TechnoTeam
Bildverarbeitung GmbH

LMK mobile R

Product presentation

LMK mobile R

TechnoTeam Bildverarbeitung GmbH

Imaging luminance measuring photometer — based on Canon CMOS camera

- Well suited for fast and easy evaluation of luminances in outdoor areas and indoor facilities

- Simplified live camera adjustment and exposure control using LMK mobile control iOS app for wireless remote access

RESTRICTIONS

- Cannot be used for measuring colored light emission spectra (given measuring uncertainties for typical white type light source only!).

- Limited use for measuring modulated light source with strong amplitude modulation.

LMK mobile R – technical overview

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Imaging luminance measuring photometer — based on CMOS DSLR camera

– Camera data and luminance image properties

Electronics	**Sensor/Resolution**	**CMOS Canon sensor with 6249 (H) x 4160 (V)**
	File format	14 Bit, Canon original RAW 3rd Edition
	PC interface	CR3 image file transfer via USB 3.0 or WiFi to the PC
Measurement result	Luminance image resolution	**3132 (H) x 2090 (V)**
	Dynamic resolution	Single measurement: **1:4000** High-Dyn measurement: **1:30000** (1/1000 s < ti < 8 s)
Measurement setup	Selection of measuring range	Set of aperture value, exposure time and ISO speed
	Measuring distance	> 170 mm
	Viewing angle	**57° (H) x 38° (V)**
	Focus	Automated focus (AF) / manual focus (MF)
	Aperture values	**F4 to F11** (calibrated for luminance measurements) in 1/3 steps
	Focal length	35 mm
	Exposure time	**30 sec. to 1/1000 sec.** (calibrated for luminance measurements)
	ISO Setting	**100 to 1600** (calibrated for luminance measurements) in 100 steps

LMK mobile R – technical overview

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Imaging luminance measuring photometer — based on CMOS DSLR camera

– Calibration and related measuring uncertainties

Measurement	**Light sensitivity**	**Av**	**4**	**4**	**11**
		ISO	100	1600	100
		Ti = 1 msec.	12 kcd/m²	750 cd/m²	**90 kcd/m²**
		Ti = 3 sec.	4 cd/m²	**0.2 cd/m²**	30 cd/m²
	Calibration uncertainty **Δ**L in %	2.5			
	Uniformity **Δ**L in %	5.1			
	Focus uncertainty **Δ**L in %	2.5			
	Repeatability **Δ**L in %	< 1.3			

LMK 6/mobile R – applications

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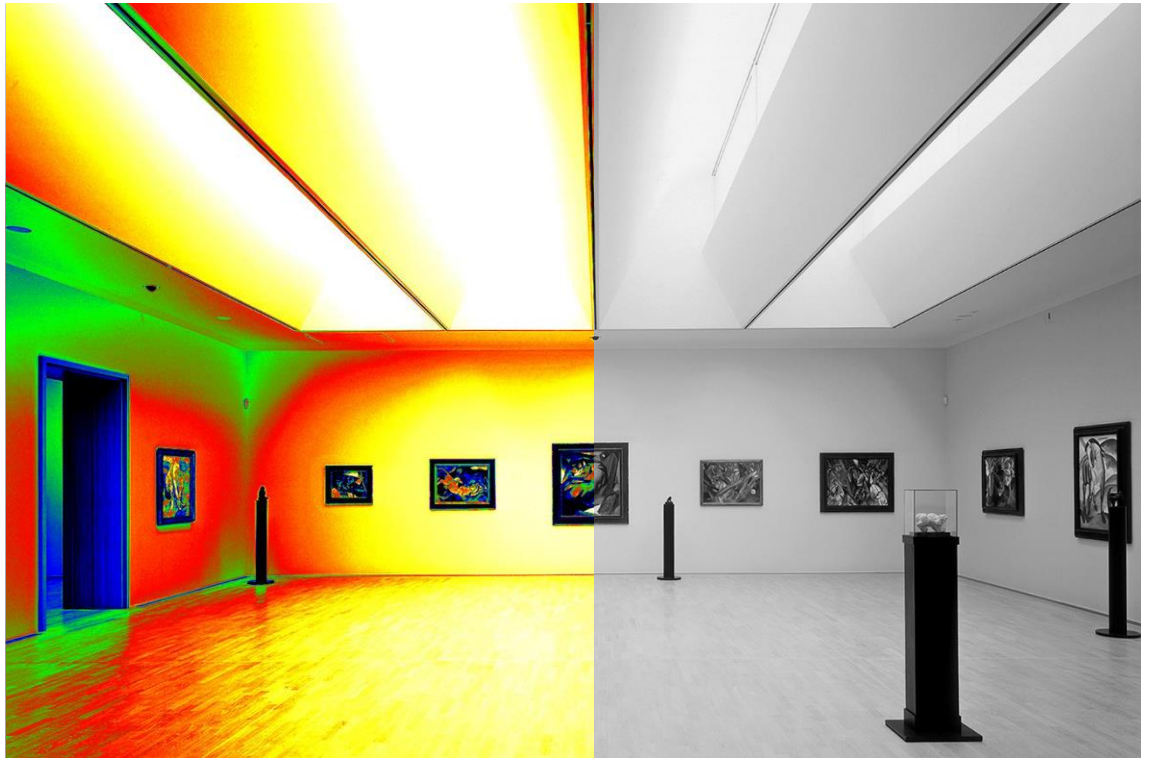
The evaluation of the luminance distribution on surfaces allows the determination of brightness level and homogeneity criteria or the calculation of surface illuminances under defined reflectance situation.

Measuring luminance

- Absolute values – of requirements for minimum and maximum luminance thresholds acc. EN 13201
- Brightness dynamic and contrast ratios – on public spaces
- Luminance distribution – visibility, determination of ergonomic and safety aspects of public infrastructure and workplaces
- Luminance uniformity - lighting appearance and visual comfort, homogeneity on large luminous boards, walls, floors, ceiling and desks



Measuring luminance level on walls, floors and ceilings - Visual appearance and safety (Lenbachhaus Munich)

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Light emission – measuring max. tolerable luminances

Visibility – Measuring luminances and calculating illuminances on surfaces

LMK mobile R – applications

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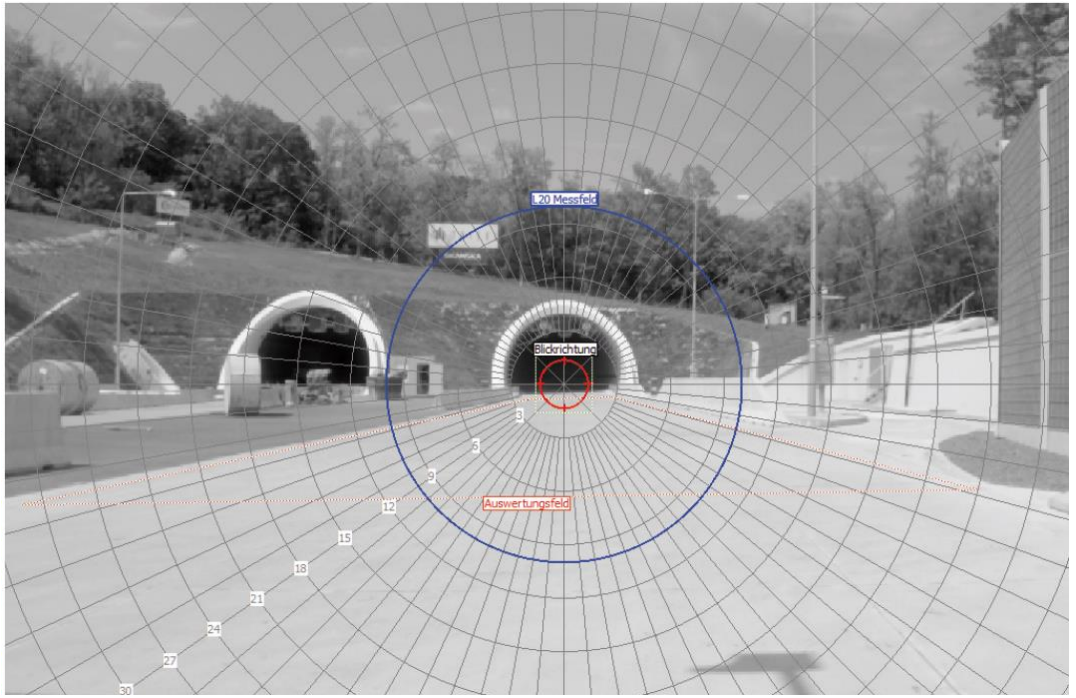
The connection spatially resolved luminance data with image based geometrical data of the lighting scenario allows the determination of visual perception criteria like glare values or other obtrusive light directions like scattered light.

Assessment of lighting geometries

- Obtrusive light – Light pollution such as sky glow or spill light
- Street and road lighting – Determination of disability glare using the $f_{(TI)}$ – method for artificial road lighting
- Tunnel entrance — Measuring the L20° luminance value of the approach zone in front of tunnel entrances
- Indoor lighting – Evaluation of artificial lighting installations, window surfaces, daylight systems with respect to discomfort glare metrics like UGR and DGP



Measuring the L20° luminance of the approach zone in front of tunnel entrances

LMK mobile R – applications

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Determination of the UGR – Discomfort glare in indoor lighting

LMK mobile R remote – iOS App

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The LMK mobile control software app – allows the control of important camera exposure setting using the iOS platform based handheld devices

LMK mobile control tasks:

- Connecting the Canon camera via WiFi hotspot to the handheld device
- Presentation of the camera live image with indication of pixel overflow
- Assistance with camera setup by showing only calibrated exposure settings and excluding unnecessary camera menu items
  - Supporting only manual mode M
  - Automated set of maximum resolution RAW images
  - Adjusting of aperture form F4 up to F11
  - Set only exposure time between 1/1000 sec and 30sec.
  - Supports only ISO 100 – 1600 sets
- Preview function for luminance images with LMK Labsoft false color indication of brightness levels
- Storing and managing often used camera and image capture settings as presets
- Easified HDR image recording – with more than 3 images in one exposure bracketing series