

# FETURA

## Fetura Optical Zoom Platform Performance Test Results

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Fetura is Qioptiq Imaging Solution's newest product. It is an optical zoom-imaging platform capable of high speeds and performance. This document outlines the testing methodology and results of Fetura.

Under controlled conditions the Fetura optical zoom system can sustain the following level of performance throughout 1 million cycles of proven operation and without any degradation to quality.

### Results:

#### Center repeatability @ image plane

Low Magnification .....  $\pm 2$  microns

High Magnification.....  $\pm 6$  microns

#### Zoom magnification repeatability

Low Magnification .....  $\pm 0.013$  %

High Magnification.....  $\pm 0.007$  %

**Zoom speed from Low to High ..... 400ms**

#### Note:

1. 95.4% or  $\pm 2\sigma$  standard deviation of all reported measurements fall within the specified tolerances.
2. In order to achieve the above results, temperature/vibration (identified as baseline noise) play a vital role in the performance of the optical system. It is highly recommended that the end user understand and characterize their test environment. Final performance values can only be attained after the subtraction of this noise floor from the actual measured values.

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### Terms and conventions:

Centration – ability of the optical system's optical center to stay on center throughout the zoom range

Magnification repeat – ability of the system to return to its original magnification position.

Standard deviation – statistical measure of variability from the mean of a normal distribution

FOV - field of view, the amount of viewable region as seen through the optics system

**Test conditions:**

Camera brand .....	Retiga 4000R
CCD format .....	2/3"
Pixel .....	7.4 microns
Zoom range .....	12.5:1
Zoom mag .....	0.52-6.5
TV tube.....	1x
Illumination method .....	backlight
Illumination .....	halogen/fiber
Image acquisition.....	Image Pro V5.1
Specimen .....	dot target
Fastening method.....	via TV tube
Vibration control.....	granite stand w/ floating air table
Environment .....	65-70°F
Sampling .....	10k samples
@100k intervals over 1.5 million cycles using 2 randomly chosen Fetura units	

**Methodology:**

Starting from lowest magnification position and ending in the highest, a centroid (x,y pixel values) of a user-selected dot from the dot target is acquired and stored. From these centroids, the centration and magnification repeat values are calculated. The zoom movement from low to high back to low is considered as one complete cycle. 10k data points are obtained at each 100k-cycle interval. This process is repeated for a total duration of 1.5 million cycles.