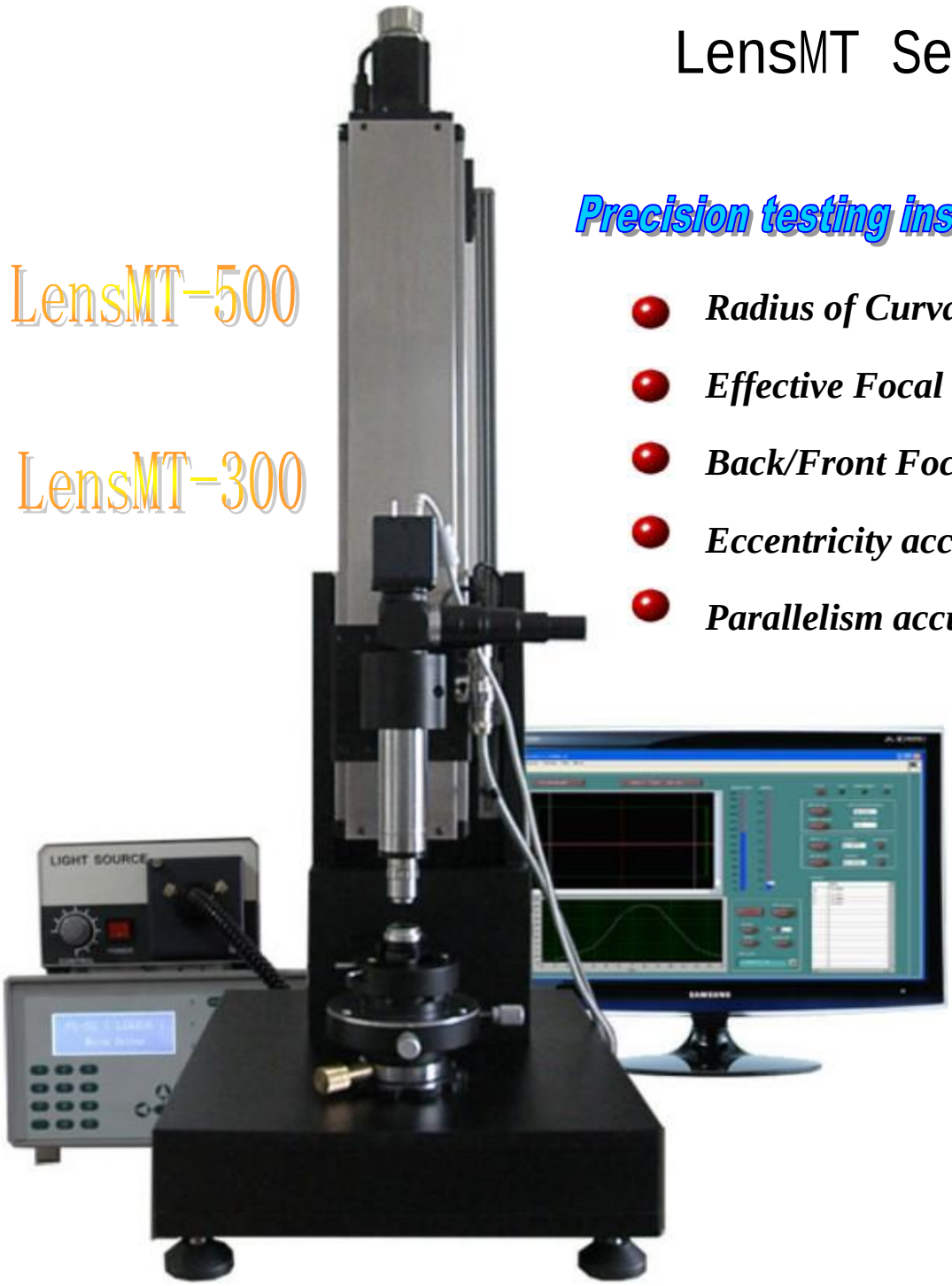
Lens Multi-Function Tester

LensMT Series

LensMT-500

LensMT-300



Precision testing instrument for:

- *Radius of Curvature；*
- *Effective Focal length*
- *Back/Front Focal length*
- *Eccentricity accuracy*
- *Parallelism accuracy*

Fuzhou HYoptest Optical instrument Co.Ltd

Address：Zhongqing-building, #10 East Technology Road, Fuzhou, Fujian, China, 350108

Email: sales@hyoptest.com **Http://www.hyoptest.com**

Tel： +86 13850158295; +86 591 8384 1181; Fax: +86 591 8714 3875

LensMT is precision testing equipment for Lens(& Lens assembly) includes the testing capabilities for Radius of Curvature, Focal Length, and Eccentricity, which make it as an excellent one-stop station to control all the main optical characteristics of spherical lens. All the measurement is no-contact, fully automatically, and highly efficiently.

Advantages：

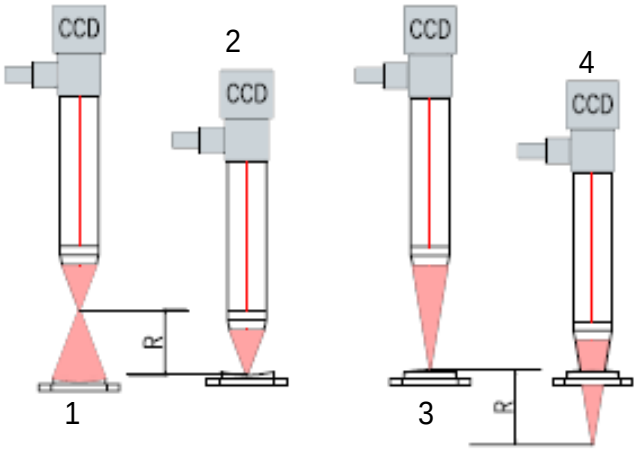
- No contact measurement without damage the Lens in testing;
- Fully automately masurement, easy operation, high efficiency and with full functions.
- Real-time monitoring and directly show result in digital.

Radius of Curvature(ROC) Measurement

RoC reflects the sphere information of lens surface, and is the most important parameter that directly be controlled during lens manufacture. Its accuracy affects the other characteristics like Focal Length etc. The RoC is measured in Reflection mode and with no-contact way without the risk to damage the polished surfaces.

Main principle:

As shown on the right Schematic, the sketch 1 and 4 are for the position of center of curvature of the tested Concave and Convex surfaces respectively, while the 2 and 3 represent for the vertex positions.



As per the definition, the RoC means the travel distance of 1&2 or 3&4.

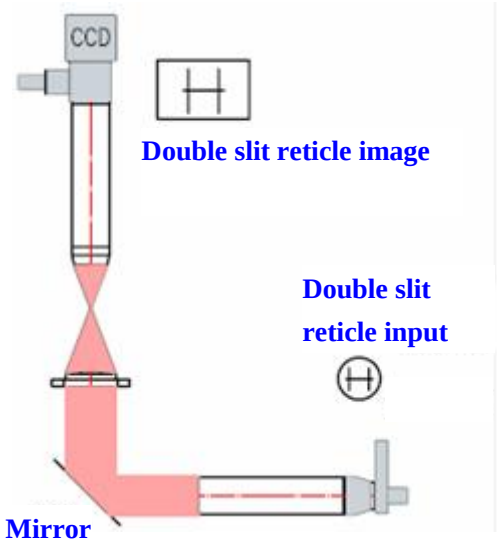
In the actual measurement, the elaborately designed software will auto-locate accurately the positions of Vertex and Center of Curvature, and linear encoder will read the positions respectively, and the software will show on the ROC value directly on the computer monitor.

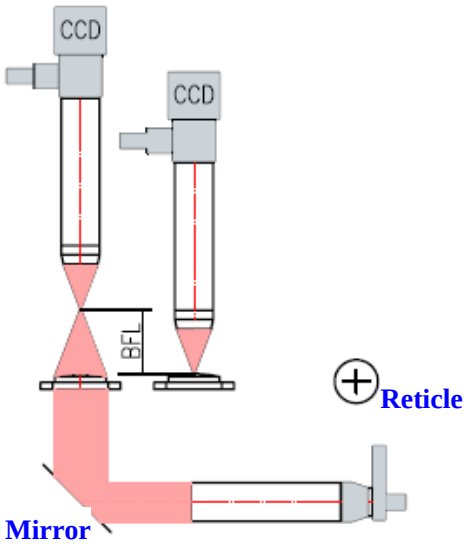
Focus Length measurement

Focus Length is one of the most important parameters in lens design, it could be comprehensively reflected by the lens material, curvature of surfaces, thickness, etc. And it directly impacts the lens actual application. The Focus length has different definitions with Effective Focus Length(EFL) and Front Focus Length/Back Focus Length(FFL/BFL). The Focus Lengths vary for different wavelength input. This equipment chooses the 546nm(green light) as the measurement wavelength.

Measuring principle

The measurement of EFL is in transmission mode, the fiber light source should be input from the collimator, which is located at back of the instrument base, and projects the double slit reticle to testing sample, to rotate the reticle changer you can choose the different gap double slit. There are total 4 choices of slit gap reticle and cross reticle in the changer to meet all the measurement.





The software will automatically calculate the EFL of tested sample based on the double slit image, and will show the result directly.

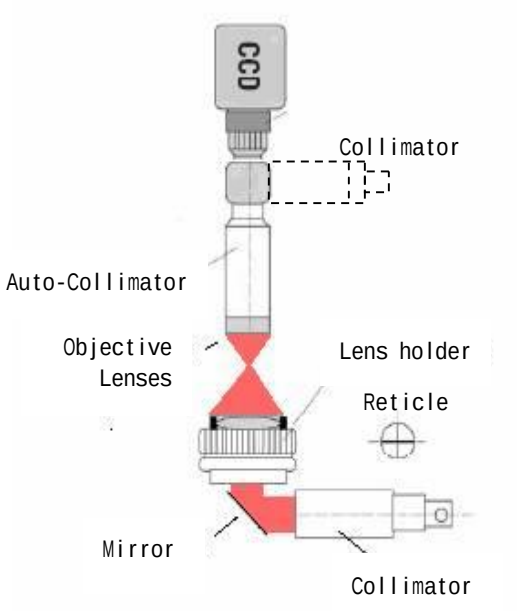
The measurement of Back focal Length and Front Focal Length(BFL/FFL) is similar as RoC testing. The detector locates the positions of lens vertex and the focus point respectively, and the linear encoder will read the data and convert to the measurement results.

Eccentricity Measurement

Eccentricity is critical for lens, the off-set of the centration could lead to the Astigmatism and Distortion, etc for the Lens and the assembly. Lens usually is edge-milled individually in manufacturing, the eccentricity is varying even in same lot, the more frequent testing is recommended.

Measuring principle

According to ISO 10110 the eccentricity is present when the optical and the reference axis of a lens do not coincide, respectively these are different in position or direction. For circular lens, the lens usually is rotated along the periphery during the measurement, and a parallel light is conducted to the lens, and either pass through (transmission mode) or reflected (reflection mode) by the lens, and generate an image on the CCD camera. When the eccentricity presents, the image would trace a circle while the lens is rotated. The center error could be calculated based on the circle radius of the rotation image.

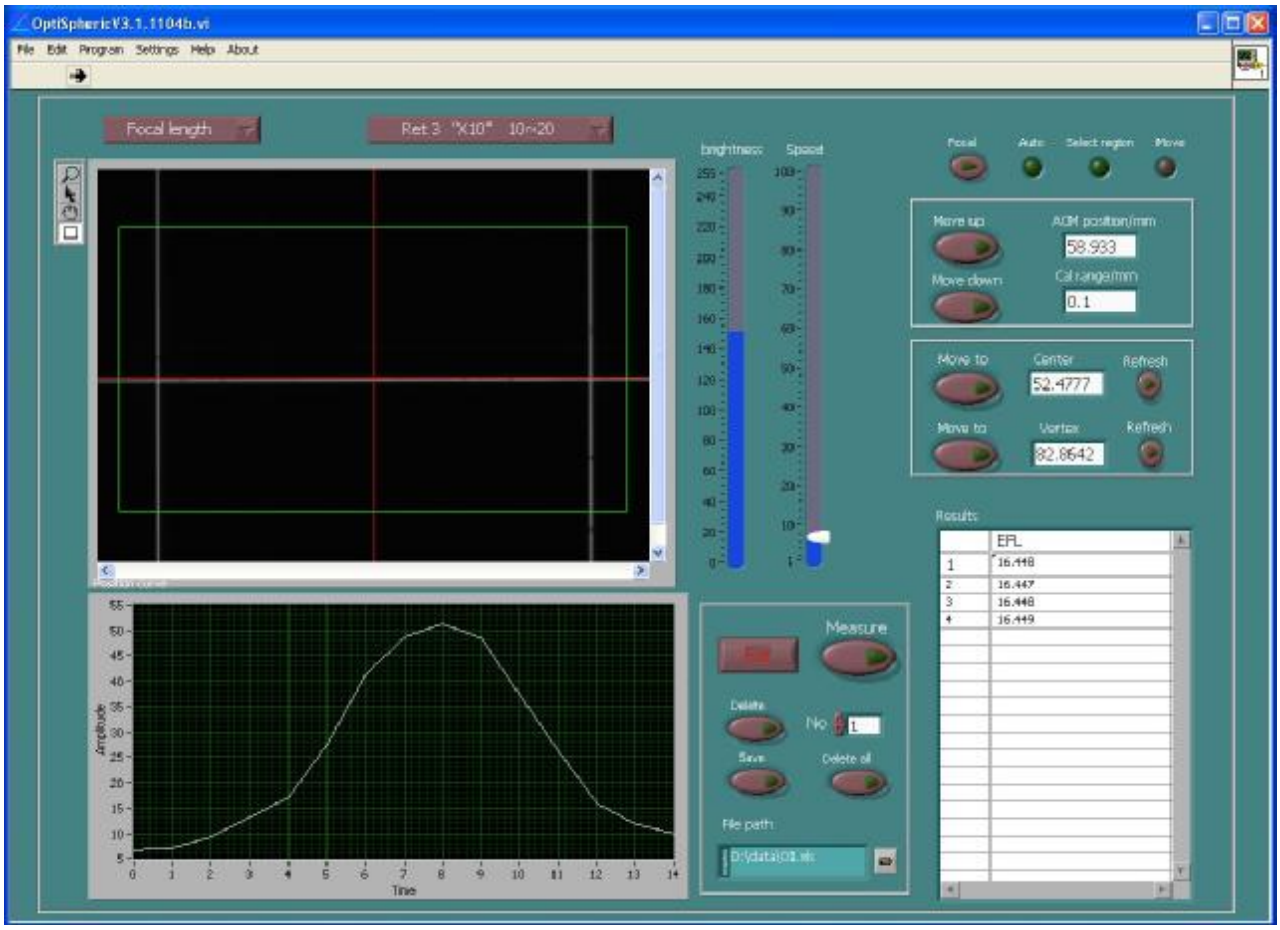


The Centration Testing Station

（As per picture Left）consists of X-Y kinematic mount, V shape chuck, Lens holders, Friction wheel and so on. It is important to adjust the V-shape chuck, Lens sample and Friction wheel at same height when in testing. The Friction wheel is run by the precision motor, it could achieve stepless speed regulation. Vacuum sucker is designed for reflection mode testing to mitigate the rotation vibration, especially for those with thin edge thickness.

Software introduction:

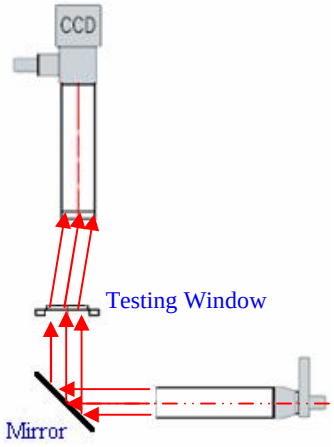
The friendly software would make the actual measurement ease, automation and with high efficiency. It could directly should the testing results and could save the results in Excel files.



Angle and Parallelism Measurement

The equipment has the function for precision angle testing. The parallelism of window could be tested by detecting the transmission beam deviation(as show the below sketch).

The Autocollimator of the equipment could be used to test the Perpendicularity, Wedge angle etc. of prisms, and the straightness/Flatness of the mechanical pasts. Please refer to the EAC (Electronic Autocollimator) introduction brochure for the details.



Technical Specifications for LensMT：

Effective Focal length (EFL)	LensMT-500	LensMT-300
Measurement Range (mm)	+5 ~ +500 -5 ~ -450	+5 ~ +300 -5 ~ -300
Accuracy	0.02% ~ 0.3%	0.02% ~ 0.3%
Back/Front Focal length（FFL/BFL）		
Measurement Range (mm)	+5 ~ +500 -5 ~ -450	+5 ~ +300 -5 ~ -300
Accuracy	0.02% ~ 0.3%	0.02% ~ 0.3%
Radius of Curvature（ROC）		
Measurement Range (mm)	±5 ~ ±450	±5 ~ ±300
Accuracy	0.02% ~ 0.3%	0.02% ~ 0.3%
Centration（Optional）		
Measurement range（mm）	-450 ~ 500	-300 ~ 300
Accuracy	0.2μm(or 3")	0.2μm(or 3")
Beam deviation Angle		
Testing Accuracy	1"	1.5"
Equipment Size(cm)	120x60x40	100x60x40
Equipment Weight(kg)	50	45

Main parts of Equipment

①. High precision motorized stage;
②. Step motor and controller;
③. Self-centering Jaw clamp and kinematic mount;
④. Rotary motor & precision station for Decenter test (Optional) ;
⑤. High Precision Digital Auto-collimator（with CCD）
⑥. Auto-Collimator + Series of Achromatic Objectives;
⑦. High density illuminator + Fiber Light Guide;
⑧. Precision Mounting plate;
⑨.Testing Software,etc

Note：Dimensions & Appearance are subject to change without notice