OL0028

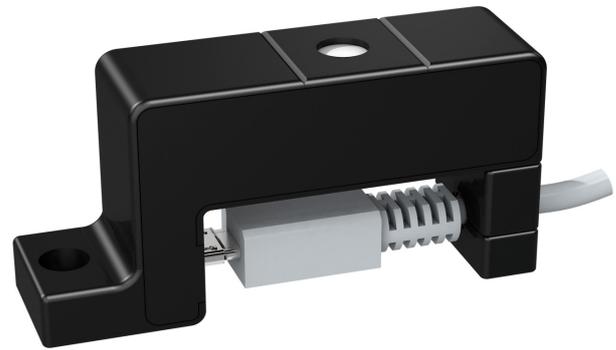## Ambient Light Analyzer

Article-No: 0110400028010710

Safety instructions and warnings

This measuring instrument must not be used if the safety of personnel depends on the correct functioning of the measuring instrument in the associated application (no safety component in accordance with the EU Machine Directive).

Installation, replacement and maintenance of the measuring instrument must only be performed by qualified personnel.

Make sure to carefully read the manual before operating the measuring instrument and the related software for the first time!

Technical data

Power supply	USB 5V
Power input	35mA
Connection	■ Exchangeable USB 2.0 cable, USB Micro-B port, screwed strain relief provided on the instrument ■ Digital IO, 3x socket contacts with 2.54mm pitch spacing. Suitable for the connection of precision connectors
Wavelength range	VIS, 380nm – 780nm
Measured variable	■ Illuminance in [lx] ■ CIE XYZ (CIE1931 2° Standard Observer) ■ Chromaticity xy, color temperature CCT, dominant wavelength Ldom (calculated)
Optics	■ Fixed lens with diffusor for cosine correction ■ Highly sensitive XYZ sensor on the basis of long-term stable glass interference filters
Measuring method and parameters	■ Integrated A/D converter for direct measurement of photocurrents ■ XYZ sensor in the front end ■ Integration time from 1ms to 1024ms in 11 increments ■ Analog gain in 5 increments ■ Averaging over 1 to 1024 measurements
Calibration of the measuring instrument	■ Standard factory calibration to NIST-traceable spectral-irradiance standard (200W quartz halogen lamp) ■ Based on spectral data of a reference light source and precisely measured, individual filter functions of the measuring instrument, a new user calibration for new types of light sources can be performed **without taking real measurements (*OPTO4L VirtuCal*)** ■ Separate calibration for color and intensity

Number of possible user calibrations	■ 256 user calibrations can be retentively stored in the instrument ■ Adjustable to new types of light sources by the user at any time
Digital IO	■ 1 output, 3.3V/40mA ■ 1 input, pull-down contact, Iin<1mA
Communication	■ Text readable command set, for direct application by the user using the terminal functions of suitable tools ■ USB HID class, no drivers required from WIN7, iOS and Android ■ Pure master/slave communication in 64byte blocks, 4ms cycle time ■ Firmware update is possible at any time
Measuring range	Illuminance <0.1 Lux to >100000 Lux
Accuracy (following light-source specific extended calibration)	Illuminance ±3% within a range of 1 Lux to 100000 Lux Chromaticity ±0.0025 at approx. 3000K, ±0.007 for monochrome colors Repeatability ±0.00005
Casing	PA12 plastic, painted black
Weight (without cable)	35 g
Temperature range	10°C to 60°C (internal compensation within a range of 10°C to 55°C)

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Intended use

The measuring instrument is designed for measuring illuminance in the unit Lux [lx] and CIE XYZ tristimulus values (dimensionless) at the measuring point. These results allow to derive further common measured variables, e.g. color temperature in [K] or the dominant wavelength [nm]. All measured variables captured/acquired are based on the CIE1931 2° Standard Observer.

In order to correctly capture illuminance independent of angle, the internal optics incorporate a diffusion serving as a cosine corrector. Nevertheless, it is important that the measurement port points towards the light source during measurement and is not shadowed by other objects in the room. The measuring instrument is designed for fixed installation but can also be used as a mobile unit.

To perform the measurement, the measuring instrument is connected to a USB host that will also act as the power supply, using a high-quality USB cable. Make sure to use the strain relief at the measuring instrument.

Normally, the actual measurement will then be performed automatically, using appropriate software tools. OPTO4L provides tools for commissioning and maintenance as well as tools purely used for recording of readings and calibration. Additionally, OPTO4L supports the integration into proprietary software by detailed documentation of the command set.

The precision of the measuring results directly depends on the selected user calibration. Using the tools provided, the user is able to perform the calibration himself for up to 256 completely different types of light sources. As a rule, the user calibration refers to the 'basic technology' of the light source, resulting in a specific 'relative spectrum', not to the light source itself!
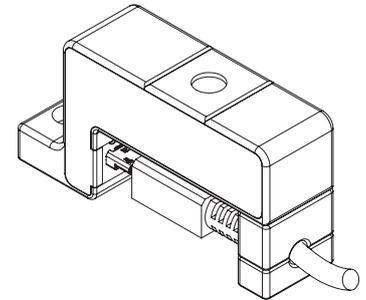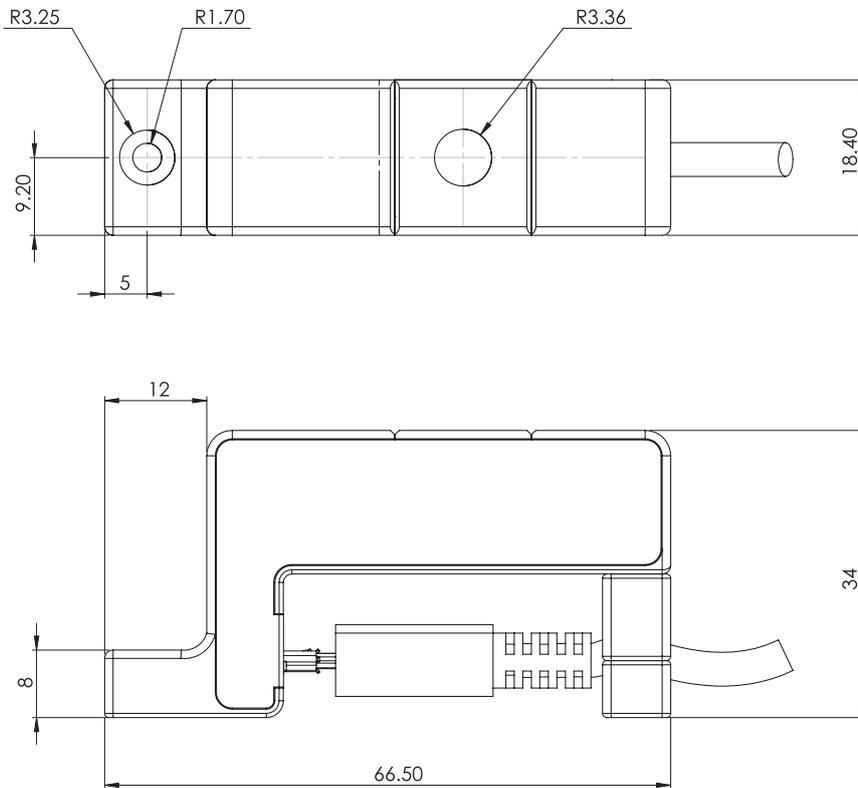
For example: The calibration can be performed for a specific white LED. Subsequently, very precise measurements can be performed on any other white LED, provided it incorporates the same blue emitter and has a similar color temperature. The use of a non-customized user calibration will result in substantial measuring errors, especially on colored light sources!

The calibration only applies to the measuring instrument for which it was performed. It cannot be transferred to other measuring instruments. In case of **OPTO4L VirtuCal**, the measured filter functions are also specific to a measuring instrument and must not be transferred to other measuring instruments. The factory calibration is performed by "real" calibration to a NIST-traceable standard lamp, resulting in the accuracy specified and documented in the supplied certificate. Additionally, the factory calibration based on **OPTO4L VirtuCal** also takes into account all black bodies within a range of 2000K to 10000K.
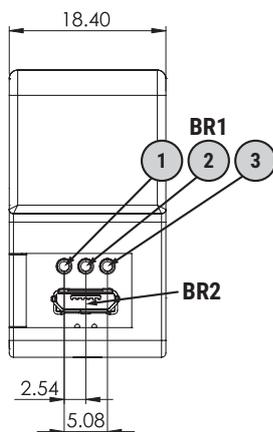
Apart from the selection of a customized user calibration, the precision of the measuring results is influenced by the chosen measuring parameters analog gain, integration time and averaging. Generally, the factory-preset compensation of the measuring instrument ensures that the results displayed are always independent of the selected parameter set. However, this only applies when it is ensured that the internal saturation is sufficiently high and, above all, when there is no overload. The latter in particular may be difficult to identify on specific types of light sources (e.g. pulsed PWM modulated LEDs). Make sure to refer to the relevant chapter in the manual when selecting the measuring parameters.

Only use a suitable soft cloth and suitable detergents to clean the diffusor at the light inlet aperture. Never use substances containing solvents.

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Datasheet

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Dimensions in mm

R3.25   R1.70   R3.36

9.20

5

18.40

12

8

34

66.50

18.40

Pin assignment

18.40

BR1
1
2
3

BR2

2.54

5.08

■ BR1
1 = IN
2 = OUT
3 = GND

■ BR2
USB socket MicroB