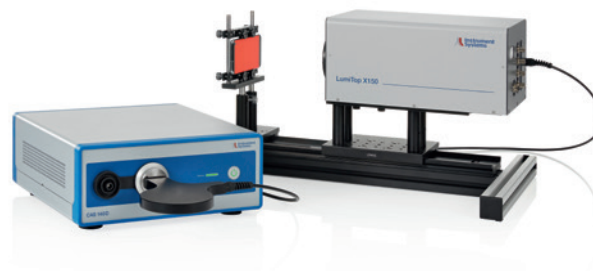


# LumiTop X150

## 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 and flicker sensor



### \\ TECHNICAL SPECIFICATIONS

LumiTop X150				
Measurement quantities				
2D	Luminance, color			
Spot	Spectrum, luminance, color, flicker			
General specifications				
Operating system	Windows 7/10 (64 bit)			
Dimensions (l x w x h) <sup>1)</sup>	365 mm x 230 mm x 160 mm			
Weight <sup>2)</sup>	10.4 kg			
Power supply	24 V			
Operating temperature range	15 – 35 °C			
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 <sup>3) 4)</sup>	L = 0.003 cd/m <sup>2</sup> – 50,000 cd/m <sup>2</sup>			
Accuracy and precision	Luminance		Color	
Accuracy of camera (rel. to CAS) <sup>5)</sup>	±0.2 %		±0.001	
Instrumental precision camera <sup>6)</sup>	±0.04 %		±0.0002	
Camera uniformity (RNU) <sup>7)</sup>	±0.15 %		±0.0006	
Measurement time <sup>8)</sup>	Single image	Region of interest	2x2 image	Region of interest
Measurement time hybrid mode	3.5 s	1.9 s	8.3 s	5.5 s
Measurement time camera only	3.2 s	1.1 s	7.5 s	4.7 s

## \\ TECHNICAL SPECIFICATIONS

CAS specifications	CAS 140D	
Interface CAS	USB, Gigabit Ethernet	
Measurement range CAS <sup>3) 9)</sup>	L = 0.0004 cd/m <sup>2</sup> – 5 x 10 <sup>6</sup> cd/m <sup>2</sup> (250 µm slit size)	
	L = 0.0013 cd/m <sup>2</sup> – 1.2 x 10 <sup>7</sup> cd/m <sup>2</sup> (100 µm slit size)	
Accuracy and precision	Luminance	Color
Accuracy of CAS	±3.0 % <sup>10)</sup>	±0.0015 <sup>11)</sup>
Instrumental precision CAS <sup>6)</sup>	±0.1 %	±0.0002
Polarization sensitivity <sup>12)</sup>	±2.0 %	±0.002

Available lenses					
Number	Focal length and magnification β	FOV size	FOV diagonal	CAS spot diagonal	Working distance <sup>13)</sup>
1	97 mm f/3.2 β = 1.35 – 1.54	max. 40 mm x 30 mm	1.9"	2.4 mm	~ 90 mm
		min. 35 mm x 26 mm	1.7"	2.1 mm	~ 100 mm
2	104 mm f/4 β = 0.28 – 0.38	max. 193 mm x 145 mm	9.5"	11.6 mm	~ 400 mm
		min. 137 mm x 103 mm	6.7"	8.2 mm	~ 300 mm
3	100 mm f/4.1 β = 0.05 – 0.2	max. 847 mm x 635 mm	41.7"	50.8 mm	~ 1600 mm
		min. 276 mm x 207 mm	13.6"	16.6 mm	~ 550 mm
4	92 mm f/3.3 β = 0.16 – 0.24	max. 331 mm x 248 mm	16.3"	19.9 mm	~ 560 mm
		min. 226 mm x 170 mm	11.1"	13.6 mm	~ 380 mm

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<sup>1)</sup> Not including external fiber and mode mixer.

<sup>2)</sup> Without CAS, with mode mixer.

<sup>3)</sup> Contact us for extended measurement range options.

<sup>4)</sup> 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).

<sup>5)</sup> 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.

<sup>6)</sup> 2σ of repeated measurements of one instrument (L ≈ 100 cd/m<sup>2</sup>, autoexposure, 3h warm up time).

<sup>7)</sup> 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.

<sup>8)</sup> 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 ≈ 500 cd/m<sup>2</sup>). Depends mainly on PC processing capability.

Single image refers to a one shot 151 MP demosaiced RGB image. 2x2 image refers to a 2x2 pixel shifted image with 151 MP resolution per color channel and is only available with optional pixel shifter hardware.

ROI-Region of Interest refers to an image size filling only 50% of the camera sensor in each dimension.

<sup>9)</sup> 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).

<sup>10)</sup> Immediately after calibration relative to calibration standard.

<sup>11)</sup> Immediately after calibration.

<sup>12)</sup> Maximum deviation from average of repeated CAS measurements with a linear polarized light source and varying polarization angle.

<sup>13)</sup> Distance between DUT and front plate of LumiTop.