

8-BANDS SPECTRUM LIGHT USB SENSOR

SPECTRUM100



DESCRIPTION

The SPECTRUM100 is a very versatile unit. It is designed using three specialized sensors that detect ultraviolet (UVA, UVB), ambient light (ALS) that matches real human eye responses, colour (RGB), infrared (Ir) and a large white light band. All three sensors are very sensitive and stable in time within their ranges of respective detection and are factory temperature compensated for a minimum temperature offset. The compact enclosure form factor allows for easy integration even in space-constrained locations.

APPLICATIONS

- OEM
- Greenhouse
- Ambient light level
- On- / off-lighting system
- Event counting
- Backlighting level
- LIMS integration
- Monitoring light colour changes
- Building automation
- Equipment light monitoring

INSTALLATION TIME

Less than 10 minutes

UNIQUE SERIAL NUMBER

Each unit is assigned a unique serial number allowing for traceability and certification

FREE DAQ SOFTWARE

Real-time data visualization and logging

DATA INTEGRATION

Command-line tools for direct data access and integration

OPTIONS

Virtual COM Port (VCP) communication protocol

ALSO AVAILABLE

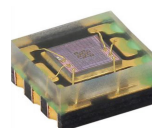
Traceability certificates

SPECIFICATIONS

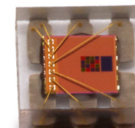
Parameter	Condition	Value	Units
ALS^[1]			
Detection range ^[2]		0 to 120 000	lx
Digital resolution		0.072	lx/step
Dynamic range		16	bit
Tolerance		≤10	%
Flicker noise rejection		100, 120	Hz
Dark offset	Dark light	3	step
Light spectral response ^[3]	Peak	550	nm
Built-in algorithms ^[6]		Filtron™	
White light			
Detection range ^[2]		0 to 120 000	lx
Digital resolution		.0072	lx/step
Dynamic range		16	bit
Tolerance		≤10	%
Flicker noise rejection		100, 120	Hz
Dark offset	Dark light	3	step
Light spectral response ^[4]	Peak	600	nm
Built-in algorithms		O-Trim™	
Colour (RGB) and Infrared light			
Detection range ^[2]	Green ch., It = 40mS	0 to 16496	lx
Digital resolution		0.007865	lx/step
resolution	Each channel	16	bit
Built-in algorithms ^[6]		Filtron™	
Irradiance responsivity ^[5]		96, 74, 56	counts/ uW/ cm2
RGB spectral response	Typ., peak	650, 550, 450	nm
IR spectral response	Peak	850	nm
RGB spectral bandwidth	λ 0.5	± 35, ± 35, ± 40	nm
Dark offset	Max	3	steps

SPECIFICATIONS

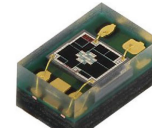
Parameter	Condition	Value	Units
Ultraviolet A and B light			
UVA responsivity	–	0.93	counts/ uW/cm2
UVA spectral response	Peak	365	nm
UVB responsivity	–	2.1	counts/ uW/cm2
UVB spectral response	Peak	330	nm
Spectral bandwidth range	UVA or UVB	±10	nm
Resolution	Up to 65536 counts	16	bits
General			
Angle of Half Sensitivity		55	°
Power supply			
Voltage	Powered through a USB port	5	V
Current consumption	Max., at 5V	25	mA
Mechanical			
Dimensions	7L X 2W x 1H	–	cm
Colour	–	Black	–
Weight	–	8	g



ALS and white light
sensor



Red, Green, blue and Ir
sensor



UVA and UVB
sensor

SPECIFICATIONS

Parameter	Condition	Value	Units
Housing and USB cable			
Temperature operating range	—	0 to 70	°C
Humidity operating range	Non condensing	10 to 90	%RH
Material	—	ABS	—
IP rating ^[7]	—	51	—
System galvanic isolation	—	None	—
USB cable length	—	1 (3)	m (ft)
Miscellaneous			
Communication Interface		USB 2.0	
USB cable length	Maximum	2	m

^[1] Ambient Light Sensor sensitivity spectrum close to human eye photopic curve.

^[2] Light source: white LED.

^[3] See figure 1

^[4] See figure 2

^[5] $\lambda_{p0} = 619 \text{ nm}$, $\lambda_{p0} = 518 \text{ nm}$, $\lambda_{p0} = 467 \text{ nm}$.

^[6] Filtron™ provides a spectrum matching real human eye responses.

^[7] If water splashing is possible, protect the sensor and the cable converter using extra precautions. Extra housing may be required depending on the application.

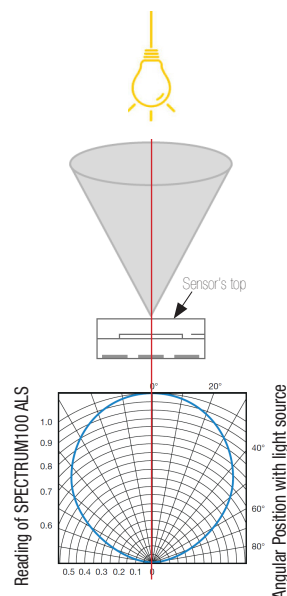


Fig. 5 - Relative radiant sensitivity vs. angular position

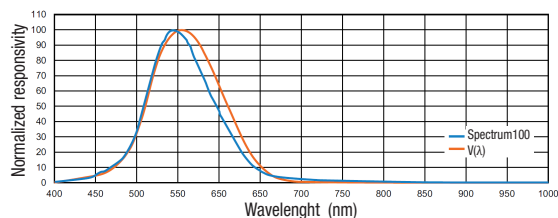


Fig.1- SPECTRUM100 (ALS) ambient light (ch.06) spectral response VS human eye response $V(\lambda)$

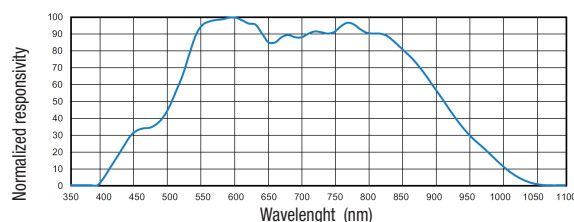


Fig. 2- SPECTRUM100 white light (ch.07) spectral response

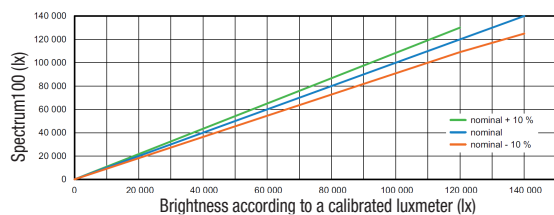


Fig. 3- SPECTRUM100 (ALS) ambient light (ch.06) measurement deviation between different light sources

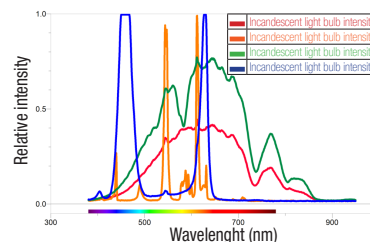


Fig. 4 - Typical spectral emission for different light sources

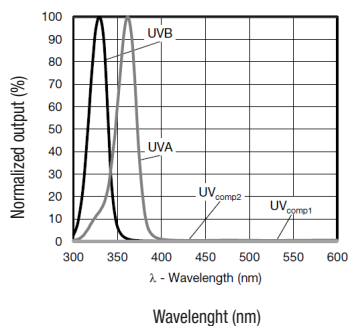


Fig. 7- SPECTRUM100 UVA and UVB light (ch.04, 05) normalized spectral response

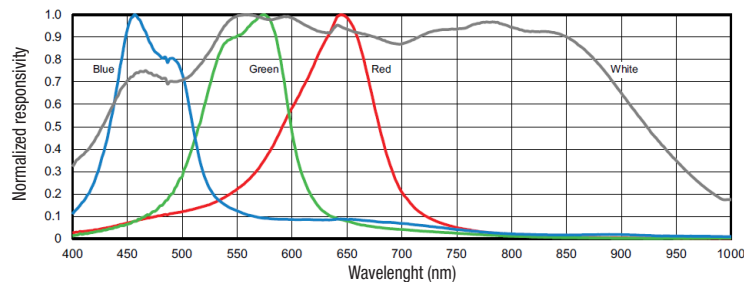


Fig. 8- SPECTRUM100 RGB light (ch.03, 01, 02) normalized spectral response

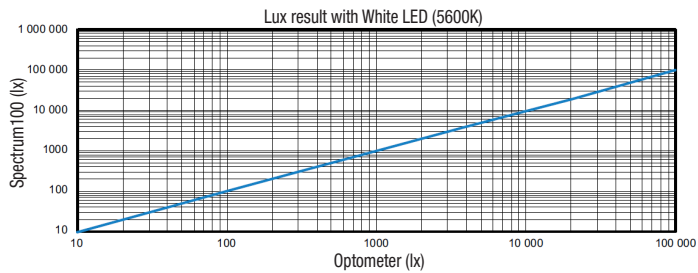


Fig. 5- SPECTRUM100 ALS light (ch.06) lux value vs Optometer lux value (up to 120000 lx)

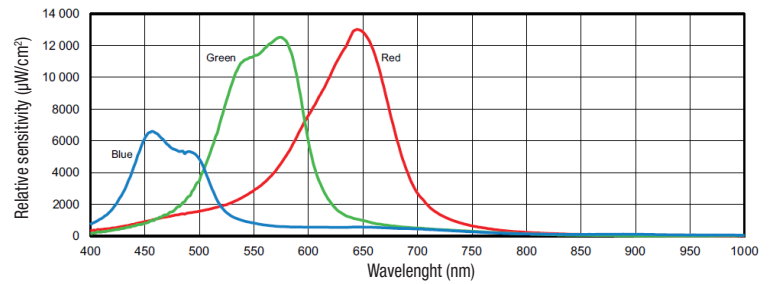


Fig. 6- SPECTRUM100 RGB light (ch.03, 01, 02) relative responsivity vs wavelength

CHANNEL ID*	DECIPTION	TYPE	NATURE	COMMENT
00	IR light intensity	IR light intensity	Real	Raw
01	Green light intensity	Green light intensity	Real	Qualitative
02	Blue light intensity	Blue light intensity	Real	
03	Red light intensity	Red light intensity	Real	
04	UVA light	UVA	Real	
05	UVB light	UVB	Real	
06	Ambiant light	Ambiant light	Real	
07	White light	White light	Real	

* Channel Id as it appears in QTenki. Virtual channel Id differ in QTenki and usbtenkiget.

EXAMPLES OF TYPICAL LUMINANCE VALUES		
DESCRIPTION	LUMINANCE	UNIT
Light from Sirius, the brightest star in the night sky	0.00001 (10^{-5})	lx
Total starlight, overcast sky	0.0001(10^{-4})	lx
Moonless clear night sky with airglow	0.002	lx
Quarter moon, 0.27 lx; full moon on a clear night	0.01	lx
Full moon overhead at tropical latitudes	1	lx
Dark limit of civil twilight under a clear sky	3.4	lx
Family living room	50	lx
Hallway / bathroom	80	lx
Very dark overcast day	100	lx
Office lighting	320 to 500	lx
Sunrise or sunset on a clear day	400	lx
Overcast day; typical TV studio lighting	1000	lx
Full daylight (not direct sun)	10000 to 25000	lx
Direct sunlight	32000 to 130000	lx

CAUTION: Keep in mind that electromagnetic interferences (EMI) may adversely reduce the precision of the sensor. Avoid using this unit close to EMI sources such as or, transformers, high voltage and fluorescent light.

CAUTION: Avoid installing the sensor in a location where considerable vibrations may be present. Large vibrations can introduce extra inaccuracy in the pressure readings.

NOTE: This product is not waterproof and must be protected if contact with water is possible. If the probe is inadvertently splashed or submerged in water for a few seconds, unplug the unit, shake it up and let it dry.

TIP: For best performance and accuracy, place the sensor at the point of interest (*i.e.* where you need to know the amount of light).

TIP: Best accuracy is reached when the sensor is facing the source (directly looking at the source, zero degree angle). Avoid placement where the sensor is at an angle from the source.

TIP: As for any precision measurement equipment, it is advised to power on the unit at least 15 minutes before using it.

Warning: This product is not designed for use in, and should not be used for, human applications.

Note: While every effort has been made to ensure accuracy in this publication, no responsibility can be accepted for errors or omissions.

Note: Data may change without notification, and you are strongly advised to obtain copies of the most recently issued datasheet.

ORDERING		
PRODUCT(S)		
PART NUMBER	OPTION	DESCRIPTION
601042	USB-SPECTRUM100	5-BANDS SPECTRUM LIGHT USB SENSOR