

Optically Addressed Spatial Light Modulator – Development Kit

DESCRIPTION

The OASLM Development Kit provides a turnkey and versatile setup for light modulation with an Optically Addressed SLM. It comprises

- optically addressed SLM, OASLM-VIS,
- electronic controller, HOA-20K,
- addressing light projector.

USB key with software, connecting cables, power supplies, mechanical mounting and screws are provided, together with documentation and operating instructions.

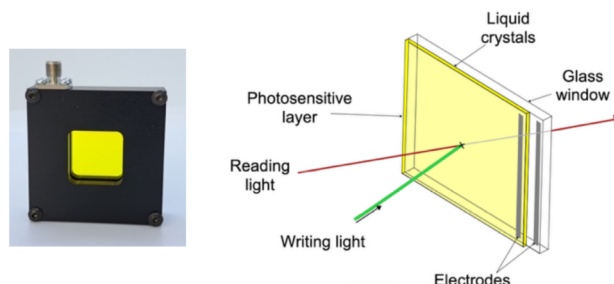


OASLM -VIS characteristics

The main features of the OASLM – VIS are

- Photosensitive substrate in the VIS
- Spatial resolution 15 μm
- Transmission-mode
- Phase or amplitude modulation
- Clear aperture 20x20mm²

Working principle of the OASLM



The addressing (writing) is made by shining the PC with visible light, optimally at 450 – 570 nm. “VIS” refers to this writing wavelength: the reading light to be modulated can be different, from 400 nm to 2 μm .

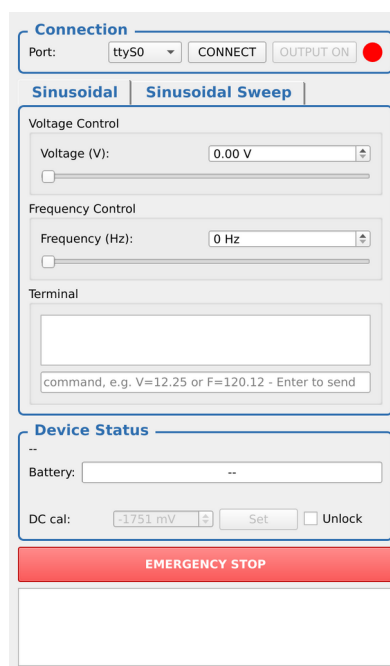
The OASLM-VIS is mounted in a compact aluminum housing, with an SMA connector for electrical driving.

The refractive index of the device is directly related to the intensity profile of the addressing light. In this way the OASLM-VIS can modulate the phase or the intensity (if inserted in between crossed polarizers) of the reading light.

ELECTRONIC DRIVER : HOA-20K

The HOA-20K is a low frequency sine wave generator specifically designed to drive LC devices.

The frequency range goes from DC to 20kHz. The maximum amplitude is 80 V peak to peak.



The parameters are programmable. A graphical interface is available.

All electronic components are low noise. For increased stability an internal rechargeable battery allows operation without mains power.

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ADDRESSING PROJECTOR

LC-PROJ is a light projector specifically developed for optical addressing. The output light is amplitude modulated by an integrated liquid crystal SLM.

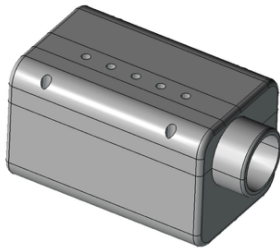
The light source is a blue LED (470 nm). The output spot is linearly polarized. It is arbitrarily shaped on its transverse section with a diameter of 35 mm and 1080 pixels over it.

The spatial resolution is 25 μ m.

The case is made with anodized Aluminum with ergonomic form to facilitate orienting and positioning of the device. An HDMI port is used for communication.

The included software (Linux, Windows, macOS) displays images, videos or live frames computed in Python on the LC-PROJ.

Power supply (19-24V_{DC})
HDMI port

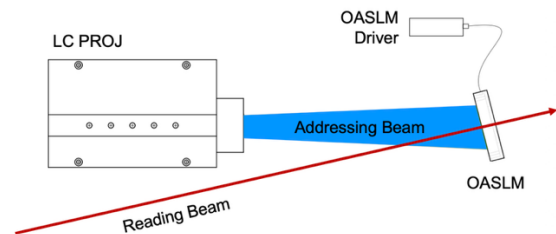


APPLICATIONS

- Wavelength conversion
- Adaptive Holography and Interferometry
- Nonlinear Optics, Optical wave-mixing
- Laser beam shaping
- Optical neural systems and Complex optics
- Education

Modulating the light

Use the LC-PROJ to send reconfigurable intensity masks to the OASLM. Let the reading beam pass through the OASLM and acquire the corresponding phase shift.



In-line configuration can be realized by using a dichroic mirror or a polarizer beam-splitter.



Complex and vortex beams, optical waves interaction, can easily be implemented with the OASLM-VIS.

Examples

- Two-wave mixing
- Optical vortex generation
- Beam cleanup
- Vibrometry