

Color Management for X Server and Views

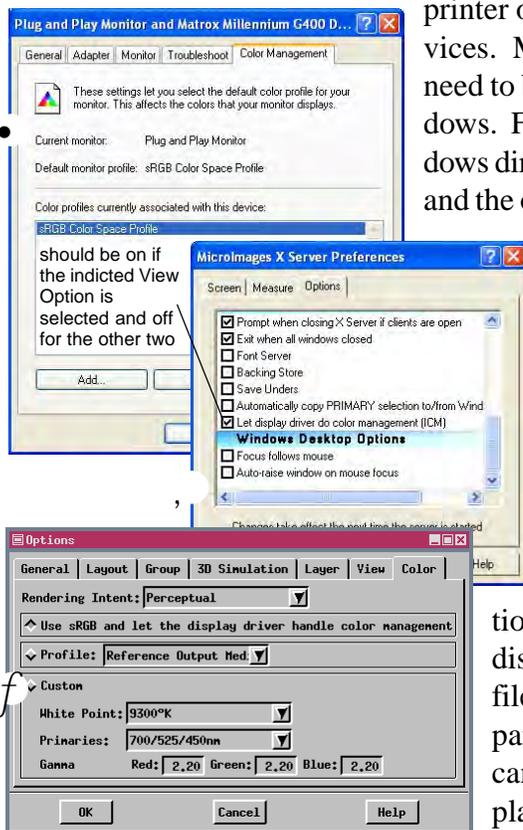
People are often disappointed or surprised by the differences in color between the map they have designed and become familiar with on their display screen and the printed product. This problem results from a lack of color communication standards in the development of the display monitor and desktop printing (and press printing) industries, as well as many other industries. This lack of standards applies both to color space specification for different devices of the same type and to communication with other devices. The TNT products have always offered color balancing tools so that you could adjust the color balance of your printed output to be pleasing, but the colors of your favored print may not have been reflected on the screen. Two complementary approaches have been implemented internationally to remedy this problem. One is the definition of a standard color space, called sRGB, developed by Hewlett-Packard and Microsoft, and the other is the International Color Consortium's (ICC) profile format. Profile format files go by two names: ICC on the Macintosh and ICM (Image Color Matching or Integrated Color Management) on Windows platforms. Such profiles tell the devices how to provide sRGB colors. ICC and ICM files can be used on either platform. Some applications require the file extension to be changed to match the platform, but this change is not necessary for TNTmips.

The TNT products now incorporate the use of these color profiles for Views, proofing to the screen, and printing (see the color plate entitled *Color Management for Printing and Proofing*). Generally, you obtain the profiles for your

printer or display monitor when you install the drivers that came with these devices. Many are also available for download from the Internet. These profiles need to be in the directory with TNTmips for operating systems other than Windows. For Windows, they can be located in their standard place within the Windows directory. Color management in TNTmips involves the X server, TNTmips, and the operating system. There are three places in Windows and Unix that need

compatible settings for the X server and View windows and an additional place for settings for printing and proofing to the screen. In Windows, you need to select a device profile in the advanced settings for your display in order for Windows to use that profile for the sRGB sent to it. You also need to set the X Server Preferences to tell the display driver to use that profile for the sRGB information sent to it and to set your Spatial Data Display View Options to use sRGB if desired. If sRGB is not appropriate for your monitor, turn off the illustrated option [Let the display driver do color management (ICM)] in the X Server Preferences and choose a standard or custom profile in the View Options.

The Mac does not have an X server setting but it is assumed that the display driver will handle the color management if you have the sRGB profile selected for your display. This display setting is made on the Color panel in the Hardware System Preferences for Displays on the Mac. You cannot use the illustrated View Options choice (Use sRGB and let the display driver handle color management) if you want to proof to the screen.



Rendering intent. The rendering intent lets you determine how to handle colors that are used in the source image (source gamut) that are not available for printing (destination gamut). There are four rendering intents: Absolute Colorimetric, Relative Colorimetric, Perceptual, and Saturation.



- **Absolute colorimetric rendering.** In this rendering method the colors in the source gamut that are available in the destination gamut are rendered exactly as they are and colors outside the destination

gamut are replaced by the nearest available color at the outer limit of the destination gamut. White may or may not be reproduced exactly.

- **Relative colorimetric rendering.** In this rendering method an exact color match is required in everything but brightness, which may be modified so that the range of brightness matches that of the destination gamut. The source white (generally, 255R, 255G, 255B) is transformed into the destination white (0C, 0M, 0Y, 0K), and all other colors are shifted accordingly.

Absolute colorimetric rendering is better suited for use when the destination gamut is wider than the source gamut while relative colorimetric rendering is generally better when the destination gamut is narrower than the source gamut.

- **Perceptual rendering.** This rendering method is best for photographic images when the destination gamut is much narrower than the source gamut. Perceptual rendering compresses the complete source gamut while preserving the relationship between colors.
- **Saturation rendering.** In this rendering method the original colors are modified to exactly fill the destination while preserving the saturation of the colors such that some parts of the color space are expanded and others are compressed. No other rendering method can expand a narrow gamut to be wider.

Profiles. The Spatial Data Display View Options let you choose from a number of standard monitor profiles or create a custom profile for your monitor. Again, the profiles you have to choose from depend on what you have installed on your machine. The primary and gamma values illustrated are those for sRGB while the white point of your monitor is determined from your monitor settings, which may be set from the menu on your monitor or elsewhere depending on your monitor and operating system.

Custom			
White Point:	9300°K	<input checked="" type="checkbox"/>	
Primaries:	700/525/450nm	<input checked="" type="checkbox"/>	
Gamma	Red: 2.20	Green: 2.20	Blue: 2.20

