Aztek Digital PhotoLab

Color Management Settings

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Overview

Correctly setting the Color Management settings within Digital PhotoLab is essential to achieving predictable and reproducible scanning results. This paper is intended to augment the Aztek manual and assist the Digital PhotoLab operator with setting and managing the Color Management settings.

The Digital PhotoLab manual includes a review of color management and linear density calibrated workflow issues so these will not be covered in this paper. Instead, this paper will focus on specific definitions of each Color Management setting option and how options interact with each other. It will also provide some concrete and specific examples which produce common workflows.

Color Management Setting Dialog Box

The Digital PhotoLab Color Management settings dialog box is located under the File menu at: File >> Preferences … >> Color Management.

The default settings for the dialog box appear in figure 1. The dialog box is divided into several sections for easier readability: Settings; Working Spaces; Scanner Default Profile; Printer Proof; Color Management Tag Policies; and Conversion Options. Note also that the format of the dialog box is very similar to the Photoshop Color settings dialog box. Since Photoshop is an important part of most digital imaging workflows, it makes sense for the dialog box to present similar information in a similar format. But the similarity doesn't stop there. The Digital PhotoLab Color Management settings are specifically designed to allow the operator to set color management policies which are totally consistent with their Photoshop color management policies. We'll come back to that point later.
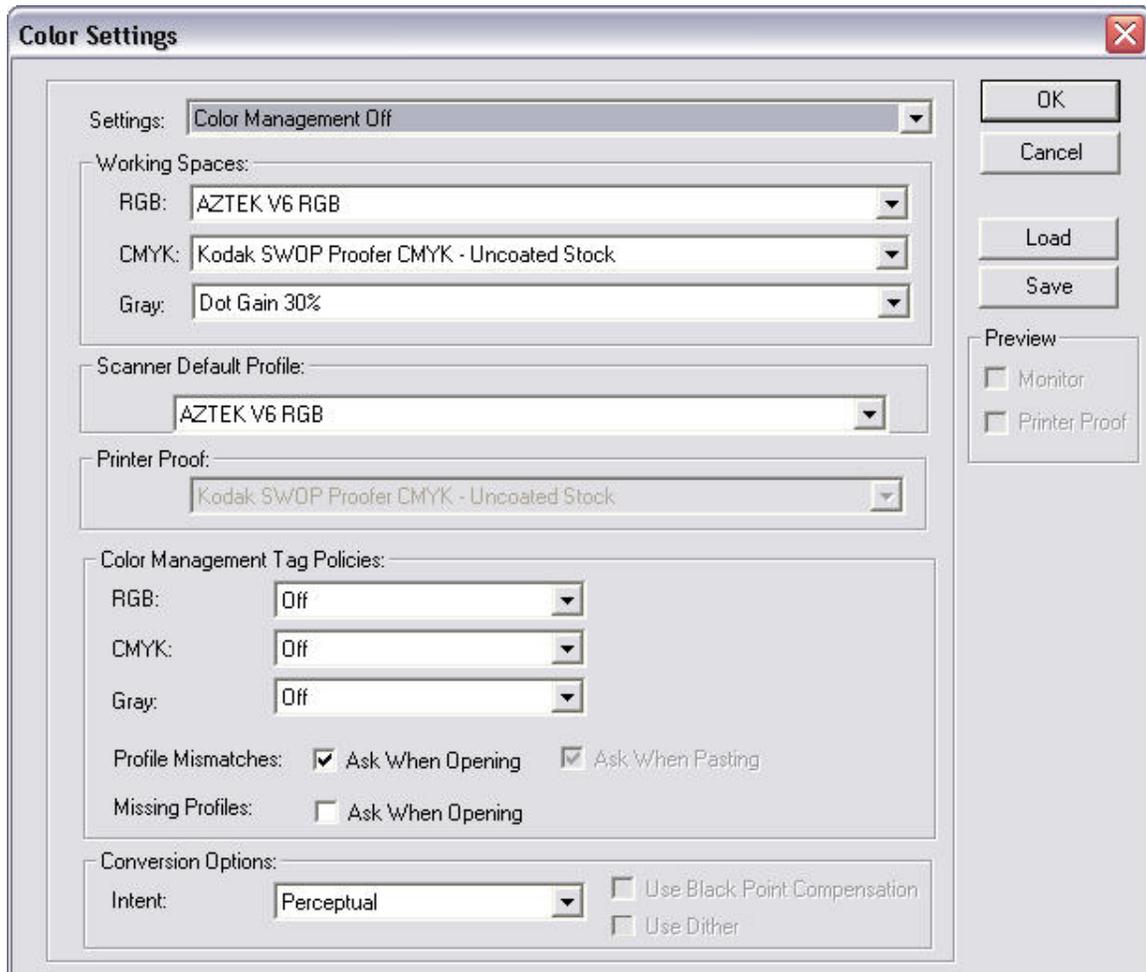

Figure 1- The Color Management Settings Dialog Box

The Settings section

The settings section provides a convenient way to switch from one set of policies to another. The pull-down menu works in concert with the Load and Save buttons to the right. The user can view various settings combinations using the pull-down menu. Settings can be saved and later loaded.

The Settings Pull-down Menu

The Settings pull-down menu lists all the settings combinations that have been saved. The default menu is shown in figure 2.   As settings are change in the dialog box, the Settings window will display "Custom" since the options have not yet been saved to a particular settings name.
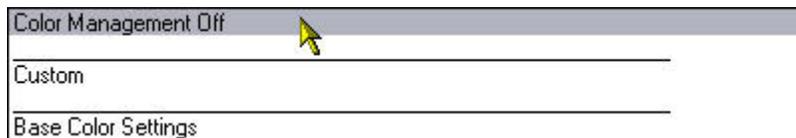
Figure 2 – The Settings pull-down menu

The Save Button

The Digital PhotoLab user can create any combination of settings that they choose in the dialog box and then save those settings for simple recall later. Press the Save button to save the settings for re-use later. The user is the presented a dialog box in which the setting file name can be chosen. See figure 3. Pick a name that conveys the meaning of the color management policy that is being saved. In this example, I have made some settings changes and have named this group of settings "My Usual Settings."
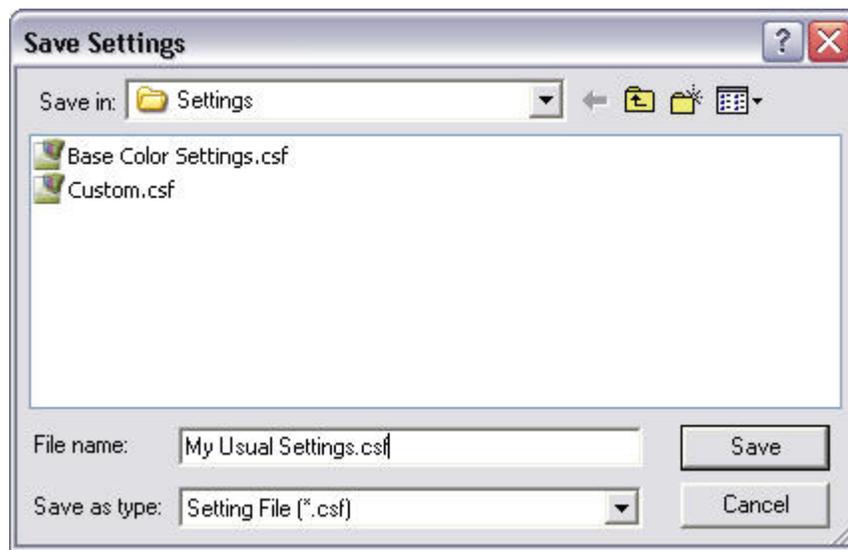
Figure 3 - The Save Settings dialog box

The Load Button

Once saved, the settings can be selected from the Settings pull-down menu to easily view the different setting files available. To make a setting appear each time Digital PhotoLab is started, press the Load button and select the settings file from the list. See Figure 4. In this example, I'm loading the "My Usual Settings".
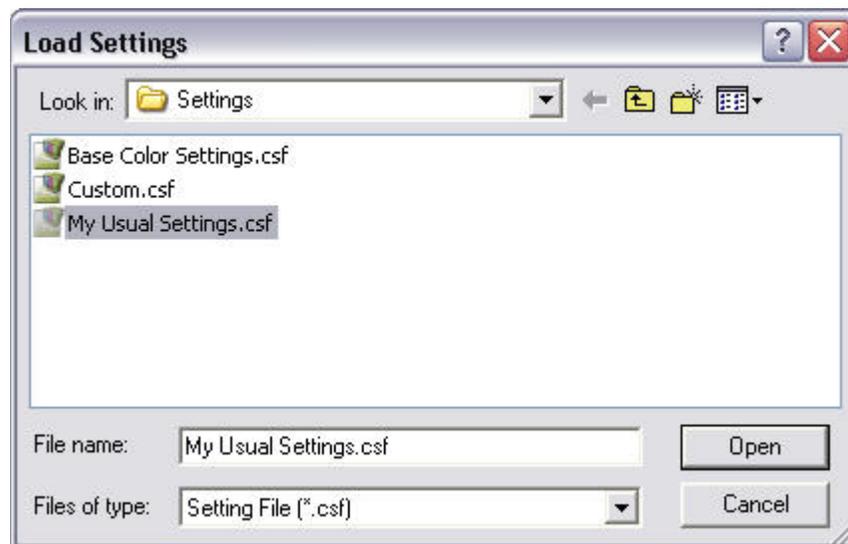

Figure 4- The Load Settings dialog box

Now, as a result of loading the previously saved settings, the Color Management setting dialog box looks figure 5.
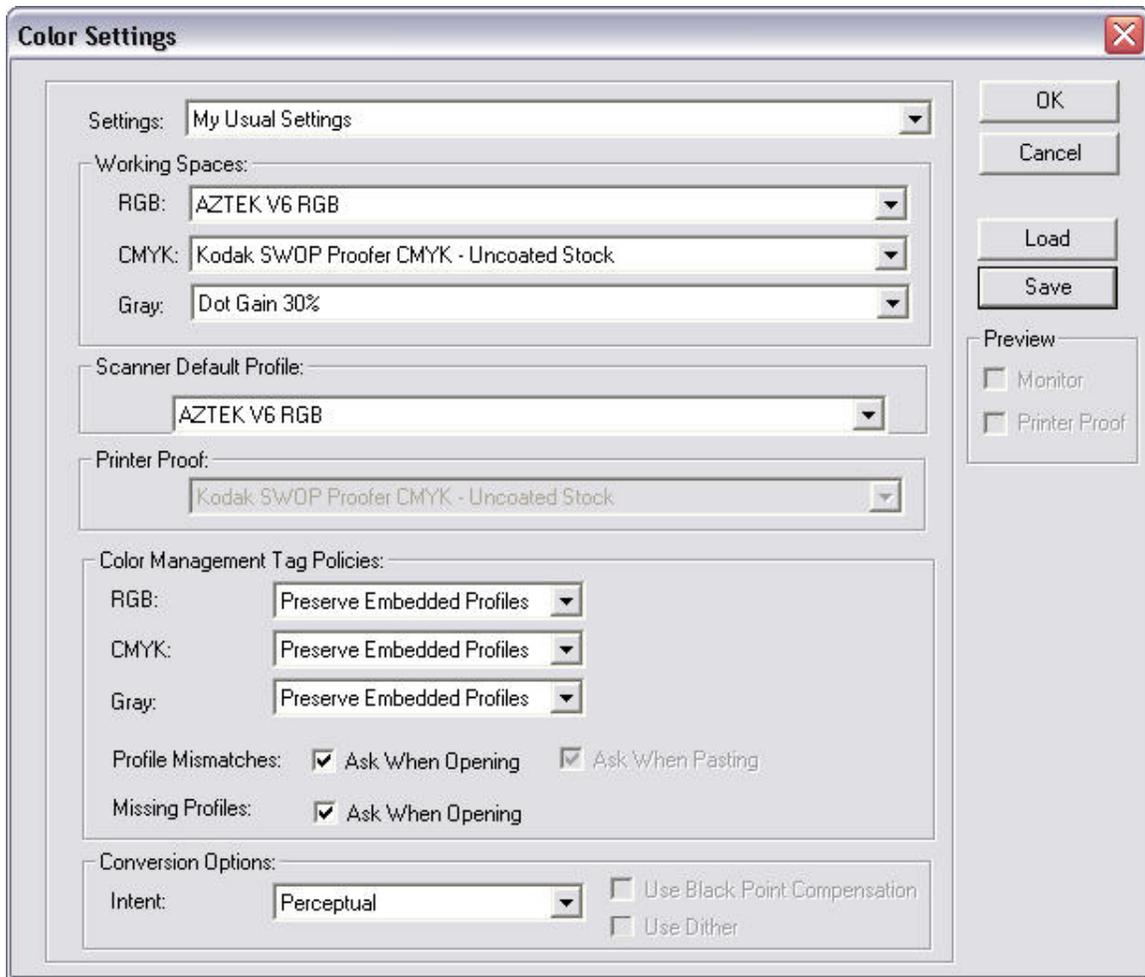
Figure 5 – After loading the "My Usual Settings.csf" file

The Working Spaces Section

The Working Spaces section contains three pull-down menus: RGB, CMYK and Gray.
The Working Spaces section is shown in Figure 6. Working spaces are essentially the
"output" profiles that will be used by the Color Management Tag Policies when
outputting a file in RGB, CMYK or Gray modes. The Working Spaces section defines
which profiles will be used for each file mode and the Tag Policies define what will be
done with these profiles, if anything. Exactly how these two interact will be covered in
the Color Management Tag Policies section. Remember to save any changes if you
intend to use them again.

Figure 6 – Working Spaces section

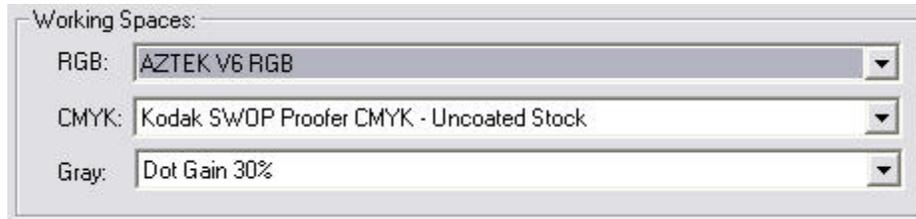## The Scanner Default Profile Section

The Scanner Default Profile section is shown in Figure 7. The section contains a single pull-down menu. The recommended profile to use is the "AZTEK V6 RGB" profile as shown in figure 7. If you decide to profile the scanner yourself using ICC profiling tools, you can set the default profile using this menu. The pull-down menu has a "Load…" option which allows the user to browse the file system to locate an externally created profile.

Figure 7 – Scanner Default Profile section

The Color Management Tag Policies Section

The Color Management Tag Policies Section is shown in Figure 8. This section is really the heart of the Color Management dialog box since this is where color management policy is set. Digital PhotoLab can be used to create new files from a scanner but it can also open files created elsewhere. It's important that the color management policies be consistent between these two operations, and they are. It's also important that the color management policies in Digital PhotoLab be consistent with other products like Photoshop and, again, they are.

Figure 8 – Color Management Tag Policies section

The section contains three pull-down menus, one for each file mode: RGB, CMYK or Gray scale. There are three options for each pull-down: "Off", "Preserve Embedded

Profiles," and "Convert to Working…" There are also two checkbox items to control the action taken when Digital PhotoLab encounters Profile Mismatches or Missing Profiles.

Tag Policy = Off

If the Pull-Down is set to Off, then no profile tagging will occur for newly created scan files. No conversion will occur for any existing file opened by Digital PhotoLab. If an existing untagged is opened in Digital PhotoLab, it will remain untagged. If it has a tag, the embedded profile will be used.

Tag Policy = Preserve

If the Pull-Down is set to Preserve Embedded Profiles, then newly created scan files will be tagged with the Scanner Default Profile when they are saved. No conversion will occur for any existing file. If an existing file is untagged, it will remain untagged. If it has a tag, that embedded profile will be used.

Tag Policy = Convert

If the pull-down is set to Convert to Working… " (RGB or CMYK or Gray), then new scan files created by Digital PhotoLab will be converted, using the Scanner Default Profile as the input profile and the respective Working Space (RGB, CMYK or Gray) as the output profile. They will be tagged with the respective Working Space when saved. Existing files which are opened in Digital PhotoLab will be converted from their existing profile to the respective Working Space profile.

Ask When Opening

The two Ask When Opening checkboxes give the user the ability to override the tag policies, regardless of whether they are set to Off, Preserve or Convert. If the Profile Mismatches checkbox is checked, then Digital PhotoLab will display a dialog box whenever an existing file is opened which has a profile which is not the same as the working space. The dialog box gives the user the option to use the existing profile, convert to the working space or discard the profile and not color manage.

If the Missing Profiles checkbox is checked, and if the tag policy is set to Off, then when Digital PhotoLab encounters an existing file with no embedded profile, it simply opens the file. Since the tag policy is set to Off and since there is no tag, there is no conflict. However, if the tag policy is set to either Preserve or Convert, then Digital PhotoLab will open a dialog box to ask the user what they want to do. The dialog box gives the user the option to leave the file as is (don't color manage), assign the working profile, or assign another profile from a pull-down menu.

The Conversion Options Section

The Conversion Options section is shown in figure 9. The section contains a single dialog box which controls the rendering intent to be applied during a profile conversion. The options are Perceptual, Saturation, Relative Colorimetric, and Absolute Colorimetric. The default is Perceptual and should suit most photographic users. Relative Colorimetric can also be a useful rendering intent for photographic images. If a profile conversion is called for, either due to the tag policy being set to Convert or due to the user asking for a conversion in one of the Ask When Opening dialog boxes, then the rendering intent defined in this section will be used for the conversion.

Figure 9 – Conversion Options section

Color Management Scenarios

This section covers different scenarios that may be desired for different reasons. The correct Digital PhotoLab Color Management settings are given for each workflow example.

Linear Density Workflow

A Linear Density workflow is one that relies on proper linearization and calibration of each device in the workflow. If each device is properly calibrated to produce linear density output, then ICC profiles are not needed and the loss of color gamut that can be associated with them can be avoided. Such a tightly coupled workflow is not always possible, but when it is, the proper Digital PhotoLab Color Management settings for a Linear Density workflow are shown in figure 10.

Working Spaces

Since newly created files will not be tagged, this has no effect on new files. For existing files which may have an embedded profile, this only matters as sort of a "safety check". Since the Ask When Opening checkbox is checked for Profile Mismatches, if a file is opened which has a profile which is different from the working space, the user will be asked what to do. In this way, the user stays informed about what profiles are in any existing files – just in case there is a need to deal with them.

Scanner Default Profile

Since the Tag Policy is set to Off, newly created scan files will not be tagged so this setting does not matter.

Color Management Tag Policies

Since the Tag Policy is set to Off, newly created scan files will not be tagged. Existing files which have no profiles will also not be tagged. Existing files which have an embedded profile will retain that profile but, as a safety check, the Ask When Opening checkbox will cause the user to be informed of a mismatch with the working space, if one exists. The Ask When Opening checkbox is NOT checked for Missing Profiles since profiles are not being used in this workflow. Therefore, if an existing file doesn't have an embedded profile, that's fine.

Conversion Options

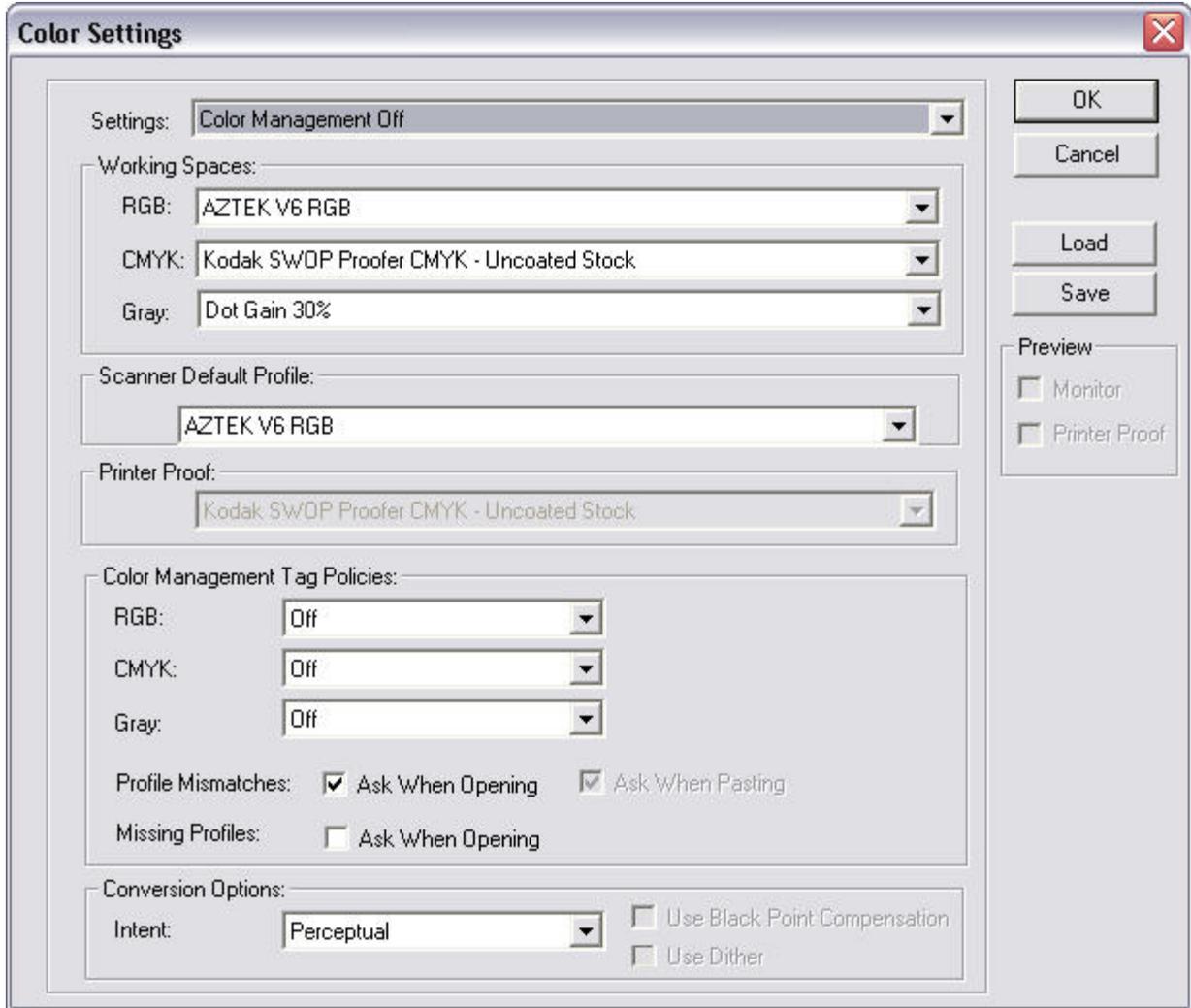Since no conversions will be done, this setting doesn't matter.

Figure 10 – Color Management settings for Linear Density Workflow

End-to-End ICC Workflow

An End-to-End ICC workflow is one that uses ICC profiles for each an every device in the workflow. To participate in such a workflow, Digital PhotoLab would be expected to do two things. First, any scans created by the scanner should be tagged with an embedded profile for the scanner. Second, when opening existing files, Digital PhotoLab should respect the embedded profiles, if any and perform any necessary conversions properly.

The proper Color management settings for an End-to-End ICC workflow are shown in figure 11.

Color Management Settings

Working Spaces

Working spaces should be set consistently between applications so as to avoid profile conversions. Each conversion is a math operation on the data. Each time the data is changed, there is a chance of posterization of any pixels whose color values are moved too far. The Aztek v6 workspace is a convenient one to use with the scanner because it is balanced for 5500 degree Kelvin (daylight) like daylight films and because it has been tested and proven to work well with the Aztek scanners. However, workspaces other than the ones shown in the figure can certainly be chosen.

Scanner Default Profile

The Scanner Default Profile should be set to the supplied Aztek profile. The supplied profile has been tested and proven to work well in both linear density and ICC workflows. Alternatively, the user can opt to profile the scanner using independent profiling tools and targets.

Color Management Tag Policies

Color Management Tag Policies should be set to Preserve. This will tag all newly created scan files with profile defined in "Scanner Default Profile". This will also avoid any unnecessary conversions of existing files. Checking both of the Ask When Opening checkboxes insures that the user is informed when mismatches or missing profiles occur so they are in full control of what happens to all profiles.

Conversion Options

Since conversions should be avoided whenever possible, this setting will usually not matter. However, the Perceptual rendering intent usually does a good job for photographs if a conversion is ever called for.
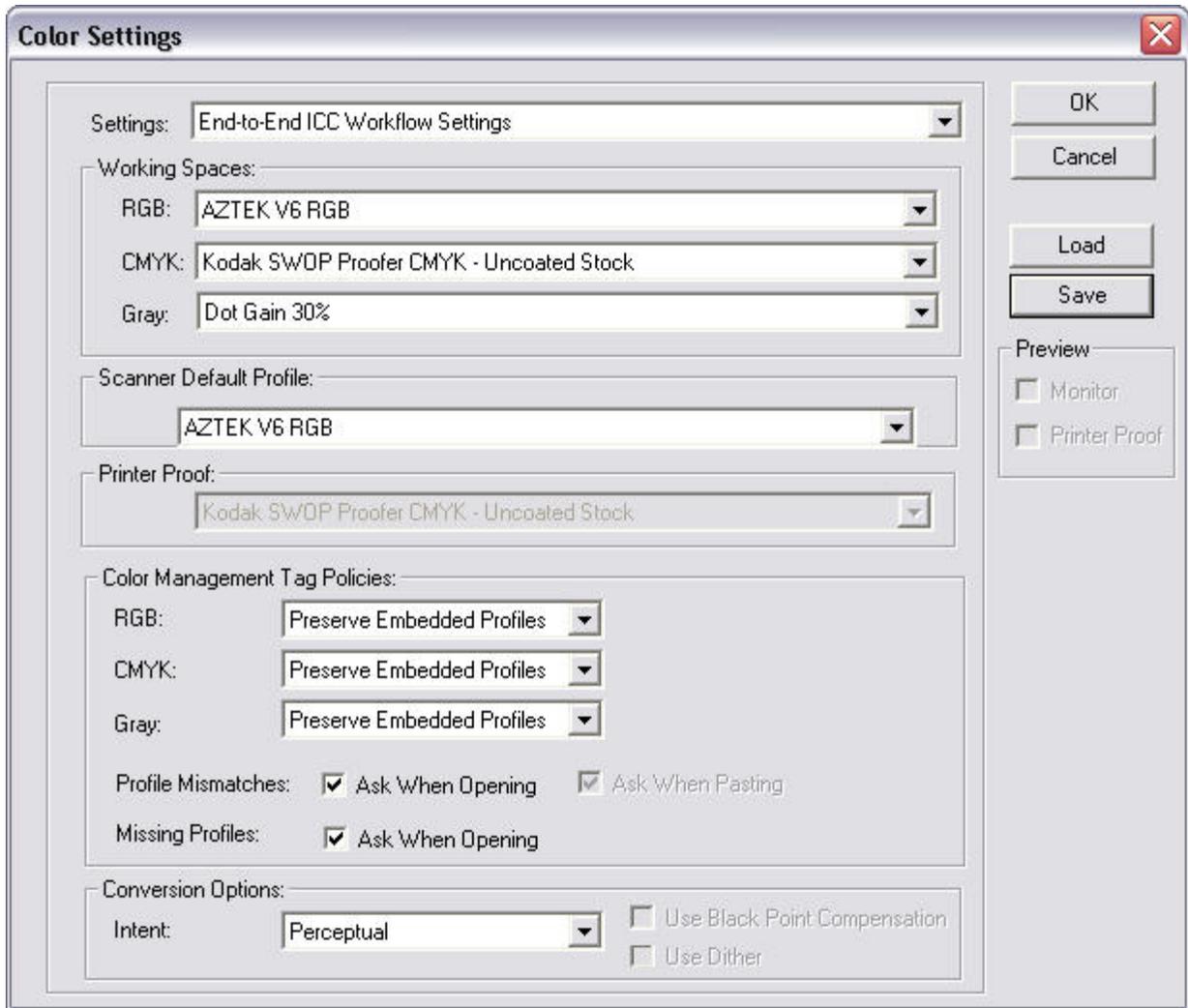
Figure 11 – Color Management Settings for End-to-End ICC Workflow

Conclusion

Aztek Digital PhotoLab provides the Color Management settings flexibility to implement different workflow options. Settings can be established for a closed loop, linear density workflow or an open ICC-based workflow or even hybrid scenarios. Settings are consistent with the behavior of the color management policy settings in Adobe Photoshop.