Spatial Light Modulators | MEETOPTICS Academy

What are Spatial Light Modulators? Spatial light modulators (SLMs) are a type of transmissive or reflective device that is used to modulate amplitude, phase, or polarization of an optical wavefront in

Apr 20, 2026

Spatial Light Modulator Principles

Spatial Light Modulator Principles Meadowlark Optics award-winning Spatial Light Modulators (SLMs) provide precision retardance control for spatially varying phase or amplitude requirements. Our SLMs

Apr 24, 2026

Spatial Light Modulators (SLMs)-JCOPTIX MALL

LCD light valve using high-temperature polycrystalline silicon TFT Transparent structure, flip design, simple and easy to build optical path Excellent transmission wavefront characteristics High contrast,

Jan 12, 2026

(PDF) Terahertz single pixel imaging with an optically

T erahertz single pixel imaging with an optically controlled dynamic spatial light modulator David Shrekenhamer, Claire M. Watts, and W illie J. Padilla ⋆

Mar 22, 2026

Spatial light modulators

Research on novel materials and designs that improve the performance and efficiency of SLMs is prevalent, showcasing innovations that address challenges like speed, resolution, and wavelength

Feb 05, 2026

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LCOS Spatial Light Modulator working principle

In this video we explain the basic principle of an LCOS phase only Spatial Light Modulator. The desired optical functionality of a phase modulator is enabled...

Apr 21, 2026

High throughput diffractive multi-beam femtosecond laser processing ...

High throughput femtosecond laser processing is demonstrated by creating multiple beams using a spatial light modulator (SLM). The diffractive multi-beam patterns are modulated in

Jan 04, 2026

Spatial Light Modulators

These spatial light modulators provide far more pixels than lower-order phase modulators such as segmented or deformable mirrors. For applications requiring

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