TechnoOptis

TechnoOptis Co., Ltd.
formerly Topcon Technohouse Corporation

Luminance Colorimeter

BM-5AC

BM-5A series for next-generation !

BM-5AC is a high sensitivity luminance colorimeter combines high reliability, operability and high speed.

Feature

POINT.1 High speed measuring for ultra low luminance.

It can measure the luminance as ultra low as 0.005 cd/m² at about 2 second.
Note: For measurement angle of 3 degree.

POINT.2 Wide measurement area

Selectable 5 measurement angle 0.1° / 0.2° / 1° / 2° / 3° enable you to measure the luminance from small to wide area without attachment lens.

POINT.3 Analog output

The BM-5AC can connect to the recorder and the oscilloscope through analog output X_2,Y, Z (selectable).

POINT.4 USB Interface

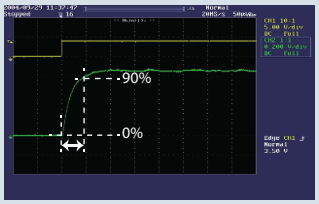
The BM-5AC is equipped with USB and RS-232C interface.

Response speed of analog output

Connecting to Oscilloscope through analog output, The BM-5AC can measure build up time and fall down time of flicker light.

Example) Rise and fall response characteristics, frequency, etc. of a flashing light source.

	NORMAL	FAST
Range 1	30ms	5ms
Range 2	30ms	0.5ms
Range 3	30ms	0.05ms
Range 4	30ms	0.5ms
Range 5	30ms	0.05ms



*The response speed in the table above is the time that it takes analog output from the instrument to reach 90% of the peak value, when measuring an LED driven by a square wave from a function generator.

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- Output impedance is approximately 100Ω. Recording instrument must have Input impedance of 10kΩ or above.
- Output voltage 0 - 4.0V

Usage

For measurement of luminance, chromaticity and color temperature, for example; optical characteristic test, Interior panel for automobile, Speed meter for automobile, Fluorescent substance.

FPD

Mobile phone

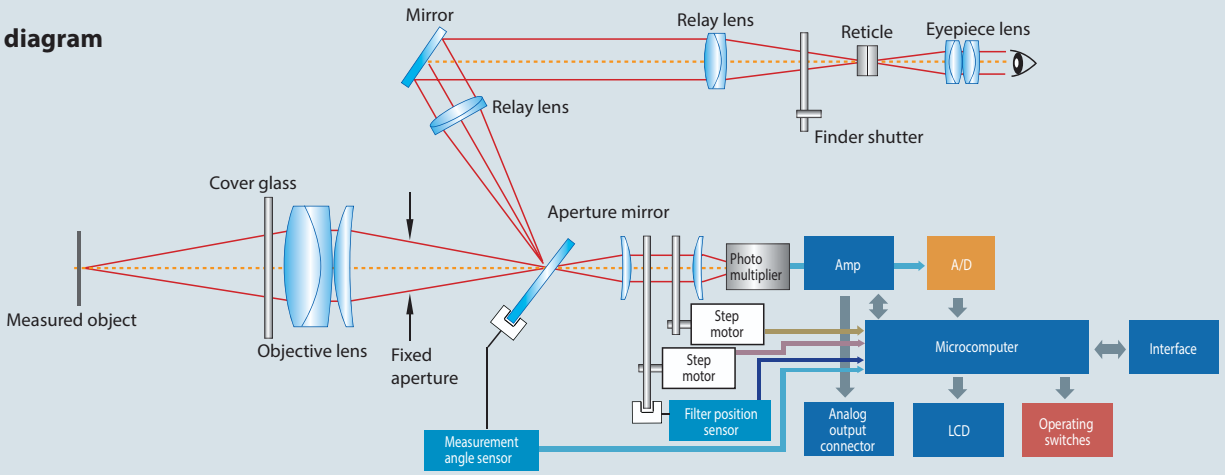
Car navigation

Automotive Switch

Speed meter

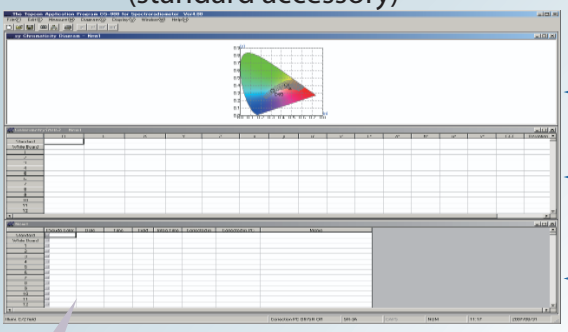
Fluorescent substance

•Block diagram



Standard accessories software supports control of instrument and data collection

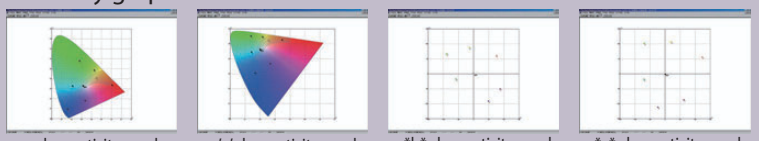
BM-5AC colorimetry software CS-900A (standard accessory)



Application software CS-900A for Windows supports BM-5AC. You can control BM-5AC using by the CS-900A, and collect, save, plot on a graph and calculate of the measured data and, use them for many purpose.
On the Colorimetry mode, it can shorten the communication time between the instrument and PC due to omitting spectral data transmission.

- xy chromaticity graph
- Colorimetry data
- Measurement conditions / note

•Chromaticity graph



xy chromaticity graph | u'v' chromaticity graph | a*b* chromaticity graph | u*v* chromaticity graph

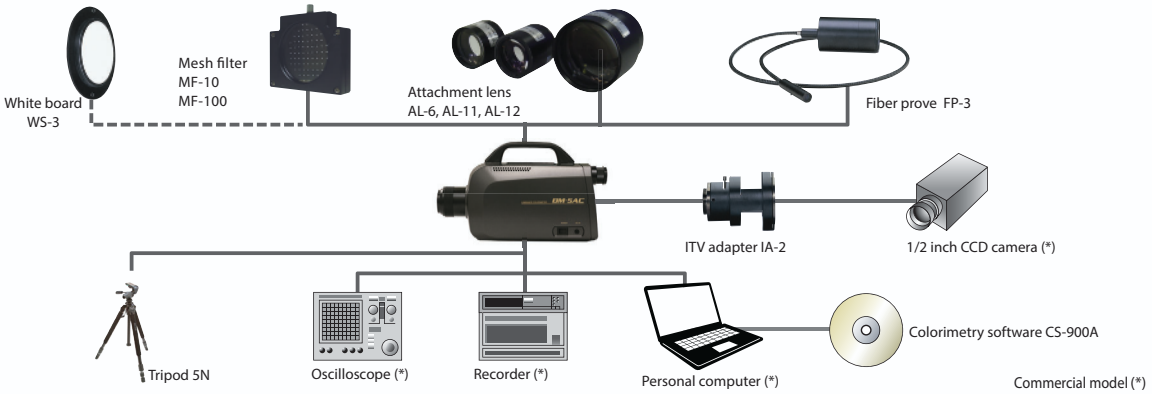
Color space mode:	L, xy, XYZ, u'v', u*v*, L*a*b*, Correlated color temperature, Deviation, Dominant wavelength, Chromaticity Statistics
Mode selection:	AUTO EACH : The measuring device determines optimum measuring range for each filter automatically.
	AUTO ALL : The measuring device determines measuring range automatically based on highest value among X_2,Y,Z.
	MANUAL ALL : Use this mode to set common measurement range for among X_2,Y,Z manually.
	MANUAL EACH : Use this mode to set individual measurement range to each X_2,Y,Z filter manually.
Selects the measurement mode:	Single / Interval / Continue
Color Range Setting	The software determines whether or not the measured color data fall within the specifid range in the color diagram.

System required (recommended)

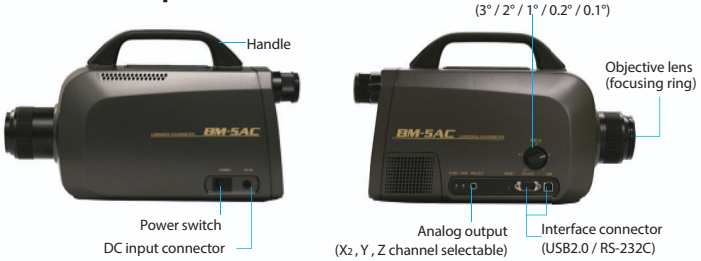
- •OS : Windows® 10 Pro or more (32bit/64bit)
  Windows® 11 Pro or more (64bit)
- •CPU : Intel® Core™ i3 2.4GHz or more
- •HDD : 1GB or more
- •Memory : 1GB or more
- •Ports : USB2.0 (One port) / RS-232C serial port (One port)

*The RS-232C cable (straight cable for DOS/V PC) must be purchased separately.

•System diagram



•Name of the parts

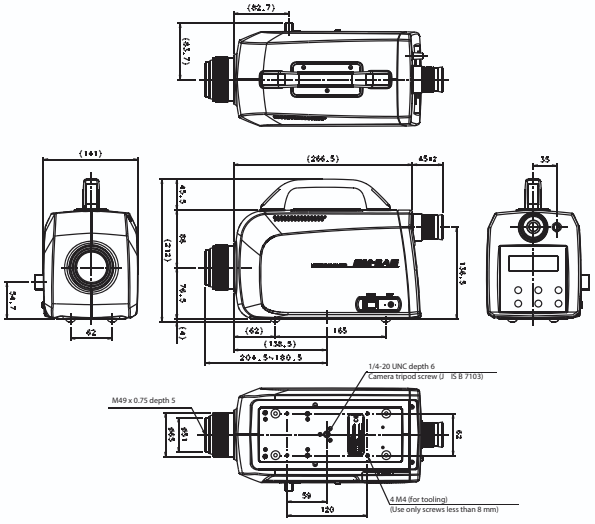


Panel switch

- •NORMAL / FINE switch…Setting measurement range
  (Rotation switch : Select parameter)
- •SINGLE / AVE switch...Setting average measurement
  (CHANGE switch : Change memory)
- •RUN / HOLD switch...Start / stop measurement
  (ENTER switch : Change display mode, memory change item
- •CALIBRATION switch...Start calibration
  (SHIFT switch : Shift the figure in display)
- •LAMP switch...ON / OFF of Back light of display
- •MODE switch...Change color diagram mode
  (FUNCTION switch : Enter function mode / return)

* The switches in parentheses are enabled while in function mode.

•External dimension



Units: mm

•Specifications

Optical system	Objective lens : f=80mm F2.5 / Eyepiece lens : View field 5°, Diopter adjustment range ±5 diopter					
Spectral sensitivity	Similar to CIE1931 color matching function					
Photo detector	Photomultiplier tube					
Measurement angle	3° / 2° / 1° / 0.2° / 0.1° (Selectable)					
Measurement distance	350mm to ∞					
Measurement area Diameter (mmø)		Measurement distance (mm)				
	Measurement angle	350	500	1,000	5,000	10,000
	3°	15.0	23.1	49.2	255	510
	2°	10.0	15.4	32.8	169	341
	1°	5.0	7.7	16.4	85	170
	0.2°	1.0	1.5	3.3	17	34
	0.1°	0.5	0.8	1.6	8	17
Measurable range	0.00005 to 1,200,000 cd/m²					
Luminance range for guaranteed accuracy	Measurement angle	Luminance (cd/m²)				
	3°	0.005 to 1,500cd/m²				
	2°	0.01 to 3,000cd/m²				
	1°	0.04 to 12,000cd/m²				
	0.2°	1 to 300,000cd/m²				
	0.1°	4 to 1,200,000cd/m²				
Accuracy	• Luminance : ±4% (for standard source A) • Chromaticity1 : dx,dy Within ±0.005 (Auto range, for standard source A) • Chromaticity2 : dx,dy Within ±0.008 (O-55,Y-48,A-73B,IRA-05,T-44,R-61,B-46,V-44,G-54) For a combination of the standard source A and the next colored glass, when COLOR ADJUSTMENT is applied.					
Repeatability *	• Luminance : For a measuring field of 3 degrees 0.005 to 0.025cd/m² : 2% or less　0.025cd/m² or above : 0.8% or less For a measuring field of 2 degrees 0.01 to 0.05cd/m² : 2% or less　0.05cd/m² or above : 0.8% or less For a measuring field of 1 degrees 0.04 to 0.2cd/m² : 2% or less　0.2cd/m² or above : 0.8% or less For a measuring field of 0.2 degrees 1 to 5cd/m² : 2% or less　5cd/m² or above : 0.8% or less For a measuring field of 0.1 degrees 4 to 20cd/m² : 2% or less　20cd/m² or above : 0.8% or less (2σ, Single mode, Auto range, for standard source A) • Chromaticity : xy 0.003 or less (2σ, Single mode, Auto range, for standard source A) measuring field 3°: 0.025cd/m² or more　measuring field 0.2°: 5cd/m² or more measuring field 2°: 0.05cd/m² or more　measuring field 0.1°: 20cd/m² or more measuring field 1°: 0.2cd/m² or more					
Measurement range	Auto / Manual 5 steps selectable					
Function	Luminance, CIE1931 chromaticity coordinates, CIE1976 chromaticity					
	coordinates, Tristimulus value XYZ, Correlated color temperature and					
	Deviation, CIE1976 L*a*b*, Eab*±Δ, CIE1976 L*u*v*, Euv*±Δ					
Output	Analog output (X_2, Y, Z), DC : 0 to 4V (One channel changeover type)					
	Digital output (Interface : USB / RS-232C)					
Measurement time	About 2 seconds (Single measurement mode)					
Display	Dot matrix 20 characters x 4 lines with back light					
Interface	USB / RS-232C					
Power supply	Dedicated AC adapter					
Power consumption	Approximately 20 VA when using an AC adapter					
Operating condition	Temperature : 0 to 40°C, Humidity : 85% R.H. or less (no condensation)					
Storage condition	Temperature : -20 to 60°C, Humidity : 85% R.H. or less (no condensation)					
External dimensions	Approx 355mm x 154mm x 212mm (LxWxD)					
Weight	Approx 3.6Kg (main unit only)					

*The precision value(luminance and chromaticity) written in this catalog is the specification value by our standard light source and measurement condition.
*Due to the nature of the product, measurement error that is out of specification value may occur by the difference of the light source, measurement condition and measurement environment.

ilac-MRA IAJapan International Accreditation Japan Accredited Calibration JCSS JCSS 0073

* 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.techno-optis.com/en/

•Extra-cost option

•Attachment lens AL-6 / AL-11 / AL-12

Placing the attachment lens on the instrument's objective lens, the focal distance shorten and reduce the minimum measurement area.

(Specifications for Measuring Small Objects)

	Measurement angle	AL-6 Measurement distance : 43 to 57mm	AL-11 Measurement distance : 19.8 to 24.2mm	AL-12 Measurement distance : 165 to 197mm
Measurement diameter (mmø)	3°	2.91 to 4.14	1.76 to 2.18	4.83 to 5.91
	2°	1.94 to 2.76	1.18 to 1.45	3.23 to 3.97
	1°	0.97 to 1.38	0.59 to 0.72	1.61 to 1.97
	0.2°	0.20 to 0.27	0.12 to 0.14	0.32 to 0.40
	0.1°	0.10 to 0.13	0.06 to 0.07	0.16 to 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.

•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 ($BaSO_4$)
• Dimension : ø78mm, t=12.5mm
• Effective white surface : ø40mm (Central portion)

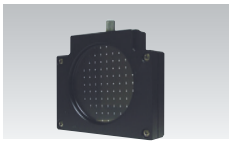
•Fiber probe FP-3

Light guide

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

•ITV adapter IA-2

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



•Mesh Filter MF-10 / MF-100

Uses when measuring the light which is over measurement range of the instrument.

•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

•Standard package of BM-5AC

•BM-5AC main body.....1ea.
•AC adapter .....1ea.
•Analog output plug.....3ea.
•CD-ROM (colorimetry software CS-900A / Instruction manual).....1ea.
•Quick manual.....1ea.
•Carrying case.....1ea.
•USB cable.....1ea.
•Lens cap for objective lens.....1ea.

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