Фотометры/колориметры LumiTop 2700/4000
Технические характеристики

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LumiTop 2700 and 4000 - Imaging colorimeter

3-in-1 measurement device: spectroradiometer, RGB camera, and flicker diode

Introduction

LumiTop 2700 / LumiTop 4000 - Spectrally optimized luminance and color measurement camera
The spectrally optimized LumiTop 2700 imaging colorimeter enables high-precision 2D color measurements at production speed. As a 3-in-1 system, it combines an RGB camera and a flicker diode with a high-end spectroradiometer of the CAS series. Thanks to ongoing reference checks with the spectroradiometer, the extremely high degree of measurement precision is applied to the complete field of view of the camera. Due to this unique combination, the LumiTop 2700 is ideal for use in display production lines, for in-process quality control and qualification tests in development. The accompanying LumiSuite software with GUI and software development kit provides for numerous analysis options in the lab.

Instrument Systems offers the LumiTop in two variants: The LumiTop 2700 with a resolution of 6.1 megapixels and the LumiTop 4000 with a higher resolution of 12 megapixels.

Main fields of application
The LumiTop series is perfect for use in display production lines or quality control, where the benefits and capabilities of both, the spectroradiometric accuracy and minimal measurement times are highly valued.

Features

- 2D color measurements with unprecedented spectroradiometric accuracy
- 3-in-1 measurement device (high-end spectroradiometer CAS 140 series, RGB camera, and flicker diode)

- Easy integration in production lines due to SDK
- No golden sample calibrations are needed

Fields of application

Fast end-of-line display tests

The LumiTop models merge a high-resolution camera with the high-end spectroradiometer CAS 140D. Using the extremely accurate spectral information of the CAS 140D measurements as live reference guarantees spectroradiometric test accuracy across the whole image of the camera. On account of this unique combination of precision and speed, the LumiTop series is ideal for use in display production lines and in-process quality control. A wide range of test applications can be realized in a single test station, as, e.g., the evaluation of display uniformity, pixel defects, white balance, color gamut, contrast ratio or the measurement of intensity modulations. Notably, the LumiTop can be equipped with a fast photometer for flicker or luminance modulation measurements.

Testing of OEM display quality standards for automotive displays

German automobile manufacturers have agreed on new quality standards for the analysis of automotive interior displays. The latter are to be implemented by suppliers and also checked in production. For meeting these special requirements Instrument Systems offers the spectrally optimized LumiTop 4000 imaging colorimeter. As one of the few 2D color measurement systems available on the market, the camera fulfills the color accuracy demanded in the “Display Specification for Automotive Application”. The accompanying LumiSuite software is the ideal measurement solution for fast end-of-line inspection with testing times of less than 15 s for the main assessment parameters, such as color, uniformity, gamma, and dot defects. This enables automotive suppliers to easily meet the strict spectral and photometric requirements in accordance with the OEM compliance guidelines.

Specifications

	LumiTop 2700	LumiTop 4000
Measurement quantities		
2D	Luminance, color	
Spot	Spectrum, luminance, color, flicker	
General specifications		
Operating system	Windows 10 (64 bit)	
Dimensions (l x w x h)	274 mm x 192 mm x 112 mm	274 mm x 192 mm x 119 mm
Weight	3.7 kg	4.0 kg
Power supply	12 V	
Operating temperature range	15 – 35 °C	

Camera specifications				
Effective resolution (h x v)	2750 x 2200 (6.1 megapixels, CCD)		4096 x 3000 pixels (12 megapixels, CMOS)	
Pixel size	4.54 µm x 4.54 µm		3.45 µm x 3.45 µm	
AD converter	12 bit			
Size sensor	1” (16.0 mm diagonal)		1.1” (17.52 mm diagonal)	
Interface camera	Gigabit Ethernet			
Measurement range 2D	L = 0.005 cd/m² - 5,000 cd/m²		L = 0.02 cd/m2 – 27,000 cd/m2	
Accuracy and precision	**Luminance**	**Color**	**Luminance**	**Color**
Accuracy of camera (rel. to CAS)	±0.4 %	±0.0015	±0.4 %	±0.002
Instrumental precision camera	±0.04 %	±0.0002	±0.04 %	±0.0002
Camera uniformity (RNU)	±0.35 %	±0.0013	±0.35 %	±0.0013
Measurement time				
Measurement time hybrid mode	0.5 s		0.7 s	
Measurement time camera only	0.5 s		0.7 s	

CAS specifications	**CAS 140CT**		**CAS 140D**	
Interface CAS	USB, PCIe		USB, PCIe, Gigabit Ethernet	
Measurement range CAS	L = 0.02 cd/m2 – 6 x 107 cd/m2		L = 0.005 cd/m2 – 4 x 107 cd/m2	
Accuracy and precision	**Luminance**	**Color**	**Luminance**	**Color**
Accuracy of CAS	±3.5 %	±0.0015	±3.0 %	±0.0015
Instrumental precision CAS	±0.1 %	±0.0002	±0.1 %	±0.0002
Polarization sensitivity	±2.0 %	±0.002	±2.0 %	±0.002

Flicker specifications	
Flicker range	5 cd/m2 – ca. 600 cd/m2

Flicker accuracy	±1 dB
Flicker instrumental precision	±0.02 dB

Spot size and field of view at selected working distances for 29 mm lens (f/2.8)							
Working distance [mm]	**385**	**400**	**500**	**700**	**800**	**1000**	**1200**
Spot size [mm]	11.0	11.5	14.9	21.7	25.1	31.9	38.6
LumiTop 2700							
Field of view [mm]	138 x 110	144 x 115	187 x 149	271 x 217	313 x 251	398 x 319	482 x 387
Field of view diagonal [in]	7.0	7.3	9.4	13.7	15.8	20.1	24.3
LumiTop 4000							
Field of view [mm]	156 x 114	163 x 119	211 x 155	307 x 225	355 x 260	450 x 330	546 x 400
Field of view diagonal [in]	7.6	8.0	10.3	15.0	17.3	22.0	26.6

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Accessories

LumiTop accessories for display measurement

- 2-in-1 audit set for inline verification of measurement accuracy (ACS)
- Luminance and chromaticity calibration (CAL)
- General instrument check service (SRV)

Software solutions

- LumiSuite Analysis Software (SW)
- Black Mura Plug-In for LumiSuite (SW)

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