

Setup Guide

Panasonic 2018 OLED FZxxx Models All Regions

Rev. 1.1

Introduction

For the Panasonic 2018 OLED models, CalMAN can automatically calibrate the TV's two-point white balance controls, the 12-point grayscale controls, and the CMS color gamut controls, in Standard Dynamic Range (SDR) mode and in High Dynamic Range HDR10 and HLG modes. This assures the most accurate rendering of both SDR and HDR picture content.

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

CalMAN Required Version

• Version 5.9.1 or later

CalMAN Recommended Workflows

SDR Calibration

Home Enthusiast workflow to optimize picture controls and calibrate two-point white balance controls, 12-point grayscale controls, and CMS color gamut controls for SDR picture content.

HDR Calibration

HDR10 Calibration workflow to optimize picture controls and calibrate two-point white balance controls, 12-point grayscale controls, and CMS color gamut controls for HDR10 picture content.

HLG Calibration workflow to optimize picture controls and calibrate two-point white balance controls, 12-point grayscale controls, and CMS color gamut controls and CMS color gamut controls for HLG picture content.

Panasonic Control Connection

• Wireless or wired network connection

Panasonic Network Setup

To connect the CalMAN calibration computer to a Panasonic model listed above, 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 TV is connected and note the TV'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 TV to search for available routers (an internet connection is not required to the router).
- 6. In the list of available routers, select the router to which you wish to connect the TV (may require a security password).
- 7. Under *Network Status Details*, note the Network Name to which the TV is connected and note the TV's *IP Address*.
- 8. Exit the TV's network setup.

CalMAN Device Connections

On the CalMAN device control tabs (upper right), connect CalMAN to your color meter, test pattern source, and the Panasonic TV.

Meter Connect

- 1. Connect your color meter to a port on the CalMAN computer.
- 2. On the *Meter Settings* tab, 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. On the *Meter Settings* tab, under the *Meter Mode* drop down, select "OLED (White) LG, Panasonic, Sony, FSI 2018" for a C6 colorimeter. For a spectrophotometer, no special selection is required.

Source Connect

- 1. For a hardware test pattern generator, connect the generator to a control port on the CalMAN computer (unless the generator uses a wireless control interface).
- 2. On the Source Settings tab, click the Find Source button.
- 3. On the *Find Source* dialog (Figure 1), select the Manufacturer and Model of your test pattern source device.
- 4. Select the *Com Port*, if appropriate.
- 5. Click Connect.

Find Source		x	
Source			
Manufacturer:	Murideo 🗸		
Model:	Murideo - Six-G		
Serial Connecti	ion		
Com Port com3 -			
	Connect		

Figure 1. Find Source window.

Display Connect

- 1. Connect the CalMAN computer to the same wireless network to which the Panasonic TV is connected.
- 2. On the Panasonic TV, 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. Under Menu\Network\Network Status\Status Details, note the IP address.

- f. Arrow down to *isfccc Network* and press *OK* on the remote.
- g. At this point, the TV will read "Waiting for Connection."
- 3. In CalMAN, on the *Display Control* tab, click the *Find Display* button.
- 4. On the *Find Display* dialog (Figure 2), select "Panasonic 2018 FZxxx Series (Ethernet)."
 - a. Under *Socket Connection*, enter the TV's IP Address that you noted above.
 - b. Click Connect on the Find Display dialog.

Find Display				
Display				
Manufacturer:	Panasonic	_	-	
Model:	Panasonic - 2018	8 FZxxx Series (Ethern	et) 🔻	
Socket Connec	tion			
IP Address		Port		
000.000.000.00	0	2048		
Note				
To connect to th	e display through	Ethernet:		
enter pin i085 (t remote). 2.) Set Adjustme 3.) Select and er 4.) When the dis	the 'i' button is jus ent Lock to Off. nable the isfccc Ne splay shows 'Waiti	ode->Professional 1->L t below the power bu etwork. ing for Connection,' er nect on this screen.	tton on the	
			Connect	

Figure 2. Find Display window.

HDTV SDR Calibration

This section outlines the CalMAN process for calibrating the Panasonic TV's controls for accurate rendering of standard dynamic range HDTV picture content.

Panasonic TV Control Presets

Preset these controls before connecting to the TV with CalMAN

- Picture/Viewing Mode Select PROFESSIONAL1 or PROFESSIONAL2
- Picture/Contrast Set to 90
- Picture/Color Temperature Select WARM 2
- Picture/Vivid Color Set to Off
- Picture/Color Remaster Set to Off
- 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

CalMAN Source Settings Tab

On the CalMAN Source Settings tab (Figure 3):

- 1. Set the Window Size option to "Window 10%."
- 2. Set the *HDR* option to "Off."

CalMAN Display Control Tab

On the Display Control tab (Figure 4):

- 1. For the *Display Mode Selection* option, select either "Pro 1 Day" or "Pro 2 Night."
- 2. For the Active Grayscale Points option, select "12 SDR."
- 3. Click the *Full DDC Reset* button and click *Yes* to reset all TV settings.

Panasonic DDC Display Controls:

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

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

DDC Display Control Settings

On the DDC Display Controls screen (Figure 5):

1. Disable the On Screen Display option.

CalMAN AutoCal:

In the Calibration Options section of the Home Enthusiast workflow, there are three display calibration pages, Grayscale - 2pt, Grayscale -Multi, and Colorspace.

To most accurately calibrate the Panasonic TV, 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 Two Point* page, click the *AutoCal* button (rotating arrows) at the right end of the meter action buttons. The *AutoCal Setup* dialog then appears (Figure 6).
- 2. On the AutoCal Setup dialog, click OK.

utoCal Setup		
Hardware Properties		
Active Grayscale Points CMS Control: Hardware 3D LUT Size:	CMS Style: HSL, CMS Points: RGBCMY None	
VirtualLUT: Grayscale Two Point S		
Active Grayscale Points	2 Point 30,100% 👻	
DeltaE Target	0.5	
		OK Cance

Figure 6. AutoCal Setup dialog for Grayscale Two Point.

Grayscale - Multi

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

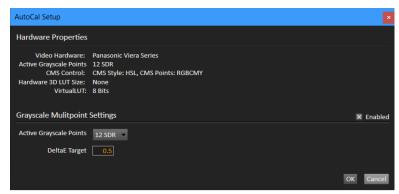


Figure 74. AutoCal Setup dialog for Grayscale Multipoint.

Colorspace

- 1. On the *Colorspace* page, click the *AutoCal* button. The *AutoCal Setup* dialog then appears (Figure 8).
- 2. On the AutoCal Setup dialog, click OK.

AutoCal Setup		
Hardware Properties		
Video Hardware: Active Grayscale Points	Panasonic Viera Series 10	
	CMS Style: HSL, CMS Points: RGBCMY	
Hardware 3D LUT Size:		
VirtualLUT: Gamut CMS Settings	a dits	
Stimulus Level:	75 💌	
DeltaE Target	0.5	
	OK Cance	1

Figure 8. AutoCal Setup dialog for Gamut CMS.

DONE - Calibration of the Panasonic TV for HDTV SDR picture content is complete.

HDR10 HDR Calibration

This section outlines the CalMAN process for calibrating the Panasonic TV's controls for accurate rendering of high dynamic range HDR10 picture content.

Panasonic TV Control Presets

Preset these controls before connecting to the TV with CalMAN.

- Picture/Viewing Mode Select PROFESSIONAL1 or PROFESSIONAL2.
- Picture/Contrast Set to 100.
- Picture/Color Temperature Select WARM 2.
- Picture/Vivid Color Set to Off.
- Picture/Rec.2020 Color Remaster Set to Min.
- Picture/Advanced/Color Gamut Select Rec. 2020.
- Picture/Advanced/Gamma Select 2.2.
- Picture/Option Settings/HDMI EOTF Type Select Auto.

CalMAN Full Field Pattern Insertion

On the CalMAN Settings / Application Measurement Options panel (Figure 9):

- 1. Check the Enable Pattern Insertion option.
- 2. Set the Pattern Insertion Frequency to 5.
- 3. Set the Pattern Insertion Duration to 5
- 4. Set the Pattern Level option to 5%.

►	Workflow Basic Options	Workflow Advanced Options	Application Measurement Options	Application Preferences	•
Col	or Measurement O	ptions			?
Sp	ectrophotometer Color	Matching Function:	1931 CIE 2° Standard Ob	server	
×	Use Software Color Ma	atching Functions			
Exa	ample Illuminant:	ī)65		-
		x	0.312712	y: 0.329008	
×	Clear Existing Data on	Read All.			
	Include Stabilizing Del				
	Include Black in Avg/N	1ax dE			
Un	iformity Read Direction	ı [.eftToRight		
Ful	l Field Pattern Inseri	tion			
×	Enable Pattern Insertio	n			
Pa	ttern Insertion Frequen	cy			5
Par	ttern Insertion Duratior	1			5
Pa	ttern Level			[0% -

Figure 9. Full Field Pattern Insertion options.

CalMAN Source Settings Tab

On the CalMAN Source Settings tab (Figure 10):

- 1. Set the Window Size option to "Window 10%."
- 2. Set the Color Format to "RGB Limited 10-bit."
- 3. Set the HDR option to "HDR10."
- 4. Set the EOTF option to "SMTPE ST 2084."
- 5. Set Max Mastering Display Luminance to 1000 nits (default).
- 6. Set MaxCLL to 1000 nits (default).

CalMAN Display Control Tab

On the Display Control tab (Figure 11):

- 1. For the *Display Mode Selection* option, select either "Pro 1 Day" or "Pro 2 Night."
- 2. For the Active Grayscale Points option, select "12 HDR."
- 3. Click the *Full DDC* Reset button and click *Yes* to reset all TV settings.

	Display Control	
Display		
Panasonic Viera Series – Open DDC Window	Fi	ind Display
Direct Display Control Informat	tion	
Panasonic Panasonic - 2018 FZxxx Series (Ethe Panasonic Viera FZ (Ethernet IP 192 Display Mode Selection Pro 1 - Day - Active Grayscale Points 12 HDR10 - Full DDC Reset	2.168.42.178:2048)	isconnect

Figure 11. Display Control tab.

Panasonic DDC Display Controls

Panasonic Display Controls are available within the CalMAN software, allowing you to make TV adjustments in the software, rather than using the TV's remote control.

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

DDC Display Control Settings

On the DDC Display Controls screen (Figure 12):

- 1. Enable the HDR Brightness Enhancer option.
- 2. Disable the On Screen Display option.

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 TV, 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

- 1. 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 13).
- 2. On the AutoCal Setup dialog, click OK.

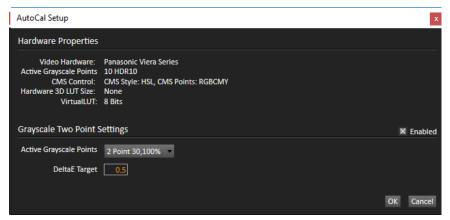


Figure 13. AutoCal Setup dialog for White Balance.

Grayscale

1. On the *Grayscale* calibration page, click the *AutoCal* button. The *AutoCal Setup dialog* then appears (Figure 14).

- 2. For the Active Grayscale Points option, select "12 HDR10."
- 3. On the AutoCal Setup dialog, click OK.

AutoCal Setup		
Hardware Properties		
Video Hardware: Active Grayscale Points CMS Control: Hardware 3D LUT Size: VirtualLUT:	12 HDR10 CMS Style: HSL, CMS Points: RGBCMY None	
Grayscale Mulitpoint	Settings	× Enabled
Active Grayscale Points DeltaE Target	12 HDR10 ¥ 0.5	
		OK Cancel

Figure 14. AutoCal Setup dialog for Grayscale.

CMS Calibration

- 1. On the CMS Calibration page, click the AutoCal button. The AutoCal Setup dialog then appears.
- 2. On the AutoCal Setup dialog, click OK.

DONE - Calibration of the Panasonic TV for HDR10 picture content is complete.

HLG HDR Calibration

This section outlines the CalMAN process for calibrating the Panasonic TV's controls for accurate rendering of high dynamic range HLG picture content.

Panasonic TV Control Presets

Preset these controls before connecting to the TV with CalMAN

- **Picture/Viewing Mode** Select *PROFESSIONAL1* or *PROFESSIONAL2*.
- Picture/Contrast Set to 90.
- Picture/Color Temperature Select WARM 2.
- Picture/Vivid Color Set to Off.
- Picture/Rec.2020 Color Remaster Set to Min.
- Picture/Advanced/Color Gamut Select Rec. 2020.
- Picture/Advanced/Gamma Select 2.2.
- Picture/Option Settings/HDMI EOTF Type Select Auto.

CalMAN Full Field Pattern Insertion

On the CalMAN Settings / Application Measurement Options panel (Figure 16):

- 1. Check the Enable Pattern Insertion option.
- 2. Set the Pattern Insertion Frequency to 5.
- 3. Set the Pattern Insertion Duration to 5
- 4. Set the Pattern Level option to 5%.

۲	Workflow Basic Options	Workflow Advanced Options	Application Measurement Options	Application Preferences	٢
Col	or Measurement O	ptions			?
Sp	ectrophotometer Color	Matching Function:	1931 CIE 2º Standard Ob	server	
×	Use Software Color Ma	atching Functions			
Exa	ample Illuminant:		D65		•
		د	: 0.312712	y: 0.329008	
×	Clear Existing Data on	Read All.			
	Include Stabilizing Del	ay for Read All.			
	Include Black in Avg/M	1ax dE			
Un	iformity Read Direction	1	LeftToRight		
Ful	l Field Pattern Inseri	tion			
×	Enable Pattern Insertio	n			
Pa	ttern Insertion Frequen	cy]	5
Par	ttern Insertion Duratior			[5
Pa	ttern Level			09	6 -

Figure 16. Full Field Pattern Insertion window.

CalMAN Source Settings Tab

On the CalMAN Source Settings tab (Figure 17):

Set the Window Size option to "Window 10%."

- 5. Set the Color Format to "RGB Limited 8-bit."
- 6. Set the HDR option to "HDR10"
- 7. Set the *EOTF* option to "HLG."

Source	Source Settings
SpectraCal VideoForge Pro	Find Source
Source Information	
SpectraCal SpectraCal VideoForge Pro 115200 I	baud
Triplet support: Full triplet support	
	Disconnect
Settings	
Window Size	Window 10%
Delay	0.25 Optimize
Pattern Size	18
Pattern APL	18
Resolution	1920x1080p59.94
Color Format	RGB Limited 10-bit
BT.2020	×
HDR	HDR10
Dolby Vision Mode	Perceptual -
EOTF	HLG -
Mastering Display Primaries	P3 •
Mastering Display White Point	D65 🔻
Max Mastering Display Luminance	1000
Min Mastering Display Luminance	0.005
MaxCLL MaxFALL	1000
MdXFALL	400
Specialty Patterns	Brightness

Figure 17. Source Settings tab.

CalMAN Display Control Tab

On the Display Control tab (Figure 18):

- 1. For the *Display Mode Selection* option, select either "Pro 1 Day" or "Pro 2 Night."
- 2. For the Active Grayscale Points option, select "12 HLG."
- 3. Click the *Full DDC Reset* button and click *Yes* to reset all TV settings.



Figure 18. Display Control tab.

Panasonic DDC Display Controls:

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

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

DDC Display Control Settings

On the DDC Display Controls screen:

- For BT.2020 Color Remaster, select "Min."
- Disable the On Screen Display option.

CalMAN AutoCal:

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

To most accurately calibrate the Panasonic TV, 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

- 1. 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 20).
- 2. On the AutoCal Setup dialog, click OK.

AutoCal Setup	3
Hardware Properties	
Video Hardware: Active Grayscale Points CMS Control: Hardware 3D LUT Size: VirtualLUT:	10 HDR10 CMS Style: HSL, CMS Points: RGBCMY None
Grayscale Two Point S	ettings 🛛 🗶 Enabled
Active Grayscale Points	2 Point 30,100% ·
DeltaE Target	0.5
	OK Cancel

Figure 20. AutoCal Setup dialog for White Balance.

Grayscale

- 1. On the *Grayscale* page, click the *AutoCal* button. The *AutoCal Setup dialog* then appears (Figure 21).
- 2. For the Active Grayscale Points option, select "12 HLG."
- 3. On the AutoCal Setup dialog, click OK.

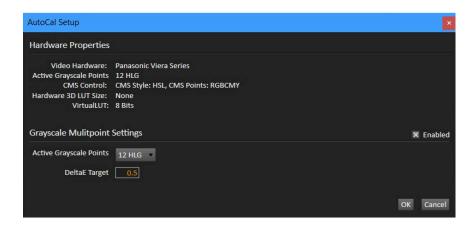


Figure 21. AutoCal Setup dialog for Grayscale.

CMS Calibration

- 1. On the CMS Calibration page, click the AutoCal button. The *AutoCal Setup dialog* then appears (Figure 22).
- 2. On the AutoCal Setup dialog, click OK.

AutoCal Setup		
Hardware Properties		
Active Grayscale Points	CMS Style: HSL, CMS Points: RGBCMY None	
Gamut CMS Settings		
Saturation Set	50% Only 👻	
Saturation Point	50%	
Stimulus Level:	50 🕶	
DeltaE Target	0.5	
	OX Can	el

Figure 22. AutoCal Setup dialog for CMS Calibration.

DONE - Calibration of the Panasonic TV for HLG picture content is complete.

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.

Contact Us

SpectraCal

Submit a Technical Support Request: http://calman.spectracal.com/techsupport.html

spectracal.com
sales@spectracal.com
+1-925-227-2700

PORTRAIT DISPLAYS

Portrait Displays, Inc. 6663 Owens Drive Pleasanton, CA 94588 USA

portrait.com