reference

basICColor

by Color Solutions Software

basICColor gray card

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Karl Koch, Markus Hitzler • Color Solutions

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Preface

basICColor gray card

Thank you for purchasing a basICColor gray card. You have acquired a very versatile control tool. Together with the desktop background files it can be used for checking monitor calibration and for setting the luminance of your viewing booth (if dimmable). Combined with a spectrophotometer, ambient light can easily be measured. In digital photography the gray card can be used for white balance and as a digital exposure meter.

The desktop backgrounds are designed for quality control of your monitor settings. Calibration should be performed, using a spectrophotometer or a colorimeter and suitable monitor calibration software. You will find information on basICColor display, the renowned monitor calibration and profiling software by Color Solutions, on our web pages (http://www.basICColor.de). Visual calibration/profiling with test images (like in OS X) will never lead to a satisfactory result since you can only adjust black (brighnes control) and white (contrast control). There is no exact information on gradation (luminance responcse curve), primary colors or gamut of your individual monitor.

In addition to controlling your own workflow the Color Solutions desktop background images are an efficient tool to make sure, your images are being viewed correctly on your customers´ or partners´ monitors.
Just ship the desktop background images with your data!
This allows your customers or partners to check their monitors for correct settings and calibration.
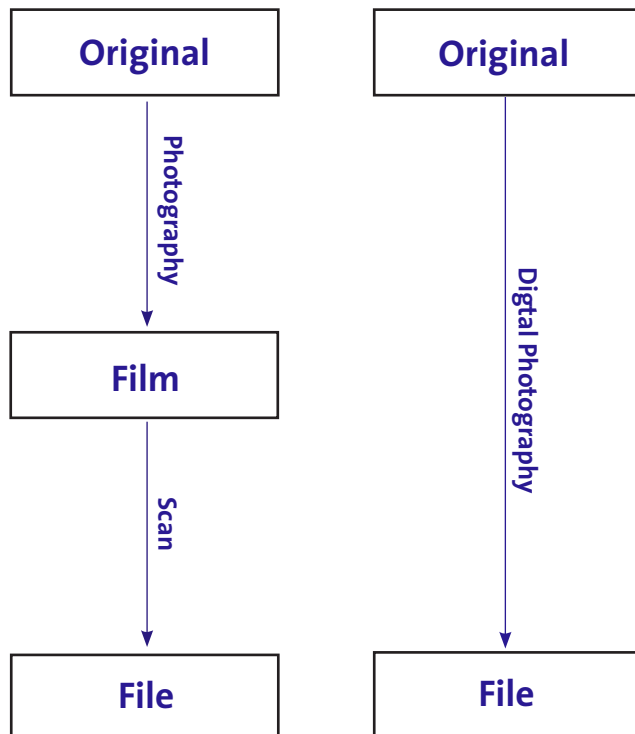
Introduction

Demands on Gray Cards

basICColor gray card

Gray Card for Digtial Photography and Pre Press

Digital photography offers the user a wide range of new possibilities. Color fidelity in particular can be improved tremendously. Instead of two conversions (Original -[Photography]- Film, Film -[Scan]- File) only one is required (Original -[Photography]- File). Color conversion from original to film is obsolete. That is the step which is not easily controlled, while scanning delivers very exact color reproduction when colormanagement is applied. Merging of the capture and the scanning process in digital photography eliminates color problems in film that otherwise cannot be corrected. In order to achieve exact color reproduction, the digital camera needs to be calibrated and profiled - just like the scanner in a conventional 2-step process.

Varying lighting conditions present a special challenge in digital photography. While all ICC-compatible programs (camera software, Photoshop, InDesign, RIPs,...) are based on the internationally (through ISO standards) standardized lighting D50 (daylight, 5000 Kelvin, equals approximately sunlight at noon), photographers are dependent on the actual lighting in the present scene. While it is necessary to standardize viewing conditions as a basis for color conversions due to a vast variety of substrates, processes (photo paper, inkjet printers, laser printers, offset, gravure, thermo transfer,...), daylight is ever changing and does not very often equal D50. Unfortunately even artificial light sources like studio flash lights do not show a spectral distribution similar to D50.

Left diagram

Original

↓ *Photography*

Film

↓ *Scan*

File

Original

↓ *Digital Photography*

File

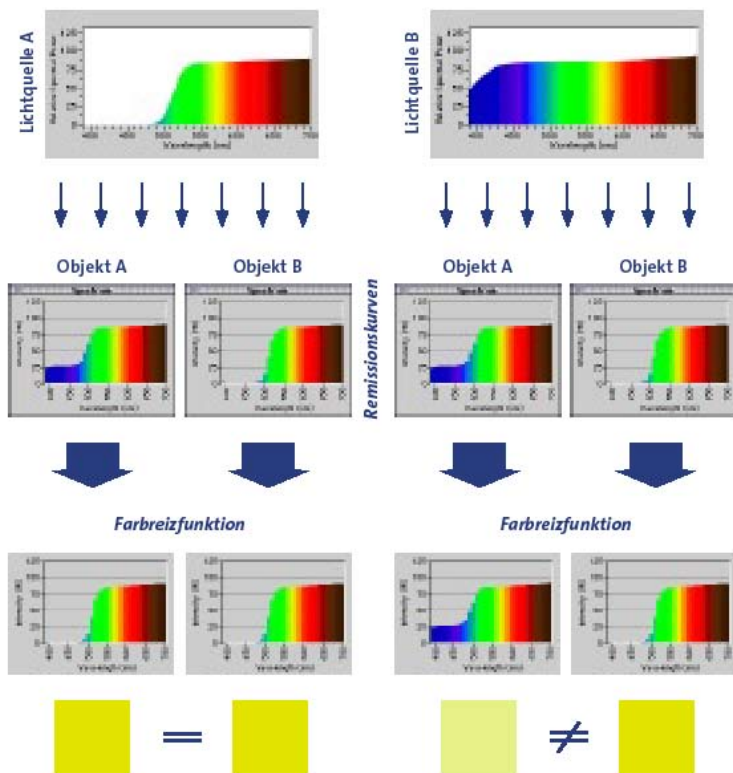## Right

Normlicht D50

Standard Illuminant D50

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Demands on Gray Cards

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Relative Spectral Distribution

When working with different illuminants, metameric failure will occur regularly. The color of two objects will look the same under one light, but they differ under another light. In everyday life you see this effect when shopping for clothing - clothes match under shop light and do not match under sunlight – or vice versa.

The white balance target bears a special relevance in respect to metamerism. If the photographer uses a metameric gray card for this purpose, all images taken under a non-D50 lighting situation will produce a color cast, although the camera had been calibrated to gray. The cast depends upon the type of metameric failure. This effect is known for most gray cards, even from well known manufacturers in the photographic industry. That´s why Color Solutions developed the *basICColor gray card* . Because of its spectral remission properties, it is nearly free of metameric failure. The color shift under different lighting situation remains way under the threshold of visual perception. Or, in brief, the *basICColor gray card* looks the same under all viewing conditions: gray without a cast.

For your reference, you find comparative measurement data of the most common commercially available gray card and the basICColor gray card on the next page. Neutral gray without a color cast is identified by it´s lightness L* (absolute black: L*= 0, ideal white: L*= 100) and a*(red-green axis) as well as b* (yellow-blue axis) are equal to 0 in the L*a*b* color model. The threshold in visual perception is approximately 1 unit (Delta E) for the average human observer. A color cast will be perceived as a bigger difference than a difference in lightness.

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Demands on Gray Cards

basICColor gray card

Comparison table:

Lighting	basICColor gray card		other gray card	
	a*	b*	a*	b*
Standard illuminant A	-0,26	-0,46	-0,46	+2,24
Standard illuminant C	-0,10	-0,42	-1,52	+2,59
Standard illuminant D50	-0,18	-0,41	-1,11	+2,48
Standard illuminant D65	-0,13	-0,39	-1,51	+2,63
Standard illuminant F2	-0,06	-0,48	-1,17	+2,66
Standard illuminant F7	-0,07	-0,44	-1,58	+2,63
Standard illuminant F11	-0,12	-0,53	-1,52	+2,70
Standard illuminant F12	-0,17	-0,53	-1,24	+2,83
Standard illuminant D75	-0,11	-0,38	-1,71	+2,69
Metameric Failure	0,20	0,14	1,25	0,59

Measurements were taken with an X-Rite 939. Since the other gray card contains optical brighteners, we measured with UV-cut filter (in favour of the other gray card). Measurement data for the *basICColor gray card* are exactly the same with or without UV-cut filter, while the other card differs in the b* value by approximately 1 unit. While the *basICColor gray card* has a* and b* values way under 1 for all lighting conditions (with a variation of less than 0,2), the other card has a visible greenish-yellow cast with a metameric failure of up to 1,25 Delta b* and 0,59 Delta a*. This is a visible difference for the human obsever, but much more so for a digital camera. For your reference: Standard illuminant A has a color temperature of 2856 Kelvin, D75 has 7500 Kelvin F2, F7, F11, F12 are fluorescent lamps.

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Demands on Gray Cards

basICColor gray card

For all these reasons the *basICColor gray card* is perfectly suited as a reference for gray and lightness comparisons for all systems used in digital photography, especially in combination with the Color Solutions desktop background.

- White balance of digital cameras for profiling and shooting
- Exposure meter (digital via color picker with profile active, analog with correction factor)
- Lightness setting of viewing booth and monitor (visually and instrumented)
- Light meter for adaptation of color temperature between monitor and viewing booth
- visual check of monitor calibration

The *basICColor gray card* was developed with the production principles of the ECI in mind (more free information under www.ECI.org). From there you can download the working space eciRGB which is based on a gamma of 1.8. The more advanced version of a working space, LStar-RGB, can be downloaded from www.LStar-RGB.com. LStar is also the tonal response curve, monitors for imaging work should be calibrated to. It allows for a harmonic distribution of grayscales in accordance with the human perception, and detail in midtones and highlights. A detailed survey regarding the usability of different working spaces can be found at www.LStar-RGB.com.

At these workstations and in imaging programs you should choose a midtone gray (R=G=B=153) for a desktop background. This kind of gray equals L*=60 under an LStar calibration. This kind of lightness is best suited for checking the gray representation of your monitor, since color casts are more irritating in light and midtone grays than in dark tones.
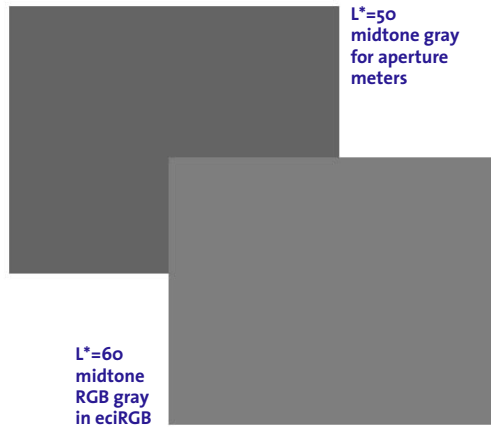
For Gamma 1.8 settings see www.LStar-RGB.com.

Color Solutions desktop background

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Demands on Gray Cards

basICColor gray card

**L*=50
midtone gray
for aperture
meters**

**L*=60
midtone
RGB gray
in eciRGB**

These are the reasons why the *basICColor gray card* for use in digital photography and pre press has a remission factor of 25%. This equals a midtone gray of L*=60. Gray cards made for conventional aperture metering (e.g. Kodak gray card) have a remission factor of 18% which equals a colorimetric midtone gray of L*=50. This value is stored in aperture meters as a reference for object measurements. For conventional aperture meters, an exactly neutral grey without metameric failure is of minor importance.

If you should intend to use the *basICColor gray card* for conventional aperture meters, you need to apply a correction factor of 1/2 f-stop. In digital photography the color picker should show values of 125 to 130 (R=G=B) in eciRGB or 150 to 155 in LStar-RGB.

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Installation

basICColor gray card

Installation

1. Desktop Background

On the CD-ROM you find desktop background images for different monitor resolutions (1024x768, 1280x1024, 1600x1200,...). Please copy the image with the resolution corresponding to your graphic card settings to your hard drive.

If your system is set to a resolution for which we do not offer the correct image, you can adapt one of a lower resolution in Photoshop (or a similar program). Please retain the embedded profile, when opening the image in Photoshop. Pick the background gray and increase the size of the image to the full monitor size and resolution. Never scale the images since the gamma control elements only work at the original size and resolution (100%).

Then select this file as the desktop background on your computer. You may have to select 2 different images on 2-screen systems, if your 2 monitors are different in size or resolution. Under windows you find the settings under "Start - System - Display" and the Tab "Background" or "Desktop". Under Mac OS 9 you find these settings in the control panel "Appearance" in the Tab "Desktop".
Under Mac OS X, open "Desktop" in "System Preferences".
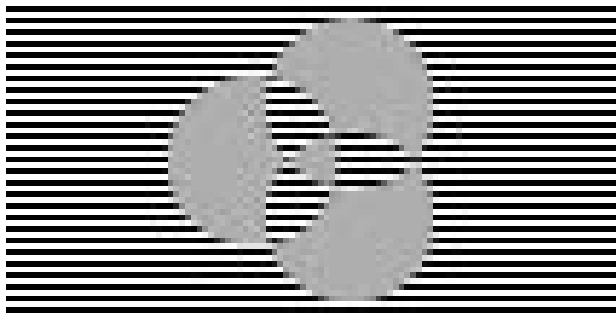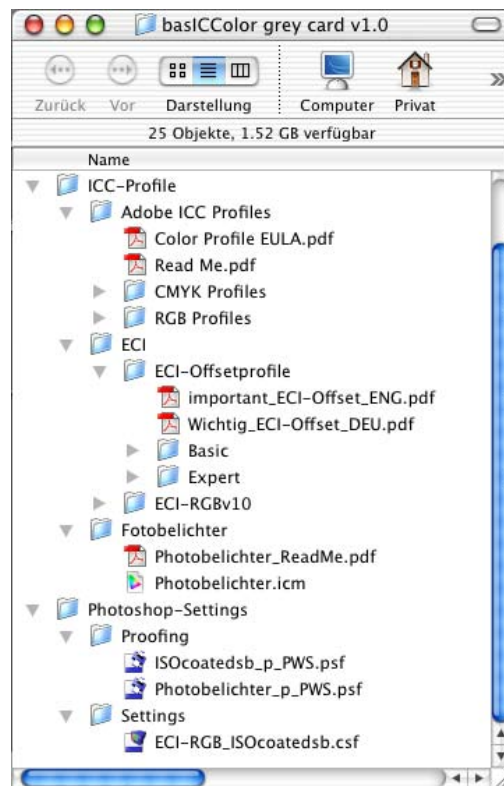

Enlarged gamma control element

The black and white lines are 1 pixel wide. In order to function properly the control element has to be used without scaling (100%). Scaling results in Moiré effects, which disables the gamma control element.

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2. ICC-Profiles

you also find some ICC-Profiles on the CD-ROM. More information please find in the PDF-files in the relevant folders. Please copy the profiles (file exteensions .icc oder .icm) into the Profile folder of your operating system:

Windows98:		windows\system\color
Windows 2000 / XP:	windows\system32\spool\drivers\color
Mac OS 9:	System folder : ColorSync Profiles
Mac OS X:	Library(s) : ColorSync : Profiles

3. Photoshop-Settings (Photoshop 6, 7, 8)

Photoshop´s color and softproof settings are stored in separate files. In order to save or load these settings, open the following menues in Photoshop:
"Photoshop - Color Settings" or "File - Color Settings" and
"View - Proof Setup - Custom...".
Please copy the sample settings on the CD-ROM to your hard drive. They contain the settings and profiles recommended by ECI.

Windows:	Programs\Gemeinsame Dateien\Adobe\Color
Mac OS 9:	System folder : Application Support : Adobe : Color
Mac OS X:	Library : Application Support: Adobe : Color

For more information see your Photoshop manual.

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Calibration and Profiling
Monitor and Calibration Check

What is Calibration, What is Profiling?

Before we start with practical work, we should clarify some terms and the concept of calibrating and profiling. The comprehension of that is an essential prerequisite for the assessment of your system.

The adjustment of color input and output systems is generally performed in 2 steps. First you calibrate the system. That means, you adjust the device to a known state (usually the ideal state for this device), using software or hardware controls or a calibration table. Scanners normally auto-calibrate themselves with a white-black reference. For printers, the process is normally called linearization and ensures a correct gray balance, TVI and total color values. Monitor calibration generates the correct white point (5000 Kelvin for use in the graphic arts),, a predefined tonal response curve (e.g. LStar, gamma 1.8 or the sRGB curve, which by the wa is not gamma 2.2, but a modified 2.2) and a perfectly neutral gray balance (R=G=B). High-End programs like basICColor display (Demo on CD-ROM) first use the hardware controls (Brightness, Contrast, RGB) for pre-calibration and then build a correction table that is downloaded into the graphic card or even the monitor (hardware-calibratable monitor required) for fine tuning the display calibration.

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Calibration and Profiling
## Monitor and Calibration Check

In the second step after the calibration the device will be profiled. The resulting ICC-profile describes the calibrated state of the device. It will be used by ICC-compatible software like Photoshop to display color data correctly on your monitor. For this color conversion, you need a minimum of 2 profiles, one for the source color space, one for the output (monitor).

Examples for the use of monitor profiles:

• Softproof of offset data on a profiled monitor:

Source color space = offset profile

Output color space = monitor profile

• Image editing of RGB data on a profiled monitor:

Source color space = working space (e.g. eciRGB or LStar-RGB)

Output color space = monitor profile

ICC-compatible programs like Photoshop send color data to the graphic card which have been color converted through source profile and monitor profile. This ensures a color correct representation independent of the working space (LStar-RGB, eciRGB, AdobeRGB, sRGB, offset-CMYK, gravure-CMYK, ...).

Calibration and profile are closely linked with each other. In general, only a well calibrated system can be described perfectly in a profile. If the calibration is faulty or inaccurate, the profile may not be able to completely correct for these deficiencies.

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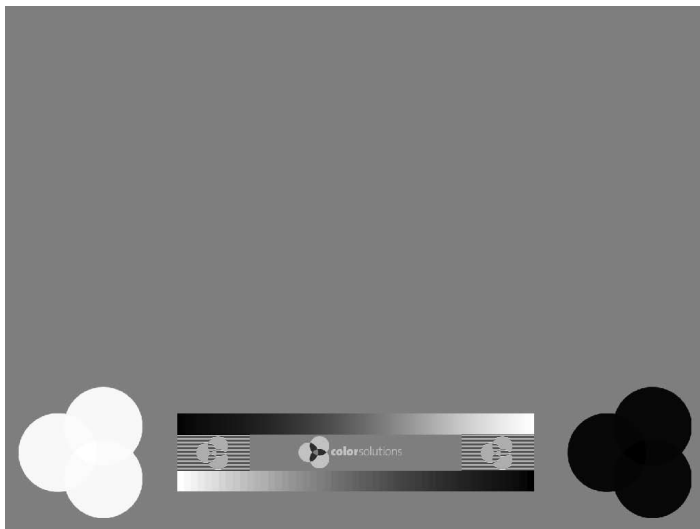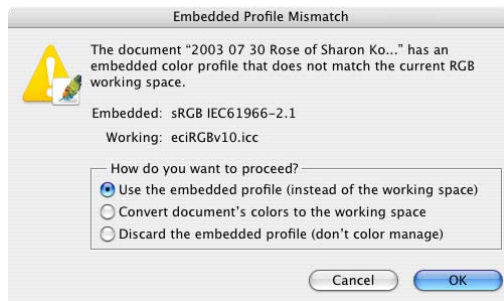
Use of the Desktop Background Images

There are 2 different sets of images, 1 set for monitors calibrated to a gamma of 1.8 and 1 set for monitors calibrated to an LStar tonal response. Be sure to use the correct one for your calibration. The images were created in the visually equidistant L*a*b* color space and then converted to eciRGB (with a gamma of 1.8) and to LStar-RGB (with an equidistant tonal response curve). Gray scales (0% - 100%) are not suited for the creation of visually equidistant test charts since the human eye does not render lightness in a linear but a logarithmic scale. In reality, this means that a 5% difference in lightness is perceived differently in highlight, midtone and shadow areas. The L*a*b* color system compensates for this effect (L*= 100 absolute white, L*= 0 absolute black, L* = 50 perfect midtone) . Now, have a look at the desktop background image - here, you see the effect of your monitor calibration without any influences from an ICC-profile. Then, load the image in Photoshop (Version 6 or higher), use the embedded profile (instead of the working space). Now calibration and ICC-profile are being used. Photoshop automatically uses the active system profile.

Since Photoshop converts from the (active) working space to monitor space, you should not see any differences if your monitor is calibrated properly. If you see significant differences, first check your Photoshop settings. If these are correct, re-calibrate and profile your monitor. Should the differences remain to be visible, the calibration table and the ICC-profile do not match. In this case, make sure your software performs a calibration and stores the results in the profile (vcg tag) or as a separate file (PC only) that then is downloaded to your graphic card with a separate gamma loader. basICColor display ensures all these prerequisites, in doubt just use basICColor display in try-out mode. Also, make sure your graphic card allows for a LUT-download. Small differences may be due to interpolation in 8 bits accuracy on the graphic board and must be accepted.

From now on, we refer to the desktop background image as seen on the desktop, not in Photoshop.
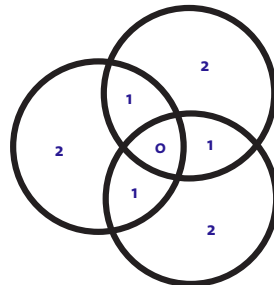
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basICColor

Rosette 1:

White definition check
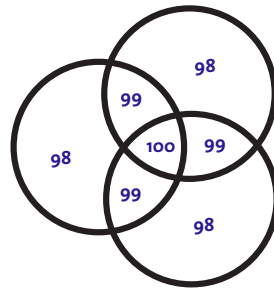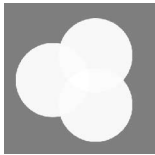
Rosette 2:

Black definition check



Step Wedge:

Gradient:

Test Elements

Rosettes

Both rosettes show a difference in lightness of Delta L* = 1 . Die lightest (L*= 100) and darkest areas (L*= 0) are located in the center of the rosettes. The values L*= 99 and L*= 1 are located in the ovelapping areas of two discs, the outer areas of the discs are L*= 98 and L*= 2. You should be able to distinguish these areas slightly. The differences between these areas should be equidistant. If not, please re-calibrate and profile your monitor with slightly different hardware settings (brightness and contrast).

Step Wedge

The wedge consists of 51 steps with a distance of Delta L*= 2 each. A correctly calibrated monitor (gamma 1.8 or LStar) with a perfect gray balance will show all steps without a color cast and with equidistant gray shades. If not, please re-calibrate and profile your monitor with slightly different hardware settings (brightness and contrast).

Gradient

in the continuous gradient, no steps should show. If you see discrete steps along the entire gradient, your graphic card may not be set to millions (16.7 million) of colors. A few steps at random places indicate a bad calibration table or inadequate hardware settings. A bad gray balance can easily be detected in the gradient. In these cases, set your graphic card to millions of colors and re-calibrate and profile your monitor with slightly different hard-ware settings (brightness and contrast).

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Functioning of the Test Elements
Monitor Calibration Check
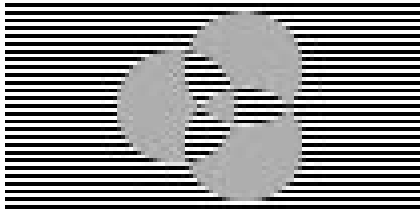
Gamma Check

If your monitor is calibrated correctly, the gamma check rosette shows the same lightness as the striped background. This element only works in it´s native resolution (100%). Make sure you selected the correct background image. If your monitor has a different resolution than the images supplied, do not rescale the image. You can increase canvas size e.g. in Photoshop and add gray areas to the background.

Background

Take a look at the background from some distance (ca. 2 to 3 meters). That way, you can easily detect irregularities of your monitor. Some monitors, especially CRTs are "patchy". This problem cannot be corrected by calibration. You need a skilled monitor technician to fix this. If you should encounter patchyness on your CRT, you can try to degauss it several times. Also make sure that there are no electromagnetic or magnetic sources in the vicinity of your monitor (loudspeakers, power supply units, power lines …). If the patches remain, you´ve got to live with them – or buy a new monitor. Calibrate the monitor in the center, where you intend to do color critical work. Remember the position of the patches because you will not be able to detect them in a color image.

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Objective of Calibration Settings
Adjustment of Monitor and Viewing Booth

Objective of the Adjustment

The background on an exactly calibrated monitor should show an L*a*b*-value of L*= 60, a*= 0, b*= 0 (+/- 1 to 2 at the exact measurement spot during calibration. Differences in L* will be less critical than in a* or b*) relative to the White Reference you calibrated your monitor to. If you view the *basICColor gray card* in the same type of illumination, the gray background should look the same as the gray card. If this is not the case, the whitepoint of your monitor and the viewing light are not the same. For viewing of photographs and proof prints you should use a dimmable viewing booth with standard illumination of 5000 K. You should calibrate your monitor to the same white point. With basICColor display you can measure the viewing booth light and use this measurement as a reference for the monitor calibration. Thus you ensure the best agreement between monitor and viewing booth. You can obtain viewing booths from Just Normlicht (http://www.just-normlicht.de), White Screen (http://www.whitescreen.de) or gti graphic technology (http://www.gtilite.com). Color Solutions offers the products from Just and gti.

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Color Temperature
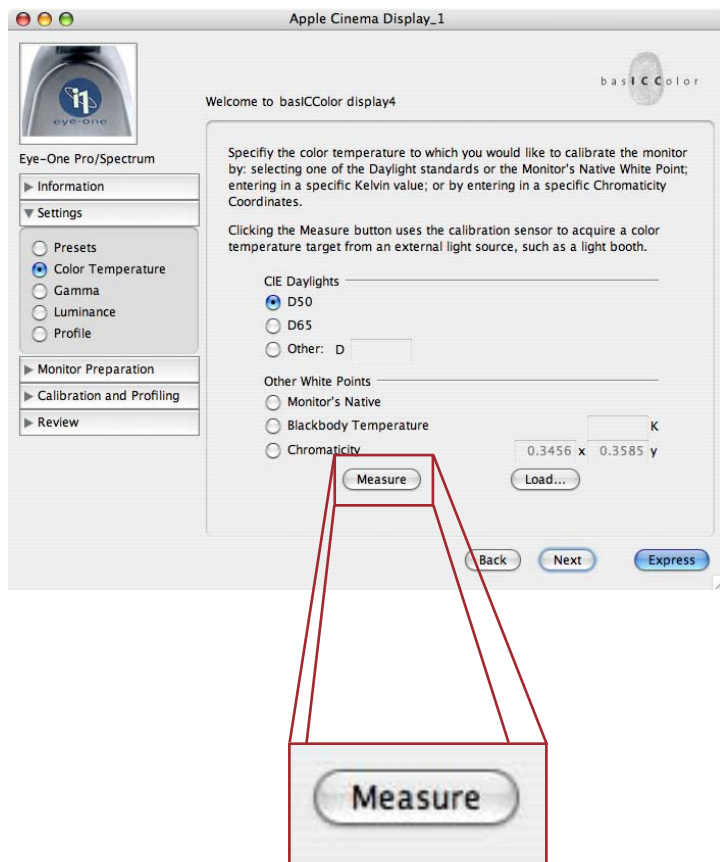## Adjustment of Monitor and Viewing Booth

Setting Color Temperature

Viewing booths for the graphic arts industry are being manufactured according to ISO standards supposedly with a color temperature of 5000 Kelvin. In reality a pure 5000 K light is impossible to produce. Additionally there are changes of the initial state due to aging and fluctuation of production quality. In real life, viewing booths show a values between 4700 und 5100 Kelvin. Additionally not all dimmers work in a color neutral way. With decreasing intensity the light tends to become warmer (lower white temperature). If your monitor and viewing booth are directly adjacent, you can achieve a good agreement by calibrating your monitor to the white point of the viewing booth instead of the exact 5000 K standard. Yet, the deviation from the standard should not be more than 500 K. For light measurement, only spectrophotometers (eg. Eye-One Pro/Monitor) are suited. They have a spectral white reference calibration ond they measure with a narrow angle of approx. 2°. Colorimeters (e.g. X-Rite DTP94, Eye-One display. basICColor SQUID, Sequel Chroma4,...) cannot be used. Their white reference is device dependent and some of them measure with angles of 60° and more.

If you own a colorimeter for monitor calibration, you calibrate to 5000 K and then compare the background image and the gray card visually. Depending on the appearance of the gray card, you gradually calibrate to lower or higher color temperatures. Then select the best fit in the monitor control panel (Mac) or system settings (Windows). Under Windows you will have to restart your computer or manually download the calibration to your video card (e.g. with basICColor Video Startup).

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Setting the Color Temperature
Adjustment of Monitor and Viewing Booth

Apple Cinema Display_1

Eye-One Pro/Spectrum

▶ Information
▼ Settings
   ○ Presets
   ● Color Temperature
   ○ Gamma
   ○ Luminance
   ○ Profile
▶ Monitor Preparation
▶ Calibration and Profiling
▶ Review

Welcome to basICColor display4

Specifiy the color temperature to which you would like to calibrate the monitor by: selecting one of the Daylight standards or the Monitor's Native White Point; entering in a specific Kelvin value; or by entering in a specific Chromaticity Coordinates.

Clicking the Measure button uses the calibration sensor to acquire a color temperature target from an external light source, such as a light booth.

CIE Daylights
● D50
○ D65
○ Other: D [   ]

Other White Points
○ Monitor's Native
○ Blackbody Temperature   [   ] K
○ Chromaticity   0.3456 x 0.3585 y

[Measure]   [Load…]

(Back) (Next) (Express)

Measure

Instrumented Setting of Color Temperature

1. Place the *basICColor gray card* in your viewing booth.
    The card should be evenly illuminated under 45° - 60°.

2. Adjust the brightness of your viewing booth so that the gray card and the monitor background on your calibrated monitor make the same impression as far as bright ness is concerned.
    If you calibrate your monitor for the first time, calibrate it to 5000 Kelvin before you adjust the brightness of your viewing booth.

3. Click "Measure" in the "Settings -> Color Temperature" Tab in basICColor display and follow the instructions on the monitor (instrument calibration ...). Now measure the white patch on the monitor. The measured value will be displayed in the "Chromaticity" field.

4. Take the Instrument off the screen and hold it towards the gray card. The distance should be approx. 20 - 30 cm.

5. Click "Accept" or "Done".
    The new color temperature will be used for the next calibration.

6. Now calibrate your monitor.

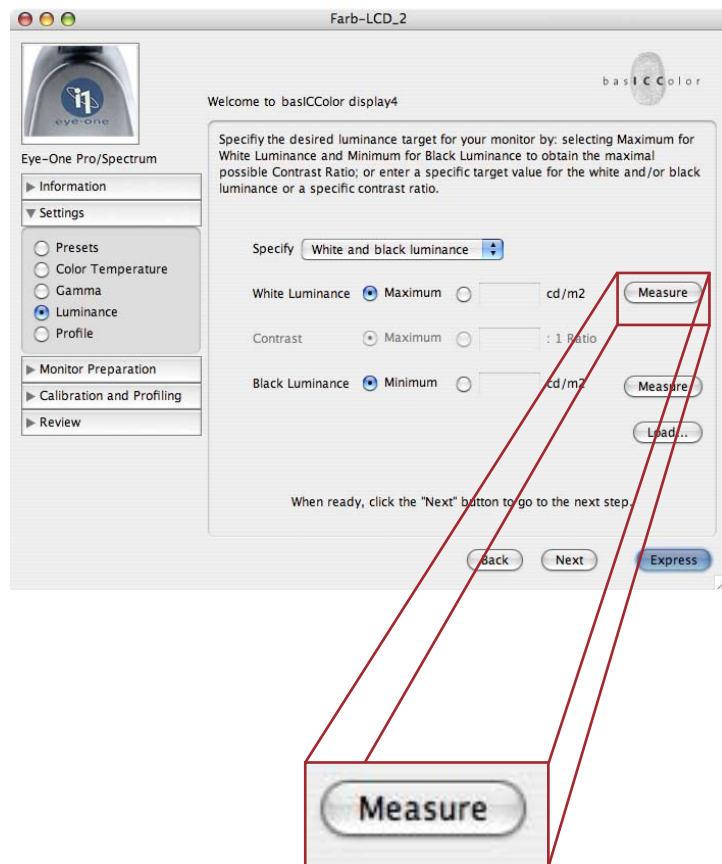## Adjustment of Monitor and Viewing Booth

Visual Setting of Brightness

For a good agreement of monitor and the visual impression of print or proof in your viewing booth, you do not only need the same color temperature. Brightness should be equivalent on both as well. Brightness is limited on monitors, especially CRTs. Viewing booth are much brighter. That is why print seems to be brighter and more rich in contrast than soft proof on the monitor. Minimum brightness of black is also limited on monitors. Monitor and viewing booth are not directly comparable – the monitor is an emissive device, while you see the print or proof in reflective mode. So the only way to adjust these two to a similar appearance is to manually dim the viewing booth.

Procedure:

1.	Place the *basICColor gray card* in your viewing booth.
	The card should be evenly illuminated under 45° - 60°.

2.	Adjust the brightness of your viewing booth so that the gray card and the monitor background on your calibrated monitor make the same impression as far as brightness is concerned. In case the color temperature of yor viewing booth changes much when dimmed, you should calibrate the monitor to that color temperature. Slight changes of the white point of the monitor should not influence the luminance much.

basICColor

Setting the Brightness
Adjustment of Monitor and Viewing Booth

Instrumented Setting of Brightness

With a spectrophotometer and the basICColor gray card, you can achieve an even exacter agreement of brightness on monitor and viewing booth.

Procedure:

1.   Place the *basICColor gray card* in your viewing booth.
      The card should be evenly illuminated under 45° - 60°.

2.   Adjust the brightness of your viewing booth so that the gray card appears much
      darker than the background on your calibrated monitor.

3.   Click "Measure" in the "Settings -> Color Temperature" Tab in basICColor display
       and follow the instructions on the monitor (instrument calibration ...). Now measure
       the white patch on the monitor.
      This measurement calibrates the instrument to the absolute luminance for L*= 100.

4.   Now position the instrument over the gray area of the background image. If your
      monitor is calibrated properly, the L*-value should be around 60. Since you are not
      measuring at the exact same spot, differences may be unavoidable.

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Setting the Brightness
Adjustment of Monitor and Viewing Booth

5. Take the Instrument off the screen and point it towards the gray card. The distance
    should be approx. 20 - 30 cm.

6. Increase the brightness of the viewing booth slowly until basICColor display shows
    an L*-value (equals Y-value) of 60. Take care that the value of 100 will not be reached,
    not even temporarily. The instrument will then be recalibrated to the brightest white.
    Should that have happened, please repeat the entire procedure.

7. If the brightness in the viewing booth is correct, click "Accept" or "Done" (depending
    on the software release version) in the measurement window of basICColor display.

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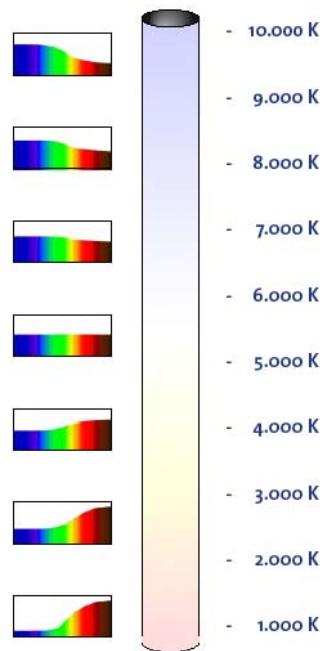
Color temperatures and the relevant relative spektral remittance (relative to D50 standard illuminant)

Gray Balance

Digital cameras are color input devices like scanners. The most important difference is that the lighting situation changes constantly. Like any other device, a camera needs to be calibrated first, then profiled. Scanners normally calibrate automatically without any user interaction. This is impossible to do with a camera.

A camera must be calibrated manually using the gray balance function.

This gray balance must be performed with a reference that has no metameric failure, like the *basICColor gray card*. Please follow the instructions of the camera manufacturer for the correct procedure for your camera model.

It depends from the lighting situation, the quality of the camera sensor, the "intelligence" of the camera electronics and last but not least from your individual demand for quality, if a simple recalibration with the *basICColor gray card* can compensate for changing lighting situations .

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Profiling

Camera Calibration and Profiling

Camera Profiling

The procedure of camera profiling depends very much from the camera software you use. Especially the calibration options vary widely. We describe the procedure for a studio camera here:

1. Create a repro situation with the same lamps that will be used for the shooting later. The lamps should be equal or very similar in their spectral characteristics. Otherwise you might encounter some nasty metamerism effects. Even different reflectors or soft boxes could result in spectrally different lighting.

2. Use a traditional exposure meter to find the correct exposure settings according to the camera manual. You cannot use the digital exposure meter here since that requires a camera profile – which we are about to create!

3. Check uniformity of your lighting, using the gray card on the back of basICColor dcam target or the *basICColor gray card*.

4. White balance the camera using the *basICColor gray card* (R=G=B, absolute values are not important at this point)

manual

Kameraprofilierung

Camera Calibration and Profiling

5. Now set the tonal response curve as close to the one of your preferred RGB working space (e.g. Gamma = 1,8 for eciRGB or linear for LStar-RGB). If the camera software allows for such a manipulation you can use a gray step wedge to do so. You can measure the wedge with a spectrophotometer in L*a*b*. Create a step wedge in Photoshop in L*a*b* with the measured values. Convert this file to your preferred working space. The RGB-values of this file are your target values for the camera linaerization. A shot of the gray card should render RGB-values of approx. 127 after the linearization.

6. Now you shoot the camera target under uniform lighting. You then open the target shot and reference data of the target (supplied by the manufacturer) in a camera profiling software like basICColor input and create the camera profile. If possible, use spectral data of your target and your lighting for best results. Unfortunately it is hard to obtain spectral data of flashlights. Thus the resulting profile, then based on D50 measurement data, will show some metamerism failure that will have to be corrected by editing the profile.
    Color Solutions have described simple editing procedures, using Photoshop and a profiling software in a separate document.

manual

basICColor

Profile Usage

Camera Calibration and Profiling

How to use Profiles

If your lighting situation doesn´t change too much, you can recalibrate the camera to the state it was in at profiling time, using the basICColor gray card.

Slight changes could be caused by soft boxes that leave the spectrum basically unchanged, but shift the weight within the spectral distribution. In that case there is no need for a new profile, these changes can be compensated by gray balancing the camera with the *basICColor gray card*. This procedure is equivalent to the use of correction filters in analog photography that compensate for color shifts of different lighting accessories or lenses. If you want to keep the characteristics of your lighting or filter, you use the basic calibration that had been used when creating the profile.

If lighting is completely different (Flash, Tungsten, HMI, daylight ...) you create new profiles for these lighting situations. This is equivalent to using different film types (daylight, artificial light) in conventional photography.

Editing of profiles allows for the creation of "cutom emulsions". This can be used for repetitive jobs that would normally require editing of the files (like a warmer skin tone in portraits). A profile tat has been edited once can save a lot of work and is much more productive than editing hundreds of shots in Photoshop.

Color Solutions offers courses for profiling and profile editing, especially for photographers.

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Penzberg, in January 2006

Authors: Karl Koch, Markus Hitzler

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Contact

Deutschland:

http://www.basICColor.de

Color Solutions Software

Color Solutions Instrument

http://www.color-solutions.de

Color Solutions Consulting

http://www.color-solutions.de

Support:

basICCare Center

support@color-solutions.de

Lorna Koch

Color Solutions Software

Falkenstrasse 15a
D-82377 Penzberg

fon   : +49 (0)8856 - 93 25 05
fax   : +49 (0)8856 - 93 25 03
mail : lorna.koch@color-solutions.de

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Markus Hitzler

Color Solutions Software

August-von-Willich-Straße 155

D-50827 Köln

fon   : +49 (0)2219 - 91 75 80
fax   : +49 (0)2219 - 91 75 81
mail : markus.hitzler@color-solutions.de

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Dr. Johannes Hoffstadt

Color Solutions Software

Kirchstraße 16

D-89081 Ulm

fon   : +49 (0)7313 - 88 66 60
mail : johannes.hoffstadt@color-solutions.de

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Karl Koch

Color Solutions Consulting

Falkenstrasse 13
D-82377 Penzberg

fon   : +49 (0)8856 - 93 25 05
fax   : +49 (0)8856 - 93 25 03
mobil: +49 (0)172 - 819 53 56
mail : karl.koch@color-solutions.de

colorsolutions

Hanspeter Harpf

Color Solutions Consulting

Falkenstrasse 13
D-82377 Penzberg

fon   : +49 (0)8856 - 93 25 05
fax   : +49 (0)8856 - 93 25 03
mobil: +49 (0)173 - 572 12 84
mail : hanspeter.harpf@color-solutions.de

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Martin Dähn

Color Solutions Instruments

Falkenstrasse 15a
D-82377 Penzberg

fon   : +49 (0)8856 - 93 25 05
fax   : +49 (0)8856 - 93 25 03
mobil: +49 (0)172 - 851 05 10
mail : martin.daehn@color-solutions.de

colorsolutions

Tim Seher

Color Solutions Software
basICCare Center

Arnoldsrasse 70

D-47906 Kempen

fon   : +49 (0)2152 - 95 99 -8 41
mail : support@color-solutions.de

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