

# COLOR



mrc



## RGB-1002, color analyzer, R, G, B, Hue, Saturation, Luminance

• The RGB-1002 is a portable color meter equipped with an external sensor probe having a 45°/0° color measuring geometry. The modern, accurate microprocessor technology uses the spectral analysis method to determine the color of the sample. Excellent repeatability due to spectroscopic analysis technique used. Saturation value: 0 to 1.000. • Friendly operation, just press the operation button to get the color value (R, G, B or H, S, L). • Relative function, can easily compare the color value of the different two measurement materials • The RGB-1002 is designed mainly for measuring the color of no lighting sample such as textiles, paper, leathers, painting materials. It is a useful tool for the quality control and the wide industrial application. • The color analyzer also can measure the reference lighting sample color value such as CRT, LCD monitor, LED lamp, lighting lamp. • For no lighting sample color measurement, a defined light source illuminates the sample and the reflected surface light is spectrometrically analyzed. • For lighting sample color measurement, the light source of sample is spectrometrically analyzed directly. • RS232 computer interface, can store the measuring color value in the computer for recording and further color analysis. • Build in CAL (Calibration) button, for no lighting sample measurement, use the included white color calibration card to make the self calibration easily. • Hand held housing case, easy to carry out. • Power supply by 006P DC 9V battery or DC 9V adapter.

## Applications

- To check the color value of textiles, paper, leathers, painting materials.
- The objective quality control of color during production.
- The color measurement and recording of products supplied by supplier to check for conformity specification.
- The comparison of color samples against color standard.
- The interpretation and statistic evaluation of color sample measurement.
- To check the reference color value of CRT monitor, LCD monitor, light lamp.

Model	RGB-1002
Display	LCD size : 59 mm x 34 mm.
Measuring geometry	45° / 0° - circular illumination at 45°, measurement at 0°.
Spectral range	400 nm to 700 nm.
Light source	Two white LED lamp.
Measuring principle	For no lighting sample color measurement such as textiles, paper, leathers, painting materials, a defined light source illuminates the sample and the reflected surface light is spectrometrically analyzed. * For lighting sample color measurement, the light source of sample is spectrometrically analyzed directly.
Color sensors	3 color photo transistors: Red photo transistor Green photo transistor Blue photo transistor
Calibration	Self calibration. * The calibration white calibration card is included.
Measurement	RGB value R (Red) value: 0 to 1023, G (Green) value: 0 to 1023, B (Blue) value : 0 to 1023. HSL value Hue value: 0 to 1.000, Saturation value: 0 to 1.000, Luminance value: 0 to 1.000.
Repeatability	R (Red) value < 3, G (Green) value < 3, B (Blue) value < 3, Hue value < 0.01, Saturation value < 0.01, Luminance value < 0.01 * Repeatability is specified under the same sample tested 10 times within two minutes. * Accuracy is specified under after the instrument is calibrated.
Buttons	OP button (Operation button) CAL button (Calibration button) REL button (Relative button) RGB/HSL button (Select RGB or HSL value) Light ON/OFF button * No lighting sample measurement, select the sensor light to on. * Lighting sample measurement, select the sensor light to off.
Power off	Auto shut off saves battery life or manual off by push button. * Power will off automatically after 3 min., if no buttons be pressed.
Low battery	Low battery indicator.
Computer interface	RS 232 PC serial interface.
Operating Temp.	0°C to 50°C (32°F to 122°F)
Operating Humidity	Less than 80% R.H.
Power Supply	DC 9V battery, Alkaline type 006P, MN1604(P3) or equivalent. DC 9V adapter input. @ AC/DC power adapter is optional.
Power Current	Standby : Approx. DC 6.3 mA. Measurement : Approx. DC 32 mA. (2 SEC.)
Weight	478 g/ 1.05 LB. * Main instrument and the sensor probe
Dimension	Main instrument: 203 x 76 x 38 mm, Sensor probe: 160x92x45 mm
Accessories Included	* Instruction manual: 1PC * Sensor probe (RGB-1002P): 1 PC * White color calibration card: 1 PC * Carrying case, CA-06: 1 PC
Optional Accessories	* AC to DC 9V adapter. * RS232 cable, UPCB-02. * USB cable, USB-01. * Data Acquisition software, SW-U801-WIN.



### CLRM-110, Precision Colorimeter

#### Advantages:

- Built-in white plate parameters. There is no need to calibrate each time which realizes rapid measurement.
- Double Locating: Illuminating locating and precise cross locating.
- Switch able Double Measurement End face: Large area stable end face and small area measurement for concave-convex end face.
- New Integrating Sphere Optical Path Design: Eliminating the stray light of main optical path and auxiliary optical path. Having the advantages of the highest measurement stability and precision.
- 4mm Measuring Aperture: suitable for covering more measuring conditions.
- Equipped with rechargeable high-capacity Li-ion battery. No need to purchase battery repeatedly.
- Once Connect to a PC the CQCS3 will allow for extended functionality.
- The CLRM-110 passed SCM Metrological Certification, CE Certification, & ISO9001 Quality Management System Certification.
- Build in prob: small and convenient; make the measurement easier.
- Exquisite appearance: adopts traditional and fashionable esthetic designs.

### Applicable Industries



Model	CLRM-110
Measurement End-face	Large stable end-face and small area concave-convex end face
Color Space	CIEL *a*b*C*h* CIEL *a*b
Color Difference Formula	$\Delta E^*ab$ $\Delta L^*a^*b$ $\Delta E^*C^*h^*$
Illuminating/Viewing Geometry	8/d
Detector	Silicon photoelectric diode
Measuring Aperture	Φ4mm
Locating	Illuminating Locating / Cross Locating
Light Source	D65
Light Source Device	LED blue light excitation
Lamp Life	5 years, more than 1.6 million
Dimension	205 x 67 x 80 mm
Storage	100pcs standards 20000pcs samples
Weight	450g
Errors Between Each Equipment	$\leq 0.50 \Delta E^*ab$
Repeatability	Standard deviation within $\Delta E^*ab$ 0.08 Average of 30 measurements of standard white plate
Power source	Rechargeable lithium-ion battery 3.7V@3200mAh
Charging Time	2 hours(8 hours for first charge)—100% electricity
PC Software	CQCS3 Software
Printer (optional)	Miniature thermal printer



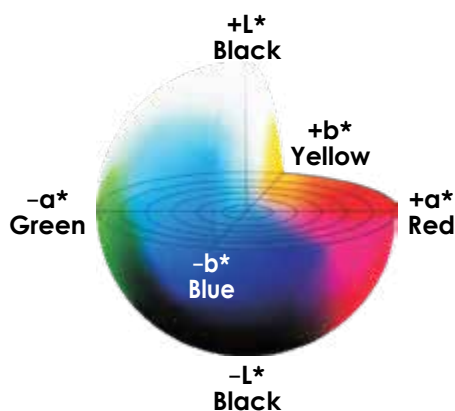


Universal Test Components

Powder Test Box

### $\Delta E$ Total Color Aberration

large  $\Delta L$  stands for the partial White color.  
small  $\Delta L$  stands for the partial black color.  
large  $\Delta a$  stands for the partial red color.  
small  $\Delta a$  stands for the partial green color.  
large  $\Delta b$  stands for the partial yellow color.  
small  $\Delta b$  stands for the partial blue color.



### CLRM-200, CLRM-300, CLRM-310, High Quality Colorimeter

#### Advantages:

#### High Quality User Interface & Convenient Operation

- One-Touch Access to the Measurement Interface. (CLRM-200/300)
- Auto White and Black calibration at Startup. (CLRM-310)
- Structure Design in line with Ergonomics.
- Easy-to-use User Interface.

#### Stable Measurement Performance

- The average fluctuation of  $\Delta E$  for CLRM-200 is less than 0.08, for CLRM-300 is between 0.04~0.06 & for CLRM-310 between in 0.03~0.06.
- Portable structure design is more conducive to keeping the instrument stable when using.

#### Flexible and Accurate Locating

- Camera locating can solve the problem of locating a small area. The minimum width of locating is 4mm. (CLRM-310)
- Illumination locating is a fast, simple and convenient locating which is created by CLRM-200/300/310.

#### More Measurement Modes (CLRM-310)

- Three measuring apertures to cover more measuring conditions
- Five color spaces for more color scheme selections.
- Three light sources suitable to cover more measuring conditions

#### PC Software-Realize More Function Expansion

- CLRM-200/300/310 has the intellectual property of PC software. The corresponding software serial number and password protection are configured in the colorimeter.
- Be able to perform color difference analysis, color difference cumulative analysis, chromaticity index, color sample database management, simulating object color, etc.

#### Advanced Power Management Design

- CLRM-200/300/310 is the first to use using high capacity Li-ion battery in colorimeter.
- CLRM-200/300/310 Li-ion battery can be repeatedly charged to save costs. As well as measuring more than 3000 times on one charge to ensure the stability of long time measurement.

Model	CLRM-200	CLRM-300	CLRM-310
Color Space	CIEL *a*b*C*h* CIEL *a*b CIEXYZ		CIEL *a*b*C*h* CIEL *a*b CIEXYZ CIERGB CIEL *u*v* CIEL *C*h Yellowness & Whiteness Color Fastness
Color Difference Formula	$\Delta E^*ab$ $\Delta L^*a^*b$ $\Delta E^*C^*h^*$		$\Delta E^*ab$ $\Delta L^*a^*b$ $\Delta E^*C^*h^*$ $\Delta ECI94$ $\Delta Ehunter$
Illuminating/Viewing Geometry	8/d		
Detector	Silicon photoelectric diode		
Measuring Aperture	Φ8mm		Φ4mm / Φ8mm
Light Source	D65		D65 D50 A
Light Source Device	LED blue light excitation		
Lamp Life	5 years, more than 1.6 million		
Dimension	205 x 70 x 100 mm		205 x 67 x 80 mm
Storage	100pcs standards 20000pcs samples		
Weight	500g		
Errors Between Each Equipment	$\leq 0.50\Delta E^*ab$	$\leq 0.40\Delta E^*ab$	$\leq 0.40\Delta E^*ab$
Power source	Rechargeable lithium-ion battery 3.7V@3200mAh		



### NS800, Spectrophotometer

features with stable performance, precise measurement and powerful functions in the leading position of the same industry.

#### Features:

- Aesthetic design perfectly combined with ergonomics structure.
- 45°/0° geometrical optics structure, comply with CIE, ISO, ASTM, DIN standard
- 3.5 inch large capacitive touch screen.
- Two standard observer perspectives, multiple light sources modes, a variety of color systems.
- The repeatability  $E^*ab$  is within 0.04, the errors between each instrument is less than  $0.2E^*ab$ .
- Large capacity storage, save more than 10000 data.
- PC software with powerful extension functions.
- High hardware configured with a number of innovative technologies.
- Oversized integrating sphere, more effective homogenization ray of lights and precise measurement.
- 15° oblique angle screen, in line with the human eye observation.

#### Applications:

NS800 spectrophotometer is widely used in plastic, electronic, paint, ink, textile, garment, printing and dyeing, food, medical cosmetic industries, scientific research institutes, schools & laboratories. It can measure reflectance spectrum and other color index precisely.

NS800 spectrophotometer not only can help to perform color matching and color management studies, but also can control product quality management accurately. The instrument is equipped with high-end color management software which can connect PC to achieve more extension functions.

Model	NS800
<b>Complete spectrum reflectance curve Input L, a, b value manually</b>	
Display Screen	TFT 3.5inch Capacitive Touch Screen
Illumination/observation system	45°/0°
Integrating sphere Size	Φ58mm
Light Source	combined LED sources
Sensor	Silicon photodiode array
Wavelength Range	400-700nm
Wavelength interval	10nm
Reflectance range	0 ~ 100%
Color Space	CIE LAB, XYZ, Yxy, LCh, CIE LUV
Color difference Formula	$\Delta E^*ab$ , $\Delta E^*uv$ , $\Delta E^*94$ , $\Delta E^*cmc(2:1)$ , $\Delta E^*cmc(1:1)$ , $\Delta E^*OO$
Other Chromaticity Data	WI(ASTM E313, CIE/ISO, AATCC, Hunter), YI(ASTM D1925, ASTM 313), TI(ASTM E313, CIE/ISO), Metamerism Index (Mt), Color Stain, Color Fastness
Illuminant	D65, A, C, D50, D55, D75, F2, F6, F7, F8, F10, F11, F12
Measuring Aperture	Φ8mm
Observer	2°/10°
Display Data	Spectral Value/Graph, Colorimetric Value, Color Difference Value/Graph, PASS/FAIL Result, Color Offset, Color Simulation
Repeatability	Spectral Reflectance: standard deviation within 0.1% (400-700nm: within 0.2%), Colorimetric value Standard deviation within $\Delta E^*ab$ 0.04
Errors between each instrument	Within $\Delta E^*ab$ 0.2
Dimension (LxWxH)	90x77x230mm
Battery	Li-ion battery, 5000 times within 8 hours
Lamp Life	5 years, more than 1.6 million measurements
Storage	1000 Standards, 10000 Samples
Optional Accessory	Universal test components for liquid, power, particle, Micro Printer, Powder Test Box



TES-135

### TES-135, Color Meter

#### Features:

- Check the color difference between two samples.
- Color difference displayed  $\Delta L^*, \Delta a^*, \Delta b^*$ ,  $\Delta E^*ab, C^*ab, H^*ab$ ,  $\Delta(Y, x, y)$ ,  $\Delta(X, Y, Z)$  or  $\Delta(Rs, Gs, Bs)$
- Color space displayed  $(L^*, a^*, b^*)$ ,  $(L^*, C^*ab, hab)$ ,  $(Y, x, y)$ ,  $(X, Y, Z)$  or  $(Rs, Gs, Bs)$ .
- Maximum, Minimum and Average function.
- Tolerance function.
- Auto memory (99 sets) & Read function.
- Mini USB interface.

Model	TES-135
Display	Triple 4 digit LCD display
Illuminating / Viewing geometry	45° / 0° - 1 illumination at 45°, measurement at 0°
Measuring area	Approx. Ø2mm
Display modes	Color difference $\Delta L^*, \Delta a^*, \Delta b^*$ , $\Delta E^*ab, C^*ab, H^*ab$ , $\Delta(Y, x, y)$ , $\Delta(X, Y, Z)$ or $\Delta(Rs, Gs, Bs)$ Color space $(L^*, a^*, b^*)$ , $(L^*, C^*ab, hab)$ , $(Y, x, y)$ , $(X, Y, Z)$ or $(Rs, Gs, Bs)$ .
Target color memory	8 channel ; set by measurement or keypad
Measuring range	$L^*$ : 10 to 100
Measurement conditions	Observe: CIE 2° Standard Observer. Illuminant: White LED lamp.
Repeatability	Standard deviation within $\Delta E^*ab$ 0.5 (Measurement conditions: Average of measurements of standard white plate).
Min. interval between measurements	Approx. 2 seconds
Auto data Memory & Read	99 sets
Auto power off	Approx. 3 minutes
Power source	One 9V battery and DC 9V AC adapter input
Battery life	Approx. 500 measurements at 10 - sec intervals
Operating temperature/humidity range	0°C to 40°C; less than 85% relative humidity
Storage temperature/humidity range	-10°C to 40°C ; less than 70% relative humidity
Dimensions	172mm x 118mm x 46mm
Weight	Approx. 220g
Accessories	Instruction manual, Battery, AC adapter, USB cable, software CD.



CLRC-115

### CLRC-115, Color Comparison Cabinet

**Application:** Paint, ink, pigment, cream manufacturer and processor's and painting's color matching • Plastic, rubber, textile and leather goods color matching • Cars / Vehicles and machineries finish color matching • Cosmetic, food, chemical, medicine and papers industries color assessment • Glass, porcelain, enamel, construction materials color assessment.

#### Technical Data

Lamps	D25x2, Ax2, CWFx2, UVx
Outside DIM.(mm)	L710xD460xH580
Inside DIM.(mm)	L680xD420xH405
Housing	Steel case with paint finishing
Counter	9999/H
Power supply	AC110/220V, 60/50Hz
Weight	Net weight 32Kg

#### Lamps of Light Source

D65	Artificial daylight	6500°K
A	Standard filament light A	2300°-2800°K
CWF	Cool white florescent light	4000°K
UV	Ultraviolet light	360mm wave length

CLRC-115 Color Comparison cabinet are designed in accordance with ASTM D1729, and lights standard of C.I.E. The cabinet are intended for use by industry work shops, manufacturers, processors and inspectors, in short, for anyone involved with color and color matching on products, incorrect formulation can be avoided.