CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

Introduction

Simulated Meter Simulated | Source | Direct Display Control

Workflow → Description

Welcome to the HT Enthusiast Extended Workflow

↘ Introduction ↙
→ Prepare ←
↓ Calibrate ↑
← Analyze →

CalMAN HDR10

Featuring ...

- Home layout outlines the workflow structure with full access
- Comprehensive Notes Management - access button always at bottom right
- Integrated session setup and hardware configuration layout
- Single layout takes all desired Pre- or Post-calibration readings
- Expanded Multi-Point Grayscale calibration and pre/post-cal chart & datagrid layouts
- Detailed Saturation Sweep calibration and pre/post-cal chart & datagrid layouts
- Detailed Gamut Luminance calibration and pre/post-cal chart & datagrid layouts
- Detailed Color Check calibration and pre/post-cal chart & datagrid layouts
- 3D Color Cube LUT calibration chart & datagrid layouts
- High-count calibration points and HDR friendly
- Layout indicators: ↕ Calibration ∫ Charts # Datagrids

Also featuring navigation for the Mouse Lazy ...

- Navigation bar shows where you are and takes you where you want to go
- Calibration scheduling function is integrated with the Nav Bar Next/Back buttons
- Toggle buttons switch between complementary layouts with one click:
  - between the Calibration layouts and their corresponding Datagrid
  - between the Pre-Calibration Readings and Post-Calibration Readings
  - between corresponding Pre-Calibration and Post-Calibration Details
  - between corresponding Post-Calibration Details and Datagrids
- And more!

INT
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HOME
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Calibrate
↕ Gry
↕ Sat
↕ Lum
↕ CCk
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PostCal Read
Analyze
∫ Gry
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Final Check
Intro

CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

Workflow Description

SpectraCal C6 LCD (LED White Yellow) - Sharp Quattron | Source | Direct Display Control

Show Outline

WORKFLOW OVERVIEW

The HT Enthusiast Extended Workflow aims at providing all the possible calibration options in an accessible user-friendly manner.

The workflow is divided into four sections or zones with a corresponding color for the three working zones.

1) ▶ Introduction: Provides general information about the workflow and its features, and random access to all layouts

2) ▶ Preparation Zone: Enter session and device setup information , take pre-calibration readings for reference, plan the dynamic aspects of the session (contrast, brightness, etc.)

3) ▶ Calibration Zone: Contains the calibration layouts with matching datagrids, and the post-calibration readings layout for all views except the 2-Point Grayscale and 3D Color Cube LUT

4) ▶ Analysis Zone: Has detailed charts and datagrids for all views in the pre- and post-calibration states (except the 3D Color Cube LUT which feeds off the calibration layout) and a final check layout for dynamic range fine-tuning with a session summary

ACTIVE CALIBRATION VIEWS

- 2-Point Grayscale
- Multi-point Grayscale
- Saturation Sweeps, also used for basic CMS calibration
- Gamut Luminance
- Color Checker with option for Slim Datagrid
- 3D Color Cube LUT with tabs for Full-feature and Minimal

- Use Minimal layout tab for hopefully faster AutoCal.
- All active calibration layouts except 2-Point have full-screen datagrids.
- Use the Slim high-content Color Checker datagrid for faster processing of hundreds of colors.

ANALYSIS CHARTS

Except the 2-Point Grayscale and 3D Color Cube LUT, there are pre-calibration and post-calibration detail chart layouts for each active calibration view.

You can toggle between them by clicking the ↑PreCal or ↑PstCal button in the Nav Bar (they super-impose when the layout switches so just keep clicking to go back and forth). Other ↑ buttons in the Nav Bar perform similar toggling duties.

Unlike in the other color views, the CIE chart in the Color Checker pre- and post-calibration chart layouts is a display option accessible by checking the CIE Chart option.

Supplementing the charts are analysis datagrid layouts with both pre- and post-calibration data for each active calibration view. You can acces them using the #Datagrid buttons.

KEY LAYOUTS

Home - has a layout map for getting the lay of the land and a fully loaded navigation matrix for acces to all layouts.

Session Setup - Integrates calibration options, initial settings & notes, and hardware/device configuration.

Pre-Calibration Readings, Post-Calibration Readings - these identically configured layouts are master controls for the pre- and post-calibration states with combined and selective reading of all views. They feed all the detail charts and datagrids. You can toggle between the pre- and post-cal reading layouts, and between a reading layout and its corresponding detail layouts, in the Nav Bar (↑PreCal and ↑PstCal) and the explicit toolbar buttons.

Final Check - Analyzes and fine-tunes the dynamic range aspect and provides a comprehensive calibration summary.

NAVIGATION BAR

Displays the normal layout sequence with instant access across views and zones

Current Layout Context
Next / Back in workflow sequence and / or buttons for navigation to related layouts

Red arrow indicates position in workflow

Screen Uniformity ScUni ← context navigation →

Multi-Point and 2-Point →

Full & Minimal →

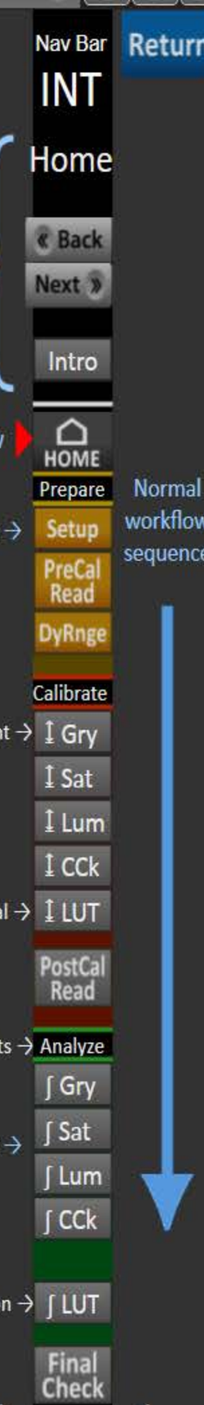
Analysis Nav Bar and Next / Back buttons follow current view: Individual Pre-Cal or Post-Cal charts, or combined Pre- & Post-Cal Datagrids

Datagrids # Gry # Sat # Lum # CCk ← context navigation →

Pre-Cal & Post-Cal Charts →

Charts from Full & Minimal calibration →

Normal workflow sequence



Navigation Bar →

Layout indicators: ↧ Calibration ∫ Charts # Datagrids

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Workflow Description

SpectraCal C6 LCD (LED White Yellow) - Sharp Quattron | Source | Direct Display Control

Show Outline

Preparation (PRP)

1 Session Setup → Screen Uniformity
2 Pre-Calibration Readings
3 Dynamic Range Analysis

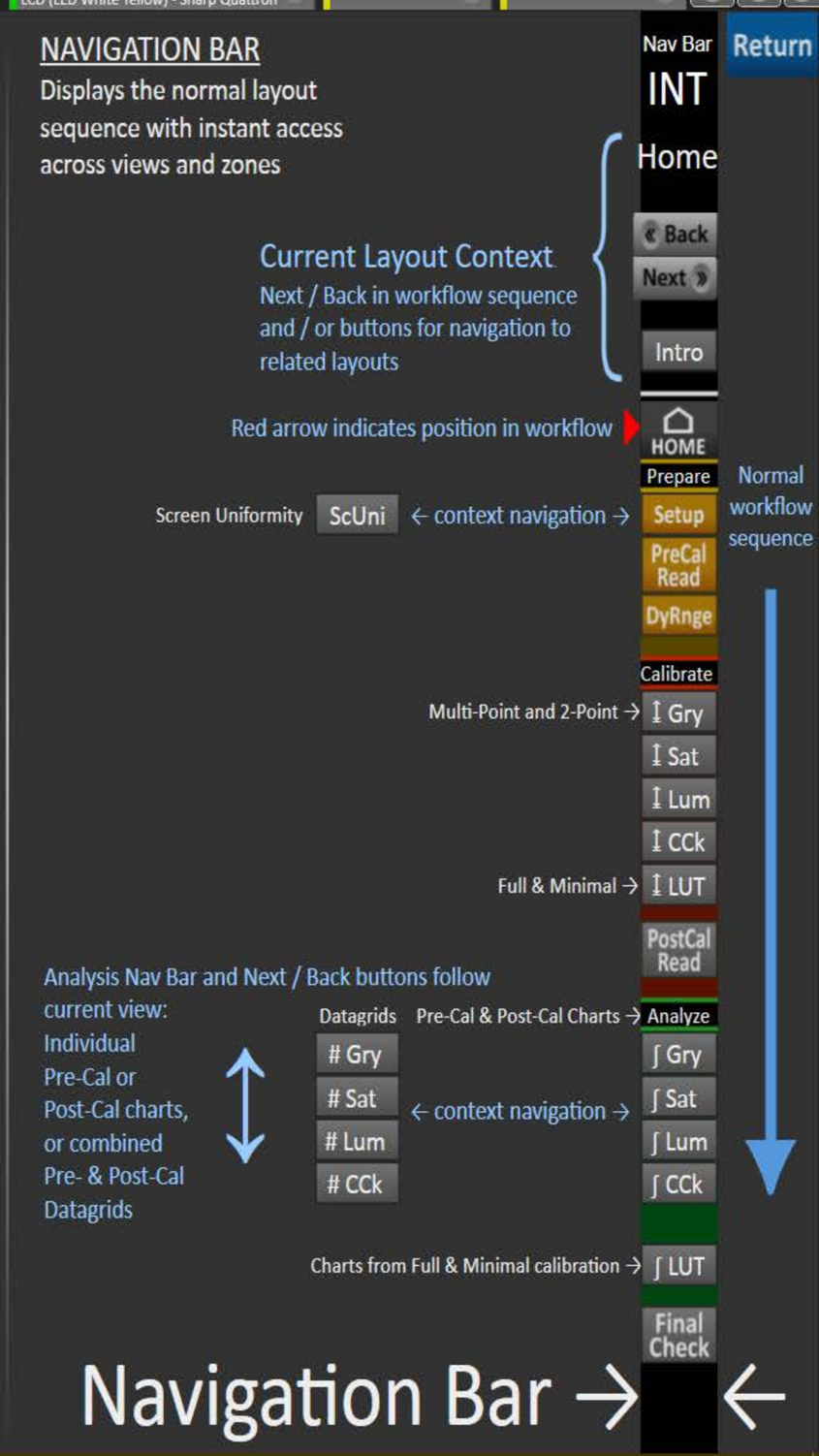
Calibration (CAL)

4 2-Point Grayscale Calibration
5 Multi-Pt Grayscale Calibration → Datagrid
6 Saturation Sweeps Calibration → Datagrid
7 Gamut Luminance Calibration → Datagrid
8 Color Checker Calibration → Datagrid (normal & slim versions)
9 3D Color Cube LUT Calibration
10 Post-Calibration Readings

Analysis (ANL)

11 Multi-Pt Grayscale Post-Cal Charts → Pre-Cal Charts → Datagrids
12 Saturation Sweeps Post-Cal Charts → Pre-Cal Charts → Datagrids
13 Gamut Luminance Post-Cal Charts → Pre-Cal Charts → Datagrids
14 Color Checker Post-Cal Charts → Pre-Cal Charts → Datagrids
15 3D Color Cube LUT Calibration Detail Charts (from Full & Minimal calibrations)

16 Final Check + Summary – Fine Tune the Dynamic Range



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CalMAN

Workflow Map

SpectraCal C6
LCD (LED White Yellow) - Sharp Quattron

Source

Direct Display Control

3/10/2017 Calibration

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ScUni • Screen Uniformity

→

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↓ Analyze →

→

DyRnge

Dynamic Range

Calibration

Grayscale	Saturation Sweeps / CMS	Gamut Luminance	Color Checker	3d Color Cube LUT
Gray ↧ 2-Pt Calibrate	Satu ↧ Calibrate	Lumi ↧ Calibrate	CChk ↧ Calibrate	LUT ↧ Calibrate
Gray ↧ Mult-Pt Calibrate	Satu # Cal Data	Lumi # Cal Data	CChk # Cal Data	↑ Has Full and Minimal layout tabs ↑
Mult-Pt # Cal Data			Cc-Slm # Slim Cal Data	LUT Full # Cal Data
				LUT Minimal # Cal Data

PostCal Read

Analysis

Grayscale	Saturation Sweeps / CMS	Gamut Luminance	Color Checker	3d Color Cube LUT
Gray # Pre/Post-Cal Data	Satu # Pre/Post-Cal Data	Lumi # Pre/Post-Cal Data	CChk # Pre/Post-Cal Data	LUT Full ∫ Cal Charts
				LUT Minimal ∫ Cal Charts
Gray ∫ Pre-Cal Charts	Satu ∫ Pre-Cal Charts	Lumi ∫ Pre-Cal Charts	CChk ∫ Pre-Cal Charts	
Gray ∫ Post-Cal Charts	Satu ∫ Post-Cal Charts	Lumi ∫ Post-Cal Charts	CChk ∫ Post-Cal Charts	

→ Final Check

Notes

Layout indicators: ↧ Calibration ∫ Charts # Datagrids

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CalMAN 5

Notes Management

Simulated Meter LCD Direct View | Source | Direct Display Control

Setup Notes

Calibration Notes

Pre-Calibration Notes

Calibration Description / Goals

Color Notes

Post-Calibration Notes

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PreCal Read | Session Setup

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CalMAN

Session Setup | Setup Help

SpectraCal C6 LCD (LED White Yellow) - Sharp Quattron | Source | Direct Display Control

Session Setup

3/10/2017 Calibration

(A) Session Options

Start New Session

Session Info

More Options

Use u'v' CIE Charts

Setup Notes

Notes

Calibration Description / Goals

Luminance Unit: cd/m²

Input Level: Video (16-235)

Stimulus Unit: Percent

DeltaE Formula: D e 2000

Gamut Coordinates: D65, HD Rec.709

Gamma Formula: Sliding power

Display • PRO-70X5FD

Target Black and White						Target
cd/m2	Blk	fL	cd/m2	Wht	fL	Gamma
0.00034		0.0001	100		29.2	2.2

(B) Display Settings

AV Mode: ISF Day

Color Temp		Contrast			Cut	Gain
Sharpness		Brightness		Red		
Color		Backlight		Green		
Tint		TV Gamma		Blue		

(C) Hardware Configuration

1 Meter

Find → | Configure | Disconnect

SpectraCal C6
Profile : None
Mode: LCD (LED White Yellow) - Sharp Quattron

2 Source

Find → | Configure | Disconnect

Optical player or standalone generator (manual cont
Optical player or standalone generator
Pattern Size: Full 100%
Triplet Support: FullTriplets

3 Display/Processor

Find → | Configure | Disconnect

None
Display Slot
Data Points
DDC

(D) Meter Setup

Processor

Position the meter as required for (1) projector or (2) flat panel to insure accurate measurements, (3) taking appropriate readings.

1 Projector

2 Flat Panel

DDC

3 Readings

White / Black in cd/m²
100 / 0

Level 100

CCT 0 / 6503 Target

500
400
300
200
100
0

Screen Uniformity

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0 | 100

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CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

Session Setup | Setup Help

SpectraCal C6 LCD (LED White Yellow) - Sharp Quattron | Source | Lumagen Radiance 3D LUT CMS 2

Session Setup

3/10/2017 Calibration

(A) Session Options

Start New Session

Session Info

More Options

Use u'v' CIE Charts

Setup Notes

Calibration Description / Goals

Notes

Luminance Unit: cd/m²

Input Level: Video (16-235)

Stimulus Unit: Percent

DeltaE Formula: D e 2000

Gamut Coordinates: D65, HD Rec.709

Gamma Formula: Sliding power

Display • PRO-70X5FD

	Target Black and White					Target
	cd/m2	Blk fL		cd/m2	Wht fL	Gamma
	0.00034	0.0001		100	29.2	2.2

(B) Display Settings

AV Mode: ISF Day

Color Temp		Contrast			Cut	Gain
Sharpness		Brightness		Red		
Color		Backlight		Green		
Tint		TV Gamma		Blue		

(C) Hardware Configuration

1 Meter — Find → | Configure | Disconnect

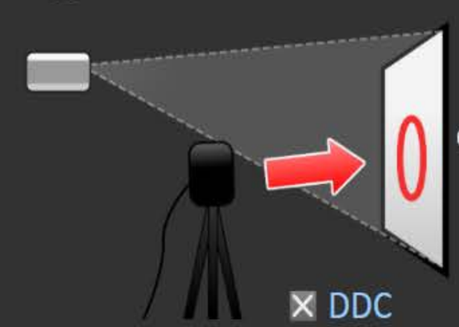
2 Source — Find → | Configure | Disconnect

3 Display/Processor — Find → | Configure | Disconnect | DDC

(D) Meter Setup

Position the meter as required for (1) projector or (2) flat panel to insure accurate measurements, (3) taking appropriate readings.

1 Projector



Display Controls

Input - Brightness	0
Input - Contrast	0
Input - Color	0
Input - Tint	0
Input - Color Red	0
Input - Color Green	0
Input - Tint Red	0
Input - Tint Green	0
Output - Gamma Factor	1
709 CMS Mode	Linear

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Setting Up the Session

(A) Enter the session description & calibration options in the corresponding drop-downs and text boxes

- Click [Session Info] to enter additional information
- Click [More Options] to open the options panel - the red [X] can be used to close it
- Click the checkmark above/below [Big] to expand the note next to it

(B) Enter the initial display settings to use for the calibration in the corresponding boxes - you can provide alternates in the Pre- and Post-Calibration layouts

(C) Find and configure the appropriate (1) meter, (2) source and (3) display devices - more info on right ⟶

(D) Position the meter as required. You can now read the Level 0 (Black) and Level 100 (White) luminance and corresponding CCT based on current settings - more info on right ⟶

(C) Hardware Configuration

1. To start calibrating your display/processor, first connect your meter.
   a) Click the meter [Find] button and select your meter.
   b) Select the Target Display Type.
2. Connect to your reference pattern source generator.
   a) Click the source [Find] button, and select your Source.
   b) Select the pattern window size and resolution.
3. Connect to your display/processor.
   a) Click the display [Find] button and select your display or processor.
   b) Click [DDC] to show the Direct Display Control panel when appropriate
4. Click the corresponding [Configure] button for more options.

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(D) Meter Positioning

1a. For projectors position the meter facing the projection screen, far enough away from the screen to avoid reading the meter's own shadow (see illustration on the left). Continue to take readings.

1b. Press the read continuous button to take measurements of a white window while moving the meter up/down/left/right, until the Y Max reading is largest. When Y Max is highest, click *Stop*.

2. For flat panels position the meter on the center of the screen (see illustration on the right). You do not need to take readings for this placement.

3. You can also read the White level CCT based on the current settings - adjust the display's color temperature to best match the target CCT.

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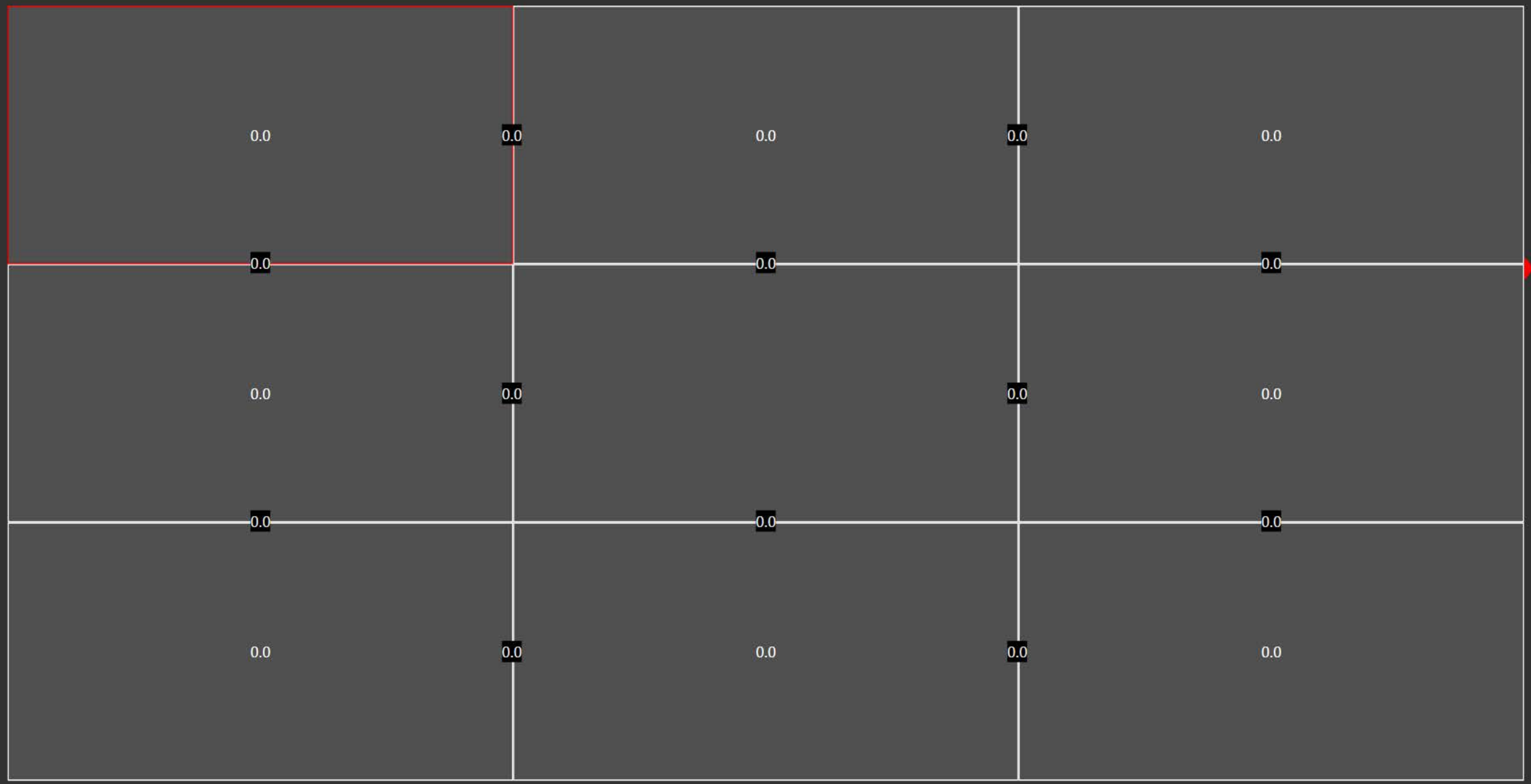
CalMAN 5

Screen Uniformity

Simulated Meter LCD Direct View | Source | Sharp Elite ISF Day

Screen Uniformity



Uniformity Type Grayscale | Rows 3 | Columns 3 | Session Setup

PRP ScUni

Setup

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30 100

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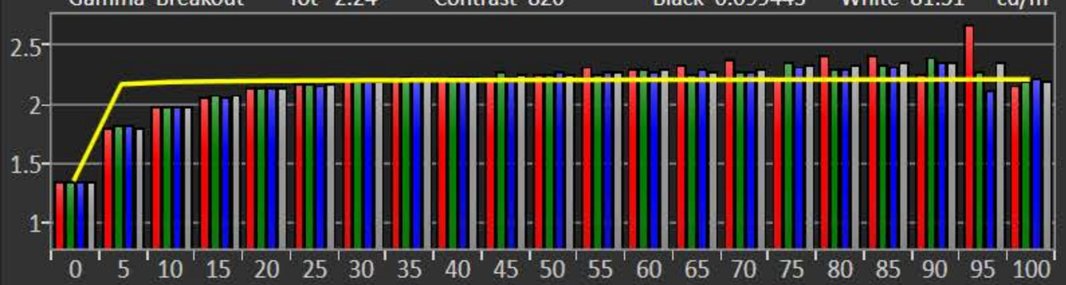
Pre-Cal Readings

Simulated Meter Simulated | Source | Direct Display Control

Pre-Calibration Readings

3/18/2017 Calibration

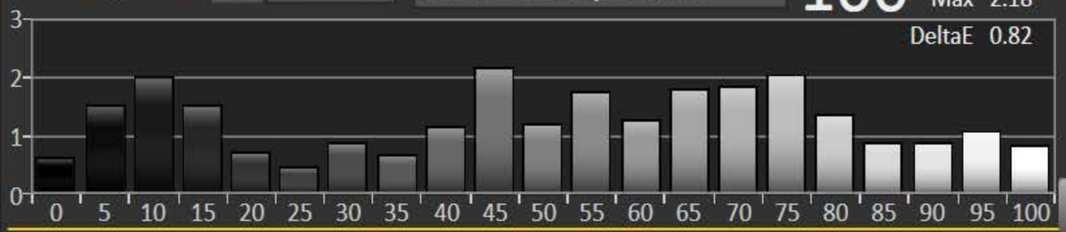
Gamma Breakout Tot 2.24 Contrast 820 Black 0.099443 White 81.51 cd/m²

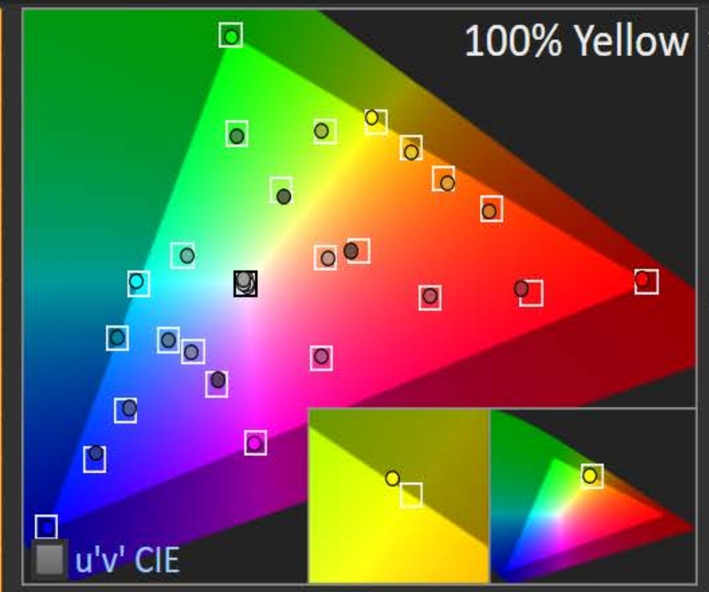


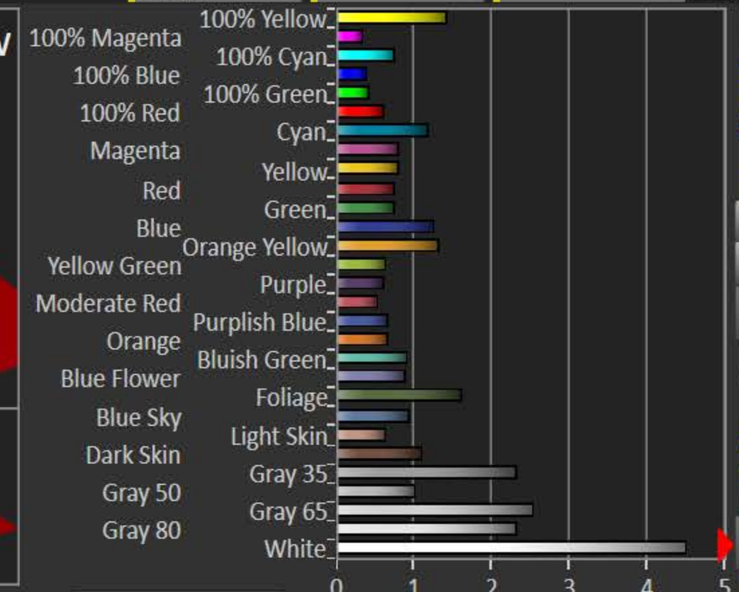
1 Grayscale

Full Charts | 21 Point 5% step 0-100% | 100 | Avg 1.31 Max 2.18

DeltaE 0.82







4 Color Checker

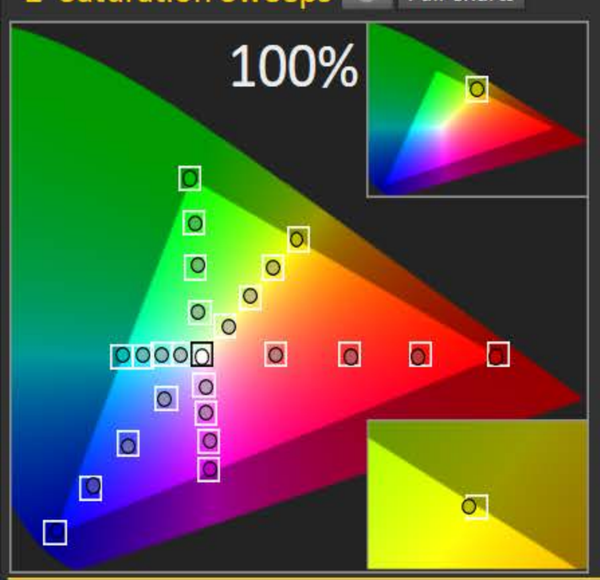
Full Charts | Add Custom Color Set → | SG Fleshtones

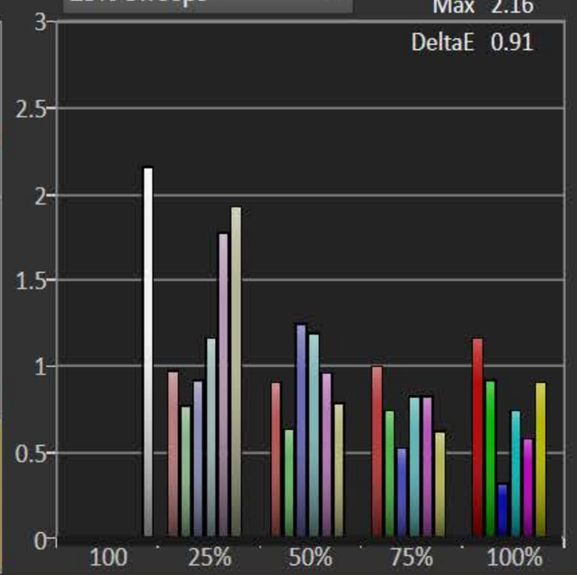
DeltaE 1.42 Avg 1.13 Max 4.5

2 Saturation Sweeps

Full Charts | 25% Sweeps | Avg 0.99 Max 2.16

DeltaE 0.91

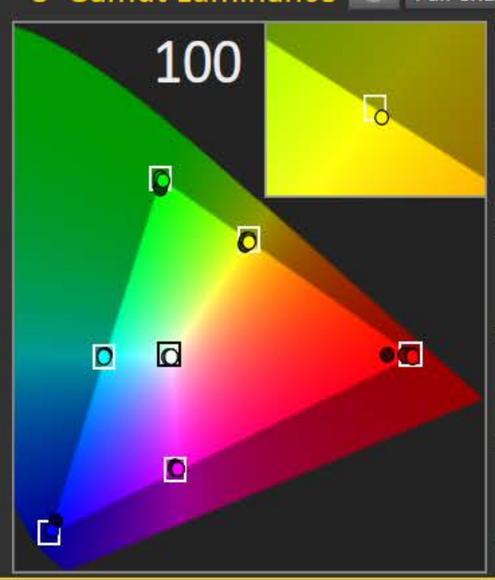


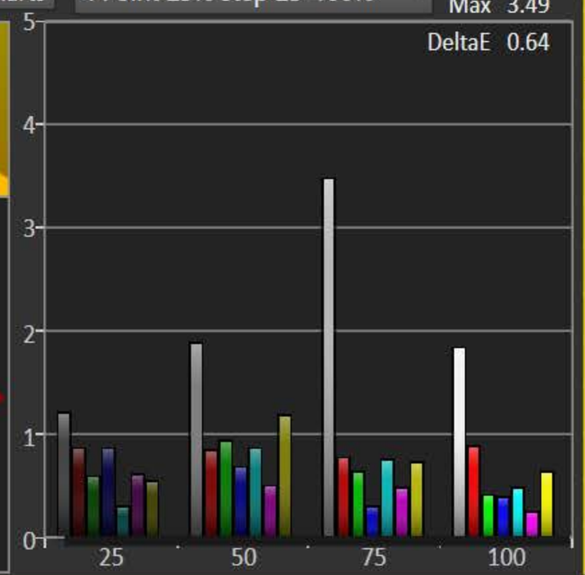


3 Gamut Luminance

Full Charts | 4 Point 25% step 25-100% | Avg 0.87 Max 3.49

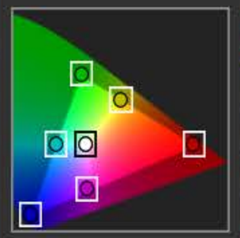
DeltaE 0.64





Select Colors

Populate CMS for HT report



PRP PreCal Read | Back | Next | PostCal Read | HOME | Prepare | Setup | PostCal Read | DyRnge | Calibrate | Gry | Sat | Lum | CCk | LUT | PostCal Read | Analyze | Gry | Sat | Lum | CCk | LUT | Final Check | PreCal

ISF Day

Pre-Cal Readings

Contrast		TV Gamma			Red	Green	Blue
Brightness		Color		Gain			
Backlight		Tint		Cut			

Notes

Display Slot

Use [···] mid-screen or below to read all series or select one from the individual series above

White | Red | Green | Blue | Cyan | Magenta | Yellow | 100W

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CalMAN 5

Dynamic Range

Simulated Meter LCD Direct View | Source | Direct Display Control

≡ Dynamic Range ≡

Overall Range

Adjust the Backlight control (for LED) to get the desired compromise between black and white levels: less Backlight = deeper black but lower white level, more Backlight = brighter white but higher black level too.

White Level

Data Points: select Clipping or Clipping with Peak White.

① Adjust the Contrast to maximize the white level without clipping any of the three primaries.

Clipping with Peak White ①

Gamma Level

Data Points: select a full set of grayscale points for this.

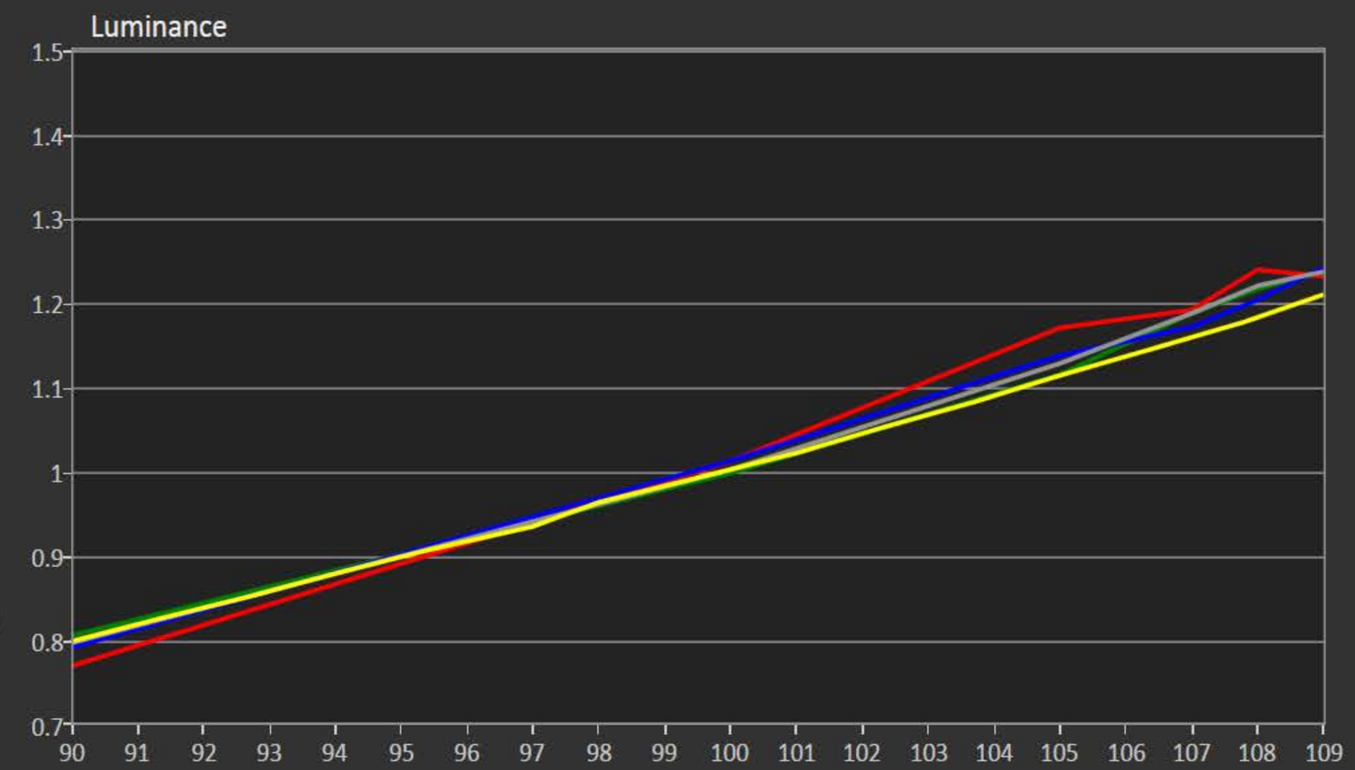
② Check the gamma level across the full grayscale based on the current settings, and adjust the display's gamma control to get a good match, tweaking with the Brightness for Black level & Contrast for White.

Clipping with Peak White ②

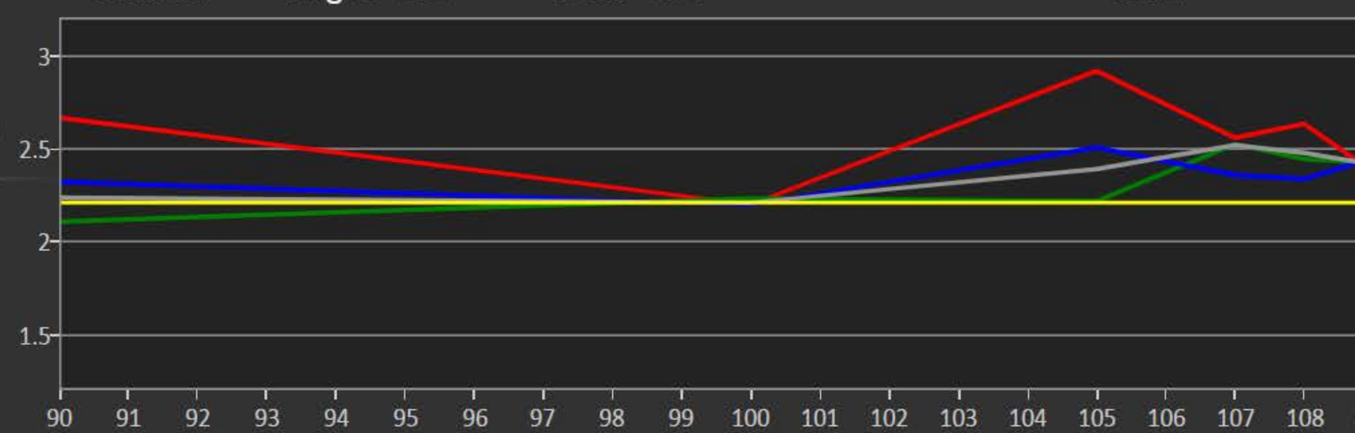
Calibration Notes

↗ Notes ↙

Contrast	78
Brightness	14
Backlight	30
TV Gamma	-4



Luminance in fL		White	23.61	109	29.14
Gamma	Target 2.2	Total	2.4		2.41



DIsplay Slot

Click the Read All button [···] to read the Grayscale

PRP DyRng

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2 Pt Grayscale

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2-Point Grayscale Calibration

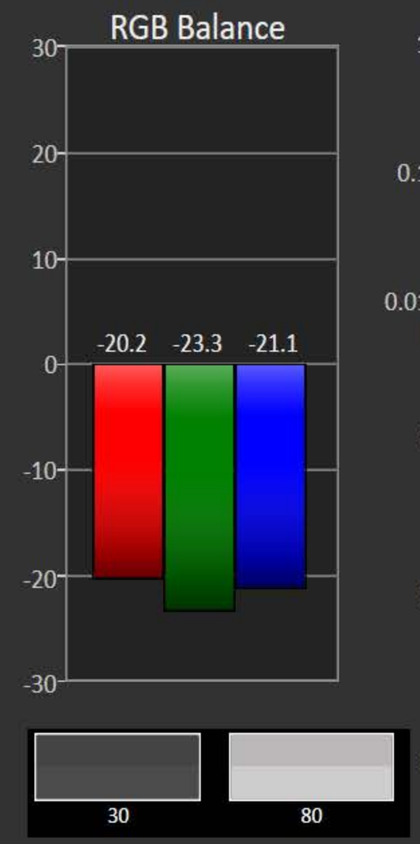
Grayscale 2-Point Adjust

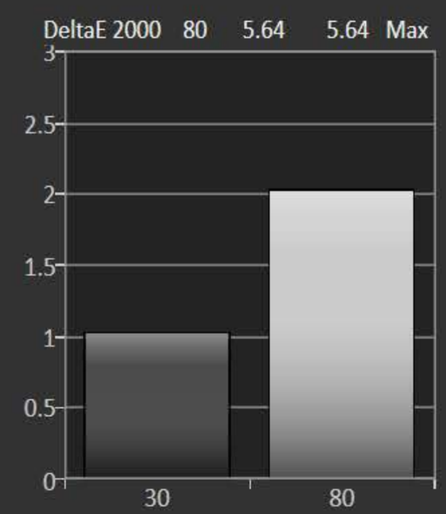
1. Reduce the Red, Green, and/or Blue (RGB) High controls to the lowest measured R, G, or B after the initial measurement of bright grayscale pattern. Continue doing this until you balance RGB to a deltaE of 3 or below (chart below).
2. Balance the RGB Low controls (if provided), while measuring a dark grayscale pattern.
3. Re-measure both bright grayscale and dark grayscale until both RGB High and RGB Low are balanced and DeltaE is under 3.

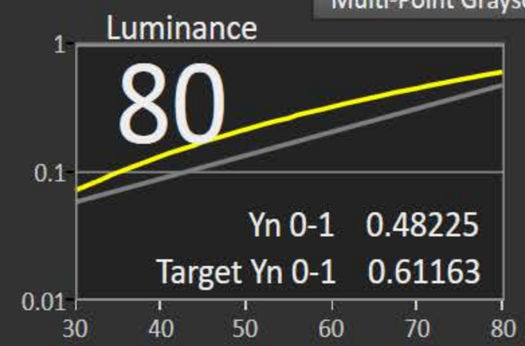
Selecting Points:

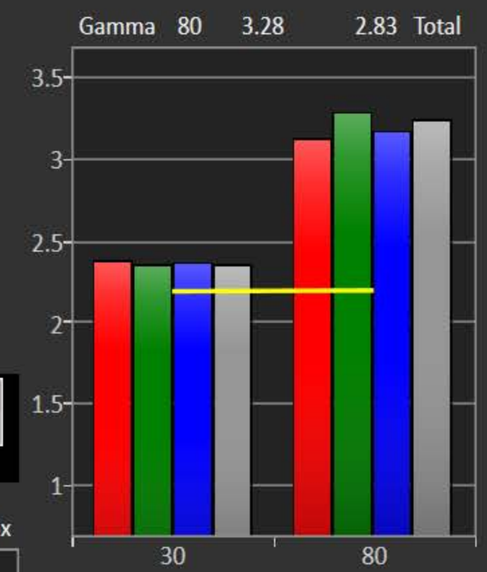
- **30% and 80%:** Use these levels if you only have access to a two point grayscale adjustment
- **30% and 100%:** Use these levels if you will be completing a multipoint adjustment afterwards and do not have access to a Peak White pattern.
- **30% and Peak White:** Use these levels if your display does not clip and you will be completing a multipoint calibration and want the best possible results.

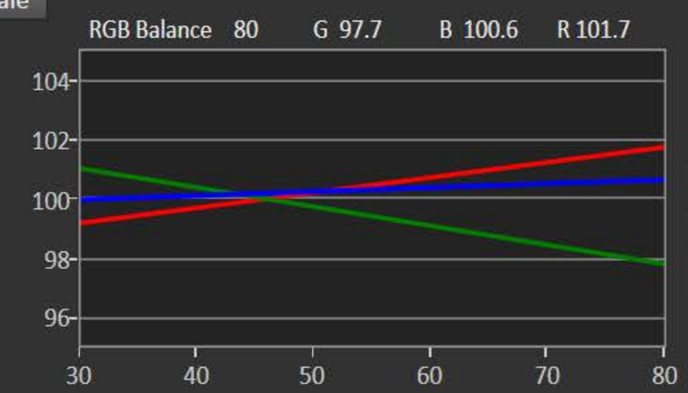
	30	80
RGB Triplet	82, 82, 82	191, 191, 191
Red index	82.0000	191.0000
Green index	82.0000	191.0000
Blue index	82.0000	191.0000
X	5.5282	46.3139
Y cd/m²	5.8782	48.2253
Z	6.3390	53.1972
Xn 0-1	0.0553	0.4631
Yn 0-1	0.0588	0.4823
Zn 0-1	0.0634	0.5320
Stimulus Percent	0.3014	0.7991
RED Stim%:0-1	0.3014	0.7991
GRN Stim%:0-1	0.3014	0.7991
BLU Stim%:0-1	0.3014	0.7991

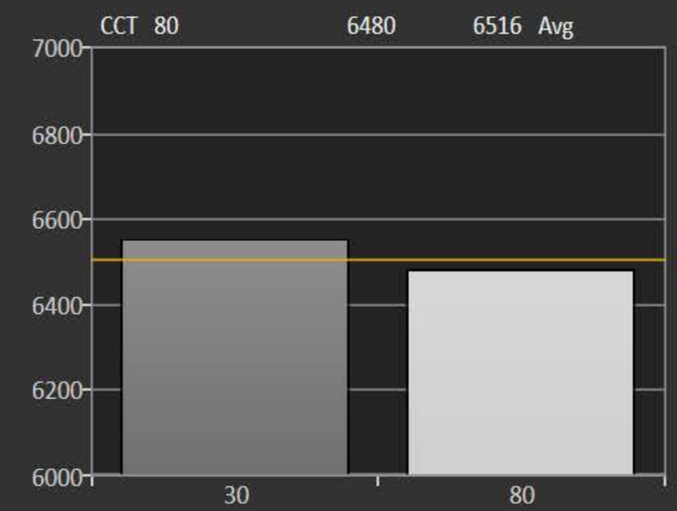












80

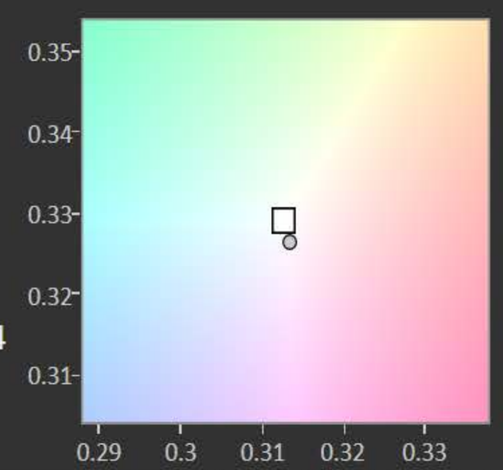
CC Temp	6480	6516	Avg
Gamma	3.28	2.83	Tot
dE 2000	2.04	1.54	Avg
		2.04	Max

White 100

	Y / Luminance cd/m²	x	y
Target →	61.16337	0.3127	0.329
Read →	48.22535	0.3135	0.3264

2 Point 30,80%

Triplet 191, 191, 191



CAL Gray 2-Pnt | Back | Next | 1M-Pt | HOME | Prepare | Setup | PreCal Read | DyRnge | Calibrate | 1M-Pt | Sat | Lum | CCk | LUT | PostCal Read | Analyze | Post | Final Check | 2-Pnt | 1M-Pt | Notes | Back | Next

CalMAN 2016 CalMAN Enthusiast for Home Video

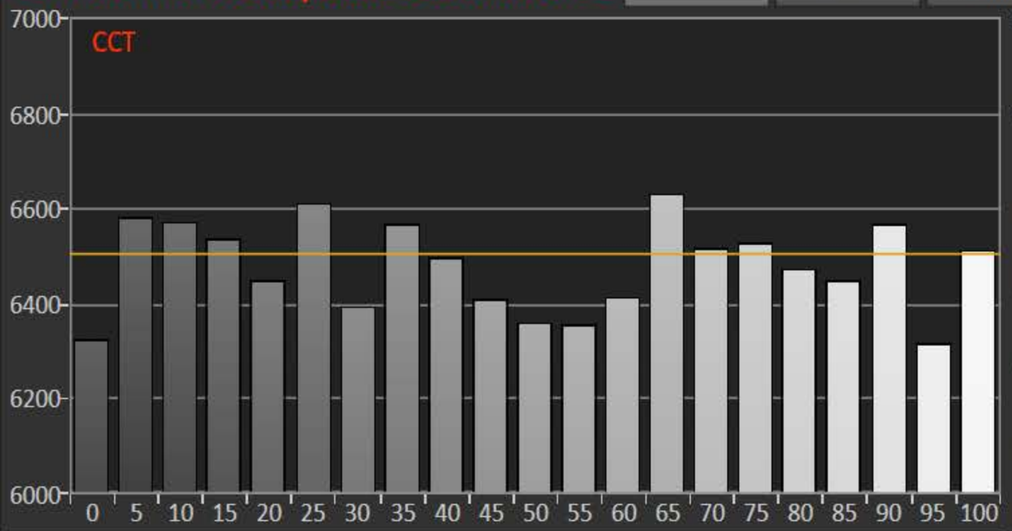
CalMAN

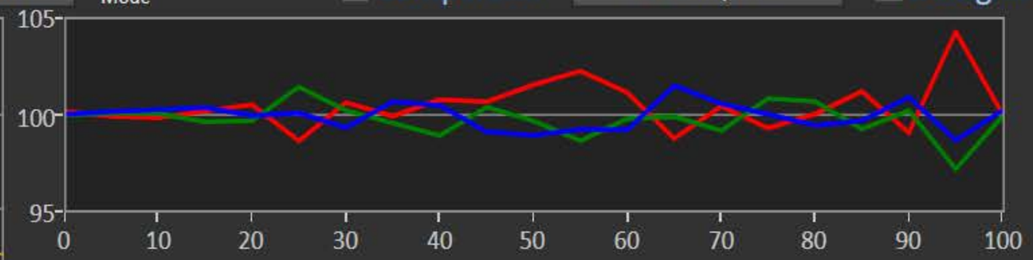
Multi-Point Grayscale

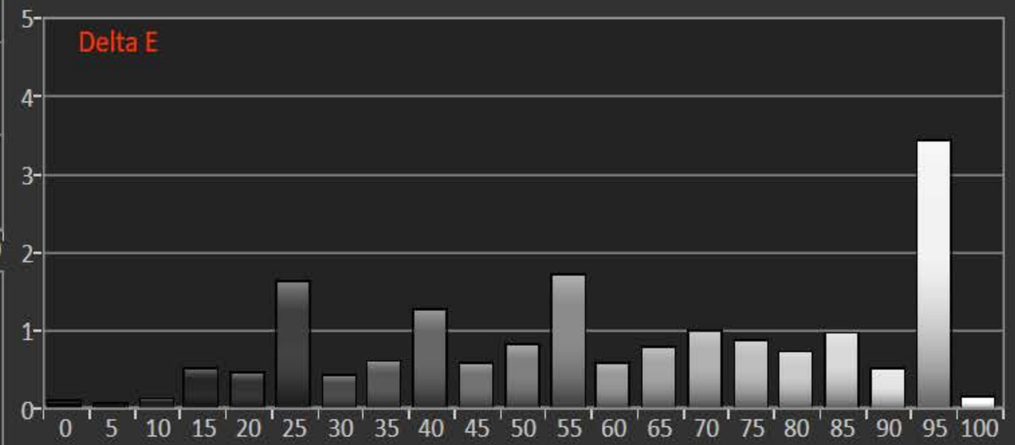
Simulated Meter Simulated | Source | Lumagen Radiance 3D LUT CMS 1

Multi-Point Grayscale Calibration

CCT | EOTF | Luminance | ←Chart Mode | Comparator | 2-Pt Grayscale | Datagrid







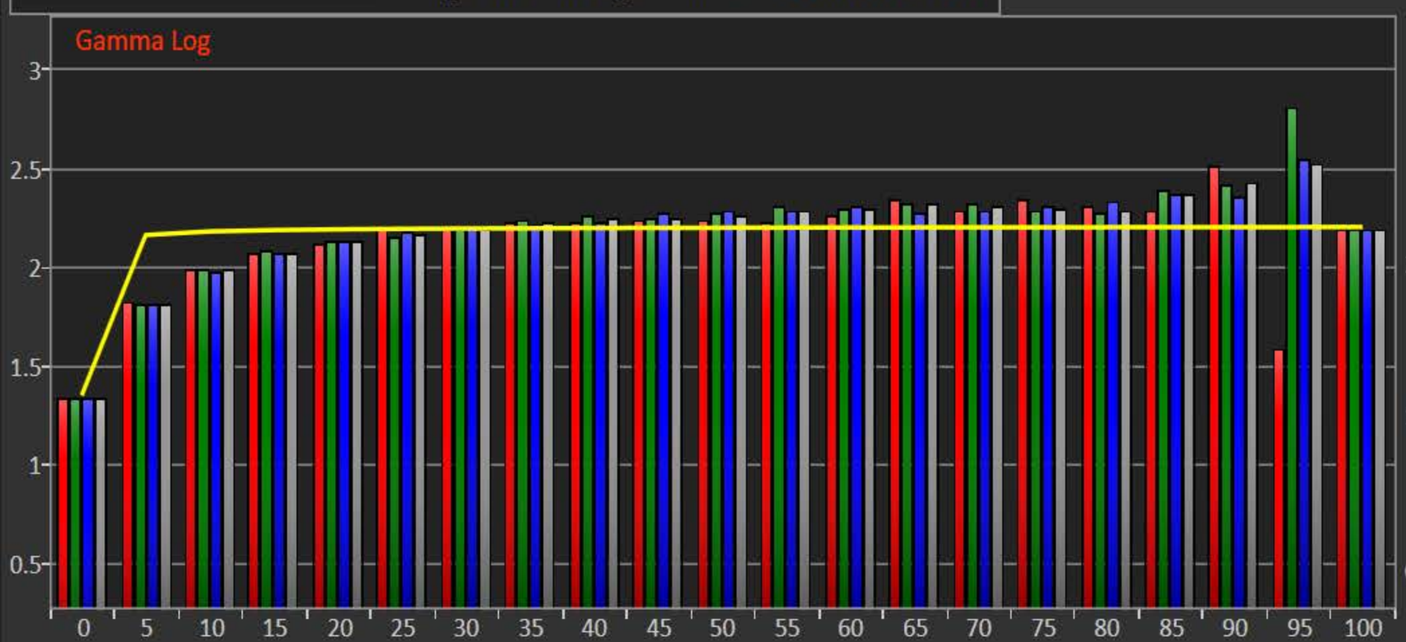
Summary

Display Slot: CMS 1

21 Point 5% step 0-100%

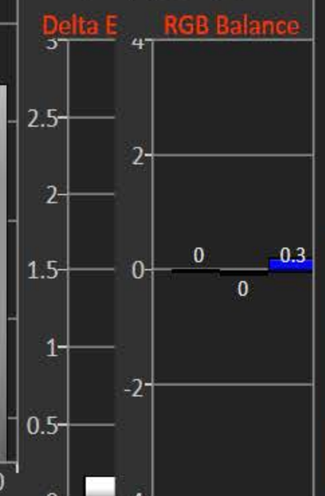
CCT		Gamma		White	81.9 cd/m²
Tgt	6503	Tgt	2.2	Black	0.0977
Avg	6488	Tot	2.25	Contrast	838

Delta E: Avg 0.88 Max @ 95 3.46



Triplet 235, 235, 235

100



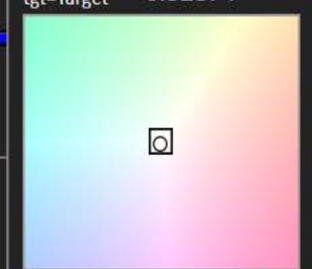
dE 0.17

Gamma 2.2

CCT 6511

Y tgt	81.85272	
cd/m²	81.85272	
x tgt	0.31271	
	0.3126	
y tgt	0.32901	
	0.32874	

tgt=Target



	Red	Green	Blue
0	0	0	0
5	5.9	6	6.3
10	10.3	10.3	10.1
15	15.1	14.9	14.8
20	19.9	19.9	19.9
25	24.7	24.8	24.9
30	30	30	30
35	34.6	34.9	34.7
40	40	40	39.9
45	44.9	45.1	45.1
50	49.8	49.9	49.9
55	54.8	54.7	54.7
60	60.1	59.7	59.5
65	65.2	65	64.8
70	69.9	70	70
75	75	74.8	74.9
80	79.9	79.9	79.8
85	85	84.8	85
90	90.1	90	90.1
95	95.3	95.5	95.4
100	99.9	99.9	100

Reset Grayscale

CAL Adjst M-Pnt | Back | Next | 2-Pt | HOME | Prepare | Setup | PreCal Read | DyRnge | Calibrate | 2-Pt | Sat | Lum | CCk | LUT | PostCal Read | Analyze | Post | Final Check | M-Pnt | 2-Pt

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

Notes | Back | Next

CalMAN 2016 CalMAN Enthusiast for Home Video

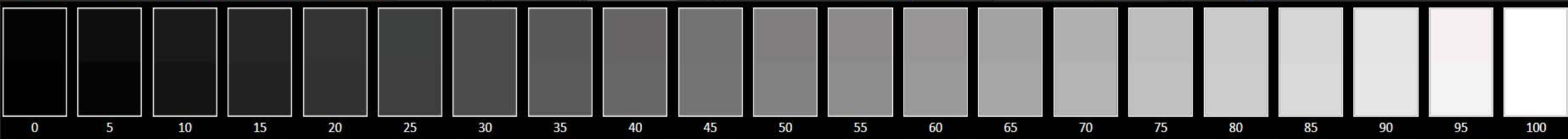
CalMAN

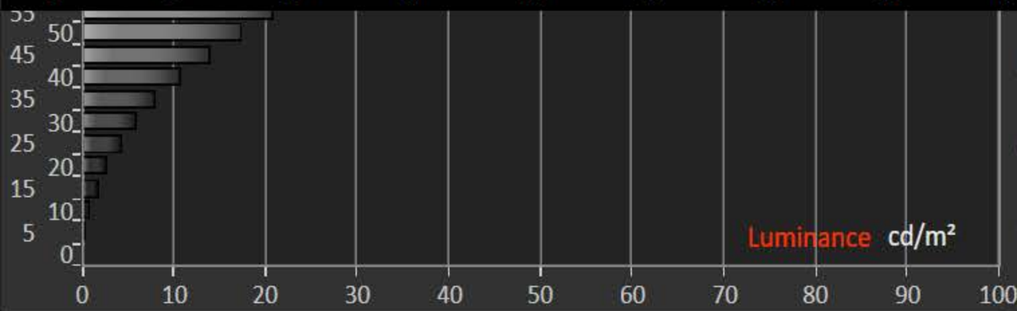
Multi-Point Grayscale

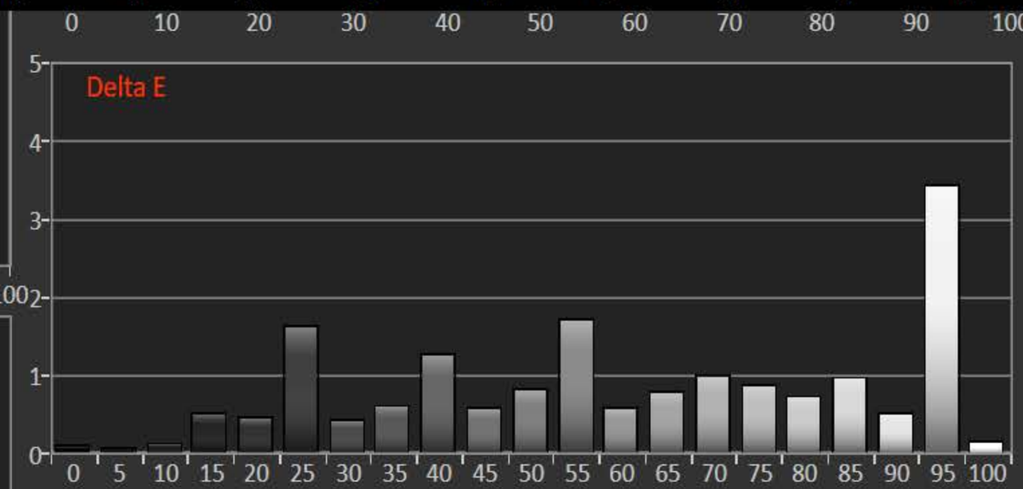
Simulated Meter Simulated | Source | Lumagen Radiance 3D LUT CMS 1

Multi-Point Grayscale Calibration

CCT | EOTF | Luminance | ←Chart Mode | Comparator | 2-Pt Grayscale | Datagrid







15	15.1	14.9	14.8
20	19.9	19.9	19.9
25	24.7	24.8	24.9
30	30	30	30
35	34.6	34.9	34.7
40	40	40	39.9
45	44.9	45.1	45.1
50	49.8	49.9	49.9
55	54.8	54.7	54.7
60	60.1	59.7	59.5
65	65.2	65	64.8
70	69.9	70	70
75	75	74.8	74.9
80	79.9	79.9	79.8
85	85	84.8	85
90	90.1	90	90.1
95	95.3	95.5	95.4
100	99.9	99.9	100

Summary

Display Slot: CMS 1

21 Point 5% step 0-100%

CCT Tgt 6503 Avg 6488

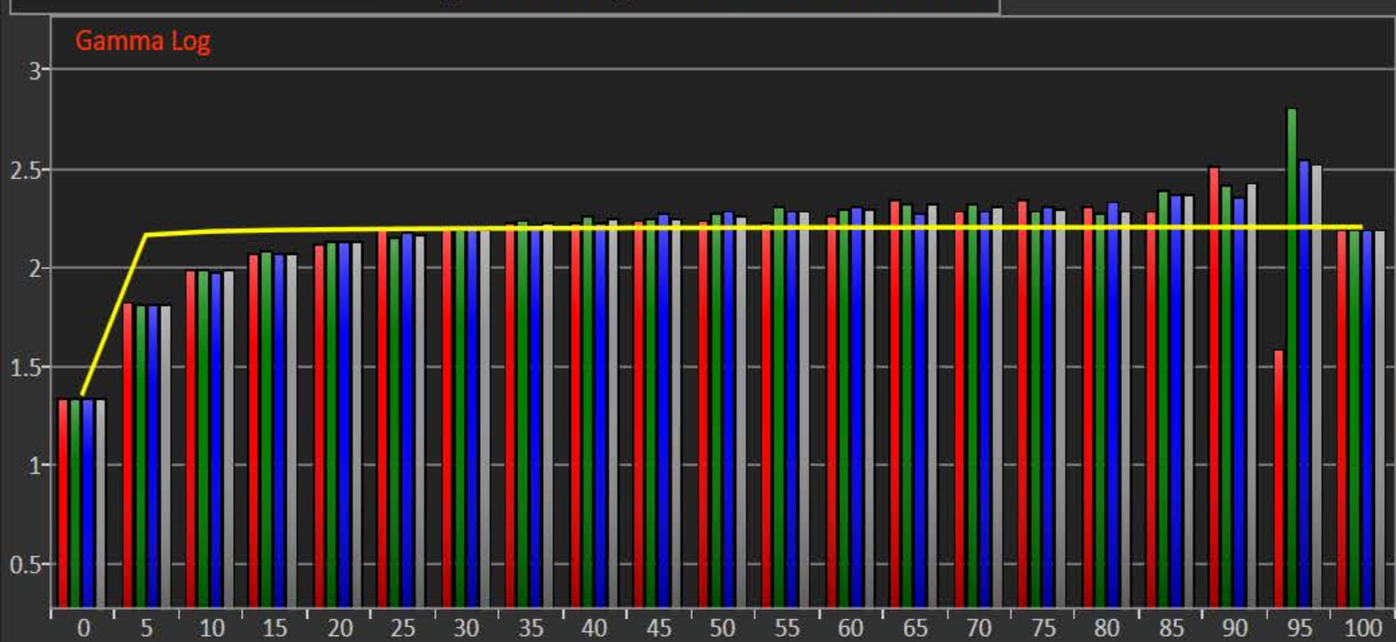
Gamma Tgt 2.2 Tot 2.25

White 81.9 cd/m²

Black 0.0977

Delta E Avg 0.88 Max @ 95 3.46

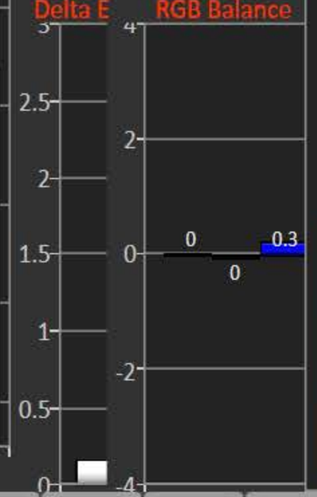
Contrast 838



Triplet 235, 235, 235

100

Delta E | RGB Balance



dE 0.17

Gamma 2.2

CCT 6511

Y tgt	81.85272	
cd/m²	81.85272	
x tgt	0.31271	0.3126
y tgt	0.32901	0.32874

tgt=Target

Reset Grayscale

CAL | Adjst | M-Pnt | Back | Next | 2-Pt | HOME | Prepare | Setup | PreCal Read | DyRnge | Calibrate | 2-Pt | Sat | Lum | CCk | LUT | PostCal Read | Analyze | Post | Final Check | M-Pnt | 2-Pt | Notes | Back | Next

CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

Multi-Point Grayscale

Simulated Meter Simulated | Source | Direct Display Control

Multi-Point Grayscale Calibration

Comparator | CCT | EOTF | Luminance | Log Luminance | Datagrid

Click grid to select it then click Configure to select data

Configure

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
RGB Triplet	16, 16, 16	27, 27, 27	38, 38, 38	49, 49, 49	60, 60, 60	71, 71, 71	82, 82, 82	93, 93, 93	104, 104, 104	115, 115, 115	126, 126, 126	136, 136, 136	147, 147, 147	158, 158, 158	169, 169, 169	180, 180, 1
Target Y cd/m²	0.0003	0.1304	0.5560	1.3223	2.4580	3.9847	5.9201	8.2793	11.0754	14.3202	18.0242	21.7983	26.4055	31.4983	37.0846	43.1716
Y cd/m²	0.0987	0.3613	0.8509	1.6148	2.6794	4.1002	5.8283	8.0501	10.5455	13.7731	17.1475	20.6818	25.3680	30.1362	35.8816	41.8620
Target x:CIE31	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127
x: CIE31	0.3114	0.3166	0.3154	0.3140	0.3149	0.3142	0.3135	0.3140	0.3145	0.3110	0.3132	0.3108	0.3113	0.3134	0.3141	0.3103
Target y:CIE31	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290
y: CIE31	0.3284	0.3272	0.3279	0.3296	0.3292	0.3299	0.3282	0.3301	0.3276	0.3297	0.3298	0.3276	0.3319	0.3275	0.3305	0.3297
Target CCT	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440
CCT	6582.0000	6306.0000	6367.0000	6432.0000	6382.0000	6419.0000	6465.0000	6424.0000	6416.0000	6592.0000	6471.0000	6618.0000	6559.0000	6475.0000	6420.0000	6630.0000

CAL
Adjst
M-Pnt
Back
Next
2-Pt
HOME
Prepare
Setup
PreCal Read
DyRnge
Calibrate
2-Pt
Sat
Lum
CCk
LUT
PostCal Read
Analyze
∫ Post
Final Check
M-Pnt
2-Pt

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

Notes
Back
Next

CalMAN 2016 CalMAN Enthusiast for Home Video

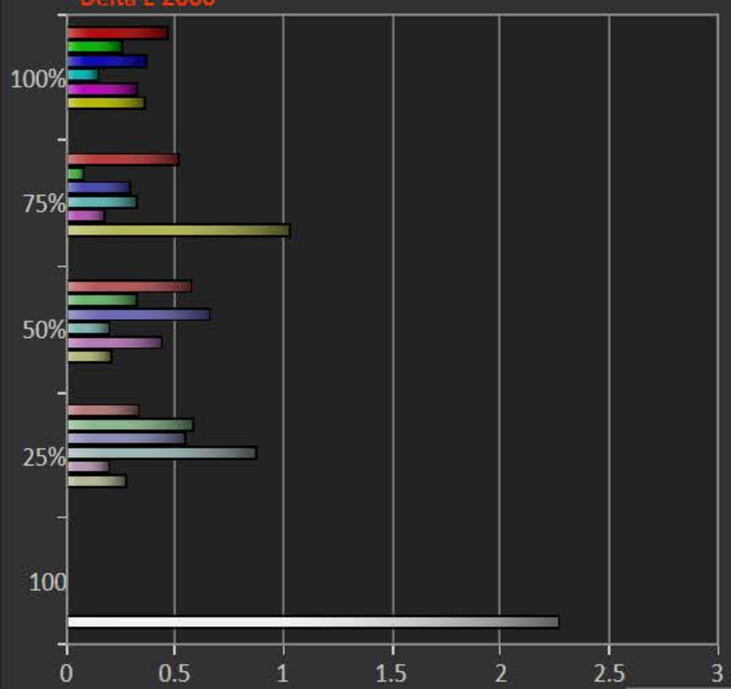
CalMAN

Saturation Sweeps

Simulated Meter Simulated | Source | Sharp Elite ISF Day

Saturation Sweeps Calibration

Delta E 2000



Datagrid

Summary

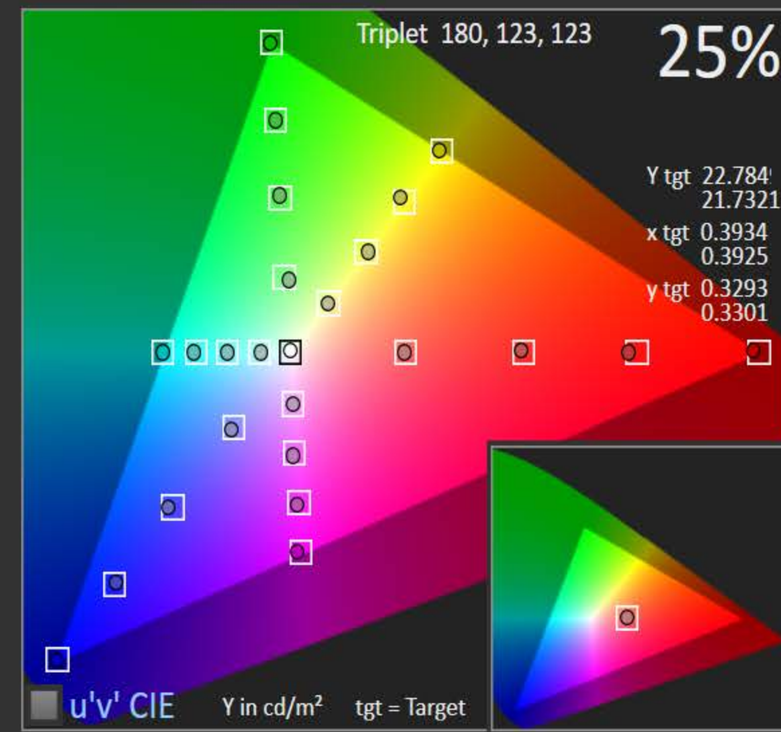
Delta E 2000
Avg 0.47
Max 2.27

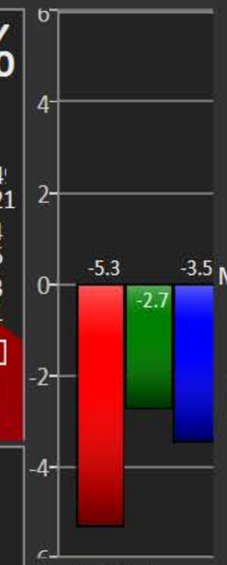
Delta L
Avg 1.013
Max 1.619

Delta H
Avg 0.431
Max 1.672

Delta C
Avg 0.7584
Max 1.83

Black 0
White 82.24

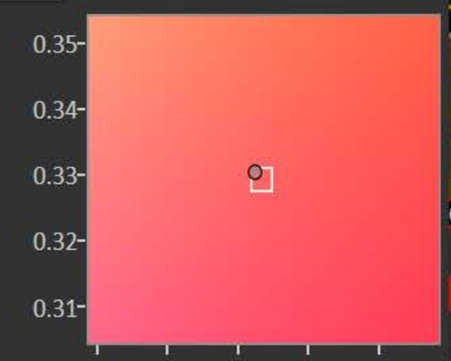




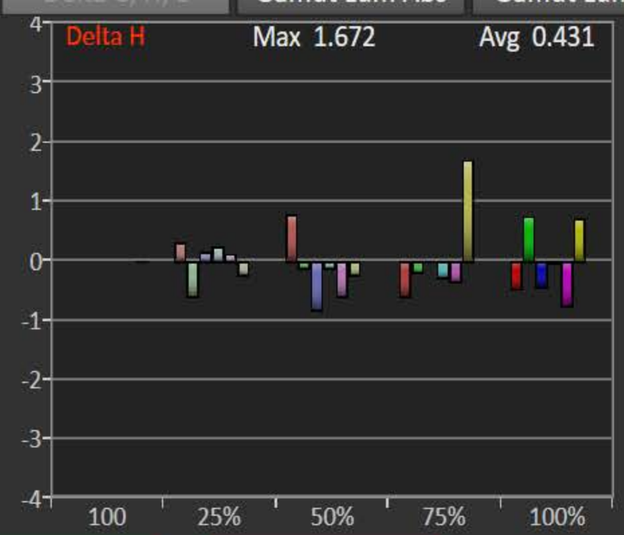
	Hue	Saturation	Luminance
Red	29	35	31
Green	30	44	23
Blue	43	29	34
Cyan	19	44	20
Magenta	37	32	24
Yellow	34	28	31

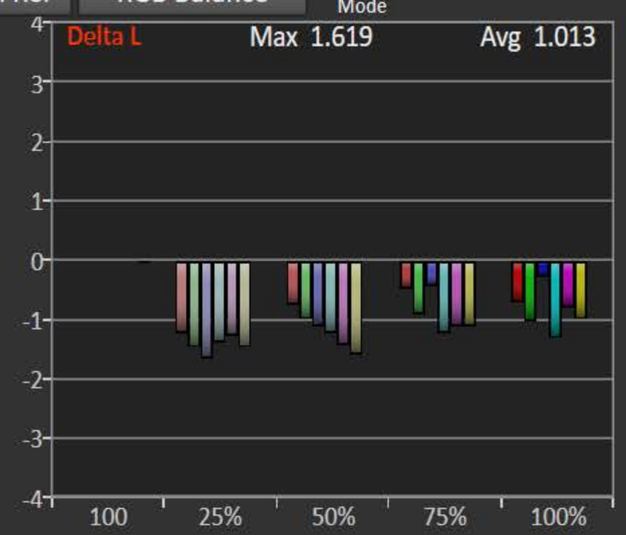
Reset CMS

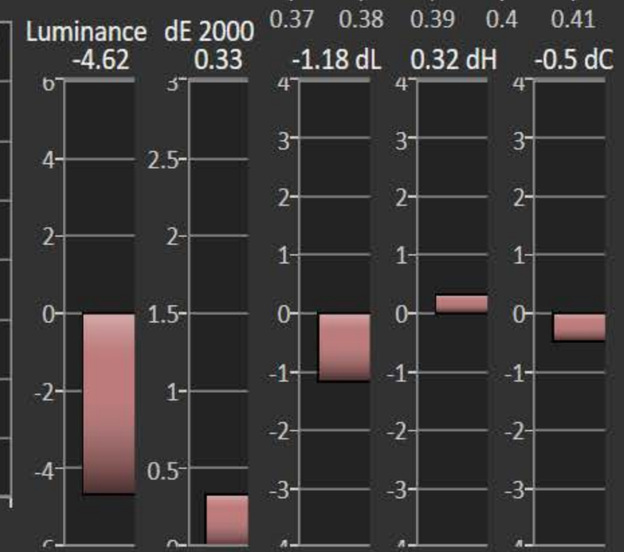
25%



Delta C, H, L | Gamut Lum Abs | Gamut Lum Rel | RGB Balance | ←Chart Mode







Display Slot: ISF Day

Sweep Level: 25% Sweeps

For classic CMS set to 75%/100% Only

CAL Satur

Back | Next

HOME | Prepare | Setup | PreCal Read | DyRnge | Calibrate | Gry | Sat | Lum | CCk | LUT | PostCal Read | Analyze | Post | Final Check | Satur

25% | 50% | 75% | 100%

Back | Next | Notes

CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

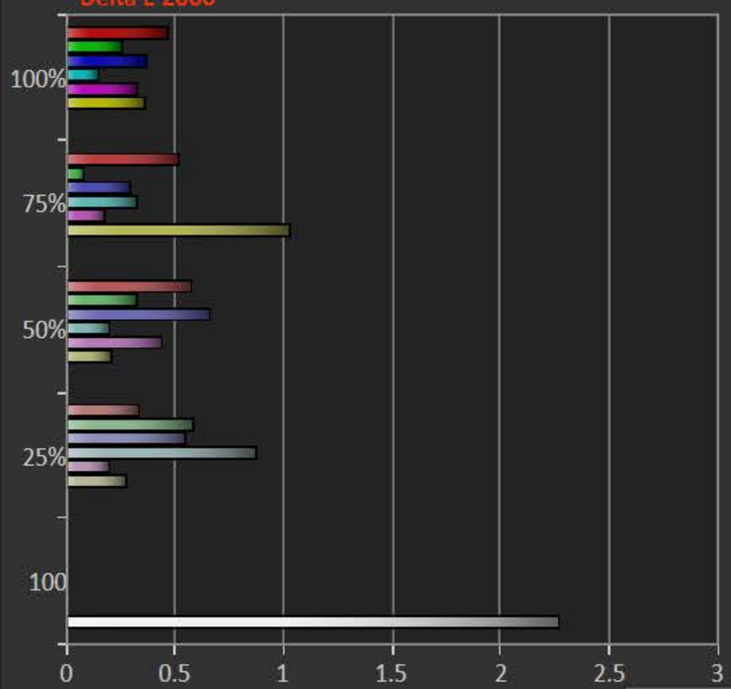
Saturation Sweeps

Simulated Meter Simulated | Source | Sharp Elite ISF Day

Saturation Sweeps Calibration

Datagrid

Delta E 2000



Summary

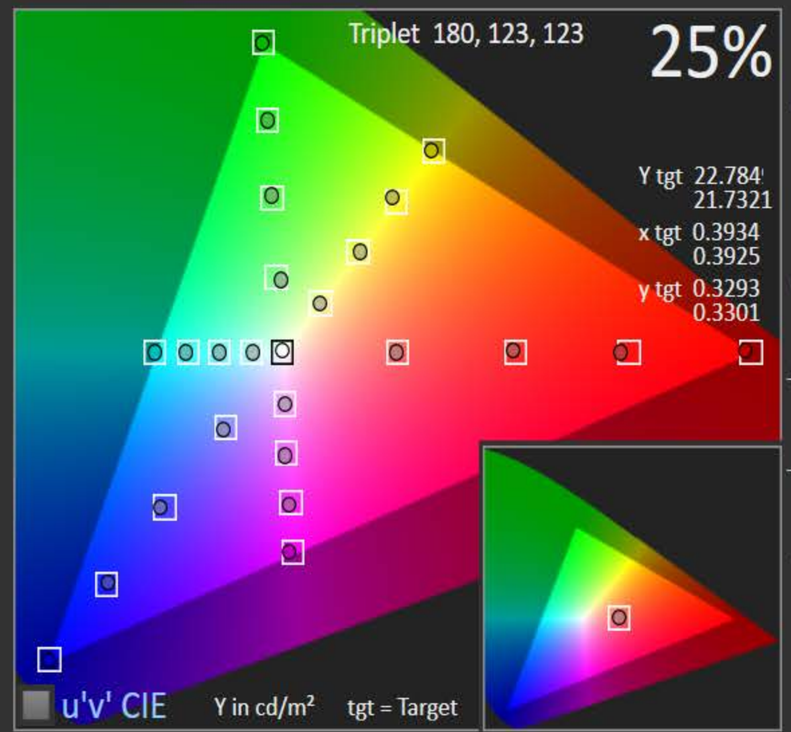
Delta E 2000
Avg 0.47
Max 2.27

Delta L
Avg 1.013
Max 1.619

Delta H
Avg 0.431
Max 1.672

Delta C
Avg 0.7584
Max 1.83

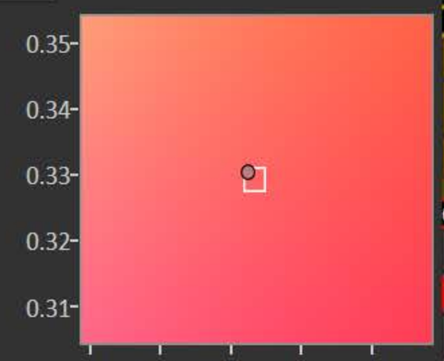
Black 0
White 82.24



	Hue	Saturation	Luminance
Red	29	35	31
Green	30	44	23
Blue	43	29	34
Cyan	19	44	20
Magenta	37	32	24
Yellow	34	28	31

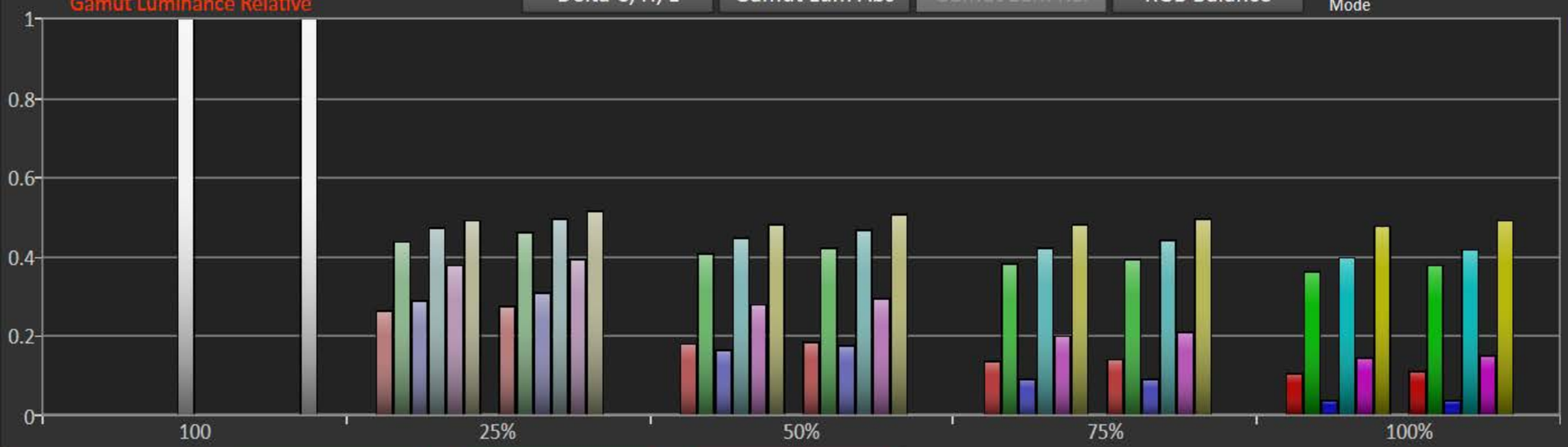
Reset CMS

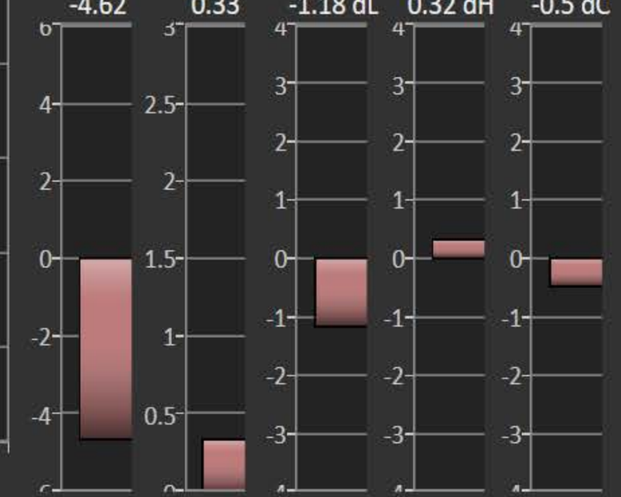
25%



Delta C, H, L | Gamut Lum Abs | Gamut Lum Rel | RGB Balance | ←Chart Mode

Gamut Luminance Relative





Display Slot: ISF Day

Sweep Level: 25% Sweeps

For classic CMS set to 75%/100% Only

CAL Satur

Back | Next

HOME | Prepare | Setup | PreCal Read | DyRnge | Calibrate | Gry | Sat | Lum | CCk | LUT | PostCal Read | Analyze | Post | Final Check | Satur

25% | 50% | 75% | 100%

Notes

CalMAN 2016 CalMAN Enthusiast for Home Video

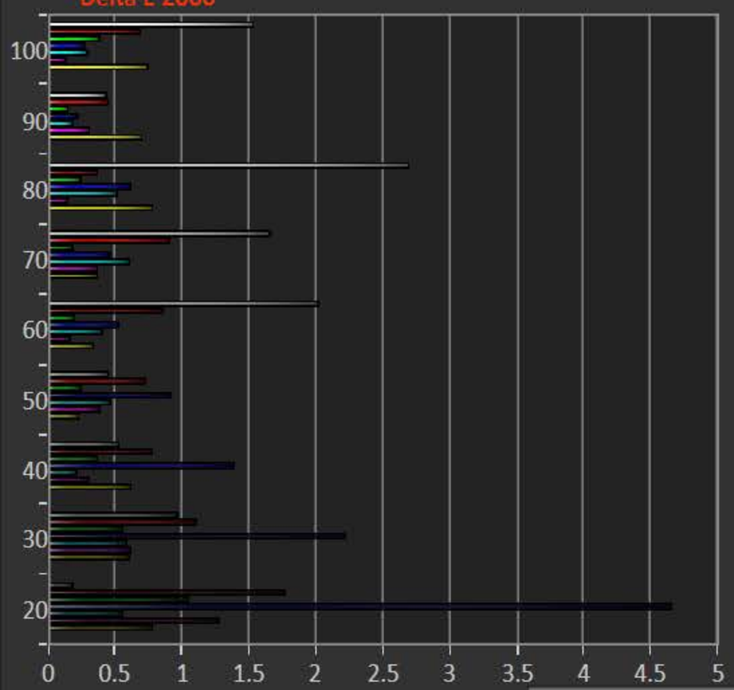
CalMAN

Gamut Luminance

Simulated Meter Simulated | Source | Sharp Elite ISF Day

Gamut Luminance Calibration

Delta E 2000



Datagrid

Summary

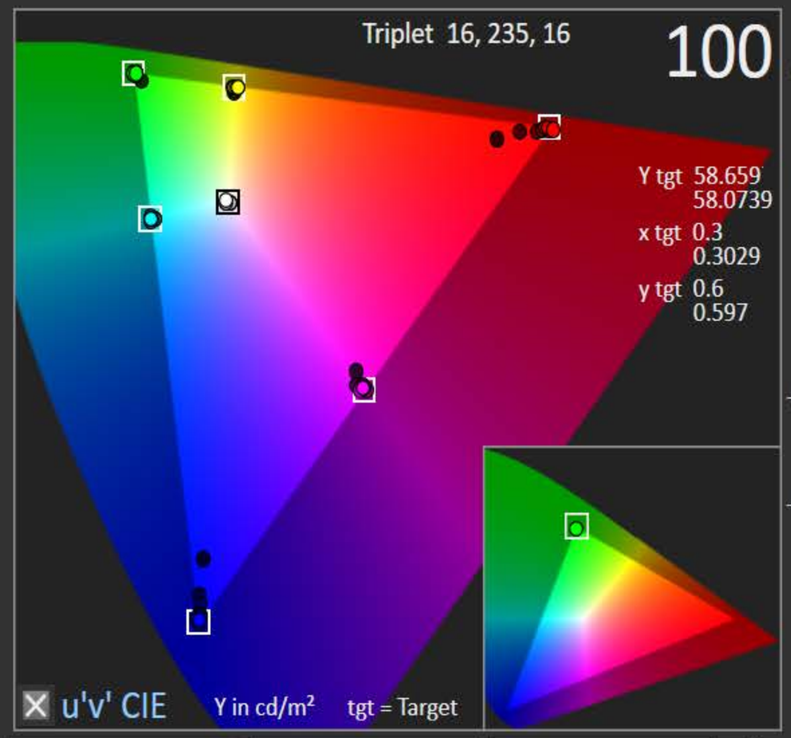
Delta E 2000
Avg 0.72
Max 4.64

Delta L
Avg 0.721
Max 1.556

Delta H
Avg 0.509
Max 2.683

Delta C
Avg 1.512
Max 10.964

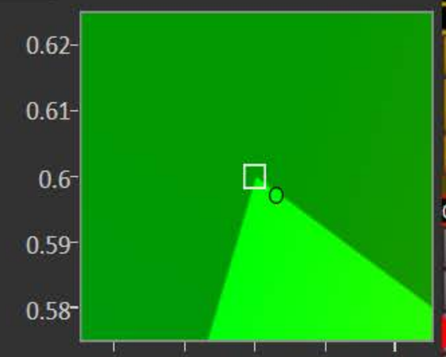
Black 0
White 82.02



100

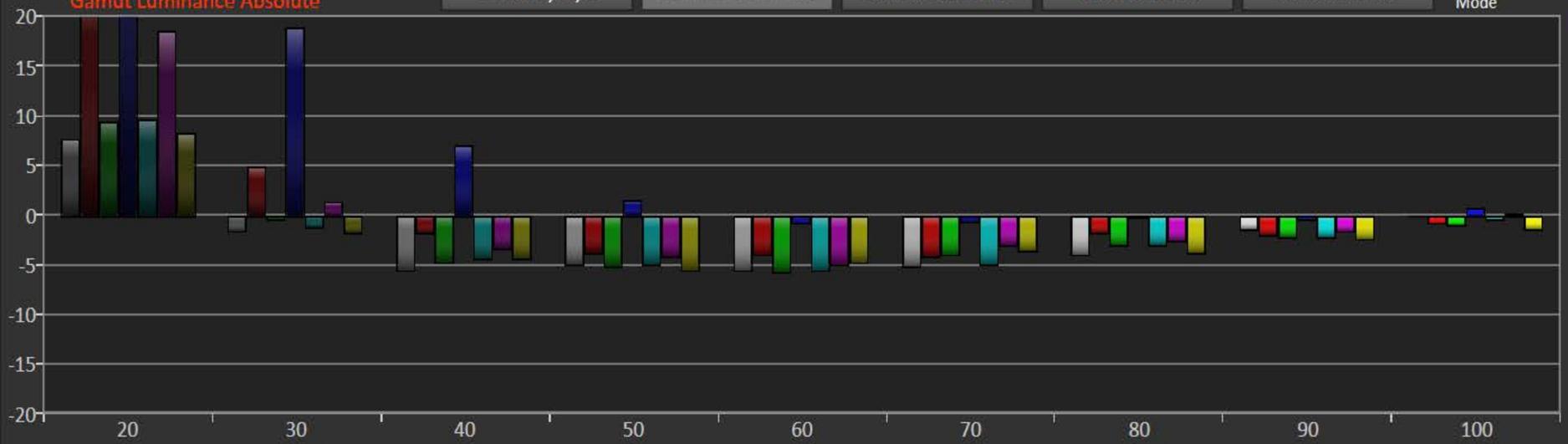
	Hue	Saturation	Luminance
Red	29	35	31
Green	30	44	23
Blue	43	29	34
Cyan	19	44	20
Magenta	37	32	24
Yellow	34	28	31

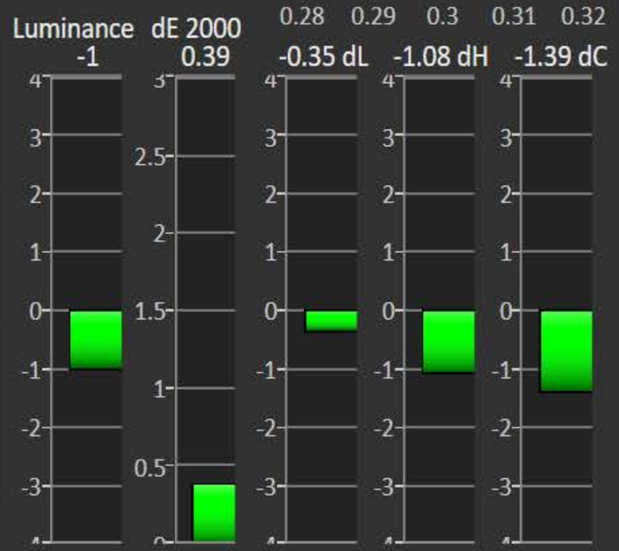
Reset CMS



Delta C, H, L | Gamut Lum Abs | Gamut Lum Rel | Y Luminance | RGB Balance | ←Chart Mode

Gamut Luminance Absolute





Comparator

Display Slot: ISF Day

Ramp Levels: 9 Point 10% step 20-100%

CAL Lumi

Back | Next

HOME | Prepare | Setup | PreCal Read | DyRnge | Calibrate | Gry | Sat | Lumi | CCk | LUT | PostCal Read | Analyze | Post | Final Check | Lumi | Notes

20 30 40 50 60 70 80 90 100

CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

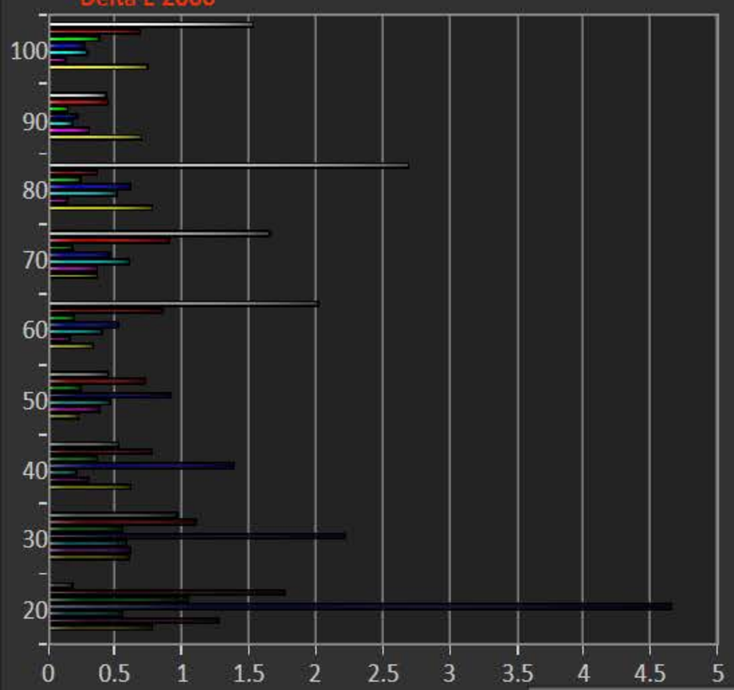
Gamut Luminance

Simulated Meter Simulated | Source | Sharp Elite ISF Day

Gamut Luminance Calibration

Delta E 2000

Datagrid



Summary

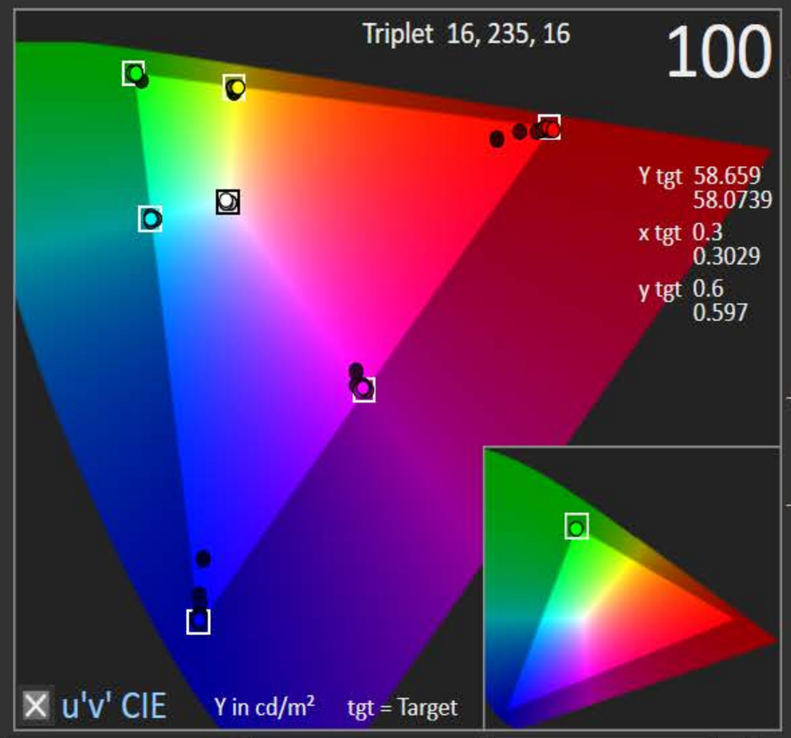
Delta E 2000
Avg 0.72
Max 4.64

Delta L
Avg 0.721
Max 1.556

Delta H
Avg 0.509
Max 2.683

Delta C
Avg 1.512
Max 10.964

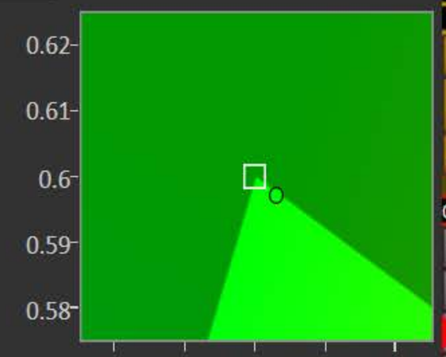
Black 0
White 82.02



100

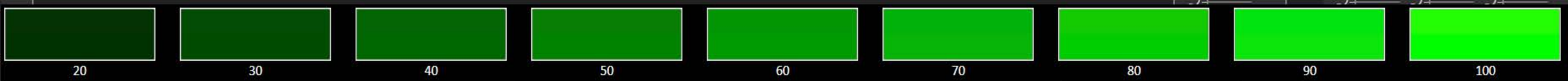
	Hue	Saturation	Luminance
Red	29	35	31
Green	30	44	23
Blue	43	29	34
Cyan	19	44	20
Magenta	37	32	24
Yellow	34	28	31

Reset CMS



Delta C, H, L | Gamut Lum Abs | Gamut Lum Rel | Y Luminance | RGB Balance | ←Chart Mode

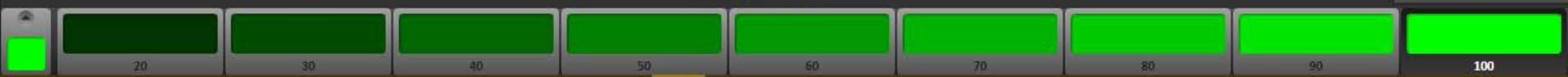
RGB Balance



Comparator

Display Slot: ISF Day

Ramp Levels: 9 Point 10% step 20-100%



CAL Lumi | Back | Next | HOME | Prepare | Setup | PreCal Read | DyRnge | Calibrate | Gry | Sat | Lumi | CCk | LUT | PostCal Read | Analyze | Post | Final Check | Lumi | Notes | Back | Next

CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

Color Checker

Simulated Meter Simulated | Source | Direct Display Control

Color Checker Calibration

Orange

Add Custom Color Set → SG Fleshtones | Select Colors | u'v' CIE

	Delta E	Delta L	Delta H	Delta C
Max	2.41	1.36	2.44	3.11
Avg	1.1	0.7	0.7	1.28

100% Yellow, 100% Magenta, 100% Cyan, 100% Blue, 100% Green, 100% Red, Cyan, Magenta, Yellow, Red, Green, Blue, Orange Yellow, Yellow Green, Purple, Moderate Red, Purplish Blue, Orange, Bluish Green, Blue Flower, Foliage, Blue Sky, Light Skin, Dark Skin, Gray 35, Gray 50, Gray 65, Gray 80, White

Orange

Points 29
Black 0
White 81.55

Delta E Avg 1.1 Max 2.41
Delta L Avg 0.7 Max 1.36
Delta H Avg 0.7 Max 2.44
Delta C Avg 1.1 Max 3.11

Orange

RGB Balance: -1.5, -3.2, 5.9

Slim Datagrid

1.47 dE | -0.76 dL | 2 dH | -1.56 dC | -2.94 Lu

Display Slot

Big CIE Chart | Comparator | Open DDC

Triplet 202, 119, 51 | Y tgt 23.42523 22.73558 | x tgt 0.51363 0.5134 | y tgt 0.40951 0.40493

CAL CChkr | Back | Next | # data | HOME | Prepare | Setup | PreCal Read | DyRnge | Calibrate | Gry | Sat | Lum | # data | LUT | PostCal Read | Analyze | Post | Final Check | CChkr | # data | Notes | Back | Next

CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

Color Checker

Simulated Meter Simulated | Source | Direct Display Control

Color Checker Calibration

8J

Add Custom Color Set → SG Fleshtones | Select Colors | u'v' CIE

Delta E — Max 2.97 — Avg 1.17

8J, 8I, 8H, 8G, 8F, 8E, 8D, 7J, 7I, 7H, 7G, 7F, 7E, 5D, 2K, 2F, 2E, 100% Yellow, 100% Magenta, 100% Cyan, 100% Blue, 100% Green, 100% Red, Cyan, Magenta, Yellow, Red, Green, Blue, Orange Yellow, Yellow Green, Purple, Moderate Red, Purplish Blue, Orange, Bluish Green, Blue Flower, Foliage, Blue Sky

Points 46
Black 0
White 81.56

Delta E
Avg 1.17
Max 2.97
Delta L
Avg 0.72
Max 1.38
Delta H
Avg 0.79
Max 2.14
Delta C
Avg 1.23
Max 3.51

8J

RGB Balance

-3.2 -3.9 -2

Slim Datagrid

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White | Gray 80 | Gray 65 | Gray 50 | Gray 35 | Dark Skin | Light Skin | Blue Sky | Foliage | Blue Flower | Bluish Green | Orange | Purplish Blue | Moderate Red | Purple | Yellow Green | Orange Yellow | Blue | Green | Red | Yellow | Magenta | Cyan | 100% Red | 100 Gre

Big CIE Chart | Comparator | Open DDC

Triplet 202, 136, 97 | Y tgt 28.42484 27.22697 | x tgt 0.44634 0.44767 | y tgt 0.3844 0.38301

1.1 dE | -1.16 dL | 0.76 dH | -0.28 dC | -4.21 Lu

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CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

Datagrid

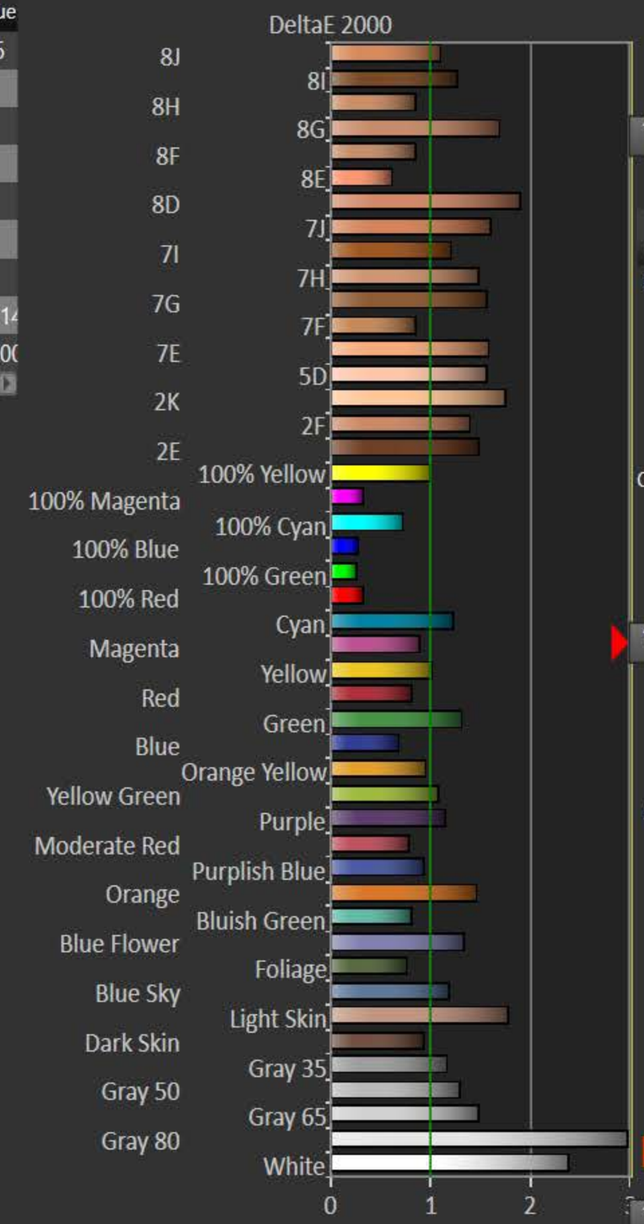
Simulated Meter Simulated | Source | Direct Display Control

Color Checker Calibration Data

Color Notes

Post-Cal Notes

	White	Gray 80	Gray 65	Gray 50	Gray 35	Dark Skin	Light Skin	Blue Sky	Foliage	Blue Flower	Bluish Green	Orange	Purplish Blue
RGB Triplet	235, 235, 235	213, 213, 213	196, 196, 196	176, 176, 176	152, 152, 152	115, 86, 73	182, 145, 128	97, 121, 150	93, 108, 73	128, 126, 167	101, 178, 161	202, 119, 51	80, 95, 156
Target Y cd/m²	81.5622	64.6728	53.0708	41.0056	28.7338	8.1889	29.1154	15.6540	10.8262	19.5283	34.7096	23.4298	9.6677
Y cd/m²	81.5622	63.4128	51.7171	39.6694	27.5214	7.9311	28.1273	14.9564	10.4658	18.4290	33.7911	22.4891	9.2960
Target x:CIE31	0.3127	0.3127	0.3127	0.3127	0.3127	0.4053	0.3776	0.2492	0.3414	0.2689	0.2616	0.5136	0.2153
x: CIE31	0.3106	0.3139	0.3116	0.3147	0.3145	0.4005	0.3772	0.2491	0.3394	0.2683	0.2615	0.5130	0.2167
Target y:CIE31	0.3290	0.3290	0.3290	0.3290	0.3290	0.3642	0.3561	0.2658	0.4309	0.2532	0.3592	0.4095	0.1900
y: CIE31	0.3301	0.3260	0.3300	0.3294	0.3302	0.3610	0.3598	0.2672	0.4282	0.2514	0.3620	0.4057	0.1893
Target CCT	6503.4440	6503.4440	6503.4440	6503.4440	6503.4440	3288.8034	3937.0473	16924.4093	5260.8192	15426.7642	8912.8173	2110.7815	12054431.14
CCT	6609.0000	6459.0000	6559.0000	6395.0000	6398.0000	3370.0000	3979.0000	16672.0000	5311.0000	15949.0000	8853.0000	2091.0000	19425327.00



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CalMAN 5 CalMAN Enthusiast for Home Video

CalMAN 5

Datagrid 1 Datagrid 2

Simulated Meter LCD Direct View | Source | Sharp Elite ISF Day

Color Checker Calibration Data Slim 1

Color Notes

Post-Cal Notes

	White	Gray 80	Gray 65	Gray 50	Gray 35	Dark Skin	Light Skin	Blue Sky	Foliage	Blue Flower	Bluish Green	Orange	Purplish Blue	Moderate Red	Purple	Yellow Green	Orange Yellow	Blue	Green	Red	Yellow	Magenta
X	77.7876	61.0123	48.7507	37.2750	26.2986	8.8506	29.7102	13.8782	8.3596	19.5980	24.1784	28.5901	10.4996	21.7371	7.0032	26.2267	36.9978	6.8547	11.2892	15.9324	45.5092	22.8581
Y cd/m²	82.1361	64.3887	51.9605	39.4948	27.5258	7.9453	27.6665	15.0250	10.3422	18.5965	33.7162	22.4271	9.3757	14.9048	5.3583	34.1802	34.2237	5.0120	18.3171	9.4403	47.6246	15.1877
Z	89.2255	68.9156	56.5328	42.8874	29.6140	5.2680	20.6814	27.1974	5.6761	35.7189	34.8715	4.5304	29.1661	10.5263	11.8224	9.1705	6.6064	23.7861	7.6832	4.2098	8.0491	23.1577
Target x:CIE31	0.3127	0.3127	0.3127	0.3127	0.3127	0.4006	0.3757	0.2511	0.3404	0.2701	0.2625	0.5090	0.2181	0.4574	0.2898	0.3763	0.4714	0.1926	0.3052	0.5370	0.4459	0.3713
x: CIE31	0.3122	0.3140	0.3100	0.3115	0.3152	0.4011	0.3806	0.2474	0.3429	0.2651	0.2606	0.5147	0.2141	0.4608	0.2896	0.3769	0.4754	0.1923	0.3027	0.5386	0.4498	0.3735
Target y:CIE31	0.3290	0.3290	0.3290	0.3290	0.3290	0.3629	0.3554	0.2679	0.4265	0.2554	0.3584	0.4096	0.1945	0.3125	0.2221	0.4916	0.4420	0.1421	0.4881	0.3185	0.4751	0.2462
y: CIE31	0.3297	0.3314	0.3304	0.3301	0.3299	0.3601	0.3544	0.2678	0.4242	0.2516	0.3635	0.4037	0.1912	0.3160	0.2216	0.4913	0.4397	0.1406	0.4912	0.3191	0.4707	0.2482
Target Y	23.9725	19.0908	15.7297	12.2251	8.6461	2.5785	8.7532	4.7999	3.3689	5.9440	10.3766	7.0626	3.0173	4.6619	1.7315	10.6763	10.4858	1.6074	5.8083	2.9229	14.4801	4.7501
Y	23.9725	18.7927	15.1654	11.5271	8.0338	2.3190	8.0748	4.3852	3.0185	5.4277	9.8405	6.5457	2.7364	4.3502	1.5639	9.9760	9.9887	1.4628	5.3461	2.7553	13.8999	4.4327
Sat: L*u*v*	0.8511	1.7024	2.6317	1.2516	1.3605	27.2376	36.4368	34.3630	26.8118	39.8050	42.4264	94.5557	61.1383	75.7477	32.5471	69.5840	87.0078	67.6115	58.7036	94.2057	89.7971	63.1732
Hue: L*u*v*	154.9229	89.9359	171.2186	162.4690	31.1852	30.8314	32.1299	242.0982	104.9206	265.2766	167.7148	31.8771	259.2219	7.9093	291.7336	99.5913	49.3505	263.7490	128.5133	9.9410	66.3329	334.7620
L*	100.0000	90.9588	83.5797	74.8782	64.5737	37.2497	64.7107	49.8493	42.1412	54.7007	70.2103	59.2554	40.2706	49.6732	30.6969	70.6040	70.6408	29.6686	54.3448	40.3995	80.7291	50.0861
Gamma Point: Flat	2.2000	2.3918	2.4148	2.4065	2.3662	3.0633	4.1827	3.6185	2.4787	4.2198	3.0934	9.0574	5.1273	6.6681	3.2836	2.9143	10.0954	5.5756	2.8600	6.2091	10.3855	5.7640

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CalMAN 5 CalMAN Enthusiast for Home Video

CalMAN 5

Datagrid 1 | Datagrid 2

Simulated Meter LCD Direct View | Source | Sharp Elite ISF Day

Color Checker Calibration Data Slim 2

Color Notes

Post-Cal Notes

	White	Gray 80	Gray 65	Gray 50	Gray 35	Dark Skin	Light Skin	Blue Sky	Foliage	Blue Flower	Bluish Green	Orange	Purplish Blue	Moderate Red	Purple	Yellow Green	Orange Yellow	Blue	Green	Red
Sat: L*a*b*	0.6204	1.1593	1.8513	0.9303	0.8218	18.7440	21.8571	21.1287	24.3426	27.5350	33.4025	64.9653	42.8658	46.0133	31.0631	61.3556	67.4832	55.9636	52.4745	57.06
Hue: L*a*b*	164.7903	113.9296	178.4161	170.8863	42.9229	48.2994	48.6241	262.6798	122.7681	292.8029	175.6531	59.1127	288.5398	19.3151	316.5401	114.7720	75.9567	296.9754	140.9788	26.01
ΔE 2000	0.8943	1.2856	2.7354	1.8713	1.9329	1.8356	2.1905	2.3949	2.2349	2.2533	1.5523	2.4757	1.7313	1.7813	1.3230	1.5597	1.4886	1.1909	1.8820	1.047
dE2000 LuminanceCompensated	0.8943	1.2375	2.6131	1.3438	1.0373	0.8165	1.4478	1.3305	0.6898	1.1012	1.2019	1.8120	0.6255	0.8422	0.0729	0.1357	1.0418	0.3478	0.4536	0.209
ΔE 1976:L*u*v*	0.8511	1.7930	2.9008	2.1911	2.4166	2.3631	3.1746	2.5055	3.1548	2.9023	2.8180	4.3853	2.0968	2.8442	2.2136	2.8697	2.9167	2.9388	2.3024	2.423
ΔE 1976:L*a*b*	0.6204	1.2886	2.2173	2.0248	2.1597	2.1639	2.6944	2.4323	2.8037	2.4610	2.6401	3.5029	1.9542	2.3289	1.8427	2.4876	2.1710	1.7639	2.0810	1.457
ΔE 1994 L*:±	0.0000	-0.5626	-1.2202	-1.7984	-1.9972	-1.9166	-2.1996	-2.0134	-2.1679	-2.1742	-1.5380	-1.9310	-1.8627	-1.5326	-1.6117	-1.9809	-1.4143	-1.4571	-1.9714	-1.121
ΔE 1994 Sat:±	0.6204	1.1593	1.8513	0.9303	0.8218	-0.5372	1.0392	-0.1402	-1.5899	0.5388	1.9196	-0.4863	-0.1473	-1.0134	-0.8934	-1.4824	-0.2522	-0.9319	-0.2732	-0.865
ΔE 1994 Hue:±	0.0000	0.0000	0.0000	0.0000	0.0000	-0.8490	-1.1583	-1.3574	-0.7958	-1.0192	-0.9590	-2.8818	-0.5723	1.4310	-0.0055	-0.2588	-1.6278	0.3461	0.6077	0.343
Signed dE94 L LuminanceCompensated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
Signed dE94 C LuminanceCompensated	0.6204	1.1593	1.8513	0.9303	0.8218	0.1327	1.5915	0.4909	-0.6577	1.3442	2.4714	1.1511	1.2309	0.0590	0.1727	-0.0772	0.8357	0.8273	1.1648	0.263
Signed dE94 H LuminanceCompensated	0.0000	0.0000	0.0000	0.0000	0.0000	-0.8341	-1.1428	-1.3371	-0.7814	-1.0038	-0.9506	-2.8455	-0.5631	1.4146	-0.0054	-0.2558	-1.6146	0.3407	0.5994	0.339

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CalMAN 2016 CalMAN Enthusiast for Home Video

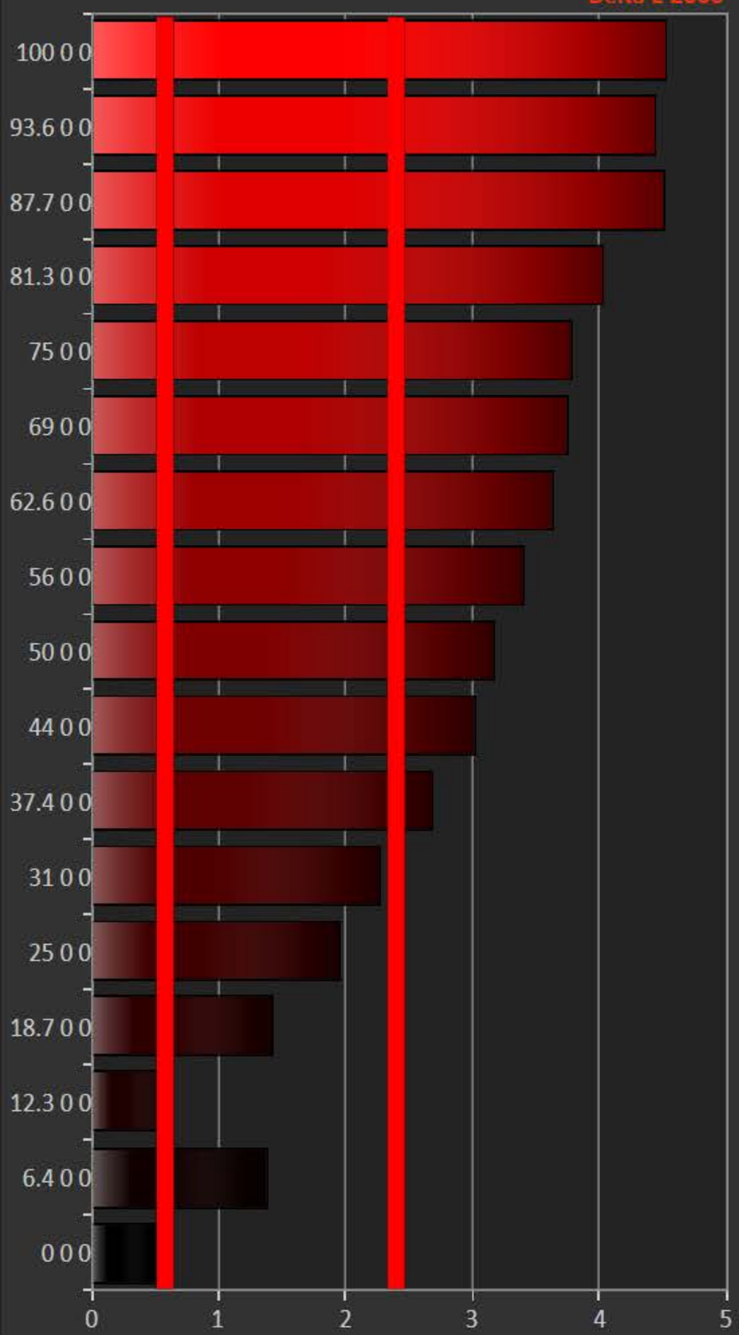
CalMAN

3D Color Cube LUT | 3D Cube LUT Minimal

Simulated Meter Simulated | Source | Direct Display Control

3D Color Cube LUT Calibration - Full

Delta E 2000



Go to Minimal 3D LUT

Summary

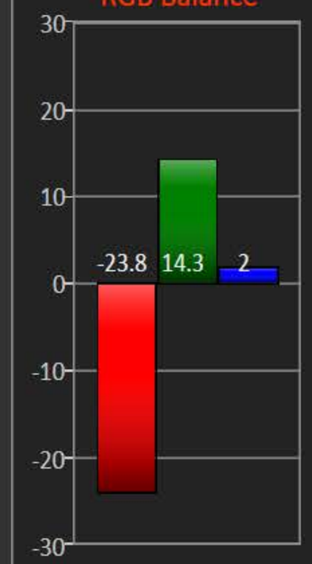
Delta C
3.13 Avg 16.65 Max

Delta H
0.59 Avg 1.9 Max

Delta L
2.2 Avg 4.47 Max

Delta E
2.46 Avg 4.53 Max
@ 100 0 0

RGB Balance



Triplet
235, 16, 16

Y tgt 21.26587
17.57197

x tgt 0.64
0.63512

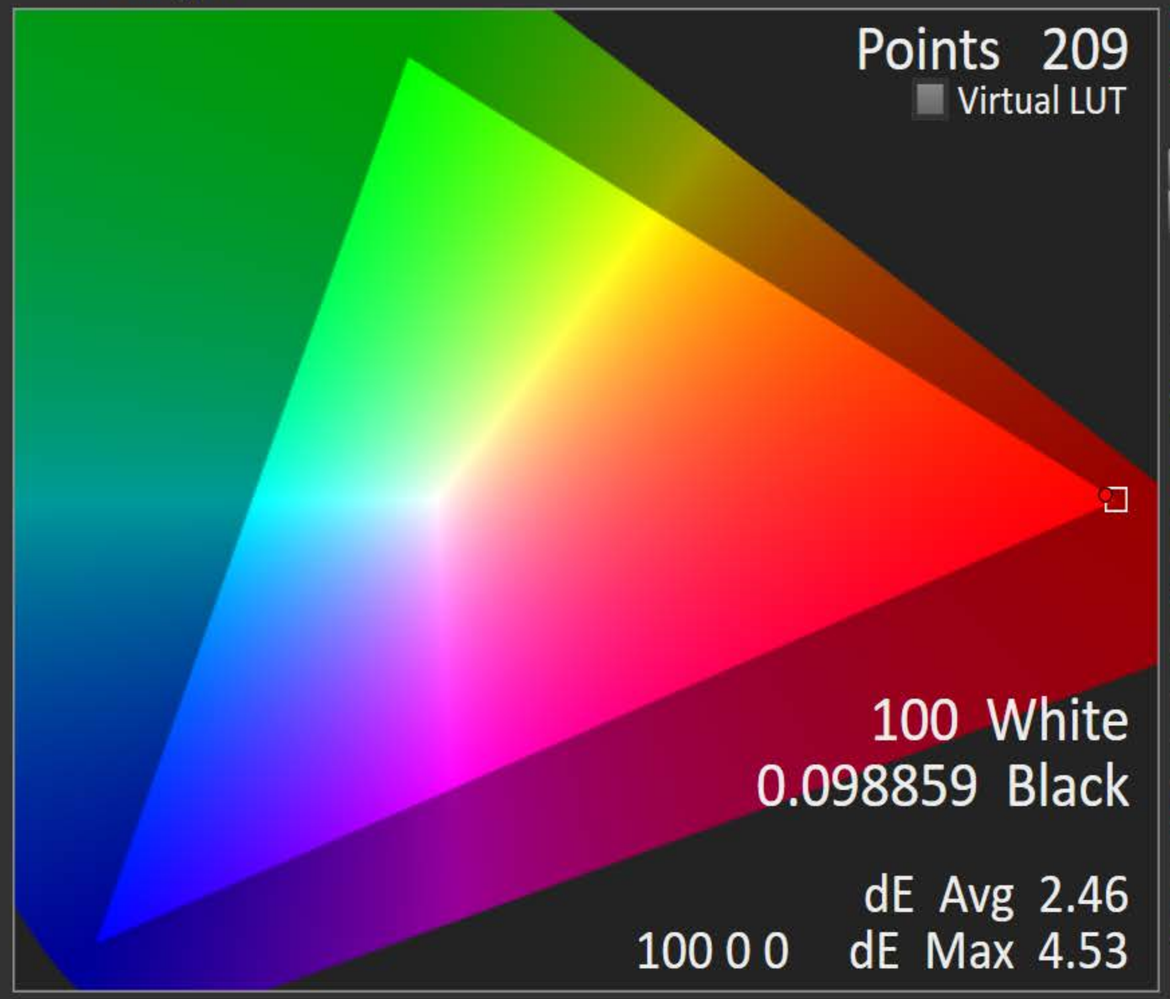
y tgt 0.33
0.33278

dC -8.52
dH 0.49
dL -4.27

dE 4.53

100 0 0

Datagrid



100 0 0 dE 4.53

u'v' CIE

Color Bars

Big Comparator

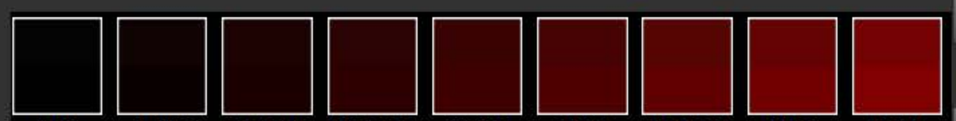
Red | Green | Blue | Cyan | Magenta | Yellow | White | Ramp

Inner Data Points

Luminance Level Points: 17 Points per side, SMPTE (0-100), 6.25% steps

Display Slot

Selected LUT



CAL 3dLUT Full

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HOME | Prepare | Setup | PreCal Read | DyRnge | Calibrate | Gry | Sat | Lum | CCk | LUT | PostCal Read | Analyze | Chrts | Final Check | 3dLUT | Notes

Ramp | 0 | 0 | 0 0 0 | 6.4 0 0 | 12.3 0 0 | 18.7 0 0 | 25 0 0 | 31 0 0 | 37.4 0 0 | 44 0 0 | 50 0 0 | 56 0 0 | 62.6 0 0 | 69 0 0 | 75 0 0 | 81.3 0 0 | 87.7 0 0 | 93.6 0 0 | 100 0 0

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CalMAN 2016 CalMAN Enthusiast for Home Video

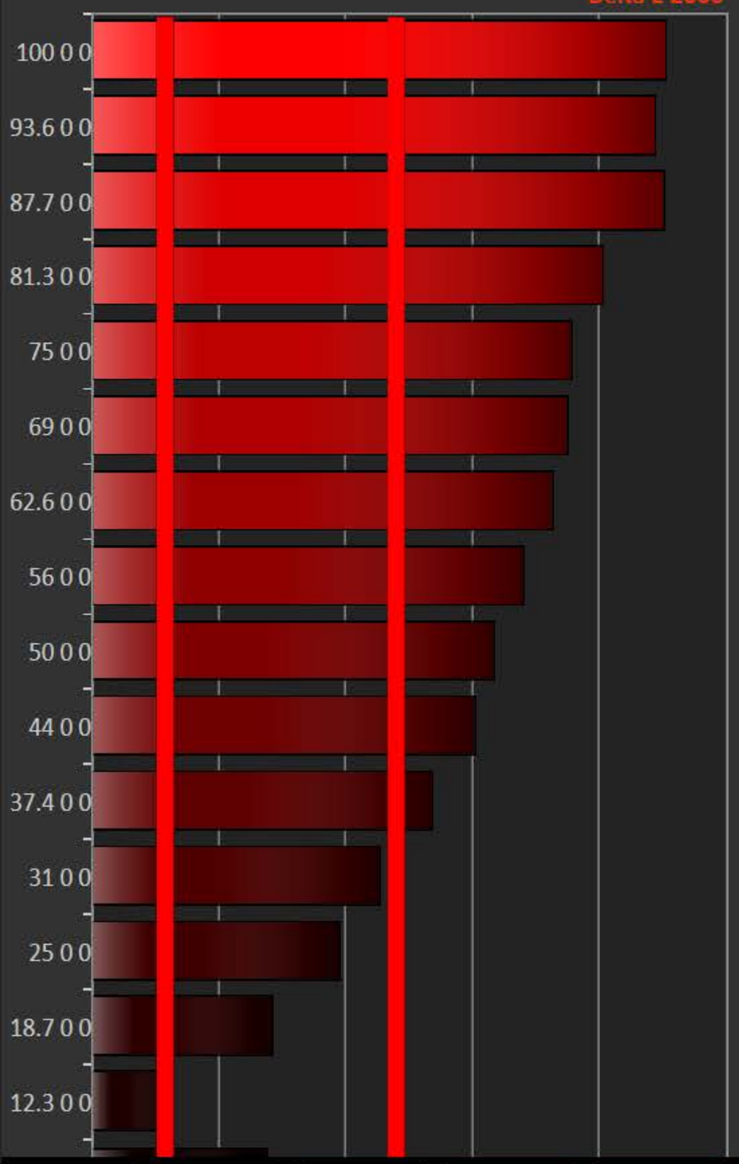
CalMAN

3D Color Cube LUT | 3D Cube LUT Minimal

Simulated Meter Simulated | Source | Direct Display Control

3D Color Cube LUT Calibration - Full

Delta E 2000



Go to Minimal 3D LUT

Summary

Delta C
3.13 Avg 16.65 Max

Delta H
0.59 Avg 1.9 Max

Delta L
2.2 Avg 4.47 Max

Delta E
2.46 Avg 4.53 Max
@ 100 0 0

RGB Balance

Triplet
235, 16, 16

Y tgt 21.26587
17.57197

x tgt 0.64
0.63512

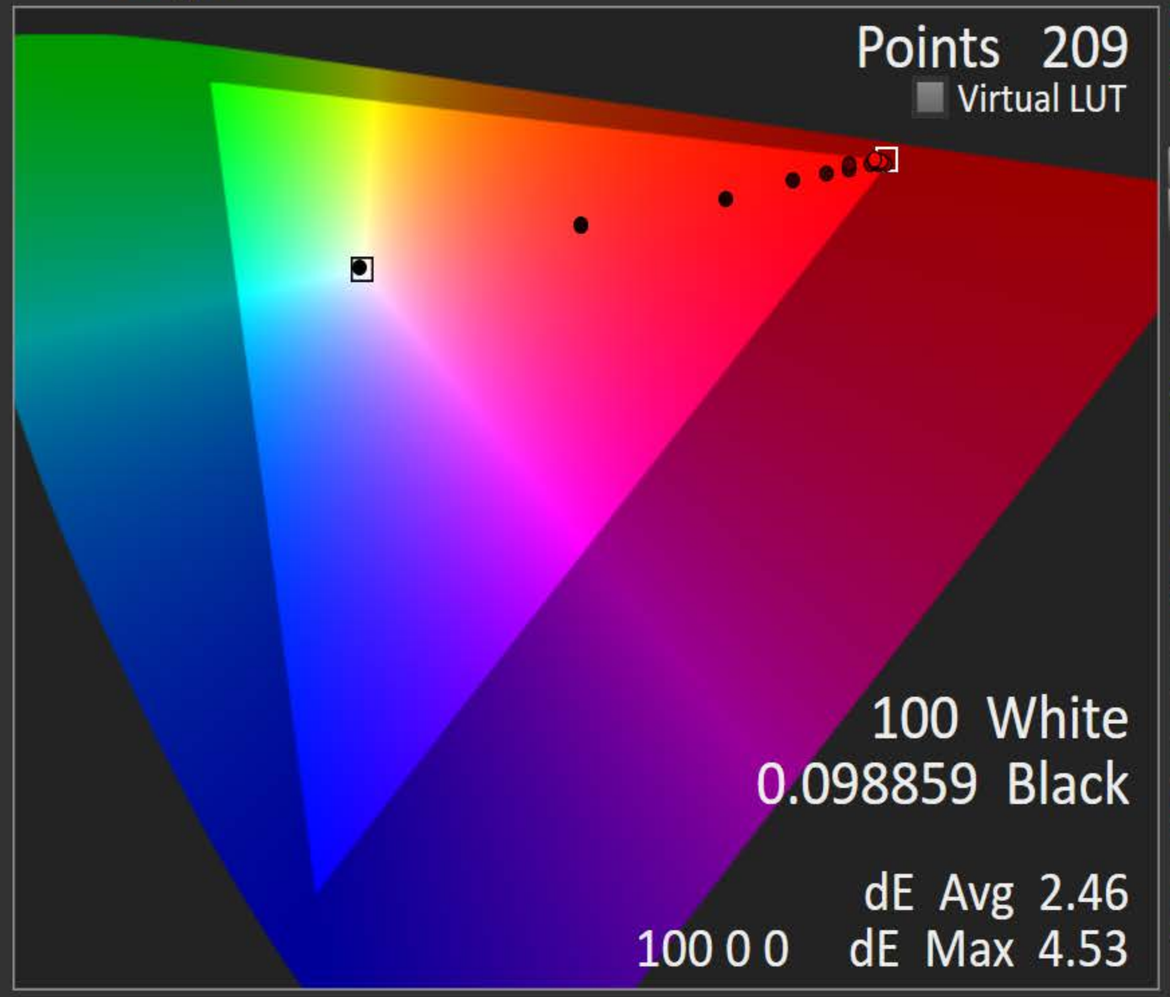
y tgt 0.33
0.33278

dC -8.52
dH 0.49
dL -4.27

dE 4.53

100 0 0

Datagrid



100 0 0 dE 4.53

u'v' CIE

Color Bars

Big Comparator

Red | Green | Blue | Cyan | Magenta | Yellow | White

Ramp

Inner Data Points | Luminance Level Points

CAL 3dLUT Full

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HOME | Prepare | Setup | PreCal Read | DyRnge | Calibrate | Gry | Sat | Lum | CCk | LUT | PostCal Read | Analyze | Chrts | Final Check | 3dLUT

Ramp | 0 | 0 | 0 0 0 | 6.4 0 0 | 12.3 0 0 | 18.7 0 0 | 25 0 0 | 31 0 0 | 37.4 0 0 | 44 0 0 | 50 0 0 | 56 0 0 | 62.6 0 0 | 69 0 0 | 75 0 0 | 81.3 0 0 | 87.7 0 0 | 93.6 0 0 | 100 0 0

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CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

3D Color Cube LUT | 3D Cube LUT Minimal

Simulated Meter Simulated | Source | Direct Display Control

3D Color Cube LUT Calibration - Minimal

Go to Full 3D LUT

Datagrid

View charts in the Analysis section

Summary

Points 146

Black 0.098735

White 82.14

dE Avg 1.29

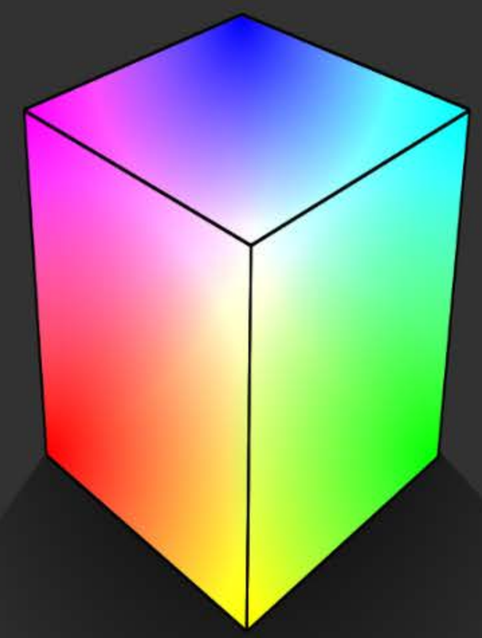
dE Max 1.95 @ 14.6 0 0

dE 1.13 @ 100 100 100

dL 0 dH 0 dC 1.15

RGB Balance

R 1.3 G -0.2 B -2.3



Action Button

Options

- Transparent Background
- Auto Stop I/O

CAL 3dLUT Mnml

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HOME

Prepare | Setup | PreCal Read | DyRnge

Calibrate | Gry | Sat | Lum | CCk | LUT

PostCal Read

Analyze

∫ Chrts

Final Check

3dLUT

Notes

Luminance Level Points: 8 Points per side, SMPTE (0-100)

Inner Data Points | Display Slot | Selected LUT

Ramp | 100 | 100 | 0 100 100 | 29 100 100 | 44 100 100 | 73 100 100 | 100 100 100

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CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

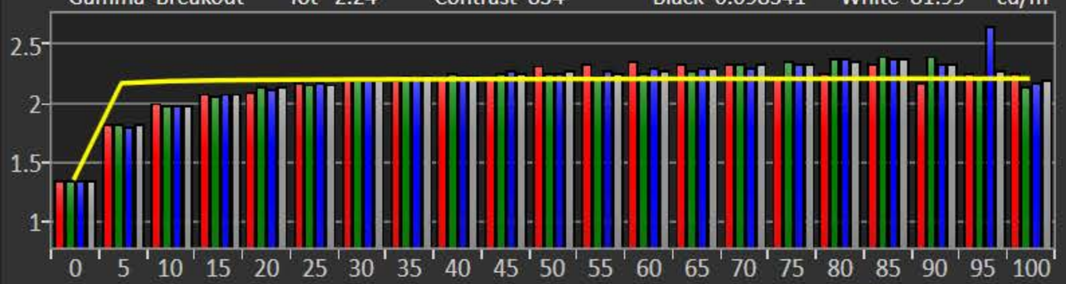
Post-Cal Readings

Simulated Meter Simulated | Source | Direct Display Control

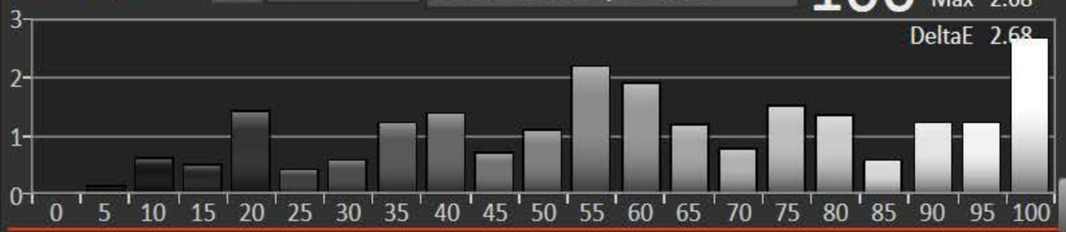
Post-Calibration Readings

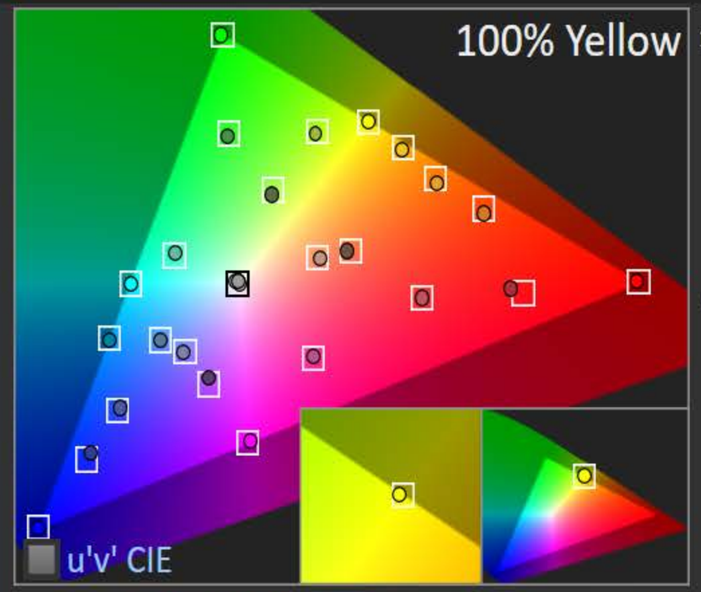
4/1/2017 Calibration

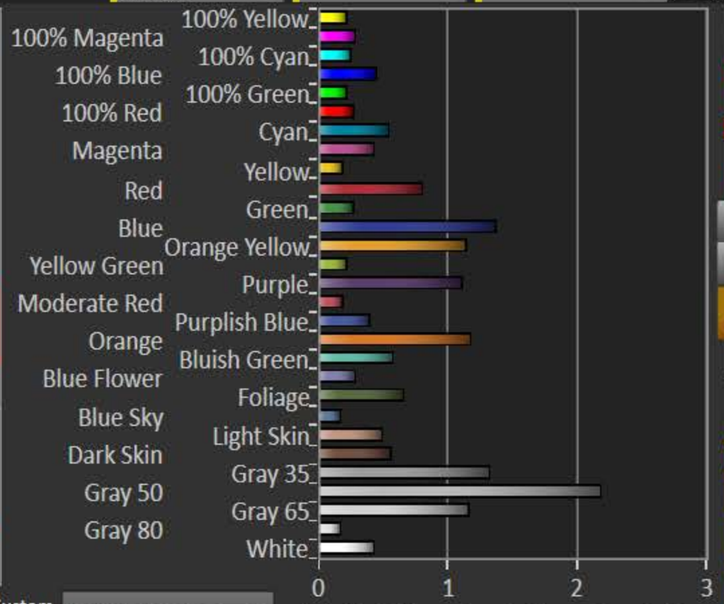
Gamma Breakout Tot 2.24 Contrast 834 Black 0.098341 White 81.99 cd/m²



1 Grayscale | Detail Charts | 21 Point 5% step 0-100% | 100 | Avg 1.16 Max 2.68



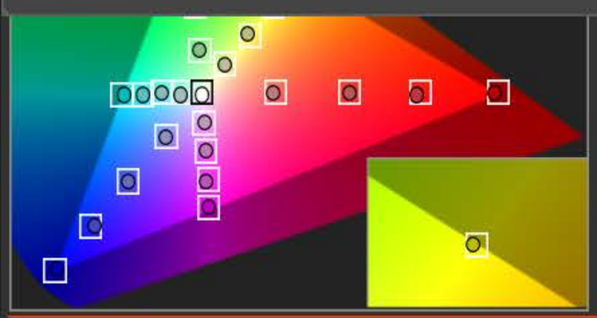


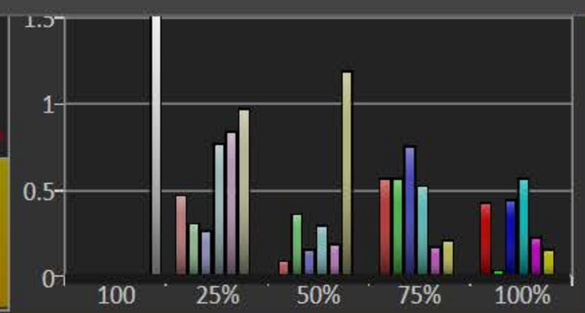


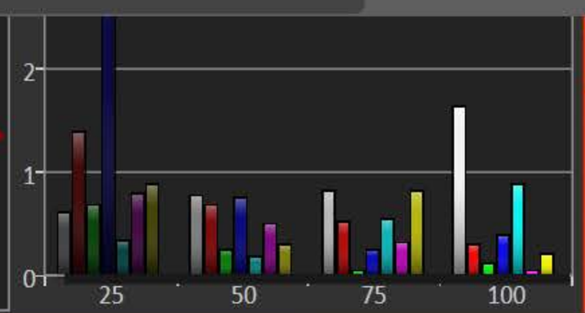
4 Color Checker | Detail Charts | Add Custom Color Set → | SG Fleshtones | DeltaE 0.22 Avg 0.61 Max 2.18

Select Colors

Comparator







LUT Calibration
Points 125
Avg dE2000 0
Max dE2000 0
@ 0 0 0

ISF Day

Post-Cal Readings

Use calibration layout tabs for additional detailed readings

Contrast
Brightness
Backlight

Setup Values

TV Gamma
Color
Tint

Red Green Blue
Gain
Cut

Notes

Display Slot

Use [···] mid-screen or below to read all series or select one from the individual series above

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CAL PstCal Read | Back | Next | PreCal Read | HOME | Prepare | Setup | PreCal Read | DyRnge | Calibrate | Gry | Sat | Lum | CCk | LUT | PreCal Read | Analyze | Gry | Sat | Lum | CCk | LUT | Final Check | PstCal

CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

Post-Calibration

Simulated Meter Simulated | Source | Direct Display Control

Post-Cal Grayscale Detail

Comparator

DeltaE 2000 Grayscale — Contrast 824 — 75 dE 1.09 — 0 Avg — 2.26 Max

Luminance cd/m² — Target 43.00148 — 41.589805 — Black 0.098297 — 81.03 White

POST-CAL

75

Post-Cal Readings — RGB Balance

-2.9 -3.3 -1.9

Gamma Target 2.2 — 2.32 — 2.2 Total

EOTF

CCT — 6551 — 6502 Avg

ANL PstCal Gray Back Next PreCal # Data HOME Prepare Setup PreCal Read Calibrate Gry PostCal Read Analyze PreCal Sat Lum CCk LUT Final Check PstCal Gray Notes

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

Pre-Cal # Datagrid Back Next

CalMAN 2016 CalMAN Enthusiast for Home Video

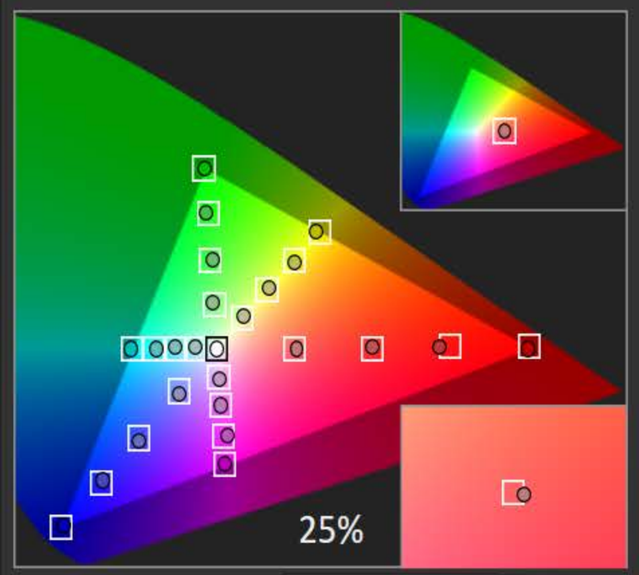
CalMAN

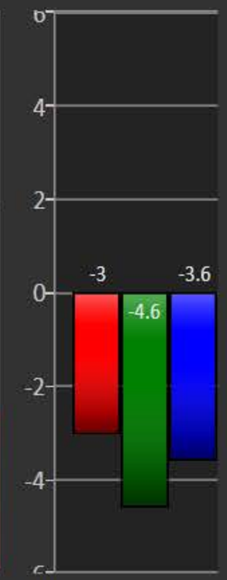
Post-Calibration

Simulated Meter Simulated | Source | Direct Display Control

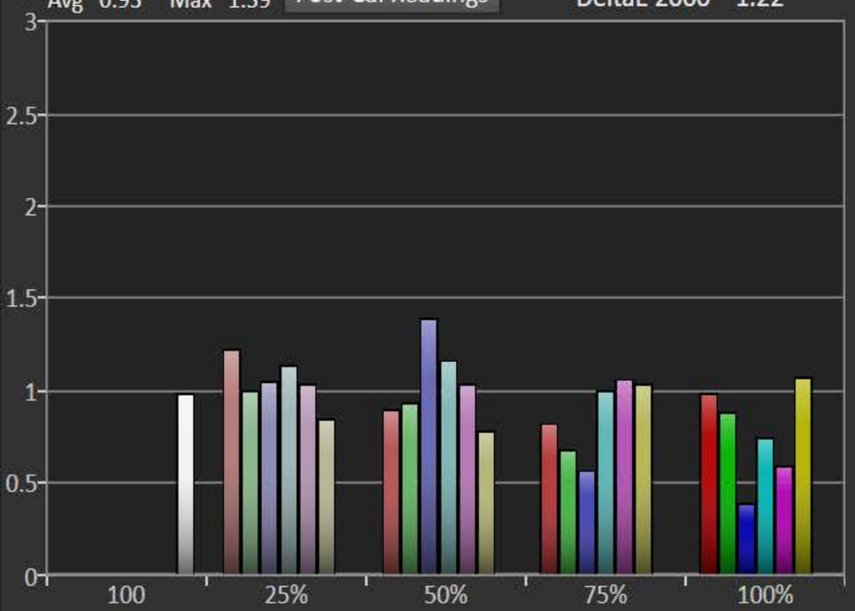
Post-Cal Saturation Sweeps Detail

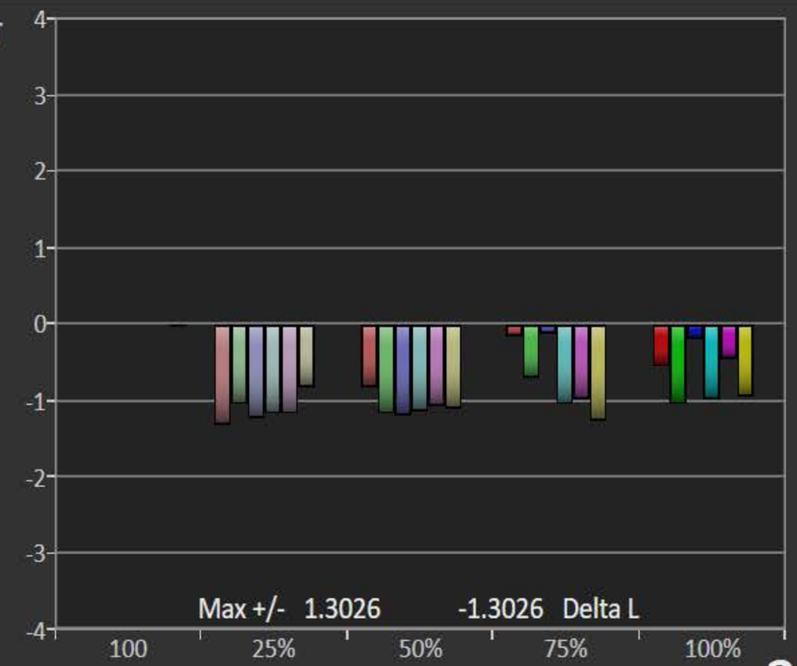
Comparator





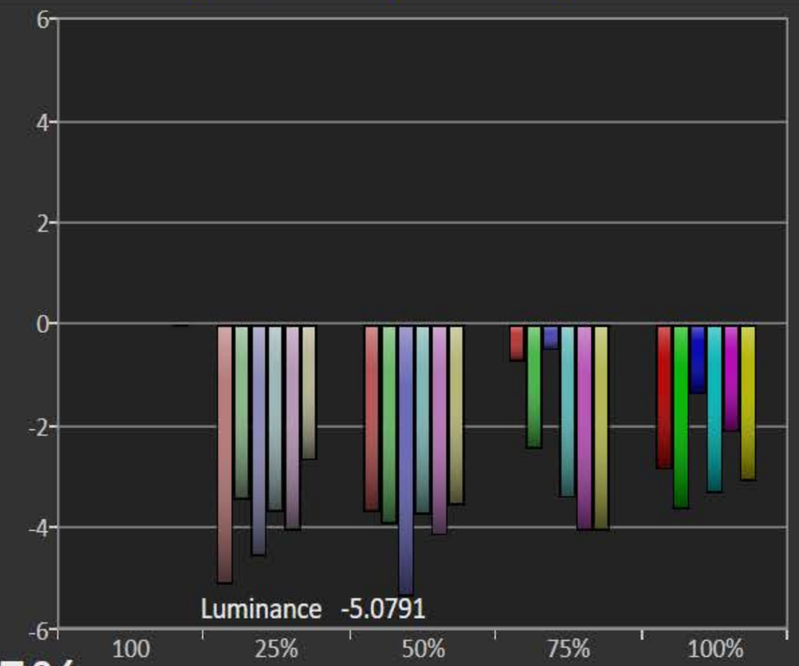
Avg 0.93 Max 1.39 | Post-Cal Readings | DeltaE 2000 1.22



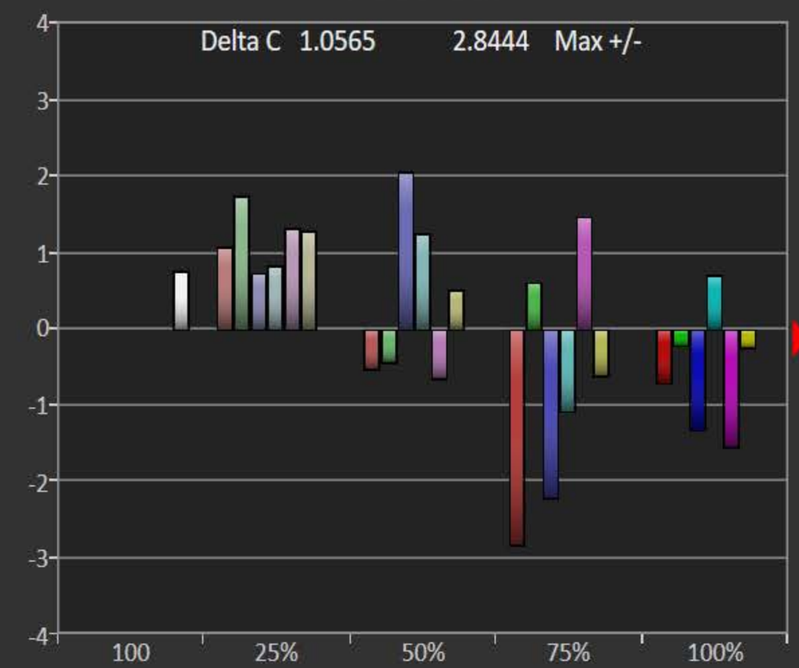


Post-Cal

25%



Post-Cal



25% | 50% | 75% | 100%

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CalMAN 2016 CalMAN Enthusiast for Home Video

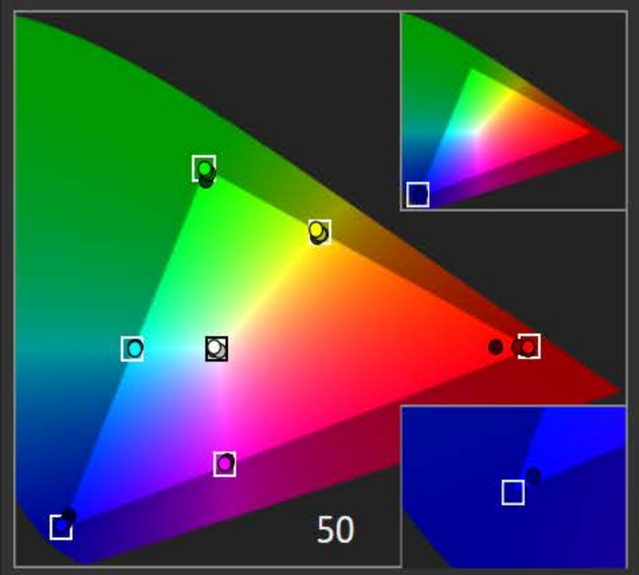
CalMAN

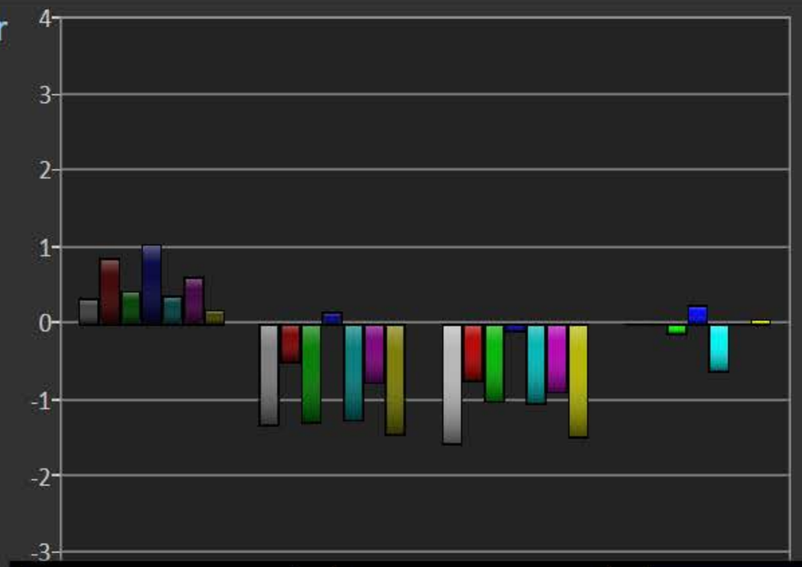
Post-Calibration

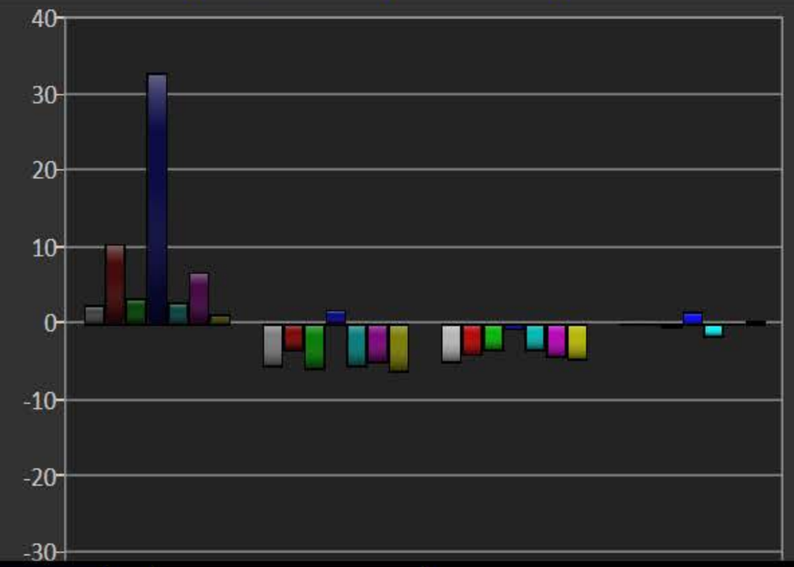
Simulated Meter Simulated | Source | Direct Display Control

Post-Cal Gamut Luminance Detail

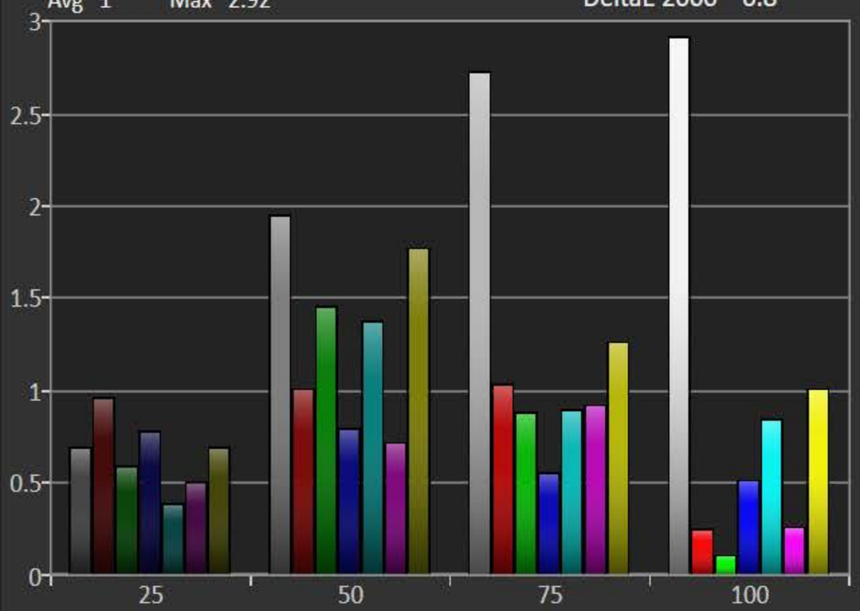
Comparator



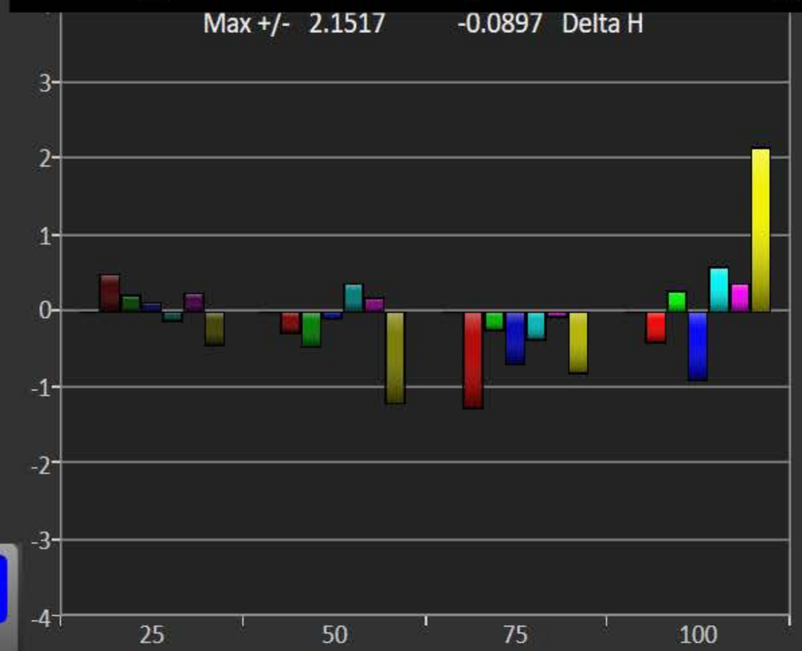




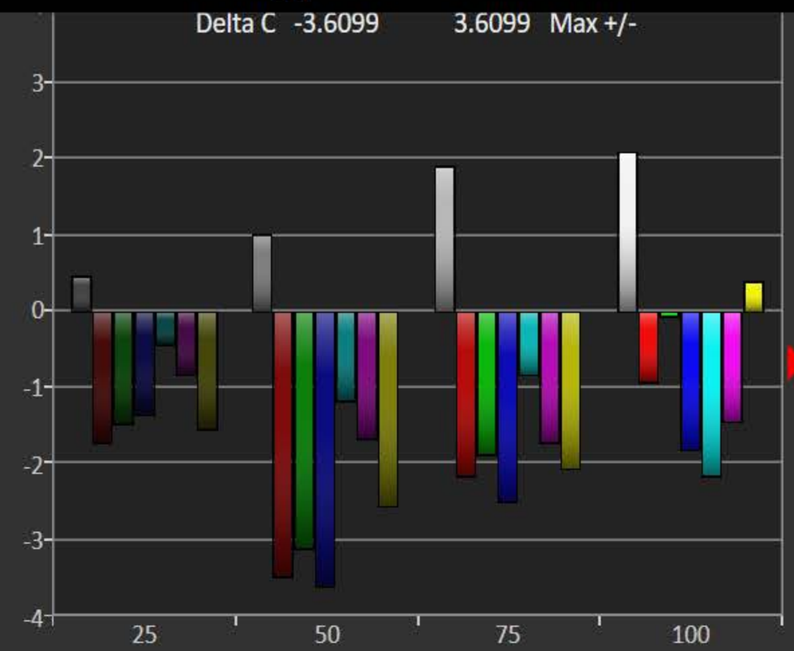
Avg 1 Max 2.92 DeltaE 2000 0.8



Max +/- 2.1517 -0.0897 Delta H



Delta C -3.6099 3.6099 Max +/-



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CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

Post-Calibration

Simulated Meter Simulated | Source | Direct Display Control

Post-Cal Color Checker Detail

Post-Cal • White

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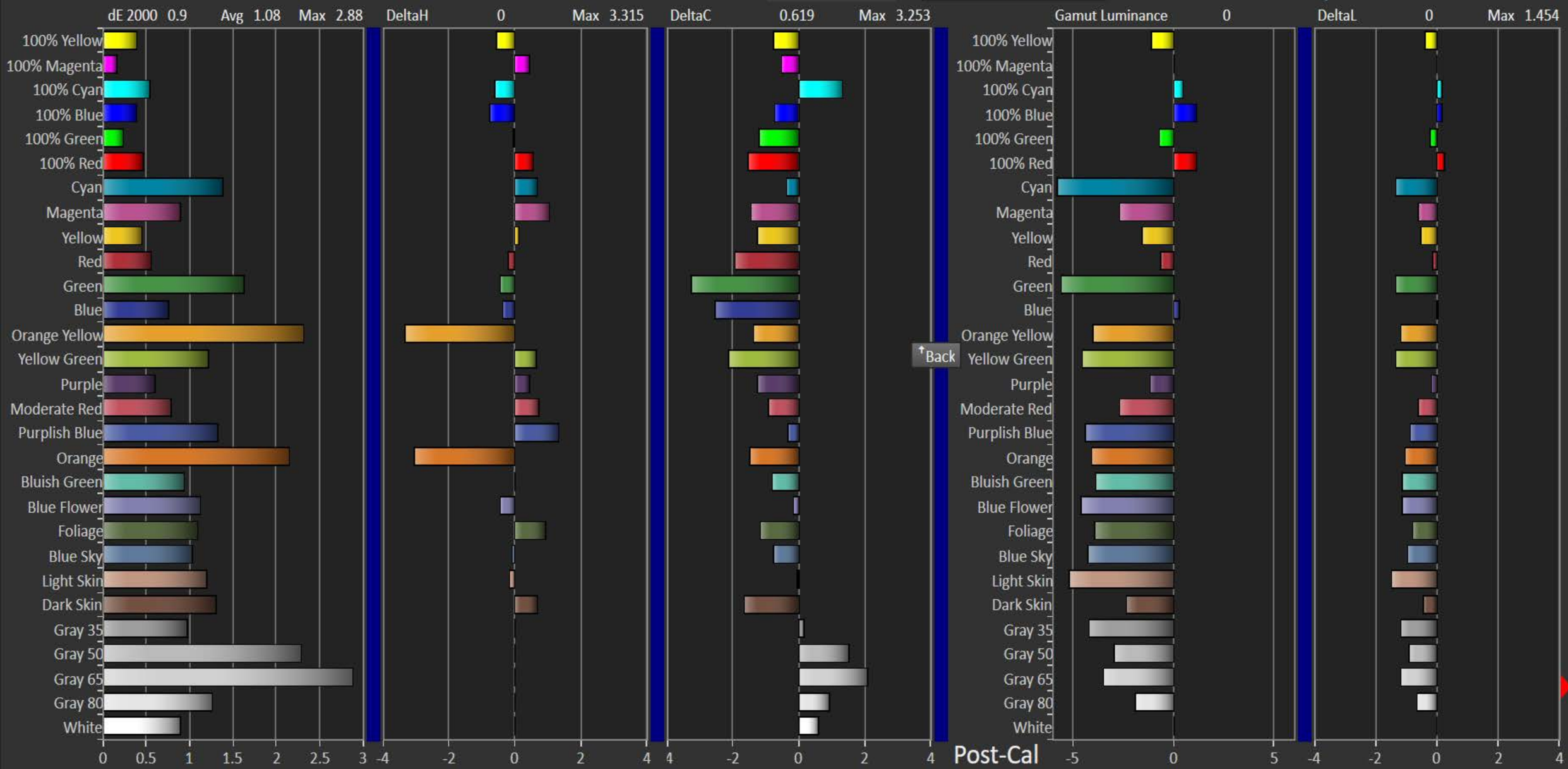
Post-Cal Readings

CIE Chart

Comparator

Post-Cal



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PstC
CChk
Notes

White | Gray 80 | Gray 65 | Gray 50 | Gray 35 | Dark Skin | Light Skin | Blue Sky | Foliage | Blue Flower | Bluish Green | Orange | Purplish Blue | Moderate Red | Purple | Yellow Green | Orange Yellow | Blue | Green | Red | Yellow | Magenta | Cyan

Pre-Cal | # Datagrid

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CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

Post-Calibration

Simulated Meter Simulated | Source | Direct Display Control

Post-Cal Color Checker Detail

Post-Cal • White

Notes

Post-Cal Readings

CIE Chart

Comparator

Post-Cal

dE 2000 0.9 Avg 1.08 Max 2.88 | DeltaH 0 Max 3.315 | DeltaC 0.619 Max 3.253

100% Yellow
100% Magenta
100% Cyan
100% Blue
100% Green
100% Red
Cyan
Magenta
Yellow
Red
Green
Blue
Orange Yellow
Yellow Green
Purple
Moderate Red
Purplish Blue
Orange
Bluish Green
Blue Flower
Foliage
Blue Sky
Light Skin
Dark Skin
Gray 35
Gray 50
Gray 65
Gray 80
White

Back

White | Gray 80 | Gray 65 | Gray 50 | Gray 35 | Dark Skin | Light Skin | Blue Sky | Foliage | Blue Flower | Bluish Green | Orange | Purplish Blue | Moderate Red | Purple | Yellow Green | Orange Yellow | Blue | Green | Red | Yellow | Magenta | Cyan | 100% Red | 100 Gre

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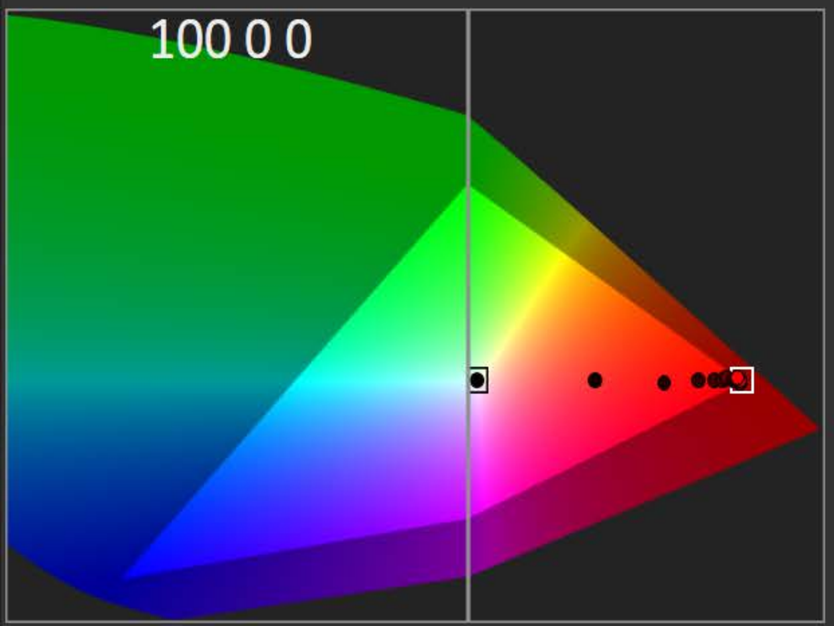
CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

DeltaE DeltaL Lminance | DeltaE DeltaH DeltaC

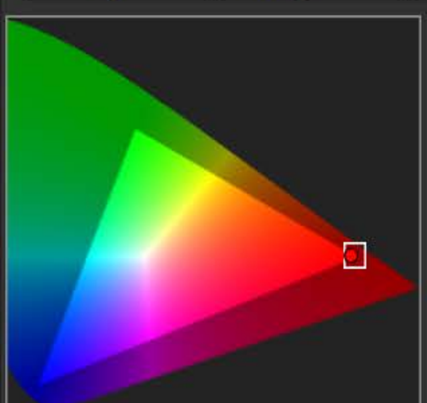
Simulated Meter Simulated | Source | Direct Display Control

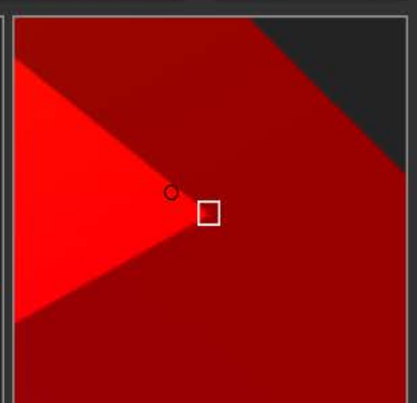
3D Color Cube LUT Full Calibration Detail 1



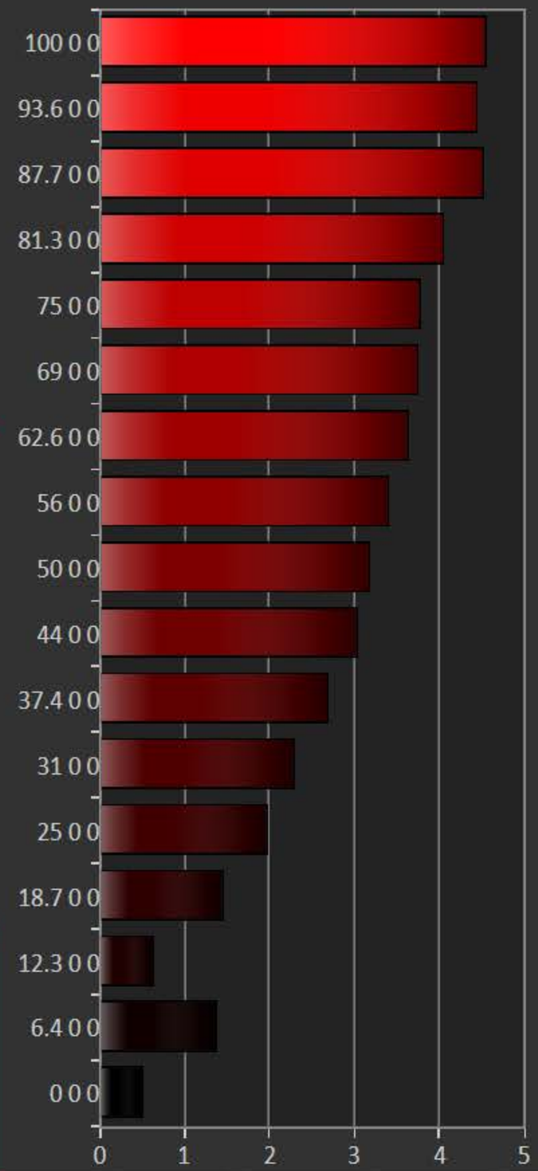
Red | Green | Blue | White

Cyan | Magenta | Yellow | Charts 2

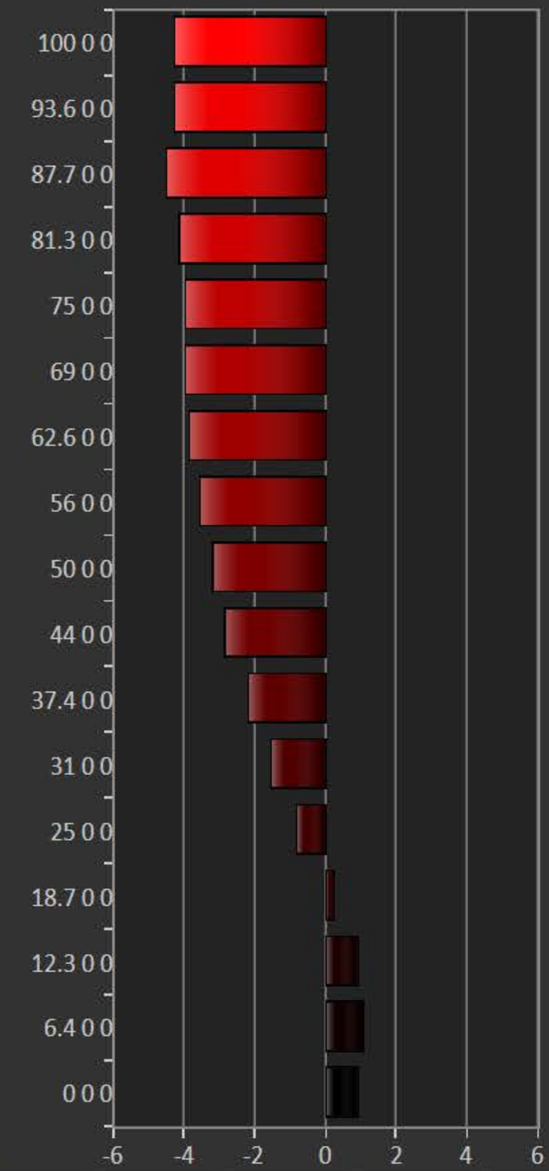




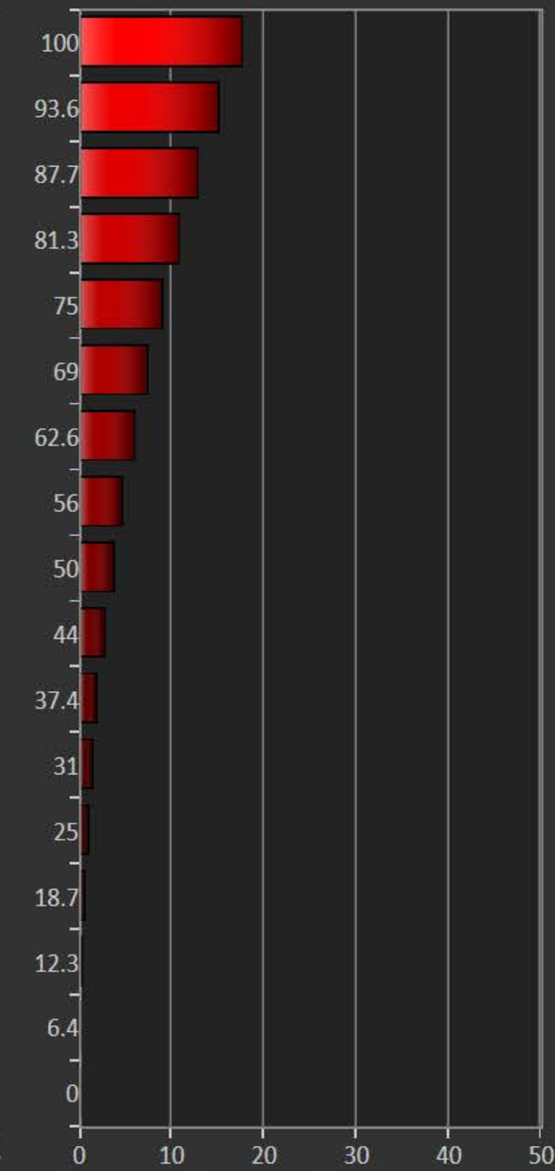
ΔE 2000 4.53 Avg 2.46 Max 4.53



Delta L -4.27 Avg -1.73 Max 4.47



Luminance 17.57197



ANL

3dLUT

Detail

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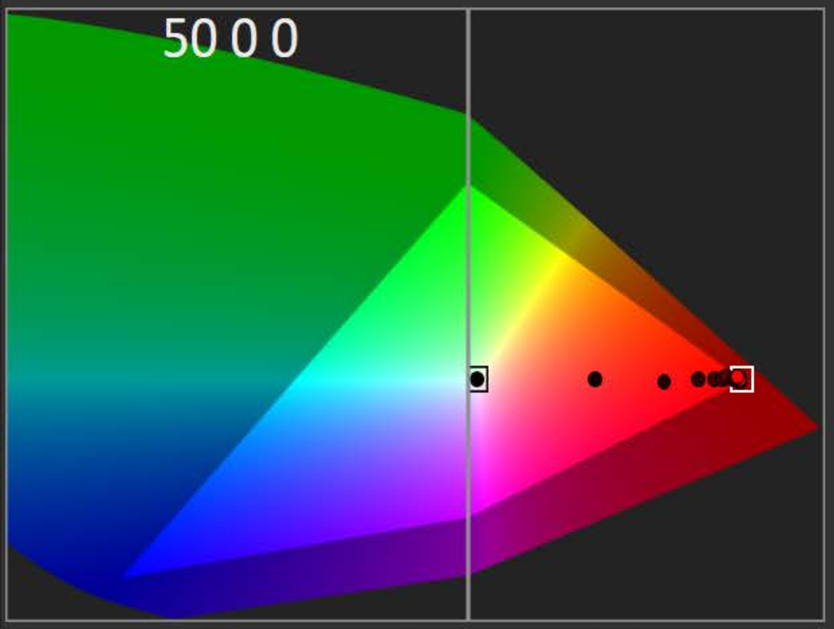
CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

DeltaE DeltaL Luminance | DeltaE DeltaH DeltaC

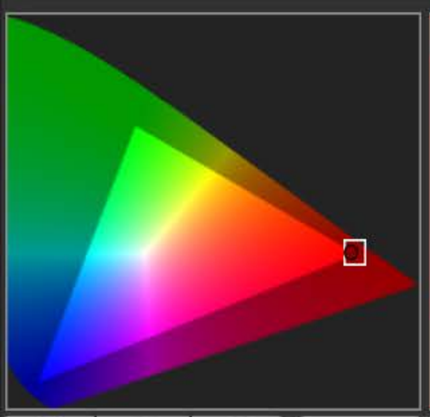
Simulated Meter Simulated | Source | Direct Display Control

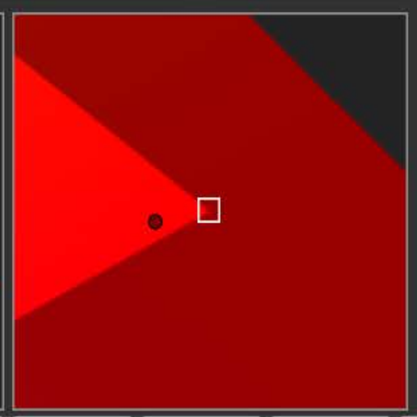
3D Color Cube LUT Full Calibration Detail 2

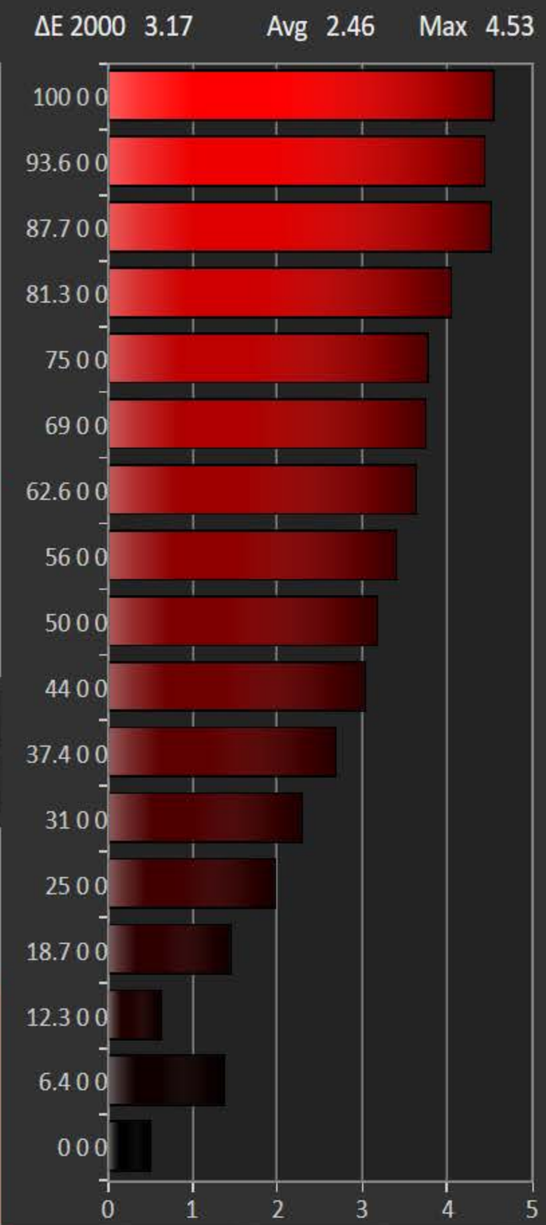


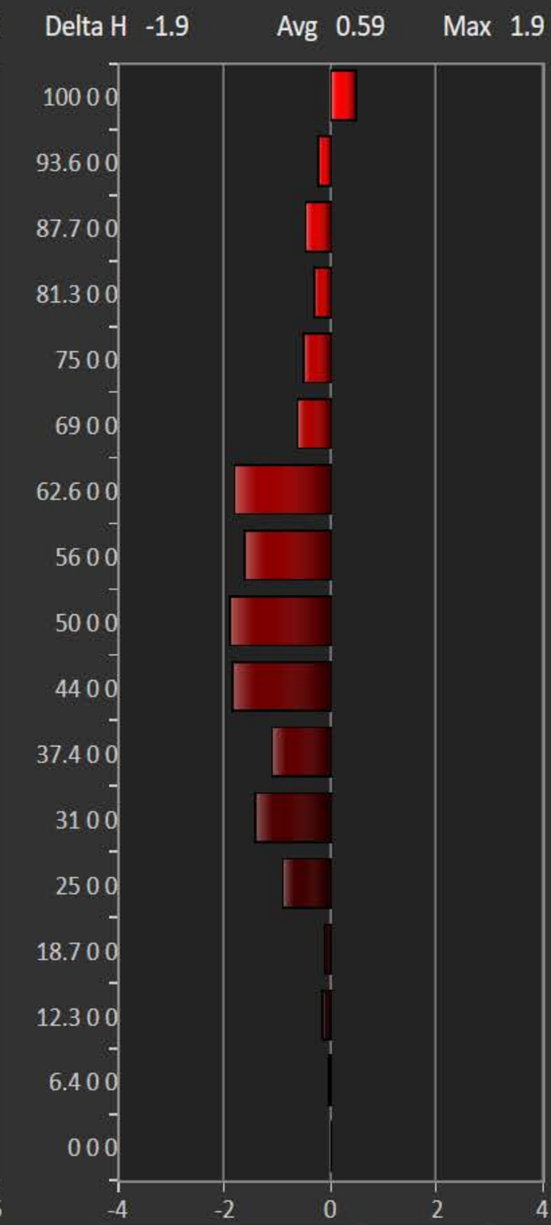
Red | Green | Blue | White

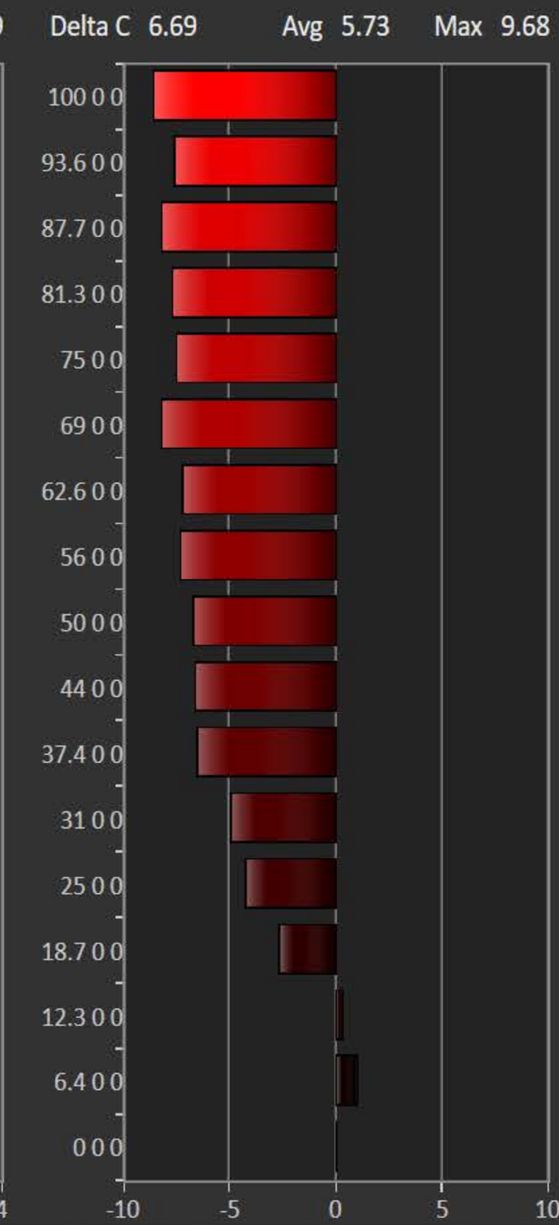
Cyan | Magenta | Yellow | Charts 1











ANL 3dLUT Detail

Back | Next | Calib | HOME | Prepare | Setup | PreCal Read | Calibrate | Calib | PostCal Read | Analyze | ∫ Gry | ∫ Sat | ∫ Lum | ∫ CCk | Calib | chrts1 | Final Check | CAL | Calib

Ramp	0	0	0 0 0	6.4 0 0	12.3 0 0	18.7 0 0	25 0 0	31 0 0	37.4 0 0	44 0 0	50 0 0	56 0 0	62.6 0 0	69 0 0	75 0 0	81.3 0 0	87.7 0 0	93.6 0 0	100 0 0

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CalMAN 2016 CalMAN Enthusiast for Home Video

CalMAN

DeltaE DeltaL Lminance | DeltaE DeltaH DeltaC

Simulated Meter Simulated | Source | Direct Display Control

3D Color Cube LUT Minimal Calibration - Charts1

Comparator

0 0 44

Red | Green | Blue | White

Cyan | Magenta | Yellow | Charts 2

ΔE 2000 2.18 Avg 2.24 Max 2.72

Delta L -1.31 Avg -1.6 Max 2.99

Luminance 1.01999

0 0 100 | 0 0 87.7 | 0 0 73 | 0 0 58.4 | 0 0 44 | 0 0 29

100 | 87.7 | 73 | 58.4 | 44 | 29

ANL

3dLUT

Detail

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PostCal Read

0 0 0 | 0 0 14.6 | 0 0 29 | 0 0 44 | 0 0 58.4 | 0 0 73 | 0 0 87.7 | 0 0 100

0 | 0 | Ramp | 0 0 0 | 0 0 14.6 | 0 0 29 | **0 0 44** | 0 0 58.4 | 0 0 73 | 0 0 87.7 | 0 0 100

Final Check

CAL

Calib

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CalMAN 5 CalMAN Enthusiast for Home Video

CalMAN 5

Final Check

Simulated Meter LCD Direct View | Source | Direct Display Control

Session Final Check

3/12/2015 Calibration

AV Mode - ISF Day

Contrast Verification

Data Points: select Clipping or Clipping with Peak White: Clipping with Peak White

① Adjust the Backlight, Brightness and Contrast controls to optimize the white level so it doesn't clip any of the primaries.

Gamma Level Verification

Data Points: select a full set of grayscale points, e.g. 11: Clipping with Peak White

② Check / adjust the gamma level across the full grayscale. Use the Backlight, Brightness, Contrast and Gamma controls to make this adjustment.

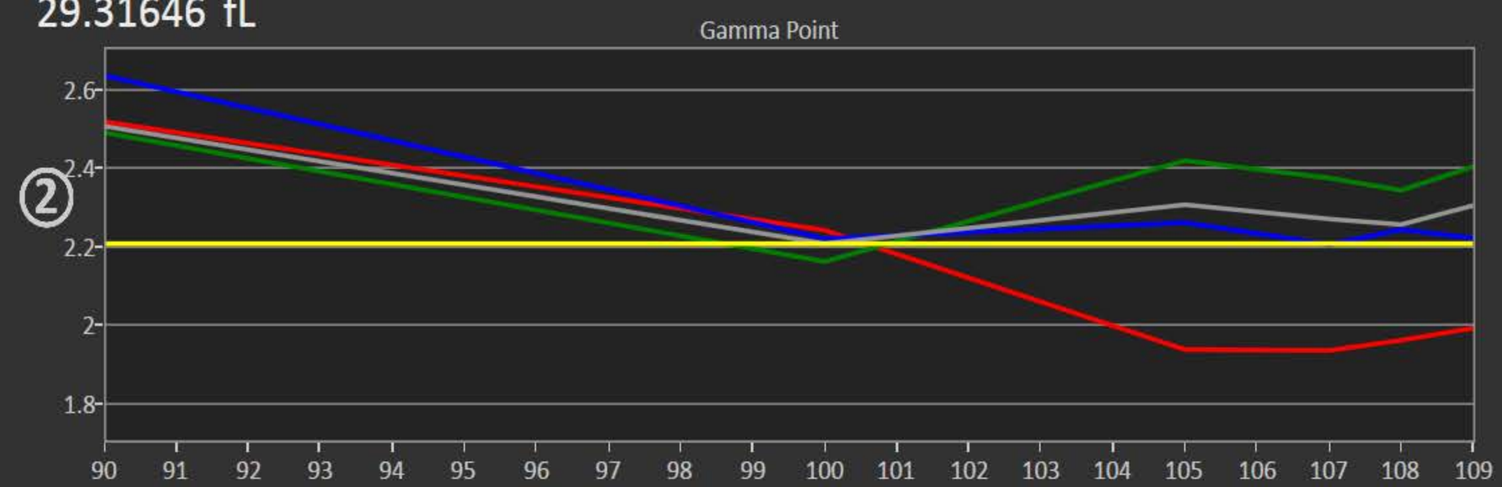
Post-Calibration Summary

Grayscale dE	Avg	1.85	Saturation dE	Avg	1.34
	Max	3.97		Max	2.34
Luminance dE	Avg	1.21	Color Checker dE	Avg	1.5
	Max	2.73		Max	3
Color Cube LUT dE	Avg	3.47	Full	Gamma Target	2.2
Use Minimal layout data	Max	4.79		Total	2.28
LUT values come from calibration Full layout, or Minimal layout if checked				CCT Target	6503
				Avg	6505
White	23.6	fL	Black 0.02895	Cntr Ratio	815

109

Gamma 2.3

29.31646 fL



Post-Calibration Notes

Notes

Save

Contrast		TV Gamma	
Brightness		Color	
Backlight		Tint	

	Red	Green	Blue
Gain			
Cut			

ANL Final Check

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Setup

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DyRnge

Calibrate

Gry

Sat

Lum

CCk

LUT

PostCal Read

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Gry

Sat

Lum

CCk

LUT

Final Check

Final

90 100 105 107 108 109

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Save

CalMAN 5 CalMAN Enthusiast for Home Video

CalMAN 5

Grayscale Datagrids

Simulated Meter LCD Direct View | Source | Direct Display Control

Pre-Cal Multi-Point Grayscale Data

Pre-Cal

	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
RGB Triplet	27, 27, 27	38, 38, 38	49, 49, 49	60, 60, 60	71, 71, 71	82, 82, 82	93, 93, 93	104, 104, 104	115, 115, 115	126, 126, 126	136, 136, 136	147, 147, 147	158, 158, 158	169, 169, 169	180, 180, 180	191, 191, 191	202, 202, 202	213, 213,
Red index	27.0000	38.0000	49.0000	60.0000	71.0000	82.0000	93.0000	104.0000	115.0000	126.0000	136.0000	147.0000	158.0000	169.0000	180.0000	191.0000	202.0000	213.0000
Green index	27.0000	38.0000	49.0000	60.0000	71.0000	82.0000	93.0000	104.0000	115.0000	126.0000	136.0000	147.0000	158.0000	169.0000	180.0000	191.0000	202.0000	213.0000
Blue index	27.0000	38.0000	49.0000	60.0000	71.0000	82.0000	93.0000	104.0000	115.0000	126.0000	136.0000	147.0000	158.0000	169.0000	180.0000	191.0000	202.0000	213.0000
X	0.3457	0.8070	1.5507	2.5551	3.8882	5.5614	7.6875	10.1106	13.0989	16.4167	19.6888	24.0357	28.6626	33.7536	40.0904	46.2302	53.1705	60.2165
Y cd/m²	0.3672	0.8538	1.6252	2.6827	4.1168	5.8679	8.0410	10.7017	13.6667	17.2630	20.6052	25.3291	30.3193	36.0375	41.9705	48.5675	56.1095	63.7856
Z	0.3983	0.9275	1.7721	2.9522	4.4960	6.3555	8.7072	11.4870	14.9198	18.7649	22.6866	27.4822	33.0907	38.8989	45.7891	53.1651	60.2279	70.0652
Xn 0-1	0.0042	0.0099	0.0189	0.0312	0.0475	0.0679	0.0939	0.1235	0.1600	0.2005	0.2405	0.2936	0.3501	0.4123	0.4897	0.5647	0.6494	0.7355
Yn 0-1	0.0045	0.0104	0.0199	0.0328	0.0503	0.0717	0.0982	0.1307	0.1669	0.2109	0.2517	0.3094	0.3703	0.4402	0.5126	0.5932	0.6853	0.7791
Zn 0-1	0.0049	0.0113	0.0216	0.0361	0.0549	0.0776	0.1064	0.1403	0.1822	0.2292	0.2771	0.3357	0.4042	0.4751	0.5593	0.6494	0.7356	0.8558
Stimulus Percent	0.0502	0.1005	0.1507	0.2009	0.2511	0.3014	0.3516	0.4018	0.4521	0.5023	0.5479	0.5982	0.6484	0.6986	0.7489	0.7991	0.8493	0.8995
RED Stim%:0-1	0.0502	0.1005	0.1507	0.2009	0.2511	0.3014	0.3516	0.4018	0.4521	0.5023	0.5479	0.5982	0.6484	0.6986	0.7489	0.7991	0.8493	0.8995
GRN Stim%:0-1	0.0502	0.1005	0.1507	0.2009	0.2511	0.3014	0.3516	0.4018	0.4521	0.5023	0.5479	0.5982	0.6484	0.6986	0.7489	0.7991	0.8493	0.8995
BLU Stim%:0-1	0.0502	0.1005	0.1507	0.2009	0.2511	0.3014	0.3516	0.4018	0.4521	0.5023	0.5479	0.5982	0.6484	0.6986	0.7489	0.7991	0.8493	0.8995

Post-Cal Multi-Point Grayscale Data

Post-Cal

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
RGB Triplet	16, 16, 16	27, 27, 27	38, 38, 38	49, 49, 49	60, 60, 60	71, 71, 71	82, 82, 82	93, 93, 93	104, 104, 104	115, 115, 115	126, 126, 126	136, 136, 136	147, 147, 147	158, 158, 158	169, 169, 169	180, 180, 180	191, 191, 191	202, 202, 202
Red index	16.0000	27.0000	38.0000	49.0000	60.0000	71.0000	82.0000	93.0000	104.0000	115.0000	126.0000	136.0000	147.0000	158.0000	169.0000	180.0000	191.0000	202.0000
Green index	16.0000	27.0000	38.0000	49.0000	60.0000	71.0000	82.0000	93.0000	104.0000	115.0000	126.0000	136.0000	147.0000	158.0000	169.0000	180.0000	191.0000	202.0000
Blue index	16.0000	27.0000	38.0000	49.0000	60.0000	71.0000	82.0000	93.0000	104.0000	115.0000	126.0000	136.0000	147.0000	158.0000	169.0000	180.0000	191.0000	202.0000
X	0.0932	0.3439	0.8091	1.5285	2.5729	3.8696	5.5551	7.7070	10.1604	12.9866	16.4463	19.6673	23.8281	28.4409	33.9237	39.7269	46.6086	52.6251
Y cd/m²	0.0992	0.3650	0.8600	1.6208	2.6897	4.0895	5.8567	7.9584	10.7172	13.5343	17.0033	20.9475	25.1634	30.0318	35.7226	42.1582	48.2138	55.6852
Z	0.1077	0.4000	0.9413	1.7635	2.8958	4.4518	6.3268	8.7499	11.5077	14.8099	18.5170	22.6696	27.2951	33.0183	39.0367	45.3711	52.7280	60.7761
Xn 0-1	0.0012	0.0043	0.0100	0.0189	0.0318	0.0478	0.0687	0.0953	0.1256	0.1606	0.2034	0.2432	0.2946	0.3517	0.4195	0.4912	0.5763	0.6507
Yn 0-1	0.0012	0.0045	0.0106	0.0200	0.0333	0.0506	0.0724	0.0984	0.1325	0.1674	0.2103	0.2590	0.3112	0.3714	0.4417	0.5213	0.5962	0.6886
Zn 0-1	0.0013	0.0049	0.0116	0.0218	0.0358	0.0550	0.0782	0.1082	0.1423	0.1831	0.2290	0.2803	0.3375	0.4083	0.4827	0.5610	0.6520	0.7515
Stimulus Percent	0.0000	0.0502	0.1005	0.1507	0.2009	0.2511	0.3014	0.3516	0.4018	0.4521	0.5023	0.5479	0.5982	0.6484	0.6986	0.7489	0.7991	0.8493
RED Stim%:0-1	0.0000	0.0502	0.1005	0.1507	0.2009	0.2511	0.3014	0.3516	0.4018	0.4521	0.5023	0.5479	0.5982	0.6484	0.6986	0.7489	0.7991	0.8493
GRN Stim%:0-1	0.0000	0.0502	0.1005	0.1507	0.2009	0.2511	0.3014	0.3516	0.4018	0.4521	0.5023	0.5479	0.5982	0.6484	0.6986	0.7489	0.7991	0.8493
BLU Stim%:0-1	0.0000	0.0502	0.1005	0.1507	0.2009	0.2511	0.3014	0.3516	0.4018	0.4521	0.5023	0.5479	0.5982	0.6484	0.6986	0.7489	0.7991	0.8493

Click Change Selection then right-click on either datagrid chart (ESCape the context menu) to show possible selections

Change Selection

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CalMAN 5 CalMAN Enthusiast for Home Video

CalMAN 5

Saturation Datagrids

Simulated Meter LCD Direct View | Source | Direct Display Control

Pre-Cal Saturation Sweeps Data

	25%	50%	75%	100%
RGB Triplet	180, 123, 123	180, 90, 90	180, 64, 64	180, 16, 16
Target x:CIE31	0.3908	0.4698	0.5474	0.6400
x: CIE31	0.3929	0.4780	0.5485	0.6341
Target y:CIE31	0.3292	0.3295	0.3297	0.3300
y: CIE31	0.3295	0.3272	0.3318	0.3323
Target Y	6.7425	4.5733	3.4772	2.7058
Y	6.2916	4.2752	3.3548	2.6404
Gamma Point: Flat	4.8983	6.3818	7.3125	8.2318
ΔE 2000	1.5453	1.6107	0.8911	0.7375
dE2000 LuminanceCompensated	0.3074	0.9149	0.5316	0.4753
ΔE 1994 L*:±	-1.7418	-1.4910	-0.7272	-0.4573
ΔE 1994 Sat:±	0.0149	1.6318	-0.7311	-2.9259
ΔE 1994 Hue:±	0.1202	-0.5134	0.9302	-0.1209
Signed dE94 L LuminanceCompensated	0.0000	0.0000	0.0000	0.0000
Signed dE94 C LuminanceCompensated	0.6388	2.6665	0.0121	-2.2353
Signed dE94 H LuminanceCompensated	0.1189	-0.5076	0.9247	-0.1205

Post-Cal Saturation Sweeps Data

	25%	50%	75%	100%
RGB Triplet	180, 123, 123	180, 90, 90	180, 64, 64	180, 16, 16
Target x:CIE31	0.3908	0.4698	0.5475	0.6400
x: CIE31	0.3956	0.4744	0.5493	0.6371
Target y:CIE31	0.3292	0.3295	0.3297	0.3300
y: CIE31	0.3287	0.3309	0.3291	0.3293
Target Y	6.7656	4.5888	3.4890	2.7151
Y	6.3458	4.3233	3.3032	2.6238
Gamma Point: Flat	4.8781	6.3513	7.3843	8.2682
ΔE 2000	1.5205	1.3931	1.0562	0.9321
dE2000 LuminanceCompensated	0.7908	0.5512	0.1658	0.6366
ΔE 1994 L*:±	-1.6132	-1.3202	-1.1072	-0.6384
ΔE 1994 Sat:±	1.1230	0.0921	-0.5612	-2.2197
ΔE 1994 Hue:±	-0.1148	0.7136	-0.1205	-1.1030
Signed dE94 L LuminanceCompensated	0.0000	0.0000	0.0000	0.0000
Signed dE94 C LuminanceCompensated	1.7009	1.0083	0.5705	-1.2556
Signed dE94 H LuminanceCompensated	-0.1136	0.7065	-0.1194	-1.0967

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Pre-Cal

25% 50% 75% 100%

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Change Selection

Post-Cal

25% 50% 75% 100%

∫ Pre-Cal ∫ Post-Cal

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CalMAN 5 CalMAN Enthusiast for Home Video

CalMAN 5

Color Check Datagrids

Simulated Meter LCD Direct View | Source | Direct Display Control

Pre-Cal Color Checker Data

Pre-Cal

	White	Gray 80	Gray 65	Gray 50	Gray 35	Dark Skin	Light Skin	Blue Sky	Foliage	Blue Flower	Bluish Green	Orange	Purplish Blue	Moderate Red	Purple	Yellow Gre
RGB Triplet	235, 235, 235	213, 213, 213	196, 196, 196	176, 176, 176	152, 152, 152	115, 86, 73	182, 145, 128	97, 121, 150	93, 108, 73	128, 126, 167	101, 178, 161	202, 119, 51	80, 95, 156	182, 88, 99	95, 69, 108	152, 176,
Target x:CIE31	0.3127	0.3127	0.3127	0.3127	0.3127	0.4006	0.3757	0.2511	0.3404	0.2701	0.2625	0.5089	0.2181	0.4574	0.2898	0.3763
x: CIE31	0.3114	0.3103	0.3121	0.3124	0.3114	0.4040	0.3802	0.2494	0.3407	0.2708	0.2617	0.5128	0.2171	0.4661	0.2899	0.3760
Target y:CIE31	0.3290	0.3290	0.3290	0.3290	0.3290	0.3629	0.3554	0.2679	0.4265	0.2554	0.3584	0.4096	0.1945	0.3125	0.2221	0.4916
y: CIE31	0.3280	0.3294	0.3295	0.3300	0.3306	0.3598	0.3543	0.2666	0.4273	0.2523	0.3609	0.4063	0.1902	0.3127	0.2234	0.4924
Target Y	23.6718	18.8519	15.5333	12.0729	8.5391	2.5473	8.6447	4.7411	3.3279	5.8708	10.2477	6.9752	2.9807	4.6046	1.7108	10.5436
Y	23.6718	18.6454	15.1301	11.6388	8.0013	2.3030	8.1124	4.3514	3.0509	5.4257	9.7691	6.6576	2.7135	4.3339	1.5651	10.0170
Gamma Point: Flat	2.2000	2.3345	2.3548	2.3287	2.3472	3.0564	4.1149	3.6088	2.4507	4.1852	3.0747	8.8507	5.1189	6.6357	3.2680	2.8562
ΔE 2000	0.6791	2.0503	0.9468	1.1176	2.1090	1.9326	1.8908	1.9130	1.6152	2.0500	1.1518	1.4750	1.7846	1.4617	1.2681	1.1597
dE2000 LuminanceCompensated	0.6791	2.0357	0.7466	0.7687	1.5368	1.2603	1.4011	0.2936	0.0969	1.1962	0.6092	1.0656	0.9895	0.8314	0.2199	0.1252
ΔE 1994 L*:±	0.0000	-0.3940	-0.8798	-1.1245	-1.7713	-1.8238	-1.7382	-1.9129	-1.7227	-1.8905	-1.3877	-1.1899	-1.7915	-1.3439	-1.4121	-1.5000
ΔE 1994 Sat:±	0.6509	1.4365	0.5077	0.5540	1.0788	0.1340	1.0243	-0.0973	-0.5453	0.7832	0.7137	-0.1409	0.5545	1.3800	-1.4370	-0.8015
ΔE 1994 Hue:±	0.0000	0.0000	0.0000	0.0000	0.0000	-1.1845	-1.1599	-0.1369	-0.0487	1.0589	-0.5079	-1.6749	0.9334	0.6440	-0.0679	0.2016
Signed dE94 L LuminanceCompensated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Post-Cal Color Checker Data

Post-Cal

	White	Gray 80	Gray 65	Gray 50	Gray 35	Dark Skin	Light Skin	Blue Sky	Foliage	Blue Flower	Bluish Green	Orange	Purplish Blue	Moderate Red	Purple	Yellow Gre
RGB Triplet	235, 235, 235	213, 213, 213	196, 196, 196	176, 176, 176	152, 152, 152	115, 86, 73	182, 145, 128	97, 121, 150	93, 108, 73	128, 126, 167	101, 178, 161	202, 119, 51	80, 95, 156	182, 88, 99	95, 69, 108	152, 176,
Target x:CIE31	0.3127	0.3127	0.3127	0.3127	0.3127	0.4006	0.3757	0.2511	0.3404	0.2701	0.2625	0.5090	0.2181	0.4574	0.2898	0.3763
x: CIE31	0.3101	0.3116	0.3135	0.3112	0.3116	0.4019	0.3826	0.2481	0.3406	0.2698	0.2609	0.5155	0.2186	0.4591	0.2897	0.3785
Target y:CIE31	0.3290	0.3290	0.3290	0.3290	0.3290	0.3629	0.3554	0.2679	0.4265	0.2554	0.3584	0.4096	0.1945	0.3125	0.2221	0.4916
y: CIE31	0.3279	0.3306	0.3256	0.3307	0.3298	0.3590	0.3541	0.2673	0.4251	0.2507	0.3583	0.4029	0.1919	0.3160	0.2252	0.4899
Target Y	23.7017	18.8756	15.5528	12.0880	8.5497	2.5504	8.6555	4.7469	3.3320	5.8781	10.2605	6.9839	2.9843	4.6103	1.7128	10.5567
Y	23.7017	18.6125	14.9954	11.6001	7.9993	2.3094	8.0700	4.3648	3.0106	5.3675	9.6883	6.5528	2.7374	4.3707	1.5718	9.9516
Gamma Point: Flat	2.2000	2.3713	2.4148	2.3448	2.3506	3.0543	4.1409	3.6047	2.4685	4.2204	3.1097	8.9740	5.1006	6.6064	3.2642	2.8836
ΔE 2000	1.4857	1.9371	2.8806	2.0892	1.8079	1.9244	2.3832	2.0553	1.9455	2.3206	1.2849	2.5135	1.6963	1.4707	1.4188	1.4694
dE2000 LuminanceCompensated	1.4857	1.9120	2.7650	1.8792	1.0420	1.2037	1.9773	0.9018	0.2073	1.3496	0.3387	2.0880	0.9226	0.7841	0.5583	0.5190
ΔE 1994 L*:±	0.0000	-0.5019	-1.2189	-1.2642	-1.8113	-1.7956	-1.9132	-1.8722	-2.0055	-2.1742	-1.6623	-1.6221	-1.6498	-1.1849	-1.3639	-1.7260
ΔE 1994 Sat:±	1.2339	1.3608	2.1105	1.3265	0.7130	-0.2952	1.7818	-0.0807	-1.2170	1.2730	0.0845	-0.0599	-0.0074	-1.2251	-2.1409	-1.6424
ΔE 1994 Hue:±	0.0000	0.0000	0.0000	0.0000	0.0000	-1.2337	-1.5709	-0.8892	-0.1413	1.0309	0.2664	-3.3229	1.0207	1.3115	-0.2319	-0.9729
Signed dE94 L LuminanceCompensated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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