CalMAN Setup Guide

Panasonic 2016 DX8xx/DX9xx Series

Rev. 1.2

Introduction

For a Panasonic model within the DX8xx or DX9xx series, CalMAN can automatically calibrate the display's two-point grayscale controls, the 10-point grayscale controls, and the CMS color gamut controls, in both Standard Dynamic Range (SDR) and High Dynamic Range (HDR) modes. This assures the most accurate rendering of both HDR and SDR picture content.

Also, the display's two Pro picture modes, Professional1 and Professional2 can each be calibrated with individual picture menu adjustments, grayscale adjustments, and CMS adjustments.

Note: The DX8xx series models support CalMAN AutoCal and DDC adjustments for Europe/CIS models only.

CalMAN Required Version

- Version 5.7.2 or later

CalMAN Recommended Workflows

- **SDR Calibration**: *Home Advanced*, *SI Advanced*, or *ISF Calibration* workflow to optimize picture controls and calibrate two point and 10-point grayscale RGB balance controls and CMS color gamut controls for SDR picture content.
- **HDR Calibration**: *HDR10 Calibration* workflow to optimize picture controls and calibrate two point and 10-point grayscale RGB balance controls and CMS color gamut controls for HDR picture content.

Panasonic Required Firmware

- All firmware versions supported

Panasonic Control Port

- Wireless or wired network connection

Panasonic Computer Connection

To connect a Panasonic model within the series listed above to the calibration computer, through a wireless (Wi-Fi) or wired (Ethernet) network:

1. In the Panasonic *Network* menu, select *Network Status*.
2. If a connection to a network router is indicated, select *Status Details*.

3. Under *Network Status Details*, note the *Network Name* to which the display is connected and note the display's *IP Address*.
4. If no network connection is indicated, in the Panasonic *Network* menu, select *Network Connection*.
5. Under *Network Connection*, select *Quick Setup*, and wait for the display to search for available routers (the router does not require an internet connection).
6. In the list of available routers, select the router to which you wish to connect the display (may require a security password).
7. Under *Network Status Details*, note the *Network Name* to which the display is connected and note the display's *IP Address*.
8. Exit the display's network setup.

Panasonic DDC Picture Controls

Panasonic picture controls are available within the CalMAN software, allowing you to make display adjustments in the software, rather than using the display's remote control.

On those calibration workflow steps where you need to make a manual display adjustment (e.g. Brightness, Contrast, etc.), you can click the *DDC Controls* button on the right end of the CalMAN Display Control tab (Figure 1), then scroll to the *Display Controls* screen to make those adjustments from the CalMAN screen.

Figure 1. The display's picture controls can be manually adjusted directly from the CalMAN software, on the DDC Display Controls screen.

Panasonic Display Standard Dynamic Range (SDR) Calibration:

Jump to HDR Calibration section

This SDR calibration section outlines the CalMAN process for calibrating the display's two point and 10-point grayscale RGB balance controls and CMS color gamut controls for accurate rendering of SDR picture content.

Display Control Presets (Preset these controls before connecting to the TV with CalMAN)

- **Picture/Viewing Mode** – Select *PROFESSIONAL1* or *PROFESSIONAL2*.
- **Picture/Color Temperature** – Select *WARM 2*.
- **Picture/Vivid Color** – Set to *Off*.
- **Picture/Color Remaster** – Set to *Off*.
- **Picture/Adaptive Backlight Control** – Set to *Min*.
- **Picture/Advanced/Color Gamut –** Set to *Rec. 709*.
- **Picture/Advanced/Gamma** – Select *2.4* for dim room lighting, *2.2* for moderate room lighting, or *2.0* for bright room lighting.
- **(DX950 only) Video Adjustment/Optional Function/HDMI RGB Range Setting/HDMI(1-4)** – Set to *Standard*.

Hardware Setup

In the CalMAN Home Advanced, SI Advanced, or ISF Calibration workflow, on the Hardware Connect page, connect CalMAN to your color meter and test pattern source.

Hardware Connect - Meter Connect

1. Connect your color meter to a port on the CalMAN computer.
2. On the Hardware Connect 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 PFS phosphor)" for a colorimeter. For a spectrophotometer, no special selection is required.

Hardware Connect - Source Connect

1. For a hardware test pattern generator, connect the generator to a port on the CalMAN computer (unless the generator uses a wireless control interface).
2. On the *Hardware Connect* page, click the *Find Source* button.
3. On the *Find Source* dialog, select the *Manufacturer* and *Model* of your test pattern source device.

Hardware Connect - Display Connect

To connect CalMAN to the Panasonic display:

1. Connect the CalMAN computer to the same wireless network to which the display is connected.
2. On the Panasonic display, open the *Picture* menu.
    a. Under *Picture/Viewing Mode*, select Professional 1 or Professional 2.
    b. Under *Picture/Lock Settings*, select *PIN*.
    c. Enter "i085" (the '**i**' button is just below the Power button on the remote).
    d. Under *Adjustment Lock*, select Off.
    e. Arrow down to *isfccc Network* and press *OK* on the remote.
    f. At this point, the display will read "Waiting for Connection."
3. In CalMAN, on the *Display Control* tab (upper right), click the *Find Display* button.
4. On the *Find Display* dialog (Figure 2), select either "Panasonic – 2016 DX8xx Series (Ethernet)" or "Panasonic – 2016 DX9xx Series (Ethernet)" corresponding to the Panasonic model under test.
    a. Under *Socket Connection*, enter the display's IP Address that you recorded above.
    b. Click *Connect* on the *Find Display* dialog.

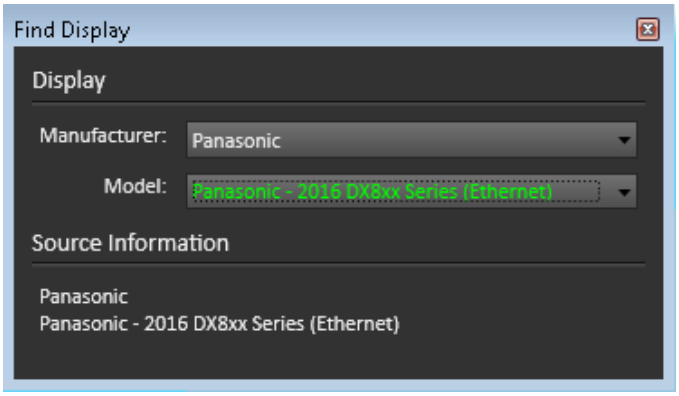

Figure 2. CalMAN Find Display dialog, for connecting to the Panasonic display.

Source Settings Tab

1. On the *Source Settings* tab (Figure 3), set the *Color Format* to "YC422."
2. Set the *Bit Depth* option to "10."
3. Set the *HDR* option to "Off."

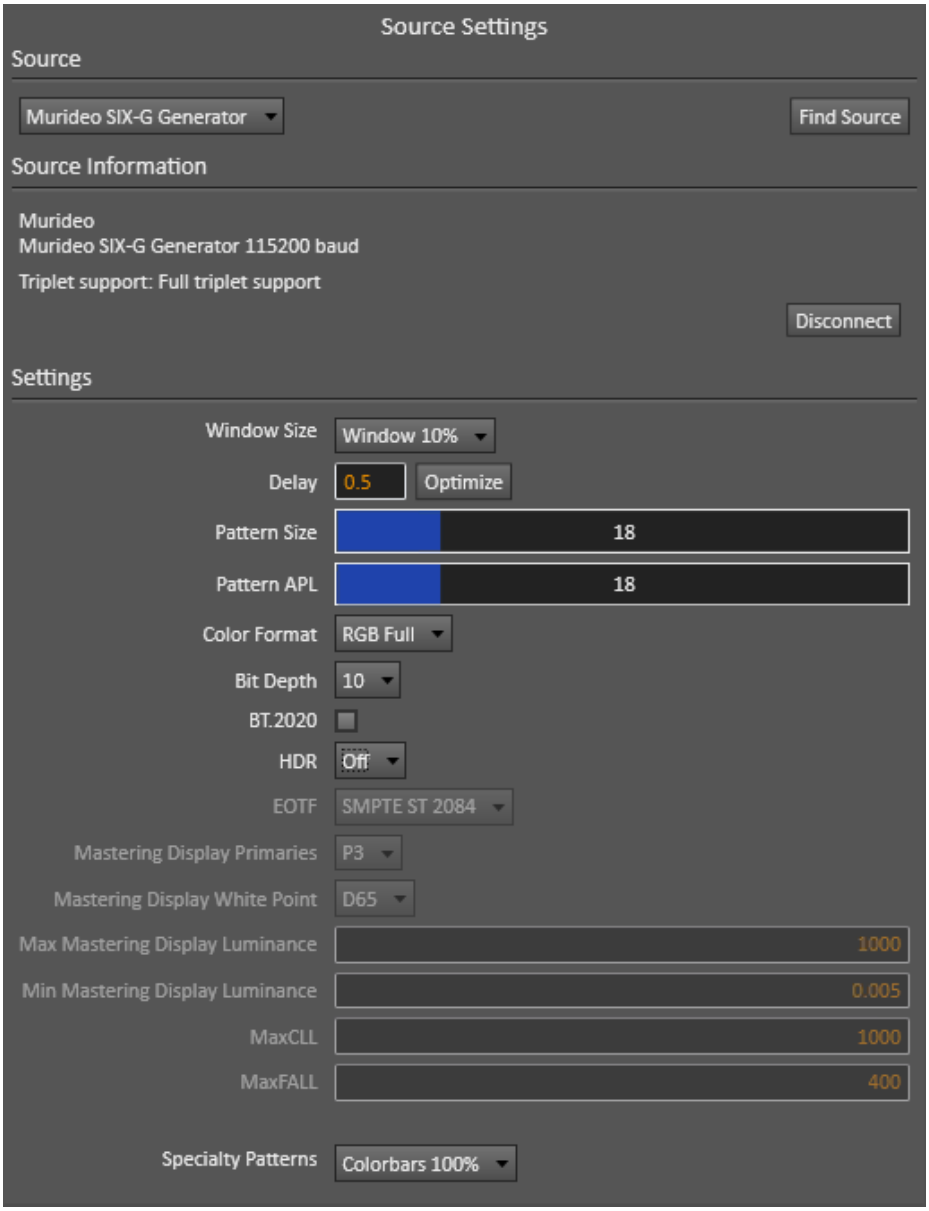

Figure 3. CalMAN Source Settings tab, for selecting test pattern source options.

Display Control Tab

1. On the Display Control tab (Figure 4), for the Display Mode Selection option, select “Pro 1 - Day” or “Pro 2 - Night.”
2. For the *Active Grayscale Points* option, select “10.”

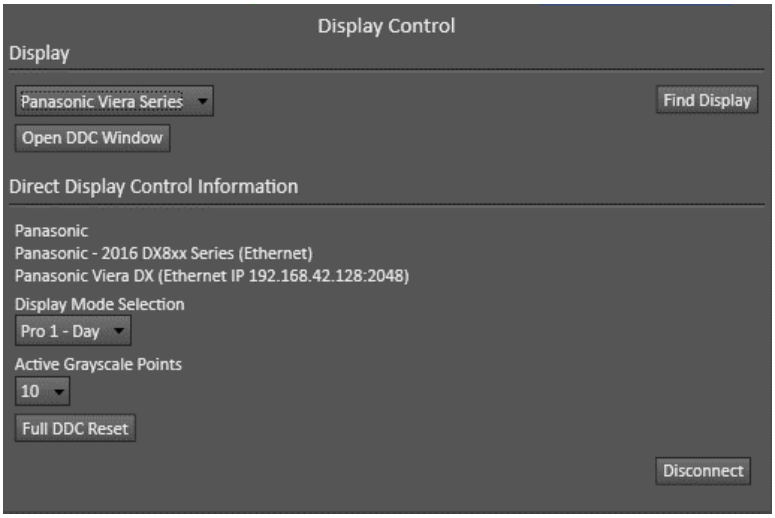

Figure 4. CalMAN Display Control tab, for selecting display control options.

CalMAN AutoCal™

In the Metered Calibration section of the Home Advanced, SI Advanced, or ISF Calibration workflow, there are three display calibration pages, Grayscale – 2pt, Grayscale/Gamma, and CMS Calibration.

To most accurately calibrate the Panasonic display, it is best to perform AutoCal on each of these three CalMAN workflow pages, in the order that the pages occur in the workflow.

Grayscale - 2pt

1. On the Grayscale - 2pt 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, click *OK*.

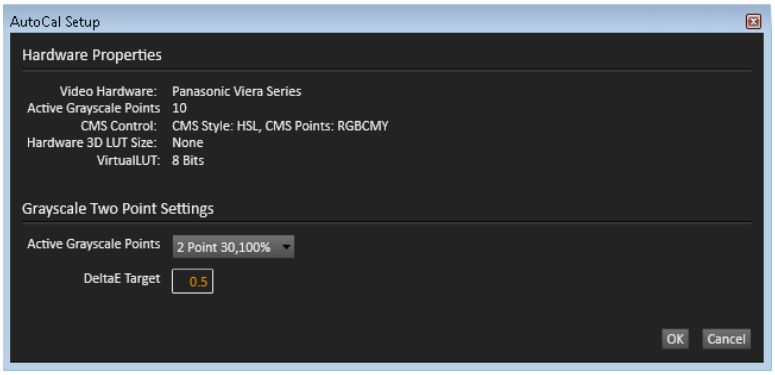

Figure 5. CalMAN AutoCal Setup dialog, for SDR Grayscale – 2pt calibration.

Grayscale/Gamma

1. On the Grayscale/Gamma page, click the *AutoCal* button. The AutoCal Setup dialog then appears (Figure 6).
2. On the *AutoCal Setup* dialog, click *OK*.

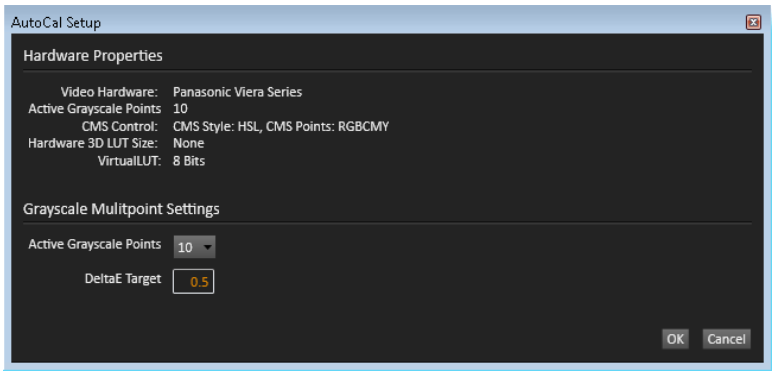

Figure 6. CalMAN AutoCal Setup dialog, for SDR Grayscale/Gamma calibration.

CMS Calibration

1. On the CMS Calibration page, click the *AutoCal* button. The AutoCal Setup dialog then appears (Figure 7).
2. On the *AutoCal Setup* dialog, click *OK*.

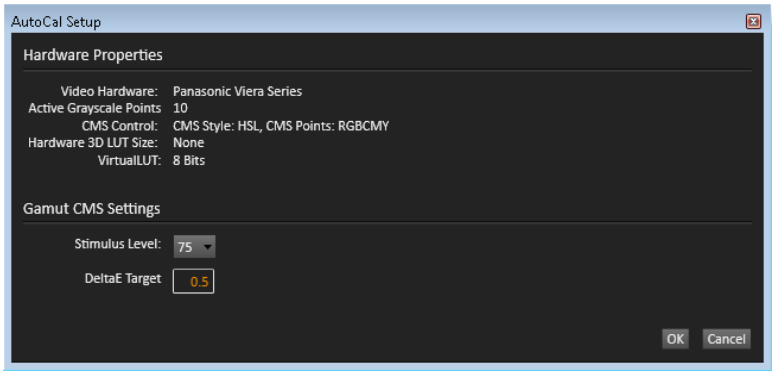

Figure 7. CalMAN AutoCal Setup dialog, for SDR CMS calibration.

When AutoCal is complete on all pages, optimize the display's Brightness control for the local viewing conditions.

DONE! –Calibration of the Panasonic display for SDR picture content is complete.

Panasonic Display High Dynamic Range (HDR) Calibration:

Jump to SDR Calibration section

This HDR section outlines the CalMAN process for calibrating the display's two point and 10-point grayscale RGB balance controls and CMS color gamut controls for accurate rendering of HDR picture content.

Display Control Presets (Preset these controls before connecting to the TV with CalMAN)

- **Picture/Viewing Mode** – Select *PROFESSIONAL1* or *PROFESSIONAL2*.
- **Picture/Color Temperature** – Select *WARM 2*.
- **Picture/Vivid Color** – Set to *Off*.
- **Picture/Rec.2020 Color Remaster** – Set to *Max*.
- **Picture/Adaptive Backlight Control** – Set to *Min*.
- **Picture/Advanced/Color Gamut –** Set to *Rec. 2020*.
- **Picture/Advanced/Gamma** – Select 2.2.
- **(DX950 only) Video Adjustment/Optional Function/HDMI RGB Range Setting/HDMI(1-4)** – Set to *Standard*.

Hardware Setup

In the CalMAN *HDR10 Calibration* workflow, on the *Hardware Connect* page, connect CalMAN to your color meter and test pattern source.

Hardware Connect - Meter Connect

1. Connect your color meter to a port on the CalMAN computer.
2. On the Hardware Connect 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 *Meter Mode* drop down, select "LCD (LED PFS phosphor)" for a colorimeter. For a spectrophotometer, no special selection is required.

Hardware Connect - Source Connect

1. For a hardware test pattern generator, connect the generator to a port on the CalMAN computer (unless the generator uses a wireless control interface).

2. On the *Hardware Connect* page, click the *Find Source* button.
3. On the *Find Source* dialog, select the Manufacturer and Model of your test pattern source device.

Hardware Connect - Display Connect

To connect CalMAN to the Panasonic display:

1. Connect the CalMAN computer to the same wireless network to which the display is connected.
2. On the Panasonic display, open the *Picture* menu.
    a. Under Picture/Viewing Mode, select Professional 1 or Professional 2.
    b. Under Picture/Lock Settings, select PIN.
    c. Press the "i" button on the remote (just below the Power button, 画面表示 on Japanese models) then press "0," "8," "5" on the keypad.
    d. Under Adjustment Lock, select Off.
    e. Arrow down to isfccc Network and press OK on the remote.
    f. At this point, the display will read "Waiting for Connection."
3. In CalMAN, on the *Display Control* tab (upper right), click the *Find Display* button.
4. On the *Find Display* dialog (Figure 8), select either "Panasonic – 2016 DX8xx Series (Ethernet)" or "Panasonic – 2016 DX9xx Series (Ethernet)" corresponding to the Panasonic model under test.
    a. Under *Socket Connection*, enter the display's IP Address that you recorded above.
    b. Click *Connect* on the *Find Display* dialog.

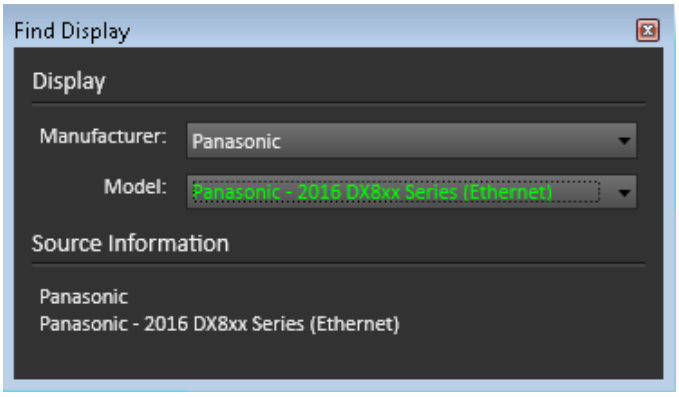

Figure 8. CalMAN Find Display dialog, for connecting to the Panasonic display.

Source Settings Tab

1. On the *Source Settings* tab (Figure 9), set the *Color Format* to "RGB Limited."
2. Set the *Bit Depth* option to "10."
3. Set the *HDR* option to "HDR10."
4. For a DX8xx series display, set *Max Mastering Display Luminance* to 500 and set *MaxCLL* to 500.

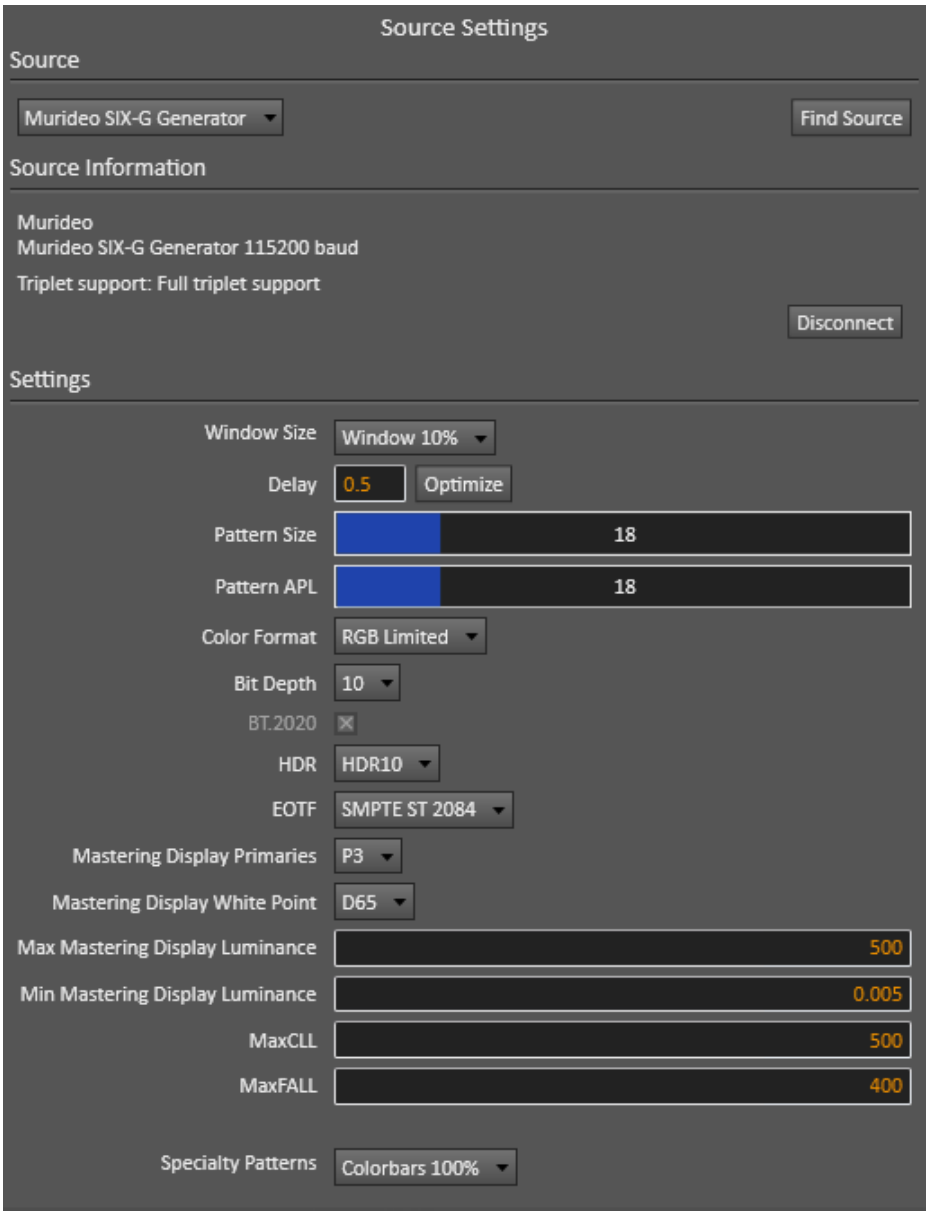

Figure 9. CalMAN Source Settings tab, for selecting test pattern source options.

5. For a DX9xx series display, set the *Color Format*, *Bit Depth* and *HDR* option the same as for a DX8xx series display, but set *Max Mastering Display Luminance* to 1000 and set *MaxCLL* to 1000 (Figure 10).

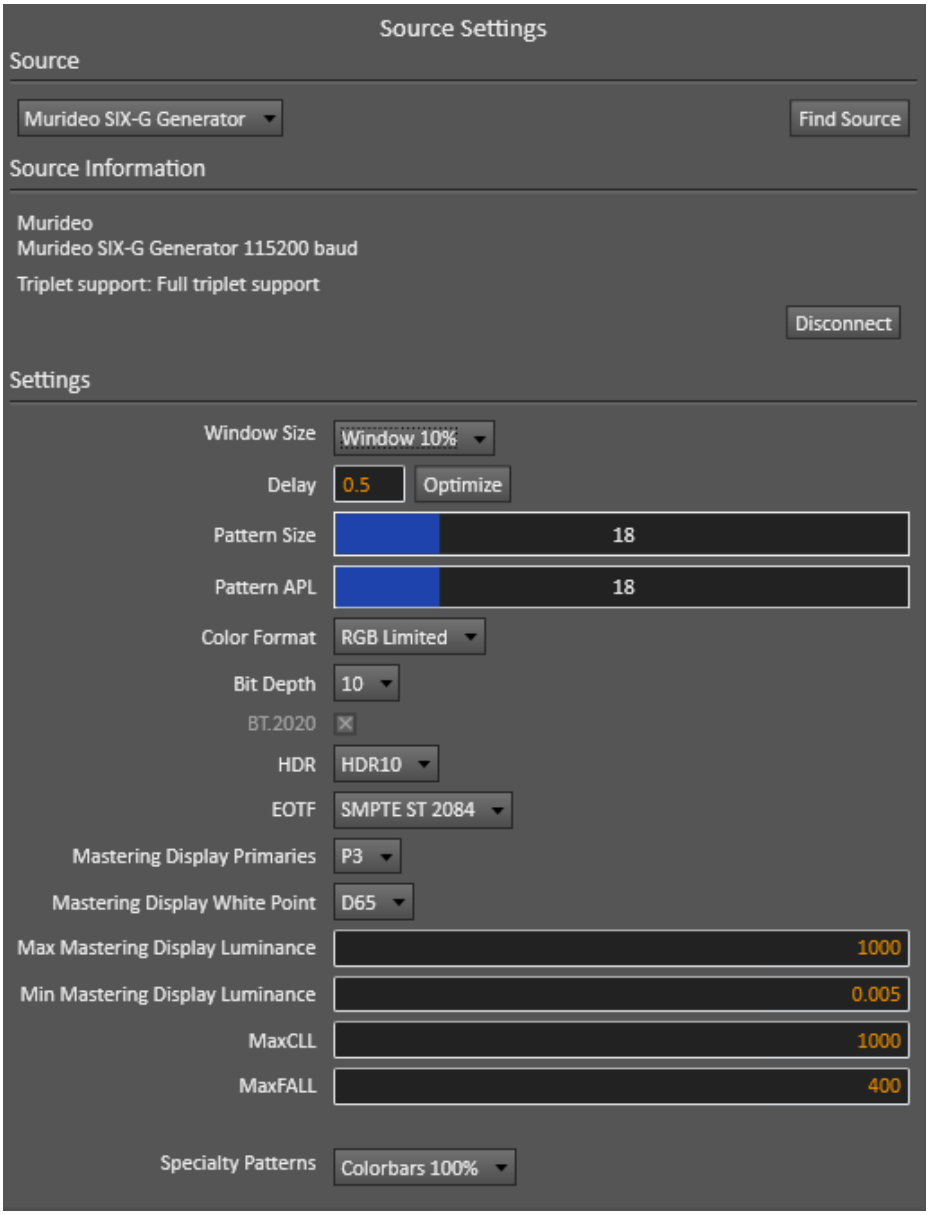

Figure 10. CalMAN Source Settings tab, for selecting test pattern source options.

Display Control Tab

1. On the *Display Control* tab (Figure 11), for the *Display Mode Selection* option, select “Pro 1 - Day” or “Pro 2 - Night.”
2. For the *Active Grayscale Points* option, select “10 HDR.”

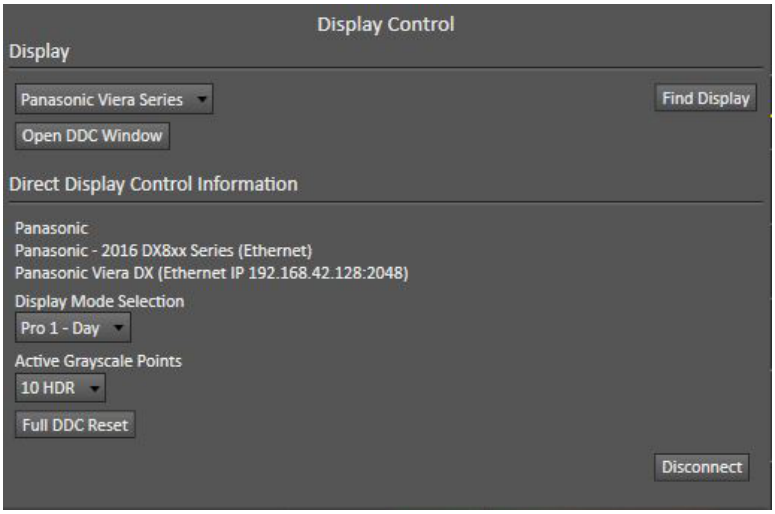

Figure 11. CalMAN Display Control tab, for selecting display control options.

CalMAN AutoCal™

In the *Metered Calibration* section of the HDR10 Calibration workflow, there are three display calibration pages, White Balance, Grayscale, and CMS Calibration.

To most accurately calibrate the Panasonic display, it is best to perform AutoCal on each of these three CalMAN workflow pages, in the order that the pages occur in the workflow.

White Balance

3. On the White Balance page, click the *AutoCal* button (rotating arrows) at the right end of the meter action buttons. The AutoCal Setup dialog then appears (Figure 12).
4. On the *AutoCal Setup* dialog, click *OK*.

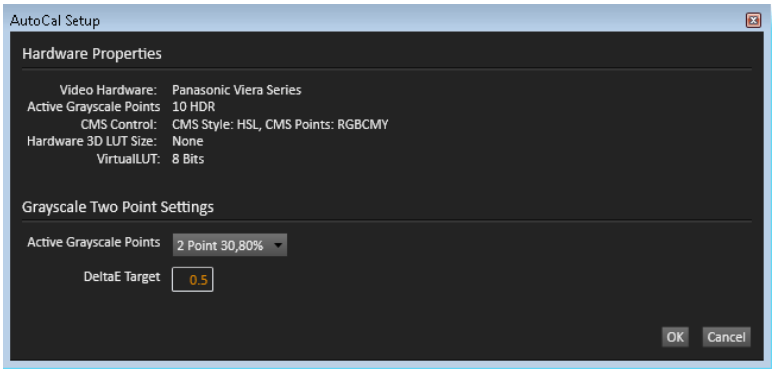

Figure 12. CalMAN AutoCal Setup dialog, for HDR10 White Balance calibration.

Grayscale

1. On the Grayscale page, click the *AutoCal* button. The AutoCal Setup dialog then appears (Figure 13).
2. On the *AutoCal Setup* dialog, click *OK*.

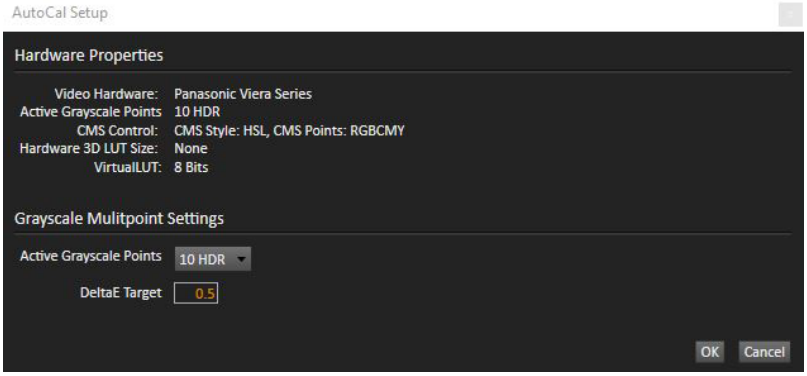

Figure 13. CalMAN AutoCal Setup dialog, for HDR10 Grayscale calibration.

CMS Calibration

1. On the CMS Calibration page, click the *AutoCal* button. The AutoCal Setup dialog then appears (Figure 14).
2. On the *AutoCal Setup* dialog, click *OK*.

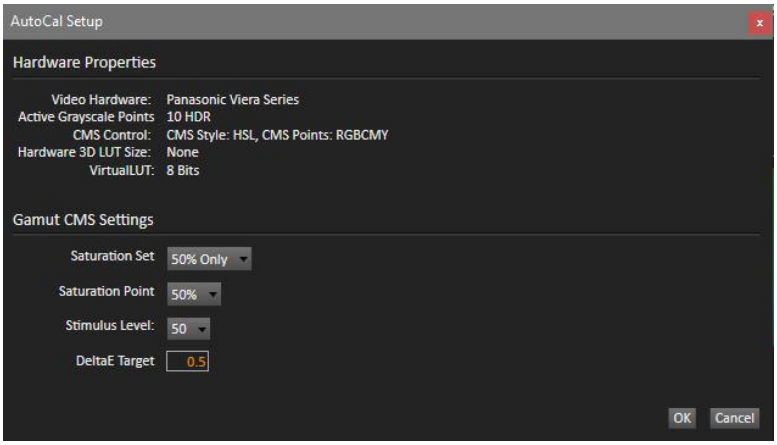

Figure 14. CalMAN AutoCal Setup dialog, for HDR10 CMS calibration.

DONE! –Calibration of the Panasonic display for HDR picture content 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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