CR-100 TRISTIMULUS
Colorimeter/Photometer

With the ability to capture data in less than 60 milliseconds, the CR-100 Tristimulus Colorimeter/ Photometer was designed for high-speed production line and Q.C. inspection, as well as product development.

COLORIMETRY
RESEARCH, INC

DESIGNED FOR PERFORMANCE

Ruggedly constructed, the CR-100 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-100 is completely solid-state with no mechanical shutter or moving parts to ensure high reliability and long MTBF. It weighs only 12 ounces (340 grams), 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-100 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-100 can also be controlled by an Ethernet 10BASE-T/100BASE-TX IEEE-802.3 compliant connection.

OPTIONAL EXTERNAL TRIGGER PORT

The CR-100 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.

ACCESSORIES

- USB cable
- Wrist strap and bracket
- ND Filters (optional)

- Universal mounting bar
- Cosine Receptor (optional)

CIE TRISTIMULUS FILTER F1' ERRORS

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

Each CR-100 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(λ) curve.
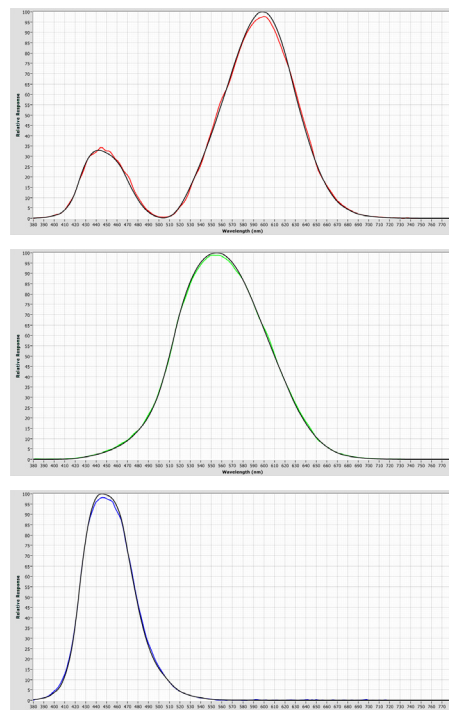
APPLICATION SOFTWARE

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 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.
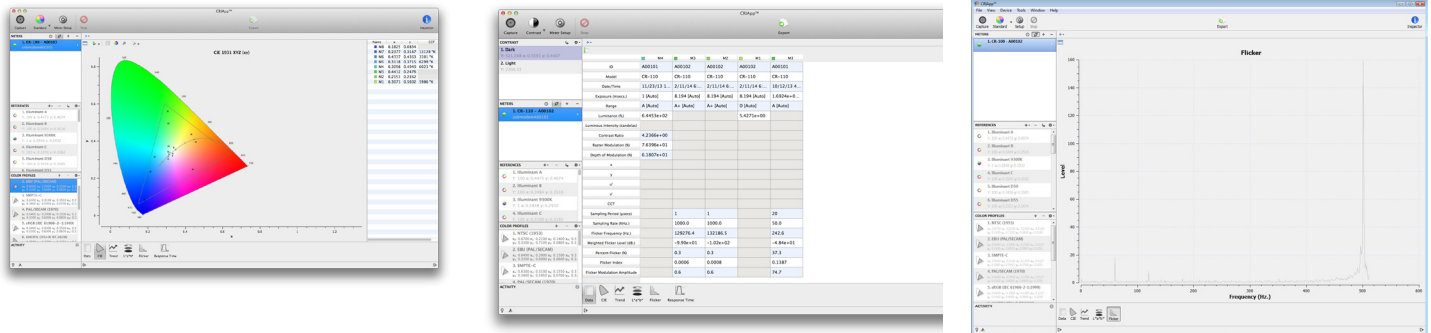
FEATURE HIGHLIGHTS

- **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-100 uses proprietary hardware and software for fast sampling of display luminance to compute flicker levels (or modulation amplitude), dominant flicker frequency components and response times.

The Colorimeter Utility is an accompanying tool that aids in updating, preserving and recovering the state of the instrument. It is also used to define a color correction based on the Four Color Matrix Method Correction.
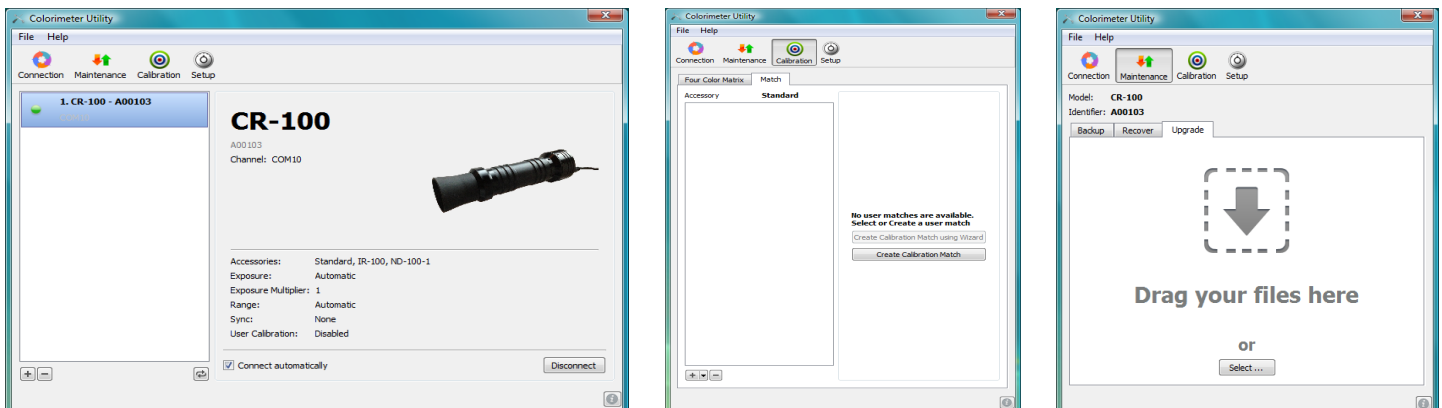
MEASUREMENT SPOT SIZE

Spot size at end of hood	23.0 mm
Spot size at 100 mm from end of hood	31.7 mm

The spot size can be calculated at any distance from the end of the rubber hood with the following equation:

Spot size (mm) = 23.0 mm + 0.08732 * distance to object (mm)

CR-100 TRISTIMULUS SPECIFICATIONS

Wavelength Range	380 – 780 nm
Luminance Range	0.0002 fL to 1500 fL 0.0002 fL @ Signal to Noise Ratio > 10, 20 seconds exposure 0.001 fL @ Signal to Noise Ratio > 10, 0.5 second exposure 0.001 fL @ Signal to Noise Ratio > 100, 20 seconds exposure 1500 fL @ Signal to Noise Ratio > 8000, 1 second exposure
Luminance Accuracy	± 2 % @ 0.1 fL, 0.4 second exposure
Luminance Repeatability	0.2 % @ 0.1 fL, 0.4 second exposure 1.5 % @ 0.01 fL, 0.5 second exposure 1.5 % @ 0.001 fL, 20 seconds exposure
Chromaticity Accuracy	± 0.0015 x, y @ 0.1 fL, 0.4 second exposure ± 0.0015 x, y @ 0.02 fL, 20 seconds exposure
Chromaticity Repeatability	0.0005 x, y @ 0.1 fL, 0.4 second exposure 0.0005 x, y @ 0.02 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	12oz. (0.34 Kg.)

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 2856 K light source.

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

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