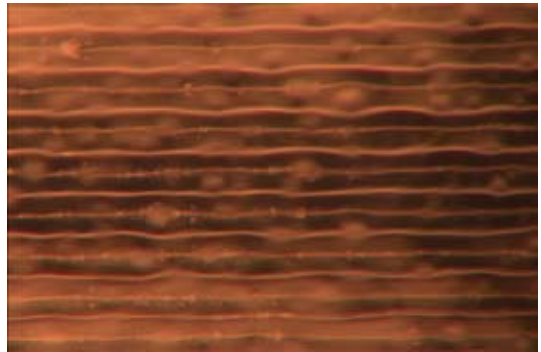
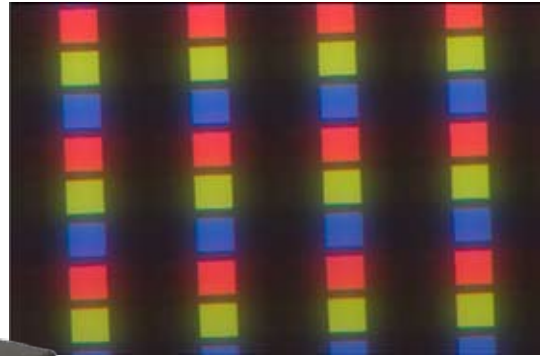
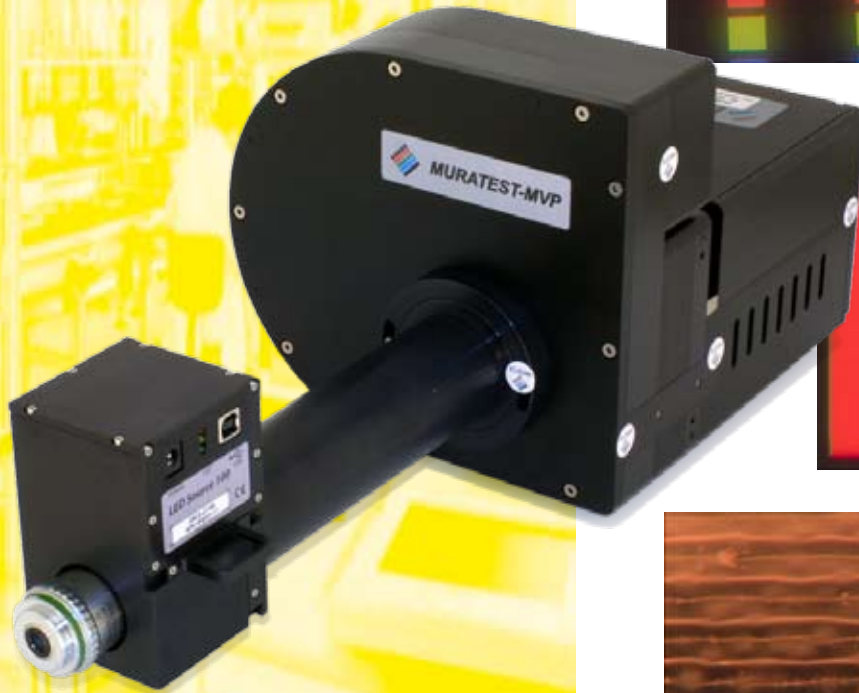


Down
to 0.5µm
spatial resolution



UNIFORMITY
COLORIMETRY
PHOTOMETRY
IMAGING
MICROSCOPY

COLOR & LUMINANCE WITH HIGH MAGNIFICATION

MURA MVP's benefits

Excellent spatial resolution down to 0.5µm

Optimized color accuracy with ELDIM 5 color filters matching to CIE curves

Variable angular apertures for precise characterization of optical properties

Different magnifications for best adjustment to customer needs

Optional RGB LED illumination for reflective displays and components

MURA MVP Description

MURA MVP is the new generation of ELDIM Micro Video Photometer. The system includes a low noise and high dynamic range Peltier cooled CCD camera, a series of five color filters and a high quality microscope objective. It allows to obtain accurate color and luminance mapping with high spatial resolution at the micrometer scale rapidly and easily.

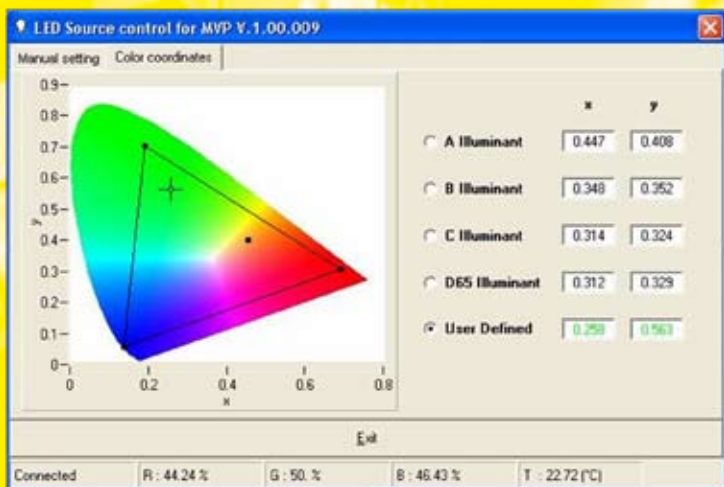


- ❶ Microscope objective
- ❷ Optional RGB LED illumination
- ❸ Color filters matched to CCD response
- ❹ Peltier cooled 1536x1024 pixels CCD camera

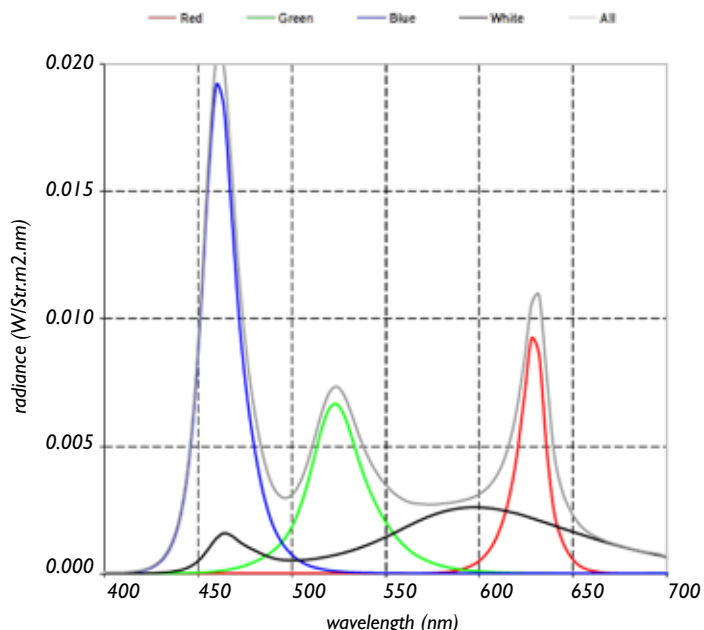
The spectral response of the real 16bits 1536x1024 pixel CCD camera is matched closely to the CIE curves to ensure excellent accuracy for the color measurement in any using conditions. The long working distance and aberration free microscope objective allows high spatial resolution and large field measurements without distortion.

MURA MVP Options

MURA MVP comes with a series of microscope objectives with different magnifications. It can include a computer controlled stabilized RGB LED illumination source for reflective measurements. A complete test stand with motorized Z axis is also available for convenient sample adjustment.



Color can be selected in the triangle using computer controlled RGB LED illumination

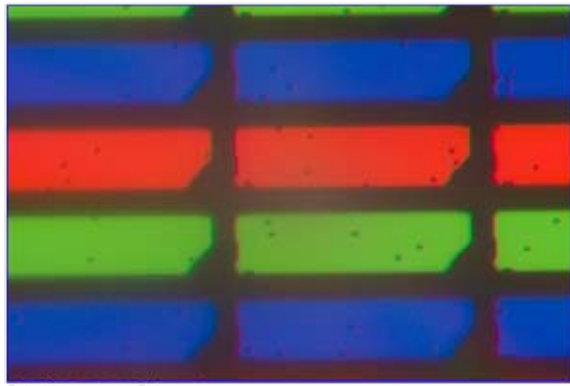


Spectral characteristic of the optional RGB LED illumination

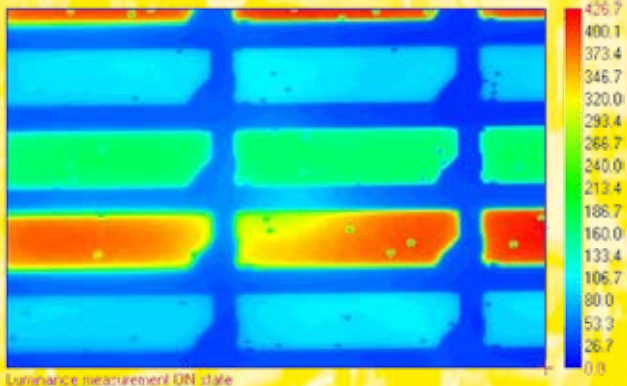
MURA MVP Applications

Emissive

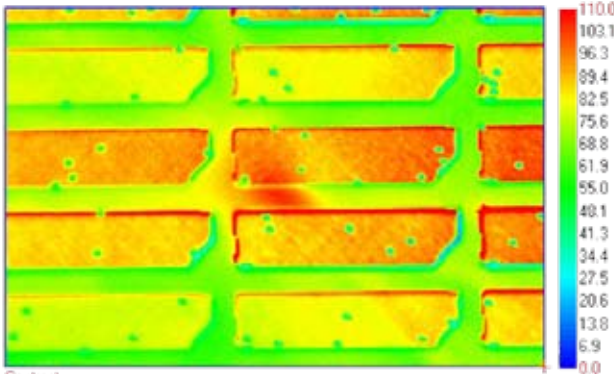
MURA MVP is useful to analyze light emission of displays at pixel level. All the defects related to the pixel structure can be detected and quantified (homogeneity within pixel, punctual defects, alignment defects...). The dispersion at pixel level in terms of color and luminance can be quantified.



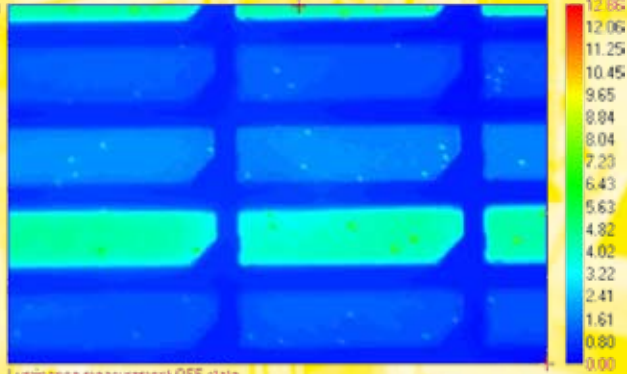
Color Measurement ON state



Luminance measurement ON state



Contrast

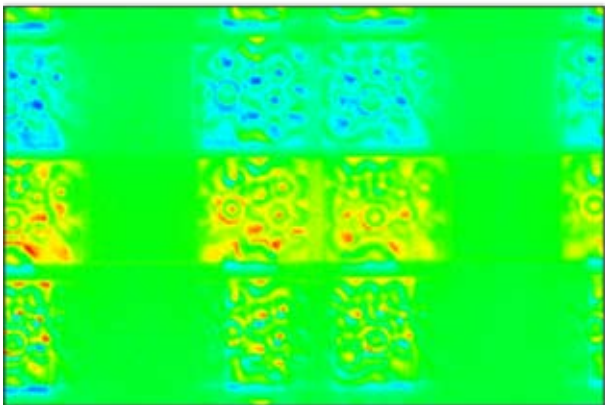


Luminance measurement OFF state

Color & luminance measurement on 15" LCD display: The luminance of each type of pixel is measured in ON state and OFF state; The impact of the spacers on the contrast is observed.

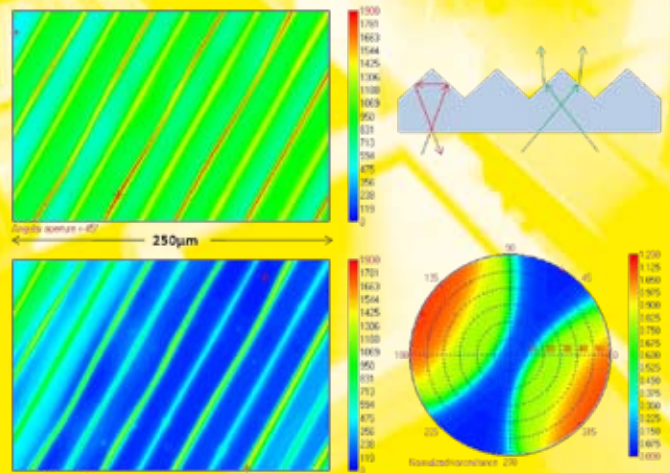
Reflective

With optional integrated RGB illumination, reflective properties can be checked at pixel level. The structure and homogeneity of the diffusing mirror generally used in these devices can, for example, be observed directly. Also micrometric structures of optical components like, for example, BEF films can be visualized and quantified.



Color coordinate x

Reflective pixels of one IPod display: the three types of pixels are clearly visible



Measurements on brightness enhancement film: the pitch of the prismatic structure is around 50µm (top right); Angle of view measurement with EZContrast is show at bottom right; large angular aperture and limited angular aperture MVP measurements (left) point out the effect of the prismatic structure and the structural imperfections.

Specifications	
Measurement modes	Luminance/CR Color
Sensor configuration	Peltier cooled CCD (adjustable -5°C/-15°C) Photopic response 16-bit A/D converter
Luminance units	Selectable cd/m ² (nit), ftl, normalized or binary format
Luminance range (*)	Full scale range 0.5 to 50000 cd/m ² Maximum sensitivity: 0.001cd/m ²
Luminance (*)	<i>Measurement time</i> Approx. 3s (**) <i>Accuracy</i> ±3% <i>Short term repeatability</i> ±0.5%
Color (*)	<i>Measurement time</i> Approx. 7.5s (**) <i>Accuracy</i> ±0.002 CIE (x,y) on A type illuminant 0.005 RMS CIE (x,y) on any color stimulus <i>Short term repeatability</i> ±0.002 on one pixel ±0.0002 on 100 pixels
Dynamic range	23000 for single shoot 44000 for high dynamic measurement mode 10 ⁷ for contrast analysis
Measurement spot imaging	10 images/s
Interface	USB 2.0
Structure features (***)	<i>Weight</i> 7kg <i>Height</i> 193mm <i>Width</i> 214mm <i>Length</i> 623mm
Power supply	110V or 220V

(*) Specification subject to change without notice
 (**) Measurement in normal mode for a 1000cd/m² sample
 (***) To be confirmed

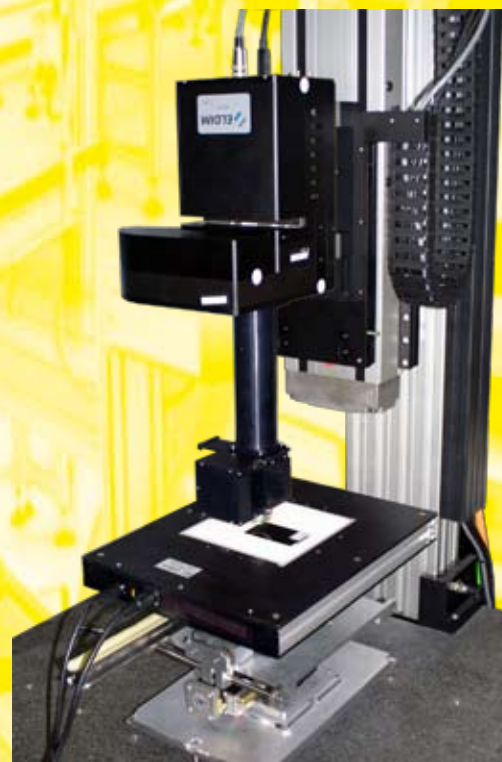
Data processing	
File management	Datacompression, remote control, data extraction, copy and paste.
Image processing	Smoothing, filtering, rotation, clipping, R.O.I. extraction, averaging.

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.

Option	
Integrated illumination	For reflective measurement, stabilized RGB LED's light source.

Option		
Objective	Field of view	Max spatial Resolution
x20	650x440µm	0.5µm
x10	1300x880µm	1µm
x5	2600x1760µm	2µm

Sensor									
CCD resolution	1536x1024								
Magnification	to be selected between x5, x10 or x20								
Working distance for x20	8.5 mm								
Iris for x20	<table border="1"> <thead> <tr> <th>Optical resolution</th> <th>Collecting aperture</th> </tr> </thead> <tbody> <tr> <td>0.5 µm</td> <td>±45°</td> </tr> <tr> <td>0.9 µm</td> <td>±20°</td> </tr> <tr> <td>2 µm</td> <td>±10°</td> </tr> </tbody> </table>	Optical resolution	Collecting aperture	0.5 µm	±45°	0.9 µm	±20°	2 µm	±10°
Optical resolution	Collecting aperture								
0.5 µm	±45°								
0.9 µm	±20°								
2 µm	±10°								
Distorsion	< 0.1%								
Achromatized	from 400 to 700nm								



MURA MVP mounted on motorized Z axis and Backlighting for film measurements



ELDIM

ELECTRONICS FOR DISPLAYS AND IMAGING DEVICES

ELDIM S.A.
 1185, rue d'Epron 14200 Hérouville Saint-Clair France
 Phone: +33 2 31 947 600 Fax: +33 2 31 940 950
 e-mail: eldim@eldim.fr web: www.eldim.fr