

Spectroradiometer

SR-5A



**Pursuing HDR, High speed, and Usability.
The new generation SR series is finally launched !!**

Completely renewal of spectroradiometer SR series

Topcon Technohouse Spectroradiometers SR series has always been the top model in the industry with cutting-edge optical technology such as mega-contrast and LED measurements. The significantly renewed SR-5A has improved measurement accuracy and pursued high-speed measurement. It is a next-generation spectroradiometer with greatly improved usability by adopting a large-screen color touch panel display.



Renewal point

Point.1 HDR(High Dynamic Range)Measurement

SR-5A supports ultra-low luminance measurement from 0.0005 cd/m² at measurement angle 2° and 1°. The range of high luminance range is extended to 500,000,000 cd/m². High-luminance LED can be measured without using an external ND filter.

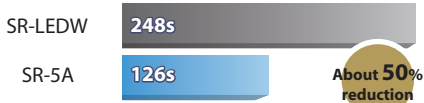
Measurement angle	SR-5A
2°	0.0005 - 1,500,000 cd/m ²
1°	0.0005 - 4,500,000 cd/m ²
0.2°	0.0125 - 100,000,000 cd/m ²
0.1°	0.05 - 500,000,000 cd/m ²

Point.2 High Speed Measuring

• Significant reduction in measurement time

The measurement time has been significantly reduced by improving the sensitivity and internal algorithm based on renewing the optical system.

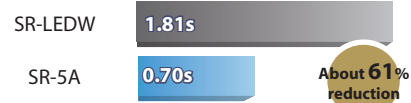
- Standard illuminant A : 0.0005cd/m²
SR-5A : at measurement angle 1°, SR-LEDW : at measurement angle 2°



• Communication time reduction

Supported by USB3.0. High-speed communication is possible by improving the communication speed of RS-232C from the existing models. (38,400 bps→115,200 bps)

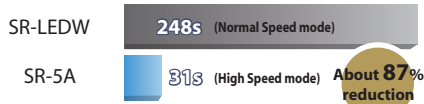
- RS-232C communication time



• High speed mode

High speed measurement by applying a special sequence.

- Standard illuminant A : 0.0005cd/m²
SR-5A : at measurement angle 1°, SR-LEDW : at measurement angle 2°



By shortening the measurement time and communication time and using the High speed mode together, the display gradation measurement time can be significantly reduced.

- Gradation measurement time
OLED(0 to 255 gradations, measuring at every 4 gradations)
*Example of total measurement time including pattern switching time (500ms)



Point.3 Significant improvement in usability by adopting a color touch panel

• Easy-to-read 4.3inch big size screen panel

The chromaticity diagram and spectral distribution can be displayed in color.

• Easy operation by touch panel

Various settings can be done easily. Numerical values can be entered with the numeric keypad.

• Various setting function

- Electric switching of measurement angle
- Electric open/close finder shutter
- Display items selectability
- Dominant/peak wavelength can be displayed.



[New model] SR-5A [Old model] SR-LEDW

Main display

Electric switching of measurement angle

Display items selectability

Numerical values can be entered with the numeric keypad

Measuring start button

Chromaticity diagram display

Spectrum distribution display

Point.4 Pursuit of the best function and compatibility for measurement system installation

• Rear interface

The interface is integrated on the back panel of the main unit with cable routing unified and flat side for system integration.

• Downsizing the main body

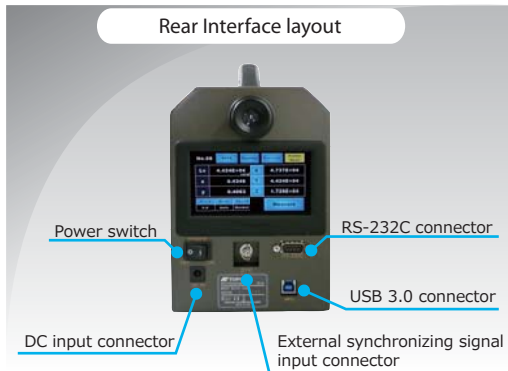
The width of the main body is thinner than the conventional SR series : 150mm → SR-5A : 130mm.

• Environment information output

Temperature / humidity / acceleration speed information output for system environment management.

• Compatibility with existing models

Same communication commands and tool setup screw positions with existing SR series enable easy transfer or update to the system.



● Other product features

| High accuracy Luminance and Chromaticity

Luminance accuracy: within $\pm 2\%$, chromaticity accuracy: within $dx \pm 0.0015$, $dy \pm 0.001$.

※Measurement angle 2° , Normal Speed mode, standard illuminant A

| Half band width is 5nm or less

Half band width is 5nm or less, which is required by colorimetry (JIS Z 8724-1997) in a visible light region.

| 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° .

| 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

Periodic flashing light (PWM) sample can be measured stably.

| FIX mode

Measurement time is faster about 1.5 sec than normal when measuring same kind of object in succession.

| CIE 170-2 Color matching function

In addition to the current CIE 1931 color matching function, it corresponds the latest color matching function of the CIE 170-2:2015 technical report.

Less visual color difference than CIE 1931 can be obtained in the filed of OLED, QD, BT2100 with laser, wide color gamut display of HDR.

| Option compatibility with existing models.

Optional items for existing models such as attachment lenses and ND filters can use.

※ITV adapter is IA-1A.

| No need of warm-up after power on.

Applies to

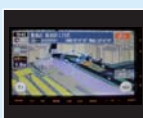
Measuring field : 2°

Luminance of object to be measured is 1cd/m^2 or above.

► Usage



Large television



Car navigation



Mobile phone



Speedometer in automobile



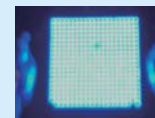
LED



Traffic signal



Head lamp



Micro-LED

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, μ LED, MiniLED and QD).FPD(LCD · OLED · QD · LD),Production line(high precision gamma measurement with spectral measuring), R&D(various evaluation such as IVL-measuring), Others(Illumination lamp, Reflection light of painted surface or printing)

► Colorimetry software CS-900A (Standard accessory)

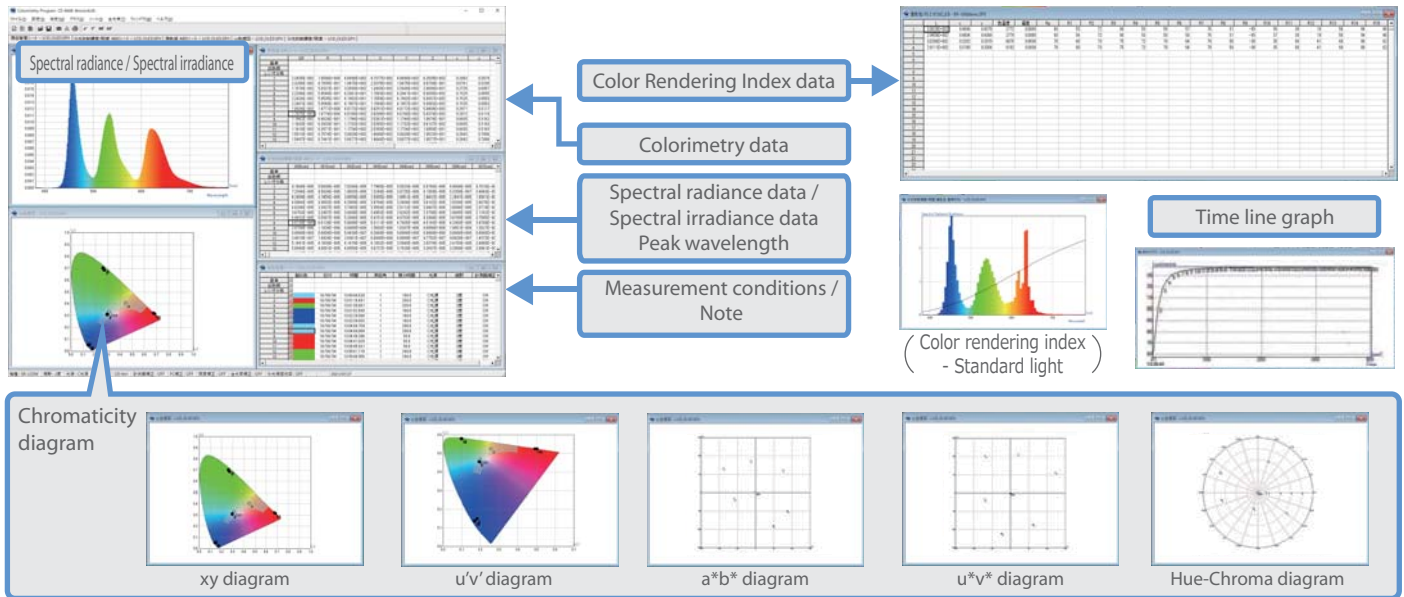
Standard accessory software can control Spectroradiometer and can process measured data with simple operation.

The CS-900A for Windows can control the SR-5A 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.



Display	: Spectral radiance graph, other graph
Color system	: Spectral radiance/Spectral irradiance(SR / SE), Radiance/Irradiance(R / Ee), (I), Luminance/Illuminance(L / Ev), Tristimulus value(XYZ), x,y, u',v', Color temperature, Deviation, Peak wavelength, 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 more more ※In the 64bit, the CS-900A support amd 64 only.
■ HDD	: 1GB or more
■ Memory	: 1GB or more
■ Port	: USB3.0/2.0 (1 pcs) RS-232C serial port (1 pcs)

*Use inter-link RS-232C cable for DOS/V.

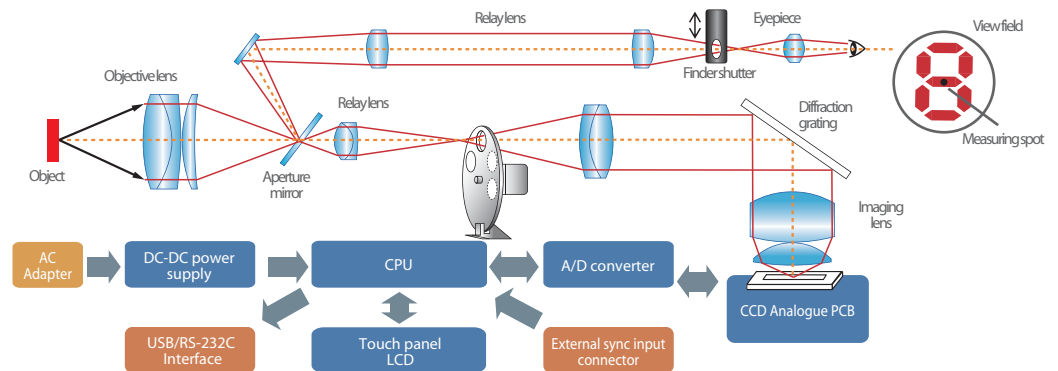
*CS-900A communication speed become slower due to use hand-shake communication method.

► Block diagram

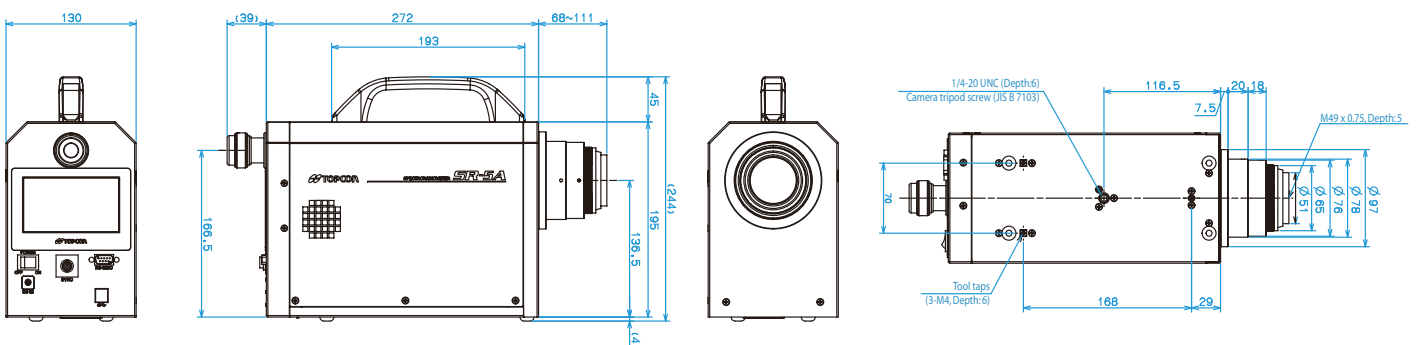
Telescopic system makes it possible to measure the absolute value of the spectral radiance of light sources or objects without coming in contact with them.

This optics also make it possible to verify the object to measure through a finder.

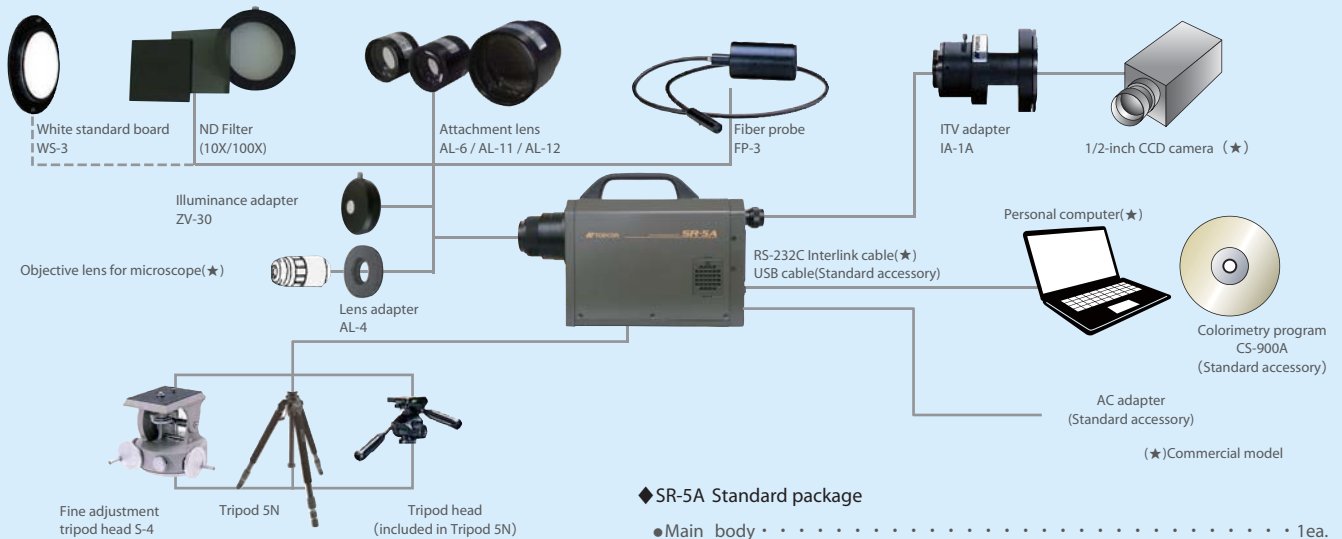
SR-5A measurement time has been significantly reduced by improving the sensitivity and internal algorithm based on renewing the optical system.



► Dimensions



System Diagram



◆SR-5A Standard package

- Main body 1ea.
- AC adapter 1ea.
- Carrying case 1ea.
- CD-ROM(Colorimetry CS-900A / Instruction manual) 1ea.
- Quick manual 1ea.
- USB cable 1ea.
- Objective lens / Eye piece lens cap even 1ea.

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

*May change slightly according to the machining precision of the aperture mirror.

*The measurement distance is the distance from the tip of the metal fixture on the instrument of the objective lens.



● Tripod 5N

The tripod 5N make collimation easy.

- Max height : 1835mm
- Min height : 585mm
- Length when stored : 810mm
- Leg stages : 3steps
- Weight : 4.7kg with tripod head



● Fine adjustment tripod head S-4

The S-4 makes up / down / left / right collimation easy.

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



● Illuminance adapter (Cosine receptor) 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

0.01 - 30,000,000 lx (At measuring angle 2° with ZV-30)

Accuracy Ev : ±2% x : ±0.0015, y : ±0.001 (For standard illuminant A)



● White standard board WS-3

Uses when measuring object color and direction high directivity light.

- Luminance factor : 90% or less (Incidence 0°, Observation 45°)
- Material : Barium sulfate (BaSO4)
- Dimension : ø78mm, t=12.5mm
- Effective white surface : ø40mm (Central portion)



● ITV adapter IA-1A

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



● Fiber probe FP-3P

Light guide

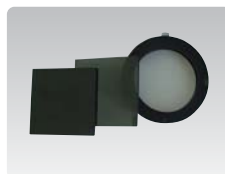
- Effective measuring angle 2°
- Measurement diameter : ø3 to 10mm
- Measurement distance : 31.0 to 84.9mm
- Fiber length : about 1m



● 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.



● ND filter(10x / 100x set)

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

► Specification

Model		SR-5A									
Optical system		Objective lens: f=82mm F2.5 / Eyepiece lens: Viewfinder visual field 5° · Diopter adjustment range ±5diop									
Dispersion element		Diffraction grating									
Photo detector		Electronic cooling linear array sensor									
Measuring angle		2° / 1° / 0.2° / 0.1°									
Measuring distance		250 - ∞ (Distance from the objective lens hardware tip)									
Measuring diameter (mm)	Measuring angle	Measuring distance(mm) (Distance from the objective lens hardware tip)									
		250	350	400	500	600	800	1000	2000	5000	
		2°	6.5	10.0	11.7	15.1	18.6	25.4	32.2	66.4	169
		1°	3.25	4.99	5.84	7.55	9.26	12.7	16.1	33.2	84.4
		0.2°	0.65	1.00	1.17	1.51	1.86	2.54	3.22	6.64	16.9
	0.1°	0.33	0.50	0.59	0.76	0.93	1.27	1.61	3.32	8.44	
Wavelength range		380 - 780nm									
Spectral accuracy		±0.3nm(on Hg emission line)									
Spectral band width		5nm or less(half width)									
Wavelength resolution		1nm									
Measurement mode		Auto, Manual(integral time / frequency), Synchronous, FIX(integral time / frequency)									
Measuring object		Spectral radiance(W·sr ⁻¹ ·m ⁻² ·nm ⁻¹)									
Measuring function		Radiance (L _e : W·sr ⁻¹ ·m ⁻²), Luminance (L _v : cd·m ⁻²), Tristimulus value XYZ, CIE 1931 chromaticity coordinates xy									
		CIE 1976 chromaticity coordinates u'v', Correlated color temperature(T _c : K) and deviation(duv)									
		Dominance wavelength(nm), Peak wavelength(nm), CIE standard observer 2° / 10°									
Accuracy	Luminance*1	±2%(for standard illuminant A)									
	Chromaticity*1	Chromaticity x: ±0.0015, y±0.001 (1°: 0.0015cd/m ² - , 0.2°: 0.0375cd/m ² - , 0.1°: 0.15cd/m ² -)									
Repeat accuracy	Luminance *2	1.5%(0.0005 - 0.005cd/m ²)									
		0.4%(0.005 - 0.1cd/m ²)									
	Chromaticity *3	0.3%(0.1cd/m ² -)									
		0.005(0.0005 - 0.005cd/m ²)									
Measuring luminance range (For standard illuminant A)	Measuring angle 2°	0.0005 - 1,500,000cd/m ²									
	Measuring angle 1°	0.0005 - 4,500,000cd/m ²									
	Measuring angle 0.2°	0.0125 - 100,000,000cd/m ²									
	Measuring angle 0.1°	0.05 - 500,000,000cd/m ²									
Polarization characteristics		Luminance: 1% or less, Spectral radiance: 2% or less(400 - 780nm)									
Display		Touch panel LC(liquid crystal) display (LC size 4.3 type)									
Interface		RS-232C: Communication speed : 4800/9600/19200/38400/57600/115200bps, Data length: 7 / 8bits									
		Parity: ODD/EVEN/NONE, Stop bit: 1/2bits									
		USB: USB3.0									
Power supply		Exclusive AC adapter AC100V - 240V, 50/60Hz, DC12V									
Power Consumption		Approx 30W									
Operating conditions		Temperature: 5 - 30°C									
		Humidity: 80%R.H. or less(without dew condensation)									
External dimensions		Approx 422 × 130 × 244 mm									
Weight		Approx 5.5kg(Only the instrument body)									

*1 : Against standard illuminant A with Normal Speed mode.

*2 : 2σ from 10 times continuous measurement at measuring angle 2° in normal speed mode.

*3 : Max value - Min value from 10 times continuous measurement at measuring angle 2° in normal speed mode.

*The measuring distance is the distance from the metallic tip of the objective lens.

*This values in this table design reference values and may differ somewhat from the actual diameter.



*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.

<https://www.topcon-techno.co.jp/en/>

