

Operating instructions

LIGHTmetric ONE



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1. General information

1.1 Safety instructions

- Read these operating instructions carefully before using the appliance! Only if the safety instructions listed in these operating instructions and the generally applicable safety precautions are observed can the proper functioning of the appliance and operational safety be guaranteed.
- The appliance may only be used for its intended purpose and in compliance with the specified technical data. Any other use is not permitted for safety reasons.
- After unpacking and before each use, the appliance must be checked for mechanical damage or loose parts. If this is the case, the appliance must not be put into operation.
- The safety of the device may also be compromised if the device is not working properly
- If it can be assumed that safety is impaired, the device must be taken out of operation and labeled in such a way that it cannot be used by third parties.
- The cord can cause strangulation if used incorrectly.
- The persons responsible for carrying out the measurements and using the device are obliged to read the instructions and operation is only permitted if they have understood them. The product is intended for professional photographers. The use of the device is prohibited for children and mentally or physically impaired persons. The device contains small parts and is not suitable for children.
- The device does not protect the user from the radiation risks of the objects to be measured. Safe handling of the light source is the responsibility of the user and is described in the user manual. The measuring device does not tempt the user to come too close to the lamp or to be dazzled by it.
- The persons responsible for carrying out the measurements and using the device must be informed about the accident prevention regulations applicable in their area.
- The device must not be held under water or other liquids.
- The battery may only be replaced with original parts in accordance with the manufacturer's instructions.
- The appliance should be stored in a fireproof bag for longer periods of time.

1.2 Hazard clause

- The device does not protect the user from the radiation risks of the objects to be measured.
- Persons who are responsible for carrying out the measurements and using the device are obliged to read and observe the operating instructions before starting the measurement.
- Persons who are responsible for carrying out the measurement and using the device must be informed about the accident prevention regulations applicable in their area.
- Handling the device during measurement requires the user to be constantly focused on the device. For this reason, the device should not be used in environments where the operator of the device must be constantly aware of his surroundings, i.e. measurements while driving, in hazardous locations, in other devices such as climatic chambers, microwaves, etc. are not permitted. Also, the measurement must not be delegated to an untrained person without knowledge and understanding of these instructions. The user himself must not carry out any measurements if he has not understood these instructions. The instruction of the device operator must include this potential hazard.
- As the manufacturer of the device, Gigahertz-Optik GmbH informs the owner of the device about possible hazards when using the device by means of these operating instructions. The owner and responsible operator of the device confirm receipt and acknowledgement of this information by accepting the device and the operating instructions. The owner and the operators are aware of the care required when selecting and instructing the operators and users of this device.

1.3 Liability

- The responsibility for all consequences resulting from the operation and use of the device with accessories lies exclusively with the user or owner.
- In no event shall Gigahertz Optik GmbH or its suppliers be liable for any direct or indirect loss of business, interruption, loss of profit or loss of data. This also applies to damage caused by the operation of the product

- In general, the terms of delivery and payment of Gigahertz-Optik GmbH apply.

1.4 Safety supplements

- The device is designed for operation in a clean environment and at the operating temperatures.
- Unless explicitly stated otherwise (e.g. in the specifications), the device and accessories should not be exposed to direct sunlight or moisture.
- The device should be switched off and secured against unintentional operation by third parties if there are indicators that do not allow safe operation. Such indicators are
 - if the device is damaged
 - if the appliance has loose parts on the outside or inside
 - if the device does not work
- Safe operation of the appliance may be restricted if it is exposed to one of the following situations:
 - Long storage outdoors or in a damp environment or other unfavorable conditions
 - Excessive stress during transportation, e.g. due to improper packaging
 - Operation in difficult ambient conditions such as high temperatures, humidity, etc.
 - Operation in hazardous environments (explosive gases, vapors, dust, etc.)
- If you store the device for a longer period of time, make sure that it is not charged more than 10-20%. Never store your batteries fully charged. For longer periods of storage, we recommend charging the battery for 15 minutes every 1 to 2 months. Avoid shocks to the battery. Hard knocks can damage the cells.
- Store the battery in a fireproof container. Do not allow the batteries to overheat in the sun and never open the battery pack. Only charge them under supervision and in a dry and safe place. Do not charge the batteries before they have cooled down. Disconnect the battery from the charger when storing it. Do not leave the battery connected to the charger if it is already charged. Check the battery every few months to see if it has inflated. If this is the case, dispose of it properly immediately.



1.5 Ambient conditions

- Optical and lighting devices are sensitive to the effects of environmental conditions such as high temperature, humidity and soiling. In particular, soiling of the diffusing lens or other optical functional surfaces can lead to significant deviations in the measured values!
- The device should not be put into direct operation if it has been moved from a cold to a warm environment. Possible condensation can affect electrical and optical functions. Therefore, wait until the device temperature has adjusted to the ambient temperature.
- The appliance should not be operated in areas with high magnetic, electromagnetic and electrostatic fields.

1.6 Maintenance and cleaning

- If the product has been calibrated, we recommend that the deadlines and intervals for recurring recalibration are observed!
- The appliance may only be opened and repairs carried out by qualified personnel!
- Caution! Make sure that the appliance is switched off before cleaning it.
- The diffuser (input optics) should be cleaned carefully with an optical cleaning cloth and isopropanol PP. Before switching on the device, please wait 15 minutes to allow any residue to evaporate.
- The measuring device (with the exception of the diffuser) and the USB cable should be cleaned with commercially available, non-aggressive plastic cleaning agents.
- When cleaning the USB plug, make sure that no moisture gets into the device.
- Do not use any aggressive cleaning agents.
- The storage bag is used to protect and store the device.

1.7 Storage

See under technical data & storage.

1.8 Guarantee

- Gigahertz-Optik GmbH guarantees that the product is free from defects in material and workmanship for a period of 12 months after delivery. If a defect or manufacturing fault occurs during the warranty period, Gigahertz-Optik will repair or replace the product free of charge.
- In the event of a warranty claim, the user must send a written notification with the product name, serial number, date of purchase and description of the defect to Gigahertz-Optik GmbH and in return will receive a service number (RMA) for the return shipment.
- The user is solely responsible for the proper packaging of the product.
- Shipping by the user must be free domicile.
- The warranty does not apply to consequential damage.
- In general, the terms of delivery and payment of Gigahertz-Optik GmbH apply.

1.9 Declaration of conformity

- Gigahertz Optik GmbH hereby declares that the device complies with the EC/EU directives and the corresponding harmonized standards due to its design and construction.
- The EU Declaration of Conformity and the product safety sheet can be requested as a separate document from Support.
- The Bluetooth module has received regulatory approval for the following items: FCC ID: A8TBM70ABCDEF, IC: 12246A-BM70BLES1F2, HVIN: Bm70BLES1F2, MIC: 202-SMD069, KCC: MSIP-CRM-mcp-BM70BLES1FC2, NCC No.: CCAN15LP0501T3, SRRC: CMIIT ID: 2016DJ5729.
- All declarations lose their validity in the event of unauthorized changes and interventions.



1.10 Amendment clause

Gigahertz-Optik GmbH reserves the right to make changes to these operating instructions without prior notice.

1.11 Contact details

Gigahertz-Optik GmbH
An der Kälberweide 12
D-82299 Türkenfeld

Phone +49 (0) 8193 93700 - 0
Fax +49 (0) 8193 93700 - 50
info@gigahertz-optik.com
www.gigahertz-optik.com

1.12 Waste disposal



The product must not be disposed of with normal household waste, but must be handed in at a collection point for the recycling of electrical and electronic equipment. This means that the device must be disposed of in accordance with the WEEE Directive (2012/19/EU).

1.13 Review

- When you receive the appliance, please check the packaging for any transport damage.
- In the event of transport damage, report this to the carrier immediately.
- After unpacking, please check the delivery for any transport damage, completeness and correctness. For completeness, see scope of delivery in the next chapter.

2. General LIGHTmetric ONE

The LIGHTmetric ONE, developed, designed and produced by Gigahertz Optik GmbH, is a measuring device for spectral irradiance measurement and color evaluation. Ideal for photographers, video artists, architects and many more.

2.1 Intended use

- The LIGHTmetric ONE is used to measure spectral irradiance and color characteristics
- Falls and awkward movements should be avoided
- The device must be kept away from water, moisture and dust
- The device contains high-precision electronic circuits and optical components. Never attempt to open the device yourself as there is a risk of damaging these components.
- The description of the application software included in the scope of delivery is not part of these operating instructions. This description can be found in the software operating instructions.
- The measuring device must be recalibrated at regular intervals. We recommend an annual recalibration (12 months).

2.2 Handling

The device is a high-precision optical measuring device, which must be handled with appropriate care. Drops or rough handling can damage the sensitive optical and electronic components inside the device. Particular care must be taken when handling the input optics (diffuser or lens). If it is touched with bare fingers, it becomes dirty and this can lead to deviations in the measurement results. The diffuser is made of sensitive glass and can be damaged (chipped glass) if it is knocked against another object.

2.3 Technical data & storage

The technical data can be found on the corresponding page on the website.

Temperature range: Storage: (-10 - 50) °C

Application: (10 - 30) °C

Humidity: The device must not be exposed to high humidity. Range 20% ~ 70% RH non-condensing

Storage: The device should be stored dust-tight and preferably free from environmental influences. The temperature and humidity range should also be observed. Otherwise, major measurement deviations may occur.

2.4 Scope of delivery

The scope of delivery includes:

- 1 x LIGHTmetric ONE
- 1 x Quick start guide
- 1 x operating instructions (online)
- 1 x transport bag
- 1 x carrying strap
- 1 x USB cable
- 1 x Access data for downloading the application software
- 1 x factory calibration certificate

2.5 Product registration

The product can be registered at <https://www.gigahertz-optik.com/en-us/customer-area/login/>. This allows you to view and download calibration certificates online, make requests to recalibrate your devices or download the latest software.

3. Description of the meter



Entrance optics
Shutter / aperture (dark offset)

Touch screen

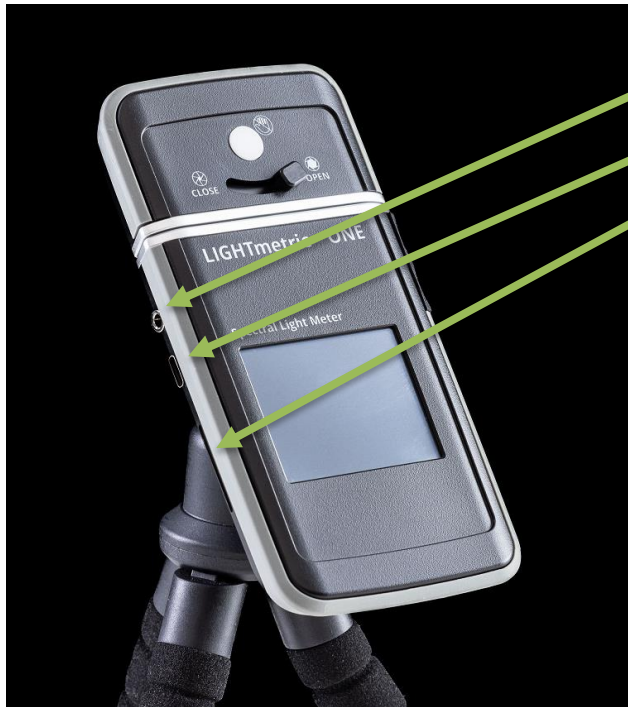
Eyelet for carrying strap



Start measurement (button 1)

Save measurement (button 2)

Tripod thread for mounting (rear)



Socket for flash synchronization

USB-C (charging, data transfer)

Socket for SD card

3.1 Power supply

The LIGHTmetric ONE can be charged via the USB-C socket as a standard USB with 5 V.

3.2 Interfaces

The LIGHTmetric ONE can be controlled via USB interface (PC) and via Bluetooth (smartphone app).

3.3 SD card

The SD card must be formatted in FAT32 format with a sector size of 512 bytes.

3.4 Software control

The LIGHTmetric ONE can be controlled using the S-LIGHTmetric. Further information on this can be found in the software manual.

3.5 Control via smartphones (app)

The LIGHTmetric ONE can be controlled via Bluetooth using a smartphone app. Further information on this can be found in the app manual.

4. Operation

4.1 Switching on and off



Switch on:

- Option 1: Press the touch display until the device switches on (approx. 2 seconds)
- Option 2: Press button 1 until the appliance switches on (approx. 2 seconds)

Switch off:

- Option 1: Press anywhere on the touch display (except buttons) until the device switches off (3 second countdown).
- Option 2 Press button 1 until the appliance goes off (3 second countdown).

4.2 General operation






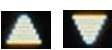




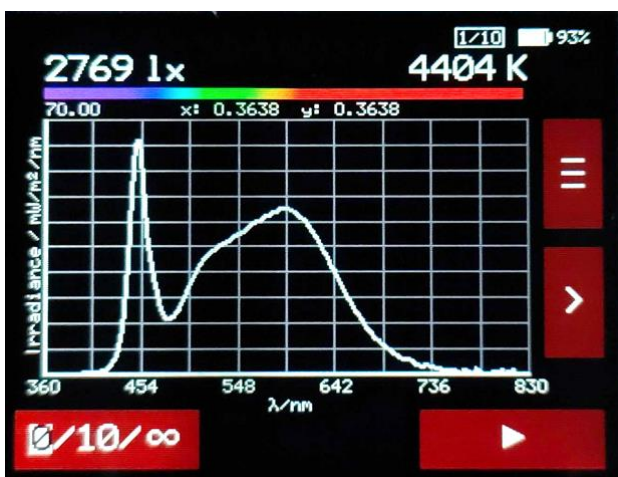
The device is controlled using the two buttons on the side and the touch display. The two buttons have the following functions:

Button 1 (top): Start measurement (press briefly), switch device on or off (press and hold)

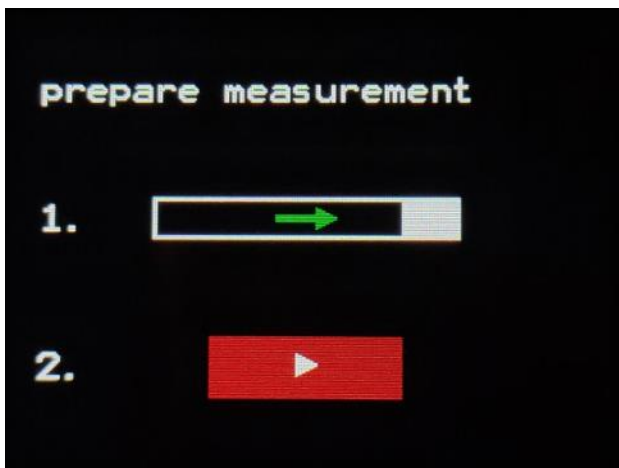
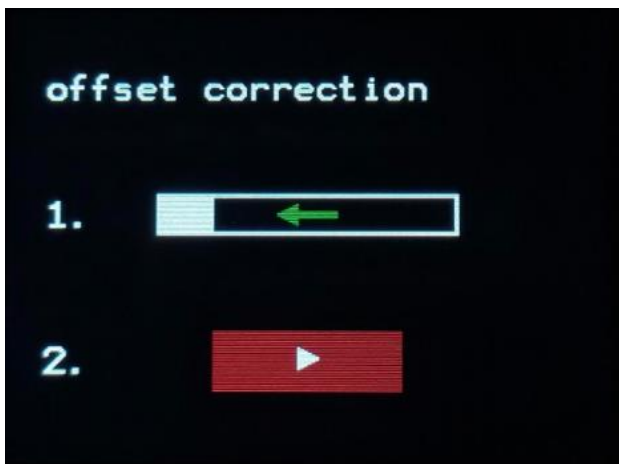
Button 2 (bottom): Save measurement

Further operation is carried out via the touch display. Areas highlighted in red serve as virtual buttons.

-  Start measurement
-  Change measuring mode
-  Open menu
-  Next display
-  Alternative display / second view
-  In the menu: Change value / selection
-  Confirm
-  Cancel



4.3 Dark adjustment



The device itself recognizes when a new offset correction (correction of the dark signal of the sensor) is necessary. This depends on various parameters (e.g. temperature change, integration time, time since last correction).

The device will display the following messages:

- "offset correction"
 - 1. an arrow to the left
 - 2. a red button with an arrow

The offset measurement can be started as follows:

- Move the slider below the input optics to the "CLOSE" position.
- Start measurement by pressing the red button.

A loading bar is then displayed. This represents the individual measurements. It is normal for the bar to move more slowly towards the end (longer exposure times).

As soon as the measurements are completed, the following message is displayed:

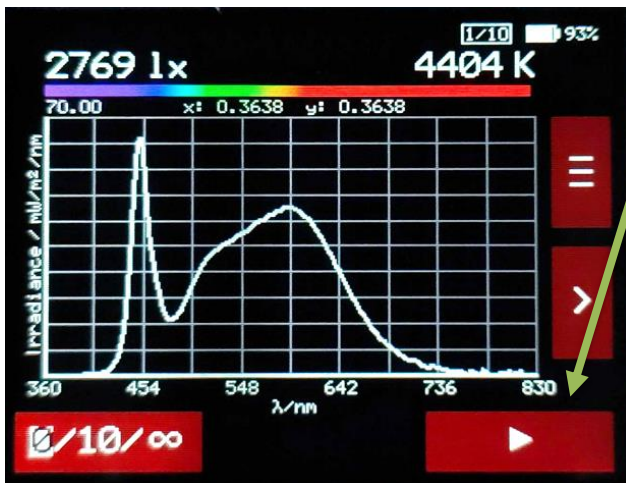
- "prepare measurement"
 - 1. an arrow to the right
 - 2. a red button with an arrow

A regular measurement can be started as follows:

- Move the slider below the input optics to the "OPEN" position
- Start measurement by pressing the red button

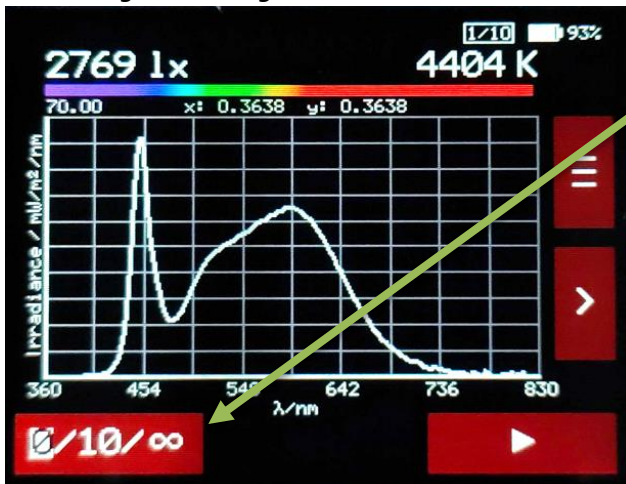
Possible error message: "error offset" see section 5.2.

4.4 Start measurement



The measurement can be started by pressing the "▶" arrow button.

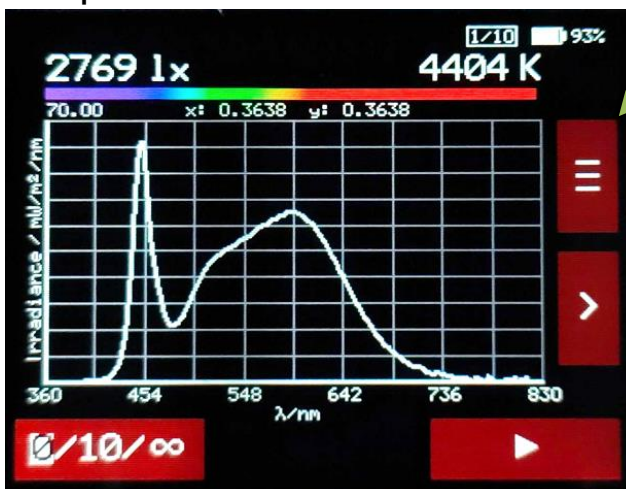
4.5 Change measuring mode



The measuring mode can be switched by pressing "0/10/∞". The character with a white background is active. The meaning of the characters is as follows:

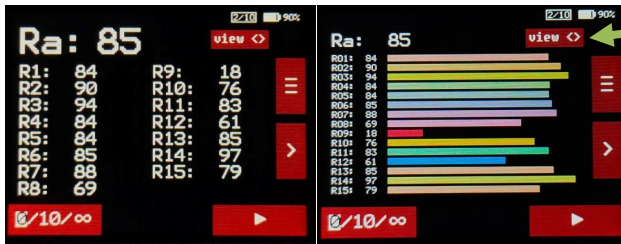
- 0: Measurement starts by pressing the arrow button (immediately)
- 10: Measurement starts 10 seconds after pressing the arrow button
- ∞: Press the arrow button to start a continuous measurement. The measurements are repeated until the pause symbol (appears instead of the arrow) is pressed.

4.6 Open menu



The menu can be opened by pressing the menu button "≡".

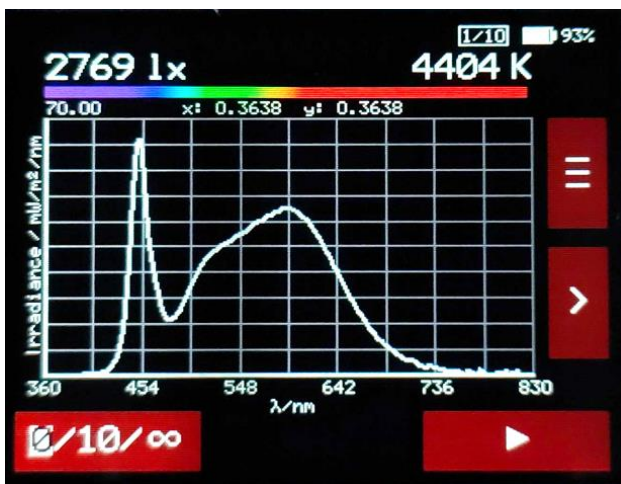
4.7 Switching the display for some displays



By pressing "view <>", the display mode of the measurement results can be switched in some displays. For example, it is possible to show the color rendering values in the CRI display as a bar chart with small numerical values or as larger numerical values without a bar chart.

4.8 Description of the displays

4.8.1 Graphic / Irradiance / CCT



This display shows the spectral irradiance as a spectrum. The illuminance, the color temperature (CCT) and the x and y color coordinates are also shown.

The wavelength in nm is plotted on the x-axis.

The minimum value of the y-axis is always 0. The maximum value of the y-axis is shown just above the axis (here: 70.00). The unit of the y-axis is shown to the left of the axis (here: mW/m²/nm)

4.8.2 CRI - Color Rendering Index (color rendering index)



This display shows the CRI values (color rendering index).

The display has two views which can be switched by pressing "view <>":

- CRI values as large numerical values
- CRI values as small numerical values and also as colored bars.



4.8.3 TM-30-18



This display shows the color rendering values Rf and Rg according to TM-30-18.

4.8.4 SSI - Spectral Similarity Index



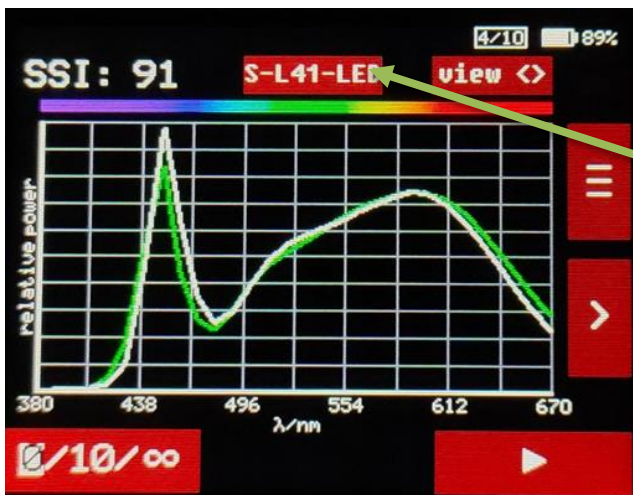
This display shows the SSI (Spectral Similarity Index)

The display has two views which can be switched by pressing "view <>".

- SSI as a numerical value
- SSI as a numerical value and additional graphic

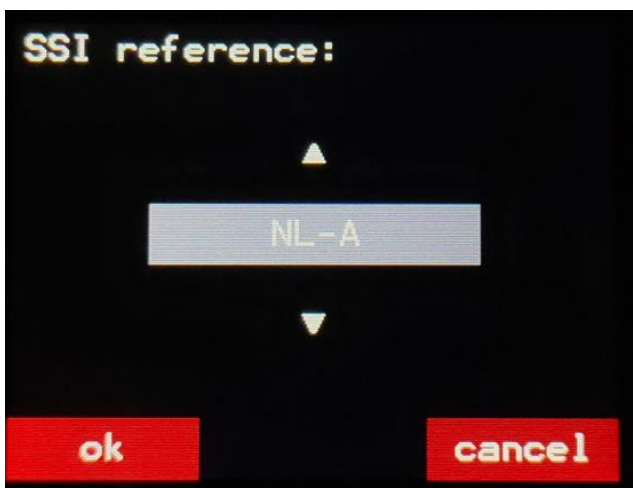
In both views, the menu for changing the reference light source can be called up by pressing on the reference light source highlighted in red.

Reference light source, pressing the red area opens the menu for setting the reference light source



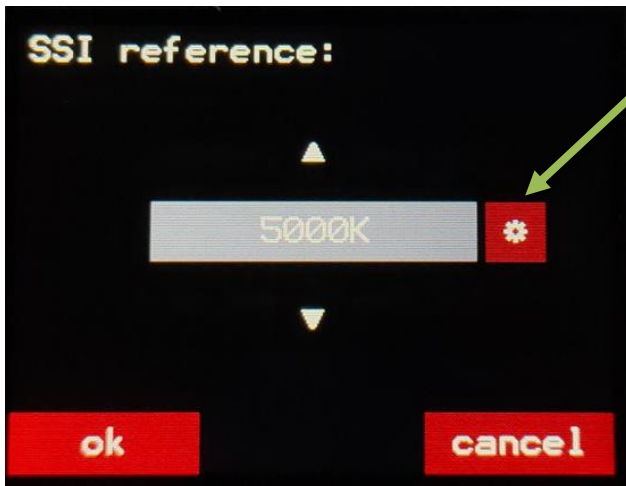
The SSI display with graphical view shows the relative spectrum of the measured light source (white) and the relative spectrum of the reference light source (green).

Reference light source, pressing the red area opens the menu for setting the reference light source

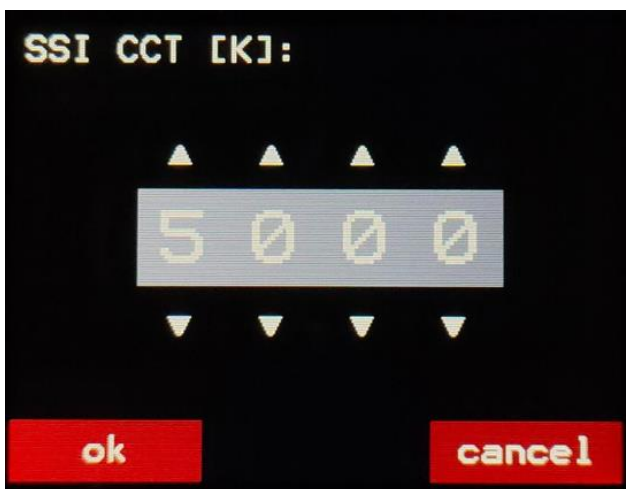


The reference light source can be selected in the menu using the arrow up "▲" and arrow down "▼" buttons. There is a choice:

- NL-A: Standard illuminant - A
- Color temperature (adjustable)
- S-L41-LED
- D65
- D55

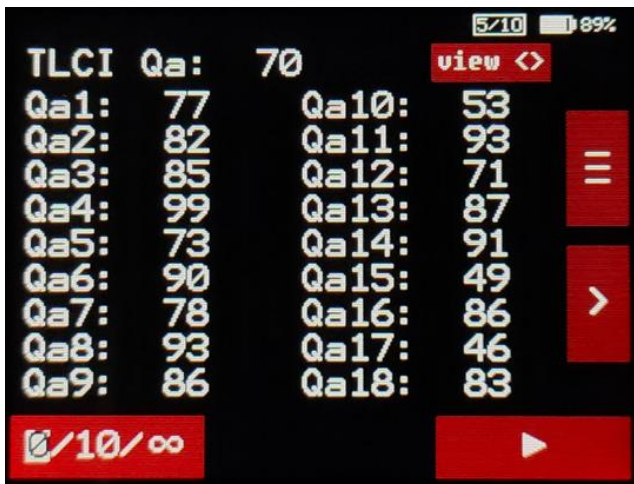


The color temperature can be changed by pressing the gear wheel symbol.



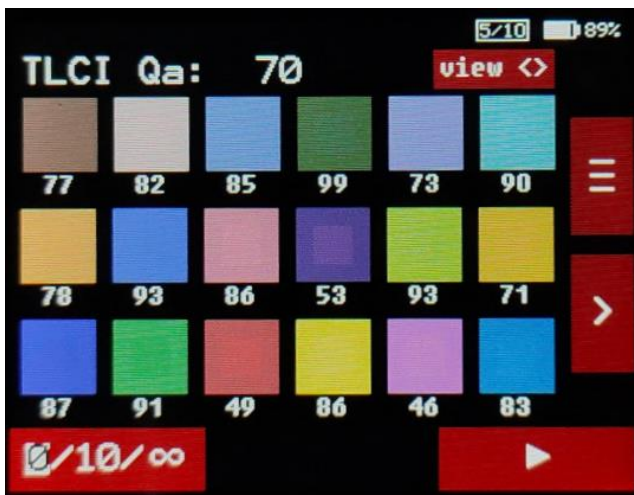
The arrow up "▲" and arrow down "▼" buttons can be used to change the numerical values of the individual digits. For example, the buttons on the far left change the 1000 digit and the buttons on the far right change the 1 digit.

4.8.5 TLCI 2012 - Television Lighting Consistency Index

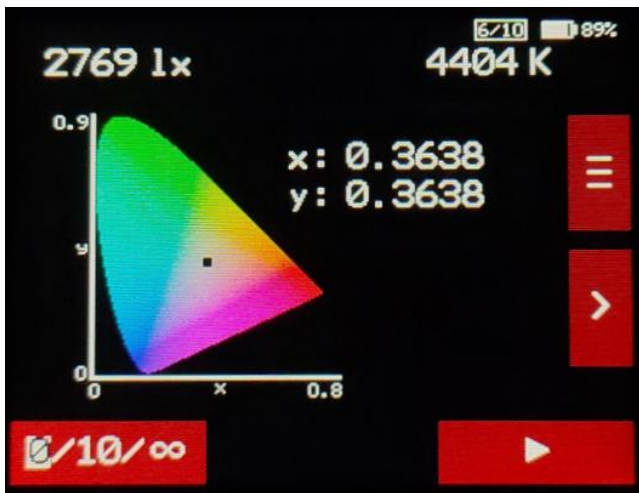


This display shows the TLCI values in accordance with TLCI 2012. The display has three views which can be switched by pressing "view <>".

- TLCI values 1 to 18 as large numerical values
- Color plates 1 to 18 with TLCI value below
- Color plates 19 to 24 with TLCI value below



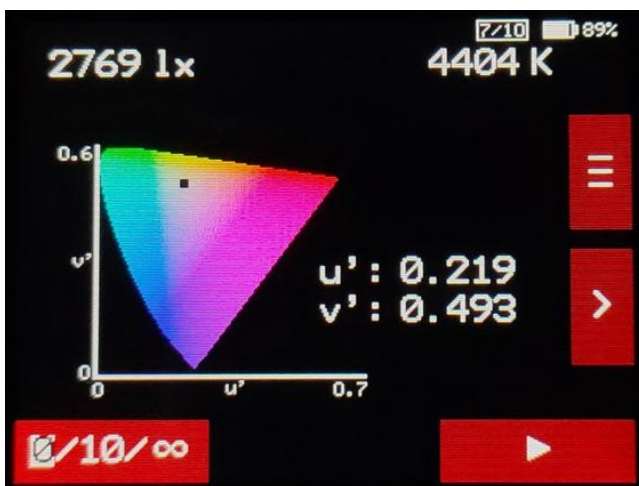
4.8.6 CIE 1931



This display shows the CIE-xy color space (CIE 1931) including the measured color coordinates (x, y).

The currently measured illuminance and the color temperature (CCT) are also displayed.

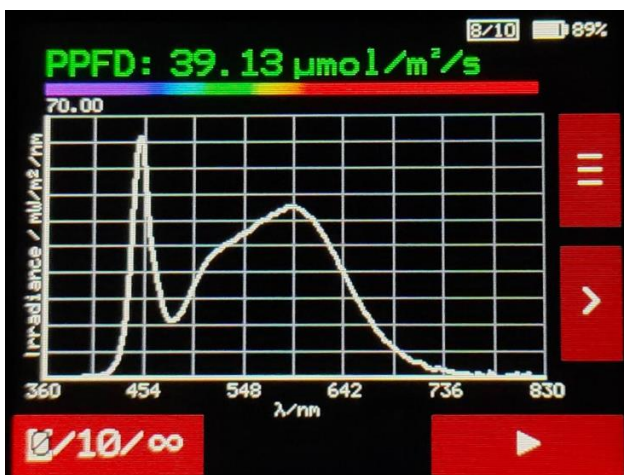
4.8.7 CIE 1976



This display shows the CIE u'v' color space (CIE 1976) including the measured color coordinates (u', v').

The currently measured illuminance and the color temperature (CCT) are also displayed.

4.8.8 PPF - Photosynthetic Photon Flux Density (Photosynthetically Active Photon Flux Density)

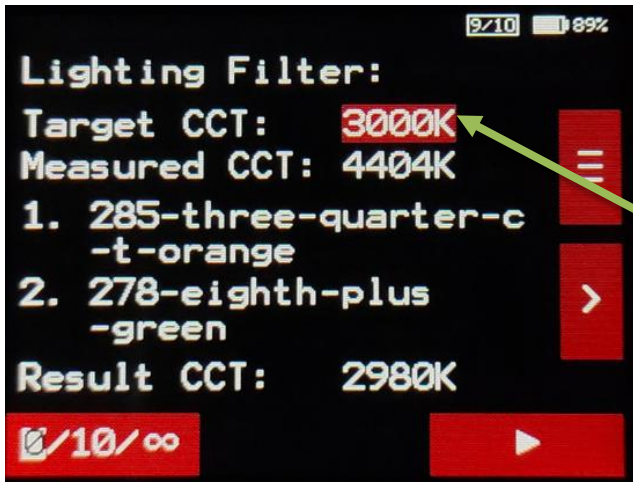


This display shows the spectral irradiance as a spectrum. In addition, the PPF value is displayed in the unit $\mu\text{mol}/\text{m}^2/\text{s}$.

The wavelength in nm is plotted on the x-axis.

The minimum value of the y-axis is always 0. The maximum value of the y-axis is shown just above the axis (here: 70.00). The unit of the y-axis is shown to the left of the axis (here: $\text{mW}/\text{m}^2/\text{nm}$)

4.8.9 Lighting Filter



In this display, lighting filters can be defined with which the current lighting can be adjusted so that the desired color temperature is achieved. A combination of up to two filters is calculated. The possible filters are listed in the appendix.

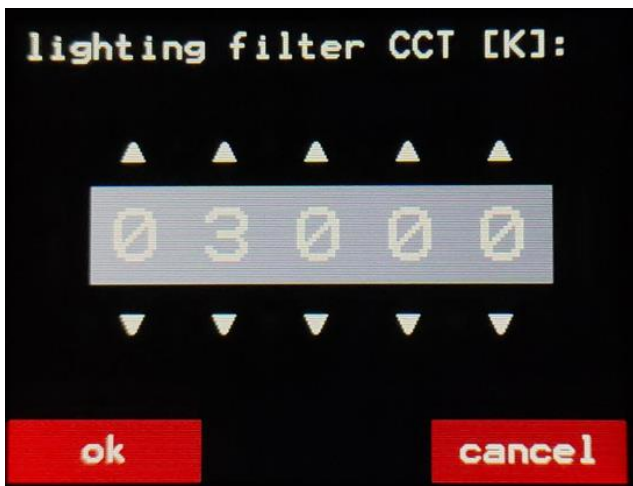
The target color temperature can be set by pressing the color temperature highlighted in red.

The measured color temperature is displayed below this.

Behind the numbers 1. and 2. are the filters which must be mounted in front of the light source to achieve the desired color temperature.

The last line shows the expected color temperature with mounted filters.

The numerical values of the individual digits can be changed using the arrow up "▲" and arrow down "▼" buttons. For example, the buttons on the far left change the 10,000 digit and the buttons on the far right change the 1 digit.



4.8.10 Melanopic



This display shows the melanopic values:

- Ev: Illuminance
- Ee,mel: Melanopic Irradiance
- Evmel,D65: Daylight Equivalent Melanopic Illuminance – Melanopic EDI

To display the measurand "Equivalent Melanopic Lux (EML)", see 4.9.13.

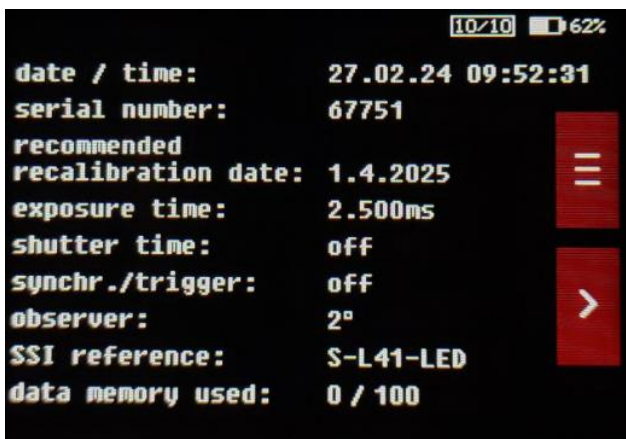
4.8.11 Circadian Light



This display shows the circadian light values:

- CL_A2.0: Circadian Light
- CS: Circadian Stimulus
- Ev: Illuminance

4.8.12 Info



This display shows general information.

4.9 Menu



The menu can be opened by pressing the menu button "≡".

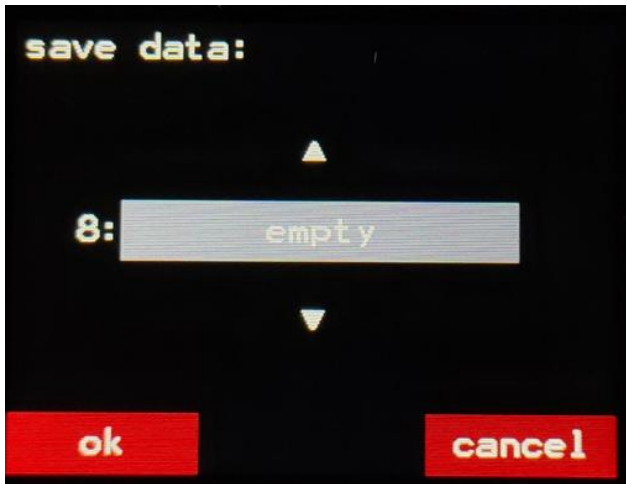


A list with buttons highlighted in red then appears. Pressing the respective button takes you to the corresponding menu.

By pressing the arrow up "▲" and arrow down "▼" buttons, further entries in the list can be displayed.

Press "cancel" to exit the menu.

4.9.1 Save data



The memory location for the measurement data can be selected and saved in this menu.

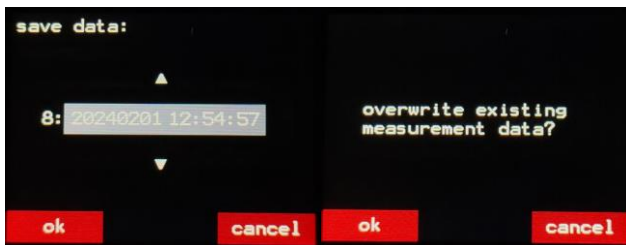
The memory location can be changed using the arrow up "▲" and arrow down "▼" buttons.

Press "ok" to save the measurement data.

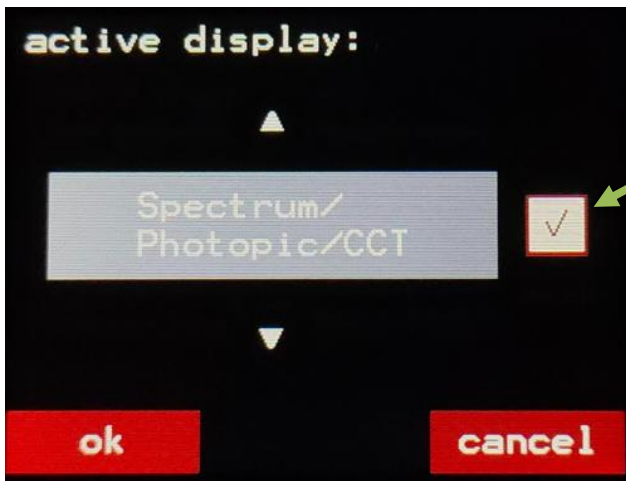
Press "cancel" to exit the menu without saving.

If an already occupied memory location is selected, there is an additional message which must be confirmed with "ok" to overwrite the measurement data.

The measurement data is saved with the date and time of the RTC in the format "YYYYMMDD hh:mm:ss".



4.9.2 Active display



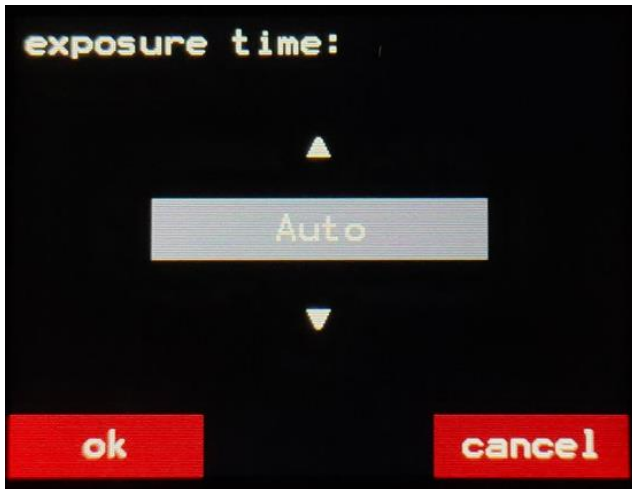
In this menu, you can select which displays are to be shown. The various displays can be shown using the arrow up "▲" and arrow down "▼" buttons.

The corresponding display can be activated or deactivated by pressing the checkbox.

The settings made are saved by pressing "ok".

Pressing "cancel" exits the menu without saving the settings.

4.9.3 Exposure time

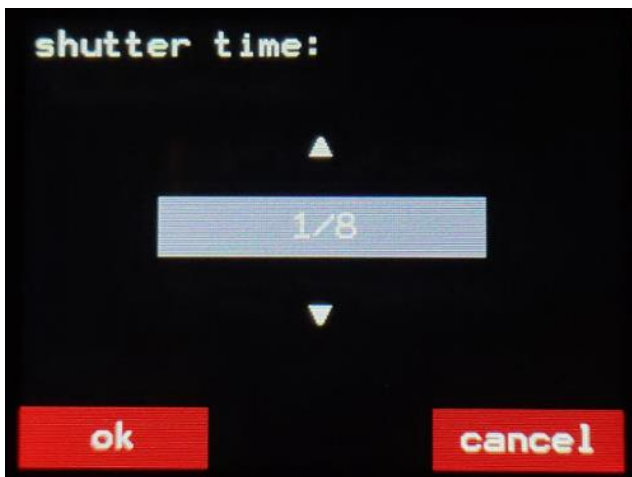


The exposure time can be set in this menu.

The default value is "Auto". With this setting, the exposure time is set automatically (recommended).

If a fixed exposure time is selected, it can happen that the signal is overdriven (overload) if the exposure time is too long or is not well balanced (poor signal-to-noise ratio) if the exposure time is too short.

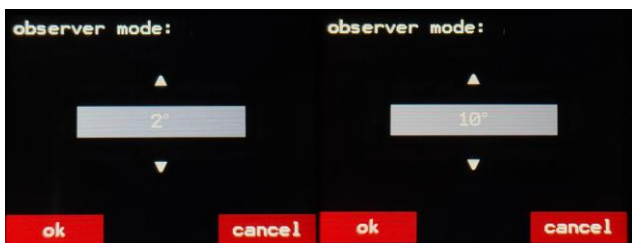
4.9.4 Shutter time



This setting can be used to adjust the total exposure time to the shutter time of the camera. If the exposure time is shorter than the set "Shutter time", the measurement is averaged until the set shutter time is reached.

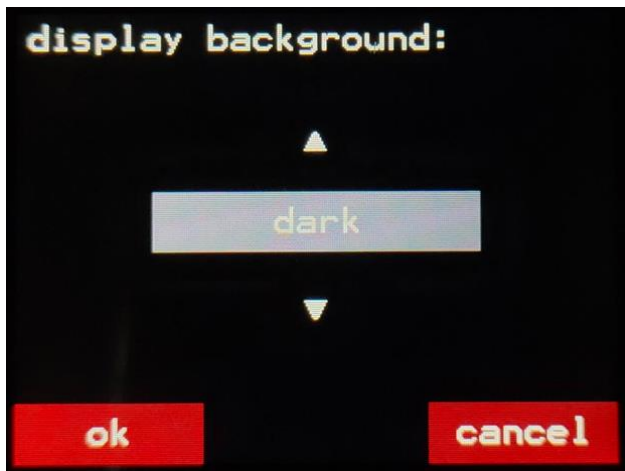
If the exposure time is greater than the set "Shutter time", only one measurement is taken.

4.9.5 Observer mode

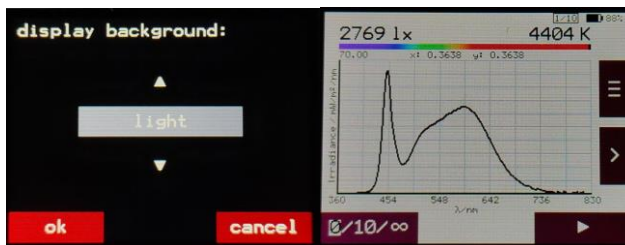


The observation angle for calculating the color coordinates of 2° or 10° can be selected in this menu.

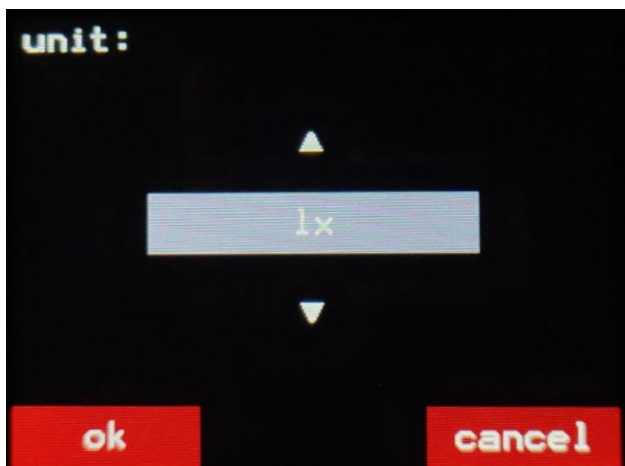
4.9.6 Display background



In this menu, you can choose between a dark and light display.



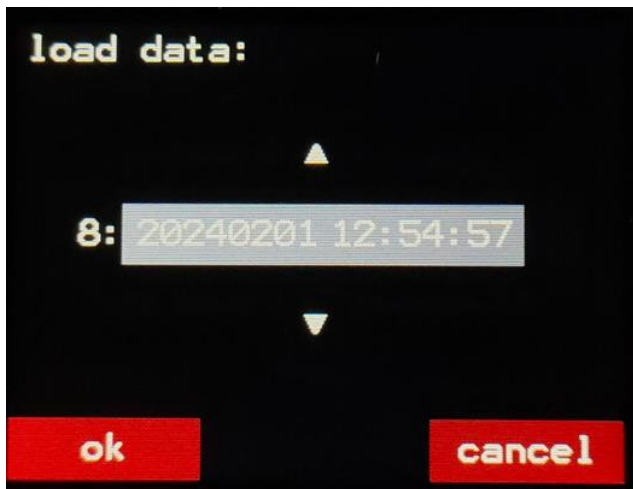
4.9.7 Unit



The unit of the illuminance display can be selected in this menu. There is a choice:

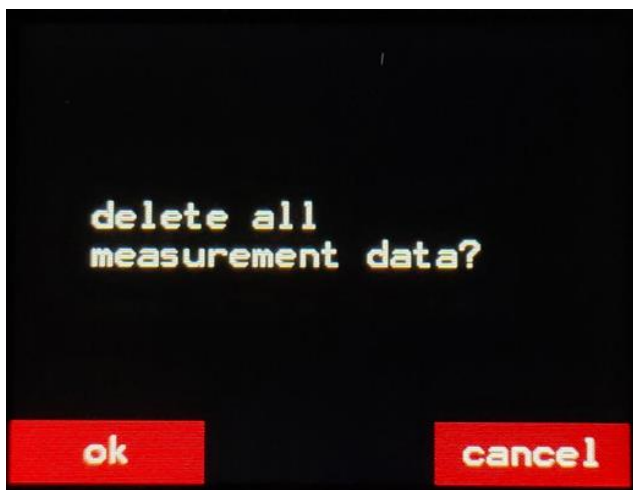
- lx (Lux)
- fc (foot-candle)

4.9.8 Load data



Previously saved measurement data can be loaded in this menu.

4.9.9 Delete data

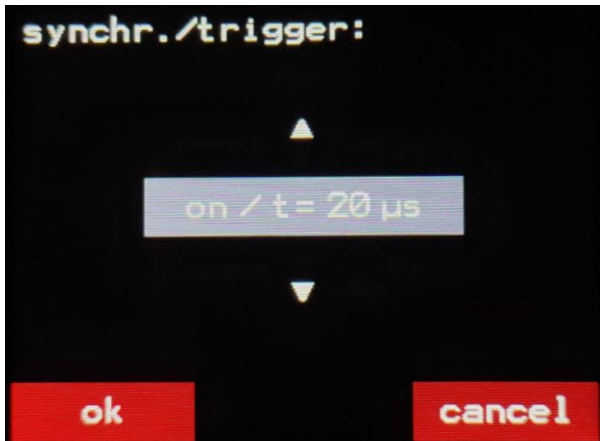


All measurement data can be deleted from the device in this menu.

Attention:

Please ensure that the required data is backed up beforehand. This process cannot be undone.

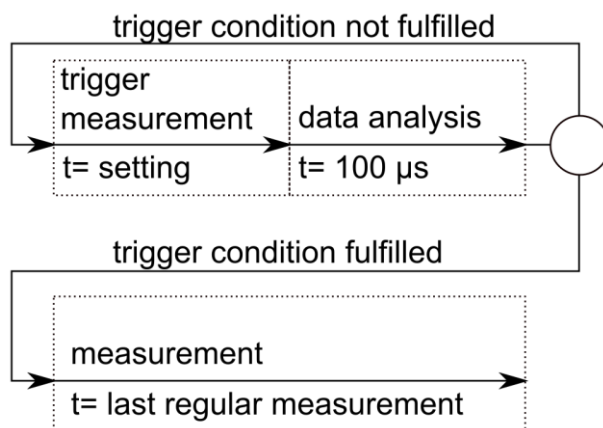
4.9.10 Synchronization / trigger



In this menu, the triggering can be switched on and off and the trigger time can be set.

The following settings are available for selection:

- off
- on / t= 20 µs
- on / t= 50 µs
- on / t= 100 µs
- on / t= 200 µs
- on / t= 500 µs
- on / t= 1 ms
- on / t= 2 ms



When the signal trigger is activated, the measuring device carries out trigger measurements and evaluations alternately. The measurement time of the trigger measurement can be set in the menu. The data evaluation takes about 100 µs. If the trigger condition is fulfilled, a regular measurement is carried out.

The trigger condition is the change in the signal for two consecutive trigger measurements. If this change is large enough, the trigger is activated.

It is recommended to start with the shortest trigger time. This offers the shortest delay but also the lowest sensitivity. If the trigger is not activated, it is recommended to gradually increase the time until the trigger starts the measurement at the desired signal.

It may be useful to use the signal trigger with a fixed exposure time (see 4.9.3). In this case, the regular measurement is carried out with the fixed time. In this case, it may be necessary to adjust the exposure time manually so that the measurement has optimal exposure time.

If the exposure time is set automatically, at first a measurement is taken with the exposure time of the last regular measurement. If an overload/underload occurs, the measurement is repeated with an adjusted exposure time. As this takes some time, the measurement may then take too long overall to carry out a measurement within one light flash.

With short flash times (shorter measuring time trigger + 100 µs + exposure time), it may make more sense to use synchronization via sync cable (see 4.10)

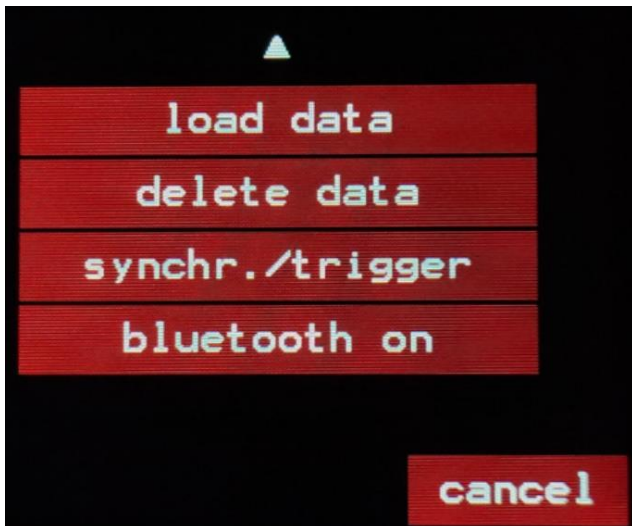
4.9.11 SD card



This menu is only active if an SD card is inserted in the SD card slot. Press the menu item "data > SD card" to transfer all data from the internal memory to the SD card.

The SD card must be formatted in FAT32 format with a sector size of 512 bytes.

4.9.12 Bluetooth

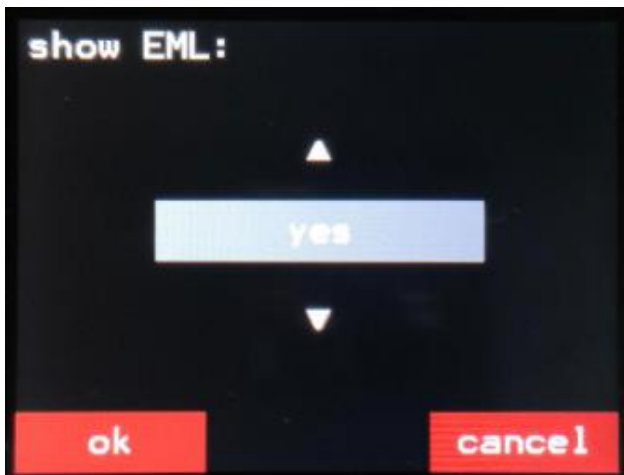


Bluetooth can be switched on or off by pressing this menu item.

If "bluetooth on" is displayed, Bluetooth is currently switched off and can be switched on by pressing the button.

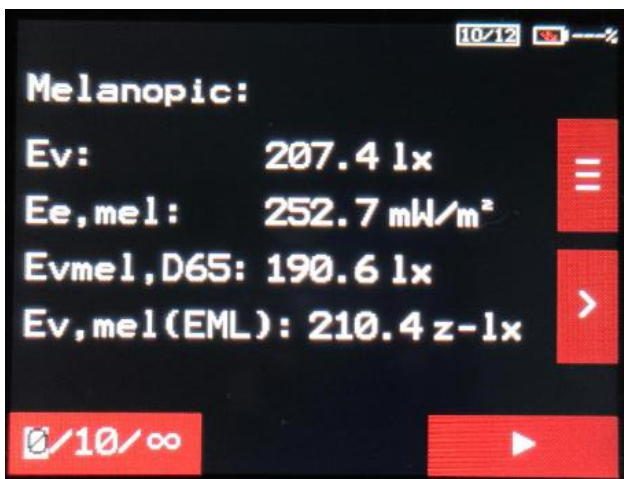
If "bluetooth off" is displayed, then Bluetooth is currently switched on and can be switched off by pressing the button.

4.9.13 Show EML



When the Melanopic display is shown, the menu item "show EML" is available in the menu.

This menu can be used to activate an additional line in the Melanopic display. This line shows the measurand "Equivalent Melanopic Lux (EML)".



4.10 Synchronization



The LIGHTmetric ONE can be connected to a camera using a standard flash sync cable. The device automatically recognizes whether the 3.5 mm jack plug has been plugged into the corresponding socket.

As soon as the flash synchronization pulse is detected via the cable, a measurement is started.

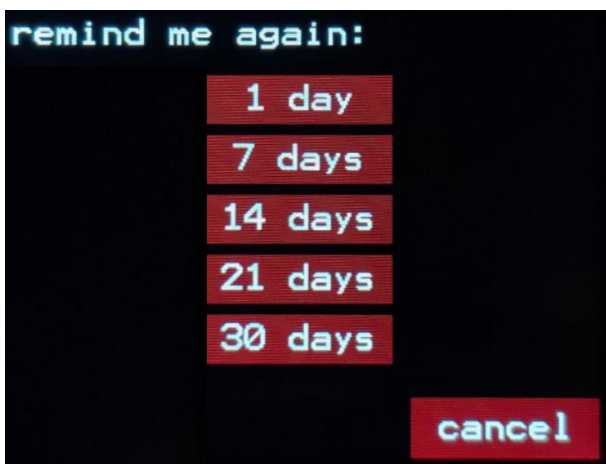
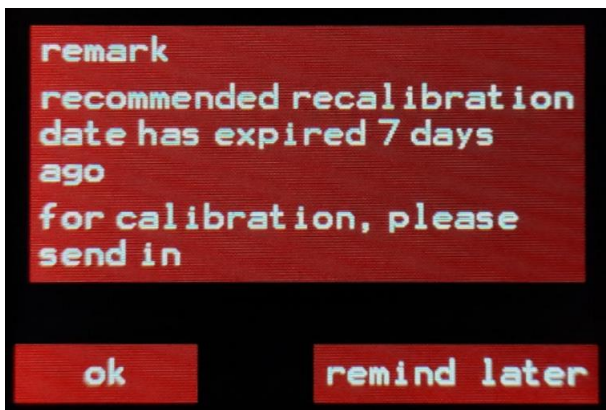
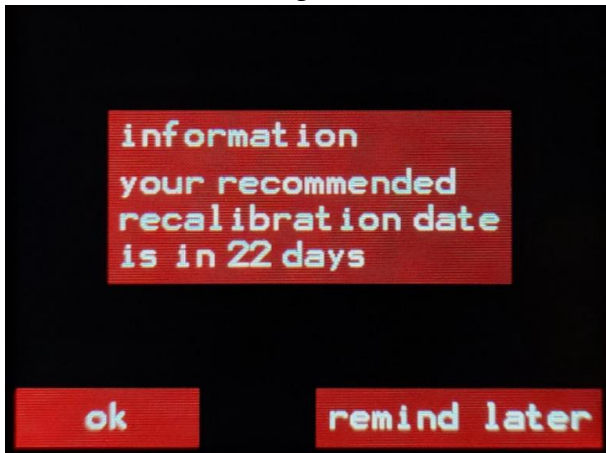
It may be useful to set the signal trigger with a fixed exposure time (see 4.9.3). In this case, the regular measurement is carried out with the fixed time. In this case, it may be necessary to adjust the exposure time manually so that the measuring device is optimally controlled.

If the exposure time is to be set automatically, a measurement is first taken with the exposure time of the last regular measurement during the regular measurement. If an overload/underload occurs, the measurement is repeated with an adjusted exposure time. As this takes some time, the measurement may then take too long overall to carry out a measurement within one light flash.



5. Warnings / error messages

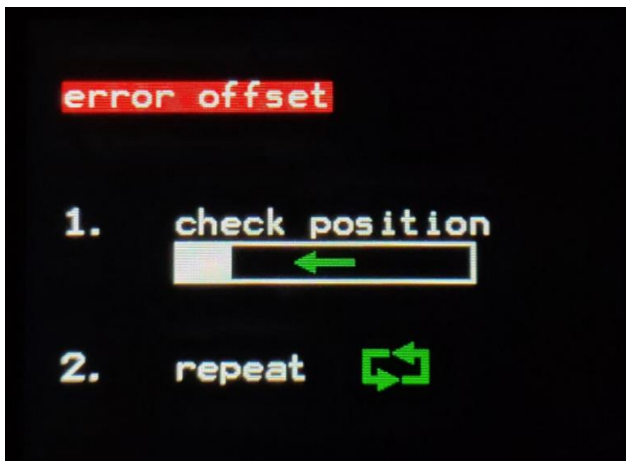
5.1 Recalibration warning



It is recommended to calibrate the device once a year. The exact date of the last calibration can be found on the calibration certificate supplied.

The device reminds the user of the recommended calibration after approx. one year. The next reminder can be postponed by up to 30 days into the future if desired ("remind later").

5.2 Error Offset



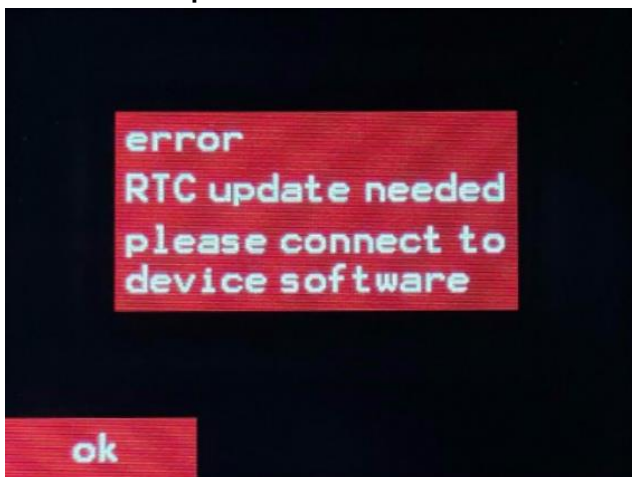
This message is displayed if the device detects during dark measurement that the slider is not fully closed (more signal than usual for dark measurement)

The message "offset correction" is then displayed again.

The error can be rectified by moving the slider to the far left position and repeating the dark measurement.

If the error still occurs, please contact support (see contact details).

5.3 Error RTC update needed



This message is displayed if the RTC (real time clock) cannot display a valid time. This may be the case, for example, if the device's battery has been completely discharged.

Solution:

1. Connect the device to the PC via USB and set the RTC using the software (see software manual).
2. Fully charge the device.

6. Miscellaneous

6.1 Calibration

The calibration of the measuring device is confirmed by the calibration certificate supplied. Gigahertz-Optik GmbH recommends its customers to have the measuring device calibrated annually.

6.2 Cleaning

Caution: Only clean the appliance when it is switched off.

Clean the lens, if present:

First clean the diffusing screens with an Edding R20 eraser. Then clean with grease-free absorbent cotton (e.g. absorbent cotton on a toothpick) soaked in a warm detergent solution consisting of pH-neutral detergent and distilled water in a ratio of approx. 1:500. Then wipe with new grease-free absorbent cotton and distilled water. Finally, dry with new grease-free absorbent cotton. Do not use cotton buds (e.g. Q-tips) as these may contain grease. Very heavy soiling such as paint, mortar etc. must be removed immediately with a clean cloth. Avoid scratching the spreading surfaces. Then clean the spreading disks as described above, starting with the eraser method, followed by the three steps with grease-free absorbent cotton. In laboratory environments, the diffusion disks can alternatively be carefully cleaned with an optical cleaning cloth and isopropanol if they are not very dirty. In the case of heavy soiling, a new calibration is recommended afterwards. Large measurement deviations are to be expected, particularly in the UV spectral range.

Cleaning of other components:

Commercially available, non-aggressive plastic cleaners are recommended for cleaning the measuring device, the USB cable, the plug-in power supply unit and the hard case. Ensure that no moisture penetrates the device in the area of the USB socket.

6.3 Possible causes of errors

- A highly conspicuous measurement deviation is detected compared to a previous measured value determination.
 - > Check spreading disk for soiling
 - > Switch off the device, switch it on again and repeat the measurement

If the error persists, please contact Gigahertz-Optik GmbH support. Alternatively, please send the device with accessories to Gigahertz-Optik GmbH for inspection.

- The meter does not switch on
 - > Mains adapter operation: check the correct connection and the correct mains voltage
 - > PC operation: check the correct connection, check PC settings with regard to USB power supply

If the error persists, please contact Gigahertz-Optik GmbH support. Alternatively, please send the device with accessories to Gigahertz-Optik GmbH for inspection.

- No measurement signal is displayed
 - > Check the meter settings and repeat the measurement

If the error persists, please contact Gigahertz-Optik GmbH support. Alternatively, please send the device with accessories to Gigahertz-Optik GmbH for inspection.

6.4 Service address

See contact details.

6.5 Further information

Further information about the product, technical articles, tutorial area, news about Gigahertz-Optik GmbH and other products, accessories and services can be found at:

www.gigahertz-optik.de

7. Appendix

7.1 Filter types for lighting filters

The following filter types are currently implemented for optimizing the colour temperature. In principle, further filter types can be implemented. If required, please contact Gigahertz-Optik (see contact details).

LEE lighting filter			
Filter number	Filter name (short)	Filter name (long)	CCT adjustment
L218	1/8 CTB	eighth-c-t-blue	3200 K - 3400 K
L203	1/4 CTB	quarter-c-t-blue	3200 K - 3600 K
L202	1/2 CTB	half-c-t-blue	3200 K - 4300 K
L281	3/4 CTB	three-quarter-c-t-blue	3200 K - 5000 K
L201	1 CTB	full-c-t-blue	3200 K - 5700 K
L283	1.5 CTB	one-and-a-half-c-t-blue	3200 K - 8888 K
L200	2 CTB	double-c-t-blue	3200 K - 26000 K
L223	1/8 CTO	eighth-c-t-orange	6500 K - 5550 K
L206	1/4 CTO	quarter-c-t-orange	6500 K - 4600 K
L205	1/2 CTO	half-c-t-orange	6500 K - 3800 K
L285	3/4 CTO	three-quarter-c-t-orange	6500 K - 3600 K
L204	1 CTO	full-c-t-orange	6500 K - 3200 K
L286	1.5 CTO	one-and-a-half-c-t-orange	6500 K - 2507 K
L287	2 CTO	double-c-t-orange	6500 K - 2147 K
L278	1/8 PLUS G	eighth-plus-green	
L246	1/4 PLUS G	quarter-plus-green	
L245	1/2 PLUS G	half-plus-green	
L244	PLUS G	lee-plus-green	
L279	1/8 MINUS G	eighth-minus-green	
L249	1/4 MINUS G	quarter-minus-green	
L248	1/2 MINUS G	half-minus-green	
L247	MINUS G	lee-minus-green	