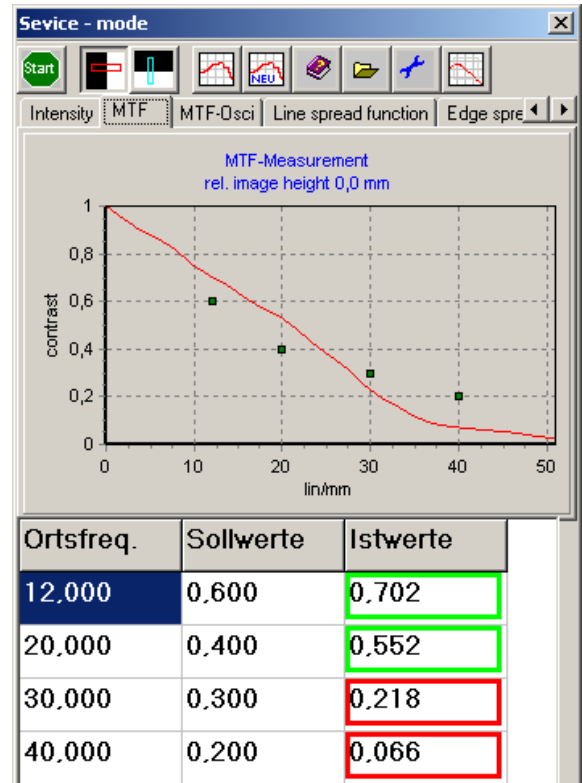




MTF-Explorer

Image evaluation software for measurement of MTF, ESF and LSF



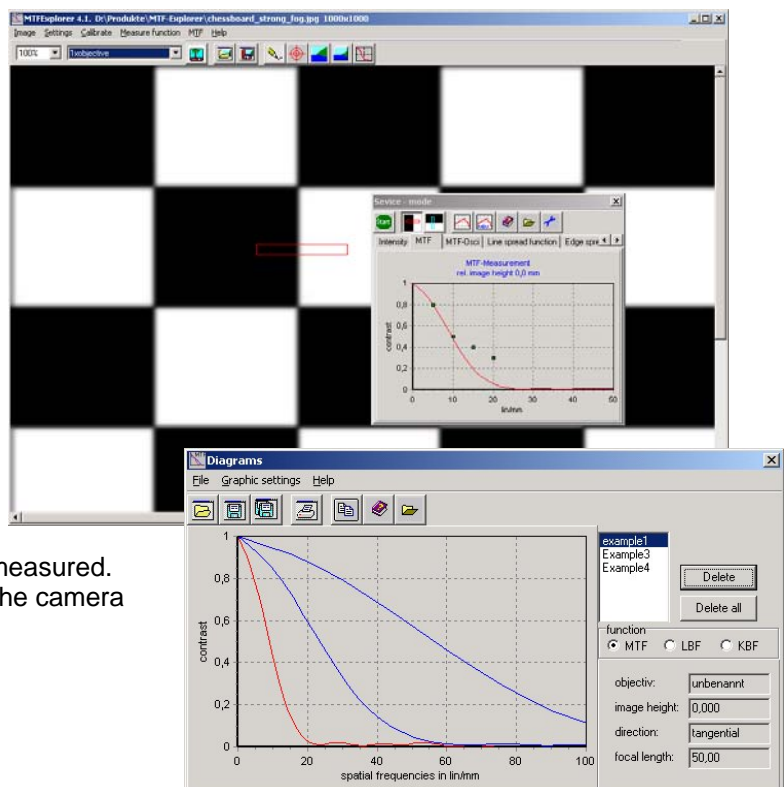
MTF-Explorer is an image evaluation software for the measurement of the modulation transfer function (MTF), Line spread function (LSF) and Edge spread function (ESF). It consists of a Windows software with interfaces to different image sources. These are Frame Grabbers for standard analogue video signal, WDM-Interface for digital cameras. Additionally it works with any saved picture in the BMP- and JPG-format up to 16 Megapixels.

MTF-Explorer: The universal solution

MTF-Explorer is the entrance to cheap and easy MTF measurement.

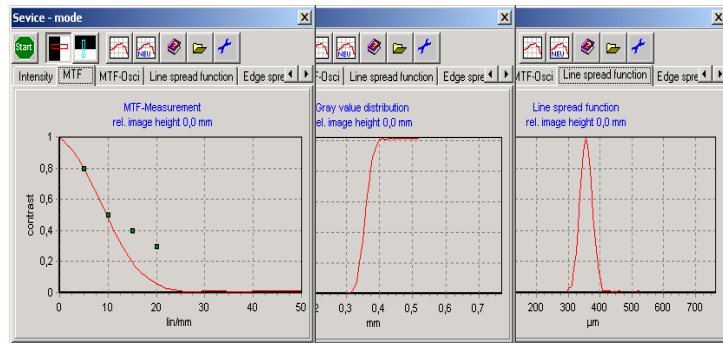
Equal, if the image acquisition is made conventional by microscope and analogue-CCD-camera or by a digital camera with fixed objective: MTF explorer can be used for nearly any application.

After the very easy calibration is done, the MTF can be directly measured! Additionally MTF-Explorer features the characterization of imaging quality of digital cameras. By help of image evaluation with MTF-Explorer not only the imaging quality of the optics can be measured. Also the influence of the CCD-Chip and the camera electronics can be determined.



Modulation Transfer Function

The modulation transfer function (MTF) is a recognized control criterion for the optical imaging quality. It characterizes the resolution of optical systems on the axis and in the image field. The MTF indicates the quotients of picture and object contrast in dependence of the spatial frequency for imaging of a line lattice with sinus functional transmission. The spatial frequency is expressed in pairs of lines per mm (lp/mm). The MTF combines resolution and contrast in a common representation.



Real time MTF-measurement offers new possibilities

The use of CCD-cameras in connection with image processing systems provides real time data of the line- or edge-intensity distribution. From this data the MTF can be computed. The MTF-data can be stored or shown on the PC screen. Additionally CCD-cameras provide the advantage, that both directions of MTF (sagittal, tangential) can be measured nearly at the same time. The MTF-Explorer uses analogue-CCD-cameras with frame grabbers for real time video digitizing. But also interfaces to high resolution digital cameras (USB 2.0 or fire wire) are available. The live video of the edge or gap is shown on the PC screen. The measuring field is freely selectable. The efficient evaluation software allows interactive measurements, because the measuring field can be defined by the operator. The real time evaluation refers both to the MTF measurement and to line and edge spread functions.



Measuring principle

The MTF measurement is based on the picture (provided either by the lens under test or the camera+lens under test) of an edge or a gap almost at the same time in meridional and sagittal direction. The picture of the edge or line produced by the test specimen is seized and evaluated by help of the MTF Explorer Software.

Features on a view

- real time representation of MTF, ESF (edge spread function) and LSF (line spread function) on the PC screen
- fast switching between tangential and sagittal MTF measurement
- Comparison with freely selectable desired MTF-values in the diagram
- Real time MTF-representation for use in objective fine tuning
- Graphic and numeric representation of the measured values with drawn in desired values (optional)
- automatic measurement at different image coordinates
- simple calibration
- objective data base
- Automatic production of meaningful metrology records (quick report)
- Software interface for digital cameras and frame grabber for analogue cameras