

MICROVISION

SS410-XE Display Measurement System

APPLICATIONS

- Display Technologies

AUTOMATED TEST SUITES

- TCO Displays 6.0 & TCO Notebooks
- ISO 9241-307 Specification
- VESA FPDM 2.0
- Custom (User Defined) Test Suites

SS410-XE MEASUREMENTS

CCD Camera

- Spot Analysis
- Line Width
- Fast Fourier Transforms (FFT's)
- MTF
- Convergence
- Geometry (Pincushion, Linearity, etc.)
- Time Variance (Jitter, Swim, Drift)

SPECTROMETER

- Luminance
- Chromaticity and Color Temperature
- Luminance/Color Uniformity
- Spectral Plots over Visual Spectrum
- Gamma
- Contrast Ratio
- Color Gamut
- 3D Display Analysis
- 3D Glasses Measurements

RTM (optional - see RTM Data Sheet)

- Motion Blur / Motion Artifacts / MPRT
- Response Time & Flicker
- Gray Scale Transition Time

SS410-XE FEATURES

- High Resolution 1392x1040 12 bit digital CCD Camera
- Diffraction Grating Spectrometer
- Automatic Measurements
- Real Time Image Processing
- Pattern Generators (analog & digital drives)
- Response Time Module (optional)
- Cosine Diffuser



SS400 Series featuring the SS410-XE Optical Measurement Module

SS410-XE SYSTEM OVERVIEW

Microvision's SS410-XE Display Measurement System satisfies a large range of measurement requirements and permits automated testing and analysis. The SS410-XE is a turn key system that includes a computer controller with CCD and Spectrometer data acquisition cameras. Also included is a three axis computer controlled positioning system that provides fast and automatic positioning of system cameras to any location on the face of the UUT. The positioning system also allows for quick connect and disconnect of any of the SS400 Series modules. System information is displayed using a Windows user interface and test results are graphically displayed and written to both text and CSV log files.

AUTOMATED TEST SUITES

A Test Suite is a Predefined or a User-defined set of measurements. Predefined suites test in full accordance to industry standards, such as ISO, TCO and VESA. A spreadsheet is also provided that automatically calculates all pass/fail criteria. A User-defined suite can be assembled by simply checking the box next to the desired function from the list of available tests. The easy to use, menu driven interface, allows for the generation of custom test suites in minutes. Each User-defined test suite can be saved and recalled for future use. The test suites also provide the ability to save each test screen to a BMP file which is invaluable for post processing of the results.

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Dedicated to the Needs of the Display Industry

SYSTEM COMPONENTS:

Mechanical Positioning System

Microvision Positioners provide travel in the horizontal (X), vertical (Y) and focus (Z) axes and are fully integrated with the drive electronics, power supply and interface contained in the horizontal portion of the stage. Control of the positioner is automatic through software control or by use of the mouse or keyboard.

System Software

The SS410-XE System runs on a Win 7 platform where a Graphical User Interface (GUI) permits easy point and click operation and control of the system. The GUI provides intuitive operation of the software and access to a complete set of display analysis and measurement functions. Measurement data is generated in text file reports and also displayed in full color graphics for easy interpretation of the results.

SS410-XE Optic Module

The Microvision SS410-XE module performs spatial, photopic, temporal and color measurements. The module contains three separate optical systems: CCD camera, diffraction grating spectrometer, and an optional Response Time Module (RTM). An automatically controlled mechanical shutter permits bias/dark current correction without operator intervention.

Optics

The SS410-XE Spectrometer optical system includes a 12mm collimating lens and a quartz depolarizer. An optional Cosine Diffuser is also available for Illuminance measurements in lux. The SS410-XE CCD Optic Module system includes a 25mm C mount lens with spacer kit. The standard magnification allows for 11 mm sampling (square) and spacers may be added or subtracted to increase or decrease the magnification. A Ronchi Ruling is provided for spatial calibration. The optional RTM module utilizes a 25mm C mount lens.

CCD Camera

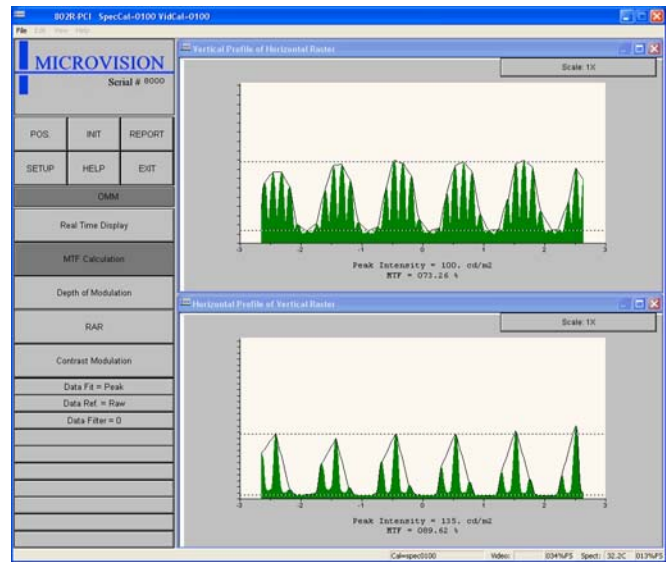
The SS410-XE Camera is a digital 1392 x 1040 CCD with Synchronous capture and an element size of 6.45 microns, square. The camera is calibrated to NIST traceable standards and a photopic filter is specially designed for luminance measurements. The CCD camera provides spatial and luminance measurements.

Computer System

A state of the art desktop or optionally a laptop provides control of all system components.

Spectrometer

The SS410-XE is equipped with a high resolution, multi-element, temperature regulated diffraction grating spectrometer. The unit is calibrated to NIST traceable standards and calibration is maintained by stabilizing the temperature using computer controlled sensing. The spectrometer provides measurements of luminance and chromaticity, as well as spectral plots over the entire visual spectrum (380nm-780nm). NIR is optional. The fiber optic cable routes the light emitted from the measured surface to the spectrometer. The resulting spectrum is imaged onto a 2048 element CCD detector and the data is transferred into the computer through a 16 bit A/D converter.



SS410-XE MTF Measurement

SS410-XE SPECIFICATIONS

High Resolution Digital CCD Camera

Image Sensor:	1392 x 1040 elements
Digital Video:	12 bit
Element Size:	6.45 μm , square pixels
Sync:	Synchronous Capture
Filters:	Photopic, 50%, 25%, 10%, & 1% ND
Standard Lens:	25mm C mount, f1.6 to f16
Field of View:	11 mm Standard, adjustable.
Digital Zoom:	up to 32X
Luminance Accuracy:	+/- 4% @ 2856K illuminant A
Luminance Range:	0.05 to 10^6 cd/m^2 with ND filters
Measurement Time:	<1 s for most measurements

Diffraction Grating Spectrometer

Spectral Range:	380 to 780nm (1000nm optional)
Luminance Range:	0.01 to 500K cd/m^2 **
Luminance Accuracy:	+/- 3% @ 2856K illuminant A
Repeatability:	RSD over 30 minutes < 0.5%
	0.01 cd/m^2 sensitivity is specified at 3% RSD
Color Accuracy (x&y):	+/- 0.002 @ 2856K
Color Repeatability:	+/- 0.0005 @ 2856K
Thermal Regulation:	Computer controlled
Optics:	12mm collimated system
Acceptance Angle:	1.5° standard
Integration Time:	16.7 ms - 5000 ms (sync @ 60Hz)
Optical Resolution:	3.8 nm (slit width 100 μm)
Calibration:	NIST Traceable calibration
Operating Temperature:	5° - 30° C
	** range includes use of Neutral Density Filters

Response Time Module (RTM)

See RTM Data Sheet

Specifications are subject to change without notice.

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