



LG OLED TV_{4K}
LG SUPER UHD TV_{4K}

2018
Quick Reference Guide

Introduction

This guide is designed as a reference to the LG HDR and SDR custom workflows in CalMAN 2018. Those workflows will walk you through the process step-by-step, pre-configures most needed CalMAN Settings, and should be the primary resource during calibration.

CalMAN can guide the calibration of a 2018 LG Super UHD LCD or an 2018 LG OLED TV in HDTV SDR, HDR10, and Dolby Vision modes. This assures the most accurate rendering of both SDR and HDR picture content by use of a 1D and 3D LUT.

CalMAN Required Version

- CalMAN 2018 v5.9.0 build 60 or newer

CalMAN Required Workflows

- LG SDR Workflow
- LG HDR Workflow

Required Hardware

- HDR and Dolby Vision Compatible Pattern Generator
 - o VideoForge PRO
 - o Murideo Six-G
- HDR Compatible Meter
 - o SpectraCal C6 or C6 HDR2000 are both suitable for this purpose

LG TV Settings

Advanced/Expert Controls

- Many advanced picture controls should be disabled during calibration. These include...
 - Dynamic Contrast
 - Dynamic Color
 - Dynamic Tone Mapping
 - Preferred Color

Picture > Energy Saving

- Energy Saving settings must be set to **OFF** during calibration

Picture > Additional Settings > Eye Comfort Mode

- Eye Comfort Mode must be set to **OFF**

Hardware Connection

To prepare to calibrate your display with a 3D LUT:

1. Connect your meter.

1. Connect your meter to you computer via USB.
2. Click the Find Meter button to connect your meter to CalMAN.
3. Select the Target Display Type.
 - For SpectraCal C6 meters
 - For OLED choose “OLED (White) LG, Panasonic”
 - For SuperUHD LCD choose “2018 LG SuperUHD LCD” where available, or “LCD (LED Blue Green)” if the former is not available.

2. Connect your HDR10/Dolby Vision compatible Pattern Generator.

1. Connect your pattern source to the TVs HDMI port.
2. Click the Find Source button to connect your source to CalMAN.
3. Select the pattern Window Size
 - OLED - Window 10%
 - LCD - Constant APL 10

3. Connect the LG Television.

1. Click the Find LG TV device button, select LG as the manufacturer and then pick LCD or OLED in the drop down under Model. Then enter your TV's IP Address into the connection dialog box.
2. An 8 digit pin number will show up on the TV, enter that into the popup window in CalMAN to finish the pairing process on your LG Television.

SDR Calibration

CalMAN Settings > Application Measurement Options

Full Field Pattern Insertion (OLED ONLY)

To prevent an LG OLED display from entering its auto dimming mode during extended measurements, the CalMAN Pattern Insertion feature periodically inserts a different test pattern during extended test pattern measurements, to reset the display's auto dimming timer.

Under CalMAN Settings > Application Measurement Options, set the following Full Field Pattern Insertion options:

- Frequency: 30 (seconds)
- Duration: 5 (seconds)
- Level: 15%

AutoCal dE Targets

- Select “dE2000_JNDab” for both LCD and OLED models

Picture Modes

Using Direct Display Controls inside of CalMAN, you can choose from a variety of picture modes to calibrate in the SDR color space. Each picture mode will have different memory slots for SDR, HDR, and Dolby Vision settings.

Available SDR Picture Modes:

- Cinema
- Expert (Light)
- Expert (Dark)
- Game
- Technicolor

You may want to use Game mode when audio/video latency is a concern, as it will reduce overall latency. Multiple picture modes may also be calibrated to account for changes in ambient lighting.

After selecting your picture mode, use the “Full DDC Reset” option in CalMAN to reset the mode to its factory defaults.

SDR Calibration (cont.)

Calibration Mode

The LG TV must be in “Calibration Mode” in order for a calibration to be completed. Step 7 of the workflow allows you to ensure this mode is on.

AutoCal Settings

Greyscale 1D LUT

- The brightness and contrast controls need to be set to default for the 1D LUT AutoCal to work correctly. (B: 50 C: 85)

ColorCube 3D LUT

- CalMAN has multiple methods for creating a 3D LUT. The first and fastest is the "Matrix LUT" which creates a 3D LUT using 3x3 Matrix math by reading just five color patches. This method takes less than 30 seconds. The resulting accuracy is equivalent to the results of a normal CMS calibration, but much faster.
- The second method is CalMAN's "Lightning LUT" which takes 101 measurements and takes about 5 minutes. The accuracy should be slightly better than the "Matrix LUT" method.
- The third method is CalMAN's "iRP Time or Point Based 3D LUT" process. The iRP LUT method is for when you need ultimate accuracy. The minimum recommended measurements is 3500 color patches. To increase accuracy of the iRP LUT method, it is recommended you change the Full Field Pattern Insertion setting to this configuration: Frequency: 10 seconds, Duration: 5 seconds, Level: 10 percent. Be aware that depending on the speed of your measurement device, the iRP LUT method can take multiple hours to complete.

HDR Calibration

CalMAN Settings > Application Measurement Options

Full Field Pattern Insertion (OLED ONLY)

To prevent an LG OLED display from entering its auto dimming mode during extended measurements, the CalMAN Pattern Insertion feature periodically inserts a different test pattern during extended test pattern measurements, to reset the display's auto dimming timer.

Under CalMAN Settings > Application Measurement Options, set the following Full Field Pattern Insertion options:

- Frequency: 5 (seconds)
- Duration: 5 (seconds)
- Level: 15%

AutoCal dE Targets

- Select “dE_ICtCp” for both LCD and OLED models

Picture Modes

Using Direct Display Controls inside of CalMAN, you can choose from a variety of picture modes to calibrate in the HDR color space. Each picture mode will have different memory slots for SDR, HDR, and Dolby Vision settings.

Available HDR Picture Modes:

- Cinema HDR
- Game HDR
- Technicolor HDR

The pattern generator needs to be enabled for HDR10 for the TV to properly enable the HDR picture modes. This is usually done within the pattern generator settings or under the source tab within CalMAN.

You may also want to use Game mode when audio/video latency is a concern. Multiple picture modes may also be calibrated to account for changes in ambient lighting.

After selecting your picture mode, use the “Full DDC Reset” option in CalMAN to reset the mode to its factory defaults.

HDR Calibration (cont.)

Pattern Generator Configuration

Enable HDR10 on your pattern generator. It is recommend to leave the HDR10 Metadata at the default values during this process.

It is also recommended to disable the HDR Dynamic Tone Mapping feature on the LG TV under "Expert Settings" in the picture options menu. Re-enable the dynamic tone mapping after the HDR calibration and verification process is complete

Calibration Mode

The LG TV must be in "Calibration Mode" in order for a calibration to be completed. Step 7 of the workflow allows you to ensure this mode is on.

In HDR mode this will disable the HDR processing in the TV, so CalMAN can calibrate the panel in gamma mode

Near the end of the workflow, you will be presented with an option to uncheck the "Enable Calibration" checkbox, which is necessary to turn back on the HDR Processing in the TV. You will then validate the calibration against the HDR10 calibration targets in the post calibration pages of the workflow.

AutoCal Settings

Greyscale 1D LUT

- LG 20 points HDR

ColorCube 3D LUT

- CalMAN has a new method for creating a 3D LUT. It is called the "Matrix LUT" which creates a 3D LUT using 3x3 Matrix math by reading just five color patches. This method takes less than 30 seconds. The resulting accuracy is equivalent to the results of a normal CMS calibration, but much faster. This is the only recommended LUT method for HDR Calibration.

About/Contact

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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