TechnoOptis

from TOPCON TECHNOHOUSE CORPORATION
to TechnoOptis Co., Ltd.

Luminance & Chromaticity Uniformity Analyzer

UA-20Y

Luminance Uniformity Analyzer

UA-20C

High-resolution & High-speed measurement and uniformity of luminance/chromaticity

New Release Model of macro size evaluation.

24.5-megapixel high resolution image will obtain measurement of subtle luminance changes and uniformity

General-purpose type for chromaticity measurement

Luminance & Chromaticity Uniformity Analyzer

UA-20C

Luminance measurement dedicated machine with Y filter

Luminance Uniformity Analyzer

UA-20Y

Features

High resolution measurement

- Equipped with 24.5-megapixel CMOS camera
- Effective pixels : 5,328 x 4,608 ultra-high resolution measurement
- High-precision uniformity measurement with ultra-high resolution

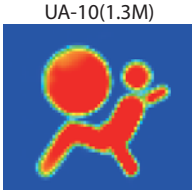
  [Minimum resolution per pixel at the shortest distance]

  Standard lens : 0.024mm, Wide-angle lens : 0.091mm

  Telephoto lens : 0.017mm, Macro lens : 0.0014mm(1.4μm)

Resolution comparison image

Conventional product UA-10(1.3M)



UA-20(24.5M)

Product line-up for various measurement situations

- Two types of measurement models
  - UA-20C : Luminance and chromaticity measurement type

    Compatible with various evaluations such as color temperature(K) and dominant wavelength(WD).

Measurement value

- Luminance(cd/m²), · Chromaticity(x,y / u′ ,v′)
- Color tempereture(K)、Deviation
- Dominant wavelength、Excitation purity
- RGB

  - UA-20Y : Luminance measurement type

    Equipped with a Y filter for highly accurate luminance measurement.

Mesurement value

- Luminance(cd/m²)

- 4 types of lens variations
  - In addition to the conventional standard/ wide/ telephoto lenses line up, we are adding a macro lens. This enables high-resolution measurements at the 1μm level.

Standard lens (S) UA-20CS/UA-20YS	Wide lens (W) UA-20CW/UA-20YW	Telephoto lens (T) UA-20CT/UA-20YT	Macro lens (M) UA-20CM/UA-20YM + C-mount lens
PC, Smart Phone	TV·Signage	Meter	AR·VR device, Sub pixel

  - Only macro type is compatible with various C-mount lenses by attaching a standard C-mount adapter.

In-house designed close-up lens : OPTIONAL LENS (ZV-70)

Measurement distance(mm)	Magnificant(M)	Horizonal(mm)	Vertical(mm)	Display size(inch)	Resolution(μm)
12.6	2.0x	3.3	2.8	0.17	0.7

Example of C-mount lens attachment
Close-up lens(2x)

Example of various C-mount wide-angle lens application

View angle	Entrance Pupil(mm)	Horizonal x Vertical x Diagonal(°)	Entrance Pupil Diameter(mm)
80°	14.5	65.0x 56.9 x 86.4	1.8
60°	14.6	44.6 x 37.3 x 58.1	3.3
40°	12.5	32.7 x 26.5 x 42.1	5.0

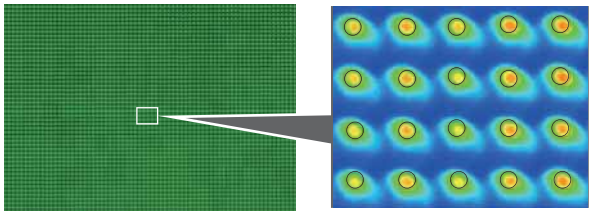
Example of C-mount lens attachment
Wide angle lens(60 °)

Wide range luminance measurement

- Luminance measurement range：0.01 - 50,000cd/m² (S/W/T)
  Luminance measurement range：0.1 - 24,000cd/m² (M)
- High brightness measurement with optional external ND filter

Lens	magnification	measurement range
S/W/T	1%	5.0 - 5,000,000cd/m²
	0.01%	500 - 500,000,000cd/m²
M	1%	10 - 24,000,000cd/m²
	0.1%	100 - 240,000,000cd/m²
	0.01%	1,000 - 2,400,000,000cd/m²
	0.001%	10,000 - 24,000,000,000cd/m²

µLED, Mini-LED device



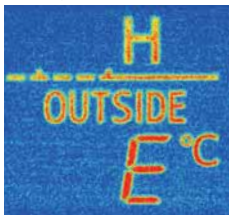
RGB color display(UA-20C)

Multi-point extraction of light-emitting parts with the automatic spot function

Various measurement condition functions

- Trimming of measurement area(ROI): Randomly set the measurement ROI area
- Image processing ROI: Measure data in a specified range
- Layer measurement: Ideal for measurements with a wide dynamic range
- Frequency setting: Supports stable measurement of pulse emission light source

No layer measurement



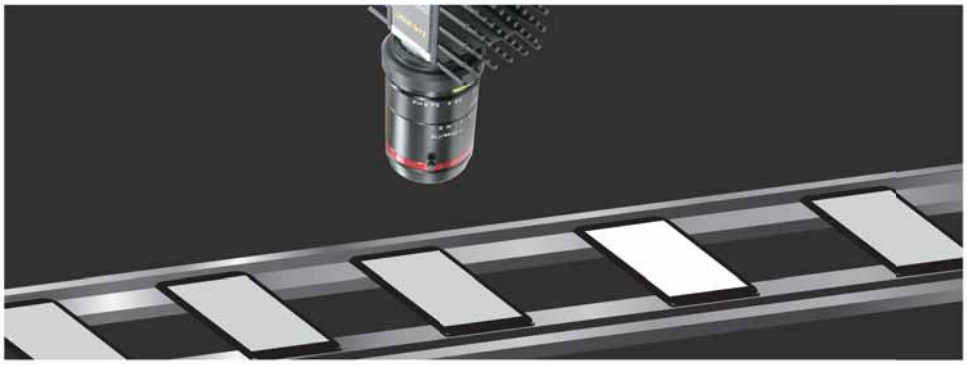
With layer measurement

Best specifications for production processes

- Palm-sized compact measuring instrument
- Body mass: Lightweight specification of about 500g
- Standard with SDK for external control
- GigE High-speed communication
- Realized high durability and long life with a drive-less equipment

Correction System with
2D spectroradiometer SR-5100HM

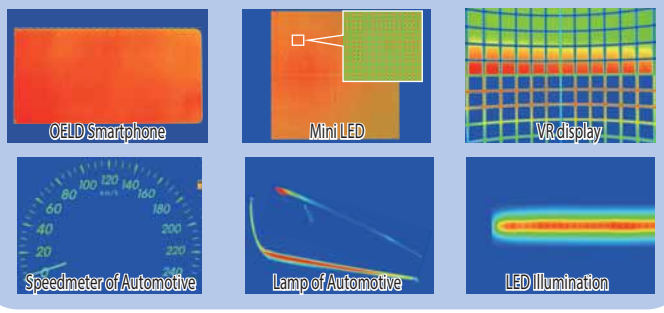
Example of lighting inspection for module manufacturing equipment



Usage

- Mura evaluation of luminance and chromaticity of LCDs and related materials, OLEDs, QDs, micro LEDs, etc.
- Evaluation of emission distribution characteristics of automobile meter panels and interior and exterior lighting
- Evaluation of luminance and chromaticity MURA of the light emitting part of LED lighting and OLED lighting

Measurement example



Application

Various analysis programs for UA-20

Colorimetric image software (standard accessory) CI-100

Collecting, storing, and displaying measured values of UA-20 main body control and measurement data from PC.
Efficient evaluation can be performed from measurement to data analysis by various information processing.

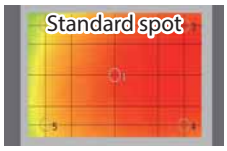
Ealuation function

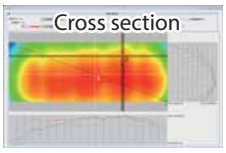
- Pseudo color
- Standard spot
- Random spot
- Auto spot
- Cross section

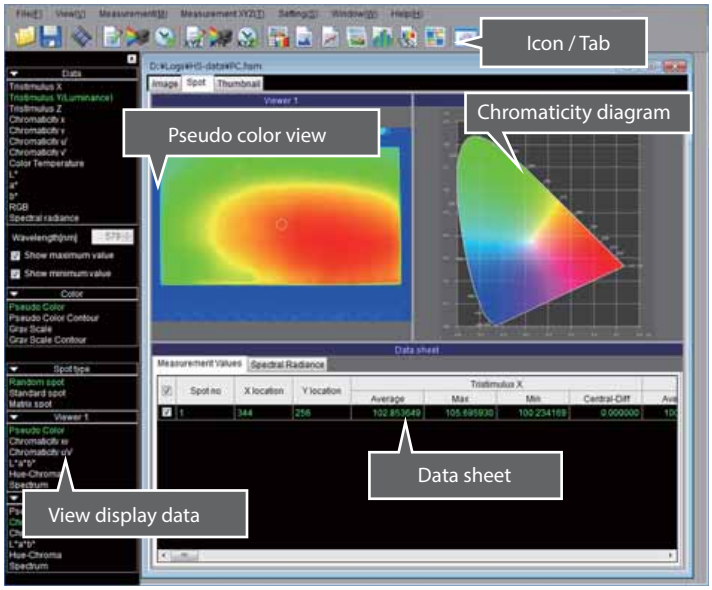
Measurement datafunction

- Luminance(cd/m²)
- Chromaticity(x,y ／ u',v')
- R,G,B
- Uniformity

＊Chromaticity and RGB evaluation is only for UA-20C







Optional software Black MURA

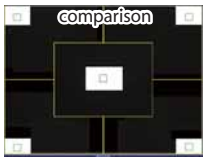
BlackMURA provides display quality analysis to DFF's vehicle OEM workgroup BlackMURA standards.

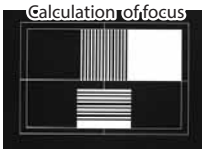
Evaluation function

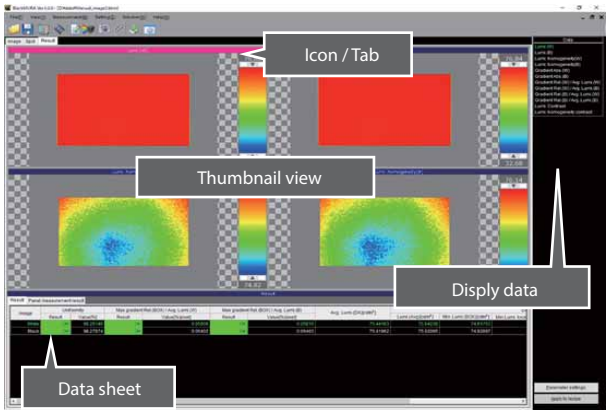
- Uniformity/gradient characteristics evaluation
- Luminance homogeneity
- Absolute and relative gradient value
- Luminance contrast and luminance homogeneity contrast
- Report function
- CSV/Image, measurement data automatic output

Camera profile evaluation

- Center and four corners comparison
- Calcuration of resolution
- Calcuration of focus







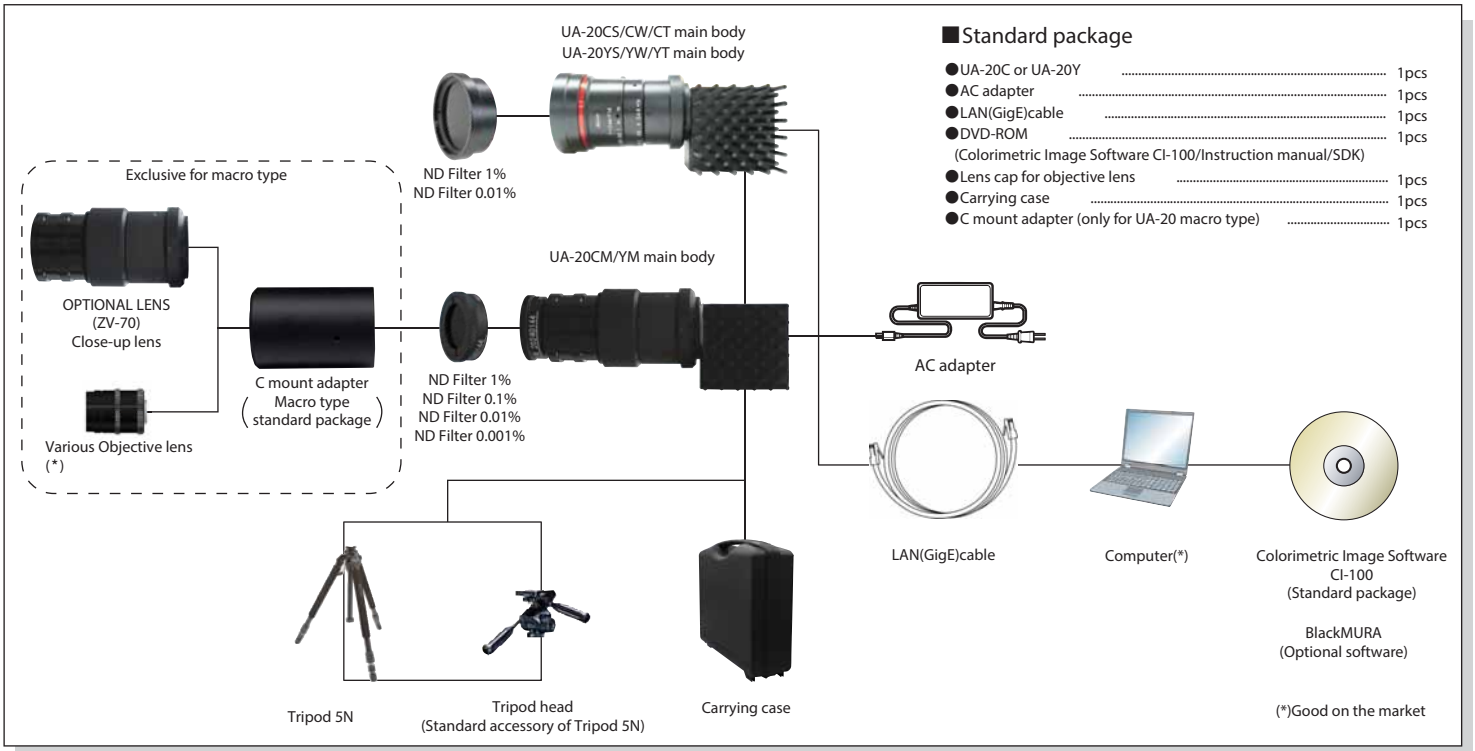
SDK (Software Development Kit)

Development kit is composed of header file and library to control SR-5100 through a network PC.
It is possible to create customized software according to external communication and the needs of user.
It can acquire and display only the necessary data, and it is also possible to reduce the file size of measurement data.
Sample program is also included.

Operating conditions

OS	Windows® 10 Pro (64bit) Windows® 11 Pro (64bit)
CPU	Intel® Core™ i7-11700 or higher
Memory	16GB or higher
HDD	500GB or higher More than 3GB free space is necessary in the system drive (that is a drive where OS is installed). If full size measurement is executed, data size of its result is about 1GB.
LAN Port	GigE 1 port *Support for Jumbo frame (Jumbo packet : 9KB and above)
Display	1,920*1,080 or higher, 16.77 million colors (32bit) or higher
Other	DVD-ROM drive

System diagram

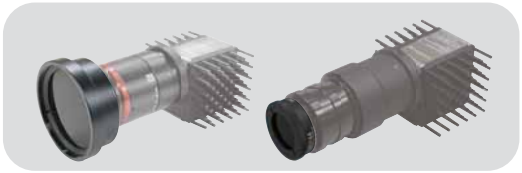


■Standard package

- ●UA-20C or UA-20Y 1pcs
- ●AC adapter 1pcs
- ●LAN(GigE)cable 1pcs
- ●DVD-ROM 1pcs
  (Colorimetric Image Software CI-100/Instruction manual/SDK)
- ●Lens cap for objective lens 1pcs
- ●Carrying case 1pcs
- ●C mount adapter (only for UA-20 macro type) 1pcs

Optional accessories

●ND filter



Neutral density filter fo measuring higer luminance than the measuring range of instrument.

ND FILTER	Lens	Magnificant
ND FILTER 1% S/W/T	S/W/T	1%
ND FILTER 0.01% S/W/T	S/W/T	0.01%
ND FILTER 1% M	M	1%
ND FILTER 0.1% M	M	0.1%
ND FILTER 0.01% M	M	0.01%
ND FILTER 0.001% M	M	0.01%

* : The high luminance side is designed for standard illuminant A up to 1,000cd/m², anybeyond that, based on the linearity of the photo detector.
* : If adding ND filter after purchase, recalibration with the main unit by our company is required.

●OPTIONAL LENS (ZV-70) : Close-up lens for Macro type

It is used for measuring micro surfaces by connecting to the C-mount of the UA-20 macro type.
Our In-house designed lens allows for high-resolution measurement.

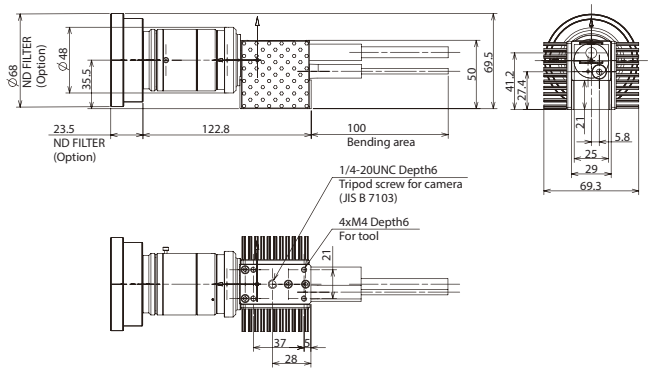
●Tripod 5N

Simplifies collimation of measurement object

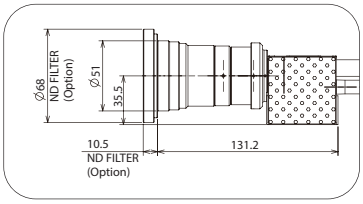
- ●Max height : 1835mm ●Min height : 585mm
- ●Folder length : 810mm ●Leg section : 3steps
- ●Weight : About 4.8kg including Tripod head

External dimensions

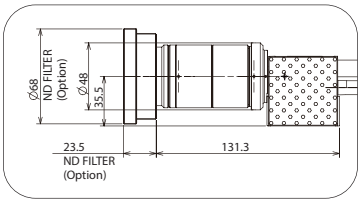
◆UA-20CS/YS



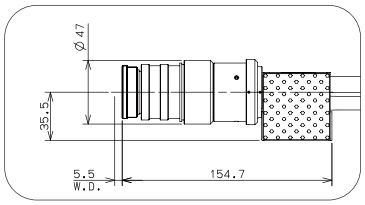
◆UA-20CW/YW



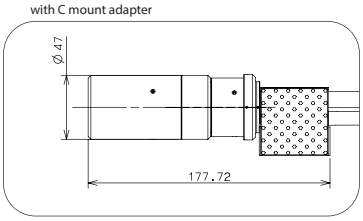
◆UA-20CT/YT



◆UA-20CM/YM



with C mount adapter



Unit : mm

Specification

Model	UA-20CS/CW/CT	UA-20CM	UA-20YS/YW/YT	UA-20YM
Photo detector	24.5 million-pixel CMOS Image sensor			
Objective lens	Fixed focal lens UA-20CS/YS : f=35mm UA-20CW/YW : f=12mm UA-20CT/YT : f=50mm			
Number of measurment point	5,328×4,608			
Data bit	12bit			
Luminance masurement range *1	0.01 - 50,000cd/m²	0.1 - 240,000cd/m²	0.01 - 50,000cd/m²	0.1 - 240,000cd/m²
Luminance linearity *1*2	±2% (0.1cd/m² -) ±3% (0.01 - 0.1cd/m²)	±2%	±2% (0.1cd/m² -) ±3% (0.01 - 0.1cd/m²)	±2%
Chromaticity accuracy *1*2	±0.003 (0.1cd/m² -) ±0.007 (0.01 - 0.1 cd/m²)	±0.003	-	
In-plane unevennes uniformity *1*3	luminance : ±2%			
	chromaticity : ±0.003		-	
Repeat characteristic *1*2	luminance : 0.3%(0.1cd/m² -) , 0.5% (0.01 - 0.1cd/m²) *4			
	chromaticity : 0.002(0.1cd/m² -) , 0.005(0.01 - 0.1cd/m²) *5		-	
Measurement time *6	Fastest about 3 sec.			
Stability	luminance : ±1%			
Repeatability	luminance : ±2%			
Temperature characteristic	luminance : ±3% (reference : 20°C, 0 - 40°C)			
Humidity characteristic	luminance : ±3% (Humidity : 80% RH or lower, No condensation)			
Interface	LAN (GigE)			
Power supply	AC 100 - 240V (50/60Hz)			
Power consumption	DC 24V 4.8VA (without PC)			
Operating conditions	Temperature : 0 - 40°C, Humidity : 80%RH or lower (No condensation)			
Storage condition	Temperature : -5 - 50°C, Humidity : 85%RH or lower (No condensation)			
Outer Dimensions	UA-20CS/YS : 122.8(L) × 69.3(W) × 59.5(H)mm UA-20CW/YW : 131.2(L) × 69.3(W) × 61.0(H)mm UA-20CT/YT : 131.3(L) × 69.3(W) × 59.5(H)mm UA-20CM/YM : 154.7(L) × 69.3 (W) × 59.5(H)m			
Weight	UA-20CS/YS : about 470g, UA-20CW/YW : about 510g, UA-20CT/YT : about 490g, UA-20CM/YM : about 540g			

*1: Standard illuminant A, *2: Evaluated on the center of the CMOS,*3: Reference: Center of the CMOS, *4: 2σ, *5: Max - Min value, *6: This value varies depending on conditions of use.

Measurement area : Standard type (UA-20CS / UA-20YS)

Measurement distance (mm)	300	400	500	1,000	1,500	2,000	2,500
Display size (inch)	6.0	7.9	9.8	19.5	29.3	39.1	48.9
Horizonal (mm)	115.3	151.0	187.7	375.4	563.1	750.8	938.5
Vertical (mm)	99.7	130.6	162.3	324.7	487.0	649.3	811.7

Measurement area : Telephoto type (UA-20CT / UA-20YT)

Measurement distance (mm)	300	400	500	1,000	1,500	2,000	2,500
Display size (inch)	4.3	5.7	7.1	14.0	20.9	27.9	34.9
Horizonal (mm)	82.6	109.5	136.9	268.1	402.2	536.3	670.3
Vertical (mm)	71.5	94.7	118.4	231.9	347.9	463.8	579.8

Measurement area : Wide type (UA-20CW / UA-20YW)

Measurement distance (mm)	250	400	500	1,000	1,500	2,000	2,500
Display size (inch)	14.9	22.8	28.5	57.0	85.5	114.0	142.5
Horizonal (mm)	285.6	438.0	547.5	1094.9	1642.4	2189.8	2737.3
Vertical (mm)	247.0	378.8	473.5	946.9	1420.4	1893.9	2367.4

Measurement area : Macro type (UA-20CM / UA-20YM)

Measurement distance(mm)	Magnification (M)	Horizonal (mm)	Vertical (mm)	Display size (inch)	Resolution (μm)
5.5	2.0x	6.6	5.7	0.34	1.4

* The measurement distance is from tip of objective lens to the measurement target.
* Abobe values are 90 % area of FOV.
* If using a C-mount adapter with the UA-20CM/YM, the product specifications and standard values of the main unit do not apply.

JCSS 0073

Accredited Calibration

* 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.

TechnoOptis Co., Ltd.
Formerly Topcon Technohouse Corporation

75-1 Hasunuma-cho, Itabashi-ku, Tokyo 174-8580 JAPAN
Phone: +81-3-3558-2666 Fax: +81-3-3558-4661
E-mail: techno-info@topcon.co.jp

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.
- Be sure to use the specified batteries.
  Using improper batteries may cause a fire or electric shock.

For more information please visit our website.

https://www.techno-optis.com/en/

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