Instrument Systems
KONICA MINOLTA Group

LumiTop 4000

Macro lens

Spectrally enhanced imaging colorimeter

Key features at a glance

- Production grade 3-in-1 test station saves time, space and money
- Optimized for µLED applications for highest accuracy
- Hardware trigger for perfect timing

\\ TECHNICAL SPECIFICATIONS

LumiTop 4000 with macro lens		
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) [1]	334.4 mm x 190 mm x 121 mm	
Weight [2]	4.5 kg	
Power supply	24 V	
Operating temperature range	15 – 35 °C	
Lens	100 mm (macro)	

Camera specifications		
Effective resolution (h x v)	4096 x 3000 pixels (12 megapixels, CMOS)	
Pixel size	3.45 µm x 3.45 µm	
AD converter	12 bit	
Size CMOS sensor	1.1” (17.52 mm diagonal)	
Interface camera	Gigabit Ethernet, M12 12-Pin Female	
Measurement range 2D [3] [4]	L = 0.06 cd/m² – 0.8 x 10^6 cd/m²	
Accuracy and precision	**Luminance**	**Color**
Accuracy of camera (rel. to CAS) [5]	±0.4 %	±0.002
Instrumental precision camera [6]	±0.03 %	±0.0001
Camera uniformity (RNU) [7]	±0.35 %	±0.0013
Measurement time [8]		
Measurement time hybrid mode	0.7 s	
Measurement time camera only	0.7 s	

Instrument Systems
KONICA MINOLTA Group

\\ TECHNICAL SPECIFICATIONS

CAS specifications	**CAS 140D**		**CAS 140CT**	
Interface CAS	USB, PCIe, Gigabit Ethernet		USB, PCIe	
Measurement range CAS [3) 9)]	L = 0.009 cd/m² – 1.2 x 10⁸ cd/m²		L = 0.045 cd/m² – 1.8 x 10⁸ cd/m²	
Accuracy and precision	**Luminance**	**Color**	**Luminance**	**Color**
Accuracy of CAS	±3.0 %[10)]	±0.0015[11)]	±3.5 %[10)]	±0.0015[11)]
Instrumental precision CAS [6)]	±0.1 %	±0.0001	±0.1 %	±0.0001
Polarization sensitivity [12)]	±2.0 %	±0.002	±2.0 %	±0.002

CAS specifications	**CAS 120**	
Interface CAS	USB	
Measurement range CAS [3) 9)]	L = 0.30 cd/m² – 4.5 x 10⁸ cd/m²	
Accuracy and precision	**Luminance**	**Color**
Accuracy of CAS	±4.0 %[10)]	±0.002[11)]
Instrumental precision CAS [6)]	±0.1 %	±0.0002
Polarization sensitivity [12)]	±2.0 %	±0.002

Flicker specifications	
Flicker range	5 cd/m² – 1800 cd/m²
Flicker accuracy [13)]	±1 dB
Flicker instrumental precision [13) 14)]	±0.02 dB

Spot size and field of view at selected working distances for 100 mm lens (f/2.8)			
Working distance [15)] [mm]	**257**	**400**	**550**
Spot size [mm]	1.0	2.8	4.4
Field of view [mm]	14.4 x 10.5	40.2 x 29.5	61.6 x 45.1
Field of view diagonal [in]	0.7	2.0	3.0

1) Inclusive lens, fiber exit, and back plate connector. At shortest working distance for the 100 mm lens.
2) Without CAS, with mode mixer.
3) External neutral density filters on the lens up to OD 3 are available for increasing the upper measurement limit or measuring modulated light sources.
4) Lower measurement limit based on a signal to noise ratio of 10:1 for 10 seconds exposure time. Upper measurement limit based on a signal level < 80 % for a white (non-modulated) LED light source using an exposure time of 27 µs.
5) Typical value for maximum deviation over the FOV relative to the CAS spot; calculated for an image with 21 pixels cropped at each edge and 13 by 13 pixel binning (34 averages) immediately after calibration with reference used for flat-field correction.
6) 2σ of repeated measurements of one instrument (L ≈ 100 cd/m², autoexposure).
7) RNU (response non-uniformity) is defined as 99.7 % percentile of the deviation of the mean image value; calculated for an image with 21 pixels cropped at each edge and 13 by 13 pixel binning (34 averages) immediately after calibration with reference used for flat-field correction.
8) Time between beginning of two subsequent measurements using the SDK; Determined with a camera exposure time of 10 ms and CAS exposure time of 200 ms for a white LED (L ≈ 500 cd/m²). Depends on PC processing capability.
9) Lower measurement limit based on a signal to noise ratio of 10:1 for maximum exposure times 65 s for CAS 140D and CAS 140CT, 20 s for CAS 120. 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 (10 ms CAS 140CT / 4 ms CAS 140D and CAS 120). Values valid for CAS 140CT, CAS 120 with 100 µm and CAS 140D with 250 µm slit width.
10) Immediately after calibration relative to calibration standard.
11) Immediately after calibration.
12) Maximum deviation from average of repeated CAS measurements with a linear polarized light source and varying polarization angle.
13) L ≈ 150 cd/m², 30Hz, 10% sine wave.
14) 2σ of repeated measurements of one instrument.
15) Distance between DUT and front plate of LumiTop 4000.

Instrument Systems GmbH | Kastenbauerstr. 2 | 81677 Munich, Germany | ph: +49 (0)89 45 49 43-58
fax: +49 (0)89 45 49 43-11 | info@instrumentsystems.com | www.instrumentsystems.com