BTS256-UV

https://www.gigahertz-optik.com/en-us/product/bts256-uv/

Product tags: UV , Handheld device ,

Description

High Intensiy UV Measurement Applications

Typical applications for high-intensity radiation sources in the ultraviolet and blue spectral range are UV radiation curing, solar simulation, UV sterilization, UV test systems, and UV sewer rehabilitation. For process-based applications with repetitive measurement tasks, broadband radiometers such as the X1-RCH-116 LED UV Curing Meter are generally the most effective solution because of their ease of use, value for money, and low re-calibration cost.

UV Spectroradiometer vs. UV Broadband Radiometer

Spectroradiometers such as the BTS256-UV are **an alternative to broadband radiometers that provide additional information about the spectral distribution of radiation sources**. The spectral information is particularly important if the wavelength-dependent aging behavior of broadband UV lamps must be investigated or if the irradiance must be measured in different wavelength ranges. This is also important if sources of differing spectral distribution must be measured. For this purpose, broadband radiometers ideally require separate calibration factors that take these spectral differences into account. This is not necessary with spectroradiometers. In addition, spectroradiometers offer more precise measured values than broadband radiometers. This is due to their spectral sensitivity function which corresponds to a rectangular function in the selected spectral measuring range. For precise measurements in the UV spectral range, very good stray-light rejection is necessary, which is not provided by the array spectrometers typically available on the market.

BTS256-UV Spectroradiometers Comply with the Latest Design Criteria for Spectroradiometric Measuring Instruments with Superb Stray Light Correction for a Portable Meter

Wide Spectral Sensitivity Range and Perfectly Suited for all Kind of UV Sources (LED, HMI, etc.)

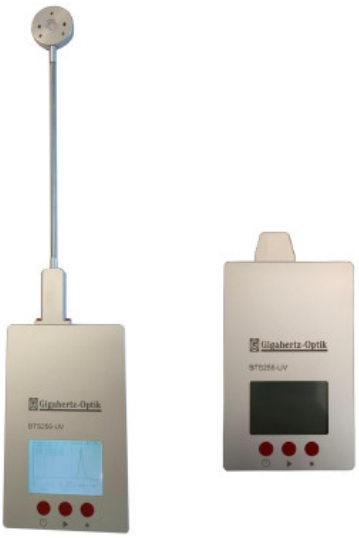
The spectral sensitivity range from 200 nm to 525 nm enables the precise irradiance measurement in the ultraviolet to blue wavelength range. Even the long-wave spectral component of UVA LEDs, which typically range up to approximately 490 nm, is completely captured. In particular, applications in UV or Blue Light curing and trends in the use of shortwave LEDs down to the UVC range are supported with this wide spectral range.

Cosine Field of View (f_2) and Flat Design

When measuring extended light sources, correct measurement of the angle-dependent irradiance requires a cosine corrected field of view function of the instrument. In addition, the distance of the sensor to the irradiance reference plane must be as small as possible. With a height of only 12 mm and precise cosine field of view (low f_2), the BTS256-UV measuring instruments are among the thinnest spectroradiometers on the market that are suitable for the precise measurement of absolute irradiance.

Stray Light Correction and Automated Dark Signal Subtraction

Stray light and dark signal both have a significant influence on measurement results of UV spectroradiometers with CCD or CMOS array sensors. Stray light is always critical if the emission spectrum of UV lamps has a long-wave component (VIS to IR), which leads to stray



BTS256-UV-4 hand-held measuring device with flexible detector head.

light in the actual measuring range of the device. The intensity of stray light in the UV range can easily exceed the intensity of the actual measurement signal and thus lead to considerable measurement errors. In contrast, dark signals are caused by operating temperature fluctuations during hand-held use and by the variation of integration times required for the measurement of differing irradiance levels.

Despite their very flat design, BTS256-UV spectroradiometers **incorporate innovative stray light correction** with an integrated optical filter as well as a dark level shutter as standard. Both functions are automated. This guarantees precise irradiance measurements of different emitter types and over varying operating temperatures.

Robust against Intense UV Radiation and High Temperature

In practice, spectroradiometers are often exposed to the high intense UV radiation and temperature effects that is supposed to trigger aging effects or crosslinking processes in an application. The BTS256-UV spectroradiometers are built into a **stainless steel housing that has excellent UV stability and low thermal conductivity** to protect the electronics. At the same time, the stability of the wavelength and irradiance readings of the meter is ensured.

Portable Hand-held UV Spectroradiometer and Process Flow Meter (Conveyor Belt)

With the BTS256-UV-1 hand-held meter, the sensor entrance optic is placed 250 mm away from the main meter. As such, it can be positioned in front of the radiation source without exposing the operator to hazardous levels of UV radiation. The sensor itself is extremely flat with an overall height of 8 mm. The calibration of the BTS256-UV-1 is carried out over a wavelength range of 225 nm - 525 nm.

With the BTS256-UV-2 flow meter, the sensor is attached directly to the meter. As such, it is ideal for UV systems where samples pass below the UV light sources on a conveyor belt. The calibration of the BTS256-UV-2 is carried out over a wavelength range of 200 nm - 525 nm.

Fast Internal Data logger

In addition to their spectral sensor, the BTS256-UV spectroradiometers include a broadband photodiode as a second detector for **fast temporal sampling**. This enables a much higher data logging rate than can be reached using only the array sensor.

IEC 61215 Series UV Preconditioning Tests of PV Modules

The qualification of PV modules according to IEC 61215 series requires preconditioning with defined doses of UVA and UVB radiation. Unlike conventional radiometers, the BTS256-UV spectroradiometer enables the most accurate measurement of UVA and UVB irradiance levels irrespective of the type of UV source used. Each device is supplied with a traceable calibration certificate and is designed to operate at the required high temperature. **See some further details in the application article about the IEC 61215 and IEC 61646 measurements**.

Factory calibration and ISO 17025 Test Certificate

The **ISO 17025 accreditated measurement laboratory of Gigahertz-Optik offers high quality, traceable factory calibrations of their BTS256-UV**. Factory calibrations are handled in Gigahertz-Optik's calibration laboratory using the same quality management procedure as per NMI accredited test measurements. NMI accredited testing measurements with an ISO/IEC/EN 17025 testing certificate are optionally available.

BTS256-UV-1 hand-held with safety distance to UV radiation

BTS256-UV-2 Continuous flow meter for use on conveyor belts

BTS256-UV-2 Continuous flow meter for use on conveyor belts / Back view
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BTS256-UV-2 Continuous flow meter for use on conveyor belts / Back view

BTS256-UV-3 for measurement in direction of the upper side of device

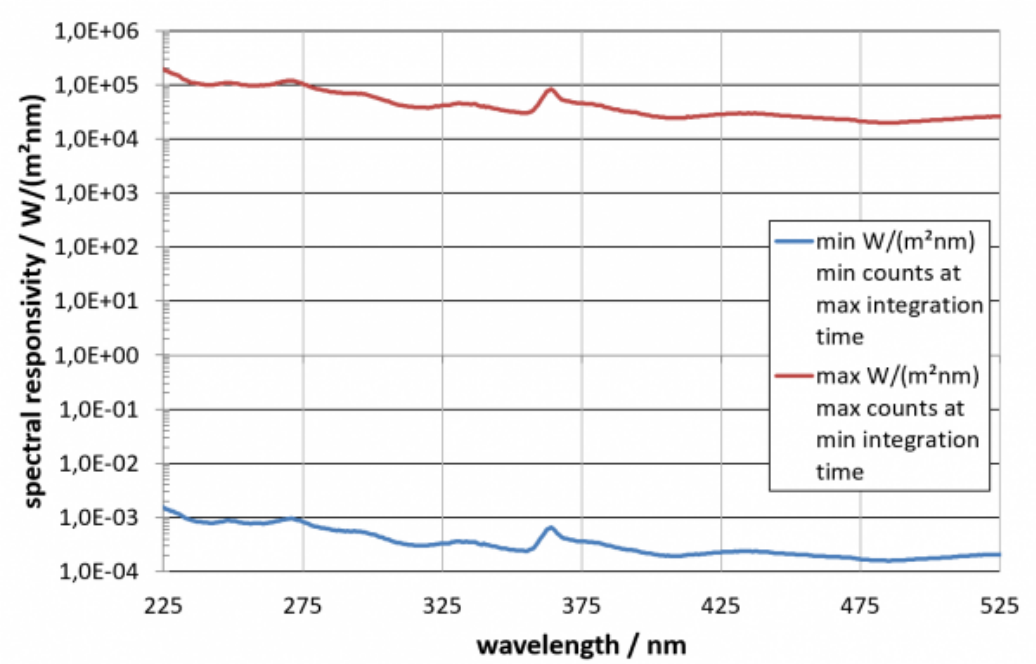
Specifications

General	
Short description	Spectroradiometer for irradiance and dose of intense UV radiation in the wavelength range 200 nm to 525 nm.
Main features	12 mm height. Stainless steel housing enables high temperature operation and intense UV radiation measurement. Electromechanical aperture for offset compensation. Internal stray light suppression. Traceable calibration.
Measurement range	up to 50,000 mW/cm² , 200 nm to 525 nm.
Typical applications	Measurement device for process control in UV curing applications both as a process flow meter as well as a mobile handheld measurement device, UV accelerated ageing of drugs, use inside environmental chambers with UV light sources.
Calibration	Factory calibration, traceable to international standards.
Product	
Sensor	Bi-technology sensor with a broadband sensor and an array spectroradiometer. Integrated aperture for automatic dark adjustment.
Input optics	different input optics. For example diffuser with 10 mm diameter directly on the device or diffuser with 9 mm diameter on heat-resistant rod.
Spectral Detector	
Chip	CMOS detector
Spectral range	(200 - 525) nm
Optical Bandwidth	2.8 nm
Data Resolution	0.1 nm

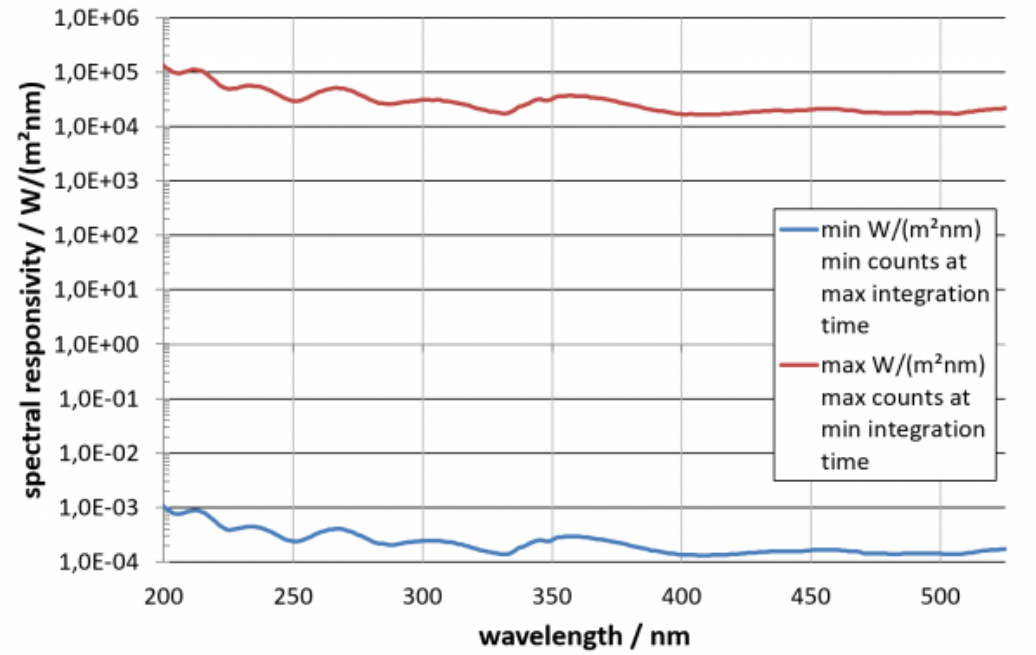
Integration Time	12 µs - 30 s [before update: (5.2 - 30000) ms]
Shutter	Automatic aperture for dark signal measurements with the same integration time as the integration time of the measurement. In addition, stray light correction by means of built-in color filter (OoR correction). Aperture delay = 100ms.
Peak wavelength	+/- 0.3 nm
Typical measurement time	BTS256-UV-2 and BTS256-UV-3: typical 360 nm LED with 50 mW/cm² - 18 ms typical 400 nm LED with 50 mW/cm² - 10 ms BTS256-UV-1: typical 360 nm LED with 50 mW/cm² - 24 ms typical 400 nm LED with 50 mW/cm² - 12 ms
Integral Detector	
ADC	12Bit
Measurement time	(0.1 - 6000) ms
Temperature range	The measured values of the diode are corrected by means of an internal temperature sensor.
Filter	Mathematical adjustment of the responsivity to a rectangular function from 250 nm to 450 nm (SMCF correction). * * The spectral responsitivity of the diode does not correspond to a rectangular function (not possible with optical filters). When measuring light sources with a spectrum that deviates from the calibration spectrum of the integral detector (UV LED, peak at 405 nm), the measurement result is corrected using SMCF. The uncertainty of this correction depends on the quality of the measured spectrum (noise) and the size of the correction factor (spectral range). To correctly calculate the SMCF, the entire spectrum of the radiator to be measured must be measured. If the emitter has radiation outside the spectral sensitivity range of the measuring device, this increases the uncertainty of the SMCF.
Typical irradiance	Blue LED with Peak @405 nm: (2E-3 - 2E3) W/m²
Graphs	

Spectral responsivity

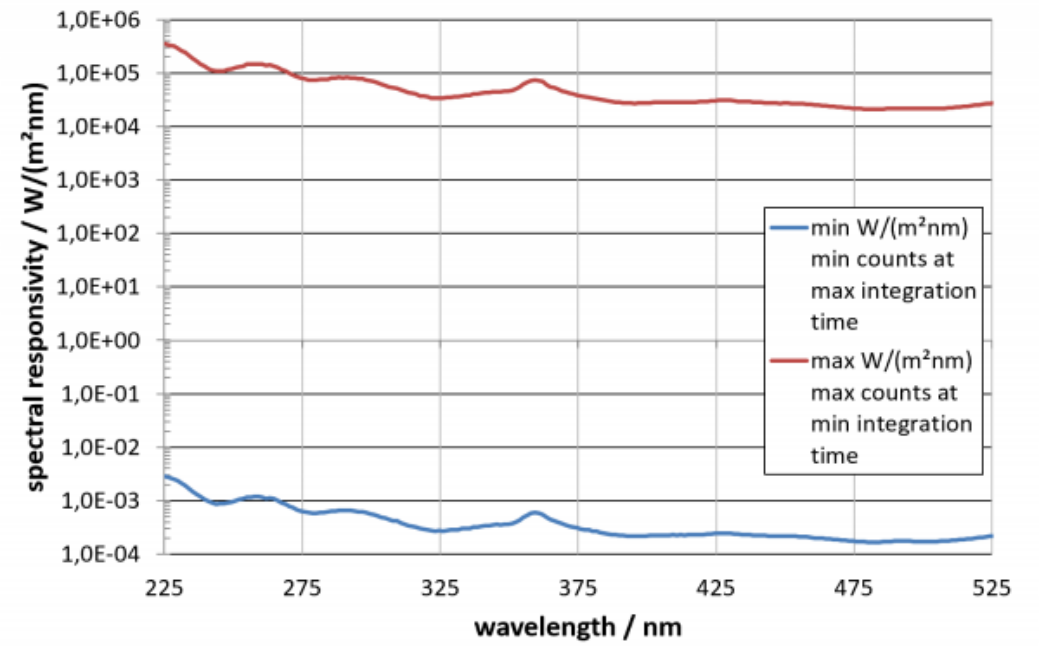
typical spectral responsivity BTS256-UV-1 (standard calibration 225 nm to 525 nm):



typical spectral responsivity BTS256-UV-2 and BTS256-UV-3 (standard calibration 200 nm to 525 nm):



typical spectral responsivity BTS256-UV-4 (standard calibration 225 nm to 525 nm):



Miscellaneous	
Microprocessor	16Bit, 25 ns command cycle time
Power Supply	5 VDC, 450 mA by USB
Interface	USB 2.0 (type mini USB) RS-485
Weight	275 g
Dimensions	basic body BTS256-UV-1 and BTS256-UV-3: 148 mm x 92 mm x 13 mm (length x width x height) basic body BTS256-UV-2: 148 mm x 92 mm x 12 mm (length x width x height)
Logger memory	100 samples (spectral data), 10000 samples (diode)
Temperature range	Operation: +10°C bis +30°C (The temperature at the measuring head can be higher for a short time) Storage: -10°C bis +50°C
Battery runtime	Lithium-Ion battery with 1400 mAh 10 hours with display backlight on and continuous measurement 60 hours in stand-by with backlight off

Downloads

Type	Description	File-Type	Download
BTS256-UV Technical datasheet	BTS256-UV Brochure	pdf	https://www.gigahertz-optik.com/assets/Uploads/Technical-Datasheet-BTS256-UV-210x297-EN-RZ-web.pdf

Type	Description	File-Type	Download
BTS256-UV-1	Technical drawing	pdf	https://www.gigahertz-optik.com/assets/V127889.pdf
BTS256-UV-2	Technical drawing	pdf	https://www.gigahertz-optik.com/assets/V128039.pdf

Purchasing information

Article-Nr	Modell	Description
Product		
15314251	BTS256-UV-1	Measuring device with rigid light guide sensor, carry case, users guide, factory calibration certificate, application software.
15314455	BTS256-UV-2	Measuring device integrated sensor back side, carry case, users guide, factory calibration certificate, application software.
15314460	BTS256-UV-3	Measuring device integrated sensor front side, carry case, users guide, factory calibration certificate, application software.
15314462	BTS256-UV-4	Measuring device with flexible light guide sensor, carry case, users guide, factory calibration certificate, application software.
Calibration		
15310353	KP-BTS256UV1-E-S	ISO/IEC 17025 testing of a BTS256-UV-1 including test certificate.
15310354	KP-BTS256UV2-E-S	ISO/IEC 17025 testing of a BTS256-UV-2 including test certificate.
15312249	KP-BTS256UV4-E-S	ISO/IEC 17025 testing of a BTS256-UV-4 including test certificate.
Re-calibration		
15310351	K-BTS256UV1-E-S	Re-calibration of a BTS256-UV-1 including factory certificate.
15310352	K-BTS256UV2-E-S	Re-calibration of a BTS256-UV-2 including factory certificate
15312248	K-BTS256UV4-E-S	Re-calibration of a BTS256-UV-4 including factory certificate.
15311115	KKP-BTS256UV1-E-S	ISO/IEC 17025 testing of a BTS256-UV-1 including test certificate and factory certificate.
15311116	KKP-BTS256UV2-E-S	ISO/IEC 17025 testing of a BTS256-UV-2 including test certificate and factory certificate.
15312250	KKP-BTS256UV4-E-S	ISO/IEC 17025 testing of a BTS256-UV-4 including test certificate and factory certificate.

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- Calibrations & Re-Calibrations (ISO/IEC 17025 Calibration Services, factory calibration, Calibration of Third-Party Products)
- Repairs & Updates
- OEM & Feasibility Consulting of Customized Solutions

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