



CaIMAN

Setup Guide

TVLogic XVM / LEM Series Monitors

Rev. 1.1

Introduction

CalMAN takes advantage of the internal 3D LUT feature for the TVLogic XVM and LEM series monitors to calibrate the monitor with a 17x17x17 10-bit 3D cube lookup table (LUT). This setup guide assists you in calibrating an XVM or LEM series monitor with the CalMAN Color Cube workflow.

CalMAN Recommended Workflow:

- Color Cube (3D LUT)

XVM / LEM Series Monitor Required Firmware:

- Version 3.5 or newer

XVM / LEM Series Monitor Control Connection:

- Null modem 9-pin female to female serial cable
- If a USB to serial adapter is required, the FTDI adapter available from SpectraCal is recommended, as it includes a data buffer for superior data integrity at high communication rates.

http://calman.spectracal.com/store/p49/CalMAN_Certified_USB_to_Serial_Adapter.html

CalMAN 3D LUT Monitor Calibration Options

There are two optional methods, outlined below, to create and load an optimized 3D LUT monitor calibration file into one of the TVLogic XVM / LEM series monitors.

Option A – Direct-Load 3D LUT: With this method, CalMAN automatically creates an optimized monitor calibration 3D LUT. CalMAN then directly loads the LUT into the connected TVLogic XVM / LEM series monitor.

Note: CalMAN also automatically saves a copy of the LUT file in its LUTs directory.

Option B – Software LUT File: With this method, CalMAN automatically creates an optimized monitor 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 XVM / LEM series monitor, using the TVLogic LutManager software.

Option A - Direct-Load 3D LUT

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CalMAN 3D LUT Monitor Calibration

Follow this procedure to automatically create and directly load an optimized monitor calibration 3D LUT into one of the TVLogic XVM / LEM series monitors.

TVLogic Display Presets

Before connecting CalMAN to a TVLogic monitor for 3D LUT calibration, preset the following controls in the TVLogic Color menu.

- **Color / Color Temp:** Select your desired Color Temp preset. *Do not use a Custom Color Temp preset to adjust the monitor's Gain and Bias controls.*
- **Color / Color Space:** Select the User Color Space to write to the User 3D LUT.

Caution: If you select one of the other Color Space modes, you will overwrite the factory 3D LUT for that mode.

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 TVLogic monitor specifics.

Initial Setup section

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

Session Setup - Meter Connect

- Connect your color meter to the CalMAN computer.
- On the *Session Setup* page, click the *Find Meter* button.
- On the *Find Meters* dialog, select your meter if it is listed, then click *Search*. If your meter is not listed on the dialog, just click *Search*.

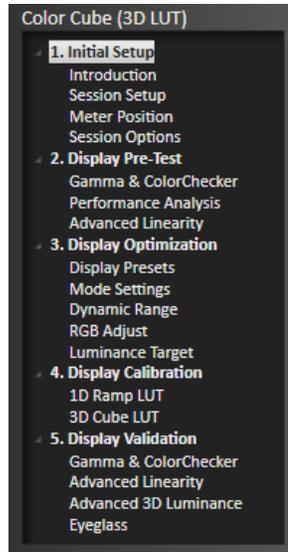


Figure 1. CalMAN Color Cube workflow outline.

Session Setup - Source Connect

- On the *Session Setup* page, click the *Find Source* button.
- On the *Source* dialog, under *Manufacturer* and *Model*, select your test pattern source, such as the CalMAN Client 3 or a hardware reference pattern generator.

Session Setup - LUT Device Setup

- Connect your TVLogic monitor to the CalMAN computer with a serial cable and USB adapter, as noted in the Control Connection section, above.
- On the *Session Setup* page, click the *Find 3D LUT Device* button.
- On the *Find Display* dialog (Figure 2), under *Manufacturer*, select “TVLogic.” Under *Model*, select “TVLogic – XVM / LEM Series.”

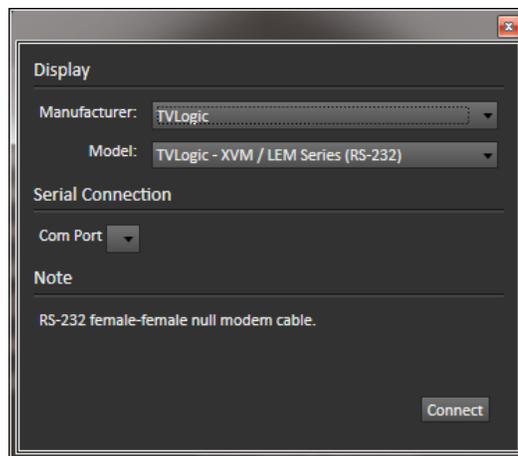


Figure 2. CalMAN Find Display dialog.

Session Options page

On the Session Options page, be sure to select the Input Signal Levels, either Video (16-235) or PC (0-255), to match the levels of the signals that are normally input to the monitor being calibrated.

Display Pre-Test section

In the *Display Pre-Test* section of the Color Cube workflow, on the *Gamma & ColorChecker* and *Advanced Linearity* pages, you can measure the performance of the monitor before you calibrate it. Then, on the *Performance Analysis* page, these monitor measurements are evaluated in a series of pass/fail performance parameters.

If the monitor fails in any of these parameters, you should consider using the following *Display Optimization* workflow section to optimize adjustments on the monitor itself.

If the monitor passes all of these performance parameters, you can skip the *Display Optimization* section and go immediately to the *Display Calibration* workflow section.

Display Optimization section

In the *Display Optimization* section of the Color Cube workflow, you are guided to optimize monitor settings for picture mode, color gamut, color temp, gamma, dynamic range, white point balance, and white point luminance.

On the *Dynamic Range* page, adjust the monitor's Brightness control to set black at the signal level that will be used for production work (16 for Video Levels or 0 for PC Levels).

On the *RGB Adjust* page, under the *RGB Adjust Levels* selection, select "2 Point 30, 100%." Click *Read Continuous* and adjust the monitor's RGB Gain controls for RGB balance at 100%.

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 TVLogic 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 TVLogic monitor.

3D Cube LUT page

1. 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 3).

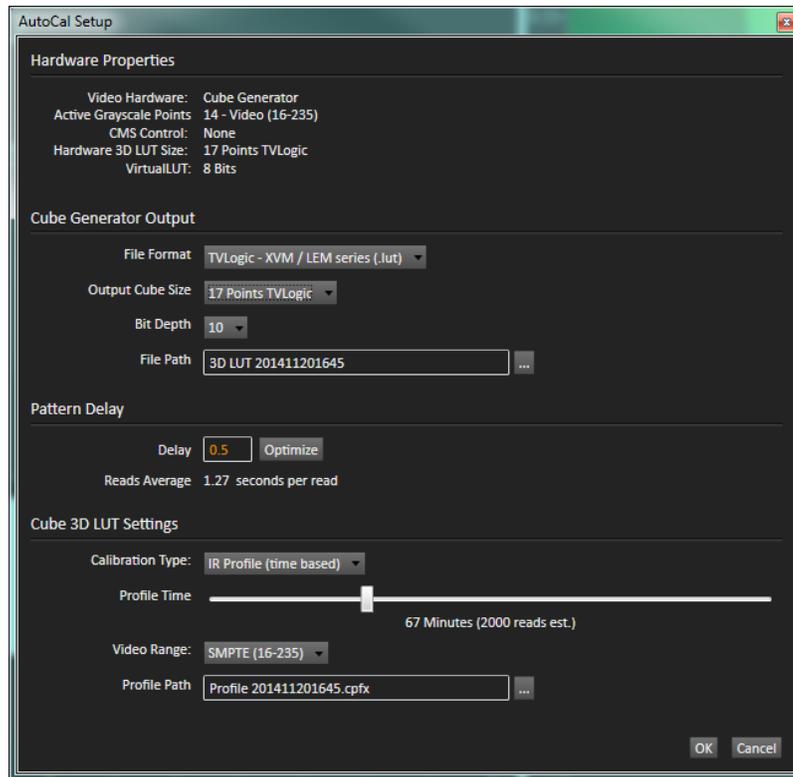


Figure 3. CalMAN AutoCal Setup dialog for 3D LUT creation.

2. For *File Format*, select “TVLogic – XVM/LEM series (.lut).”
3. Under *File Path*, select the desired directory path and provide a name for the LUT file that CalMAN will create (e.g. monitor ID and date).
4. 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. 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.
 6. Click *OK*.

Upon completion of the AutoCal 3D hardware LUT calibration process, CalMAN automatically loads the optimized 17x17x17 LUT calibration data into the TVLogic monitor.

Display Validation section

When the cube calibration completes, CalMAN automatically loads the optimized 17x17x17 LUT calibration data into the TVLogic monitor. You can test the performance of the monitor, in the *Display Validation* section of the Color Cube workflow, to validate the accuracy of the monitor when using the 3D calibration LUT. You can switch back to the *Gamma & ColorChecker Pre-Test* page to compare to the pre-calibration performance.

DONE – TVLogic XVM / LEM monitor 3D LUT calibration and setup is complete.

Option B - Software LUT File

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CalMAN 3D LUT Monitor Calibration

Follow this procedure to create an optimized software 3D LUT calibration file, ready to be loaded into a TVLogic XVM / LEM series monitor.

TVLogic Display Presets

Before connecting CalMAN to a TVLogic monitor for 3D LUT calibration, preset the following controls in the TVLogic Color menu.

- **Color / Color Temp:** Select your desired Color Temp preset. Do not use a Custom Color Temp preset to adjust the monitor's Gain and Bias controls.
- **Color / Color Space:** Select the User Color Space to write to the User 3D LUT.

Caution: If you select one of the other Color Space modes, you will overwrite the factory 3D LUT for that mode.

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 TVLogic monitor specifics.

1. On the *Session Setup* page, under *Find 3D LUT Device*, select "SpectraCal - Cube Generator (3D LUT)."
2. Skip the *1D Ramp LUT* page (a 1D LUT does not need to be created).
3. On the *3D Cube LUT* page, click the *AutoCal* action button in the lower right.
4. On the popup *AutoCal Setup* dialog (shown below), under File Format, select "TVLogic – XVM/LEM series (.lut)" (creates a 17x17x17 10-bit 3D LUT format file).

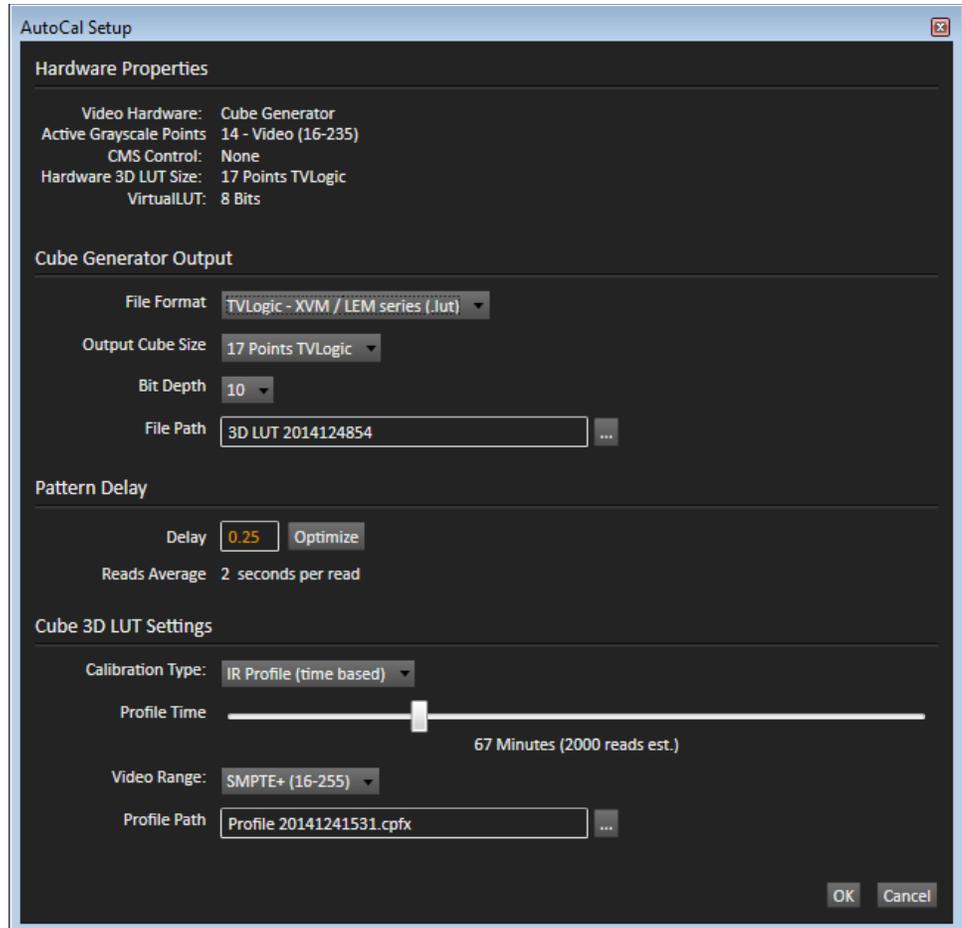


Figure 4. CalMAN AutoCal Setup dialog for 3D LUT creation.

5. Also on the *AutoCal Setup* dialog, under *File Path*, select a convenient location for the LUT file that CalMAN will create. Name the .lut file to identify the monitor and the date.
6. 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.

7. Click *OK*.

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

TVLogic XVM / LEM Series Monitor LUT Load

When CalMAN completes its automatic 3D LUT calibration, the created software LUT file is ready to be loaded into an XVM / LEM series monitor. To load a software 3D LUT calibration file into an XVM / LEM series monitor:

1. Use a null modem serial cable to connect the XVM / LEM series monitor to the CalMAN computer.
2. Open the TVLogic LutManager software.
3. Under *Function*, select *Import LUT*.
4. Under *Monitor*, select the target colorspace slot on the monitor.
5. Under *External LUT*, select *Assimilate 17*, then click the [...] button and navigate to your previously selected CalMAN LUT file location.
6. Click the *Write* button (respond YES to back up any current LUT file).

DONE – TVLogic XVM / LEM monitor 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.

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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