

# CHROMA METER CS-100A

**A compact, lightweight, battery-powered instrument with a 1° measurement angle for high-accuracy non-contact measurements of the luminance and chromaticity of light sources and reflective subjects**



## MAIN FEATURES

### Compact and lightweight

### Measurements of subjects at a distance

SLR (single-lens-reflex) viewing system and flare-free optical system provide accurate measurements of subjects at a distance with virtually no influence from light outside the measurement area

### Measurements of small subjects

1° measurement angle allows measurements of subjects as small as  $\phi 14.4\text{mm}$  (at a subject distance of 1014mm); by using optional Close-Up Lenses, subjects as small as  $\phi 1.3\text{mm}$  can be measured.

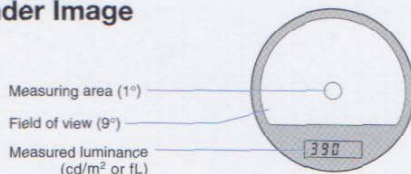
### Collor difference can also be measured

### Calbration to a user-selected reference is also possible

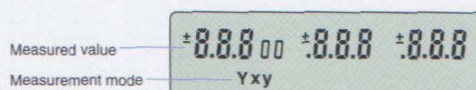
### Luminance units of $\text{cd}/\text{m}^2$ or fL can be selected

## EASY-TO-READ DISPLAY

### Viewfinder Image



### External display



## MAIN APPLICATIONS

### Light-Source Measurements

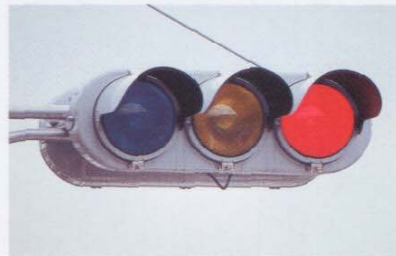
- Luminance and chromaticity of small light sources such as LEDs, miniature neon lamps, etc.
- Luminance and chromaticity of general light sources such as tungsten lamps, fluorescent lamps, etc.
- Luminance and chromaticity of traffic signals, airport guidance lights, emergency exit signs, etc.

### Reflective-Subject Measurements

- Color measurements of subjects which cannot be measured by contact methods, such as distant building walls, just-painted surfaces, subjects with complicated shapes, or subjects which should not be touched for sanitary reasons.

### Display Measurements

- Luminance and chromaticity of color TVs and CRTs
- Luminance measurements of monochrome TVs and SRTs
- Luminance and chromaticity of projection TVs and video projectors.



## SPECIFICATIONS

Model	Chroma Meter <b>CS-100A</b>
Type	SLR spot colorimeter for measuring light-source and surface luminance and chromaticity
Acceptance angle	1°
Optical system	85mm f/2.8 lens; SLR viewing system; flare factor less than 1.5%
Angle of view	9° with 1° measurement area indication
Focusing distance	1014mm (40 in.) to infinity
Receptors	3 silicon photocells filtered to detect primary stimulus values for red, green and blue light
Spectral response	Closely matches CIE 1931 Standard Observer curves ( $\bar{x}_\lambda, \bar{y}_\lambda$ , and $\bar{z}_\lambda$ )
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 <sup>2</sup> or fL (switchable)
Measuring range	FAST: 0.01 to 299,000cd/m <sup>2</sup> (0.01 to 87,530fL); SLOW: 0.01 to 49,900cd/m <sup>2</sup> (0.01 to 14,500fL)
Accuracy	Luminance (Y): $\pm 2\%$ of reading $\pm 1$ digit Chromaticity (x,y): $\pm 0.004\%$ (Illuminant A measured at ambient temperature of 18 to 28°C/64 to 82°F)
Repeatability	Luminance (Y): $\pm 0.2\%$ of reading $\pm 1$ digit Chromaticity (x,y): FAST: Y 100cd/m <sup>2</sup> or above: $\pm 0.001$ ; 48.1 to 99.9cd/m <sup>2</sup> : $\pm 0.002$ ; below 48.1cd/m <sup>2</sup> : below measurement range SLOW: Y 25.0cd/m <sup>2</sup> or above: $\pm 0.001$ ; 12.0 to 24.9cd/m <sup>2</sup> : $\pm 0.002$ ; below 12.0cd/m <sup>2</sup> : below measurement range (Measurement subject: Illuminant A)
Target value	1; set by measurement or numerical input
Measurement modes	Absolute color: Yxy; color difference: $\Delta(Yxy)$
Display	External: LCD; 3 values (Y, x, and y) of 3 digits each with additional indications Viewfinder: 3-digit LCD (showing luminance value Y) 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 via data output terminal
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	79x208x154mm (3-1/8x8-3/16x6-1/16 in.)
Weight	890g (2 lb.) without battery
Standard accessories	Lens cap; Eyepiece cap; Protective filter, ND eyepiece filter; 9V battery; Chromaticity chart; Case

Specifications are subject to change without notice.

## OPTIONAL ACCESSORIES

### Data Processor DP-101

Compact, portable, multi-function data processor to increase the versatility of Minolta Chroma Meter CS-100A

#### Additional Color Notations

When DP-101 is used with the CS-100A, measured values can be calculated in terms of Yxy, L\*a\*b\*, Yu'v', color temperature, and distance from blackbody locus  $\Delta uv$  for absolute color values and in terms of  $\Delta(Yxy)$ ,  $\Delta(L*a*b*)$ ,  $\Delta E^*ab$ ,  $\Delta(Yu'v')$ , and  $\Delta u'v'$  for color difference.



#### Data Storage and Printout

DP-101 has memory space for up to 300 sets of measurement data and a built-in thermal printer for printing out data either at the time of measurement or from memory at a later time.

#### Interval Timer for Automatic Measurements

## SPECIFICATIONS

Type	Battery-powered multi-function data processor for use with Minolta Chroma Meter CS-100A
Measurement modes	Absolute and difference
Chromatic systems	Absolute color: Yxy, Yu'v', L*a*b*, color temperature, distance from blackbody locus $\Delta uv$ Color difference: $\Delta(Yxy)$ , $\Delta(Yu'v')$ , $\Delta u'v'$ , $\Delta(L*a*b*)$ , $\Delta E^*ab$
Calibration channels	4
Target color channels	17 (4for each calibration channel and 1quick-input temporary target-color channel); set by measurement or numerical input
Data memory	Space for 300 sets of measurement data divisible into 16 pages; built-in NiCd battery for backup maintains data in memory even if POWER switch is set to OFF
Display	16-character x 2-line dot-matrix LCD with adjustable viewing angle
Printer	24-character thermal-dot
Statistical calculations	Maximum, minimum, mean, and standard deviation
Interval timer	Timer interval user-selectable from 3s to 99m
Data communication	RS-232C format; transmission rate: 9600 baud (can be set by service personnel to 600, 1200, 2400, or 4800; output voltage: CMOS $\pm 5V$ ; RS-232C terminal uses DIN 8-pin connector)
Other	Multiple-measurement-averaging mode; remote-control socket; can supply to CS-100A
Power source	6 AA-size batteries or included AC Adapter
Dimensions	220x50x200mm (8-11/16x2x7-7/8 in.)
Weight	1300g (2.87 lb.) not including batteries
Standard accessories	Data Cable DP-A12; AC Adapter AC-A11; thermal paper (one roll); DIN 8-pin plug (1); 3.5mm (1/8-inch) subminiature plug; Shoulder Case DP-A30

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### Close-Up Lenses



Close-Up Lenses	Minimum measuring area
No.153	$\phi 8.0\text{mm}$
No.135	$\phi 5.2\text{mm}$
No.122	$\phi 3.2\text{mm}$
No.110	$\phi 1.3\text{mm}$

### 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 Vn



Angle Finder Vn 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 Vn can also be focused and the magnification can be set to 1x or 2x.

## SYSTEM DIAGRAM (Optional Accessories)

