

Virtual Production Tool Set Color Calibrator

User Guide

Software Version 3.0

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Overview

About Color Calibrator

“Color Calibrator” is an application that measures and calibrates the color reproduction characteristics of displays and cameras used in a virtual production environment.

It accepts X-OCN files captured using the Sony MPC-3610 (VENICE / CineAltaV), MPC-3626/ MPC-3628 (VENICE 2 / CineAltaV 2), and MPC-2610 (BURANO / CineAltaB) Digital Cinema Cameras or SDI output signals from a camera that supports S-Log3, and generates 3D LUT files used for calibration (correction of color characteristics).

The calibration operation is performed in conjunction with the “Camera and Display Plugin” Unreal Engine plugin, but calibration is also possible using Color Calibrator alone in use cases that do not use Unreal Engine.

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Usage Precautions

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About the Display Screen

The displayed screen may vary from that shown in this document, depending on the computer and operating environment.

Setup

Operating Environment

Operating conditions

To use the application, an Internet connection is required when launched for the first time and every 28 days thereafter. The proxy server for Internet connection uses the Windows OS proxy settings.

[Note]

When a connection to the Internet is established, the application is enabled for the subsequent 28 days. Note that when working offline, you will need to connect to the Internet every 28 days.

Recommended operating environment

OS:

Windows 11 (64-bit)

CPU:

Quad core Intel (4th generation Core or later) or AMD (Zen series or later), 2.5 GHz or higher

Memory:

6 GB RAM or higher

HDD:

500 MB free space or higher

GPU:

AMD Radeon RX 400 series or later
NVIDIA GeForce GTX 750 series or later

Monitor:

1920×1080 or higher

Supported devices

Camera:

MPC-3610 (VENICE / CineAltaV)
MPC-3626 and MPC-3628 (VENICE 2 / CineAltaV 2)
MPC-2610 (BURANO / CineAltaB)
ILME-FR7: Only SDI connection supported
BRC-AM7: Only SDI connection supported
HDC-5500 and HDC-5500V version 3.01 or

later: Only SDI connection supported
HDC-F5500 version 3.01 or later: Only SDI connection supported
HDC-3500 and HDC-3500V version 3.01 or later: Only SDI connection supported
SDI capture card:
Decklink 8K Pro
manufactured by Blackmagic Design

[Note]

SDI capture cards are required only for input of the output signal from a camera using SDI connection.

3D LUT box:

Micro Converter BiDirectional SDI/HDMI
12G
manufactured by Blackmagic Design

[Note]

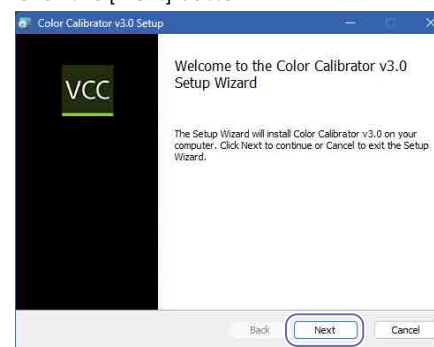
A 3D LUT box can be used when there is no way to apply a calibration LUT, for example, when applying a screen process.

Installing Color Calibrator

This section describes how to install Color Calibrator using the "ColorCalibrator_xxxxx.msi" installer. The "xxxxx" part of the file name indicates the version of the application.

1 Run "ColorCalibrator_xxxxx.msi."
The setup wizard launches.

2 Click the [Next] button.

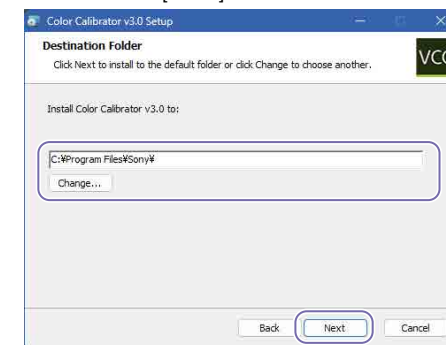


3 When the software end user license agreement appears, check the contents.

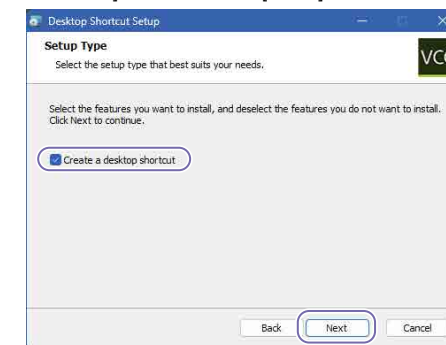
4 Place a check mark in [I accept the terms in the License Agreement] to proceed, and click the [Next] button.



5 Specify the installation destination folder and click the [Next] button.

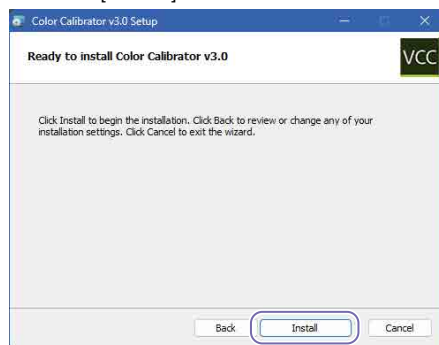


6 To create a shortcut on the desktop, place a check mark in [Create a desktop shortcut] and click the [Next] button.



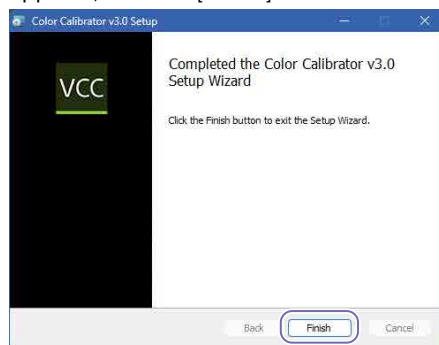
To continue without creating a shortcut, leave the checkbox empty and click the [Next] button.

- 7 When the ready to install screen appears, click the [Install] button.



Installation of the application begins.

- 8 When the installation completed screen appears, click the [Finish] button.



The setup wizard closes.

SDI Connection with Camera

You can perform a calibration by inputting the SDI output signal from a camera directly into Color Calibrator.

To use SDI connection, attach a supported SDI capture card to the computer running Color Calibrator.

For details about SDI capture cards, see “Supported devices” (page 6).

While DeckLink 8K Pro allows you to set the SDI connectors, Color Calibrator automatically sets the connection to “SDI 1&2 In, SDI 3&4 Out.” Connect the SDI input signal to the SDI 2 connector.

Supported input signals

The SDI connection supports the following input signals.

Resolution:

1920×1080

Frame rate and signal format:

23.98/24/25/29.97 (PsF or Progressive, YPbPr, 1.5G)

50/59.94 (Progressive, YPbPr, 3G)

Color space:

S-Gamut3/SLog3

S-Gamut3.Cine/SLog3

ARRIWideGamut3/LogC3

ARRIWideGamut4/LogC4

REDWideGamut/Log3G10

Connection with a Display Device

Color Calibrator V3.0 can output a calibration chart so that calibration can be performed even when using a screen process or a system other than Unreal Engine.

Windows external monitor

HDMI and DisplayPort:

Set 10-bit or higher output.

Windows HDR is not supported.

SDI output

Resolution:

1920×1080

2048×1080

3840×2160

4096×2160

Frame rate and signal format:

23.976/24/25/29.97/30/50/59.94/60 (Progressive)

23.976/24/25 (for PsF, 1920×1080, 2048×1080)

Connection:

Single Link or Dual Link

For the DeckLink 8K Pro, connect SDI4 as Link A and SDI3 as Link B.

3D LUT box

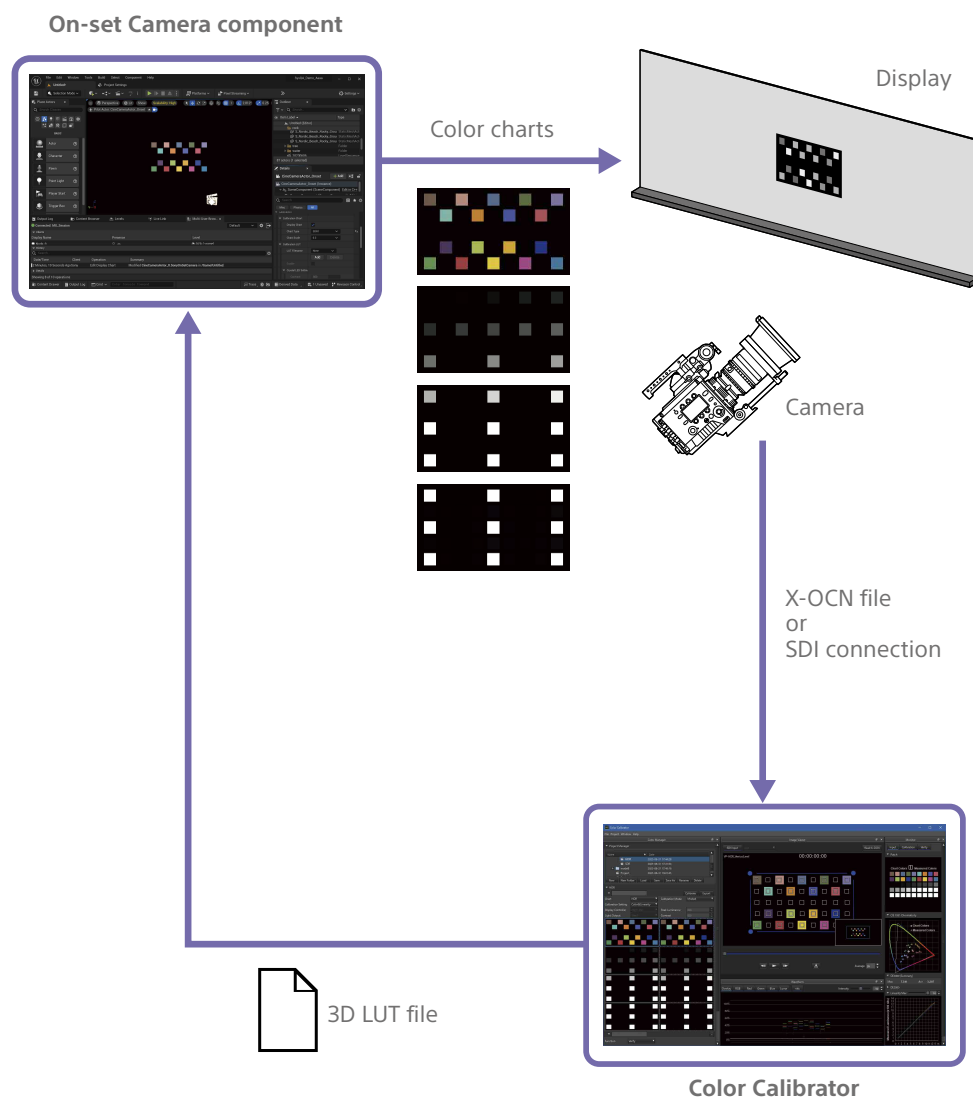
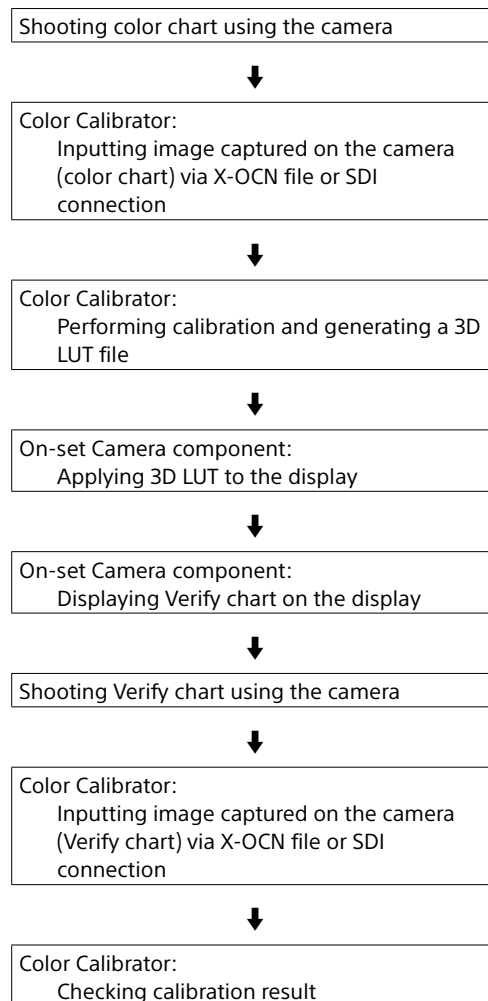
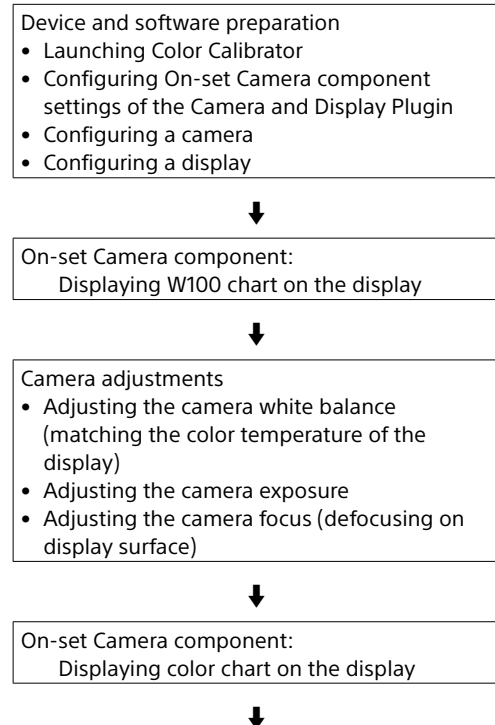
In cases where it is difficult to apply a calibration LUT to the background image display system when using a screen process or a system other than Unreal Engine, you can connect a 3D LUT box between the display device and a PC and apply the calibration result using the 3D LUT box. For details about generating a cube file for a 3D LUT box, see “Generating a 3D LUT File” (page 22).

Overview of Calibration Operations

Color Calibrator can perform calibration in conjunction with the "Camera and Display Plugin" Unreal Engine plugin or running standalone without using the plugin. When used in conjunction with Camera and Display Plugin, you can use a workflow that uses consistent color management of Sony cinema cameras from pre-vis to shooting. Alternatively, when shooting without using 3D assets, such as a screen process, you can use the chart output function of Color Calibrator to correct the effects of color distortion when re-shooting a display without using the plugin.

Calibration operation workflow using the plugin

The basic operation workflow for calibration using the plugin is shown below.



Calibration operation workflow not using the plugin

The basic operation workflow for calibration without using the plugin is shown below.

Device and software preparation

- Launching Color Calibrator
- Configuring a camera
- Configuring a display



Color Calibrator:
Displaying W100 chart on the display



Camera adjustments

- Adjusting the camera white balance (matching the color temperature of the display)
- Adjusting the camera exposure
- Adjusting the camera focus (defocusing on display surface)



Color Calibrator:
Displaying color chart on the display



Shooting color chart using the camera



Color Calibrator:
Inputting image captured on the camera (color chart) via X-OCN file or SDI connection
Executing calibration and generating a 3D LUT file



Background display application or 3D LUT box:
Applying 3D LUT to the display



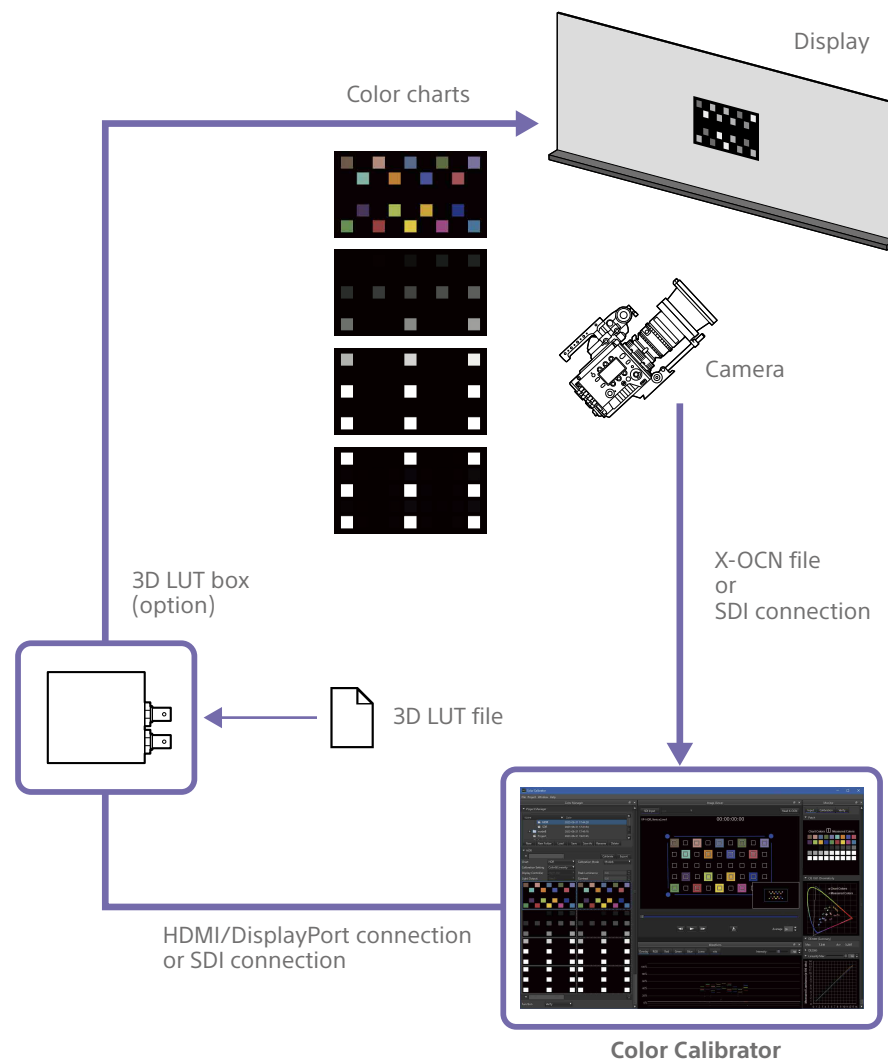
Color Calibrator:
Displaying Verify chart on the display



Shooting Verify chart using the camera



Color Calibrator:
Inputting image captured on the camera (Verify chart) via X-OCN file or SDI connection
Checking calibration result



Calibration Types

Color Calibrator performs calibration to match the display mode (HDR or SDR) of the display and the luminance management operating mode (Mode A or Mode B).

It supports the following four types of calibration according to the combinations of the display mode of the display and the luminance management operating mode. For the use case where the Camera and Display Plugin is not used, such as a screen process, or when shooting with cameras other than CineAlta, use Mode A.

- HDR & Mode A
- HDR & Mode B
- SDR & Mode A
- SDR & Mode B

Display mode of the display

Select the type of calibration to match the display mode (HDR or SDR) of the display used when shooting.

HDR

When the display mode of the display is HDR, display an HDR image (color chart) and measure the color characteristics of the display and camera.

This mode enables you to calibrate color reproduction characteristics that include HDR high luminance characteristics.

SDR

When the display mode of the display is SDR, display an SDR image (color chart) and measure the color characteristics of the display and camera.

This mode enables you to calibrate SDR color reproduction characteristics.

[Note]

With SDR, calibration performance may not be obtained, depending on the display characteristics of the display. If calibration performance is not obtained, it is recommended to adjust the display settings of the display or switch to HDR operation.

Luminance management operating mode

Select the type of calibration to match the operating mode (Mode A or Mode B) set using [Sensitivity Simulation] of a Virtual Camera actor of the Camera and Display Plugin.

[Note]

In Mode B operating mode, a lens with T-number indicator and RDD18 metadata are required. In Color Calibrator, Mode B can be selected only when importing an X-OCN file or when inputting an SDI output signal that has RDD18 metadata.

An F-number indicator does not include the lens transmittance, so accurate brightness measurement and correction is not possible. If using a lens or camera whose T-number is unknown, use Mode A.

The Mode B functionality is in beta. This is an experimental feature, so conduct sufficient testing before operating in Mode B.

Mode A

This is an operating mode where the deviation in optical luminance between an actual display and camera is included in a Virtual Camera actor.

In Mode A, the brightness of the output video from a Virtual Camera actor changes in the same way as the actual shooting environment, depending on the type of display used in the virtual space.

Mode A calibrates the luminance and color of the output video of a real camera so that it matches the output video of a Virtual Camera actor.

Mode B (Beta)

This is an operating mode where the deviation in optical luminance between an actual

display and camera is not included in a Virtual Camera actor.

In Mode B, the brightness of the output video from a Virtual Camera actor does not change, depending on the type of display used in the virtual space.

Mode B calibrates the luminance and color of the output video of a real camera so that it matches the output video of a Virtual Camera actor.

[Note]

In Mode A, the brightness of the display (inner frustum) does not change when the 3D LUT for calibration is applied.

Use Mode A when not using a Virtual Camera actor in the pre-vis process or when there is no need to calibrate the luminance of a Virtual Camera actor and a real camera.

In Mode B, the deviation in optical brightness between the actual display and the camera is included in the 3D LUT for calibration, so applying the 3D LUT changes the brightness of the actual display (inner frustum).

Basic Operation

You can perform calibration using Color Calibrator and the On-set Camera component of the Camera and Display Plugin, or using the chart display function of Color Calibrator. The calibration procedure will vary depending on the calibration type. Perform the calibration to match the type.

For details about calibration types, see “Calibration Types” (page 10).

For details about calibration when using a system camera (HDC series), see “System Camera Calibration Operation” (page 16).

For details about calibration when using a non-Sony camera, see “Non-Sony Camera Calibration Operation” (page 17).

“HDR & Mode A” Type Calibration Operation

Use the following calibration procedure when the display mode of the display is HDR and the luminance management operating mode is Mode A.

1 Display the W100 chart on the display. For details, see “Displaying Color Charts on the Display” (page 23).

2 Check the display settings. The display must be set to the appropriate settings for successful calibration. Check that the display is configured as follows.

- Color space setting of the display controller matches the color chart.
- W100 chart is displayed at 100 nits emission (check by measuring the display using a spectral radiance meter or other device).

For details, see “Configuring a Display” (page 26).

3 Check the camera settings. Check that the camera is configured as follows. For details, refer to the manual for the camera.

- Input Color Space: “S-Gamut3.Cine/SLog3” or “S-Gamut3/SLog3”
- Recording Format: X-OCN video format
- ND Filter: “Clear”
- White Balance: “6500K”
On cameras that cannot be set to “6500K,” set to the value closest to 6500K.
- Exposure Index: VENICE 2 8K (CineAltaV 2 8K) / BURANO (CineAltaB): “800EI”
VENICE 2 6K (CineAltaV 2 6K) / VENICE (CineAltaV): “500EI”
For other cameras, set to match the “Base ISO” setting.
- Base ISO: VENICE 2 8K (CineAltaV 2 8K) / BURANO (CineAltaB): “ISO 800”
VENICE 2 6K (CineAltaV 2 6K) / VENICE (CineAltaV): “ISO 500”
For other cameras, set the Low “Base ISO” setting.

[Notes]

- To input an output signal from a BURANO (CineAltaB) via SDI connection, set the codec to XAVC. To input an X-OCN file from a BURANO (CineAltaB), set the codec to X-OCN and import a recorded X-OCN file into Color Calibrator.
- There are no restrictions on the “FPS” and “Shutter” settings, but at high shutter speeds, flicker may occur if the display and camera are not synchronized.
- When operating using a display with a color temperature other than 6500K, set “White

Balance” to match the color temperature of the display.

4 Check the camera viewfinder settings. The camera viewfinder must be set to the appropriate settings for successful calibration. Check that the viewfinder is configured as follows.

- Zebra function of the viewfinder is enabled.
- Zebra display of the viewfinder is set to zebra 2 (display level of 61%).
- Output video of the viewfinder is set to Log.

For details, see “Configuring Camera Output” (page 28).

[Note]

If the zebra function cannot be used, use a waveform monitor or the [Waveform] window of Color Calibrator. Input the camera output video (Log) to the waveform monitor or Color Calibrator and check that the signal waveform is displayed.

5 Adjust the exposure by shooting a W100 chart using the camera. Set the exposure (61%) appropriate for shooting a color chart in S-Log3. Adjust the shutter and iris to set the exposure so that the zebra appears on the W100 chart when viewed in the viewfinder. The zebra is displayed when the exposure is 61% or higher. When the exposure is set such that the zebra starts to appear, the W100 chart will be captured at 61% exposure.

[Note]

If the zebra function cannot be used, check the camera output signal in a waveform monitor or using the [W100 Adjust] button of Color Calibrator, and adjust the shutter and aperture so that the W100 chart luminance level is close to 100%.

6 Display the HDR1 chart on the display. For details, see “Displaying Color Charts on the Display” (page 23).

[Note]

Check that the color space setting of the display controller matches the color chart.

7 Shoot and record the HDR1 chart using the camera. Shoot the HDR1 chart using the camera and record to a file in X-OCN format. Observe the following when shooting the color chart.

- Turn off all lighting in the shooting location and do not use any lighting other than the display.
- Check that nothing is displayed in the outer frustum surrounding the chart display area. If anything other than the chart is displayed, it may be reflected onto the chart and affect the accuracy of calibration.
- Place the chart in the center of the display screen, leaving some space around the chart. When shooting, this helps suppress the effects of peripheral light reduction of the lens.
- Make sure that the chart is not in focus. If you are focused on the display surface, moiré may occur.

When an output signal from a camera is input to Color Calibrator via SDI connection

Calibration is performed by direct input of the video captured by the camera, so there is no need to record to a file.

When using SDI connection, set the SDI output video to Log.

For details, see “Configuring Camera Output” (page 28).

- 8 Shoot and record the “HDR2,” “HDR3,” and “HDR4” charts.
Repeat steps 6 to 7 to shoot and record the HDR2 chart, HDR3 chart, and HDR4 chart in the same way.
- 9 Access the X-OCN files recorded in step 7 from the computer running Color Calibrator.
If direct access is not possible, transfer the files to the computer.
When an output signal from a camera is input to Color Calibrator via SDI connection
Input the video captured by the camera directly. Access to files is not required.
- 10 Sample the HDR1 chart to HDR4 chart using Color Calibrator.
Sample the captured color charts.
When the calibration type is HDR & Mode A, set [Chart] to [HDR] and [Calibration Mode] to [ModeA] in the [Color Manager] window.
For details, see “Sampling a Color Chart” (page 19).
- 11 Perform calibration using Color Calibrator.
Click the [Calibrate] button in the [Color Manager] window to perform calibration.
Click the [Calibration] button in the [Monitor] window to check the calibration result. The [Calibration] button shows the calibration result based on simulation values.
For details, see “Performing Calibration” (page 21).
- 12 Generate a 3D LUT file (*.cube) using Color Calibrator.
Click the [Export] button in the [Color Manager] window to generate a 3D LUT file.

For details, see “Generating a 3D LUT File” (page 22).

- 13 Set the 3D LUT file for calibration in the On-set Camera component or in the 3D LUT box.
Set the 3D LUT file generated in step 12 and check that the calibration is applied to the display.
For details, see “Applying a 3D LUT to the Display” (page 23).
- 14 Display the Verify chart on the display.
For details, see “Displaying Color Charts on the Display” (page 23).
- 15 Shoot and record the Verify chart using the camera.
Shoot and record the Verify chart the same way as in step 7.
- 16 Sample the Verify chart using Color Calibrator.
Sample the captured Verify chart.
For details, see “Sampling a Color Chart” (page 19).
- 17 Check the calibration result using Color Calibrator.
Click the [Verify] button in the [Monitor] window to check the calibration result with 3D LUT applied. The [Verify] button shows the actual calibration result, not a result based on simulation values.

Managing calibration data

The measurement data for calibration and the calibration result data can be saved as a project in Color Calibrator.
For details, see “[Color Manager] Window” (page 32).

“HDR & Mode B” Type Calibration Operation

Use the following calibration procedure when the display mode of the display is HDR and the luminance management operating mode is Mode B.

- 1 Set the calibration chart to “W100” in the On-set Camera component.
The W100 chart appears on the display.
For details, see “Displaying Color Charts on the Display” (page 23).
- 2 Check the display settings.
The display must be set to the appropriate settings for successful calibration.
Check that the display is configured as follows.
 - Color space setting of the display controller matches the color chart.
 - W100 chart is displayed at 100 nits emission (check by measuring the display using a spectral radiance meter or other device).
 For details, see “Configuring a Display” (page 26).
- 3 Check the camera settings.
Check that the camera is configured as follows.
For details, refer to the manual for the camera.
 - Input Color Space:
“S-Gamut3.Cine/SLog3” or “S-Gamut3/SLog3”
 - Recording Format:
X-OCN video format
 - ND Filter:
“Clear”

- White Balance:
“6500K”
On cameras that cannot be set to “6500K,” set to the value closest to 6500K.
- Exposure Index:
VENICE 2 8K (CineAltaV 2 8K) / BURANO (CineAltaB): “800EI”
VENICE 2 6K (CineAltaV 2 6K) / VENICE (CineAltaV): “500EI”
For other cameras, set to match the “Base ISO” setting.
- Base ISO:
VENICE 2 8K (CineAltaV 2 8K) / BURANO (CineAltaB): “ISO 800”
VENICE 2 6K (CineAltaV 2 6K) / VENICE (CineAltaV): “ISO 500”
For other cameras, set the Low “Base ISO” setting.
- FPS:
“23.98”
- Shutter (angle):
“180”
- Iris (T-number):
“T4.0”

[Notes]

- To input an output signal from a BURANO (CineAltaB) via SDI connection, set the codec to XAVC. To input an X-OCN file from a BURANO (CineAltaB), set the codec to X-OCN and import a recorded X-OCN file into Color Calibrator.
- When operating using a display with a color temperature other than 6500K, set “White Balance” to match the color temperature of the display.

- 4 Set the calibration chart to “HDR1” in the On-set Camera component.
The HDR1 chart appears on the display.
For details, see “Displaying Color Charts on the Display” (page 23).

[Note]

Check that the color space setting of the display controller matches the color chart.

5 Shoot and record the HDR1 chart using the camera.
Shoot the HDR1 chart using the camera and record to a file in X-OCN format. Observe the following when shooting the color chart.

- Turn off all lighting in the shooting location and do not use any lighting other than the display.
- Check that nothing is displayed in the outer frustum surrounding the chart display area. If anything other than the chart is displayed, it may be reflected onto the chart and affect the accuracy of calibration.
- Place the chart in the center of the display screen, leaving some space around the chart. When shooting, this helps suppress the effects of peripheral light reduction of the lens.
- Make sure that the chart is not in focus. If you are focused on the display surface, moiré may occur.

When an output signal from a camera is input to Color Calibrator via SDI connection

Calibration is performed by direct input of the video captured by the camera, so there is no need to record to a file. When using SDI connection, set the SDI output video to Log.
For details, see “Configuring Camera Output” (page 28).

6 Shoot and record the “HDR2,” “HDR3,” and “HDR4” charts.
Repeat steps **4** to **5** to shoot and record the HDR2 chart, HDR3 chart, and HDR4 chart in the same way.

7 Access the X-OCN files recorded in step **5** from the computer running Color Calibrator.

If direct access is not possible, transfer the files to the computer.

When an output signal from a camera is input to Color Calibrator via SDI connection

Input the video captured by the camera directly. Access to files is not required.

8 Sample the HDR1 chart to HDR4 chart using Color Calibrator.
Sample the captured color charts. When the calibration type is HDR & Mode B, set [Chart] to [HDR] and [Calibration Mode] to [ModeB] in the [Color Manager] window.
For details, see “Sampling a Color Chart” (page 19).

9 Perform calibration using Color Calibrator. Click the [Calibrate] button in the [Color Manager] window to perform calibration. Click the [Calibration] button in the [Monitor] window to check the calibration result. The [Calibration] button shows the calibration result based on simulation values.
For details, see “Performing Calibration” (page 21).

10 Generate a 3D LUT file (*.cube) using Color Calibrator.
Click the [Export] button in the [Color Manager] window to generate a 3D LUT file.
For details, see “Generating a 3D LUT File” (page 22).

11 Set the 3D LUT file for calibration in the On-set Camera component.
Set the 3D LUT file generated in step **10** and check that the calibration is applied to the display.

For details, see “Applying a 3D LUT to the Display” (page 23).

12 Set the calibration chart to “HDR-Verify” in the On-set Camera component.
The Verify chart appears on the display.
For details, see “Displaying Color Charts on the Display” (page 23).

13 Shoot and record the Verify chart using the camera.
Shoot and record the Verify chart the same way as in step **5**.

14 Sample the Verify chart using Color Calibrator.
Sample the captured Verify chart.
For details, see “Sampling a Color Chart” (page 19).

15 Check the calibration result using Color Calibrator.
Click the [Verify] button in the [Monitor] window to check the calibration result with 3D LUT applied. The [Verify] button shows the actual calibration result, not a result based on simulation values.

Managing calibration data

The measurement data for calibration and the calibration result data can be saved as a project in Color Calibrator.
For details, see “[Color Manager] Window” (page 32).

“SDR & Mode A” Type Calibration Operation

Use the following calibration procedure when the display mode of the display is SDR and the

luminance management operating mode is Mode A.

1 Display the W100 chart on the display.
For details, see “Displaying Color Charts on the Display” (page 23).

2 Check the display settings.
The display must be set to the appropriate settings for successful calibration.
Check that the display is configured as follows.

- Color space setting of the display controller matches the color chart.
- W100 chart is displayed at appropriate luminance emission (check by measuring the display using a spectral radiance meter or other device).

For details, see “Configuring a Display” (page 26).

3 Check the camera settings.
Check that the camera is configured as follows.
For details, refer to the manual for the camera.

- Input Color Space:
“S-Gamut3.Cine/SLog3” or “S-Gamut3/SLog3”
- Recording Format:
X-OCN video format
- ND Filter:
“Clear”
- White Balance:
“6500K”
On cameras that cannot be set to “6500K,” set to the value closest to 6500K.
- Exposure Index:
VENICE 2 8K (CineAltaV 2 8K) / BURANO (CineAltaB): “800EI”
VENICE 2 6K (CineAltaV 2 6K) / VENICE (CineAltaV): “500EI”

For other cameras, set to match the “Base ISO” setting.

- Base ISO:
VENICE 2 8K (CineAltaV 2 8K) / BURANO (CineAltaB): “ISO 800”
VENICE 2 6K (CineAltaV 2 6K) / VENICE (CineAltaV): “ISO 500”
For other cameras, set the Low “Base ISO” setting.

[Notes]

- To input an output signal from a BURANO (CineAltaB) via SDI connection, set the codec to XAVC. To input an X-OCN file from a BURANO (CineAltaB), set the codec to X-OCN and import a recorded X-OCN file into Color Calibrator.
- There are no restrictions on the “FPS” and “Shutter” settings, but at high shutter speeds, flicker may occur if the display and camera are not synchronized.
- When operating using a display with a color temperature other than 6500K, set “White Balance” to match the color temperature of the display.

- 4** Check the camera viewfinder settings. The camera viewfinder must be set to the appropriate settings for successful calibration.

Check that the viewfinder is configured as follows.

- Zebra function of the viewfinder is enabled.
- Zebra display of the viewfinder is set to zebra 2 (display level of 61%).
- Output video of the viewfinder is set to Log.

For details, see “Configuring Camera Output” (page 28).

[Note]

If the zebra function cannot be used, use a waveform monitor or the [Waveform] window of Color Calibrator. Input the camera output video (Log) to the waveform monitor or Color Calibrator and check that the signal waveform is displayed.

- 5** Adjust the exposure by shooting a W100 chart using the camera.

Set the exposure (61%) appropriate for shooting a color chart in S-Log3.

Adjust the shutter and iris to set the exposure so that the zebra appears on the W100 chart when viewed in the viewfinder.

The zebra is displayed when the exposure is 61% or higher. When the exposure is set such that the zebra starts to appear, the W100 chart will be captured at 61% exposure.

[Note]

If the zebra function cannot be used, check the camera output signal in a waveform monitor or using the [W100 Adjust] button of Color Calibrator, and adjust the shutter and aperture so that the W100 chart luminance level is close to 100%.

- 6** Display the SDR1 chart on the display. For details, see “Displaying Color Charts on the Display” (page 23).

[Note]

Check that the color space setting of the display controller matches the color chart.

- 7** Shoot and record the SDR1 chart using the camera.

Shoot the SDR1 chart using the camera and record to a file in X-OCN format.

Observe the following when shooting the color chart.

- Turn off all lighting in the shooting location and do not use any lighting other than the display.
- Check that nothing is displayed in the outer frustum surrounding the chart display area. If anything other than the chart is displayed, it may be reflected onto the chart and affect the accuracy of calibration.
- Place the chart in the center of the display screen, leaving some space

around the chart. When shooting, this helps suppress the effects of peripheral light reduction of the lens.

- Make sure that the chart is not in focus. If you are focused on the display surface, moiré may occur.

When an output signal from a camera is input to Color Calibrator via SDI connection

Calibration is performed by direct input of the video captured by the camera, so there is no need to record to a file.

When using SDI connection, set the SDI output video to Log.

For details, see “Configuring Camera Output” (page 28).

- 8** Shoot and record the “SDR2” and “SDR3” charts.

Repeat steps **6** to **7** to shoot and record the SDR2 chart and SDR3 chart in the same way.

- 9** Access the X-OCN files recorded in step **7** from the computer running Color Calibrator.

If direct access is not possible, transfer the files to the computer.

When an output signal from a camera is input to Color Calibrator via SDI connection

Input the video captured by the camera directly. Access to files is not required.

- 10** Sample the SDR1 chart to SDR3 chart using Color Calibrator. Sample the captured color charts. When the calibration type is SDR & Mode A, set [Chart] to [SDR] and [Calibration Mode] to [ModeA] in the [Color Manager] window. For details, see “Sampling a Color Chart” (page 19).

- 11** Perform calibration using Color Calibrator. Click the [Calibrate] button in the [Color Manager] window to perform calibration. Click the [Calibration] button in the [Monitor] window to check the calibration result. The [Calibration] button shows the calibration result based on simulation values.

For details, see “Performing Calibration” (page 21).

- 12** Generate a 3D LUT file (*.cube) using Color Calibrator. Click the [Export] button in the [Color Manager] window to generate a 3D LUT file.

For details, see “Generating a 3D LUT File” (page 22).

- 13** Set the 3D LUT file for calibration in the On-set Camera component or in the 3D LUT box. Set the 3D LUT file generated in step **12** and check that the calibration is applied to the display. For details, see “Applying a 3D LUT to the Display” (page 23).

- 14** Display the Verify chart on the display. For details, see “Displaying Color Charts on the Display” (page 23).

- 15** Shoot and record the Verify chart using the camera. Shoot and record the Verify chart the same way as in step **7**.

- 16** Sample the Verify chart using Color Calibrator. Sample the captured Verify chart. For details, see “Sampling a Color Chart” (page 19).

- 17** Check the calibration result using Color Calibrator. Click the [Verify] button in the [Monitor] window to check the calibration result with 3D LUT applied. The [Verify] button shows the actual calibration result, not a result based on simulation values.

Managing calibration data

The measurement data for calibration and the calibration result data can be saved as a project in Color Calibrator. For details, see “[Color Manager] Window” (page 32).

“SDR & Mode B” Type Calibration Operation

Use the following calibration procedure when the display mode of the display is SDR and the luminance management operating mode is Mode B.

- 1** Set the calibration chart to “W100” in the On-set Camera component. The W100 chart appears on the display. For details, see “Displaying Color Charts on the Display” (page 23).
- 2** Check the display settings. The display must be set to the appropriate settings for successful calibration. Check that the display is configured as follows.
- Color space setting of the display controller matches the color chart.
 - W100 chart is displayed at appropriate luminance emission (check by

measuring the display using a spectral radiance meter or other device).

For details, see “Configuring a Display” (page 26).

- 3** Check the camera settings. Check that the camera is configured as follows. For details, refer to the manual for the camera.
- Input Color Space: “S-Gamut3.Cine/SLog3” or “S-Gamut3/SLog3”
 - Recording Format: X-OCN video format
 - ND Filter: “Clear”
 - White Balance: “6500K”
On cameras that cannot be set to “6500K,” set to the value closest to 6500K.
 - Exposure Index: VENICE 2 8K (CineAltaV 2 8K) / BURANO (CineAltaB): “800EI”
VENICE 2 6K (CineAltaV 2 6K) / VENICE (CineAltaV): “500EI”
For other cameras, set to match the “Base ISO” setting.
 - Base ISO: VENICE 2 8K (CineAltaV 2 8K) / BURANO (CineAltaB): “ISO 800”
VENICE 2 6K (CineAltaV 2 6K) / VENICE (CineAltaV): “ISO 500”
For other cameras, set the Low “Base ISO” setting.
 - FPS: “23.98”
 - Shutter (angle): “180”
 - Iris (T-number): “T4.0”

[Notes]

- To input an output signal from a BURANO (CineAltaB) via SDI connection, set the codec to XAVC. To input an X-OCN file from a BURANO (CineAltaB), set the codec to X-OCN and import a recorded X-OCN file into Color Calibrator.
- When operating using a display with a color temperature other than 6500K, set “White Balance” to match the color temperature of the display.

- 4** Set the calibration chart to “SDR1” in the On-set Camera component. The SDR1 chart appears on the display. For details, see “Displaying Color Charts on the Display” (page 23).

[Note]

Check that the color space setting of the display controller matches the color chart.

- 5** Shoot and record the SDR1 chart using the camera. Shoot the SDR1 chart using the camera and record to a file in X-OCN format. Observe the following when shooting the color chart.
- Turn off all lighting in the shooting location and do not use any lighting other than the display.
 - Check that nothing is displayed in the outer frustum surrounding the chart display area. If anything other than the chart is displayed, it may be reflected onto the chart and affect the accuracy of calibration.
 - Place the chart in the center of the display screen, leaving some space around the chart. When shooting, this helps suppress the effects of peripheral light reduction of the lens.
 - Make sure that the chart is not in focus. If you are focused on the display surface, moiré may occur.

When an output signal from a camera is input to Color Calibrator via SDI connection

Calibration is performed by direct input of the video captured by the camera, so there is no need to record to a file. When using SDI connection, set the SDI output video to Log. For details, see “Configuring Camera Output” (page 28).

- 6** Shoot and record the “SDR2” and “SDR3” charts. Repeat steps **4** to **5** to shoot and record the SDR2 chart and SDR3 chart in the same way.

- 7** Access the X-OCN files recorded in step **5** from the computer running Color Calibrator. If direct access is not possible, transfer the files to the computer.
- When an output signal from a camera is input to Color Calibrator via SDI connection**
Input the video captured by the camera directly. Access to files is not required.

- 8** Sample the SDR1 chart to SDR3 chart using Color Calibrator. Sample the captured color charts. When the calibration type is SDR & Mode B, set [Chart] to [SDR] and [Calibration Mode] to [ModeB] in the [Color Manager] window. Also, set [Display Controller], [Light Output], [Contrast], and [Peak Luminance] to match your display/display controller. For details, see “Sampling a Color Chart” (page 19).

- 9** Perform calibration using Color Calibrator. Click the [Calibrate] button in the [Color Manager] window to perform calibration. Click the [Calibration] button in the [Monitor] window to check the calibration result. The [Calibration] button shows the calibration result based on simulation values.

For details, see “Performing Calibration” (page 21).

- 10** Generate a 3D LUT file (*.cube) using Color Calibrator. Click the [Export] button in the [Color Manager] window to generate a 3D LUT file. For details, see “Generating a 3D LUT File” (page 22).

- 11** Set the 3D LUT file for calibration in the On-set Camera component. Set the 3D LUT file generated in step **10** and check that the calibration is applied to the display. For details, see “Applying a 3D LUT to the Display” (page 23).

- 12** Set the calibration chart to “SDR-Verify” in the On-set Camera component. The Verify chart appears on the display. For details, see “Displaying Color Charts on the Display” (page 23).

- 13** Shoot and record the Verify chart using the camera. Shoot and record the Verify chart the same way as in step **5**.

- 14** Sample the Verify chart using Color Calibrator. Sample the captured Verify chart. For details, see “Sampling a Color Chart” (page 19).

- 15** Check the calibration result using Color Calibrator. Click the [Verify] button in the [Monitor] window to check the calibration result with 3D LUT applied. The [Verify] button shows the actual calibration result, not a result based on simulation values.

Managing calibration data

The measurement data for calibration and the calibration result data can be saved as a project in Color Calibrator.

For details, see “[Color Manager] Window” (page 32).

System Camera Calibration Operation

System cameras support shooting of HDR displays in SDR (with HDR mode set to “Off”) only.

However, calibration uses the “HDR & Mode A” type procedure using “Cinema” in HDR mode.

[Note]

System cameras do not support calibration operations using an X-OCN file. Input an output signal from a camera via SDI connection to Color Calibrator.

“HDR & Mode A” type

Perform an “HDR & Mode A” type calibration using the following procedure and set the display mode of the display to SDR.

- 1** Display the W100 chart on the display. For details, see “Displaying Color Charts on the Display” (page 23).

- 2** Check the display settings. The display must be set to the appropriate settings for successful calibration. Check that the display is configured as follows.
- Color space setting of the display controller matches the color chart.
 - W100 chart is displayed at 100 nits emission (check by measuring the display using a spectral radiance meter or other device).
- For details, see “Configuring a Display” (page 26).

- 3** Check the camera settings. Check that the camera is configured as follows. For details, refer to the manual for the camera and MSU (master setup unit).
- OETF: “S-Log3(Cinema)”
 - Color Space: “SG3” or “SG3C”
 - Flare: “OFF”
 - Gain: Total Gain “0 dB”
 - White: When 5600K is off: R “64” / G “0” / B “-79”
 - ND filter: “CLEAR”
 - CC filter: “3200K”

[Notes]

- The camera configuration items are described using the settings on an MSU as an example.
- There are no restrictions on the “FPS” and “Shutter” settings, but at high shutter speeds, flicker may occur if the display and camera are not synchronized.
- When operating at a display color temperature other than 6500K, select the appropriate CC filter, then set the G value of “White” to 0 and

adjust the R and B values so that the W100 chart is displayed white.

- 4** Connect the camera and a waveform monitor. The camera and waveform monitor must be set to the appropriate connection for successful calibration. You can also use the [Waveform] window of Color Calibrator as a waveform monitor. Input the camera output video (Log) to the waveform monitor or Color Calibrator and check that the signal waveform is displayed.

- 5** Adjust the exposure by shooting a W100 chart using the camera. Set the exposure (61%) appropriate for shooting a color chart in S-Log3. Check the camera output signal in a waveform monitor or the [Waveform] window of Color Calibrator, and adjust the shutter and aperture so that the W100 chart luminance level is 61% or 100 nits in nits display mode.

- 6** Display the HDR1 chart on the display. For details, see “Displaying Color Charts on the Display” (page 23).

[Note]

Check that the color space setting of the display controller matches the color chart.

- 7** Shoot the HDR1 chart using the camera and input the output signal to Color Calibrator. Shoot the HDR1 chart using the camera and directly input the output signal from the camera via SDI connection to Color Calibrator. Observe the following when shooting the color chart.

- Turn off all lighting in the shooting location and do not use any lighting other than the display.
- Check that nothing is displayed in the outer frustum surrounding the chart display area. If anything other than the chart is displayed, it may be reflected onto the chart and affect the accuracy of calibration.
- Place the chart in the center of the display screen, leaving some space around the chart. When shooting, this helps suppress the effects of peripheral light reduction of the lens.
- Make sure that the chart is not in focus. If you are focused on the display surface, moiré may occur.

8 Shoot and input the “HDR2,” “HDR3,” and “HDR4” charts to Color Calibrator. Repeat steps **6** to **7** to shoot and input the HDR2 chart, HDR3 chart, and HDR4 chart in the same way.

9 Sample the HDR1 chart to HDR4 chart using Color Calibrator. Sample the captured color charts. When the calibration type is HDR & Mode A, set [Chart] to [HDR] and [Calibration Mode] to [ModeA] in the [Color Manager] window. For details, see “Sampling a Color Chart” (page 19).

10 Perform calibration using Color Calibrator. Click the [Calibrate] button in the [Color Manager] window to perform calibration. Click the [Calibration] button in the [Monitor] window to check the calibration result. The [Calibration] button shows the calibration result based on simulation values. For details, see “Performing Calibration” (page 21).

11 Generate a 3D LUT file (*.cube) using Color Calibrator. Click the [Export] button in the [Color Manager] window to generate a 3D LUT file. For details, see “Generating a 3D LUT File” (page 22).

12 Set the 3D LUT file for calibration in the On-set Camera component or in the 3D LUT box. Set the 3D LUT file generated in step **11** and check that the calibration is applied to the display. For details, see “Applying a 3D LUT to the Display” (page 23).

13 Display the Verify chart on the display. For details, see “Displaying Color Charts on the Display” (page 23).

14 Capture the Verify chart using the camera and input to Color Calibrator. Capture and input the Verify chart the same way as in step **7**.

15 Sample the Verify chart using Color Calibrator. Sample the captured Verify chart. For details, see “Sampling a Color Chart” (page 19).

16 Check the calibration result using Color Calibrator. Click the [Verify] button in the [Monitor] window to check the calibration result with 3D LUT applied. The [Verify] button shows the actual calibration result, not a result based on simulation values.

Managing calibration data

The measurement data for calibration and the calibration result data can be saved as a project in Color Calibrator. For details, see “[Color Manager] Window” (page 32).

Non-Sony Camera Calibration Operation

For non-Sony cameras, refer to the calibration procedure for “HDR & Mode A” type (page 11) if the display mode is HDR, and refer to the calibration procedure for “SDR & Mode A” type (page 13) if the display mode is SDR and perform calibration using the following procedure. The steps after step **5**, where you execute sampling of the color chart, are the same as for Sony cameras.

1 Display the W100 chart on the display. For details, see “Displaying Color Charts on the Display” (page 23 or page 25).

2 Check the display settings. The display must be set to the appropriate settings for successful calibration. Check that the display is configured as follows.

- Color space setting of the display controller matches the color chart.
- W100 chart is displayed at 100 nits emission (check by measuring the display using a spectral radiance meter or other device).

For details, see “Configuring a Display” (page 26).

3 Check the camera settings. Check that the camera is configured as follows. For details, refer to the manual for the camera.

- SDI Output (Resolution): 1920×1080
- SDI Output (Look): Log
- ND Filter: Clear
- White Balance: 6500K
- Exposure Index/ISO: Default setting of the camera

- 4
- Adjust the exposure by shooting a W100 chart using the camera.
Adjust the W100 signal level by adjusting the shutter and aperture so that it is 61% in S-Log3. Color Calibrator converts the input signal to S-Log3 for display, so the target signal levels for each color space are as follows.

Camera output setting	Camera output (IRE)	[Waveform] window	[W100 Adjust]
SLog3	60.9%	60.9%	100%
LogC3	55.9%	60.9%	100%
LogC4	41.8%	60.9%	100%
Log3G10	48.3%	60.9%	100%

[Note]
Select the [Image Viewer] window input color space to match the SDI output color space of the camera.

- 5
- Sample the color charts.
If the display being captured is HDR, sample "HDR1," "HDR2," "HDR3," and "HDR4" using Color Calibrator. If it is SDR, sample "SDR1," "SDR2," and "SDR3."

Color Calibrator Operation

The following operations are performed using Color Calibrator.

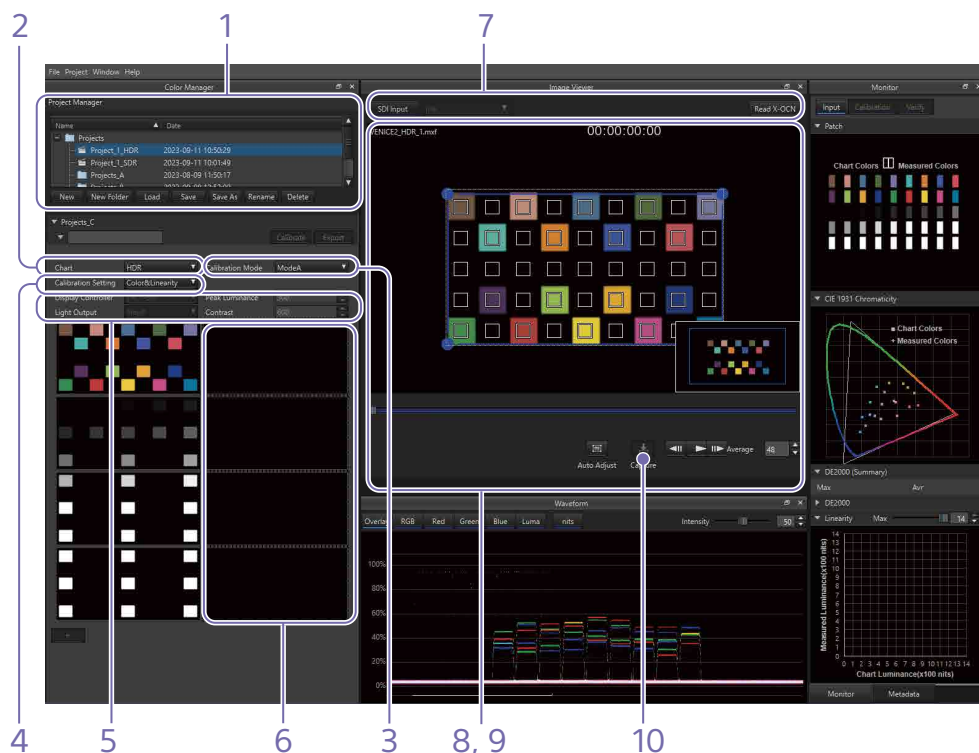
- Sample measurement image (color chart) from video captured by a camera.
- Perform calibration.
- Generate 3D LUT files for calibration.
- Compare and check calibration results.
- Manage calibration data as a project.

For details about screen operation, see “4. Color Calibrator Screen” (page 31).

Sampling a Color Chart

You can sample color charts used for calibration using Color Calibrator.

Capture an image (color chart) from video captured by a camera and record it as a measurement image.



- 1 Create a project in the [Color Manager] window.
Create a project for saving calibration data in the project manager section. Select a save destination folder, click the [New] button, and enter a project name. A new project is created and is displayed in the calibration section in the [Color Manager] window.
To use an existing project
Select a project and click the [Load] button.
The calibration data for the selected project is displayed in the calibration section.
To create a new folder
Click the [New Folder] button and enter a folder name.
A folder is created in the selected folder.

- 2 Select the set of color chart images in [Chart].
HDR:
Set of images when the calibration type is HDR (display mode of the display is HDR).
SDR:
Set of images when the calibration type is SDR (display mode of the display is SDR).

- 3 Select the luminance management operating mode in [Calibration Mode].
ModeA:
Mode that reproduces the luminance captured by a camera on a Virtual Camera actor of the Camera and Display Plugin.
ModeB:
Mode that reproduces the luminance displayed by a Virtual Camera actor of the Camera and Display Plugin when shooting with a camera.

[Note]

Set to the same operating mode as [LED Settings] > [Sensitivity Simulation] of the Virtual Camera actor. Set to [ModeA] when not using a Virtual Camera actor or when there is no need to calibrate the luminance of a Virtual Camera actor and a real camera.

- 4 Select the calibration configuration mode in [Calibration Setting].
Color&Linearity:
This mode is used to correct both luminance characteristics and color reproduction characteristics from measured values.
[Color&Linearity] is appropriate when the display mode of the display is HDR.

Color Only:

This mode is used to correct color reproduction characteristics only from measured values.
Only [Color Only] is configurable when the display mode of the display is SDR where there is often a difference in the luminance of the display between when calibrating and when shooting. Luminance characteristics are not calibrated.

- 5 If the calibration type is SDR & Mode B, set the display/display controller. When [Chart] is set to [SDR] and [Calibration Mode] is set to [ModeB], configure the following settings to match your display/display controller.
Crystal LED and ZRCT-300
Set [Display Controller] to [ZRCT-300], then set the display optical output in [Light Output] and the contrast of the display in [Contrast].

[Note]

Set the same values for [Light Output] and [Contrast] as the display controller settings.

Other display/display controller

Set [Display Controller] to [Other], then set the peak luminance of the display in [Peak Luminance].

[Note]

Set the same value for [Peak Luminance] as the display controller setting.

- 6 Select a capture image area. A blue frame is added to the selected capture image area. Each capture image area (numbered 1 to 4 from the top) corresponds to the following color charts, depending on the [Chart] setting (HDR or SDR).

Position	HDR	SDR
1	HDR1 chart	SDR1 chart
2	HDR2 chart	SDR2 chart
3	HDR3 chart	SDR3 chart
4	HDR4 chart	-

- 7 Display the video for calibration in the [Image Viewer] window.
- When using SDI connection**
- Input the video captured by the camera. When the [SDI Input] button is clicked, SDI connection becomes enabled. When the output signal from a camera is input to Color Calibrator correctly, the video being captured is displayed in the input image area.
- The color space acquired from the RDD18 metadata embedded in the SDI input is displayed on the right of the [SDI Input] button.
- If it cannot be acquired, the color space can be selected. Select the correct color space of the input signal.

[Note]

An error message is displayed if a signal format or color space not supported by SDI connection is detected.

When an error message is displayed, calibration cannot be performed, even when a video is being displayed in the input image area. Check the SDI connection to the camera and the output signal settings.

When using an X-OCN file

Load an X-OCN video file captured by a camera.

When the [Read X-OCN] button is clicked, select a file to display the video in the input image area.

The file name and playback position (hour:minute:second:frame) are displayed at the top of the input image area.

- 8 Display the captured image of the target color chart.
- Display the image of the color chart corresponding to the capture image area selected in step 6 in the input image area.
- When using SDI connection**
- Shoot the target color chart.
- The following control buttons are available.
- ▶ button: Pauses/resumes video input.
 - ⏮ button: Loads 1 frame of the video currently being captured.

When using an X-OCN file

Move to the captured frame of the target color chart using the seek bar or control buttons.

The following control buttons are available.

- ⏮ button: Moves to the previous frame.
- ▶ button: Starts/stops playback.
- ⏭ button: Moves to the next frame.

- 9 Set the positions of the color measurement guides.
- You can drag the ● marks at the four corners of the image and adjust them so that the color patches and □ marks (color measurement guides) overlap.

To change the size of the □ marks (color measurement guides)

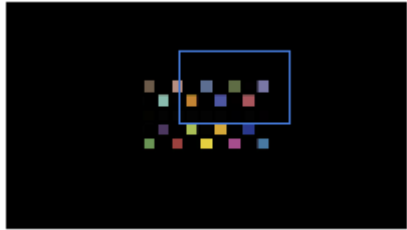
You can adjust the size of the □ marks (color measurement guides) in [Average]. Set the □ marks (color measurement guides) so that they are about 70% to 80% the size of the image color patch.



To zoom in/zoom out

You can zoom in/out in the input image area by moving the mouse wheel up/down.

When zoomed in, a zoom indicator is displayed in the input image area. In the zoom indicator, the range displayed in the input image area is enclosed by a blue frame. You can change the display range by moving the blue frame.



To adjust the □ marks (color measurement guides) automatically

Click the 📐 (Auto adjustment) button. The position and size of the □ marks (color measurement guides) are adjusted automatically to match the color chart image.

- 10 Click the 📷 (Capture) button to register the image.
- The image is registered in the capture image area selected in step 6.

[Note]

The color of the image in the capture image area is the average value of the color within the □ marks (color measurement guides).

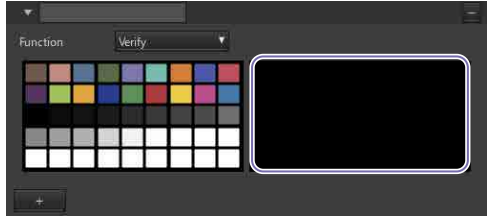
- 11 Sample all the color charts.
- Repeat steps 6 to 10 to sample the other charts in the same way.
- To save the project**
- Click the [Save] button in the [Color Manager] window.

Sampling the Verify chart

Click the [+] button in the bottom left in the [Color Manager] window to display the Verify chart.

[Note]

The [+] button becomes enabled after calibration ends.



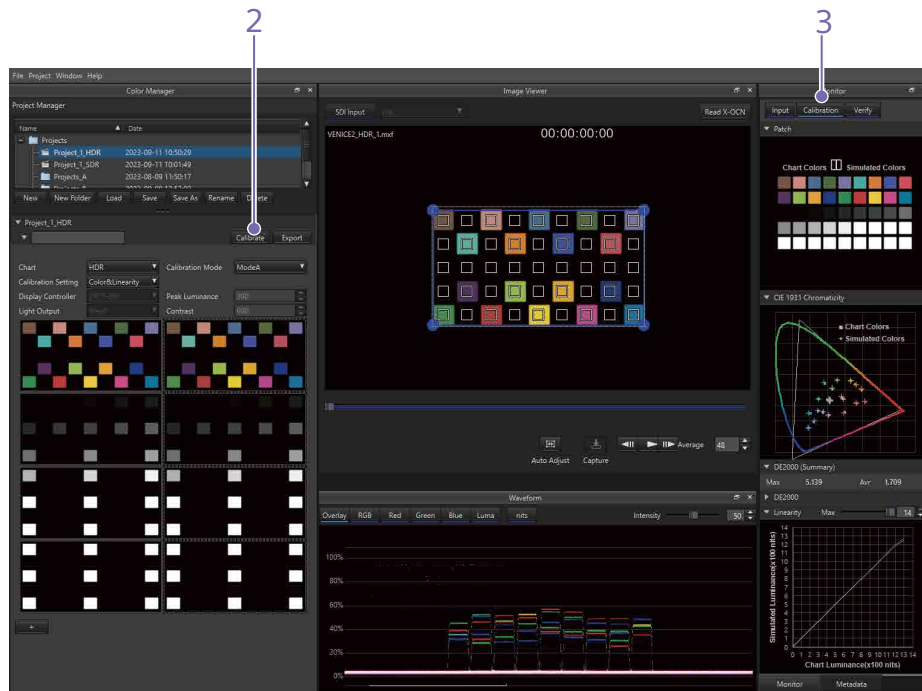
Sample the chart in the same way as the other charts. Register the captured image of the Verify chart in a capture image area.

When sampling is finished, check the calibration result in the [Monitor] window. Click the [Verify] button in the [Monitor] window to compare the color chart (theoretical values) and calibration results as color patches or graphs.

For details, see "[Monitor] Window" (page 39).

Performing Calibration

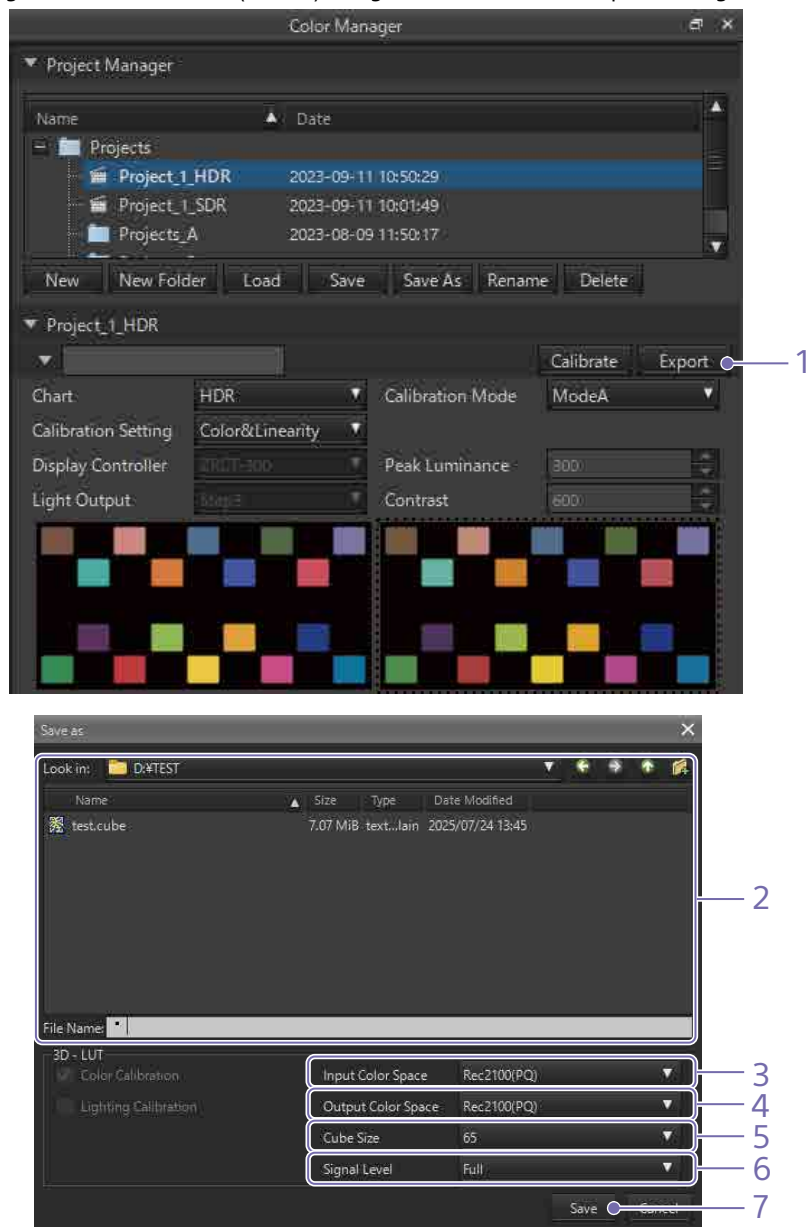
You can perform calibration using Color Calibrator after sampling the color charts.



- 1 Sample the color charts captured by the camera.
For details, see “Sampling a Color Chart” (page 19).
- 2 Click the [Calibrate] button in the [Color Manager] window.
The calibration is executed.
[Note]
Check that the correct luminance management operating mode is selected in [Calibration Mode] to match the calibration type.
- 3 Click the [Calibration] button in the [Monitor] window to check the calibration result.
A comparison of the color charts (theoretical values) and calibration result based on simulation is displayed as color patches or graphs.
For details, see “[Monitor] Window” (page 39).

Generating a 3D LUT File

You can generate a 3D LUT file (*.cube) using Color Calibrator after performing a calibration.



- 1 Click the [Export] button in the [Color Manager] window.
The [Save as] dialog appears.
- 2 Specify the save destination folder and file name for the 3D LUT file.
- 3 Select the color space of the input signal in [Input Color Space].
Set to [Rec2100(PQ)] when using the On-set Camera component.
If applying a 3D LUT in other systems, select an appropriated signal color space.
- 4 Select the color space of the output signal in [Output Color Space].
Set to [Rec2100(PQ)] when using the On-set Camera component.
If applying a 3D LUT in other systems, select an appropriated signal color space.
- 5 Select the size of the 3D LUT to output in [Cube Size].
Set to [65] when using the On-set Camera component.
- 6 Select the signal level at which to apply the 3D LUT in [Signal Level].
Set to [Full] when using the On-set Camera component.
- 7 Click the [Save] button.
A 3D LUT file is generated.

[Note]

Set [Cube Size] to [33] when outputting a 3D LUT for the 3D LUT box. The [Signal Level] setting will depend on the system configuration and connection format settings, but generally you should select [Narrow].

On-set Camera Component Operation

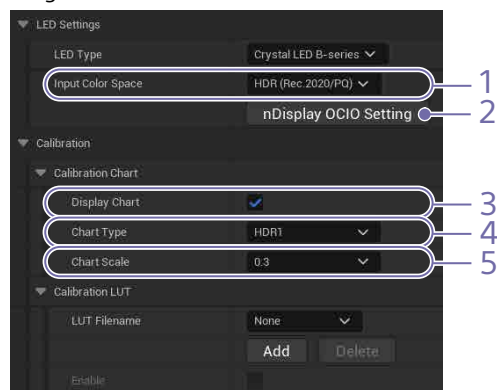
The following operations are performed by the On-set Camera component of the Camera and Display Plugin.

- Display color charts on the display.
- Apply 3D LUT files for calibration to the display.

For details about On-set Camera component operations, refer to the Camera and Display Plugin manual.

Displaying Color Charts on the Display

You can display color charts for calibration on the display using the On-set Camera component of the Camera and Display Plugin. Select the On-set Camera component in the [Details] panel of the camera actor, and configure the color space of the display in [LED Settings] and the color charts in [Calibration] in the [Sony On Set Camera] section. For details, refer to the Camera and Display Plugin manual.



- 1 Set the color space of the display in [LED Settings] > [Input Color Space]. Check that [Input Color Space] is configured to match the color space setting of the display. Depending on the display controller, "PQ/ Native" color space may be configurable. If used, set [Input Color Space] to [HDR (Rec.2020/PQ)].

- 2 Configure the OCIO settings using the [nDisplay OCIO Setting] button in [Input Color Space]. The OCIO settings of the nDisplay are set to match the color space of the display.

- 3 Place a check mark in [Display Chart] in [Calibration] > [Calibration Chart].

- 4 Select the color chart to display in [Chart Type] in [Calibration Chart]. The selected color chart appears on the display.

- 5 Set the size (0.1 to 1.0) of the color chart to display in [Chart Scale] in [Calibration Chart].

Selecting a color chart

Select a chart to match the color charts for calibration specified in [Chart Type] of the On-set Camera component.

- When the calibration type is HDR

Color chart	[Chart Type]
W100 chart	W100
HDR1 chart	HDR1
HDR2 chart	HDR2
HDR3 chart	HDR3
HDR4 chart	HDR4
Verify chart	HDR-Verify

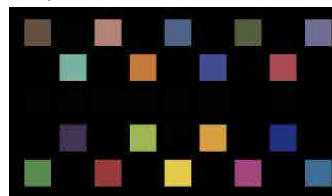
- When the calibration type is SDR

Color chart	[Chart Type]
W100 chart	W100
SDR1 chart	SDR1
SDR2 chart	SDR2
SDR3 chart	SDR3
Verify chart	SDR-Verify

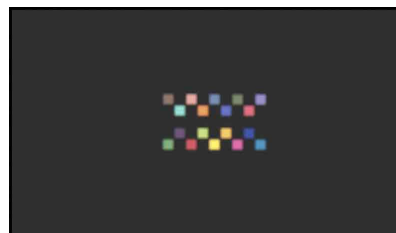
Checking the color chart display

Check that the color chart configured in the On-set Camera component is displayed correctly on the real display.

- Color chart display in On-set Camera component



- Color chart display on the display

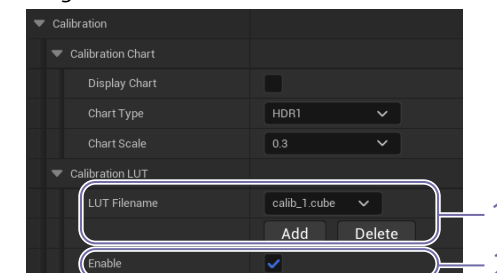


[Notes]

- Check that nothing is displayed in the outer frustum surrounding the chart display area. If anything other than the chart is displayed, it may be reflected onto the chart and affect the accuracy of calibration.
- Place the chart in the center of the display screen, leaving some space around the chart. When shooting, this helps suppress the effects of peripheral light reduction of the lens.

Applying a 3D LUT to the Display

You can apply a 3D LUT for calibration, generated using Color Calibrator, to the display using the On-set Camera component of the Camera and Display Plugin. Select the On-set Camera component in the [Details] panel of the camera actor, and configure the 3D LUT settings in [Calibration] in the [Sony On Set Camera] section. For details, refer to the Camera and Display Plugin manual.



- 1 Set the 3D LUT file (*.cube) generated using Color Calibrator in [LUT Filename] in [Calibration LUT]. When you click the [Add] button and select a 3D LUT file, the file is added to the [LUT Filename] drop-down list and becomes available for selection.

[Note]

The color space that is set when generating a 3D LUT file must match the OCIO settings of the nDisplay.

- 2 Place a check mark in [Enable] in [Calibration LUT]. [Calibration LUT] is enabled and the settings for the selected 3D LUT file are applied.

[Note]

When calibrating by displaying a color chart, first disable [Calibration LUT].

When using the Crystal LED B-series

When calibrating using Color Calibrator with [Chart] set to [HDR] and [Calibration Setting] set to [Color&Linearity], set [Calibration LUT] > [Crystal LED B-series Settings] of the On-set Camera component to correctly match the display controller. When set correctly, linearity correction is applied properly.

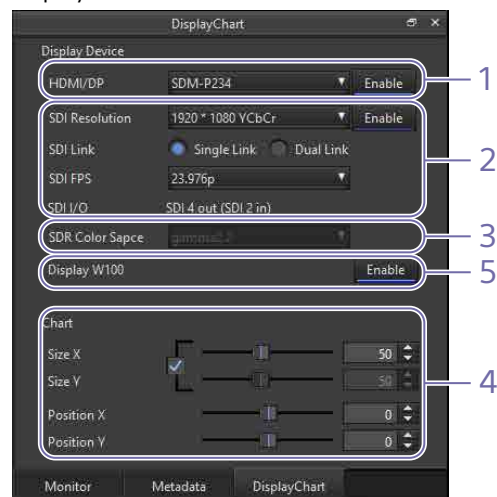
If the display controller settings are changed, you can still apply the calibration without regenerating a 3D LUT file by setting [Crystal LED B-series Settings] to the same settings.

Operating when Not Using On-set Camera Component

When not using the plugin, such as when using a screen process, you can use the chart output function of Color Calibrator to perform calibration.

Displaying Color Charts on the Display

When using a Windows external display connection or SDI output, select the display device and set the SDI output in the [Display Chart] window, then click the [Enable] button to display the color chart for calibration on the display.



- 1 When using a Windows external display connection, select the device to use for shooting from the display models in [HDMI/DP] and click the [Enable] button. Set the resolution and frame rate using the Windows display settings. Display models, excluding the primary display, are displayed as selection options in [HDMI/DP]. To perform effective

calibration, measurements must be taken using the settings that will be used during actual shooting. For HDR connection, it is recommended that you select an output of 10 bits color depth or higher in the graphics card settings. Since the HDR output function of Windows is not supported, handle HDR signals with the Windows HDR output function turned off, or use SDR signals.

- 2 When using SDI output, set the output resolution, SDI connection method, and frame rate, and then click the [Enable] button. The color chart is output via SDI connection.
- 3 Select the display color space for calibration in [SDR Color Space] when [Chart] is set to [SDR] in the [Color Manager] window. The Rec2100 PQ color chart is displayed when [Chart] is set to [HDR] in the [Color Manager] window. When the color chart display begins, the W100 chart for adjusting the capture frame and luminance level appears.
- 4 Adjust the camera framing and luminance level so that the chart is captured in an appropriate position. Adjust the display size, aspect ratio, and display position of the chart in [Chart], as required.
- 5 After adjusting the image frame and the luminance level of the input signal, click the [Enable] button in [Display W100] to release the W100 chart display and switch the color chart.

Switch the color chart to display in the capture image area in the [Color Manager] window.

Applying a 3D LUT to the Display

To apply a 3D LUT during a screen process, for example, using an application or display device that outputs the background image and which supports a 3D LUT, generate a 3D LUT file that is supported by the application or system and apply it. 3D LUT files should be applied as close to the display device as possible in the color pipeline. If you do not have a means to apply a 3D LUT, use a 3D LUT box or similar device. This application has been confirmed to work under the following conditions.

3D LUT box: Micro Converter BiDirectional SDI/HDMI 12G manufactured by Blackmagic Design

Connection interface: HDMI and SDI

Signal level: Narrow

3D LUT output: [Cube Size] set to 33, [Signal Level] set to Narrow

For details about importing a 3D LUT file, refer to the manual for the 3D LUT box.

Configuring a Display

The display must be set to the appropriate settings for successful calibration. Observe the following when performing a calibration.

When the display mode of the display is HDR

- Check that the color space of the display is set to the same color space as [Input Color Space] in [LED Settings] of the On-set Camera component.
- Measure the display using a spectral radiance meter or other device and check that 100 nits is being emitted from the W100 chart.
- As a general rule, it is recommended that you set the color temperature of the display to 6500K. Operation is supported using a different setting, depending on the environment. In this case, set "White Balance" on the camera to match the color temperature of the display.

When the display mode of the display is SDR

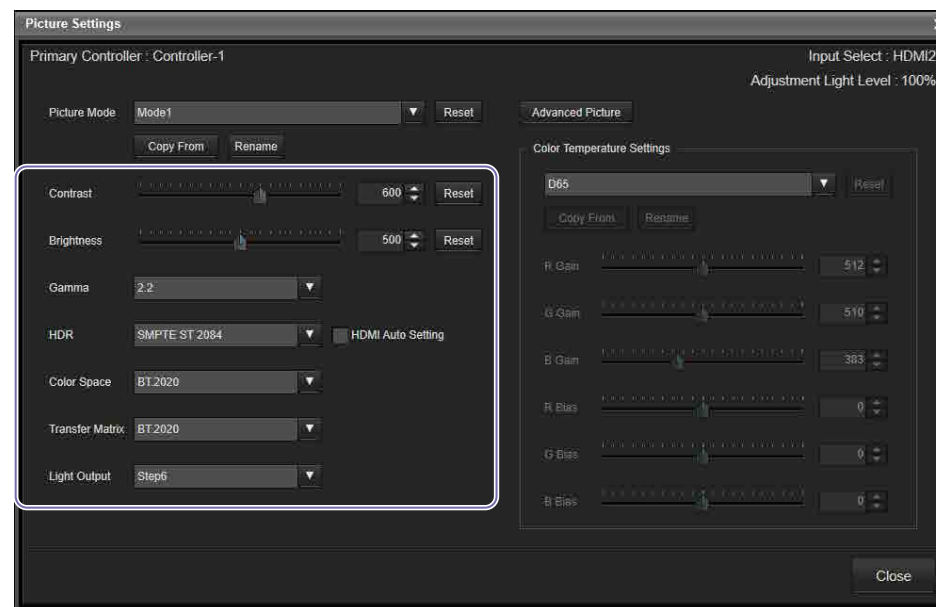
- Check that the color space of the display is set to the same color space as [Input Color Space] in [LED Settings] of the On-set Camera component.
- Set the display controller so that an appropriate luminance is emitted from a W100 chart and check by measuring the display using a spectral radiance meter or other device.
- As a general rule, it is recommended that you set the color temperature of the display to 6500K. Operation is supported using a different setting, depending on the environment. In this case, set "White Balance" on the camera to match the color temperature of the display.

Display Configuration Method

This section describes how to configure the display using Display Control Software (version 1.05) with the following devices.

- Sony Crystal LED B-series
- ZRCT-300 Display Controller

For details, refer to the Display Control Software manual.



When the display mode of the display is HDR
Configure each item as follows using Display Control Software.

Contrast:
"600"

Brightness:
"500"

Gamma:
Set to arbitrary value.

HDR:
Set to a curve matching the shooting environment.
Must match the color chart configured in the On-set Camera component. When the color chart setting is "HDR (Rec.2020/PQ)," select "SMPTE ST 2084."

Color Space:
Set to the color space matching the shooting environment.
Must match the color chart configured in the On-set Camera component.

Transfer Matrix:
Set to match the transfer matrix of the device that is input to the display controller.

Light Output:
"Step6"

When the display mode of the display is SDR
Configure each item as follows using Display Control Software.

Contrast:
Set to arbitrary value.

Brightness:
"500"

Gamma:
Set to a curve matching the shooting environment.
Must match the color chart configured in the On-set Camera component.

HDR:
"Off"

Color Space:

Set to the color space matching the shooting environment.

Must match the color chart configured in the On-set Camera component.

Transfer Matrix:

Set to match the transfer matrix of the device that is input to the display controller.

Light Output:

Set to arbitrary value.

Configuring Camera Output

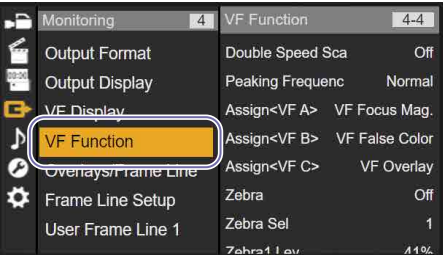
When the calibration type is Mode A, set the zebra function and output video of the viewfinder appropriately. In Mode A, standard white in S-Log3 must be set to 61 IRE when shooting a color chart. Use the zebra function of the viewfinder to adjust the brightness. Also, when an output signal from a camera is input to Color Calibrator via SDI connection, set the SDI output video to Log. For SDI connection, you can select from the following color spaces.

- S-Gamut3/SLog3
- S-Gamut3.Cine/SLog3
- ARRIWideGamut3/LogC3
- ARRIWideGamut4/LogC4
- REDWideGamut/Log3G10

Configuring VENICE 2 (CineAltaV 2)

Configuring the zebra function of the viewfinder

- 1 Press and hold the MENU button to display the full menu on the sub display.
- 2 Select Monitoring > VF Function in the menu and configure the zebra function.



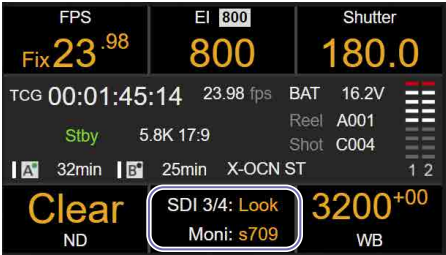
Configure the following settings.

- Zebra:
"On"

- Zebra Select:
"2"
- Zebra2 Level:
Check that the value is set to "61%."

Configuring the viewfinder output video

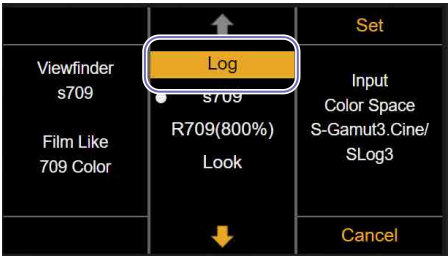
- 1 Press the HOME button to display the Home screen.
- 2 Press ITEM key 5 to select the item in the bottom center.



- 3 Press ITEM key 3 to select the item in the top right (Viewfinder).



- 4 Select [Log].

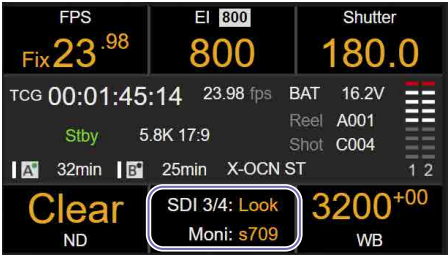


The output video of the viewfinder is set to Log.

Configuring the SDI output video

Configure the following when using SDI connection.

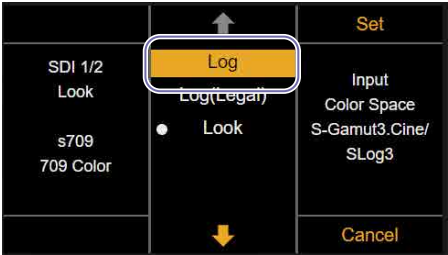
- 1 Press the HOME button to display the Home screen.
- 2 Press ITEM key 5 to select the item in the bottom center.



- 3 Press ITEM key 1 to select the item in the top left (SDI 1/2), or press ITEM key 2 to select the item in the top center (SDI 3/4).



- 4 Select [Log].



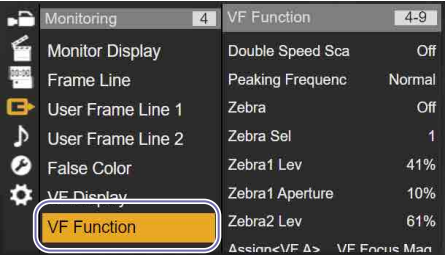
The SDI output video is set to Log.

Configuring VENICE (CineAltaV)

Configuring the zebra function of the viewfinder

- 1 Press and hold the MENU button to display the full menu on the sub display.

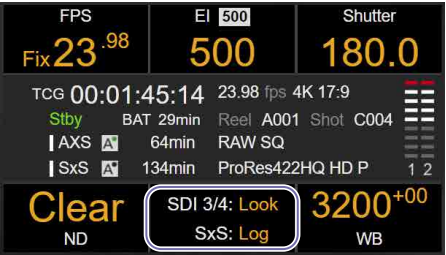
2 Select Monitoring > VF Function in the menu and configure the zebra function.



- Configure the following settings.
- Zebra:
"On"
 - Zebra Select:
"2"
 - Zebra2 Level:
Check that the value is set to "61%."

Configuring the viewfinder output video

- 1 Press the HOME button to display the Home screen.
- 2 Press ITEM key 5 to select the item in the bottom center.



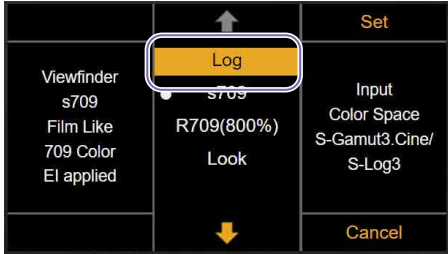
3 Press ITEM key 1 to switch to page 2.



4 Press ITEM key 2 to select the item in the top center (Viewfinder).



5 Select [Log].



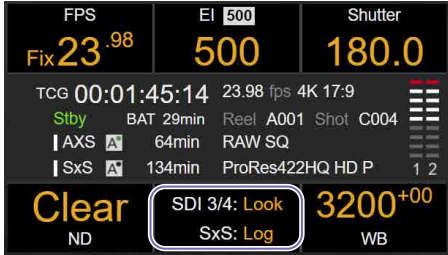
The output video of the viewfinder is set to Log.

Configuring the SDI output video

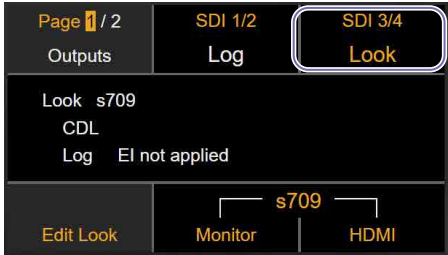
Configure the following when using SDI output 3/4 via SDI connection.

[Note]
When "RM/RCP Paint Control" is set to "Off" on VENICE (CineAltaV), the SDI 1/2 output video is set to Log (fixed). When using SDI 1/2, configuring the SDI output video is not required.

- 1 Press the HOME button to display the Home screen.
- 2 Press ITEM key 5 to select the item in the bottom center.



3 Press ITEM key 3 to select the item in the top right (SDI 3/4).



4 Select [Log].

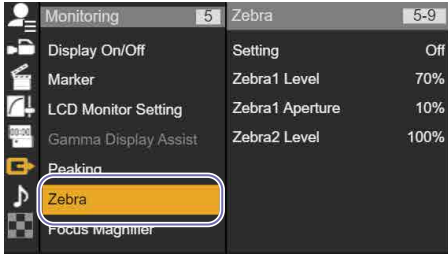


The SDI output video is set to Log.

Configuring BURANO (CineAltaB)

Configuring the zebra function of the viewfinder

- 1 Press and hold the MENU button to display the full menu on the sub display.
- 2 Select Monitoring > Zebra in the menu and configure the zebra function.

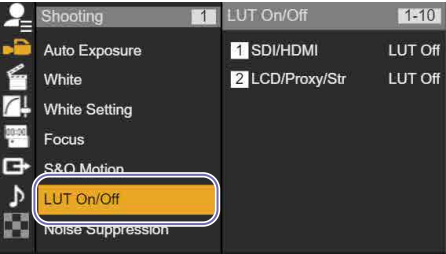


Configure the following settings.

- Setting:
"Zebra2"
- Zebra2 Level:
Set to "61%."

Configuring the viewfinder output video

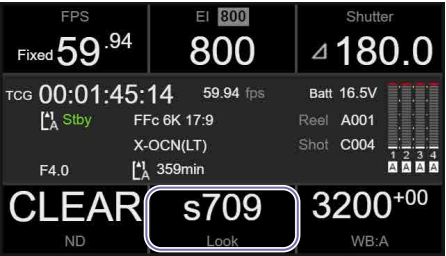
- 1
- Press and hold the MENU button to display the full menu on the sub display.
- 2
- Select Shooting > LUT On/Off in the menu and set [LCD/Proxy/Stream] to [LUT Off].



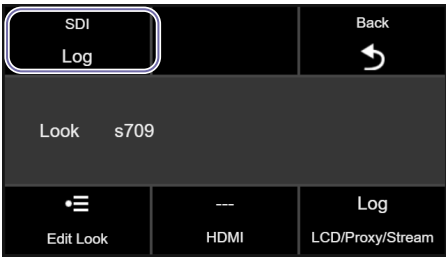
Configuring the SDI output video

Configure the following when using SDI connection.

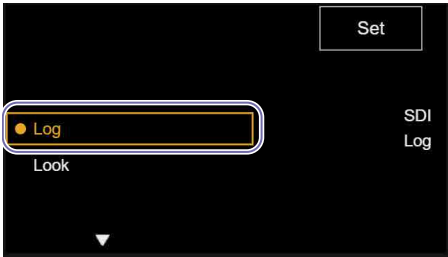
- 1
- Press the HOME button to display the Home screen.
- 2
- Press ITEM key 5 to select the item in the bottom center.



- 3
- Press ITEM key 1 to select the item in the top left (SDI).



- 4
- Select [Log].



The SDI output video is set to Log.

Screen Structure

Color Calibrator is comprised by a menu bar and five operation windows.

Each operation window can be displayed as a floating window or as a docked window using the following methods.

- Double-clicking the window title.
- Moving a window by clicking the center or edge of the screen and using drag & drop.



1. Menu bar
2. [Image Viewer] window (page 36)
3. [Color Manager] window (page 32)
4. [Waveform] window (page 38)
5. [Monitor] window (page 39) /
[Metadata] window (page 41)
Switches between the display of the
[Monitor] window and [Metadata] window
using the window selection tabs.

Menu bar

Displays the following menus.

[File] menu:

Select [Exit] to exit Color Calibrator.

[Project] menu:

The following project operations in the [Color Manager] window can be executed from the menu.

[New], [New Folder], [Load], [Save], [Save As], [Rename], [Delete]

[Window] menu:

Use to show/hide the following Color Calibrator windows.

[Color Manager], [Image Viewer], [Waveform], [Monitor], [Metadata]

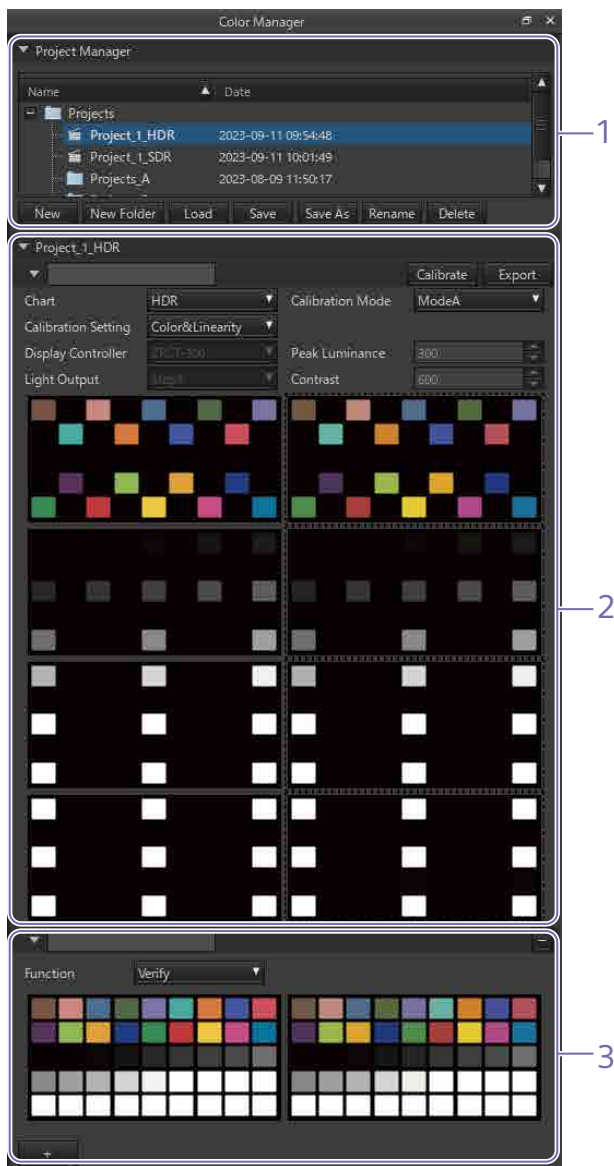
[Help] menu:

Select [Privacy Policy] to display the privacy policy. You can also change the terms of the agreement.

Select [About Color Calibrator] to display the Color Calibrator version information.

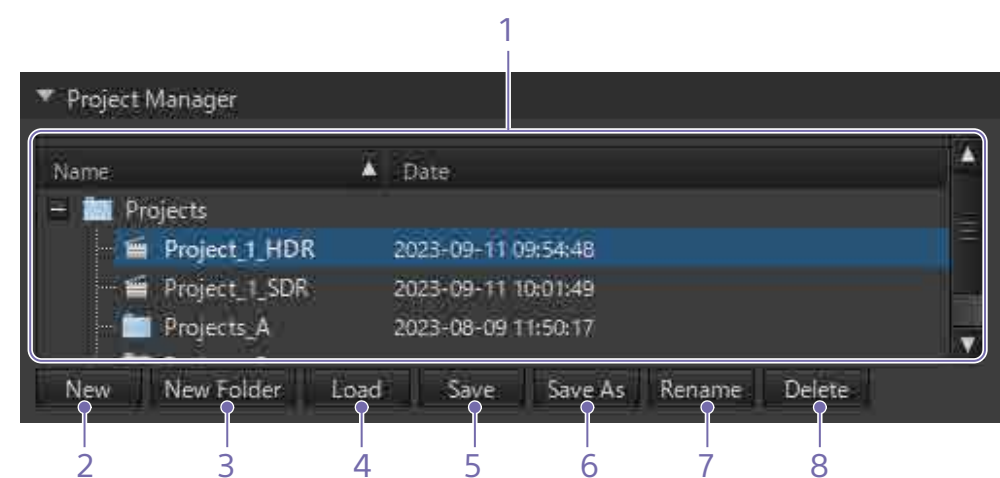
[Color Manager] Window

The [Color Manager] window is used to manage projects, register images for measurement (sampling), perform calibration, and generate 3D LUT files (*.cube).



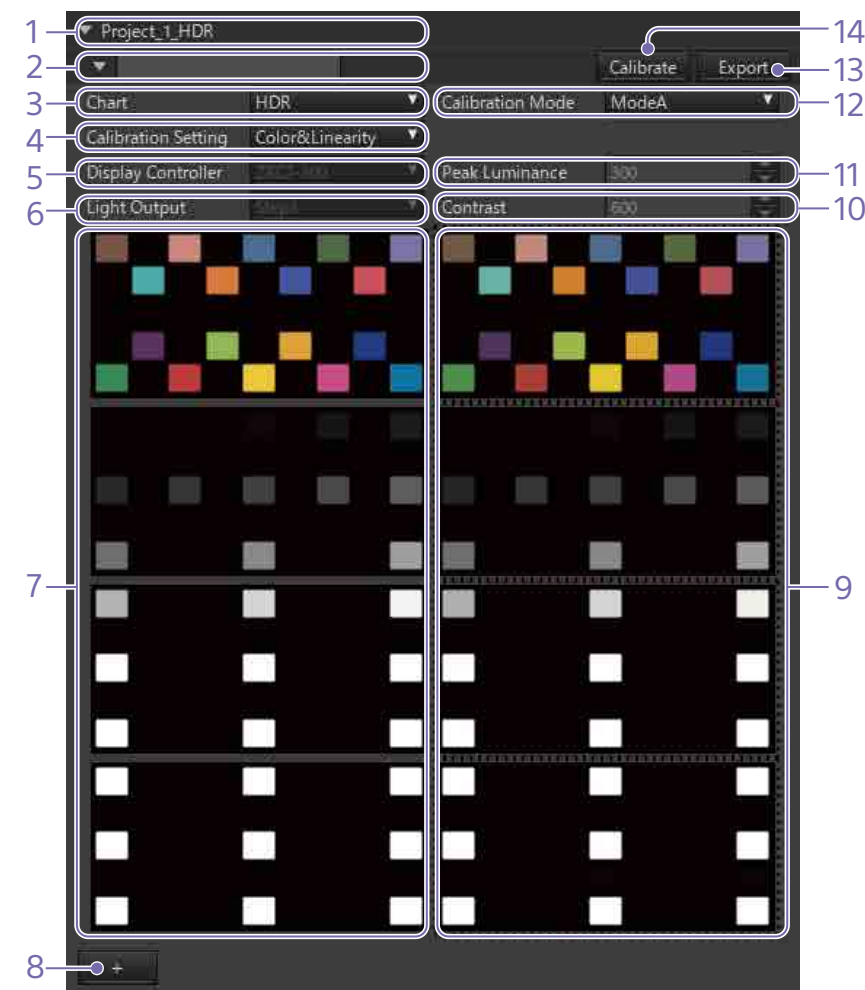
No.	Item	Description
1	Project manager section	Use to perform project tasks. The project manager saves and manages calibration measurement data and calibration result data as a "project." For details, see "Project manager section" (page 33).
2	Calibration section	Use to perform calibration tasks. Register images for measurement, perform calibration, and generate 3D LUT files. For details, see "Calibration section" (page 33). You can check the calibration result via simulation in the [Monitor] window after performing calibration.
3	Verify chart section	Use to perform tasks to verify the calibration result. Register measurement images to which the 3D LUT is applied. For details, see "Verify chart section" (page 35). You can check the actual calibration result in the [Monitor] window by registering an image in the capture image area.

Project manager section



No.	Item	Description
1	Project list	Displays a list of folders and projects managed by the project manager. The currently opened project is displayed in bold. An asterisk (*) is appended to the project name of projects with unsaved data.
2	[New] button	Creates a new project. A project is created in the folder selected in the project list.
3	[New Folder] button	Creates a new folder. A folder is created in the folder selected in the project list.
4	[Load] button	Opens the project selected in the project list. You can also double-click a project in the project list to open it.
5	[Save] button	Overwrites and saves the currently opened project.
6	[Save As] button	Saves the currently opened project with a different name.
7	[Rename] button	Renames the project selected in the project list.
8	[Delete] button	Deletes the project selected in the project list.

Calibration section



No.	Item	Description
1	Project name	Displays the name of the project.
2	Comment	You can enter an arbitrary comment.

No.	Item	Description
3	[Chart]	<p>Selects the set of color chart images.</p> <p>HDR:</p> <p>Set of images when the calibration type is HDR (display mode of the display is HDR).</p> <p>Displays the HDR1 to HDR4 chart images in the color chart display area.</p> <p>SDR:</p> <p>Set of images when the calibration type is SDR (display mode of the display is SDR).</p> <p>Displays the SDR1 to SDR3 chart images in the color chart display area.</p>
4	[Calibration Setting]	<p>Selects the calibration configuration mode.</p> <p>Color&Linearity:</p> <p>This mode is used to correct both luminance characteristics and color reproduction characteristics from measured values. [Color&Linearity] is appropriate when the display mode of the display is HDR.</p> <p>Color Only:</p> <p>This mode is used to correct color reproduction characteristics only from measured values.</p> <p>Only [Color Only] is configurable when the display mode of the display is SDR.</p>
5	[Display Controller]	<p>Sets the type of display controller used for calibration when [Chart] is set to [SDR] and [Calibration Mode] is set to [ModeB].</p> <p>ZRCT-300:</p> <p>Uses Crystal LED and ZRCT-300 display controller.</p> <p>Other:</p> <p>Uses other display and/or display controller.</p>
6	[Light Output]	<p>Sets the optical output of the display when [Display Controller] is set to [ZRCT-300].</p> <p>Set value: Step1 to Step6</p>
7	Color chart display area	Displays the color chart image corresponding to the [Chart] setting.
8	[+] button	<p>Displays the Verify chart section.</p> <p>[Note]</p> <p>The [+] button becomes enabled after calibration ends.</p>
9	Capture image area	Registers the measurement images captured in the [Image Viewer] window.
10	[Contrast]	<p>Sets the contrast of the display when [Display Controller] is set to [ZRCT-300].</p> <p>Set value: 0 to 1000</p>

No.	Item	Description
11	[Peak Luminance]	<p>Sets the peak luminance of the display when [Display Controller] is set to [Other].</p> <p>Set value: 10 to 2000</p>
12	[Calibration Mode]	<p>Sets the operating mode for luminance management.</p> <p>ModeA:</p> <p>Mode that reproduces the luminance captured by a camera on a Virtual Camera actor of the Camera and Display Plugin.</p> <p>ModeB:</p> <p>Mode that reproduces the luminance displayed by a Virtual Camera actor of the Camera and Display Plugin when shooting with a camera.</p>
13	[Export] button	<p>Generates 3D LUT files for calibration.</p> <p>[Note]</p> <p>The [Export] button becomes enabled after calibration ends.</p>
14	[Calibrate] button	<p>Executes the calibration.</p> <p>[Note]</p> <p>The [Calibrate] button becomes enabled after images are registered in all capture image areas.</p>

[Note]

[Display Controller], [Light Output], [Contrast], and [Peak Luminance] configuration is required only when the calibration type is SDR & Mode B.

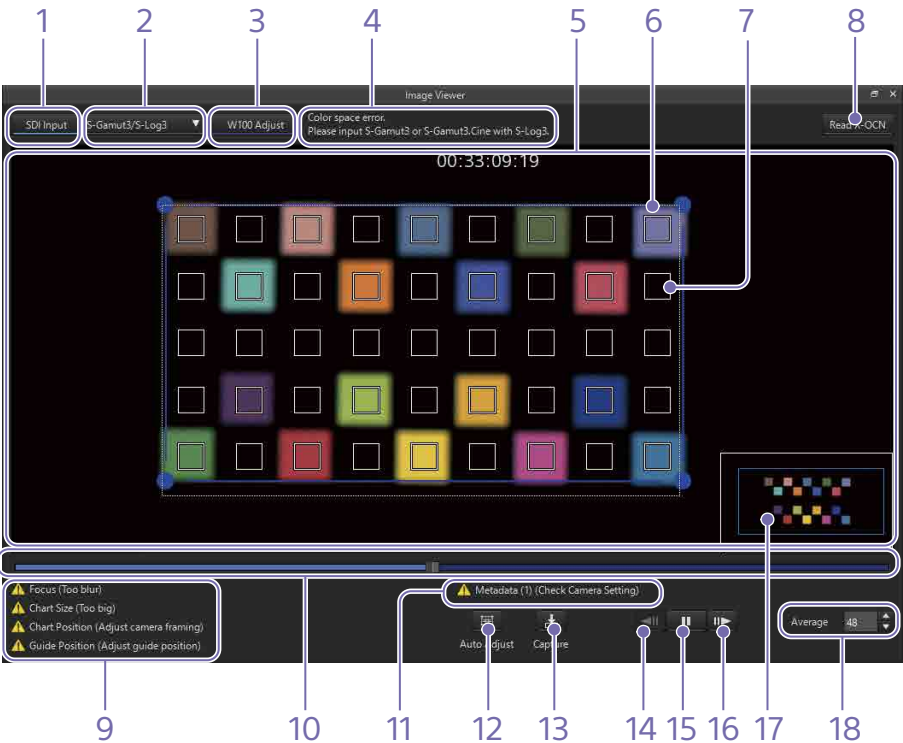
Verify chart section









No.	Item	Description
1	Comment	You can enter an arbitrary comment.
2	Verify chart display area	Displays the Verify chart image.
3	[+] button	Adds a Verify chart section. You can create multiple Verify chart sections, as required.
4	Capture image area	Registers the measurement images (images with 3D LUT applied) captured in the [Image Viewer] window.
5	[-] button	Deletes a Verify chart section.



[Image Viewer] Window

The [Image Viewer] window is used to display X-OCN file video or video input from a camera via SDI connection, and to capture images used for calibration.



No.	Item	Description
1	[SDI Input] button	Inputs video captured by a camera via SDI connection. When the [SDI Input] button is clicked, the blue bar is displayed highlighted and SDI connection becomes enabled. When the output signal from a camera is input correctly, the video being captured is displayed in the input image area. To disable the SDI connection, click the [SDI Input] button again. [Note] The [SDI] button cannot be operated if an SDI capture card is not attached to the computer.
2	Color space display	Displays the color space acquired from the RDD18 metadata embedded in the SDI input when SDI connection is enabled. If RDD18 metadata cannot be acquired on a system camera or other camera, the color space can be selected. Select the appropriate color space to match the color space of the input signal.
3	[W100 Adjust] button	Displays the W100 chart, and the luminance level entered when adjusting the camera to adjust the brightness of the captured image is displayed numerically. You can obtain more accurate measurements by adjusting the camera so that the displayed value is close to 100%.
4	Message display	Displays error messages, such as when a signal is not being input via SDI connection or when an unsupported signal format or color space is detected. [Note] When an error message is displayed, calibration cannot be performed, even when a video is being displayed in the input image area. Check the SDI connection to the camera and the output signal settings.
5	Input image area	Displays the X-OCN file video or the input video from a camera. You can zoom in/out using the mouse wheel.
6	Chart shooting guides	Displays the appropriate size and position for shooting the chart as white dotted lines. Adjust the camera position so that the input video overlaps the chart shooting guides.
7	Color measurement guides	Sets the position of the □ marks (color measurement guides) matching the color patches of the image. You can drag the ● marks at the four corners of the image and adjust them so that the color patches and □ marks (color measurement guides) overlap.
8	[Read X-OCN] button	Loads an X-OCN video file captured by a camera. When the [Read X-OCN] button is clicked, select a file to display the video in the input image area. The file name and playback position (hour:minute:second:frame) are displayed at the top of the input image area.

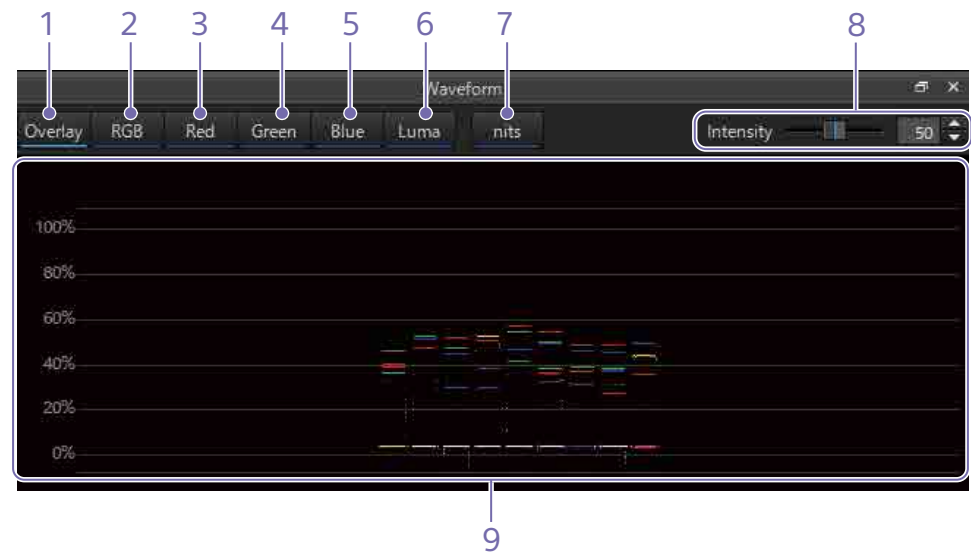
No.	Item	Description
9	Input video warning display	<p>Displays the following warnings when a problem occurs with the input video.</p> <p>Focus (Too sharp) / (Too blur): If you are focused on the display surface, moiré may occur. Or if the focus is too far from the display surface, accurate measurement may not be possible. Adjust the focus to the appropriate position.</p> <p>Chart Size (Too small) / Chart Size (Too big): The size of the chart being captured may not be the right size. Adjust the camera.</p> <p>Chart Position (Adjust camera framing): The position of the chart being captured may be offset from the center. Adjust the camera.</p> <p>Guide Position (Adjust guide position): The color measurement guides for the input video may not have been set to appropriate positions. Adjust the color measurement guides.</p> <p>[Note] The "Chart Size" and "Chart Position" warnings are displayed according to the size and position of the color measurement guides, not the input video.</p>
10	Seek bar	<p>Displays the playback position of an X-OCN file. Click on the seek bar or drag the slider to move the playback position.</p> <p>[Note] The seek bar is not displayed when SDI connection is enabled.</p>
11	Metadata warning display	<p>Displays a warning if there are inappropriate camera settings in the metadata input from the X-OCN file or SDI connection. If a warning is displayed, check the contents of the warning in the [Metadata] window and correct the corresponding configuration item.</p>
12	 (Auto adjustment) button	<p>Automatically adjusts the position and size of the  marks (color measurement guides) and [Average] value to match the input video. If the auto adjustment results are not as expected, manually adjust the  marks (color measurement guide) and the [Average] value.</p>
13	 (Capture) button	Captures an image from the display in the input image area and registers it in a capture image area in the [Color Manager] window.
14	 button	<p>Moves to the previous frame for X-OCN file video. Disabled for SDI connection video.</p>
15	 button	<p>Starts/stops playback for X-OCN file video. Pauses/resumes video input for SDI connection video.</p>

No.	Item	Description
16	 button	<p>Moves to the next frame for X-OCN file video. Loads 1 frame of the video currently being captured for SDI connection video.</p>
17	Zoom indicator	<p>Displayed when the input image area is zoomed in. The range displayed in the input image area is enclosed by a blue frame. You can change the display range by moving the blue frame. You can change the position of the zoom indicator within the input image area using drag & drop.</p>
18	[Average]	Specifies the size of the  marks (color measurement guides).

[Waveform] Window

Displays the waveform of the image displayed in the [Image Viewer] window.

[Note]
The display in the [Waveform] window is the S-Gamut3/S-Log3 signal waveform.

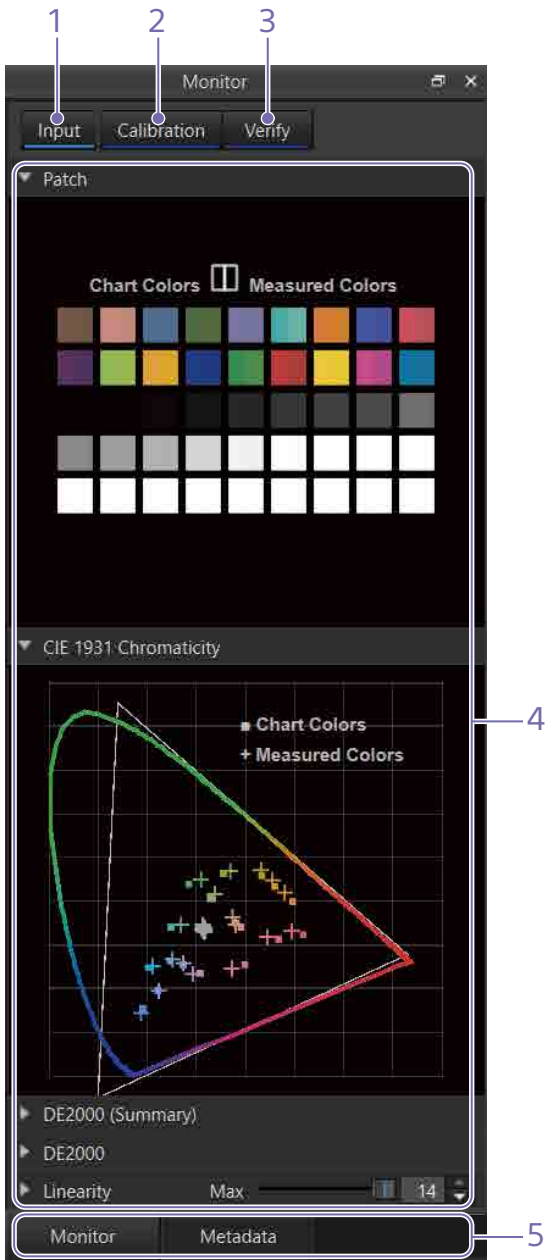


No.	Item	Description
8	[Intensity]	Adjusts the brightness of the waveforms displayed in the waveform display area.
9	Waveform display area	Displays the image waveform.

No.	Item	Description
1	[Overlay] button	Displays the Red, Green, and Blue waveforms overlaid. When the button is selected, the blue bar is displayed highlighted.
2	[RGB] button	Displays the Red, Green, and Blue waveforms side by side. The Red waveform is displayed on the left, Green in the center, and Blue on the right. When the button is selected, the blue bar is displayed highlighted.
3	[Red] button	Displays the Red waveform only. When the button is selected, the blue bar is displayed highlighted.
4	[Green] button	Displays the Green waveform only. When the button is selected, the blue bar is displayed highlighted.
5	[Blue] button	Displays the Blue waveform only. When the button is selected, the blue bar is displayed highlighted.
6	[Luma] button	Displays the luminance level waveform. When the button is selected, the blue bar is displayed highlighted.
7	[nits] button	Switches the vertical axis units to nits display or IRE display. When the [nits] button is clicked, the blue bar is displayed highlighted and nits display is enabled. When the [nits] button is clicked again, the nits display is disabled and the units return to IRE display.

[Monitor] Window

The [Monitor] window is used to compare and display the theoretical values and measured values of the calibration image (color chart) using color patches or graphs.



No.	Item	Description
1	[Input] button	Displays a comparison of the theoretical values and color chart measured values. When the button is selected, the blue bar is displayed highlighted.
2	[Calibration] button	Displays a comparison of the result with calibration applied based on a simulation using the theoretical values and color chart measured values. When the button is selected, the blue bar is displayed highlighted. [Note] The [Calibration] button becomes enabled after calibration ends.
3	[Verify] button	Displays a comparison of the theoretical values and color chart measured values with 3D LUT for calibration applied. When the button is selected, the blue bar is displayed highlighted. [Note] The [Verify] button becomes enabled after calibration ends, but the comparison result is displayed after sampling the Verify chart.
4	Comparison display area	Displays the comparison results. Five types of comparison results are displayed ([Patch], [CIE 1931 Chromaticity], [DE2000 (Summary)], [DE2000], [Linearity]). For details, see "Comparison display area" (page 40).
5	Window selection tabs	Switches between the [Monitor] window and [Metadata] window. [Monitor] tab: Displays the [Monitor] window. [Metadata] tab: Displays the [Metadata] window.

Comparison display area

Used to check the comparison results in five different ways.

Patch

Displays the theoretical value and measured value of each color patch side by side.

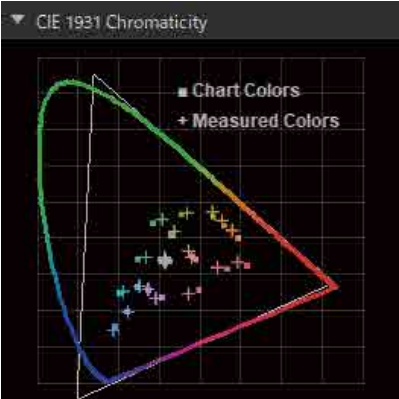


CIE 1931 Chromaticity

Displays the theoretical value and measured value of each color patch as CIE 1931 xy values.

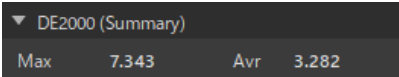
[Note]

The displayed RGB color space is S-Gamut3.



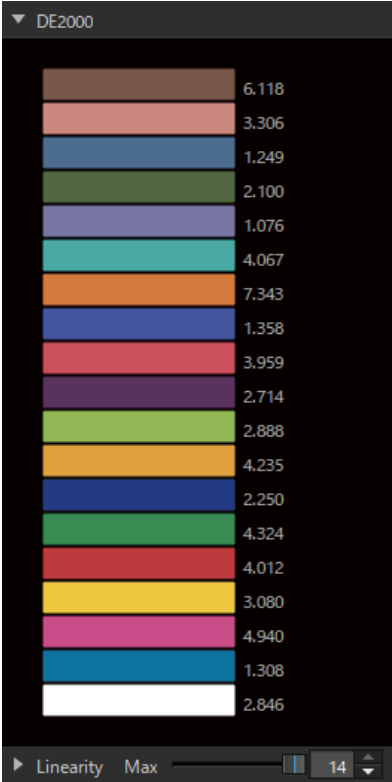
DE2000 (Summary)

Displays the color difference of the measured color patches as the maximum value and average value of DE2000.



DE2000

Displays the color difference of each measured color patch as a DE2000 value.



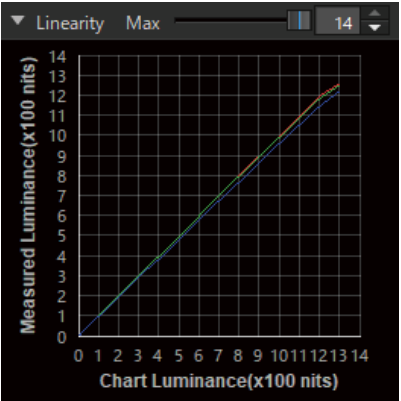
Linearity

Displays a graph of the measured value against the theoretical brightness response value for R, G, and B.

You can change the brightness range to display in the graph by adjusting the maximum brightness in [Max].

[Note]

HDR color charts are displayed in units of nits. SDR color charts are displayed in units of IRE.

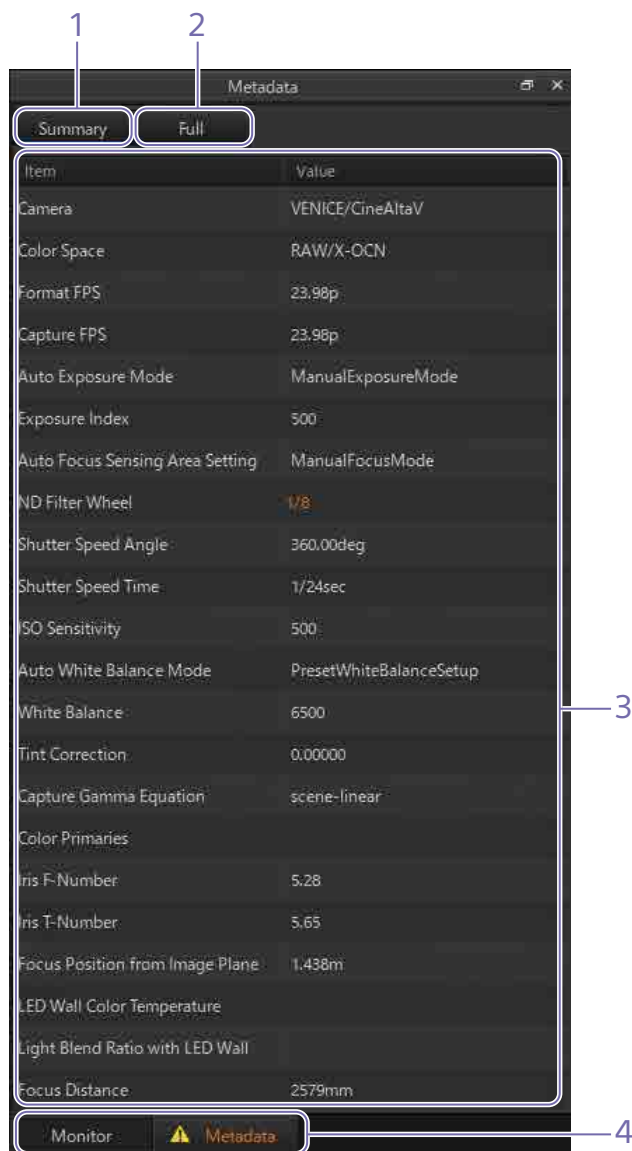


[Metadata] Window

The [Metadata] window is used to display the RDD18 metadata embedded in an X-OCN file or input signal via SDI connection.

[Note]

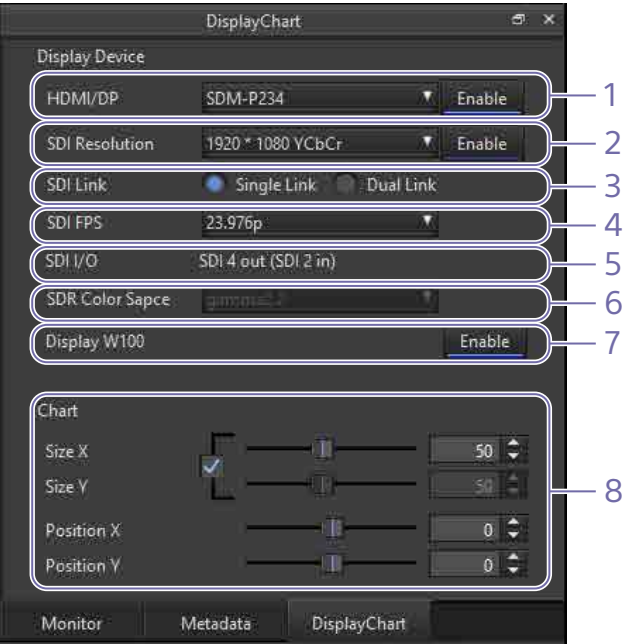
If the camera settings used for calibration operation differ from the camera settings in the metadata, a warning will be displayed. Check the target item of the warning in the [Metadata] window and adjust the camera settings.



No.	Item	Description
1	[Summary] button	Displays the metadata related to calibration. When the button is selected, the blue bar is displayed highlighted.
2	[Full] button	Displays all the acquired metadata. When the button is selected, the blue bar is displayed highlighted.
3	Metadata display	Displays the contents of the RDD18 metadata. For warning items, the setting value is displayed orange.
4	Window selection tabs	Switches between the [Monitor] window and [Metadata] window. [Monitor] tab: Displays the [Monitor] window. [Metadata] tab: Displays the [Metadata] window. If there are any metadata warning items, the tab will be marked with a warning mark and the text will be displayed in orange.

[Display Chart] Window

The [Display Chart] window is used to display the color chart required for calibration on the display when calibrating without using the Camera and Display Plugin, such as in a screen process.



No.	Item	Description
1	[HDMI/DP]	Selects the display device. Click the [Enable] button to output the color chart on the selected display. This can be selected when a secondary display is connected in Windows.
2	[SDI Resolution]	Selects the resolution of the SDI output. Click the [Enable] button to output the color chart on the SDI output This can be selected if an SDI output device is available.
3	[SDI Link]	Selects whether to use Single Link or Dual Link, if available for selection, at the selected resolution and frame rate.
4	[SDI FPS]	Selects the frame rate of the SDI output.
5	[SDI I/O]	Displays the SDI input/output connector numbers.
6	[SDR Color Space]	Selects the color space for the display when [Chart] is set to [SDR] in the [Color Manager] window.
7	[Display W100]	Displays the W100 chart when the [Enable] button is enabled. Displays the chart selected in the [Color Manager] Window when the [Enable] button is disabled.
8	Chart display position adjustment	Adjusts the display size and position of the chart.