Testo
Tech Sheet

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testo 885/testo 890: Detailed analysis thanks to a minimum focus distance of 10 cm.

The standard lens (wide-angle lens) of the testo 885 and testo 890 thermal imagers is able to focus on measurement objects down to a distance of ≥ 10 cm. With it, they reach the best minimum focus distance in the hand-held thermal imager class.

IFOV and focus distance

The IFOV (instantaneous field of view) describes the geometric resolution of a detector. We distinguish between IFOVgeo and IFOVmeas. The IFOVgeo is the smallest recognizable object, while the IFOVmeas describes the smallest measurable object. The IFOVmeas in testo 885 and testo 890 is exactly 3 x3 pixels, i.e. three times the IFOVgeo.

Despite the smaller distance to the measurement object, the aperture angle remains the same. However, the measurable area of the object becomes relatively smaller. This means a smaller area of the object is portrayed with the same infrared resolution.

Calculation of IFOV:
IFOV = alpha = 2 * arctan (pixel pitch/2*f')
Pixel pitch = edge length of a single pixel
f' = focal length

In order to ensure that only the radiation from the measurement object impacts on a pixel, and the measurement value is not influenced by the background, the object should have a size of at least 3 x 3 pixels.
This size factor is sustainably influenced by the optics of the thermal imager and the directional accuracy of the measurement pixel to the measurement object.

How do testo 885 and testo 890 achieve this low focus distance?

he reason for the remarkably low focus distance when using the standard lens (wide-angle lens) is the ideal interplay of optics and mechanics. On the one hand, Testo has developed a wide-angle lens which provides a sufficiently high level of image sharpness (MTF) even at a low focus distance. MTF stands for Modular Transfer Function and is a measure of image sharpness.

On the other hand, the testo 885 and testo 890 thermal imagers are mechanically constructed in such a way that short object distances can still be presented in sharp focus on the sensor.

This makes it possible to set the image width exactly even at a low focussing distance of 10 cm. For this reason, the image is presented in sharp focus on the sensor even at a low distance.

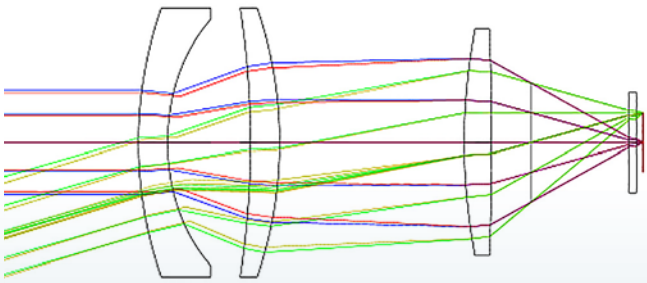

Fig. 1: Typical radiation progression in the lens.