TOPCON

Correspondance of CIE 170-2

SPECTRORADIOMETER

Spectroradiometer series

SR-LEDW / SR-LEDH / SR-NIR
SR-UL2s / SR-UL2 / SR-UL1R / SR-3AR

NEW *Added Special HighSpeed mode.*

Topcon provides wide variety of Spectroradiometer for ultra-low luminance measuring, ultra-high luminance and Near infrared measurement.

SR-LED series is best suited for the inspection of High-intensity LED.

SR-LEDW-5N

0.0005 to 5,000,000 cd/m²

SR-LEDW

0.0005 to 5,000,000 cd/m²

SR-LEDH

10 to 4,500,000 cd/m²

SR series Spectroradiometer is suited to measure Spectral distribution, Luminance, Chromaticity and Correlated color temperature of the light emitted from display device, car interior and lamp.

Customize

SR-UL2s

0.0005 to 300,000 cd/m²

SR-UL2

0.0005 to 300,000 cd/m²

SR-UL1R

0.001 to 300,000 cd/m²

▶ Product features

- **Half band-width is 5nm or less.**
  SR-LEDW-5N has a half-width of 5 nm or less, which is required by colorimetry (JIS Z 8724-1997) in a visible light region.

- **Most suitable for measuring directly to ultra-high intensity LED light.**
  Ultra-high intensity LED light can be measured directly without Integrating sphere, diffusing board and external ND filter.
  It is easy to manage by the luminance which repeatability is higher.
  Also, measurement range of luminance is up to 4,500,000 cd/m² when measurement angle is 1°. *Only SR-LED series

- **High uniformity of the sensitivity on the measurement area.**
  Uniformity of the sensitivity on the measuring area is within 5% in luminance and within 0.001 in chromaticity at measuring angle of 1°. * SR-LEDW only.

- **High accuracy measurement of flashing light.**
  Synchronous measurement function.
  The instrument can detect and measure frequency of flash by inputting synchronous signal. Arbitrary frequency value can be set manually.
  Integral time delay function.
  Following kind of light can be measured with stable;
  Frequency flashing of light on black screen, Intermittent light, and Periodic flashing light.

- **Spectral observation.**
  SR series can conduct spectral radiance measurement and so that spectral distribution and spectral radiance can be observed.

- **High accuracy Luminance and Chromaticity measurement.**
  Accuracy (Luminance) : ±2%, Accuracy (Chromaticity) : dxdy ±0.002
  * In Normal speed mode at measuring angle of 2° for standard illuminant A.

- **High speed measurement for in-line inspection is 0.4sec (minimum) .**
  LAN (Ethernet 10/100 BASE-TX) communication allows
  high speed measurement of 0.4sec.
  *Under Measurement angle 2°, Integral time 100ms,
  High speed mode and LAN (STB command). *SR-LEDH only

- **FIX mode.**
  Measurement time is faster about 1.5sec than normal when measuring same kind of object in succession. * SR-LEDW, SR-LEDH only.

- **The SR-NIR can measure spectral distribution in near infrared range (600-1030nm)with high accuracy.**

- **Combine with SR series for visible light, Spectral distribution can be measured from visible to near infrared range(380-1030nm).**

- **No need of warm-up after power on.**
  Measuring field:2°
  Luminance of object to be measured is 1cd/m² or above.

- **Improvement of chromaticity accuracy.**
  Chromaticity:dx,dy:±0.0013 (for standard illuminant A)
  *SR-UL2s only

The SR-NIR achieves high accuracy measurement of very faint Near infrared.

Near infrared spectroradiometer

SR-NIR

600 to 1030 nm

SR-3AR

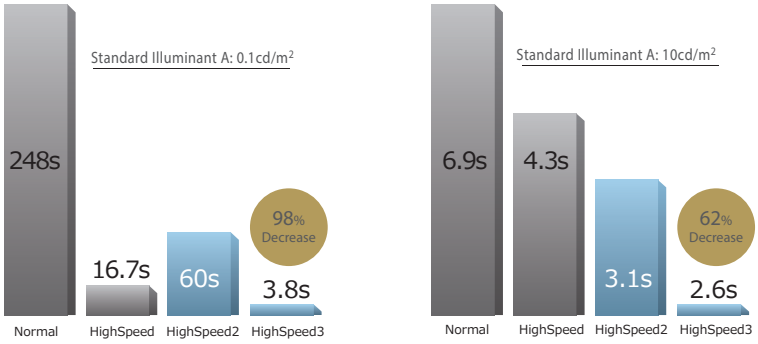
0.1 to 300,000 cd/m²

Measurement reliability

The SR series spectroradiometer is built-in spectroscope and measure spectral radiance of each wavelength from 380 to 780nm. And luminance, chromaticity, other color data is output using color matching function.
Other measuring instruments can be calibrated using the result data of SR series as reference.
Note: except Near infrared spectroradiometer SR-NIR.

NEW Ultra-high speed measurement mode

e.g.) SR-UL1R (Measuring angle 1°)



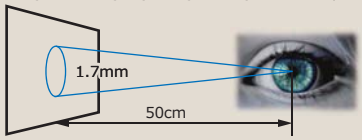
Normal	Approx 1 to 248sec. / * Approx 1 to 31sec.
HighSpeed	Approx 1 to 17sec.
NEW HighSpeed 2	Approx 1 to 60sec. / *Approx 1 to 10sec.
NEW HighSpeed 3	Approx 1 to 6sec.

Applicable model: Spectroradiometer SR-LEDW, SR-UL2,SR-UL1R, SR-3AR
The measurement time differs depending on the measurement target.
*SR-3AR only

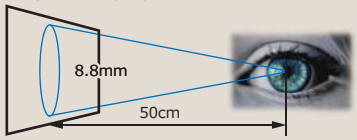
▶ CIE170-2:2015 Color Matching Function **NEW**

This color matching function is using cone fundamentals for the Fundamental Chromaticity Diagram with Physiological Axes which was released in 2006.
Visual color difference is obtained the result less than CIE 1931 in the field of OLED, QD, BT2020 with laser, wide color gamut display of HDR and general lighting.

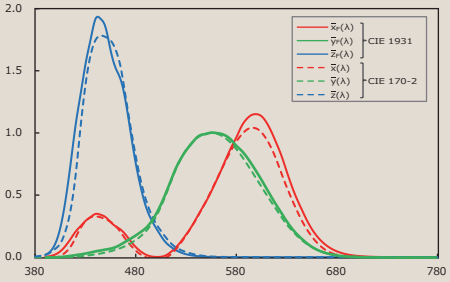
2 degree viewing angle : High color gamut Display etc.



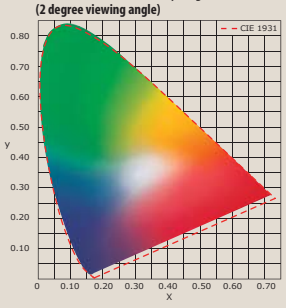
10 degree viewing angle : General Illumination etc.



CIE 170-2:2015 Color matching function (2 degree viewing angle)



CIE 170-2:2015 Chromaticity Diagram (2 degree viewing angle)



Available to change field of view(2 degree or 10 degree) and CIE(1931 or 170-2) using application software named CS-900A that is standard accessory.

*Even if chromaticity is same due to difference of color range in chromaticity diagram, color tones are different in CIE1931 and CIE170.

Provides high accuracy of spectrophotometry per 1 nm and a host of calculation features.

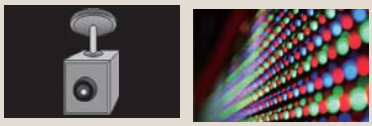
▶ Usage

• ***SR-LEDW / SR-LEDH / SR-UL2s / SR-UL2 / SR-UL1R / SR-3AR***

Large Television | Car Navigation | Monitor of mobile phone | Speed meter in automobile | LED | Traffic signal | Head lamp | Next-generation illumination

Optical characteristic evaluation of Flat Panel Display(LCD,OLED,QD,LD), Fluorescent material, Large Television, Mobile phone, Automobile (Component, Interior panel and various type of lamp), Indicator (Large Panel LED, Traffic light, mobile phone), Parts for display (LCD module, LED and Optical filter), Material (Back light, Fluorescent material, Optical filter, Organic EL and LED).

• ***SR-NIR***



- For measuring NIR LED illumination of the safety prevention in automobile.
- For measuring NIR LED illumination of the monitoring camera.
- For measuring NIR beam coming from remote controller.
- For measuring emission line of Ne and Ar lamps.
- For measuring Transmission characteristics in NIR of optical film and lens.
- For monitoring output of NIR LED of near-infrared range
- Other near-infrared measurement.

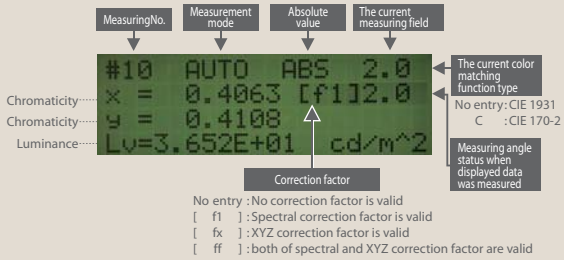
▶ Color Systems Display of Calculation Results

▶ Computing

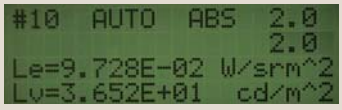
• common with SR-LEDW / SR-LED / SR-UL2 / SR-UL1R / SR-3AR

Not only spectral distribution but also chromaticity, Tristimulus value, luminance and correlated color temperature can be determined by calculation immediately. Tristimulus value X,Y,Z, at 10 degree observers can be determined also.

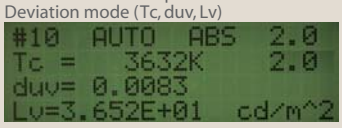
● Luminance / Chromaticity mode (Lv, x,y)



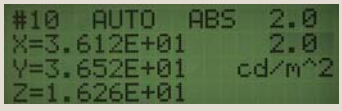
● Radiance / Luminance mode (Le, Lv)



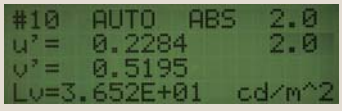
● Correlated color temperature / Deviation mode (Tc, duv, Lv)



● Tristimulus value mode (XYZ)

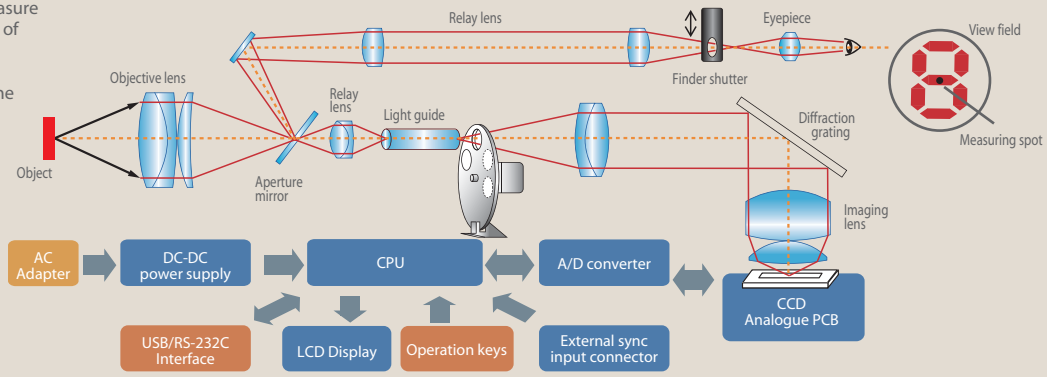


● Luminance / Chromaticity mode (Lv, u',v')



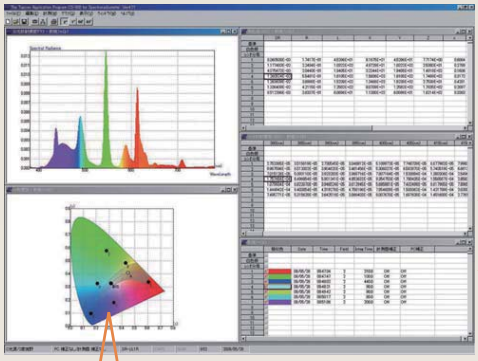
▶ Block diagram

Telescopic system makes it possible to measure the absolute value of the spectral radiance of light sources or objects without coming in contact with them.
This optics also make it possible to verify the object to measure through a finder.



Standard accessory software can control Spectroradiometer and can process measured data with simple operation.

▶ Colorimetry software CS-900A (Standard accessory)

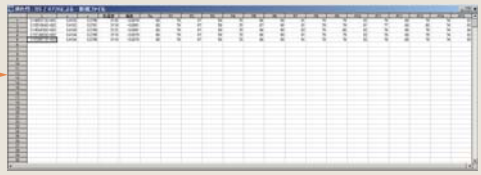


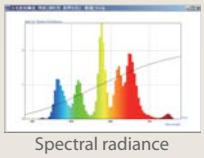
Color Rendering Index data

Colorimetry data

Spectral radiance data / Spectral irradiance data peak wavelength

Measurement conditions / Note

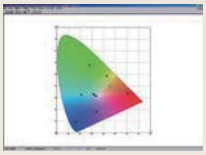




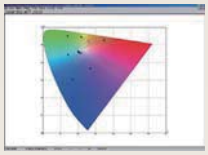
Spectral radiance

Time line graph

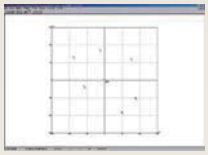
Chromaticity diagram



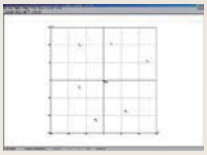
xy diagram



u'v' diagram



a*b* diagram



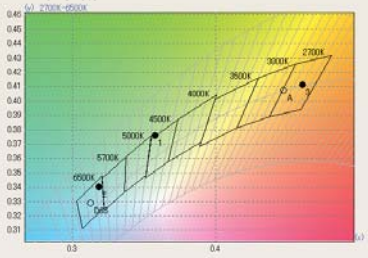
u*v* diagram

Hue-chroma diagram

The CS-900A for Windows can control the SR series and collect, save, and, graph measured data.
The measurement time can be shortened by selecting Colorimetry mode. In Colorimetry mode, the instrument will omit spectral radiance data and send the measured data of luminance, chromaticity, and color temperature.

* Judging the unevenness of LED color, classifying LED color into ANSI rank, and judging whether or not measured color data fall within certain rank.
* You can specify area in the color diagram and CS-900A judge whether or not color data fall within the area.

ANSI C78.377



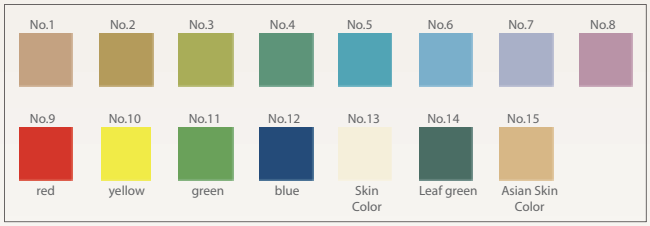
● *Total luminous flux measuring function*

SR series mounted to Integrating sphere, CS-900A has a function to calculate Total luminous flux from SR series measured data.
* Integrating sphere, standard light, Auxiliary light, and adapter for SR series should be purchased by customer.

● *Color rendering index (CRI)*

Color rendering index is measure of how well light source render the color of object compared to reference light source.
Ideal light source for CRI is rated as 100. Light sources with a high CRI are desirable.
The lower the CRI rating, the less accurately colors will be reproduced.

test color samples



● *Evaluation for Accessible design*

Age-related luminance contrast, which is used in illumination and visual display design, can be evaluated complying with JIS S 0031.
Evaluation items
(1).Contrast ratio CR
(2).Weber ratio C_W
(3).Michelson contrast C_m
Evaluation based on Photopic and Scotopic are also available when entering their sensitivity data into software.

NEW ***This new Color Matching Function is corresponded to the latest CIE 170-2:2015 technical report.***

Display	: Spectral radiance graph, other graph
Color system	: L, xy, XYZ, Spectral radiance, u'v', u*v*, L*a*b*, Color temperature, Deviation, Dominant wavelength, Excitation purity, Color Rendering Index
Function	: Fundamental operations of Spectral data
Mode	: Spectral mode, Colorimetry mode
Condition setting	: Auto/Frequency/Integral time, Integ. delay mode, Measurement speed, Measurement angle, Average, Single / Interval / Continue
Evaluation	: CIE standard observer, Light source, Color Rendering Index

Hardware requirement

OS	: Windows® 7 Ultimate / Professional (32bit/64bit) Windows® 8.1 Pro or more (32bit/64bit) Windows® 10 Pro or more (32bit/64bit)
CPU	: Intel® Core™ i3 2.4GHz or more *In the 64bit, the CS-900A support and 64 only.
HDD	: 1GB or more
Memory	: 1GB or more
Port	: USB 2.0 (1pce), RS-232C serial port *use inter-link RS-232C cable for DOS/V

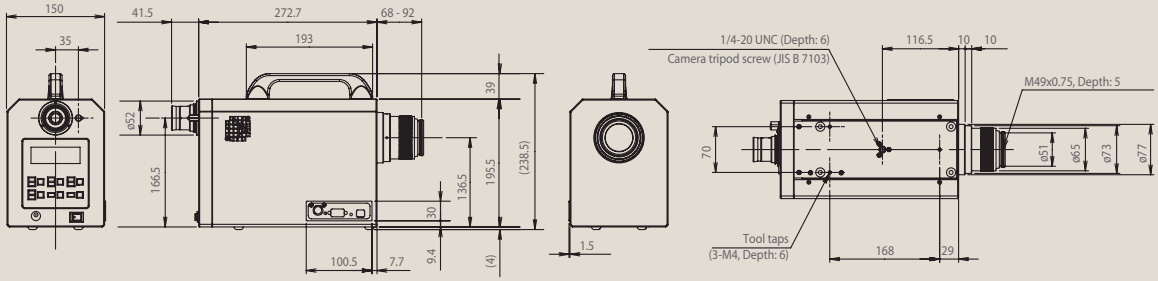
▶ *Specification*

		SR-LEDW-5N		SR-LEDW		SR-LEDH		SR-NIR	
Optical system		Objective lens: f= 82 mm F2.5, Eyepiece lens: 5° view field, Diopter adjustment range: ±5diopter				Objective lens: f= 82 mm F2.5, Collimation lens:: 5° view field		Objective lens: f= 82 mm F2.5, Eyepiece lens: 5° view field, Diopter adjustment range: ±5diopter	
Dispersing element		Diffraction grating							
Photodetector		Electronically cooled linear CCD				Electronically cooled back incidence type CCD		Electronically cooled linear CCD	
Measuring angle		2° / 1° / 0.2° / 0.1°				2° / 1° collimation only (motor drive)		2° / 1° / 0.2° / 0.1°	
Measuring distance		350 mm to ∞ (distance from metallic tip of objective lens)							
Measuring diameter (mmø)	Measuring angle	Measuring distance (mm) (distanc e from metallic tip of objective lens)							
		350	400	500	600	800	1000	2000	5000
	2°	10.0	11.7	15.1	18.6	25.4	32.2	66.4	169
	1°	4.99	5.84	7.55	9.26	12.7	16.1	33.2	84.4
	0.2°	1.00	1.17	1.51	1.86	2.54	3.22	6.64	16.9
	0.1°	0.50	0.59	0.76	0.93	1.27	1.61	3.32	8.44
Wavelength range		380nm to 780nm						600 to 1030nm	
Spectral accuracy		±0.3nm (on Hg emission line)						±0.5nm (on Hg emission line)	
Spectral band width		5nm or less (half width)		5 to 8nm (half width)		6 to 9nm (half width)		5 to 8nm (half width)	
Wavelength resolution		1nm							
Measurement mode		Auto / Manual (integral time / frequency), synchronous , FIX(INTEG / FREQ)				Auto / Manual (integral time / frequency), FIX		Auto/manual (integral time/frequency), external vertical sync signal input	
Measuring object		Spectral radiance (W, sr $^{-1}$, m $^{-2}$, nm $^{-1}$)							
Calculation function		Radiance (Le: W, sr $^{-1}$, m $^{-2}$), luminance (Lv: cd, m $^{-2}$), CIE1931 chromaticity coordinates xy, CIE1976 chromaticity coordinates u'v', tristimulu s value XYZ Correlated color temperature (Tc: K) and deviation (duv), CIE standard observer 2°/10°						-	
Repeatability		Luminance : ±2% Chromaticity(x,y) : ±0.002 (for standard illuminant A)						with in ±7% (600 to 1030nm for Topcon Standard light)	
Repeatability	Luminance *1	1.5% (0.0005 to 0.005 cd/m^2)				0.3%		2% or less (600 to 1030nm for Topcon Standard light)	
		0.4% (0.005 to 0.1 cd/m^2)							
		0.3%(0.1 cd/m^2 or more)							
	Chromaticity *2	0.005(0.0005 to 0.005 cd/m^2)				0.0005			
		0.0015(0.005 to 0.1 cd/m^2)							
		0.0005(0.1 cd/m^2 or more)							
Measurement Luminance range (cd/m^2) (for standard illuminant A) *3	2°	0.0005 to 1,500,000				10 to 1,500,000		0.5 to 3,000 *4	
	1°	0.0015 to 4,500,000				30 to 4,500,000		1 to 9,000 *4	
	0.2°	0.0375 to 5,000,000				-		20 to 70,000 *4	
	0.1°	0.15 to 2,000,000				-		100 to 300,000 *4	
Minimum luminance display		5.000E-06				1.000E-01		-	
Polarization error		Luminance 1% or less, Spectral radiance 2% or less (400nm to 780nm)				Luminance 1% or less, Spectral radiance 5% or less (400nm to 780nm)		Spectral radiance 5% or less	
Interface		RS-232C Baud rate: 4800/9600/19200/38400 bps, Parity: Odd/even/none, Date length: 7/8 bits, Stop bit: 1/2 bits USB : USB2.0				RS-232C Baud rate : 9600/19200/38400 bps, Parity : even, Date length : 7 bits, Stop bit : 1 bits, LAN : TCP/IP, Ethernet 10/100BASE-TX		RS-232C Baud rate: 4800/9600/19200/38400 bps, Parity: Odd/even/none, Date length: 7/8 bits, Stop bit: 1/2 bits USB : USB2.0	
Power supply		Provided AC adapter AC100V-240V, 50/60Hz, DC12V							
Power consumption		Approx.36W				Approx.33W		Approx.36W	
Operating conditions		Temperature : 5°C to 30°C				Temperature : 5°C to 35°C		Temperature : 5°C to 35°C	
		Humidity: 80%R.H. and below (No condensation)							
External dimensions		About 406 mm x 150 mm x 239 mm (L x W x D)				About 413 mm x 98 mm x 231.5 mm (L x W x D)		About 406 mm x 150 mm x 239 mm (L x W x D)	
Weight		About 5.5 kg (main unit only)				About 5.3 kg (main unit only)		About 5.5 kg (main unit only)	

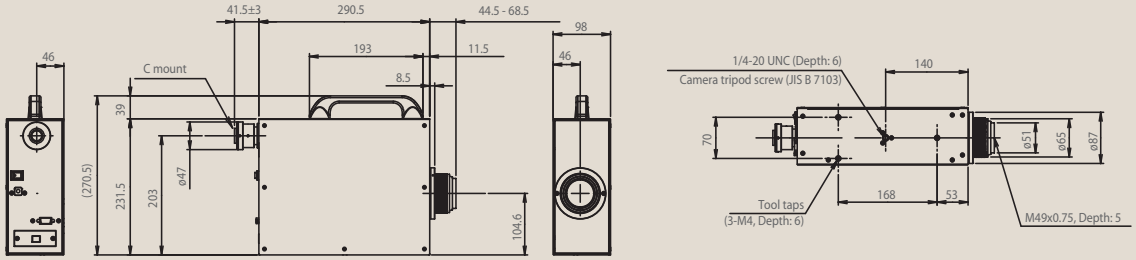
*1: 2σ from 10 times continuous measurement at measuring angle 2° in normal speed mode.
*2: Max value - Min value from 10 times continuous measurement at measuring angle 2° in normal speed mode.
*3: Measurable range in Normal and High speed mode.
*4: SR-NIR can not measure quantity of luminance. The value is for reference, when measuring standard illuminant A.
*: The measuring distance is the distance from the metallic tip of the objective lens.
*: The values in this table are design reference values and may differ somewhat from the actual diameter.

▶ *Dimensions*

• SR-LEDW / SR-UL2s / SR-UL2 / SR-UL1R / SR-3AR / SR-NIR



• SR-LEDH



Units : mm

▶ *Specification*

		SR-UL2s		SR-UL2		SR-UL1R		SR-3AR	
Optical system		Objective lens: f= 82 mm F2.5, Eyepiece lens: 5° view field, Diopter adjustment range: ±5diopter							
Dispersing element		Diffraction grating							
Photodetector		Electronically cooled linear CCD							
Measuring angle		2° / 1° / 0.2° / 0.1°							
Measuring distance		350 mm to ∞ (distance from metallic tip of objective lens)							
Measuring diameter (mmø)	Measuring angle	Measuring distance (mm) (distanc e from metallic tip of objective lens)							
		350	400	500	600	800	1000	2000	5000
	2°	10.0	11.7	15.1	18.6	25.4	32.2	66.4	169
	1°	4.99	5.84	7.55	9.26	12.7	16.1	33.2	84.4
	0.2°	1.00	1.17	1.51	1.86	2.54	3.22	6.64	16.9
	0.1°	0.50	0.59	0.76	0.93	1.27	1.61	3.32	8.44
Wavelength range		380nm to 780nm							
Spectral accuracy		±0.3nm (on Hg emission line)							
Spectral band width		5 to 8nm (half width)							
Wavelength resolution		1nm							
Measurement mode		Auto/manual (integral time/frequency), external vertical sync signal input							
Measuring object		Spectral radiance (W, sr^{-1}, m^{-2}, nm^{-1})							
Calculation function		Radiance (Le: W, sr^{-1}, m^{-2}), luminance (Lv: cd, m^{-2}),							
		CIE1931 chromaticity coordinates xy, CIE1976 chromaticity coordinates u'v', tristimulu s value XYZ							
		Correlated color temperature (Tc: K) and deviation (duv), CIE standard observer 2°/10°							
Repeatability		Luminance : ±2% Chromaticity(x,y) : ±0.0013 (for standard illuminant A)		Luminance : ±2% Chromaticity(x,y) : ±0.002 (for standard illuminant A)					
Repeatability	Luminance *1	1.5% (0.0005 to 0.005 cd/m^2)				1.5% (0.001 to 0.005 cd/m^2)		0.3%	
		0.4% (0.005 to 0.1 cd/m^2)				0.4% (0.005 to 0.1 cd/m^2)			
		0.3% (0.1 cd/m^2 or more)				0.3% (0.1 cd/m^2 or more)			
	Chromaticity *2	0.005 (0.0005 to 0.005 cd/m^2)				0.005 (0.001 to 0.005 cd/m^2)		0.0005	
		0.0015 (0.005 to 0.1 cd/m^2)				0.0015 (0.005 to 0.1 cd/m^2)			
		0.0005 (0.1 cd/m^2 or more)				0.0005 (0.1 cd/m^2 or more)			
Measurement Luminance range (cd/m^2) (for standard illuminant A) *3	2°	0.0005 to 3,000				0.001 to 3,000		0.1 to 3,000	
	1°	0.0015 to 9,000				0.003 to 9,000		0.3 to 9,000	
	0.2°	0.0375 to 70,000				0.075 to 70,000		7.5 to 70,000	
	0.1°	0.15 to300,000				0.3 to 300,000		30 to 300,000	
Minimum luminance display		5.000E-06				1.000E-05		1.000E-03	
Polarization error		Luminance 1% or less, Spectral radiance 2% or less (400nm to 780nm)							
Interface		RS-232C Baud rate: 4800/9600/19200/38400 bps, Parity: Odd/even/none, Date length: 7/8 bits, Stop bit: 1/2 bits USB : USB2.0						NORMAL SPEED MODE: About 1 to 31seconds. HIGH SPEED MODE: About 1 to 17seconds. (excludes communication time with computer)	
Power supply		Provided AC adapter AC100V-240V, 50/60Hz, DC12V							
Power consumption		Approx.36W						Approx.34W	
Operating conditions		Temperature : 5°C to 30°C						Temperature : 5°C to 35°C	
		Humidity: 80%R.H. and below (No condensation)							
External dimensions		About 406 mm x 150 mm x 239 mm (L x W x D)							
Weight		About 5.5 kg (main unit only)							

*1: 2σ from 10 times continuous measurement at measuring angle 2° in normal speed mode.
*2: Max value - Min value from 10 times continuous measurement at measuring angle 2° in normal speed mode.
*3: Measurable range in Normal and High speed mode.
*: The measuring distance is the distance from the metallic tip of the objective lens.
*: The values in this table are design reference values and may differ somewhat from the actual diameter.

▶ *System Diagram*

▶ Optional accessories

• Attachment lens 3 sets AL-6 / AL-11 / AL-12

These lenses make focal length shorten and make measurement area shrink.

(Specifications for Measuring Small Objects)

	Measurement angle	AL-6 Measurement distance 51.72 to 68.53mm	AL-11 Measurement distance 19.56 to 24.80mm	AL-12 Measurement distance 165 to 197mm
Measurement area (Diameter mmø)	2°	2.00 to 2.88	1.18 to 1.53	3.23 to 4.00
	1°	1.00 to 1.44	0.59 to 0.76	1.62 to 2.00
	0.2°	0.20 to 0.29	0.15 to 0.19	0.32 to 0.40
	0.1°	0.10 to 0.14	0.06 to 0.08	0.16 to 0.20

*Measurement distance may differ slightly depending on aperture mirror machining accuracy.
*Measurement distance is from metal tip of attachment lens to the object.

• Fiber probe FP-3P

Light guide used for remote detection of light from measurement object.

- Effective measurement angle: 2°
- Measurement diameter: 3 to 10 mmø
- Measurement distance: 31.0 to 84.9 mm
- Fiber length: Approx.1m

• Tripod 5N

Simplifies collimation of measurement object.

- Max height : 1835mm
- Min height : 585mm
- Folder length : 810mm
- Leg sections : 3
- Weight : 4.81Kg (including Tripod stand)

• Fine Adjustment Stand S-4

Simplifies vertical and lateral collimation.

- Elevation angle : 40°
- Depression angle : 80°
- Rotation : 360°
- Weight : Approx. 1.7Kg

• Tripod Tripod-SR

Simplifies collimation with smooth movement.

- Max height : 1614mm
- Min height : 234mm
- Folder length : 694mm
- Leg sections : 3
- Weight : 3.0Kg (including Tripod stand)

• The adapter for microscope: AL-4

AL-4 is for connecting between the lens for microscope and objective lens of instrument.
It is possible to measure very small area using the lens for microscope.

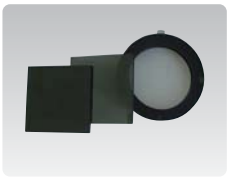
• Reference White Board WS-3

Used for measurement of object color or light source with directionality.

- Luminance factor : 90% or above
  (for measurement parameters of 0° incidence and 45° observation)
- Material: Barium sulfate ($BaSO_4$)
- Dimensions: 78 mm , t = 12.5 mm
- Effective white surface: 40 mm (at center)

• CCD Adapter IA-2

Adapter for connecting instrument to the CCD camera.
(C mount, 1/2 size)



• ND filter (10x / 100x set)

Neutral density filter for measuring higher luminance than the measuring range of instrument.

• Illuminance adapter (Cosine receptor) for SR-series ZV-30

- Complying with JIS C1609-1:2006 AA class
  The spectral irradiance and illuminance may be measured by attaching an illuminance adapter to the Spectroradiometer.
  *Calibration of your Spectroradiometer and Illuminance adapter is required in Topcon factory before you use the illuminance adapter with your instrument.
- For measuring illuminance, chromaticity, color temperature, and color rendering index of light from LED, OLED illumination. For measuring illuminance of light from projector.

Measurement range

0.001	to	30,000,000 lx	(SR-LEDW at measuring angle 2° with ZV-30)
0.02	to	60,000 lx	(SR-UL1R at measuring angle 2° with ZV-30)
6	to	7,000,000 lx	(SR-ULR at measuring angle 0.1° with ZV-30)
2	to	60,000 lx	(SR-3AR at measuring angle 2° with ZV-30)
600	to	7,000,000 lx	(SR-3AR at measuring angle 0.1° with ZV-30)

Accuracy Ev : ±2% , xy : ±0.002 (for standard illuminant A)

- SR-LEDW / SR-UL2s / SR-UL2 / SR-UL1R / SR-3AR / SR-NIR Standard package
  - Main body.....1ea.
  - AC adapter.....1ea.
  - Carrying case.....1ea.
  - CD-ROM (Colorimetry software CS-900A / CS-900A CF Tool / Instruction manual)...1ea.
  - Quick manual.....1ea.
  - USB cable.....1ea.
  - Objective lens cap.....1ea.
- SR-LEDH Standard package
  - Main body.....1ea.
  - AC adapter.....1ea.
  - CD-ROM (Colorimetry software CS-900A / CS-900A CF Tool / Instruction manual)...1ea.
  - Objective lens cap.....1ea.

ISO 14001 JACO EC97J1081 — UKAS ENVIRONMENTAL MANAGEMENT 051

JCSS 0073

TOPCON TECHNOHOUSE has been certified as a provider of optical solutions, according to the Japanese Measurement Law.

We will issue a calibration certificate bearing the JCSS logo, which guarantees the accuracy of illuminance (illuminance meter), and luminosity (lamp) based on national standards.

*Some screens are simulated.
*The specifications and external appearances of product in this catalogue may be changed without prior notice due to improvements.
*The catalogue includes products that are sold separately.
*The actual color of products may differ slightly from the catalogue due to lighting and printing conditions.

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SAFETY PRECAUTIONS

Make sure to carefully read the "Manual" to ensure that you use the product properly and safely.
•Always connect the instrument to the specified power supply voltage. Improper connection may cause a fire or electric shock.

For more information please visit our website.
http://www.topcon-techno.co.jp/en/

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