

Successful Soft Proofing

Making your monitor really match the proof

Revised January 2007

Having displayed CMYK images successfully on RGB monitors since 1984, I know that soft proofing is the single most valuable feature of ICC (International Color Consortium) color management. But many people who have tried setting up a soft proofing system find the results unimpressive and write it off as impossible. Why do I succeed when so many fail? Read on and I'll share a few simple tips that will bring your soft proofs much closer to the proof or printed sheet than you ever thought possible.

(Note: This was written originally for CRT monitors but the basic principles are true for LCDs.)

Software & hardware

First of all, if you don't already own a good ICC monitor profiling package go out and spend about \$200 on ColorEyes Display or MonacoOPTIX Pro. Both of these support, or come bundled with, a colorimeter that measures your screen's appearance in CIE Lab, (which defines how the eye sees color).

To use my technique you don't need a fancy or expensive monitor, but you do need one with user-adjustable RGB gain or white balance controls. Not all monitors have this feature, so if you're shopping for a new monitor, make sure you can tweak the white point with three RGB sliders accessed from the monitor itself. A few pre-set color temperatures aren't enough.

Some LCD monitors don't have manual RGB sliders, but you can still use this technique with the built-in tools for visual white point tuning provided in both the software packages named above.

Finally, you will need some means of illuminating the original or proof with standard D50 lighting, and a way of reducing the intensity of that lighting to the brightness of the monitor screen. Remember, the only value of a soft proof is its ability to simulate a proof, original photo or a piece of artwork, and the color and brightness of the lighting in which they are viewed is critical to the whole process.

Adjacent lighting

The first task is to set up a lighting system adjacent to the monitor that illuminates the original or proof at the same brightness level as the monitor image.



GTI's PDV-3D (with optional sidewalls)

To create matched lighting, reduce ambient room light to a low level and adjust a variable-intensity viewing booth such as GTI's PDV-3D or SOFV-1e (placed alongside the monitor) until it matches the brightness of a white screen image¹. If don't have a variable booth, replace your overhead bulbs with D50 tubes from GTI or GretagMacbeth or Just-Normlicht, and partially hide them with NON-FLAMMABLE opaque material, until a piece of neutral white proofing stock held next to the monitor is the same brightness as the white screen. While you have the scissors out, make a black cardboard hood to keep light off the monitor surface.

Monitor calibration

Having adjusted the brightness of the ambient lighting, adjust the monitor's 'white point' to match the view booth. Here's where misinformation abounds. Most people assume the monitor should be set to a standard color temperature like D50 or D65, but calibrating to

¹ A blank Photoshop image filed with 255, 255, 255 RGB.

either of these seldom results in a screen color that matches a standard viewing booth.

The common mismatch between calibrated monitors and standard light sources is partly explained by the difficulty of mass-producing fluorescent tubes to soft proofing tolerances, and partly by the enormous challenge of measuring the fragile illusion of ‘white’ created by three monitor phosphors. Fortunately, there is a simple solution to both these problems.

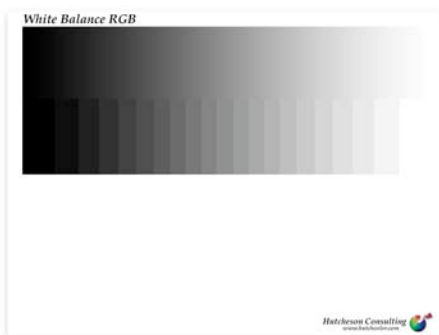
The eyes have it

To ensure that a ‘white’ monitor screen really does match the ‘white’ of the adjacent illuminant, all you have to do is tweak the monitor’s white point until the two match visually, using the monitor’s digital RGB sliders. This should only be done after optimizing brightness and contrast.

The white point is usually controlled by three RGB sliders displayed temporarily on the monitor screen. Start by setting them all to maximum (100 or 255). Then reduce one or two of the three until the monitor color seems to match the gray back wall of the booth. Leave at least one of the sliders at maximum – reducing all three simply sacrifices brightness. If your software calibrates and profiles at the same time and forces you to choose a fixed white point, simply adjust the hardware white after creating the profile.

Checking gray balance

Ideally you should fill the top half of your white screen with a neutral gray scale and evaluate grays while setting white balance. An easy way to do this is to download my free “White_Balance_RGB” target from www.hutchcolor.com/Images_and_targets.html.



White_Balance_RGB test image

Some monitors let you adjust black balance with RGB bias controls as well as white balance. Adjusting bias and gain separately to neutralize the gray scale can dramatically improve the quality of your monitor profile and extend the useful life of your monitor.

What else you’ll need

The final requirements for useful soft proofing are good source and destination profiles and an ICC-compatible imaging software like Photoshop, which lets you test different rendering intents, profiles and CMMs on the fly. Don’t expect an accurate soft proof with “canned” printer profiles. You really must acquire or build your own custom ICC profiles of the device you are trying to simulate before soft proofing will really work. Until then, your monitor is little better than a toy.

Learning more

These notes just hint at the many things you can do to improve your soft proofing experience. If you want the very best soft proofing possible, contact us for a quote on custom on-site color management training.

About the author

Don Hutcherson (don@hutchcolor.com) was the world’s first independent color management consultant. His company, HutchColor, LLC, installs and trains custom-tailored ICC-based color management systems for some of the world’s best agencies, printers, separators, publishers, photolabs, movie studios, museums, magazines, newspapers and manufacturers of color management software.