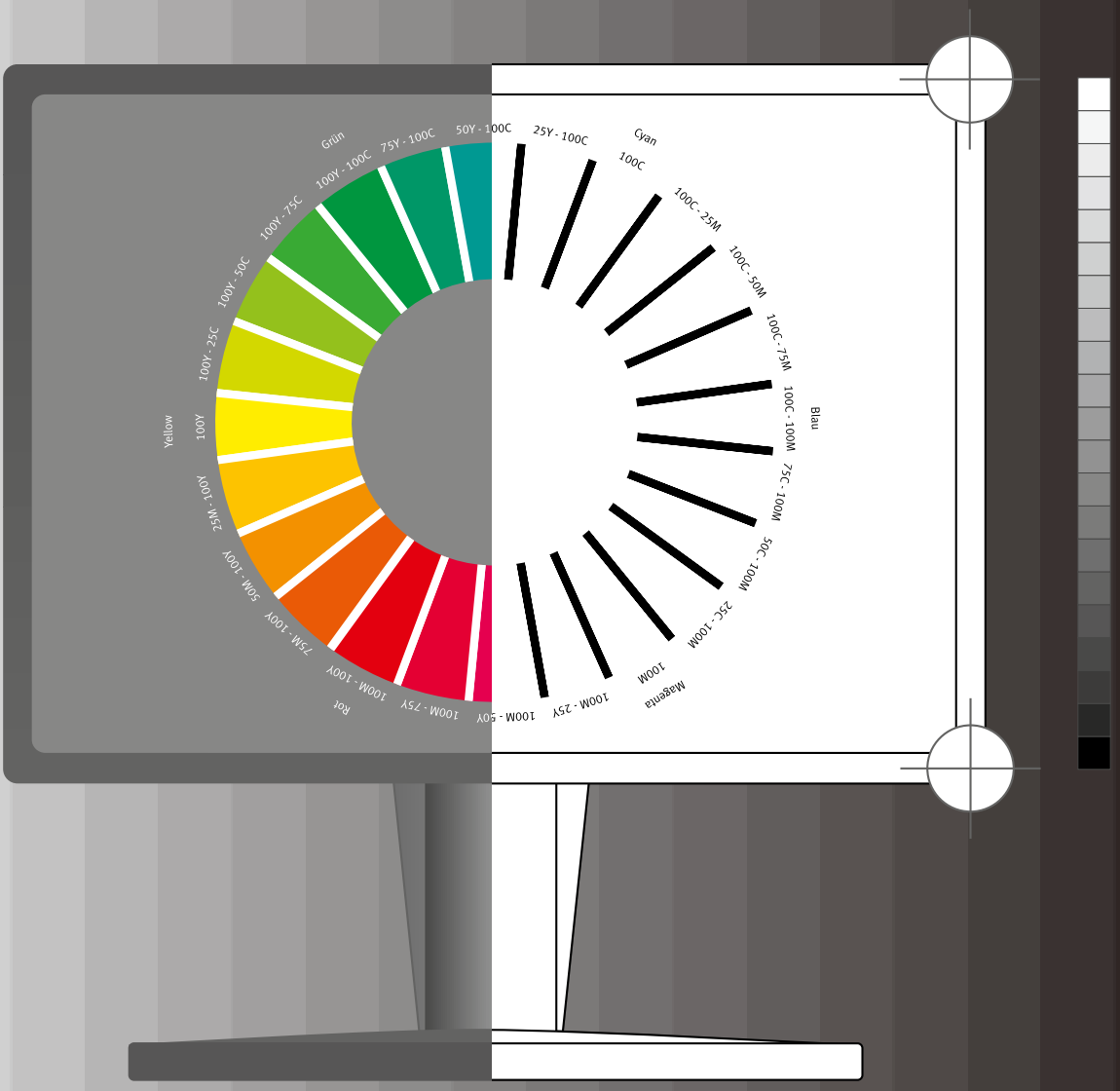
Manual



iColor Display 3.7
Intelli Proof Displays

QUATO®

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About the manual

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Introduction

Dear Customer

In the past years, colormanagement made a big leap forwards. In the day to day work in graphic arts and industry, color is a central issue. More and more tasks, previously performed by specialists, are now performed by creative professionals. The prepress area on the other hand is confronted with the rising demands in case of speed and quality. The solution for both parties is to harmonize color performance and reproduction between all parts of the workflow.

That is the only way to ensure a consistent color transformation from the creative professionals to the final print or product. The heart of this workflow is - of course - the monitor that acts as a creative tool on the one hand and as a precise judgement instance on the other hand. Photographers need an exact color control in real-time, prepress professionals demand a precise reproduction and simulation of CMYK data while graphic designers want to judge their spot colors on the screen.

Consequently, Quato offers solutions that match the requirements of all the different users.

Why colormanagement?

Every input or output device interprets colors in a different way. This can be compared with the differences in color perception between human beings, as everyone has a different color perception and „thinks“ colors different. This is because we all differ in respect of social, cultural and even physical development.

In contrast to the human being, we are able to adjust any device to behave exactly like or at least close to a standard. Colormanagement and calibration are the key technologies to achieve a streamlined color reproduction.

The display is a vital part in this workflow as it is used for both, the artist´s work and the color judgement. In an ideal world, the display should be able to simulate what is later printed by the printer and shows the colors of the digital camera or scanner the same way as these devices have recognized the color. All this is only possible if a description of every device is available - the color profile or ICC-profile. Working spaces (standardized color environments) make sure that colors can be transformed from one device to another.

Four times the same image, but four times with a different color interpretation, because four different devices are used with colormanagement and calibration.

Environmental light

The human eye is heavily influenced by environmental issues in the way that the surrounding light changes the perception of colors. Thus, wrong or insufficient environmental lighting is one of the most problematic issues upon comparing softproofs on a display with prints. The tonal response of a print always depends on the light that is used to illuminate the viewing area. As lighting is crucial, metameric effects will occur. The color rendering (and our perception) will be different from the original. A red could easily tend to be orange, or a blue looks much less saturated just because of different light sources.

To ease the color communication, ISO 12647, ISO 12646 and 3664 define D50 as the standard lighting for judging colors and proofs.

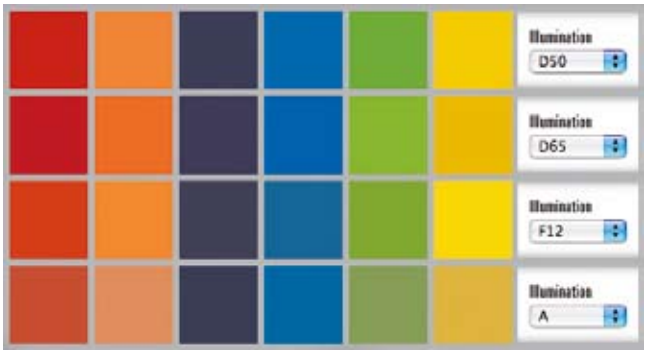
Companies like Just, GTI or VeriWide supply D50 light sources for proofing and press environments. However, other 5.000K tubes (designed for plants for example) or full-spectrum bulbs will most likely not match the D50 standard and should not be used.

INFO

ISO 3664 defines the requirement for the environmental lighting in the graphic industry:

> *The light source must match the D50 standard and needs a rendering index (precision) of at least 90%. The light intensity should match 2000 Lux (+/- 500) for press rooms and 450 Lux (approx. 140cd/m2) for prepress.*

For a display for proof/print comparison, ISO 3664 and 12646 (Proofing Displays) define a working luminance for the display of 120cd/m2 to 160cd/m2. A viewing booth therefore needs a light intensity of 377 Lux to 503 Lux.



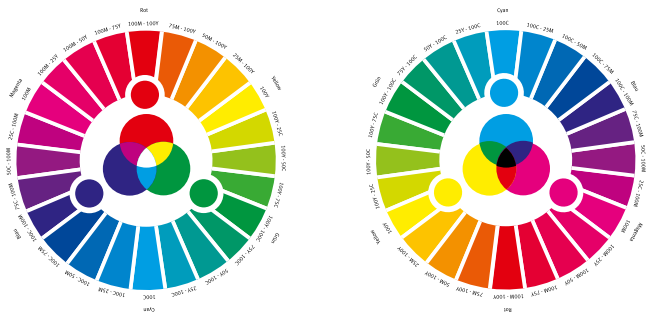
Different light creates different color rendering.

INFO

*The deviation between two colors is expressed in Delta Error, short DeltaE or ΔE. In most cases, a pure ΔE is based on the 1976 color difference formula based on the L*a*b* system.*

$$\Delta E = \sqrt{(L_1 - L_2)^2 + (a_1 - a_2)^2 + (b_1 - b_2)^2}$$

The Quato software uses this standard DeltaE Lab or DeltaE 1976 formula. If other formulas (like ΔE 94 or ΔE 00) are used, the Quato software expressively informs about this.



Additive colors (left) and subtractive colors (right). The primary colors always mix to the secondary. And the secondaries of one system are the primaries of the other one (and vice versa).

Color Difference

The human eye has a quite different sensitivity for color difference between colors and grays. Plus, the eye is a different sensitivity in different color regions. In general, one can say, that color deviations can be recognized from 3 ΔE on. With some colors, it will be below ΔE 3, with some colors above this treshold. Deviations in a gray balance or between grays are already observed from 1 ΔE on. Deviations above 3-5 ΔE (colors) and 1ΔE (grays) are visible for the trained eye.

Measurement Devices for Displays

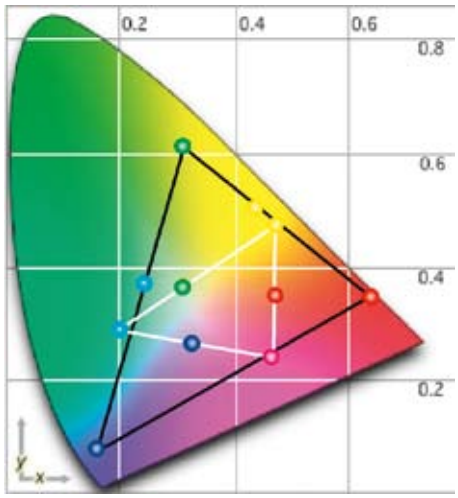
There are two types of colour measuring instrument. Colorimeters, as the name implies, see colors. A colorimeter has sensors that, in much the same way as the human eye, break the wavelengths of light down into red, green and blue areas. Colorimeters are most often used to measure the colour emitted by displays. The second way to measure color is with a spectrophotometer. A spectrophotometer can measure the wavelengths of light emitted from a light source or reflected by an object. They are the best way to measure colour. However, on displays, spectrophotometers suffer from poor precision in dark areas. Here colorimeters are much better suited. On the other hand, a colorimeter need to be trained on a certain display type to be accurate. Therefore, a device correction is needed for displays that differ from the standard (like Wide Gamut or White-LED/ RGB-LED). A spectrophotometer does not need any kind of training.

Display Basics

A display uses an additive color system where the addition of red, green and blue results in white. So far the theory. Unfortunately, the real world is different. With printers and the used subtractive system, cyan, magenta and yellow should result in black. However, the result is not a pure black, but something olive. That´s why we use blank ink in addition. For displays, red, green and blue may result in some kind of white, but at different luminance levels, their behaviour is quite non-linear. Plus, a display is not a pure additive system; it´s a bit more like a transmissive system. The light from the back (either CCFL or LED) passes the color filters and the TFT itself. In theories, the secondary additive colors cyan, magenta

and yellow are the primary colors of the subtractive system. So far the theory (again). In practice, a subtractive cyan looks much different than an additive cyan. And an additive red looks even more different than a subtractive red.

However, to make sure that a display shows the right white and the behaviour of all three channels at any luminance is correct, a display needs to be adjusted.



Subtractive system (white) and additive system (black)

Ways of Calibration

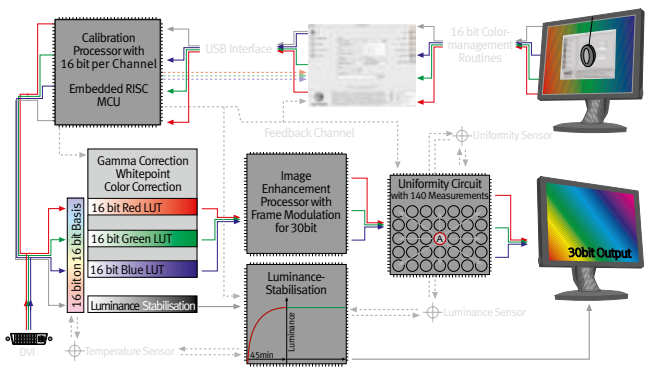
The color depth of a graphic signal from the computer to the display is 8bit - means 16.7 million colors or 245 shades per channel. If this signal is changed, the number of colors will be lower the bigger the change will be. Therefore the best way is to avoid any corrections of the signal. But as we have learned, a display needs to be adjusted to show colors correctly. That means the corrections have to be either done in the displays or on the computer.

If the signal is corrected on the computer (in the Look Up Table [LUT] of the graphics card), the signal to the display does no longer contain the full 8bit bandwidth. This will result in a loss of detail and choppy gradiants. Up to 20% per channel or 50% of all colors will be lost.

LUT correction on the graphic card (left) versus correction inside the display LUT (right)

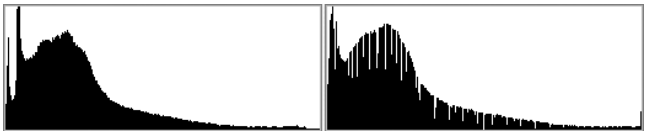
A better way is to correct as much as possible inside the display and let only the remaining deviations be corrected by the graphic card LUT. The loss can be reduced to 10% per channel or 25% of all the colors.

However, the best way is to do all corrections inside the display and also correct the non-linear behaviour there. This will help to keep the full bandwidth. To do so, a dedicated interface is needed to communicate with the display. This approach is called hardware calibration, while the first two ways are called software calibration.



Schematics of the process of a hardware calibration.

The hardware-calibrated Quato displays either use USB or DDCI to communicate with the software on the computer and adjust the displays internally with up to 16bit precision. The high-precision LUT inside the display is then used to correct all the deviations, and the signal is downscaled to 10bit when it passes the internal display driver circuits. The scaling can be compared with high-end photography where images are kept in 16bit mode until all corrections have been done. Then, a scaling to 8bit shows no



8bit signal after 16bit correction (left) versus the 8bit signal after corrections in 8bit (right).

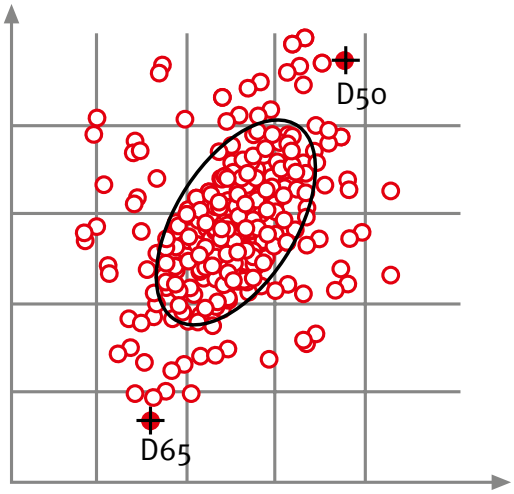
losses in comparison to make all adjustments in an 8bit image and having a lot of losses later.

Calibration Basics

Apart from the calibration technology, the calibration setup is also quite important. The right values for Luminance, Gamma (or Gradation or Tonal response) and Whitepoint are not always easy to find.

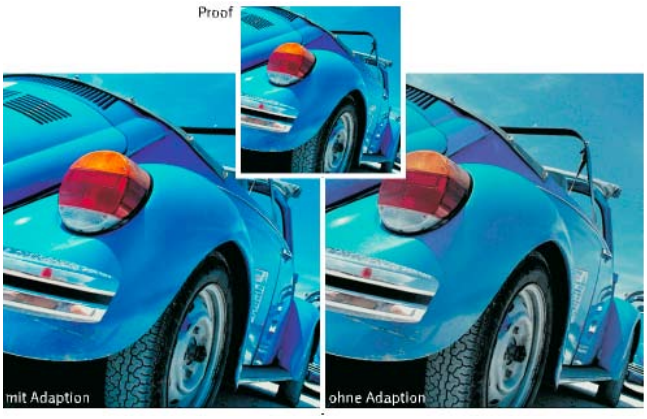
Whitepoint

Of course, according to ISO 3664 and others, D50 is the right whitepoint. But this does not match for screens. A display, calibrated to D50, will always looks to warm compared to a D50 viewing booth.



Tolerances for the whitepoint for paper type 1. The majority of the probes is within the range of 5.600 to 6.000 K.

Research has found that for paper type 1 (gloss or matte coated offset), a whitepoint between 5.600 K to 6.000 K should be used to simulate the D50 appearance on a screen. Other paper types may need different whitepoints - pretty much depending on the paper color.

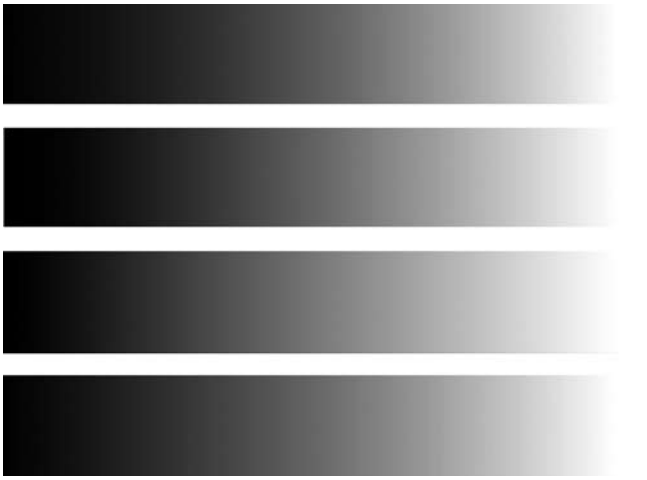


Without chromatic adaption, the display would render colors much too cold (right). With adaption, the appearance (left) looks like the original (top).

As the display no longer uses D50, we have to apply a chromatic adaption to comply to the ICC-standard of D50.In fact, iColor Display automatically uses a chromatic adaption if a whitepoint other than D50 is used for the calibration. The default adaption is „Bradford“ as most image editing software makes use of this adaption, too.

iColor Display offers some more adaptions like vonKries, XYZ-scaling or Cato2/LMS. These adaption should only be used if you need to comply to special environments.

Gradation



Comparison (from top to bottom) between L, Gamma 2.2, Gamma 1.8 and the TVI from ISOcoatedv2 shows that L* and Gamma 1.8 match Offset printing quite well.*

The gradation or tonal response curce (TRC) is another important part that needs to be adjusted correctly. Sometimes, one can find statements like „PC uses Gamma 2.2 and Mac uses Gamma 1.8, and therefore the display has to calibrated to these values“. This is wrong because the gradation (gamma is one possible gradation) is not defined by the computer platform but by the working space that is used in Photoshop and Co. Only if you do basic colormanagement task on operating system level, the standard gradation of the operating system counts. Here, Windows XP/Vista/7 and Mac OS X 10.6 make use of Gamma 2.2 while Mac OS X 10.5 or older use 1.8.

If you work with sRGB, then your gradation in the calibration setup should be sRGB or at least Gamma 2.2 (right, sRGB is not exactly Gamma 2.2). If you are using Adobe-RGB, then it should be Gamma 2.2; with ECI-RGB 1.0 it is Gamma 1.8 and with ECI-RGB 2.0 it is L* gradation.

Note: Keep in mind that sRGB is not a very good idea as a working space as it limits the input from larger spaces (and the print to larger gamuts, too).

If there is a mismatch between the display´s gradation and the one used in applications like Photoshop, smooth gradiants will look choppy and many details will be lost.

Luminance

ISO 12646 (minimum requirements for softproofing displays) defines a luminance range of 120cd/m2 to 160cd/m2. The darker the environment, the lower the brightness has to be within the defined range.

Keep in mind that driving a display at higher luminances than 160cd/m2 will result in a fast aging of the backlight. The backligth decay is not covered by any warranty. Therefore, please use the display at the recommended luminance level.

Profile locations

Color profiles can be stored in many different locations on your harddrive. iColor Display always uses the system´s native profile location.

Mac OS X stores profiles in the „ColorSync“ folder inside the system and the user library. To gain access to these profiles for every user, the iColor Display stores profiles always in the system library.

Macintosh HD -› Library -› ColorSync -› Profile

Windows stores color profiles in a subfolder inside „System32“:

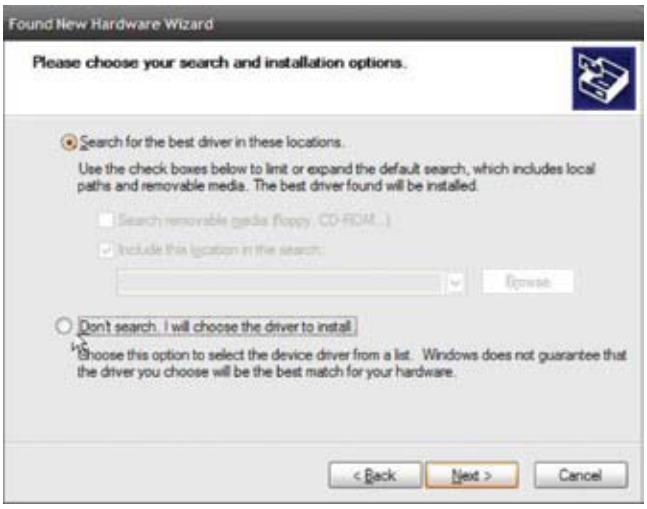
C:\WINDOWS\system32\spool\drivers\color

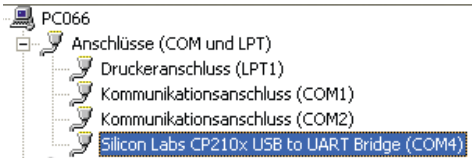
More Info

More info about calibration and how to set up the applications can be found in the Softproofing Handbook, available on the website of the FOGRA.

http://forschung.fogra.org/index.php?getlang=en

Software Installation for Calibration Software and Measurement Devices





Software installation for Intelli Proof Displays for Windows XP 32 / Vista 32/64 / Windows 7 32/64

Insert the Quato-CD, start the Installer and select your language.

The Installer copies the software and drivers onto your harddisk.

C:\Programs\Quato\iColorDisplay

It also links the application to your start menu and places a link on the desktop on request.

You can now connect the Quato display´s USB-port and the measurement device to your computer. Windows will note that new hardware was found. Please follow the steps for your Windows version below.

Notice: Please make sure that you have administrator rights for both, installation and iColor Display (to successfully save profiles).

Installation for Windows XP 32

If Windows prompts with a question about automatic driver search in the internet, just ignore this and follow the steps below.

Now select that you would like to install the software from another source.

Search the directory (see above) of the iColor Display application, and select the „driver“ folder.

Windows possibly reports about a missing signature of the driver. Just ignore this message.

Now Windows will tell you that the driver has been installed correctly, and that your device is now ready to use.

You can check the status of the device by using the hardware manager. The display´s interface is called „..Cp210x....“.

Please perform the installation of the measurement device drivers in the same way as described above.

Notice: Windows XP 64 bit is not supported by the driver or iColor Display application.

Installation for Windows Vista 32/64

If Windows prompts with a question about automatic driver search in the internet, just ignore this and follow the steps below.

Now select that you would like to install the software from another source.

Search the directory (see above) of the iColor Display application and select the „driver“ folder.

Windows possibly reports about a missing signature of the driver. Just ignore this message.

Now Windows will tell you that the driver has been installed correctly and that your device is now ready to use.

You can check the status of the device by using the hardware manager. The display´s interface is called „..Cp210x....“.

Please perform the installation of the measurement device drivers in the same way as described above.

Installation for Windows 7 32/64

If Windows prompts with a question about automatic driver search in the internet, just ignore this and follow the steps below.

Now select that you would like to install the software from another source.

Search the directory (see above) of the iColor Display application, and select the „driver“ folder.

Windows possibly reports about a missing signature of the driver. Just ignore this message.

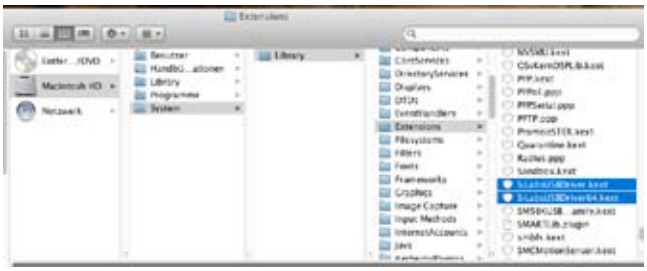
Now Windows will tell you that the driver has been installed correctly, and that your device is now ready to use.

You can check the status of the device by using the hardware manager. The display´s interface is called „..Cp210x....“.

Please perform the installation of the measurement device drivers in the same way as described above.

Software installation for Intelli Proof displays for Mac OS X

Please insert the CD and open the Disk Image (.dmg). Copy the iColor Display folder to your hard-disk.



The Version 3.8.x.x or newer of iColor Display does not need a driver for the Intelli Proof calibration interface.

If a driver from an earlier version is installed please unistall this driver as below:

please remove the following entries from directory MacintoshHD:\System\Libary\Extensions
SilabsUSBDriver.kext
SilabsUSBDriver64.kext

After removing a restart of your system is requiered.

You can check the status of the device with the Apple System Profiler (About...-› more Info). The USB-Interface shows up as „CP210x“ (Calibration Processor).

The measurement devices can be connected to your Mac without installing a driver. iColor Display includes all necessary device frameworks.

Only for the Basiccolor Discus measurement device a driver is necessary. It could be found in the iColor Display.dmg, folder Drivers.

Notice: You need administrator rights to install the driver. Saving profile in the ColorSync folder also needs administrator rights.

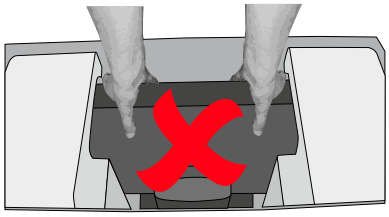
Notice: If you have only obtained the iColor Display Software without Display, skip the installation of the hardware and just proceed to the introduction of the software.

Hardware Installation

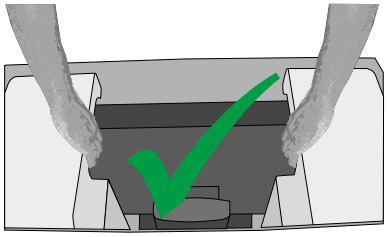
Unpacking Notice

Do not pull the display out of the box by pulling the display itself. Always pull the cushion. Pulling the display can result in pressure marks on the display and would result in voiding any warranty claims.

Safety Notice



Before you lift or reposition your display, you may need to disconnect cables and power cord. Use correct lifting techniques when positioning the display. When lifting or carrying the display, hold it at the edges. Don't lift the display by the stand, the cord or the display frame.

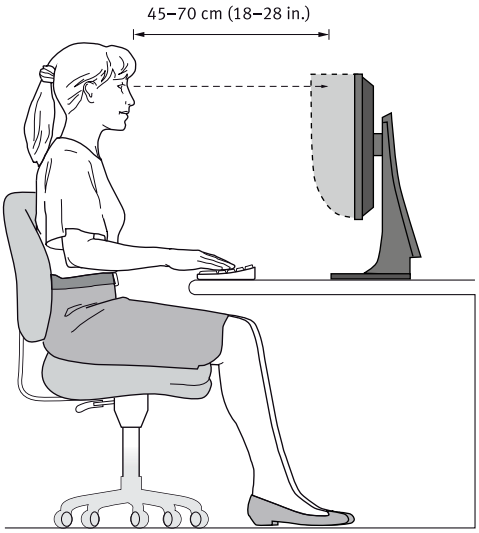


Disconnect the power cord to clean the screen on your display. Use a soft, dry cloth to wipe dust from the screen. Do not clean the screen with a cleaner containing alcohol or acetone. Use a cleaner intended for use with a screen or display. Never spray cleaner directly onto the screen. It might drip inside the display and cause damage.

Even though the display has a power switch on the back, the only way to completely disconnect power is to unplug the power cord.

Disconnect power immediately if the power cord is frayed or damaged, if something spilled on the display, or if the display has fallen down or is damaged in some other way.

Use only the power cord that came with your display. The power cord has a three-wire grounding plug (a plug that has a third grounding pin) that fits only a grounded AC outlet.



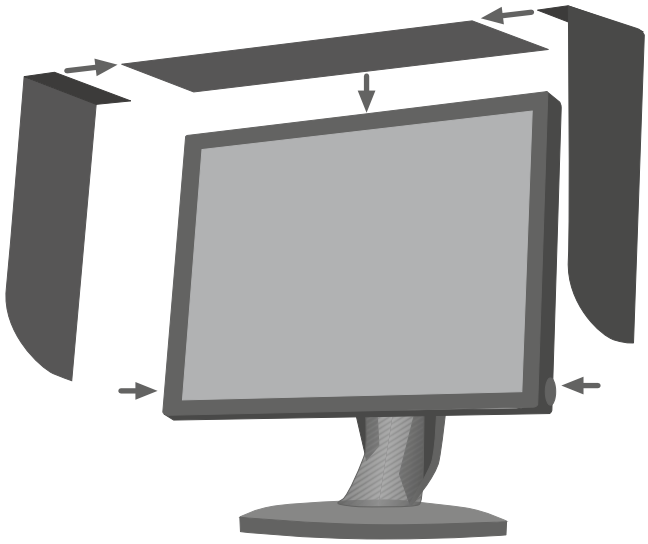
Ergonomics

Here are some guidelines for adjusting your display to reduce glare and to accommodate your physical size and shape.

Arrange the display so that the top of the screen is slightly below your eye level when you are sitting at

the desk. The best distance from your eyes to the screen is up to you, although most people prefer 45 to 70 cm.

Position the display by tilting it up or down to minimize glare and reflections from overhead lights and nearby windows.

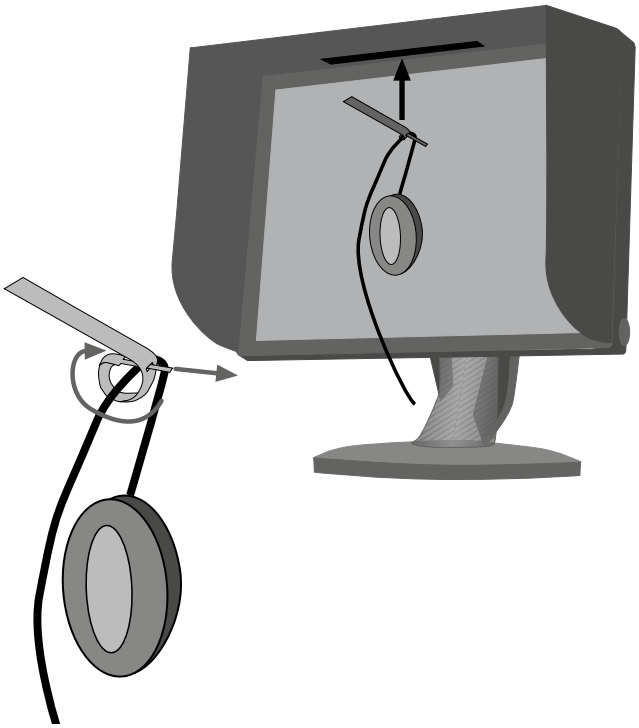


Installation of the Hood

Assemble the three parts of the hood and place the hood on the velcro strips of the screen. Please make sure that the hood and the velcro on the screen are properly aligned. You can bend the hood slightly to make the mounting procedure a bit easier.

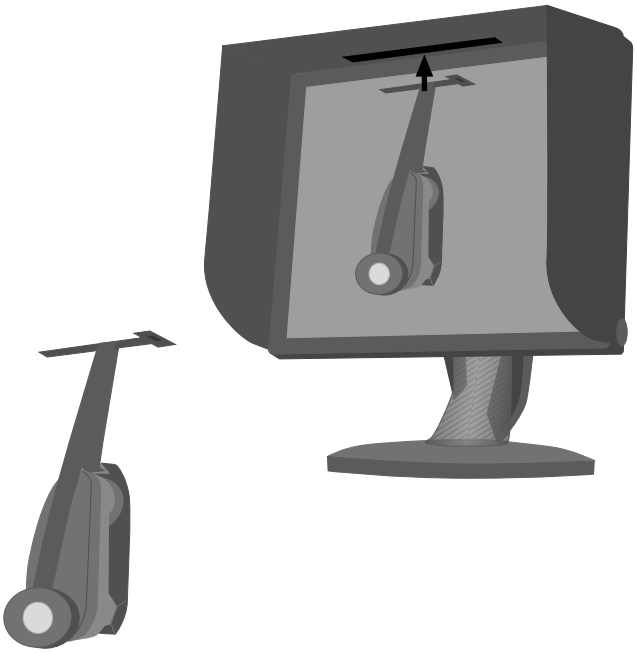
Mounting of the Sensor

To mount the optional measurement sensor (Silver Haze Pro), use the velcro sling that is located on the inner top of the hood. Make a sling and guide the USB-cable through the sling. Then, fasten the sling and mount it on the velcro in the inner top of the hood as shown on the right side.

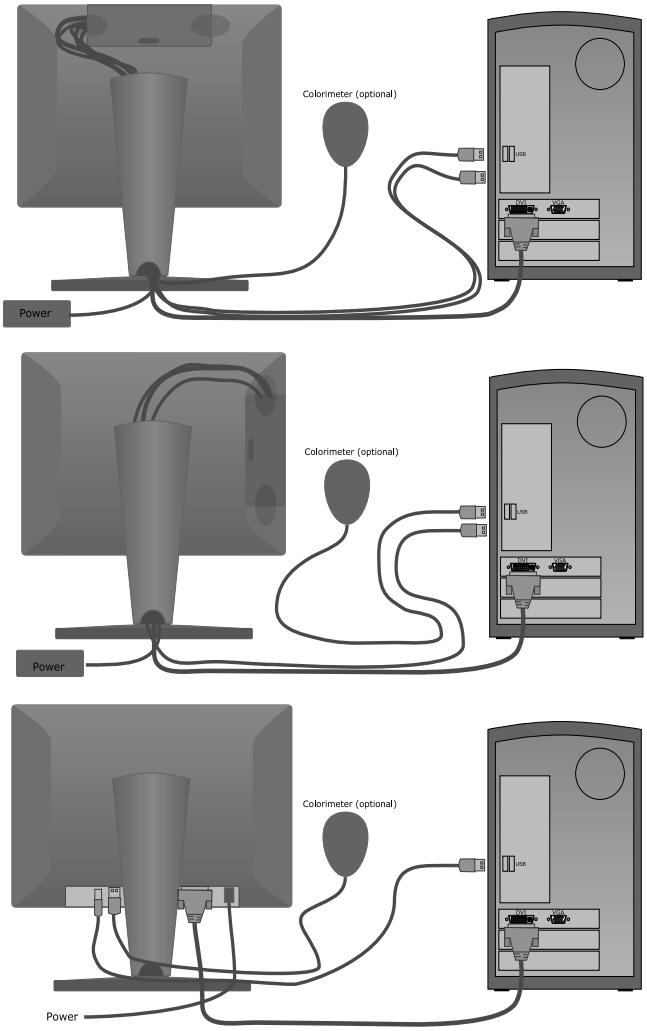


If you use other devices like the EyeOne Display or the Datacolor Spyder 2/3, the velcro sling can also be used.

If you want to use the EyeOne Pro spectrophotometer, please also use the velcro sling but do not use it as a sling. Simply guide the counter weight strip of the EyeOne Pro between the two velcro parts and mount the flattened sling on the velcro as shown on the right side.



Always remove your sensor after calibration as the units warm up significantly and this can reduce the long and short term precision.



Connection layout for 21.3”/20.1” (top), 19” (mid) and 22” to 26” (bottom) Quato displays.

Connecting the Display to your Mac or PC

21.3“, 19“, 20.1“ units

Open the port-cover on the back and connect the video cable, power supply cable and USB cable to the display. Route the cables through the cable cabinet in the display stand and connect them to your Mac or PC.

Make sure that the USB cable or any measurement device is connected directly to the computer to avoid USB problems.

22“-26“ units

Connect the USB cable and video cable with your Mac or PC and plug in the power cord.

Make sure that the USB cable or any measurment device is connected directly to the computer to avoid USB-issues.

Notice: Connect the USB cable or any measurement device only after the software installation.

Notice: Only a digital connection (DCI, HDMI or DisplayPort) will allow a hardware calibration. If the display is connected via VGA (or the VGA part of DVI-I), no hardware calibration will be performed.

Basics

TFTs need a warmup period. Do not calibrate or use the display for color critical work in the first 60 minutes. During this warmup period, gamma, whitepoint and luminance shift and the internal stability circuit will take command after 30 minutes.

Avoid activating the power saving as after waking up, the display again needs at least 30 minutes to return to working temperature and color stability. To avoid image retention, make use of screen savers.

Connecting the display to a switched power outlet

may (however unlikely) result in a loss of the internal calibration table as the display always needs a minimal voltage to keep the internal flash alive. The internal capacitors will normally bridge at least 24 hours.

User controls

Some units (22“-26“) have a power switch on the back. This needs to be switched on at first.

On the right side of the display, you will find the only user control.

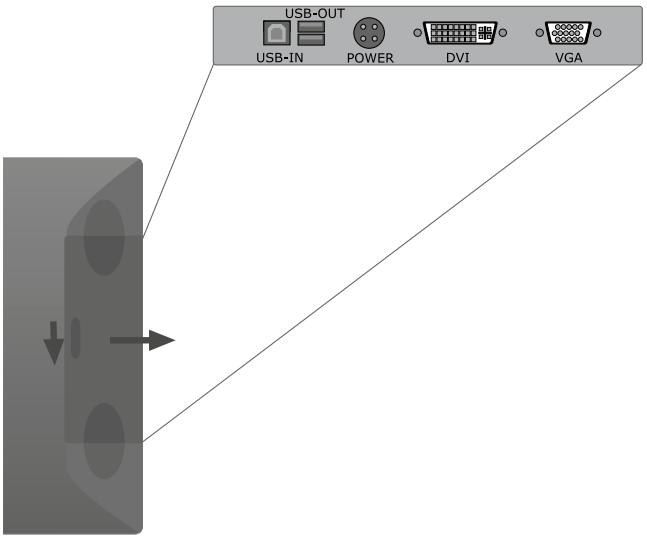
- a short click on this button opens the OSD
- a long click on the button switches the unit on/off
- turning the button up/down lets you move through the OSD. Clicking the button lets you select a function and again, turning will change values

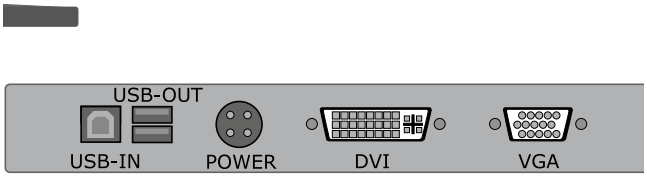
Notice: The OSD is not often used as control and setup is performed by the iColor Display software

Notice: When adjusting color values for a manual calibration, do not increase the values above the level of 70. Higher values would create channel clipping and the calibration would be very unprecise.

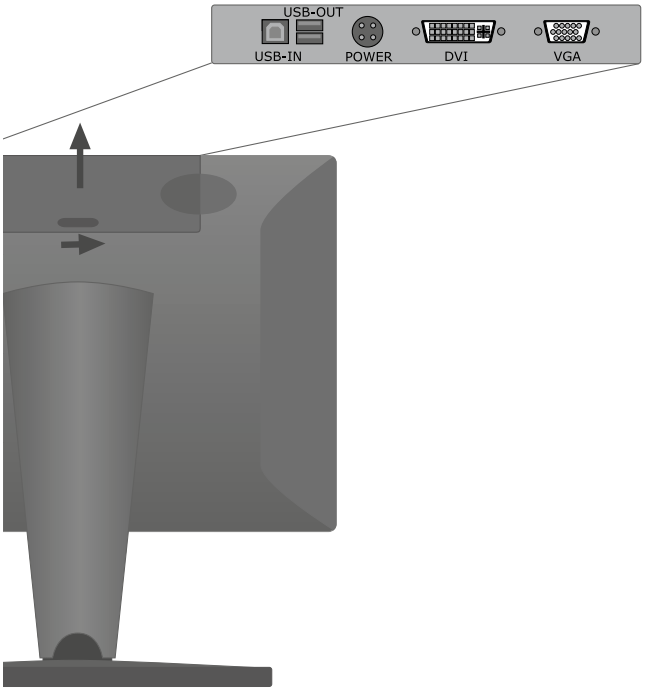
Connection Layout

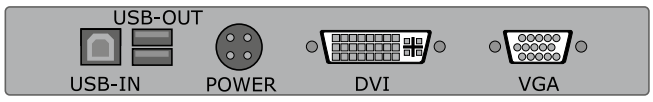
Intelli Color 190

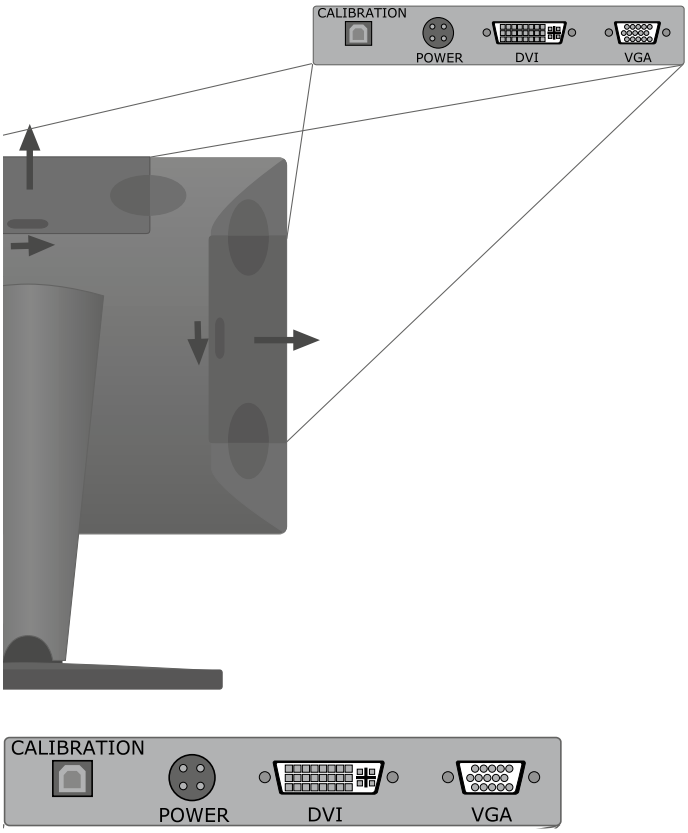




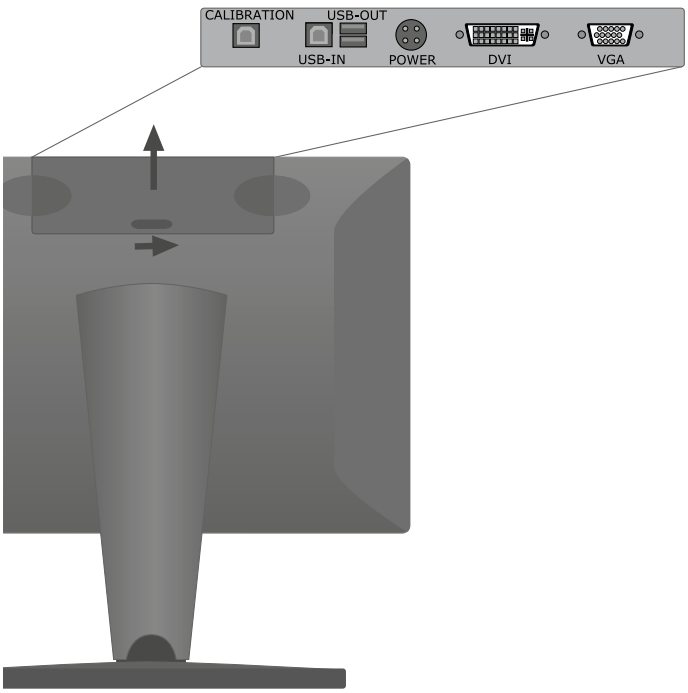
Intelli Color 201 and 213



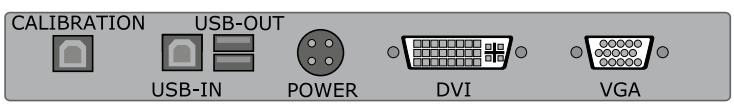


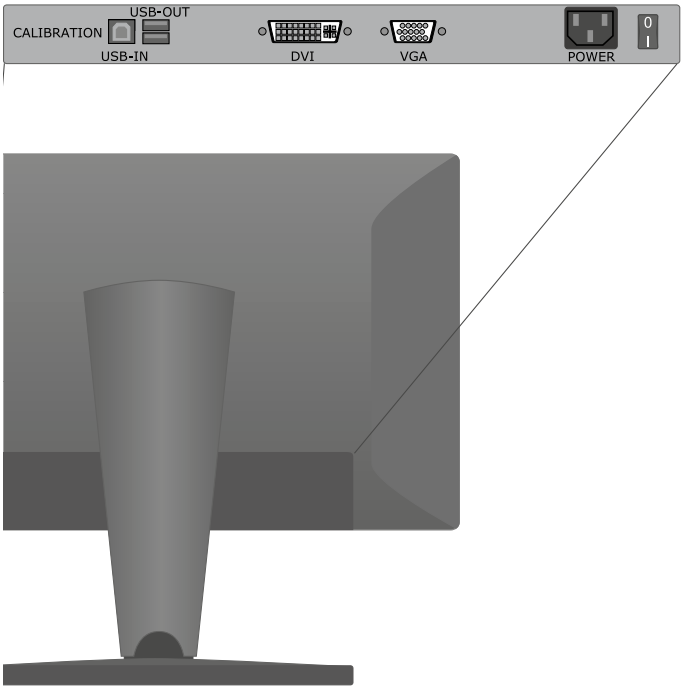


Intelli Proof 190 and 201

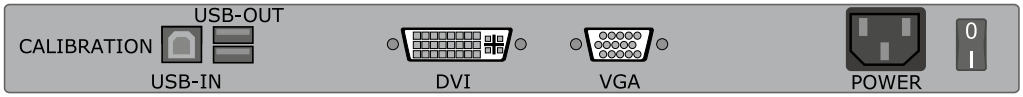


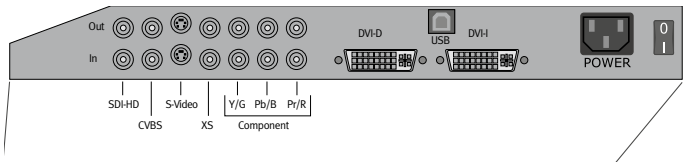
Intelli Proof 213 and 213 excellence



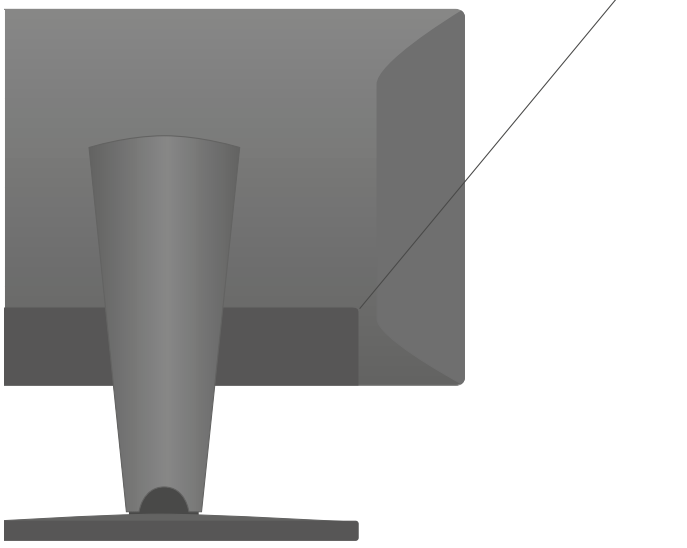


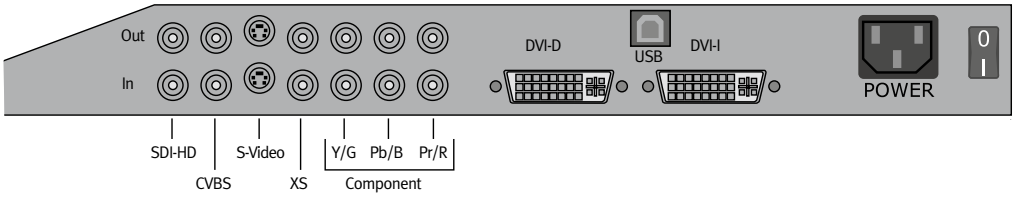
Intelli Proof 220/240/242 le
Intelli Proof 230/240
Intelli Proof 220/230/240/242/260/262/264 excellence

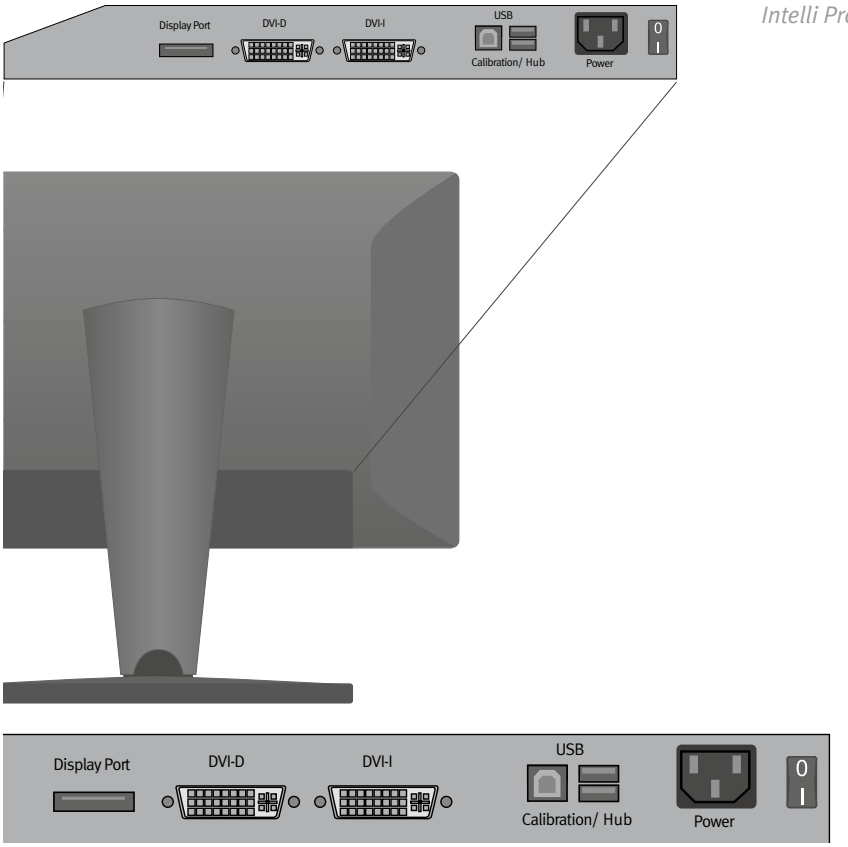




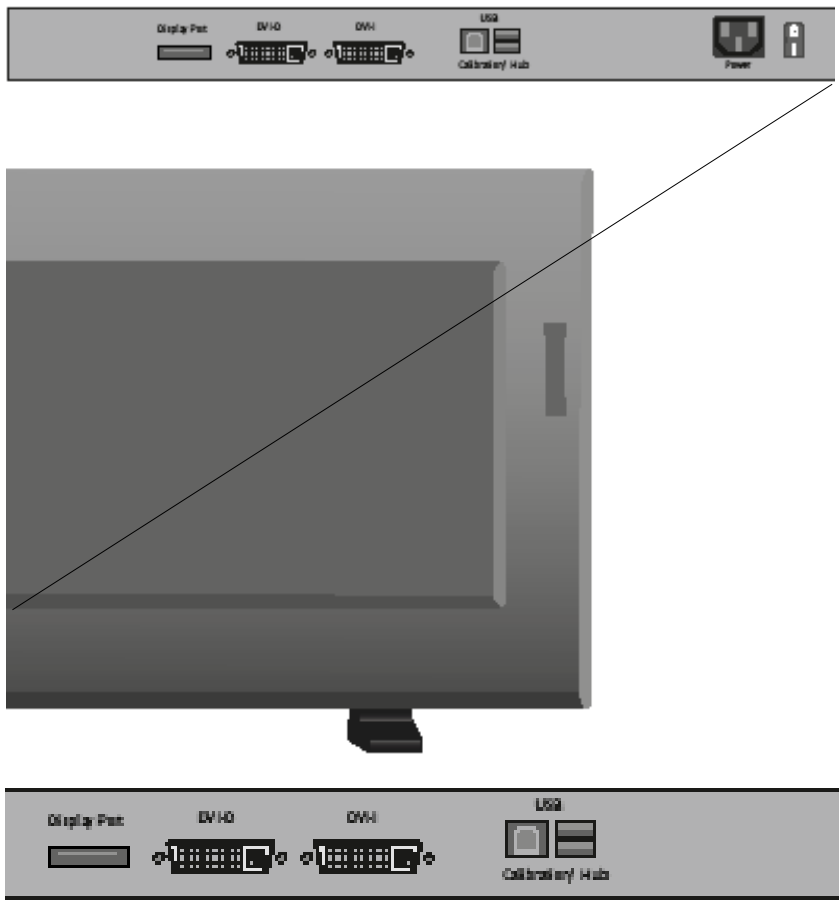
Intelli Proof 240 motion and 260 motion excellence





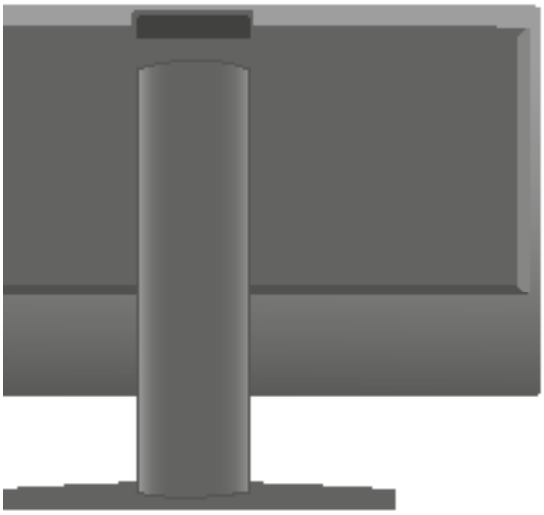


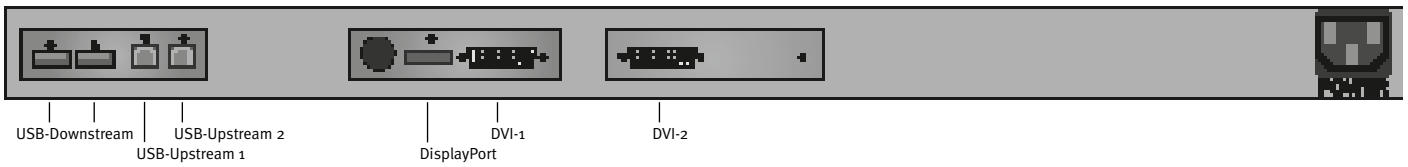
Intelli Proof 242 excellence and 240 excellence LED



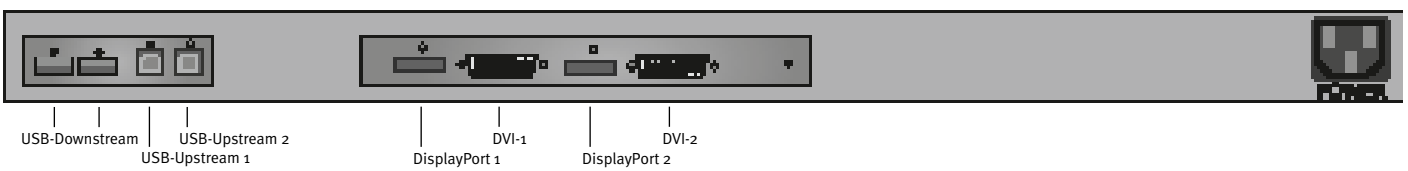
Rückseitige Anschlüsse des Proof View 700-42 und des Intelli Proof 420 excellence

excellence





excellence



The OSD for the Intelli Proof/Color 190, 201, 213 , 213 excellence and Proof View 700 offers the following functions:

- Input
- Auto Setup (analogue)
- Brightness (luminance)
- Contrast (analogue)
- Image (analogue)
- Calibration (only used for Intelli Color)
- Frequency/Phase (analogue)
- Management

To select the connection, choose Input.

Auto Setup performs an automatic adjustment when a VGA signal is used.

Brightness controls the backlight brightness.

Contrast is only available if the display is used in VGA-mode.

Image adjusts position and size of the image in analogue mode.

The Calibration Menu is used to adjust the manual calibration values of the Intelli Color 190, 201 and 213. Select the preset that matches your setup closest, and adjust the RGB values.

- HW calibration (Hardware Calibration)
- RGB 1.8 (RGB adjustment with Gamma 1.8)
- RGB 2.2 (RGB adjustment with Gamma 2.2)
- RGB L* (RGB adjustment with L* Gradation)
- D55-1.8 (5.500K with Gamma 1.8)

Notice: Some older displays do not allow separate RGB adjustments. If an Intelli Proof 190/201/213 is used, the calibration software will switch the display to hardware calibration mode.

Frequency and phase can be used to finetune an image if the Auto Setup results in a suboptimum image performance.

Management is used to select languages, to change the OSD position and to reset the whole unit.

The OSD for the Intelli Proof 230/240/230 excellence, 220/240/242 le offers the following functions:

- Input (only LE units)
- Auto Setup (analogue)
- Brightness (luminance)
- Contrast (analogue)
- Image (analogue)
- Color Setup
- Frequency/Phase (analogue)
- Management

To select the connection, choose Input.

Auto-Setup performs an automatic adjustment when a VGA signal is used.

Brightness controls the backlight brightness.

Contrast is only available if the display is used in VGA mode.

Image adjusts position and size of the image in analogue mode.

The Color Setup is used to switch between the two calibration modes:

- Hardware Calibration
- RGB (RGB adjustment with Gamma 2.2)

For a manual calibration, just select RGB and adjust the RGB values accordingly.

Frequency and phase can be used to finetune an image if the Auto Setup results in a suboptimum image performance.

Management is used to select languages, to change the OSD position, to reset the whole unit and to change the input (non-LE units).

The OSD for the Intelli Proof 220/240/260/262 excellence offers the following functions:

- Input
- Auto Setup (analogue)
- Brightness (luminance)
- Contrast (analogue)
- Image (analogue)
- Color Setup
- Frequency/Phase (analogue)
- Management
- Stabilisation

To select the connection, choose Input.

Auto Setup performs an automatic adjustment when a VGA signal is used.

Brightness controls the backlight brightness.

Contrast is only available if the display is used in VGA mode.

Image adjusts the position and size of the image in analogue mode.

The Color Setup is used to switch between the two calibration modes:

- Hardware Calibration
- RGB (RGB adjustment with Gamma 2.2)

For a manual calibration, just select RGB and adjust the RGB-values accordingly.

Frequency and phase can be used to finetune an image if the Auto Setup results in a suboptimum image performance.

Management is used to select languages, to change the OSD position and to reset the whole unit.

The Stabilisation feature is used to toggle between a stabilized mode or unstabilized mode (whitepoint/ luminance).

The OSD for the Intelli Proof 242 excellence und 240 excellence LED offers the following functions:

- Input Source Settings
    - Exit
    - Digital DVI-I
    - Analog DVI-I
    - Digital DVI-D
    - Display Port
- Video
    - Exit
    - Auto Setup (analogue)
    - Brightness (luminance)
    - Contrast
    - Saturation
    - Hue
    - Display
- Color Mode Setting
    - Exit
    - H.W. (hardware) Calibration
    - RGB (RGB adjustment)
    - Color Gamut
    - RBGYCM (6 axis Color adjustment)
- Management Setting
    - Exit
    - Scaling
    - OSD Position
    - Recall (Reset)
    - UART Switch (for service only)
    - Language

Upon the first use, the display will show an “Out of Sync” warning because the unit does not search for a signal automatically. Therefore, please press the button, on the right and select an input.

Auto Setup performs an automatic adjustment when a VGA signal is used.

Brightness controls the backlight brightness.

The Color Mode is used to switch between the two calibration modes, to simulate smaller gamut (max. gamut setting is neutral).

Management is used to select languages, to change the OSD position, the scaling and to reset the whole unit.

The OSD for the Intelli Proof 240 motion und 260 motion excellence offers the following functions:

- Auto Setup (analogue)
- Brightness (luminance)
- Image
- Color Mode
- Input
- Management
- Lux Stable (Stabilisation)
- Hours
- PIP

Upon the first use, the display will show an “Out of Sync” warning because the unt does not search for a signal automatically. Therefore, please press the button on the right, and select an input.

Auto Setup performs an automatic adjustment when a VGA signal is used.

Brightness controls the backlight brightness.

Image adjusts the position and size of the image in analogue mode.

The Image adjustment supports some advanced video related features:

- Contrast (default: 50)
- Black Level (default: 50)
- Position
- Clock/Phase (analogue)
- Reversal (180° rotation)
- Blue Channel (displays only the blue channel to check about noise)
- Range Switch (toggles between 15-237 levels - aka Video Mode - and 0-255 levels aka PC mode)

The Color Mode is used to switch between the three calibration modes.

- Normal (manual RGB adjustment)
- Gamma
- Hardware Calibration

Notice: The Hardware Calibration can only be used

for PC signals. For Video signals either the Gamma or the Normal mode should be used. The display uses only one LUT for all input sources.

Management is used to select languages, to change the OSD position, the scaling, and to reset the whole unit

The Stabilisation feature is used to toggle between a stabilized mode or unstabilized mode (whitepoint/ luminance).

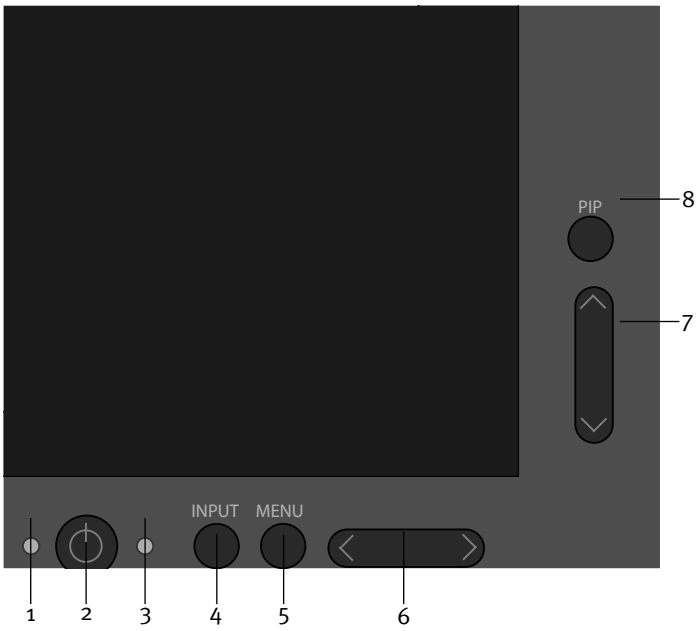
The PIP feature allows you to display a second video source in a moveable and sizeable window. Only one data and video connection can be active during PIP. It is not possible to mix two data or two video connections.

Bedienelemente

Funktionen der OSD-Bedienelemente (On-Screen-Display) auf der Vorderseite des Monitors

Um auf das OSD-Menü zuzugreifen, drücken Sie die Taste MENU.
Zum Wechseln des Signaleingangs drücken Sie die Taste SELECT.

HINWEIS
Zum Wechseln des Signaleingangs muss das OSD-Menü geschlossen werden.



1 Sensor für Umgebungshelligkeit
Ermittelt die Umgebungshelligkeit und bewirkt so eine automatische Anpassung verschiedener Monitoreinstellungen. Standardmäßig ist die Funktion deaktiviert.

2 Netzschalter
Schaltet den Monitor ein und aus.

3 LED
Zeigt an, dass der Monitor eingeschaltet ist.

4 INPUT/SELECT
Öffnet das OSD-Steuerungsmenü. Öffnet die OSD-Untermenüs. Ändert die Eingangsquelle, wenn das OSD-Steuerungsmenü nicht aktiv ist.* Halten Sie die Taste gedrückt, um das USB-Auswahlmenü anzuzeigen, wenn das OSD-Steuerungsmenü nicht aktiv ist.

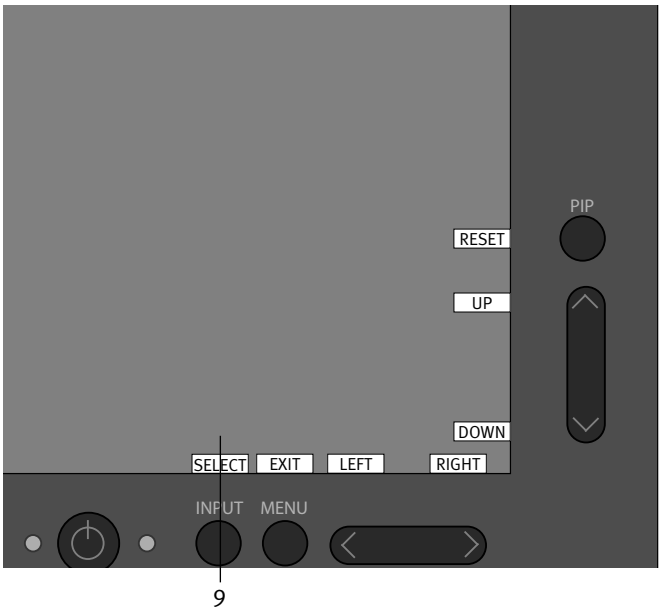
5 MENU/EXIT
Zugriff auf das OSD-Menü. Schließt das OSD-Untermenü. Schließt das OSD-Steuerungsmenü.

6 LINKS/RECHTS
Navigiert im OSD-Steuerungsmenü nach LINKS bzw. RECHTS. Sie können die Helligkeit direkt anpassen, während das OSD-Menü aus ist.*

7 AUF/AB
Navigiert im OSD-Steuerungsmenü nach oben bzw. unten. Zeigt das Menü „Bildmodus“ an, wenn das OSD-Steuerungsmenü nicht aktiv ist.* *1

8 RESET/PIP
Setzt das OSD-Steuerungsmenü zurück auf die Werkseinstellungen. Der BiB-Modus kann ausgewählt werden, wenn das OSD ausgeblendet ist.*2 Halten Sie die Taste gedrückt, um das Menü ECO-MODUS zu öffnen, während das OSD-Menü ausgeblendet ist.*

9 TASTENBESCHREIBUNG
Die Tastenbeschreibung wird beim Zugriff auf das OSD-Steuerungsmenü automatisch auf dem Bildschirm angezeigt.
Sie wird beim Drehen des OSD-Steuerungsmenüs ebenfalls gedreht.*3



* Bei ausgeschalteter HotKey-Funktion ist diese Funktion deaktiviert.

*1 Menü BILDMODUS
Drücken Sie die Tasten AUF/AB, um den BILDMODUS auszuwählen. Im BIB- oder PARALLELMODUS kann der Bildmodus für das Haupt- und das Sekundärbild durch Drücken der Tasten LINKS/RECHTS unabhängig voneinander ausgewählt werden.

*2 Menü BIB-MODUS
Drücken Sie die Tasten AUF/AB, um das Sekundärbild zu aktivieren/deaktivieren. Drücken Sie die Tasten LINKS/RECHTS, um das Haupt- und das Sekundärbild zu tauschen.

*3 Die Funktionalität der Tasten LINKS/RECHTS und AUF/AB ist je nach Darstellung (Querformat/Hochformat) Des OSD-Menüs austauschbar.

Support

Troubleshooting

Before performing any of these steps, make sure your computer is turned on, the display is plugged into an outlet, all the cables are connected properly to your computer and display, and your computer is not in sleep mode.

If the screen does not display an image:

- Check the cables and connectors again to make sure they are connected properly to your computer and the display.
- Make sure your computer is turned on and is not in sleep mode.
- Make sure that the computer supports the native resolution and frequency of the screen.

If the screen is dim or discolored:

- Make sure the display´s color profile is active.
- Reset the screen by using the OSD and upload the profile again with the iColor Display Software.
- After years of usage, the backlight will age. This is typical for TFT displays and not covered by the warranty.

If the screen is non-uniform:

- Perform a UDACT uniformity measurement. If the values are within 10% and 4 ΔC, the display is within the specs for a ISO 12646-compliant display.
- For ADC-equipped Intelli Proof excellence and LE displays, Quato offers an ADC-update service to re-uniform your unit. Call your local dealer for details.

If the software does not show „Hardware Calibration“:

- Make sure the USB-cable is connected and the driver is installed properly.
- Make sure you use a Quato Intelli Proof display. Third party displays cannot be hardware-calibrated.

If the screen produces an audible noise:

- A litte noise from the backlight inverter does typically occur and is not an indication of need for service.

WARNING: Your display is a high-voltage component and should not be opened for any reason (the backlight inverter uses up to 3.000V), even when it is unplugged. There are no user-serviceable parts inside. Opening the unit will void the warranty.

TFT Pixel failure criteria

Although TFT technologies have been constantly improved in the past few years, single pixel defects can still not be completely avoided in the production process of TFT panels.

There are typically millions of these subpixels on an LCD display. For example, the LCD panel used in the Intelli Proof 240 is made up of 2.3 million pixels and 6.9 million red, green, and blue subpixels. Occasionally, a transistor does not work perfectly, which may result in the affected subpixel being turned on (bright) or turned off (dark). With the millions of subpixels on a display, it is quite possible to have a low number of faulty transistors on an LCD. Therefore, a certain number of subpixel anomalies is considered acceptable. Rejecting all but perfect LCD panels would significantly increase the retail price for products using LCD displays. These factors apply to all manufacturers using LCD technology.

ISO standard 13406 defines pixel defect classes I to IV, whereas only devices of the defect classes I,II and III are sold to the „public“. Class I devices are distributed for military and clinical purposes only. According ISO 13406-II, a 24“ display with 1.920x1.200 pixel resolution is allowed to have up to 12 defective pixels.

However, QUATO has defined special acceptance criteria which go far beyond the demands of the ISO standard 13406-2.

Pixel failure criteria for Intelli Proof/Color monitors:

- *Zero defective pixels in the center area (DIN A6 landscape)*
- *max. 2 defective pixels in the remaining area*

Pixel failure criteria for Intelli Proof LE monitors:

- max. 3 defective pixels

The above-mentioned pixel failure criteria apply only for the state of delivery. Pixel failures occurring later- are not covered by the warranty.

Notice: Older Intelli Proof/Intelli Color and all other Quato general purpose TFTs comply to the ISO 13406.

Image retention (persistence)

If you leave an unchanging image (like a login screen or the same desktop picture) on the screen for a long period of time, you may see a faint remnant of the image even after a new image replaces it. This is called „persistence“.

You can prevent image persistence by using the Screen Saver to make sure that a static image isn ot on the display for long periods of time. Do not use the Energy Saver sleep feature because you need to warm up the display after sleep again for at least 60 minutes.

Service and Hotline

Quato displays are manufactured at very high standards. If in any event, the display should nevertheless show a problem that cannot be solved by the user and is not mentioned in the FAQ on Quato´s website, you can reach the Quato support team via phone or email under the following number and address:

Phone	+49 (0)531 – 281-3840 Monday to Friday 9:00 am to 5 pm (CET)
Fax	+49 (0)531 – 281-3899
eMail	support@quato.de

Please fill the service form on Quato´s website (either digital or the PDF), and return it to Quato.

Upon a qualified defect, you will get a RMA number that must be noted on package and shipping documments.

Notice: The local Quato partner is responsible for collecting and returning unit to Quato. Please get in touch with the local Quato partner first. You can also send the unit on your behalf (and cost) to Quato.

Quato will return the unit after repair or replace it. The decision regarding repair or replacement is up to Quato, and the end user has no legal rights to expect or demand a new unit in exchange of a used unit. The warranty period is not extended by any kind of repair.

Notice: Quato services displays only in the country where the display was originally sold to.

Specifications

Silver Haze Pro Colorimeter

Monitor type	LCD (TFT) und CRT
Measurement System	CIE-XYZ CIE 1931
Optimized to	72% NTSC*
Sensor type	Colorimeter
Spectral range	400-700nm
Dynamic range	0.05-500 cd/m² (CRT) 0.05-1.000 cd/m² (LCD)
Aperture	4.4 mm diameter
Precision (Luminance)	4% +/- (typical)
Precision (Chroma)	0.003 (CRT) (typical) 0.005 (LCD) (typical)
Speed	4 seconds/patch
Inter-Instrument Agreement	0.003 (CRT) 0.005 (LCD)
Linearity	1.5% +/-
Interface	USB 1.1
Power	via USB
Size	64 x 89 x 41mm
Weight	120gr
Temperature range	+10° to +35° C
Storage	+0° to +45° C
Environment	30% to 60% relative humidity non-condensing

* To measure larger gamuts or different spectra correctly, a correction for the device is necessary. iColor Display offers corrections for all Quato wide gamut displays, generic PVA/IPS wide gamut displays and displays with White-LED-Backlight.

Notice: Do not let the device rest too long on the display as it will heat up and the precision will drop. Always perform certifications right after the measurements to avoid heat issues.

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Specifications

Intelli Color / Proof 190

Size	48cm diagonal (19“)
Screen Size	horizontal 378mm x vertikal 304mm
Panel	S-IPS with antireflective coating, 16ms
Resolution	sXGA 1.280 x 1.024 pixels
Pixel Pitch	0,29 (H) x 0,29 (V) mm
Bit Depth	internal 10bit, external 10bit
Luminance	270cd/m² (typical)
Contrast	700:1 (typical)
Viewing Angle	178° (1:10)
Video Signal	Analogue: RGB (0,7 Vp-p), [75 Ohm] Digital: Based on DVI-Standard v1.0
Sync Signal	Separate Sync (TTL-Level: +/-), Sync on Green, Composite Sync (TTL-Level: +/-),
Scaling	1:1 or full screen

The display always needs the native resolution during start up.

Plug & Play	VESA DDC2B-compatible Energy management VGA: based on DPMS DVI: based on DMPM
Connections	1x 19 pol. DVI-D (digital DVI), 1x 15 pol. VGA USB 1.1 calibration port with Intelli Proof 190, bus-powered USB 1.1 2-port hub (Intelli Color)
Ergonomics	Height adjustment: 60mm Tilt: -5° to +35° Rotation: 90° left/right
Power	60W, 3W standby
Voltage	100 - 240VAC, 50/60Hz
Environment	5 - 35°C
Dimensions	approx. 430 x 490 x 220mm
Weight	approx. 9kg
VESA	100mm

Intelli Color / Proof 201

Size	51cm diagonal (20.1“)
Screen Size	horizontal 408mm x vertikal 306mm
Panel	S-IPS with antireflex coating, 16ms
Resolution	UXGA 1.600 x 1.200 pixels
Pixel Pitch	0,25 (H) x 0,25 (V) mm
Bit Depth	internal 10bit, external 10bit
Luminance	300cd/m² (typical)
Contrast	800:1 (typical)
Viewing Angle	178° (1:10)
Video Signal	Analogue: RGB (0,7 Vp-p), [75 Ohm] Digital: Based on DVI-Standard v1.0
Sync Signal	Separate Sync (TTL-Level: +/-), Sync on Green, Composite Sync (TTL-Level: +/-)
Scaling	1:1 or full screen

The display always needs the native resolution during start up.

Plug & Play	VESA DDC2B-compatible Energy management VGA: based on DPMS DVI: based on DMPM
Connections	1x 19 pol. DVI-D (digital DVI), 1x 15 pol. VGA USB 1.1 calibration port with Intelli Proof 201, bus-powered USB 1.1 2-port hub (Intelli Color)
Ergonomics	Height adjustment 60mm Neigung: -5° to +35° Rotation: 90° left/right
Power	60W, 3W standby
Voltage	100 - 240VAC, 50/60Hz
Environment	5 - 35°C
Dimensions	approx. 430 x 490 x 220mm
Weight	approx. 9kg
VESA	100mm

Intelli Color / Proof 213 / Proof 213 excellence

Size	54 cm diagonal (21.3“)
Screen Size	horizontal 435mm x vertical 326mm
Panel	Dual-Domain S-IPS with antireflex coating, 25ms
Resolution	UXGA 1.600 x 1.200 pixels
Pixel Pitch	0,27 (H) x 0,27 (V) mm
Bit Depth	internal 10bit, external 10bit
Luminance	250cd/m² (typical) 200cd/m² (typical) (excellence)
Contrast	550:1 (typical)
Viewing Angle	178° (1:10)
Video Signal	Analogue: RGB (0,7 Vp-p), [75 Ohm] Digital: Based on DVI-Standard v1.0
Sync Signal	Separate Sync (TTL-Level: +/-), Sync on Green, Composite Sync (TTL-Level: +/-)
Scaling	1:1 or full screen

The display always needs the native resolution during start up.

Plug & Play	VESA DDC2B-compatible Energy management VGA: based on DPMS DVI: based on DMPM
Connections	1x 19 pol. DVI-D (digital DVI), 1x 15 pol. VGA USB 1.1 calibration port (IP only) USB 1.1 2-port hub (bus powered)
Ergonomics	Height adjustment: 60mm Tilt: -5° to +35° Rotation: 90° left/right
Power	60W, 3W standby
Voltage	100 - 240VAC, 50/60Hz
Environment	5 - 35°C
Dimensions	approx. 480 x 520 x 220mm
Weight	approx. 11kg
VESA	100mm

Proof View 700/21

Size	54cm diagonal (21.3“)
Screen Size	horizontal 435mm x vertical 326mm
Panel	IPS-Pro with antireflex coating, 16ms
Resolution	UXGA 1.600 x 1.200 pixels
Pixel Pitch	0,27 (H) x 0,27 (V) mm
Bit Depth	internal 10bit, external 10bit
Luminance	700cd/m² (max.)
	550cd/m² (calibrated) = 1.730 Lux
Contrast	1000:1 (typical)
Viewing Angle	178° (1:10)
Video Signal	Analogue: RGB (0,7 Vp-p), [75 Ohm]
	Digital: Based on DVI-Standard v1.0
Sync Signal	Separate Sync (TTL-Level: +/-),
	Sync on Green, Composite
	Sync (TTL-Level: +/-)
Scaling	1:1 or full screen

The display always needs the native resolution during start up.

Plug & Play	VESA DDC2B-compatible
	Energy management
	VGA: based on DPMS
	DVI: based on DMPM
Connections	1x 19 pol. DVI-D (digital DVI),
	1x 15 pol. VGA
	2-port hub (self powered)
	calibration via USB
Ergonomics	Height adjustment: 60 mm
	Tilt: -5° to +35°
	Rotation: 90° left/right
Power	85W, 3W standby
Voltage	100 - 240VAC, 50/60Hz
Environment	5 - 35°C
Dimensions	approx. 480 x 520 x 220mm
Weight	approx. 11kg
VESA	100mm

Intelli Proof 230, 230 excellence

Size	58,5cm diagonal (23“)
Screen Size	horizontal 495mm x vertical 310mm
Panel	S-IPS with antireflex coating, 12ms
Resolution	WUXGA 1.920 x 1.200 pixels
Pixel Pitch	0,26 (H) x 0,26 (V) mm
Bit Depth	internal 10bit, external 10bit
Luminance	300cd/m² (typical)
Contrast	800:1 (typical)
Viewing Angle	178° (1:10)
Video-Signal	Analogue: RGB (0,7 Vp-p), [75 Ohm] Digital: Based on DVI-Standard v1.0
Sync Signal	Separate Sync (TTL-Level: +/-), Sync on Green, Composite Sync (TTL-Level: +/-)
Scaling	1:1 or full screen

The display always needs the native resolution during start up.

Plug & Play	VESA DDC2B-compatible Energy management VGA: based on DPMS DVI: based on DMPM
Connections	1x 19 pol. DVI-D (digital DVI) 1x 15 pol. VGA USB 2.0 calibration port with 2-port hub (self powered)
Ergonomics	Height adjustment: 60mm Tilt: -5° to +35° Rotation: 90° left/right
Power	80W, 3W standby
Voltage	100 - 240VAC, 50/60Hz
Environment	5 - 35°C
Dimensions	approx. 535 x 520 x 220mm
Weight	approx. 15kg
VESA	100mm

Intelli Proof 240, 242 LE

Size	60,9cm (24”)
Screen Size	horizontal 518mm x vertical 324 mm
Panel	A-MVA with 12ms und antireflex coating (240 LE) S-PVA with 12ms und antireflex coating (242 LE)
Resolution	WUXGA 1.920 x 1.200 pixels
Pixel Pitch	0,27 (H) x 0,27 (V) mm
Bit Depth	internal 10bit, external 10bit
Luminance	400 cd/m² (typical)
Contrast	1.000:1 (typical)
Viewing Angle	178° (1:10)
Video-Signal	Analogue: RGB (0,7 Vp-p), [75 Ohm] Digital: Based on DVI-Standard v1.0
Sync Signal	Separate Sync (TTL-Level: +/-), Sync on Green, Composite Sync (TTL-Level: +/-)
Scaling	1:1 or full screen

The display always needs the native resolution during start up.

Plug & Play	VESA DDC2B-compatible Energy management VGA: based on DPMS DVI: based on DMPM
Connections	1x 19 pol. DVI-D 1x 15 pol. VGA USB 2.0 calibration port with 2-port hub (self powered)
Ergonomics	Height adjustment: 60mm Tilt: -5° to +35° Rotation: 90° left/right
Power	80W, 3W standby
Voltage	100 - 240VAC, 50/60Hz
Environment	5 - 35°C
Dimensions	approx. 602 x 520 x 220mm
Weight	approx. 15kg
VESA	100mm

Intelli Proof 220 LE, 220 excellence

Size	55,9cm (22”)
Screen Size	horizontal 474mm x vertical296 mm
Panel	S-IPS (e-IPS) with 12ms und antireflex coating (222 ex) S-PVA with 12ms und antireflex coating (220 LE)
Resolution	WSXGA+ 1.680x1.050 pixels
Pixel Pitch	0,28 (H) x 0,28 (V) mm
Bit Depth	internal 10bit, external 10bit
Luminance	300cd/m² (typical)
Contrast	1.000:1 (typical)
Viewing Angle	178° (1:10)
Video Signal	Analogue: RGB (0,7 Vp-p), [75 Ohm] Digital: Based on DVI-Standard v1.0
Sync Signal	Separate Sync (TTL-Level: +/-), Sync on Green, Composite Sync (TTL-Level: +/-)
Scaling	1:1 or full screen

The display always needs the native resolution during start up.

Plug & Play	VESA DDC2B-compatible Energy management VGA: based on DPMS DVI: based on DMPM
Connections	1x 19 pol. DVI-D 1x 15 pol. VGA USB 2.0 calibration port with 2-port hub (self powered)
Ergonomics	Height adjustment: 60 mm Tilt: -5° to +35° Rotation: 90° left/right
Power	80W, 3W standby
Voltage	100 - 240VAC, 50/60Hz
Environment	5 - 35°C
Dimensions	approx. 602 x 520 x 220mm
Weight	approx. 15kg
VESA	100mm

Intelli Proof 240 / 260 / 262 excellence

Size	60,9cm (24”) diagonal 64,7cm (26”) diagonal
Screen Size	horizontal 518mm x vertical 324mm (24”) horizontal 550mm x vertical 343mm (26”)
Panel	S-IPS (H-IPS) with antireflex coating, 12ms
Resolution	WUXGA 1.920 x 1.200 pixels
Pixel Pitch	0,27 mm (24”), 0,29 mm (26”)
Bit Depth	internal 10bit, external 10bit
Luminance	400cd/m² (24”) (typical) 400cd/m² (26” - 262) (typical) 500cd/m² (26” - 260) (typical)
Contrast	1.000:1 (typical)
Viewing Angle	178° (1:10)
Video Signal	Analogue: RGB (0,7 Vp-p), [75 Ohm] Digital: Based on DVI-Standard v1.0
Sync Signal	Separate Sync (TTL-Level: +/-), Sync on Green, Composite Sync (TTL-Level: +/-)
Scaling	1:1 or full screen

The display always needs the native resolution during start up.

Plug & Play	VESA DDC2B-compatible Energy management VGA: based on DPMS DVI: based on DMPM
Connections	1x 19 pol. DVI-D 1x 15 pol. VGA USB 2.0 calibration port with 2-port hub (self powered)
Ergonomics	Height adjustment: 60 mm Tilt: -5° to +35° Rotation: 90° left/right
Power	80 W, 3 W standby
Voltage	100 - 240VAC, 50/60Hz
Environment	5 - 35°C
Dimensions	approx. 602 x 520 x 220mm
Weight	approx. 15kg
VESA	100mm

Intelli Proof 240 LED excellence / 242 excellence

Size	60,9cm diagonal
Screen Size	horizontal 518mm x vertical 324mm
Panel	S-IPS (H-IPS) with antireflex coating, 12ms
Resolution	WUXGA 1.920 x 1.200 Pixels
Pixel Pitch	0,27mm
Bit Depth	internal 10bit, external 10bit nativ
Luminance	400cd/m² (24" ex) (typical) 250cd/m² (24" LED) (typical)
Contrast	1.000:1 (typical)
Viewing Angle	178° (1:10)
Video-Signal	Analogue: RGB (0,7 Vp-p), [75 Ohm] Digital: Based on DVI-Standard v1.0
Sync Signal	Separate Sync (TTL-Level: +/-), Sync on Green, Composite Sync (TTL-Level: +/-)
Scaling	1:1 or full screen

The display always needs the native resolution during start up.

Plug & Play	VESA DDC2B-compatible Energy management VGA: based on DPMS DVI: based on DMPM
Connections	1x 19 pol. DVI-D 1x 23 pol. DVI-I DisplayPort 10bit USB 2.0 calibration port with 2-port hub (self powered)
Ergonomics	Height adjustment: 140 mm Tilt: -5° to +35° Rotation: 90° left/right Rotation: 90°
Power	60W, <2W standby
Voltage	100 - 240VAC, 50/60Hz
Environment	5 - 35°C
Dimensions	approx. 602 x 520 x 220mm
Weight	approx. 15kg
VESA	100mm

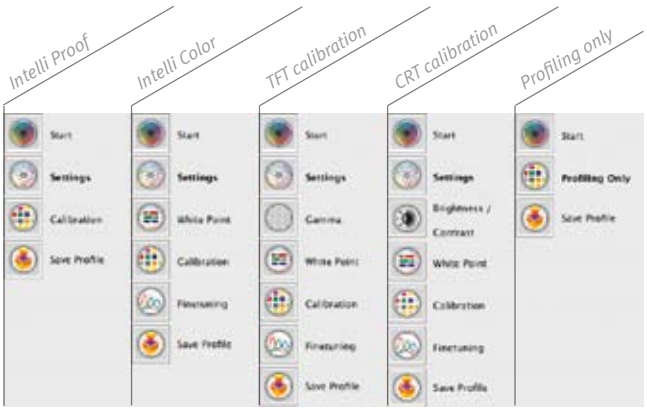
Intelli Proof 240 motion / 260 motion excellence

Size	60,9cm (24”) diagonal
	64,7cm (26”) diagonal
Screen Size	horizontal 518mm x vertical 324mm (24”)
	horizontal 550mm x vertical 343mm (26”)
Panel	S-IPS with antireflex coating, 12ms
Resolution	WUXGA 1.920 x 1.200 pixels
Pixel Pitch	0,27mm (24”), 0,29mm (26”)
Bit Depth	internal 10bit, external 10bit
Luminance	400cd/m² (24”) (typical)
	500cd/m² (26”) (typical)
Contrast	700:1 (24”) (typical)
	1.000:1 (26”) (typical)
Viewing Angle	178° (1:10)
Video-Signal	Analogue: RGB (0,7 Vp-p), [75 Ohm]
	Digital: Based on DVI-Standard v1.0
	SDI: Single Link HD-SDI
Sync Signal	Separate Sync (TTL-Level: +/-),
	Sync on Green, Composite
	Sync (TTL-Level: +/-),
Scaling	1:1 or full screen

The display always needs the native resolution during start up.

Plug & Play	VESA DDC2B-compatible
	Energy management
	VGA: based on DPMS
	DVI: based on DMPM
Connections	1x 19 pol. DVI-D
	1x 23 pol. DVI-I
	USB calibration port
Video-In/Out	SDI-HD, Component, S-Video, Fbas
Ergonomics	Height adjustment: 60 mm
	Tilt: -5° to +35°
	Rotation: 90° left/right
Power	80W, 3W standby
Voltage	100 - 240VAC, 50/60Hz
Environment	5 - 35°C
Dimensions	approx. 602 x 520 x 220mm
Weight	approx. 15kg
VESA	100mm

iColor Display Software



iColor Display´s different calibration setups.

Activate your license by clicking "Load License" and select the "Quato iColor Display.lic" file from the CD.

Overview

Quato's iColor Display offers a clean and well organized interface that is split into the calibration part on the left and the tools part on the right. To navigate within the software, just click the buttons on the left/right side. iColor Display provides a selection of calibration setups.

- Hardware calibration for Intelli Proof/Intelli Proof LE
- Factory calibration for Intelli Color
- Software calibration CRT
- Software calibration TFT
- Profiling only (for notebooks)

Each option offers a different feature set that is optimized for the specific task. Aside from Quato monitors, all other monitors can be calibrated with iColor Display by using the manual software calibration option. In manual mode, the software supports the adjustment of gamma if the monitor can control its gamma, and whitepoint (RGB) and luminance. This offers a high precision and match to the target. Nevertheless, only the hardware calibration offers optimum results with Quato Intelli Proof Displays.

Notice: iColor Display needs administrator rights to save and load the profiles. It is also possible to enable admin rights on the profiles folder only.

Licensing

Upon the startup of iColor Display, the software searches for a connected Quato Display, and enables the features in accordance to the detected display.

If no Quato display is used, you have to manually load the license file. The license file is called „Quato iColor Display.lic" and can be found on the CD (except LE). On a Mac, open the „About iColor Display" and press the „Register" button. Now load the license file. On a PC, open the „Help Menu" and select „Register". Then load the license file.

Calibration interval

As all Quato displays support at least a basic stabilisation feature, a re-calibration is only needed on a monthly basis. If the environmental situation changes a lot or a third party display without stabilisation is used, a shorter interval might be necessary.

Setup

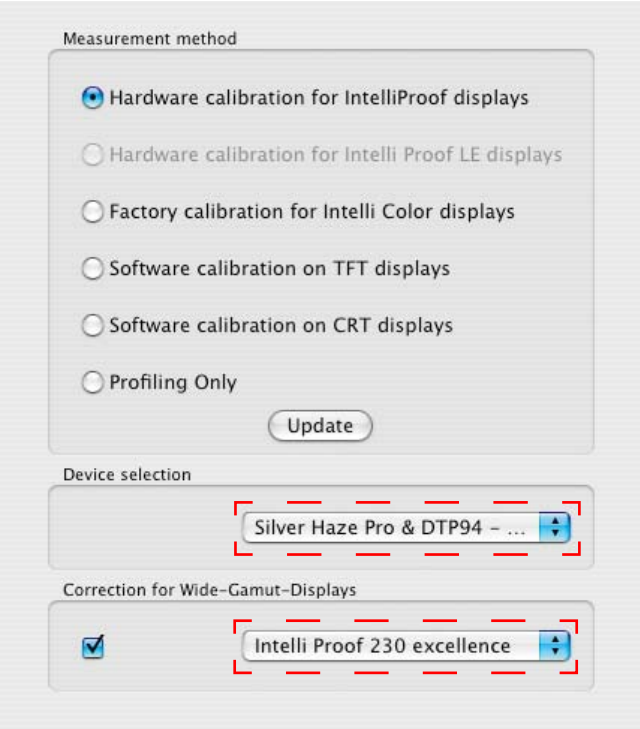
iColor Display´s main window offers six calibration setup for the different display types and calibration technologies.

Please select the calibration setup that matches your system and display. If no Quato displays are connected, the first two entries will be grayed out.

Afterwards, select your measurement device. iColor Display supports the following devices:

- Xrite Eye One Pro Spectrophotometer
- Xrite Color Munki Spectrophotometer
- Xrite Eye One Display Colorimeter
- Xrite DTP94
- Datacolor Spyder 2/3
- Quato Silver Haze Pro

Notice: As colorimeters need to be trained to specific display types and spectra, it is absolutely necessary to enable the wide gamut correction if a Quato wide gamut display, a third party wide gamut display or a display with white-LED backlight (like the Apple Cinema 24 Display or the iMac 21.5“/27“) is used in conjunction with a colorimeter (not used with spectrophotometers).



iColor Display´s startup window with the different calibration setup, the device selection and the wide gamut correction.

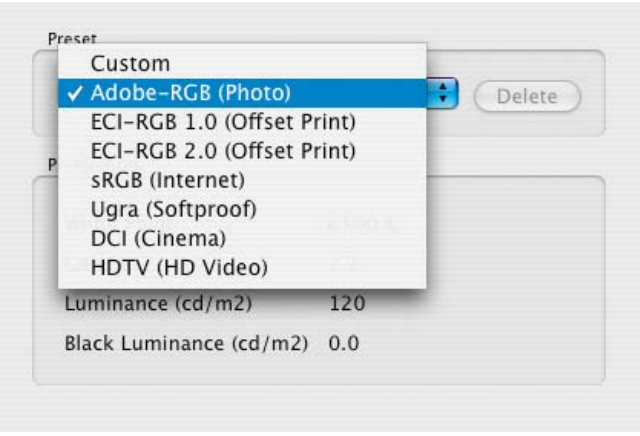
Calibration Settings

To meet the demands of novice users as well as professional or corporate users, iColor Display offers three setup options.

Easy Mode

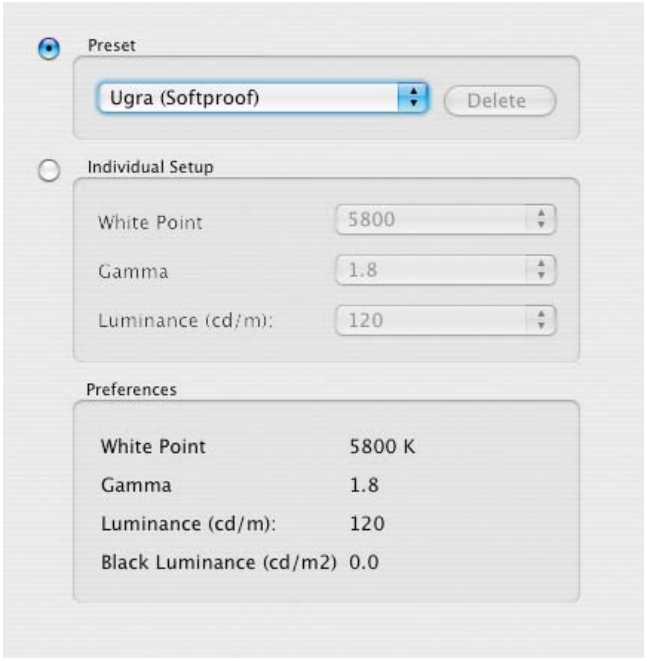
The “Easy Mode“ is targeted to novice users or corporate users that use specific corporate-wide presets. Simply select the working color space suitable for the workflow, and double check it in your preferred image-editing application. To match the most common working spaces and environments, iColor Display offers a wide range of presets:

- Adobe-RGB 6.500K, Gamma 2.2, 120cd/m2
- sRGB 6.500K, sRGB, 120cd/m2
- ECI-RGB 1.0 5.000K, Gamma 1.8, 120cd/m2
- ECI-RGB 2.0 5.000K, L*, 120cd/m2
- UGRA 5.800K, Gamma 1.8, 120cd/m2
- DCI 6.300K, Gamma 2.6, 150cd/m2
- HDTV 6.500K, HDTV, 150cd/m2

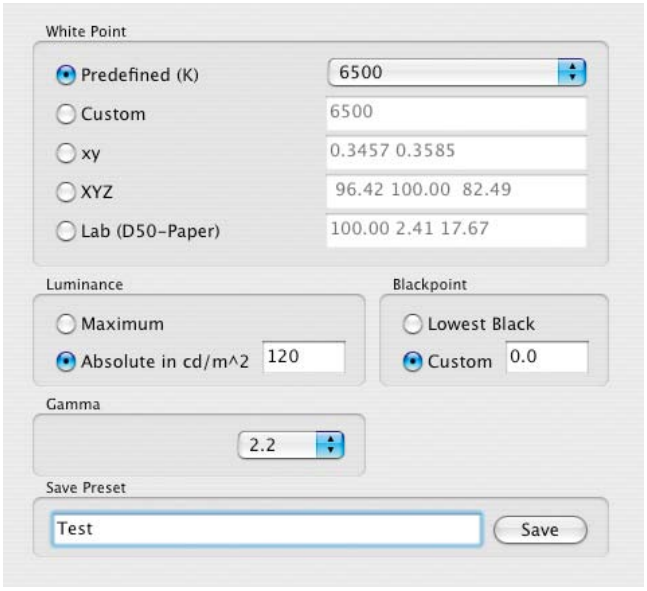


iColor Display´s easy mode for novice users.

Working space / calibration gradation match (top) vs. mismatch (bottom)



The LE mode offers a basic setup or selection of a preset.



The advanced mode offers a variety of parameters to define the calibration target.

It is possible to add more user-defined presets by saving a setup from the advanced mode (see there).

Notice: Keep in mind that the gradation of the calibration and the gradation of the used working space in Photoshop (for example) must match each other to avoid visible deviations.

LE Mode

The „LE Mode“ offers a basic setup of Whitepoint, Gamma and Luminance or the selection of one of the presets.

- Adobe-RGB 6.500K, Gamma 2.2, 120cd/m2
- sRGB 6.500K, sRGB, 120cd/m2
- ECI-RGB 1.0 5.000K, Gamma 1.8, 120cd/m2
- ECI-RGB 2.0 5.000K, L*, 120cd/m2
- UGRA 5.800K, Gamma 1.8, 120cd/m2
- DCI 6.300K, Gamma 2.6, 150cd/m2
- HDTV 6.500K, HDTV, 150cd/m2

Notice: This mode is only activated by the software if an Intelli Proof LE display is detected.

Notice: Keep in mind that the gradation of the calibration and the gradation of the used working space in Photoshop (for example) must match each other to avoid visible deviations.

If you want to gain full access to all features of the software, the LE-version can easily be upgraded to a full version.

Advanced Mode

In the “Advanced Mode“, the user has access to all advanced parameters for the calibration. Here, the whitepoint can be defined in Kelvin, in CIExy, in CIE-XYZ or with a measured paper white in CIELAB D50.

Both the white and the black point are individually configurable. The „Lowest Black“ setting will force tha calibration to use the darkest black of the used display - no matter if this black level migt have a color cast. The „Custom“ setting at 0.0 (the default) will always try to adjust the black level to a value as low as possible, but still chromatically neutral. If you want to set up a display to a specific blackpoint (for example to match different displays), then fill in the desired value in cd/m2.

iColor Display offers traditional Gamma-, L*-, HD-,

real sRGB- and auto-gradation as tonal response curves. The latter is used if a display has a specific gradation that does not match the offered tona responses.

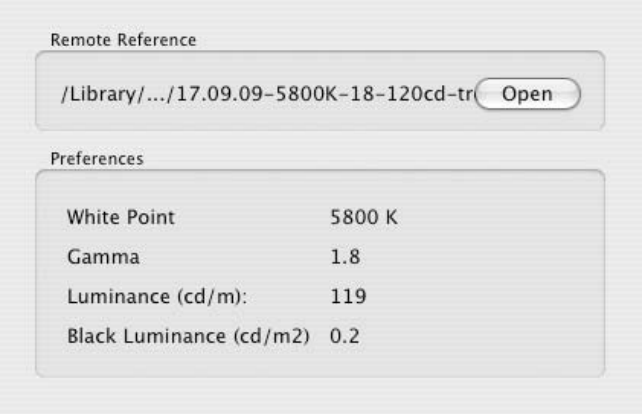
Notice: Keep in mind that the gradation of the calibration and the gradation of the used working space in Photoshop (for example) must match each other to avoid visible deviations.

The luminance should be within the defined range of ISO12646 (120cd/m2 to 160cd/m2). The maximum setting is not suited for day-to-day work.

A user setup can be saved and later be selected in the „Easy Mode“. Thus, setups can be made easily, and the users only need to select the preset for the subsequent calibrations. This is especially useful in companies where one standard is defined and everyone has to comply to this standard.

Reference Mode

With the “Reference Mode“, several Quato monitors can be matched exactly to each other - even remote. Just define one display as reference and publish the profile so that all the other users will have access to it.



The Reference Mode makes life easier for remote users.

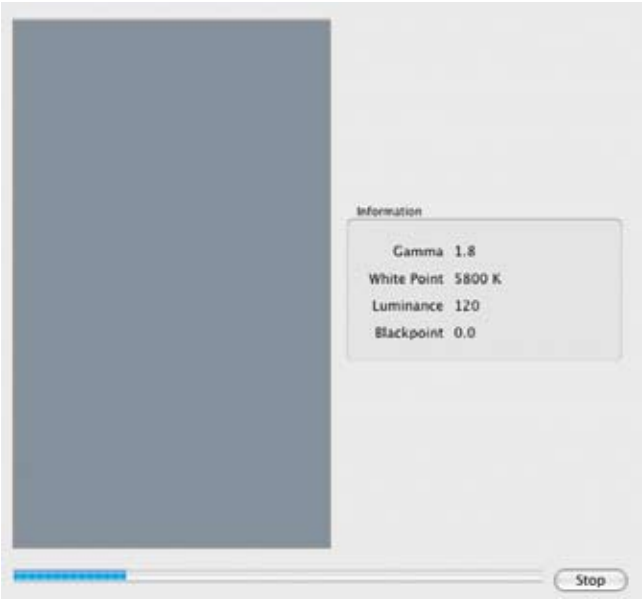
All users simply select the published profile by opening it and the exact setting of the reference display will be used for calibration. This includes the white point´s xy-values (not Kelvin), the luminance and gradation characteristics.

Notice: Keep in mind that a real match is only possible if the displays and measurement devices are all of the same type, and the used measurement devices only differ within a tight range. Mixing types and brands would result in only a basic match to the reference.

However, if the „Reference Mode“ is used with Quato displays of the same type and the measurement devices have a good inter-instrument agreement, a user display will show almost exactly the colors as the reference display.

The environmental light plays a prominent role when trying to communicate colors remotely. Therefore, it is absolutely necessary to have a consistent light in all workplaces.

Hardware Calibration



The hardware calibration is performed automatically.

When pressing the „Calibration“ button on the left, the software might request you to place the device on an opaque surface for the the black calibration. Follow the instructions on the screen and place the sensor on the measurement window.

Notice: Make sure that during calibration power saving and screen saver are switched off.

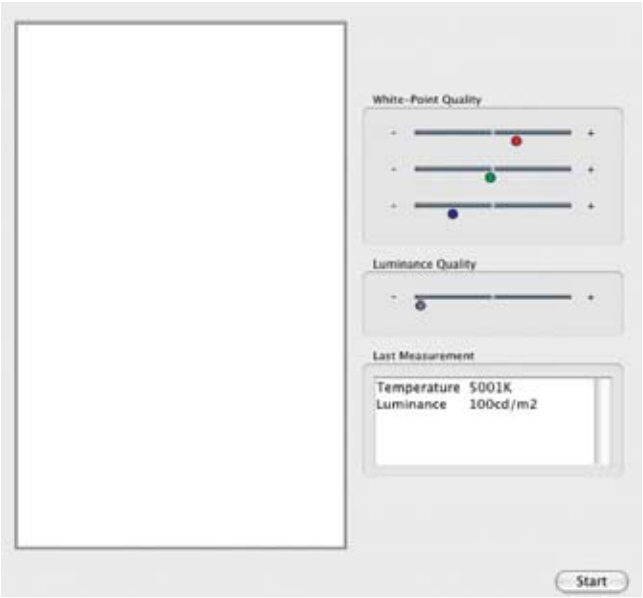
After pressing the „Start“ button, the hardware is calibrated automatically. Next to the measurement window, iColor Display shows the target values for your information. All measured values are also displayed in the color calculator widget on the right bottom of the iColor Display window. The software adjusts the internal color tables (LUT) of the monitor with up to 16-bit precision per channel via USB- or USB/DDC/ci-communication. An emphasis is put on the calibration of the gray balance in order to guarantee smooth gradients, precise color rendering and an accurate representation of the monitor’s color behavior.

The calibration itself lasts between 12-15 minutes - depending on how many iterations the software has to perform to match the target.

Software Calibration

For a software calibration, white point, gamma, contrast and luminance must be manually adjusted prior to the calibration to adjust the screen as much as possible to the calibration target.

Intelli Color factory calibration



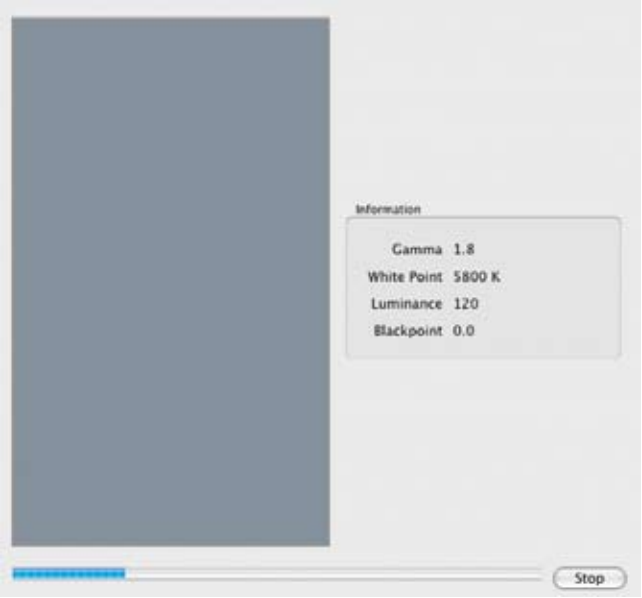
Quality indicators help adjusting the display close to the target.

At first, adjust the „Whitepoint“. The software might ask you to place the device on an opaque surface for the black calibration. Follow the instructions and place the sensor on the measurement window.

iColor Display supports the user with quality indicators that show if the adjusted level of RGB and luminance match the target. Open the OSD of the Intelli Color Display and adjust Red, Green, Blue and the luminance until the quality indicator will closely match the center and gets illuminated. If the RGB-indicators remain right of the center position, the color channels show clipping. Reduce the RGB-values in the OSD until the clipping will be gone, and the indicators will have moved to the center.

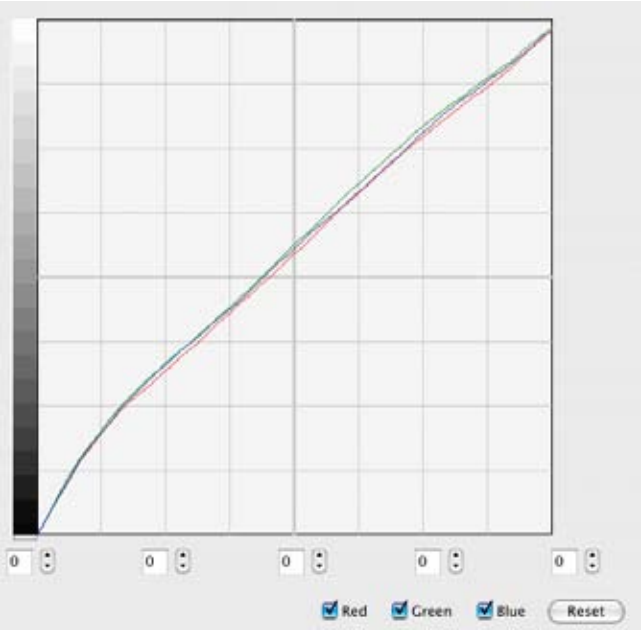
As soon as all values are adjusted close to the target, the software will automatically stop the measurement. If it is not possible to get the indicators close to the center position, the measurement has to be terminated by the user.

Next, press the „Calibration“ button on the left. After pressing the „Start“ button, the measurement will start. Next to the measurement window, iColor Display shows the target values for your information. All measured values are also displayed in the color calculator widget on the right bottom of the iColor Display window. During calibration, the remaining deviations will be corrected in the Video Card Gamma Table (VCGT) of the graphics card. The stronger the correction, the more loss in dynamic range will occur, which can result in visible banding. An emphasis is put on the calibration of the gray balance in order to guarantee smooth gradients, precise color rendering and an accurate representation of the monitor's color behavior. The calibration itself lasts between 8-10 minutes - depending on how many iterations the software has to perform to match the target.



The software calibration adjusts the remaining deviations.

The „Finetuning“ feature allows you to check the correction curves that are stored in the Videocard Gamma Table (VCGT) - often called graphic card LUT. It is possible to finetune the curves by either adusting them all together or one by one. However, this is only a finetuning function. Greater deviations between display and expectation should be corrected by adjusting the settings. Next, went on to save the profile.



Finetuning helps to optimize slight devliations.

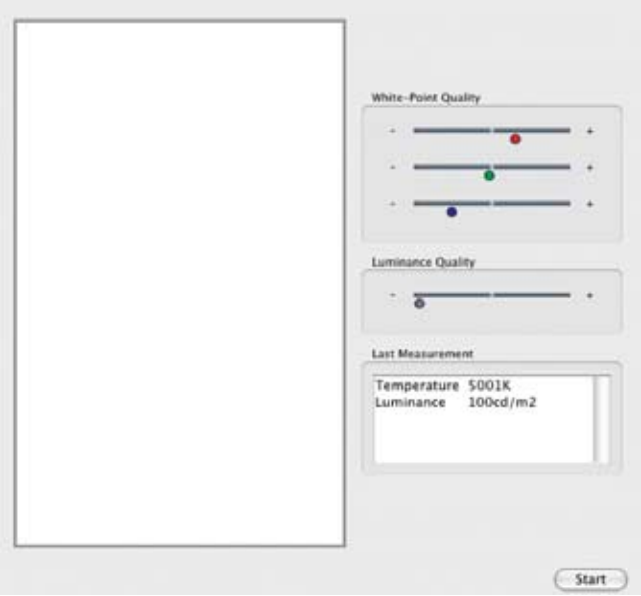
Software calibration on TFT displays

Notice: If your display does not support a gamma adjustment, start the process with the whitepoint adjustment.

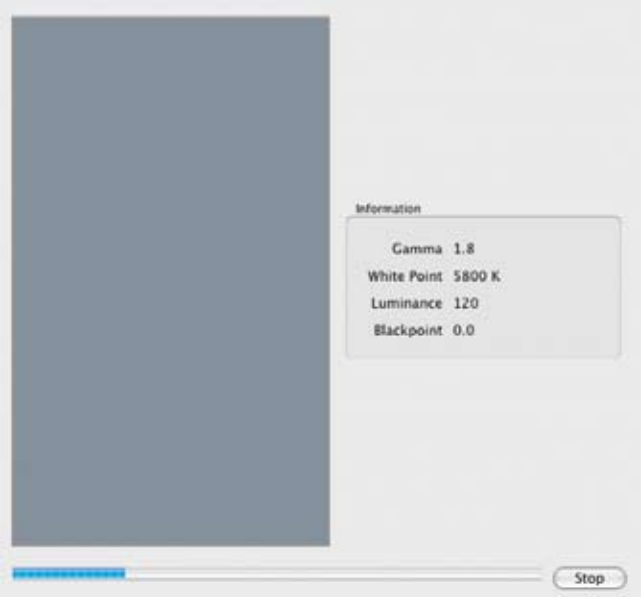
At first, adjust the „Gamma“ if your display supports a gamma adjustment. The software might request you to place the device on an opaque surface for the black calibration. Follow the instructions on the screen and place the sensor on the measurement window. Open the OSD of your display and adjust the gamma until the quality indicator matches the center position or is close to the center.

The Gamma adjustment is only usefull on TFTs that support it.

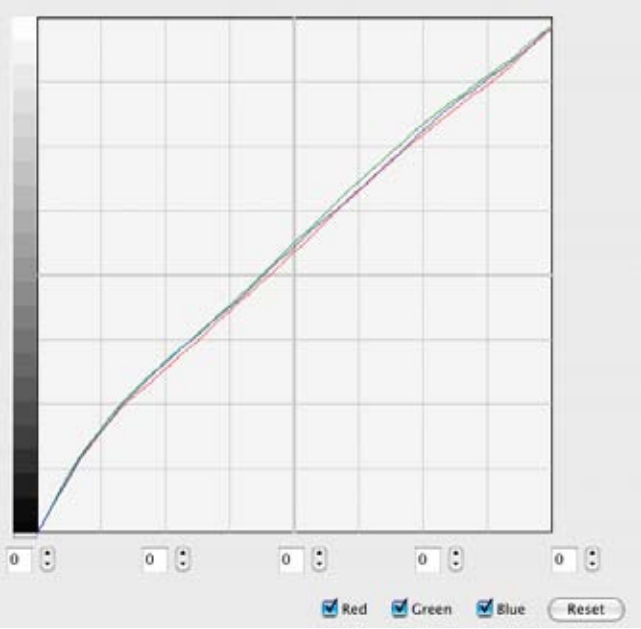
Adjusting the gamma close to your target helps to reduce the amount of correction that is needed inside



Quality indicators help adjusting the display close to the target.



The software calibration adjusts the remaining deviations.



Finetuning helps optimizing slight devlations.

the color profile. However, this only makes sense if your target is also a gamma value. If you want to use L* or sRGB, the gamma feature should be skipped.

Next, adjust the „Whitepoint“. The software might ask you to place the device on an opaque surface for the black calibration. Follow the instructions on the screen and then, place the sensor on the measurement window.

iColor Display supports the user with quality indicators that show if the adjusted level of RGB and luminance match the target. Open the OSD of your display and adjust Red, Green, Blue and the luminance (backlight) until the quality indicator will closely match the center and gets illuminated. If the RGB-indicators remain right of the center position, the color channels show clipping. Reduce the RGB-values in the OSD until the clipping will be gone and the indicators will have moved to the center.

As soon as all values are adjusted close to the target, the software will automatically stop the measurement. If it is not possible to get the indicators close to the center position, the measurement has to be terminated by the user.

Next, press the „Calibration“ button on the left. After pressing the „Start“ button, the measurement will start. Next to the measurement window, iColor Display shows the target values for your information. All measured values are also displayed in the color calculator widget on the right bottom of the iColor Display window. During calibration, the remaining deviations will be corrected in the Video Card Gamma Table (VCGT) of the graphics card. The stronger the correction, the more loss in dynamic range will occur, which can result in visible banding. An emphasis is put on the calibration of the gray balance in order to guarantee smooth gradients, precise color rendering and an accurate representation of the monitor’s color behavior. The calibration itself lasts between 8-10 minutes - depending on how many iterations the software has to perform to match the target.

The „Finetuning“ feature allows you to check the correction curves that are stored in the Videocard Gamma Table (VCGT) - coften alled graphic card LUT. It is possible to finetune the curves by either adusting them all together or one by one. However, this is only a finetuning function. Deviations between display and expectation should be corrected by adjusting the settings. Now, went on to save the profile.

Software calibration on CRT displays

At first, adjust the „Brightness / Contrast“. The software might request you to place the device on an opaque surface for the the black calibration. Follow the instructions on the screen and place the sensor on the measurement window. Open the OSD of your display and adjust brightness and contrast until the quality indicator matches the center position or is close to the center.

Next, adjust the „Whitepoint“. Follow the instructions on the screen and place the sensor on the measurement window.

iColor Display supports the user with quality indicators that show if the adjusted level of RGB and luminance match the target. Open the OSD of the Intelli Color Display and adjust Red, Green, Blue (gains) until the quality indicator will closely match the center and gets illuminated. If the RGB-indicators remain right of the center position, the color channels show clipping. Reduce the RGB-values in the OSD until the clipping is gone and the indicators move to the center.

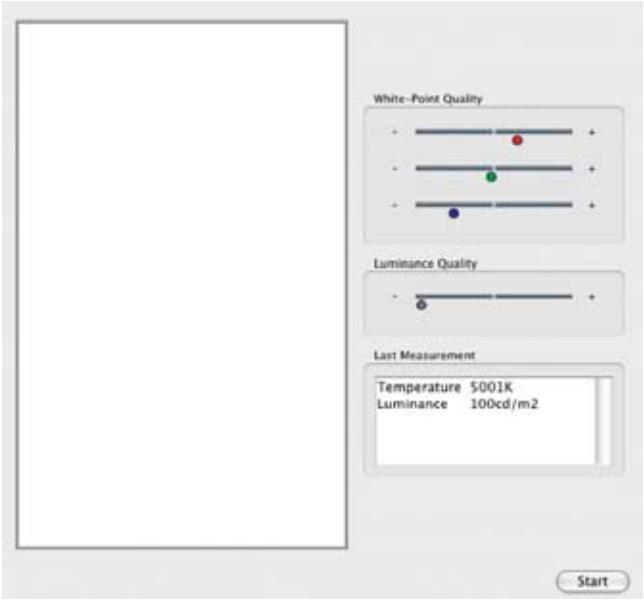
As soon as all values are adjusted close to the target, the software will automatically stop the measurement. If it is not possible to get the indicators close to the center position, the measurement has to be terminated by the user.

Next, press the „Calibration“ button on the left. After pressing the „Start“ button, the measurement will start. Next to the measurement window, iColor Display shows the target values for your information. All measured values are also displayed in the color calculator widget on the right bottom of the iColor Display window. During the calibration, the remaining deviations will be corrected in the Video Card Gamma Table (VCGT) of the graphics card. The stronger the correction, the more loss in dynamic range will occur, which can result in visible banding.

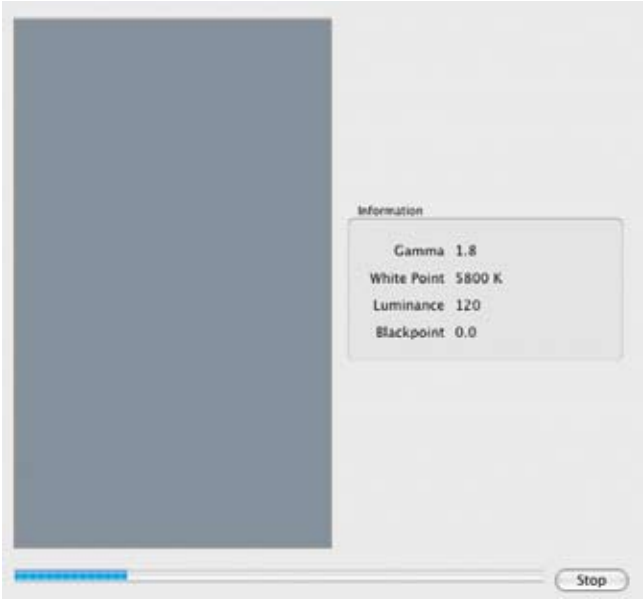
An emphasis is put on the calibration of the gray balance in order to guarantee smooth gradients, precise color rendering and an accurate representation of the monitor’s color behavior.

The calibration itself lasts between 8-10 minutes - depending on how many iterations the software has to perform to match the target.

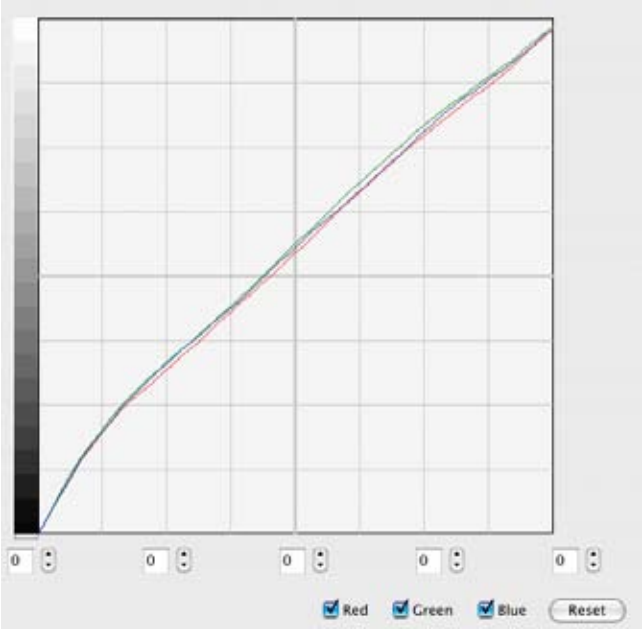
Quality indicators help to adjust the display close to the target.



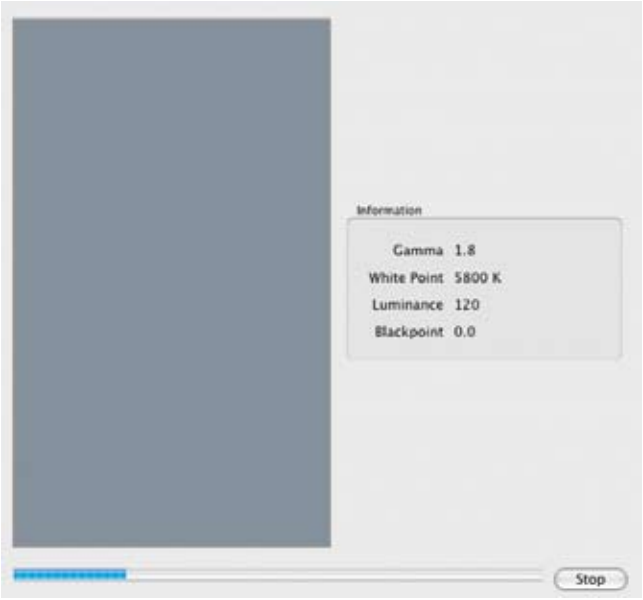
Quality indicators help to adjust the display close to the target.



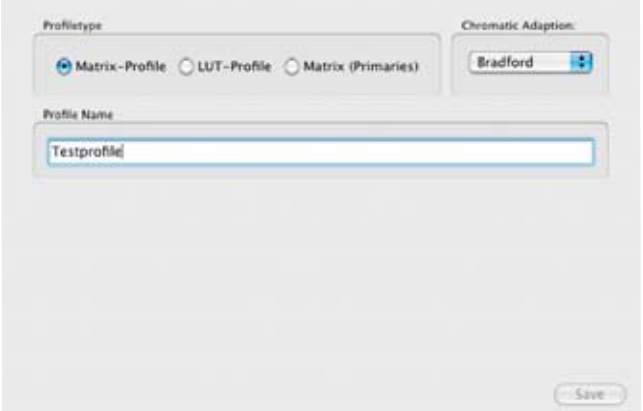
The software calibration adjusts the remaining deviations.



Finetuning helps to optimize slight devlations.



The software calibration adjusts the remaining deviations.



Saving the profile is the last step of the calibration process.

The „Finetuning“ feature allows you to check the correction curves that are stored in the Videocard Gamma Table (VCGT) - often called graphic card LUT. It is possible to finetune the curves by either adusting them all together or one by one. However, this is only a finetuning function. Greater deviations between display and expectation should be corrected by adjusting the settings. Next, went on to save the profile.

Profiling only

This calibration setup is useful for displays that do not allow any kind of hardware adjustment (like notebooks) and have a small gamut and bit depth.

Keep in mind, that if there is a VCGT loaded on your graphic card, the profiling feature will not skip it, but use it as the basis of the profiling. If you want to have a linear VCGT, set up a profile for the display with a linear VCGT prior to the profiling process.

The software might ask you to place the device on an opaque surface for the the black calibration. Follow the instructions on the screen and then, place the sensor on the measurement window.

During profiling, only the color characteristics will me measured. No correction or adjustment to a specific target whitepoint or luminance will take place. However, as the display is now precisely described, colormanagement applications are able to transform color correctly.

Next, went on to save the profile.

Saving the profile

After the adjustment and calibration process, the profile can be saved in three different ways.

- optimized matrix profile with a mixture of primary/secondary colors (on by default)
- 16-bit XYZ LUT profile incl. XYZ matrix
- primary color matrix profile

A display with a linear behaviour is best suited by the default opti mized matrix. To gain more precision, a LUT profile can be used for applications that support LUT based display profiles - like Photoshop CS3 or newer. Older Photoshop releases do not support display LUT profiles.

For a whitepoint other than D50, a Bradford chromatic adaptation is activated by default. Additionally, XYZ-scaling (reverse vonKries), vonKries, CAT02 and LMS are also available.

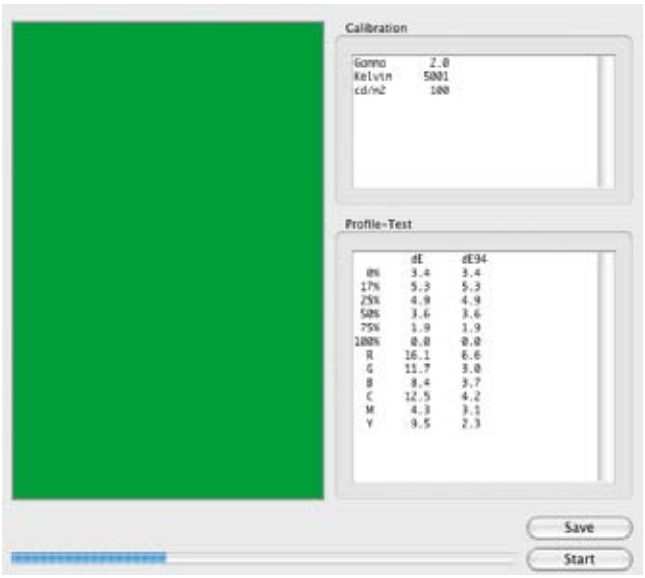
Profile Test

To evaluate the precision of the calibration and profile, iColor Display offers a set of test features.

Notice: Necessarily perform the evaluation right after saving the profile to make sure that the instrument has neither changed its position on the screen nor remains on the screen for too long and got warmed up (temperature influences precision).

Profile Test

Place the measurement device on the measurement window (if not already placed there), and press the „Start“ button. iColor measures the primary and secondary colors plus a short gray balance and displays the results for both, ΔE1976 (Lab) and ΔE94. Values lower than 5ΔE are generally acceptable. You can save the results in an extensive report as a PDF.



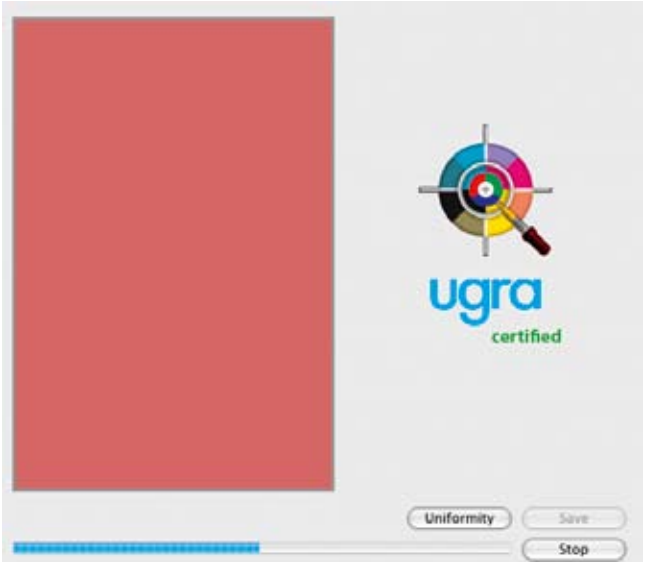
The profile test offers an overview about the profile precision.

UDACT

The ugra Display Analysis and Certification Tool (UDACT) allows - for the first time ever - the individual and objective certification of softproofing and color displays. Backed up by the reputation of the Swiss Center of Competence for Media and Printing Technology, the UDACT is the first institutional approach for the certification of soft proofing displays.

In today´s media landscape, an objective certification of the calibration precision - like the ugra/fogra MediaWedge for contract proofing - is one of the most demanded developments. There is a lot of confusion on the user´s side regarding the precision and usage of softproof displays. This is also due to the different color deviation methods and specifications used in the validation routines of today´s calibration software.

As a result, it is impossible to compare the validation results of product A with product B. There are too many unknown variables in use. Therefore, the user has some fundamental questions:



The UDACT certification evaluates displays and includes recommendations for the use.

If a display passed the tests, the “certified” or “passed” logotype will be displayed.

If a display fails in only one of the UDACT criteria, then the whole certification fails.

UDACT´s ISO 12646-compliant uniformity check.

UGRA
Display Analysis & Certification Tool
Report

Basics

Date:	2009-1-12 10:08:28
Report-Version:	v1.3.1
Monitor-Name:	QUATO 230
EDID-Name:	QUATO 230
EDID-Serial:	DTCG23A0046
Profile:	/Library/ColorSync/Profiles/12.01.09-5800K-18-120cd-trc.icc
Created:	2009-1-12 9:59
Measurement device:	eye-one pro

Summary

The monitor has passed the certification according to the UGRA DACT specifications.

Calibration

White Point	yes
Gray balance	yes
Profile quality	yes

Softproofing

MultiColor, HighBody	no
Offset/Gravure Paper Type 1/2	yes
Offset on uncoated paper	yes
Newspaper Printing	yes
sRGB	yes
AdobeRGB	no
ECI-RGB	no

Diagram

WhitePoint
Gray Balance
Profile Quality
Softproof Quality

The UDACT report can be saved as a PDF.

· Which settings should be used?
· How precise is the calibration?
· Is the monitor suited for calibration?
· Which printing technology can be reproduced on the screen?

A good answer to these questions could be an ISO regulation. Fortunately, the ISO 12646 and ISO 14861 will help to get things sorted, but both are not intended for a desktop certification.

Thus, these regulations do not enable users to certify their individual display, but give some guidelines for testing and certification and define minimum requirements only.

The aim of ugra Display Analysis and Certification Tool is to implement a foundation for the objective, quality-oriented and comparable evaluation for an individual soft proofing display. In addition to the certification process, a recommendation for a specific printing is also given.

Notice: UDACT is only available for hardware-calibrated Quato displays and the Intelli Color series.

SWOP certification and Media Wedge measurement

The SWOP certification can be used to check whether a Quato display and the color reproduction in Adobe Photoshop match by using a special SWOP testimage and ICC-profile.

To perform the certification, the Quato SWOP ADS (application data sheet) has to be followed. The complete ADS and necessary files can be found on the Quato website and on the Quato CD.

At first, calibrate the display by using the following parameters:

- Gamma 2.3
- Whitepoint 5.000K
- LUT-profile

It is also possible to use a different setup, but the certification will not be based on the ADS.

Then, you can measure the SWOP control wedge within the software. The report on the left will tell if the unit has passed or not.

Next, copy the „Quato_SWOP_2006_0320.ICC“ profi-

le to your operating system´s profile folder.

To check the color rendering in Photoshop, open the supplied „Quato_SWOP_controlbar.tif“ image and follow the instruction below:

Open the file: “Quato_SWOP_controlbar.tif” in Photoshop and set the viewing size of the file to 200%.

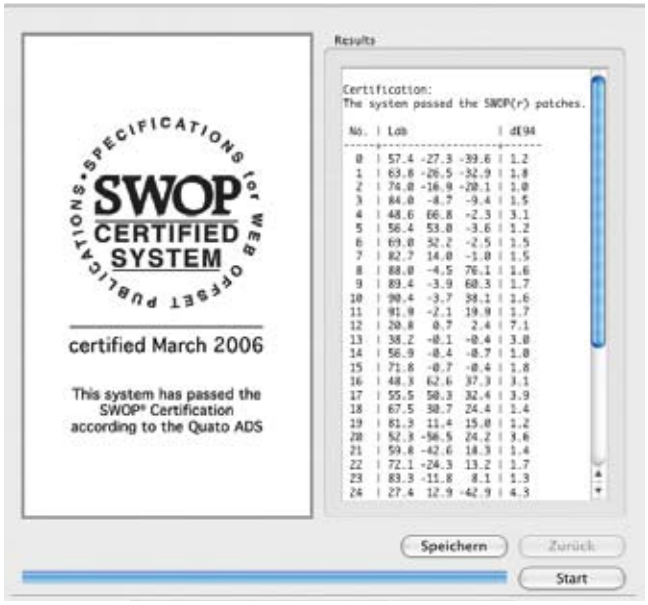
Choose: Proof Setup from the View Menu in Photoshop, then „Custom“. In the dialog, choose the “Quato_SWOP_2006_0320.ICC” profile and make sure that both „Preserve CMYK Numbers“ and „Simulate Paper Color“ are selected. This will ensure that you are properly viewing a SWOP proof in Photoshop.

Validate the Quato display by following the instruction in the SWOP validation tool. First measure the white patch in the Quato application before moving the iColor Window out of the center of the screen as shown on the right side. Then move the proper patch of the “Quato_SWOP_controlbar.tif” file in Photoshop to the center of the screen, and measure each patch in the order instructed.

The Delta E values should remain less than 3.0 ΔE maximum / 2ΔE average for a SWOP Certified display system in Photoshop.

If the systems passed certification, a SWOP logo will appear and a report of the validation process can be saved and printed.

Make sure to follow the instructions for a SWOP certification.



If the system complies to the SWOP ADS, the logo will appear.

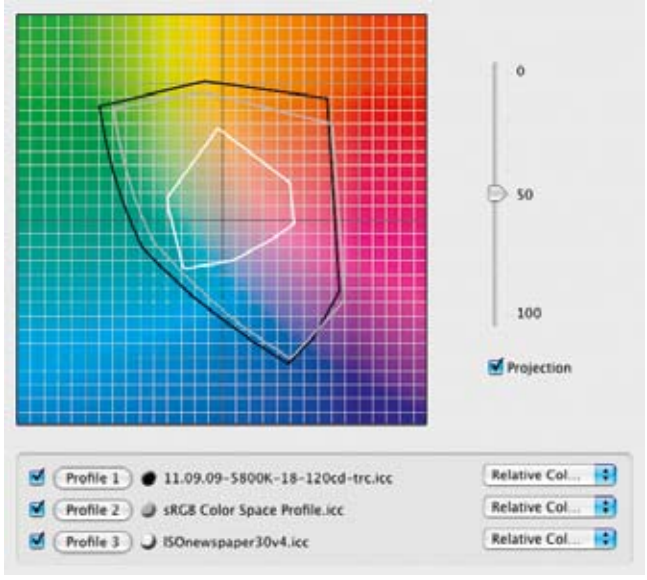
Gamut Viewer

The Gamut Viewer offers the ability to display up to three ICC-Profiles in a*b* projection or slices through the luminance levels.

The profile of the active calibration is always shown on top of the three profiles. You can now open any other ICC-compliant profile to evaluate the gamut and rendering intent.

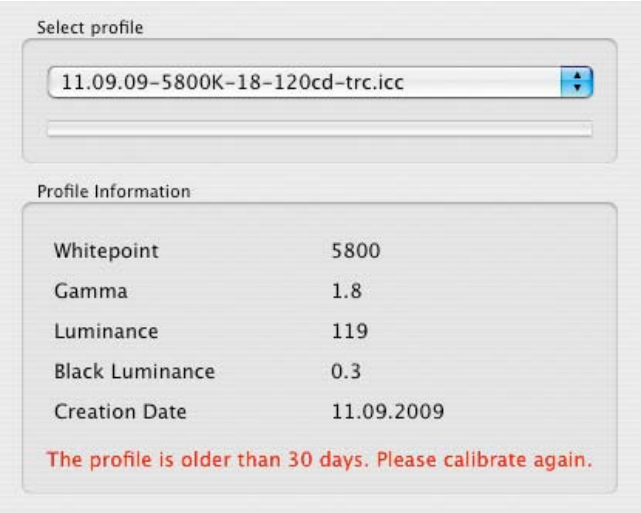
Comparing the monitor profile for example to ISOcoated_v2 or Adobe-RGB illustrates the gamut match between the display and the other color spaces.

To switch between the luminance levels and the projection mode, simply select/deselect „Projection“.



The gamut viewer supports two different modes.

Select Profile



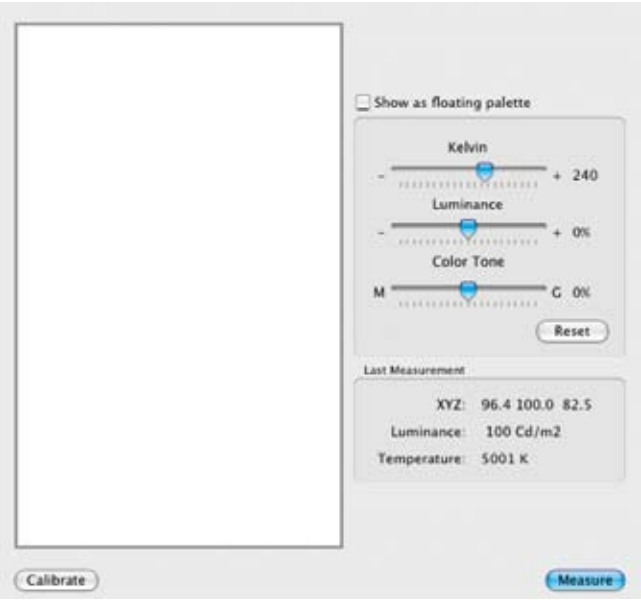
iColor Display can upload/activate profiles and register them.

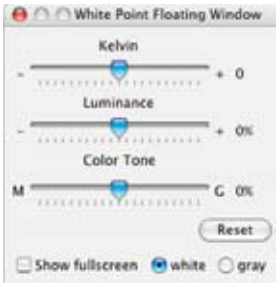
iColor Display offers the ability to upload/activate profiles. If an Intelli Proof display is used, the activation will upload the profile to the display´s LUT and will register it to and activate it for the operating system. This feature can also be used to switch between different calibration setups within a minute.

If a non-Quato display is used, the activation will register it to and activate it for the operating system.

If a profile is older than 30 days, the software will display a warning. It is not recommended to use profiles older than 30 days. However, the software will not limit the use of older profiles.

Whitepoint Editor





The Whitepoint Editor allows to adjust the whitepoint for a screen to screen or screen to viewing booth match.

To match two displays to each other or a display to a D50 viewing booth, iColor Display offers an easy-to-use whitepoint editor.

To perform the adjustment, select „Show as floating palette“ and select „Show fullscreen“ with either a gray or white background. The gray background is best used to adjust two displays to each other while the white background is best suited to match a display to a viewing booth. To match it to a viewing booth, the paper - for which the adjustment should be done - must be inside the booth. Keep in mind that display(s) and viewing booth need to have a quite similar luminance

To adjust the whitepoint, simply move the „Kelvin“ slider. Doing so will move the whitepoint exactly up/down on the black body curve (the target of every calibration is at first the black body curve).

To finetune the luminance, iColor Display can reduce the luminance of every display. However, the increase only works if an Intelli Proof display is connected.

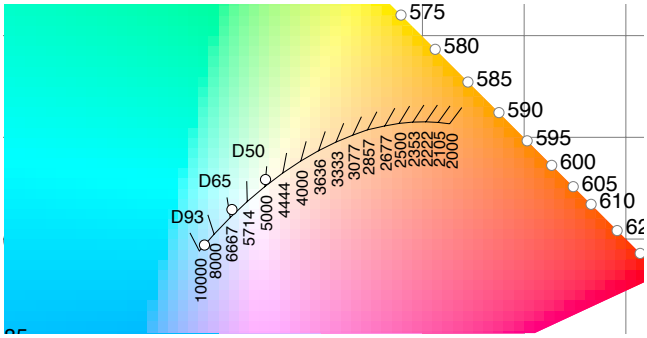
If the visual match cannot be fully performed by the Kelvin and luminance adjustment, it is possible to adjust a color tint. This will move the whitepont away from the black body curve.

Notice: UDACT will always check if the whitepoint deviation from the black body curve is not more than 3 ΔE. If the „Color Tone“ adjustment moves the white-

point too far away from the black body curve, UDACT will fail. However, in this case the visual match has a higher priority than a metrical base.

When the visual match is performed, return to the main window, place the measurement device on the screen and measure the whitepoint. Then press „Calibrate“ to re-calibrate the display to the new whitepoint and - if adjusted - luminance. The tonal response of the original profile will be kept.

Notice: It is necessary to perform an initial calibration becauee iColor Display needs a basis for the calculations.



The black body curve within the chromatic diagram.

Spot Color / Color Differences

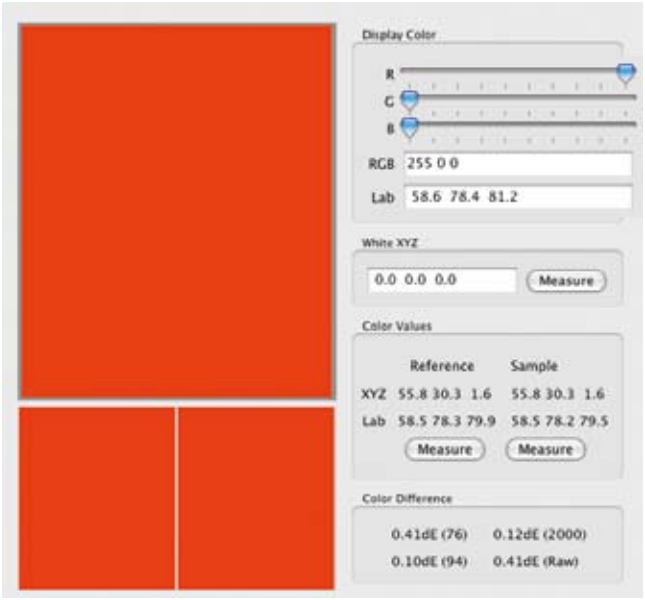
To evaluate the color representation, iColor Display’s Spot Color measurement allows to measure two colors and calculates the color deviation between them. Possible colormanagement workflow issues can be traced by measuring between two applications - for example Red 255 in Adobe Photoshop and Adobe Indesign.

At first, place the measurement device on the measurement window. Then, perform a white measurement and press „Measure“.

You can either define a color in iColor Display, measure it here, define the same color in another application and perform a second measurement.

You can also measure any color in an application. Define the color in one application (like Photoshop) and measure the reference there. Then, define the color in the second application and measure the sample. Make sure that the position of the measurement device is not changed to avoid wrong readings due to display non-uniformity.

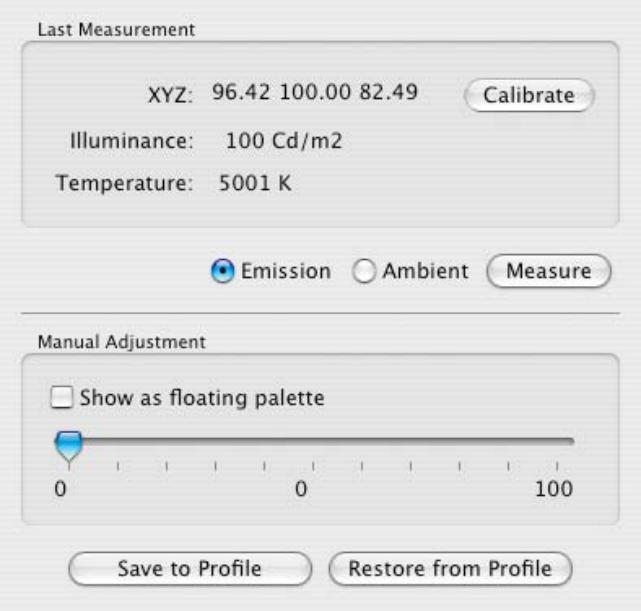
iColor Display will display the color deviations below the measured values.

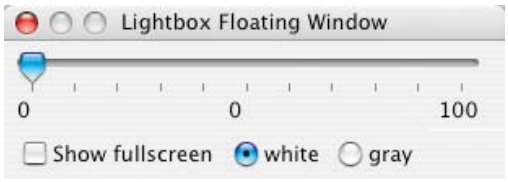


The spot color option lets you compare colors .

Lightbox

This feature is used to measure the luminance and paper white of a whitebox and to adjust the luminance with USB-interfaced lightboxes from Quato or Just. Additionally, you can perform ambient light measurements if the measurement device supports





The Lightbox adjustment helps to set the right whitepoint and luminance for display to lightbox comparisons.

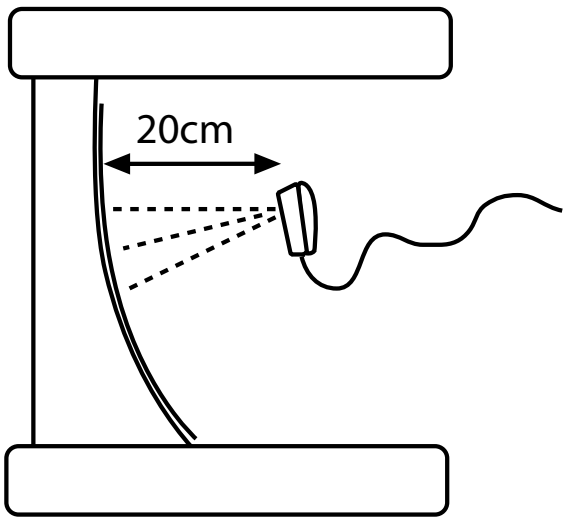
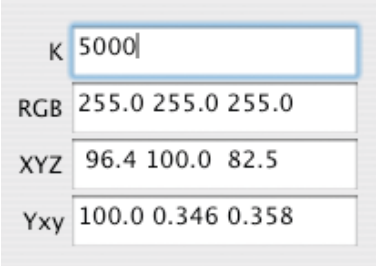


Illustration of the measurement of paper inside a viewing booth.



The color calculator widget.

this.

If a USB-interfaced lightbox is attached (and the drivers are installed!), the luminance of the booth can be adjusted by using the slider.

To get a better match, open the floating palette and switch to full screen in white. With a paper in the lightbox, you can visually adjust the lightbox to the best matching value in comparison to the display.

You can then write the adjusted value to the actual display profile and can later restore the values from the profile.

To perform an ambiant measurement, place the ambient light head (if necessary) on the device (Eye One Display 2, Eyoe One Pro and Color Munki) and follow the instructions. The ambient measurement is only for reference purposes. It is not recommended to calibrate a display based on ambient light measurements.

To measure the paper reflection and use this for the calibration, place the measurement device with 20cm distance to the paper inside the booth as shown in the illustration on the left. Then press „Measure“ and calibrate the display to the measured whitepoint. The tonal response of the initial profile will be used.

You can later use the whitepoint editor to finetune the visual match.

Notice: It is necessary to perform an initial calibration because iColor Display needs a basis for the calculations.

Color Calculator

The color calculator widget on the right bottom of the iColor Display main window shows the latest measured color during measurement.

However, the widget can also be used to calculate colors from and to different standards. If you, for example, type in a correlated Kelvin value, the software will tell you about the corresponding XYZ, Yxy and RGB (based on the active profile) values. This also works vice versa, but then not the correlated but the real Kelvin value will be shown.