


HAS04

FAST

Wavefront sensor
The kHz

High-speed
High accuracy
Compact & versatile

 compatible



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Imagine
Optic

HASO4 FAST +

Ideal for measuring rapid changes in wavefronts, the HASO4 FAST Shack-Hartmann Wavefront Sensor, with a frame rate of 1 kHz, meets all demanding dynamic applications.



Compatible with the **Optical Engineer Companion** modular system: easily combine the accessories you need.

APPLICATIONS

Successfully used in the most demanding applications in optical metrology that require high speed and high wavefront measurement accuracy, fast adaptive optics correction and free-space communications, the HASO4 FAST performs multiple functions :

- + Quantify the transitional regime of active optical elements such as variable focal length lenses
- + Quantify the pointing stability of high frame rate laser
- + Drive a deformable mirror in high frame rate adaptive optics setups
- + Fast inspection: measure the optical system's aberrations and verify that the optics comply with specifications

FEATURES

- + Direct wavefront acquisition of converging and diverging F/5 beams with an accuracy of $\lambda/100$ RMS including astigmatism and high-order aberrations
- + Perfect knowledge of the measurement time by using the external trigger feature
- + Latency optimized to less than 2.2 ms, including wavefront measurement, allowing high performance adaptive optics
- + Only 1 nW power level needed on the sensor to acquire the wavefront with an accuracy of $\lambda/100$ RMS at 1 kHz
- + Patented technology for simultaneous and independent measurements of phase and intensity



SPECIFICATIONS*

OPERATING SPECS

Aperture dimension	1.2 x 1.2 mm ²
Number of microlenses	16 x 16
Maximum acquisition frequency	1.25 kHz
Calibrated wavelength range	400 - 900 nm
Minimum power	0.15 nW
External trigger	TTL signal

OPERATING SYSTEM

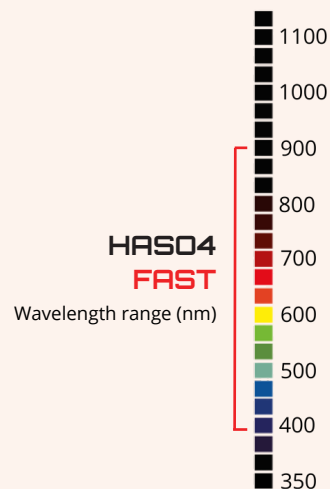
Windows 10

OPTICAL SPECS

Repeatability	$\lambda/200$ RMS
Absolute wavefront measurement accuracy	≤ 6 nm RMS
• λ between 400 - 600 nm	$\sim \lambda/100$ RMS
• λ between 600 - 900 nm	~ 75 μ m
Spatial sampling	$> \pm 3^\circ$
Tilt dynamics range	± 0.008 m to $\pm \infty$
Focus dynamics range	

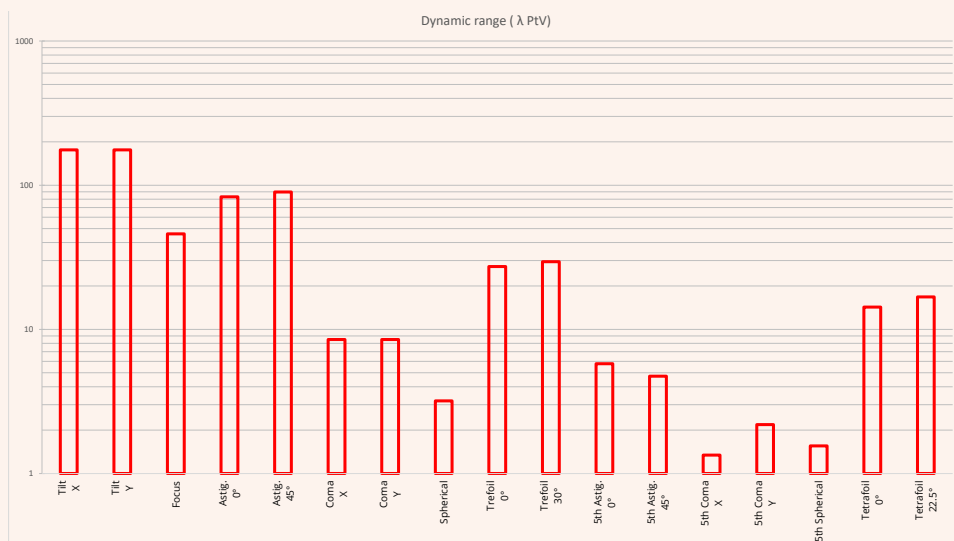
MISC

Dimensions (Height x Width x Length)	42 x 48 x 60 mm ³
Weight for USB version	185 g
Working temperature	15 - 30 °C
Interface	USB 3.0
Power consumption	3 W



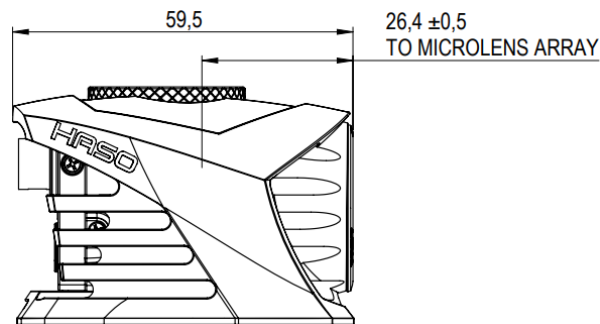
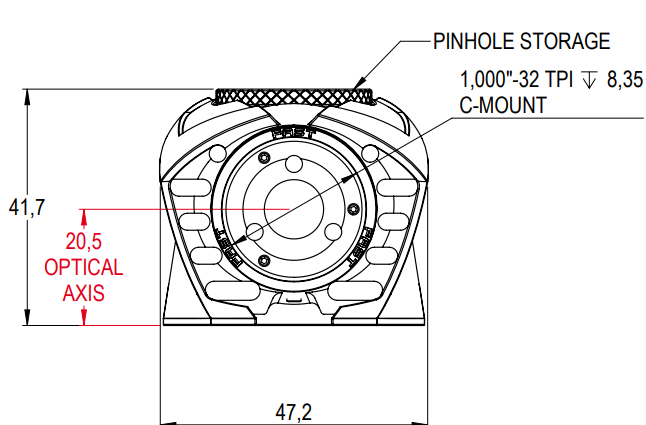
HASO4 FAST

Dynamic range at $\lambda = 635$ nm



*Subject to changes without further notice

DIMENSIONS (mm)



SOFTWARE

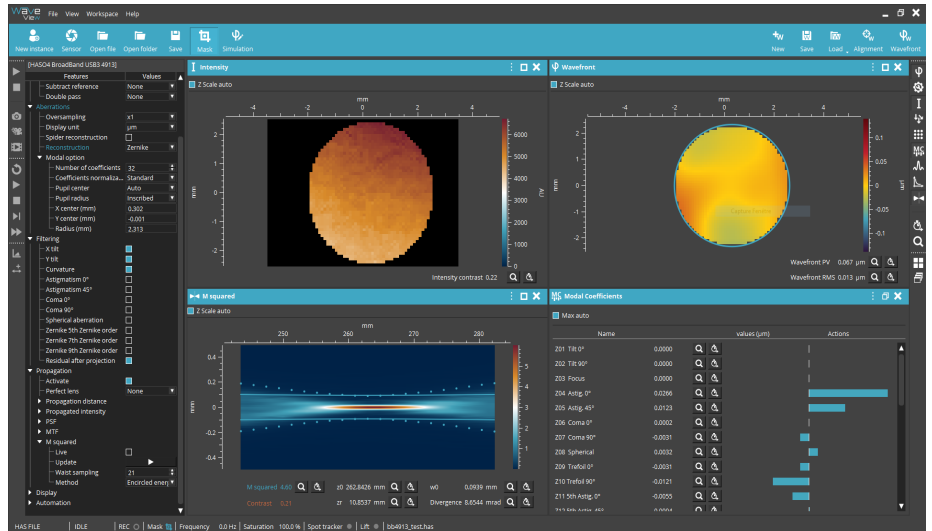
WAVEVIEW™ Metrology Software

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.

Options :

- + Extensions for PSF, MTF and Strehl ratio
- + Optional SDK in C/C++, LabVIEW and Python



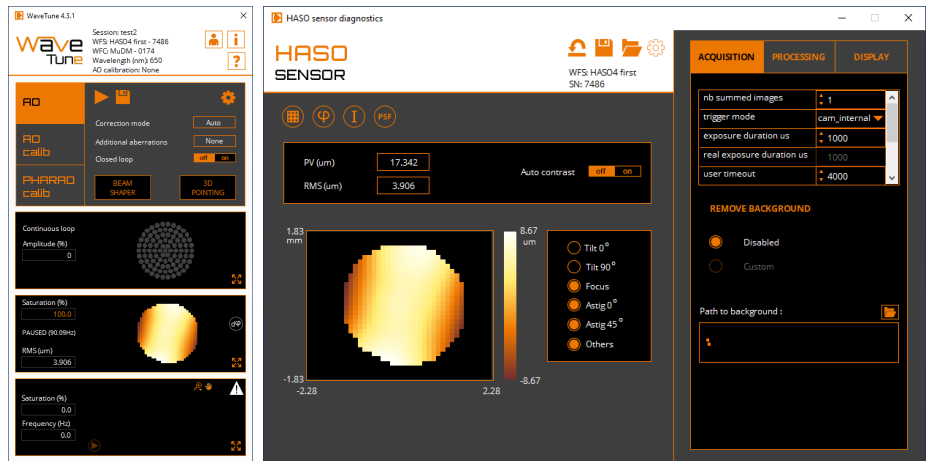
WAVETUNE™ Adaptive Optics Software

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, MIRAO and mu-DM deformable mirrors, as well as to a wide range of active components.

Options :

- + Optional SDK in C/C++, LabVIEW and Python





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