

LUMINANCE METERS LS-100/LS-110

Compact, lightweight, easy-to-use SLR luminance meters with a wide measuring range

Luminance Meter LS-100

1° acceptance angle,
Measuring range: 0.001 to 299,900cd/m²
(0.001 to 87,530fL)

Luminance Meter LS-110

1/3° acceptance angle,
Measuring range: 0.01 to 999,900cd/m²
(0.01 to 291,800fL)

MAIN FEATURES

Flareless SLR optical system for accurate measurements

The SLR (single-lens-reflex) optical system allows precise aiming and ensures that the viewfinder shows the exact area to be measured. The optical system is also virtually flareless, eliminating the influence of light from outside the measurement area.

Narrow acceptance angle for measurements of small specimens

Acceptance angles of only 1° for **LS-100** and 1/3° for **LS-110** allow accurate measurements of small specimen areas. In addition, optional close-up lenses can be used to measure areas as small as $\phi 1.3\text{mm}$ when using **LS-100** and $\phi 0.4\text{mm}$ when using **LS-110**.

User calibration and color-correction functions

To increase the versatility of the **LS-100** and **LS-110**, both models are equipped with user calibration and color correction functions. The user calibration function allows the meter to be calibrated to a user-selected standard instead of the preset Minolta standard; this function can also be used to standardize the response of several meters. The color correction function allows the response of the meter to be adjusted when measuring colored specimens.

Luminance ratio and peak luminance measurements

In addition to measurements of the present luminance, the **LS-100** and **LS-110** can also determine the percent ratio of the measured luminance to a luminance value stored in memory as well as the peak luminance or luminance ratio measured.

RS-232C data communication

Use of the built-in RS-232C interface allows the meter to be connected to a personal computer.

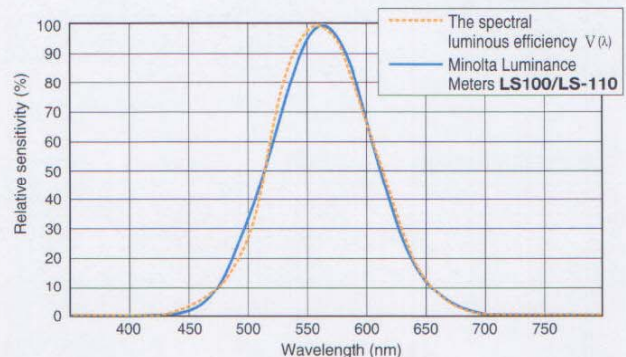
Lightweight, compact design powered by a single 9V battery for portability

(Power can also be supplied by optional Data Printer **DP-10**.)



LS-100

RELATIVE SPECTRAL RESPONSE



Ideally, the relative spectral responsivity of the luminance meter should match $V(\lambda)$ of the human eye for photopic vision. As shown in the graph above, the relative spectral responsivity of Minolta Luminance Meters **LS-100/LS-110** is within 8% ($f1'$) of the CIE spectral luminous efficiency $V(\lambda)$.

CIE ; Commission Internationale de l'Éclairage

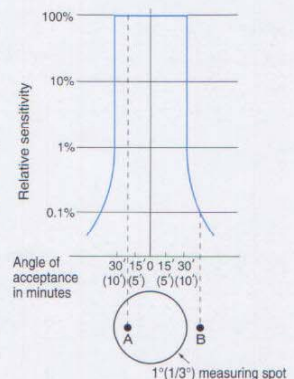
$f1'$ (CIE-s symbol) ; The degree to which the relative spectral responsivity matches $V(\lambda)$ is characterized by means of the error $f1'$.

REDUCTION OF FLARE

The degree to which the influence of light from outside the defined measuring area is eliminated is an important factor in the performance of luminance meters. In Minolta Luminance Meters, the flare factor is kept to below 1.5%, even if an object with extremely high luminance is just outside the meter's measuring area.

The graph at right shows the effect when a bright point is moved from A inside the measuring area to B just outside the measuring area.

If the measured value at A is defined at 100%, the measured value at B would be less than 0.1%.



SPECIFICATIONS

Model	Luminance Meter LS-100	Luminance Meter LS-110
Type	SLR spot luminance meter for measuring light-source and surface brightness	
Acceptance angle	1°	1/3°
Optical system	85mm f/2.8 lens; SLR viewing system; flare factor less than 1.5%	
Angle of view	9°	
Focusing distance	1014mm (40 in.) to infinity	
Minimum measuring area	ø14.4mm	ø4.8mm
Receptor	Silicon photocell	
Relative Spectral Response*	Within 8% (f ₁) of the CIE spectral luminous efficiency V (λ)	
Response time	FAST: Sampling time: 0.1s, time to display: 0.8 to 1.0s; SLOW: Sampling time: 0.4s, time to display: 1.4 to 1.6s	
Luminance units	cd/m ² or fL (switchable)	
Measuring range	FAST: 0.001 to 299,900cd/m ² (0.001 to 87,530fL) SLOW: 0.001 to 49,990cd/m ² (0.001 to 14,590fL)	FAST: 0.01 to 999,900cd/m ² (0.01 to 291,800fL) SLOW: 0.01 to 499,900cd/m ² (0.01 to 145,900fL)
Accuracy	0.001 to 0.999cd/m ² (or fL): ±2% ±2 digits of displayed value 1.000cd/m ² (or fL) or greater: ±2% ±1 digit of displayed value (Illuminant A measured at ambient temperature of 20 to 30°C/68 to 86°F)	0.01 to 9.99cd/m ² (or fL): ±2% ±2 digits of displayed value 10.00cd/m ² (or fL) or greater: ±2% ±1 digit of displayed value
Repeatability	0.001 to 0.999cd/m ² (or fL): ±0.2% ±2 digits of displayed value 1.000cd/m ² (or fL) or greater: ±0.2% ±1 digit of displayed value (Measurement subject: Illuminant A)	0.01 to 9.99cd/m ² (or fL): ±0.2% ±2 digits of displayed value 10.00cd/m ² (or fL) or greater: ±0.2% ±1 digit of displayed value
Temperature/humidity drift	Within ±3% ±1 digit (of value displayed at 20°C/68°F) within operating temperature/humidity range	
Calibration mode	Minolta standard/user-selected standard (switchable)	
Color correction factor	Set by numerical input; range: 0.001 to 9.999	
Reference luminance	1; set by measurement or numerical input	
Measurement modes	Luminance; luminance ratio; peak luminance or luminance ratio	
Display	External: 4-digit LCD with additional indications Viewfinder: 4-digit LCD with LED backlight	
Data communication	RS-232C; baud rate: 4800bps	
External control	Measurement process can be started by external device connected to data output terminal	
Power source	One 9V battery; power can also be supplied by optional Data Printer DP-10	
Power consumption	While measuring button is pressed and viewfinder display is lit: 16mA average While power is on and viewfinder display is not lit: 6mA average	
Operating environment conditions	Temperature: 0 to 40°C (32 to 104°F); relative humidity 85% or less (at 35°C/95°F) with no condensation, Maximum altitude: 2000m, Installation category: II, Pollution degree: 2	
Storage temperature range	-20 to 55°C (-4 to 131°F); relative humidity 85% or less (at 35°C/95°F) with no condensation	
Dimensions	79x208x150mm (3-1/8x8-3/16x5-7/8 in.)	
Weight	850g (30 oz.) without battery	
Standard accessories	Lens cap; Eyepiece cap; ND eyepiece filter; 9V battery; Case	

* Equivalent to 2% specified for T-1 series.
8% CIE(f₁), new JIS(1993)
2% old JIS

Specifications are subject to change without notice.

OPTIONAL ACCESSORIES

Data Printer DP-10

A compact, lightweight data printer with built-in D/A converter

Compact, lightweight, and battery-powered for complete portability

Timer-controlled measurements

Measurements can be taken automatically at intervals of 10s, 30s, 2m, or 10m.

Optional AC Adapter can be used. Power can also be supplied to the Luminance Meter from the DP-10.

Built-in D/A converter

Analog output is provided for connection to an analog recorder or similar device when taking continuous measurements.

Six analog output ranges: 10, 10², 10³, 10⁴, 10⁵, or 10⁶ (cd/m² or fL)



SPECIFICATIONS (DP-10)

Type	24-character thermal-dot (7x5 dot matrix)	
Printing speed	0.8s/line (1.2s/line including return to start of next line)	
Printed data	Measurement number: 1 to 9,999 Measured values: Maximum 6 digits Elapsed time since first measurement: 00:00 to 99:59 (h:m)	
Interval timer	Interval time: 10s, 30s, 2m, or 10m Automatic printout after measurement	
Analog output	Output range	10, 10 ² , 10 ³ , 10 ⁴ , 10 ⁵ , or 10 ⁶ (cd/m ² or fL); manually selected
	Output voltage	1V (full scale)
	Output resolution	0.1mV/digit (1mV/digit when range of 10 is selected when using LS-110)
	Response time	300ms
	Temperature drift	0.02mV/°C
Accuracy	0.4% of value displayed by Luminance Meter ±0.2mV	
Power source	6 AA-size batteries or optional AC Adapter AC-A10 (output: 9V, 1A)	
Dimensions	186x53x102mm (7-5/16x2-1/16x4 in.)	
Weight	440g (15.5 oz.) without batteries or thermal paper	

Specifications are subject to change without notice.

Close-Up Lenses



Close-Up Lenses	Minimum measuring area	
	With LS-100	With LS-110
No.153	ø8.0mm	ø2.7mm
No.135	ø5.2mm	ø1.8mm
No.122	ø3.2mm	ø1.1mm
No.110	ø1.3mm	ø0.4mm

Long Eye-Relief Eyepiece



When the Long Eye-Relief Eyepiece is used, the measuring area and measurement display inside the viewfinder can be seen with the eye 5cm (2 in.) away from the eyepiece.

Angle Finder V_N



Angle Finder V_N allows the measuring area and measurement display inside the viewfinder to be seen at an angle of 90° to the normal viewfinder optical axis. Angle Finder V_N can also be focused and the magnification can be set to 1x or 2x.

