

# Adaptive optics components for researchers



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**Precision ocular wavefront analysis**  
**Large-stroke wavefront correction**  
**Powerful command & control software**  
High precision • Wide dynamic range • Unique fonctionnalité

<sup>1</sup> In laboratory conditions using an artificial eye. Individual results may vary. <sup>2</sup> Wavefront seen by the analyser. <sup>3</sup> Difference between the real wavefront and a reference wavefront obtained in similar conditions ( $5 \lambda$  of shift maximum). <sup>4</sup> In each of the 52 channels. Sum of absolute voltages not to exceed 25 V.

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## adaptive optics adapted to eye care

Imagine Eyes understands the unique requirements of researchers in domains ranging from ophthalmology to vision science. Many of our customers are leading figures in their areas of expertise and we work closely with them to ensure that our products respond to their needs. From ocular wavefront analysis and correction components to full-featured adaptive optics solutions, we deliver the technology you need to achieve your objectives. When you need it, we are there for you with exemplary customer support.

Our products combine precision, dynamic range, repeatability, unique functionality and ease of use to provide you with the tools you need to produce publication quality data faster and to bring new discoveries to light. When brought together into one solution, mirao, HASO 32 - eye and CASAO form the AOKi™ - eye — a powerful solution for professionals at the forefront of vision science and eye health research.

For more information about Imagine Eyes and our products, please visit our website [www.imagine-eyes.com](http://www.imagine-eyes.com) or call us on +33 (0)1 64 86 15 66.

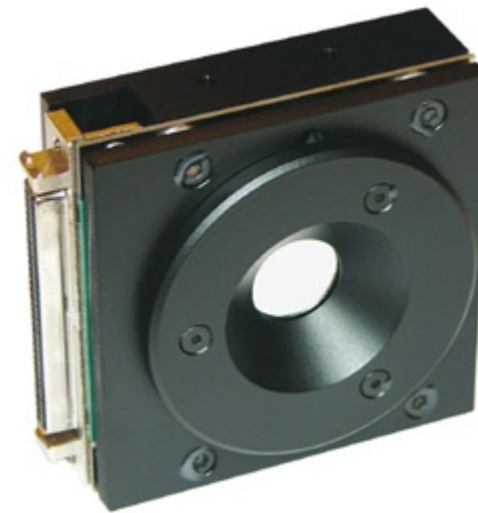
### HASO 32 - eye Wavefront Sensor



Imagine Eyes' HASO™ 32-eye wavefront sensors are specially designed to meet the special needs of researchers in eye care and vision science for high-performance, versatile devices at a competitive price. Calibrated to the ideal wavelength for ophthalmic applications, the HASO 32 - eye is based on patented Shack-Hartmann technology that unites key features including high-resolution, exceptional repeatability and wide-dynamic range to go beyond the measurement capabilities of competing products. Their small footprint, low power consumption and industry standard Firewire connectivity facilitates seamless integration with other products when building high-performance ocular wavefront analysis and adaptive optics systems.

- 4.5 x 3.6 mm<sup>2</sup> aperture dimension
- 40 x 32 sub-apertures dedicated to analysis (1280 lenslets)
- > ± 3° (400 λ) tilt dynamic range
- ± 0.015 m to ± ∞ (400 λ) focus dynamic range
- < λ/200 repeatability (RMS)<sup>1</sup>
- < λ/100 wavefront measurement accuracy (absolute mode)<sup>2</sup>
- < λ/150 wavefront measurement accuracy (relative mode)<sup>3</sup>
- 5 μrad tilt measurement sensitivity
- 3.10<sup>-3</sup> m<sup>-1</sup> focus measurement sensitivity
- ~ 110 μm spatial resolution
- 60 Hz maximum acquisition frequency
- 780 nm calibrated wavelength
- 12 V / 2 W power supply
- Dimension/weight 30 x 35 x 54 / 150 g
- HASOv3 and SDK included
- Firewire connectivity

### mirao 52-e Electromagnetic Deformable Mirror

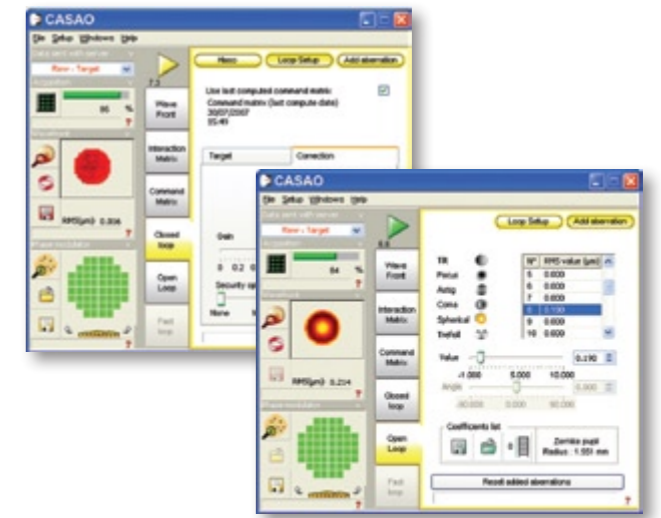


Imagine Eyes' patented mirao™ 52-e Electromagnetic Deformable Mirror is the only product of its kind on the market today. Only mirao has the large-stroke and optical quality needed to correct for the wide-ranging aberrations found in eyes – even in highly-aberrated and pathologically affected eyes. Even more, its low voltage input makes it ideal for integration into medical devices.

In retinal imaging, mirao enables you to improve both the transverse and axial resolutions of today's leading cellular imaging techniques including OCT and confocal/multiphoton microscopy. As a component in your vision simulation system, mirao allows you to correct for aberrations and simulate the effects of various aberrations on vision.

- 52 actuators
- 15 mm effective pupil diameter
- ±50 μm maximum generated wavefront (tilt PV)
- 0.01 μm surface quality (RMS active flat)
- 0.02 μm wavefront quality (RMS active flat)
- Integrated tip/tilt correction
- Spatial frequency correction of Zernike order up to 6
- > 95% linearity
- < 2% hysteresis
- Maximum actuator input voltage: ± 1 V<sup>4</sup>
- Coating: protected silver
- Power consumption: 50W maximum
- Mirror unit dimensions/weight: 64 x 64 x 23 mm / 490 g
- Electronic unit dimensions/weight 230 x 245 x 90 mm / 3 Kg
- Application Programming Interface included
- USB2 connectivity

### CASAO Command & Control software



CASAO™ is a unique application that seamlessly combines wavefront measurement and correction features with extensive instrument diagnostics to provide users with an ergonomic adaptive optics PC workspace. Perfectly adapted for use with our HASO™ 32 - eye and mirao™ 52-, CASAO is the only software tool that you need to get the most out of your open or closed-loop system.

Newcomers to adaptive optics will appreciate CASAO's unique, hands-on tutorial mode that guides you step by step through measurement, correction and diagnostics. Experienced users can choose between standard and automatic modes that put the ensemble of CASAO's features at your disposal right away. Even more, CASAO's wavefront and instrument diagnostics enable you to better understand and use the information you acquire by providing detailed information on its nature.

#### CASAO SDK & CASAO Fast

For users that want to build their own software applications based on CASAO's unique functionality, we offer the CASAO SDK. The SDK regroups all of CASAO's functions into a readily accessible library of DLLs that enable rapid development. The CASAO FAST option is available for users with special applications that require high temporal frequencies.

