

# Diffraction Projection Engine

for HOLOEYE Spatial Light Modulators



**Pioneers in Photonic Technology**

## HOLOEYE Spatial Light Modulators

HOLOEYE offers a wide range of LCOS based phase modulating Spatial Light Modulators. Typically these devices are used in a broad range of technical applications at different wavelengths ranges from the UV to the mid IR.

At the visible range SLMs are also used for a growing number of imaging-like applications (e.g. holographic projection, 3D holographic displays or structured illumination). Especially in the field of AR / VR displays and Heads-up-Displays phase SLMs offer the advantage of superior light efficiency because the image is generated by diffraction (redistribution of light) instead of blocking light (amplitude modulation) like at conventional projection systems. Besides that the holographic approach of a phase SLM can be used to add additional optical functions like dynamic focusing or aberration correction.



The diffractive approach with a phase SLM is fairly simple as it only requires a linearly polarized light source and the SLM itself. However, as diffraction angles are limited (dependent on pixel size of the used SLM) it might be necessary to use additional optics to magnify the output image.

As the development of such a diffraction based projection system is complex and time consuming, HOLOEYE offers a compact standard Diffractive Projection Engine which works for a broad field of imaging applications.

## Diffractive Projection Engine

The HOLOEYE Diffractive Projection Engine is compatible with the current versions of PLUTO-2, LETO, GAEA-2 and the LUNA Spatial Light Modulators.



The compact projection engine is designed to work with a linearly polarized laser source coupled into a polarization-maintaining single mode fiber with FC/APC connector. It can also be used with fiber coupled RGB laser sources for color sequential

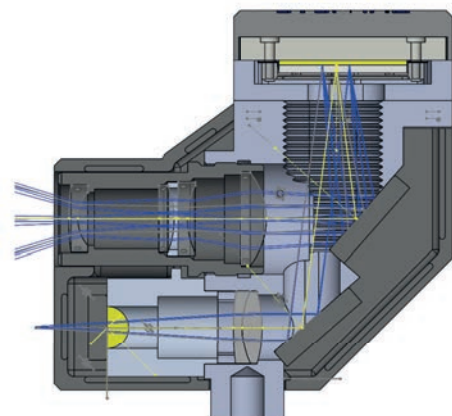
hologram projection using a fast SLM like the LETO device.

The angular magnification is in the area of 5.3x (slightly dependent on wavelengths and pixel pitch). The working distance ranges from 15 cm (for GAEA SLM) / 27 cm (for PLUTO SLM) to infinity. The field of view also depends on the used HOLOEYE SLM:

- FoV GAEA: 42°(full angle): ~240 mm @ 300 mm distance
- FoV LUNA: 34°(full angle): ~185 mm @ 300 mm distance
- FoV LETO: 24°(full angle): ~130 mm @ 300 mm distance
- FoV PLUTO: 20°(full angle): ~110 mm @ 300 mm distance

### Specifications

Wavelengths Range	450 - 630 nm
Transmission Optics	75 % (@520 nm)
Fiber Connector	FC/APC
SLM Illumination Angle	< 7.5 degrees
Angular Magnification	~5.3 x
Mechanical Dimensions	50 x 40 x 30 (mm)
Working Distance	15 to 27 cm – infinity
FoV	Dependent on SLM / Wavelength



## Applications

- AR / VR Displays
- Head Mounted Displays
- Heads-Up Displays
- Structured Illumination

