

# MSC15

<https://www.gigahertz-optik.com/en-us/product/msc15>

**Product tags:** VIS



## 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 and handheld

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 ( $f2 \leq 3\%$ ), 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. Activating and deactivating of individual measurement displays is possible as well via a configuration menu which is implemented into the MSC15. 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. In addition, the MSC15 is equipped with an internal memory which can be used to store up to 10 measurements measurements internally and read them out via software later. The device allows the comfortable management of the stored measurements on its screen.

### 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

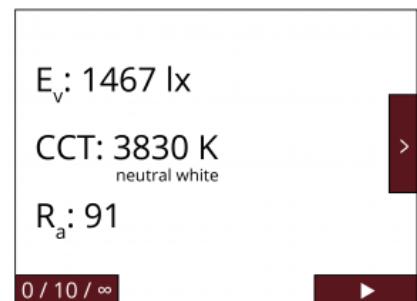
The MSC15 also includes additional functions for use in specialist fields of lighting.

**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.

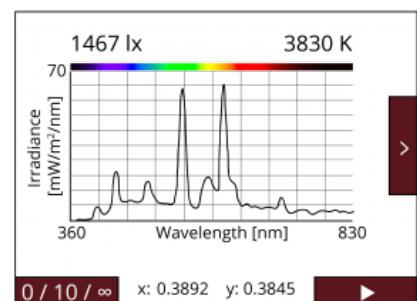
**Neonatal phototherapy lamps** used for the treatment of hyperbilirubinemia can be accurately measured in accordance with the latest standards and guidance, irrespective of the lamp type or manufacturer. The MSC15 directly displays total irradiance for bilirubin,  $E_{bi}$  ( $\text{mW}/\text{cm}^2$ ) 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



*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*



*Display of the spectral power distribution, photopic lux and CCT*

American Academy of Pediatrics recommendations.

**Human Centric Lighting** requires new metrics beyond traditional photometric and colorimetric values (ref. CIE TN 003:2015). The MSC15 directly displays melanopic irradiance, melanopic illuminance (equivalent melanopic lux) and melanopic daylight equivalent illuminance according to CIE S 026:2018.

Ra: 91

R1: 96	R9: 50
R2: 98	R10: 73
R3: 71	R11: 90
R4: 94	R12: 78
R5: 96	R13: 95
R6: 92	R14: 80
R7: 95	R15: 97
R8: 86	

0 / 10 /  $\infty$

## Options for the MSC15:

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

*Display of the CRI's*

$E_v$ : 1467 lx

$E_s$ : 2470 lx

$E_s/E_v$ : 1.684

0 / 10 /  $\infty$

*Display of photopic and scotopic lux and their ratio.*

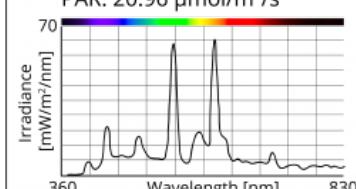
Melanopic:

$E_v$ : 738.9 lx  
 $E_{e,mel}$ : 686.3 mW/m<sup>2</sup>  
 $E_{v,mel}$ , D65: 517.5 lx

0 / 10 /  $\infty$

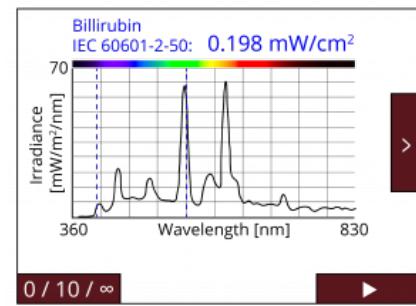
*Display of melanopic lux, etc. according to CIE S 026:2018 and Well building Standard*

PAR: 20.96  $\mu$ mol/m<sup>2</sup>/s

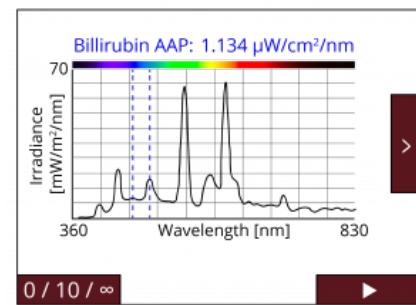


0 / 10 /  $\infty$

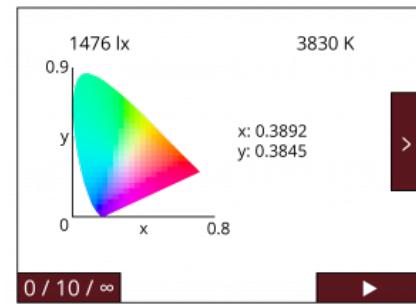
### *Display of PAR and the spectral power distribution*



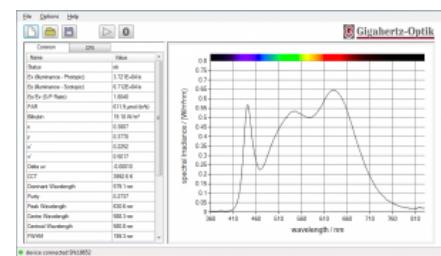
## Display of Bilirubin according IEC 60601-2-50 and the spectral power distribution



### *Display of Bilirubin according AAP and the spectral power distribution*



### *CIE 1931 view*



### *Example measurement in the*

# 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
Measurement range	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. Storage of 10 measuring points and selection of different display views is possible.  (Class B according DIN 5032-7 or AA according to JIS C 1609-1:2006)
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Measured Quantity	Illuminance photopic Illuminance scotopic Spectral Irradiance Color coordinates (x,y) CCT CRI (color rendering index) PAR- PPFD Melanopic irradiance Melanopic illuminance (equivalent melanopic lux) Melanopic daylight equivalent illuminance Total irradiance for bilirubin ( $E_{bi}$ ) Average spectral irradiance for bilirubin (AAP)
Input optics	Diffuser window with 10mm diameter, cosine corrected field of view, $f2 \leq 3\%$

## Spectral Detector

spectral range	(360 - 830) nm
Optical Bandwidth	10 nm
	optical bandwidth correction applied according to CIE 214
Measurement range typ. white LED	(1 - 350000) lx
$\Delta y \Delta x$ uncertainty	$\pm 0.002$ (Standard illuminant A)
CCT Measurement range	(1700 - 17000) K
$\Delta CCT$	$\pm 50K$ (standard illuminant type A)
	$\pm 4\%$ (depending on the LED spectrum)
Repeatability	$\pm 0.0002$
Peak wavelength	$\pm 1$ nm

## Calibration

Calibration uncertainty	Illuminance (standard illuminant A) +/- 3%
	Illuminance (typ. LED) +/- 4%
<i>(Traceable to national standard. Uncertainty of the standard is included)</i>	

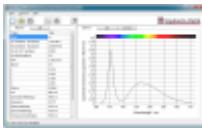
## Miscellaneous

Interface	USB 2.0
temperature range	Operation: 10°C to +30°C Storage: -10°C to +50°C
Power Supply	5VDC by USB
Power Supply	rechargeable battery 8h of operation (continuous measurement, 100% display backlight on) 13.5h of operation (one measurement, standby mode, 100% display backlight on) 30h of operation (one measurement, standby mode, reduced display backlight to 10% (sufficient for indoor lighting conditions))
Display	Color Touchscreen
Weight	160 g
Dimensions	136 mm x 74 mm x 32 mm

## Downloads

Type	Description	File-Type	Download
MSC15 Technical Datasheet	MSC15 brochure	pdf	<a href="https://www.gigahertz-optik.com/assets/Uploads/Technical-Datasheet-MSC15-210x297-EN-sheets.pdf">https://www.gigahertz-optik.com/assets/Uploads/Technical-Datasheet-MSC15-210x297-EN-sheets.pdf</a>
Brochure	Light measurement solutions for general and specialized lighting	pdf	<a href="https://www.gigahertz-optik.com/assets/Uploads/generallighting-broschuere-DINA4-hoch-v2.pdf">https://www.gigahertz-optik.com/assets/Uploads/generallighting-broschuere-DINA4-hoch-v2.pdf</a>

## Configurable with

Product Name	Product Image	Description	Show product
S-SDK-MSC15		Software Development Kit for MSC15 and CSS-45 variants.	<a href="https://www.gigahertz-optik.com/en-us/product/s-sdk-msc15">https://www.gigahertz-optik.com/en-us/product/s-sdk-msc15</a>
S-MSC15		Application software for MSC15 and CSS-45 variants.	<a href="https://www.gigahertz-optik.com/en-us/product/s-msc15">https://www.gigahertz-optik.com/en-us/product/s-msc15</a>

## Purchasing information

Article-Nr	Modell	Description
<b>Product</b>		
15298960	MSC15	MSC15 measurement device, USB cable, case for device and USB cable, S-MSC15 software as a download, calibration, Factory calibration certificate
15310290	KP-MSC15-E-S	Option: DIN EN ISO/IEC 17025:2018 Test Certificate (DAkkS)  Spectral irradiance measurement in wavelength range from 360nm to 830nm.
<b>Re-calibration</b>		
15300569	K-MSC15-I	Calibration of the MSC15 including wavelength adjustment. Factory calibration certificate
15310249	KKP-MSC15-E-S	Factory Calibration Certificate with DIN EN ISO/IEC 17025:2018 Test Certificate.
<b>Software</b>		
15306347	S-SDK-MSC15	Software development kit