SHARP

SHARP Display Calibration Utility
OPERATION MANUAL

Version 1.0

Applicable models (as of November 2021)	Available models differ according to region.
LCD MONITOR 8M-B32C1	

Contents

Important Information

- This software has been shipped after strict quality control and product inspection. If, however, you find any failure or malfunction, contact your product dealer.
- Please understand that SHARP CORPORATION bears no responsibility for errors made during use by the customer or a third party, nor for any other malfunctions or damage to this software arising during use, except where indemnity liability is recognized under law.
- Transcribing or duplicating part or all of this manual and/or this software without permission from our company is not permitted.
- As a part of our policy of continuous improvement, SHARP reserves the right to make design and specification changes for product improvement without prior notice.
- The contents or details may vary depending on the screen configuration and OS version, etc.
- This manual does not contain basic operating instructions for Windows.
- This manual assumes use in landscape orientation, except where specifically noted.
- Individual differences of colorimetric sensor or measurement errors may affect calibration results and measurements. After adjustment, be sure to observe the results and adjust manually.

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Introduction

This is a software to adjust brightness and color of SHARP monitors using a colorimetric sensor.

System Requirements*1

Monitor	Resolution of 1366 x 768 or more is required*2
Operating system	Windows 10 (64-bit version)*2
Free space on hard drive	At least 3 GB (free space separately required for data storage)
Interface	USB 2.0 (for monitor connection) USB 1.1 (for colorimetric sensor connection)
Colorimetric sensor	A colorimetric sensor compatible with this software is required. X-Rite i1Pro 3 X-Rite i1Pro 3 Plus

*1 A computer must satisfy the system requirements of the operating system.
*2 Operate Windows10 in desktop mode.

Installing

Install SHARP Information Display Downloader.
Download SHARP Display Calibration Utility from SHARP Information Display Downloader.
When using SHARP Display Calibration Utility, connect a SHARP monitor to the computer in which SHARP Display Calibration Utility using a commercially available USB cable.
When the Information Display Downloader is installed, you can check and download the most recent versions of the software programs.
For detailed information of SHARP Information Display Downloader, refer to its operation manual.
SHARP Information Display Downloader and SHARP Display Calibration Utility can also be downloaded from our product support page.

* You must be in a network environment that allows access to the Internet.

! Caution

- The operations in this section require administrator privilege.
- If this software is not displayed correctly, reduce the font size from “Change the size of text, apps, and other items” in Windows Settings.
  When confirming or changing the setting, click the [Start] button and navigate to [Settings] - [System] - [Display].

■ Installing the software

1. **Exit all running software applications.**
2. **Double-click the setup program.**
3. **Follow the instructions on screen.**
   - When “User Account Control” screen is displayed, click “Yes” (or “Permit”).
   - When “Security Warning” screen (The publisher could not be verified) is displayed, click “Permit”.

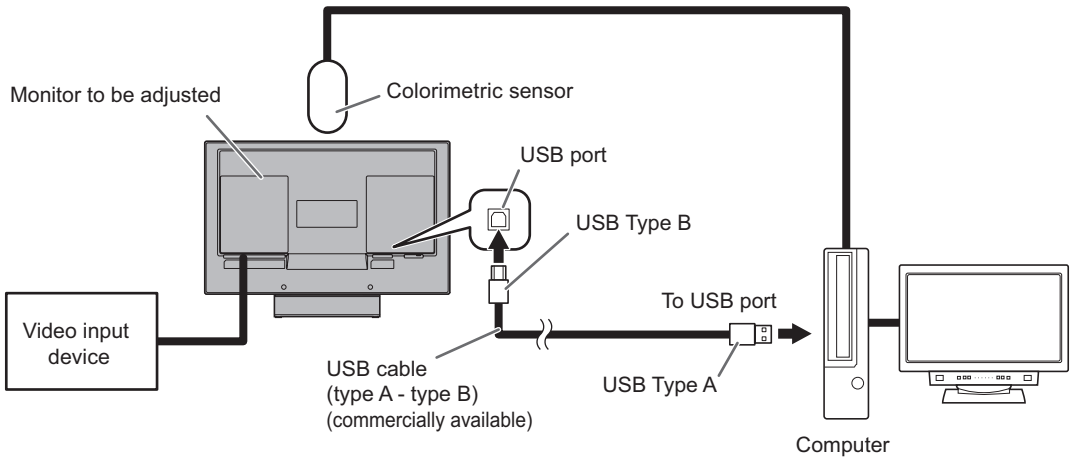
This completes the software installation.

■ Installing a software for the colorimetric sensor

Install a software for the colorimetric sensor according to its operation manual.

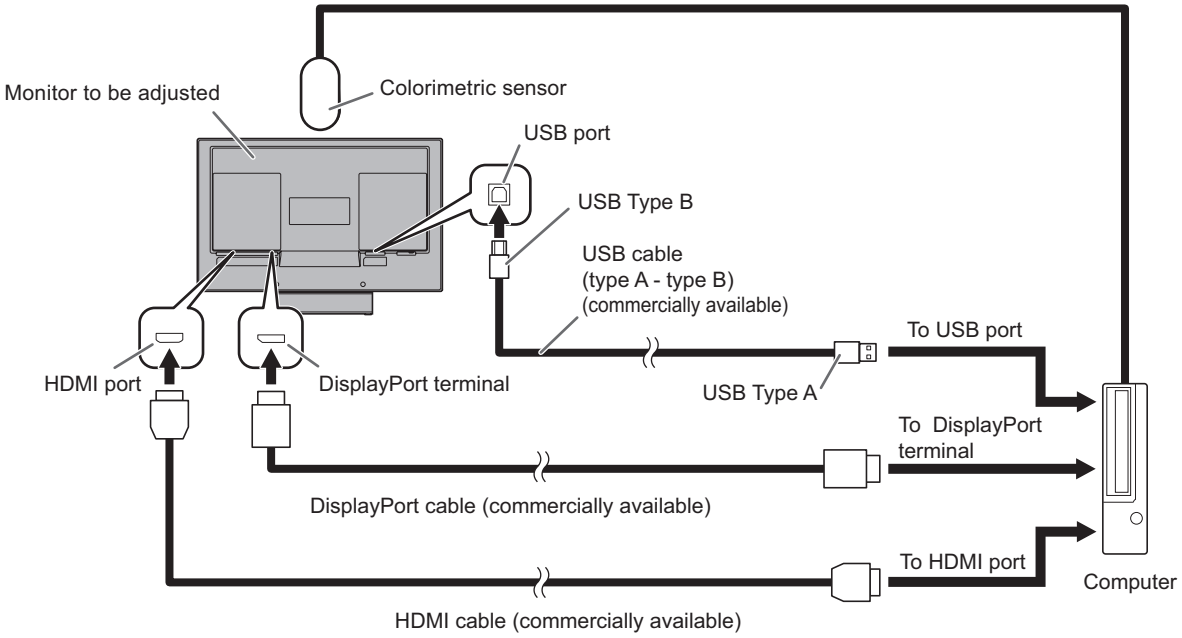
Connecting Peripheral Equipment

1. **Connect a colorimetric sensor to the computer.**
   For details, refer to the instruction manual of colorimetric sensor.
2. **Connect the computer and a monitor to be adjusted with a USB cable.**
3. **Connect a video input device to the monitor to be adjusted.**



This completes connection.

To operate this software by displaying its contents to the display to be adjusted, connect it to the computer with an HDMI cable or a DisplayPort cable.

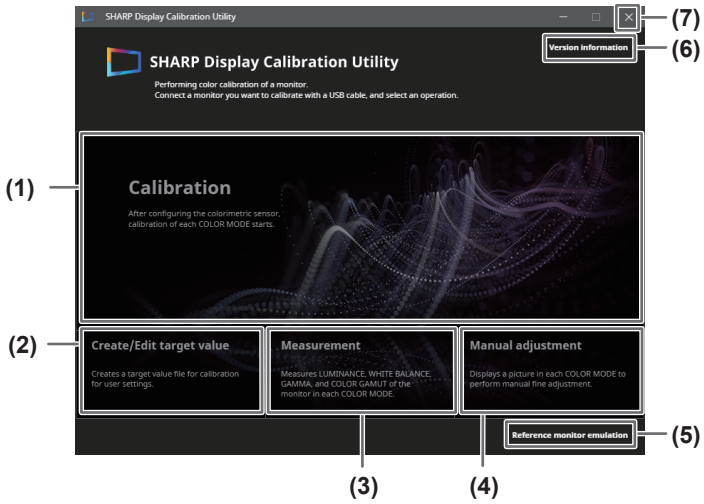


About This Software

Starting up the software

If any other software is running, close them.
To start up the software, double-click the desktop shortcut icon “SHARP Display Calibration Utility”.
Once the home screen is displayed, select an operation you want to perform.

“Home” screen



(1) Calibration
Click to select a color mode you want to calibrate (see page 10), configure the colorimetric sensor settings (see page 11), and start “Calibration”. (See page 12.)

(2) Create/Edit target value
Creates a target value file for “Calibration” for user settings. (See page 7.)

(3) Measurement
Click to select a color mode you want to measure (see page 10), configure the colorimetric sensor settings (see page 11), and measure the monitor status. (See page 12.)

(4) Manual adjustment
Perform manual fine adjustment by watching an actual video displayed on the monitor. (See page 14.)

(5) Reference monitor emulation
If there is no colorimetric sensor, perform “Reference monitor emulation” to adjust the color expression of “USER1” and/or “USER2” to replicate that of HDR video display of the reference monitor.

(6) Version information
Displays version information of this software.

(7) Exit
Exits this software.

TIPS

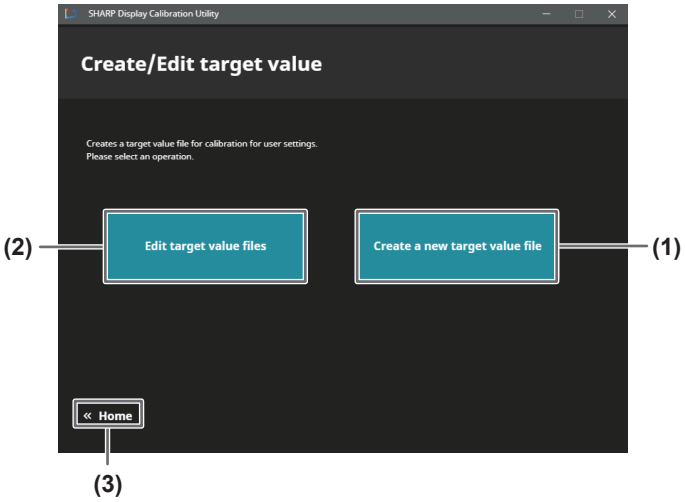
- The software can also be started by clicking the [Start] button and navigate to [SHARP Display Calibration Utility] - [SHARP Display Calibration Utility].
- While this software is running, do not operate the menu of the monitor.

Creating/Editing Target Values

Creates a target value file for “Calibration” for user settings.

1. **Double-click the shortcut icon on the desktop.**
2. **Click “Create/Edit target value” on the home screen.**
   “Create a new target value file” and “Edit target value files” are displayed.

“Selection for creating/editing target value file” screen



(1) Create a new target value file
Creates a new target value file. (See page 8.)

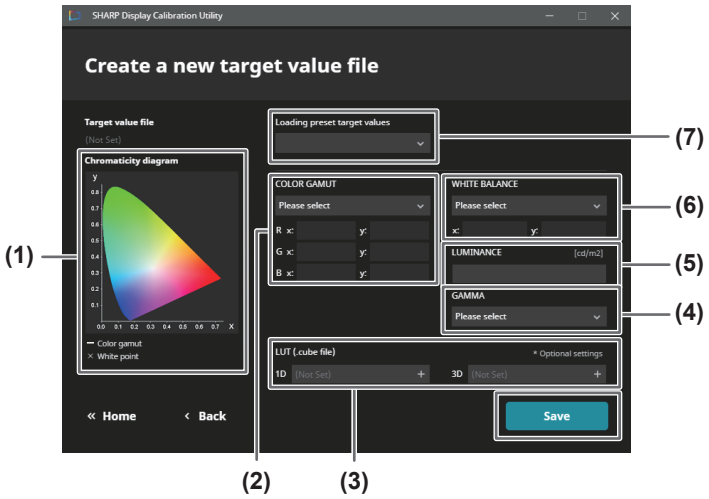
(2) Edit target value files
Edits target value files. (See page 9.)

(3) Home
Returns to the home screen of SHARP Display Calibration Utility.

Creating a new target value file

1. **Double-click the shortcut icon on the desktop.**
2. **Click “Create/Edit target value” on the home screen.**
3. **Click “Create a new target value file”.**
4. **Create a new target value file.**
5. **Click “Save”.**
   A new target value file is saved.
   When “Save” is complete, the application proceeds to the “Edit target value files” screen.

“Create a new target value file” screen



(1) Chromaticity diagram
Color gamut and white point are displayed.

(2) Color gamut
- Select a color gamut standard from “Rec.2020”, “Rec.709”, “SMPTE-C”, “DCI-P3”, “AdobeRGB”, “sRGB”, “EBU”, “Rec.2020 (Ref.monitor)*”, or “Custom”.
- When “Custom” is selected, x and y values of R, G, and B can be specified manually.
- Configured color gamut is displayed on the chromaticity diagram as a triangle drawn with solid lines.

(3) LUT (.Cube file) (optional)
Select LUTs (.Cube files) you want to load.

(4) Gamma
Configure gamma by specifying a value between “1.6” and “2.6” (in steps of 0.1) or selecting from “HLG” or “PQ”.

(5) Luminance
Configure luminance.

(6) White balance
- Configure white balance by specifying a value between “2500K” and “10000K” (in steps of 100K) or selecting from “Custom”, “D50”, “D60”, “D65”, “DCI”, or “D65(Ref.monitor)*” .
- When “Custom” is selected, x and y values of white balance can be specified manually.
- White point of the configured white balance is displayed on the chromaticity diagram as a cross.

(7) Loading preset target values
You can load preset values of color mode to create target values based on them.

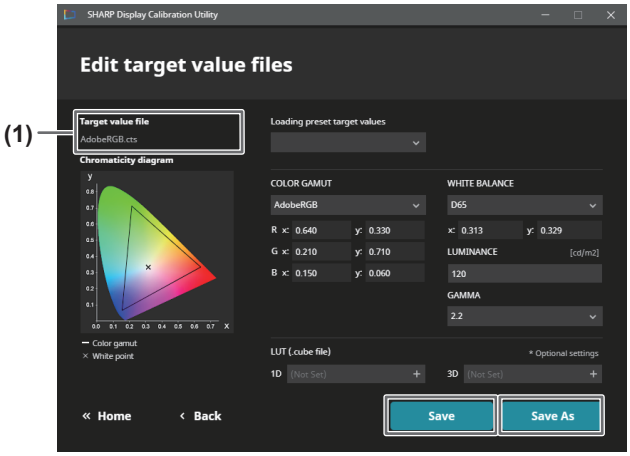
* When “Calibration” is performed with the target value file with the color gamut set to “Rec.2020 (Ref.monitor)” and the white balance set to “D65(Ref.monitor)”, the color tone can be adjusted to replicate that of HDR video display of the reference monitor.

Editing a target value file

1. **Double-click the shortcut icon on the desktop.**
2. **Click “Create/Edit target value” on the home screen.**
3. **Click “Edit target value files”.**
4. **Select a target value file (***.cts) from the file selection dialog box, and click “Open”.**
5. **Edit the target value file.**
6. **Click “Save”.**
   The target value file which is currently being edited will be overwritten.

   Click “Save As”.
   The target value file which is currently being edited will be saved as a new file.

“Edit target value files” screen



(1) Target value file
Displays a name of the selected target value setting file.

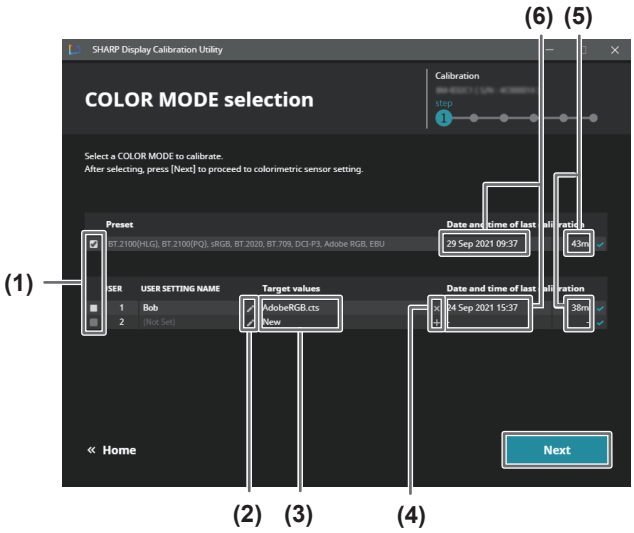
Calibration and Measurement

Select a color mode for “Calibration” or “Measurement”, configure the colorimetric sensor settings, and perform “Calibration” or “Measurement”.
Install a software for the colorimetric sensor in advance.

1. **Connect a monitor to be adjusted to the computer with a USB cable.**
2. **Double-click the shortcut icon on the desktop.**
3. **Click “Calibration” or “Measurement” on the home screen.**
4. **Select a preset or user you want to perform “Calibration” or “Measurement” on.**

   User setting cannot be checked unless target values are set.
   In the case of “Calibration”, each check takes approximately 30 to 80 minutes.
   In the case of “Measurement”, each check takes approximately 1 to 4 minutes.

“COLOR MODE selection” screen for calibration
(“COLOR MODE selection” screen for measurement in the case of measurement)



(1) Select target for “Calibration” or “Measurement”

(2) ( ) Set/Change “User setting name (users of the color mode)” of the monitor

(A user-defined name must be set in 1 to 12 single-byte alphanumeric characters and symbols)

(3) Edit a target value file (when a target value is a file name) or create a new one (when target values are to be newly created) (See pages 8 and 9.)

(4) ( ) Select or ( ) deselect a target value file

(5) Time elapsed for last calibration

(6) Date and time of last calibration

5. **Click “Next”.**

   Proceed to initialization and installtion of the colorimetric sensor.

! Caution

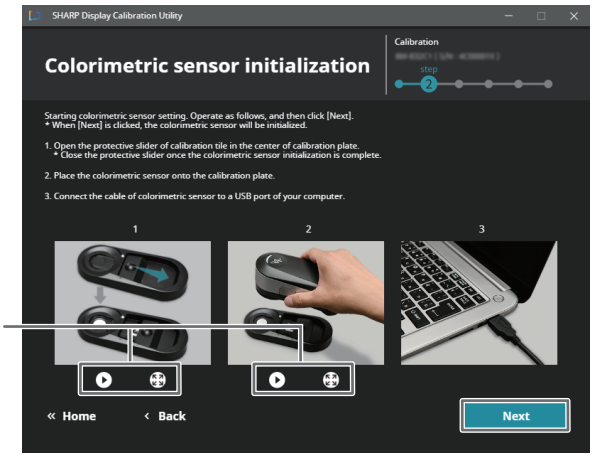
- Before performing “Measurement”, turn on the monitor to be measured and wait for at least 30 minutes until the luminance stabilizes.
  To perform more precise measurement:
  - Set the “COLOR MODE” in the PICTURE menu of the monitor settings to the “COLOR MODE” to be measured.
  - After the above configuration, wait for at least 30 minutes before performing measurement.
- “Calibration” can be performed right after turning on a monitor to be calibrated, since it includes time to stabilize the luminance.
- Perform “Calibration” or “Measurement” within the operating temperature range of colorimetric sensor.
  For the operating temperature range of colorimetric sensor, refer to the operation manual of colorimetric sensor.
- During “Calibration” or “Measurement”, make sure that the ambient temperature does not change drastically.
  If more than approximately 10°C of temperature change occurs inside the colorimetric sensor due to change of the ambient temperature, an error will result.

For the colorimetric sensor, refer to its operation manual.
Follow the instructions on the screen of Display Calibration Utility to initialize or install the colorimetric sensor and perform “Calibration” and “Measurement”.
When “Calibration” is selected, “Calibration” is performed, and then “Measurement” is performed.
When “Measurement” is selected, “Measurement” is performed without “Calibration”.

!Caution

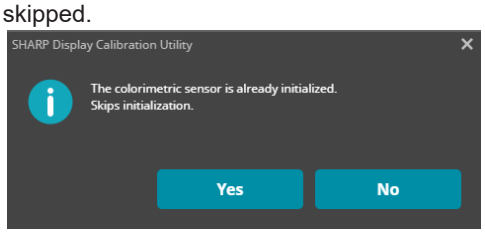
- Do not touch the monitor screen. Display unevenness may occur, which affects the result of “Calibration” or “Measurement”. When installing the colorimetric sensor to the monitor, handle it gently so that the colorimetric sensor touches the monitor surface softly, in order to prevent display unevenness.

“Colorimetric sensor initialization” screen



(1) (▶) Play video, (⛶) Expand video

If initialization of the colorimetric sensor is already completed, following dialog box is displayed, and the initialization can be skipped.

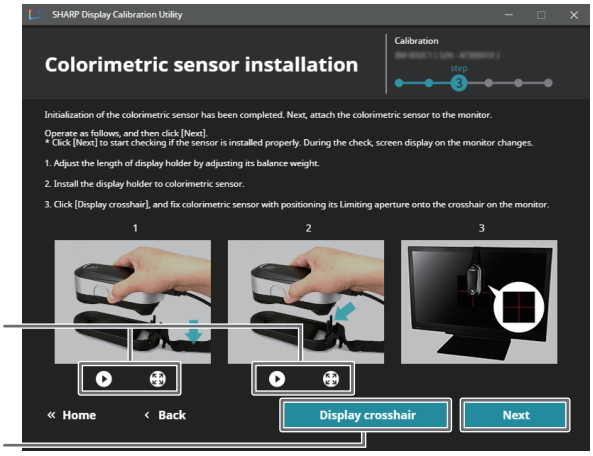


6. Click “Next”.

Initialization of the colorimetric sensor will be performed.

“Colorimetric sensor installation” screen

Install the colorimetric sensor to the monitor on which “Calibration” or “Measurement” is to be performed.
Make sure that the contact surface of colorimetric sensor does not leave the monitor surface.



(2) Display a crosshair on the monitor

Align the colorimetric sensor with the center of the crosshair displayed on the monitor and install it.

Remove a crosshair on the monitor

Remove the crosshair displayed on the monitor.

In the case of landscape orientation, a crosshair is displayed at the center of the monitor.
In the case of portrait orientation, a crosshair is displayed at the top of the monitor.

7. Click “Next”.

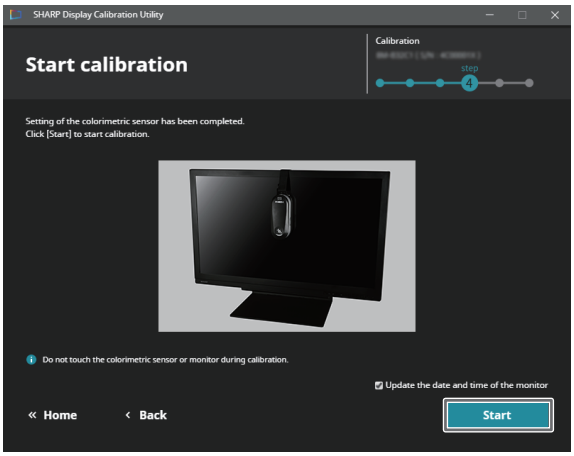
Confirm the colorimetric sensor installation and configure colorimetric sensor settings.
The monitor display changes.

!Caution

- Do not touch the monitor or colorimetric sensor until “Calibration” or “Measurement” is complete.
- Do not operate any other software until “Calibration” or “Measurement” is completed.
- When performing “Measurement”, set “LUMINANCE CLIPPING”, “GAMUT WARNING”, “MARKER”, “PEAKING”, “FALSE COLOR”, and “MONO/BLUE ONLY” in the EXTENSION menu of the monitor settings to “OFF”. If an item is grayed out, it is already set to “OFF”.
- If initialization of the colorimetric sensor fails, the colorimetric sensor may not be connected to the computer properly, or the software for colorimetric sensor is not installed.
- If sunlight or ambient light is too strong, calibration or measurement may not be performed properly.

“Start calibration” screen
(“Start measurement” screen in the case of measurement)

When “Update the date and time of the monitor” is checked, time settings of the computer and monitor will be synchronized.



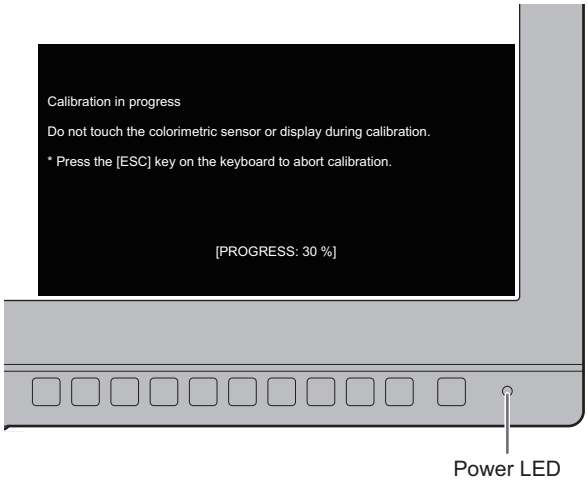
8. **Click “Start”.**
   “Calibration” or “Measurement” starts.

   Display of the monitor to be calibrated changes.

“Calibration in progress” screen
(“Measurement in progress” screen in the case of measurement)

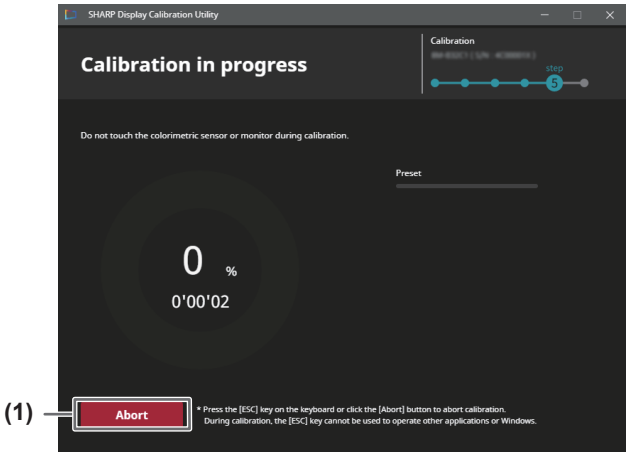
During calibration or measurement, the screen shown on the right is displayed on the monitor which is being adjusted. (It may take a couple of minutes until it is displayed.)

Press the [ESC] key, and then press the [ENTER] key to abort the process.
If you want to continue the process after pressing the [ESC] key, press the [ESC] key again.



If Display Calibration Utility is displayed on a monitor other than the one to be adjusted, the scrren shown on the right is displayed on it.

(1) Aborting the calibration
(Aborting the measurement in the case of measurement)
Click “Abort”, and then click [OK] on the dialog box to abort the process.
If you want to continue the process after clicking “Abort”, click [Cancel].

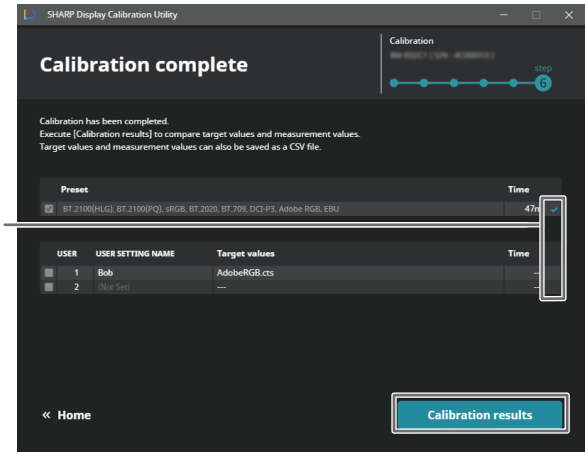


!Caution

- If the monitor power is turned off or the USB cable is disconnected before “Calibration” or “Measurement” is completed, monitor settings, the settings of “POWER MANAGEMENT” in the SETUP menu and the PICTURE menu may change. In that case, reconfigure the settings to the state before adjustment, and retry “Calibration” or “Measurement”.
- If the monitor is turned off or the USB cable is disconnected before completing “Calibration”, the power LED of the monitor blinks in green at the next startup of the monitor, and settings except “POWER MANAGEMENT” revert to the state before adjustment.
  In that case, reconfigure “POWER MANAGEMENT” of the monitor to the state before adjustment, and retry “Calibration”.

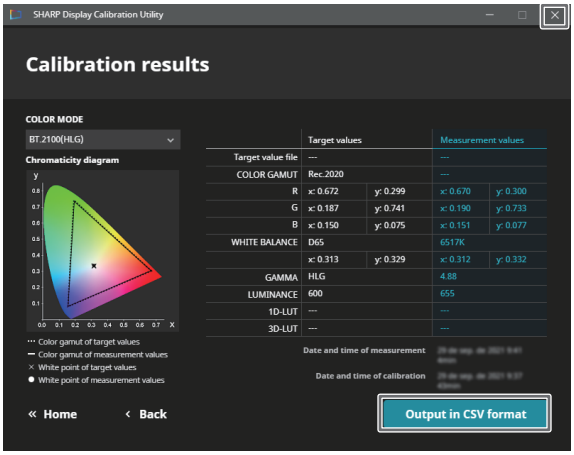
“Calibration complete” screen
(“Measurement complete” screen in the case of measurement)

(1) ( ) is displayed when succeeded, and ( ) is displayed when failed



9. Click “Calibration results”.
Click “Measurement results” in the case of measurement.
Results of “Calibration” or “Measurement” are displayed on the following screen.

“Calibration results” screen
(“Measurement results” screen in the case of measurement)
You can compare target values and measured values.



10. Click “Output in CSV format”.
Saves target values and measured values as a CSV file.

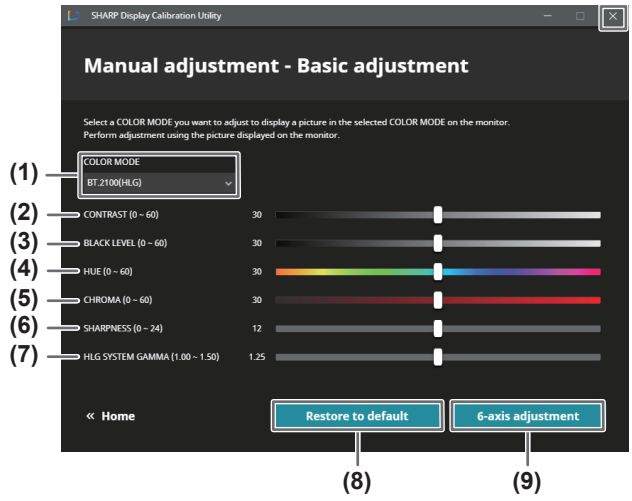
11. Click ( ) to exit.

Manual Adjustment

Perform manual fine adjustment by watching an actual video displayed on the monitor.

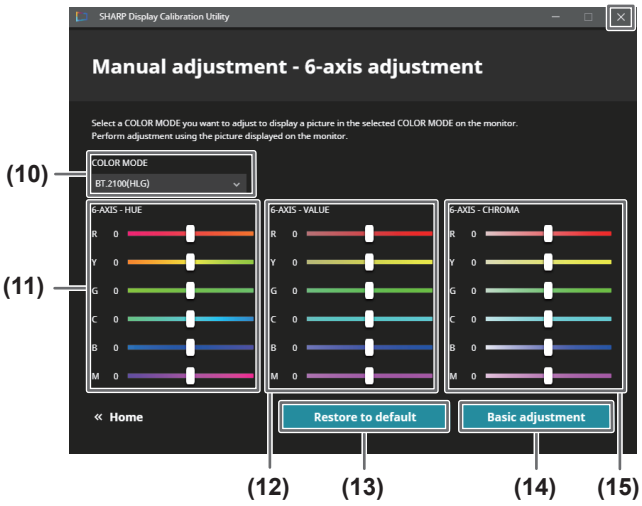
1. **Connect a monitor to be adjusted to the computer with a USB cable.**
2. **Double-click the shortcut icon on the desktop.**
3. **Click “Manual adjustment” on the home screen.**
   If there is no video signal, input a video signal to the display to be adjusted.
4. **Adjust the video manually.**
   Select a “COLOR MODE” you want to adjust to display a video on the monitor with the selected “COLOR MODE”.
5. **Once manual adjustment is complete, click ( ) to exit.**

“Manual adjustment - Basic adjustment” screen



(1) “COLOR MODE” selection for basic adjustment
(2) Contrast adjustment
(3) Black level adjustment
(4) Hue adjustment
(5) Chroma adjustment
(6) Sharpness adjustment
(7) HLG SYSTEM GAMMA setting
(8) Restore contrast, black level, hue, chroma, sharpness, and HLG SYSTEM GAMMA to default
(9) Move to the “6-axis adjustment” screen of manual adjustment

“Manual adjustment - 6-axis adjustment” screen



(10) “COLOR MODE” selection for 6-axis adjustment
(11) 6-axis - Hue adjustment
(12) 6-axis - Value adjustment
(13) Restore 6-axis - Hue, 6-axis - Value, and 6-axis - Chroma to default
(14) Move to the “Basic adjustment” screen of manual adjustment
(15) 6-axis - Chroma adjustment

! Caution

- “HLG SYSTEM GAMMA” can be configured in the following cases:
  - When “COLOR MODE” is “BT.2100(HLG)” or “HDR AUTO(HLG)*”.
  - When “COLOR MODE” is “USER1” or “USER2”, “CUSTOM SETTING*” is “OFF*”, and “GAMMA(EOTF)*” is “HYBRID LOG GAMMA(HLG)*”.
  - When “COLOR MODE” is “USER1” or “USER2”, “CUSTOM SETTING*” is “ON*”, “GAMMA” is “HLG”, and “LUT (.cube file)” is not specified.

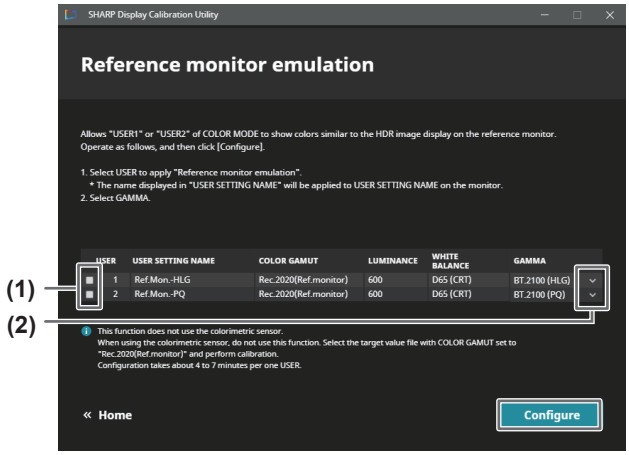
  * Setting items of the monitor menu.
- In manual adjustment, you cannot change settings in some cases depending on settings of the monitor. For example, “6-axis - Hue” cannot be changed when “FALSE COLOR” is set to “ON”. Also, you cannot change settings when there is a communication error with the monitor.

Reference Monitor Emulation

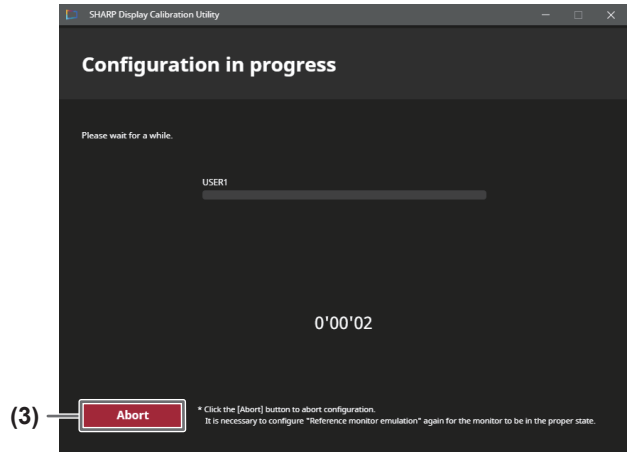
If there is no colorimetric sensor, perform “Reference monitor emulation” to adjust the color expression of “USER1” and/or “USER2” of color mode to replicate that of HDR video display of the reference monitor.
If there is a colorimetric sensor, perform “Calibration” with the target value file with the color gamut set to “Rec.2020 (Ref. monitor)” and the white balance set to “D65(Ref.monitor)”.

1. **Connect a monitor to be adjusted to the computer with a USB cable.**
2. **Double-click the shortcut icon on the desktop.**
3. **Click “Reference monitor emulation” on the home screen.**
   If there is no video signal, input video signal to the monitor to be adjusted.
4. **Select users to apply “Reference monitor emulation”.**
   “Reference monitor emulation” takes approximately 4 to 7 minutes per checked item.
5. **Select gamma, and click “Configure”.**
6. **Once the configuration is complete, click (×) to exit.**

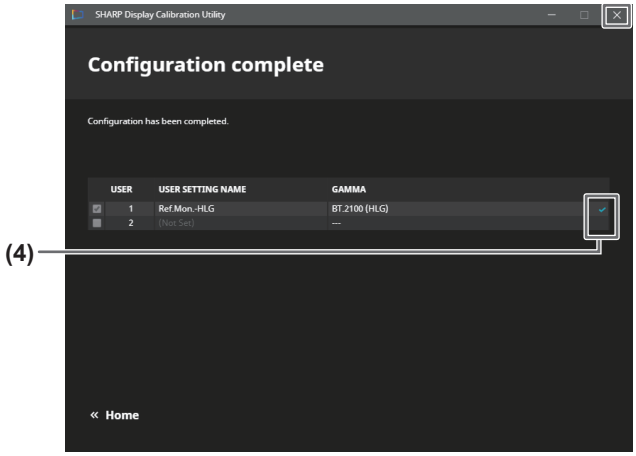
“Reference monitor emulation” screen
Select users and gamma to be adjusted.
(1) Select users to apply “Reference monitor emulation”
(2) Select gamma



“Configuration in progress” screen
Progress is displayed for each user.
(3) Aborting Reference monitor emulation
Click to abort the configuration process.
After aborting, retry “Reference monitor emulation”.



“Configuration complete” screen
(4) (✓) is displayed when succeeded, and (✗) is displayed when failed



Uninstalling the Software

! Caution

- Uninstallation requires administrator privilege.

1. **Exit all running software applications.**
2. **Click the “Start” button, and select “Settings”.**
3. **Click “Applications”.**
4. **Select “SHARP Display Calibration Utility”, and click “uninstall”.**
5. **Follow the instructions on screen.**
   When the “User Account Control” dialog box appears, click “Yes”.

This completes the uninstallation process.

SHARP

SHARP CORPORATION

DCU V1.0 EN21M(1)