Color managing your monitor

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If you're a professional photographer, here's the client phone call you don't want to get: "We just got the catalog proofs, and we've got problems ..." You can guess what comes next; the colors of the client's products don't look right.

If you had shot the job on film, you could fall back on the color in the transparency, but a digital picture is just numbers on a hard disk. How do you make sure those numbers represent the colors they're supposed to? And how do you make the colors you see on your monitor match what your printer—and the client's printer—produce? The answer is a process called color management. If you're a digital pro, you need it.

Color requires careful management in a digital workflow because every device—camera, scanner, monitor, printer—interprets color data differently. They often employ different methods of specifying colors (i.e., RGB for monitors, CMYK for printers). Each also has its own gamut—the range of colors a device is capable of depicting, often defined as a color space. An RGB color value of R:225/G:50/B:50, for instance, is red, but without color management it will almost certainly be a different shade of red when printed on two different printers. Without color management, it will also almost certainly display as a different shade of red on two different monitors too.

Color management uses ICC-compliant device profiles to compensate for these differences. (ICC stands for International Color Consortium, the organization that sets color management standards.) Device profiles are small data files that mathematically describe how a particular device reproduces color. An ICC-savvy application (like Photoshop) or operating system (like Windows XP) uses profiles to accurately map colors between devices with different gamuts, such as your monitor and printer. If you set it up right, an ICC color-managed workflow can prevent that "we've got problems" client call.

Device profiles come in three flavors—input (scanners, cameras, and so on), monitor, and output (inkjet printers, offset press, and so on). You'll need to create profiles for every device in your imaging chain, and your monitor is the best place to start.

You can profile your monitor by eyeball with software applications like Adobe Gamma (included with Photoshop.) Success will be hit and miss. You'll almost certainly get more accurate profiles with a hardware profiling system, like GretagMacbeth's Eye-One Monitor or ColorVision's Monitor Spyder LCD/CRT packages, which measure your monitor with either a spectrophotometer or colorimeter. Better hardware monitor profiling kits aren't cheap, but a good one is worth its weight in gold.

Your printer comes next. A "canned" ICC profile generated by the manufacturer probably came with it, but you can, and should, create a better one yourself. Lower end printer profiling packages, like Monaco EZcolor and ColorVision's ProfilerPlus, use your flatbed scanner to measure color patches on test prints and then generate a profile. They're a good entry point to printer profiling. Systems like the aforementioned GretagMacbeth's Eye-One Pro with Eye-One Match, which measure your test prints with a spectrophotometer, are the best (and the most expensive).

The trickiest part comes last: an input profile for your digital camera. You create these by photographing a test target such as a GretagMacbeth ColorChecker, and the camera profiling software analyzes the resulting image file. To generate a good profile, you have to get the camera's white balance and the lighting of the target exactly right.

Once you've generated your profiles, you need to tell Windows XP and Photoshop about them. This allows your color-managed workflow to begin the task of correctly mapping colors from one device to another. In Windows XP, you associate profiles with devices in the properties dialog box of the device, both for monitors and for printers. Check Photoshop's help file for instructions related to that program's extensive color management settings.

There's one last cool thing about ICC profiles: they're portable. You can embed them within images, and they tell anyone who opens the image how to accurately map the picture's colors to their own monitors and printers. (Usually you will convert your images to your Photoshop working color space and embed that profile.) If you just said, "Aha! This is the key to keeping my clients happy," you're right. As long as your clients are ICC-savvy—unfortunately, many aren't—they should be able to use your embedded profile to make accurate printed output from your image. Another alternative is to obtain or build a profile of your client's printer or press and make the conversion yourself before you send the file.

Color management doesn't guarantee perfectly accurate and consistent color every time. No system could, mainly because the technology of color—electrons in a CCD, phosphors on screen, ink on paper—is so varied. In addition, setting up a properly color-managed workflow is hard work. But color management is the only way to get close to perfectly consistent color, and it will save you untold headaches—and valuable time—down the road.

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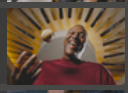

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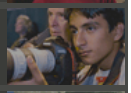

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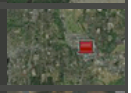

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