

LumiTop M150

Spectrally enhanced imaging colorimeter

Key features at a glance

- ▲ Ultra-high resolution camera with 151 MP to provide single pixel evaluation for state-of-the art DUTs
- ▲ Proven concept of LumiTop – spectrally enhanced imaging colorimeter
- ▲ Combination of 2D-RGB sensor with spectroradiometer

\\ TECHNICAL SPECIFICATIONS

LumiTop M150 imaging colorimeter		
Measurement quantities		
2D	Luminance, color	
Spot	Spectrum, luminance, color, flicker	
Camera specifications		
Effective resolution (h x v)	14,192 x 10,640 (151 megapixels, CMOS)	
Pixel size	3.76 μm x 3.76 μm	
Dynamic range	80.8 dB	
AD converter	14 bit	
Size sensor	2.6" (66.8 mm diagonal)	
Interface camera	Gigabit Ethernet, M12 12-Pin Female, Quad CoaXPress (4 x 6.25 Gbit/s)	
Measurement range 2D ^{1) 2)}	L = 0.04 cd/m ² – 2.2 x 10 ⁷ cd/m ²	
Accuracy and precision	Luminance	Color
Accuracy of camera (rel. to CAS) ³⁾	±0.2 %	±0.001
Instrumental precision camera ⁴⁾	±0.04 %	±0.0002
Camera uniformity (RNU) ⁵⁾	±0.15 %	±0.0006
Measurement time ⁶⁾	Single image	Region of interest
Measurement time hybrid mode	2.0 s	1.6 s
Measurement time camera only	1.7 s	1.0 s

\\ TECHNICAL SPECIFICATIONS

CAS specifications	CAS 140D	
Interface CAS	USB, PCIe, Gigabit Ethernet	
Measurement range CAS ^{1) 7)}	$L = 0.017 \text{ cd/m}^2 - 1.5 \times 10^8 \text{ cd/m}^2$ (100 μm slit size)	
Accuracy and precision	Luminance	Color
Accuracy of CAS	$\pm 3.0 \%$ ⁸⁾	± 0.0015 ⁹⁾
Instrumental precision CAS ⁴⁾	$\pm 0.1 \%$	± 0.0002
Polarization sensitivity ¹⁰⁾	$\pm 2.0 \%$	± 0.002

Field of view / Working distance at selected magnification		
Magnification / NA	FOV size	Working distance
$\beta = 11.25 / 0.2$	4.74 mm x 3.56 mm	13 mm

Instrument Systems is continually working on the further development of its products. Technical changes, errors and misprints do not justify claims for damages. For all other purposes, our Terms and Conditions of Business shall be applicable.

¹⁾ Contact Instrument Systems for extended measurement range options: (preliminary specifications)

E.g. adding an OD2 filter would change the measurement range to $L = 4 \text{ cd/m}^2 - 2.2 \times 10^9 \text{ cd/m}^2$

²⁾ Lower measurement limit based on a signal to noise ratio of 10:1 for maximum exposure time (60 s). Upper measurement limit based on a defocused measurement with signal level < 80 % of a white (non-modulated) LED light source at minimum exposure time (80 μs).

³⁾ Typical value for maximum deviation over the FOV relative to the CAS spot; calculated for an image with 72 pixels cropped at each edge and 12 by 12 pixels binning (34 averages) immediately after calibration with reference used for flat-field correction.

⁴⁾ 2 σ of repeated measurements of one instrument ($L \approx 100 \text{ cd/m}^2$, autoexposure).

⁵⁾ RNU (response non-uniformity) is defined as 99.7 % percentile of the deviation of the mean image value; calculated for an image with 72 pixels cropped at each edge and 12 by 12 pixels binning (34 averages) immediately after calibration with reference used for flat-field correction.

⁶⁾ Time between beginning of two subsequent measurements using the SDK; determined with a camera exposure time of 20 ms and CAS exposure time of 200 ms for a white LED ($L \approx 500 \text{ cd/m}^2$). Depends mainly on PC processing capability. ROI (Region of Interest) refers to an image size filling only 50 % of the camera sensor in each dimension.

⁷⁾ Lower measurement limit based on a signal to noise ratio of 10:1 for maximum exposure times 65 s for CAS 140D. Upper measurement limit based on a signal level < 80 % for a white (non-modulated) LED light source using a CAS internal optical density filter OD4 and minimum exposure time 4 ms (CAS 140D).

⁸⁾ Immediately after calibration relative to calibration standard.

⁹⁾ Immediately after calibration.

¹⁰⁾ Maximum deviation from average of repeated CAS measurements with a linear polarized light source and varying polarization angle.