TRIOPTICS
See the Difference

ImageMaster® Cine

Testing and fine-tuning of the image quality of large lenses and lens systems

Passion for optics

TRIOPTICS develops and produces the world's largest range of optical measurement and manufacturing technology for the development, quality control and production of lenses, lens systems and camera modules.

ImageMaster® Cine

High-quality lenses from the photo and film industry need to meet the highest demands for image quality and deliver demonstrably superior optical performance. The MTF measurement has established itself as the recognized measurement method for qualitatively assessing the optical quality of lenses.

With its ImageMaster® product range, TRIOPTICS is the market leader for MTF measuring instruments for high-precision measurement of image quality. ImageMaster® Cine was specially developed for the inspection and alignment of sophisticated lenses.

The complete ImageMaster® Cine portfolio encompasses various solutions for different customer requirements for the fast MTF function testing and alignment of optical elements of photo and film lenses.

Lens manufacturers use these systems for quality control or final adjustment during production. Rental companies benefit from the ability to quickly inspect the lenses upon their return.

ImageMaster® Cine Linear

ImageMaster® Cine Linear ensures fast and economical quality inspections of photographic and film lenses and is particularly suitable for incoming inspection in the rental business. The horizontally designed measuring device carries out MTF measurements on the axis for finite and infinite measuring distances. The device is also used for the highly precise determination of the effective focal length (EFL) and the flange focal length (FFL).

When different film and photo lenses are to be measured in a short time, the quick and easy change between finite and infinite measurement configurations ensures a productive and user-friendly workflow. Since a large number of test objects have already been stored in a database, the configuration is automatic and not susceptible to operator error.

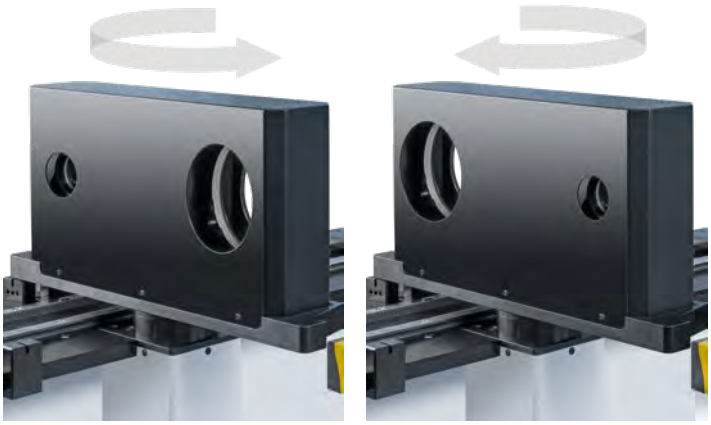
This ensures high productivity and reliability in quality inspections.

Main features

- Fast and economical testing of the imaging quality of photo and film lenses
- Finite (300 - 3,048 mm) and infinite MTF measurement on the axis
- Two collimators for rapid change of focal length
- Various filters and reticles
- Modulatable LED (RGBW) light source, e.g., to detect chromatic aberrations/chromatic effects
- Optional: integratable optical low-pass filter and cover glasses to test correspondingly equipped cameras

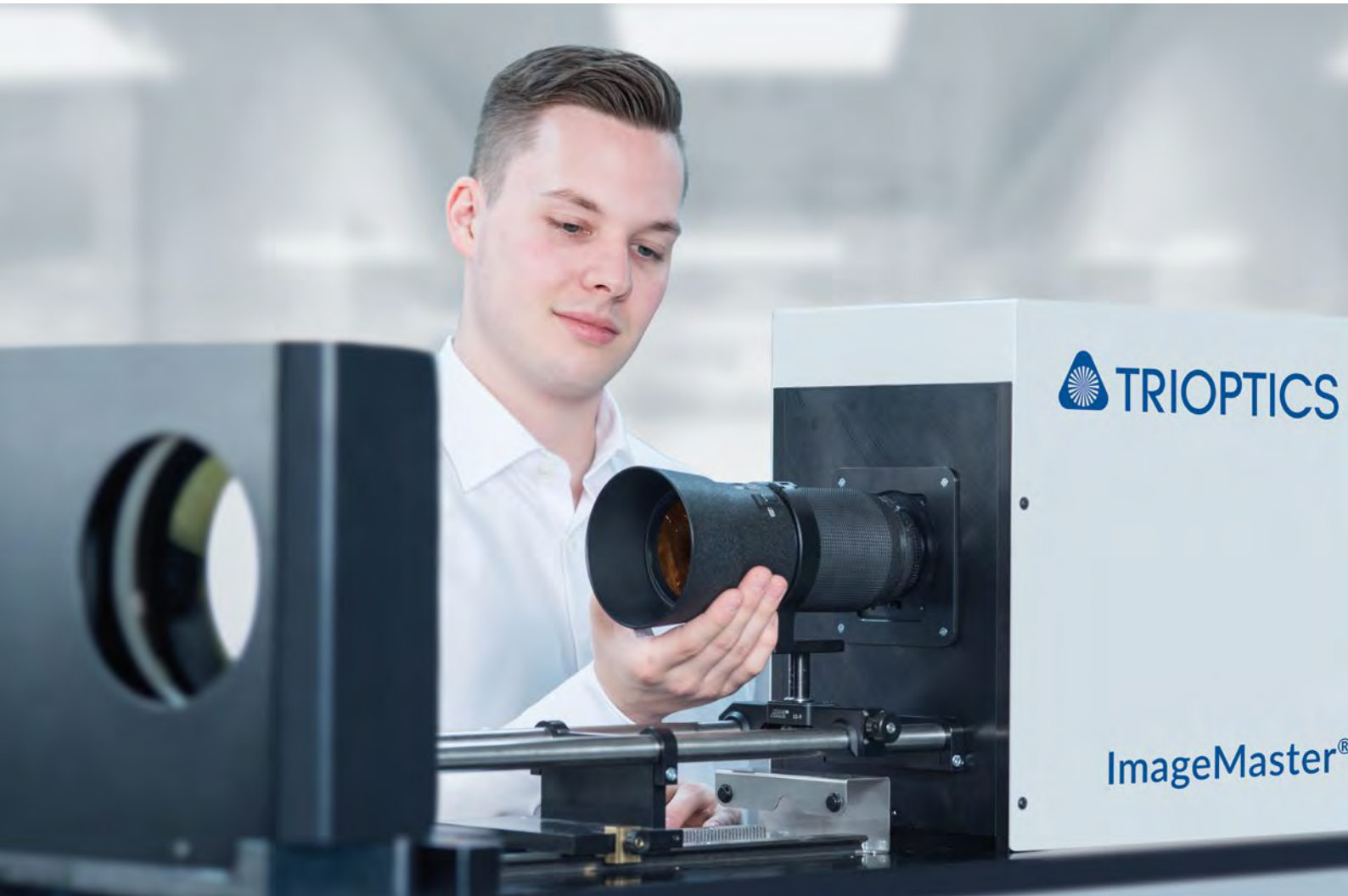
ImageMaster® Cine Linear measures the following parameters:

- MTF on-axis
- Effective Focal Length (EFL)
- Flange Focal Length (FFL)
- Focal shift
- Chromatic aberration
- Object distances (image to object)



Fast motorized change between one finite and two infinite measurement configurations

ImageMaster® Cine Linear



ImageMaster® Cine Flex

Manufacturers of sophisticated photo and film lenses often test a large number of lenses of different sizes within a short period of time and need a highly accurate measuring device that can be used flexibly for different lens sizes. With its automated measuring sequence and the possibility of quickly changing between different lens sizes, ImageMaster® Cine Flex is the perfect solution for this requirement.

One special advantage of the ImageMaster® Cine Flex is the ability to perform on-axis and off-axis measurement at two field positions. The simultaneous measurement with real-time MTF values allows fast fine tuning of the lens components for optimizing the image quality.

A large number of test samples can be stored in a database. This makes the configuration automatic and largely independent of the operator.

The measurement results obtained provide the necessary data to assess whether the tested lens fully meets the imaging quality requirements. Test samples that do not meet the quality criteria can be readjusted and realigned in repair mode to meet the requirements. The possibility of adjustment in combination with easy access to the sample offers a significant advantage for optimizing the quality control workflow.

For high-precision measurements of the MTF and other optical parameters, the device can be equipped with a high-precision air bearing for the sample holder.

ImageMaster® Cine Flex

Main features

- High flexibility for the measurement of different lens types
- Fast quality and functional testing and alignment of optical elements
- The MTF measurement can be on-axis or off-axis
- Testing in different field positions with 2 or 3 motorized telescopes
- Flexible switching between different sample sizes
- Optional: measurement in horizontal or vertical alignment
- Motorized guide to flexibly adapt to the height of the test sample
- Measurement with test specimen rotation (manual or motorized)
- Software with lens repair function

ImageMaster® Cine Flex measures the following parameters:

- MTF on-axis and off-axis
- Effective Focal Length (EFL)
- Flange Focal Length (FFL)
- Field curvature
- Tilt of image plane
- Depth of Focus (DOF)
- Astigmatism
- Focal shift

Simultaneous live MTF measurements on the axis and in two field positions ensure rapid optimization of image quality

Software

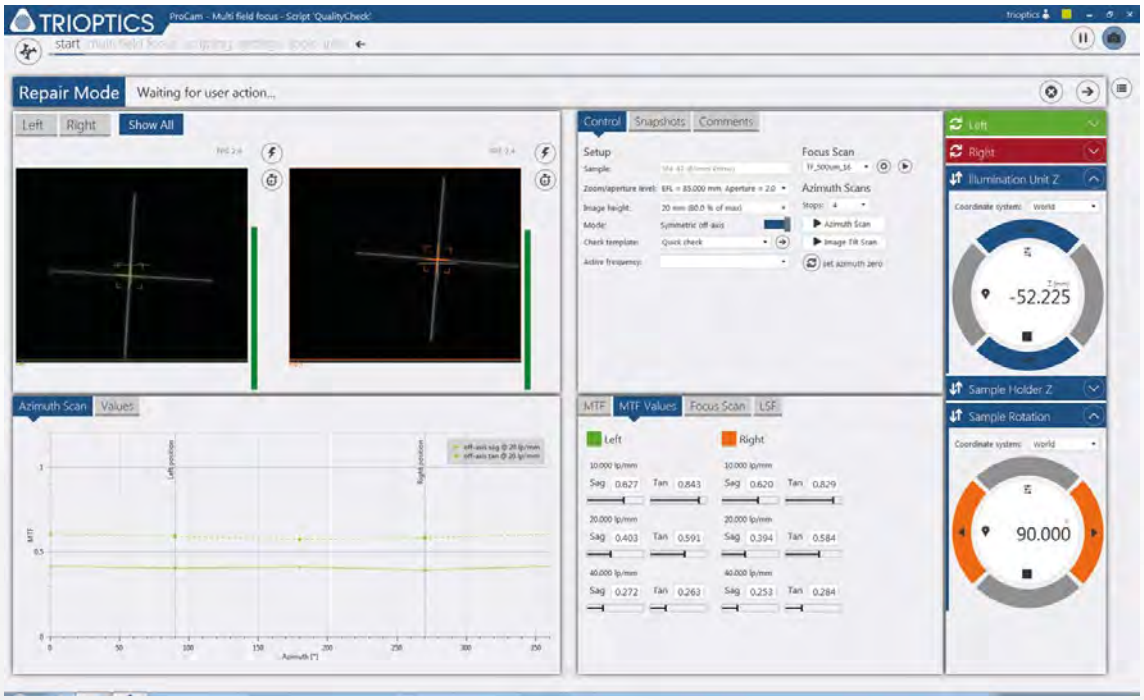
For ImageMaster® Cine Linear and Cine Flex

- Guided measurement process
- Pass/fail result by checking the MTF and EFL specifications
- Database storage of the measurement parameters and specifications of different test sample types in addition to measurement results and pass/fail criteria. This makes it easy to switch between different types of test samples.
- Real-time images of all telescopes / real-time MTF curves for all telescopes (sagittal and tangential)
- Scripting language for customer-specific workflows / customer-specific measurement processes
- Measurement reports as a PDF- and MS Excel file

For ImageMaster® Cine Flex: Lens repair mode

Software Interface:

- MTF vs. angle of rotation:
  - Real-time curve for a quick overview by manually rotating the lens
  - Motorized rotation with real-time curve
- Automatic movement of the telescope and rotation of the test sample to display the maximum and minimum MTF
- Real-time MTF during alignment of the lens components
- Manual/motorized rotation of the test sample for success monitoring
- Focal length measurement



Software: Lens repair mode

Overview of the product line

ImageMaster® Cine

	Linear	Flex
		
Accuracy (MTF on-axis and off-axis)	±3 % MTF	±3 % MTF
Repeatability (MTF on-axis and off-axis)	±1 % MTF	±1 % MTF
EFL (effective focal length) accuracy	± 0,2 %	± 0,3 %
FFL (flange focal length) accuracy	5 µm	10 µm
Measurement distances	Infinite object distance + finite object distance (300 mm to 3,048 mm/10ft)	Infinite object distance (infinite reverse)
MTF measurement frequency	Up to 100 lp/mm	Up to 100 lp/mm
Max. image height	Only on-axis	± 25 mm
Max. object angle	Only on-axis	± 52.5°
Spectral range	RGBW	RGBW
Clear aperture	120 mm	120 mm
Sample FFL (flange focal length) range	15 mm ... 75 mm	20 mm ... 65 mm
Sample EFL (effective focal length)	12 mm ... 280 mm	12 mm ... 280 mm
Max. sample dimensions	Length ≤ 500 mm Lens Diameter ≤ 240 mm	Length ≤ 500 mm Lens Diameter ≤ 240 mm
Max. sample weight	12 kg	12 kg
Dimensions (height x width x depth)	700 mm x 3.800 mm x 700 mm	2.600 mm x 2.000 mm x 1.100 mm
Weight	400 kg	1.000 kg

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