

Device Profiles

There are several classes of profiles. Chief among them for desktop computer users are device profiles, which are computer files that characterize a device's color reproduction capabilities. They contain information relating to the color space and gamut of a specific device. The color management system uses the device profile to convert device dependent color information into a device-independent color space.

Standard device profiles are provided by color device vendors, and are typically installed when the device's software is installed. A standard format for device profiles was established by the International Color Consortium (ICC). Device profiles on the Macintosh are called ICC files and called ICM files under Windows.

In many cases, you may not be aware of the device file's existence. For example, if you install printer drivers for an Epson photo quality printer, the device profiles are part of the printer driver. The profiles buried in the printer driver are based strictly on Epson inks and papers. When you select a paper type in the printer driver, the proper ICC/ICM file is used to convert the image to the printer's color space. As long as you stick with the vendor's inks and papers, the subject of device profiles might never come up.

But if you want to proof what the final print will look like on your monitor before actually printing, or if you want to use inks and/or papers from third party vendors, you need individual profiles that can be accessed by your photo editing software.

Let's take a look at each of the three categories of device profiles: input, display, and output.

Input Profiles

The average digital camera or desktop scanner cannot be profiled. Not until you get into the realm of expensive scanning camera backs and drum scanners is profiling an issue. What you can do with certain digital cameras and desktop scanners is select the color space profile that the image will be tagged with.

Display Profiles

Monitors are a different story. If you are pursuing quality and repeatability in your work, then you need to both calibrate and characterize (profile) your monitor. Monitor vendors typically include a generic profile for monitor models, but these profiles are not useful since the monitor has not been calibrated. Adobe Gamma, a utility that ships with certain Adobe products, is the very least you should use to calibrate and profile. Monitors with built in calibration hardware, or third party calibration hardware devices are a much better choice than visual only systems like Adobe Gamma.

Output Profiles

Output profiles, typically for color printers, characterize the unique color space of a specific printer, ink, and paper combination. In other words, there needs to be a specific profile for each kind of printing paper used, with each kind of ink used, for each printing device. That can clearly be a lot of individual profiles to manage and use if you print to more than one device, like to experiment with different kinds of paper, or might even like to experiment with different kinds of inks.

While manufacturers include profiles for their printers using their inks and their papers, they typically do not provide profiles for third party inks or papers. Worse yet, vendors like Epson bury their profiles in their printer drivers, so they cannot be individually accessed.

Soft Proofs

Why would you want to access a vendor's profile if you are only using that vendor's papers and inks? Adobe Photoshop 6 includes the capability of soft proofing images before printing. Soft proofing is a process where a good approximation of a printed image can be viewed on screen prior to printing to facilitate image editing. Photoshop utilizes an ICC/ICM profile for a specific printer-paper-ink combination to translate the color image being edited into the color space of a calibrated and profiled monitor (a really good reason to calibrate and profile your monitor).

Then, if you want to experiment with different types of printing papers, say watercolor papers for fine art printing, you need profiles for each of the papers used even if you continue to use a vendor's inks. You need the profiles for both soft proofing and printing predictable and repeatable color. The coating and surface texture of a paper have a profound effect on the way ink is laid down and how it reflects light back to the viewer. Trying to use a vendor's proprietary paper and ink profiles for third party papers is usually a recipe for frustration and lots of wasted paper and ink.

So how do you obtain profiles for papers or inks?

Custom Profiles

Custom profiles are available from a variety of sources. You can purchase third party software to create your own custom profiles. As you might imagine, profiling software runs from the relatively inexpensive to very expensive.

For the less expensive software utilities, you typically need a flatbed scanner to accomplish this task which consists of printing a proprietary color pattern using the printer, inks, and paper to be profiled. This print is then scanned on a flatbed scanner, the scanned image is then analyzed by the software, and a custom profile is created based on the reading of the scanned image. That profile usually requires further editing to fine tune it. Profile making using these low-cost utilities is less than satisfactory. If you like to experiment, have plenty of time, paper, and ink, profile creation with these low-cost solutions can be educational, if not ultimately too frustrating to be truly useful.

More expensive software and hardware profile systems can be purchased, costing into the thousands of dollars. These systems are those generally used by master printers. If the cash flow from your business or your technical training doesn't justify purchasing one of these high-end profiling systems, custom profiles can be purchased from third party vendors.

Some users make profiles available for free or a modest cost on their websites. These are generally profiles created with the low cost software mentioned above. Some master printmakers and digital vendors create profiles with high-end equipment and software and sell profiles individually, or in sets for specific printers. The adage that you get what you pay for generally applies here. The best of these profiles are really quite good, and for a few hundred dollars you can obtain comprehensive sets for most printers. Compared to the cost of wasted ink, watercolor paper, and time, these profiles are actually quite a bargain.

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