

# HASO<sup>TM</sup> FAST

## High-speed and high-resolution without compromising dynamic range!



Our HASO Fast Shack-Hartmann wavefront sensors provide fast accurate and reliable measurements by uniting the standard HASO family's standard functionalities that customers have come to rely on, including absolute measurement, unequalled accuracy and insensitivity to vibration, with an acquisition speed of 950 Hz and a spatial resolution of 16 x 16 microlenses.

Our proprietary Dynamic Spot Tracking<sup>TM</sup> and Auto Spot Finder<sup>TM</sup> features combined with the exceptional optical quality of our refractive microlenses in our patented Rotated Square<sup>TM</sup> configuration provide superior accuracy and eliminate crossing spots, without compromising dynamic range. Even more, Imagine Optic's proprietary calibration technology enables you to obtain absolute measurements every time, without the need for a reference beam, and our patented sensor design allows you to measure phase and intensity independently and in real-time.

When coupled with our HASO v3 software package, you can perform both zonal and modal wavefront reconstruction; calculate the PSF, MTF and Strehl ratio; visualize the spot diagram; and obtain the M<sup>2</sup> parameter. Adaptive optics users can take advantage of our CASAO<sup>TM</sup> software package to control adaptive optics loops to compensate for atmospheric turbulence, optimize the focal spots of laser beams and Freespace communications.

If you would like more information on our products, please visit our website [www.imagine-optic.com](http://www.imagine-optic.com), call +33 (0)1 64 86 15 60, or e-mail us at [contact@imagine-optic.com](mailto:contact@imagine-optic.com).

	HASO 16
Aperture dimension	2,5 x 2,5 mm <sup>2</sup>
Sub-apertures dedicated for analysis <sup>1</sup>	16 x 16
Refractive microlens technology	standard square
Tilt dynamic range	> ± 3 °
Focus dynamic range - minimum local radius of curvature	± 0,025 m
Focus dynamic range - maximum n.a.	0.1
Repeatability (rms)	< λ/200
Wavefront measurement accuracy in absolute mode (rms) <sup>2</sup>	~ λ/100
Wavefront measurement accuracy in relative mode (rms) <sup>3</sup>	~ λ/150
Tilt measurement accuracy (rms)	6 μrad
Focus measurement accuracy (rms)	5x10 <sup>-3</sup> m-1
Spatial resolution	~ 160 μm
Maximum acquisition frequency	955 Hz
Processing frequency	800 Hz
Working wavelength	350-1100 nm
Calibrated wavelength range	On request
Extended calibrated wavelength range	On request
Working temperature	15 – 30°

(1) Difference between the real wavefront and a reference wavefront obtained in similar conditions (10 λ of shift maximum).  
(2) Wavefront as seen by the wavefront sensor. Performance kept on the whole spectral range.



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