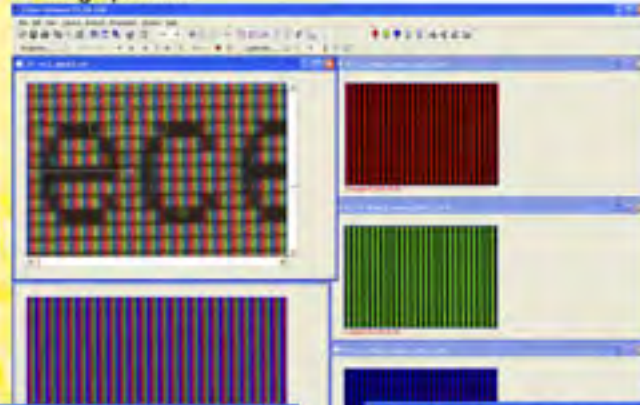


Uniformity Series

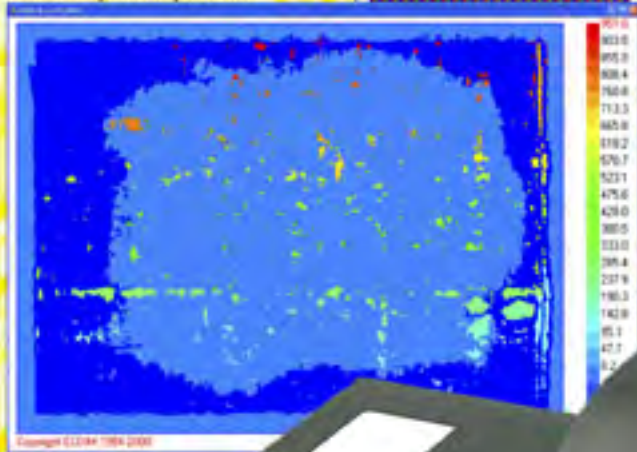
MURATest

Down to
9µm resolution

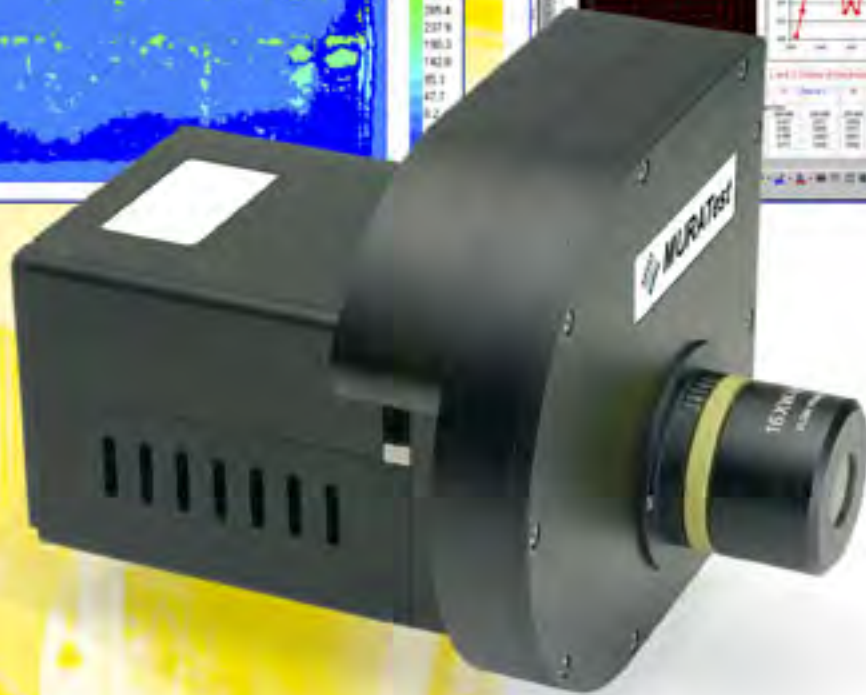
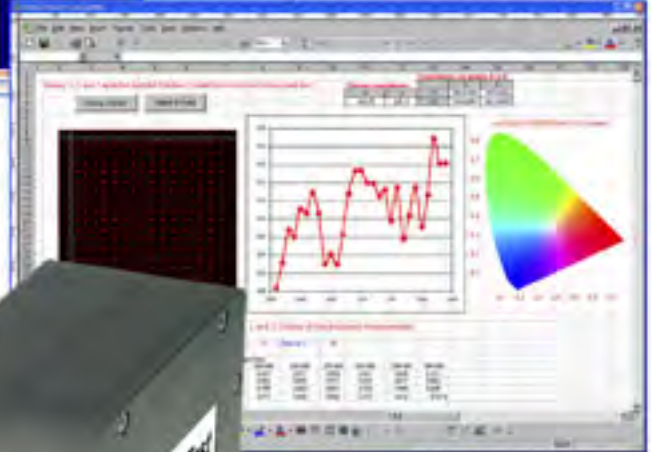
1:1 magnification



Mura defect inspection



ActiveX



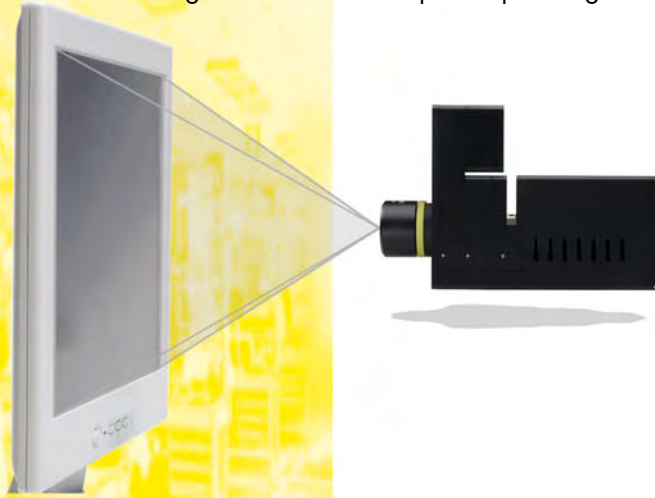
**UNIFORMITY
COLORIMETRY
PHOTOMETRY
IMAGING**

**For characterization and analysis
color from any emitting
or reflecting target**

ADVANCED COLORIMETRY by ELDIM

MURATest description

The **MURATest** delivers fast and accurate color uniformity analysis of any light-emitting surfaces. The device is ideally suitable for quantifying the uniformity of display modules, display walls and clusters. The **MURATest** makes a breakthrough in video-colorimetry. Its innovative design makes use of 5 colored filters and high grade optics. Also its manufacturing process includes various design and calibration steps for optimizing its measurement capability.



SENSOR HEAD

The camera is peltier-type cooled to deliver high sensitivity even for extreme conditions such as low light level. The head accommodates various sensor resolutions, including the large 16M pixels.

- Low noise and high dynamic range
- Blue enhanced Kodak CCD type
- CCD cooled and stabilized at -20°C absolute
- 16-Bit A/D converter
- Dark current compensation
- CCD flat field calibration
- Automatic or manual sensitivity modes
- USB 2.0 Plug & Play

FILTERING

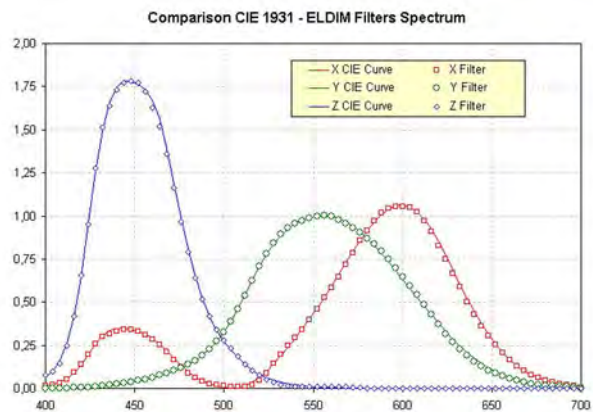
Color wheel video-colorimeters typically feature 3 filters and yield poor color accuracy. Three-filter colorimeters are accurate only around the color reference used as the calibration standard. Their accuracy undoubtedly drops elsewhere in the color space. ELDIM proprietary design and process provide an alternative solution and deliver 0.005 RMS x,y color accuracy on any color stimulus.

Design

- Characterisation of the CCD spectral response
- Use of 5 glass filters
- Each filter is specially designed to match perfectly the CIE reference curves
- The telecentric-on-CCD optical design avoids the aberrations
- High grade optics delivers accurate light transmission

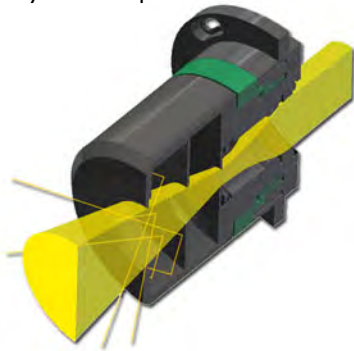
Calibration

- Enhanced NIST recommendation : from 4 to 7 color matrix method
- Reference colors spread around the visible color space
- Connection to international standards



OPTICS

All the optical components are manufactured within the ELDIM optical lab. The unique telecentric-on-CCD design and the high quality control process result in high MTF and low distortion performances.

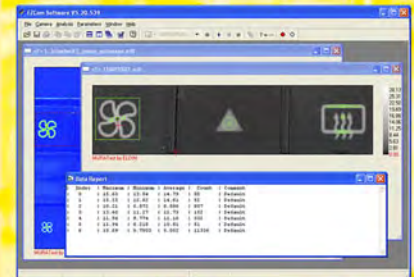


- Optical aberration under CCD pixel size
- No vignetting effect
- Distortion < 0.1%
- MTF > 50 lpm
- Frontal iris virtual eye measurements
- No extra calibration when changing the working distance

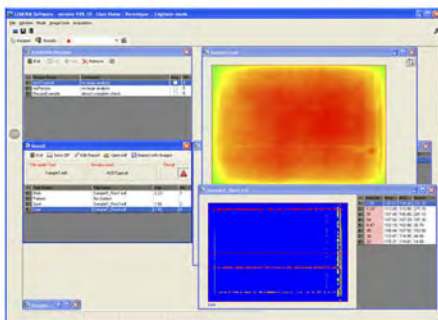
APPLICATIONS

The addition of high grade optics, an high performing filtering and the latest generation of scientific sensors matches the needs of numerous industry standards. ELDIM MURATest is hence suitable for many different advanced lighting applications. ELDIM MURATest is delivered with application dedicated softwares.

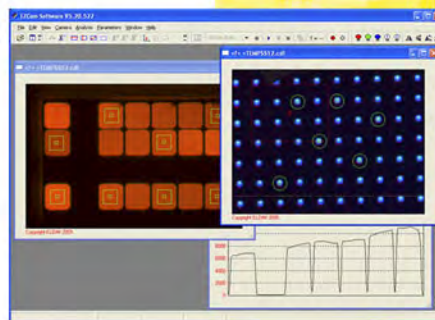
- LCD module uniformity and mura defect
- PDP image sticking
- LED wall calibration
- CCFL lamps and backlight modules
- Dashboards and cockpits ergonomy
- Projection systems homogeneity



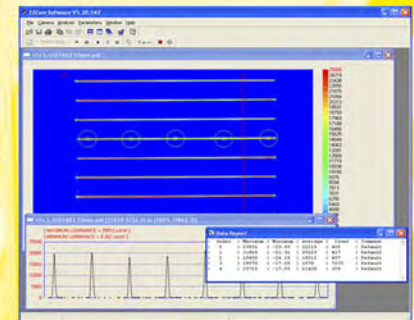
Automotive



Mura defect



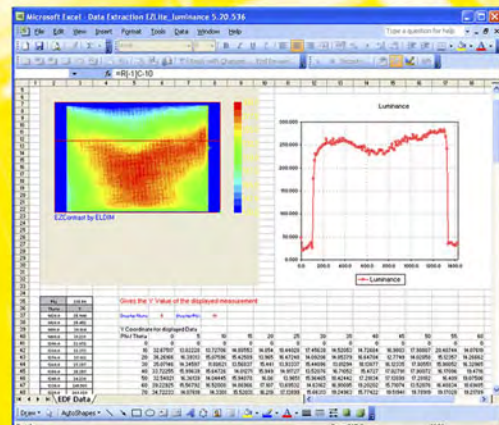
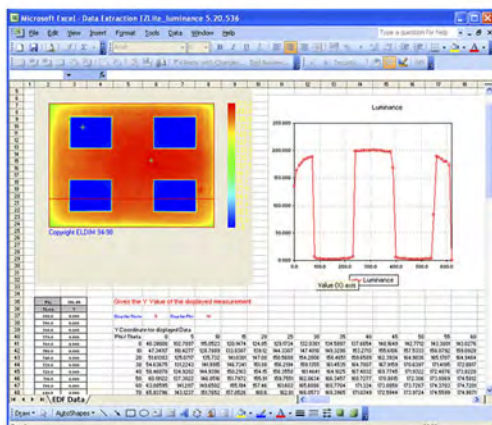
Ledwall



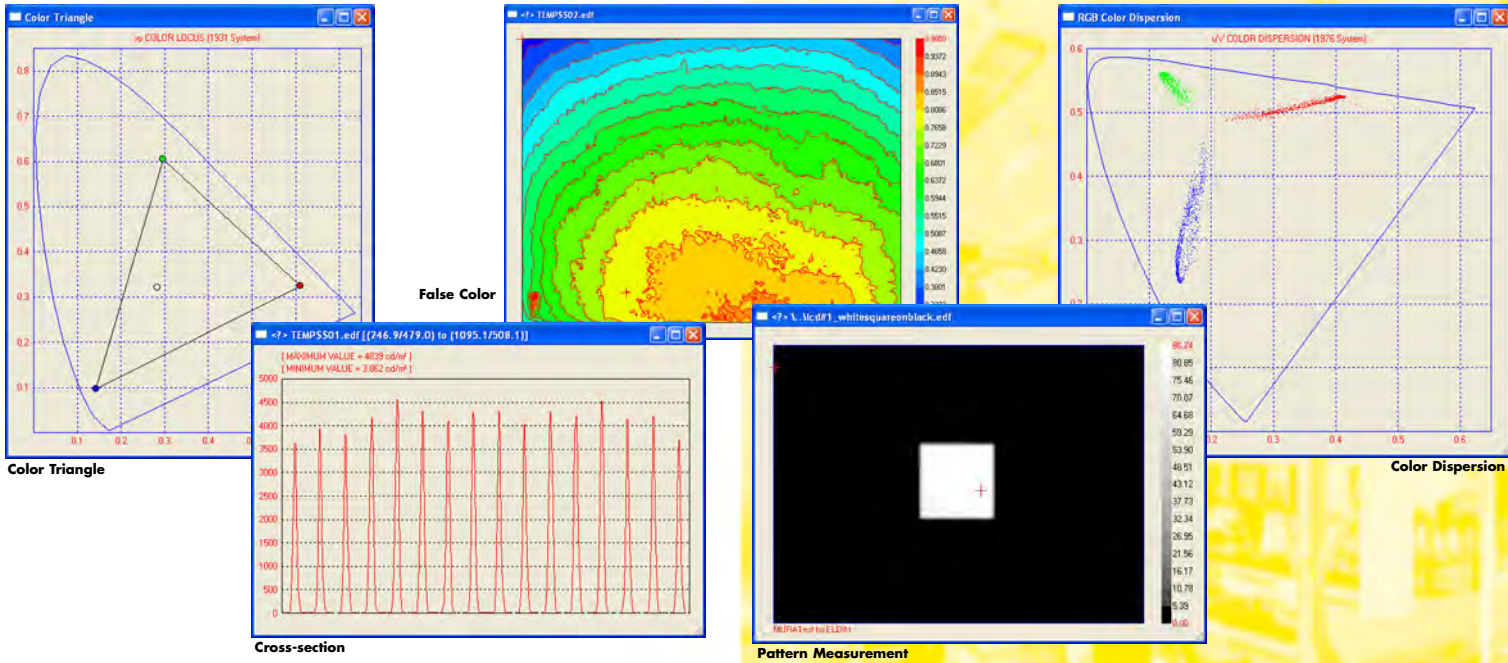
CCFL

SOFTWARE

The software delivers both remote control of the camera and data analysis. All camera parameters are set through a dialog box and are saved for later applications. The interface is friendly and includes convenient analysis tools such as cross-section, zoom, region-of-interest extraction and data reporting. An ActiveX function library is also included for further analysis or measurement automation. The user may thus build its own routines in LabVIEW, Excel or Visual Basic.



UNIFORMITY



Specifications

measurement modes	-Luminance/CR -Color
Sensor configuration	Peltier cooled CCD (adjustable -5°C/-20°C) Photopic response 16-bit A/D converter
Luminance units	Selectable cd/m² (nit), fl, normalized or binary format
Luminance range (*)	Full scale range 0.05 to 5000 cd/m² (without ND filter) enhanceable to 500,000 cd/m² Maximum sensitivity: 0.0001 cd/m²
Luminance (*)	Measurement time Approx. 3s (**) Accuracy ± 3 % Short term repeatability ± 0.5 %
Color (*)	Measurement time Approx. 7.5s (**) Accuracy ± 0.002 CIE (x,y) on A type illuminant 0.005 RMS CIE (x,y) on any color stimulus Short term repeatability ± 0.002 on one pixel ± 0.0002 on 100 pixels
Dynamic range	23 000 for single shoot 44 000 for high dynamic measurement mode 10° for contrast analysis
Interface	USB 2
Structure Features	Weight 6 kg Height 193 mm Width 214 mm Length 323 mm
Power supply	110 V or 220 V

(*) Specification subject to change without notice.

(**) Measurement in normal mode for a 100 cd/m² sample

Minimum PC configuration

Dimension 4500 Pentium IV processor (min 2 GHz)
512 MB DDR SDRAM 266MHz.
HDD 40GB Ultra DMA
ATI RAGE Ultra 128, 16MB SDRAM
CD-RW 40x/10x/40x
Flat panel Dell 15" LCD
Microsoft® Windows XP and Office XP

Luminance & Contrast

Features	Auto-range, Automatic sensitivity / Dynamic optimization, Contrast competition, Binning.
Analysis	Cross-section (Horizontal, Vertical or free) (decimal or logarithmic), Isocurves only, False color representation, Isoluminance, Isocontrast, Filters (acquisition, computing), Report printing.
Mathematical functions	Add, Subtract measurements, Multiply by or Add a constant, Measurement Rotation or flip, Copy/Paste Pictures and Data.
Display modes	(x, y, Y), (u', v', Y), (X, Y, Z), (L*, u*, v*), (L*, a*, b*)
Units	xy, u'v', Lu*v* or La*b*
Features	Color intensity, Color difference and Color dispersion, Color Triangle, Cross section, Color temperature

Data Processing

File management	Data compression, Remote control, Data extraction, Copy and Paste
Image processing	Smoothing, filtering, rotation, clipping, R.O.I. extraction, Averaging

Options

CCD resolution	1536x1024 (± 8° & ± 16°) 3072x2048 (± 9°) 4872x3248 (± 16°)
Optic lenses	± 8° FOV., F# 5.9 ± 9° FOV., F# 5.9 ± 16° FOV., F# 4 other : contact us
Front entrance iris	To be chosen in a range from 2 mm to 7.2mm
Micro or Macro measurement	1:1 additional lens magnification 1:2 additional lens magnification 1.4 additional lens magnification
Application software	Anti-moiré correction LED Wall calibration Mura defect detection & quantification

Eldim S.A. reserves the right to modify the characteristics of the material described herein prior notice.



ELDIM

ELECTRONICS FOR DISPLAYS AND IMAGING DEVICES

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