

MSC15

<http://www.gigahertz-optik.de/en-us/product/msc15>

Product tags: VIS , Spectral Data , Color Temperature , CRI , Bilirubin , PAR , Scotopic , Luminous Color , Photometry , General lighting



Description

LEDs enable much greater control of the lighting quality than the technologies they are rapidly replacing. Many international standards now specify requirements for internal and external lighting systems in terms of both 'quality' and 'quantity' of light as well as in terms of efficiency and life time. Photometry in the lighting industry generally focuses on the intensity (i.e. illuminance) and color (i.e. correlated color temperature CCT and color rendering index CRI) of light falling on a surface. LED lamps are extremely versatile in terms of emission spectra, which is why spectral measurement of the illuminance and color has now become essential for any high-end light meters.

The MSC15 – compact, handheld, and low cost

The MSC15 from Gigahertz-Optik GmbH is a modern light meter whose technical concept allows for precise measurement of the illuminance spectrum, color, and color rendering. Its cutting-edge design concentrates on measurement accuracy rather than unnecessary esoteric electronic features which results in a high quality meter for an attractive price. The light sensor consists of a fast spectroradiometer that covers a spectral range between 360 nm and 830 nm (V-lambda range according to CIE S023) with a spectral bandwidth of 10 nm. The device also integrates an optical bandwidth correction feature (CIE 214) in order to further improve the quality of the values calculated based on the spectral measurement data. Another key feature that ensures accurate illuminance measurements of extended lighting conditions is its carefully designed field of view. Accurate illuminance measurements are only possible with a precise, cosine-corrected entrance optic. The MSC15 has an excellent cosine response ($f_2 \leq 3\%$), at the same time as offering a wide measurement range for illuminance and color between 1 lx and 350,000 lx. The colored touch screen of the device makes it extremely easy to use. Uninterrupted operation of more than 8 hours is provided by its lithium ion battery which is recharged via the USB 2.0. Remote control of the device and data read out are made possible by the supplied software.

Calibration of the MSC15

One essential quality feature of photometric devices is their precise and traceable calibration. The MSC15 is calibrated by Gigahertz-Optik's calibration laboratory that is accredited by DAkkS (D-K-15047-01-00) for the *spectral responsivity* and *spectral irradiance* according to ISO/IEC 17025. Every device is supplied with its respective calibration certificate.

Additional functions of the MSC15

The MSC15 also includes additional functions for use in specialist fields of lighting.

LED grow lights need to be measured in terms of the Photosynthetically Active Radiation (PAR) they produce. An additional function of the MSC15 is the display of Photosynthetic Photon Flux Density (PPFD) in $\mu\text{mol}/\text{m}^2\text{s}$ (400 nm to 700 nm) which is a measure of the total number of photons within the PAR wavelength range that reach a surface each second per square meter area.

Neonatal phototherapy lamps used for the treatment of hyperbilirubinemia can be accurately measured in accordance with the latest standards and guidance, irrespective of the lamp type or manufacturer. The MSC15 directly displays total irradiance for bilirubin, E_{bi} (mW/cm^2) in accordance with IEC 60601-2-50:2009+A1:2016 as well as average spectral irradiance ($\mu\text{W}/\text{cm}^2/\text{nm}$) in accordance with the latest American Academy of Pediatrics recommendations.

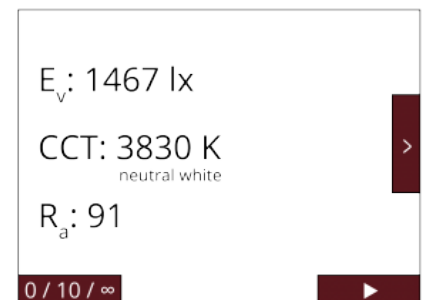
Human Centric Lighting requires new metrics beyond traditional photometric and colorimetric values (ref. CIE TN 003:2015). The MSC15



MSC15 for measurement of the illuminance, spectrum, color, and color rendering in the lighting industry



Touchscreen for intuitive handling of the meter

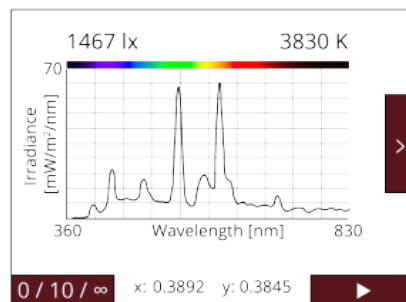


Display of photopic lux, CCT and CRI Ra

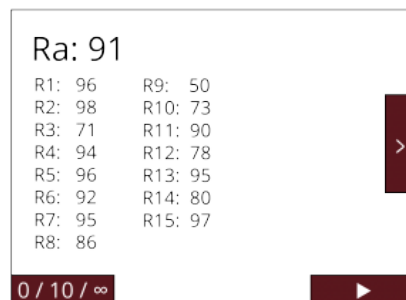
directly displays melanopic irradiance, melanopic illuminance (equivalent melanopic lux) and melanopic daylight equivalent illuminance.

Options for the MSC15:

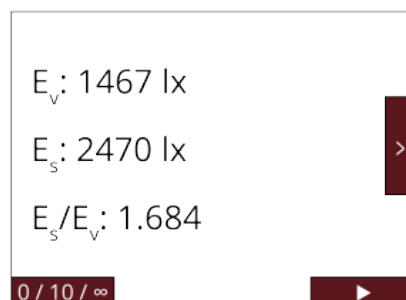
- Software development kit for integration of the device in the user's own software



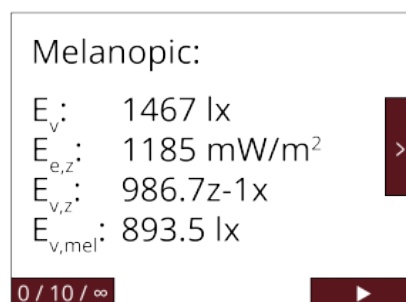
Display of the spectral power distribution, photopic lux and CCT



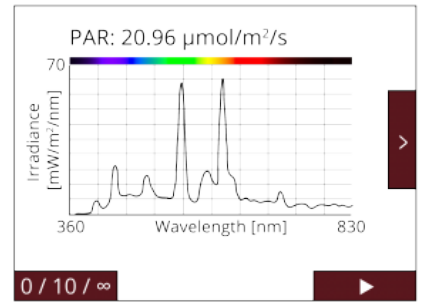
Display of the CRI's



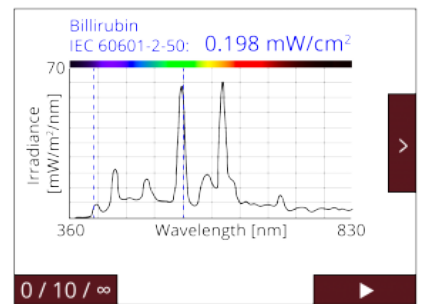
Display of photopic and scotopic lux and their ratio.



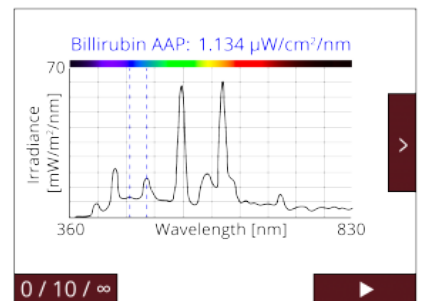
Display of melanopic lux, etc. according to CIE TN 003: 2015 and Well building Standard



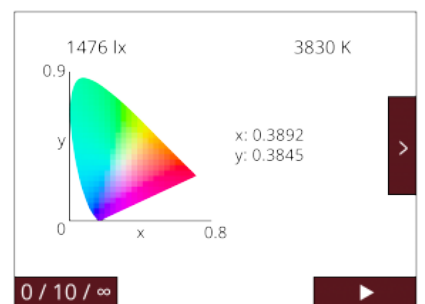
Display of PAR and the spectral power distribution

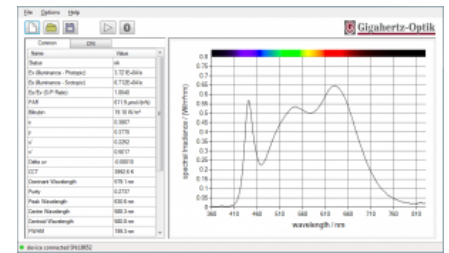


Display of Bilirubin according IEC 60601-2-50 and the spectral power distribution



Display of Bilirubin according AAP and the spectral power distribution





Example measurement in the MSC15's software

Specifications

General	
Short description	Spectroradiometer for measurement of the illuminance, spectrum, light color, and color rendering
Main features	Mobile meter, spectroradiometer with a 10 nm optical bandwidth and additional optical bandwidth correction (CIE214), precise cosine field of view function, Lithium ion battery with over 8 operation hours
Range of measurement	1 lx to 350,000 lx, 360 nm to 830 nm
Typical applications	Precise spectral light meter for the lighting industry
Calibration	Factory calibration. Traceable to international calibration standards
Product	
MSC15	Handheld meter for illuminance and light color. Color-Touchscreen, simple intuitive Operation with clearly arranged display views. (Class B according to DIN 5032-7 or AA according to JIS C 1609-1:2006)
Measurement Quantities	Illuminance photopic Illuminance scotopic Spectral Irradiance Color coordinates (x,y) CCT CRI (color rendering index) PAR- PPF Melanopic irradiance Melanopic illuminance (equivalent melanopic lux) Melanopic daylight equivalent illuminance Total irradiance for bilirubin ($E_{b\lambda}$) Average spectral irradiance for bilirubin (AAP)
Entrance Optic	Diffuser window with 10mm diameter, cosine corrected field of view, $f_2 \leq 3\%$
Spectral Detector	
Wavelength Range	(360 - 830) nm
Optical Bandwidth	10 nm

optical bandwidth correction applied according to CIE 214

Measurement range typ. white LED	(1 - 350000) lx
$\Delta x, \Delta y$ reproducibility	± 0.0002
$\Delta x, \Delta y$ uncertainty	± 0.002 (Standard illuminant A)
CCT Measurement range	(1700 - 17000) K
Δ CCT	± 50 K (standard illuminant type A) $\pm 4\%$ (depending on the LED spectrum)
Calibration	
Calibration uncertainty	Illuminance (standard illuminant A) +/- 3% Illuminance (typ. LED) +/- 4% <i>(Traceable to national standard. Uncertainty of the standard is included)</i>
Miscellaneous	
Interface	USB 2.0
Temperature Range	Operation: 10°C to +30°C Storage: -10°C to +50°C
Power	rechargeable battery minimum 8h of operation
Charging voltage	5VDC by USB
Display	Color Touchscreen
Weight	160 g
Dimensions	136 mm x 74 mm x 32 mm

Purchasing information

Article-Nr	Modell	Description
Product		
15298960	MSC15	MSC15 measurement device, USB cable, case for device and USB cable, SMSC15 Software, calibration, calibration certificate
Re-calibration		
15300569	K-MSC15-I	Calibration of the MSC15 including wavelength adjustment. Calibration certificate
Software		
15306347	S-SDK-MSC15	Software development kit