SpectraCal

CM CalMAN
Setup Guide

Lumagen Radiance

XD, XE, XS, Mini 3D, 20xx series, 21xx series

Rev. 1.4

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Introduction

The Lumagen Radiance processors provide controls to calibrate 11 or 21 point grayscale. They also provide controls to calibrate the standard CMS primary and secondary color points, or to calibrate a 3D cube lookup table (LUT) for SMPTE video level signals. (NOTE: The Radiance models are not suitable for creating a 3D LUT for use with full range/PC levels.)

CalMAN Recommended Workflows

- Color Cube or CalMAN Studio to calibrate Radiance grayscale RGB balance and 3D LUT.

- HT Advanced or SI Advanced to calibrate Radiance grayscale RGB balance and standard CMS.

Radiance Required Firmware

- Any recent version for grayscale and standard CMS calibration.

- 091612, or later, for 3D LUT calibration

  Radiance firmware updates can be found at
  http://www.lumagen.com/testindex.php?module=updates

  To update the Radiance firmware, connect the supplied RS232 (null modem) cable between the RS232 port on the Radiance and your PC, unzip the update file from Lumagen, and run the update program. Select the appropriate RS232 port, select the 57600 baud rate, and click Start. While the update is being performed, the Radiance will display "Update in Progress" on its video output.

Radiance Control Connection

- 21xx series: USB cable (serial cable can be used, at slower speed)

- Older models: DB-9 female to DB-9 female null-modem RS-232 cable (pin2 - pin3, pin3 - pin2)

  Radiance RS-232 Echo must be On
  Menu > Other > I/O Setup > RS-232 Setup > Echo: On

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Radiance Connection Notes

- Connect the Radiance to the CalMAN computer with the specified cable.
- A USB to Serial adapter, if used, needs to include a data buffer, such as the certified FTDI converter.

FTDI USB to Serial Converter

For connecting to and controlling a Radiance with computers that do not have an RS232 connection, SpectraCal recommends the FTDI USB to RS232 converter. Extensive testing has determined that FTDI converters, which include a data buffer, are the most reliable converters to use for CalMAN device control.

Two versions of the FTDI USB-Serial Converter are available for purchase on the following FTDI product page:

http://www.ftdichip.com/Products/Cables/USBRS232.htm

FTDI Device Driver download

http://www.ftdichip.com/Drivers/VCP.htm

Or, CalMAN Device Driver Pack

http://www.spectracal.com/download.php?id=3

CalMAN Grayscale and 3D LUT Calibration

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CalMAN can calibrate the 1D grayscale ramp and the 3D LUT in the Radiance with a direct USB control connection. To produce optimized 1D LUT and 3D LUT calibration files and automatically load them into the Radiance:

1. In the Radiance menu, set the *3D Color Gamut Options* to Enabled and select the number of 3D LUT points.

    - Menu > Output > CMS's > CMSx > Color Gamut > Options > Enabled; Yes
    - Menu > Output > CMS's > CMSx > Color Gamut > Options > Points; [per model]
        - 4913 points – 21xx series, 41xx/44xx series (Pro)
        - 729 points – 20xx series
        - 125 points – older models

2. In CalMAN, load the "Color Cube (3D LUT)" workflow.

3. Proceed through each step of the workflow in the normal fashion, using the following notes for guidance on the indicated workflow pages.

4. On the *RGB Adjust* page, under the RGB Adjust Levels selection, select "2 Point 30, 100%." Click *Read Continuous* and adjust the display's RGB Gain controls for RGB balance at 100%. Adjust the display's RGB Offset/Bias controls (if provided) for RGB balance at 30%.

5. On the *1D Ramp* LUT page, click the AutoCal action button in the lower right to optimize calibration of the display's grayscale and gamma.

6. On the *3D Cube LUT* page, click the *AutoCal (*rotating arrows) button at the right end of the meter action buttons. The *AutoCal Setup* dialog then appears (Figure 1).
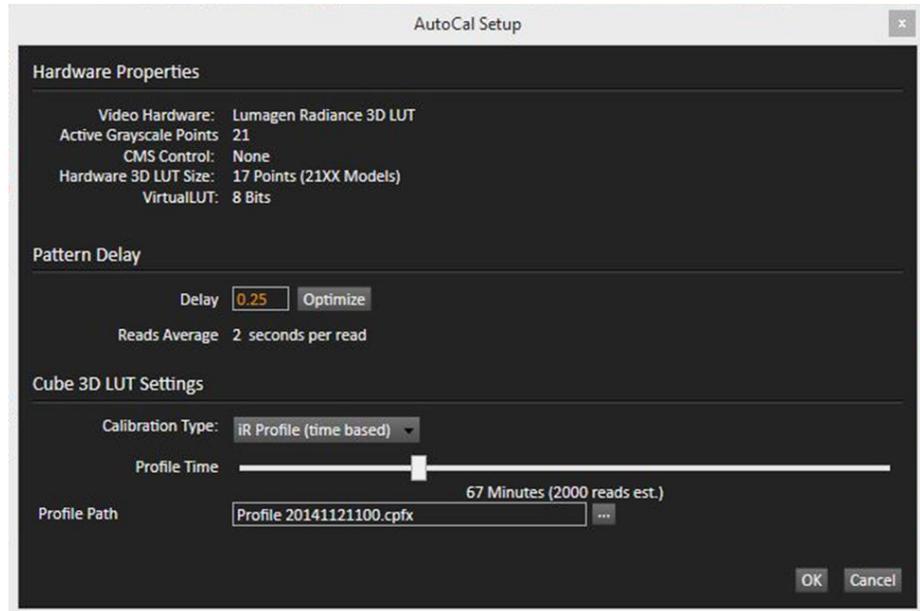
Figure 1. CalMAN 3D LUT AutoCal Setup dialog for Lumagen Radiance.

7. Under *Calibration Type*, select the desired type of 3D LUT calibration process.

    *   **IR Profile (time based)**: Creates the best quality display calibration 3D LUT possible in the selected period of time. You select how much display quality you have time for, from 30 minutes to maximum display quality (6,000 points max). Uses Intelligent Resolution Profiling to search out the most nonlinear color space areas and correct those first.

    *   **IR Profile (point based)**: Creates the best quality display calibration 3D LUT possible with the selected number of measurement points (1,000 - 10,000 points). Uses Intelligent Resolution Profiling to search out the most nonlinear color space areas and correct those first.

    *   **Lightning LUT**: Creates a display calibration 3D LUT in five minutes or less. Produces a very high quality result on professional displays with moderate linearity. Displays with significant nonlinearity may produce marginal results.

8. Under *Video Range*, select "SMPTE (16-235)" if you are calibrating a video display that clips or compresses signals above reference white, as tested on the CalMAN Dynamic Range page.

9. Click *OK*.

Upon completion of the AutoCal 3D hardware LUT calibration process, CalMAN automatically loads the optimized LUT calibration data into the Radiance.

DONE – Radiance grayscale and 3D LUT calibration and setup is complete.

CalMAN Grayscale and Standard CMS Calibration

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CalMAN can calibrate the grayscale ramp and the primary/secondary colors in the Radiance. To connect a Radiance for grayscale calibration and standard CMS primary/secondary color calibration:

1. In the Radiance menu, set the 3D Color Gamut Options to Disabled and 8 Points.

    - Menu > Output > CMS's > CMSx > Color Gamut > Options > Enabled; No
    - Menu > Output > CMS's > CMSx > Color Gamut > Options > Points; 8

2. In CalMAN, load the HT Advanced or SI Advanced workflow.

3. On the CalMAN Settings tab (gear icon), under Workflow Basic Options, select *Video (16-235)* [SMPTE legal].

4. Proceed through each step of the workflow in the normal fashion, using the following notes for guidance on the indicated workflow pages.

5. On the *Hardware Connect* page, click the *Find Source* button, select "Lumagen – Radiance series," then click *Connect.*

6. On the *Hardware Connect* page, click the *Find Processor/Display* button, select "Lumagen – Radiance CMS," then click *Connect.*

7. On the *Dynamic Range* page, adjust the display's black level/Brightness control to 16.

8. Skip the *Grayscale - 2pt* page (no advantage when doing the following multipoint AutoCal).

9. On the *Grayscale/Gamma* page, click the AutoCal button and wait for the AutoCal process to complete.

10. On the *CMS Calibration* page, click the AutoCal button and wait for the AutoCal process to complete.

DONE – Radiance Grayscale and CMS calibration is complete.

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About Portrait Displays

Portrait Displays, Inc., since 1993, is a leading application software provider (ASP) for PC, smartphone, and tablet displays. The Portrait Displays team now includes **SpectraCal**, the world's leading provider of video display calibration software. The combined companies offer value-added, feature-rich solutions to both OEM display manufacturers and end users seeking improved accuracy and manageability of their displays.

Portrait Displays, an Intel Capital Portfolio company, is a private corporation with headquarters in Pleasanton, California, USA with representatives in Europe, Taiwan, China, Japan, and Korea.

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