HP DreamColor Assistant User Guide

SUMMARY

This guide provides information about managing color presets, calibrating the panel, and using external measurement instruments using HP DreamColor Assistant software.

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1   Getting started

This app allows you the ability to manage color presets, calibrate, and customize settings for DreamColor panels.

Calibration presets

Displays are color calibrated at the factory with six factory-calibrated color presets designed to provide default configurations for a wide variety of workflows and use cases. All presets can be redefined and calibrated to meet specific requirements. The following presets are included:

- **AdobeRGB**: This wide gamut format provides a wide range of green tones, as compared to sRGB.

- **sRGB**: This is the standard gamut for Windows and the Internet.

- **BT.709**: This preset conforms to the ITU standard for high-definition television production and broadcast.

- **DCI P3**: This wide gamut preset conforms to the DCI digital cinema standard and is suitable for both digital cinema and photography workflows.

- **Native**: This widest possible gamut uses the native primaries of the panel.

- **DICOM**: This preset is used for nondiagnostic evaluation of PACS medical imaging.

NOTE: To view more information about the presets, select **Color Space Preset Information**.

Table 1-1   Color Space Presets (CIE 1976 u'v') (17.3" Panel)

Preset Name	Red Primary	Green Primary	Blue Primary	White Point	Gamma	Luminance
AdobeRGB	0.451, 0.523	0.076, 0.576	0.175, 0.158	D65	2.2	Panel maximum
sRGB	0.451, 0.523	0.125, 0.563	0.175, 0.158	D65	sRGB	Panel maximum
BT.709	0.451, 0.523	0.125, 0.563	0.175, 0.158	D65	BT.1886	160 cd/m^2
DCI P3	0.496, 0.526	0.099, 0.578	0.175, 0.158	P3	2.6	90[*] cd/m^2 **NOTE:** * This value is TBD based upon the panel low luminance performance.
Native	Panel	Panel	Panel	D65	2.2	Panel maximum
DICOMM	Panel	Panel	Panel	NA	DICOM	Panel maximum

Table 1-2   Color Space Presets (CIE 1976 u'v') (15.6" Panel)

Preset Name	Red Primary	Green Primary	Blue Primary	White Point	Gamma	Luminance
AdobeRGB	0.451, 0.523	0.076, 0.576	0.175, 0.158	D65	2.2	Panel maximum
sRGB	0.451, 0.523	0.125, 0.563	0.175, 0.158	D65	sRGB	Panel maximum
BT.709	0.451, 0.523	0.125, 0.563	0.175, 0.158	D65	BT.1886	200 cd/m^2

Table 1-2 Color Space Presets (CIE 1976 u'v') (15.6" Panel) (continued)

Preset Name	Red Primary	Green Primary	Blue Primary	White Point	Gamma	Luminance
DCI P3	0.496, 0.526	0.099, 0.578	0.175, 0.158	P3	2.6	90˚ cd/m²
Native	Panel	Panel	Panel	D65	2.2	Panel maximum
DICOMM	Panel	Panel	Panel	NA	DICOM	Panel maximum

DreamColor power profile

Follow the instructions outlined here to enable the custom power plan provided by HP DreamColor Assistant.

1. Select **Enable DreamColor Power Profile**.

2. **Windows Power Profile** opens.

2 Display calibration

The display is color critical, so it can be calibrated to meet your production requirements and recalibrated to maintain color accuracy.

The display is manually calibrated with all calibration algorithms running from host-based software, which is required. The system can also include an integrated XYZ colorimeter, enabling standalone calibration. For those that prefer to use an external instrument, a wide variety of third-party measurement instruments are supported.

Display information

Displays characteristics can be referenced under color space preset information based on the predefined factory calibration.

Display warm-up from cold start

The LEDs used in the display backlight require a period of stabilization before the display is calibrated. HP recommends that the displays be allowed to warm up so that the backlight can stabilize.

HP recommends to allow the display to warm up for a minimum of 30 minutes before beginning calibration.

Calibration frequency

The Advanced IPS panel is quite stable, but the LEDs in all backlights dim gradually over time.

As a general rule, you can expect a modern LED panel to dim by approximately 1% of its peak luminance for every 1000 hours of use. Because this display has both blue and red LEDs, the differential dimming of these LEDs can result in a slight color shift. For many uses, though, no color shift is perceived even after 2000 or more hours between calibrations.

As the display has an integrated calibration instrument, you may decide to calibrate more frequently than you might otherwise. The frequency of calibration for your facility should be determined as much by comfort level as anything else. The display can be set to automatically recalibrate on a user-defined schedule, making this recalibration easy to do on a regular basis.

3   Backing up and restoring user calibrations

Restoring factory calibrations

You can restore all presets to their factory calibrations.

To restore factory calibration:

▲   Select **Restore Factory Calibration**.

📝 **NOTE:**   All customized preset names revert to their original names.

Restoring calibrated luminance

You can restore factory calibrated brightness levels.

To restore brightness levels:

▲   Select **Restore Calibrated Luminance**.

📝 **NOTE:**   You might see the brightness level increase or decrease after selection, depending on the
currently calibrated brightness level.

4   User calibration methods

User calibration is the process of specifying the calibration targets (primaries, white point, gamma/EOTF, and luminance), and then instructing the calibration software to calibrate to those targets.

The menu-driven method for user calibration allows you to recalibrate an existing preset or to specify a new configuration for an existing preset. You can access this from the **Launch Calibration Tool** menu

User calibration

User calibration allows you to define a color preset by specifying the calibration targets (primaries, white point, gamma/EOTF, and peak luminance) and then calibrating the preset to the targets. User calibration can be performed by launching the calibration tool.

Follow the directions outlined here to recalibrate by manually adjusting the gamut, white point gamma, and luminance values.

1. Warm up the monitor.

2. Connect a calibration instrument and place it into position.

3. Select **Launch Calibration Tool**.

4. To manually adjust, enter the values in their respective fields under the **Recalibrate Color-Space Presets** tab.

    -or-

    Select the **Help Me Decide** tab and select from the options to generate recommended recalibration settings.

    📝 **NOTE:**   You can save your presets under new names. Select **Rename Preset**, rename your preset, and select the green check mark to save. Select the red X to cancel.

5. Select **Recalibrate now**.

6. Follow the on-screen instructions.

    📝 **NOTE:**   You hear an initiation sound when you close the computer. During recalibration, you hear a shutter sound. The initiation sound plays again to signal that calibration is complete. If you open the computer before recalibration is complete, the preset is restored to default settings. Recalibration might take up to 15 minutes.

White point

This menu provides the standard white points.

● D65: The standard white point for most video productions as well as most computer graphics and design work. It can also be used for film production.

● D50: The standard white point for soft proofing and print production. It is warmer than the D65 white point.

- D55: The traditional white point for film projection. It is the white point of the light output of a film projector's lamp house.

- DCI-P3: The standard white point for a digital cinema projector.

Gamma/EOTF

This menu provides the following options.

- 2.2: A power function 2.2 gamma considered the standard gamma for use in daylight-level environment illumination.

- 2.4: A power function 2.4 gamma that was formerly the standard gamma for dim lighting environments. For video work this gamma function has been superseded by the BT.1886 EOTF (electro-optical transfer function).

- 2.6: A power function 2.6 gamma that is the standard gamma for cinema lighting environments with essentially no ambient illumination.

- BT.1886: An EOTF that has been defined by the International Telecommunication Union (ITU) as the standard EOTF for professional high-definition video production and finishing.

- sRGB: An EOTF based on the power function 2.2 gamma but designed to provide better lower-black representation by transitioning from a curve to a linear function for the lowest grayscale values.

- DICOM: Used for non-diagnostic evaluation of PACS medical imaging, such as digital x-rays or CAT scans.

Luminance

This menu provides luminance values as well as the option to select any luminance value between 48 and up to 600 candelas per square meter (cd/m²).

- 600 cd/m²: The maximum luminance that can be calibrated to in the display.

- 100 cd/m²: The standard luminance, originally defined by SMPTE, for video online and finishing work.

- 120 and 80 cd/m²: Two options that provide bracketed values around 100 cd/m², based on the typical environment illumination in VFX studios.

- 48 cd/m²: The standard front-of-screen illuminance for motion picture presentation, equivalent to 17 fl (footlamberts).

After you have set up the instrument per specifications, defined the calibration, and confirmed the chosen values, calibration begins. The calibration will take approximately 3½ minutes when using the internal instrument. Calibration time may be longer with some external instruments. Do not turn the display off during the calibration process. The preset is given a name based on the calibration targets selected.

NOTE: If an external instrument is connected, you are asked if you want to use the internal or external instrument for calibration measurements. If you choose external, a line-up target is provided on-screen to assist you in positioning the external instrument at the center of the screen.

5   Using external measurement instruments

The display includes a high-precision XYZ colorimeter and also provides native support for many types of measurement instruments, from a low-cost colorimeter to high-end colorimeters and spectroradiometers.

These instruments can be used instead of the built-in instrument for calibration. In addition, external instruments can be used to align the internal instrument.

Many of the supported instruments were chosen in consultation with HP's studio partners and represent the instruments they have standardized in their facilities. Some of these instruments require specific configurations or calibrations in order to work properly with the display.

NOTE: With all of these instruments it is very important that the measurement instrument be positioned so that it is perpendicular to the face of the display.

Klein Instruments K10 and K10-A colorimeters

These are high-speed, very accurate lightweight devices that support either direct monitor contact or use in a darkened room as a distance unit.

Configuration

HP recommends using manufacturer guidance when setting up this device.

Usage guidelines

Be sure to note the tips and guidelines when using the Klein K10-A with the display.

- Direct contact measurement is recommended using the K-10 SF Lens Hood. This allows you to calibrate the display under typical room lighting (though dimmed lighting is still recommended for best black measurements).

  If using distance measurement, HP strongly recommends that you use a completely darkened environment for calibration.

- If necessary, use ChromaSurf to recalibrate the black level prior to calibration. The K10-A should hold its black level calibration for an extended period, but if recalibration is necessary, it is a very quick procedure.

  After display calibration, if the display shows the lower grayscale as light gray with little to no shadow definition, then you need to recalibrate the K10-A's black level and recalibrate the display.

Photo Research spectroradiometers

The display supports the majority of Photo Research spectroradiometers.

- PR-655 SpectraScan
- PR-670 SpectraScan
- PR-680 / PR-680L SpectraDuo

- PR-730 SpectraScan

- PR-740 SpectraScan

The Photo Research instrument must have the USB interface. This is optional on some models but is required for connection to the display. If multiple interfaces are supported by the instrument, the USB communication method must be enabled and active.

Configuration

These instruments contain a wide number of configuration options, all of which you can set using the touchscreen LCD interface on the back of the instrument. The following table lists the recommended configuration for each display.

Table 5-1 Recommended configuration for each display

	PR 655	PR 670	PR 680	PR 680L	PR 730	PR 740
Minimum firmware version	3.12	3.14	3.14	3.14	3.10	3.14 – 74X
Bandwidth	8 nm	--	--	--	2 nm	2 nm
Aperture	--	1°	1°	1°	1°	0.5°
Adaptive	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Sensitivity	--	Extended	Extended	Extended	Extended	Extended
Speed	--	Normal	Normal	Normal	Normal	Normal
Sync	Auto	Auto	Auto	Auto	Auto	Auto
Smart black	--	Disabled	Disabled	Disabled	Disabled	Disabled
Sensor mode	--	--	--	Spectro	--	--

Usage guidelines

Note the tips and guidelines when using a Photo Research spectroradiometer with the display.

☼ **TIP:**   Because this instrument is used for noncontact measurements, typically at a distance of 1 meter or more, make all measurements in a completely darkened environment.

TIP: You can make contact measurements using one of the flexible probe options, but take care to properly mount the probe perpendicular to the display surface.

TIP: For best results, follow the recommended instrument recalibration schedule.

Konica Minolta CA-310 colorimeter

The Konica Minolta CA-310 is high-speed colorimeter.

Designed for both independent measurement and to be driven externally, the instrument has two parts: the main body, containing the core logic hardware, and a lightweight measurement probe. Connect the instrument to the monitor using a USB-A to USB-B cable.

Configuration

The instrument must be set to xyLv measurement mode. Most critically, because this device is a colorimeter, you must calibrate both white point and matrix before making any display measurements.

You can store your calibration in any memory channel, but you must select that channel before you connect the instrument to the display.

Usage guidelines

Note the tips and guidelines for using the Konica Minolta CA-310 with the display.

- You must perform black level (zero) calibration each time after you turn on the instrument. When you calibrate multiple displays, Konica Minolta recommends that you perform zero calibration every hour, especially when you calibrate to a low luminance target, such as 48 cd/m².

- Confirm that the instrument has been properly calibrated and the memory channel that you calibrated is active.

- HP recommends making direct contact measurement using the standard hood. This allows you to calibrate the display under typical room lighting (though dimmed lighting is still recommended for best black measurements).

  If you are using noncontact measurement, the instrument distance can be no more than 30 mm (1.2 in) from the display surface. HP strongly recommends that you use a completely darkened environment for noncontact measurement.

X-Rite i1Pro 2 spectrophotometers

The X-Rite i1Basic Pro 2, i1Photo Pro 2, and i1Publish Pro 2 are low-cost spectrophotometers. HP recommends that you purchase the i1Basic Pro 2, because the i1Photo Pro 2 and i1Publish Pro 2 contain additional software and equipment that you do not need for display calibration.

As with the X-Rite i1Display colorimeter, the instrument comes with associated software on an optical disc. HP recommends that you install the software, which is required to calibrate the instrument before use with the display.

Configuration

Use the X-Rite software to calibrate the i1Pro 2 before use. Consult the product user guide for more information.

Usage guidelines

Note the tips and guidelines when using the X-Rite i1 Pro 2 with the display.

- Mount this instrument in the included display holder when using it with the display.

- Adjust the counterweight so that the instrument is in contact with the display panel.

X-Rite i1Display Pro colorimeter

X-Rite's i1DisplayPro is a low-cost measurement instrument that is available at retail. Although the instrument includes profiling software on an optical disc, you do not have to install the software to calibrate the display because the i1Display instrument is connected directly to the display.

IMPORTANT: HP strongly recommends against the use of the included X-Rite software with the display, because it performs a host-based profile of the panel and not a full calibration.

Configuration

No configuration is required for the i1Display Pro instrument. The display will automatically load the required calibration matrix (EDR file) into the instrument when it is connected.

Usage guidelines

Note the tips and guidelines when using the X-Rite i1Display Pro with the display.

- The display can take up to five seconds after instrument connection to display the first calibration menu. This is normal for this instrument.

- Use this instrument in direct connection mode with the counterweight adjusted to maintain the instrument position during calibration.

- HP recommends that calibration be conducted in a dimly lit environment.

- Rotate the ambient light filter away from the instrument lens prior to taking measurements. Leaving the filter in place will cause measurement errors.

- The i1Display Pro has an error tolerance for factory calibration of each instrument. Visible calibration differences can occur if a different probe is used for each display. HP recommends that you use a single i1Display Pro kit to calibrate all displays within a facility or workflow.

Colorimetry Research CR-250 spectroradiometer

The Colorimetry Research CR-250 is a low-cost spectroradiometer than you can use as either a contact instrument with the optional rubber hood or as a distance measurement device using an optional viewing system.

Configuration

No configuration is required for the CR-250 instrument.

Usage guidelines

Note the tips and guidelines when using the Colorimetry Research CR-250 with the display.

- If used as a contact instrument, HP recommends calibration in a dim lighting environment.

- If used as a noncontact instrument, HP recommends calibration in a dark environment.

Portrait Displays C6 HDR2000 colorimeter

The Portrait Displays C6 is an advance light measuring device than you can use as an portable accurate contact instrument available at retail.

IMPORTANT: You do not need to install additional software to calibrate the display since the C6 instrument is connected directly to the display.

Configuration

No configuration is required for the Portrait Displays C6 HDR2000 instrument.

Usage guidelines

Note the tips and guidelines when using the Portrait Displays C6 HDR2000 with the display.

Use the instrument in direct contact with the display using the counterweight adjusted to maintain the instrument position during calibration. HP recommends calibration in a dim lighting environment.