



HAS04 Broadband

The Optical Metrology
Workhorse

350- 1100nm
Alignment-Free
Wavefront Sensor



 compatible



HASO4 BROADBAND +

A great choice for almost any lab or industrial application, the HASO4 BroadBand is Imagine Optic's most versatile wavefront sensor.

The second generation was released in 2020, and features the new SpotTracker technology.

It provides absolute wavefront and tilt information, eliminating alignment requirements.



This instrument 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
- + Directly measure the optical system's wavelength dependency
- + Pilot a wavefront corrector to change the system's aberrations
- + Check whether the optical mount overly distorts the optics

FEATURES

Successfully used in the most demanding of applications in optical metrology, microscopy, and laser diagnostics, the HASO Broadband performs multiple functions :

- + Direct wavefront acquisition of converging and diverging F/5 beams with an accuracy of about $\lambda/100$ rms, including astigmatism and high-order aberrations
- + Beam collimation with an accuracy better than 300 m radius of curvature
- + Control and adjustment of axial laser beam deviation better than $3\mu\text{rad}$ 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)
- + Patented technology for simultaneous and independent measurements of phase and intensity



SPECIFICATIONS

OPERATING SPECS

| | |
|-------------------------------|---------------------------|
| Aperture dimension | 7.0 x 5.2 mm ² |
| Number of microlenses | 68 x 50 |
| Maximum acquisition frequency | 20 Hz |
| Calibrated wavelength range | 350 - 1100 nm |
| Minimum power | 0.15 nW |
| External trigger TTL signal | |

OPERATING SYSTEM

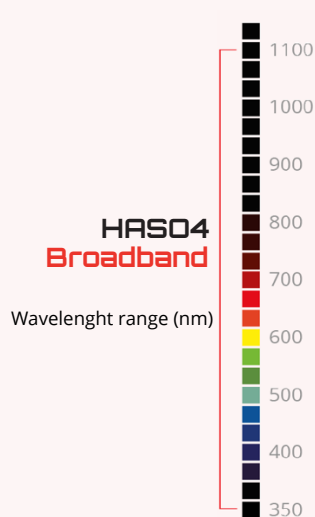
Windows 7 & 10

OPTICAL SPECS

| | |
|---|-------------------------------|
| Repeatability | < $\lambda/200$ rms |
| Wavefront measurement accuracy in absolute mode | |
| · λ between 350-600 nm | ≤ 6 nm rms |
| · λ between 600-1100 nm | $\sim \lambda/100$ rms |
| Spatial sampling | $\sim 105 \mu\text{m}$ |
| Tilt dynamics range | $> \pm 3^\circ$ |
| Focus dynamics range | ± 0.010 m to $\pm \infty$ |

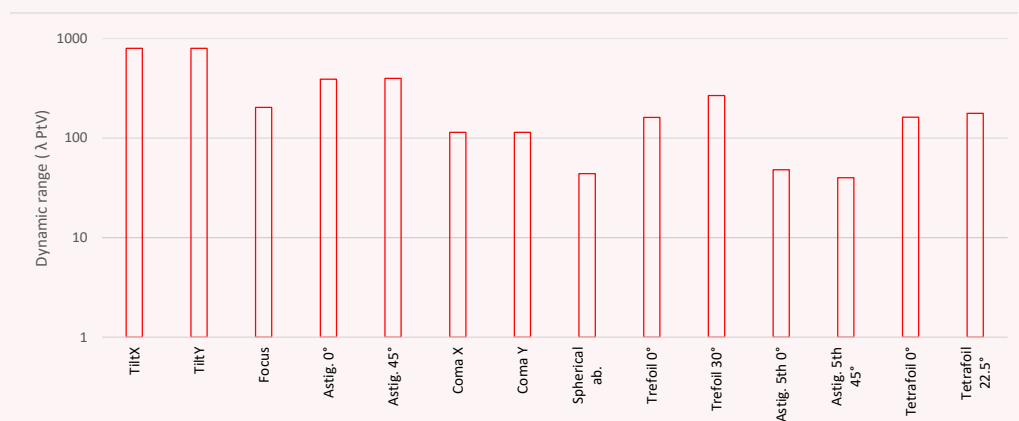
MISC

| | |
|----------------------------------|--------------------------------------|
| Dimension/weight for USB version | 42 x 47 x 60 mm ³ / 185 g |
| Working temperature | 15 - 30 °C |
| Interface / Power consumption | Ethernet / 2.9 W USB 3.0 / 2.9 W |

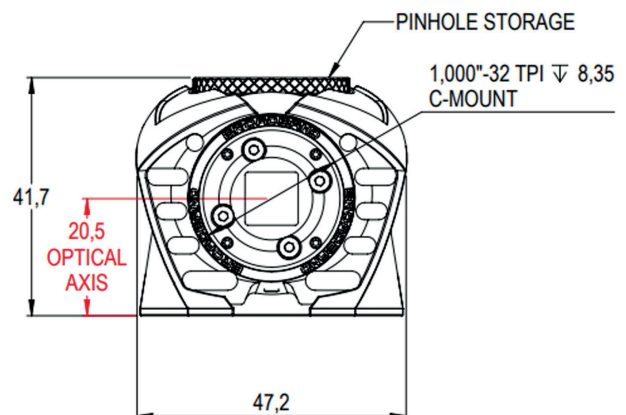
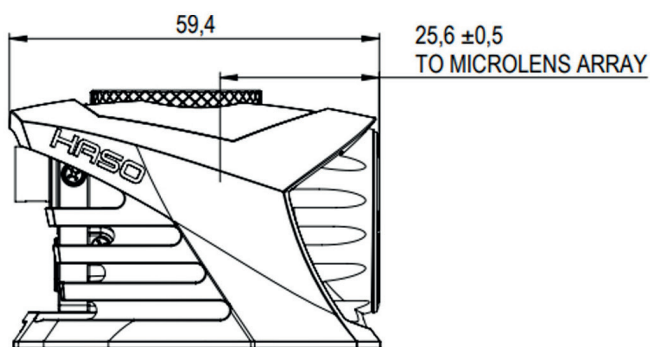


HASO4 Broadband

Dynamic range



DIMENSIONS (mm)

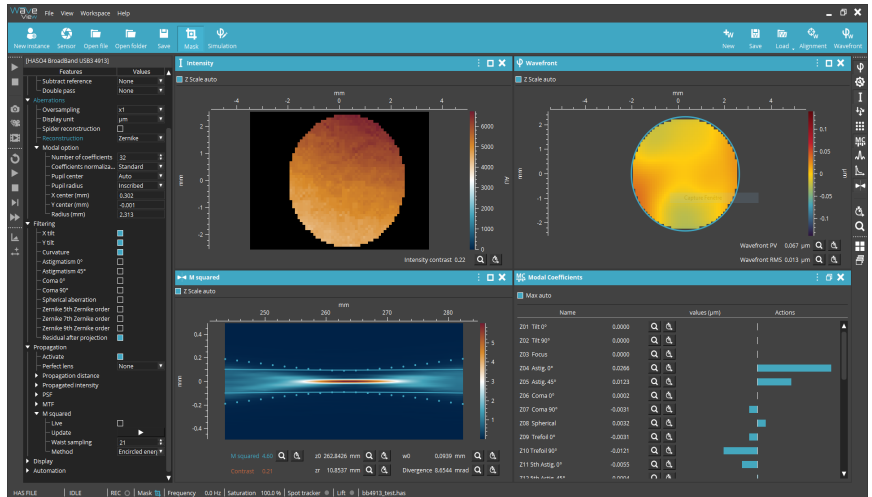


SOFTWARE

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.

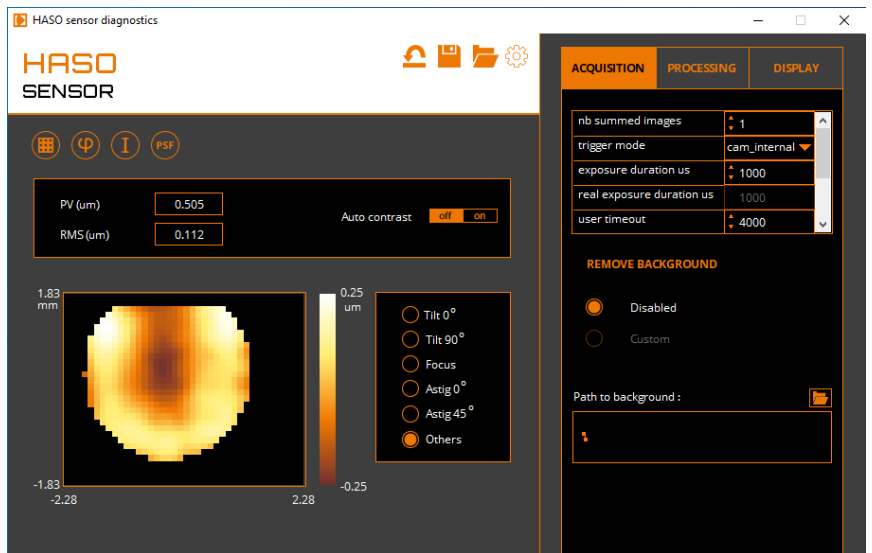
- + Extensions for PSF, MTF, Msquare and Strehl ratio
- + Optional SDK in C/C++, LabVIEW and Python
- + Windows10 64 bits compatible



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



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