



MICROVISION

SS420 Display Measurement System

Automatic Testing featuring Off-Axis Capabilities

Automated Test Suites

- TCO Displays 6.0 & TCO Notebooks
- ISO 9241-307 Flat Panel Specification
- VESA FPDM 2.0
- User Defined Test Suites

Photopic Analysis

- Luminance/Contrast vs. Viewing Angle
- Luminance Uniformity
- Contrast Ratio Plots
- Gamma Plots
- Reflectance Measurements

Colorimetric Analysis

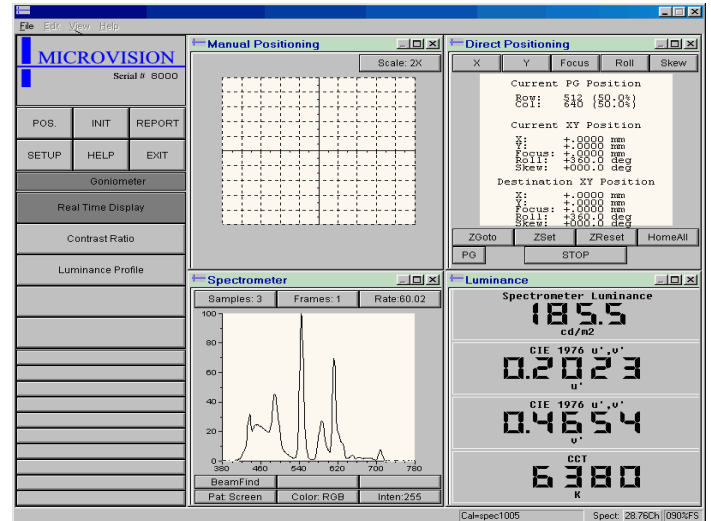
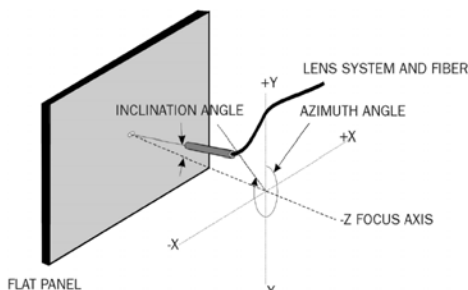
- Chromaticity vs. Viewing Angle
- Color Uniformity
- Correlated Color Temperature
- Color Gamut
- CIE Chromaticity Plots

Temporal Analysis (optional)

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

3D Analysis

- Glasses Measurements
- Extinction Ratio
- Crosstalk / Ghosting



SYSTEM OVERVIEW:

The SS420 Flat Panel Display Measurement System is a dedicated system that can automatically characterize the image quality of all types of flat panel & projection displays. The SS420 System is a computer based measurement system that uses a goniometric method of collecting off-axis data. The SS420 System is a completely integrated system providing ease of use, flexibility and automatic test suites.

Accurate measurements of luminance and chromaticity are made utilizing a diffraction grating spectrometer, eliminating the need for color filters and the problems associated with filter matching. A single fiber optic cable mates the collimating optics with the spectrometer. A mechanical positioner allows movement of the detector to any location on the panel under test while a goniometric assembly provides the ability to make off-axis measurements. A quartz depolarizer eliminates the effects of polarization.

In the typical operating mode, the positioning system moves the spectrometer to a desired measurement location on a vertically positioned display (horizontal mounting is optional). The patterns and colors of the display panel are driven from a pattern generator. A single click of the mouse initiates a variety of preprogrammed tests or test suites that generate reports of the measurement data.

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.

The SS420 System includes a goniometric assembly which mounts on the basic positioner and provides automatic off-axis movement in the inclination and azimuth axis. The step increments of data collection is completely flexible and user programmable.

System Software

The SS420 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 and CSV file reports and also displayed in full color graphics for easy interpretation of the results.

Optics

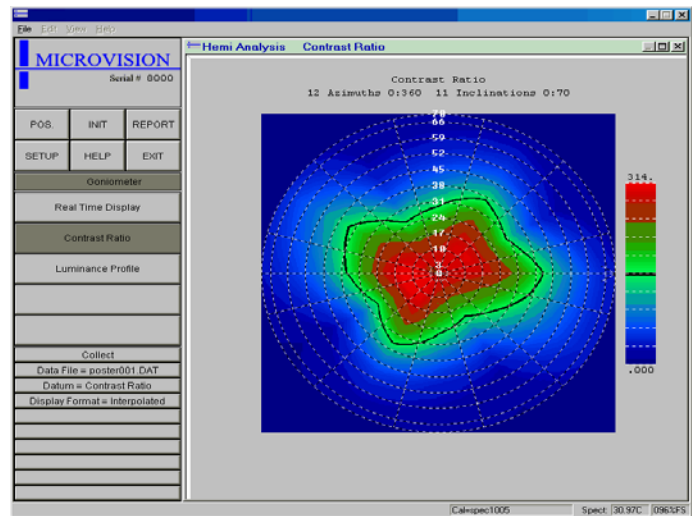
The SS420 optical system includes a 12 mm collimating lens and a quartz depolarizer. The lens collects collimated light emitted from the surface of a display and a quartz depolarizer negates the effects of polarized light from the panel under test. The optical system images the light into a single element fiber optic cable that is routed to the spectrometer. The optical system is mounted on the goniometric assembly to provide off-axis measurements. The acceptance angle of the optical system is adjustable for different applications. Typically, the acceptance angle of the optic system is set to 1.5 degree. Neutral Density Filters of 50%, 25%, 10%, and 1% and a 5mm aperture are supplied standard. Refer to section B19 Collimated Optics in the *IDMS V1.03 Information Display Measurements Standard* for more details.

Computer System

The SS420 System is integrated into a state of the art computer which provides control of all system components. A desktop computer is standard and a laptop is optional.

Spectrometer

The SS420 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). Optionally, the spectrometer can be configured to cover the NIR spectrum as well. 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.



SS420 SPECIFICATIONS:

Diffraction Grating Spectrometer

Wavelength Range:	380 to 780nm (1000nm optional)
Luminance Range:	0.01 to 500K cd/m ²
Luminance Accuracy:	+/- 3% @ 2856K illuminant A
Lum. 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° or 6.0° *
Digital Resolution:	16 bit A/D
Integration Time:	16.7 ms - 5000 ms (sync @ 60Hz)
Optical Resolution:	3.8nm FWHM, slit width: 100 µm
Calibration:	NIST traceable calibration
Operating Temperature:	5° - 30° C

* 1.5° : 100 µm core diameter optical fiber

6.0° : 400 µm core diameter optical fiber

Response Time Measurement System (Optional)

See RTM Data Sheet

Goniometer Specs:

Resolution: Inclination = 0.1° steps up to 85°
Azimuth = 1.0° steps up to 360°

Specifications are subject to change without notice.

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