LG
Life's Good

USER MANUAL

SuperSign
White Balance

Please read this manual carefully before operation and retain it for future reference.

CONTENTS

SuperSign White Balance

The SuperSign White Balance is a software to control the White Balance between the Monitors developed by LG Electronics with its own technology. You can control in steps the RGB and backlight settings of the monitors connected using a separate calibration sensor via SuperSign White Balance, thereby adjusting the White Balance. It can also compensate for the screen uniformity of professional video display monitors.

Monitor

The Monitor of LG Electronics has an embedded Ethernet network interface card to enable users to control the settings of each monitor connected via a short-range network or to control a monitor via an RS-232C serial port.
Please refer to the [Information] > [Release Note] menu of the software to see which Monitor model supports the SuperSign White Balance software.

Professional Video Display Monitor

LG Electronics' professional video display monitors (OLED Pro, etc.) display the best image quality onto the screen, enabling accurate color expression. The screen uniformity of the monitor can be calibrated using SuperSign WB software.
For professional video display monitor models that support SuperSign WB software, please check the [Information] > [Release Notes] menu of the software.

🛑 NOTE

• The supported models may be added for the SuperSign White Balance software. If the model of the monitor registered by the user differs from the actual monitor model, a malfunction may occur, so please register the accurate monitor model.

⚠ CAUTION

• Parts of the screen may not be displayed normally if the **Medium (M)-125%** or **Large (L)-150%** option has been selected in **Control Panel > Control Panel > Shape and Personal Settings > Display** when running the program on a Windows operating system.
• This software is professional software that helps adjust the colour of the monitor and the screen uniformity. Therefore, we recommend that an expert in colour calibration with excellent understanding and a great sense of colours use this software. General users are not recommended to use it.

System Requirements

Hardware
RAM: 4 GB or higher
Disk: 400 MB or higher

Software
.Net Framework 4.5
Visual Studio C++ (2013) redistributable package

System
Windows Platform
* Some Windows OS may not normally display a specific GUI screen.

Features

User-friendly automatic calibration for monitors
You can conveniently adjust the White Balance of the monitor as you wish with just a few settings.

Manual calibration for precise adjustment
Thanks to its intuitive UI, you can easily perform a minute precise adjustment at an expert level.

Camera calibration
You can conduct a simultaneous calibration for multiple Videowall monitors already installed by a simple method via a Wizard-type UI using a camera that supports the SuperSign White Balance software. (3 X 3 at the maximum)

Uniformity Compensation Feature
For some professional monitors (OLED Pro models, etc.), the uniformity compensation feature can be used to improve uniformity within the monitor screen.

SuperSign White Balance Configuration

The SuperSign White Balance configuration refers to setting the connection of the SuperSign White Balance software, which is a White Balance calibration program. The connection setting of SuperSign White Balance supports the two methods below.
- LAN (Local Area Network) connection
- RS-232C serial communication

LAN Connection

This is a method to connect to a network by using a router such as a switch or a hub. Insert a network cable connected to the LAN to the Ethernet port of the Monitor.

⚠ **CAUTION**
• If you simultaneously register a single monitor to multiple computers or manage a monitor while simultaneously running different versions of the software, it may not normally work.

How To Set IP Address of Network Monitor

After connecting the network cable, you need to set the IP of the Monitor to complete the network connection. Below is how to set the IP of the monitor.

1 Press the **SETTINGS / ☼** button on the remote control.
2 Select [Advanced Setting].
3 Select [Network].
4 Select [Connect Wired Network (Ethernet)].

🛑 NOTE

• The LAN is a computer network that connects nearby regions including homes, offices, and schools into one unit.
• The menu screen display is an example to help users operate the product, so it may vary by models.
• The UI operation may vary by the model. Please refer to the User Manual of the product for details.

RS-232C Serial Communication

To enable communication via the RS-232C serial port, you need to directly connect a PC and a monitor with the SuperSign White Balance software using an RS-232C cable. Likewise, to connect one or more monitors, you need to connect a PC to the first monitor using an RS-232C cable and then connect the other monitors using an RS-232C cable as in the below figure.
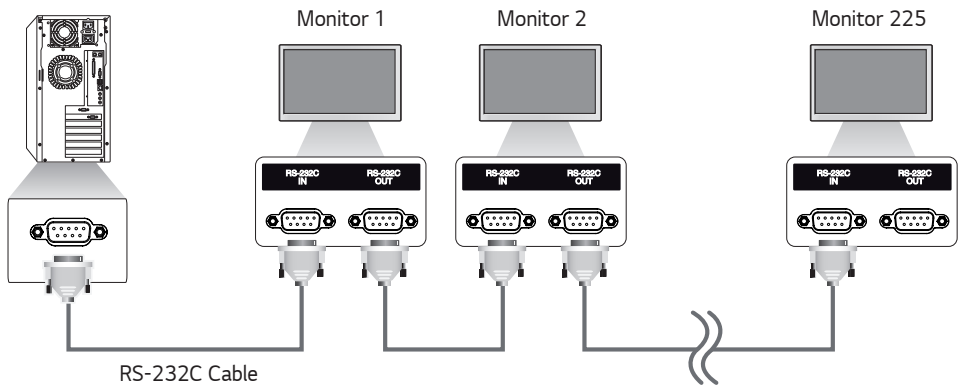
RS-232C Cable

⚠ CAUTION

• You can connect up to one thousand monitors using an RS-232C cable, but it is recommended to connect only up to 225 monitors considering the bandwidth of the RS-232C cable.
• The RS-232C cable may not be provided to some models.
• OLED Pro model does not support the RS-232C connection.

Installation of SuperSign White Balance

Install the SuperSign White Balance software on a PC to be connected to the Monitor via a network or a serial cable. You can control the Monitor by using SuperSign White Balance installed on a PC.
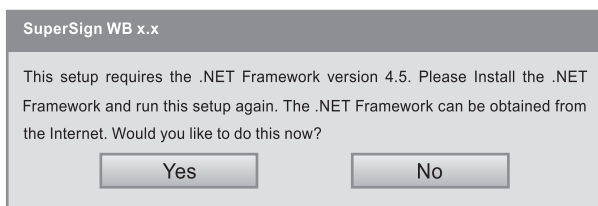
How To Install SuperSign White Balance

1 Run the Setup.exe file of SuperSign White Balance that you have downloaded.

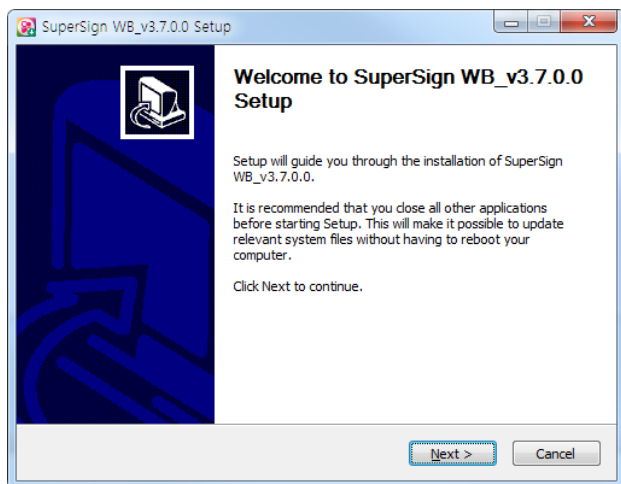2 When the Setup Wizard window appears, click [Next].

⚠ CAUTION

• If the below alert window appears while running the Setup.exe, first install .NET Framework 4.5 referring to the [How To Install .NET Framework 4.5], and then continue to install SuperSign White Balance.
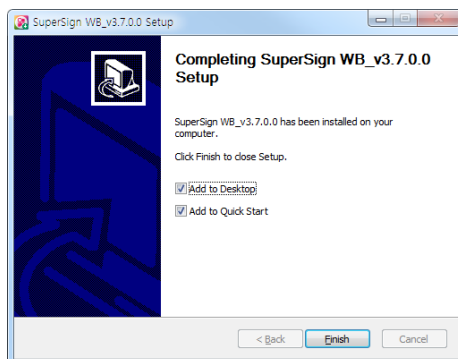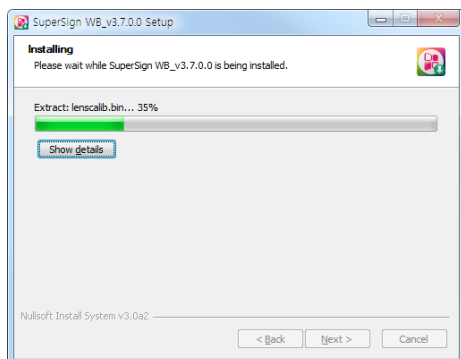
SuperSign WB x.x

This setup requires the .NET Framework version 4.5. Please Install the .NET Framework and run this setup again. The .NET Framework can be obtained from the Internet. Would you like to do this now?

| Yes | No |

3 When the Setup Wizard window appears, click [Next].

4 After you agree to the Terms of Use, click [I Agree]. Click the [Browse] button to change the default installation folder.

5 Click the [Install] button to proceed with the installation of the program.
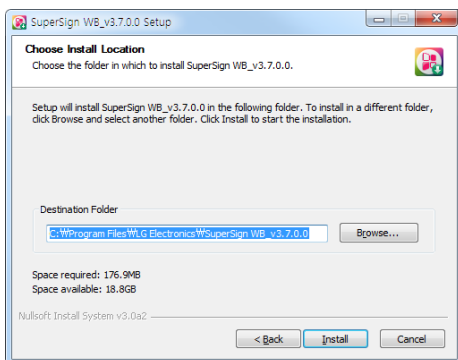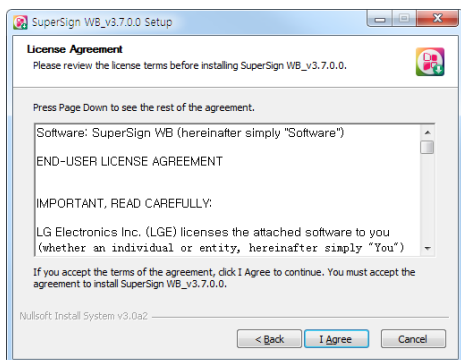
6 When the installation is completed, click the [Finish] button.

How To Delete SuperSign White Balance

Remove SuperSign White Balance by selecting **Start** > **Settings** > **Control Panel** > **Add/Delete Program** > **SuperSign WB x.x**.

⚠ CAUTION

• If the installation is not done properly, or the program does not work after the installation, please go through the below processes.

How To Install .NET Framework 4.5

1 Download .NET Framework 4.5 from the below websites, and run it.
 https://www.microsoft.com/en-US/download/details.aspx?id=30653

2 Install it, and then reboot.

🛈 NOTE

• Conduct this process only for the PC that has no .NET Framework installed.

How To Install Visual Studio (2013) Redistributable Package

1 Download the Visual C++ (2013) Redistributable Package from the below website, and run it.
 https://www.microsoft.com/en-US/download/details.aspx?id=40784

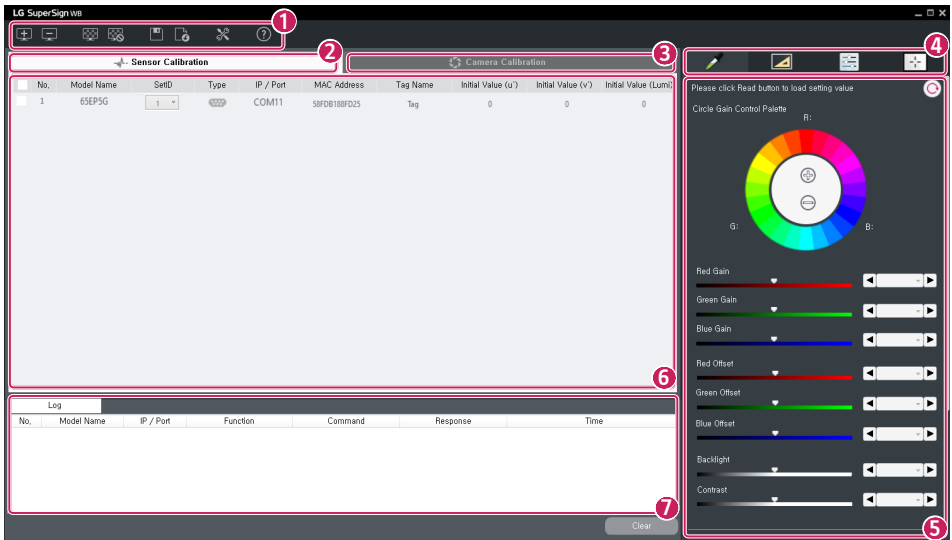2 Install it, and then reboot.

🛈 NOTE

• Conduct this process only for the PC that has no Visual Studio (2013) Redistributable Package installed.
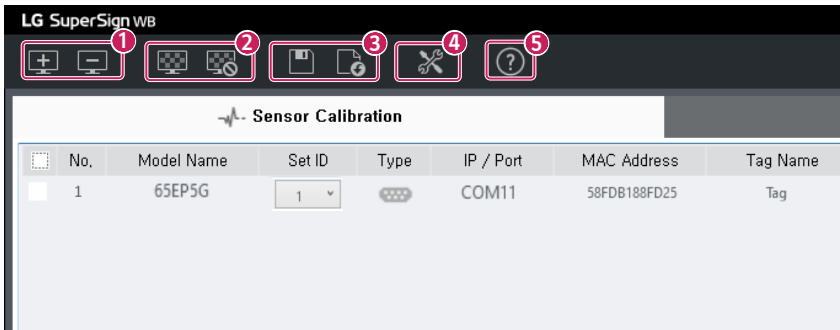
Overview of SuperSign White Balance

Take a look at overall features of the SuperSign White Balance software.

No.	Item	Description
1	**Menu**	Provides the basic menu used in SuperSign White Balance.
2	**Sensor Calibration tab**	This tab provides a menu to enable the user to do calibration by using a normal contact-type sensor. If you select it, the area of 4, 6 will turn into a menu that you can use a normal contact-type sensor.
3	**Camera Calibration tab**	This tab provides a menu to enable the user to do calibration by using a camera. The area of 4, 6 will turn into a menu to use camera calibration.
4	**Feature tab**	It provides the features in the form of a tab in accordance with the selected calibration mode.
5	**Control Panel**	You can view or adjust a detailed setting of the feature that you have selected in the Feature tab.
6	**Monitor Management area**	Provides information on the registered monitor or shows the Videowall configuration that you can set.
7	**Log tab**	Shows the results of executing the command.

Menu

Provides the basic features used in SuperSign White Balance and [Help].

No.	Item	Description
❶	**Add / Delete Device**	You can register or delete a monitor to be managed with SuperSign White Balance.
❷	**Test Pattern On / Off**	You can display a specific pattern required for calibration on the screen of the selected monitor or remove the pattern from the screen.
❸	**Configuration Save / Load**	Saves the current setting of the monitor as a file or opens the setting file.
❹	**Option**	You can change the settings of SuperSign White Balance.
❺	**Information**	You can check the version information and release note of SuperSign White Balance. Refer to the release notes for supported Signage product information.

Management of Monitor

How To Add Monitor

Click the ⊞ button on the top menu, and a window you can add a monitor will appear.

12
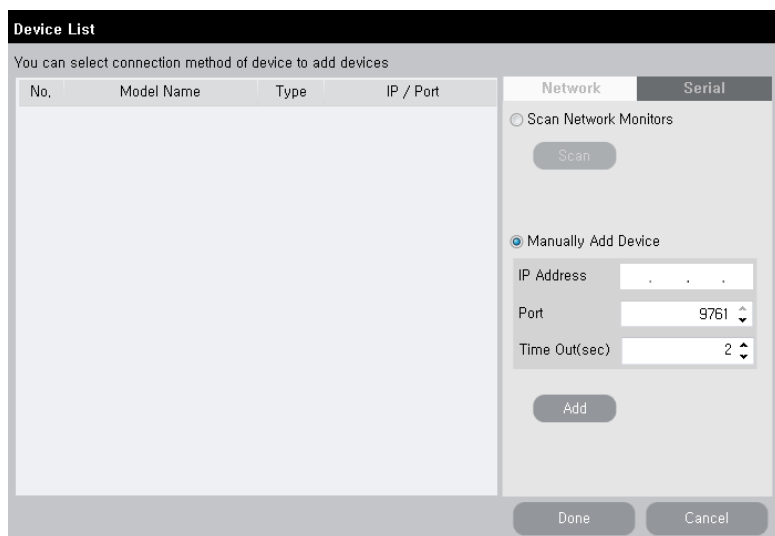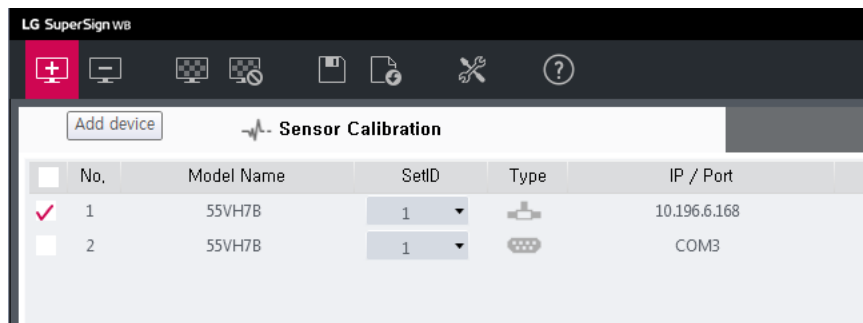
How To Add Monitor Connected to Network

1 You can scan a network to add a monitor.
2 You can manually enter an address to add a monitor.
3 If a monitor to be added appears on a list on the left side, check if the information is correct, and click the [Done] button.


How To Add Monitor Connected via Serial Port

1 Enter the relevant information and click the [Add] button and the monitor will be added according to the information.
2 If a monitor to be added appears on a list on the left side, check if the information is correct, and click the [Done] button.

🛈 NOTE

• If the connection is made via a serial cable, you can add multiple monitors at once.
• After adding a monitor, the set ID must be set equal to the set ID of the actual monitor to operate the program normally. (Set ID default is 1.)
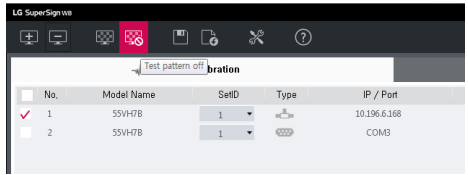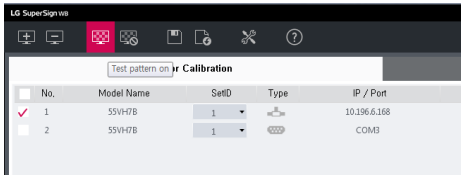
How To Delete Monitor

Click the ⬚ button in the top menu, and a window you can delete a monitor will appear.
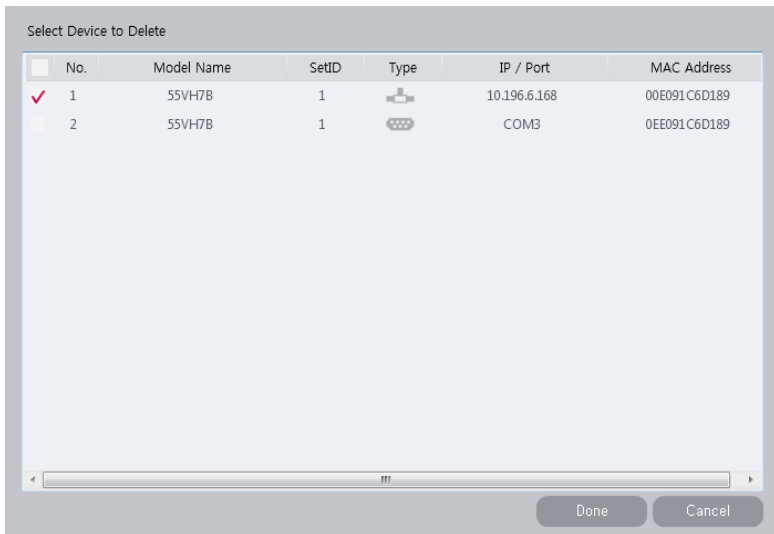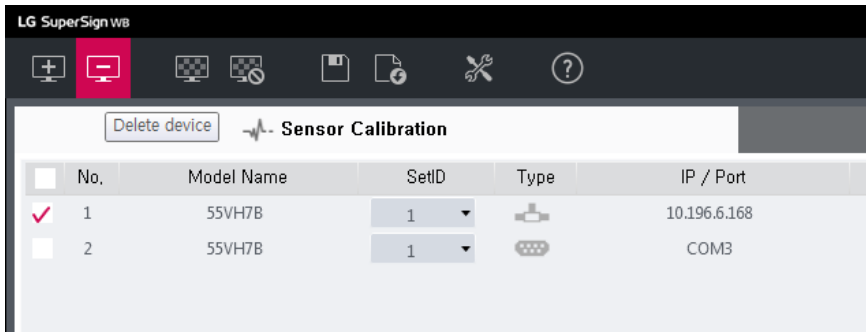
- Click on the monitor to be deleted and click the [Done] button, and the registered monitor will be deleted.
- To delete all the monitors, select the checkbox on the top, and click the [Done] button. Then, all the registered monitors will be deleted.

Test Pattern On/Off

1 Click the [Test pattern on] in the menu, and the test pattern to see the White Balance of the current monitor will appear on the screen of the selected monitor in the list of monitors.

2 Click the [Test pattern off], and the screen of the selected monitor with the test pattern on will return to its original status.

How To Save Configuration File

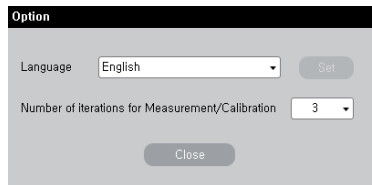Saves the current setting of the monitor and manages it as a file.
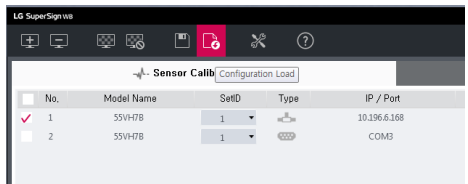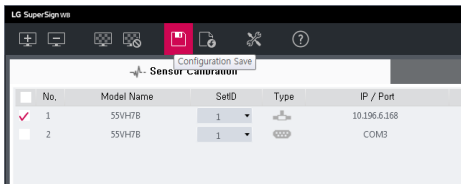
• You can save/import the information on the list of monitors in the form of a file.

Option

Language

To change the language of the program, select [Option] > [Language].
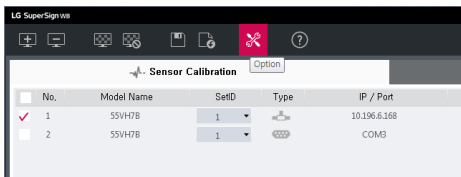
Setting the Number of Times to Measure with Sensor in Case of Execution of Measurement/Calibration Features

This menu is to set the number of times to measure with a sensor when measurement or calibration is operated. To change the number of times of measurement, change the number in the box. The smaller the number is, the higher the measurement's speed will be. The greater the number is, the smaller the measurement errors of the sensor get.

List of Monitors
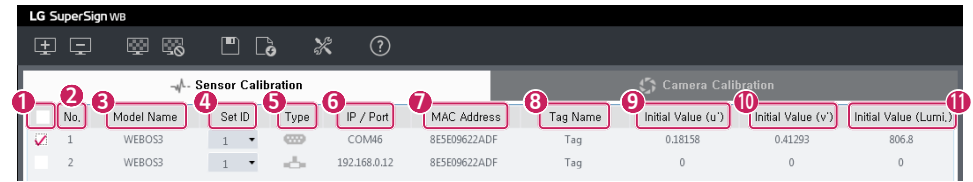
| No.	Item	Description
❶	**Checkbox**	Select a monitor. You can select multiple monitors.
❷	**No.**	All monitors on the list will be displayed on the screen in the order of being connected.
❸	**Model Name**	You can view the model name of the connected monitor.
❹	**Set ID**	You can check and change the set ID set for the monitor.
❺	**Connection Type**	It turns into ▦ (Serial) or ⬚ (Network) in accordance with the connection type.
❻	**Connection Information**	The COM Port number (in case of the serial) or the IP address(in case of the network) of the connected monitor will appear.
❼	**MAC Address**	Displays the unique MAC address of the connected monitor.
❽	**Tag Name**	You can enter a separate tag name for each monitor for managing the monitors.
❾	**Initial Value (u')**	Displays the color coordinate (u') in the basic status of the monitor.
❿	**Initial Value (v')**	Displays the color coordinate (v') in the basic status of the monitor.
⓫	**Initial Value (Lumi.)**	It displays the brightness in the basic status of the monitor.

Feature tab
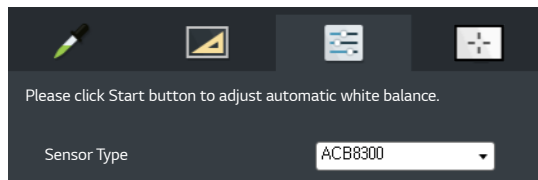
The Feature tab of the sensor calibration provides the four features of [Color Value], [Measure], [Calibration], and [Duplication].

To use these features, you need to connect a supported contact-type sensor to the PC and attach it to the monitor. Afterward, you need to select a monitor to apply the color from the list of the monitors.

* The [Uniformity Compensation] feature is supported only for OLED Pro models, and uniformity can be increased in the corresponding tab for areas within one screen.

Sensor Calibration
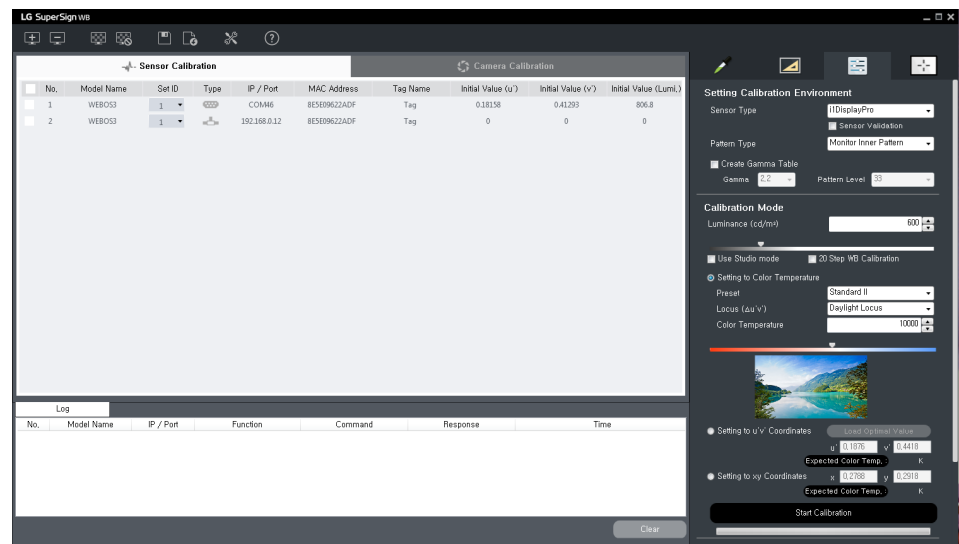
On this screen, you can do calibration via a normal contact-type sensor supported by SuperSign White Balance.

The supported contact-type sensors are as follows.

- Spyder5,SpyderX, ACB8300 (LG Sensor), i1DisplayPro, CA210, CA310

When you select the [Sensor Calibration] tab, a window to check the registered monitors in the form of a list will appear on a lower side of the tab, and a Feature tab to conduct the calibration feature with a sensor will appear on a right side of the tab.

🛈 NOTE

- When installing a driver to use a sensor, please refer to the websites of each manufacturer. But, for the Spider series, the relevant sensor's driver installation file is provided in the USB Driver folder, which is a subsidiary folder of the folder where SuperSign White Balance is installed.
- For the i1displayPro sensor, the supporting company has been changed from X-Rite to Calibrite, and the brand name has also changed. Refer to the website calibrite.com for more information.
- In case of conducting calibration with CA210 or CA310, you need to download the SDK file from the manufacturer's homepage and install it to normally operate a sensor calibration.
  Manufacturer: Konica Minolta
- To do the calibration with CA210 or CA310, you need to first conduct a 0-calibration.
- Calibration results for OLED models may change due to the device's afterimage compensation feature (OLED Panel Settings). All related items must be turned off before performing calibration.

⚠ CAUTION

- If the sensor is forcibly connected to the USB port before the calibration function is activated or just before operation, or if the sensor is not correctly attached to the center of the monitor, the monitor may not function properly. In this case, start calibration again. In this case, start calibration again.
- The SpyderX sensor must be attached in the correct direction. That is, the sensor must be attached upright to the screen with the connection cord facing upward in order to obtain proper measurement data.

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Color Value

Select a specific monitor from the list of the monitors, and click the ⟳ button to see the color information on the relevant monitor.

To change the color value, click the arrow button on the right side of each piece of the information.
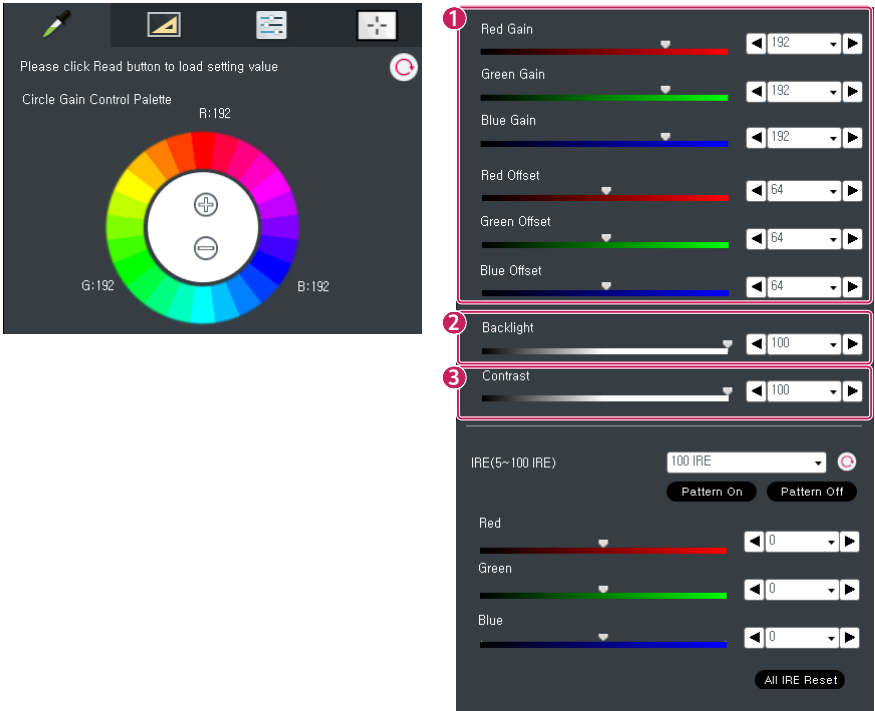
No.	Item	Description
❶	**Color Value Setting**	You can view the current status or change the settings of [Red Gain], [Red Offset], [Green Gain], [Green Offset], [Blue Gain], and [Blue Offset] in accordance with whether each model is supported or not.
❷	**Backlight**	Adjusts the backlight value of the monitor, and it is the same as the backlight of the OSD menu video of the monitor.
❸	**Contrast**	Adjusts the contrast value, and it is the same as the contrast of the OSD menu video of the monitor.

You can also change the color value via the [Gain] (circular gain control palette) on the top.

- From the circular gain control, you can select a color you feel from the monitor or a color you want to increase in the monitor with a test pattern turned on the monitor.
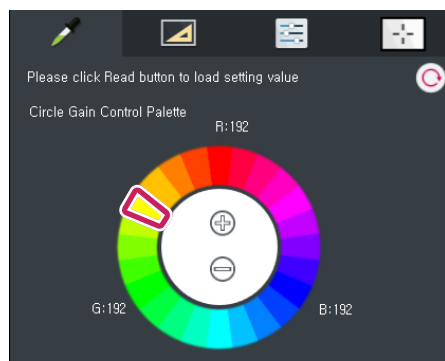

- The selected color will be applied to the circle in the center of the screen.
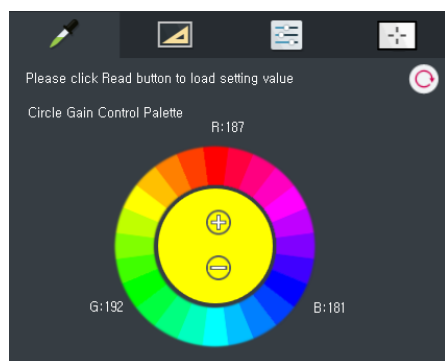
- The top of the circle in the center is the "+" button and the bottom is the "-" button. Each time you click the "+" button, the selected color becomes darker, and each time you click the "-" button, the selected color becomes lighter.
- Click the desired red/green/blue color and press the "+" part of the circle in the center, and the gain value of red/green/blue increases and a red/green/blue tone in the monitor becomes stronger. If you click the "-" part, on the other hand, the gain value of red/green/blue decreases and a red/green/blue tone in the monitor becomes lighter.
- For the yellow/cyan/magenta colors, two gain values will be changed at the same time. For yellow, the gain values of red/green will change, for cyan, those of green/blue will change, and for magenta, those of blue/red will change.
- If you select any other color, the increase rate will change according to the selected color.
- The changed values will be displayed together with the slider bar and drop-down box at the bottom.
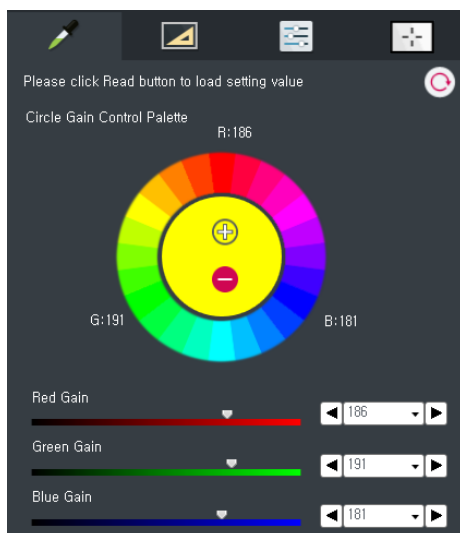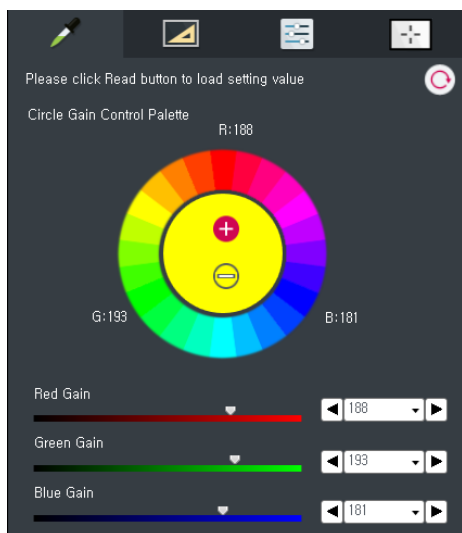
Measurement

You can measure the White Balance of the selected monitor by using a sensor. To use this feature, only one monitor must be selected for measurement from the list of monitors on the left side, and a sensor supported by SuperSign White Balance must be connected to the PC. The list of the supported sensors is displayed in the list of the item of [Sensor Type] on the Measurement tab.

1 Select the name of the sensor connected to the PC from the item of [Sensor Type].

No.	Item	Description
❶	Apply Sensor Validation Data	For an aged sensor which is deteriorated that its reliability cannot be guaranteed, the measurement results of the sensor may be inclined to a specific color. So, this option is able to identify the characteristics of the sensor in terms of software during the measurement and to refer to and reflect the characteristics in the measurement results. This calibrates in terms of software for a sensor physically deteriorated, so it is recommended to use it only limitedly for some cases where an error of the sensor is unreliable. - Only when you select the Sensor Verification option in the Calibration tab and conduct calibration, the sensor calibration value will be applied.
❷	Pattern Type	This option is to set whether to select [Monitor Inner Pattern] as a pattern to be measured by the user or to select a random external input pattern output from the screen of the monitor without displaying a separate pattern. If you select [No Pattern], you need to manually display a pattern to be measured on the screen via an external input, etc. - When it is not a pure white pattern, there may occur an error in measurement.
❸	Standard Illuminant / Observer Degree	These are subsidiary indicators for measuring a value for [L*ab Coordinates] and [Optimal Value Calculation]. It is a menu to set a value for a light source in a place where the Videowall is installed. - [Standard Illuminant]: in general, you only need to set D65, and you can select D50 or D75 depending on the light source. - [Observer Degree]: it is to set an observer degree of the standard observer, and you can select either 2° or 10°.
❹	Exit all functions of targer device	When you conduct a measurement while another app is running on the Monitor, [Monitor Inner Pattern] may not appear. So, this feature is to allow a measurement to be conducted after checking the relevant option and sending a command to close the app.
❺	Start Measurement	A measurement is conducted in the current measurement environment. The relevant result will appear in the area of [Measurement Result] under the [Start Measurement] button.
❻	Monitor Information Check	The [Red Gain], [Green Gain], [Blue Gain], and [Backlight] are features to read the relevant value of the targeted monitor and display the value on the screen. You can change the read value into a random value. - When changing the value, the existing measurement value will be initialized.
❼	Sensor Measurement Result	The [Brightness (cd/m2)], [Color Temperature], [u'v' Coordinates], [xy Coordinates], [L*ab Coordinates], etc. show the results of measurement done by using a sensor on the screen.
❽	Check the initial Value	This allows the user to measure the initial value of the registered Monitor and to save the relevant result. It is necessary to calculate the optimal calibration value of the installed Videowall. - When you measure the initial value, you need to display a white pattern on the monitor screen and then preheat it for a sufficient period of time (about two hours) to measure a precise value. It is recommended to attach a sensor to the center of the monitor.
❾	Optimal Value Calculation	This feature is able to analyze the initial values of the selected monitors and to calculate the optimal calibration color coordinates. You must select the monitor that you have checked the initial value before calculating the optimal value.
❿	Include Illuminant	This option allows the user to calculate the optimal value by considering the light source in a place with the Videowall installed. If you select this option, the optimal value will differ according to the setting of the [Standard Illuminant] in the area of [Setting Measurement Environment]. The default value is "No selection." - Please refer to page 34 for detailed methods related to checking the initial value and calculating the optimal value.

Calibration

You can calibrate the White Balance of the monitor automatically by using a contact-type sensor.

1 Connect a supported sensor to the PC, and select the monitor to be calibrated from the list of the monitors.

2 Set [Sensor Type], [Gamma], [Pattern Level], [Brightness], [Color Temperature], etc. and click the [Start Calibration] button.

3 Click the [Start Calibration] button, and calibration will proceed with a target value set in the Calibration mode. The results of the calibration will be displayed on the area of [Calibration Result] at the bottom.

No.	Item	Description
❶	**Sensor Type**	You can select a type of the sensor to use.
❷	**Sensor Verification**	Since the reliability of old sensors that have undergone deterioration cannot be guaranteed, the sensor's measurement results may appear biased to a certain colour. This option identifies the sensor's characteristics through software and reflects them onto the results. This option is recommended for use only when the level of error is unreliable, since the corrections are done by software for sensors that have physically deteriorated. (Not supported for OLED Pro models.)
❸	**Pattern Type**	[Pattern Type] is to set whether to select [Monitor Inner Pattern] as a pattern to be calibrated by the user or to select a random external input pattern output from the screen of the monitor without displaying a separate pattern. If you select [No Pattern], you need to in person display a pattern to be calibrated on the screen via an external input, etc. When it is not a pure white pattern, there may occur an error in calibration.
❹	**Create Gamma Table**	Check [Create Gamma Table], and a new gamma table will be created, and you can save it as a file after it is created. By default, it is not saved. If you check the [Create Gamma Table], the items of [Gamma] and [Pattern Level] will be activated, and the pattern type will be automatically fixed as [Monitor Inner Pattern]. - [Gamma] is a value to show the degree of gamma for gamma calibration. The SuperSign White Balance sets 2.2 as the default value. - The [Pattern Level] refers to the number of samplings for each color (R/G/B/W) when you check the [Create Gamma Table]. You can select from the steps of 9, 17, and 33.

❹	Calibration Mode	For an actual calibration, there are detailed items listed for you to select a calibration method and a target value.
		- By using the item of [Brightness], you can set the target brightness of the monitor for calibration, and the calibration will be conducted according to the set brightness. However, in accordance with the maximum brightness spec. of the monitor, the set brightness may not be reached.
		- You can select [Studio Mode] when you want to calibrate with a low color temperature between 2800K and 4900K. If you uncheck [Studio Mode], you can select a color temperature between 5000K and 16000K.
		- [White Balance Calibration of 20 Steps] is to conduct calibration under the designated conditions for each IRE by decreasing the IRE from 100 by five steps. If you select the option, patterns will appear for each gradation, and the relevant gradation will be calibrated consecutively. However, if the brightness of patterns for each gradation decreases to below a certain level, the calibration will end.
		- The [Preset] is a set value of [Color Temperature] which is frequently used. If you select the [Preset], the value will automatically change into the relevant [Color Temperature]. However, the preset setting is not available in [Studio Mode] or the [Manual Coordinate Setting] mode.
		- The [Locus] is a menu to set to apply the same correlated color temperature differently according to the value of Δu′v′. According to the set value of Δu′v′ of the [Locus], each Locus will have different color coordinate values at the same color temperature.
		- The lower [Color Temperature] is, the more reddish the image will become, and the higher [Color Temperature] is, the more bluish the image will become. The default value is set to be 10000K, which is the value of Standard II of [Preset].
		- The preview image (the virtual monitor screen) symbolically shows the changes in the image tone according to changes in the color temperature. You can see the changes in the image tone according to the changes in the color temperature.
		- [Setting to u′v′ Coordinates]: You can designate calibration target color coordinates as the value of the u′v′ color coordinate system.
		- [Setting to x y Coordinates]: You can designate calibration target color coordinates as the value of the x y color coordinate system.
❺	Calibration Result	[Calibration Result] shows the results of the calibration to the user after the calibration is conducted.

How To Select White Balance Desired by User

[Setting to Color Temperature] Mode

You can select the desired color temperature of the user based on the value of Kelvin(K). In this case, the [Preset] is a set value of Color Temperature which is frequently used. If you select the [Preset], the value will automatically change into the relevant color temperature. However, preset mode is not available in Studio mode or Manual Coordinate Setting Mode. The lower the color temperature is, the more reddish the image will become, and the higher the color temperature is, the more bluish the image will become. The default value is set to be 10000K, which is the value of Standard II of Preset. The [Locus Δu'v'] is to show a difference in colors at the same color temperature. It is expressed as a locus in the unit of Δu'v', and the default value is set as [Daylight Locus]. The preview image (the virtual monitor screen) symbolically shows the changes in the image tone according to changes in the color temperature and locus. You can see the changes in the image tone according to the changes in the color temperature and locus.

[Setting to u'v' Coordinates] Mode

This function is to set the desired color temperature of the user to the value of the CIE 1976 u'v' color coordinate system. The setting range is as follows. (u': 0.18239 - 0.25727 / v': 0.42304 - 0.52968)

- If you select the [Setting to u'v' Coordinates] mode, the device can automatically import the optimal calibration coordinates obtained by running the [Optimal Value Calculation] feature in the [Measure] tab. (Please refer to page 35 for details on how to use.)

[Setting to xy Coordinates] Mode

This function is to set the desired color temperature of the user to the value of the CIE 1931 xy color coordinate system. The setting range is as follows. (x: 0.26180 - 0.45190 / y: 0.26480 - 0.40860)

🛈 **NOTE**

- Click the [Expected Color Temperature] button of each manual setting mode, and the correlated color temperature value of the relevant coordinates will be calculated and displayed.

⚠ **CAUTION**

- The Color Temperature setting and Manual Color Coordinate setting are mutually exclusive.
- The success of calibration for the value specified by the user may vary according to whether it has been set to studio mode, the specifications for monitor colour expression, or the sensor's level of deterioration.
- In Manual Coordinate Setting mode, creating a gamma table is not available in some color coordinates.
- The results of [Calibration] may vary according to the performance and error range of the sensor used for [Calibration].
- The color of the preview image is to help the user understand and may differ from the actual color of the monitor.

[Uniformity Compensation]

The screen's [Uniformity Compensation] feature is supported for OLED Pro models, which are for image quality professionals. This feature enables users to increase screen uniformity. In order to use this feature, the program and the OLED Pro product must be connected, and the PC with the program installed must be connected to the calibration sensor via USB.

The method for operation is as follows.

1 Each area of the screen is measured through a sensor.
2 The measurements are displayed to the user by calculating the luminance and chromaticity uniformity according to the value of the centre point of the screen or the set standard light source.
3 Compensation value is calculated based on the centre point of the screen.
4 The obtained values are collectively transferred to OLED Pro and applied.

SuperSign WB provides a feature to assist users in performing this procedure.

Feature Description
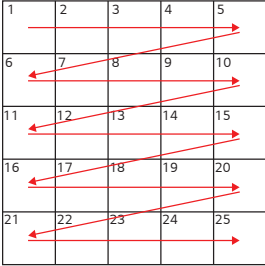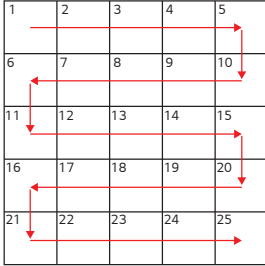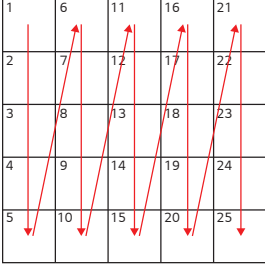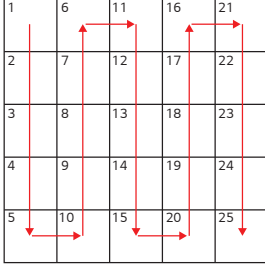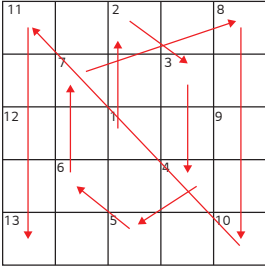
No.	Item	Description
❶	**Pattern Type**	Divide the screen and determine the number of patterns to be measured. 9 points (3X3), 13 points (based on EBU recommendations), and 25 points (5X5) are supported.
❷	**Standard Light Source**	Enter the standard lighting values for the space where OLED Pro is installed. It must be set according to the actual environment since this value can be used to calculate the Δu*v* value and the chromaticity uniformity. If measuring pure uniformity without considering the lighting factor, the chromaticity value of the screen's [Centre Point] can be set as the standard lighting. Set it to 6503K (D65) under a typical lighting environment.

No.	Item	Description
❸	**Pattern Check**	The user may check how the actual measurement pattern appears on the OLED Pro screen. Once the pattern number, pattern colour, and background colour have been selected, clicking [Pattern On] displays the pattern matching that information on the OLED Pro screen. If the pattern colour and background colour are the same, checking Display Outline displays the border between the pattern and the background. Clicking Pattern Off clears the pattern displayed from the screen.

Check Pattern

Pattern Number	1 ∨
Pattern Color	Black ∨
Background Color	Black ∨
Border Marking	☑

Pattern On   Pattern Off

Close

25 points	25 points	25 points
Pattern Number 13	Pattern Number 3	Pattern Number 25
Pattern Colour Blue,	Pattern colour Black,	Pattern colour Grey,
Background Colour White	Background colour White,	Background colour Grey
Direction 1	Direction 1	Direction 1

No.	Item	Description
④	**Measurement Mode**	In the case of manual mode, the next pattern measurement will begin only once the measurement has been paused and the pop-up asking whether to move on has been clicked. Manual mode may be selected if it takes a long time to move the sensor according to the pattern. In the case of auto mode, the pattern automatically changes position and measures from beginning to end without having to click on the mouse. The auto feature may be selected if the user is familiar with pattern locations or if it is difficult to select individually using the mouse. Here, the time to move on to the next pattern can be set in the Measurement Interval text box. The default value is three seconds.
⑤	Measurement Direction	When the measurement direction is set, the order of measurement (the order in which the pattern appears) varies depending on the setting. The order of direction is as follows.

No.	Item	Description

• Pattern Direction (example - 25 points)

 - Measurement Direction (the number in the cell is the pattern number and order of measurement.)

For Direction 1:

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

For Direction 2:

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

For Direction 3:

1	6	11	16	21
2	7	12	17	22
3	8	13	18	23
4	9	14	19	24
5	10	15	20	25

For Direction 4:

1	6	11	16	21
2	7	12	17	22
3	8	13	18	23
4	9	14	19	24
5	10	15	20	25

* However, the measurement direction is fixed for EBU 13 Points.

11		2		8
	7		3	
12		1		9
	6		4	
13		5		10

6	Start Measurement	After conditions have been set up to this point, press the Start Measurement button to start the measurement. The pattern appears on the screen in order according to pattern order and direction, and after pattern measurement, a grey pattern and grey background appear at the location of the next pattern, indicating the position. Measurements continue when the user places the sensor exactly in the centre of the pattern accordingly.
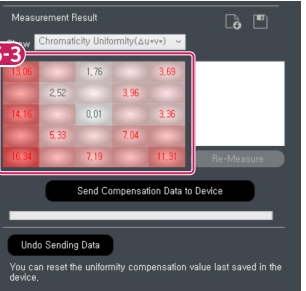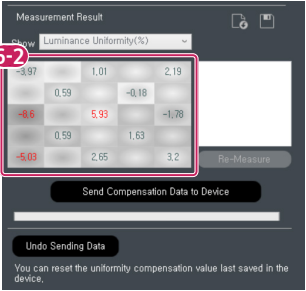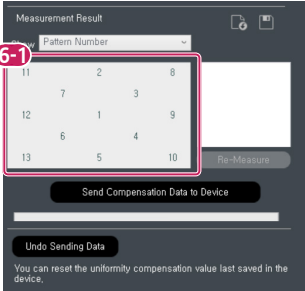
- Measurement Data Check UI: The pattern number for the pattern direction is shown as default, but if the measurement is complete or if the measurement data file is opened, luminance uniformity or chromaticity uniformity can be checked in the combo box menu. The error value of the uniformity of each area of the screen is displayed as a numerical value. The larger the absolute value, the worse the uniformity. The degree of deviation from uniformity is shown through the background colour.
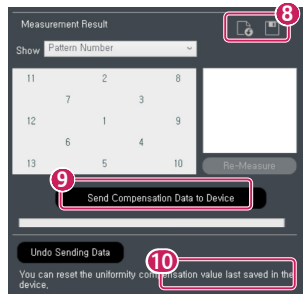
No.	Item	Description
6-1	Pattern Number	The pattern numbers corresponding to the set measurement direction are shown. The pattern number becomes the order of measurement.
6-2	Luminance Uniformity	The background colour is displayed in white if it is brighter than the average value. The background colour is displayed in black if it is darker than the average value.
6-3	Chromaticity Uniformity	The lower the number, the whiter the display, and the greater the uniformity error, the redder the background colour.
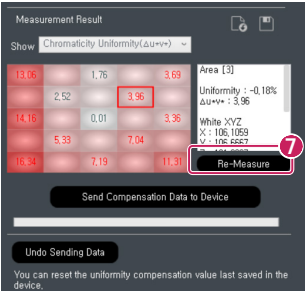
No.	Item	Description
7	Remeasurement	Measurement information and calibration data can be checked by clicking the area on the Measurement Data Check UI . Also, remeasurement can be performed for the area if measurement information is available.

🛈 NOTE

In the case of EBU 13 Points, the area with and without measurement data is displayed together, and only the calibration data is displayed if there is no measurement information (empty areas).

No.	Item	Description
⑧	**File Management**	• Save Data File : The measured data of the screen uniformity can be saved in the form of an .mea file. • Open Data File : Measurement data files that have been saved can be opened. If the imported measurement data is valid, the luminance and chromaticity uniformity values of the measurement data are displayed in the measurement data UI.
⑨	**Reset**	When the uniformity compensation data has already been transmitted to the monitor, clicking the Reset button initialises the data transmitted to the monitor.
⑩	**Start Data Transfer**	If the measurement data is valid to calculate the compensation data, the Start Data Transfer button is activated, and clicking the button transmits the calibration data to the monitor. However, if the calibration data has already been transmitted to the monitor, the user has two options. • Overwrite : Reads the previously transmitted compensation data values, adds them to the newly calculated compensation data, and transmits the final calibration data to the monitor. • Data Replace - Transmits the newly calculated compensation data after resetting the previously transmitted compensation data value.

* In general, it is recommended to perform this function in the following order: Reset the previously transmitted calibration data value, conduct the uniformity measurement, and then send the uniformity compensation data obtained through the measurement to the monitor.

* The value may not be measured normally if the sensor is not precisely matched to the pattern or if the sensor has been deteriorated.

[Reference] Calculation of Optimal Color Coordinate

You can use a feature to read the default value of each monitor and to calculate and recommend the optimal calibration coordinates for the monitors to be calibrated based on the default value from the SuperSign White Balance 3.7.15 version and higher. The provided feature enables you to conduct calibration with the coordinates recommended for all targeted monitors via the feature and enjoy the maximum performance of the monitor while making the colors uniform.

Measurement of Initial Color Coordinate Value of Each Monitor

1 Check the checkbox of the monitor for an initial value to be calculated.
2 Click the [Check the initial Value] button with the sensor connected and attached to the display.

	No.	Model Name	Set ID	Type	IP / Port	MAC Address	Tag Name	Initial Value (u')	Initial Value (v')	Initial Value (Lumi.)
☑	1	WEBOS3	1 ▼		COM46	8E5E09622ADF	Tag	0.18158	0.41293	806.8
	2	WEBOS3	1 ▼		192.168.0.12	8E5E09622ADF	Tag	0	0	0

🔔 NOTE

• Select all monitors for calculating the optimal values. If you do not select a monitor, the monitor will be excluded from the calculation of the optimal values.

3 The information (u',v', brightness) of the initial values measured will be recorded herein. Measure the initial values of all monitors this way.
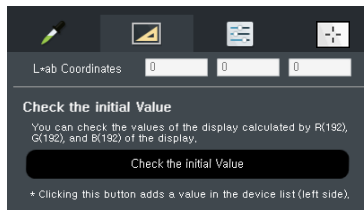

4 Click the [Calculation] button to calculate the optimal calibration coordinates based on the initial color coordinates.
5 Click the [Calculation] button, and the optimal values of the selected monitors will be calculated. You can record the values and apply them to all monitors.
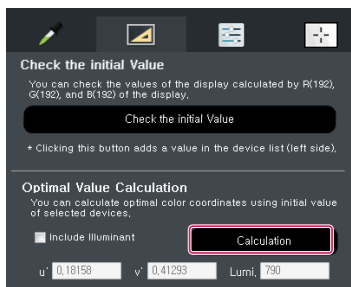
Process to Calibrate All Monitors with Calculated Optimal Value

1   Select [Setting to u'v' Coordinates]. Then, click on the [Load Optimal Value] button, and then the brightness and color coordinates will automatically be changed into the calculated values.

2   Select only one monitor for calibration, connect a sensor, and click the [Start Calibration] button to conduct calibration with the value.
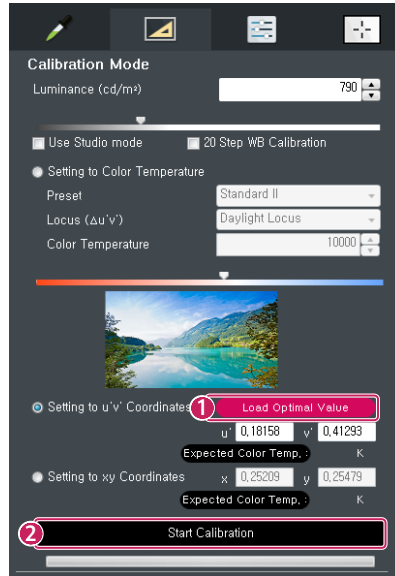
Camera Calibration

Camera Calibration is a feature to adjust the White Balance of the Videowall conveniently and quickly by using a camera. To use this feature, you need to have a separate license issued for the PC with the software installed.

How To Start

To conduct calibration with a camera, select the [Camera Calibration] tab on the screen.

The icon of the Feature tab on the right side of the screen will change into the icon of the Camera Calibration feature.
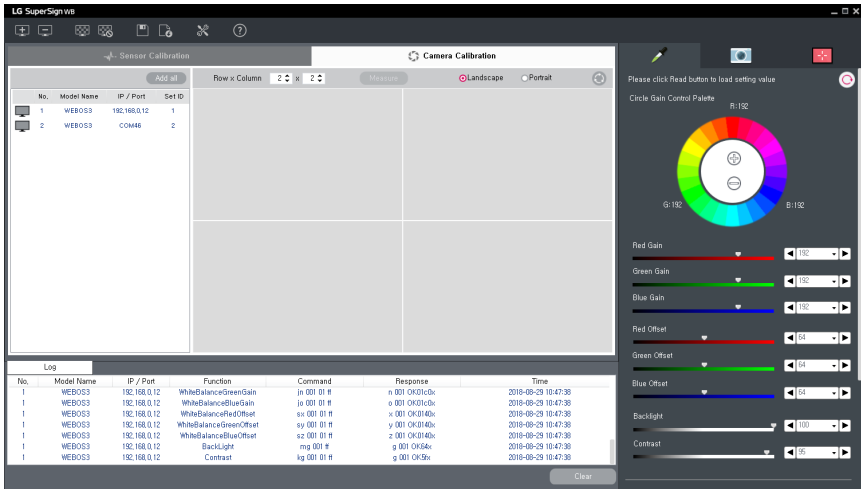
Videowall Configuration

1 Enter the size of the Videowall to adjust.

Enter the proper numbers for the rows and columns.

The maximum adjustable size is 3 x 3.

2 Select whether the Videowall is installed in the horizontal direction or vertical direction.

3 Select a device from the device list on the left side to configure the Videowall.

You can configure the Videowall by adding all the selected devices at once by using the [Add All] button.

* You can initialize the content configured by the Videowall Initialization button.

* The Measurement button can be selected when the Camera Calibration process is finished, and you can check the adjusted result value.

⚠ CAUTION

• The configuration position of the actual video wall and the configuration position of the video wall in the SSWB screen should be the same for each set ID. Calibration will not work if the actual position is different.

Feature tab

Color Value

You can select monitors one by one and adjust a variety of the settings.
It works the same way as the Color Value menu of the sensor calibration, so please refer to the previous chapter.

Camera Setting

In this step, your surrounding environment is evaluated and your camera's settings are automatically optimized for camera selection and camera calibration.

Calibration Menu

Conducts calibration with a camera.
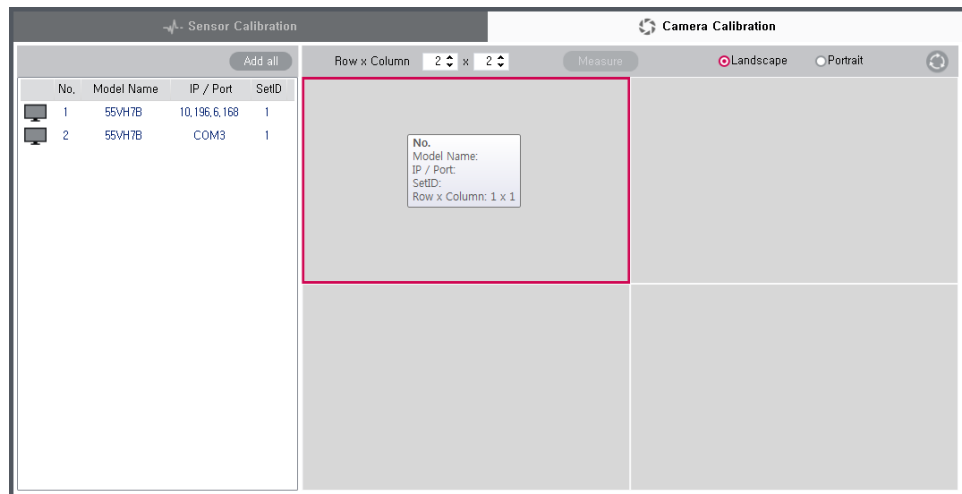
Camera Setting

Checks if the environment is proper for camera calibration and automatically sets the required settings of the camera.

**The Camera Calibration feature is available only for the below models.**

Supported Cameras: Nikon DSLR Camera D5300, D5500, D5600

Supported Lenses: AF-S DX NIKKOR 18-55 mm f/3.5-5.6G VR II Lens

* The camera mode is recommended to be set as the **M** or the **Auto** modes.

Check Camera Position

After selecting the camera, adjust the camera position so that the video wall is fully illuminated within the camera screen.
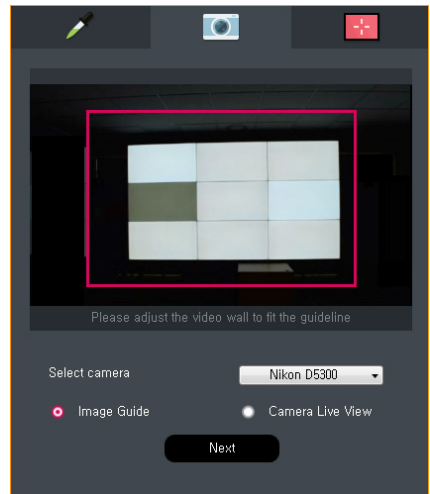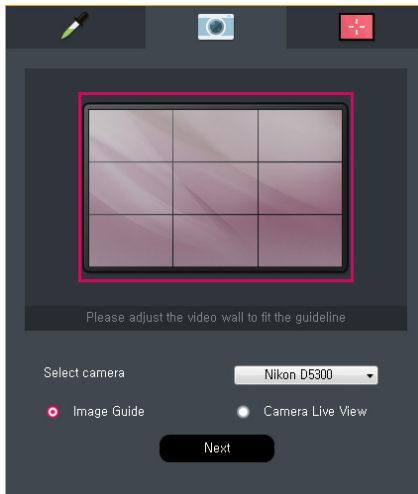

1 Select the camera as shown above and adjust the distance and position between the video wall and the camera so that it is as fully illuminated as possible while entering the guideline.

2 Select [Camera Live View] to view the live video of the camera.

3 Align with the guideline, and click the [Next] button to proceed to the next step.

* Do not adjust the size with the zoom feature of the camera. Use the 18 mm setting of the lens.

Auto Setting

It automatically analyzes the surrounding environment, checks if the environment is proper for calibration, and adjusts the settings of the camera.
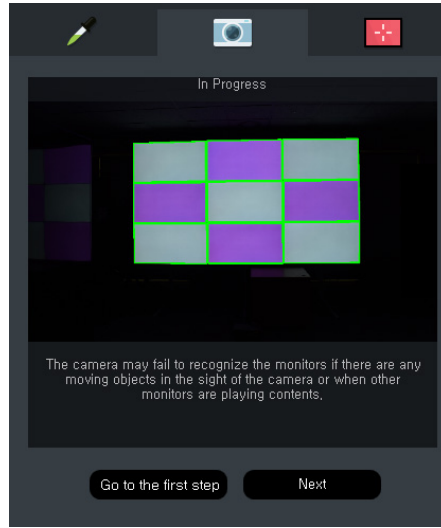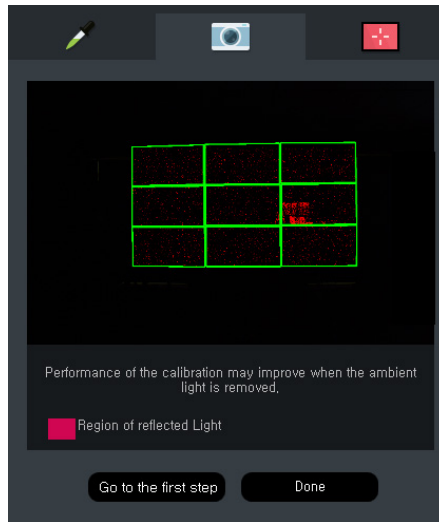

1 It updates and shows the video shot during automatic setting.
2 After completing all settings, click the button and proceed to the next step.

⚠ NOTE

• In case of an error during the automatic setting, the process will stop and the error will be notified.

Detection of Light Reflection

It is a step to check the detected light reflection area.

- To check the detected light reflection area and proceed to the next step, select the [Done] button. To restart from the beginning, select the [Go to the first step] button.
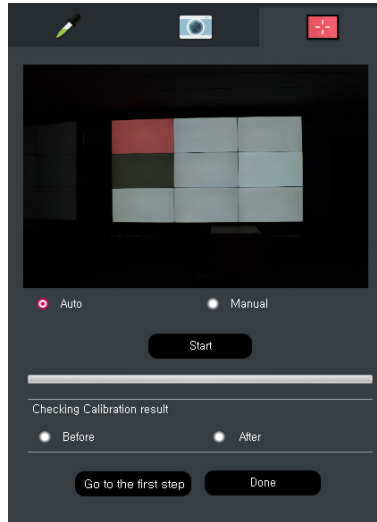
🚩 NOTE

- Do not use the detected light reflection area when you conduct calibration.
- If there are too many light reflection areas, an error message will be output.

Calibration Menu

Conducts calibration of the Videowall.

The icon of the Calibration menu is activated to allow the calibration to proceed only after all camera settings are normally done.

First, select whether to automatically select Standard Monitor or to manually select from the Videowall Configuration on the left side via the menu to select [Auto] or [Manual].

1 Select Standard Monitor and click the [Start] button to start the calibration.

2 When the calibration is finished, use [Checking Calibration Result] to compare the before and after of the calibration.

3 To restart from the beginning, click the [Go to the first step] button. To finish the calibration, click the [Done] button.

4 To restart the calibration, click the [Start] button.

ⓘ NOTE

• Automatic selection is to automatically detect the monitor most suitable to be used as the reference monitor for the current video wall configuration.

• If you manually select, you can designate a monitor as the standard monitor. The manually selected monitor is not kept as the standard monitor when a monitor is automatically selected.

• When calibration starts, the device notifies the progress with the Status Progress bar.

ENGLISH

Select Calibration Monitor

When calibrating the Videowall, you can adjust only a part of it instead of the whole part.

You can individually select a monitor to calibrate by left-clicking in the Videowall Monitor Management window.

ⓘ NOTE

- If you select [Auto] in the Calibration menu, basically all monitors are selected as the monitor to adjust.
- If you select [Manual], you can click and select your desired monitor. The selected monitor will appear in red color.

Error Description

1 The camera does not normally work.
   - Reboot the camera, and try again.
   - Reboot the PC and the camera, and try again.

2 This lens is not supported.
   - The camera calibration supports only the AF-S DX NIKKOR 18-55 mm f/3.5-5.6G VR II lens. Please
     check the lens model.

3 Switch the lens to the AF mode.
   - When the lens is MF, you cannot conduct calibration normally. Switch the lens to AF.

4 Failed to connect the cable.
   - There is a problem in the RS-232C connected to the monitor or the LAN cable connection. Check the
     status of the cable connection.

5 Align with the guideline.
   - Readjust the position of the camera and the distance between the camera and Videowall to align the
     Videowall with the guideline.

6 Adjust the shooting angle.
   - Readjust the position the camera and the distance between the camera and Videowall to make the
     camera face the front/center of the Videowall.

7 Failed to detect the monitor.
   - Failed to detect each monitor of the Videowall. Please remove things that block the view of the camera
     or the monitor, if any. A strong lighting or bright object nearby may affect the operation, so please
     remove such things.

8 Failed to automatically set the camera.
   - Failed to automatically set the settings of the camera. Please remove things that block the view of the
     camera or the monitor, if any. A strong lighting or bright object nearby may affect the operation, so
     please remove such things.

9 There are many light reflection areas detected.
   - Please remove a lighting or light source reflected in the monitor.

10 Adjust the focal distance of the lens to 18 mm.
   - To normally conduct calibration, you need to adjust the focal distance of the lens to 18 mm.

11 Low battery.
   - Low camera battery. Connect the AC power or replace the battery.

Precautions

1 To obtain the best calibration result, the camera and Videowall must face the center on the front side of each other.

2 The maximum adjustable size of the Videowall is 3 x 3.

3 Calibration is available only for the Videowall which is configured in a square shape.
Any Videowall installed in an atypical shape is not supported.
(e.g. those installed in a diagonal direction, in a crossing direction, in a radial shape, or in a mixture of horizontal and vertical directions, etc.)

4 The adjustment may fail due to different external environments, camera positions, and color coordinates and brightness characteristics of each monitor.

5 To prevent the camera from shaking during calibration, please fix the camera with a tripod.

6 Install the camera in the horizontal direction. If you install the camera in the vertical direction, the monitor may not be detected, and calibration cannot normally proceed.

7 The camera calibration does not support the color temperature of [Studio Mode]. Try any other method for calibration.

8 The data measured by the camera may differ from the actual data.

9 When the color value of the standard monitor is an extreme value, the adjustment may not be done normally. (e.g. R gain: 255, G gain or B gain: 0, etc.)