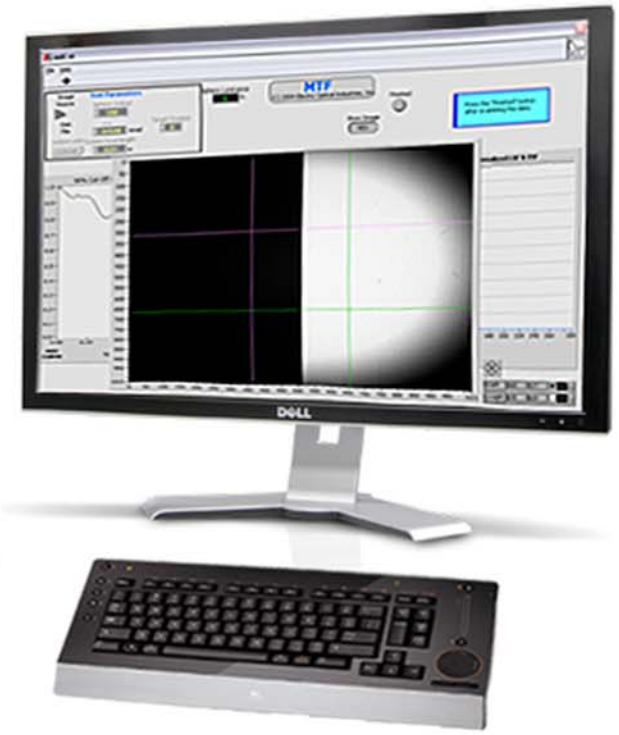
EO TESTLAB SOFTWARE

EO TestLab creates a new standard in testing electro optical systems utilizing industry standard methodology. EO TestLab is used in several government facilities collecting and formatting data into easy to comprehend reports. Combined with EOI proprietary enhancements, it also ensures accurate test data. Human variability in testing is minimized while speed and accuracy are increased.



Special Features:

- ***Reduced Test Time***
- ***Consistent Results***
- ***Increased Testing Discipline***
- ***Improved Documentation***
- ***Higher Traceability***
- ***Real Time Focus VI***

EO TestLAB provides a full suite of test modules to perform a single test or complete system characterization. Also available individually, the tests include: MRTD, Auto MRTD, MTF, MDT, NETD, NPSD, SiTF, MRC, SNR, FOV, Distortion, Focus, Uniformity and Resolution. Both EO TestLab IR Suite and Visible Suites are available. Contact EOI for further information and descriptions.

Computer Hardware Requirements
PC Compatible laptop or desktop. A frame grabber is also required for most tests.

Software Requirements
MS Windows 2000, XP, or Vista**.**

Test Hardware
Dependent on tests conducted. Contact EOI for recommendations.

Infrared Tests Include:
NET
FOV
SiTF
MDT
MRTD
Auto MRTD
NPSD
Uniformity
MTF
SNR
Distortion
Focus
Blackbody Control

Visible Tests Include:
Resolution
MRC
Uniformity
MTF
SNR
Distortion
Focus
Sphere Control

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Test Descriptions

Focus - Real Time Focus VI
This Real Time Focus VI enables the real time maximization of the LSF and ESF functions for use with other subsequent tests that utilize the knife-edge target such as the MTF.

Minimum Resolvable Temperature Difference - MRTD
MRTD is a subjective measure of an infrared sensor's sensitivity and ability to resolve detail. Four bar targets of selected spatial frequencies are presented to the sensor. Trained observers adjust the temperature difference between the target and background until each pattern is resolved. The software analyses the data and provides a graph of differential temperature vs spatial frequency.

Uniformity
The uniformity of the sensor is measured by flooding the sensor with a uniform infrared or visible source. One or more frames of data are captured and averaged. The percentage of variation from the mean signal level is plotted.

Auto MRTD
Auto MRTD minimizes the variability inherent in using human observers. A manual MRTD is performed to "train" the software. Once "trained", the software can completely automate the process and minimize the need for trained observers during testing.

Signal to Noise Ratio - SNR
The signal to noise ratio for a sensor is measured by taking samples of both the signal region and the background region. The signal level and RMS noise for each region are calculated and the signal to noise ratio per video line is plotted.

Minimum Resolvable Contrast - MRC
MRC is a subjective measure of a visible sensor's sensitivity and ability to resolve data. A series of four bar targets of selected spatial frequencies and different contrast coatings are presented to the sensor. A trained observer selects the smallest target reasonable at each contrast level. The software collects the data and provides a graph of contrast vs spacial frequency at each luminance level.

Modulation Transfer Function - MTF
MTF is a measure of the sensor's ability to reproduce signals as a function of spatial frequency. A knife edge target is back-illuminated by either an infrared or visible light source. The edge response data is analyzed to generate the MTF.

Minimum Detectable Temperature - MDT
MDT is similar to MRTD except a series of pin hole targets of selected size are presented to the sensor. Trained observers adjust the infrared source temperature until each target is detected. The software stores the data and provides a graph of minimum detectable temperature vs spatial frequency.

Noise Equivalent Temperature Difference - NETD
NETD is defined as the differential temperature at which the signal to noise ratio of the sensor under test is unity. EOI provides two industry standard methods for calculating NETD. The first method samples both signal and a background regions of the sensor output to calculate the NETD. The second method obtains the NETD from the measured noise and the SiTF. With either method, the NETD per video line is plotted.

Noise Power Spectral Density - NPSD
NPSD is the autocorrelation of the Fourier transform of the noise trace of the sensor in either the horizontal or vertical direction. The sensor is covered with a non-reflective black cloth. One or more frames of data are captured, analyzed and plotted as RMS noise^2 vs spatial frequency.

Resolution
The horizontal and vertical resolution of a visible sensor is measured using a 1951 USAF resolution target. A trained observer selects the group and element number of the smallest target that can be resolved in each direction for a given luminance level.

Signal Transfer Function - SiTF
SiTF is a measure of the sensor's response when the target size is fixed and the background intensity is varied. The dynamic range of the sensor is calculated and a least squares fit is performed to calculate the SiTF slope.

Custom Test Modules
Contact EOI for custom test modules to meet your most demanding test requirements.

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