PRECISION COLOR CONTROL EXPANDED COLOR INTERPRETATION FOR EVERY LIGHT SOURCE AT THE TOUCH OF YOUR FINGERTIPS

Lighting solutions and applications have never been in greater demand and expansion as they are today. Fueled by advances in lighting technology such as OLED's, lighting has become just as much a lifestyle today as it is a necessity in our daily lives. With the overwhelming popularity of these new light sources, the need to understand, manage and control them has never been in more demand. Manufacturing quality and process along with varying color and illumination can often result in consistency issues. In response, Sekonic, a leader for nearly 70 decades in light measurement instruments, offers an ergonomic, intuitive advanced Spectrometer C-7000.

The Spectrometer C-7000 is a portable handheld spectrometer, designed especially for industrial use. Utilizing Sekonic's CMOS linear image sensor design and software, the C-7000 can measure every light source (LED, HMI, Fluorescent, Flash, Natural Light spectrum) with remarkable precision and data feedback. In addition, with recent firmware enhancement it offers expanded lighting interpretation metrics and metering applications for industrial lighting. The new firmware provides expanded color interpretation (TM-30, TLCI/TLMF, SSI and CRI comparison), to enhance its precision color control for every light source. Final with the C-7000 Utility software, output of memorized data is provided at every 1nm (nanometer) increments in CSV format.

Ultimate Tool for Color Control

Utilizing a CMOS Linear Image sensor the C-7000 series spectrometer measures any light source with repeatable and precise accuracy
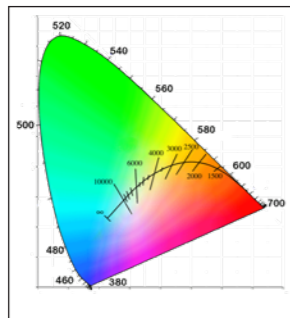
Wide measuring range *Correlated color temperature (1,600 to 40,000K) *Illuminance (1 to 200,000lx)

Intuitive color touch screens offer easy navigation through Spectral distribution, lighting comparisons, CRI color data and more

Precise Measurement

Measures LED, HMI, Fluorescent, Tungsten, Natural Light and Flash in 1 nanometer (nm) output wavelenght increments from 380 to 780 nm.

It conforms to requirement of "Illuminance meter class" for JIS C 1609-1: 2006 "Illuminance meters Part 1: General measuring instruments" Class A, and DIN 5032 Part 7 Class C.
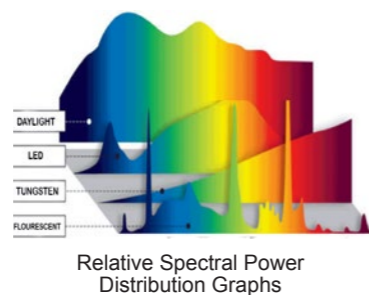
Relative Spectral Power Distribution Graphs

KEY New Features

✓ TM-30, TLCI/TLMF, SSI, CRI comparison
✓ Continous/Single measurement selection
✓ Preset Display (Toolbox menu)
✓ Windows(7 to 10) and MAC OS (10.13 to 10.15)Ready Utility
✓ MiniB USB cable included
✓ SDK in Visual Basic (Windows only) for Remote Control

Memory Function and Data Management

Up to 999 measurements can be stored in memory. C-7000 Utility (in CD-ROM included in the package) offers easy settings and updating firmware of the meter.

Via C-7000 Utility software for both Windows and Macintosh, the output of the spectrum data at every 1nm in CSV format and the graphics of the Spectrum,TM-30, CIE1931/1964 or CIE1976 in JPEG/BMP/PNG format are also available.
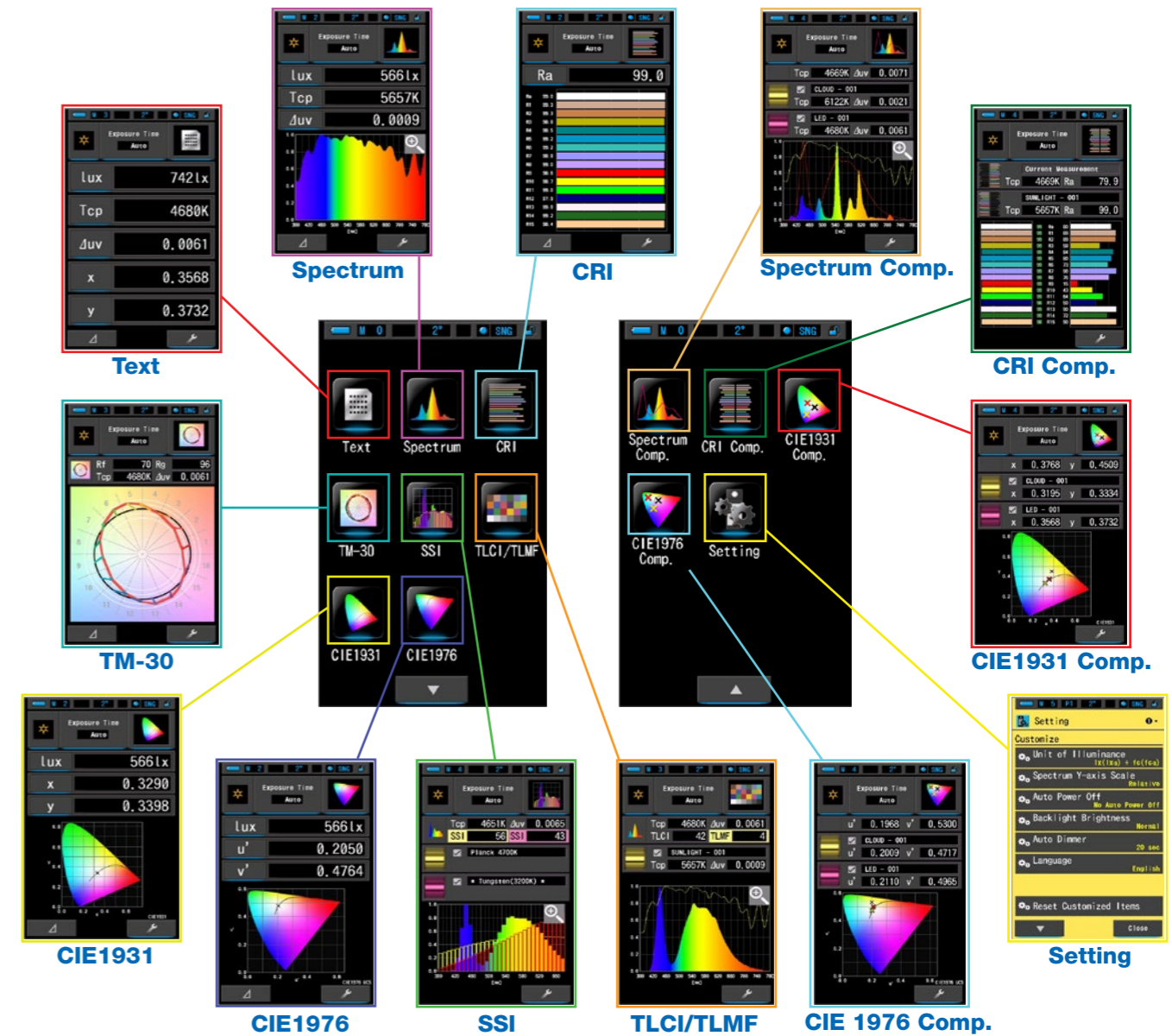
Wide Measuring Range of Color Temperature and Illuminance

Wide measurement range of Color Temperature (1,563 to 100,000K) and illumination (1 to 200,000lx = 0.1 to 18,600fc in ambient light, 20 to 20,500lx · s = 1.86 to 1,900fc · s in flash light)
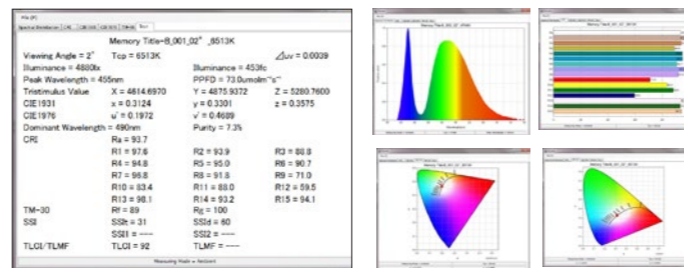
Various Display Modes with Intuitive Color Touch Screen

The C-7000's 4.3" large color touch dot-matrix screen displays various modes and functions in a logical and intuitive layout. The main selection screen displays the quick icons for the following Display Modes.

Text

Spectrum

CRI

Spectrum Comp.

CRI Comp.

TM-30

CIE1931 Comp.

CIE1931

Setting

CIE1976

SSI

TLCI/TLMF

CIE 1976 Comp.

Various Display Items

✓ Correlated color temperature (Tcp)
✓ Deviation (Δuv)
✓ Tristimulus Value (X, Y, Z, / X10, Y10, Z10)
✓ CIE1931(CIE1964) Chromaticity Coordinates (x, y, z / x10, y10, z10)
✓ CIE1976 Chromaticity Coordinates (u', v' / u'10, v'10)
✓ Dominant Wavelength (λd)
✓ Excitation Purity (Pe)
✓ Peak Wavelength (λp)
✓ Lux(lx) or Foot-Candle(fc) – ambient light
✓ Lux sec. (Hlx) or Foot-Candle sec. (Hfc) – flash light
✓ PPFD: Photosynthetic Photon Flux Density (µmolm-2s-1)
✓ TM-30 (Rf, Rg)
✓ SSI (Tungsten, Daylight, SSI1, SSI2)
✓ TLCI/TLMF
✓ CRI (Ra / R1 to R15)
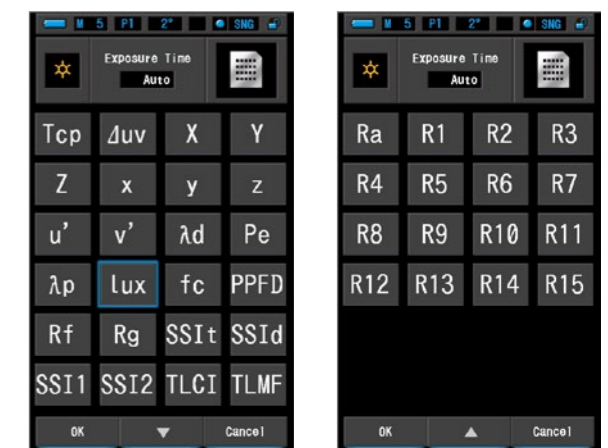
Display Items Library

WHAT IS ILLUMINANCE AND LUMINANCE?

Luminance

Luminance is the measurement of how much light is coming from, passing through or reflected from a surface at a particular angle. It also indicates how much light intensity can be perceived by the human eye. The International System of Units (SI) uses candela/square meter (cd/m^2) as the units to measure luminance. In the U.S. one of the most common units of measure is the foot-lambert (fl); 1 foot-lambert (fl) equals 3.426 cd/m^2. In the screens/display industry the term nit (nt) is commonly used. Nit is a non-SI term used for luminance, and 1 nit is equivalent to 1 cd/m^2. In the display industry, luminance is used to quantify the brightness of displays.
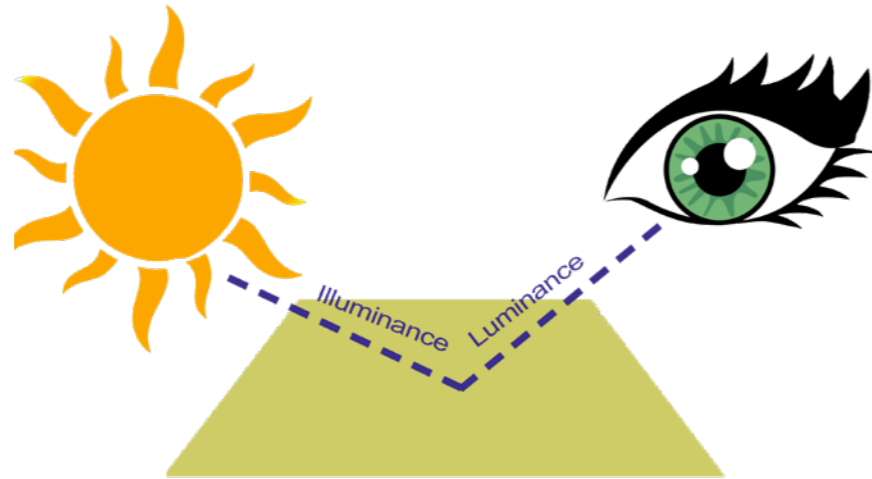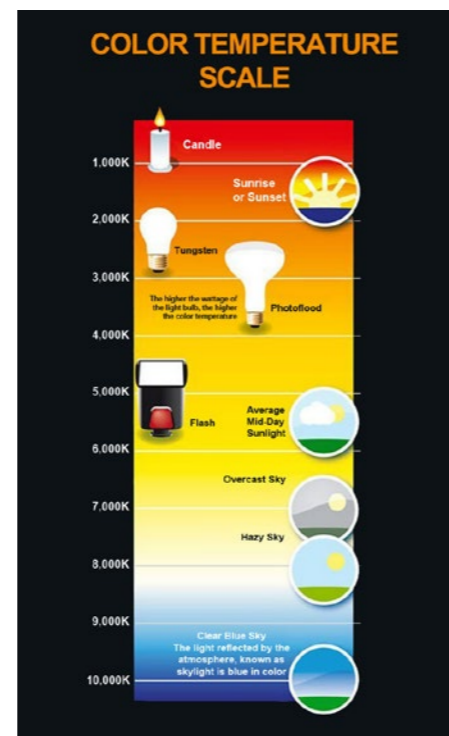
Illuminance

Illuminance is the measurement of how much light is falling onto (illuminating) and covering a surface area. Illuminance also indicates how humans perceive the brightness of an illuminated area. The terms illuminance and brightness can be confusion as the same thing, but they're not, as brightness can also describe luminance. The difference between the two is that illuminance refers to intensity of light falling onto a surface, while brightness refers to the visual and physiological perceptions of light. Brightness should not be used as a quantitative measurement at all. The SI unit for illuminance is lux (lx). In the U.S. people sometimes use the non-SI term foot-candle when referencing illuminance. The term "foot-candle" means "the illuminance on a surface by a candela source one foot away". One foot-candle is equivalent to one lumen per square foot which is approximately 10.764 lux.

WHAT IS COLOR TEMPERATURE?

Color temperature is a way of describing the Color (chromaticity) of a light source in a numeric value. It is usually expressed as either warm (yellowish) or cool (bluish) and measured in Kelvin (K). Color temperatures over 5,000K are called cool colors (bluish white). Clear blue skies, electronic flash and certain continuous light sources are examples of 'cool' blue light. Lower color temperatures (under 3,000 K) are called warm colors (orange or red), candles, sunsets and tungsten bulbs are examples of these types of light sources. The Kelvin Color Temperature scale is based on heating an object at various degrees of physical heat and recording the color changes.

For example, if we heat up a lamp filament at some point, the filament will get hot enough to begin to glow. As it gets hotter, its glowing color will change, moving from deep reds, such as a low burning fire, to oranges and then yellows and finally up to white superhot. Light sources that glow in this manner are considered "incandescent radiators" (like blackbody) and the advantage to them is that they have a continuous spectrum of light. This means that they radiate light energy at all wavelengths of their spectrum, thus render all the colors of a scene being illuminated by them, equally. Only light from sources functioning in similar ways can meet the definition of color temperature.

COLOR TEMPERATURE SCALE

WHY IS COLOR TEMPERATURE IMPORTANT?

In order to accurately view or evaluate objects, environments, events or grow various plants, the consistence of color temperature and illumination of light is extremely important.

Like photography, videography and cinematography, light sources need to produce consistent, repeatable, and correct color temperature for optimum color representation. However, color temperature can be even more important for industrial lighting applications. Because different light sources can change the appearance of a product finish, the mood in theater lighting, a medical evaluation, quality control in manufacturing, proper plant growth and even the perceived value of jewelry, its critical to select and maintain the desired color temperature of a light source. Without color temperature control, the color of lighting can have a large impact on how people experience an environment or accurately achieve a desired result.

WHAT IS CRI AND WHY IS IT IMPORTANT?

CRI (Color Rendering Index) is a quantitative measure revealing the ability of a light source to represent the colors of various objects faithfully in comparison with an ideal or natural light source. The Color Rendering Index (CRI) is a scale from 0 to 100, which describes how a light source makes the color of an object appear to the human eye and how well subtle variations in colors and shades are revealed. The higher the CRI, the better the color rendering ability. A Black Body Radiator (i.e.: a filament from a light bulb) is considered the "reference" light source and they produce a CRI value of 100. CRI values can be evaluated from R1 through R8 (color rendering index) and R9 through R15 (special color rendering index). Each R value represents a color for specific color rendering performance for the measured light source. Ra is commonly used because it represents an average color rendering performance of a light source from R1 through R8. It is important to measure various light sources for their CRI values before using them.

Specification andComparison Chart

Product Name and Model			C-7000	C-800
Illuminance Meter Class			* Class A of JIS C 1609-1: 2006 "Illuminance meters Part 1: General measuring instruments" * DIN 5032 Part 7 Class C	* Class A of JIS C 1609-1: 2006 "Illuminance meters Part 1: General measuring instruments"
Sensor			CMOS linear image sensor	CMOS linear image sensor
Spectral Wavelength Range			380nm to 780nm	380nm to 780nm
Output Wavelength Pitch			1nm (Requires the C-7000 Utility to output memorized data)	N/A
Spectral Bandwidth			Approx. 11nm (half bandwidth)	Approx. 11nm (half bandwidth)
Measuring Mode	Ambient light:		Yes	Yes
	Cord flash		Yes	Yes
	Cordless flash		Yes	Yes
	Radio triggering		No	No
Measuring Range	Incident light	Ambient light:	1 to 200,000lx (3 significant digits)	1 to 200,000lx (3 significant digits)
			0.09 to 18,600fc	0.09 to 18,600fc
			1,563 to 100,000K (more than 5lx required)	1,600 to 40,000K (more than 5lx required)
		Flash Light:	20 to 20,500lx•s	20 to 20,500lx•s
			1.86 to 1,900 fc•s	1.86 to 1,900 fc•s
			2,500 to 100,000K	2,500 to 40,000K
	Reflected light	Ambient light:	N/A	N/A
			N/A	N/A
		Flash Light:	N/A	N/A
Accuracy (Standard Illuminant A)			Illuminance: ±5% ± 1 digit (1 to 2,990lx), ±7.5% ± 1 digit (3,000 to 200,000lx)	Illuminance: ±5% ± 1 digit (1 to 2,990lx), ±7.5% ± 1 digit (3,000 to 200,000lx)
			x,y: 0.003 (Standard Illuminant A, 800lx)	CCT: ±4MK^{-1}(Standard Illuminant A, 800lx)
Repeatability (Standard Illuminant A)			Illuminance: 1% + 1 digit (30 to 200,000lx), 5% + 1 digit (1 to 29.9lx)	Illuminance: 1% + 1 digit (30 to 200,000lx), 5% + 1 digit (1 to 29.9lx)
			x,y: 0.001 (500 to 200,000lx)	CCT: 2MK^{-1} (500 to 200,000 lx)
			x,y: 0.002 (100 to 499lx)	CCT: 4MK^{-1} (100 to 499 lx)
			x,y: 0.004 (30 to 99.9lx)	CCT: 8MK^{-1} (30 to 99.9 lx)
			x,y: 0.008 (5 to 29.9lx)	CCT: 17MK^{-1} (5 to 29.9 lx)
Visible-region Relative Spectral Response Characteristics			Within 9%	Within 9%
Cosine Response (f2)			Within 6%	Within 6%
Temperature Drift (fT) (Standard Illuminant A 1,000lx)			Illuminance: ±5% of indicated value	Illuminance: ±5% of indicated value
			x,y: ±0.006	CCT: ±12MK^{-1}
Humidity Drift (fH) (Standard Illuminant A 1,000lx)			Illuminance: ±3% of indicated value	Illuminance: ±3% of indicated value
			x,y: ±0.006	CCT: ±12MK^{-1}
Power Source			AA (1.5v) x 2 pcs, USB bus power	AA (1.5v) x 2 pcs, USB bus power
Measurement Time	Ambient light:		Auto - Max.: 15 sec., Min.: 0.5 sec.	Auto - Max.: 15 sec., Min.: 0.5 sec.
			Manual - 0.1s, 1sec.	N/A
	Flash Light:		1s to 1/500s (in 1 step)	1s to 1/500s (plus 1/75, 1/80, 1/90, 1/100, 1/200, 1/400) (in 1, 1/2, 1/3 step)
Display Mode			Text mode, Spectrum mode, CRI mode, TM-30 mode, SSI mode, TLCI/TLMF mode, CIE1931 (CIE1964) mode, CIE1976 mode, Spectrum Comparison mode, CRI Comparison mode, CIE1931 (CIE1964) Comparison mode, CIE1976 Comparison mode	Text mode, Spectrum mode, Spectrum comparison mode, CRI mode, CRI comparison mode, TM-30 mode, SSI mode, TLCI/TLMF mode, Filter mode (Camera / Lighting), Multi Lights Mode, White Balance Correction Mode
Measuring Capability (Display Item)			Correlated Color Temperature (Tcp),Deviation (Δuv), Tristimulus value (XYZ / X$_{10}$Y$_{10}$Z$_{10}$), CIE1931/1964 (xyz / x$_{10}$y$_{10}$z$_{10}$), CIE1976 (u', v' / u'$_{10}$v'$_{10}$), Dominant wavelength (Λd), Excitation purity (Pe), Peak wavelength (Λp), Lux(lx) or Foot-Candle(fc) – ambient light, Lux Second(Hlx) or Foot-Candle Second(Hfc) – flash light, PPFD, TM-30 (Rf, Rg), SSI (Tungsten, Daylight, SSI1, SSI2), TLCI/TLMF, CRI (Ra, R1 to R15)	Correlated color temperature (CCT), Deviation (Δ uv), LB/CC filter number (camera/gel), LB/CC index, CC number, Lux(lx) or Foot-Candle(fc) – ambient light, Lux Second(Hlx) or Foot-Candle Second(Hfc) – flash light, CRI (Ra, R1 to R15), Rf, Rg, SSI (daylight, tungsten, selected light source), TLCI, TLMF, x, y, Hue, Saturation,
Other Functions			Up to 999 memory, Preset function, Auto power off, Auto dimmer, 2 or 10 deg. filed of view setting, Continuous/Single measurement selection	Up to 99 memory, Preset function, Auto power off, Auto dimmer
Display languages			English, Japanese, Chinese (Simplified)	English, Japanese, Chinese (Simplified)
Interface			USB 2.0 (Mini B)	USB 2.0 (Mini B)
Operating Temperature			-10 to 40 deg. C	-10 to 40 deg. C
Storage Temperature			-10 to 60 deg. C	-10 to 60 deg. C
Dimensions			73mm (w) x 183mm (h) x 27mm (d) = 2.9" (w) x 7.2" (h) x 1.1" (d) (excluding protruding part of light receiving) max. thickness 40mm (d) = 1.6" (d)	73mm (w) x 183mm (h) x 27mm (d) = 2.9" (w) x 7.2" (h) x 1.1" (d) (excluding protruding part of light receiving) max. thickness 40mm (d) = 1.6" (d)
Weight			230g = 8.1oz (without batteries)	230g = 8.1oz (without batteries)
Standard Accessory	Software/Utility		Yes (included in the package)	Yes (Downloaded from website)
	Operating Manual		Yes (Downloaded from website)	Yes (Downloaded from website)
	USB cable		Yes (included in the package)	No (optional)
	Start Up Guide		Yes (included in the package)	Yes (included in the package)
	Strap		Yes	Yes
	Synchro terminal cap		Yes (built-in)	Yes (built-in)
	Soft case		Yes	Yes

Features and specifications are subject to change without notice.

Lumidisc for L-308 Series:
This flat diffuser can be attatched to the light recieving part of the L-308 series to measure flat subjects or lighting contrast with precision.

Slide Set for L-398 Series:
A total of 11 slides are available, for direct reading of aperture on Foot-Candle scale in incident measurement.

5 Degree Viewfinder for L-478 Series:
For accurate, reflected light, spot measurements of specific subject areas. It is useful for distant objects such as landscapes or for metering subjects that generate light (neon signs, etc.), highly reflective surfaces or translucent subjects (stained glass, etc.).

Deluxe Case for L-478 Series:
The Deluxe Case for the L-478 series provides a stylish way to transport the meter and a convenient way to store the optional 5-degree viewfinder. Padded front and back panels provide excellent protection. Front pouch with hook-and-loop closure is provided to store the meter's optional 5-degree viewfinder or lumisphere when not in use.

Step-up ring for L-858D (30.5 - 40.5mm):
The step-up ring, available as an optional accessory, makes it possible to mount step rings and filters of other manufacturers. This simplifies the setting of exposure without the troublesome correction calculation of PL filters, etc. The step-up ring can also be used as a hood to protect lenses from scratching, soiling, etc.

Radio Transmitters RT-BR for L-858D
This transmitter module is compatible with 2.4GHz frequency for Broncolor radio systems, which is sold separately and requires a receiver for each remote flash. Installing the transmitter module in the L-858D enables triggering an electronic flash units wirelessly, while simultaneuosly taking a measurement. It also allows you to control the power of flash output and turn modeling lamps ON or OFF.

Radio Transmitters RT-GX for L-858D
This transmitter module is compatible with 2.4GHz frequency for Godox radio systems, which is sold separately and requires a receiver for each remote flash. Installing the transmitter module in the L-858D enables triggering an electronic flash units wirelessly, while simultaneuosly taking a measurement. It also allows you to control the power of flash output and modeling lamps.

Radio Transmitter RT-EL/PX for L-858D
This transmitter module is compatible with 2.4GHz Elinchrom (EL-Skyport) and Phottix (Strato II protocol) radio systems, and require a receiver for each remote flash. Installing the transmitter module in the L-858D enables triggering the electronic flash units wirelessly. With EL-Skyport radio system, you can wirelessly control the power output of a flash and turn modeling lamps ON or OFF.

Radio Transmitter RT-3PW for L-858D
This transmitter module is compatible with 433MHz CE (Europe) frequency for PocketWizard radio systems, which is sold separately and requires a receiver for each remote flash. Installing the transmitter module in the L-858D enables triggering an electronic flash units wirelessly while simultaneuosly taking a measurement. With the PocketWizard ControlTL system, you can wirelessly control the power output of a flash and turn modeling lamps ON or OFF.

Synchro Cord:
This is a five-meter long cord with three plugs to connect with flash, light meter and camera. Cord has two male connectors and one female one. One of the male connectors has the lock function not to easily come off.