BTS256-E *Preliminary Datasheet*

Technological Advances in General Lighting

The latest trends in general lighting involve replacing traditional light sources with SSL Solid State Lighting for energy savings, relatively lower cost and longer lifetime. Fluorescent tube and CFL compact fluorescent lamps are also preferable to incandescent type sources.

New Lightmeter for Solid State Lighting

In the same way that traditional incandescent light bulbs are slowly being phased out due to inefficient operation the traditional illuminance meter or *Luxmeter* has had to undergo a redesign in order to accurately measure these new technology light sources. A state-of-the-art Luxmeter must be able to accurately measure LED based light sources with illuminance, spectral distribution and luminous color measurement capability.

State-of-the-Art LED Illuminance Meter

Gigahertz-Optik's new BTS256-E LED-Luxmeter provides all necessary data required to qualify LED type general lighting installations. It's Bi-Technology light sensor with a precise cosine corrected light collecting optic are its key components ensuring accurate light, color and spectral measurements over a wide dynamic measurement range.

256-Pixel Diode Array Spectral Radiometer

The BTS256-E Bi-technology light sensor's 10nm spectral bandwidth combined with 256 pixel resolution meets the requirements for accurate luminous color data calculation. A built-in remote shutter for dark-signal pixel offset compensation expands the dynamic range of the C-MOS diode array detector.

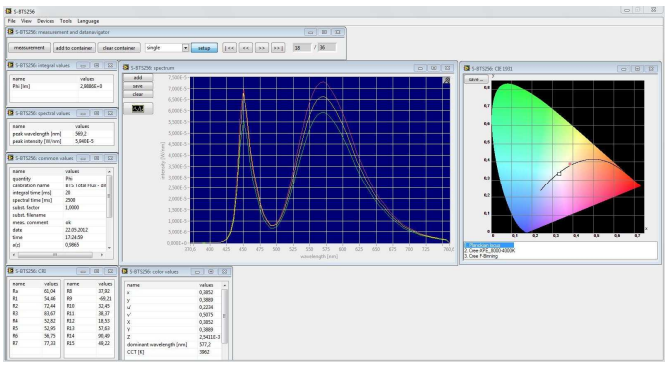
Photometric Corrected Photodiode

Silicon photodiode type photodetectors offer the widest possible linear dynamic range of up to eight decades. Gigahertz-Optik's unique Bi-Technology light sensor with a photometric corrected silicon photodiode offers therefore linearity within a wide dynamic measurement range. The handicap of spectral mismatching errors of filter corrected photodiodes is compensated on-line using the diode array's spectral measurement data.

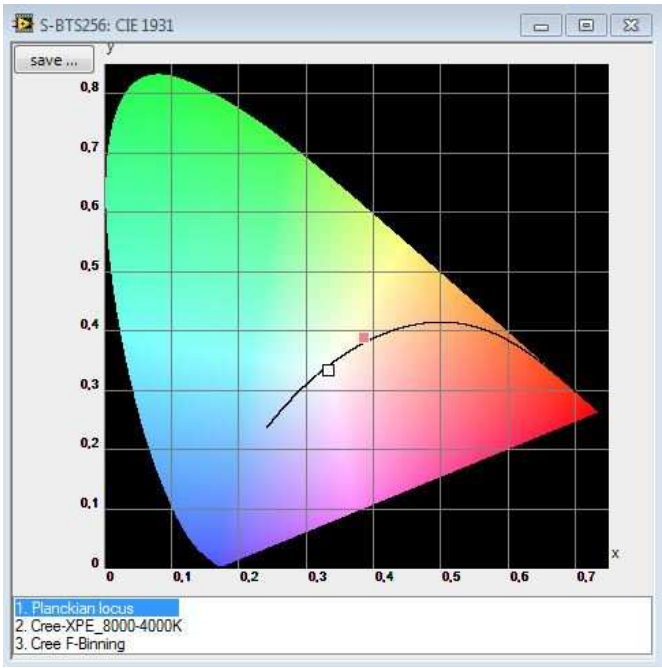
Precise Measurement of PWM Light Sources

The Bi-Technology sensor supports the measurement of Pulse-Width-Modulated light sources by self-synchronization with the signal of the photodiode.

BTS256-E LED-Luxmeter



S-BTS256-E Software with configurable Desktop



Graphical Display CIE 1931 chromaticity diagram. Can be enlarged to full screen size.

Precise Cosine Corrected Field-of-View

A basic requirement for accurate illuminance measurements in general lighting application is that the light meter must have a cosine corrected field-of-view for incident light reaching the detector at all angles.

Large 20mm Diameter Light Input Optic

A large diameter input optic is important to average out any hot-spot effects in general lighting set-ups. Beside that a large diameter input optic magnifies the light meters sensitivity.

Compact and Rugged LED-Luxmeter

Gigahertz-Optik's new BTS256-E LED-Luxmeter is one of the most compact hand-held LED lightmeters available. Its robust aluminum housing protects the high precision internal electronics and electro-optics with excellent ambient electromagnetic shielding.

On-Board Display for Use without PC

For mobile use the BTS256-E LED-Luxmeter operates on a rechargeable lithium battery and features a 60x52 mm large size 240x160 pixel resolution transflective display located on the same side of the housing as the input optic. Three front panel control buttons control all meter functions.

USB2 Interface for PC Operation

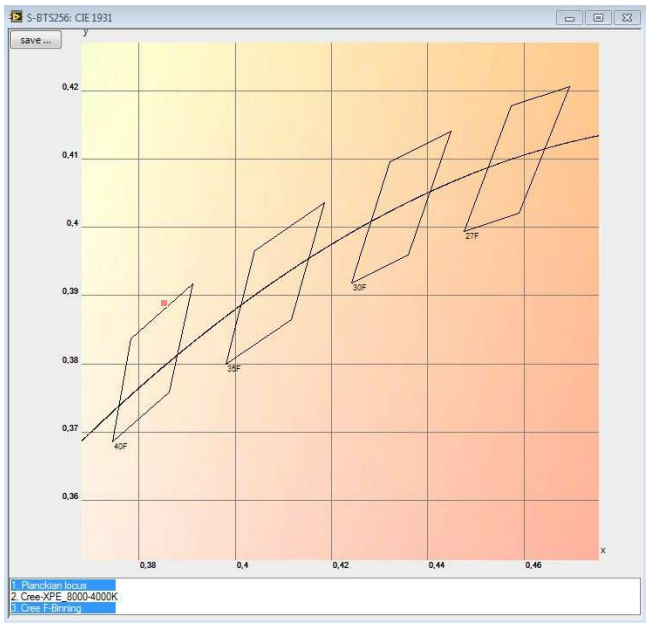
For use with a PC and data read-out the BTS256-E LED-Luxmeter has a USB2 interface for data communication and to recharge the battery.

PC Software

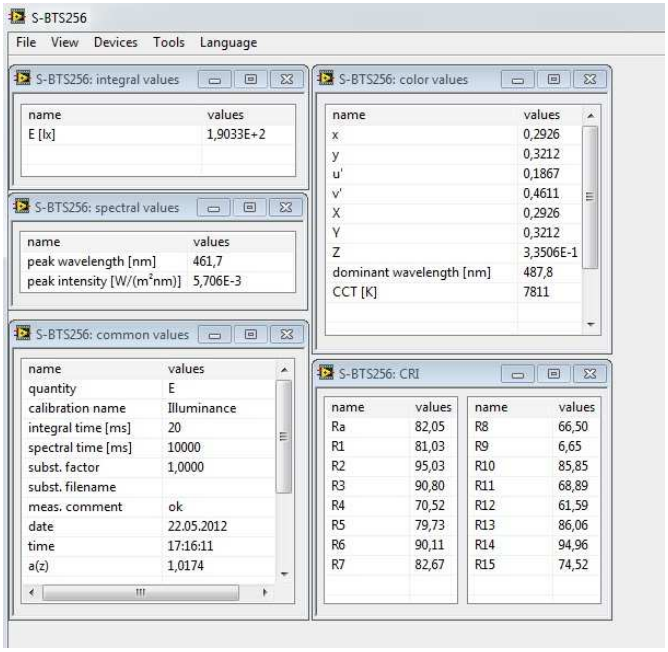
The S-BTS256-E software includes all features necessary for measurement, display and data export in the lab, field or in fabrication. It supports complete control of the BTS256-E and all peripheral Gigahertz-Optik equipment supplied with it. The software offers different routines for data acquisition, a selection of numerical and graphical displays for data visualization and different export options such as ASCII format and Microsoft Excel.

Software Development Kits

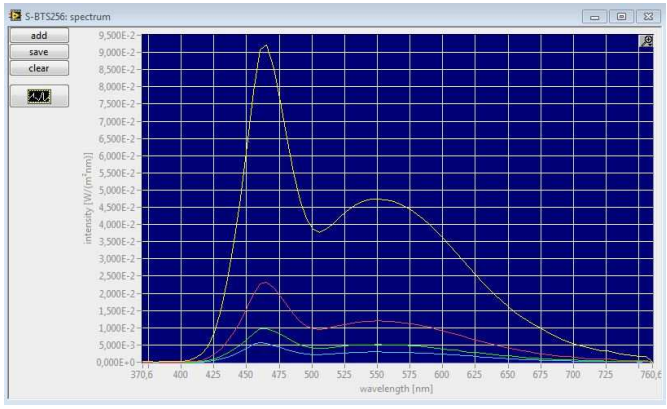
For system integration purposes and self-programmers, Gigahertz-Optik GmbH offers software development kits. SDKs are available for National Instruments LabView, Microsoft .NET, C/C++. The software development kits make it easier to embed the BTS256-E LED-Luxmeter within customer self-made software.



CT bins within the CIE 1931 Chromaticity diagram.



Numerical data displays including Color Rendering Data from Ra to R15.



Graphical display for multiple test sources spectrum. Can be enlarged to full screen size.

Specifications

Sensor Design	BiTech Sensor with fine photometric matching photodiode and 256 pixel CMOS photodiode array. Integrated shutter for remote controlled offset compensation.
Light-input Optic	20mm diameter diffuser window with cosine corrected field of view. F2 error < 3 %
Integral Sensor	Silicon photodiode with photometric correction filter. Transimpedance amplifier with integration time setting from 100µs to 6s. Seven (7) measurement ranges with correction range transcendent offset correction. 16Bit ADC
	Max measureable Illuminance value ≥199,999 lx Noise equvalent Illuminance value ≤ 0.01lx
Spectral Sensor	CMOS diode array spectrometer. Spectral range 380 to 750nm. Pixel resolution 1.5nm. optical resolution 10nm
	Integration time setting from 5.2ms to 30s in manual or automatic mode
	Remote operated shutter for dark signal measurements with identical integrating time than that of the measurement. Delay 100ms open state, 100ms close state
	Measurement time at 199,999 lx ≤ 5ms (white light) Measurement time at 100 lx ≤ 1s (white light)
	Illuminance calibration uncertainty +/-3.2%
	Peak wavelength: +/- 1nm
	Dominant wavelength: +/- 1nm
	Δx, Δy reproducibility: Standard Illuminant A +/-0.0001, LEDs +/- 0.0002 at 2000cts Peak -power
	Δx, Δy uncertainty: Standard Illuminant A +/-0.002, LED +/- 0.004
	CCT Measurement range: 1700 to 17000 K
	ΔCCT: Standard Illuminant A 50K; LED up to +/- 4% depending of LED spectrum
	Color Rendering Index Ra and R1 to R15
Microprocessor	16Bit, 25ns instruction cycle time
Power	5VDC
Remote interface	USB2; Mini USB connector
Temperature	operating: 10 to 30°C Storage: -10 to 50°C
Dimensions/Weight	160mm (6.3 in) L x 85mm (3.3) W x 60mm (2.4 in) H. Weight: 500g (1.1 lb)
Carrying case	hard case, 333 x 280 x 70mm, 650g

Purchasing Information		
Model	**Item No.:**	**Description**
BTS256-E	102826	BTS256-E, operation manual, USB cable for recharge at PC
BHO-17	102828	Hard case for storage and transportation of BTS256-E
S-BTS256-E	tbc	User Software; CD with software and operation manual
S-SDK-BTS256-E	tbc.	Software Development Kit; CD with software and operation manual
Re-Calibration:		
K-BTS256-E-I	300264	Re-calibration of BTS256-E LED-Luxmeter

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