UV Radiometers

- Radiometric measurements of UV radiation
- Easy-to-use Android applications - mobile phone based
- Exposure limits for UVC radiation
- Calibrated UV sensor probes
- Certified calibration laboratory at sglux

sglux
The UV Experts

BostonElectronics

www.boselec.com | shop.boselec.com | boselec@boselec.com | 617.566.3821

Ultraviolet (UV) Radiometers

Catalog

INTRODUCTION

A UV radiometer is needed for quantification and documentation of the impact of UV radiation on biological or chemical processes, as well as the UV effect on the health of human beings, animals, plants or material properties (i.e. occupational and environmental impacts).

The features of a UV radiometer of choice will depend on the individual customer's requirements or a standard/ guideline. The following UV radiometers are available for different purposes, viz. for validation of DVGW/ÖNORM duty sensors (DVGW W 294-3:2006 / ÖNORM M 5873); for UV hazard assessment in workplaces (2006/25/EC); and for the measurement of the UV Index (ISO 17166). The last category refers to UV radiometers that are configured and calibrated according to the customer's requirements and UV datalogger for long-term UV dosimetry.

We produce radiometers with "classical" appearance consisting of a handheld device and a UV sensor. Alternatively, our digital UV sensor can be connected to a Smartphone (Android) using an Android radiometer / dosimeter app.

The core components of a UV radiometer or datalogger are the UV sensor and the sensor's calibration. sglux is strictly committed to uncompromising quality, reliability and accuracy of the UV sensor and its calibration. Our quality management is DIN/ISO 9001 certified. Our well-equipped calibration laboratory works in close cooperation with governmental metrology authorities. Please find collaborative publications here (LINK). The calibration is PTB (Physikalisch-Technische Bundesanstalt, German National Metrology Institute) traceable, and works according to guideline DAkkS-DKD-MB-3 and the technical report CIE 220:2016.

Ultraviolet (UV) Radiometers

Catalog

REFERENCE RADIOMETERS FOR UV PURIFIER SENSOR VALIDATION

Reference radiometers are used to validate the calibration of UV duty sensors used in UV water purifiers.

UV purifiers use UV light to inactivate bacteria. These purifiers use UV duty sensors to control the UV light emission of the source (e.g. a low pressure UVC tube) and, eventually, to detect a fouling effect of UV transparent glass components of the purifier.

If a UV purifier is designed and operated according to the guidelines DVGW W 294-3:2006 or ÖNORM M 5873, the UV duty sensor needs (according to chapter 8.2 of the guidelines DVGW W 294-3:2006) a recalibration after 10,000 hours of operation or after two years of use. This recalibration is usually organized by the purifier's manufacturer.

The owners of purifiers need to regularly validate the duty sensor using a reference radiometer (designed according to guideline DVGW W 294-3:2006). This is done by replacing the duty sensor with the reference radiometer sensor, and comparison of the values. If these values deviate by more than 5 % the duty sensor needs to be recalibrated or replaced.

The sglux reference radiometers listed below are used for this purpose. We calibrate the reference radiometers using the world's first traceable calibration standard for high irradiation levels, in particular for UV water purification duty sensor calibration. sglux developed this standard in the years 2010 to 2012, in collaboration with the German PTB.

Please refer to our website (www.sglux.com) for datasheet download and price information of the products listed below.

Ultraviolet (UV) Radiometers

Catalog

UVRRM ÖNORM

Reference Radiometer for validation of ÖNORM/DVGW-160° duty sensors according to ÖNORM M 5873. The unit is powered by a 9 V battery that allows several years of use if infrequently used. The radiometer price includes a PTB traceable calibration.

UVRRM DVGW

Reference Radiometer for validation of DVGW-40° duty sensors according to DVGW W 294-3:2006. The unit is powered by a 9 V battery that allows several years of use if infrequently used. The radiometer price includes a PTB traceable calibration.

UVRRM DVGW 40° + ÖNORM 160°

Reference Radiometer with two sensors for validation of DVGW-40° and ÖNORM-160° duty sensors according to DVGW W 294-3:2006 and ÖNORM M 5873. The unit is powered by a 9 V battery that allows several years of use if infrequently used. The radiometer price includes a PTB traceable calibration.

AQUATOUCH

Reference Radiometer with two sensors for validation of DVGW-40° and ÖNORM-160° duty sensors according to DVGW W 294-3:2006 and ÖNORM M 5873. The AQUATOUCH device is designed for developers and for all-day use under harsh conditions. It offers a broad range of functions such as a datalogger, data export and graphic display with trend information. The radiometer price includes a PTB traceable calibration.

sg*LUX* GmbH |Richard-Willstätter-Str. 8 | D–12489 Berlin | Tel. +49 30 5301 5211 | welcome@sglux.de | www.sglux.de

Ultraviolet (UV) Radiometers

Catalog

UV RADIOMETERS FOR UV HAZARD ASSESSMENT IN WORKPLACES

The radiometers are used for hazard assessment of artificial UV radiation in workplaces.

If a workplace in the European Union is suspected to be exposed to artificial UV radiation, a UV hazard assessment according to guideline 2006/25/EC needs to be done. This method ensures that the maximum dose of 30 J/m²/day (as defined by this guideline) will not be exceeded. Basically, the guideline stipulates that artificial UV radiation needs to be avoided as much as possible.

Harmful UV radiation needs to be suspected in companies that use or maintain UV polymerisation machines for lacquer or print hardening, or companies where UV radiation is used to disinfect air or liquids (e.g. hospitals, canteen kitchens or laundries).

The mandatory hazard assessment needs a suitable radiometer such as the sglux Safester UVC. These radiometers need a spectral responsivity according to Table 1.2 of the guideline 2006/25/EC and a calibration on the UV source used. The Safester UVC complies with class 1 (highest precision requirements) of DIN/ISO 5051-11 for actinic radiometers.

For a correct understanding of the measurement value obtained by such a radiometer, it is adequate to divide the exposure limit of 30 J/m²/day by the actual value and subsequently calculate the maximum exposure time. However, this procedure is quite impractical and prone to errors.

The special feature of the sglux Safester UVC is not just to display the measurement value, but also to calculate the maximum exposure time and to display this information using graphic symbols which are easy to understand. Based on this information, it is possible to generate actions to eliminate the harmful radiation. If this is not possible, e.g. during machine maintenance, suitable guidelines for skin and eye protection need to be developed, communicated and implemented.

Please refer to our website (www.sglux.com) for datasheet download and pricing information of the products listed below.

SAFESTER UVC

Radiometers for hazard assessment of artificial UV radiation emitted by low pressure UVC sources in workplaces, according to European Union guideline 2006/25/EC, visualization of the maximum exposure time per day, with acoustical and optical warning features.
The radiometers comply with class 1 (highest precision requirements) of DIN 5031-11 for actinic radiometers. The price includes the following:

- a UV sensor with PTB traceable calibration
- a calibration certificate and,
- a Smartphone.

The Safester UVC is also available without the Smartphone as a software download.

Ultraviolet (UV) Radiometers

Catalog

MEASUREMENT OF THE SOLAR UV INDEX ACCORDING TO ISO 17166

The radiometers are used to measure the UV Index according to the ISO 17166 standard.

The UV Index quantifies the risk of sunburn at a given exposure to solar radiation. The ISO 17166 standard defines the scientific background and the requirements for UV Index radiometers. The sglux UV Index radiometers are renowned worldwide for their high precision (= lowest measurement uncertainty) and are used by governmental institutions that use the obtained value to carry out their duty of informing the respective populations about the UV Index.

The Safester UVI radiometer is used by persons that need to pay special attention to solar UV radiation, in particular persons suffering from lupus erythematosus or xeroderma pigmentosum, or persons with increased risk of developing skin cancer. Another group of users are persons that by medical prescription and therapeutic purposes need to be exposed to UV radiation, such as psoriasis patients. Another important application of the Safester UVI is the documentation of the UV Index while investigating the impact of solar UV on plants or animals.

A UV Index radiometer should not be used for lifestyle reasons, e.g. to monitor solar UV exposure during sunbathing or outdoor activities. Even though sglux radiometers are extremely precise measuring instruments, the measured value can never replace the common sense together with daily local UVI forecast that should remind us to enjoy exposure to solar UV only in moderation.

Please refer to our website (www.sglux.com) for datasheet download and price information of the products listed below.

UV INDEX REFERENCE RADIOMETER (SMARTPHONE BASED)

Digital Smartphone (Android) based UV Index radiometer with graphic display for hazard assessment of natural UV radiation in workplaces according to the ISO 17166 standard (UV Index). The price includes a UV sensor with PTB traceable calibration, a calibration certificate and a Smartphone. The radiometer is also available without a Smartphone and a software download.

UV INDEX REFERENCE RADIOMETER (CLASSICAL DESIGN)

Digital UV Index radiometer with graphic display for hazard assessment of natural UV radiation in workplaces according to the ISO 17166 standard (UV Index). This device is designed for developers and for all-day use under harsh conditions. It offers a broad range of functions such as a datalogger, data export and graphic display with trend information. The price includes a UV sensor with PTB traceable calibration, and a calibration certificate.

Ultraviolet (UV) Radiometers

Catalog

OTHER UV RADIOMETERS AND UV DATALOGGERS

The radiometers are used to measure UV radiation of various processes conforming to various standards.

Industrial, medical or scientific processes use UV radiation to influence or modify the properties of materials or tissues. Usually this UV radiation needs to be quantified to guarantee the process reproducibility. Every process is distinct, with regard to the type of UV radiation and its intensity. A standard UV radiometer cannot be used; an individual calibration and a customized configuration are required instead. Furthermore, some applications require that the sensor device have a specific geometry, e.g. a side-looking sensor. sglux provides a customization service which are applicable to the radiometers listed below.

Please refer to our website (www.sglux.com) for datasheet download and price information of the products listed below.

UVTOUCH

Digital 2-channel UV radiometer with graphic display, touch screen, dosimeter and datalogging function. Data transmission (CAN) complies with GLP and LIMS standards. The UVTOUCH device is designed for developers and for all-day use under harsh conditions. The price includes one sglux UV sensor (free selection from the sglux line) and a customized PTB traceable calibration.

UV RADIOMETER SXL 55

Digital Smartphone (Android) based UV radiometer with graphic display and dosimeter function. Data transmission (CAN) complies with GLP and LIMS standards. The price includes one sglux UV sensor (free selection from the sglux line) and a customized PTB traceable calibration.

UVMICROLOG

Rugged UV datalogger for long-term monitoring of moving goods, persons or animals. It includes one customized UV sensor (broadband UV, UVA, UVB, UVC, erythema or v(lambda)) with PTB traceable calibration. Additional sensors for temperature, pressure, relative humidity, and illuminance (VIS) are available. The UVMicrolog stores up to 2,000,000 data records and is also available in an IP67 waterproof version.

UVMINILOG

Rugged UV datalogger for long-term monitoring of moving goods, persons or animals. It includes one or two customized UV sensors (broadband UV, UVA, UVB, UVC, erythema or v(lambda)) with PTB traceable calibration. Additional sensors for temperature, pressure, relative humidity, and illuminance (VIS) are available. The UVMinilog stores up to 2,000,000 data records. The battery lifetime is up to 18 months of permanent logging without re-charging of the battery.

Ultraviolet (UV) Radiometers

Catalog

LIST OF PUBLICATIONS

P. Sperfeld[1], B. Barton[1], S. Pape[1], A. Towara[1], J. Eggers[2], G. Hopfenmueller[3]
[1]Physikalisch-Technische Bundesanstalt Braunschweig und Berlin (PTB), Germany, [2]DVGW-Technologiezentrum Wasser, Karlsruhe, Germany, [3]sglux GmbH, Berlin, Germany
„Spectral irradiance measurement and actinic radiometer calibration for UV water disinfection“
Metrologia, Issue 51 (2014), *p. 282-288.*

P. Sperfeld[1], B. Barton[1], S. Pape[1], A. Towara[1], J. Eggers[2], G. Hopfenmueller[3]
[1]Physikalisch-Technische Bundesanstalt Braunschweig and Berlin (PTB), Germany, [2]DVGW-Technologiezentrum Wasser, Karlsruhe, Germany, [3]sglux GmbH, Berlin, Germany
„Spectral Irradiance Measurement and Actinic Radiometer Calibration for UV Water Disinfection“
Proceedings of NEWRAD 2014, edited by S. Park, P. Kaerhae and E. Ikonen. (Aalto University, Espoo, Finland 2014) *P. 128.*

B. Barton[1], P. Sperfeld[1], A. Towara[1], G. Hopfenmueller[2]
[1]Physikalisch-Technische Bundesanstalt Braunschweig und Berlin (PTB), 4.1 Photometry and Applied Radiometry, Braunschweig, Germany, [2]sglux GmbH, Berlin, Germany
„Developing and setting up a calibration facility for UV sensors at high irradiance rates“
EMEA Regional Conference, Karlsruhe, Germany (2013)

P. Sperfeld[1], B. Barton[1], S. Pape[1], G. Hopfenmueller[2]
[1]Physikalisch-Technische Bundesanstalt Braunschweig und Berlin (PTB), 4.1 Photometry and Applied Radiometry, Braunschweig, Germany, [2]sglux GmbH, Berlin, Germany
„Traceable spectral irradiance measurements at UV water disinfection facilities“
EMEA Regional Conference, Karlsruhe, Germany (2013)

G. Hopfenmueller[1], T.Weiss[1], B. Barton[2], P. Sperfeld[2], S. Nowy[2], S. Pape[2], D. Friedrich[2], S. Winter[2], A. Towara[2], A. Hoepe[2], S. Teichert[2]
[1]sglux GmbH, Berlin, Germany, [2]Physikalisch-Technische Bundesanstalt Braunschweig und Berlin (PTB), 4.1 Photometry and Applied Radiometry, Braunschweig, Germany
„PTB traceable calibrated reference UV radiometer for measurements at high irradiance medium pressure mercury discharge lamps“
EMEA Regional Conference, Karlsruhe, Germany (2013)

D. Prasai[1], W. John[1], L. Weixelbaum[1], O. Krueger[1] G. Wagner[2], P. Sperfeld[3], S. Nowy[3], D. Friedrich[3], S. Winter[3] and T. Weiss[4]
[1]Ferdinand-Braun-Institut, Leibniz-Institut fuer Hoechstfrequenztechnik, Berlin, Germany, [2]Leibniz-Institut fuer Kristallzuechtung, Berlin, Germany, [3]Physikalisch-Technische Bundesanstalt Braunschweig und Berlin (PTB), 4.1 Photometry and Applied Radiometry, Braunschweig, Germany, [4]sglux GmbH, Berlin, Germany
„Highly reliable silicon carbide photodiodes for visible-blind ultraviolet detector applications“
J. Mater. Res., first view (2012)

S. Nowy[1], B. Barton[1], S. Pape[1], P. Sperfeld[1], D. Friedrich[1], S. Winter[1], G. Hopfenmueller[2], and T. Weiss[2]
[1]Physikalisch-Technische Bundesanstalt Braunschweig und Berlin (PTB), 4.1 Photometry and Applied Radiometry, Braunschweig, Germany, [2]sglux GmbH, Berlin, Germany
„Characterization of SiC photodiodes for high irradiance UV radiometers“
Proceedings of NEWRAD2011, edited by S. Park and E. Ikonen. (Aalto University, Espoo, Finland, 2011) *P. 203.*

B. Barton[1], P. Sperfeld[1], S. Nowy[1], A. Towara[1], A. Hoepe[1], S. Teichert[1], G. Hopfenmueller[2], M. Baer[3], and T. Kreuzberger[3]
[1]Physikalisch-Technische Bundesanstalt Braunschweig und Berlin (PTB), 4.1 Photometry and Applied Radiometry, Braunschweig, Germany, [2]sglux GmbH, Berlin, Germany, [3]SGIL Silicaglas GmbH, Langewiesen, Germany
„Characterization of new optical diffusers used in high irradiance UV radiometers“
Proceedings of NEWRAD2011, edited by S. Park and E. Ikonen. (Aalto University, Espoo, Finland, 2011) p. 278.1.

UV Radiometer SXL 55

Measuring device for determining the UV irradiance

GENERAL FEATURES

Properties of the UV Radiometers SXL 55

The UV Radiometer SXL55 is an instrument for diverse applications in UV detection. It consists of a calibrated SiC UV sensor probe and an Android smartphone which serves as a display unit.

Besides the UV-Surface housing various sglux sensors are available upon request. Those types of sensors are listed in our product catalog UV Sensor Probes in the Android USB output category. This flexible configuration allows to choose the type of housing and also to select the desired measurement range and spectral responsivity.

Moreover, the SXL55 is able to distinguish up to 5 different calibrations (stored in the sensor probe) and recognize them autonomously using the preinstalled sglux Radiometer-app.

GETTING STARTED

Connect the sensor to the smartphone's USB terminal and start the sglux radiometer app.

Select the desired radiation source in the menu (upper right side). If the source to be measured is not stored in the sensor, the use of another sensor or a further sensor calibration by sglux is recommended to avoid false values.

The radiometer app offers two different display screens. The standard view displays the irradiance as well as the source data. The advanced view offers the opportunity to display further information and to select other measurement options (e.g. dose measurement, sensor temperature).

UVMICROLOG

UV datalogger for science and production monitoring

GENERAL FEATURES

Properties of the UVMICROLOG

The UVMICROLOG is a datalogger to log ultraviolet and/or visible light information obtained by one sensor. Additionally, the instrument can be equipped with internal sensors to measure pressure, acceleration, humidity and temperature.
The UVMICROLOG stores 2,000,000 parameters. The rechargeable battery allows up to 3 months of permanent measurement without battery charging.
The logger is available as waterproof version (IP67) on request.

Sensor selection

The applications of a UV and/or VIS datalogger are quite varied and therefore the required sensitivity, environmental endurance, spectral response and field of view must be tailored for individual conditions of use. We configure each UVMICROLOG according to the application's specific requirement such as logging of very low UV radiation in a museum, logging of sun radiation (UVA, Erythema, visible) or logging of radiation intensity and dose during a curing process. Our calibration laboratory is happy to do a traceable calibration of the UVMICROLOG.

SPECIFICATIONS

Fixed Specifications **Parameter**	**Value**
Dimensions (L x W x H)	59 mm x 22(33) mm x 16 mm
Weight	40 g
Operating Temperature	-15 ... +65°C
Storage Temperature	-20 ... +70°C
Capacity Lithium-polymer Battery	170 mAh
Data Storage	2 000 000 parameters
Number of UV/VIS detectors	1
Interface	USB
Min. Storage Rate UV/VIS Intensity	2 per day
Max. Storage Rate UV/VIS Intensity	50 per second

UV MICROLOG

UV datalogger for science and production monitoring

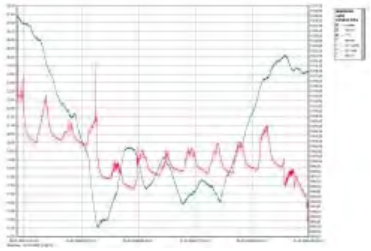
OPTIONAL INTERNAL SENSORS

The UVMICROLOG can be equipped with further internal sensors (in addition to one or two external sensors):

* External Temperature
* Relative Humidity
* Pressure
* Acceleration (3-Axis)

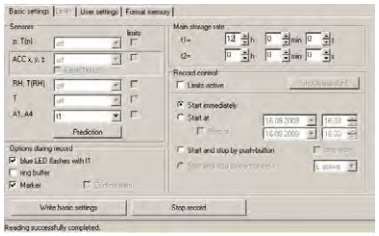
Measure	**Working Range**	**Accuracy**
Internal Temperature	-10°C ... +58°C	+/-0.1°C (+5°C ... +45°C) +/-0.2°C (-10°C ... +58°C)
Relative Humidity	0 ... 100% rel. hum. (-20°C ... +65°C)	+/-2% rel. hum. (10...85% rel. hum., 0°C ...+40°C) +/-4% rel. hum. (85...95% rel. hum., 0°C ... +40°C)
Pressure	0 ... 2500 mbar abs.	+/-2.5 mbar (750 ... 1100 mbar absolute)
Acceleration (3-Axis)	+/-10 G / +/-2 G sel.	+/-0.15 g (25°C)

SOFTWARE (*FOR DOWNLOAD AT WWW.DOWNLOAD.SGLUX.DE/DATALOGGERS/)*



Using the software *SETUP* the user customizes the properties of the UVMICROLOG. With the software *READER* the USB data transfer ist started. The *VIEWER* is used for graphical displaying. The data can be exported as a csv file for analyzing in standard software like Excel or Origin. The software *ONLINE* is displaying online measurements. The software is compatible to MS Windows XP to Windows 10.

LOGGING FEATURES



- Record limits can be set for all used sensors.
- Measurements can be started via a connected computer (date and time for the start can be chosen).
- Prediction feature calculates memory and battery capacity for the chosen measurement rates.
- For monitoring of sensitive transport goods a shock measurement can be activated (if acceleration sensor is equipped). Therefore a threshold can be chosen. Every acceleration above this threshold is recorded. The mixing gravitational acceleration is not taken into account.

UV Radiometer SXL 55

Measuring device for determining the UV irradiance

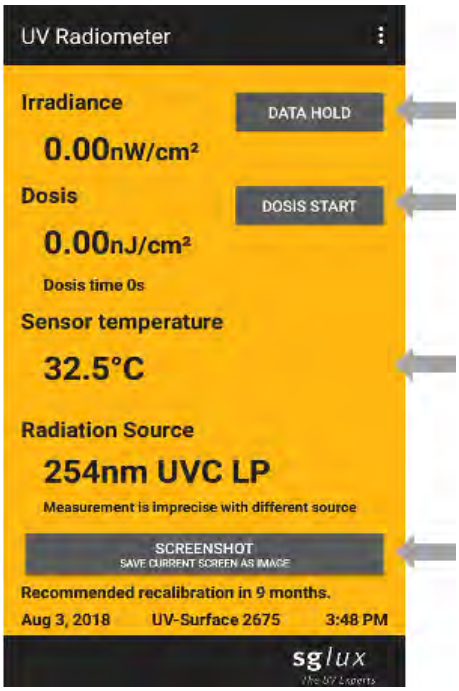
STANDARD VIEW

Drop-down menu
The radiation source (calibration) can be selected here. The advanced view is also selectable.

Here, the radiation source to which the sensor has been calibrated is displayed. The source to be measured must be identical. If necessary, the source selection can be changed, or another sensor can be used.

The recommended re-calibration time of the sensor is displayed here.

ADVANCED VIEW



This button freezes the display (e.g. to read the information easily or to take a screenshot).

Here the dose measurement can be started (integration of the irradiance over the time).

Internal sensor temperature (in general slightly above ambient temperature).

The screenshot function stores the actual display as a photo on the smartphone.

UVMINILOG

UV datalogger for science and production monitoring

sglux The UV Experts

Boston Electronics

GENERAL FEATURES

Properties of the UVMINILOG

The UVMINILOG is a datalogger to log ultraviolet and/or visible light information obtained by one or two sensors. Additionally, the instrument can be equipped with internal sensors to measure pressure, acceleration, humidity and temperature. The UVMINILOG stores 2,000,000 parameters. The rechargeable battery allows up to 18 months of permanent measurement without battery charging.

Sensor selection

The applications of a UV and/or VIS datalogger are quite varied and therefore the required sensitivity, environmental endurance, spectral response and field of view must be tailored for individual conditions of use. We configure each UVMINILOG according to the application's specific requirement such as logging of very low UV radiation in a museum, logging of sun radiation (UVA, Erythema, visible) or logging of radiation intensity and dose during a curing process. Our calibration laboratory is happy to do a traceable calibration of the UVMINILOG.

SPECIFICATIONS

Fixed Specifications **Parameter**	**Value**
Dimensions (L x W x H)	53 mm x (28.5) 43.5 mm x 29.5 mm
Weight	60 g
Operating Temperature	-15 ... +65°C
Storage Temperature	-20 ... +70°C
Capacity Lithium-polymer Battery	900 mAh
Data Storage	2 000 000 parameters
Number of UV/VIS detectors	1 or 2
Interface	USB
Min. Storage Rate UV/VIS Intensity	2 per day
Max. Storage Rate UV/VIS Intensity	50 per second

UVMINILOG

UV datalogger for science and production monitoring

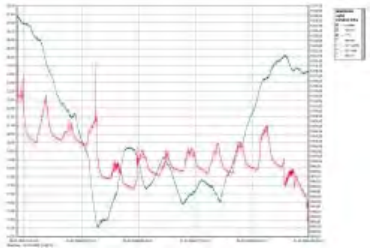
OPTIONAL INTERNAL SENSORS

The UVMINILOG can be equipped with further internal sensors (in addition to one or two external sensors):

* External Temperature
* Relative Humidity
* Pressure
* Acceleration (3-Axis)

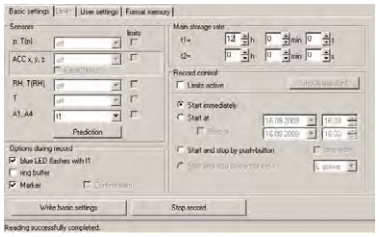
Measure	**Working Range**	**Accuracy**
Internal Temperature	-10°C ... +58°C	+/-0.1°C (+5°C ... +45°C) +/-0.2°C (-10°C ... +58°C)
Relative Humidity	0 ... 100% rel. hum. (-20°C ... +65°C)	+/-2% rel. hum. (10...85% rel. hum., 0°C ...+40°C) +/-4% rel. hum. (85...95% rel. hum., 0°C ... +40°C)
Pressure	0 ... 2500 mbar abs.	+/-2.5 mbar (750 ... 1100 mbar absolute)
Acceleration (3-Axis)	+/-10 G / +/-2 G sel.	+/-0.15 g (25°C)

SOFTWARE (*FOR DOWNLOAD AT WWW.DOWNLOAD.SGLUX.DE/DATALOGGERS/)*



Using the software *SETUP* the user customizes the properties of the UVMINILOG. With the software *READER* the USB data transfer ist started. The *VIEWER* is used for graphical displaying. The data can be exported as a csv file for analyzing in standard software like Excel or Origin. The software *ONLINE* is displaying online measurements. The software is compatible to MS Windows XP to Windows 10.

LOGGING FEATURES



- Record limits can be set for all used sensors. If a signal is exceeding a limit the red LED is flashing (on request).
- Measurements can be started via a connected computer (date and time for the start can be chosen) or manually by a push-button (on request).
- The push-button can be used as a marker to mark special events in the recording.
- Prediction feature calculates memory and battery capacity for the chosen measurement rates.
- For monitoring of sensitive transport goods a shock measurement can be activated (if acceleration sensor is equipped). Therefore a threshold can be chosen. Every acceleration above this threshold is recorded. The mixing gravitational acceleration is not taken into account.

UV-Wireless

Wireless cosine corrected UV sensor with receiver unit

sglux The UV Experts

Boston Electronics

GENERAL FEATURES

The UV-Wireless is a bundle of a wireless cosine corrected UV sensor and a receiver unit that shows the current irradiance and dose measurement values. The units communicate via low-power 2,4 GHz. The UV-Wireless is used when sensor wiring would cause problems or even is impossible. A typical application of the UV-Wireless is the control of UV radiation emitted to disinfect air and surfaces. The unit will be configured upon individual customer's requirements which are clarified within the order process. Configurable parameters are the measurement range and the spectral responsivity (see page 2).

SPECIFICATIONS OF THE SENSOR UNIT

Dimensions	please refer to drawing on page 2
Weight of sensor unit	151 g
Temperature Coefficient (30 to 65°C)	0.05 to 0.075%/K
Operating and Storage Temperature	0 to +60˚C
IP Protection Class	IP40
Spectral Sensitivity	Broadband UV, UVA, UVB, UVC, UV-Index, Bluelight and UV+VIS
Battery Lifetime	10 hours (unlimited use when the charger is attached)
Radio Range	15 meters in air, 10 meters if a wall is in between and 3 meters in a chamber
Connections	micro USB charger terminal
Measuring Range	five orders of magnitiude, individually configured according to customer's requirments
Transmission	low-power 2.4 GHz

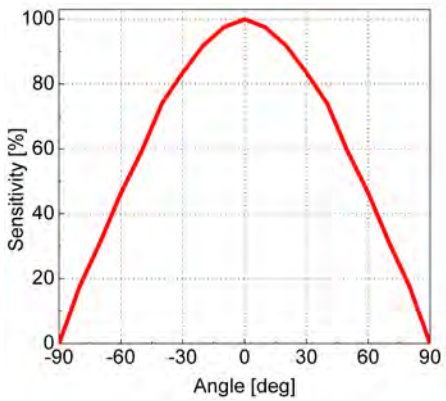
SPECIFICATIONS OF THE RECEIVER UNIT

Dimensions	please refer to drawing on page 2
Weight	131 g
Operating Temperature	0 to +40˚C
Storage Temperature	0 to +60˚C
IP Protection Class	IP4
Battery Lifetime	10 hours (unlimited use when the charger is attached)

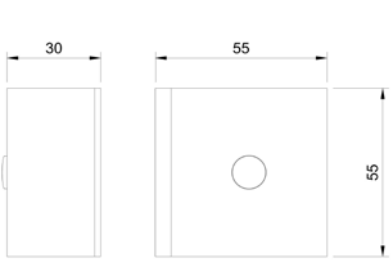
UV-Wireless

Wireless cosine corrected UV sensor with receiver unit

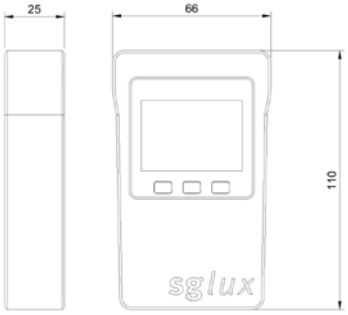
SENSOR FIELD OF VIEW



DRAWINGS



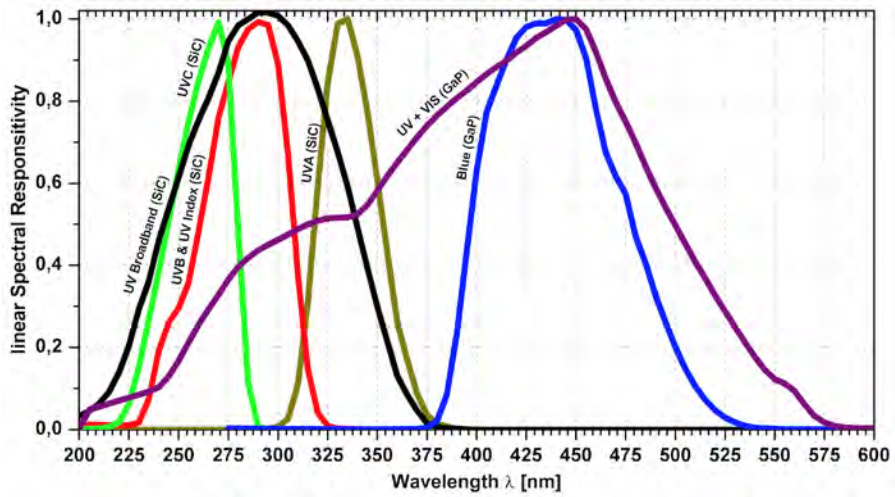
drawing of the Sensor unit



drawing of the Receiver unit

SPECTRAL RESPONSIVITY SELECTION OPTIONS

The below shows the available spectral responsivity curves. For UV measurement, by default unfiltered broadband SiC should be applied. If a UV source also emits radiation that must not contribute to the sensor's signal (e.g. UV medium pressure lamps that also emit non germicidal UV radiation) a filtered sensor (UVC, UVB or UVA only) is to be applied. For measurement of radiation around 400 nm SiC is not suitable. Here GaP based detectors are used.



UV-Wireless

Wireless cosine corrected UV sensor with receiver unit

sglux The UV Experts

Boston Electronics

GETTING STARTED

Charge the sensor unit while removing the cover and insert the USB cable. Charge the receiver unit while inserting the USB cable. Switch on both units while pressing the red button on the display unit. The power switch of the sensor unit is behind the cover.

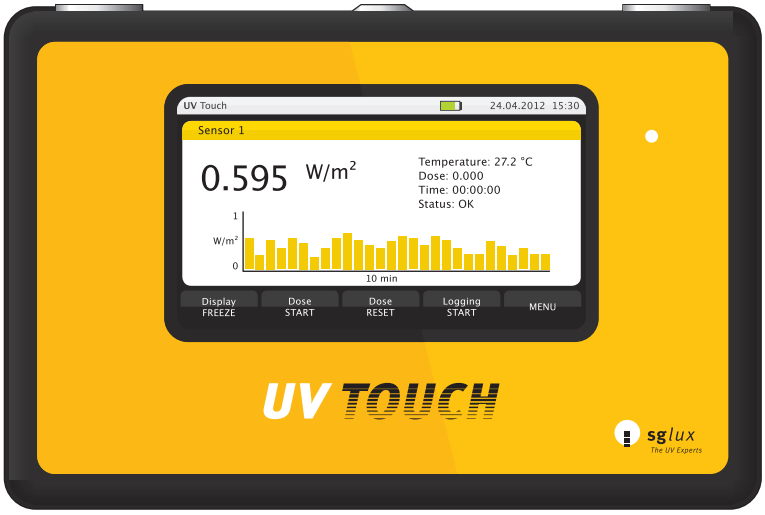
The receiver starts displaying the current irradiance. While pressing the "start"-button a dose measurement can be started.

The current dose and the time elapsed since the dose measurement start is displayed. The dose measurement can be stopped while pressing the stop button.

After having stopped the dose measurement it is possible to continue (press the "continue" button) or to reset (press the "reset" button) the dose measurement. After resetting the dose measurement the "start" button re-appears.

UV TOUCH High Precision Touch Control UV Radiometer, Dosimeter & Datalogger

Hold the world of UV radiation in your hand. Radiation hard SiC detectors guarantee reliable values for years.
Modern CAN based signal conversion offers a large dynamic range.
The intuitive full touch screen control makes working a pure pleasure.



UV TOUCH

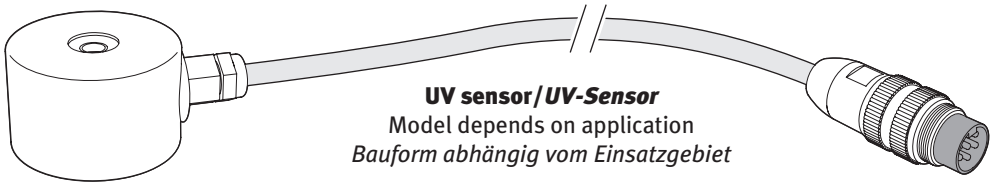
SiC Photodetector
guarantees radiation hardness

CAN bus signal processing
offers a large dynamic range

Intuitive touch screen control
makes working a pleasure

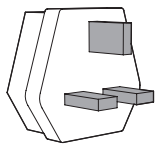
*Halten Sie die Welt der UV-Strahlung in Ihrer Hand. Strahlungsharte SiC-Detektoren garantieren zuverlässige Werte im Mess-Alltag. Hochmoderne CAN-basierte Übertragungstechnologie sichert einen großen Dynamikbereich. Eine intuitive Touch-Screen-Bedienung macht die Arbeit mit dem **UVTOUCH** zum Vergnügen.*

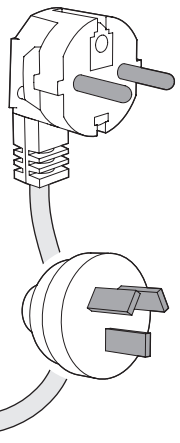
I. Components – *Komponenten*



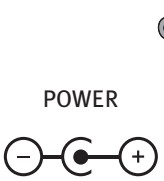
UV sensor/*UV-Sensor*
Model depends on application
Bauform abhängig vom Einsatzgebiet

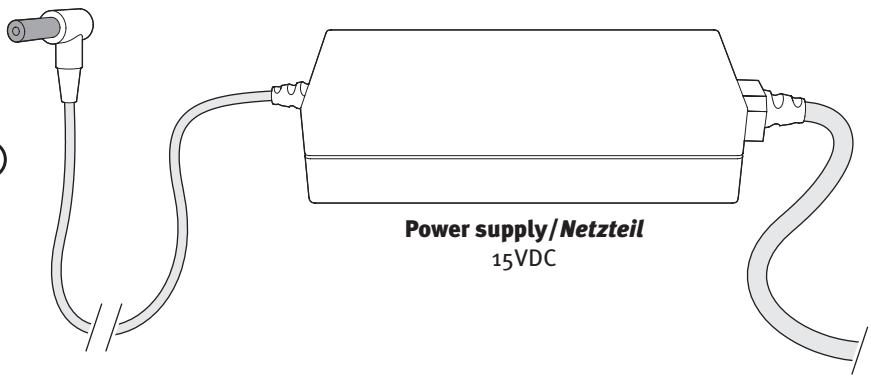
(Sensor not included. Please order a customized digital probe and calibration separately.)
(Sensor nicht enthalten. Bitte bestellen Sie den passenden Sensor separat.)



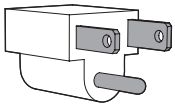


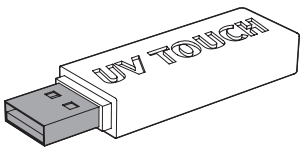
POWER





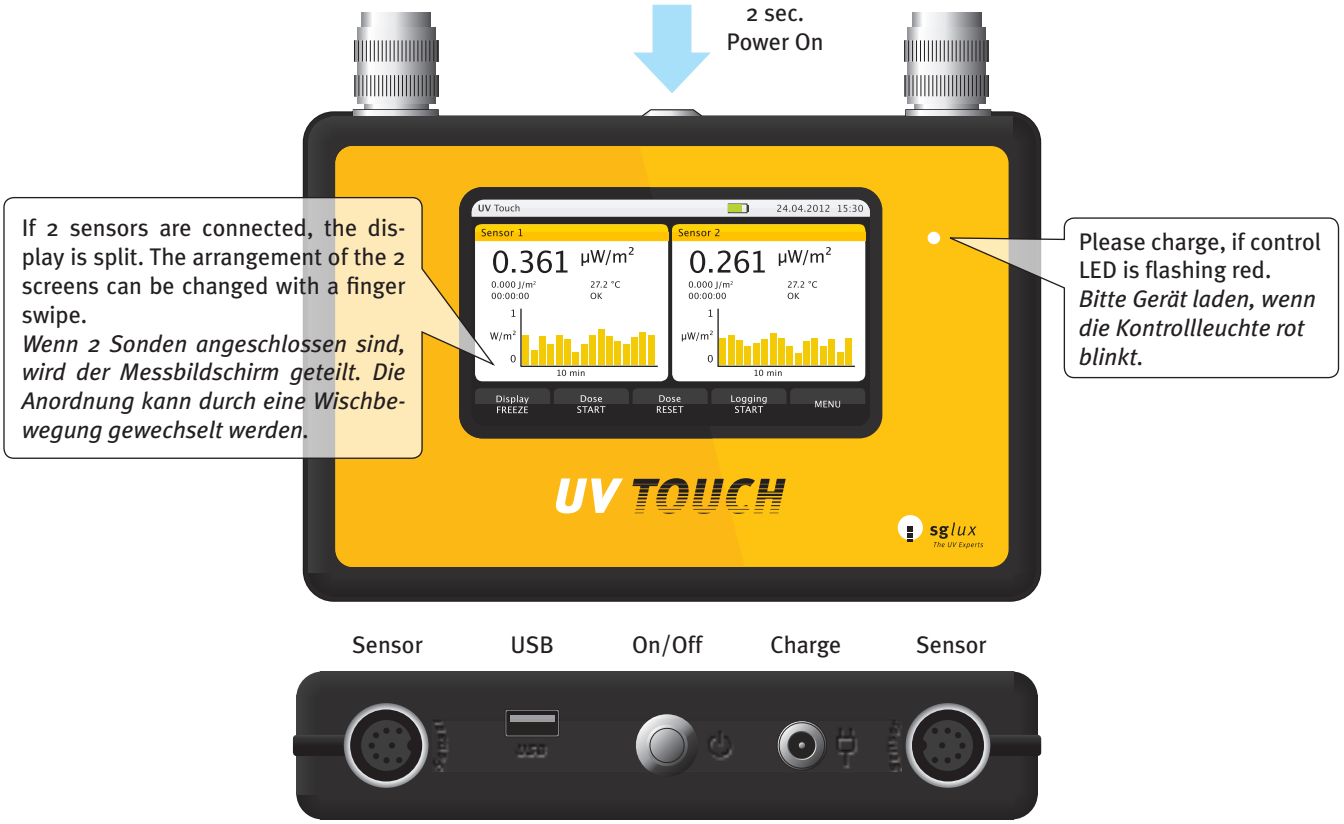
Power supply/*Netzteil*
15VDC



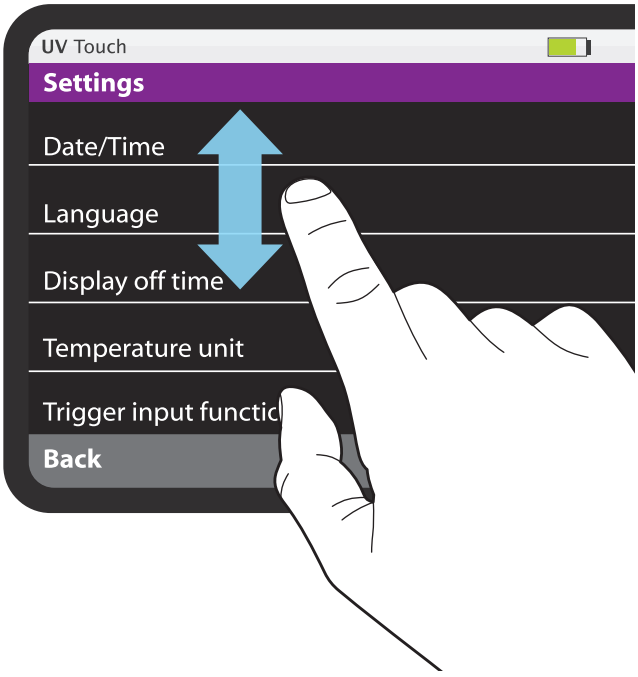


4GB USB flashdrive/*4GB USB-Stick*
For transfer of log files and installation of firmware updates
Zur Übertragung von Loggingdaten und Installation von Firmware-updates

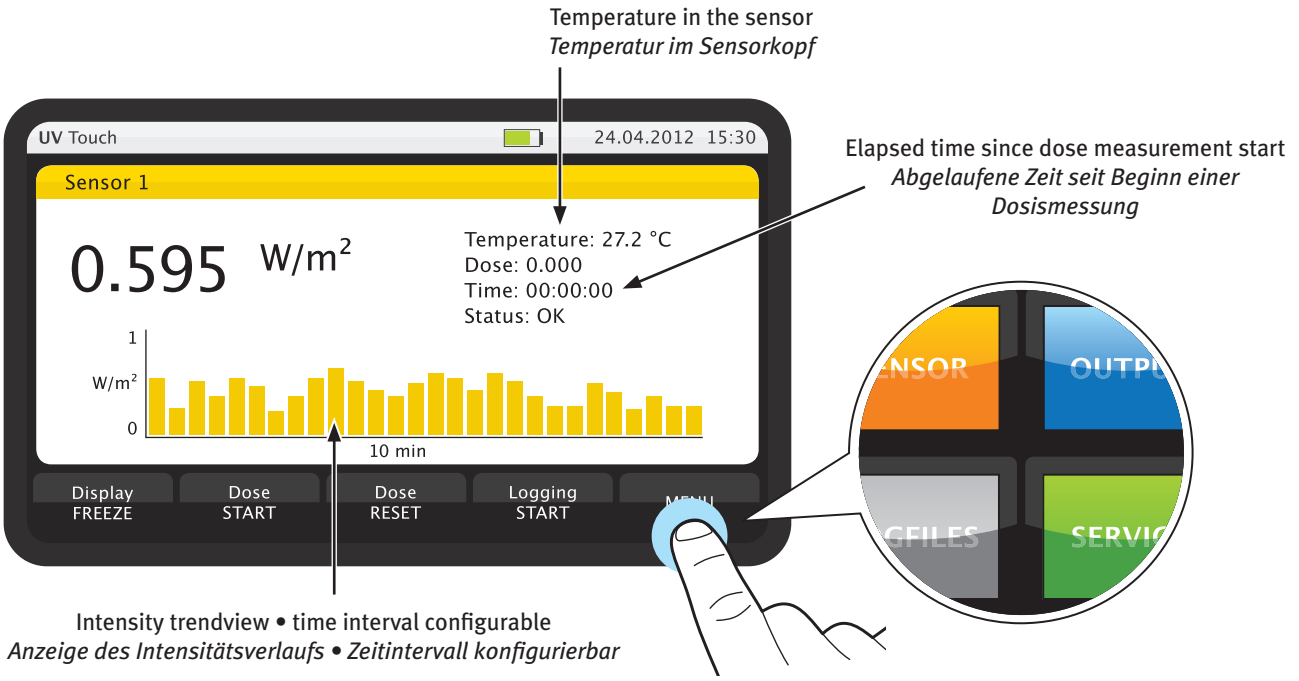
II. Getting started – *Inbetriebnahme*



III. Handling – *Handhabung*



Main screen and menus – *Hauptbildschirm und Menus*



Setting of irradiation and area units, determination of sensor names

Einstellung von Einheiten der Bestrahlungsstärke und Bezugsfläche, Vergabe von Sensornamen

Configuration of switch outputs: Setting of thresholds, optional hysteresis and related measured output

Konfiguration der Schaltausgänge; Einstellung, auf welche Messgröße sich das Schaltsignal bezieht; Einstellung des Schwellwertes und einer möglichen Hysterese

Basic settings: date, time, language, temperature unit, logging interval, external control, configuration of the trend view length

Basiseinstellungen des Handgerätes: Datum, Uhrzeit, Sprache, Temperatureinheit, Logging-Intervall, externe Ansteuerung, Konfiguration der Verlaufsanzeige-Länge

Manufacturer information, upload of firmware updates

Hersteller-Informationen, Aufspielen von Firmwareupdates

Editing of logfiles, logfile transfer to USB flash drive

Editieren von Logging-Daten und Übertragung auf USB-Stick

Exit to main screen

Zurück zum Hauptbildschirm

Technical data, service information – *Technische Daten, Kontaktinformationen*

Dimensions (W x H x D)/*Größe (B x H x T)*	175 x 117 x 37 mm
Weight/*Gewicht*	900 g
Operation temperature/*Betriebstemperatur*	0–50°C
Storage temperature/*Lagertemperatur*	-20–50°C
Supply voltage/*Betriebsspannung*	15 V
Power supply input voltage (multiplug consigned) *Betriebsspannung des Netzteils*	100–240VAC
Power consumption (standard conditions, battery fully charged) *Leistungsaufnahme im Normalbetrieb (Akku voll geladen)*	5 W
Power consumption while charging *Leistungsaufnahme während des Ladevorgangs*	28 W
Pressure/*Luftdruck*	300–1080 hPa
Rel. Humidity (non-condensing)/*Rel. Feuchte (nicht-kondensierend)*	< 70%
Battery lifetime (min.)/*Akkubetriebsdauer (min.)*	10 h
Calibration values/*Kalibrierwerte*	Stored in sensor/*Gespeichert im Messkopf*
Dynamic range/*Dynamikbereich*	> 5 Decades/> *5 Dekaden*
Power supply/*Stromversorgung*	Internal battery, power supply unit/ *Interner Akku, Netzteil*
Data storage/*Messwertspeicher*	> 11.000.000 Measurements/*Messungen*
Measurement range/*Messbereich*	s. Sensor
Display/*Display*	4,3“ TFT
Housing material/*Gehäusematerial*	Aluminium
Protection level/*Schutzklasse*	IP 62

Attention! While operating the UVTOUCH the following must be observed:
Do not expose the UVTOUCH to direct sunlight, intense heat radiation, or high electro-magnetic radiation. Please connect the UVTOUCH USB-port to a USB flashdrive only. Do not connect the USB port to a computer. Use the UVTOUCH with the provided power supply only.
While charging the ambient temperature must not exceed 40°C (104°F).

Achtung! *Bei der Benutzung des UVTOUCH Handheld ist folgendes zu beachten:*
Gerät keiner direkten Sonneneinstrahlung, keiner intensiven Wärmebestrahlung und keiner starken ektromagnetischen Strahlung aussetzen. USB-Anschluss am UVTOUCH ausschließlich mit einem USB-Stick verbinden. Nicht an einen Computer anschließen. Gerät nur mit dem mitgelieferten Netzteil betreiben. Beim Ladevorgang darf die Umgebungstemperatur höchstens 40°C betragen.

Accessories/*Zubehör:* **IO-Box**

Logic input for external UVTOUCH control/*Logik-Eingang zur externen Steuerung des UVTOUCH*
Relais output for switching external devices/*Relais-Ausgänge zur Schaltung externer Geräte*

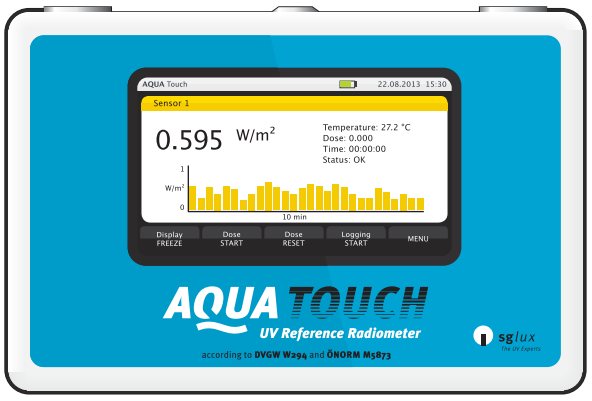
CE RoHS IP 62

sglux
The UV Experts

welcome@sglux.de
www.sglux.de
Tel **+49–30–53 01 52 11**
Fax **+49–30–53 01 52 09**
sglux GmbH
Max-Planck-Str. 3, D–12489 Berlin

AQUA TOUCH Reference Radiometer according to DVGW W294–3 & ÖNORM M5873

Handheld for PTB traceable calibrated UV sensors according to DVGW W294–3 and ÖNORM M5873
for low and medium pressure lamps



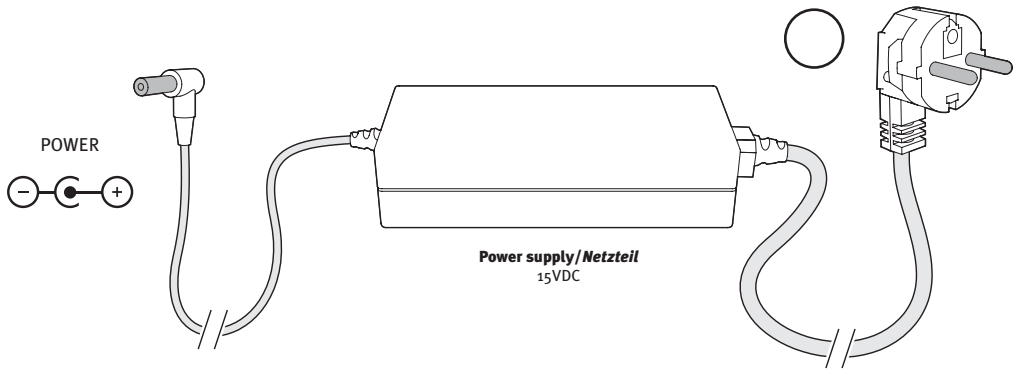
SiC Photodetector
guarantees radiation hardness

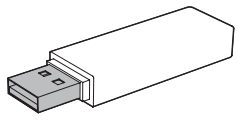
CAN bus signal processing
offers a large dynamic range

Intuitive touch screen control
makes working a pleasure

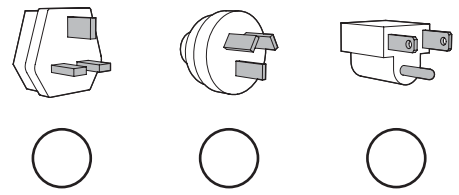
Handgerät für PTB-rückführbar kalibrierte UV-Sensoren gemäß DVGW W294–3 und ÖNORM M5873 für Nieder- und Mitteldruckstrahler

I. Components included in delivery – *Lieferumfang*

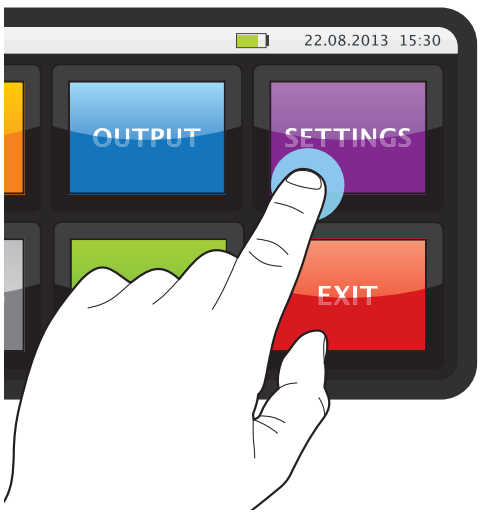


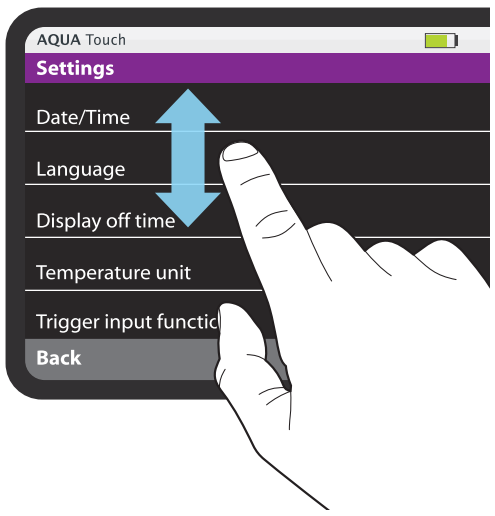


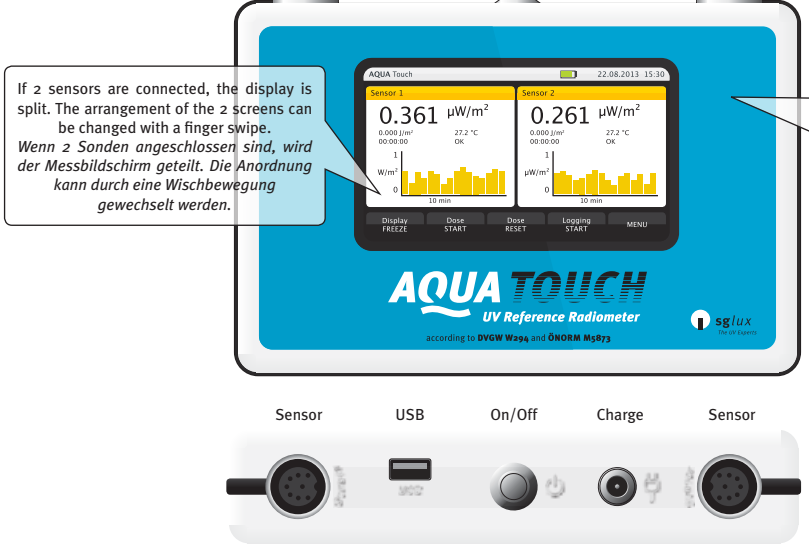
4GB USB flashdrive/*4GB USB-Stick*
For transfer of log files and installation of firmware updates
Zur Übertragung von Loggingdaten und Installation von Firmware-updates



III. Handling – *Handhabung*

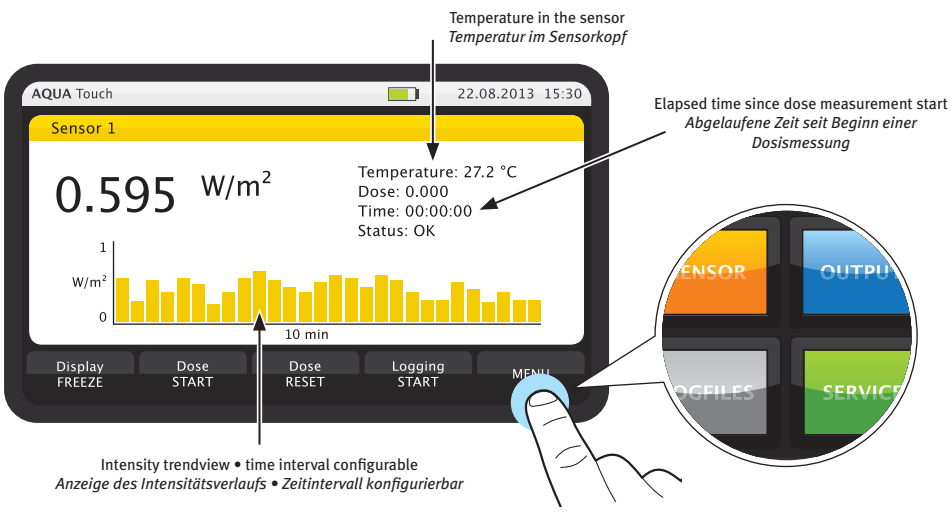


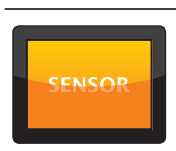




II. Getting started – *Inbetriebnahme*

Main screen and menus – *Hauptbildschirm und Menus*





Setting of irradiation and area units, determination of sensor names

Einstellung von Einheiten der Bestrahlungsstärke und Bezugsfläche, Vergabe von Sensornamen

Configuration of switch outputs: Setting of thresholds, optional hysteresis and related measured output

Konfiguration der Schaltausgänge; Einstellung, auf welche Messgröße sich das Schaltsignal bezieht; Einstellung des Schwellwertes und einer möglichen Hysterese

Basic settings: date, time, language, temperature unit, logging interval, external control, configuration of the trend view length

Basiseinstellungen des Handgerätes: Datum, Uhrzeit, Sprache, Temperatureinheit, Logging-Intervall, externe Ansteuerung, Konfiguration der Verlaufsanzeige-Länge

Manufacturer information, upload of firmware updates

Hersteller-Informationen, Aufspielen von Firmwareupdates

Editing of logfiles, logfile transfer to USB flash drive

Editieren von Logging-Daten und Übertragung auf USB-Stick

Exit to main screen

Zurück zum Hauptbildschirm

Technical data, service information – *Technische Daten, Kontaktinformationen*

Dimensions (W x H x D)/*Größe (B x H x T)*	175 x 117 x 37 mm
Weight/*Gewicht*	900 g
Operation temperature/*Betriebstemperatur*	0–50°C
Storage temperature/*Lagertemperatur*	-20–50°C
Supply voltage/*Betriebsspannung*	15 V
Power supply input voltage (multiplug consigned) *Betriebsspannung des Netzteils*	100–240VAC
Power consumption (standard conditions, battery fully charged) *Leistungsaufnahme im Normalbetrieb (Akku voll geladen)*	5 W
Power consumption while charging *Leistungsaufnahme während des Ladevorgangs*	28 W
Pressure/*Luftdruck*	300–1080 hPa
Rel. Humidity (non-condensing)/*Rel. Feuchte (nicht-kondensierend)*	< 70%
Battery lifetime (min.)/*Akkubetriebsdauer (min.)*	10 h
Calibration values/*Kalibrierwerte*	Stored in sensor/*Gespeichert im Messkopf*
Dynamic range/*Dynamikbereich*	> 5 Decades/*> 5 Dekaden*
Power supply/*Stromversorgung*	Internal battery, power supply unit/ *Interner Akku, Netzteil*
Data storage/*Messwertspeicher*	> 11.000.000 Measurements/*Messungen*
Measurement range/*Messbereich*	s. Sensor
Display/*Display*	4,3“ TFT
Housing material/*Gehäusematerial*	Aluminium
Protection level/*Schutzklasse*	IP 62

Attention! While operating the AQUA TOUCH the following must be observed:
Do not expose the AQUA TOUCH to direct sunlight, intense heat radiation, or high electro-magnetic radiation. Please connect the AQUA TOUCH USB-port to a USB flashdrive only. Do not connect the USB port to a computer. Use the AQUA TOUCH with the provided power supply only. While charging the ambient temperature must not exceed 40°C (104°F).

Achtung! *Bei der Benutzung des AQUA TOUCH Handheld ist folgendes zu beachten:*
Gerät keiner direkten Sonneneinstrahlung, keiner intensiven Wärmebestrahlung und keiner starken ektromagnetischen Strahlung aussetzen. USB-Anschluss am AQUA TOUCH ausschließlich mit einem USB-Stick verbinden. Nicht an einen Computer anschließen. Gerät nur mit dem mitgelieferten Netzteil betreiben. Beim Ladevorgang darf die Umgebungstemperatur höchstens 40°C betragen.

Accessories/*Zubehör:* **UV Sensor**

Choose a PTB traceable calibrated UV sensor (40° or 160°) with desired dynamic range
Wählen Sie zu diesem Gerät einen PTB-rückführbar kalibrierten UV- Sensor (40° oder 160°) mit gewünschtem Dynamikbereich

CE RoHS IP 62

sglux
The UV Experts

welcome@sglux.de
www.sglux.de
Tel **+49–30–53 01 52 11**
Fax **+49–30–53 01 52 09**
sglux GmbH
Richard-Willstätter-Str. 8, D–12489 Berlin

Reference Radiometer

UVRRM according to DVGW and ÖNORM

GENERAL FEATURES

Properties of the Reference Radiometer

The Reference Radiometer UVRRM is designed to check and recalibrate duty sensors for water sterilisation systems according DVGW and ÖNORM. This mobile radiometer consists of a handheld unit with sensor type selection switch and two sensor heads. The sensors are built according to DVGW W 294-3:2006 and ÖNORM M 5873. They are identical in construction with the duty sensors. The radiometer is calibrated to microbicidal weighted irradiance at λ = 254 nm against a PTB traceable standard. Medium pressure calibration can be done on request.

HAND-HELD DISPLAY DEVICE

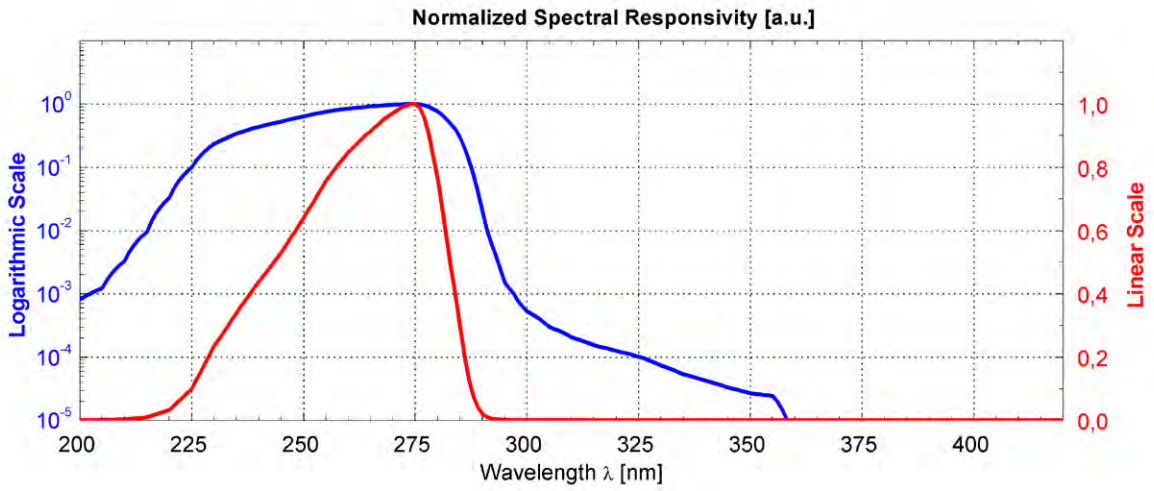
- 20 / 200 / 2,000 / 20,000 W/m² ranges, selectable with rotary switch
- Display with 3 ½ digits
- Hold function: to be activated with main switch at left side of case (off - on - hold)
- Battery powered: 9V type 6F22 or similar, displays „Batt“ when battery runs down, battery has to be changed

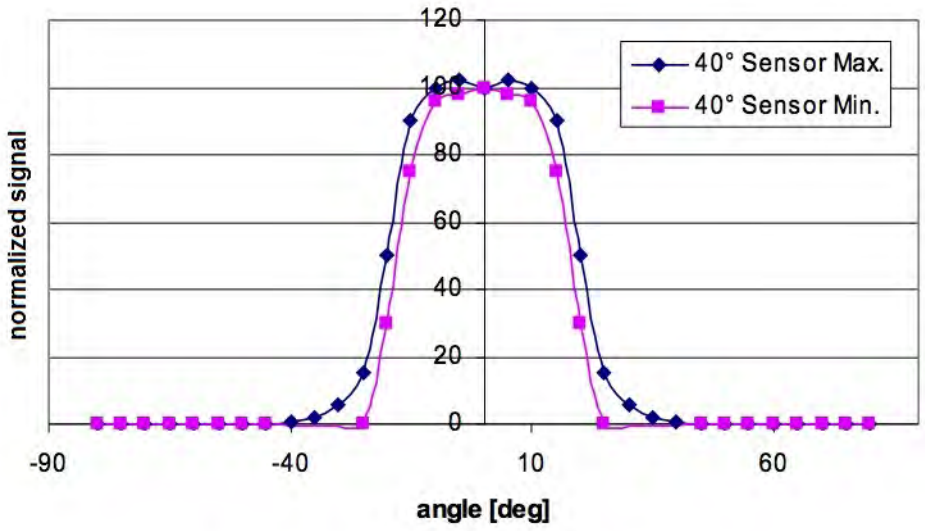
Reference Radiometer

UVRRM according to DVGW and ÖNORM

PLUG-IN SENSOR UNIT - according to DVGW W 294-3:2006

- Sensor with coaxial cable plugs into hand-held display device
- Range of sensed wavelength: 220 ... 290 nm, spectral sensitivity according to DVGW W 294-3:2006
- Wavelength of calibration: 254 nm
- Field of view: 40°
- Sensor: SiC-photodiode with filter





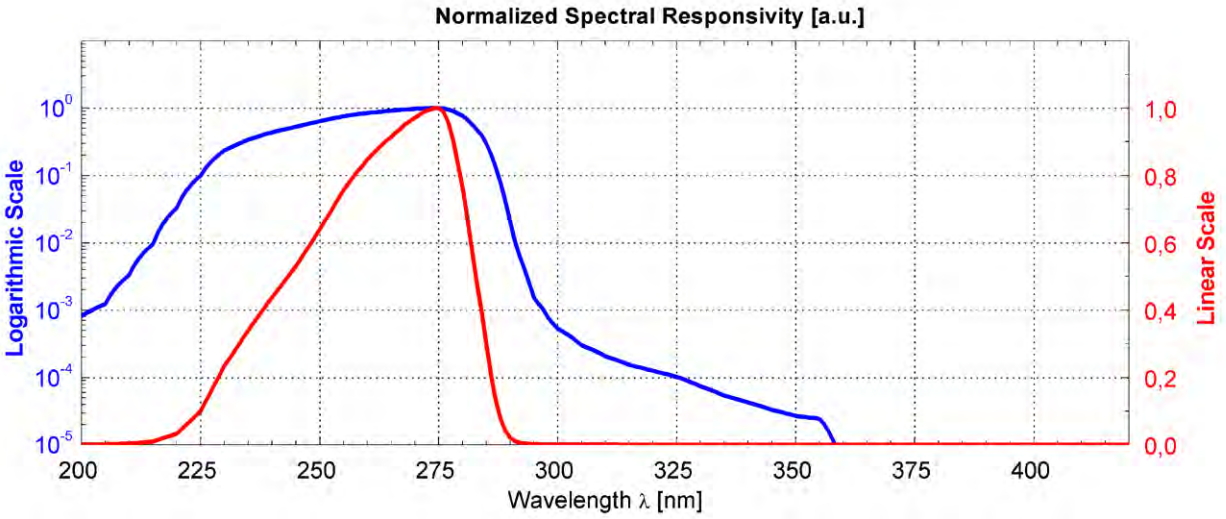
DVGW Sensor: sensor field of view

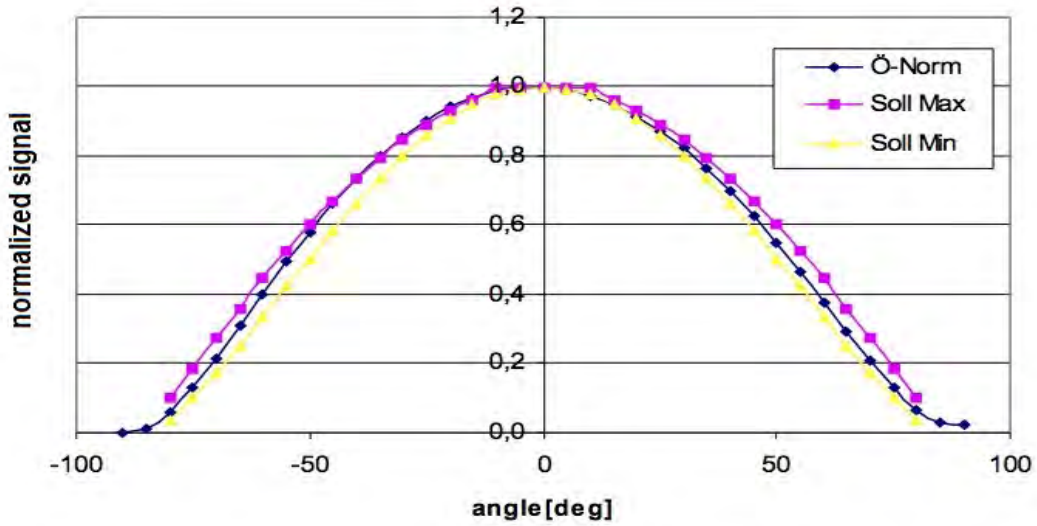
Reference Radiometer

UVRRM according to DVGW and ÖNORM

PLUG-IN SENSOR UNIT - according to ÖNORM M 5873

- SiC-based sensor with coaxial cable plugs for hand-held display device
- Wavelength range: 220 ... 290 nm, spectral sensitivity according to ÖNORM M 5873 / DVGW W 294-3:2006
- Wavelength of calibration: 254 nm
- Field of view: 160°





ÖNORM Sensor: sensor field of view

Reference Radiometer

UVRRM according to DVGW and ÖNORM

CALIBRATION

- Radiation source: Hg-low-pressure, quasi-parallel radiation (using sufficient distance and screen)
- Calibration of sensor at 2 W/m² microbicidal weighted irradiation
- Calibration by substitution with PTB calibrated reference sensor
- Relative expanded uncertainty of measurement (k=2): 6%
- Re-calibration is recommended after 1 year.

OPERATING INSTRUCTIONS

Plug one of the sensor units into the hand held display device (coaxial connector) and select the corresponding sensor type with the left rotary switch (DVGW or ÖNORM). Please select the measurement range according to the expected measurement values using the rotary switch.
Note: In case of saturation, please select a higher measurement range (although the device will not be damaged if saturated).

Switch the device on (sliding switch, left side of case, middle position). The display shows the measurement value in the selected range. Please note that there can be a significant settling time until stable values are shown (up to 3 sec. in the 20 W/m² range). In this most sensitive range an offset error of ±2 digits is tolerable.

Using the sliding switch position “Hold” the current measurement value displayed will be shown until the sliding switch is put back into middle position.

Please switch the device off after use. **There is no timed automatic power down**.
In case of low battery voltage (below 2/3 U_{max}) the sign “Batt” appears in the display. Please change battery to avoid measurement errors. The device will power down automatically if the battery runs down further on. The lifetime of a new battery (alkali) is approximately 100 hours.

Please keep the sensor measurement window clean. If necessary clean it with a soft fabric.

Reference Radiometer

UVRRM according to DVGW W 294-3:2006

GENERAL FEATURES

Properties of the Reference Radiometer

The Reference Radiometer UVRRM is designed to check and recalibrate duty sensors for water sterilisation systems according DVGW norm. This mobile radiometer consists of a handheld unit and one sensor head. The sensor is built according to DVGW W 294-3:2006. It is identical in construction with the duty sensors. The radiometer is calibrated to microbicidal weighted irradiance at λ = 254 nm against a PTB traceable standard. Medium pressure calibration can be done on request.

HAND-HELD DISPLAY DEVICE

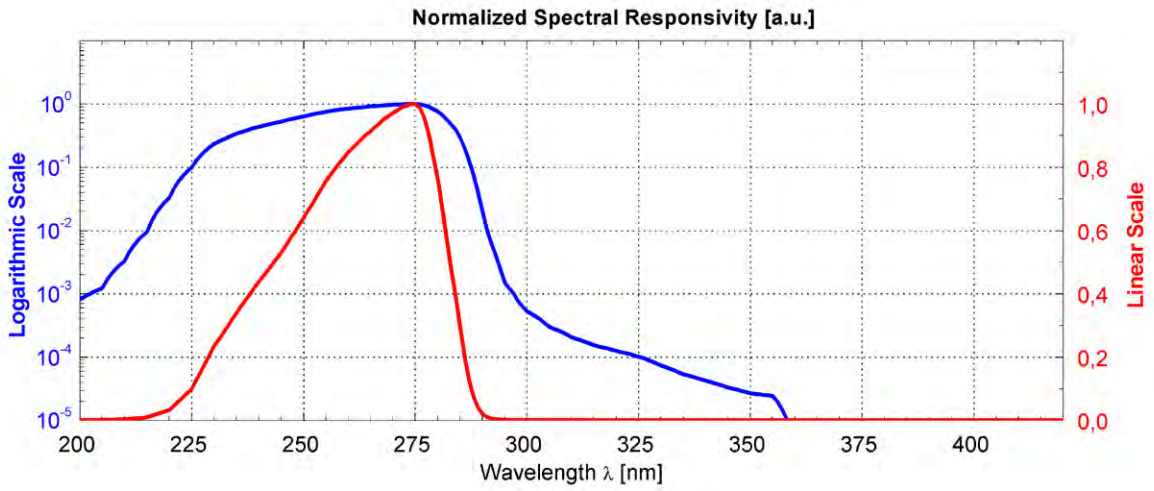
- 20 / 200 / 2,000 / 20,000 W/m² ranges, selectable with rotary switch
- Display with 3 ½ digits
- Hold function: to be activated with main switch at left side of case (off - on - hold)
- Battery powered: 9 V type 6F22 or similar, displays „Batt“ when battery runs down, battery has to be changed

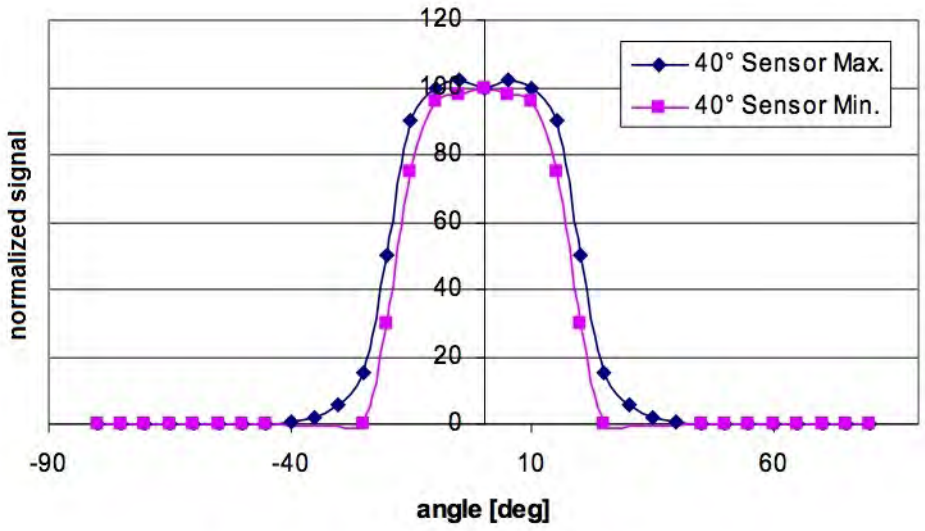
Reference Radiometer

UVRRM according to DVGW W 294-3:2006

PLUG-IN SENSOR UNIT - according to DVGW W 294-3:2006

- Sensor with coaxial cable plugs into hand-held display device
- Range of sensed wavelength: 220 ... 290 nm, spectral sensitivity according to DVGW W 294-3:2006
- Wavelength of calibration: 254 nm
- Field of view: 40°
- Sensor: SiC-photodiode with filter





DVGW Sensor: sensor field of view

Reference Radiometer

UVRRM according to DVGW W294-3

CALIBRATION

- Radiation source: Hg-low-pressure, quasi-parallel radiation (using sufficient distance and screen)
- Calibration of sensor at 2 W/m² microbicidal weighted irradiation
- Calibration by substitution with PTB calibrated reference sensor
- Relative expanded uncertainty of measurement (k=2): 6%
- Re-calibration is recommended after 1 year.

OPERATING INSTRUCTIONS

Plug the sensor unit into the hand held display device (coaxial connector). Please select the measurement range according to the expected measurement values using the rotary switch.
Note: In case of saturation, please select a higher measurement range (although the device will not be damaged if saturated).

Switch the device on (sliding switch, left side of case, middle position). The display shows the measurement value in the selected range. Please note that there can be a significant settling time until stable values are shown (up to 3 sec. in the 20 W/m² range). In this most sensitive range an offset error of ±2 digits is tolerable.

Using the sliding switch position “Hold” the current measurement value displayed will be shown until the sliding switch is put back into middle position.

Please switch the device off after use. **There is no timed automatic power down**.
In case of low battery voltage (below 2/3 U_{max}) the sign “Batt” appears in the display. Please change battery to avoid measurement errors. The device will power down automatically if the battery runs down further on. The lifetime of a new battery (alkali) is approximately 100 hours.

Please keep the sensor measurement window clean. If necessary clean it with a soft fabric.

Reference Radiometer

UVRRM according to ÖNORM M 5873

GENERAL FEATURES

Properties of the Reference Radiometer

The Reference Radiometer UVRRM is designed to check and recalibrate duty sensors for water sterilisation according ÖNORM. This mobile radiometer consists of a handheld unit and one sensor head. The sensor is built according to ÖNORM M 5873. It is identical in construction with the duty sensors. The radiometer is calibrated to microbicidal weighted irradiance at λ = 254 nm against a PTB traceable standard. Medium pressure calibration can be done on request.

HAND-HELD DISPLAY DEVICE

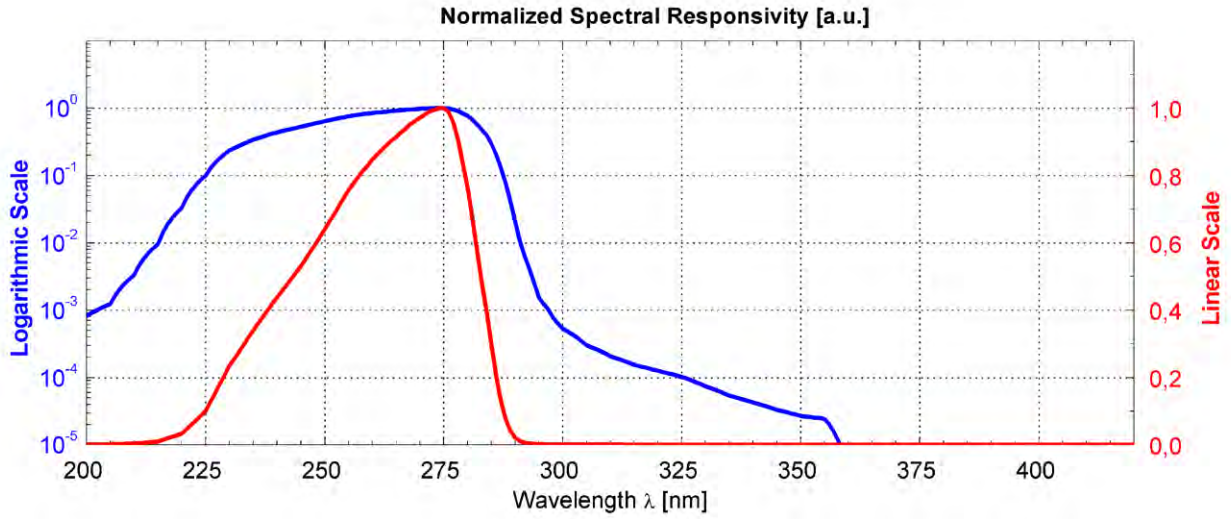
- 20 / 200 / 2,000 / 20,000 W/m² ranges, selectable with rotary switch
- Display with 3 ½ digits
- Hold function: to be activated with main switch at left side of case (off - on - hold)
- Battery powered: 9 V type 6F22 or similar, displays „Batt“ when battery runs, battery has to be changed

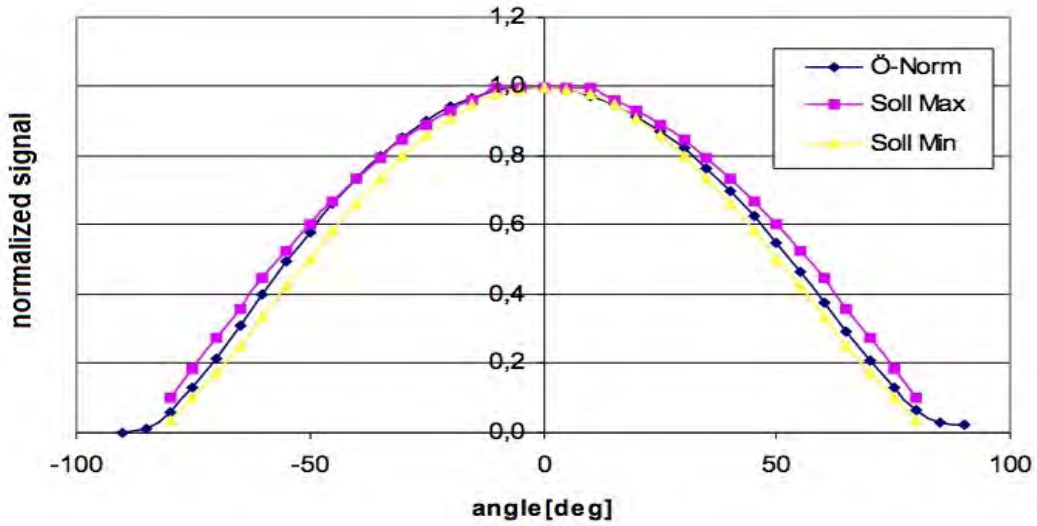
Reference Radiometer

UVRRM according to ÖNORM M 5873

PLUG-IN SENSOR UNIT - according to ÖNORM M 5873

- SiC-based sensor with coaxial cable plugs for hand-held display device
- Wavelength range: 220 ... 290 nm, spectral sensitivity according to ÖNORM M 5873 / DVGW W 294-3:2006
- Wavelength of calibration: 254 nm
- Field of view: 160°





ÖNORM Sensor: sensor field of view

Reference Radiometer

UVRRM according to ÖNORM M 5873

CALIBRATION

- Radiation source: Hg-low-pressure, quasi-parallel radiation (using sufficient distance and screen)
- Calibration of sensor at 2 W/m² microbicidal weighted irradiation
- Calibration by substitution with PTB calibrated reference sensor
- Relative expanded uncertainty of measurement (k=2): 6%
- Re-calibration is recommended after 1 year.

OPERATING INSTRUCTIONS

Plug the sensor unit into the hand held display device (coaxial connector). Please select the measurement range according to the expected measurement values using the rotary switch.
Note: In case of saturation, please select a higher measurement range (although the device will not be damaged if saturated).

Switch the device on (sliding switch, left side of case, middle position). The display shows the measurement value in the selected range. Please note that there can be a significant settling time until stable values are shown (up to 3 sec. in the 20 W/m² range). In this most sensitive range an offset error of ±2 digits is tolerable.

Using the sliding switch position “Hold” the current measurement value displayed will be shown until the sliding switch is put back into middle position.

Please switch the device off after use. **There is no timed automatic power down**.
In case of low battery voltage (below 2/3 U_{max}) the sign “Batt” appears in the display. Please change battery to avoid measurement errors. The device will power down automatically if the battery runs down further on. The lifetime of a new battery (alkali) is approximately 100 hours.

Please keep the sensor measurement window clean. If necessary clean it with a soft fabric.

UV Radiometer SXL 55-UVC

UV radiometer / dosimeter for measurement of Hg low pressure lamps

GENERAL FEATURES

The UV Radiometer SXL 55-UVC is a radiometer / dosimeter for measurement of the germicidal irradiation and dose of a UVC Hg low pressure source at a definded position. It consists of a PTB traceably calibrated UVC sensor and a smartphone.
By default sensitivity range is 0 ... 200 mW/cm².

Besides chemical treatment, UVC sterilization is applied to disinfect air and tools in hospitals, doctor's offices, pharmacies as well as food and pharmaceutical production facilities and public washrooms. In most cases the needed UVC radiation is generated by Hg low pressure lamps.

However, surfaces in other facilities that are open to the public are not yet object of systematic disinfection. The COVID19 pandemy rised the attention to also disinfect these locations, e.g disinfection of air and surfaces in open office environments, factories, depots, public transportation, washrooms and lockers, surface disinfection of packages, disinfection of tools in workshops and production facilities.

While designing and using of UVC disinfection systems it is important to ensure that the surface to be disinfected will be irradiated with a sufficient germicidal UVC dose. The International Ultaviolet association's website (iuva.org) publishes a good overview at the state of the art and recommended irradiation doses for different purposes.

GETTING STARTED

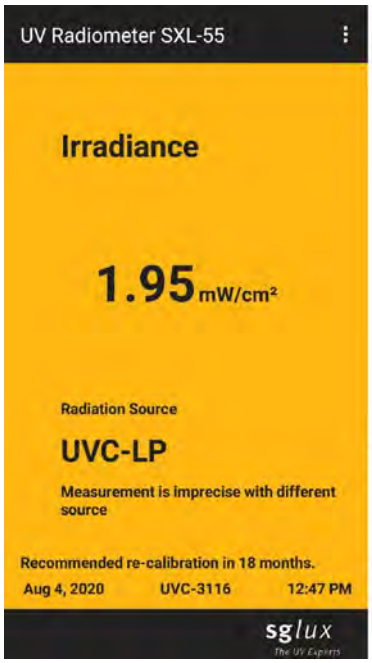
Connect the sensor to the smartphone's USB terminal and start the sglux radiometer app.

The radiometer app offers two different display screens. The standard view displays the irradiance as well as the UV source to be used for measurment (a Hg low pressure lamp). The advanced view offers the opportunity of a dose measurement and displays the sensor's temperature.

UV Radiometer SXL 55-UVC

UV radiometer / dosimeter for measurement of Hg low pressure lamps

STANDARD VIEW

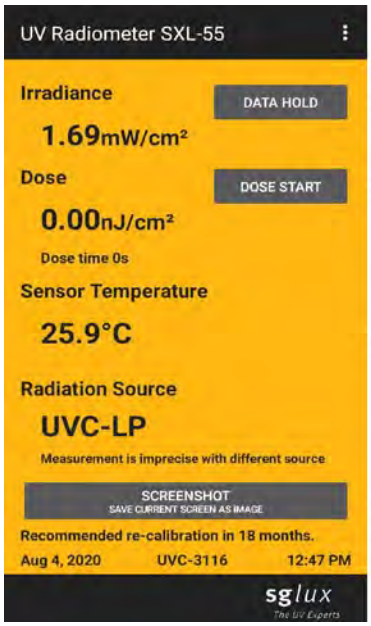


Drop-down menu
Skip to advanced view

Information about radiation source to which the sensor has been calibrated is displayed (a Hg low pressure lamp).

Information about date, time, sensor type and serial number and remaining time until recommended re-calibration.

ADVANCED VIEW



This button freezes the display (e.g. to read the information easily or to take a screenshot).

Start of the dose measurement (integration of the irradiance over the time). After having started, the measurement can be stopped and then either continued or it can be set back to zero.

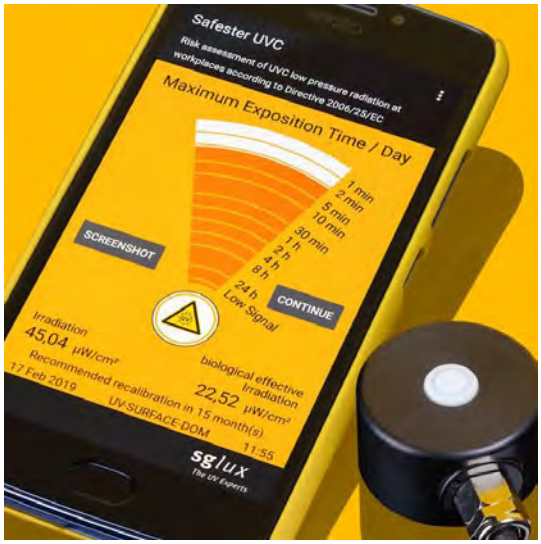
Internal sensor temperature

The screenshot function stores the actual display as a jpg-file on the smartphone's homescreen.

Safester UVC

Instrument to detect harmful UVC radiation according to Directive 2006/25/EC

GENERAL FEATURES

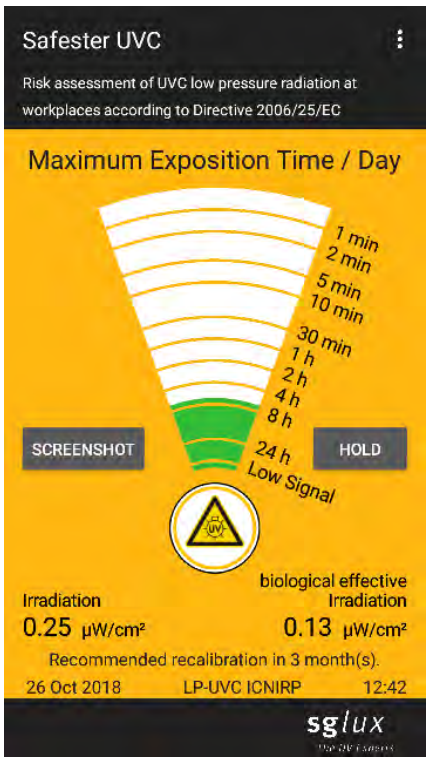


Properties of the Safester UVC

The Safester UVC is an instrument to detect harmful UVC radiation in workplaces according to the "Directive 2006/25/EC of the European Parliament and of the Council of 5 April 2006 on the minimum health and safety requirements regarding the exposure of workers to risks arising from UVC radiation." According to DIN 5031-11, the Safester UVC fulfills the highest requirements of quality class 1 for actinic radiometer and can therefore be used for precision measurements. The instrument measures and displays the maximum time a person can be exposed to a given UVC irradiation anticipating that this irradiation will not change over time. It consists of a calibrated UV sensor with calibration certificate, an Android Smartphone, a battery charger and a carry case. The instrument must not be used to detect other UV radiation sources than UVC low pressure tubes. A current example of use is to ensure that UV air disinfection equipment used to inactivate COVID virus do not emit harmful UV irradiation intensity that may damage skin and eyes.

GETTING STARTED

Protect eyes and skin and switch on the UVC low pressure source. Please note that the Safester sensor also reacts to strong sunlight. Accordingly we recommend to avoid sunlight e.g. by closing a curtain, or doing the measurement when no sunlight is present (clouds, morning or evening time).



USING THE SAFESTER UVC

Connect the sensor to the Smartphone's USB terminal and power on the Smartphone. The app will start automatically. Point the sensor to a place where UVC radiation is suspected, move it and turn it, observe the display and enter the shortest exposition time displayed into your Risk Assessment Protocol.

In addition to the max. exposition time, the currently measured biologically effective irradiation according to TROS IOS / ICNIRP is displayed.

Safester UVC

Instrument to detect harmful UVC radiation according to Directive 2006/25/EC

SCIENTIFIC BACKGROUND

Occurrence of harmful UV radiation

Harmful UV radiation is generated by UV light sources used in industrial processes such as curing or welding machines or end user devices such as UV sterilizers for air and water or ozone generators. In case of improper shielding some of these devices emit a radiation such strong that just a few seconds will irreversibly damage the human eye. During normal use these devices usually protect the operator from this radiation. However, defective or unsuited devices and devices in maintenance mode emit harmful UV radiation.

Functional Principle of the Safester UVC

The Directive 2006/25/EC defines a maximum daily dose of harmful artificial UV radiation with H_{eff} = 30 J/m². H_{eff} is defined by the following formula:

$$H_{eff} = \int_0^t \int_{\lambda = 180\ nm}^{\lambda = 400\ nm} E_\lambda(\lambda, t) \cdot S(\lambda) \cdot d\lambda \cdot dt$$

where:

t	time of exposure
λ	wavelength of UV irradiation between 180 nm an 400 nm
E_λ	spectral irradiance of the source
S_λ	spectral weighting taking into account the wavelength dependence of the health effects of UV radiation on eye and skin, (according to Table 1.2 of the Directive)

The Safester UVC works with a Silicon Carbide (SiC) UV photodiode combined with a filter to suppress the influence of the sun's UV radiation. The spectral responsivity of this photodiode is close to the wavelength dependence of the health effects of UV radiation, but it is not identical. Thus, the Safester UVC must not be used to measure other sources than low pressure UVC lamps.

The calibration of the sensor is done using a traceable UVC reference source. Please find further information in the Calibration Certificate that comes with the instrument.

Directive 2006/25/EC - artificial optical radiation

This Directive aims to improve the health and safety of workers by laying down limit values for exposures of workers to artificial optical radiation to eyes and skin. Exposure to natural optical radiation (sunlight) and its possible health consequences are not covered by the Directive. The Directive gives legal definitions on optical radiation, on wavelength ranges (visible, ultraviolet, infrared), on kinds of artificial optical radiation (laser radiation and non-coherent radiation), on exposure limit values whose compliance ensures the physical health of workers who are exposed to artificial optical radiation at work, and on parameters for measurement such as irradiation, radiance and radiant exposure. The employer is obliged to assess and to measure (and/or to calculate) the levels of exposure to artificial optical radiation to which workers are likely to be exposed.

Safester UVC

Instrument to detect harmful UVC radiation according to Directive 2006/25/EC

Further Information

The following links guide to a “Non-binding guide to good practice for implementing Directive 2006/25/EC” issued by the European Commission. We recommend to study this document carefully before using the Safester UVC.

ec.europa.eu/social/BlobServlet?docId=6790&langId=en (English language)
ec.europa.eu/social/BlobServlet?docId=6790&langId=fr (French language)
ec.europa.eu/social/BlobServlet?docId=6790&langId=es (Spanish language)

sg*lux* GmbH | Richard-Willstätter-Str. 8 | D–12489 Berlin | Tel. +49 30 5301 5211 | welcome@sglux.de | www.sglux.de

Safester UVI

Mobile instrument for measuring the UV-Index according to ISO 17166

GENERAL

Ultraviolet (UV) sunlight is ionizing radiation. Absorbed by human or animal tissue, it frees electrons and causes chemical reactions. UV radiation plays an essential role in the formation of vitamin D and is helpful in many cases, such in mood improvement and the treatment of psoriasis.

However, not all chemical reactions that UV radiation induces are beneficial. UV radiation absorbed by DNA can lead to genetic mutation. Skin reddening, termed sunburn or erythema, is linked to skin cancers. In addition, UV radiation increases the risk of developing eye damage such as photokeratitis and cataracts. Nowadays, stratospheric ozone-layer depletion increases UV-levels at the earth surface.

The UV-Index [1], defined by the ISO 17166 standard, quantifies the risk of erythema at a given solar UV-exposure spectrum. The arbitrary definition of one UV-Index equals to an erythema weighted irradiance of 25 mW/m². Accordingly, the UV-Index value two corresponds to 50 mW/m².

The typical UV-Index ranges from 0 to 11. The higher the index value, the greater the potential for harmful damage and the less time it takes for harm to occur. As most of the UV-related health risks could be avoided by reducing exposure to UV radiation, detailed information about the actual UV-Index is essential for being able to take appropriate measures.

FEATURES

With **Safester UVI** sglux developed a compact portable measurement system, which is able to precisely detect the UV-Index according to ISO 17166 [2]. The system consists of a sensor unit and a standard edition Smartphone used for visualisation of the measured values and displaying of protective measures, as recommended by the World Health Organization (WHO).

The entrance optic of the sensor unit is equipped with an optimal cosine-corrected diffusor, which allows detection of sun radiation from the upper hemisphere. The core of the sensor consists of a silicon-carbide (SiC) based diode, which is an intrinsic visible blind photodetector. In other words the sensor is insensitive for visible and infrared light, which makes over 90 % of the solar radiation, and it only detects UV radiation. This eliminates the need for efficiency-limiting optical filters to remove out-of-band visible or infrared photons. In order to achieve an optimal adaption of the erythema action spectrum, a specially designed interference filter is applied [3]. In this way, a UV-Index determination with a low measurement uncertainty of ± 6 % for values between 3 and 8 can be achieved, while for values higher than 8 **Safester UVI** offers an even lower uncertainty of just ± 3 %. Please note that WHO recommends UV-protective actions for UV-Index values over 3.

Furthermore, a standard Android Smartphone is used for displaying the measured values and the appropriate protection measures, which should be implemented. The sensor unit is connected to the Smartphone via micro-USB cable. The whole system, consisting of sensor unit and Smartphone, weighs around 260 g, which makes it ideal for portable and in real time UV-Index detection.

Anyway, **Safester UVI** is not the only device made by sglux, which is equipped with the above-described SiC-based photodiode. Other sglux sensors such as **UV-Cosine_UVI** and UV-Index sensor **TOCON_UVI** are also equipped with this SiC-based photodiode. Furthermore, the outstanding quality of sglux-sensors has been published in a number of scientific papers [4,5,...].

Please note that **Safester UVI** is designed only for detection of solar UV radiation measurements [1]. sglux offers a broad range of measuring equipment for UV-Index determination including artificial UV radiation light sources. Please do not hesitate to contact us if you are interested in any other kind of UV-measurement equipment.

MEASUREMENT IMPLEMENTATION

In order to measure the UV-Index according to the ISO 17166, **Safester UVI** sensor should be placed at a shadow-free position. Please take care that the sensor is not shaded due to nearby buildings, plants or reflections of mirroring surfaces, which would interfere with the **Safester UVI** measurements. The measurement should be performed at an elevated location with a free 360° view of the horizon. During measurement the sensor should be placed horizontally.

In case of every day applications, when you want to find out what kind of protective measures are needed for avoiding erythema, the **Safester UVI** sensor should be placed at the same location as the user. Shadows and reflections are permitted, but during this kind of measurement the sensor should be placed horizontally. Thus, UV-Index values comparable to ISO 17166 can be measured. Afterwards, the sensor can be placed at the same orientation as the irradiated person to determine the actual UV-Index values, which might be higher than the ones of the horizontal measurement. In order to implement the necessary protection, measurements at different body parts can be taken under consideration.

SAFESTER UVI UTILISATION

Connect the sensor to the USB-port of your Smartphone and turn the Smartphone on. The measurement app starts automatically. Place the sensor in the measuring position to determine the current UV-Index. The display shows the UV-Index and coloured background display. The colours correspond to the WHO nomenclature. In addition, the erythema-weighted irradiance value given in mW/m² is indicated in the lower right corner of the display. By pressing the hold button, the continuously measured UV-Index can be interrupted and the last read value is displayed. The screenshot function saves the current displayed values as images to the Smartphone.

Safester UVI

Mobile instrument for measuring the UV-Index according to ISO 17166

UNDERSTANDING OF THE UV-INDEX VALUES

Typical UV-Index values are in the range between 0 and 11. **Safester UVI** presents the UV-Index values in large figures and coloured background display. The colours correspond to the nomenclature of WHO.

The following table includes WHO's concrete recommendations of action for UV-Index values between 3 and 11 [1]. :

UV-Index 1-2	low UV-Index	No protection required
UV-Index 3-5	moderate UV-Index	Put on a shirt, put on a hat, cover-up with sun cream
UV-Index 6-7	high UV-Index	Put on a shirt, put on a hat, wear sunglasses, cover-up with sun cream; seek shade during midday hours
UV-Index 8-10	very high UV-Index	UV resistant shirt, hat, sunglasses and sunscreen are a must; avoid being outside during midday hours
UV-Index 11	extreme UV-Index	UV resistant shirt, hat, sunglasses and sunscreen are a must; avoid being outside

TECHNICAL DATA

Brief description	broadband radiometer handheld device for UV-Index determination
Main features	portable, compact measurement system consisting of UV-Index sensor with SiC-based photodiode, filter in accordance with the UV erythema action spectrum and Smartphone for data collection and monitoring
Measuring ranges	wavelength: 290 nm ... 390 nm UV-Index: 0.... 25+ erythema relevant UV radiation intensity: 0 ...625 mW/m²
Input optics	diffusor with a diameter of 11 mm, cosine corrected field of view
Photodiode	SiC erythema photodiode
Calibration	PTB-traceable factory calibration
Measurement uncertainty	<= UVI 2 ± 12 %, >UVI 2: ± 6 %, >UVI 8: ± 3%
Interface	USB 2.0
Temperature range	-5°C ... + 45 °C
Power supply	via Smartphone USB
Weight	260 g

SOURCES

1. WHO: Global solar UV index - A Practical Guide, https://www.who.int/uv/publications/en/UVIGuide.pdf

2. ISO 17166:1999(en), https://www.iso.org/obp/ui/#iso:std:iso:17166:ed-1:v2:en

3. McKinlay AF, Diffey BL, A reference action spectrum for ultraviolet induced erythema in human skin.CIE J 1987; 6: 17-22.

4. A.W. Schmalwieser, J. Gröbner, M. Blumthaler, B. Klotz, H. De Backer, D. Bolsée, R. Werner, D. Tomsic, L. Metelka, P. Eriksen, N. Jepsen, M. Aun, A. Heikkilä, T. Duprat, H. Sandmann, T. Weiss, A. Bais, Z. Toth, A. M. Siani, L. Vaccaro, H. Diémoz, D. Grifoni, G. Zipoli, G. Lorenzetto, B. H. Petkov, A. Giorgio di Sarra, F. Massen, C. Yousif, A.A. Aculinin, P. den Outer, T. Svendby, A. Dahlback, B. Johnsen, J. Biszczuk-Jakubowska, J. Krzyscin, D. Henriques, N. Chubarova, P. Kolarz, Z. Mijatovic, D. Groselj, A. Pribullova, J. Ramon Moreta Gonzales, J. Bilbao, J. M. Vilaplana Guerrero, A. Serrano, S. Andersson, L. Vuilleumier, A. Webb and J. O'Hagan (2017) UV Index monitoring in Europe. Photochem. Photobiol. Sci., 16, 1349-1370, DOI 10.1039/C7PP00178A

5. Dae-Hwan Park, Seung-Taek Oh, and Jae-Hyun Lim: Development of a UV Index Sensor-Based Portable Measurement
Device with the EUVB Ratio of Natural Light, Sensors 2019, 19(4), 754; doi:10.3390/s19040754

UV Sensor "UV-Surface_UVI"

Top looking surface-mount UV sensor for UV-Index measurements

GENERAL FEATURES

Properties of this sensor

This UV sensor is designed for very high accuracy UV-Index measurements. The measurement uncertainty of this sensor is 5% only. The spectral response curve and the field of view (cosine type) are in near perfect accordance with the requirements defined in the ISO 17166 standard. The sensor contains integrated electronics and is shielded against electromagnetic interference. The sensor can be configured as a voltage of 0 to 5 V, a current of 4 to 20 mA, CAN bus interface or USB. The UV sensor is available with a PTB traceable calibration.

Page 3 of this datasheet allows to enter the signal output requirements of the needed sensor. After selection you may forward this document to factory or agent, or alternatively use the sensor probe online configurator at www.sglux.com. Please contact us for assistance.

SPECIFICATIONS

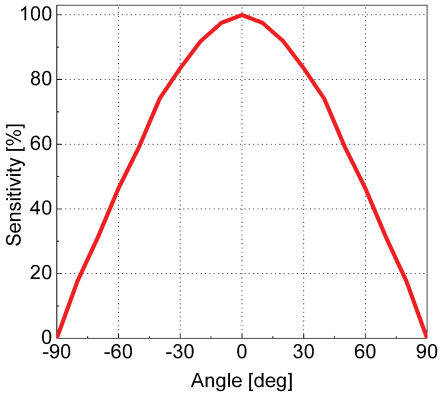
Fixed Specifications **Parameter**	**Value**
Dimensions	please refer to drawing on page 2
Weight	56 g
Spectral Sensitivity	UV-Index (erythema curve) according to ISO 17166, measurement uncertainty 5 %
Temperature Coefficient (30 to 65°C)	0.05 to 0.075%/K
Operating Temperature	-20 to +80°C
Storage Temperature	-40 to +80°C
IP Protection Class	< 80%, non condensing

Configurable Specifications **Parameter**	**Value** (page 3 shows more detailed information)
Signal Output	0 to 5 V or 4 to 20 mA or CAN bus signal (125kbit/s) or USB
Current Consumption	for 0 to 5 V = < 30 mA / for 4 to 20 mA = signal out / digital = < 17 mA
Connections	cable = 2 m cable with tinned leads on free end CAN = 2 m cable with 8 pin male connector (to converter or else) USB = with 1.5 m cable with USB-A plug
Measuring Range	up to UVI 30

UV Sensor "UV-Surface_UVI"

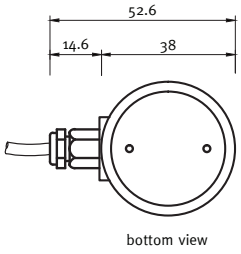
Top looking surface-mount UV sensor for UV-Index measurements

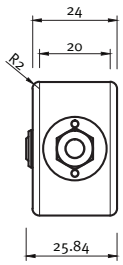
FIELD OF VIEW

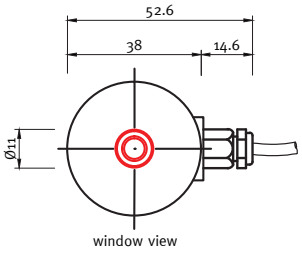


DRAWING

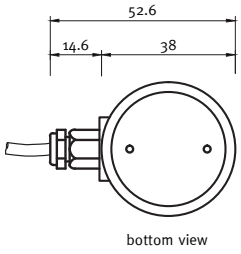
ANALOG CABLE

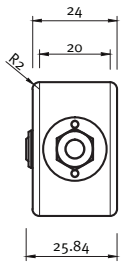


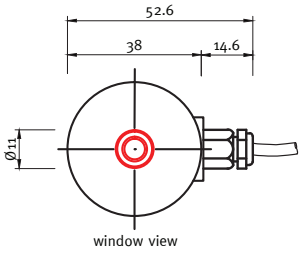


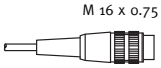


DIGITAL









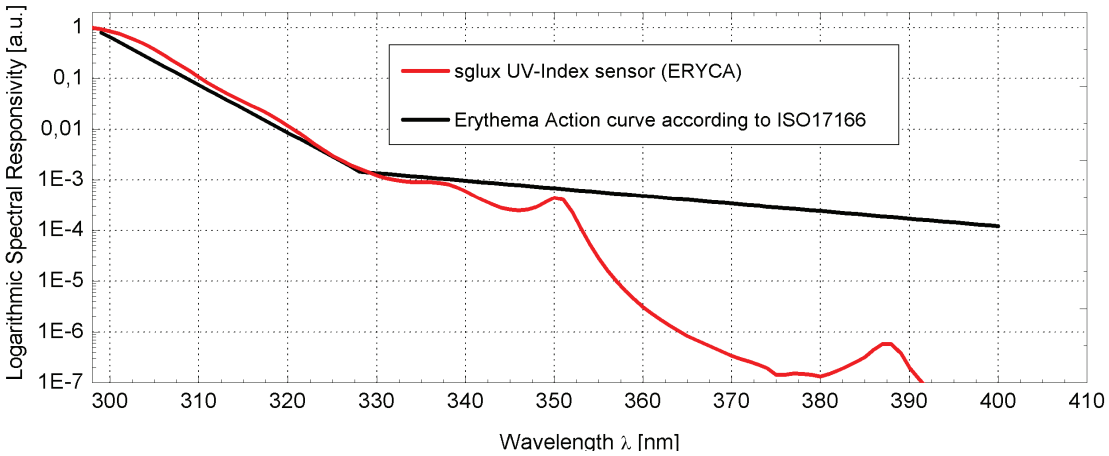
KFV 80 plug

pin layout

UV Sensor "UV-Surface_UVI"

Requirements questionaire sheet

STEP 1 ⇢ Normalized Spectral Responsivity



STEP 2 ⇢ Signal Output Type Selection

Please tick your selection. The pin configuration is shown in drawings on page 2.

Output Type	Description	Connection = "cable"
☐ 0 to 5 V	0 to 5 V voltage output proportional to radiation input. Supply voltage is 7 to 24VDC, current consumption is < 30 mA.	☐ V_- = brown, V_+ = white, V_{out} = green, shield = black
☐ 4 to 20 mA	4 to 20 mA current loop for PLC controllers. The current is proportional to the radiation, supply voltage is 24VDC.	☐ V_- = brown, V_+ = white, shield = black
☐ CAN bus signal	VSCP protocol according to the following specifications: http://download.sglux.de/probes-digital/digiprobe-can/	Pins 1 & 7 = CAN low Pins 3 & 8 = CAN high Pins 2 & 4 & 5 = GND
☐ USB	The signal is transmitted via standard USB-A plug to a computer. Software and 1.5 m cable are included. Other cable lengths on request. Programming guide available: http://download.sglux.de/probes-digital/digiprobe-usb/digiprobe_USB_Programming_Guide.pdf	

Products for UV-Index measurements

sglux The UV Experts
Boston Electronics

PHOTODIODES AND SENSORS (MEASUREMENT UNCERTAINTY ‹ 5%)

SiC UV photodiodes

UV-Index photodiodes, different active chip areas and housings, with erythema filter

SiC TOCONs

UV-Index hybrid sensor in a TO5 housing with 0 - 5 V signal output, with erythema filter

TOCON_PTFE24V_UVI

UV-Index hybrid sensor (TOCON) in PTFE housing (male thread M12x1), EMC safe, with erythema filter

TOCON_UVI

UV-Index hybrid sensor (TOCON) in PTFE housing (with G1/4" thread), EMC safe, with erythema filter

UV-Surface_UVI

top looking surface-mount UV sensor probe with cosine FOV, EMC safe, with erythema filter

UV-Cosine_UVI

waterproof UV-Index sensor probe with cosine FOV, EMC safe, for outdoor use, with erythema filter

UV-INDEX DISPLAYS AND NETWORK COMPUTERS

UV-Index reference radiometer

Reference radiometer for UV-Index measurements, incl. calibrated (PTB traceable) UVI sensor probe

Skylink UV transmitter

network computer with UV-Index sensor

STAND-ALONE UV INDEX TRANSMITTER

sglux The UV Experts
Boston Electronics

- measurement and calculation of the UV Index
- data transmission via cellular radio to a server using the MQTT protocol
- solar powered with integrated battery
- various approaches to display the UV Index measured by the unit

PRODUCT DESCRIPTION

The sglux solar cell powered stand-alone UV Index transmitter measures the UV Index according to the standard ISO17166:2019 and the WHO requirements. The UV Index quantifies the risk of sunburn at a given solar UV exposure spectrum. The unit transmits the current UV Index via cellular radio using the MQTT protocol to a server where the obtained values are stored. By default this server is hosted by sglux. Alternatively the user's server can be used. The unit does not require any wiring to the building where it is placed. It can also be used where lightning protection requirements exclude wires on the roof of a building. The unit bases on the UV sensor "sglux ERYCA" that is featured by a spectral responsivity very close to the erythema action curve (picture 1). Set-up and use of the UV Index transmitter does not require specific metrological or computer knowledge.

SPECIFICATIONS

sensor	SiC based UVI sensor "sglux ERYCA" with interference filter according to ISO17166 and WHO requirements, spectral responsivity close to the erythema action curve as defined by ISO17166, cosine field of view
measurement uncertainty	+-10%
measurement range	0.00 ..... 1.00 W/m² biological effective UV irradiance, equals to UVI 0 ... 40
calibration	versus the sun, PTB traceable
resolution	2 mW/m², equals to UVI 0.08
temperature range	-30°C ... 70°C
power supply	10 W solar cell with battery reserve, 7 days operation time under cloudy conditions
transmitted values	biological effective UV irradiance in W/m², battery voltage, charging current, battery status, internal temperature. Additional optional values (e.g. external temperature, humidity) can be measured and transmitted.
wireless connection	via cellular radio. A SIM card with a suitable data plan is required.
weight	3.4 kg
dimensions	see drawing

STAND-ALONE UV INDEX TRANSMITTER

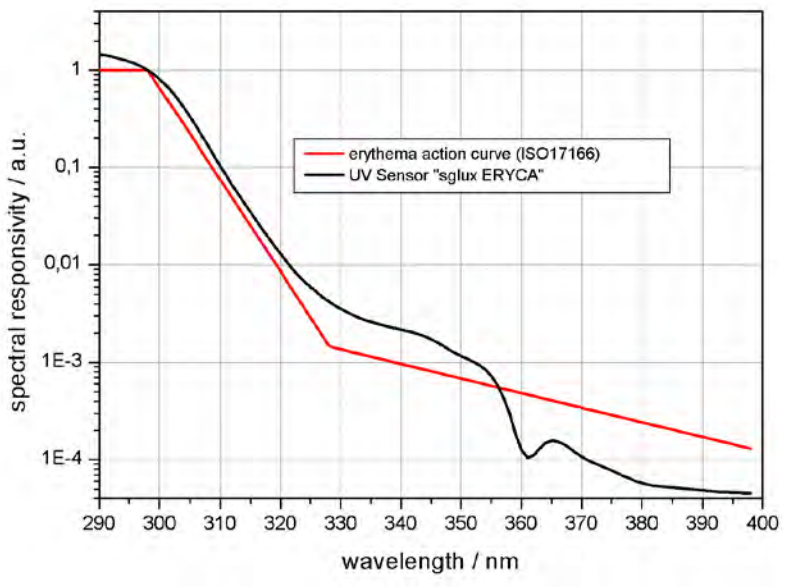


figure 1 spectral responsivity of the sglux ERYCA sensor compared with the erythema action curve according to ISO17166:2019

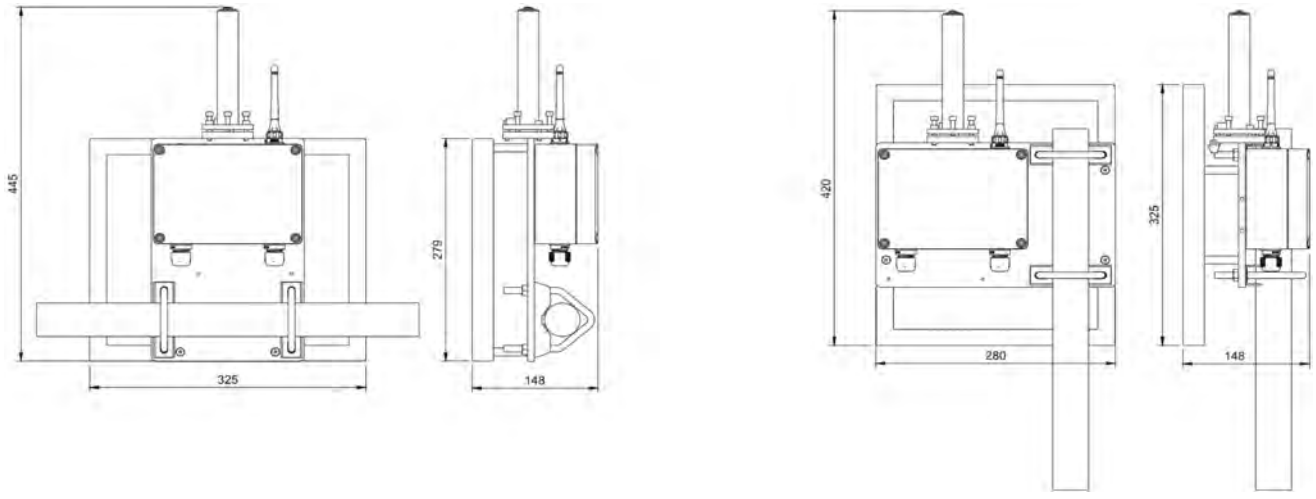


figure 2 dimensions, the drawing on left shows the horizontal (railing) mounting version and the drawing on right shows the vertical (mast) mounting version (as shown in the photo on page 1)

CUSTOMIZED APPROACHES FOR DISPLAYING OF THE RECORDED UV INDEX

There are many possible reasons to operate a UV Index measuring unit. As various are the approaches to display the obtained UV Index values. A scientific approach is to get the values from the server and to analyze and apply or publish them according to some specific research interest or according to a public authority requirement. This approach requires good meteorological and database administration skill. We supply free of charge a plug & play solution for unskilled persons. We offer a web based desktop display as shown on figure 3. It shows the current and the previous day's UV Index. The text shown on figure 3 can be deleted or modified according to the customer's requirements.

Other possible display approaches (not yet implemented) could include a smartphone optimized web site or a smartphone app. Also possible is a display optimized to a wall mounted monitor. If used in construction areas, public pools etc. a mechanical display using a clock hand pointer can be a display solution. sglux is happy to produce such special software and hardware for customized application.

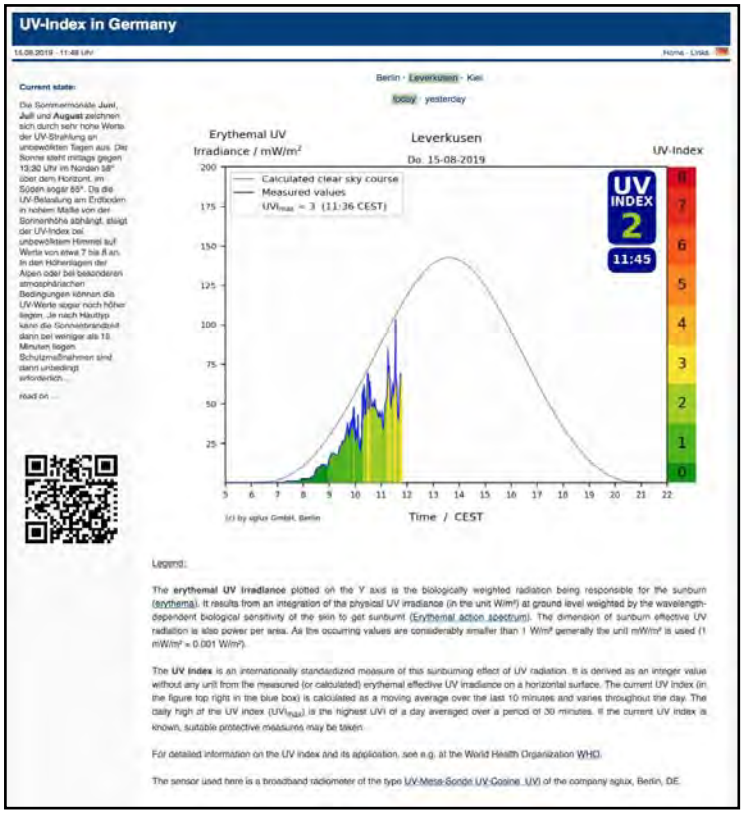


figure 3 example of the web based desktop diplay, colors and UV Index calculation according to the WHO requirements

sglux GmbH | Richard-Willstätter-Str. 8 | D–12489 Berlin | Tel. +49 30 5301 5211 | welcome@sglux.de | www.sglux.de
Rev. 2.0 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.