Printing System 50

Color Printing

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Introduction

This document explains how to manage color output on the Printing System 50 and provides information about color conversion and other color operations.

This document is part of a set that includes documentation for users and system administrators. For more information about supported operating systems and system requirements, see *Configuration and Setup*.

Terminology, conventions, and documentation resources

This document uses the following terminology and conventions to refer to the Printing System 50, printer, and supported operating systems.

Term or convention	Refers to
Aero	PS-50 (in illustrations and examples)
Command WorkStation	Fiery Command WorkStation
Printer	TASKalfa Pro 15000c
PS-50	Printing System 50
Mac OS	All supported Mac operating systems. For a complete list, see System Requirements in *Configuration and Setup*.
Windows	All supported Windows operating systems. For a complete list, see System Requirements in *Configuration and Setup*.
Warning:	A warning concerning operations that may lead to death or injury to persons if not performed correctly. To use the equipment safely, always pay attention to these warnings.
Caution:	A caution concerning operations that may lead to injury to persons if not performed correctly. To use the equipment safely, always pay attention to these cautions.
Important:	Operational requirements and restrictions. Be sure to read these items carefully to operate the equipment correctly, and avoid damage to the equipment or property.

The following documentation resources are available for the Printing System 50.

Resource	Description
User documentation	Documents in this set: *Color Printing*, *Configuration and Setup*, *Fiery Graphic Arts Package Premium Edition*, *Printing*, *Utilities*

Resource	Description
Online help	• Help can be accessed directly from each Fiery application or by going to help.efi.com. • Each help system is available as a printable PDF, accessed from the PDF icon in the upper right corner of the Help window.
Additional reference material	• *Fiery Color Reference* - help.efi.com/ref/colorref/en-us/ • *Variable Data Printing* - help.efi.com/ref/vdp/en-us/ • *Workflow Examples* - help.efi.com/ref/workflows/en-us/ • *Configure Help* - help.efi.com/configure/3.0/en-us/ • *Fiery Ticker Help* - help.efi.com/fieryticker/2.0/en-us/

Key features of ColorWise

ColorWise is the color management system (CMS) built into the PS-50 and designed to provide both casual and expert users with the best color output for a variety of purposes. The ColorWise default settings provide high-quality, out-of-box color from many applications.

ColorWise default settings allow casual users to achieve quality output without knowing about or changing any color settings on the PS-50. ColorWise also provides controls to allow expert users to obtain the best color output.

Depending on your particular needs, you can:

- Set the behavior of CMYK printing to emulate offset press standards.
- Match PANTONE and other spot colors for the best match when printing using four-color press conditions or presses with extra colorants.
- Select a rendering intent for RGB printing. Rendering intents allow for rich, saturated printing of presentation graphics, smooth, accurate printing of photographs, and relative or absolute colorimetric rendering for specialized needs.
- Define the source of incoming RGB color data for better color conversion of RGB data with no source information.
- Determine whether RGB data is converted into the full gamut of the printer or is first converted into the gamut of another device, such as a press standard. This feature is useful for making one device behave like another for RGB data. It also allows you to evaluate the appearance of an RGB file under different printing conditions without having to convert the RGB file to CMYK first.

ColorWise color management (ColorWise) offers an open color architecture, allowing users to customize the PS-50 to meet new printing needs as they arise. ColorWise supports ICC profiles, which are industry-standard color profiles that describe the color behavior of a device. Note that ICC specification version 4 profiles (profile version 4.2.0.0) are supported as well as version 2. Downloading ICC profiles to the PS-50 enables the PS-50 to simulate a custom press (or another printer), as well as accurately print colors from a particular monitor or scanner. In addition, you can create customized ICC profiles for the PS-50.

Color features in Command WorkStation

Command WorkStation includes color-management tools and color-related features.

- Color management

  Command WorkStation allows you to set the default settings of the ColorWise print options for the PS-50. These default settings are applied to all print jobs sent to the PS-50, unless a user overrides them for an individual job.

- Profiles

  Command WorkStation allows you to manage all of the ICC profiles used in PS-50 workflows. You can also create custom profiles by editing existing CMYK output profiles and saving them as new profiles.

  Grayscale Source Profiles are listed under Resources > Profiles. You can select one of these factory-installed grayscale profiles to use for source-to-output profile color conversion.

- Calibrator

  For consistent color, calibrate the PS-50 on a regular basis. Command WorkStation includes an easy-to-use calibrator, which allows you to calibrate using a measurement instrument.

  Command WorkStation also allows you to use any Status T densitometer by importing data in a standard file format. In this case, it is important to note that the quality of the instrument used determines the quality of the calibration.

- Spot-On (spot colors)

  Spot-On is a spot color (named color) manager. You can adjust and manage lists of spot colors and their CMYK equivalents. The matching lists of spot colors and CMYK values are known as spot color groups. Spot-On allows you to edit spot color definitions on the PS-50 and create custom spot color definitions and groups.

  Spot-On is also required for spot color overprinting, when a job contains overlapping spot-color objects.

- Image Enhance Visual Editor (IEVE)

  IEVE is an image-editing application that provides users with a visual workspace to adjust individual images in a job. With IEVE, you can see the effects of your adjustments and fine-tune the appearance of an image.

- Halftone Simulation

  The Halftone Simulation feature allows you to configure a custom halftone screen and apply it to a job. For more information, see *Fiery Graphic Arts Package, Premium Edition*.

Installing and starting Command WorkStation on a Windows or Mac OS computer is described in *Utilities*. You can install Command WorkStation from the User Software DVD or from the PS-50 over the network.

Fiery Graphic Arts Package, Premium Edition

Fiery Graphic Arts Package, Premium Edition contains features that are especially suited to the requirements of graphic arts applications.

The following features are included in Fiery Graphic Arts Package, Premium Edition:

Feature	Where to set values or access	Print option name
2-color print mapping in Spot-On	Command WorkStation: Device Center: Resources: Spot Colors	2-color print mapping
Configurable auto trapping	Command WorkStation: Device Center: Color Setup: Trapping	Auto trapping
Control bar	Command WorkStation: Device Center: Color Setup: Control Bar	Control Bar
Halftone simulation custom frequency per color	Command WorkStation: Device Center: Color Setup: Halftone Simulation	Halftone simulation
Hot Folders file filters	Hot Folders	none
ImageViewer	Command WorkStation: Job Center: ImageViewer	none
Integrated Altona Visual Test	none	none
Postflight	Command WorkStation: Job Center: Actions > Properties: Job Info	Postflight
Preflight	Command WorkStation: Job Center: Actions > Preflight	none
Ugra/Fogra Media Wedge	none	Control Bar

Color print options

The PS-50 provides print options that affect the output of color objects in various color spaces. By specifying the appropriate settings for each print option, you can obtain the expected results for your jobs.

Color management determines how color data in a job is converted to the color data that is sent to the printer. Some color print options affect the color management applied to a job. Other color print options are not related to color management.

Color management on the PS-50

The color management system on the PS-50 determines how the color data in a document is converted from source to output.

Applications allow you to generate color data in different color spaces. The most common type of color data produced from office applications is RGB, while prepress applications generally produce CMYK data. Desktop applications also generate spot colors, such as PANTONE colors. A single page of a document may contain a mix of RGB, CMYK, grayscale, and spot colors.

Through print options that apply specifically to RGB, CMYK, grayscale, or spot color data, you specify the color management of a job.

Note: Before you set these color management options, you must set the Color mode option, which specifies the output color space (CMYK, for example). If you change the Color mode setting, color management options are reset to the server default settings.

Print options that affect CMYK data	Print options that affect RGB data	Print options that affect grayscale data	Print options that affect spot-color data
CMYK source	RGB source	Grayscale source	Spot color matching
Use CMYK embedded profiles	Use RGB embedded profiles	Use Gray embedded profiles	Use spot group
CMYK rendering intent	RGB rendering intent	Grayscale rendering intent	
Black point compensation	Separate RGB/Lab to CMYK source		
PDF/X output intent			

Print options that affect CMYK data	Print options that affect RGB data	Print options that affect grayscale data	Print options that affect spot-color data
Black text and graphics	Black text and graphics		
Black overprint (for pure black)	Black overprint (for pure black)		
Print CMYK gray using black only	Print RGB gray using black only	Print gray using black only	
Output profile	Output profile	Output profile	Output profile

RGB Source applies strictly to RGB color data. The other options that affect RGB color also affect Lab, XYZ, and other calibrated color spaces, which are more rarely used.

Auto trapping

Trapping is a technique where the size of objects is modified so that colors printed next to each other overlap slightly, to prevent white spaces between two colors.

These white spaces between colors can be caused by factors such as misregistration, the physical properties of the toner, and the stiffness of the media.

Figure 1: Auto trapping off

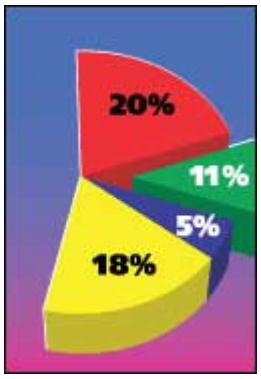
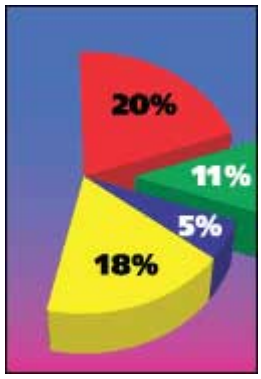


Figure 2: Auto trapping on



If you turn on the Auto trapping option, trapping is applied to text and graphic objects in a job.

The PS-50 has default trapping values that are optimized for a Fiery-driven print device using regular paper.

If the default trapping values do not provide the results necessary for the media that you use, you can modify the values to meet your requirements in Command WorkStation with the configurable auto trapping feature.

Configurable auto trapping is part of Fiery Graphic Arts Package, Premium Edition. For more information about configurable auto trapping, see *Fiery Graphic Arts Package, Premium Edition*.

Black overprint (for pure black)

The Black overprint (for Pure Black) option specifies whether black text, or black text and vector graphics (where black is defined as RGB=0, 0, 0, or as CMYK=0%, 0%, 0%, 100%) print over colored backgrounds. If you turn off this option, black text, or black text and graphics knock out colored backgrounds. Knocking out can create a white edge around objects, or a white space, caused by the misalignment of color plates.

Note: You can set Black overprint (for Pure Black) only if Black text and graphics is set to Pure Black On.

The Black overprint (for Pure Black) option has the following settings:

- Text - Black text overprints colored backgrounds, eliminating white gaps and reducing the halo effect from misregistration of colors.
- Text/Graphics - Black text and graphics overprint colored backgrounds, eliminating white gaps and the halo effect from misregistration of colors.
- Off - Black text and graphics knock out colored backgrounds.

Note: PostScript applications may perform their own black overprint conversions before printing.

An example of how you might use this setting is a page that contains black text on a light blue background. The background blue is CMYK=40%, 30%, 0%, 0%. The black text is CMYK=0%, 0%, 0%, 100%.

- With Black overprint (for Pure Black) set to Text or Text/Graphics, the final text or graphic portions of the page are overprinted, or combined with the underlying color. Black colors generated by applications (for example, RGB=0, 0, 0 or CMYK=0%, 0%, 0%, 100%) are printed using black only. This means that black text and line art do not exhibit halftone artifacts (as long as the printer is calibrated correctly). No transition in cyan and magenta occurs and the quality of the output is improved, because it does not show artifacts near the edges of text.
- With Black overprint (for Pure Black) set to Off, the border of the text or graphic is on an edge that has cyan and magenta on one side (outside the object) and black on the other side (inside the object). This transition may cause visible artifacts due to the practical limitations of the printer.

Note: The reproduction of CMYK components is affected by the CMYK Source setting and calibration when CMYK is not 0%, 0%, 0%, 100%.

Black point compensation

The Black point compensation option lets you control the output quality of shadow areas for CMYK source colors.

Black point compensation works by scaling the source colors so that the darkest point in the source profile maps to the darkest point in the output profile. Use Black point compensation to enhance details in shadows when the CMYK source space is larger than the gamut of the printer. In proofing applications, when the CMYK source space is smaller than the gamut of the printer, do not use this option.

Note: For RGB source colors, black point compensation is always applied to Relative Colorimetric. Black point compensation does not apply to Absolute Colorimetric. Photographic already scales the saturated colors and shadow detail to the color capabilities of the output device, so black point compensation is not relevant.

Black text and graphics

The Black text and graphics option affects black text and vector graphics. When you set this option to Pure Black On, the black generated by applications (RGB=0, 0, 0 or CMYK=0%, 0%, 0%, 100%) is printed using black only.

With Black text and graphics set to Pure Black On, black text and line art are not misregistered, since only one colorant is used. This setting also eliminates blasting, which is an undesirable effect that occurs when excess amounts of ink or toner, combined with certain types of paper stock, cause objects to spread beyond their defined boundaries.

For some jobs, we recommend setting Black text and graphics to Normal. For example, if a job includes gradient fills that use black, the Normal setting gives the best result.

If you set Black overprint (for pure black) to Text or Text/Graphics, Black text and graphics must be set to Pure Black On.

Note: Use Black text and graphics only when printing composites, not separations.

The following table describes the behavior of Black text and graphics with black defined in different color spaces.

Color	Black text and graphics = Normal	Black text and graphics = Pure Black On or Rich Black On
RGB=0,0,0 (all other RGB values are unaffected by Black text and graphics)	Printed according to the definition for RGB=0,0,0 in the output profile. This may be a rich black (one that uses multiple colorants) if the output profile specifies a rich black, or K-only if the output profile specifies K-only for RGB=0,0,0. The output is affected by calibration.	Printed as 100% K (Pure Black On) or 100% K plus 50% Cyan (Rich Black On) using black and cyan.

Color	Black text and graphics = Normal	Black text and graphics = Pure Black On or Rich Black On
CMYK=0%,0%,0%,100% (all other CMYK values are unaffected by Black text and graphics)	Printed as K-only or as a rich black using all colorants, depending on the CMYK source and CMYK rendering intent settings. If CMYK rendering intent is set to Pure Primaries, CMYK=0%,0%,0%,100% prints as 100% K and the amount of black is limited by the CMYK source profile and calibration. If CMYK source is set to Bypass conversion, CMYK=0%,0%,0%,100% prints as 100% K and the amount of black is limited by the CMYK source profile and calibration. If CMYK rendering intent is set to Relative Colorimetric, CMYK=0%,0%,0%,100% is printed as a rich black using all colorants according to the output profile. The output is affected by calibration. **Note:** Setting CMYK source to ColorWise OFF disables the CMYK Source profile and calibration. In this case, the black is not limited by calibration.	Printed as 100% K (Pure Black On) or 100% K plus 50% Cyan (Rich Black On) using black and cyan, regardless of the CMYK source and CMYK rendering intent settings.
Spot colors (unaffected by Black text and graphics)	Standard spot color processing	Standard spot color processing

Note: PostScript applications may convert elements defined as RGB=0, 0, 0 to four-color CMYK black before sending the job to the PS-50. These elements are not affected by the Black text and graphics option.

CMYK rendering intent

The CMYK rendering intent option specifies a rendering intent for color conversion. This conversion can be optimized for the type of color image being printed.

The PS-50 also provides support for a fifth rendering intent, Pure Primaries.

Note: If you experience tone reproduction problems, use the Photographic setting.

Rendering intent	Best used for	Equivalent ICC rendering intent
Photographic - Typically results in less-saturated output than presentation rendering when printing out-of-gamut colors. This style preserves tonal relationships in images, and scales the grayscale tonal range in the source to the available tonal range in the output device.	Photographs, including scans and images from stock photography CDs and digital camera images.	Image, Contrast, and Perceptual
Presentation - Creates saturated colors but does not match printed colors precisely to displayed colors. In-gamut colors, such as flesh tones, are rendered well. This style is similar to Photographic rendering intent, and can be used to increase contrast for grayscale content.	Artwork and graphs in presentations. This style can be used for mixed pages that contain presentation graphics and photographs.	Saturation, Graphics
Relative Colorimetric - Provides white point transformation between the source and destination white points. For example, the bluish-white color (gray) of a monitor is replaced by paper white. This style avoids visible borders between blank spaces and white objects. Relative Colorimetric is the default rendering intent for grayscale and is best suited for preserving the appearance of gray.	Advanced use when color matching is important, but you prefer white colors in the document to print as paper white. This style may also be used with PostScript color management to affect CMYK data for simulation purposes.	Relative Colorimetric

Rendering intent	Best used for	Equivalent ICC rendering intent
Absolute Colorimetric - Provides no white point transformation between the source and destination white points. For example, the bluish-white color (gray) is not replaced by paper white. This style can introduce gamut clipping in high light and shadow details.	Situations when exact colors are needed and visible borders are not distracting. This style may also be used with PostScript color management to affect CMYK data for simulation purposes. Setting CMYK rendering intent to Absolute Colorimetric simulates the white of the paper using CMYK values rather than leaving the paper white areas of the page unprinted. This has the same effect as the former Paper Simulation feature.	Absolute Colorimetric
Pure Primaries - Uses pure colorants, free from contaminating colorants that are introduced when color management tries to match the appearance of a color on image systems with different color capabilities.	When source content is made up of one or two process colorants, they remain as one or two process colorants in the final print. This rendering intent does not achieve colorimetric accuracy, and content is not expected to match that of other print systems.	Pure Primaries

Combine separations

The Combine separations option specifies how to print separated CMYK data.

You can combine Cyan, Magenta, Yellow, and Black separations.

You can also combine one or more spot colors.

- Off - Prints each separation individually.
- On - Combines separations as a single, composite-color document, and automatically sets the following print options: Color mode (CMYK) and Black overprint (for pure black) (Off).

The results of combining the multiple plates are predictable and accurate, regardless of the original application used. This feature also fully supports DCS 2.0 file formats when included in a PostScript print job from a page-layout application.

The following applications have been tested with Mac OS and Windows for compatibility with the Combine separations option:

- Adobe Illustrator
- Adobe InDesign
- Adobe PageMaker
- QuarkXPress

Note: You cannot use Combine separations at the same time that you use the following features: Substitute colors, Composite overprint, or Black overprint (for pure black).

Note: You cannot use Combine separations at the same time that you use Postflight.

Composite overprint

The Composite overprint print option allows you to print overprinted objects as specified in the source file.

When overlapping objects are printed, the foreground object can either overprint or knock out the background object. With overprinting, the color of the background object shows through the foreground object where they overlap, and the resulting color is a combination of the colors of the two objects. With a knockout, the foreground object hides the background object where they overlap.

- Off - An overprinted object knocks out a background object.
- On - The area of overlap between two overprinted objects is a blend of the two colors.

Note: The Composite overprint option does not overprint the foreground object if it is an RGB object.

The Composite overprint print option is supported for PostScript and PDF jobs produced by the following applications:

- Adobe Acrobat
- Adobe Illustrator
- Adobe InDesign
- QuarkXPress
- CorelDRAW

The 2-color print mapping option is ignored when Composite overprint is turned on.

You cannot use Composite overprint at the same time that you use Combine separations.

Device link profiles

To be selected for a print job, a device link profile must reside on the PS-50 and be associated with a specific source profile and output profile.

When you select the source profile and output profile settings associated with a device link profile, the PS-50 bypasses its normal color management and applies the device link conversion to the color data in the job. The source profile and the output profile are not used.

Profiles that do not reside on the PS-50 do not appear as settings. A device link profile that is not associated with a source profile setting and an output profile setting cannot be selected for a job. Therefore, even though the source profile and output profile that are associated with a device link profile are not used to calculate color conversions, they must reside on the PS-50.

Device link profiles are disabled when certain Color input settings have been specified. See the table below:

RGB-CMYK device link	CMYK-CMYK device link
Use RGB embedded profiles	Use CMYK embedded profiles
RGB rendering intent	CMYK rendering intent **Note:** In Fiery system software FS200/200 Pro and earlier, CMYK Processing Method

RGB-CMYK device link	CMYK-CMYK device link
Print RGB gray using black only	Print CMYK gray using black only
	Black point compensation

Grayscale rendering intent

The Grayscale rendering intent option specifies a rendering intent for color conversion. This conversion can be optimized for the type of gray objects being printed.

To control the appearance of text, graphics, and images in grayscale, select the appropriate rendering intent. The PS-50 allows you to select from the four rendering intents currently found in industry-standard ICC profiles.

Note: If you experience tone reproduction problems, use the Photographic setting.

Rendering intent	Best used for	Equivalent ICC rendering intent
Photographic - Typically results in less-saturated output than presentation rendering when printing out-of-gamut colors. This style preserves tonal relationships in images.	Photographs, including scans and images from stock photography CDs and digital camera images. Photographic scales the grayscale tonal range in the source to the available tonal range in the output device.	Image, Contrast, and Perceptual
Presentation - Creates saturated colors but does not match printed colors precisely to displayed colors. In-gamut colors, such as flesh tones, are rendered well. This style is similar to the Photographic rendering intent.	Artwork and graphs in presentations. This style can be used for mixed pages that contain presentation graphics and photographs. Presentation increases contrast for grayscale content.	Saturation, Graphics
Relative Colorimetric - Provides white point transformation between the source and destination white points. For example, the bluish-white color (gray) of a monitor is replaced by paper white. This style avoids visible borders between blank spaces and white objects.	Advanced use when color matching is important, but you prefer white colors in the document to print as paper white. Relative Colorimetric, the default rendering intent for grayscale, preserves the appearance of gray when compared with output from previous Fiery products.	Relative Colorimetric
Absolute Colorimetric - Provides no white point transformation between the source and destination white points. For example, the bluish-white color (gray) is not replaced by paper white.	Situations when exact colors are needed and visible borders are not distracting. Absolute Colorimetric can introduce gamut clipping in high light and shadow details.	Absolute Colorimetric

ImageViewer Curves

The ImageViewer Curves print option lets you apply color curve edits from ImageViewer that have been saved on the server as a preset.

ImageViewer in Command WorkStation can be used to edit the CMYK curves of a job on the PS-50. These curve edits can be saved as a preset and applied to other jobs. Use the ImageViewer Curves option to select a preset for your job.

Factory-supplied curve edits apply some typical color corrections:

- No correction
- Lighter highlights
- Midtone boost
- Shadow detail
- Reduce C (cyan) cast
- Reduce M (magenta) cast
- Reduce Y (yellow) cast

After the job is processed, the edits become part of the job and are no longer visible as edits when you view the job in ImageViewer.

Optimize RGB transparency

The Optimize RGB transparency option corrects color rendering errors that can occur when documents contain transparency effects applied to mixed color spaces, including RGB, CMYK, and Lab.

Optimize RGB transparency affects jobs with the following characteristics:

- The job is in PDF format (submitted to the PS-50 as a PDF file, not submitted by printing from an application).
- The job contains transparent RGB, Lab, or CMYK objects. They might be objects that you specified as transparent using an application that supports this capability, or they might be objects with a special effect, such as a drop shadow, that uses transparency to achieve the effect.
- The transparent objects overlap, creating an area of mixed color.

If you turn on Optimize RGB transparency, the PS-50 uses the source profiles selected in Job Properties instead of overriding these profiles with a predefined selection. This ensures use of the user's selections for color managing transparency, rather than replacing these selections with a set of conventional profiles that may not achieve the desired appearance. If you turn off Optimize RGB transparency, the area of overlapping colors might print with incorrect color or undesirable artifacts.

When Adobe PDF Print Engine Preferred is turned on, the PS-50 does not convert the PDF job to PostScript when processing the job. In this case, the effect of Optimize RGB transparency is to recognize blending color spaces in the job, and this applies to jobs containing a single color space or mixed color spaces in transparency effects.

Optimize RGB transparency can result in a longer processing time, especially for variable data printing (VDP) jobs that contain multiple individual PDF pages. We recommend that you turn on Optimize RGB transparency only when necessary to achieve correct color output.

You can specify Optimize RGB transparency for a job in Job Properties in Command WorkStation, Hot Folders, or a virtual printer.

When you print from the printer driver, the Optimize RGB transparency option does not appear because jobs printed from the printer driver are always submitted to the PS-50 as PostScript jobs, which are not affected by Optimize RGB transparency.

Output profile

The Output profile print option specifies the output profile used to process a job. Color data in a print job is converted to the color space of the printer, which is described by the output profile.

In addition, the calibration that is associated with the output profile is applied to the job before printing.

The PS-50 includes one or more default output profiles, each created for a specific media type. You can also import your own output profiles to the PS-50.

Use job defined settings

Rather than select a specific output profile for your job, you can let the PS-50 determine the output profile automatically. The color mode and media type used in the print job determine the profile, or if the job uses media from Paper Catalog, the output profile specified in Paper Catalog is used. For more information on default output profiles, see Setting a default color output profile on page 19 and How does the PS-50 decide which output profile to use? on page 20.

Device link profiles

If a CMYK-to-CMYK or RGB-to-CMYK device link profile is available for the specified output profile and source profile, Device link profile selected is displayed below the Output profile drop-down list box. When a device link profile has been selected, the specific device link profile name is displayed below the Source profile drop-down list box. The other source settings in the area are disabled as they are not applicable in the device link profile workflow.

In this case, the selected output profile is not used for color management, since the device link profile is used.

Setting a default color output profile

If you do not want to manually select an output profile for every job, you can specify an output profile as the default. You can also override the default setting for a specific job.

Your preferred output profile must be specified according to the Use job defined settings rules.

For jobs using Paper Catalog:

- Do not modify the front and back color profile settings for your media/substrate.

  The specified profile will be used, unless the setting is Server's default.

For jobs not using Paper Catalog, or when Paper Catalog specifies Server's default:

- Go to Device Center > Resources > Profiles. Under Output Profiles, select your preferred output profile and associate it with all the available media types.

  Note: Not all PS-50's support association of output profiles with media.

You can override the default for a specific job by going to Job Properties > Color > Output profile. Instead of Use job defined settings, select a profile from the list. You can also set a specific output profile as the default by accessing Set defaults from the Server menu in Job Properties.

Note: The default output profile displayed in the Color tab of the Default Settings window is that set by the PS-50. The note displayed there ("Use job defined settings" is always the default profile selection.) refers to the Output Profile menu in Job Properties.

If a job is using Paper Catalog, the default output profile will be that specified in the Paper Catalog entry for the front color profile and the back color profile. Server's default is the profile determined by the PS-50. For more information, see How does the PS-50 decide which output profile to use? on page 20.

How does the PS-50 decide which output profile to use?

How the PS-50 decides which output profile(s) to use in a job takes into account a number of factors, depending on which of three major implementations of Paper Catalog is used.

The three possible implementations of Paper Catalog are:

- Paper Catalog must be used for media selection.
- Paper Catalog is optional for media selection.
- Paper Catalog is not available for media selection.

The PS-50 runs a number of tests to decide on the output profile to use.

1 Is Job Properties set to automatic output profile selection?

2 Is Paper Catalog used?

3 Which output profile is set most closely to the settings for your job?

Is Job Properties set to automatic output profile selection?

For automatic profile selection, Output Profile in the Color tab of Job Properties must be set to Use job defined settings. The option is displayed as Use job defined settings when more properties than the media alone are considered. For example, Color Mode (CMYK+) might be used in addition to the media itself to determine the profile.

If a specific output profile is specified, it will be used. Make a specific selection when you are not satisfied by the automatic selection of the PS-50 or when you want to experiment with other profiles.

Is Paper Catalog used ?

When a Paper Catalog media is specified in Job Properties, check the Paper Catalog output profile association. To see the front and back color profiles association, right-click the chosen media in Paper Catalog and select Edit. If a specific output profile is associated with the media/substrate, that profile will be used.

If the output profile association is set to Server's default, the third test will be used.

Which output profile is set most closely to the settings for your job?

Check the association between the available output profiles and the job settings. Go to Device Center > Resources > Profiles and expand the Output Profiles section.

Print options offered vary widely, according to the PS-50. Media Type is offered very frequently. Options in the Media Type column typically do not match one-for-one the large number of equivalent job settings. For instance, Job Properties may offer multiple coated options, while there might be only one output profile setting associated with coated media type. In this case, the output profile associated with coated will be used for all coated media.

To change which output profile will be used by default with a media type, double-click the output profile of your choice, then check the media type this profile is compatible with. A single output profile can be specified for many, or all of the available media settings.

PDF/X output intent

The PDF/X output intent option, when turned on for a PDF/X job, specifies the use of the PDF/X output intent embedded in the PDF/X document. Typically, whether you use this option depends on whether you are printing a proof or the final output (production printing).

PDF/X is a subset of the PDF specification. PDF files can contain a variety of elements (text, graphics, even animations) and it is not always obvious how these elements should be displayed or printed. PDF/X was designed with a focus on high-quality printing. It excludes the use of PDF features that are not appropriate for graphic arts and adds features that prevent ambiguities related to printing. A PDF/X compliant document contains embedded information about the intended printing conditions for the document.

Prints for proofing are expected to look exactly like the output of the final production device, regardless of the capabilities of the printer. For instance, when proofing Newsprint, you want the color gamut of the printer to be very limited compared to its capabilities. In production, you usually want to maximize the use of the printer gamut by applying specific color features. Even in production, however, you might choose to limit the color gamut in order to achieve consistency in the color produced by different devices.

The PDF/X output intent option only affects PDF/X files (conforming to the PDF/X3 or PDF/X-1a standard). It has no effect on non-PDF files or PDF files that are not PDF/X compliant. Profiles specified by PDF/X files must be embedded in the files, not referenced from an external location.

Note: With Fiery Graphic Arts Package, Premium Edition, you can use a Hot Folders filter to determine if a PDF file is PDF/X compliant. For information about this Hot Folders filter, see *Hot Folders Help*.

When PDF/X output intent is turned on and no other setting conflicts, the PS-50 processes a PDF/X compliant file in a way that produces results defined by the intents and source color spaces embedded in the file. The PS-50 ignores the CMYK rendering intent and CMYK source options. The rendering intents in the PDF/X file are used and the printed output is limited to the color gamut specified by the output profile embedded in the file.

When PDF/X output intent is turned off, the PDF/X output intent is ignored.

You can specify the PDF/X output intent print option for a job in Job Properties in Command WorkStation, Hot Folders, or a virtual printer.

When you print from the printer driver, the PDF/X output intent option does not appear because jobs printed from the printer driver are always submitted as PostScript jobs.

When you turn on PDF/X output intent, you must select the Use RGB embedded profiles option so that the rendering intent embedded in the PDF/X file is used. The PDF/X output intent and Use RGB embedded profiles options are accessible from the Color tab of Job Properties.

Print RGB/CMYK gray using black only

When the Print RGB gray using black only option is turned on, any RGB color that has equal R, G, and B values is printed as K-only black instead of CMYK black. Similarly, when Print CMYK gray using black only is turned on, any CMYK color where C, M, and Y are 0 (zero), and K is any value is printed as K-only black instead of CMYK black.

You can turn on Print RGB gray using black only or Print CMYK gray using black only for either Text/Graphics or Text/Graphics/Images. "Graphics" refers to vector graphics. "Images" refers to bitmap images.

Note: You can also turn on Print gray using black only for the Grayscale source profile, with the same options of Text/Graphics and Text/Graphics/Images.

The following limitations apply:

- The Print RGB gray using black only and Print CMYK gray using black only options have no effect on a job that is sent as separations.
- If CMYK rendering intent is set to Pure Primaries, Print CMYK gray using black only does not affect the output.
- If Separate RGB/Lab to CMYK source is turned on, Print RGB gray using black only is turned off. Likewise, if Print RGB gray using black only is turned on, you cannot turn on Separate RGB/Lab to CMYK source.
- If Black Text and Graphics is set to Pure Black On or Rich Black On, it takes precedence over Print RGB gray using black only and Print CMYK gray using black only for 100% black text and graphics.
- If a gray is specified as a spot color, Print RGB gray using black only and Print CMYK gray using black only do not affect that gray.

RGB rendering intent

The RGB rendering intent option specifies a rendering intent for RGB/Lab-to-CMYK color conversion. This conversion can be optimized for the type of color image being printed.

To control the appearance of images in artwork, or RGB photographs from Adobe Photoshop, select the appropriate rendering intent. The PS-50 allows you to select from the four rendering intents currently found in industry-standard ICC profiles.

Note: If you experience tone reproduction problems, use the Photographic setting.

Rendering intent	Best used for	Equivalent ICC rendering intent
Photographic - Typically results in less-saturated output than presentation rendering when printing out-of-gamut colors. This style preserves tonal relationships in images.	Photographs, including scans and images from stock photography CDs and digital camera images.	Image, Contrast, and Perceptual
Presentation - Creates saturated colors but does not match printed colors precisely to displayed colors. In-gamut colors, such as flesh tones, are rendered well. This style is similar to the Photographic rendering intent.	Artwork and graphs in presentations. This style can be used for mixed pages that contain presentation graphics and photographs.	Saturation, Graphics

Rendering intent	Best used for	Equivalent ICC rendering intent
Relative Colorimetric - Provides white point transformation between the source and destination white points. For example, the bluish-white color (gray) of a monitor is replaced by paper white. This style avoids visible borders between blank spaces and white objects.	Advanced use when color matching is important, but you prefer white colors in the document to print as paper white. This style may also be used with PostScript color management to affect CMYK or RGB data for simulation purposes.	Relative Colorimetric
Absolute Colorimetric - Provides no white point transformation between the source and destination white points. For example, the bluish-white color (gray) is not replaced by paper white.	Situations when exact colors are needed and visible borders are not distracting. This style may also be used with PostScript color management to affect CMYK or RGB data for simulation purposes.	Absolute Colorimetric

RGB source, CMYK source, and Grayscale source

The RGB source, CMYK source, and Grayscale source print options allow you to define the color spaces of the RGB, CMYK, and grayscale data, respectively, in your document so that the appropriate color conversion occurs on the PS-50.

Commonly used color spaces are available on the PS-50. For others, you can import CMYK and RGB custom profiles to the PS-50. Custom grayscale profiles cannot be imported.

RGB source

When you specify a profile for RGB source, the PS-50 overrides source color space definitions or profiles that other color management systems may have specified. For example, if your document contains an embedded RGB profile, the RGB source setting overrides it.

When you specify an RGB source profile, the output from the PS-50 is consistent across platforms. The RGB source options are as follows:

- EFIRGB - Specifies an EFI-defined color space recommended for users who have no detailed information about their RGB data.
- sRGB (PC) - A Microsoft and Hewlett-Packard recommended color space designed for typical home and office applications.
- Apple Standard - Specifies the color space of an older Mac OS computer monitor.
- Adobe RGB (1998) - An Adobe-defined color space, used in some prepress workflows as the default working space for Adobe Photoshop.

- eciRGB v2 - The European Color Initiative (ECI) recommended space for use as an RGB working color space and color data exchange format for ad agencies, publishers, reproduction, and printing houses.
- Fiery RGB v5 - An EFI-defined color space recommended for users of office applications. This color space is similar to EFIRGB but is larger and can provide a more desirable blue output.

In cases where you do not want RGB source to override another specified source color space, select the Use RGB embedded profiles option.

If the Use RGB embedded profiles option is enabled, the PS-50 honors objects in the document with RGB profiles, and objects without profiles are color managed with the RGB source profile from Job Properties.

CMYK source

The CMYK source option can be set to any CMYK source profile that is present on the PS-50.

To properly manage color in a printed image that was separated using an ICC profile, the same profile must be specified for printing the image.

The CMYK source profile setting you specify depends on the CMYK profile or press standard for which the CMYK data was separated. This option affects CMYK data only.

- For images that were separated using a custom separation (such as a separation produced with an ICC profile), select the profile used for RGB to CMYK conversions in the prepress workflow on the PS-50 with the CMYK source setting.
- For images that were separated for a press standard, select the press standard as the CMYK source setting.

If the job contains an embedded CMYK profile, select the Use CMYK embedded profiles option. The embedded profile is applied to CMYK data.

The CMYK source option can be set to any CMYK source profile that is present on the PS-50.

If you do not want CMYK data in a job to be converted to the output color space, you can select one of the following settings:

- Bypass conversion - This setting sends the original CMYK data in the job to the printer without conversion, but with calibration applied.
- ColorWise OFF - This setting sends the original CMYK data in the job to the printer without calibration applied and without converting the CMYK data. The CMYK data is still subject to the total ink or toner limit, however.

  The ColorWise OFF setting is available for a specific job but it cannot be the default setting on the PS-50. You select this setting for a specific job.

  Note: When you print with the ColorWise OFF setting, make sure that the options you choose in your application do not cause the application to modify CMYK data. You must specify no color management in the application when you print with the ColorWise OFF setting.

Grayscale source

The PS-50 supports separate processing of jobs with Device Gray and ICC Based Grayscale through their own color conversion.

For FS200/FS200 Pro and earlier, the grayscale color spaces were processed through the CMYK color path.

The Grayscale source profile setting provides factory-installed grayscale profiles to use for source-to-output profile color conversion. Users cannot import their own grayscale ICC profiles.

If the job contains an embedded profile associated to grayscale objects in the document, select the Use Gray embedded profiles option.

The Grayscale source option can be set to any of the factory-installed grayscale source profiles that are present on the PS-50.

Separate RGB/Lab to CMYK source

The Separate RGB/Lab to CMYK source option determines how RGB colors (as well as Lab and XYZ colors) are converted to CMYK. This option defines the color spaces that are used by the PS-50 to separate the RGB data into CMYK values.

- When Separate RGB/Lab to CMYK source is turned on, all RGB colors are first converted to the CMYK color space defined by the CMYK source print option before being converted to the CMYK color space of the printer (as defined by the Output profile print option). The result is a simulation of the RGB colors that would be output from a printer with the characteristics defined by the CMYK source profile.

  With Separate RGB/Lab to CMYK source, for example, if a high-quality ICC profile is available for another printer, your printer can simulate the behavior of that other printer.
- When Separate RGB/Lab to CMYK source is turned off, all RGB colors are converted directly to the CMYK color space of the printer (as defined by the Output profile print option).

Spot color matching

The Spot color matching option provides automatic matching of spot colors with their best CMYK equivalents.

- On - The PS-50 uses a built-in table to generate the closest CMYK matches of spot colors your printer can produce. (New tables are generated when you add new output profiles.)

  With Spot-On, the PS-50 uses the CMYK matches determined through Spot-On.
- The Use spot group menu allows you to select a spot color group that PS-50 searches first for spot color definitions during file processing. When new spot color groups have been created in Device Center > Resources > Spot Colors, the new groups are listed in the Use spot group menu. If a spot color is not found in the selected list, the PS-50 searches all other spot color groups for a matching spot color name. If the name is not found, the spot color is rendered with the alternate color in the document.
- Off - The PS-50 processes spot colors as CMYK data and uses the alternate color space provided by the spot color. By default, most applications use the CMYK equivalents defined by the spot color manufacturer, such as PANTONE. These are the same CMYK equivalents used by applications that include spot color libraries.

Note: Spot colors that are not included in the built-in table are processed with the alternate color space.

For jobs that include spot colors, turn Spot color matching on unless you are printing press simulations. In that case, turn Spot color matching off and select the appropriate CMYK source.

For PDF and PostScript jobs that include spot colors that are not in the built-in table, turning Spot color matching on causes the alternate color space to be used. The PS-50 references the built-in table to generate the closest CMYK matches of the original spot color.

Note: Use Spot color matching only when printing composites, not when printing separations.

Substitute colors

Substitute colors are colors that, when called for in a document by their RGB or CMYK values, are substituted with a different color that is defined in the Spot-On color dictionary. This permits exact color control and overrides individual RGB and CMYK colors.

Spot-On allows you to create a list of substitute colors. To enable substitute colors for a job, turn on the Substitute colors option.

Note: You cannot use Substitute colors at the same time that you use Postflight.

When you use Substitute colors at the same time that you use Spot color matching, be sure that the CMYK color that you want to replace with a substitute color is not a CMYK color that is also defined as a spot color. Otherwise, the spot color may be replaced with the substitute color, which may not be the result that you expect.

For more information about creating and using substitute colors, see *Command WorkStation Help*.

Use RGB/CMYK/Gray embedded profiles

You can specify whether the PS-50 uses the source profile (either RGB or CMYK or grayscale) that is embedded in the print job rather than the source profile specified in the print settings.

RGB

If you turn on Use RGB embedded profiles, the PS-50 honors the embedded RGB profile information for objects tagged with an RGB profile and uses the RGB source profile for RGB objects without an RGB profile. If you turn off this option, the PS-50 uses the profile specified in the RGB source option.

CMYK

If you turn on Use CMYK embedded profiles, the PS-50 honors the embedded CMYK profile information for objects tagged with a CMYK profile and uses the CMYK source profile for CMYK objects without a CMYK profile. If you turn off this option, the PS-50 uses the profile specified in the CMYK source option.

Gray

If you turn on Use Gray embedded profiles, the PS-50 honors the embedded gray profile information for objects tagged with a gray profile and uses the source gray profile for gray objects without a gray profile.

Use spot group

Use spot group uses the default spot color group for the print job.

Where to specify color print options

You can set color print options for all jobs by setting the default values on the PS-50. You can set the color print options for a specific job to different values if the default values are not what you want for the job.

You specify default values for color print options in Color Setup in Command WorkStation. You can also set default values from PS-50 Setup, as described in *Configuration and Setup*. The defaults apply to all subsequent print jobs unless you override them.

Note: A job uses the PS-50 default settings at the time it is sent to the PS-50 Hold queue, not at the time the job is processed for printing.

How you set specific color print options for a particular job depends on how you submit the job to the PS-50.

- When you print a job from an application through the printer driver, specify color print options using the settings that appear in the printer driver.

  The printer driver sends a PostScript file to the PS-50 that incorporates the settings for the color print options you selected.
- When you print a job through Hot Folders or a virtual printer, specify color print options in the Job Properties settings. These settings override the default settings on the PS-50.
- When a job is in the Hold queue of the PS-50, specify color print options through the Job Properties settings in Command WorkStation. These settings override the default settings on the PS-50.

The following color print options are located in both (1) the Color tab of the printer driver or Job Properties and (2) in Color Setup in Device Center:

- 2-color print mapping
- Auto trapping
- Black overprint (for pure black)
- Black point compensation
- Black text and graphics
- CMYK rendering intent
- CMYK source or device link
- Combine separations
- Composite overprint
- Grayscale rendering intent
- Grayscale source
- Optimize RGB transparency (Job Properties only)
- Output profile
- PDF/X output intent
- Print CMYK gray using black only
- Print gray using black only
- Print RGB gray using black only
- RGB rendering intent
- RGB source or device link
- Separate RGB/Lab to CMYK source
- Spot color matching
- Substitute colors
- Use CMYK embedded profiles

- Use Gray embedded profiles
- Use RGB embedded profiles

Print from an application

To print from an application, you use the printer driver for your operating system (Windows or Mac OS).

- For information about how to install the printer driver, set up the PS-50 for printing, and set print options with the printer driver, see *Printing*.
- When you print a job from a Mac OS application using the printer driver, you must also set color-management print options appropriately.

Print with color settings in Mac OS

Printing a job from a Mac OS application varies from application to application, because many Mac OS applications have their own print dialog that is different from the Mac OS system print dialog. To set color management print options when you are using the Mac OS system print dialog and the printer driver for Mac OS, follow the steps below. For more information about how to set print options with the printer driver for Mac OS, see *Printing*.

1 Select Print in your application.

2 Expand the dialog box, if necessary, by clicking the arrow next to the Printer name.

3 Click Preview, select Color Matching from the drop-down list, and then click In Printer.

4 Set other print options as needed, and then click Print to send your job.

Color profiles

The PS-50 includes by default a number of RGB and CMYK profiles that you can use for printing through the RGB Source, CMYK/Grayscale Source, and Output Profile settings for a job.

You can manage the profiles on the PS-50 with Profile Manager in Command WorkStation, which allows you to import ICC profiles to the PS-50, export profiles, delete profiles (except for default profiles), and set the properties of profiles. You can also create custom CMYK source or output profiles by editing an existing profile and saving it as a new profile.

You can install (copy) additional ICC profiles from the User Software DVD to your computer. Use the ICC profiles with applications that support ICC standards, such as Adobe Photoshop.

You can also install ICC profiles from the PS-50 to your computer over the network.

ICC profiles on the User Software DVD

The User Software DVD contains additional ICC profiles that you can install (copy) to your computer.

Adobe ICC Profiles folder

The Adobe ICC Profiles folder is located inside the Windows Color Files\Legacy\ICC Profiles folder or Mac Color Files/Legacy/ICC Profiles folder.

The profiles in this folder were created by Adobe Systems, Inc. For more information, see the documents included in the folder.

CMYK Profiles:

- CoatedFOGRA27.icc
- CoatedFOGRA39.icc
- CoatedGRACoL2006.icc
- JapanColor2001Coated.icc
- JapanColor2001Uncoated.icc
- JapanColor2002Newspaper.icc
- JapanColor2003WebCoated.icc
- JapanWebCoated.icc
- UncoatedFOGRA29.icc
- USWebCoatedSWOP.icc
- USWebUncoated.icc
- WebCoatedFOGRA28.icc

- WebCoatedSWOP2006Grade3.icc
- WebCoatedSWOP2006Grade5.icc

RGB Profiles:

- AdobeRGB1998.icc
- AppleRGB.icc
- ColorMatchRGB.icc
- PAL_SECAM.icc
- SMPTE-C.icc
- VideoHD.icc
- VideoNTSC.icc
- VideoPAL.icc

ECI folder

The ECI folder is located inside the Windows Color Files\Legacy\ICC Profiles folder or Mac Color Files/Legacy/ICC Profiles folder.

The profiles were created by the European Color Initiative (ECI). For more information, see the documents included in the CMYK Profiles and RGB Profiles folders, as well as the ECI web site at www.eci.org.

CMYK Profiles:

- ISOcoated_v2_300_eci.icc
- ISOcoated_v2_eci.icc
- ISOuncoatedyellowish.icc
- PSO_Coated_300_NPscreen_ISO12647_eci.icc
- PSO_Coated_NPscreen_ISO12647_eci.icc
- PSO_LWC_Improved_eci.icc
- PSO_LWC_Standard_eci.icc
- PSO_MFC_Paper_eci.icc
- PSO_SNP_Paper_eci.icc
- PSO_Uncoated_ISO12647_eci.icc
- PSO_Uncoated_NPscreen_ISO12647_eci.icc
- SC_paper_eci.icc

EFI Support folder

The EFI Support folder is located inside the Windows Color Files\Legacy\ICC Profiles folder or Mac Color Files/Legacy/ICC Profiles folder.

These profiles were created by EFI. For more information, see the General Requirements for Applications in Commercial Offset Lithography (GRACoL) website at www.gracol.org, the Fogra website at www.fogra.org, and the Specifications Web Offset Publications (SWOP) website at www.swop.org.

CMYK Profiles:

- EFIEURO.icc
- EFISWOP.icc
- Enterprise CMYK.icc
- GRACoL2006_Coated1_EFI.icc
- ISOCoated.icc
- ISOCoated_FOGRA39L_EFI.icc
- ISOUncoated_FOGRA29L_EFI.icc
- SWOP2006_Coated3_EFI.icc
- SWOP2006_Coated5_EFI.icc

RGB Profiles:

- EFI Fiery RGB Chroma.icc
- EFI Fiery RGB Chroma+.icc
- EFI Fiery RGB Chroma++.icc

Note: The EFI Fiery RGB Chroma profiles are designed to provide saturated colors, especially in nighttime images, while maintaining photographic detail. Of the three profiles, EFI Fiery RGB Chroma.icc has the least effect and EFI Fiery RGB Chroma++.icc has the greatest effect.

- EFIRGB.ICC
- Fiery RGB v2.icc
- Fiery RGB v4.icc
- Fiery RGB v5.icc
- RGB D65 (Splash).icc

Japan Profiles:

- EFIDIC.ICC
- EFIJMPA2.icc
- EFIJMPA3.icc
- JapanColor2011Coated.icc
- JC2001_type1_EFI.icc
- JC2001_type2_EFI.icc
- JC2001_type3_EFI.icc
- JC2001_type4_EFI.icc
- TOYO Offset Coated 2.0.icc

Add ICC profiles from the User Software DVD

The User Software DVD includes a number of ICC profiles that you can add to the PS-50:

For most ICC-aware applications, you must install the files in the Color folder (Windows) or the Library/ColorSync/Profiles folder (Mac OS). For use with the PS-50, you can copy the files to a folder of your choice.

Note: On Mac OS, see the ColorSync documentation for setting ColorSync profiles, such as EFIRGB.

1 Install the profiles on your computer.

2 Use Command WorkStation to import the files to the PS-50.

Install ICC profiles on a Windows computer

1 Insert the User Software DVD into the DVD drive.

2 Open the folder (Windows Color Files) containing the profile.

3 Right-click the profile that you want and click Install Profile.

The profiles are installed automatically to the Windows\System32\spool\drivers\color folder on your computer.

Install ICC profiles on a Mac OS computer

You must log on with Administrator privileges.

1 Insert the User Software DVD into the DVD drive.

2 Open the folder (Mac Color Files) containing the profile.

3 Copy the profiles into Library/ColorSync/Profiles.

Install ICC profiles on a Windows computer over the network

1 Browse to the PS-50 over the network, using the IP address or DNS server name.

2 Type the user name and password, if required.

Ask your administrator if this information is required.

3 Double-click the PC_User_SW directory.

4 Open the ICC folder.

5 Right-click the profile that you want and click Install Profile.

The profiles are installed automatically to the Windows\System32\spool\drivers\color folder on your Windows computer.

Install ColorSync profiles on a Mac OS computer over the network

You must log on with Administrator privileges.

1. Select Go > Connect to Server.
2. Type smb:// followed by the IP address of the PS-50 and click Connect.

   If you cannot locate your PS-50, contact your administrator.
3. Type the user name and password, if required.

   Ask your administrator if this information is required.
4. Double-click the Mac_User_SW directory.
5. Open the ColorSync folder.
6. Copy the profiles into Library/ColorSync/Profiles.

Color Bars folder

The Color Bars folder is located inside the Windows Color Files folder or Mac Color Files folder. These files are used for the Control Bar feature.

Note: The Fogra color bar files can be used only in legacy Fiery systems you may still own. When Command WorkStation is connected to thePS-50, the new Control Bar Builder interface is presented and directly offers the Fogra color bar wedges.

The Control Bar feature is available with Fiery Graphic Arts Package, Premium Edition. For more information, see *Fiery Graphic Arts Package*.

You can copy these additional color files from the User Software DVD to your computer.

You can also copy these files from the PS-50 to your computer over the network.

- FieryColorBar.eps
- Ugra Fogra-MediaWedge V2.2x_EFIv1.eps
- Ugra Fogra-MediaWedge V3.0a_EFIv1.eps

Calibration

In this documentation, “density” (all lower case) means the perceived darkness of a colorant caused by the absorption or reflection of light on media, irrelevant of its measurement unit. The actual density of an ink can be reported with various measurement units like Density (D), Lightness (L*), even percentage.

Calibrating the PS-50 ensures consistent and reliable color output. Calibration adjusts the toner densities to compensate for the difference between the expected response (target) densities of the printer and the actual measured densities that the printer outputs.

Periodic calibration is necessary to monitor the actual output of the printer. To calibrate the PS-50, you use the Calibrator module included with Fiery Color Profile Suite and measure printed color patches on media.

Calibration is applied to all jobs, but you can disable it for a specific job. The ColorWise OFF setting for the CMYK source option disables calibration (and color management) for CMYK data in a job. You might want to disable calibration for testing purposes, for example.

Changing calibration has the potential to affect *all* jobs for *all* users, so consider limiting the number of people authorized to perform calibration. Set an Administrator password to control access to calibration (see *Configuration and Setup*).

Managing calibration settings

Every output profile on the PS-50 must be associated with a calibration setting. The calibration setting provides the PS-50 with measurements of each of the printed colorants, for specific printing conditions (for example, media type). This data, along with the expected density response of the printer, allows the PS-50 to apply corrections to color values that are sent to the printer, to achieve the calibrated output.

An output profile can be associated with only one calibration setting, but the same calibration setting can be used by more than one output profile.

A calibration setting must be associated with at least one output profile, otherwise the calibration setting will never be used for printing.

Output profiles and calibration settings

The PS-50 has one or more factory-supplied output profiles.

Output profiles and their associated calibration settings may produce acceptable color quality. However, you may need to create custom calibration settings and output profiles, depending on your situation.

	Your media	Action	Notes
1	Recommended media for a factory-supplied output profile (the media that the profile is based on)	Printing with the output profile produces acceptable color. You do not need to create a calibration setting or custom profile.	You can find the recommended media for an output profile in Calibrator.
2	Media similar to a factory-supplied profile's recommended media	You might be able to use a factory output profile. The print settings required for your media (for example, media type and media weight) must match the print settings required by the recommended media. If the color quality is acceptable, you do not need to create a calibration setting or custom profile.	The output profile name usually indicates the general type of media (for example, plain, coated, or heavy). You can find the print settings required for the recommended media in Calibrator.
3	Media that is similar to a factory-supplied profile's recommended media, but uses different print settings	You must create a custom calibration setting and custom profile.	Use profile-generating software to create a custom profile.
4	Media that does not yield acceptable color with any factory-supplied profile	You must create a custom calibration setting and custom profile.	Use profile-generating software to create a custom profile.

Note: Recommended media is chosen for color quality, as well as other factors, such as feeding reliability and quality of transfer.

Custom calibration settings

If you are printing on a media that is similar to the recommended media, but uses different print settings, you might still be able to use the output profile, but you must create a custom calibration setting. If the color quality is acceptable, you do not need to create a custom profile.

You can add a new calibration setting that you can then select when performing calibration. You can delete a custom calibration setting. You cannot delete a factory-supplied calibration setting.

For information about adding a custom calibration setting, see the online help.

Custom calibration settings and output profiles

If you determine that none of the factory-supplied output profiles produces acceptable color with your media, you must create a custom calibration setting in Calibrator and a custom profile using profile-generating software.

To create a custom calibration setting, you print images of color patches on the PS-50 using your media and measure the media with Calibrator.

If Fiery Color Profiler Suite is installed on your computer, you can start it from within Calibrator to create a custom output profile immediately after creating a custom calibration setting.

Note: If you are creating only a custom output profile, make sure that the printer is well calibrated before creating the profile (if calibration is supported on the printer). For information about performing printer calibration, see the documentation that accompanies the printer.

When color quality is important, make sure that the PS-50 is calibrated for the particular halftone screen that you use. Changing a halftone screen usually modifies the color response of the printer. For more information, see *Fiery Graphic Arts Package, Premium Edition*.

Understanding calibration

Calibration generates adjustments to toner densities that account for the difference between the actual measurements and the expected response (target).

- Measurements represent the actual color behavior of the printer.
- Calibration settings contain sets of measurements that represent the output for specific printing conditions, such as media and print options.
- Each calibration setting is associated with a calibration target that describes the expected behavior of the printer.

After you calibrate the PS-50 for a specific print setting, the measurements are stored. These measurements are used to adjust output densities when you print with the output profile associated with the calibration setting.

Although the needs of most users are met by the default calibration setting, the PS-50 allows you to select a calibration setting to customize calibration for specialized jobs.

Every output profile has an associated calibration setting. If you have not specified one, the calibration setting associated with the default output profile is used.

How calibration works

Success in obtaining satisfactory print quality from the PS-50 depends on many factors. Among the most important are establishing and maintaining optimal ink or toner densities. By doing this, you obtain consistent printed color from print run to print run.

Calibration allows you to:

- Maximize the color reproduction capabilities of the PS-50.
- Ensure consistent color quality from print run to print run.
- Produce consistent output across more than one PS-50.
- Achieve better color matches when reproducing spot colors, such as PANTONE colors or other named color systems.
- Optimize the PS-50 for using ColorWise rendering intents, CMYK simulations, and ICC profiles.

Even with a calibrated system, ink or toner density is affected by the settings of the printer, humidity, and temperature. Color density also tends to drift over time. Uneven color density on media affects calibration results. Regular measurement detects day-to-day variations in density, gradation, and color reproduction, and calibration corrects them.

Calibration works by calculating adjustments that compensate for the difference between actual (measured) and target values. These calibration adjustments are often depicted as mathematical curves for each of the colorants.

When to calibrate

Calibrate the PS-50 at least once a day, depending on the volume of print jobs. If it is very important to maintain consistent color, or your printer is subject to wide fluctuations in temperature or humidity, calibrate every few hours. For optimal performance, calibrate whenever there is a noticeable change in print quality or printing results are not as expected.

If you must split a print job into two or more batches to print at different times, it is important to calibrate before you print each batch. You should also calibrate the PS-50 after printer maintenance or printer calibration. However, because the printer may be less stable immediately after maintenance, wait until you have printed approximately 50 images before you calibrate.

Note: Because output from the printer is very sensitive to changes in temperature and humidity, do not install the printer near a window, in direct sunlight, or near a heater or air conditioner. Media is also sensitive to climate changes. Store it in a cool, dry, stable environment, and keep media sealed until it is used.

To monitor print quality, print a color reference image. A good reference image includes fully saturated color patches and pale tints of cyan, magenta, yellow, and black. Images with skin tones offer a good basis for comparison. Save and periodically compare the images you print. If a noticeable change in appearance occurs, calibrate the PS-50.

When you examine the reference image, all color patches should be visible, even though they may be very faint in the five to two percent range. Each patch set should show uniform gradation from patch to patch as the color lightens from 100% to zero.

If the solid patches (100% cyan, magenta, yellow, or black) look less saturated over time, show the images to your service technician to determine whether adjusting the printer can improve output.

Spot-On

The Spot color matching print option automatically matches spot colors with their best CMYK equivalents so that spot colors can be simulated using the CMYK colors. However, you may want to adjust the default CMYK equivalents to achieve a better match for your specific printing conditions. You can modify spot colors with the Spot-On spot color editor (Spot Colors in Command WorkStation).

Note: Spot colors are also called "named" colors because a color name is used to represent a specific CMYK value.

Spot Colors comes pre-loaded with libraries of named colors such as those from PANTONE, HKS, TOYO, and DIC. The spot color libraries store the original colors with their device-independent definitions (Lab values). For each output profile on the PS-50, the PS-50 computes the best available CMYK reproduction of each spot color. Each time a new profile is generated or updated, the PS-50 automatically recalculates the best CMYK equivalents.

Spot-On supports other features related to spot colors:

- In Spot Colors, you can create a list of "substitute" colors. These are colors that, when called for in a document by their RGB or CMYK values, are substituted with a different color having the CMYK values from the Spot Colors color definition. This permits exact color control and overrides individual RGB and CMYK colors.

  For more information, see Substitute colors on page 26.

- When a job that specifies overprinting for spot-color objects is printed with the Composite overprint print option, Spot-On enables the correct color processing.

  For more information, see Composite overprint on page 16.

Spot Colors in Command WorkStation

The Spot Colors feature is a spot color (named color) manager in Command WorkStation that allows you to edit spot color definitions on the PS-50 and create custom spot color definitions. Spot Colors is a part of the Spot-On feature. If Spot-On is available for your PS-50 and is activated on the PS-50, you can adjust and manage lists of spot colors and their CMYK equivalents.

The Spot-On feature is in Command WorkStation, in Device Center, in the Spot Colors window under the Resources tab.

You can create a list of "substitute" colors. These are colors that, when called for in a document by their RGB or CMYK values, are substituted with a different color having the CMYK values from the Spot Colors color definition. This permits exact color control and overrides individual RGB and CMYK colors.

If 2-Color print mapping is available for your PS-50, and is enabled, Spot Colors also allows you to assign spot colors and process colors to the generic colors that are used in a job. The 2-Color print mapping feature is designed for print shop operators to simulate a two-color press. You can print a two-color job to a two-color device by mapping the colors in a job to the colors that are already created on the device.

For more information about 2-Color print mapping, see *Fiery Graphic Arts Package, Premium Edition*.

For more information about Spot Colors and Substitute Colors, see *Command WorkStation Help*.

How Spot-On works

Spot-On allows you to adjust and manage lists of spot colors and their CMYK equivalents. The matching lists of spot colors and CMYK values are known as spot color dictionaries. Spot-On allows you to maintain multiple spot color dictionaries for each output profile on the PS-50.

In Spot-On, you specify the job properties that you use to print a job. Based on the settings, Spot-On determines the output profile and its associated spot color dictionary.

If you select Output profile X and redefine PANTONE 123 from 30%M to 50%M using Spot-On, the output will reflect 50%M when you print a job with Output profile X. If you print a job with Output profile Y, you will get the original value.

If you select Output profile X and create a custom color named "My Purple" and define it as 80%C 40%M, the PS-50 automatically calculates the Lab values using Output profile X and creates new CMYK values for use with Output profile Y.

To use the Spot-On features with named colors, you must enable the Spot color matching print option.

Note: Spot colors that are identified by name are printed with their defined CMYK values. Edits to an output profile made in Command WorkStation do not affect how spot colors are printed.

Any edits made to a job with the color adjustment features in ImageViewer affect all of the colors in the job, including spot colors.

Monitor settings

This feature requires that a job be displayed with correct colors on your monitor. To display the colors correctly on your monitor, you must set up the monitor according to the manufacturer's recommendations, and specify the correct monitor profile for your monitor.

Specify the following settings for the monitor:

- On the monitor: Brightness, Contrast, and Color Temperature
- In the operating system: Resolution, Refresh rate, and Number of colors

For more information about setting up the monitor and the monitor profile, see the documentation that accompanies the monitor.

Image Enhance Visual Editor

Image Enhance Visual Editor (IEVE) is an image editing application that provides users with a visual workspace to adjust individual images in a job. With IEVE, you can see the effects of your adjustments and fine-tune the appearance of an image.

With IEVE, you can adjust tone, color, and sharpness, and perform red-eye correction. You can apply the same adjustments to all images on a page or a range of pages. When you save a set of adjustments as a preset, you can easily apply the same adjustments in the future.

Adjustments made in IEVE affect the job on the server and cannot be applied to the original source document.

IEVE is accessible from Command WorkStation. For more information about IEVE, see *Fiery Command WorkStation Help*.

Access IEVE in Command WorkStation

1. In Job Center in Command WorkStation, select the job containing the images that you want to adjust.

   Note: IEVE supports PDF, PostScript, and imposed (.dbp) jobs only.

2. To start IEVE, do one of the following:

   - Select Actions > Image Enhance Visual Editor.
   - Right-click the selected job and select Image Enhance Visual Editor from the menu that appears.

IEVE and Apply image enhancement print option

IEVE adjustments are independent of the configurable Apply image enhancement print option. If the Apply image enhancement print option is turned on for a job that is also modified with IEVE, the effects of both are applied to the images in the job. We recommend that you use one or the other, not both, for a job.

- The Apply image enhancement print option is a faster way to apply simple adjustments that do not require visual confirmation before printing.
- IEVE is faster for making selective adjustments that require fine-tuning and visual inspection.