



OEC

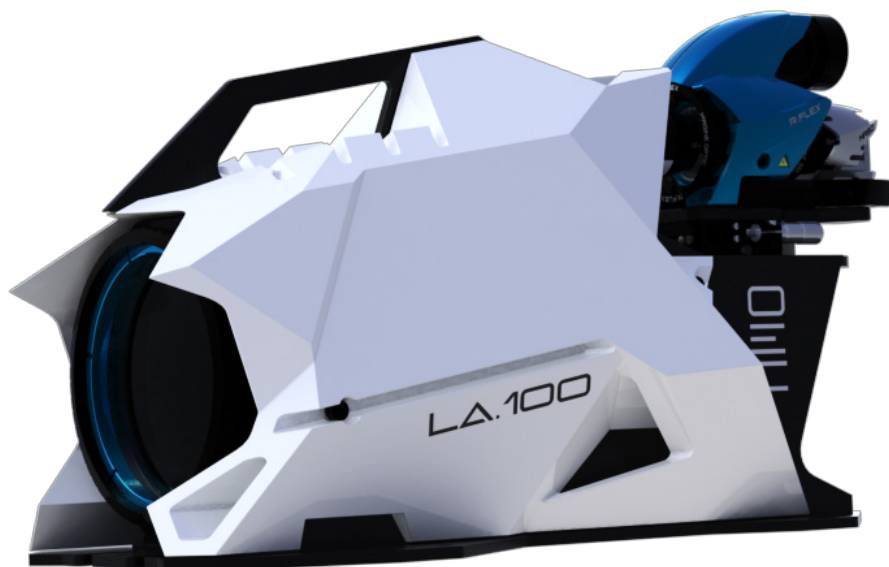
Optical Engineer Companion

Metrology solution
The all-rounder

Metrology on-the-go
Modular system
Upgradable



 compatible



OPTICAL ENGINEER COMPANION +

Our family of products now teams up to support your optical metrology



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

CONFIGURATION

The OEC refers to a family of standard sensors and accessories that can be instantaneously combined to create the configuration you need for your optical tests.

Select the modules among:

- 1
a variety of metrology sources from UV to SWIR
- 2
a large range of HASO™ or LIFT wavefront sensors
- 3
several R-FLEX™ illumination systems
- 4
a choice of R-FLEX LA™ beam expanders

...and use them in combination or separately.

#1

METROLOGY SOURCE: MS-λ



MS-λ
400 - 1550 nm

Perfect-wavefront metrology source:

- + Laser Diode or SLED
- + Monomode fiber
- + FC/APC output
- + Manual or remote (USB) control
- + Adjustable intensity output
- + Trigger input
- + Optical power: 5 mW

| Reference | Wavelength (nm) |
|-----------|------------------------------------|
| MS-405 | 405 |
| MS-488 | 488 |
| MS-520 | 520 |
| MS-635 | 635 |
| MS-785 | 785 |
| MS-830 | 830 |
| MS-1064 | 1064 |
| MS-1550 | 1550 |
| MS-CUSTOM | contact us for specific wavelength |

#2

WAVEFRONT SENSOR: HASO™ & LIFT



HASO LIFT 680
680 x 504 phase points



HASO LIFT 272
272 x 200 phase points



HASO 126 VIS
13.8 x 10.2 mm



HASO BROADBAND
350 - 1100 nm

HASO 126 BROADBAND
350 - 1100 nm



HASO FIRST
λ/100 RMS at custom wavelength



HASO FAST
980 kHz



HASO SWIR LIFT
160 x 128 phase points



HASO SWIR
0.9 - 1.7 μm

#3

ILLUMINATION SYSTEM: R-FLEX™



R-FLEX2 VIS
400 - 1100 nm



R-FLEX2 SWIR
1 - 1.7 μm

R-FLEX VIS and SWIR are illumination systems coupling our sources with our wavefront sensors for testing:

- + in double pass optical configuration
- + concave surfaces or refractive optics of any f/# choosing the appropriate focusing module (MOD F) below:

Compact, lightweight, insensitive to vibrations and atmospheric turbulences, R-FLEX is easy to align onto the optics to be tested.

It is the perfect solution for large telescopes, optics in vacuum chambers.

| Reference | Focal length (mm) | Back power required (%) | Working distance ¹ (mm) | Module length ² (mm) | HASO LIFT 680 | HASO LIFT 272 | HASO4 126 / BROADBAND | HASO4 BROADBAND | HASO4 FIRST | HASO4 FAST | HASO SWIR LIFT | HASO SWIR |
|--------------|-------------------|-------------------------|------------------------------------|---------------------------------|--|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------|
| | | | | | f/#, (wfe ³) (nm RMS) | f/#, (wfe ³) (nm RMS) | f/#, (wfe ³) (nm RMS) | f/#, (wfe ³) (nm RMS) | f/#, (wfe ³) (nm RMS) | f/#, (wfe ³) (nm RMS) | f/#, (wfe ³) (nm RMS) | |
| MOD F4.5 | 4.5 | 50 | 0.6 | 205.9 | - | 0.9 (120) | - | 0.9 (120) | 1.3 (30) | 3.8 (5) | - | - |
| MOD F9 | 8.9 | 50 | 1.2 | 250.0 | - | 1.8 (40) | - | 1.8 (40) | 2.5 (10) | 7.5 (5) | - | - |
| MOD F9 HR | 9 | 50 | 0.6 | 247.8 | 0.9 (130) | - | 0.9 (130) | - | - | - | - | - |
| MOD F18 HR | 17.8 | 50 | 1.2 | 247.2 | 1.8 (50) | - | 1.8 (50) | - | - | - | - | - |
| MOD F20 | 20.4 | 3 | 10.4 | 50.3 | - | 4 (160) | - | 4 (160) | 5.6 (40) | 17.2 (5) | - | - |
| MOD F20 SWIR | 20 | 3 | 10 | 71.8 | - | - | - | - | - | - | 2.7 (250) | 2.7 (250) |
| MOD F31 | 30.3 | 3 | -0.7 | 66.6 | 3 (250) | 5.9 (20) | 3 (250) | 5.9 (20) | 8.4 (10) | 25.5 (5) | - | - |
| MOD F31 SWIR | 31 | 3 | 10 | 114.7 | - | - | - | - | - | - | 4.2 (150) | 4.2 (150) |
| MOD F40 | 41.7 | 3 | 8 | 40.8 | 4.1 (150) | 8.1 (15) | 4.1 (150) | 8.1 (15) | 11.5 (10) | 35.1 (5) | - | - |
| MOD F40 SWIR | 40 | 3 | 3.3 | 62.2 | - | - | - | - | - | - | 5.4 (100) | 5.4 (100) |
| MOD F50 | 51.7 | 3 | 3.6 | 103.1 | 5.1 (100) | 10 (10) | 5.1 (100) | 10 (10) | 14.2 (5) | 43.5 (5) | - | - |
| MOD F50 SWIR | 50 | 3 | 3.3 | 92.1 | - | - | - | - | - | - | 6.8 (25) | 6.8 (25) |
| MOD F60 | 60.1 | 3 | 15.2 | 42.5 | 5.9 (30) | 11.7 (8) | 5.9 (30) | 11.7 (8) | 16.5 (5) | 50.5 (5) | - | - |
| MOD F60 SWIR | 60 | 3 | 12.8 | 45 | - | - | - | - | - | - | 8.1 (50) | 8.1 (50) |
| MOD F75 | 75.1 | 3 | 12.8 | 73.6 | 7.4 (20) | 14.6 (5) | 7.4 (20) | 14.6 (5) | 20.6 (5) | 63.1 (5) | - | - |
| MOD F76 SWIR | 75.3 | 3 | 12.8 | 74.3 | - | - | - | - | - | - | 10.2 (25) | 10.2 (25) |
| MOD CUSTOM | | | | | contact us for specific aperture, working distance, etc. | | | | | | | |

All focusing modules have pupil imaging: the microlens array of the wavefront sensor is imaged at the infinity by the focusing modules

¹Distance between the focal plane and the first mechanical interface of the module (with centering tool removed)

²Distance from the mounting interface of the module to the first mechanical interface of the module (with centering tool removed)

³Wavefront Error (wfe) at the output of the module for a circular pupil corresponding to the nominal f-number (f/#)

#4

BEAM EXPANDER: R-FLEX LA™



R-FLEX LA VIS
400 - 1100 nm



R-FLEX LA SWIR
1.05 - 1.70 μm

R-FLEX LA VIS and SWIR are beam expander coupling our R-FLEX for testing:

- + in double pass optical configuration or single pass for large beam lasers
- + flat wavefront or surfaces of any diameter choosing the appropriate platform reference below:

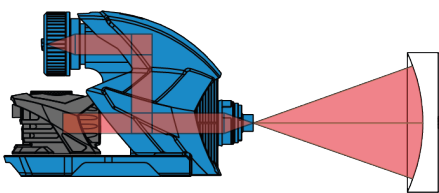
At wavelength, easy alignment and characterization of

beam expanders
filters, dichroic beamsplitter
flat mirrors
optical windows
polarization scramblers.

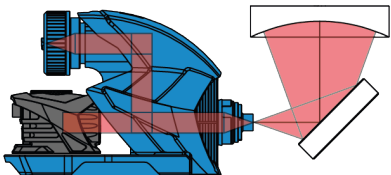
| Reference | Test diameter (mm) | Spectral range |
|-----------|----------------------------------|----------------|
| LA.30 | 30 | VIS, SWIR |
| LA.50 | 50 | VIS, SWIR |
| LA.75 | 75 | VIS, SWIR |
| LA.100 | 100 | VIS, SWIR |
| LA.150 | 150 | VIS, SWIR |
| LA.200 | 200 | SWIR |
| LA.CUSTOM | contact us for specific diameter | |

OPTICAL SETUPS

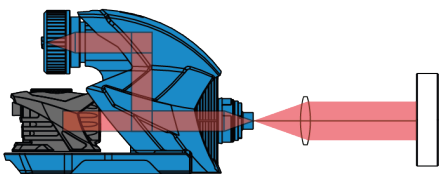
Concave surfaces / refractive optics testing: use R-FLEX™



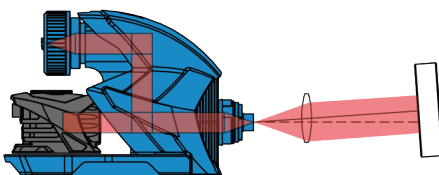
(Uncoated) Small to large concave mirrors



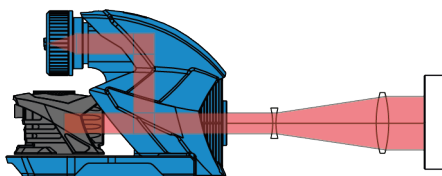
(Very) Large telescopes and collimators characterization and alignment



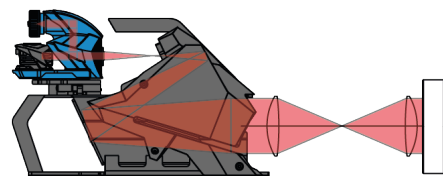
Lenses of any diameter, on-axis



Lenses of any diameter, in the field

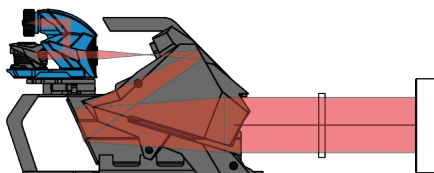


Beam expanders characterization and alignment

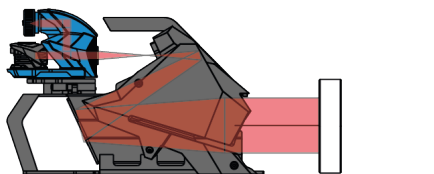


Beam expanders, afocal systems characterization and alignment

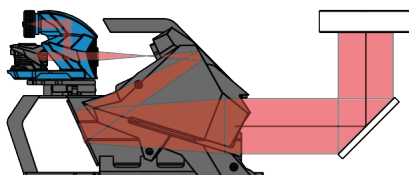
Flat wavefront / surfaces testing: use R-FLEX™ + R-FLEX LA™



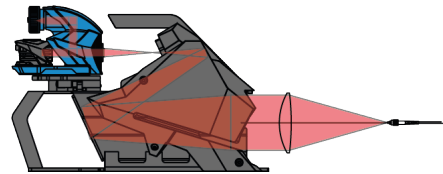
Filters, windows in transmission



Mirrors, filters in reflection



Head-Up displays, dichroics, beamsplitters



Collimated lasers and external sources



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