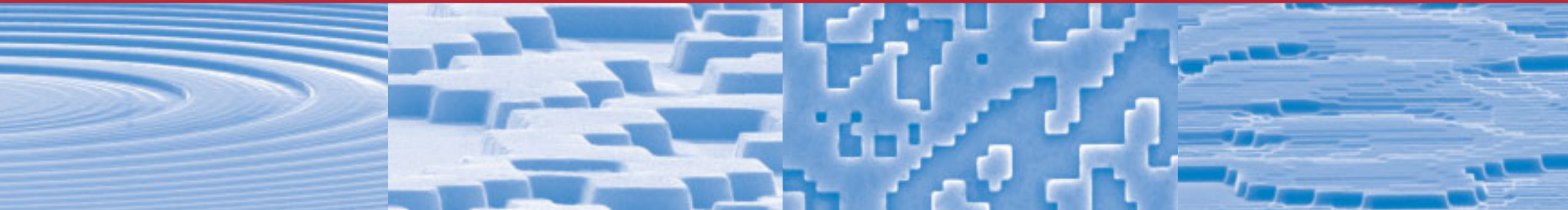


» Diffractive Optics » Spatial Light Modulators » OEM-Microdisplay Services



Pioneers in Photonic Technology

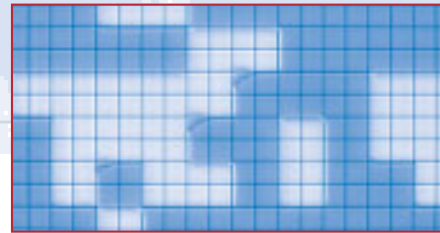
>> Optical Technology

Optical technology: A key technology...

Producing, transforming, transmitting and measuring light for future-oriented applications. Photonics consistently makes use of the properties of light to develop state-of-the-art technological solutions.

Thanks to its versatile character, optical technology is now found in a wide range of everyday applications and products. Optical technology is a key technology in a number of fields such as information technology, product engineering, metrology, sensors, medicine, and biosciences, especially on the micro- and nano-scales.

Light measurement procedures are state-of-the-art, have an almost unlimited application potential, ensure a maximum of precision and security whilst also being environmentally compatible.



... and the future technology for the 21st century

Experts are calling the 21st century the “century of the photon”. Without a doubt, optical technologies will enable radical changes within the fields of information technology, industrial manufacturing, metrology, and biotechnology. Processes will become faster, cheaper, and more accurate. The potential of photonics is truly unlimited, which is why, those who have actively participated in the developments of optical technology thus far, are well positioned to institute the “New Era of Light”.
Welcome to HOLOEYE Photonics!

The most important application areas for Optical Technologies:

- + Information- and communication technologies:
Crossing borders with light-speed
- + Industrial manufacturing:
Light as a multifunctional tool
- + Industrial measurement:
High accuracy with tight tolerances
- + Medicine and Biotechnology:
Advanced tools and methods for research and diagnosis

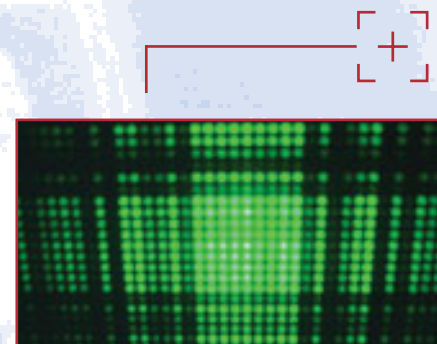
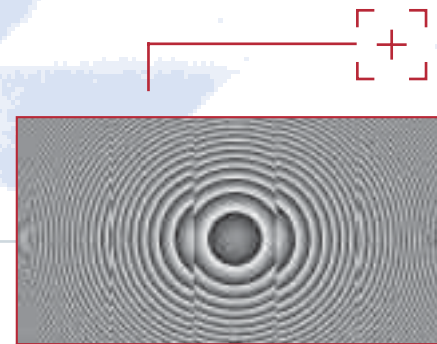
HOLOEYE Photonics AG – Pioneers in Photonic Technology

Since 1999 HOLOEYE Photonics has been researching, developing and producing Diffractive Optical Elements (DOE) and Spatial Light Modulators (SLM). From the very beginning our goal has been to build strong customer relations and share our intellectual know-how with industry by providing our services and products at a reasonable cost. Pioneer work in conjunction with reputable industrial and scientific research institutes across the world has established us as an innovative technology leader, and more important, a qualified partner for optical technology development with an undisputed reputation for cooperation. HOLOEYE Photonics AG supplies products and services as well as customized solutions and technology consulting in the field of diffractive and adaptive optics.

Fast Customized Solutions

HOLOEYE Photonics' priorities focus on providing complex feasible industrial solutions. We act similar to an external R&D department for our customers to produce fast Customer-Specific-Solutions. HOLOEYE assumes the management of the general project team which includes our own developers and consultants, experts supplied by the customer and internationally renowned scientists and technical suppliers. This type of approach results in an inspiring cooperation that is able to react very quickly.

The multidisciplinary team is able to deliver a successful solution to a complex problem in a pragmatic fashion by addressing both the economical and technical issues jointly in an innovative manner. This approach works well on small and large scale projects, whether designing a single element prototype or an element for mass production.



DOE: Diffractive Optical Elements

Diffractive optics modulate light by diffraction. These micro-structured optical elements are binary or multiple phase level, where the surface structures are either etched in fused silica or embossed in different polymer materials.

Diffractive optics have unique properties enabling them to realize optical functions, which are almost impossible to achieve using classical optical components. Furthermore, they can even be used as conventional optical elements such as lenses, prisms or aspheres.

SLM: Spatial Light Modulators

Spatial light modulators form a new generation of adaptive optical components. They are a digital-to-analogue interface that transform numerical functions dynamically into the optical systems. Modulators based on microdisplays are addressable diffractive elements providing similar features to static diffractive micro-optics.

As this technology is also capable of amplitude or phase modulation, it can be implemented in almost all optical technology fields.

>> DOE Technology

DOE Technology

Diffractive Optical Elements (DOE) delivered by HOLOEYE are used in various application fields ranging from basic research to industrial high volume applications. HOLOEYE's complete customer service involves design, development, and commercialization of DOEs, specifically for the fields of technical optics and lasers. HOLOEYE has established a full service design and development technology cycle that provides its customers with a fully integrated closed-loop development process. HOLOEYE's array of products and services ranges from standard DOE-based diffraction grating development to large-scale complex bilateral joint DOE projects that rely on integrated teams consisting of specialized partners. HOLOEYE believes that success in this field is driven primarily by consulting efforts and less by technology. HOLOEYE's success is based on its ability to communicate with the customer, evaluate their needs, analyze the problem at hand, and then manufacture a solution using an array of replication technologies at HOLOEYE's disposal. One of the unique advantages of HOLOEYE is its connection with aSLM technology, which enables HOLOEYE to simulate the solution prior to manufacturing, which is a service no other solution provider can currently offer.



Basically, diffractive optics are capable of achieving almost the same optical functions as refractive optics but they are much smaller and lighter. And that is not all... In contrast to the classical optical components, these micro-optical components can also enhance the functions of laser beams. Beam splitters, Fourier holograms, beam shapers, diffusers and various grating structures act like optical processors, reshaping light to almost any desired distribution. DOEs are not limited to lasers; partially coherent light from LEDs or other light sources can also be modulated.

Beam splitters

Diffract the original laser beam into a certain number of beams with a specific direction and intensity.

Fourier holograms

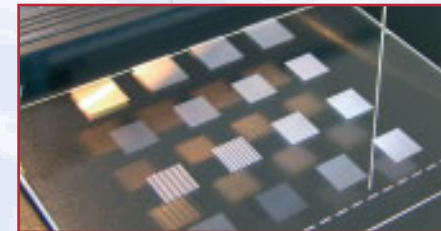
A special type of beam splitter where special patterns, like images, are realized by diffraction in the optical far field.

Beam shapers

Used to map a certain phase function onto the laser beam in order to modify its propagation. One classic application is the top-hat generation.

Diffusers

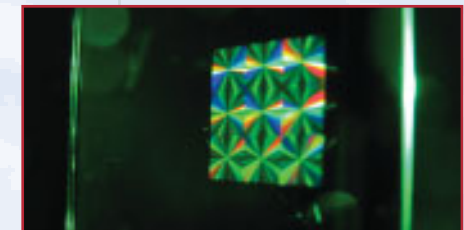
Special scattering plates, where the light is diffused over a certain geometry. The primary objective is to generate a homogeneous illumination.



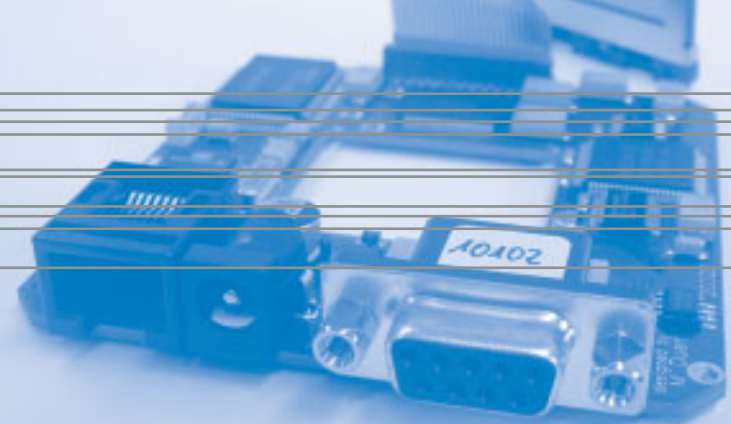
HOLOEYE Photonics AG would like to thank the following Institutions for the joint basic research and scientific development work:

- + Humboldt-University of Berlin - Department of Physics, Laboratory of Coherent Optics - Berlin, Germany
- + Fraunhofer Institute for Telecommunications - Heinrich-Hertz-Institut - Berlin, Germany
- + German Aerospace Center - Optical Information Systems - Berlin, Germany
- + University of Stuttgart - Institute of Applied Optics - Stuttgart, Germany
- + Nanyang Technological University - Sensors and Actuators Program (Director Prof. A. Asundi) School of Mechanical and Production Engineering, NTU - Singapore
- + University of Chicago - Department of Chemistry - Chicago, USA
- + University of St. Andrews - School of Physics and Astronomy - St. Andrews, UK

For more details look at www.holoeye.com/ScientificPartners



>> SLM Technology



SLM Technology

HOLEEYEs active Spatial Light Modulator (aSLM) systems are based on both translucent and reflective high resolution liquid crystal microdisplays. These devices can modulate light spatially in amplitude and phase, so they act as an active dynamic optical element. The optical function or information to be displayed can be taken directly from the optic design software or an image source and can be transferred by a computer interface.

Implementation is accomplished using the VGA or DVI port on a standard computer's graphics card. The smart systems architecture simplifies this process.

In many cases no additional optics are necessary or the aSLM can be incorporated in existing optical setups and devices.



More than 100 companies, universities, and institutes are utilizing HOLEEYEs devices throughout the world in a wide range of photonic applications. These dynamically addressable devices are suitable for almost any optical system, starting from imaging applications, using white light and coherent light sources, up to utilization as an addressable optical element.

Researchers are currently using HOLEEYEs aSLMs in applications that require dynamic phase modulation, beam splitting and beam shaping, to name a few. Imagine a camera with a zoom lens that has no moving parts, some researchers are hoping to achieve this goal using HOLEEYEs aSLM technology.

>> OEM Microdisplay Services

The following implementation examples demonstrate just a small part of the application field:

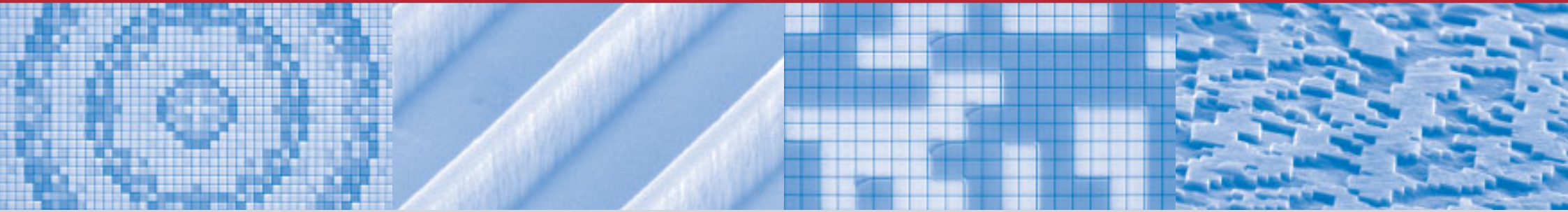
- + Display Applications
- + Beam Splitting
- + Laser Beam Shaping
- + Coherent Wavefront Modulation
- + Phase Shifting
- + Optical Tweezers
- + Digital Holography
- + Laser Pulse Modulation



OEM Microdisplay Services

Previously, the availability of microdisplay components has been limited. However, with the growth in the HDTV market in the recent past, this is no longer the case. HOLOEYE has positioned itself to offer adapted OEM solutions in optics and electronics based on the new LCoS™ GEN II display of Brillian Corporation, one of the leading microdisplay manufacturing companies in the world for the HDTV market. These systems outperform all other display technologies with respect to resolution, size, ease of use, and quality. HOLOEYE provides manufacturers in the field of technical optics, specifically technical projection, imaging and display technologies, with OEM-hardware and implementation design services. HOLOEYE and BRILLIAN Corporation, Tempe, AZ have signed an exclusive agreement, which enables HOLOEYE to address all technical related markets with LCoS™ GEN II displays in Europe and North-America. Another aim is to convert the ideas HOLOEYE and their customers have proven with aSLM developer kits to OEM products.





If you have any questions or would like detailed product literature, please don't hesitate to contact us directly via email or phone!
We look forward to hearing from you and are excited about the possibility of working with you to help you meet and exceed your technology objectives.

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