KONICA MINOLTA

Illuminance Spectrophotometer

CL-500A

For evaluation of light sources including LED and EL illumination

Giving Shape to Ideas

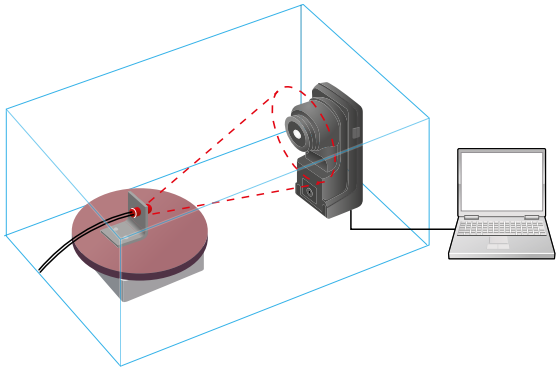
Evaluation of CRI (colour rendering index) and illuminance measurement (JIS AA Class)

Conforms to both DIN and JIS standards.

The CL-500A is the first handheld illuminance spectrophotometer to conform to DIN 5032 Part 7 Class B and JIS C 1609-1:2006 General Class AA.

Can be easily mounted on inspection jigs, etc.

The CL-500A is equipped with standard tripod sockets on both the top and bottom surface, so it can be easily mounted on a jig. The CL-500A can also be used as a sensor for systems that use an integrating sphere for total flux measurements of light sources and lamps. The software development kit (SDK) for the CL-500A is available free of charge from the Konica Minolta website, so customers can create their own software.



All–in–one instrument. No PC needed.

The CL-500A can measure CRI, colour temperature, the spectral irradiance waveform and peak wavelength using the built in display. No PC connection is needed.

The CL–500A weighs only 350g, making it easy to hold for extended working periods.

High–speed measurement

Using the SDK, high-speed measurements at 5 times/sec. can be taken.

Lightweight, handheld instrument

The CL-500A weighs only 350g and includes a carry case and wrist strap as standard.

What is colour–rendering property?

Illumination can be provided by hundreds of different types of light source, both natural and man-made. For assessment or comparison of colour it has always been standard practice to compare colours under natural light, either genuine or simulated using fluorescent lamps. In addition to fluorescent lamps, next-generation light sources such as LEDs (light emitting diodes) are increasingly being adopted as illuminating lamps.
When comparing how objects look under different lamps against how they look under natural light, how closely they match is called the “colour-rendering property.” A lamp that produces a hue similar to that of natural light is said to have a good (high) colour-rendering property.
The colour-rendering index is a quantification of the colourrendering properties of a lamp or other light source, and was defined to provide objective criteria. The colour-rendering index expresses the comparison between the light source being tested and a standard illuminant*. The maximum value is 100, with the value decreasing as the colour-rendering difference increases, indicating how far the appearance under the test light source is from the natural colour under sunlight.

* Standard illuminant with the same colour temperature as the light source being tested. (Light along the blackbody locus corresponds to sunlight.)

Includes Data Management Software
Free SDK available for fine control of application and data

Spectral irradiance waveform display

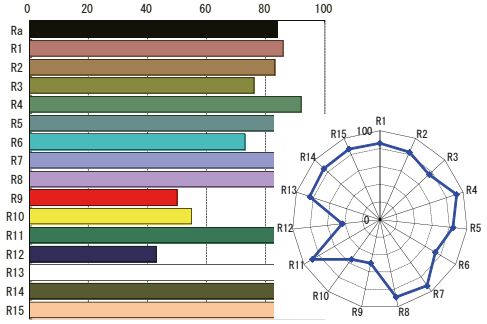
Peak wavelengths can be easily identified, so classification and high accuracy grading of light sources can be performed. In addition, numerical data at 1 nm can be displayed in list form.

LED binning function

In addition to quantifying colour variations, the software is equipped with a function to enable easy binning of LEDs.

Multi–point measurement using multiple CL–500A units

Data Management Software CL-S10w can be used to control up to 10 CL-500A units for multi-point measurements. This can be expanded using the SDK.
Please contact your local Konica Minolta Sensing office for further information.



Informative colour–rendering index display

Shifts between a test light source and a standard light source can be seen at a glance, with bar graphs showing the general colour-rendering index R_a (the average of special colour-rendering indexes R1 to R8) and the special colour-rendering indexes for a total of 15 colours (R1 to R15).

Model	Illuminance Spectrophotometer CL-500A
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
Spectral wavelength range	360 to 780 nm
Output wavelength pitch	1 nm
Spectral bandwidth	Approx. 10 nm (half bandwidth)
Wavelength precision	±0.3 nm (Median wavelengths of 435.8 nm, 546.1 nm, and 585.3 nm *2 as specified in JIS Z 8724)*3
Measuring range	0.1 to 100,000 lx (chromaticity display requires 5 lx or more)
Accuracy*4, 5 (Standard Illuminant A)	Ev (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%+1 digit xy: 0.0005 (500 to 100,000 lx) xy: 0.001 (100 to 500 lx) xy: 0.002 (30 to 100 lx) xy: 0.004 (5 to 30 lx)
Relative spectral response charachteristic (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: ±3% of displayed value; xy: ±0.003
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 accurary) 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 (Ri (i=1~15)); Spectral graph; Peak wavelength; Δ (XYZ); Δ ($X_{10}Y_{10}Z_{10}$); Δ ($E_V$xy); Δ (E_Vu'v'); Rank display
Other functions	Data memory: 100 data; User calibration function (when connected to computer); Continuous measurement (when connected to computer); Auto off function
Display languages	English, Japanese, Chinese (Simplified)
Interface	USB 2.0
Power	Rechargeable internal lithium-ion battery (Operating time per charge: Approx. 6 hours when new); AC adapter; USB power bus
Operating temperature/humidity range	-10 to 40°C, relative humidity of 85% or less (at 35°C) with no condensation
Storage temperature/humidity range	-10 to 45°C, relative humidity of 85% or less (at 35°C) with no condensation
Dimensions (W × D × H)	70 × 165 × 83 mm
Weight	350g

*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 Ev (Illuminance)

SAFETY PRECAUTIONS

For correct use and for your safety, be sure to read the instruction manual before using the instrument.

- Always connect the instrument to the specified power supply voltage.
- Improper connection may cause a fire or electric shock.

- Displays shown are for illustration purpose only.
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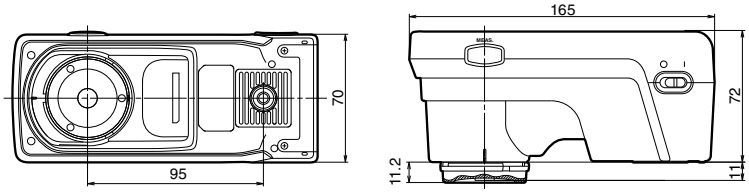
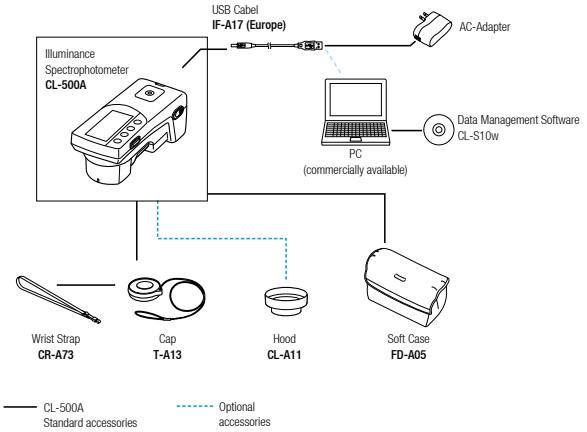
ILLUMINANCE SPECTROPHOTOMETER **CL-500A**

< Dimensions in mm >



< System Diagram >



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