

CL-500A

Технические характеристики

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Illuminance Spectrophotometer CL-500A

A hand held Illuminance spectrophotometer ideal for the measurement of LED lighting. The CL-500A provides full spectral data from 360-780nm allowing accurate assessment of color rendering and other measures such as lux and color temperature that are traceable to international standards.



Introduction

Portable solution for measuring light-source colour and illuminance

The CL-500A is Konica Minolta's first compact, lightweight illuminance spectrophotometer which can be used for evaluation of light sources including next-generation lamps such as LED and EL illumination. The advanced sensor measures CRI (Colour Rendering Index), illuminance, chromaticity, and colour temperature of virtually any light source, the built-in display means that it is suitable for use in the lab or out in the field.



Main applications

- Spectral evaluation of light sources including next-generation lamps such as LEDs, OLEDs and EL illumination
- Checking the illuminance, chromaticity, dominant wavelength and correlated color temperature of various kinds of light sources including organic EL lighting (OLED), LEDs, etc.
- LED billboard development, quality control, and maintenance
- Evaluating the light distribution characteristics of LED illumination modules
- Evaluating the illuminance distribution of lighting fixtures
- Building and interior lighting research

- Spatial lighting production and adjustment
- Color-viewing cabinet maintenance
- Projector light source research and color inspection
- Checking environments for psychological research experiments

Features

Compact, portable and battery-powered

- **Ability to measure CRI.** Measures and displays spectral distribution graph and peak wavelength in addition to illuminance, chromaticity, and colour temperature.
- **The first compact, lightweight spectral irradiance meter in the world to conform to DIN and JIS standards.** The CL-500A conforms to both DIN 5032 Part 7 Class-B and JIS C 1609-1:2006 General Class AA standards which ensure high accuracy illuminance measurements.
- **Portable & Lightweight** – Weighs only 350g. A high speed processor and integrated LCD screen provides the CL-500A the ability to function as a stand-alone instrument. The CL-500A also has an internal memory of 100 data points that may be downloaded and evaluated more thoroughly using a PC connection if required.
- **Includes Data Management Software CL-S10w** – A convenient, easy to use Excel add-in software is included as a standard accessory for easy control of measurement procedures.
- **Measurement of scotopic illuminance.** Next to photopic illuminance also scotopic illuminance can be measured. In addition the scotopic/photopic (S/P) ratio can be displayed.
- **High-speed measurement** – Using the Software Development Kit (SDK) you can obtain measurements as fast as 5 times/sec. The instrument is suitable for production applications.

Applications

- The CL-500A is a compact, lightweight illuminance spectrophotometer that can be used not only for illuminance measurements but also for spectral evaluation of light sources including next-generation lamps such as LEDs, OLEDs and EL illumination.
- The CL-500A makes use of multiple sensors and an optical grating to measure CRI (Colour Rendering Index). CRI is a quantification of the colour-rendering properties of a lamp or other light source, and was defined to provide objective criteria. The CL-500A will measure and display the CRI (Ra) as well as the individual indices from R1 through to R15. The fact that the CL-500A is a spectral sensor based instrument means it is well suited to measuring narrow bandwidth light sources including LEDs, OLEDs, Ultra High Pressure lamps (UHP), etc. Another benefit of the sensor based detector is the ability to display spectral distribution in graphical form.
- Photometric units including illuminance in Lux and foot-candle, colour temperature (CCT) in Kelvin, chromaticity in xy and u'v' color space, tri-stimulus values XYZ, Duv, dominant wavelength and excitation

purity can also be measured.

- The lightweight and portable design of the CL-500A allows it to be used for multiple applications within the lighting industry. The built-in display enables the CL-500A to be used as a stand-alone instrument without the need for a computer. The highly portable CL-500A can be used virtually anywhere CRI or colour temperature of lamps and LEDs need to be measured. The spectral irradiance waveform and peak wavelength can also be viewed directly on the unit.
- The standard data management software (CL-S10w) included with the instrument can download measurement data directly to Excel as well as display spectral irradiance values, spectral waveform, chart colour rendering indices and features an LED Binning function. Multi-point measurements are also possible by connecting up to 10 CL-500A units together. For more specialised applications the software development kit is available free of charge to provide fine control over data and application.

Specifications

Main Specifications of the CL-500A

Model	Illuminance Spectrophotometer CL-500A	
Illuminance meter class	Illuminance meter class Conforms to requirements for Class AA of JIS C 1609-1: 2006 "Illuminance meters Part 1: General measuring instruments"*1 Conforms to DIN 5032 Part 7 Class B	
Wavelength range	360 ~ 780 nm	
Output wavelength spacing	1 nm	
Spectral bandwidth	Approx. 10 nm (half bandwidth)	
Wavelength accuracy	±0.3 nm (Median wavelengths of 435.8 nm, 546.1 nm, and 585.3 nm *2 as specified in JIS Z 8724) *3	
Measurement range	Ø 0.1 to 100,000 lx (chromaticity display requires 5 lx or more)	
Accuracy *4, 5 (Standard illuminants A)	E _v (Illuminance) : ±2%±1 digit of displayed value	
	xy: ±0.0015 (10 to 100,000 lx) xy: ±0.002 (5 to 10 lx)	
Repeatability (2σ) (Standard illuminant A)	E _v : 0.5% + 1digit	
	xy: 0.0005 (500 ~ 100,000 lx) xy: 0.001 (100 ~ 500 lx) xy: 0.002 (30 ~ 100 lx) xy: 0.004 (5 ~ 30 lx)	
Visible-region relative spectral response characteristics (f1')	Within 1.5% of spectral luminous efficiency V (λ)	
Cosine response (f2)	E _v : Within 3%	
Temperature drift (fT)	E _v : ±3% of displayed value; xy: ±0.003	

Humidity drift (fH)	E_v : $\pm 3\%$ of displayed value; xy : ± 0.003
Storage temperature/humidity range	-20 to 55°C, relative humidity 85% or less (at 35°C) with no condensation
Measurement time	Super Fast mode: Approx. 0.2 sec. (when connected to computer); Fast mode: Approx. 0.5 sec.; Slow mode: Approx. 2.5 sec.; Automatic exposure time setting (high accuracy) mode: Approx. 0.5 to 27 sec.
Display modes	XYZ; $X_{10}Y_{10}Z_{10}$; E_{vxy} ; $E_vu'v'$; E_v ; Dominant wavelength, Excitation purity; Correlated color temperature, Δuv ; General color-rendering index (R_a); Special color-rendering indexes (R_i ($i=1\sim 15$))); Spectral graph; Peak wavelength; Δ (XYZ); Δ ($X_{10}Y_{10}Z_{10}$); Δ (E_{vxy}); Δ ($E_vu'v'$); Rank display
Other Features	Data memory: 100 data; User calibration function (when connected to computer); Continuous measurement (when connected to computer); Auto off function
Language	English, Japanese, Chinese (Simplified)
Interface	USB2.0
Power	Rechargeable internal lithium-ion battery (Operating time per charge: Approx. 6 hours when new); AC adapter; USB power bus
Operating temperature and humidity range	-10 to 40°C, relative humidity of 85% or less (at 35°C) with no condensation
Storage temperature and humidity	-10 to 45°C, relative humidity of 85% or less (at 35°C) with no condensation
Size	70 × 165 × 83 mm
Weight	350 g

*1 For Section 7.6.3 Response Time, when measurement speed mode is set to FAST mode.

*2 For 585.3 nm, evaluation performed using substitute wavelength of 587.5 nm.

*3 Based on Konica Minolta test standards (change in temperature of 2°C or less after zero calibration.)

*4 Automatic exposure time setting (high accuracy) mode

*5 Linear for E_v (Illuminance)

Main specifications of Data Management Software CL-S10w

Model	Add-in for Excel® (Excel® is required to use this add-in.)
Operating environment	One of the following environments with Excel® installed: * Languages in parenthesis () are the OS language. Windows® XP + Excel® 2003 (English, Japanese, or Simplified Chinese) Windows® 7 + Excel® 2010 32 bit (English, Japanese, or Simplified Chinese) * For details on system requirements for above versions of Windows® and/or Excel®, refer to their respective specifications.
Compatible instruments	CL-500A, CL-200A, CL-200

All information provided herein, specifications and dimensions are subject to change without notice due to circumstances.

Standard Accessories for CL-500A

FD-A05 Soft case

Item Order Code: A3E2-600



IF-A17 USB Cable (2m)



Receptor Cap with Strap T-A13



Suggested Accessories for CL-500A

CL-A11 Hood

Item Order Code: 1877-700



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