



# CR-200 TRISTIMULUS

## Colorimeter/Photometer



With the ability to capture data in less than 60 milliseconds, the CR-200 Tristimulus Colorimeter/ Photometer was designed for high-speed production line and Q.C. inspection, as well as product development.

## DESIGNED FOR PERFORMANCE

Ruggedly constructed, the CR-200 housing is machined aluminium and stainless steel, and can withstand high acceleration rates for the most demanding motion positioning systems and environments. All optical components are fixed to ensure that no optical misalignments occur due to vibration, shock or high acceleration/ deceleration rates. The CR-200 is completely solid-state with no mechanical shutter or moving parts to ensure high reliability and long MTBF. It weighs only 1 pound (0.45 kg), and it is the perfect tool for display inspection or for mounting on fast moving XYZ tables. Its small size and shape allows for several instruments to be mounted in the same motion control system and the simultaneous measurement of several spots in the same display.

## VERSATILE INTERFACE OPTIONS

The CR-200 is powered directly from any USB port and consumes only 120mA at 5V (600 mW), making it a portable instrument without the need for batteries. It is a USB 2.0 compatible device, remotely controlled by the host software from any personal computer, laptop or net book. As an option, the CR-200 can also be controlled by an Ethernet 10BASE-T/100BASE-TX IEEE-802.3 compliant connection.

## OPTIONAL EXTERNAL TRIGGER PORT

The CR-200 can be equipped with an External Trigger Port. The External Trigger Port/Sync Input enables remote measurement activation from either a push button or a peripheral device, while the External Trigger Port/Sync Output allows synchronization signals to measure strobes/pulsed lights, and start/stop signals. This option is ideal for fast temporal events that need to be precisely synchronized with the measurement or data capture.

## VIEWING SYSTEM OPTIONS



### **The CR-200 Detachable Viewing System (Patent pending)**

The CR-200 has been designed with a direct viewing system that is easily detachable from the instrument's main body (e.g., snaps in and out manually), and can be replaced with a different type of viewing system depending on the user needs allowing the viewer more comfortable use better suited for the experiment/test setup than a traditional, fixed viewing system.



### **The CR-200 Rotatable Viewing Systems (Patent pending)**

The direct viewing system has been utilized for several decades in optical measuring instruments. Typically, the eyepiece is in a fixed location on the instrument and is otherwise non-movable. As such the viewer must align himself or herself with the angle of the viewing optics to use the eyepiece. This can be disadvantageous in situations where the eyepiece is in an inaccessible and/or uncomfortable spot for the viewer. The CR-200 overcomes the limitations of the typical direct viewing system by offering the horizontally rotatable viewing system VO-201 and the horizontally and vertically rotatable viewing system VO-203.



### **The CR-200 Perpendicular Viewing System:**

For those cases where the CR-200 is mounted vertically on a fix test fixture or a robotics controlled XYZ table, the Perpendicular Viewing System VO-202 is an alternative to the rotatable viewing system VO-203 that can also be used with an instrument that is mounted vertically.



### **The CR-200 Camera Viewing System**

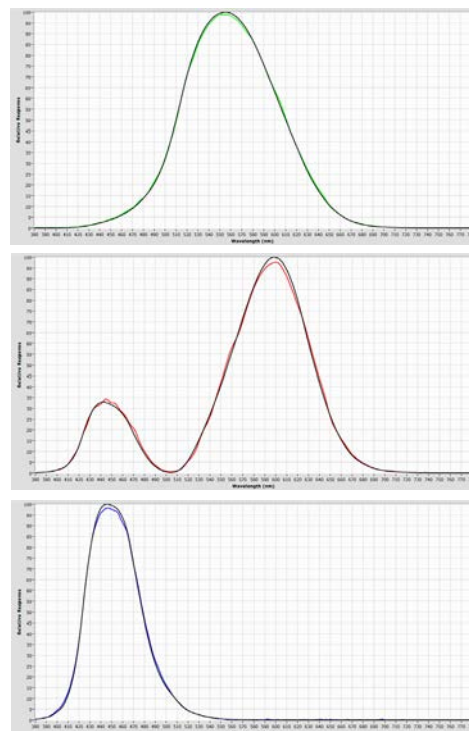
The VO-204 is a very compact viewing system that couples to a small C-Mount camera for positioning and monitoring the measuring spot from a robotics controlled system.

## CIE TRISTIMULUS FILTER F1' ERRORS

	Guaranteed	Typical
Y (Photopic)	$\leq 2.0\%$	1.4 – 1.8%
Xr (Red)	$\leq 3.0\%$	2.3 – 2.7%
Xb (Red under Blue)	$\leq 1.2\%$	0.8 – 1.0%
Z (Blue)	$\leq 3.5\%$	2.2 – 2.7%

Each CR-200 goes through a strict quality control process. Every tristimulus filter is measured using a double monochromator and the results are provided in a large graph along with the relative errors at 1 nm wavelength increments. Both the data are included with the unit so the user can verify that his instrument is within the maximum f1' errors guaranteed.

The f1' value, specified in percentage error, represents the degree to which the relative spectral responsivity deviates from the CIE  $V(\lambda)$  curve.



## ACCESSORIES

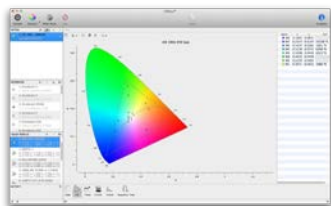
- USB Cable
- Viewing system
- Universal mounting bar
- Cosine Receptor (optional)
- ND Filters (optional)

## APPLICATION SOFTWARE

The PC-based software application, is a streamlined, cross-platform, user-centric assistant used to perform all your colorimetric- based analysis. It provides a familiar workspace no matter which platform you are in. The CR-100 and CR-200 come standard with a built-in, easy-to-learn, English language command interpreter to control all aspects of their operation via a computer, tablet or smart device, making it easy for users to create their own software dedicated to perform specific measurement tasks or for inclusion in an Automated Test Environment.

In addition, a fully documented communication language with numerous real-world, sample templates are included as starting points for customers to build their own software tools using any of the modern computer development environments. LabVIEW driver is available upon request.

## FEATURE HIGHLIGHTS



- **Cross Platform:** Your working environment is the same in every platform while taking advantage of features specific to the host operating system.
- **Intuitive:** The user interface is designed with a user-friendly approach with controls at your fingertips, not hidden away in menus or complex preferences.
- **Connectivity:** The software is engineered to support simultaneous data capture from multiple connected instruments based on the contextual task at hand. Select an instrument to take a reading or simultaneously use all open instruments.
- **Data Visualization:** Measurements are presented in a customizable tabular grid or charts. The software supports multiple types of measurements, and co-exists gracefully within the same streamlined interface.
- **Four-color Matrix Method Support:** The Four-color Matrix Method (FCMM), developed by the National Institute of Standards and Technology (NIST), improves the accuracy of tristimulus colorimeters for measurements of color displays and has been verified to be appropriate for cathode ray tubes (CRTs), liquid crystal displays (LCDs), and organic light emitting diode (OLED) displays.
- **Display Flicker & Response Time Measurements:** The CR-200 uses proprietary hardware and software for fast sampling of display luminance to compute flicker levels (or modulation amplitude), dominant flicker frequency component and response times.

# MEASUREMENT SPOT SIZE

Working Distance (mm)	3° Aperture (mm)
2000	103.5
1500	77.3
1000	51.1
750	38.02
500	24.94

Working Distance (mm)	3° Aperture (mm)
400	19.69
300	14.46
254	12.05
250	11.84
240	11.31

# CR-200 TRISTIMULUS SPECIFICATIONS

Wavelength Range	380 – 780 nm
Luminance Range	0.007 Nits to 20558 Nits (0.002 fL to 6000 fL) 0.007 Nits (0.002 fL) @ Signal to Noise Ratio > 10, 20 seconds exposure 0.034 Nits (0.01 fL) @ Signal to Noise Ratio > 10, 0.5 second exposure 0.034 Nits (0.01 fL) @ Signal to Noise Ratio > 100, 20 seconds exposure 20558 Nits (6000 fL) @ Signal to Noise Ratio > 8000, 0.001 second exposure
Luminance Accuracy	± 2 % @ 1 Nits (0.3 fL), 0.5 second exposure
Luminance Repeatability	0.2 % @ 1 Nits (0.3 fL), 0.5 second exposure 1.5 % @ 0.1 Nits (0.03 fL), 0.5 second exposure 1.5 % @ 0.01 Nits (0.003 fL), 20 seconds exposure
Chromaticity Accuracy	± 0.0015 x, y @ 1.7 Nits (0.5 fL), 0.5 second exposure ± 0.0015 x, y @ 0.34 Nits (0.1 fL), 20 seconds exposure
Chromaticity Repeatability	0.0005 x, y @ 1.7 Nits (0.5 fL), 0.5 second exposure 0.0005 x, y @ 0.34 Nits (0.1 fL), 20 seconds exposure
Polarization Error	≤ 0.1 %
Synchronization Frequencies	10-500 Hz (Custom Synchronization from 10 Hz to 10 KHz available)
Exposure Time Range	1 ms to 20 seconds
Power Requirements	5V, 120 mA (600 mW) via USB 2.0
Interface	USB 2.0, Ethernet
Weight / Mass	1 pound (0.45 kg) 1.2 pounds (0.54 kg) with viewing system VO-201

**NOTE:**  
When Custom Synchronization is selected, the user is required to enter the refresh rate or the on/off frequency of the device he is measuring.  
All the above measured with a NIST-traceable 2856K light source, with a 3° aperture.



Get in touch

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As part of our policy of continuous product improvement, we reserve the right to change specifications at any time