Opto Alignment

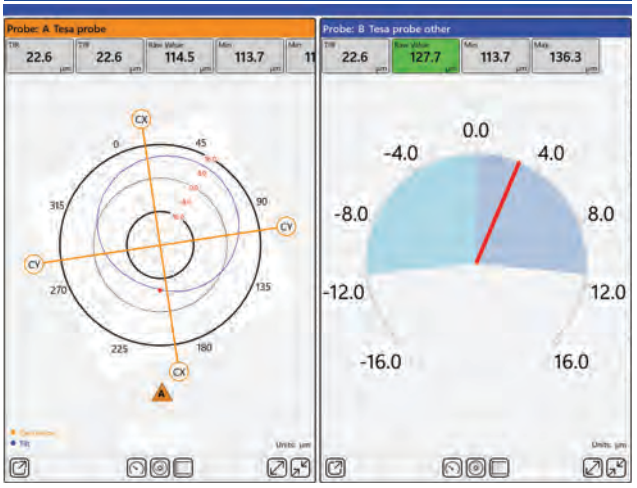
Lens Alignment System (LAS™)

The latest generation Lens Alignment System (LAS™) is designed for high-precision lens centration and tilt measurement on single-to-multi-element folded lens assemblies (>30 optical surfaces). The LAS™ is capable of precision alignment optimization for spherical, aspheric, cylindrical, and parabolic optics, and can work with radii of curvature (ROCs) from +/- 1.0 mm to infinity (plano), and optical diameters of up to 1-m.

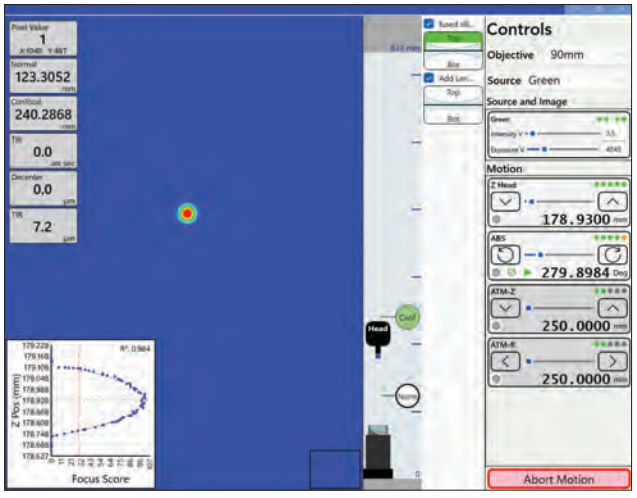
The LAS™ is available in four different size configurations, depending upon user needs (see table for comparison), and up to 5 wavebands can be integrated into a single platform for operation from visible up to LWIR.

The CalcuLens™ 3.1 software platform provides a seamless user interface for scalable implementation of the LAS™ into larger-scale production and optimization.

Improved Software Interface



Automation-capable API In Development

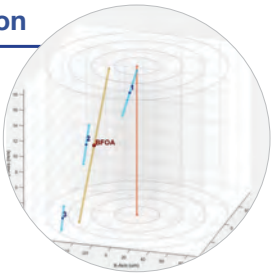


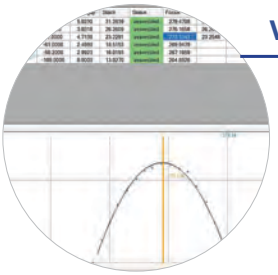
CalcuLens™ 3.1 Alignment & Assembly Software

LAS™ Applications

Multi-Lens Inspection

CalcuLens™ Inspection has a 3D-Viewer option enables LAS™ users to see individual lens element orientations in an optical assembly and a best fit optical axis.



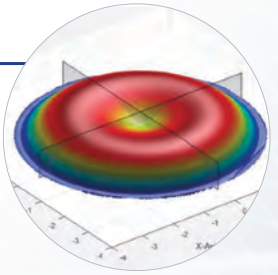


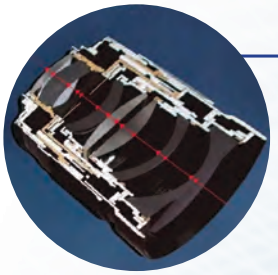
Vertex Measurement

CalcuLens™ Vertex enables the LAS™ to make relevant distance measurements in optical assemblies to within ±2.5 µm.

Surface Profiling

The quick-attach LAS-Profiler™ module offers an economical alternative to a stand-alone 3D profilometry tool for aspheric and other types of rotationally symmetric lenses



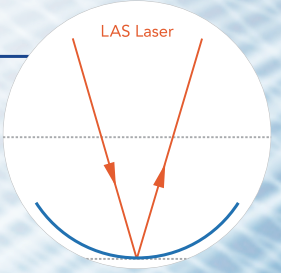


DMI Inspection

DMI option enables the LAS™ to make relevant distance measurements in optical assemblies, but with higher accuracy and through deeper lens assemblies.

ROC Measurement

CalcuLens™ ROC measures the radius of curvature of lens surfaces with an accuracy of 0.05% by utilizing the unique design of the LAS™.



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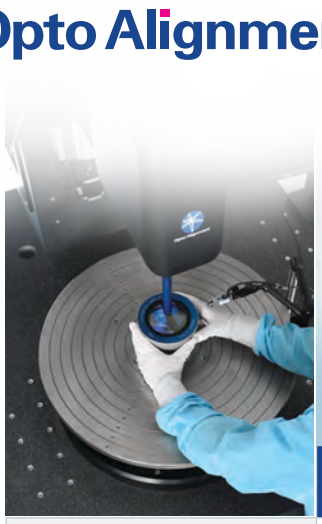
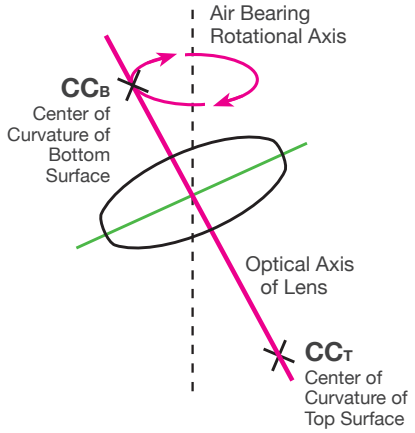
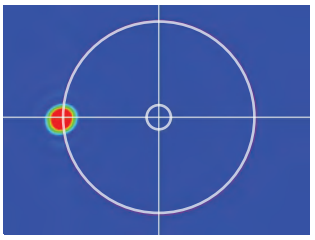


	LAS-BT	LAS-P	LAS-UP	LAS-XUP
Platform Size	Compact Bench-Top	Midsize Precision	Large Ultra Precision	Extra Large Ultra Precision
Centration Accuracy	0.2µm			
Angle Accuracy	0.5"			
Air Bearing Spindle Ø	100mm	150/200mm	300/400mm	600/800mm
Vertical Travel	633mm	1500mm	2000mm	3000mm
Sample Capacity	57kg	136/226 kg	544/907 kg	>1300 kg

LAS™ Measuring Principle

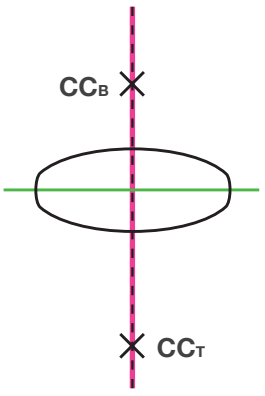
BEFORE ALIGNMENT
(Lens with tilt)

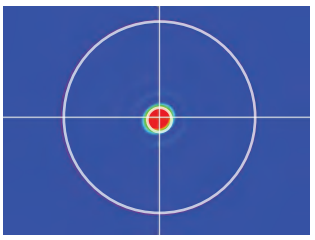




CalcuLens™ Output
(Laser reflection scribes an orbit)

AFTER ALIGNMENT
(Lens with tilt removed)





CalcuLens™ Output
(Laser reflection stationary)

1. Use CalcuSurf™ to align chuck or lens barrel/ cell to air bearing spindle (ABS) rotational axis
2. Mount sample lens on aligned chuck or inside aligned lens housing
3. Use CalcuLens™ Assembly to measure lens tilt/ centration error and hence location of center of curvatures (CC) of top and bottom surfaces in 3D
4. Line through top and bottom CCs defines the lens' optical axis and angular offset relative to the rotational axis of the ABS
5. Move lens until error is nulled and laser reflected image is stationary as ABS is rotated
6. Repeat above for each lens in stack

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