

HOLOCHIP



www.holochip.com

MISSION

Holochip's mission is to provide engineers, scientists, product developers and consumers with innovative solutions for utilizing and manipulating light.

VALUES

Our goal is to provide the highest quality adaptive lenses in the industry without compromising quality.

To achieve this, we pride ourselves on:

Expanding the range of applications where solid-state varifocal lenses are used.

Establishing the APL™, APX™, DIOPTAR™ and MAGNITAR™ series lenses as the preferred solution for optical applications where the dioptric range, optical performance, physical size, durability, ruggedness, insensitivity to acceleration and gravity, and cost are critical parameters.

Providing the largest format and highest quality adaptive lenses in the industry without compromising quality.

Continuously improving our products and technology through relentless R&D and attention to our customers' needs.

Providing complete optical solutions for military, aerospace, medical, manufacturing, automotive and a host of other industries.

CORE COMPETENCIES

Fluidic Lenses

Adaptive lenses provide a more compact, faster and lighter weight alternative to traditional imaging lens assemblies. Traditional imaging systems with zoom and/or auto-focus change focal length by the mechanical movement of two or more lenses elements along the optical axis. This is usually accomplished by moving lens elements or groups with a motorized cam. This is an inherently heavy, power hungry and expensive method.

In contrast, adaptive lens systems achieve these same effects by varying the focal length, instead of the position, of two or more adaptive lens elements. In terms of functionality, the fixed focal length and adjustable location of traditional lens systems are replaced by adjustable focal length and fixed location in adaptive systems.

The curvature of the individual lenses is adjusted to change their individual focal lengths. By leveraging the optical power of static glass or polymer lens elements that surround the adaptive lens, small, coordinated changes in the focal lengths of the adaptive elements result in large changes in system focal length or magnification. Thus, large focal length and zoom ranges can be achieved with very little change in the system, as compared to a traditional zoom lens.

Holochip™ adaptive lenses leverage fluidic pressure to control the curvature of optical membranes. Each lens comprises an optical fluid encapsulated by a deformable membrane. Increasing fluidic pressure leads to a reduction in radius of curvature of the membrane, thereby increasing the focal power of the lens.



Holochip™ Advantage

Fluidic lenses have always been subject to aberrations due to the effect of gravity on the lens fluid. The membrane encapsulating the lens fluid should ideally be deflected into a spherical surface by fluid pressure, however, the force of gravity prevents this. When the optical axis of the lens is perpendicular to the direction of gravity, gravitational force acting on the fluid deforms the surface of the membrane. This deviation from a spherical surface manifests as optical aberrations.

To solve this problem, Holochip developed the new DIOPTAR™ family of lenses which incorporate Holochip's™ patented Anewtonian Lens Technology™ or ALT™. ALT™ enables large aperture fluidic lenses, free from gravitationally induced aberration, regardless of lens orientation. Position-independent aberration-free operation is achieved with a fluidic doublet design. Further, the doublet design allows DIOPTAR™ lenses to withstand far greater forces of acceleration without suffering from aberrations.

Anewtonian Lens Technology™

This technology eliminates gravitationally induced aberrations and allows high quality imaging regardless of lens orientation or aperture diameter. Conventional fluidic lenses suffer significant aberrations which grow worse with an increase in aperture diameter.

Product Suite

Holochip™ offers a variety of adaptive lenses to meet the demands of a wide range of applications. Adaptive lenses enable the development of compact optical systems by eliminating the need for mechanical translation of the lens elements in the system. Further, variable focal length lenses accelerate optical system prototyping, providing developers with the ability to quickly test and optimize optical layout and systems.

DIOPTAR™

The DIOPTAR™ is the newest family of Holochip adaptive lenses, constructed from polycarbonate, enabling a light weight and rugged solution for numerous imaging applications. To enable low power actuation, the DIOPTAR lens family utilizes an all-capacitive-load actuation subsystem. This feature makes the DIOPTAR™ lenses ideal for mobile applications where electrical power is limited. Potential applications include surveillance cameras, targeting systems, UAVs, helmet-mounted or visor displays, machine vision, 2D and 3D display systems, LED and illumination and much more.

Features:

- » Low aberrations independent of orientation
- » Wide range of dioptric power
- » Low electrical power consumption
- » Wide temperature range
- » Large aperture
- » Lightweight and compact



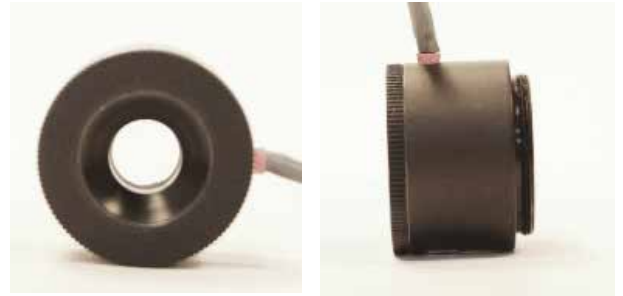
MAGNITAR™

The MAGNITAR™ is a large aperture, high-resolution adaptive lens with high laser power handling capabilities. The lens has a large aspect ratio (aperture to bezel) and can be easily integrated into imaging systems where space is at a premium. Potential applications include adaptive zoom (imaging, scopes/binoculars), display systems, machine vision, laser control, and ophthalmology.



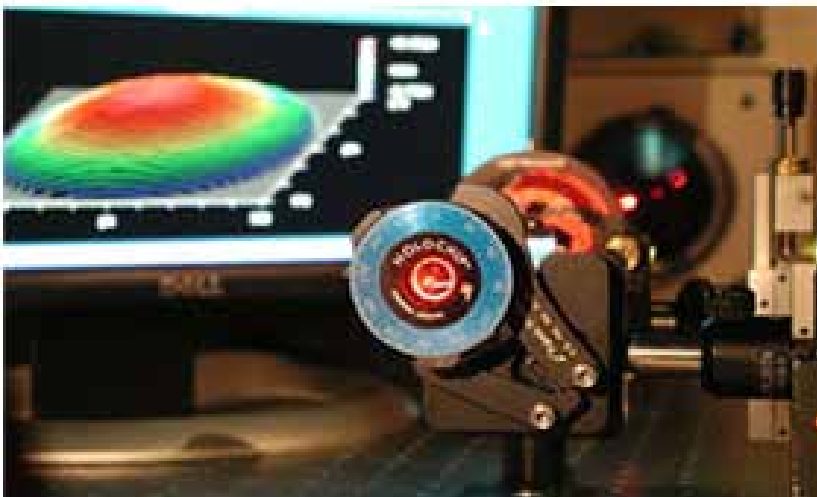
APX™

The APX™ is an electrically actuated lens equally suited for use in lab environments, laser machining, machine vision, and imaging and numerous other applications. The focal length may be altered very rapidly, up to 20 kHz, by delivering a control signal of 0-5v to the system. The APX™ is the first adaptive lens capable of providing optical performance comparable to that of a glass singlet. Potential applications include adaptive zoom (imaging, scopes/binoculars), display systems, machine vision, laser control, and ophthalmology.



APL™

The APL™ was the first product released by Holochip and provides a useful addition to any optics lab's toolbox of lenses. The APL™ is a manually-adjustable variable-focal length fluidic lens. By rotating the outer ring of the lens, the focal length may be adjusted, allowing the lens to replace a plethora of traditional singlets, making the APL™ ideal for rapidly prototyping new optical systems without the need for host of static lenses. Potential applications include replacement for glass singlets, optical system prototyping, adaptive illumination systems, and ophthalmology.





MARKETS/CUSTOMERS

Holochip partners with governmental agencies and companies around the globe. These partners offer access to world-class research, development and manufacturing facilities as well as a worldwide distribution network.

» **U.S. Air Force**

» **DARPA**

» **U.S. Army**

» **U.S. Navy**





HOLOCHIP

Holochip's high quality adaptive lenses enable a new generation of imaging and laser systems that are lighter, more capable and available at a lower cost than ever before.

OBJECTIVE

Holochip was founded in 2004 on the philosophy that the emergence of affordable, durable, and high-quality variable-focus lenses signifies a new and sustainable photonics market segment. Today, the adaptive lens, born at the crossroads of traditional lenses and adaptive optics, has grown and now impacts applications in a plethora of technology sectors.



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