HASO SWIR
R.FLEX2 SWIR

FOR λ **= 1.0 - 1.7 µm**
WITH λ/200 RMS ACCURACY

LARGE RANGE OF F/#
AVAILABLE

COMPACT AND ROBUST
FOR EASY INTEGRATION

**UP TO 150 Hz**
ACQUISITION FREQUENCY

SWIR wavefront and MTF measurements for characterizing optical components, such as lenses, filters, waveplates, telescopes and complex optical systems

A UNIQUE SET OF ADVANTAGES

- λ/200 rms measurement accuracy in double-pass configuration

- Collimated or diverging exit beam with the F/# that matches to optics under test

- Highly accurate wavefront analysis even with central obscuration and/or spider-beam types

- Insensitive to vibrations and atmospheric turbulences

- Removable wavefront sensor for using it as a stand-alone unit

- Several accessories available , such as laser diode light sources, reference mirrors for calibration and translation stages

Example of measurement configuration
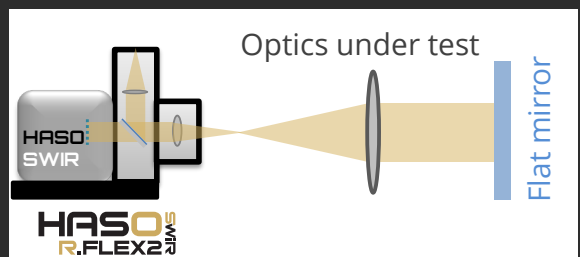
Optics under test

Flat mirror

HASO SWIR

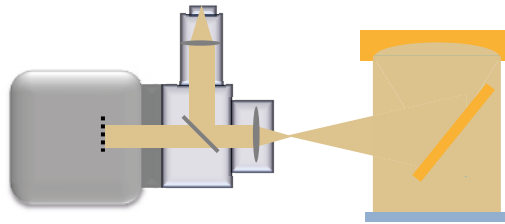HASO R.FLEX2 SWIR

Examples of measurement configuration

Measuring large concave mirrors

HASO R-Flex2 SWIR has been optimized using proprietary designs that enable manufacturers to accurately measure large uncoated concave mirrors by positioning the unit to measure at the center of curvature.
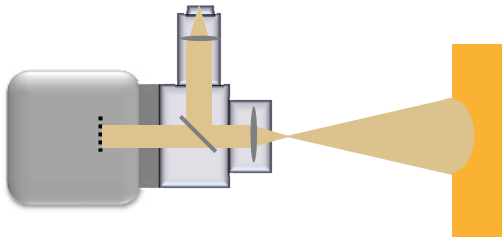
Characterizing complex optical systems

Complex optical systems such as telescopes and collimators can be readily characterized by HASO R-Flex2 SWIR. The best focal point can be found using wavefront error whereas, if the focus point is defined mechanically, optics can be aligned for that point.

Measuring lenses on-axis

Any diameter lenses are easily measured with HASO R-Flex2 SWIR by using a coated or uncoated flat reference mirror to reflect the beam back to the wavefront sensor without adding any aberrations.
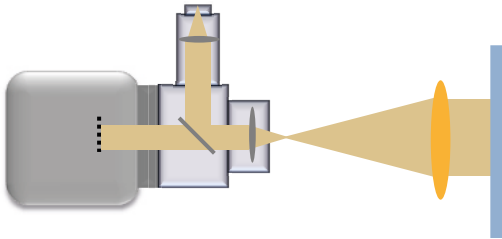
Characterizing lenses in the field

By mounting the HASO R-Flex2 SWIR onto a translation stage and orienting the flat reference mirror correspondingly, you can qualify lenses at any point in the field.
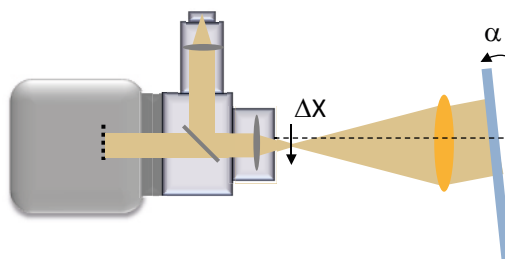
Characterizing & aligning beam expanders

HASO R-Flex2 SWIR 's modularity is particularly useful since its focusing unit dismounts quickly and therefore a collimated beam can be used as an illumination source to characterize the beam expander without adding any aberrations.
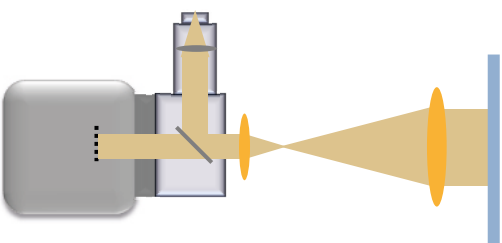
Working with external sources

High N/A external sources can be accurately measured because the optical head can be completely characterized (left image). Dismount it, and you can use the wavefront sensor as a stand-alone unit (right image).
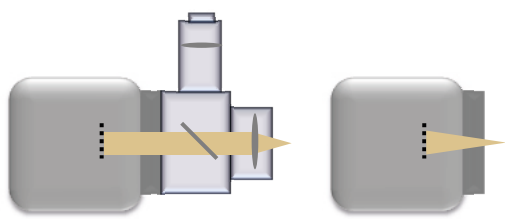
HASO SWIR · R-FLEX2 · MOD

Wavefront sensor · Collimator · Focusing module · Optics under test · Reference flat mirror
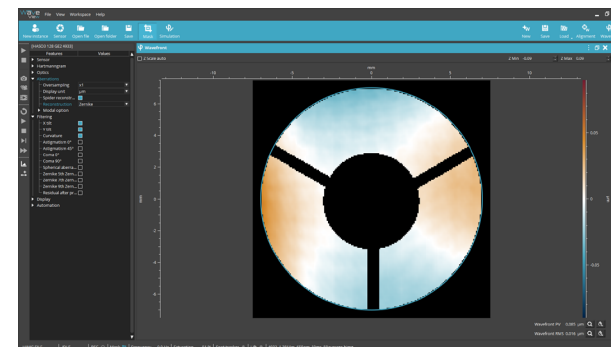

R-Flex2 SWIR SPECIFICATIONS

Compatible wavefront sensor	HASO SWIR
Wavefront measurement accuracy in double pass configuration	λ/200 RMS
Aperture dimension	9.30 x 7.44 mm2
Number of phase points	40 x 32
Collimated beam diameter	~12mm*
Maximum acquisition frequency (Hz)	150 Hz

FOCUSING MODULES

Focusing module name	F number	Focal length (mm)	Wavefront error (nm RMS)**	Working distance from the module (mm)	Required back power (%)
MOD F20	2.7	20	250	10.0	3
MOD F31	4.2	31	150	10.0	3
MOD F40	5.4	40	100	3.3	3
MOD F50	6.8	50	25	3.3	3
MOD F60	8.1	60	50	12.8	3
MOD F76	10.2	75.3	25	12.8	3

* Output light beam diameter only, its useable area is always determined by sensor's aperture dimension.
** WaveFront Error (WFE) at the output of the module for a circular pupil corresponding to the nominal F/#

Screenshot of WaveView software showing reconstructed wavefront of a beam with an obscuration.

Zernike coefficient window

Accessories

Translation stages
Our ΘΧΘΥ rotation stage for angular alignment or the 5-axis stage that provides 2-way rotation around X and Y axes as well as 3-way translation along X, Y and Z axes is a perfect complement to the HASO R-Flex system.

Software add-on
HASO R-Flex is delivered with WaveView software, which is a leading wavefront metrology software providing 180 independent features. We also offer optional software modules including MTF (Modulation Transfer Function) and PSF (Point Spread Function) that increase the functionality of HASO R-Flex system.

Reference mirrors
Spherical reference mirror (ø20mm useful pupil, R=15mm, F/0.75) for the calibration of HASO R-Flex in double-pass measurement configuration
Flat reference mirror for autocollimation. Several options are available in diameter and flatness.

Single-Mode Laser Source (SMLS)
For those who want to use their HASO R-Flex at different wavelengths, we provide additional single-mode diode lasers to further expand the versatility of the system. Please contact us if you prefer to use your own light source.

NEW: R-Flex Kit
Kit for R-Flex calibration check and maintenance. It includes a light source for pre-alignment and fiber checking, a dust remover, a telescopic mirror, a torch lamp, a plane mirror, a retroreflector, and the instruction for R-Flex calibration check.

Available SMLS wavelengths:

Model name	Wavelength (nm)	Maximal power (mW)
SMLS 1064-S	1064	4.5
SMLS 1550-S	1550	4.5
SMLS custom	Ask	Ask

SMLS

SWIR related products

- HASO SWIR
- HASO4 SWIR 1550
- R-Flex2 SWIR
- R-Flex Large Aperture (LA) SWIR