

CCS-1000 Uniform Tunable Source



The Model CCS Camera Calibration Systems are the latest addition to Labsphere's growing line of camera calibration solutions. When integrated with the spectral monitor option, the spectrometer and software allows the system to display the spectral output and photometric values of the source with results expressed in $\text{mW}/\text{cm}^2\text{-sr-nm}$, cd/m^2 , lux, CRI and Duv. The integrating sphere source simplifies and enhances production testing of camera modules by eliminating multiple steps in the image quality correction process, with a choice of uniform standard illuminants and colors from one compact and robust source.

Multi-Sourced Solution

The CCS-1000 is engineered with multiple step dc controlled LEDs, each calibrated with the integrating sphere source. It is nearly every visible light source in one device. With the software controlled LED channels it is possible to generate the spectrum of standard illuminant light sources such as A, C, D50, D55, D65, D75, and Neutral Source E with very high reproducibility. Not only does the user have the option to select from predefined spectrums, the CCS-1000 also allows one to create their own spectral arrangement and save them to recall at anytime for user defined test methods. With the integrated spectrometer option, one can see the broad range of the white and color as well as the sources radiometric and photometric performance.

Compact and Robust for Production Environments

The CCS-1000 is engineered for the high performance requirements in the field of camera module production testing and calibration for image and color quality. The source is engineered to easily mount in a production test station. The 750 mm diameter window enables test and calibration over a large field of view with highly uniform illumination. With Labsphere's highly diffuse reflectance material, Spectralon®, and an LED module that has been seasoned for more than 1000 hours, long term repeatability and reproducibility are ensured in the application environment. The power control module is tethered to the source module by way of a detachable 2 m cable.

DETAILS

One instrument, multiple spectrums

Choice to have spectral monitor

Part of Labsphere's spectrally tunable sources for camera calibration and test

APPLICATIONS

Production Testing For:

- Spatial Non Uniformity
- Defect Pixel
- White Balance
- Channel Cross Talk
- Quantum Efficiency
- SNR

Spectral Monitor Option

When seeing the spectral radiance and photometric performance in near real time, and having the ability to re-calibrate the source in the field is important, Labsphere offers the CCS-1100 option. The CCS-1100 has the same high performance and light output control of the CCS-1000 with the added benefit of a spectral monitor, that allows one to capture the spectral output and recalibrate the source output.

OSC-1000 Optimization Solution Creator Option

This option allows users to upload their desired spectral output target, which will optimize the LED inputs for the best match. With this program, users can save it and add it to their favorites!

ORDER INFORMATION

CCS-1000
Uniform Tunable Source

CCS-1100
Uniform Tunable Source with
integrated spectrometer

OSC-1000
Optimization Solution Creator Option

ACCESSORIES SUPPLIED

- Quick Start Guide
- Software Development Kit
- Uniformity Report
- Calibration Files
- Transport Case

CCS-1000 Uniform Tunable Source

CONTROL SOFTWARE

- Predefined Spectrums
- Individual LED Channel Control
- Spectral Output
- Photometric Performance

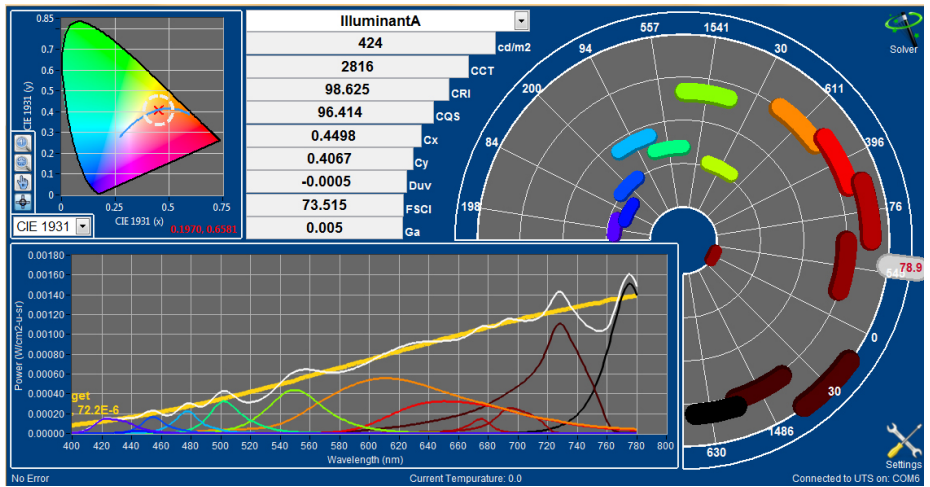


Figure 1: Example of Illuminant A

Uniform Tunable Source allows reproduction of standard spectrums with exception color matching with high uniformity across a large area.

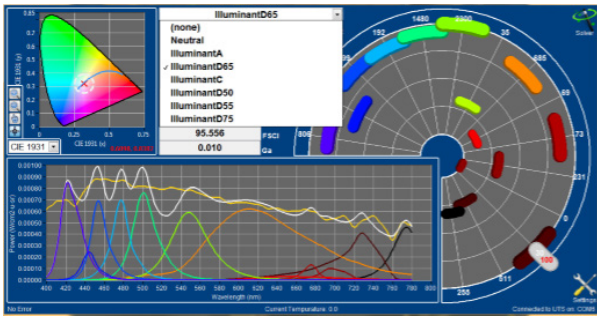


Figure 2: Choose from a selection of Preset Spectrums or Create your Own

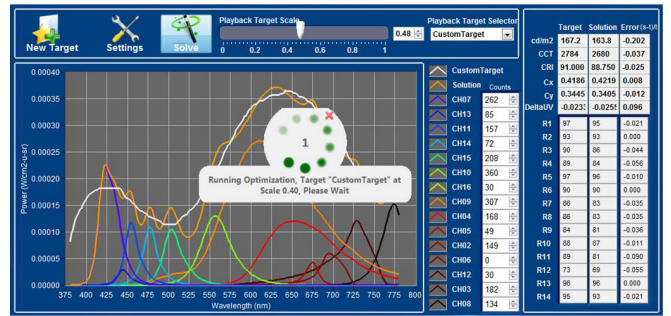


Figure 3: Optional OSC-1000 Optimization Solution Creator will Optimize the Spectral Output to Your Target Spectrum

Illuminant	Illuminant Ra	Illuminant Duv	CCS Duv Tolerance
A	100	0.0000	± 0.002
C	97.5	-0.0022	± 0.002
D50	100	0.0032	± 0.002
D55	100	0.0032	± 0.002
D65	100	0.0032	± 0.002
D75	100	0.0032	± 0.002
Neutral E	95.3	-0.0044	± 0.002

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Luminance Spatial Uniformity: >96%

Typical Spectral Output CIE 1931 Illuminants:

- A: Ra >95, Duv 0.002, 50 to 500 cd/m²
- C: Ra >94, Duv 0.002, 50 to 500 cd/m²
- D50: Ra >95, Duv 0.002, 50 to 500 cd/m²
- D55: Ra >95, Duv 0.002, 50 to 500 cd/m²
- D65: Ra >95, Duv 0.002, 50 to 500 cd/m²
- D75: Ra >95, Duv 0.002, 50 to 500 cd/m²
- E: Ra >93, Duv 0.002, 50 to 500 cd/m²
- Red: 700 nm, 0 to 5E-3 mW/cm²-sr
- Green: 525 nm, 0 to 0.7E-3 mW/cm²-sr
- Blue: 420 nm, 0 to 0.9E-3 mW/cm²-sr

Light Source: Integrating Sphere
LED Module: filter white channels and discrete color channels controlled with direct current
Spectral Range: 400 nm to 800 nm
Usable Life: 6000 hrs

Calibrated Life: 3000 hrs

Stability: 0.2% after 5 minutes

Warm Up Time: 5 minutes

Control: Software Development Kit and User Software
Individual Light Channel Control
On, Off
Preset Functions for Illuminant Spectrums
Illuminance at Illuminant
All Off
Stability indicator

With Spectrometer Option

Spectral Radiance (mW/cm²-sr-nm)
Luminance (cd/m²)
Illuminance (lux)
CRI
Duv
Source Calibration

Operating Temperature: 20 - 40 degrees C, 0 - 70% RH

Computer Requirements: Windows®, Linux, 32 bit
RS-232 DB9 or USB

Power Input: 110/220 VAC, 50/60 Hz

Dimensions: Integrating Sphere Source Module 18 cm x 18 cm x 24 cm
Power Module 43 cm x 37 cm x 5 cm

Weight: Integrating Sphere Source Module 8 kg
Power Module 6 kg