CM CalMAN Setup Guide

Blackmagic Design Teranex Mini

Rev. 1.3

Introduction

CalMAN takes advantage of the internal 3D LUT feature of the Blackmagic Design Teranex Mini to calibrate a video display with a 33x33x33 16-bit 3D cube lookup table (LUT).

CalMAN automatically creates an optimized display calibration 3D LUT and saves it to a computer file in a user-selected location. The LUT file can then be manually loaded into the Teranex Mini.

This setup guide assists you in calibrating the Teranex Mini with the CalMAN Color Cube workflow.

CalMAN Required Software

- Version 5.7.2 or later
- CalMAN Ultimate or CalMAN Studio can be used to create 3D LUTs for a Teranex Mini.

CalMAN Required Workflow

- Color Cube (3D LUT)

CalMAN 3D LUT Monitor Calibration

Follow this procedure to create an optimized software 3D LUT calibration file, ready to be manually loaded into a Teranex Mini.

Color Cube (3D LUT) Workflow

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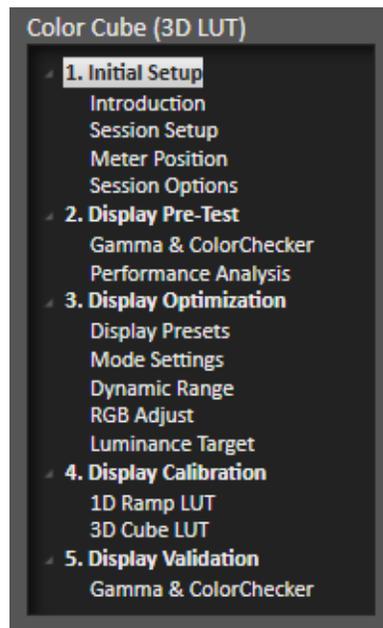
Initial Setup section

Figure 1. Initial Setup section of the Color Cube workflow.

In the Initial Setup section of the Color Cube workflow (Figure 1), step through the following pages:

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, for a colorimeter, select "LCD (LED White)." 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 Source dialog, select your desired test pattern source.

Session Setup - LUT Device Setup

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

2. On the *Find Display* dialog (Figure 2), under *Manufacturer*, select 'SpectraCal.'

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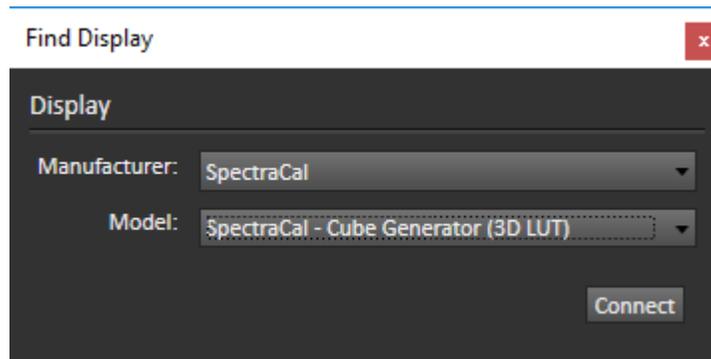
4. Click *Connect*.

Figure 2. CalMAN Find Display dialog with Cube Generator selection.

Display Pre-Test section

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

If the *Performance Analysis* page (Figure 3) 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 to optimize the internal display controls and then repeat the 3D LUT calibration by clicking the *Optimize Display* button on the final calibration validation page.

On the Performance Analysis page (Figure 3):

- To proceed first to the workflow *Display Optimization* section, click the *Optimize Display* button.

- To skip directly to the *Display Calibration* section, click the *Calibrate Cube LUT* button.
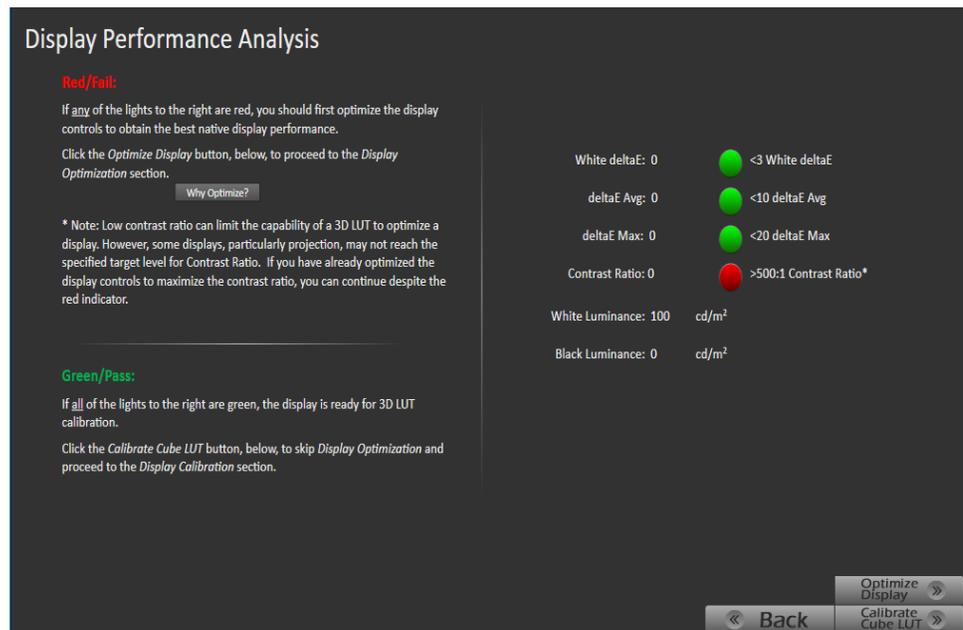

Figure 3. The Performance Analysis page provides pass/fail analysis of the display pre-test measurements that were performed on the preceding workflow page.

Display Optimization section

To optimize the monitor's internal picture controls before creating a 3D calibration LUT, advance through the control adjustment pages in the *Display Optimization* section of the workflow (Figure 4).
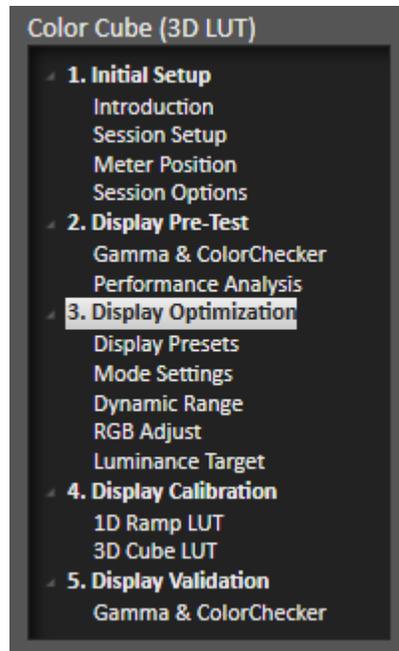
Figure 4. The Display Optimization section of the workflow helps you optimize the monitor's picture controls if there were any monitor performance failures, or if you have previously created a 3D LUT for the display with less than the desired improvement.

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 Teranex Mini 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 the 1D Ramp LUT page when creating a 3D LUT file for a Teranex Mini, as it does not support a correction 1D 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 5).

2. On the *AutoCal Setup* dialog, under *File Format*, select "Blackmagic Design – Teranex Mini (.cube)" (creates a 33x33x33 16-bit 3D LUT .cube format file).
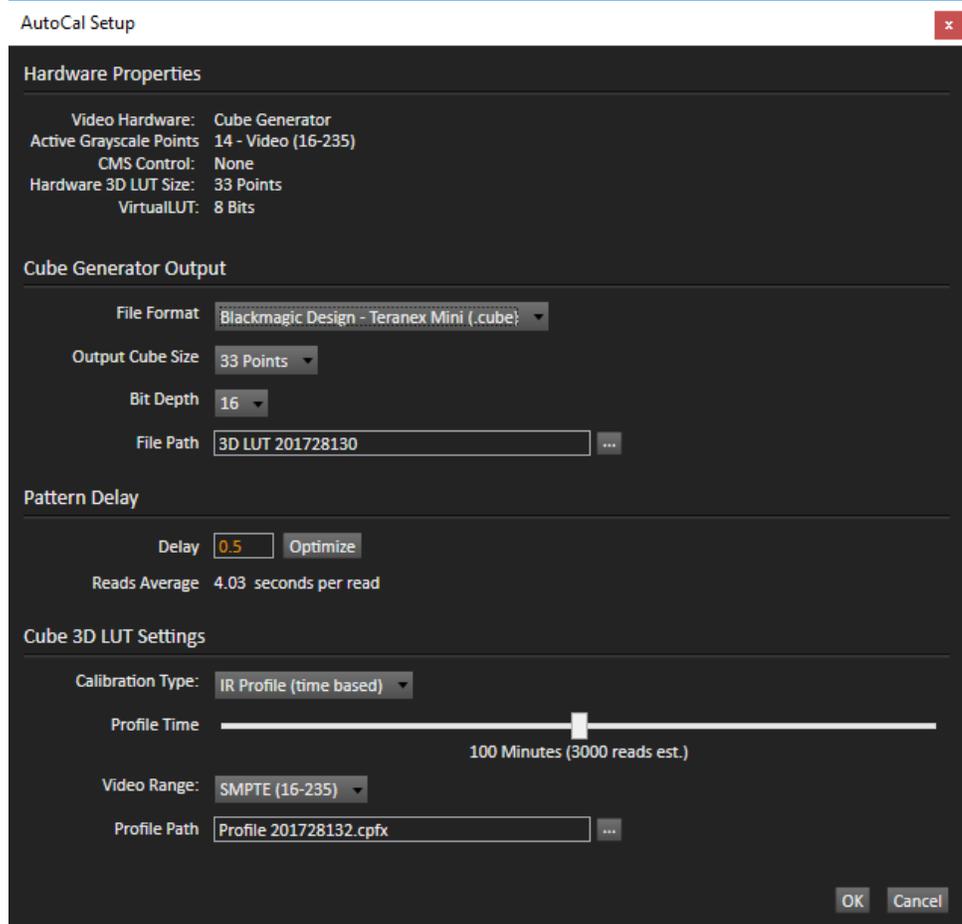
Figure 5. 3D LUT AutoCal Setup dialog.

3. On the *AutoCal Setup* dialog, under *File Path*, select a convenient location for the LUT file that CalMAN will create. Name the .cube file to identify the monitor and the date.

4. On the *AutoCal Setup* dialog, 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.

5. On the *AutoCal Setup* dialog, click *OK*.

Upon completion of the AutoCal 3D software LUT calibration process, CalMAN automatically writes the optimized 3D LUT calibration data into a Teranex Mini format .cube file, in the selected drive location.

To load the 3D LUT file into the Teranex Mini, proceed to the following section.

Teranex Mini 3D LUT Load

When CalMAN completes its automatic 3D LUT calibration, the created software 3D LUT file is ready to be loaded into the Teranex Mini. The Teranex Mini supports two separate LUTs, LUT 1 and LUT 2.

To load the software 3D LUT calibration file into your Teranex Mini:

1. Open the Blackmagic Teranex Setup administration software.

2. Click the 'Load' button for the desired LUT slot.

3. Select the desired .cube file that CalMAN saved to your computer.

4. Click "OK."

5. Click "Save" to confirm your settings.

   - The LUT filename will appear next to each "Load" button so you know which LUT is being used for LUT 1 or LUT 2.

   - To turn a LUT on, click the "Use LUT 1" or "Use LUT 2" checkboxes. To turn the LUT off, click the "Bypass LUT" checkbox.

   - The 3D LUT can also be applied to your converter's loop output by checking the "Enable 3D LUT on loop SDI output" checkbox.

DONE! – Teranex Mini 3D LUT calibration and setup 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.

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