Datasheet

OL0011-ES

FPD Light Analyzer

Article-No: 0110400011020709

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 pin headers
Wavelength range	VIS, 380nm – 780nm
Measured variable	▪ Luminance in [cd/m2] ▪ XYZ (CIE1931 2° Standard Observer) ▪ Chromaticity xy, color temperature CCT, dominant wavelength Ldom (calculated)
Optics	▪ Fixed aperture lens with ±1.8° aperture angle ▪ Highly sensitive XYZ sensor on the basis of long-term stable glass interference filters ▪ 8mm measuring spot diameter for contact measurement
Performing measurements	Contact or tele-measurement
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	▪ Based on physical measurements performed on a reference instrument (e.g. CCFL, WideGamut, White-LED, Plasma, OLED, etc.) ▪ Alternatively, by simulation based on spectral data of a reference instrument and precisely measured, individual filter functions of the measuring instrument **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 ▪ Individually adjustable by the user to the latest monitor models 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 possible at any time
Measuring range	Luminance <0.2cd/m2 to >2000cd/m2
Accuracy (following monitor-specific extended calibration)	Luminance ±2% within a range of 1cd/m2 to 1000cd/m2 Chromaticity ±0.0025 for D65, ±0.007 for other colors Repeatability ±0.00005
Casing	PA12 plastic, painted black
Weight (without cable)	40 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 luminance [in the unit cd/m2] and chromaticity xy (dimensionless) on panel lights. These results allow to derive further commonly used measured variables, e.g. color temperature in [K] or dominant wavelength [nm]. All measured variables captured are based on the CIE1931 2° Standard Observer.

Since the internal optics provide a clearly defined aperture angle, even an illuminated projection screen can be interpreted as a panel light. Therefore the instrument can also be used for performing measurements on beamers and similar projection systems. However, it needs to be taken into consideration that the diameter of the measuring spot increases correspondingly when the distance is greater. Moreover, when performing tele-measurements, measuring errors caused by extraneous light or reflections on other objects in the room must be prevented.

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, not to the light source itself! For example: The calibration can be performed for a specific CCFL wide gamut monitor. Subsequently very precise measurements can be performed on any other monitor as long as it uses the same CCFL backlight and color filter (and any other components having an impact on the relative spectrum emitted). The use of a non-customized user calibration will result in substantial measuring errors, especially as far as chromaticity is concerned!

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.

Apart from the selection of a customized user calibration, the precision of the measuring results is influenced by the selected measuring parameters analog gain, integration time

and averaging. Generally, the factory-preset compensation of the measuring instrument ensures that the readings 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 protective glass at the light inlet aperture. Never use substances containing solvents.

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 on the measuring instrument.

For contact measurements, the measuring instrument is positioned flat against the luminous surface with the measurement port towards it. Small spacers on the instrument prevent heat from accumulating at the measuring point, especially during extended measurements. For the same reason, it is recommended to position the luminous surface and the sensor at an angle or in a vertical position. Make sure that the measuring instrument is always aligned in parallel to the luminous surface (unless you wish to perform measurements at a specific angle). The same applies to tele-measurements. For this purpose, suitable equipment must be used to ensure the instrument is able to capture the surface to be measured. Optionally, e.g. the digital output can be used for connecting a laser pointer to be used as a kind of sight device.

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. Further processing, e.g. into ICC profiles or hardware LUTs must be performed with third-party tools. Additionally, OPTO4L supports the integration into proprietary software by detailed documentation of the command set.

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OPTO4L

Dimensions in mm

Ø 2.70

19.50

9.50

22.30

8

11

Ø 8.10

Ø 2.90 THRU ALL

35

28

16

Ø 2.90 THRU ALL

3.80

8.50

70.40

3.80

19.50

Pin assignment

5.08

2.54

BR1

1 2 3

BR2

19.50

■ BR1

1 = IN
2 = OUT
3 = GND

■ BR2

USB socket MicroB