



# HASO4 FIRST

The Optical Metrology  
**On demand wavelength**

350-1100 nm  
Your Shack-Hartmann  
Wavefront Sensor



 compatible





## The smallest and simpler HASO4 Shack-Hartmann Wavefront Sensor : optimized for one wavelength, ideal for OEM

The second generation,  
available since 2022, is now  
faster and has a improved  
spatial resolution while  
keeping the same accuracy.



HASO4 FIRST is  
compatible with the  
Optical Engineer  
Companion metrology  
system.

## APPLICATIONS

- + Quantify the optical system's aberrations
- + Align the system to ensure that it performs at its best
- + Predict the optical system's performance in terms of focalization capability or imaging quality
- + Quantify the effects of temperature and gravity on the system's performance
- + Verify that the optics comply with specifications
- + Pilot a wavefront corrector to change the system's aberrations
- + Check whether the optical mount overly distorts the optics

## FEATURES

- + Beam collimation with an accuracy better than 200m radius of curvature
- + A 20mm focal length measurement with a sensitivity of  $1\mu\text{m rms}$
- + Direct wavefront acquisition of converging and diverging F/5 beams with an accuracy of  $\lambda/100\text{ rms}$  including astigmatism and high-order aberrations
- + Control and adjustment of axial laser beam deviation better than  $5\mu\text{rad rms}$
- + 3D localization of a focal spot up to  $0.1\mu\text{m rms}$  and  $1\mu\text{m rms}$  for lateral and axial resolution respectively (0.1 NA beam)



# SPECIFICATIONS

## OPERATING SPECS

Aperture dimension	4.48 x 3.66 mm <sup>2</sup>
Number of microlenses	44 x 36
Maximum acquisition frequency	125 Hz
One wavelength +-50 nm in the range	350-1100 nm
Minimum power	0.15 nW
External trigger TTL signal	

## OPERATING SYSTEM

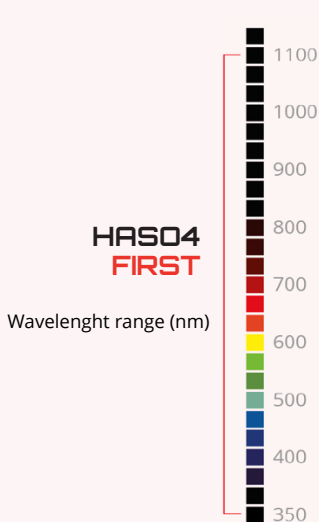
Windows 7 & 10

## OPTICAL SPECS

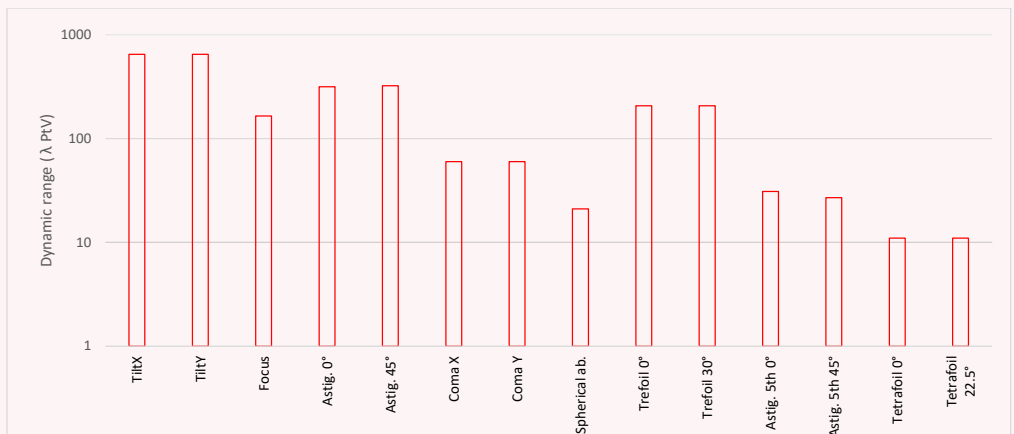
Repeatability	< $\lambda/200$ rms
Wavefront measurement accuracy	$\sim \lambda/100$ rms
Spatial sampling	$\sim 100 \mu\text{m}$
Tilt dynamics range	$> \pm 3^\circ$
Focus dynamics range	$\pm 0.018 \text{ m to } \pm \infty$

## MISC

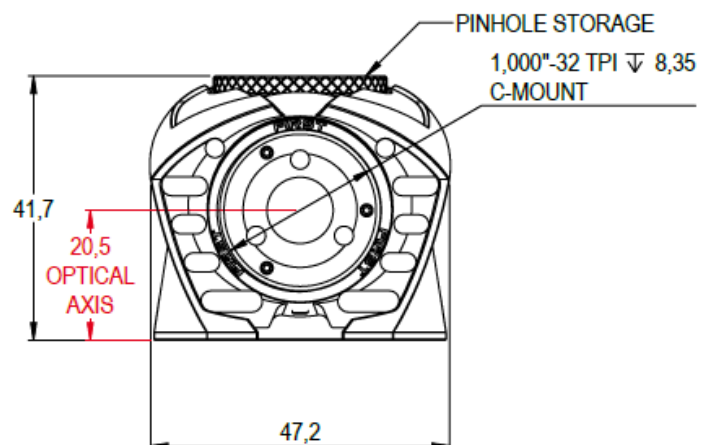
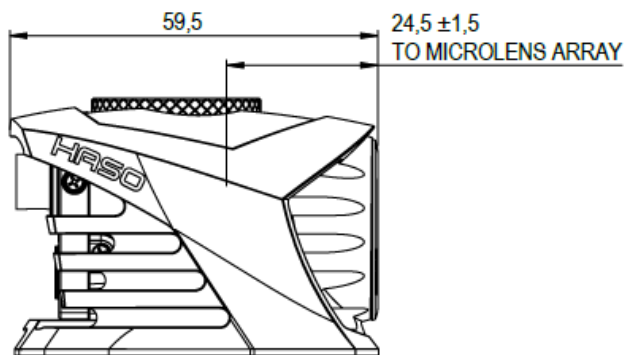
Dimension/weight for USB version	60 x 48 x 42 mm <sup>3</sup> / 185 g
Working temperature	15 - 30 °C
Interface / Power consumption	USB 3.0 / 2.7 W



## HASO4 FIRST Dynamic range



# DIMENSIONS (mm)

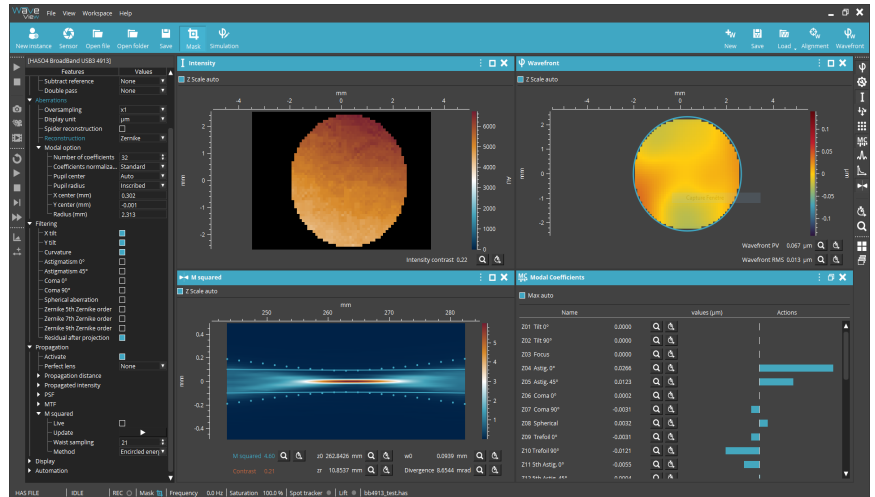


# SOFTWARE

## WAVEVIEW 4.3 Metrology Software

WaveView is the most advanced wavefront measurement and analysis software. It offers more than 150 features and tools optimized for a wide range of highly demanding applications.

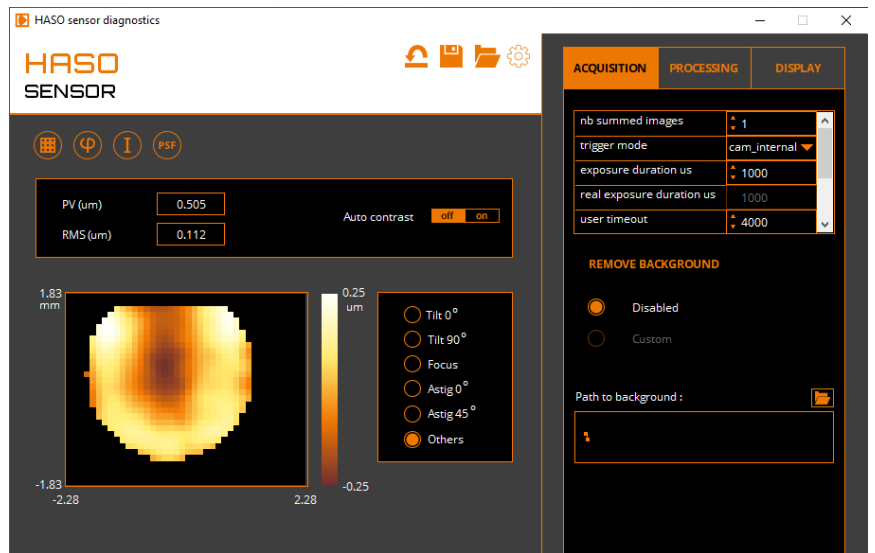
- + Extensions for PSF, MTF, Msquare and Strehl ratio
- + Optional SDK in C/C++, LabVIEW and Python
- + Windows10 64 bits compatible



## WAVETUNE 4.3 Adaptive Optics Software

WaveTune is a unique software that seamlessly combines wavefront measurement and correction features with extensive instrument diagnostics. It is perfectly adapted to our HASO wavefront sensors, ILAO Star, and MIRA0 deformable mirror, as well as to a wide range of active components.

- + Compatibility with many deformable mirrors
- + Optional SDK in C/C++, LabVIEW and Python



## CONTACT US

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