

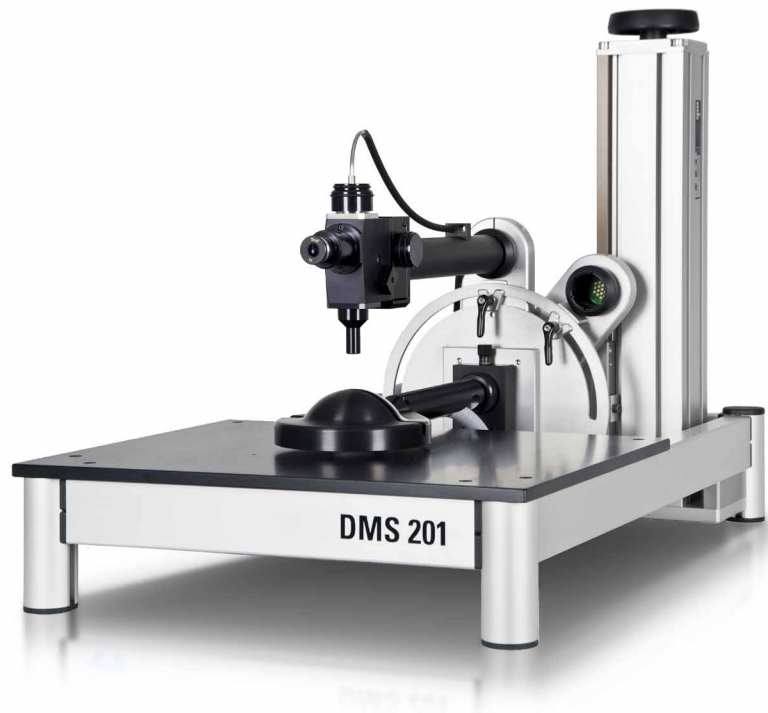
DMS 201

Goniometer System

with manual positioning

Product highlights

- 2 manual axes for angular positioning and adjustment
- Measurement and evaluation of emissive, transmissive, reflective, and transreflective displays
- For evaluation of all photometric and colorimetric characteristics versus angle of inclination, electrical driving, time and temperature



The DMS 201 is a cost-effective goniometer for analyzing the electro-optical characteristics of displays. The measurement system is based on a manual positioning device with 2 axes (optionally 3 axes) and is used to determine luminance, contrast, and color properties at variable electrical driving and various viewing angles.

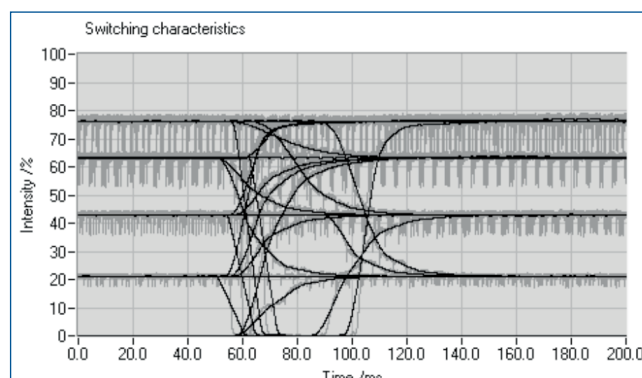
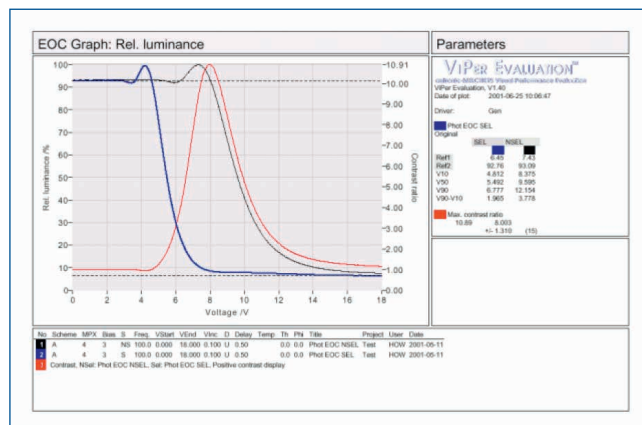
The DMS 201 is an ideal system for applications that do not require automated angular scans.

Options

- Fast photometer for analysis of temporal luminance variations (flicker evaluation, gray-to-gray transition times, etc.)
- Spectrometer for radiometric, photometric and colorimetric analysis
- Directional light sources for measurement of reflectance factor and in-plane BRDF
- Forced air temperature control of the display under test
- DMSControl software for automated measurement sequences
- ViPer software for analysis, evaluation and visualization of measurement data
- Software interface for various video test-pattern generators

Measurements and evaluations

- Angular scan: variation of luminance, contrast and chromaticity with viewing direction for evaluation of directional uniformities and BRDF
- EOC: variation of luminance, contrast and chromaticity with electrical driving for evaluation of EOTF-characteristics (e.g. threshold-, saturation-voltage, gamma)
- Transients: luminance versus time for e.g. response time evaluation
- Reflectance characteristics under diffuse and directional illumination
- Comprehensive software package for measurement analysis (optional)
- Customer specific measurements defined with DCI scripting sequences



Standard components

- Table top version
- Manual inclination stage for microscope, with scale
- Manual adjustment of height (z axis), appr. 300 mm stroke
- Measurement microscope with adjustable spot sizes (depending on sensor system)
- Threads for mounting the adapter for HCS chamber and for DUT fixtures
- Integrated transmissive illumination

Optional components

The following optional components and accessories are available for the DMS 201:

Goniometer:

- Fixture for diffuse reflective illumination (DHS and SDR) and cover of heat-cool stage (HCS)
- Manual inclination stage of reflective illumination (PID, VADIS, PLS), with scale
- Manual rotary stage with scale

Temperature control:

- HCS-3: forced air temperature control device, temperature range -35 °C to +85 °C, with integrated diffuse reflective illumination
- HCS-3A: modified version of HCS-3 improved for easier handling, temperature range -40 °C to +85 °C, adjustable DUT fixture

Light sources and illumination systems:

- HEL-4: light source with halogenic incandescent lamp
- LC-8: xenon light source for higher light output
- DHS: diffusing hemisphere for evaluation of contrast of reflective displays
- DHS-HC: diffusing hemisphere for evaluating the contrast of reflective displays; illumination geometry similar to HCS-3
- PID: collimated parallel beam illumination
- VADIS: variable aperture diffuse illumination source for e.g. scattering characterization of surfaces (BRDF), measurement of reflectance factor
- PLS: LED point-light source for measurement of reflectance characteristics including BRDF
- SDR: integrating sphere for measurement of diffuse reflectance factor, specular component excluded or included (d/8, SCE or SCI)

Light measuring devices:

- PMT 3: fast photometer with photomultiplier tube, bandwidth 100 kHz, 500 kHz or 2 MHz
- CAS 140CT: Model VIS; 360 to 830 nm; 1024 pixel back-illuminated CCD detector; 2.2 nm spectral resolution (100 μm slit); 0.5 nm/pixel data point interval (CAS140CT-151)

DUT driving:

- ASG: arbitrary signal generator with 1 or 4 analog output channels (depending on basic system variant); standard and user defined signal waveforms; for direct addressing, passive matrix driving and control of TFT arrays (gate and data signals), etc.
- Source meter: programmable current or voltage source with digital multimeter, in particular for current driven display devices like OLED displays; can be combined with a multiplexer (for driving and measurement of displays with multiple segments and matrix displays)
- DCI: device control interface for scripting and communication with various external devices, e.g. video pattern generators, module drivers, power supplies, etc. via RS232, GPIB, USB, or TCP/IP

Software:

- DMSCControl: administration, configuration and control of the instrument, definition and management of measurement sequences
- Visual performance evaluation (ViPer): evaluation and representation of measurement results (on- and off-line), data exchange with other software (e.g. spreadsheet applications) and report generation (e.g. PDF documents)
- Report generator: user configurable data export from DMSCControl to spreadsheet software

Technical data

DMS 201	
Axis	Scan range
Range of inclination for microscope	-90° ... 90°
Range of inclination for illumination (optional)	-90° ... 90°
z stroke (height)	0 ... 300 mm
DUT dimensions	
Maximum size (L x W)	500 mm x 400 mm (23" diagonal for a 16:9 panel) for center measurement; 250 mm x 200 mm (11.5" diagonal for a 16:9 panel) for full manual x-y positioning range
Dimensions ¹	
Size (table top version) (L x W x H)	790 mm x 500 mm x 580 mm
Height of measurement table	140 mm
Mass ¹	
Mechanism (incl. microscope)	35 kg
Ambient operating conditions	
Ambient temperature	23 °C (±5 °C)
Humidity	0 – 60 % rel. humidity

¹ All sizes and masses approximate

Photometer PMT 3	
Bandwidth	100 kHz, 500 kHz or 2 MHz
Measurement spot diameter	0.5, 1, 3, 8 mm
Spectrometer CAS 140CT	
Spectral range ²	360 ... 830 nm (usable spectral range depending on software used)
Spectral resolution	2.2 nm
Data point interval ³	0.5 nm
Measurement spot diameter	0.5, 1, 3, 8 mm

² DMSCControl software range: 380 ... 800 nm

³ DMSCControl data point interval: 1 nm

Order information

Order number	Description
Basic system	
DMS-201-1	Model DMS 201-1 comprising: - Goniometer with 2 manual axes - Microscope viewing optics
Options - Temperature control	
DMS-3-10	HCS-3 temperature chamber with ThermoStream control unit
DMS-3-20	HCS-3A temperature chamber with ThermoStream control unit
Options - Light sources and illumination systems	
DMS-5-10	HEL-4 light source with 150 W tungsten halogen lamp
DMS-5-12	LC-8 xenon light source for higher light output
DMS-5-20	PID-800 parallel illumination device (collimated beam)
DMS-5-30	VADIS-800 variable aperture diffuse illumination source for reflective measurement
DMS-5-40	DHS diffusing hemisphere for reflective displays
DMS-5-41	DHS-HC diffusing hemisphere for evaluating the contrast of reflective displays; illumination geometry similar to HCS-3 source
DMS-5-50	SDR integrating sphere for diffuse reflectance
DMS-5-60	PLS LED point-light source illumination for measurement of BRDF
Options – Light measuring devices	
DMS-1-10	CCD spectrometer set for DMS systems; incl. CAS 140CT VIS model (CAS140CT-151) 360 nm – 830 nm (usable spectral range depending on software used)
DMS-1-20	Fast photometer with PMT 3/100, PMC and DAQ board
Options – DUT driving	
DMS-2-10	Keithley 2400 series source meter set for DMS, including cabling and interface
DMS-2-20	GRU display driving and data acquisition unit; with ASG-1 (1 channel) and power amplifier PA 3/60
Options – Software	
DMS-SW-10	DMSCControl and ViPer software for control, measurement, evaluation and illustration
DMS-SW-35	DCI device control interface for external devices (for DMSCControl)
DMS-SW-40	Report generator for data export to Excel spread sheets



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