SpectraCal

CalMAN Setup Guide

Canon Monitors

3D LUT Calibration

Rev. 1.1

PORTRAIT
DISPLAYS

Introduction

The following Canon DP-V series monitors can import a 3D LUT for color correction to counter color performance drift over time and maintain panel specifications to a desired industry standard. CalMAN Display Calibration Software performs a comprehensive monitor performance test for a Canon DP-V series monitor to determine whether the monitor conforms to desired standards. Then, if desired, it creates a custom 3D LUT file, optimized to calibrate the Canon monitor to the selected performance standard. The calibration LUT file(s) can then be loaded into the Canon monitor 3D LUT memory via a USB memory stick.

Note: CalMAN currently supports calibrating the Canon DP-V series monitors only for SDR content with a 3D LUT. CalMAN does not support calibrating the Canon monitors for HDR content or with a 1D LUT.

Canon Monitors with LUT Import Capability

The following Canon monitors can import 3D LUTs in the Canon *clut format.

- DP-V1710
- DP-V2410 (firmware version 1.2 or later)
- DP-V3010 (firmware version 1.2 or later)
- DP-V2420

CalMAN Required Software

- Version 5.7.1 or later
- CalMAN Ultimate or CalMAN Studio can be used to create 3D LUTs for Canon monitors.

CalMAN Required Workflow

- Color Cube (3D LUT)

Canon Monitor Initial Setup

- Before running the CalMAN calibration software, select the desired Gamma and Color Gamut modes in the Canon monitor.

- If the gamma you are targeting is not available in the monitor menu, select the monitor's Gamma mode that is closest to the gamma you are targeting.

- If the color gamut you are targeting is not available in the monitor menu, select the monitor's "Native" gamut mode instead.

CalMAN will create a calibration 3D LUT based on these selected gamma and gamut modes. The calibration 3D LUT will be accurate only if the monitor remains in these selected modes.

CalMAN 3D LUT Monitor Calibration

Follow this procedure to create an optimized software 3D LUT calibration file, ready to be loaded into a supported Canon monitor.

Color Cube (3D LUT) Workflow

The Color Cube workflow in CalMAN is used to create a monitor calibration 3D LUT. In the CalMAN main menu, select *Open Workflow Template*, then select *Color Cube (3D LUT)*. Proceed through each step of the Color Cube workflow in the normal fashion, using the following notes for Canon monitor specifics.

Initial Setup section

In the Initial Setup section of the Color Cube workflow, step through the following pages:
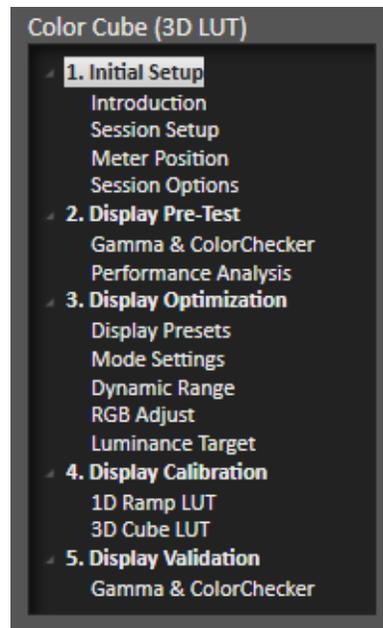

Figure 1. CalMAN Color Cube (3D LUT) workflow outline.

Session Setup - Meter Connect

1. Connect your color meter to the CalMAN computer.

2. On the *Session Setup* page, click the *Find Meter* button to connect your meter.

3. On the *Find Meters* dialog, select your meter if it is listed, then click Search. If your meter is not listed on the *Find Meters* dialog, just click *Search*.

4. Under the Target Display Type drop down, select "LCD (LED RGB)" for a colorimeter. For a spectrophotometer, no special selection is required.

Session Setup - Source Connect

1. On the *Session Setup* page, click the *Find Source* button.

2. On the *Find Source* dialog, select the Manufacturer and Model of your test pattern source device.

Session Setup - LUT Device Setup

1. On the *Session Setup* page, click the *Find 3D LUT Device* button.

2. On the *Display* dialog, under *Manufacturer*, select 'SpectraCal.'

3. Under *Model*, select 'SpectraCal - Cube Generator (3D LUT).'

4. Click *Connect*.

Display Pre-Test section

You can measure the performance of a Canon monitor before you calibrate it, on the pre-test *Gamma & ColorChecker* page.

If the *Performance Analysis* page (Figure 2) then indicates any red pass/fail lights for the monitor's native performance, you can proceed to the *Display Optimization* section of the workflow to optimize the monitor's internal picture controls before performing the 3D LUT calibration. A few minutes spent optimizing the monitor's native performance typically yields a more accurate 3D LUT calibration. The degree of improvement depends greatly on the individual monitor.

If you skip display optimization at this time and the final calibration validation indicates less than the desired improvement, you can easily return to the *Display Optimization* section and then repeat the 3D LUT calibration by clicking the *Optimize Display* button on the final calibration validation page.

On the *Performance Analysis* page:

*   Click the *Optimize Display* button to proceed first to the workflow *Display Optimization* section.

*   Click the *Calibrate Cube LUT* button to skip directly to the *Display Calibration* section.
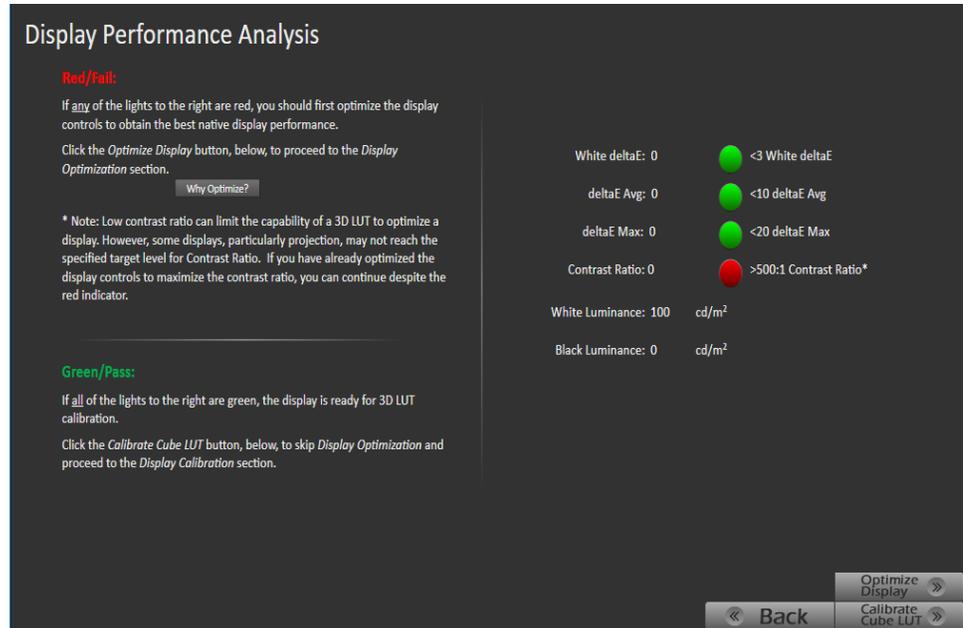
Figure 2: The Performance Analysis page provides pass/fail analysis of the display pre-test measurements that were performed on the preceding workflow page.

Display Optimization section

To optimize the monitor's picture controls before creating a 3D calibration LUT, advance through the control adjustment pages in the *Display Optimization* section of the workflow (Figure 3).
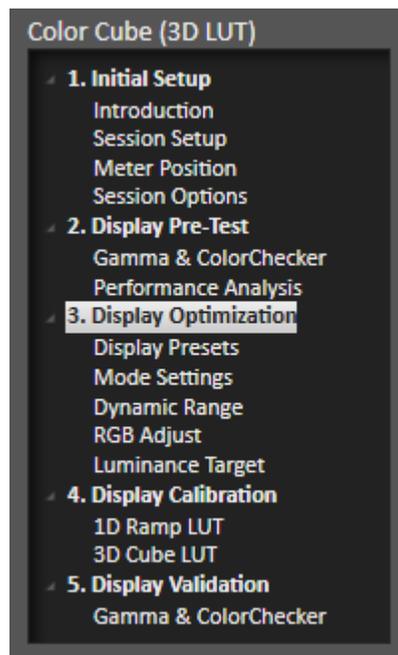

Figure 3: The Display Optimization section of the workflow helps you optimize the monitor's picture controls if there were any monitor performance failures, or if you

have previously created a 3D LUT for the display with less than the desired improvement.

Display Calibration section

In the *Display Calibration* section of the Color Cube workflow, there are provisions for calibrating both a 1D RGB LUT (*1D Ramp LUT* page) and a 3D cube LUT (*3D Cube LUT* page). When we are calibrating a Canon monitor with a 3D LUT, we will skip the *1D Ramp LUT* page (1D RGB LUT) and use only the *3D Cube LUT* page.

1D Ramp LUT page

Skip over this page when creating a 3D LUT file for a Canon monitor, as the Canon monitor does not support a 1D correction LUT.

3D Cube LUT page

1. On the *3D Cube LUT* page, click the *AutoCal* button (rotating arrows) at the right end of the meter action buttons. The *AutoCal Setup* dialog then appears (Figure 4).

2. On the popup *AutoCal Setup* dialog (shown below), under File Format, select "Canon – LUT (.clut)."

3. Also on the *AutoCal Setup* dialog, under *File Path*, select a convenient location for the LUT file that CalMAN will create. Name the .clut file to identify the monitor and the date. *Note: To load the LUT file(s) into the Canon monitor, the LUT file(s) will need to be saved to a USB flash drive.*
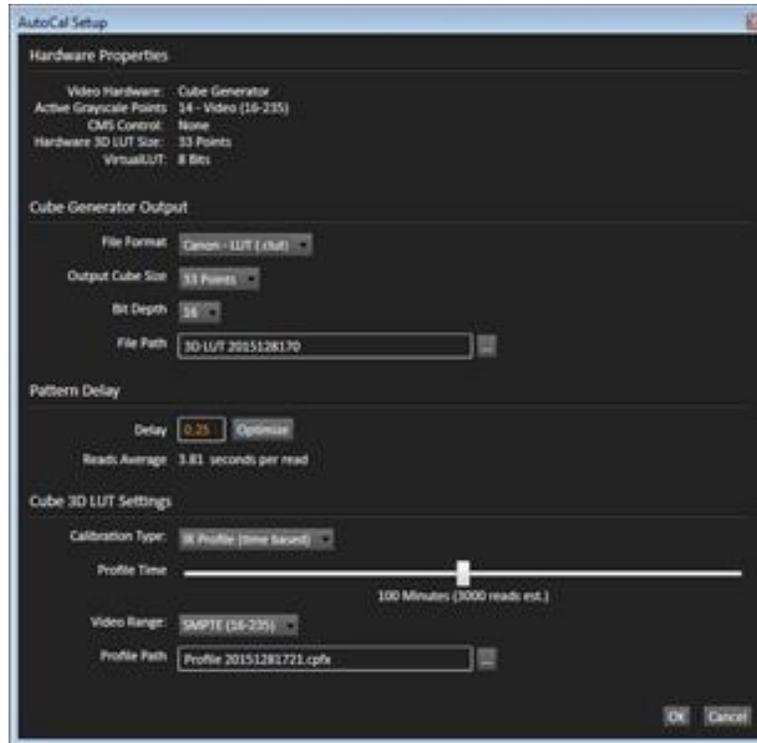
Figure 4: The AutoCal Setup dialog allows you to specify the 3D LUT format, the LUT file name and location, and the quality/time tradeoff for the calibration process.

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

   - **IR Profile (time based)**: Creates the best quality monitor calibration 3D LUT possible in the selected period of time. You select how much monitor quality you have time for, from 30 minutes to maximum monitor 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 monitor 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 monitor calibration 3D LUT in five minutes or less. Produces a very high quality result on professional monitors with moderate linearity. Monitors with significant nonlinearity may produce marginal results.

5. Click *OK*.

Upon completion of the AutoCal 3D LUT calibration process, CalMAN automatically writes the optimized 3D LUT calibration data into a Canon

format .clut file in the default location (\Documents\SpectraCal\CalMAN XXX\LUTs) or in a user-selected drive location.

Canon Monitor LUT Load

When CalMAN completes its automatic 3D LUT calibration, the created 3D LUT file is ready to be loaded into a supported Canon monitor. To load a software LUT calibration file into one of the Canon monitor LUT slots:

1. Save the .clut file to the root folder of a USB flash drive.

2. Plug the USB flash drive into the Canon monitor front panel USB port.

3. Press the Canon MENU button to open the OSD menu.

4. Select "Adjustment" > "Detail Settings" > "LUT Import" using the jog dial.

5. In the "Filename" field, select the desired file from the flash drive with the .clut extension.

6. In the "LUT Type" field, select "User LUT" (Do not select Gamma LUT or Gamut LUT.)

7. In the "Select LUT" field, select the desired User LUT slot (1-8).

8. Select "Execute," then select "OK." LUT file import starts.

9. Select your new USER 3D LUT in the Canon menu, to apply the LUT to the monitor.

DONE – Color calibration of the Canon monitor with a 3D LUT 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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