

CalMAN 5

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Simulated Meter  
LCD Direct View (LED Backlight)

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# HT Enthusiast Extended Workflow

v10.1.0

## Featuring

- Home layout displays the full workflow structure
- Integrated session and hardware setup layout
- Single layout takes all desired Pre- or Post-calibration readings
- Expanded Grayscale calibration and pre/post-cal chart 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 layout
- 21 / 23-point Grayscale friendly

## Also featuring navigation for the mouse-lazy

- Navigation bar shows where you are & 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!





# HT Enthusiast Extended Workflow

## CALIBRATION VIEWS

- Grayscale - has both full-point and two-point layouts
- Gamut Saturation Sweeps - also used for basic CMS Gamut calibration
- Gamut Luminance
- Color Checker
- 3D Color Cube LUT for supported hardware

## WORKFLOW OVERVIEW

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

The workflow is divided into four sections or Zones. The corresponding zone symbol is shown in buttons navigating across zones except the Home button.

- 1) Introduction - general information about the workflow features
- 2) ▼ Preparation Zone - enter session setup information, take current readings for reference, plan the dynamic aspects of the session (contrast, brightness, etc.)
- 3) ◀ Calibration Zone - calibration layouts with matching datagrids (except 3D Color Cube) and post-calibration readings for all views
- 4) ▲ Analysis Zone - has detailed charts for all views in the pre- and post-calibration states and a final check layout for fine-tuning with a session dE 2000 summary.

## ANALYSIS CHARTS

There are pre-calibration and post-calibration layouts for each calibration view. You can toggle between them by clicking the "↑PreCal" or "↑PstCal" button in the layouts. They super-impose when the layout switches so just keep clicking to go back and forth.

The ↑ buttons that come up in the nav bar perform similar toggling duties.

All views except Grayscale have detail datagrid layouts (the Grayscale datagrid is part of its pre/post layouts). You can access those with the "↑Data" buttons with a similar toggle arrangement as the "↑PstCal" button. Ddatagrid layouts contain both pre- and post-calibration grids.

Unlike the other color views, the Color Checker pre- and post-calibration detail charts do not have CIE charts. Instead there's a combined layout with both big Color Checker CIE charts which you can access through their "↑CIE Charts" buttons.

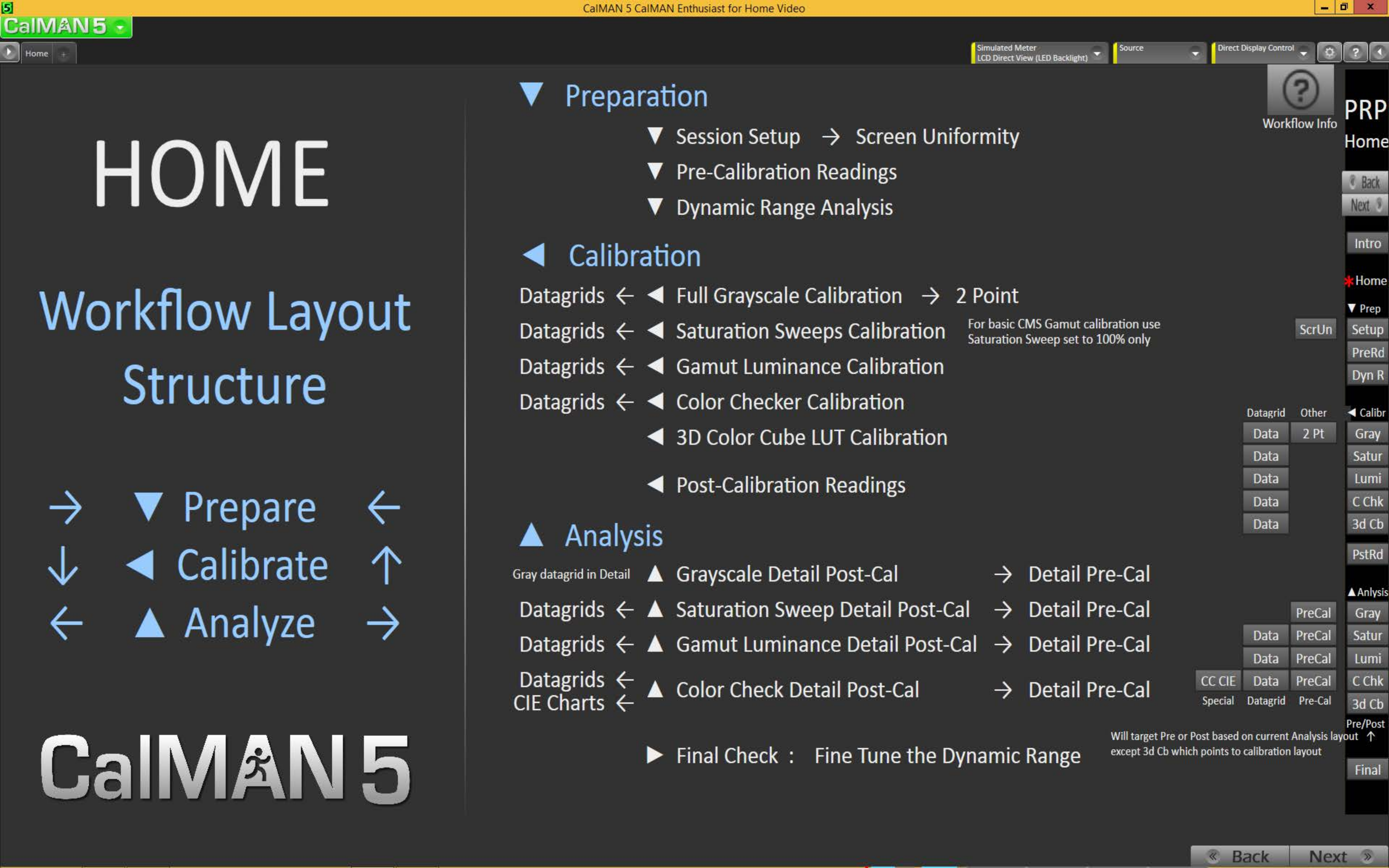
## KEY LAYOUTS

HOME (Preparation) - has a layout map for getting the lay of the land and a fully loaded navigation bar for moving randomly around the layouts.

SESSION SETUP (Preparation) - Integrates calibration configuration and hardware setup.

PRE-CALIBRATION READINGS (Preparation) Navbar label "PreRd"  
POST-CALIBRATION READINGS (Calibration) Navbar label "PstRd"- these practically identical 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 have comprehensive navigation buttons to calibration and detail layouts. All charts have return buttons to these as well. The toolbar has toggle buttons between these layouts, labeled Pre and Pst.





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HOME

Workflow Layout Structure

→

▼ Prepare

←

↓

◀ Calibrate

↑

←

▲ Analyze

→

CalMAN 5

▼ Preparation

▼ Session Setup → Screen Uniformity

▼ Pre-Calibration Readings

▼ Dynamic Range Analysis

◀ Calibration

Datagrids ← ◀ Full Grayscale Calibration → 2 Point

Datagrids ← ◀ Saturation Sweeps Calibration

Datagrids ← ◀ Gamut Luminance Calibration

Datagrids ← ◀ Color Checker Calibration

◀ 3D Color Cube LUT Calibration

◀ Post-Calibration Readings

▲ Analysis

Gray datagrid in Detail ▲ Grayscale Detail Post-Cal → Detail Pre-Cal

Datagrids ← ▲ Saturation Sweep Detail Post-Cal → Detail Pre-Cal

Datagrids ← ▲ Gamut Luminance Detail Post-Cal → Detail Pre-Cal

Datagrids ← ▲ Color Check Detail Post-Cal → Detail Pre-Cal

CIE Charts ←

► Final Check : Fine Tune the Dynamic Range

For basic CMS Gamut calibration use Saturation Sweep set to 100% only

Will target Pre or Post based on current Analysis layout except 3d Cb which points to calibration layout



CalMAN 5

Session SetupHelp+

Home?

(A) Session Options

Session InfoMore Options

Setup Notes

Display • PRO-70X5FD

Radiance source / display @ com2  
Elite display IP 192.168.1.45

Calibration Description

Try for better contrast and pop

Target Black0Target White100Target Gamma2.2

(B) Settings

AV ModeISF Night

Color TempLow

Sharpness

Color

Tint

Contrast

Brightness

Backlight

TV Gamma

LowHigh

Red

Green

Blue

(C) Calibration Plan

For Navigation Bar Next / Back

Plan calibrations

2-Pt Grayscale

Full Grayscale

Saturation Sweeps

Gamut Luminance

Color Checker

3D Color Cube LUT

Gamut Coordinates

D65, HD Rec.709

Gamma Formula

Power

Input Level

Video (16-235)

Delta E Formula

d E2000

Stimulus Unit

percent

(D) Hardware Configuration

1 Meter

Find →Configure

CalMAN Simulated Profile : None

Units fLMode LCD Direct View (LED Backlight)

2 Source

Find →Configure

Optical player or standalone generator (manual cont  
Optical player or standalone generator

Pattern SizeFull 100%

3 Display / Processor

DCCFind →Configure

Sharp - 2011 Elite (RS-232, Ethernet)  
Sharp Elite SOCKET 192.168.1.45:10002

Display SlotISF NightData Points11

(E) Meter Setup

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

3 Readings

Y Max / Min fL  
24.27 / 0.0293582

CCT 6382 / 6503 Target

700068006600640062006000

→ Screen Uniformity

PRP Setup

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ScrUni

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Session SetupHelp+

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(A) Session Options

Session InfoMore Options

Setup Notes

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Gamma Formula

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Input Level

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d E2000

Stimulus Unit

percent

(D) Hardware Configuration

1 Meter

Find →Configure

2 Source

Find →Configure

3 Display / Processor

DCCFind →Configure

(E) 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

Brightness2

Contrast80

Color0

Tint0

Sharpness2

Color TemperatureLow

Gamma0

Backlight35

Gamut RangeStandard

Motion EnhancementOff

Precision Color Plus

Active Contrast

Film ModeOff

Digital Noise ReductionOff

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Final





# Setting Up the Session

## (A) Enter the session description & configuration

- Click [More Options] to open the options panel
- Click [Session Info] to enter additional information

(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) If convenient define a calibration - the planned layouts will be indicated and followed by the Next / Back buttons of the Navigation Bar

(D) Find and configure the appropriate (1) meter, (2) source and (3) display devices - more info at right →

(E) 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 at right →

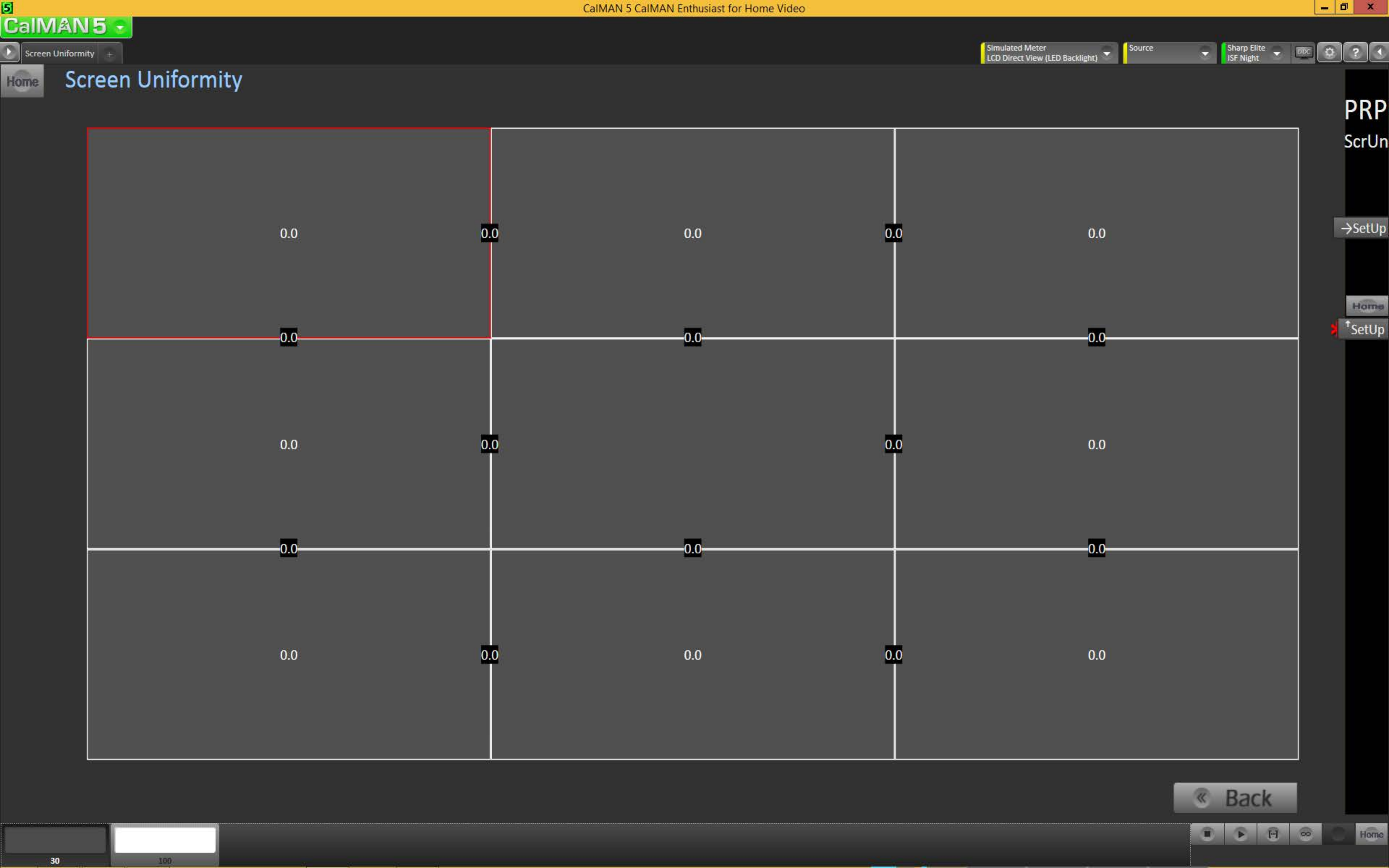
## (D) Hardware Configuration

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.
  - c) Select the desired meter luminance measurement unit.
2. Then connect your reference pattern source generator.
  - a) Click the source *Find* button, and select your Source.
  - b) Select the pattern window size and resolution.
3. Then, connect your display/processor.
  - a) Click the display *Find* button.
4. Click the *Configure* buttons for more options.

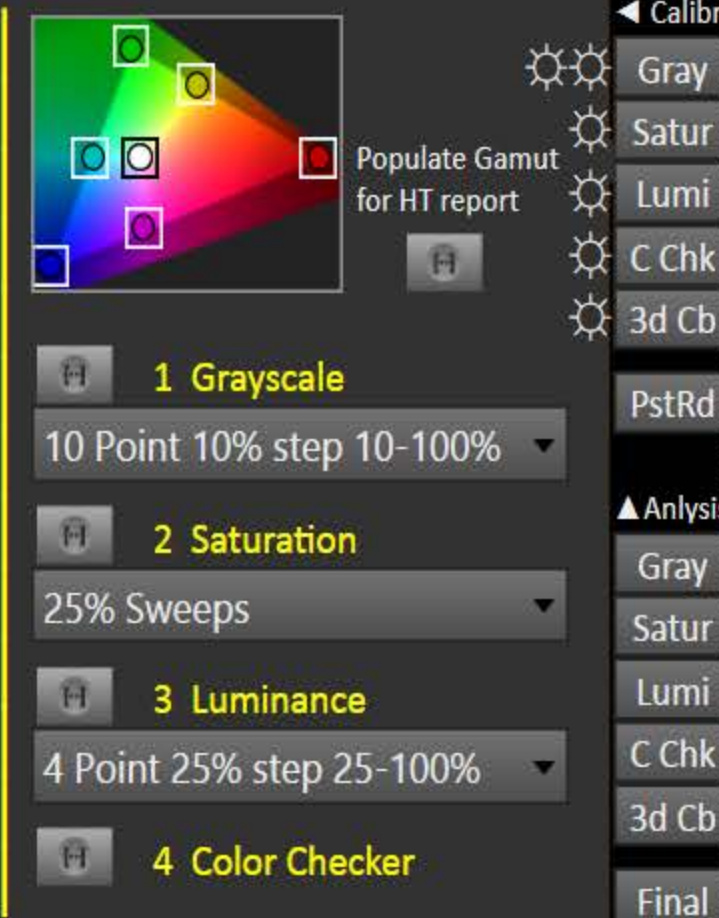
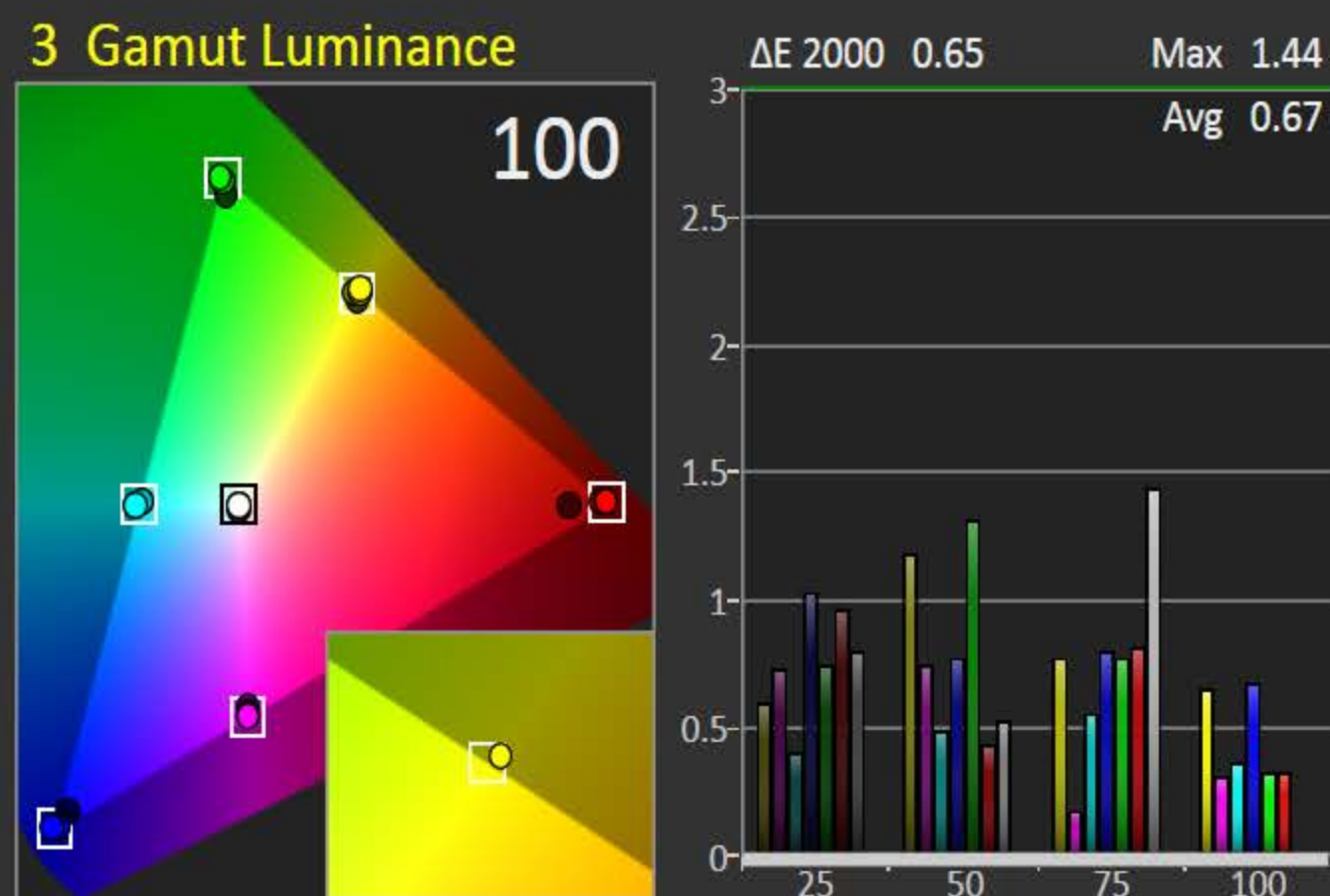
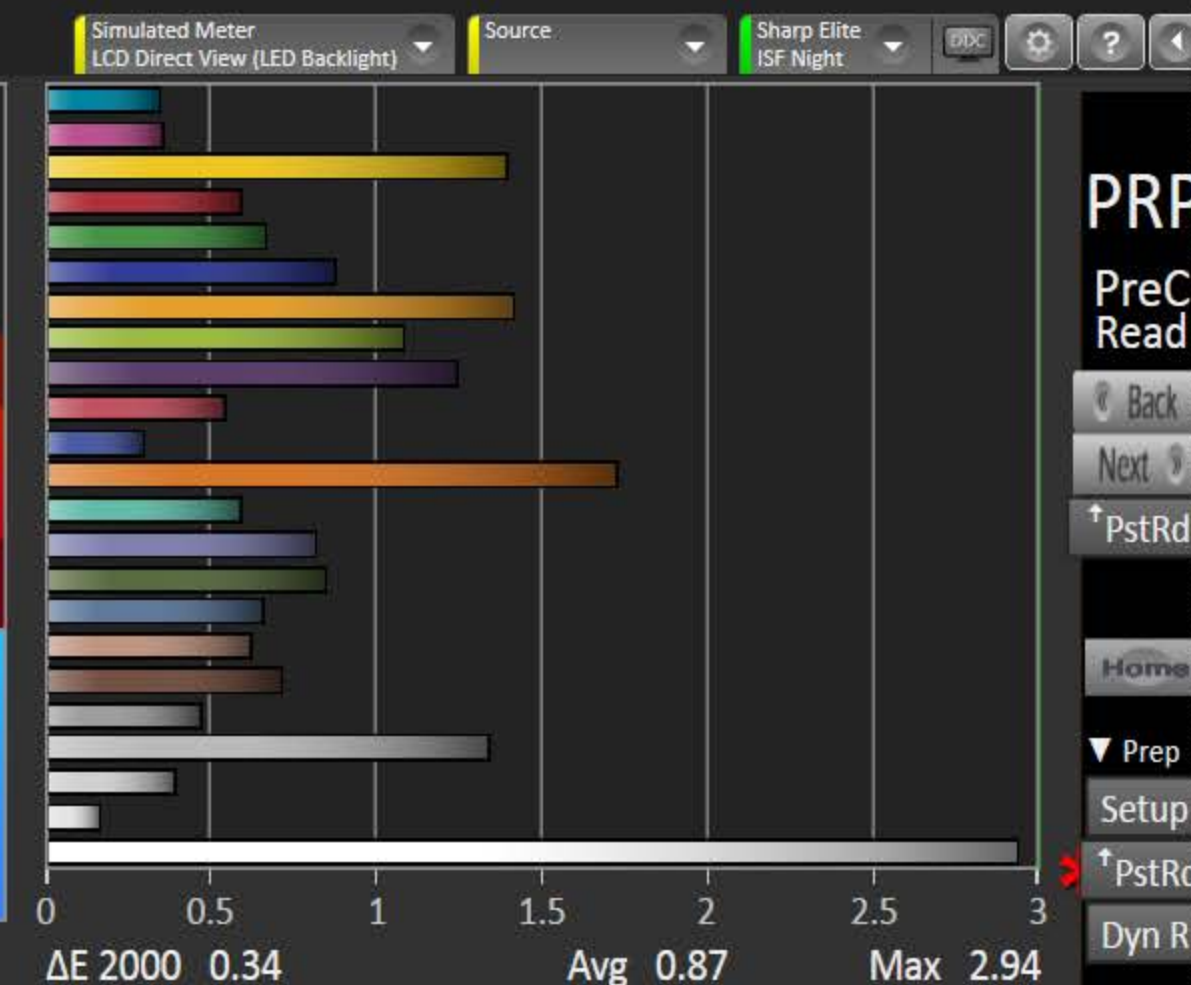
## (E) Meter Positioning

1. For flat panels position the meter on the center of the screen (see illustration to the right). You do not need to take readings for this placement. Click Next.
- 2a. For projectors position the meter facing the projection screen, far enough away from the screen to avoid reading the meter's own shadow (example to the right). Continue to take readings.
- 2b. 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*.
3. You can also read the CCT based on the current settings - adjust the display's color temperature to best match the target CCT.









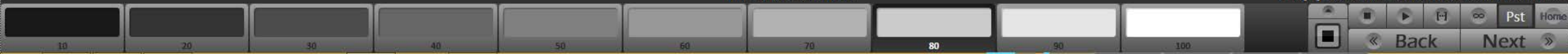
## Pre-cal notes

## Pre-Cal

Display Slot

ISF Night

Use [...] below to read ALL series or select a series above





CalMAN 5

Dynamic Range

OVERALL RANGE

Adjust the Backlight (for LED) control 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.

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.

12 Point 10% step 0-109%

2

Calibration Notes

Better contrast

Contrast

Brightness

Backlight

TV Gamma

Luminance

Luminance in fL

White 24.27

3.16

Gamma

Target 2.2

Total 2.26

2.24

Display Slot ISF Night

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

0

10

20

30

40

50

60

70

80

90

100

109

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2 Pt Grayscale

Home

2 Pt Grayscale Calibration

# Grayscale Two 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.

2 Point 30,80%

Calibration Notes

10

8

6

4

2

0

-2

-4

-6

-8

-10

30

80

0.5981

30

0.0598

Yn 0-1 0.05981

Target Yn 0-1 0.07145

Gamma 30 2.35 2.74 Total

3

2.5

2

1.5

30

80

30

80

DeltaE 2000 30 2.21 4.63 Max

4

2

0

30

80

30

CC Temp 6382 6442 Avg

Gamma 2.35 2.74 Tot

dE 2000 2.21 3.42 Avg

4.63 Max

White 29.19

Y / Luminance fl x y

Target → 2.08545 0.3127 0.329

Meter → 1.74568 0.3147 0.331

Display Slot Triplet

ISF Day 82, 82, 82

RGB Balance 30 G 100.1 B 99.2 R 100.7

104

102

100

98

96

30

40

50

60

70

80

CCT 30 6382 6442 Avg

7000

6800

6600

6400

6200

6000

30

80

0.35

0.34

0.33

0.32

0.31

0.29

0.3

0.31

0.32

0.33

CAL Gray

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Full

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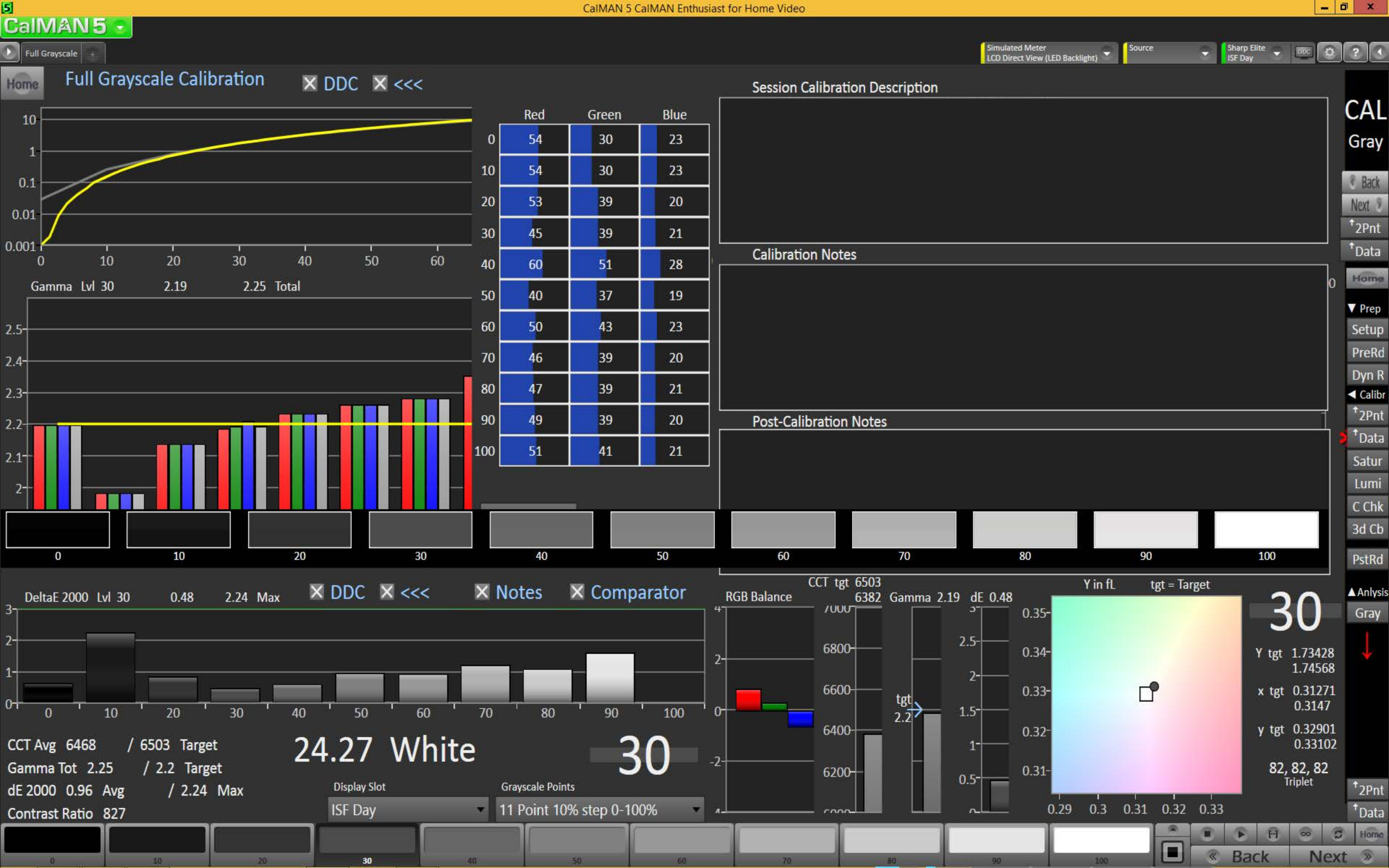




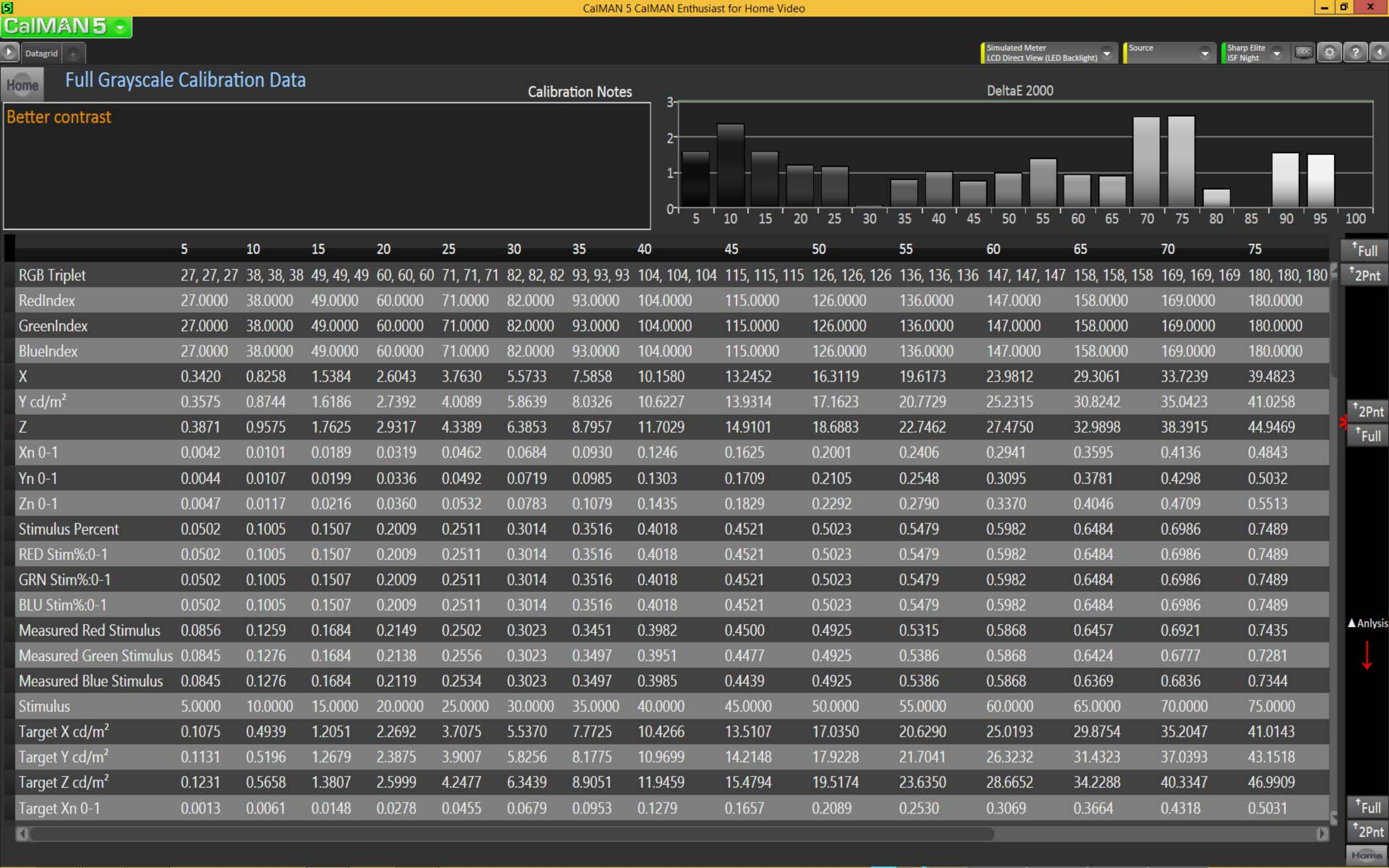








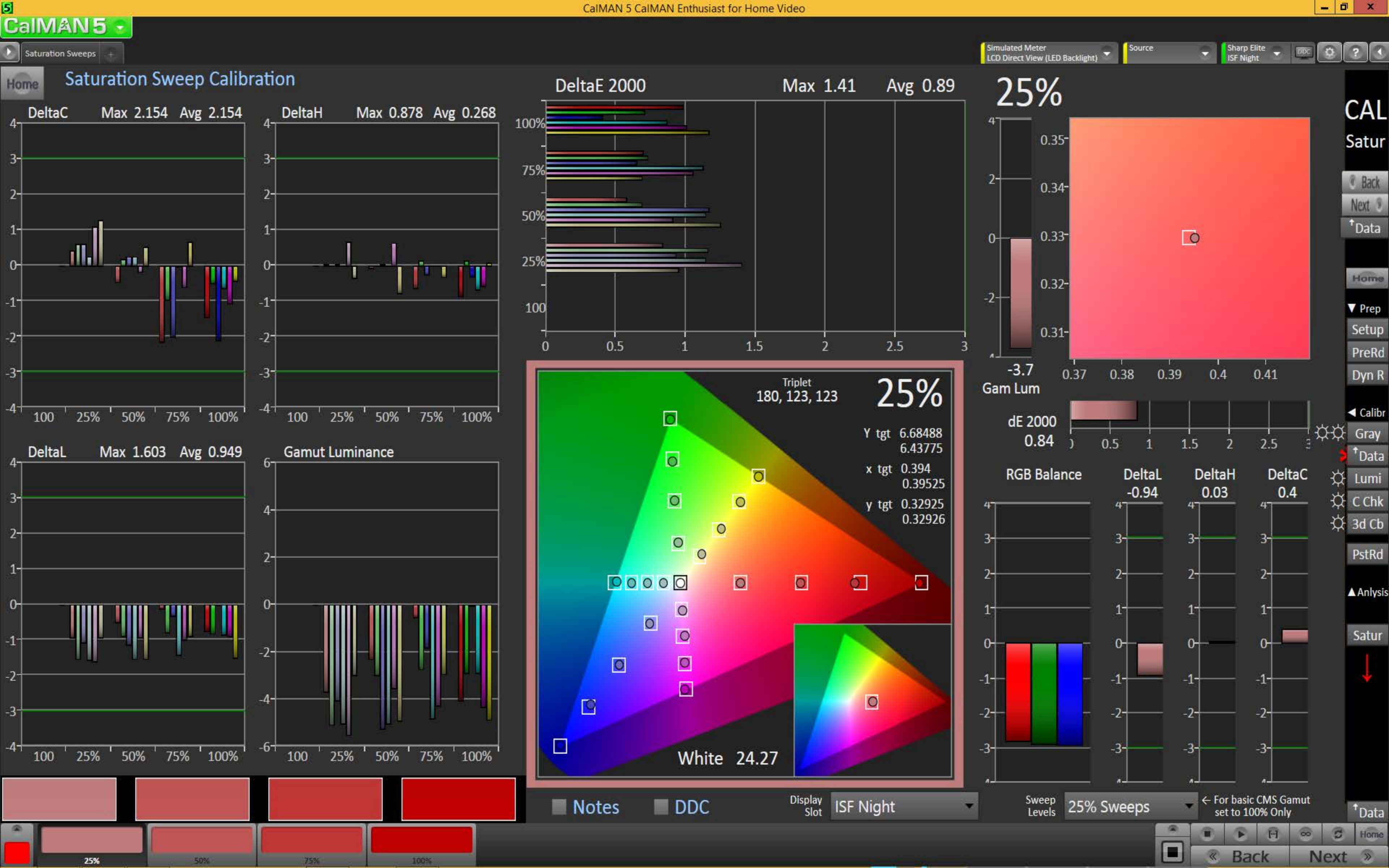




↑ 2Pnt

Home







	Hue	Saturation	Luminance
Red	35	37	34
Green	28	50	22
Blue	43	37	36
Cyan	27	39	23
Magenta	34	39	33
Yellow	33	33	36

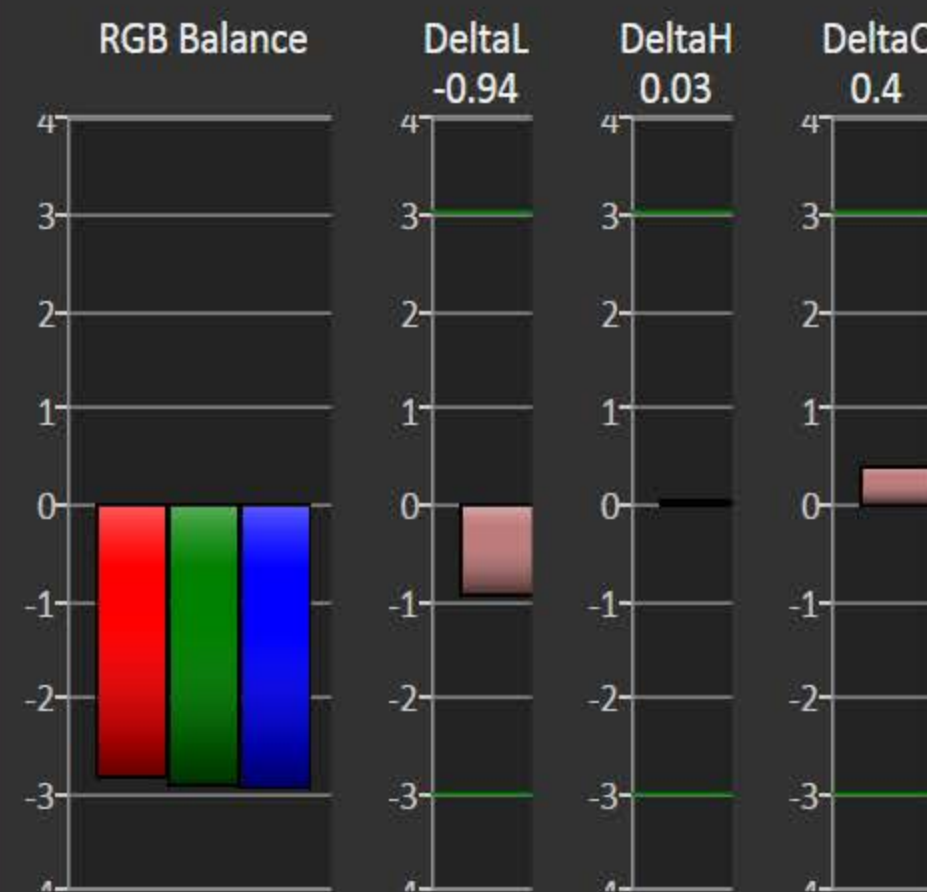
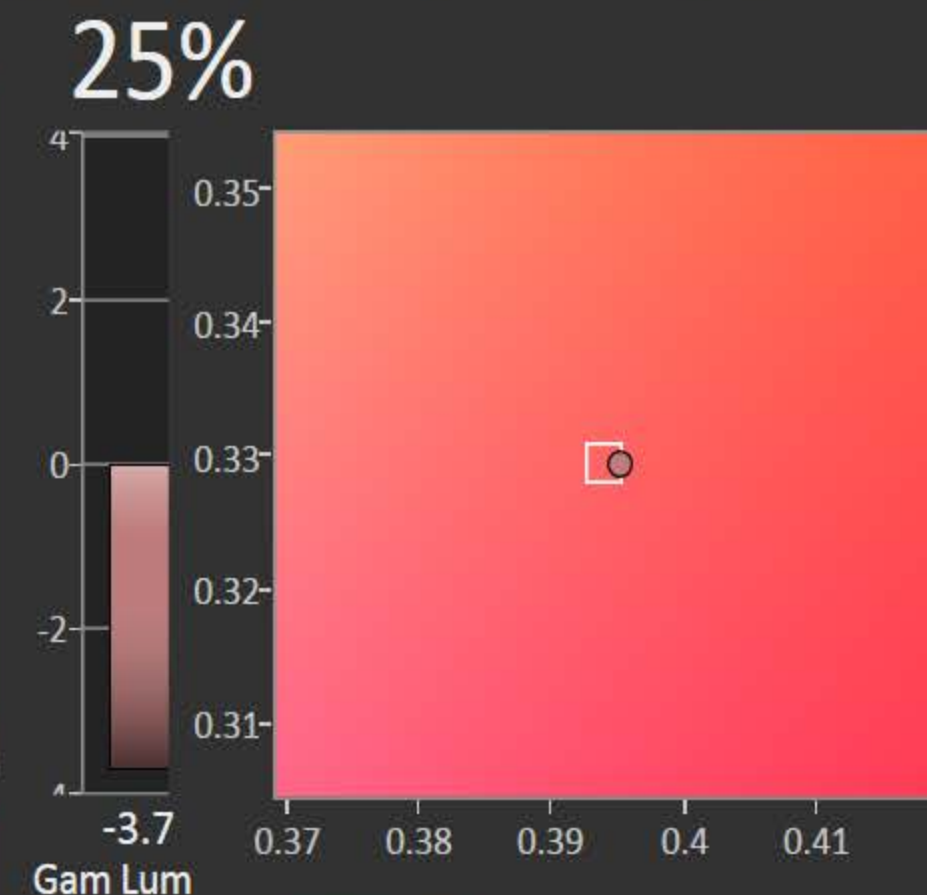
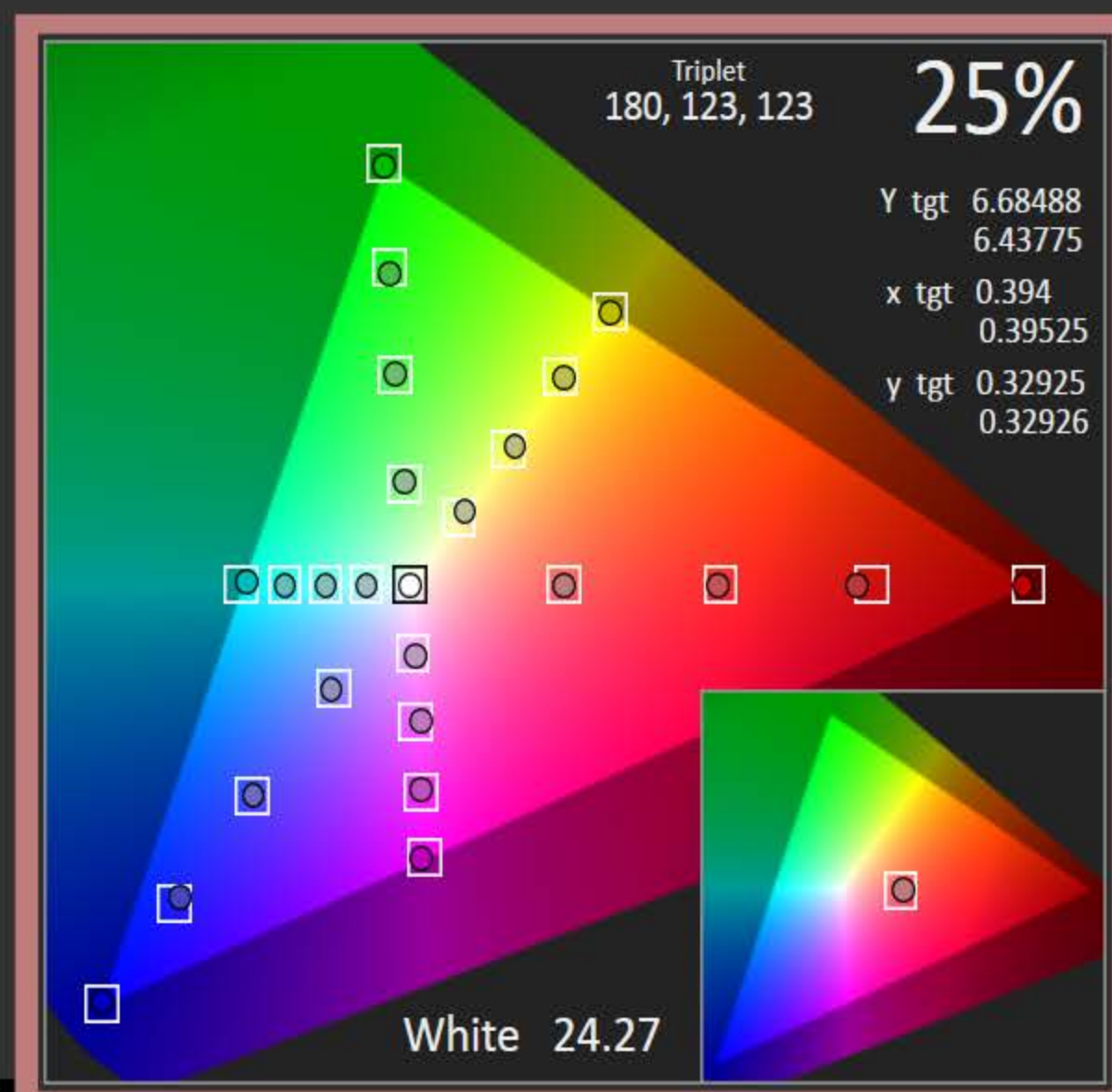
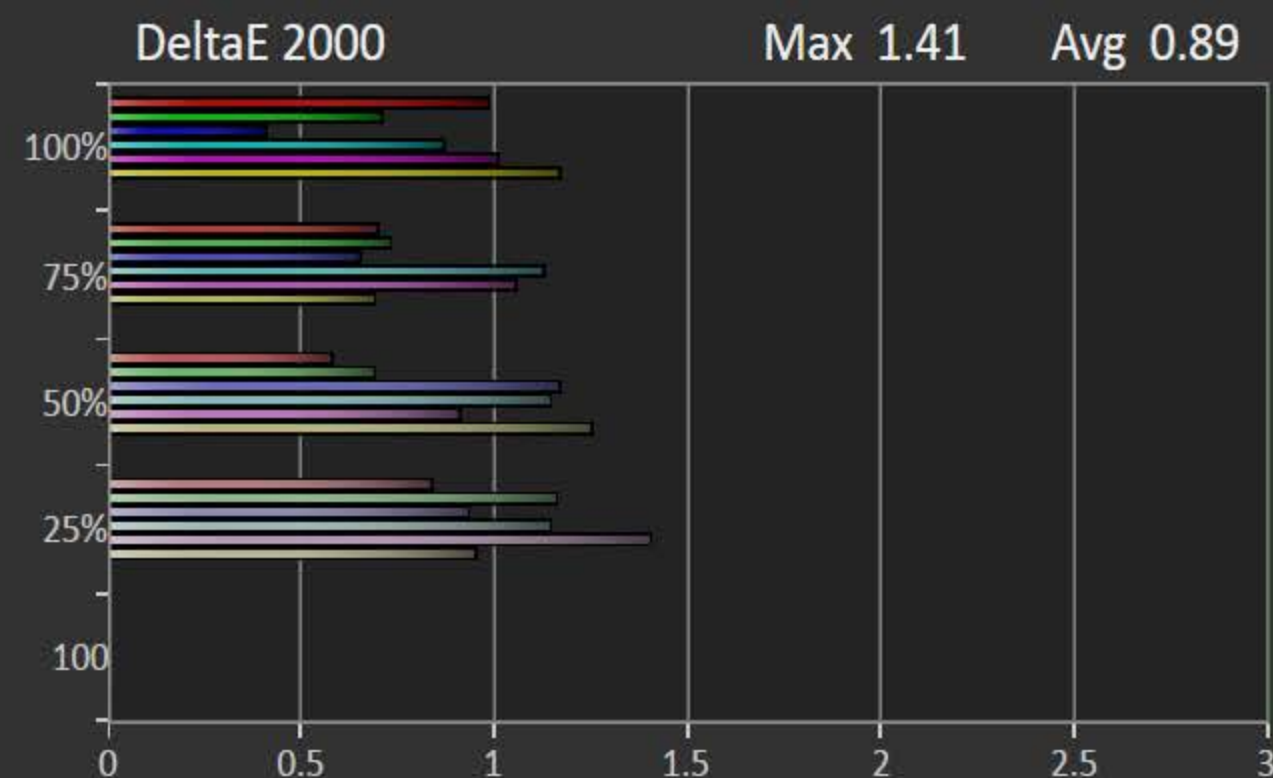
Reset CMS

### Color Notes

## Less saturation

## Calibration Notes

## Better contrast



 Notes

☒ DDC

Display  
Slot

ISF Night

## Sweep Levels

25% Sweeps

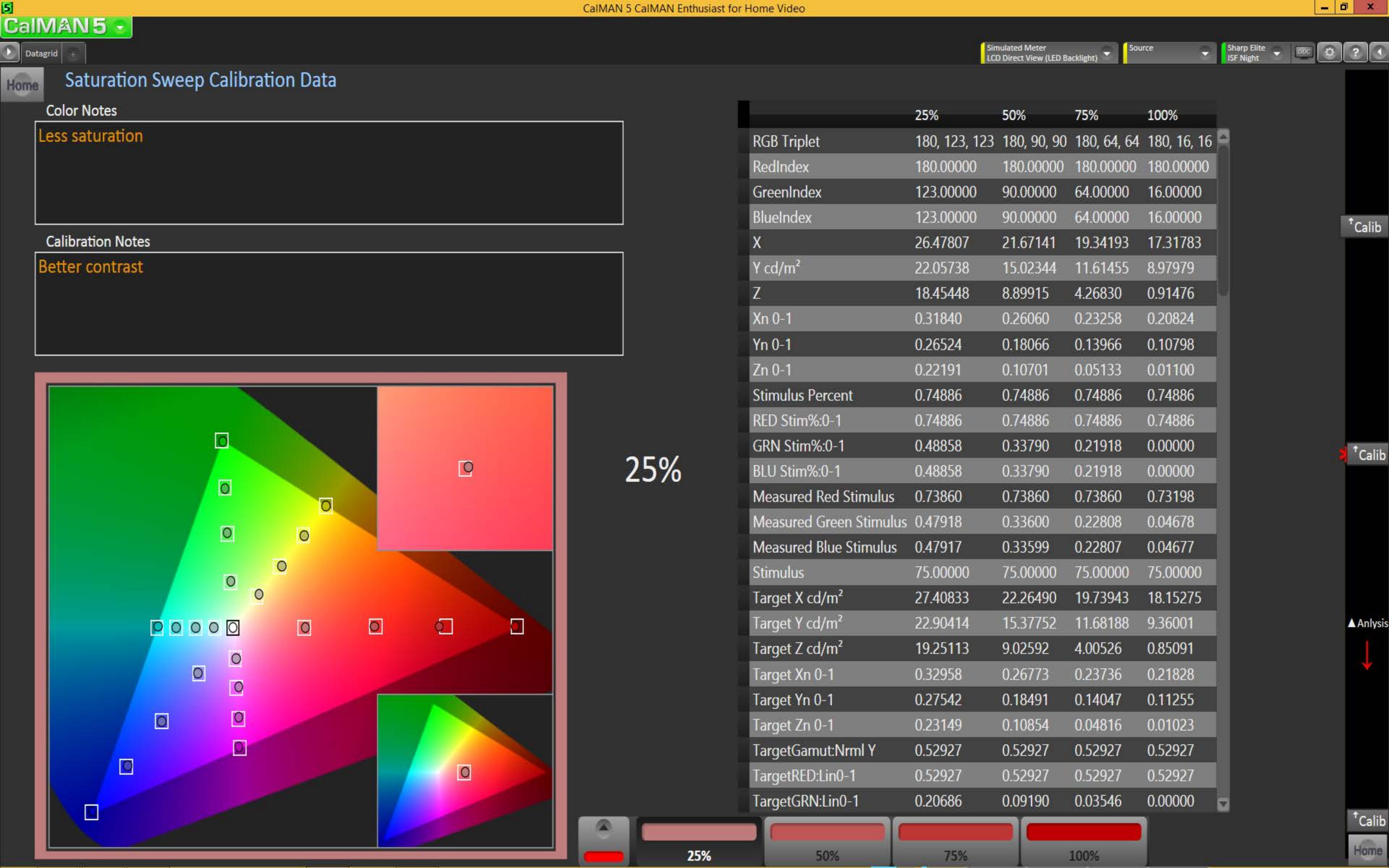
← For basic CMS Gamut set to 100% Only

↑ Data

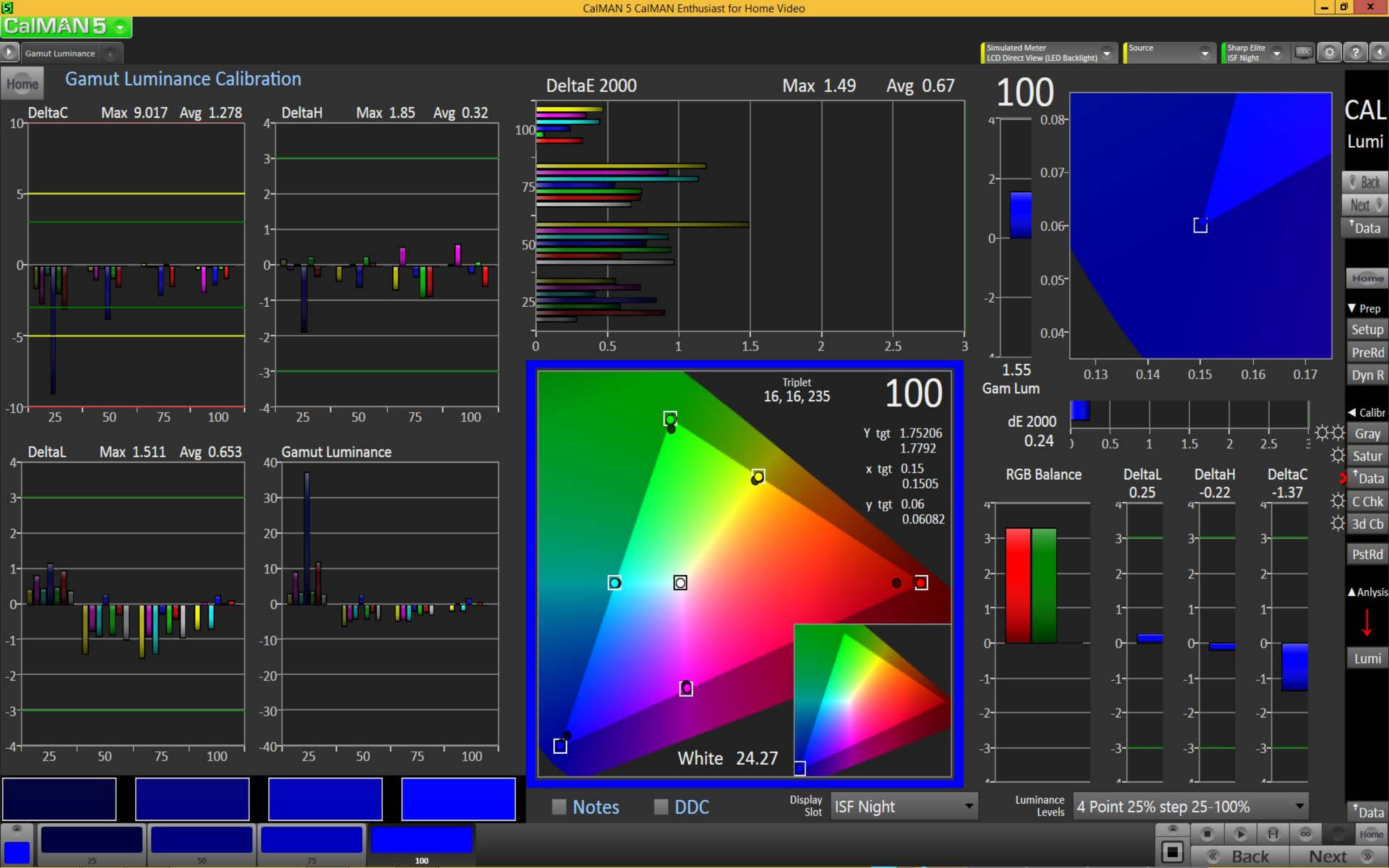


A screenshot of the iPad interface showing the 'Back' and 'Next' buttons. The 'Back' button is on the left, and the 'Next' button is on the right. Both buttons are highlighted with a yellow border. Above the buttons are several icons: a square, a play button, a list icon, an infinity symbol, a refresh icon, and a 'Home' button.















CalMAN 5

Color Checker

Simulated Meter  
LCD Direct View (LED Backlight)

Source

Sharp Elite  
ISF Day

Home

Color Checker Calibration

Orange Yellow

DeltaE 2000

Max 1.58

Avg 0.82

Max 1.45

DeltaL

Avg 0.57

	Hue	Saturation	Luminance
Red	29	37	38
Green	34	48	26
Blue	41	32	39
Cyan	26	38	20
Magenta	34	39	24
Yellow	27	32	37

Reset CMS

dE 2000 1.27

dE Max 1.58

dE Avg 0.82

Orange Yellow

White

Gray 80

Gray 65

Gray 50

Gray 35

Black

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

Purple

Moderate Red

Purplish Blue

Orange

Bluish Green

Blue Flower

Foliage

Blue Sky

Light Skin

Calibration Notes

Color Notes

y tgt 0.4427

0.43868

Triplet 213, 154, 55

White 23.8

Comparator

Notes

DDC

Grey

Display Slot

ISF Day

6

-4

-2

0

2

4

6

4

-2

0

2

4

-2.83 Lum

White

Gray 80

Gray 65

Gray 50

Gray 35

Black

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% Green

100% Blue

100% Cyan

100% Magenta

2E

Back

Next



CalMAN 5

Color Checker

Simulated Meter  
LCD Direct View (LED Backlight)

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Sharp Elite  
ISF Day

Home

Color Checker Calibration

Orange Yellow

DeltaE 2000

Max 1.58

Avg 0.82

Max 1.45

DeltaL

Avg 0.57

8J					
8I					
8H					
8G					
8F					
8E					
8D					
7J					
7I					
7H					
7G					
7F					
7E					
5D					
2K					
2F					
2E					
100% Yellow					
100% Magenta					
100% Cyan					
100% Green					
Cyan					
Magenta					
White					
Gray 80					
Gray 65					
Gray 50					
Gray 35					
Black					
Dark Skin					
Light Skin					
Blue Sky					
Foliage					
Purple					
Moderate Red					
Purplish Blue					
Orange					
Bluish Green					
Blue Flower					
Foliage					
Blue Sky					
Light Skin					

Calibration Notes

Color Notes

Reset Grayscale

	Red	Green	Blue
0	54	30	23
10	54	30	23
20	53	39	20
30	45	39	21
40	60	51	28
50	40	37	19
60	50	43	23
70	46	39	20
80	47	39	21
90	49	39	20
100	51	41	21

Orange Yellow

dE 2000 1.27

dE Max 1.58

dE Avg 0.82

Orange Yellow

Blue

Green

Red

Yellow

Magenta

Cyan

y tgt 0.4427

0.43868

Triplet 213, 154, 55

White 23.8

Comparator

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CalMAN 5

CalMAN 5 CalMAN Enthusiast for Home Video

Datagrid

Simulated Meter

LCD Direct View (LED Backlight)

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Direct Display Control

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Color Checker Calibration Data

Color Notes

Calibration Notes

	White	Gray 80	Gray 65	Gray 50	Gray 35	Black	Dark Skin	Light Skin	Blue Sky	Foliage	Blue Flower	Bluish Green	0
RGB Triplet	235, 235, 235	213, 213, 213	196, 196, 196	176, 176, 176	152, 152, 152	16, 16, 16	115, 86, 73	182, 145, 128	97, 121, 150	93, 108, 73	128, 126, 167	101, 178, 161	2
RedIndex	235.0000	213.0000	196.0000	176.0000	152.0000	16.0000	115.0000	182.0000	97.0000	93.0000	128.0000	101.0000	2
GreenIndex	235.0000	213.0000	196.0000	176.0000	152.0000	16.0000	86.0000	145.0000	121.0000	108.0000	126.0000	178.0000	1
BlueIndex	235.0000	213.0000	196.0000	176.0000	152.0000	16.0000	73.0000	128.0000	150.0000	73.0000	167.0000	161.0000	5
X	77.9860	61.8198	50.2133	38.3672	26.5942	0.0937	8.9618	29.6884	14.2960	8.4439	20.1577	24.3448	2
Y cd/m²	81.5303	65.0427	52.8311	40.3675	27.9807	0.0986	8.1038	27.8773	15.2038	10.5808	18.9469	33.5003	2
Z	88.2841	70.8261	57.5287	43.9568	30.4687	0.1074	5.3231	20.7040	27.7881	5.8283	36.0853	35.1467	4
Xn 0-1	0.9565	0.7582	0.6159	0.4706	0.3262	0.0011	0.1099	0.3641	0.1753	0.1036	0.2472	0.2986	0
Yn 0-1	1.0000	0.7978	0.6480	0.4951	0.3432	0.0012	0.0994	0.3419	0.1865	0.1298	0.2324	0.4109	0
Zn 0-1	1.0828	0.8687	0.7056	0.5391	0.3737	0.0013	0.0653	0.2539	0.3408	0.0715	0.4426	0.4311	0
Stimulus Percent	1.0000	0.8995	0.8219	0.7306	0.6210	0.0000	0.4521	0.7580	0.6119	0.4201	0.6895	0.7397	0
RED Stim%:0-1	1.0000	0.8995	0.8219	0.7306	0.6210	0.0000	0.4521	0.7580	0.3699	0.3516	0.5114	0.3881	0
GRN Stim%:0-1	1.0000	0.8995	0.8219	0.7306	0.6210	0.0000	0.3196	0.5890	0.4795	0.4201	0.5023	0.7397	0
BLU Stim%:0-1	1.0000	0.8995	0.8219	0.7306	0.6210	0.0000	0.2603	0.5114	0.6119	0.2603	0.6895	0.6621	0
Measured Red Stimulus	1.0103	0.9024	0.8210	0.7265	0.6150	0.0472	0.4479	0.7479	0.3692	0.3519	0.5059	0.3830	0
Measured Green Stimulus	0.9972	0.9024	0.8210	0.7265	0.6150	0.0472	0.3220	0.5777	0.4746	0.4171	0.4969	0.7293	0
Measured Blue Stimulus	0.9972	0.9024	0.8210	0.7265	0.6150	0.0472	0.2672	0.5014	0.6058	0.2672	0.6844	0.6507	0
Stimulus	100.0000	90.0000	82.0000	73.0000	62.0000	0.0000	45.0000	76.0000	61.0000	42.0000	69.0000	74.0000	8
Target X cd/m²	77.4919	61.3910	50.3360	38.8457	27.1684	0.0000	8.9950	30.7424	14.5485	8.4597	20.5931	25.1505	2
Target Y cd/m²	81.5303	64.5904	52.9592	40.8701	28.5843	0.0000	8.0694	28.9693	15.5119	10.6948	19.3806	34.5756	2
Target Z cd/m²	88.7840	70.3369	57.6710	44.5063	31.1274	0.0000	5.0756	21.6133	28.4017	5.6104	36.6961	36.4837	4
Target Xn 0-1	0.9505	0.7530	0.6174	0.4765	0.3332	0.0000	0.1103	0.3771	0.1784	0.1038	0.2526	0.3085	0
Target Yn 0-1	1.0000	0.7922	0.6496	0.5013	0.3506	0.0000	0.0990	0.3553	0.1903	0.1312	0.2377	0.4241	0
Target Zn 0-1	1.0890	0.8627	0.7074	0.5459	0.3818	0.0000	0.0623	0.2651	0.3484	0.0688	0.4501	0.4475	0
TargetGamut:Nrml Y	1.0000	0.7922	0.6496	0.5013	0.3506	0.0000	0.1743	0.5436	0.3394	0.1484	0.4413	0.5152	0
TargetRED:Lin0-1	1.0000	0.7922	0.6496	0.5013	0.3506	0.0000	0.1743	0.5436	0.1121	0.1003	0.2287	0.1247	0
TargetGRN:Lin0-1	1.0000	0.7922	0.6496	0.5013	0.3506	0.0000	0.0813	0.3121	0.1984	0.1484	0.2198	0.5152	0
TargetBLU:Lin0-1	1.0000	0.7922	0.6496	0.5013	0.3506	0.0000	0.0518	0.2287	0.3394	0.0518	0.4413	0.4037	0
TargetGamut:Nrml MaxY	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.5677	0.6537	0.5607	0.8841	0.5386	0.8232	0
Target x:CIE31	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.4063	0.3780	0.2489	0.3416	0.2686	0.2614	0
Target y:CIE31	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3645	0.3562	0.2653	0.4319	0.2528	0.3594	0

DeltaE 2000

8J

8I

8H

8G

8F

8E

8D

7J

7I

7H

7G

7F

7E

5D

2K

2F

2E

100% Yellow

100% Magenta

100% Cyan

100% Green

100% Red

Cyan

Magenta

Yellow

Red

Green

Blue

Orange Yellow

Yellow Green

Purple

Purplish Blue

Orange

Bluish Green

Blue Flower

Foliage

Blue Sky

Light Skin

Dark Skin

Black

Gray 35

Gray 50

Gray 65

Gray 80

White

0

1

2

3

↑ Calib

↑ Calib

▲ Analysis

↓

↑ Calib

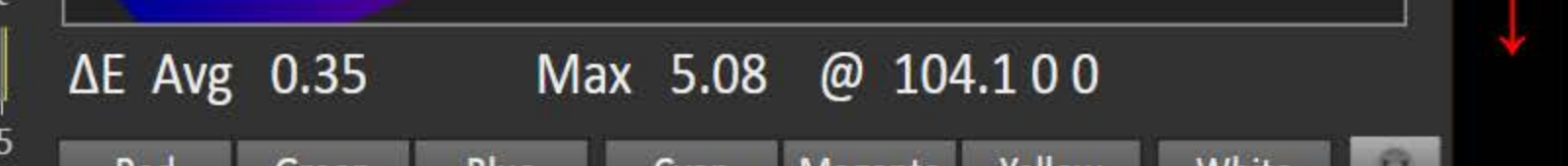
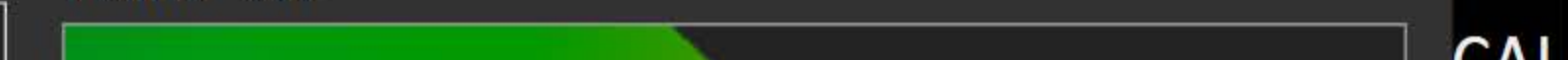
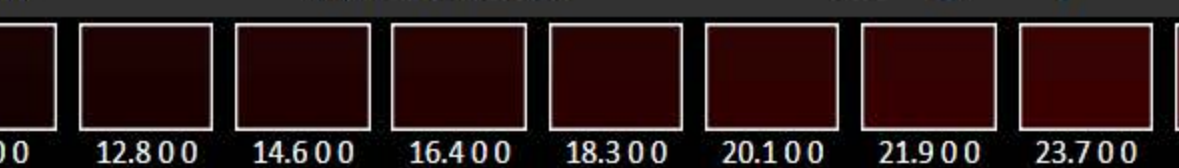
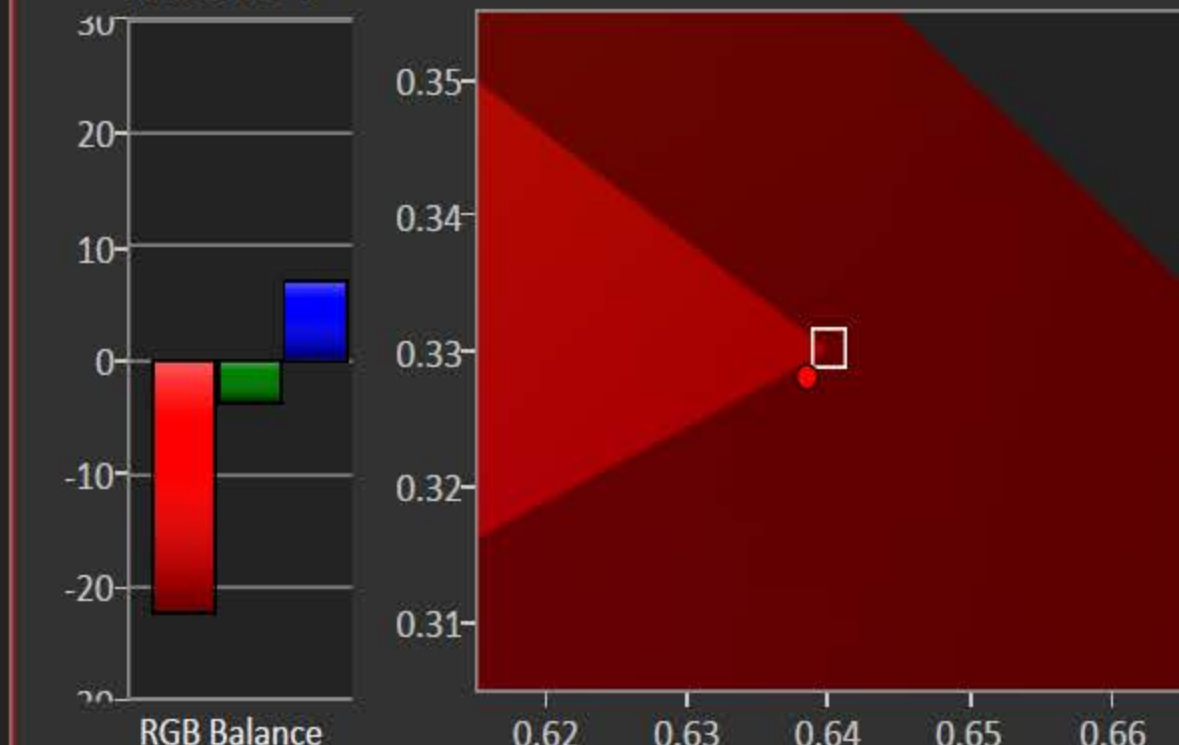
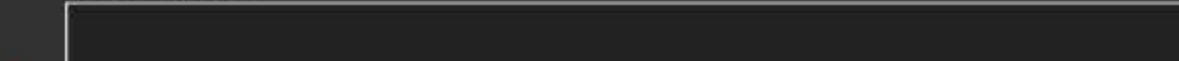
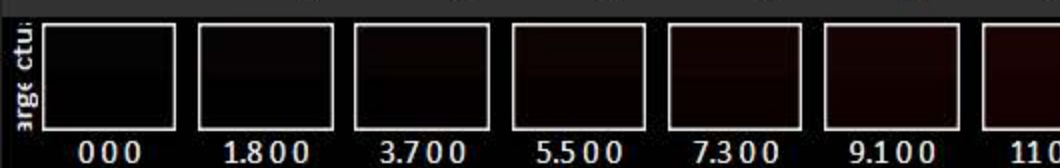
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Category	Value
109.100	109.100
107.800	107.800





CalMAN 5

▶

Datagrid

+

Home

3D Color Cube LUT Calibration Data

Color Notes

Less saturation

Calibration Notes

Better contrast

0 102.3 102.3



White

Red

Green

Blue

Cyan

Magenta

Yellow

	0 0	0 1.8 1.8	0 3.7 3.7	0 5.5 5.5	0 7.3 7.3	0 9.1 9.1	0 11 11	0 12.8 12.8	0 14.6 14.6	0 16.4 16.4	0 18.3 18.3	0 20
RGB Triplet	16, 16, 16	16, 20, 20	16, 24, 24	16, 28, 28	16, 32, 32	16, 36, 36	16, 40, 40	16, 44, 44	16, 48, 48	16, 52, 52	16, 56, 56	16,
RedIndex	16.00000	16.00000	16.00000	16.00000	16.00000	16.00000	16.00000	16.00000	16.00000	16.00000	16.00000	16.0
GreenIndex	16.00000	20.00000	24.00000	28.00000	32.00000	36.00000	40.00000	44.00000	48.00000	52.00000	56.00000	60.0
BlueIndex	16.00000	20.00000	24.00000	28.00000	32.00000	36.00000	40.00000	44.00000	48.00000	52.00000	56.00000	60.0
X	0.09560	0.13243	0.18455	0.24702	0.33198	0.43209	0.57769	0.71404	0.85777	1.06274	1.25667	1.43
Y cd/m²	0.10059	0.15348	0.23024	0.32883	0.45100	0.59838	0.80404	1.01462	1.20672	1.52948	1.80043	2.09
Z	0.10953	0.18356	0.28532	0.41811	0.58034	0.77845	1.04898	1.35738	1.60589	2.05993	2.41923	2.79
Xn 0-1	0.00116	0.00161	0.00224	0.00299	0.00402	0.00524	0.00700	0.00865	0.01040	0.01288	0.01523	0.01
Yn 0-1	0.00122	0.00186	0.00279	0.00399	0.00547	0.00725	0.00974	0.01230	0.01463	0.01854	0.02182	0.02
Zn 0-1	0.00133	0.00222	0.00346	0.00507	0.00703	0.00943	0.01271	0.01645	0.01946	0.02497	0.02932	0.03
Stimulus Percent	0.00000	0.01826	0.03653	0.05479	0.07306	0.09132	0.10959	0.12785	0.14612	0.16438	0.18265	0.20
RED Stim%:0-1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00
GRN Stim%:0-1	0.00000	0.01826	0.03653	0.05479	0.07306	0.09132	0.10959	0.12785	0.14612	0.16438	0.18265	0.20
BLU Stim%:0-1	0.00000	0.01826	0.03653	0.05479	0.07306	0.09132	0.10959	0.12785	0.14612	0.16438	0.18265	0.20
Measured Red Stimulus	0.04737	0.04761	0.04764	0.04424	0.04576	0.04555	0.04996	0.04207	0.05211	0.03905	0.04694	0.02
Measured Green Stimulus	0.04737	0.05967	0.07356	0.08819	0.10239	0.11705	0.13406	0.14986	0.16173	0.18119	0.19491	0.20
Measured Blue Stimulus	0.04737	0.06014	0.07356	0.08756	0.10167	0.11624	0.13313	0.14986	0.16173	0.18118	0.19490	0.20
Stimulus	0.00000	2.00000	3.70000	5.50000	7.30000	9.00000	11.00000	13.00000	14.60000	16.40000	18.30000	20.0
Target X cd/m²	0.00000	0.00665	0.03056	0.07457	0.14041	0.22941	0.34262	0.48094	0.64517	0.83600	1.05408	1.29
Target Y cd/m²	0.00000	0.00973	0.04472	0.10912	0.20547	0.33570	0.50136	0.70378	0.94410	1.22336	1.54249	1.90
Target Z cd/m²	0.00000	0.01322	0.06075	0.14824	0.27914	0.45607	0.68112	0.95611	1.28260	1.66198	2.09553	2.58
Target Xn 0-1	0.00000	0.00008	0.00037	0.00090	0.00170	0.00278	0.00415	0.00583	0.00782	0.01013	0.01278	0.01
Target Yn 0-1	0.00000	0.00012	0.00054	0.00132	0.00249	0.00407	0.00608	0.00853	0.01144	0.01483	0.01869	0.02
Target Zn 0-1	0.00000	0.00016	0.00074	0.00180	0.00338	0.00553	0.00826	0.01159	0.01554	0.02014	0.02540	0.03
TargetGamut:Nrml Y	0.00000	0.00015	0.00069	0.00168	0.00316	0.00517	0.00772	0.01083	0.01453	0.01883	0.02374	0.02
TargetRED:Lin0-1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00
TargetGRN:Lin0-1	0.00000	0.00015	0.00069	0.00168	0.00316	0.00517	0.00772	0.01083	0.01453	0.01883	0.02374	0.02
TargetBLU:Lin0-1	0.00000	0.00015	0.00069	0.00168	0.00316	0.00517	0.00772	0.01083	0.01453	0.01883	0.02374	0.02
TargetGamut:Nrml MaxY	1.00000	0.78734	0.78734	0.78734	0.78734	0.78734	0.78734	0.78734	0.78734	0.78734	0.78734	0.78
Target x:CIE31	0.31271	0.22465	0.22465	0.22465	0.22465	0.22465	0.22465	0.22465	0.22465	0.22465	0.22465	0.22
Target y:CIE31	0.32901	0.32874	0.32874	0.32874	0.32874	0.32874	0.32874	0.32874	0.32874	0.32874	0.32874	0.32

16

Ramp

Ramp

0 74.9 74.9

0 76.7 76.7

0 78.5 78.5

0 80.4 80.4

0 82.2 82.2

0 84 84

0 85.8 85.8

0 87.7 87.7

0 89.5 89.5

0 91.3 91.3

0 93.2 93.2

0 95 95

0 96.8 96.8

0 98.6 98.6

0 100.5 100.5

0 102.3 102.3

0 104.1 104.1

0 105.9 105.9

0 107.8 107.8

0 109.1 109.1

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▲ Anlysis

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

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

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

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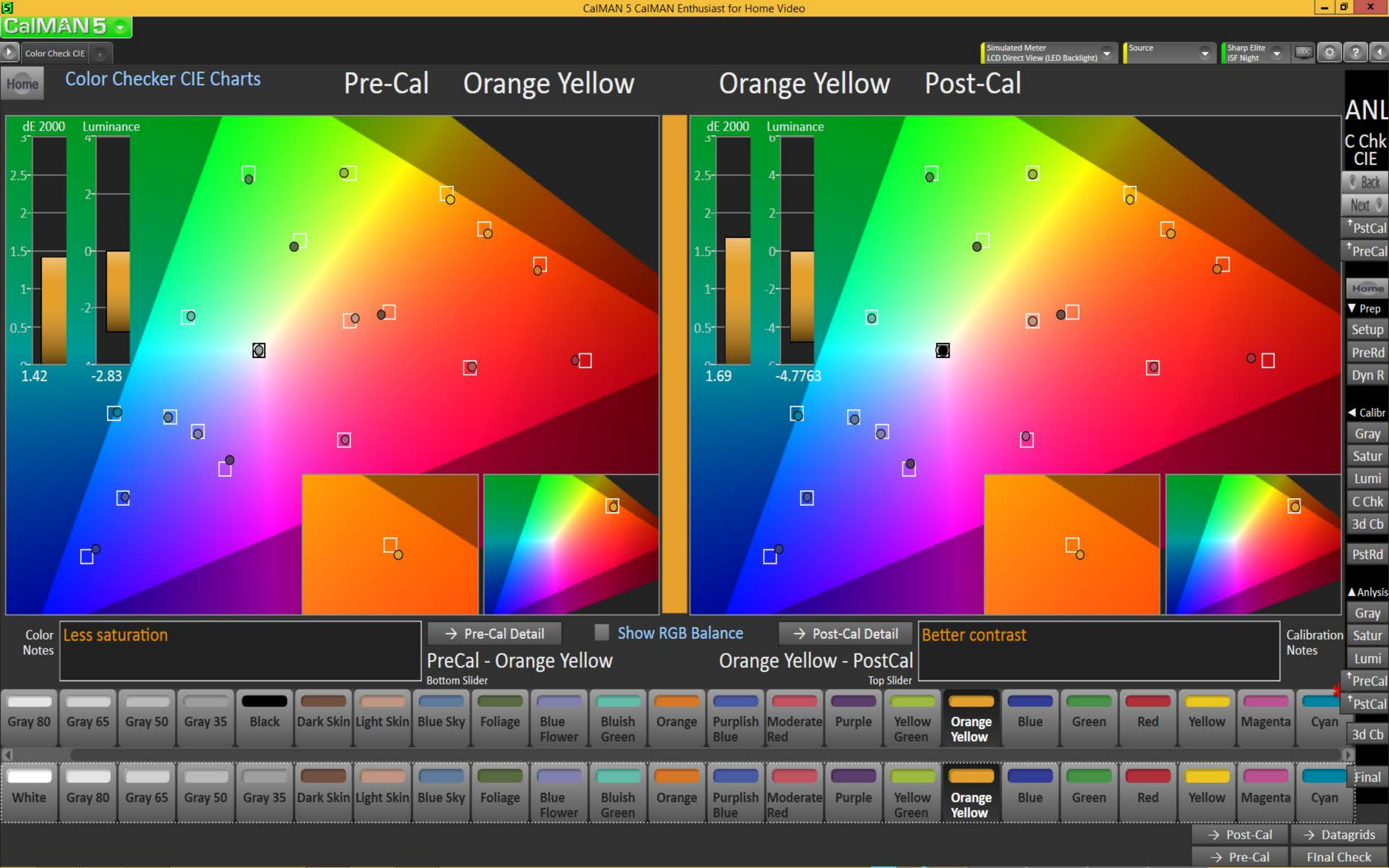








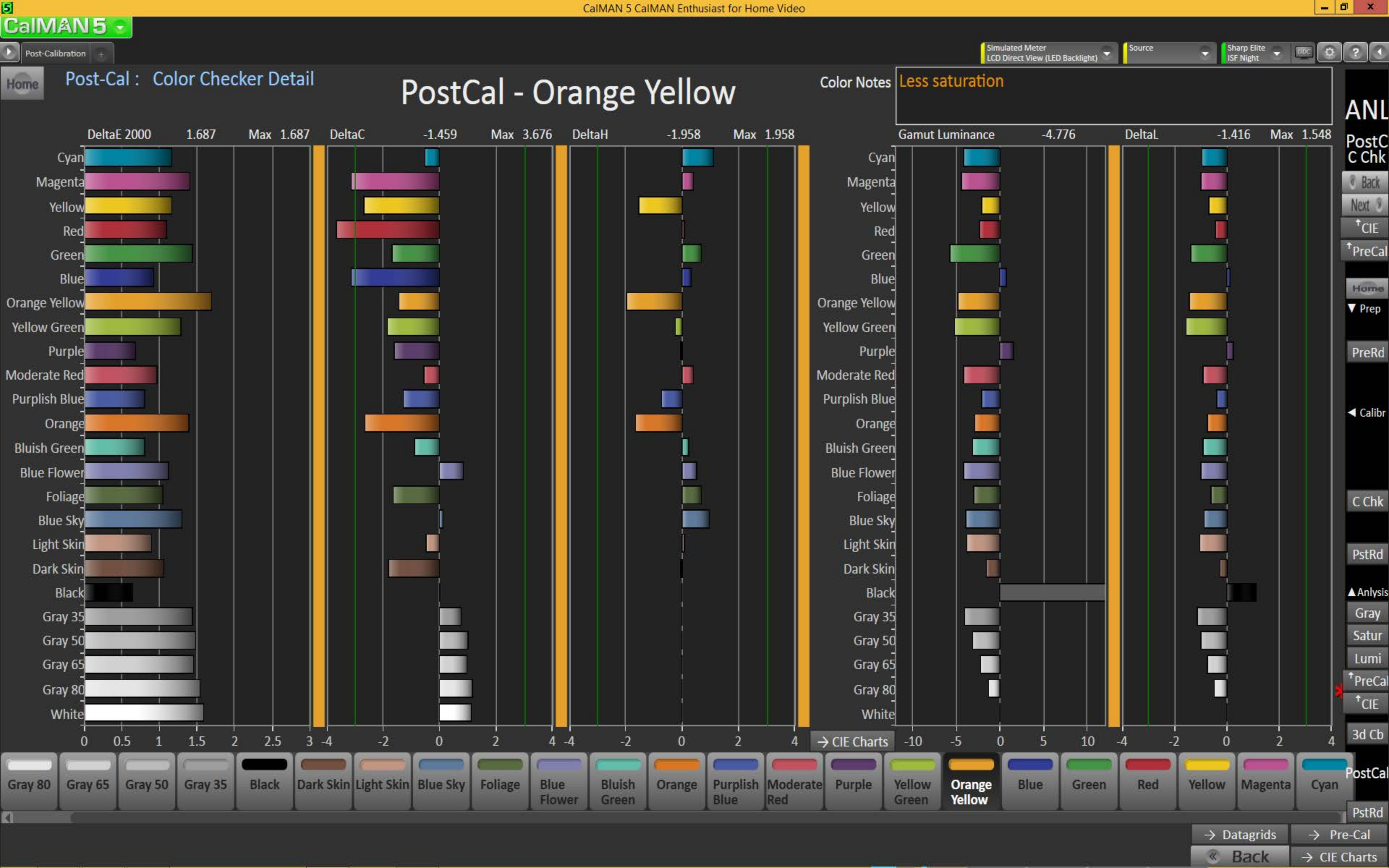




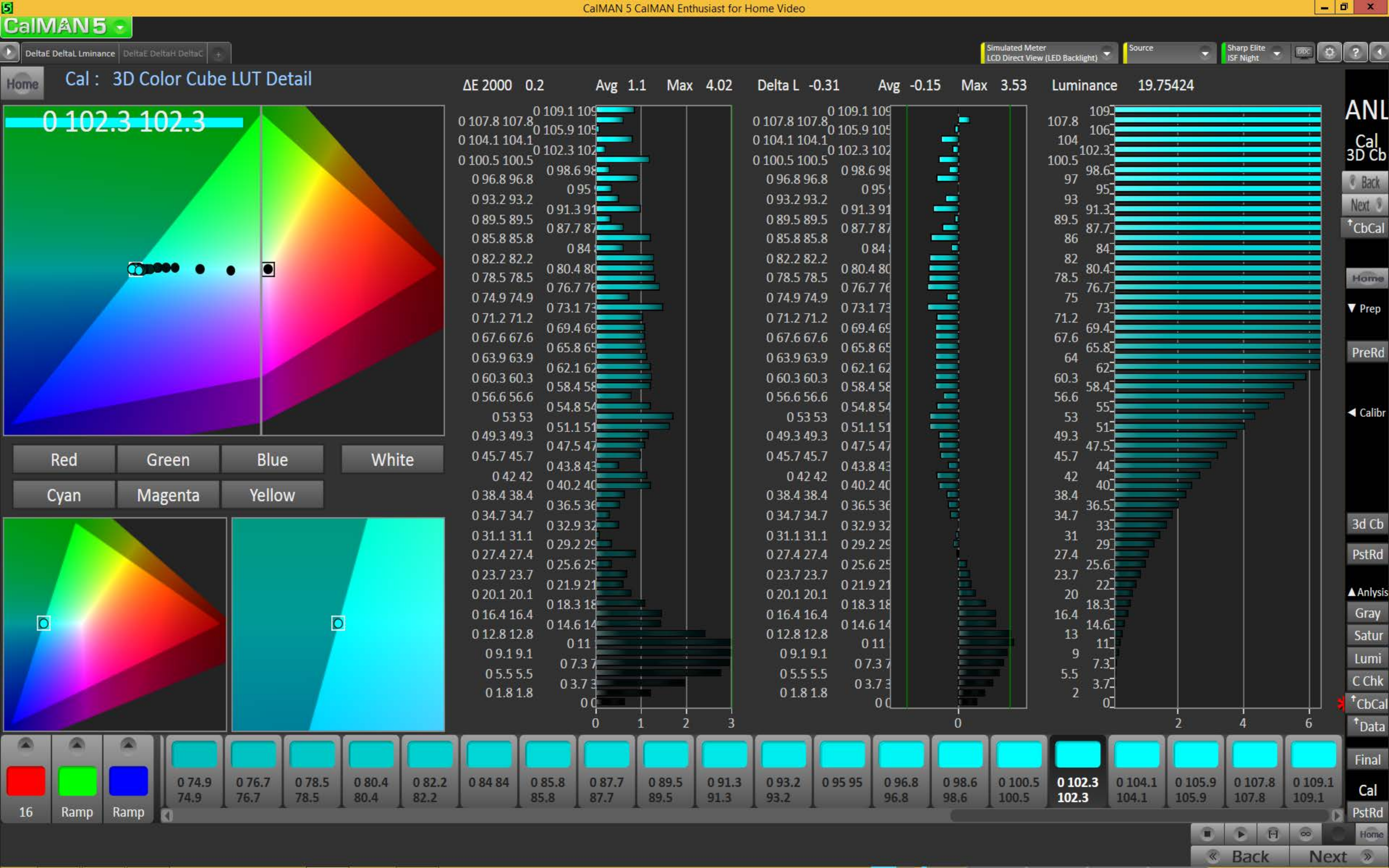








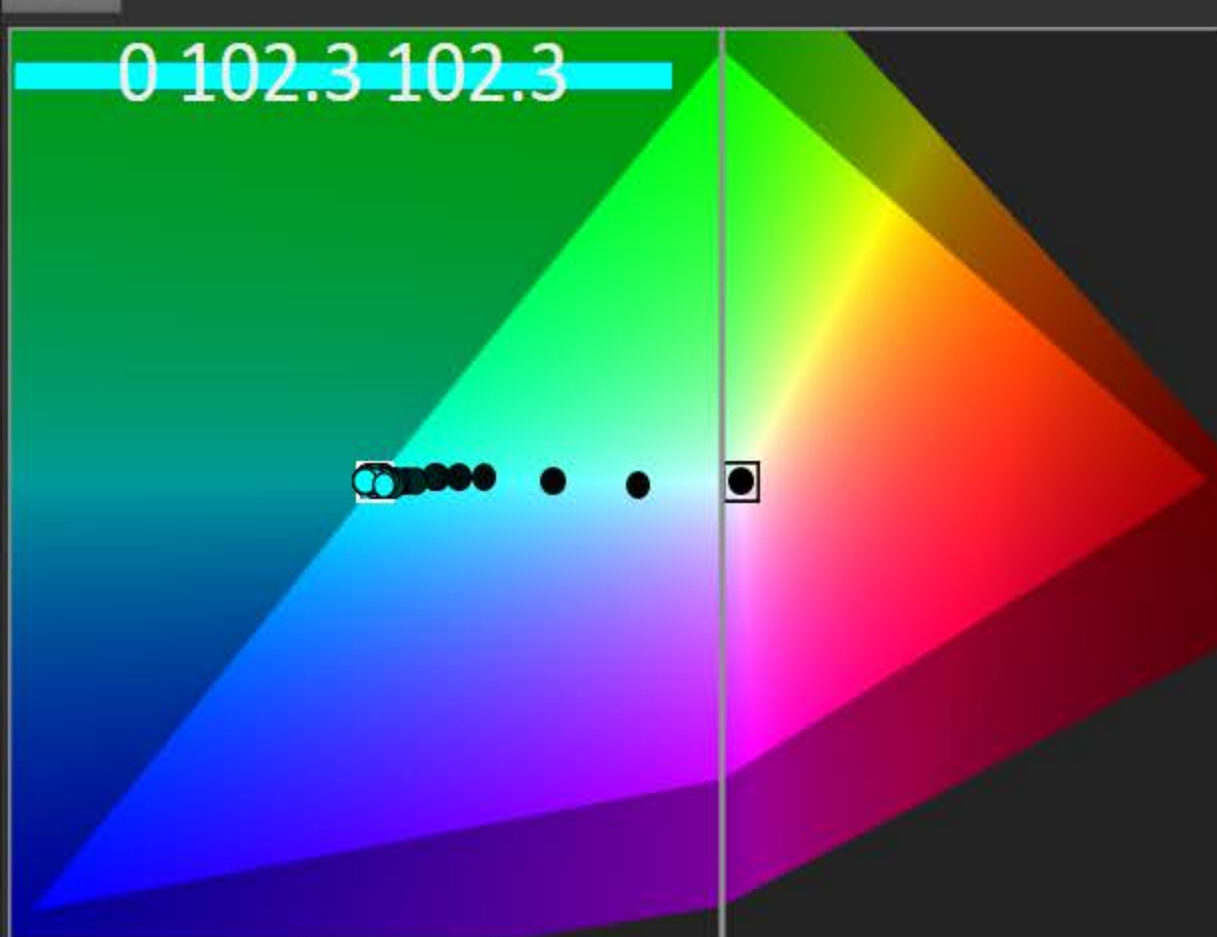






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### Cal : 3D Color Cube LUT Detail



Red

Green

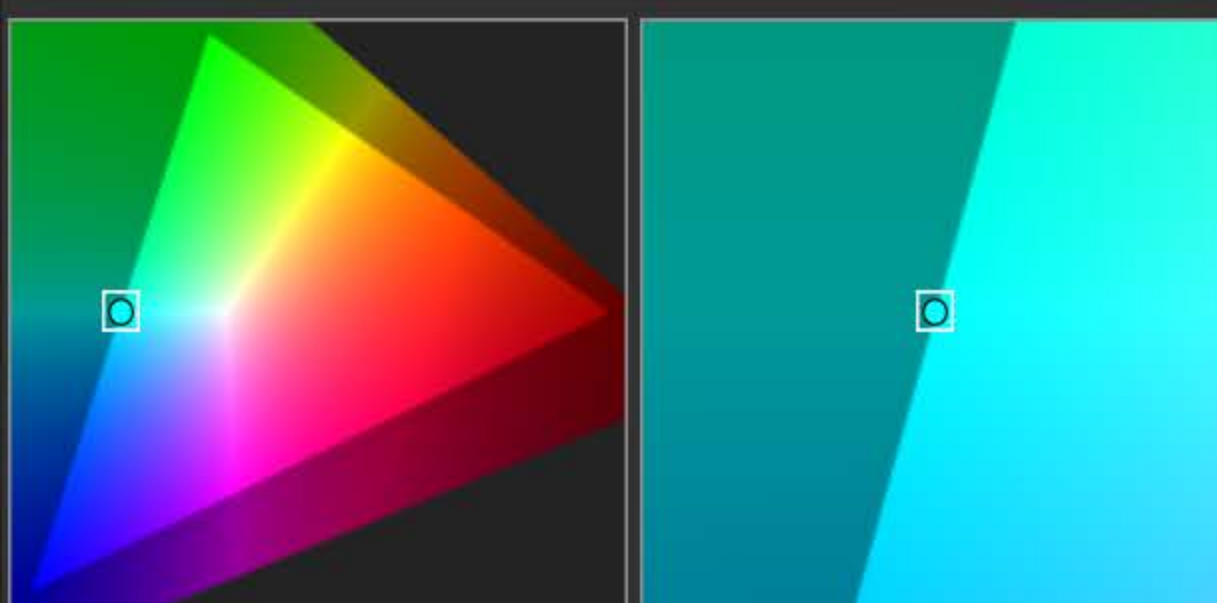
Blue

White

Cyan

Magenta

Yellow

 $\Delta E_{2000} \quad 0.2$ 

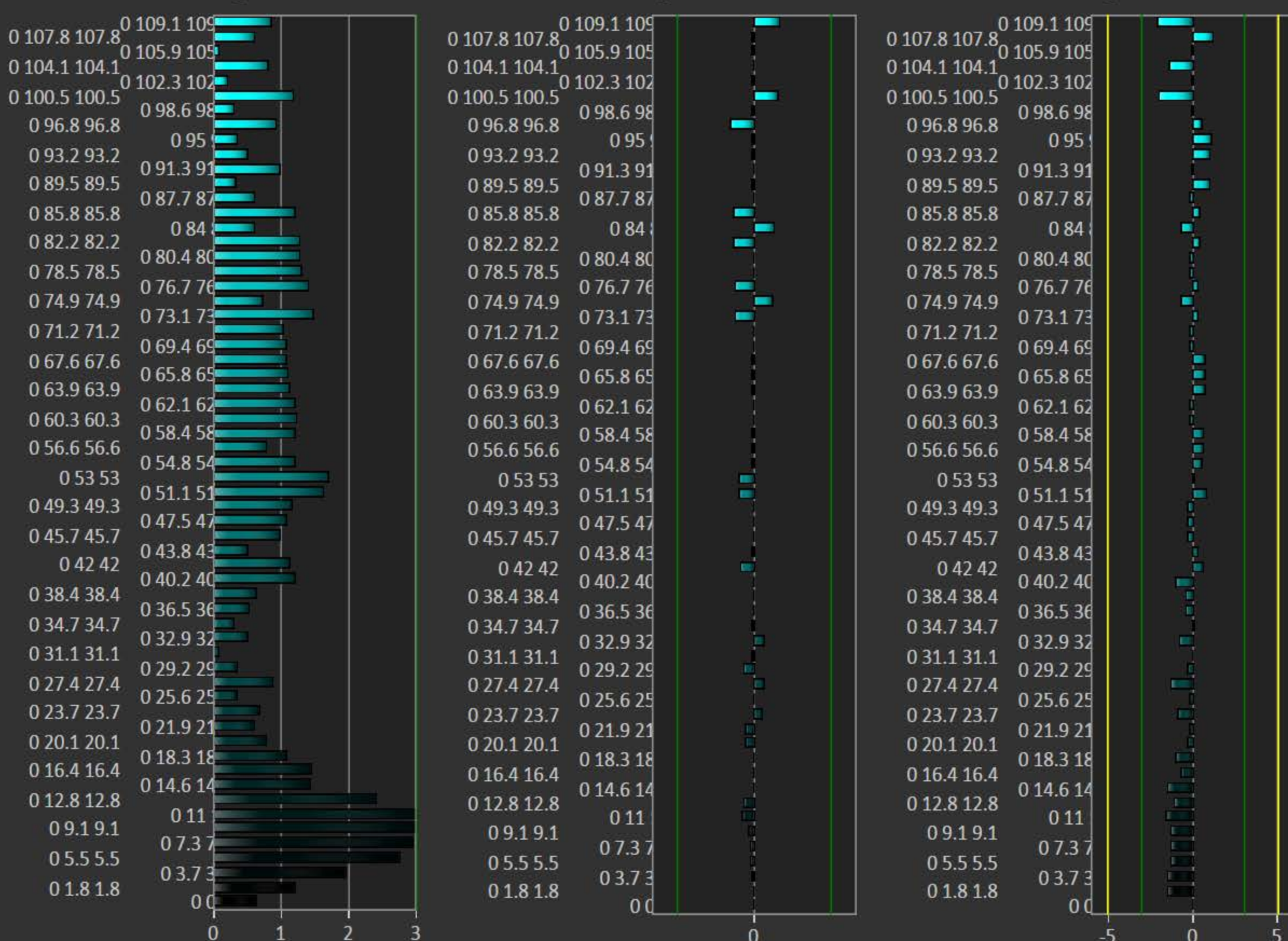
Avg 1.1    Max 4.02

Delta H 0


Avg -0.12    Max 2.68

Delta C -0.08

Avg -0.6 20.68 Max



AND  
Cal  
3D Cb

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▼ Prep

PreRd

◀ Calibr

3d Cb

PstRd

### ▲ Analysis

Gray

Satur

Lumi

C Chk

ch↑cal

ADtagr

Final

12/1/92

Cal

PstRd

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CalMAN 5

Final Check

CONTRAST VERIFICATION

Data Points: select Clipping or 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: 12 Point 10% step 0-109%

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

1

Luminance



2

Gamma Point



109

29.7700778 fL

White 23.8 fL

Black 0.0293582

Contrast Ratio 811

Post-Calibration Summary

Grayscale dE Avg 0.74

Grayscale dE Max 2.36

Saturation dE Avg 0.69

Saturation dE Max 1.39

Luminance dE Avg 0.92

Luminance dE Max 1.68

Color Checker dE Avg 1.18

Color Checker dE Max 1.69

3D Color Cube LUT Avg 1.1

3D Color Cube LUT Max 4.02

Gamma Total 2.18

CCT Average 6479

Final Notes

Post-cal notes

Contrast

Brightness

Backlight

TV Gamma

Color

Tint

Save

0

10

20

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70

80

90

100

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Calibr Gray

PstRd

Anlysis

Gray

Satur

Lumi

C Chk

3d Cb

Final



CalMAN 5

Saturation Datagrids

Simulated Meter  
LCD Direct View (LED Backlight)

Source

Sharp Elite  
ISF Night

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Pre-Cal : Saturation Sweep Data

	25%	50%	75%	100%
RGB Triplet	180, 123, 123	180, 90, 90	180, 64, 64	180, 16, 16
x: CIE31	0.0000	0.0000	0.0000	0.0000
Target x:CIE31	0.3940	0.4771	0.5572	0.6400
y: CIE31	0.0000	0.0000	0.0000	0.0000
Target y:CIE31	0.3293	0.3295	0.3297	0.3300
Y	0.0000	0.0000	0.0000	0.0000
Target Y	8.0385	5.3969	4.0999	3.2850
Gamma Point: Flat	0.0000	0.0000	0.0000	0.0000
ΔE 2000	0.0000	0.0000	0.0000	0.0000
ΔE 1994 L*:±	0.0000	0.0000	0.0000	0.0000
ΔE 1994 Sat:±	0.0000	0.0000	0.0000	0.0000
ΔE 1994 Hue:±	0.0000	0.0000	0.0000	0.0000
Signed dE94 L LuminanceCompensated	0.0000	0.0000	0.0000	0.0000
Signed dE94 C LuminanceCompensated	0.0000	0.0000	0.0000	0.0000
Signed dE94 H LuminanceCompensated	0.0000	0.0000	0.0000	0.0000

Post-Cal : Saturation Sweep Data

	25%	50%	75%	100%
RGB Triplet	180, 123, 123	180, 90, 90	180, 64, 64	180, 16, 16
x: CIE31	0.3973	0.4773	0.5471	0.6364
Target x:CIE31	0.3940	0.4771	0.5572	0.6400
y: CIE31	0.3313	0.3295	0.3297	0.3300
Target y:CIE31	0.3293	0.3295	0.3297	0.3300
Y	6.4377	4.2988	3.3234	2.6209
Target Y	6.5538	4.4001	3.3427	2.6783
Gamma Point: Flat	4.5204	5.9168	6.8066	7.6278
ΔE 2000	0.7300	0.5205	0.8659	0.7319
ΔE 1994 L*:±	-0.4482	-0.5112	-0.1161	-0.4030
ΔE 1994 Sat:±	0.4555	-0.3083	-2.8057	-2.0810
ΔE 1994 Hue:±	0.8180	0.0088	-0.7846	-0.8868
Signed dE94 L LuminanceCompensated	0.0000	0.0000	0.0000	0.0000
Signed dE94 C LuminanceCompensated	0.6224	0.0619	-2.6821	-1.4724
Signed dE94 H LuminanceCompensated	0.8156	0.0087	-0.7838	-0.8836

Click Change Selection then right-click above on either datagrid panel to show possible selections (ESC the context menu)

25%

50%

75%

100%

PRE-CAL

Change Selection

25%

50%

75%

100%

POST-CAL

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→ Pre-C Detail

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CalMAN 5

Color Check Datagrids

Simulated Meter  
LCD Direct View

Generic Calibration DVD

Direct Display Control

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Pre-Cal : Color Checker Data

PRE-CAL

	Black	Gray 35	Gray 50	Gray 65	Gray 80	White	Dark Skin	Light Skin	Blue Sky	Foliage	Blue Flower	Bluish Green	Orange	Purplish Blue	Moderate Red	Purple	Yellow Green	Orange Yellow	Blue	Green	Red
RED Linear 0-1	0.0012	0.3372	0.5002	0.6008	0.7999	1.0227	0.1676	0.5243	0.1146	0.0996	0.2045	0.1270	0.6987	0.0676	0.5322	0.1039	0.3267	0.7735	0.0297	0.0648	0.4284
TargetRED:Lin0-1	0.0000	0.3506	0.5013	0.6496	0.7922	1.0000	0.1743	0.5436	0.1121	0.1003	0.2287	0.1247	0.6982	0.0668	0.5436	0.1061	0.3506	0.7922	0.0293	0.0601	0.4415
Green Linear 0-1	0.0012	0.3277	0.4946	0.6295	0.7773	0.9939	0.0783	0.2912	0.1840	0.1428	0.2097	0.4871	0.1861	0.1039	0.0846	0.0467	0.4768	0.3388	0.0476	0.2817	0.0295
TargetGRN:Lin0-1	0.0000	0.3506	0.5013	0.6496	0.7922	1.0000	0.0813	0.3121	0.1984	0.1484	0.2198	0.5152	0.1902	0.1061	0.0865	0.0441	0.5013	0.3620	0.0441	0.3016	0.0264
Blue Linear 0-1	0.0012	0.3277	0.4854	0.6178	0.7774	0.9939	0.0531	0.2127	0.3218	0.0548	0.4135	0.3785	0.0224	0.3590	0.1140	0.1432	0.0469	0.0241	0.2999	0.0607	0.0411
TargetBLU:Lin0-1	0.0000	0.3506	0.5013	0.6496	0.7922	1.0000	0.0518	0.2287	0.3394	0.0518	0.4413	0.4037	0.0177	0.3737	0.1183	0.1484	0.0478	0.0225	0.3121	0.0601	0.0388
x: CIE31	0.3147	0.3147	0.3147	0.3107	0.3147	0.3147	0.4023	0.3813	0.2515	0.3398	0.2661	0.2638	0.5132	0.2166	0.4653	0.2896	0.3756	0.4773	0.1909	0.3072	0.5397
Target x:CIE31	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.4063	0.3780	0.2489	0.3416	0.2686	0.2614	0.5146	0.2147	0.4641	0.2882	0.3774	0.4749	0.1883	0.3049	0.5474
y: CIE31	0.3310	0.3290	0.3310	0.3310	0.3290	0.3290	0.3600	0.3562	0.2634	0.4237	0.2540	0.3602	0.4053	0.1912	0.3131	0.2233	0.4955	0.4387	0.1420	0.4874	0.3194
Target y:CIE31	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3645	0.3562	0.2653	0.4319	0.2528	0.3594	0.4095	0.1891	0.3122	0.2164	0.4955	0.4427	0.1349	0.4948	0.3187
Y	0.0294	7.8463	11.7818	14.8148	18.6114	23.7957	2.2724	7.9736	4.2634	3.0276	5.3131	9.5820	6.7415	2.7271	4.3291	1.5667	9.8485	9.7210	1.4753	5.2255	2.7410
Target Y	0.0000	8.3427	11.9285	15.4569	18.8516	23.7957	2.3552	8.4551	4.5274	3.1214	5.6565	10.0914	6.8004	2.7857	4.4263	1.5423	10.3871	10.2085	1.4348	5.5394	2.7497

Post-Cal : Color Checker Data

POST-CAL

	Black	Gray 35	Gray 50	Gray 65	Gray 80	White	Dark Skin	Light Skin	Blue Sky	Foliage	Blue Flower	Bluish Green	Orange	Purplish Blue	Moderate Red	Purple	Yellow Green	Orange Yellow	Blue	Green	Red
RED Linear 0-1	0.0013	0.3511	0.4964	0.6131	0.7800	1.0353	0.1660	0.5313	0.1117	0.1005	0.2165	0.1296	0.6902	0.0730	0.5492	0.1061	0.3368	0.7695	0.0303	0.0639	0.4379
TargetRED:Lin0-1	0.0000	0.3506	0.5013	0.6496	0.7922	1.0000	0.1743	0.5436	0.1121	0.1003	0.2287	0.1247	0.6982	0.0668	0.5436	0.1061	0.3506	0.7922	0.0293	0.0601	0.4415
Green Linear 0-1	0.0012	0.3412	0.4824	0.6424	0.8030	0.9887	0.0816	0.3071	0.1941	0.1461	0.2167	0.4970	0.1811	0.1080	0.0897	0.0461	0.4971	0.3514	0.0486	0.2942	0.0297
TargetGRN:Lin0-1	0.0000	0.3506	0.5013	0.6496	0.7922	1.0000	0.0813	0.3121	0.1984	0.1484	0.2198	0.5152	0.1902	0.1061	0.0865	0.0441	0.5013	0.3620	0.0441	0.3016	0.0264
Blue Linear 0-1	0.0012	0.3412	0.4825	0.6305	0.8030	1.0077	0.0528	0.2254	0.3321	0.0549	0.4363	0.3862	0.0206	0.3670	0.1164	0.1426	0.0529	0.0259	0.3061	0.0641	0.0439
TargetBLU:Lin0-1	0.0000	0.3506	0.5013	0.6496	0.7922	1.0000	0.0518	0.2287	0.3394	0.0518	0.4413	0.4037	0.0177	0.3737	0.1183	0.1484	0.0478	0.0225	0.3121	0.0601	0.0388
x: CIE31	0.3147	0.3147	0.3147	0.3107	0.3107	0.3147	0.4003	0.3773	0.2495	0.3398	0.2661	0.2638	0.5152	0.2186	0.4653	0.2916	0.3736	0.4733	0.1909	0.3052	0.5377
Target x:CIE31	0.3127	0.3127	0.3127	0.3127	0.3127	0.3127	0.4063	0.3780	0.2489	0.3416	0.2686	0.2614	0.5146	0.2147	0.4641	0.2882	0.3774	0.4749	0.1883	0.3049	0.5474
y: CIE31	0.3290	0.3290	0.3290	0.3310	0.3290	0.3270	0.3640	0.3562	0.2654	0.4257	0.2520	0.3602	0.4053	0.1932	0.3151	0.2233	0.4935	0.4407	0.1420	0.4874	0.3174
Target y:CIE31	0.3290	0.3290	0.3290	0.3290	0.3290	0.3290	0.3645	0.3562	0.2653	0.4319	0.2528	0.3594	0.4095	0.1891	0.3122	0.2164	0.4955	0.4427	0.1349	0.4948	0.3187
Y	0.0288	8.0064	11.3198	14.8148	18.6114	23.3198	2.2724	8.1364	4.3504	3.0276	5.4215	9.5820	6.4772	2.7816	4.4157	1.5354	10.0495	9.7210	1.4753	5.3321	2.7410
Target Y	0.0000	8.1759	11.6899	15.1477	18.4745	23.3198	2.3081	8.2860	4.4368	3.0590	5.5433	9.8896	6.6644	2.7300	4.3378	1.5115	10.1794	10.0044	1.4061	5.4286	2.6947

Change Selection

Click Change Selection then right-click above on either datagrid panel to show possible selections (ESC the context menu)

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