



# Xerox EX Print Server, Powered by Fiery® for the Xerox Color 1000 Press

## Color Printing



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## INTRODUCTION



This document explains how to manage color output on the Xerox EX Print Server, Powered by Fiery for the Xerox Color 1000 Press and provides information about calibration and color profiles.



This document is part of a set that includes documentation for users and system administrators. For a complete description of your Xerox EX Print Server, Powered by Fiery for the Xerox Color 1000 Press, see the other documents available at your site.

For more information about supported operating systems and system requirements, see [Welcome](#).

### Terminology and conventions

This document uses the following terminology and conventions.

Term or convention	Refers to
Aero	EX Print Server (in illustrations and examples)
Press	Xerox Color 1000 Press
EX Print Server	Xerox EX Print Server, Powered by Fiery for the Xerox Color 1000 Press
Mac OS	Apple Mac OS X
Titles in <i>italics</i>	Other documents in this set
Windows	Microsoft Windows XP, Windows Vista, Windows Server 2003/2008, Windows 7
	Topics for which additional information is available by starting Help in the software
	Tips and information

Term or convention	Refers to
 <b>WARNING</b>	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.
 <b>CAUTION</b>	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.
<b>IMPORTANT</b>	Operational requirements and restrictions. Be sure to read these items carefully to operate the equipment correctly, and avoid damage to the equipment or property.

## About this document

This document is organized to supply you with key information about managing the color output of your EX Print Server. To manage color in general, you use Command WorkStation. You can also manage color for a specific job by setting print options in the printer driver or in the job properties in Command WorkStation and Hot Folders.

This document covers the following topics:

- Setting values for ColorWise print options
- Managing color profiles and other color files
- Calibrating the EX Print Server to achieve consistent color output
- Managing spot colors
- Importing calibration measurement data from a text file

**NOTE:** The Glossary in the *Fiery Color Reference* defines words in bold, for example, **output profile**, that appear throughout this document. Color terms and concepts, such as “color space,” “spot color,” “gamut,” and “source profile,” are used throughout this document. If you are new to desktop color, or if any terms are unfamiliar, see the *Fiery Color Reference*.

## Key features of ColorWise

ColorWise is the **color management system (CMS)** built into the EX Print Server 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 Windows and Mac OS applications. This allows casual users to achieve quality output without knowing about or changing any color settings on the EX Print Server. ColorWise also allows expert users to obtain the best color output.

ColorWise features allow you to modify printing results. 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, custom plates.
- 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 press 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 EX Print Server 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 EX Print Server enables the EX Print Server to simulate a custom press (or another press), as well as accurately print colors from a particular monitor or scanner. In addition, you can create customized ICC profiles for the press.

## Color management in Command WorkStation

Designed to give flexible control of color printing, Command WorkStation includes the following color management tools:

- Color management

Command WorkStation allows you to set the default settings of the ColorWise print options for the EX Print Server. These default settings are applied to all print jobs sent to the EX Print Server, unless a user overrides them for an individual job by changing settings in the printer driver or in Job Properties.

- Profiles

Command WorkStation allows you to manage all of the ICC profiles used in EX Print Server workflows. You can also create custom profiles by editing existing CMYK source or output profiles and saving them as new profiles. The AutoGray feature allows you to adjust the gray balance of output profiles.

- Calibrator

For consistent color, calibrate the EX Print Server on a regular basis. Command WorkStation includes an easy-to-use calibrator, which allows you to calibrate using an optional [spectrophotometer](#) or [densitometer](#) (see “[Calibration](#)” on page 44).

Command WorkStation also allows you to use any [Status T](#) densitometer by importing data in a standard file format (see “[Importing Density Measurements](#)” on page 59). 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. If Spot-On is available for your EX Print Server and is enabled, 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 dictionaries. Spot-On allows you to edit spot color definitions on the EX Print Server and create custom spot color definitions and dictionaries.

Installing and starting Command WorkStation on a Windows or Mac OS computer is described in [Utilities](#). Command WorkStation can be installed from the User Software DVD or from the EX Print Server over the network.



## COLORWISE PRINT OPTIONS

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

### About this chapter

This chapter provides an overview of the ColorWise management system, which controls color on the EX Print Server (see [page 10](#)), and detailed explanations of each print option. For the location of each print option, see the following table.

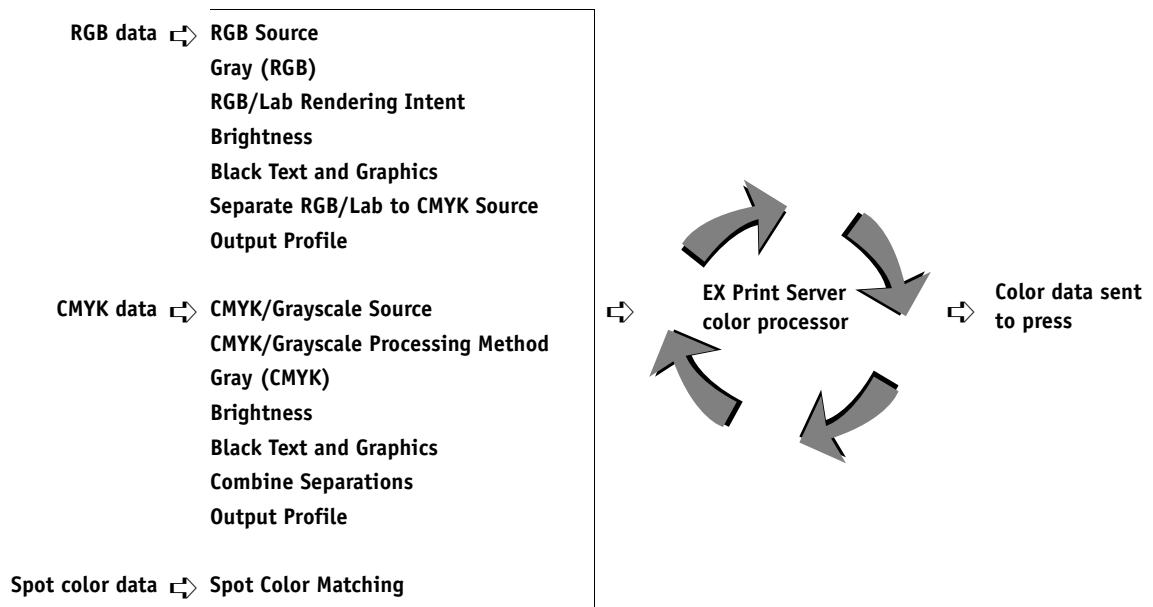
ColorWise print option	See
Auto Trapping	<a href="#">page 11</a>
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Use Embedded Profile If Present	<a href="#">page 24</a>

This chapter also provides information about **PostScript** printer drivers and instructions for setting the ColorWise print options for Windows and Mac OS computers. For information about printer drivers, see [page 27](#).

## Managing color on the EX Print Server

Applications allow you to generate color data for the EX Print Server in many 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. To complicate matters, a single page may contain a mix of RGB, CMYK, and spot colors. The EX Print Server allows you to control the printing of mixed-color documents with features that apply specifically to RGB, CMYK, or spot color data.

The following diagram illustrates the print options in the EX Print Server color management process that affect color data conversions. You can access these print options when you send a print job to the EX Print Server. Most of these options and settings are described in subsequent sections of this chapter.



RGB Source or Device Link is the only color option that applies strictly to RGB color data. The other options that affect RGB color also affect the more rarely used Lab, XYZ, and other calibrated color spaces.

**NOTE:** With PostScript 3, a PostScript job can include calibrated CMYK (or CIEBasedDEFG) data. The RGB/Lab Rendering Intent print option, which normally affects only RGB data, affects calibrated CMYK data as well. The RGB Source or Device Link setting does not affect calibrated CMYK data.

## Descriptions of ColorWise print options

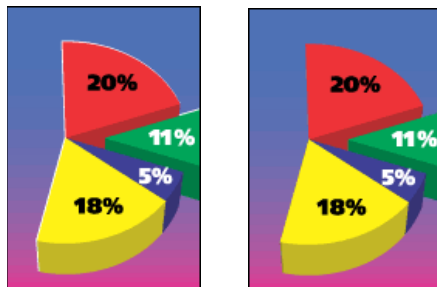
The following sections provide detailed explanations of the ColorWise print options and how these options affect print jobs.

**NOTE:** For information about the following print options, see *Fiery Graphic Arts Package*.

- Halftone Simulation
- Paper Simulation
- 2-Color Print Mapping

### 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, or “halos,” can be caused by factors such as misregistration, the physical properties of the dry inks, and the stiffness of the media. This illustration shows the same image with and without trapping.



If you enable the Auto Trapping option, trapping is applied to all of the objects in a job.

The EX Print Server is shipped with trapping values that are optimized for a Fiery-driven print device using regular paper. If these values do not provide the results necessary for the media that you use, and if Fiery Graphic Arts Package, Premium Edition is configured on the EX Print Server, you can modify the values to meet your requirements. For more information, see *Fiery Graphic Arts Package*.

## Black Overprint

The Black Overprint option allows you to specify whether or not black text or black text and graphics, defined as RGB=0, 0, 0, or as CMYK=0%, 0%, 0%, 100%, overprints colored backgrounds.

- **Text:** Black text overprints colored backgrounds, eliminating white gaps and reducing the halo effect or misregistration of colors. You can choose this setting only if the Black Text and Graphics option is set to Pure Black On.
- **Text & Graphics:** Black text and graphics overprint colored backgrounds, eliminating white gaps and reducing halo effects or misregistration of colors. You can choose this setting only if the Black Text and Graphics option is set to Pure Black On.
- **Off:** Black text or text/graphics knocks out colored backgrounds.

**NOTE:** Before sending the print job to the press, PostScript applications may perform their own black overprint conversions.

One 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 set to Text or Text & Graphics, the final text or text/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 the black dry ink. This means that black text and line art does not exhibit halftone artifacts (as long as the press is calibrated correctly). No transition in cyan and magenta dry inks occurs. The quality of the output is improved, because it does not show artifacts near the edges of the black text.
- With Black Overprint Off, the border of the text or text/graphics is on an edge that has cyan and magenta dry inks on one side (outside the text) and black dry ink on the other side (inside the text). This transition may cause visible artifacts due to the practical limitations of the press.

**NOTE:** The reproduction of CMYK components is affected by the CMYK/Grayscale Source setting and calibration curve when CMYK is not 0%, 0%, 0%, 0%.

## Black Text and Graphics

The Black Text and Graphics option affects black text and [vector graphics](#). Under most circumstances, set this option to Pure Black On. When Black Text and Graphics is set to Pure Black On, black colors generated by applications (for example, RGB=0, 0, 0 or CMYK=0%, 0%, 0%, 100%) are printed using black dry ink only. The black text and line art do not exhibit halftone [artifacts](#) (as long as the press is calibrated correctly) and are not misregistered, since one dry ink is used. In addition, this setting eliminates [blasting](#). This option must be set to Pure Black On if you want to set the Black Overprint option to Text or Text/Graphics.

For some jobs, it is preferable to set this option to Normal, for example, if the page includes [gradient](#) fills that use black. The following table describes the behavior of the Black Text and Graphics option with black data defined in different color spaces.

**NOTE:** Use the Black Text and Graphics option only when printing composites, not when printing separations.

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 the Black Text and Graphics setting)	RGB=0,0,0 is printed according to the definition for RGB=0,0,0 in the output profile. This may be a rich black using all dry inks if the output profile specifies a rich black, or may be K-only if the output profile specifies K-only for RGB=0,0,0. The output is affected by the calibration curve.	RGB=0,0,0 is printed as K-only, using the black dry ink (Pure Black On) or 100% K plus 50% Cyan (Rich Black On) using black and cyan dry inks. All other RGB values are unaffected by the Black Text and Graphics setting.
CMYK=0%,0%,0%,100% (all other CMYK values are unaffected by the Black Text and Graphics setting)	CMYK=0%,0%,0%,100% may be printed as K-only or as a rich black using all dry inks, depending on the CMYK/Grayscale Source setting.  If CMYK/Grayscale Source is set to a specific profile, CMYK=0%,0%,0%,100% prints as K-only and the amount of black dry ink is limited by the CMYK Source profile and the calibration curve.  Setting CMYK/Grayscale Source to ColorWise Off disables the CMYK Source profile and the calibration curve. In this case, the black dry ink is not limited by the calibration curve.	CMYK=0%,0%,0%,100% is printed as K-only, using the black dry ink (Pure Black On) or 100% K plus 50% Cyan (Rich Black On) using black and cyan dry inks, regardless of the CMYK/Grayscale Source and CMYK/Grayscale Processing Method settings. All other CMYK values are unaffected by the Black Text and Graphics setting.  Setting CMYK/Grayscale Source to ColorWise Off disables the CMYK source profile and the calibration curve. In this case, the black dry ink is not limited by the calibration curve.
Spot Colors (unaffected by the Black Text and Graphics setting)	Standard spot color processing	Standard spot color processing

**NOTE:** PostScript applications, such as QuarkXPress, may convert elements defined as RGB=0, 0, 0 to four-color CMYK black before sending the job to the EX Print Server. These elements are not affected by the Black Text and Graphics option. For more information, see [Fiery Color Reference](#).

## CMYK/Grayscale Processing Method

The CMYK/Grayscale Processing Method allows you to define your preferred CMYK-to-CMYK conversion technique.

- **Quick** applies one-dimensional transfer curves to adjust output densities in the cyan, magenta, yellow, and black channels. This technique leads to eye-pleasing color output from your press because pure primary colors are not “contaminated” by other **colorants**. While it is the fastest simulation method and perfect for drafts, avoid using it for final documents that are used as press proofs. Other techniques offer the color simulation accuracy required by proofing applications.
- **Full (Source GCR)** provides a complete and accurate simulation based on colorimetric transformations. Hues are preserved, even for primary colors. The **Gray Component Replacement** level specified in the original (source) document is preserved. Process black expressed in CMY is reproduced using CMY dry ink. Full (Source GCR) is recommended for the highest quality press proofing applications.
- **Full (Output GCR)** is a complete and accurate simulation method based on colorimetric transformations. Hues are preserved, even for primary colors. With this method, the Gray Component Replacement (GCR) level that was specified in the original document is not preserved. Instead, all CMYK data is re-separated using the GCR level specified by the output profile. This simulation technique is similar to traditional ICC color matching methods and is more appropriate than Full (Source GCR) for full color printing designed for the press, but reproduced on your press.

**NOTE:** When you specify Pure Black On for Black Text and Graphics and Full (Output GCR) or Full (Source GCR) for CMYK/Grayscale Processing Method, the black text and graphics in your document are printed with 100% black-only dry ink.

## CMYK/Grayscale Source or Device Link

The CMYK/Grayscale Source or Device Link print option allows you to print press proofs or simulations. This setting specifies the offset press standard or other color printing device that you want to simulate. This option affects CMYK data only.

When you specify a setting other than None or ColorWise Off for the CMYK/Grayscale Source, the EX Print Server overrides [source color space](#) definitions or profiles that other color management systems may have specified. In cases where you do *not* want this setting to override another specified source color space, choose None.

If your document contains an embedded CMYK profile that you want to use, select the Use Embedded Profile If Present (CMYK) option (see [“Use Embedded Profile If Present \(RGB and CMYK\)”](#) on page 24. In this case, the CMYK/Grayscale Source setting is ignored and the embedded profile is used instead.

In the printer driver, you can view an unlimited number of custom Full simulations created using Command WorkStation. The number of custom simulations is limited by the available disk space on the EX Print Server.

The CMYK/Grayscale Source setting you specify depends on the press standard for which the CMYK data was separated.

- For images that were separated using a custom separation (such as a separation produced with an ICC profile), choose the corresponding profile on the EX Print Server with the CMYK/Grayscale Source setting.
- For images that were separated for [SWOP](#), choose SWOP as the CMYK/Grayscale Source setting.



To properly simulate a printed image that was separated using an ICC profile, the same profile must be present on the EX Print Server. For more information about importing ICC profiles to the EX Print Server, see Command WorkStation Help.

Two settings are available if you want no CMYK simulation:

- The None setting sends your original CMYK data to the press with calibration applied, but without conversions to simulate another printer.

The None setting is recommended if you use another color management system instead of ColorWise (for example, ColorSync or Photoshop). In this case, the EX Print Server is expecting to receive CMYK data already in the device color space of the EX Print Server. The EX Print Server will not convert the data, but it will apply calibration.

- The ColorWise Off setting sends your original CMYK data to the press without calibration applied and without conversions to simulate another printer. The CMYK data is still subject to maximum density constraints, however.

The ColorWise Off setting is not available as a setting in Command WorkStation and cannot be the default CMYK/Grayscale Source setting. You choose this setting for a specific job.

**NOTE:** When you print with the ColorWise Off setting, make sure the options you choose in your application do not cause the application to modify CMYK data. If you enable PostScript Color Management or include an embedded profile, the color data sent by the application is similar to Lab color. When you print with settings like Let Printer Determine Colors or Let Photoshop Determine Colors, the application either converts the CMYK data or tags it for color management. You must specify No Color Management in the application when you print with the ColorWise Off setting.

## Combine Separations

The Combine Separations setting specifies how to print separated CMYK data. It supports: Cyan, Magenta, Yellow, Black.

With the Fiery Graphic Arts Package or Fiery Graphic Arts Package, Premium Edition, you can combine an unlimited number of spot color separations along with the CMYK separations. For more information, see [Fiery Graphic Arts Package](#).

- **Off** prints each separation individually.
- **On** combines separations as a single, composite-color document, and automatically makes the settings for the following print options: Color Mode (CMYK) and Black Overprint (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
- Adobe FreeHand
- QuarkXPress

For information about using the Combine Separations option with applications such as Photoshop, see [Fiery Color Reference](#).



## Composite Overprint

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 knock-out, the foreground object hides the background object where they overlap.

The Composite Overprint print option allows you to print overprinted objects as specified in the source file. By default, the Composite Overprint print option is off and overlapping objects print as knockouts.

**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
- Adobe FreeHand
- QuarkXPress
- CorelDRAW

The 2-Color Print Mapping option is ignored when Composite Overprint is enabled.

## Gray (RGB) and Gray (CMYK)

When Gray (RGB) is enabled, any RGB color where R=G=B is printed using only black dry ink instead of processed black. Similarly, when Gray (CMYK) is enabled, any CMYK color where C=M=Y=0 and K=any value is printed using only black dry ink instead of processed black.

You can choose to apply the Gray (RGB) or Gray (CMYK) option to either Text and Graphics or to Text, Graphics, and Images.

The following limitations apply:

- The Gray (RGB) or Gray (CMYK) option has no effect on a job that is pre-separated.
- If CMYK/Grayscale Processing Method is set to Quick, the Gray (CMYK) setting does not affect the output.
- If Separate RGB/Lab to CMYK Source is enabled, the Gray (RGB) option is set to Off. Likewise, if the Gray (RGB) option is not set to Off, you cannot enable 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 Gray (RGB) or Gray (CMYK) for 100% black text and graphics.
- If a gray is specified as a spot color, the Gray (RGB) or Gray (CMYK) option does not affect that gray.

## Output Profile

Because the output profile is applied to all data in the print job, make sure the profile you select is the right one for your job. The default output profile consists of a profile for your press that describes its color characteristics and a **calibration target** that describes the expected behavior of the press.

Use Command WorkStation to import your own output profile to the EX Print Server. Imported output profiles that do not already include a calibration target are at first associated with the calibration target that is tied to the default output profile. You can edit calibration target D-Max values separately.

Select the Use Media Defined Profile setting to automatically apply the output profile associated with the media type used in a print job rather than setting a specific output profile. For more information, see Command WorkStation Help.



## PDF/X Output Intent

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.

The PDF/X Output Intent option, when enabled for a PDF/X job, specifies that the EX Print Server use the PDF/X output intent embedded in the PDF/X document. Typically, whether you use this option depends on whether you are using the EX Print Server for proofing or for production (final) printing.

Prints for proofing are expected to look exactly like the output of the final production device, regardless of the capabilities of the EX Print Server or the press. For instance, when proofing Newsprint, you want the color gamut of the press to be very limited compared to its capabilities. In production, you usually want to maximize the use of the press gamut by applying specific color features of the EX Print Server or the press. 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 locations.

**NOTE:** With the Fiery Graphic Arts Package, Premium Edition option, 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 enabled and no other setting conflicts, the EX Print Server 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 EX Print Server ignores the CMYK/Grayscale Processing Method and CMYK/Grayscale 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 disabled, the EX Print Server ignores the PDF/X output intent.

You can specify the PDF/X Output Intent print option for a job in Job Properties in Command WorkStation but not when you print from the printer driver. PDF/X files can be imported directly to the EX Print Server using Command WorkStation or Hot Folders, but printer drivers always convert PDF before sending a job to the EX Print Server. The PDF/X Output Intent option does not appear in the printer driver.

## RGB/Lab Rendering Intent

The RGB/Lab Rendering Intent option specifies a rendering intent for color conversions. To control the appearance of images, such as prints from office applications or RGB photographs from Photoshop, select the appropriate rendering intent. The EX Print Server allows you to choose from the four rendering intents currently found in industry standard ICC profiles.

EX Print Server rendering intent	Best used for	Equivalent ICC rendering intent
<b>Photographic:</b> 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.	<b>Image, Contrast, and Perceptual</b>
<b>Presentation:</b> 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. In many cases, this style can be used for mixed pages that contain presentation graphics and photographs.	<b>Saturation, Graphics</b>
<b>Relative Colorimetric:</b> 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 data for simulation purposes.	<b>Relative Colorimetric</b>
<b>Absolute Colorimetric:</b> Provides <i>no</i> 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 data for simulation purposes.	<b>Absolute Colorimetric</b>

## RGB Source or Device Link

The RGB Source or Device Link setting allows you to define the characteristics of the RGB data in your document so that the appropriate color conversion occurs on the EX Print Server. Commonly used monitor color spaces are available from the printer driver and the EX Print Server. For others, use Command WorkStation to download custom monitor or scanner profiles.

When you specify a setting other than None for the RGB Source, the EX Print Server overrides [source color space](#) definitions or profiles that other color management systems may have specified. In cases where you do *not* want this setting to override another specified source color space, choose None.

If your document contains an embedded RGB profile that you want to use, select the Use Embedded Profile If Present (RGB) option (see [“Use Embedded Profile If Present \(RGB and CMYK\)”](#) on page 24). In this case, the RGB Source setting is ignored and the embedded profile is used instead.

When you specify a setting other than None, because the color space definitions are overridden, the output from the EX Print Server is consistent across platforms. The EX Print Server 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)** specifies the definition of a Windows computer monitor profile used as the default.
- **Apple Standard** specifies the definition of a Mac OS computer monitor profile used as the default.
- **Adobe RGB (1998)** is an Adobe-defined color space, used in pre-press as the default working space in Photoshop 5.
- **eciRGB** is 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** is 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.

- **None** instructs the EX Print Server to allow the RGB sources you defined elsewhere, such as in the application, to be used. When you set RGB Source to None, the appearance of colors is *not* independent of the file type. For example, RGB EPS files look different from RGB TIFF files.

With RGB Source set to None, PostScript RGB data that contains a source color space definition is converted using the RGB/Lab Rendering Intent option (see “[RGB/Lab Rendering Intent](#)” on page 20). Non-PostScript RGB data and PostScript RGB data that does not contain a source color space definition are converted using the EFIRGB source profile and Presentation rendering intent.

### 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. The name of this option is meant to be descriptive, because the option defines the color spaces that are used by the EX Print Server to “separate” the RGB data into CMYK values.

The two choices available for this option determine whether RGB data is converted into the full gamut of the press (Separate RGB/Lab to CMYK Source disabled) or is first converted into the gamut of another digital printer or press standard (Separate RGB/Lab to CMYK Source enabled). This feature helps make one device behave like another for RGB data. For example, if a high-quality ICC profile is available for another print device, the press can simulate the behavior of that device.

Separate RGB/Lab to CMYK Source is also useful for prepress applications. For example, it allows you to experiment with the appearance of an RGB scan under different press printing conditions, without having to convert the RGB data to CMYK data for each condition. When the desired printing condition is found, convert the file to CMYK, using the same CMYK/Grayscale Source that you used during the experimentation.

**NOTE:** Use the Separate RGB/Lab to CMYK Source print option in conjunction with the Output Profile or CMYK/Grayscale Source print options.

- **Enabled** converts all RGB colors into the CMYK color space for a specified simulation (select the desired simulation with the CMYK/Grayscale Source print option).
- **Disabled** converts all RGB colors into the CMYK color space of your press.

## Spot Color Matching

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

- **On:** The EX Print Server uses a built-in table to generate the closest CMYK matches of spot colors your press can produce. (New tables are generated when you add new output profiles.)

With Spot-On, the EX Print Server uses the CMYK matches determined through Spot-On (see [page 56](#)).

- **Off:** The EX Print Server processes the spot color as CMYK data and uses 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 treated as CMYK.

For jobs that include spot colors, set Spot Color Matching to On unless you are printing press simulations. In that case, set Spot Color Matching to Off and choose the appropriate CMYK/Grayscale Source (see [page 15](#)).

For a PDF job that includes spot colors that are not included in the built-in table, setting Spot Color Matching to On retains the original spot colors. The EX Print Server 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.

## Spot Color Matching and the PANTONE Coated Color Reference

The PANTONE Coated Color Reference prints differently depending on the Spot Color Matching setting (see [Fiery Color Reference](#)).

- **On:** The EX Print Server uses a built-in table or, with Spot-On, the Spot-On color dictionaries to generate the best matches for the PANTONE colors that your press can produce. The PANTONE number is displayed below each swatch.

For more information about Spot-On, see [page 56](#).

- **Off:** The EX Print Server prints swatches using the CMYK values recommended by Pantone, Inc. (and used by applications that provide PANTONE color libraries). The CMYK values used to generate the color, as well as the PANTONE number of the color, are printed below each swatch. These CMYK values are printed through the selected CMYK/Grayscale Source and Output Profile settings.

## Substitute Colors

Spot-On allows you to 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-On color dictionary. This permits exact color control and overrides individual RGB and CMYK colors.

To enable substitute colors for a job, select the Substitute Colors option.



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

## Use Embedded Profile If Present (RGB and CMYK)

If the Use Embedded Profile If Present (RGB) option is enabled, the EX Print Server ignores the RGB Source option and uses the RGB profile embedded in the print job as the RGB source profile. If the Use Embedded Profile If Present (RGB) option is disabled, the EX Print Server uses the profile specified in the RGB Source option.

Similarly, if the Use Embedded Profile If Present (CMYK) option is enabled, the EX Print Server ignores the CMYK/Grayscale Source option and uses the CMYK profile embedded in the print job as the CMYK source profile. If the Use Embedded Profile If Present (CMYK) option is disabled, the EX Print Server uses the profile specified in the CMYK/Grayscale Source option.

## Specifying ColorWise print options

To modify EX Print Server printing behavior, do any of the following:

- Specify default values for ColorWise options in Color Setup in Command WorkStation. You can also set default values from EX Print Server Setup, as described in [Configuration and Setup](#). The defaults apply to all subsequent print jobs unless you override them.
- Specify ColorWise options for an individual print job using the menus that appear in the printer driver.
- Specify ColorWise options for a job printed through Hot Folders using the Job Properties settings in Hot Folders.
- Specify ColorWise options for a job already submitted and held at the EX Print Server using the Job Properties settings in Command WorkStation.



For the location of each print option, see the following table.

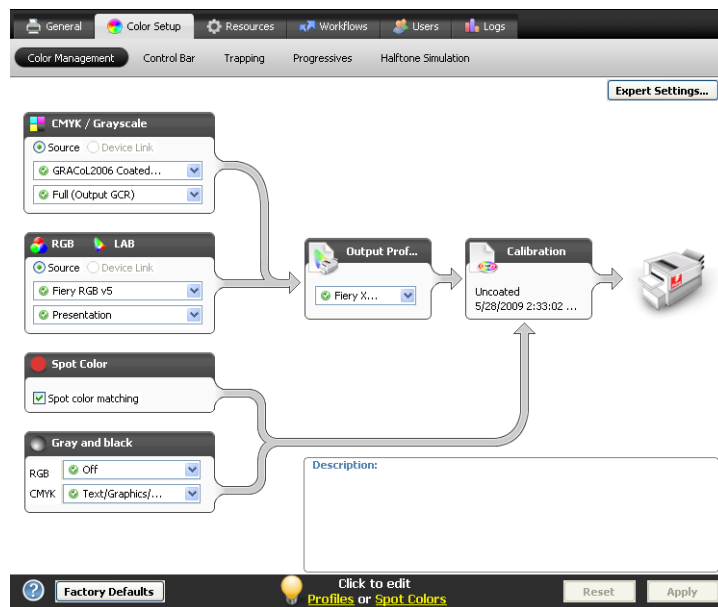
ColorWise print option	Color window of printer driver or Job Properties	Basic Settings of printer driver, Job Properties, or Color Setup	Expert Settings of printer driver, Job Properties, or Color Setup
Auto Trapping	✓		
Black Overprint			✓
Black Text and Graphics			✓
CMYK/Grayscale Processing Method		✓	✓
CMYK/Grayscale Source or Device Link		✓	✓
Combine Separations	✓		
Composite Overprint	✓		
Gray (RGB and CMYK)		✓	✓
Output Profile		✓	✓
PDF/X Output Intent			✓ (Job Properties only)
RGB/Lab Rendering Intent		✓	✓
RGB Source or Device Link		✓	✓
Separate RGB/Lab to CMYK Source			✓
Spot Color Matching		✓	✓
Substitute Colors	✓		
Use Embedded Profile If Present			✓

## Setting default values in Command WorkStation

Command WorkStation allows you to set the default values for the ColorWise print options and print settings for the EX Print Server.

These settings are applied to all print jobs sent to the EX Print Server, unless a user overrides them for an individual job by changing settings in the printer driver. These default settings can also be overridden using Command WorkStation Job Properties. In addition, the defaults set in Command WorkStation are automatically reflected in the printer driver and in EX Print Server Setup (for those options that can be set in Setup).

The ColorWise print option settings are in the Color Management tab under the Color Setup tab in the Device Center. For more information, see Command WorkStation Help.



## Setting print options in the printer driver

The printer driver writes a PostScript file containing the instructions generated by your application and the settings for the ColorWise print options you selected. The printer driver then sends the PostScript file to the EX Print Server. The EX Print Server performs PostScript processing and color conversions and sends raster color data to the press.

### Setting print options for Windows

This section explains how to set color management print options with the Adobe and Microsoft PostScript printer drivers for Windows, PostScript 3 printer drivers that take full advantage of the color features of the EX Print Server.

Before you proceed, do the following:

- Install the printer driver and the EX Print Server PPD (see [Printing](#)).
- Set up the EX Print Server for printing (see [Printing](#)).

**NOTE:** The following illustrations and instructions do not apply to all applications. Many applications, such as Adobe PageMaker, Photoshop, Adobe Illustrator, QuarkXPress, and CorelDRAW, have other color management options in addition to those presented in the printer driver. For information about specific applications, see [Fiery Color Reference](#).

Use the following procedure to set the color options for Windows computers.

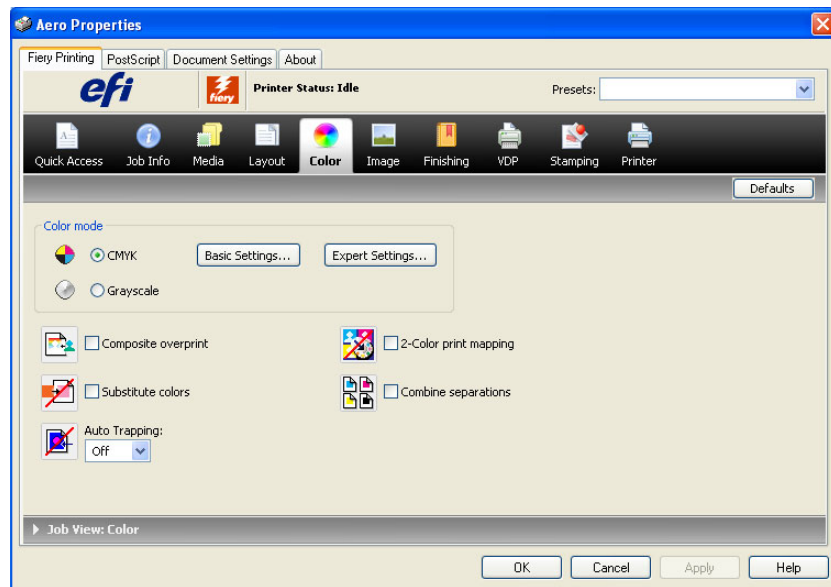
---

**TO SET PRINT OPTIONS FOR WINDOWS COMPUTERS**

- 1 Choose Print in your application.
- 2 Select EX Print Server as your printer and click Properties.

In the Properties dialog box, the Fiery Printing tab is displayed.

- 3 Click the Color icon.

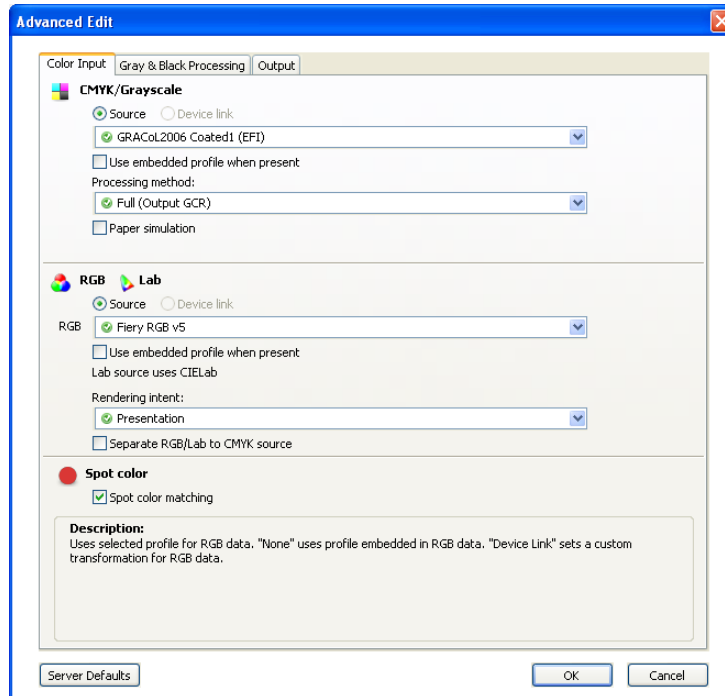


- 4 Specify the settings for the print options in the Color window.

For information about ColorWise print options, see [page 11](#).

## 5 Click Expert Settings.

The Advanced Edit window appears.



If the Expert Settings button is not active, make sure that Two-Way Communication is set up. For information about enabling Two-Way Communication, see printer driver Help.

**NOTE:** Alternatively, you can click Basic Settings to display the Color Management window, which also displays ColorWise print options. However, not all of the print options appear in the Color Management window.

## 6 Click Server Defaults to display the default values currently set on the EX Print Server.

## 7 Specify settings for the ColorWise print options in each of the tabs.

For most users, the default settings provide adequate color control. For information about individual print options, see [page 11](#).

## 8 Click OK to save the settings and close the Advanced Edit window.

## 9 Click OK to close the Properties window, and then click OK to send your job.

## Setting print options in Mac OS

This section explains how to set color management print options with the printer drivers for Mac OS.

Before you proceed, do the following:

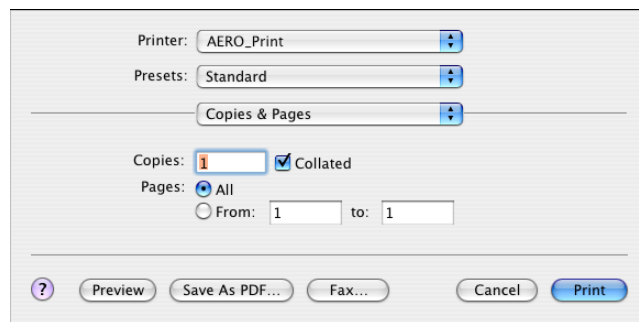
- Install the EX Print Server PPD (see [Printing](#)).
- Set up the EX Print Server for printing (see [Printing](#)).

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### TO SET PRINT OPTIONS FOR MAC OS X COMPUTERS

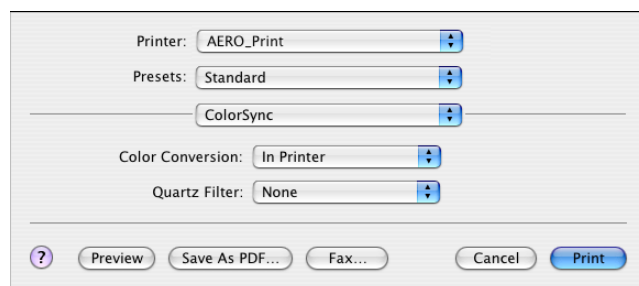
#### 1 Choose Print in your application.

The Print dialog box appears.

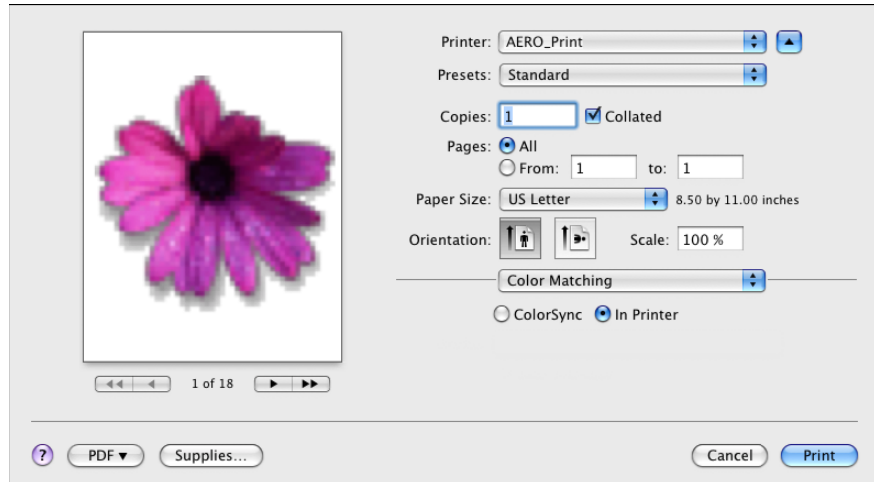


#### 2 Mac OS X v10.5 only: Expand the dialog box, if necessary, by clicking the arrow next to the Printer name.

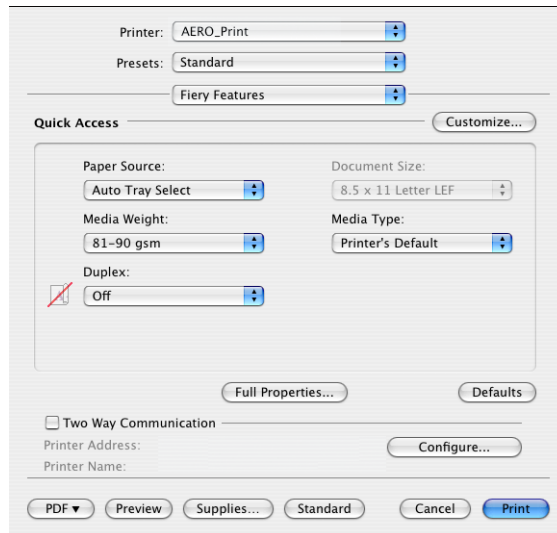
#### 3 Mac OS X v10.3.9 and 10.4.x: Click Copiers & Pages, choose ColorSync from the drop-down list, and then choose In Printer from the Color Conversion list.



**Mac OS X v10.5: Click Preview, choose Color Matching from the drop-down list, and then select In Printer.**



**4 Choose Fiery Features from the drop-down list.**



**5 Select Two-Way Communication.**

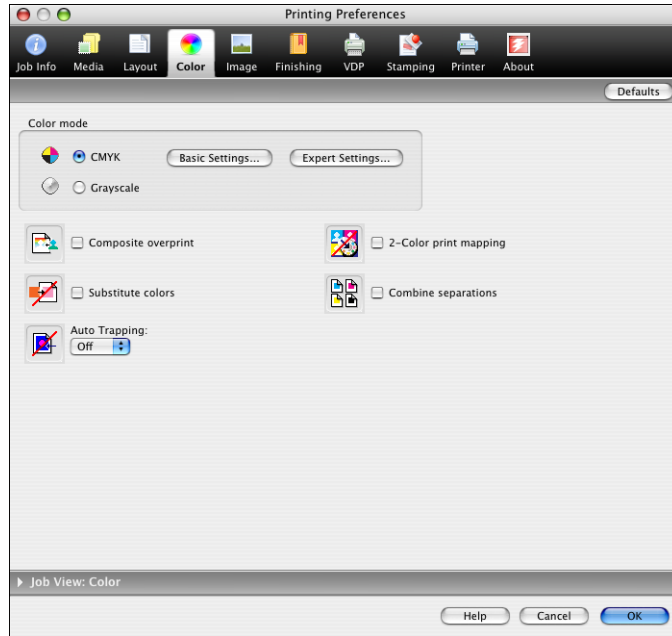


For information about enabling Two-Way Communication, see printer driver Help.

**6 Click Full Properties.**

**7 Click the Color icon.**

The Color pane appears.

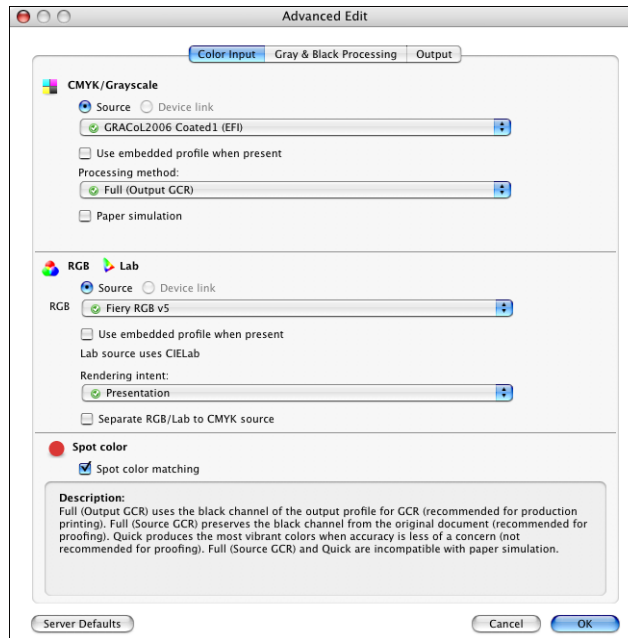
**8 Specify settings for the print options in the Color pane.**

For information about ColorWise print options, see [page 11](#).



**9 Click Expert Settings.**

The Advanced Edit window appears.



**NOTE:** Alternatively, you can click Basic Settings to display the Color Management window, which also displays ColorWise print options. However, not all of the print options appear in the Color Management window.

**10 Click Server Defaults to display the default values currently set on the EX Print Server.**

**11 Specify settings for the ColorWise print options in each of the tabs.**

For most users, the default settings provide adequate color control. For information about individual print options, see [page 24](#).

**12 Click OK to save the settings and close the Advanced Edit window.**

The Color pane reappears.

**13 Click OK to close the Printing Preferences window, and then click Print to send your job.**

# COLOR PROFILES

The EX Print Server 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. For more information about these options, see [ColorWise Print Options](#).

You can manage the profiles on the EX Print Server using Command WorkStation. You can import or delete other profiles as well.

## Color files

The User Software DVD includes a number of files, including color profiles, that are useful for color management. To add color profiles to the EX Print Server:

- Install them on your computer.
- Use Command WorkStation to import them to the EX Print Server.



For information about importing profiles to the EX Print Server using Command WorkStation, see Command WorkStation Help.

## Installing additional ICC profiles on your computer

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

Location on User Software DVD	Profiles
ICC folder (Windows) or ColorSync folder (Mac OS)	<p>EFIRGB.ICC provides an EFI-defined color space for RGB data.</p> <p>The following output profiles, which are the factory default output profiles, are designed for optimal color output when printing on an appropriate paper. These output profiles also reside on the EX Print Server by default:</p> <ul style="list-style-type: none"> <li>• Fiery Xerox CP1000 Uncoated 90gsm</li> <li>• Fiery Xerox CP1000 Uncoated 220gsm</li> <li>• Fiery Xerox CP1000 Coated 120gsm</li> <li>• Fiery Xerox CP1000 Coated 210gsm</li> <li>• Fiery Xerox CP1000 Coated 280gsm</li> </ul>

**Location on User  
Software DVD**

Adobe ICC Profiles  
folder  
(inside the Windows  
Color Files\ICC  
Profiles folder or  
Mac Color Files:  
ICC Profiles folder)

**Profiles**

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

**CMYK Profiles:**

- EuropeISOCoatedFOGRA27.icc
- EuroscaleUncoated.icc
- JapanColor2001Coated.icc
- JapanColor2001Uncoated.icc
- JapanColor2002Newspaper.icc
- JapanWebCoated.icc
- USSheetfedCoated.icc
- USSheetfedUncoated.icc
- USWebCoatedSWOP.icc
- USWebUncoated.icc

**RGB Profiles:**

- AdobeRGB1998.icc
- AppleRGB.icc
- ColorMatchRGB.icc
- sRGB Color Space Profile.icm

**Location on User  
Software DVD**

ECI folder  
(inside the Windows  
Color Files\ICC  
Profiles folder or  
Mac Color Files:  
ICC Profiles folder)

**Profiles**

These profiles were created by the European Color Initiative (ECI). For more information, see the documents included in the CMYK Profiles folder and the RGB Profiles folder, as well as the ECI web site at [www.eci.org](http://www.eci.org).

**CMYK Profiles:**

- ISOcoated\_v2\_300\_eci.icc
- ISOcoated\_v2\_eci.icc
- ISOuncoated.icc
- ISOuncoatedyellowish.icc
- ISOwebcoated.icc
- SC\_paper\_eci.icc

**RGB Profiles:**

- ECI-RGB.V1.0.icc
- eciRGB\_v2.icc
- eciRGB\_v2\_ICCv4.icc

**Location on User  
Software DVD**

EFI Support folder  
(inside the Windows  
Color Files\ICC  
Profiles folder or  
Mac Color Files:  
ICC Profiles folder)

**Profiles**

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

## Japan Profiles:

- EFIDIC.ICC
- EFIJMPA2.icc
- JC2001\_type1\_EFI.icc
- JC2001\_type2\_EFI.icc
- JC2001\_type3\_EFI.icc
- JC2001\_type4\_EFI.icc
- TOYO Offset Coated 2.0.icc

## RGB Profiles:

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

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

---

**TO INSTALL ICC PROFILES ON A WINDOWS COMPUTER FROM THE USER SOFTWARE DVD**

- 1 **Insert the User Software DVD into the DVD drive.**
- 2 **Open the folder containing the profile.**
- 3 **Right-click the profile that you want, and then click Install Profile.**

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

---

**TO INSTALL ICC PROFILES ON A MAC OS COMPUTER FROM THE USER SOFTWARE DVD**

- 1 **Insert the User Software DVD into the DVD drive.**
- 2 **Open the folder containing the profile.**
- 3 **Copy the profiles into Library: ColorSync: Profiles.**

**NOTE:** You must be logged in as an administrator.

---

**TO INSTALL ICC PROFILES ON A WINDOWS COMPUTER FROM THE EX PRINT SERVER OVER THE NETWORK**

- 1 **Browse for the EX Print Server over the network, using either the IP address or the DNS server name.**
- 2 **Type the user name and password, if required.**  
Consult your administrator to see 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 then click Install Profile.**

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

---

**TO INSTALL COLORSYNC PROFILES ON A MAC OS COMPUTER FROM THE EX PRINT SERVER OVER THE NETWORK**

- 1 Choose Connect to Server from the Go menu.**
- 2 Type smb:// followed by the IP address of the EX Print Server and click Connect.**  
If you cannot locate your EX Print Server, contact your administrator.
- 3 Type the user name and password if required.**  
Consult your administrator to see 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.**

**NOTE:** You must be logged in as an administrator.

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

## Other color files

You can copy additional color files from the User Software DVD or the EX Print Server. These files are useful for color matching and for calibration.

Windows Color  
Files folder  
or  
Mac Color  
Files folder

**CMYK Color Reference.ps:** An 11-page, Letter-size PostScript file used for reference when defining CMYK colors in applications.

**PANTONE Book.ps:** A 20-page, Letter-size PostScript file that indicates the closest equivalent of PANTONE coated colors that the EX Print Server and your press model can produce. The method used to print the PANTONE Book.ps file differs, depending on the Spot Color Matching setting. For more information, see [“Spot Color Matching”](#) on page 23.

**RGB page 01.doc:** A Microsoft Word file that you can print to view available RGB colors.

**RGB page 02.ppt:** A Microsoft PowerPoint file you can print to view available RGB colors.

Color Bars folder  
(inside the Windows  
Color Files folder  
or  
Mac Color Files  
folder)

**FieryColorBar.eps:** Used for the Control Bar feature. For more information about Control Bar, see [Fiery Graphic Arts Package](#).

**Ugra Fogra-MediaWedge V2.2x\_EFIv1.eps:** Used for the Ugra/FOGRA MediaWedge feature. For more information about this feature, see [Fiery Graphic Arts Package](#).

PS Files folder  
(inside the Windows  
Color Files\  
Calibration Files  
folder  
or  
Mac Color Files:  
Calibration Files  
folder)

**Custom21.ps, Custom34.ps, Standard21.ps, and Standard34.ps:** PostScript files of color patches for obtaining measurements.

The numbers in the file names refer to the number of patches on the page. The Custom files allow you to download measurement patches that incorporate the current calibration set of the press. The Standard files allow you to download standard measurement patches that bypass the current calibration set of the press.

**NOTE:** These files are provided for expert users and should not be used for day-to-day calibration.



Halftone Calibration Files folder (inside the Windows Color Files\Calibration Files folder or Mac Color Files: Calibration Files folder)	Images of measurement pages for various calibration instruments and page sizes, used for calibrating the EX Print Server for different halftone screens. Files are provided for Adobe Photoshop and for other applications. For more information about halftone calibration, see <i>Fiery Graphic Arts Package</i> .
Photoshop folder (inside the Windows Color Files\Calibration Files\Halftone Calibration Files folder or Mac Color Files: Calibration Files: Halftone Calibration Files folder)	<p><b>NOTE:</b> For the X-Rite DTP32 Series II densitometer, use the calibration file for the X-Rite DTP32 densitometer.</p> <p><b>NOTE:</b> Files for the ED-100 densitometer are provided. However, the ED-100 is not a supported measurement device.</p> <p>The following halftone calibration files are provided for Adobe Photoshop:</p> <p>DTP32_A3.psd DTP32_A4.psd DTP32_Letters.psd DTP32_Tabloid.psd DTP41_A3.psd DTP41_A4.psd DTP41_Letters.psd DTP41_Tabloid.psd ED100_A3.psd ED100_A4.psd ED100_Letters.psd ED100_Tabloid.psd ES1000_A3.psd ES1000_A4.psd ES1000_Letters.psd ES1000_Tabloid.psd</p> <p><b>NOTE:</b> For the X-Rite DTP32 Series II densitometer, use the calibration file for the X-Rite DTP32 densitometer.</p> <p><b>NOTE:</b> Files for the ED-100 densitometer are provided. However, the ED-100 is not a supported measurement device.</p>

Other Applications  
folder (inside the  
Windows Color  
Files\Calibration  
Files\Halftone  
Calibration Files  
folder  
or  
Mac Color Files:  
Calibration Files:  
Halftone Calibration  
Files folder)

The following halftone calibration files are provided for other applications (besides Adobe Photoshop):

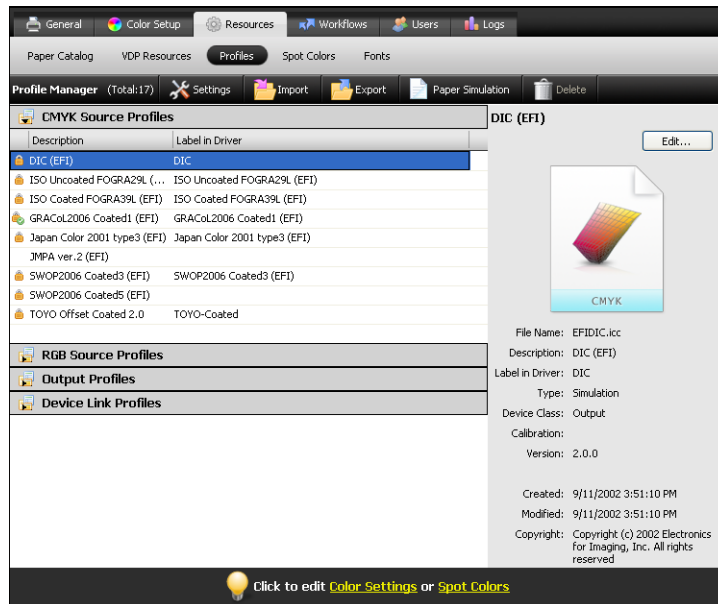
DTP32\_A3.eps  
DTP32\_A4.eps  
DTP32\_Letters.eps  
DTP32\_Tabloid.eps  
DTP41\_A3.eps  
DTP41\_A4.eps  
DTP41\_Letters.eps  
DTP41\_Tabloid.eps  
ED100\_A3.eps  
ED100\_A4.eps  
ED100\_Letters.eps  
ED100\_Tabloid.eps  
ES1000\_A3.eps  
ES1000\_A4.eps  
ES1000\_Letters.eps  
ES1000\_Tabloid.eps

**NOTE:** For the X-Rite DTP32 Series II densitometer, use the calibration file for the X-Rite DTP32 densitometer.

**NOTE:** Files for the ED-100 densitometer are provided. However, the ED-100 is not a supported measurement device.

## Managing profiles on the EX Print Server

Command WorkStation allows you to import ICC profiles to the EX Print Server, 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 then saving it as a new profile. These features are in the Profiles tab under the Resources tab in the Device Center. For more information, see Command WorkStation Help.



# CALIBRATION

Calibrating the EX Print Server ensures consistent and reliable color output. Calibrate the EX Print Server using the Calibrate feature in Command WorkStation with a densitometer or a spectrophotometer.

If you defined a custom halftone screen, you must calibrate the EX Print Server for that halftone screen before you print a job with it. For more information, see [Fiery Graphic Arts Package](#).

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](#)).

## Calibration methods

You can calibrate the EX Print Server using the following methods:

Term	Refers to
DTP32 or DTP32 Series II	X-Rite DTP32 or DTP32 Series II automatic densitometer
DTP41	X-Rite DTP41 automatic spectrophotometer
ES-1000	Spectrophotometer ES-1000 hand-held spectrophotometer



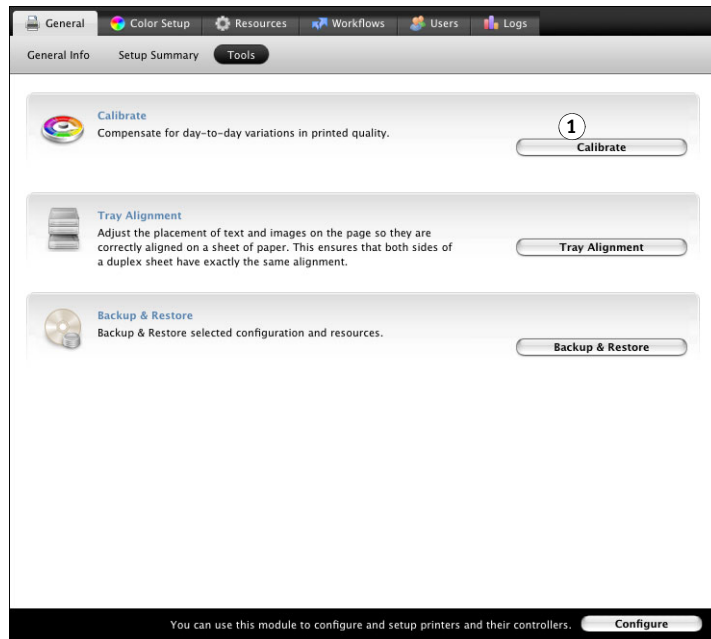
All of these calibration methods are performed through Command WorkStation. For more information about each of these methods, see Command WorkStation Help.

## Calibrating with Command WorkStation



### 1 Click to start calibration

The Calibrate feature in Command WorkStation allows you to calibrate the EX Print Server using the measurement method of your choice. The Calibrate feature is in the Tools tab under the General tab in the Device Center. For more information, see Command WorkStation Help.



**NOTE:** Multiple users can be connected to one EX Print Server with Command WorkStation, but only one user at a time can use the Calibrate feature. If you try to calibrate when another user is using Command WorkStation to calibrate, an error message appears.

**NOTE:** You can disable calibration (and color management) for CMYK data in a job by using the ColorWise Off setting for the CMYK/Grayscale Source option. For more information, see [“CMYK/Grayscale Source or Device Link”](#) on page 15. You might want to disable calibration for testing purposes, for example.

## Managing calibration sets

Every output profile on the EX Print Server must be associated with a calibration set. The calibration set provides the EX Print Server with measurements of the density response of the press dry inks for specific printing conditions (for example, media type). This data, along with the expected density response of the press, allows the EX Print Server to apply corrections to color values that are sent to the press, to achieve the calibrated output. For more information, see [“An overview of calibration”](#) on page 53.

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

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

## Using the output profiles and calibration sets

The EX Print Server is shipped with one or more output profiles. You may obtain good color quality with the factory-supplied output profiles and their associated calibration sets (see scenarios 1 and 2 in the table below). However, you may need to create custom calibration sets and output profiles depending on your situation (see scenarios 3 and 4 in the table below).

	Your paper	Action	See
1	Recommended paper for a factory-supplied output profile (the paper that the profile is based on)	You will obtain acceptable color when you print with the output profile. You do not need to create a calibration set or custom profile.	See <a href="#">“Recommended paper and print settings”</a> on page 47 to find out the recommended paper for an output profile.
2	Paper similar to a factory-supplied profile's recommended paper	You might be able to use the output profile. The print settings required for your paper (for example, media type and media weight) must match the print settings required by the recommended paper. If the color quality is sufficient, you do not need to create a calibration set or custom profile.	The output profile name usually indicates the general type of paper (for example, plain, coated, or heavy). To find out the print settings required for the recommended paper, see <a href="#">“Recommended paper and print settings”</a> on page 47.
3	Paper that is similar to a factory-supplied profile's recommended paper but uses different print settings	You might still be able to use a factory-supplied output profile, if you create a custom calibration set and use it to calibrate the EX Print Server with your paper.	For more information, see <a href="#">“Adding custom calibration sets”</a> on page 48.
4	Paper that does not yield acceptable color with any factory-supplied profile	You must create a custom calibration set and a custom profile.	For more information, see <a href="#">“Adding custom calibration sets and output profiles”</a> on page 48.

### Recommended paper and print settings

You can check the recommended paper and print settings for a particular output profile using Profile Manager and Calibrator.

---

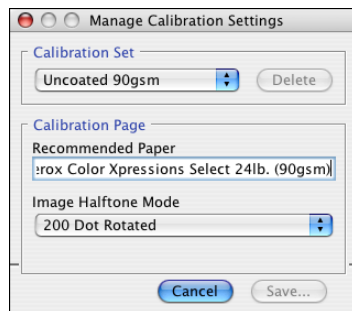
#### TO FIND THE RECOMMENDED PAPER AND PRINT SETTINGS FOR AN OUTPUT PROFILE

- 1 In Command WorkStation, in Device Center, go to Color Setup > Color Management.
- 2 Select the Output Profile and note the name of the calibration set displayed to the right.
- 3 In Device Center, go to General > Tools and click Calibrate.

Calibrator starts in a separate window.

- 4 Under Calibration Set, select Manage.

The Manage Calibration Settings window appears.



- 5 Select the calibration set from the list.

The recommended paper and the required print settings are displayed.

- 6 Click Cancel to close the window.

## Adding custom calibration sets

If you are printing on a paper that is similar to the recommended paper but uses different print settings, you might still be able to use the output profile, but you must create a custom calibration set. If the color quality is sufficient, you do not need to create a custom profile (see scenario 3 in the table under [“Using the output profiles and calibration sets”](#) on page 46).

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



For instructions on adding a custom calibration set, see Command WorkStation Help.

## Adding custom calibration sets and output profiles

If you determine that none of the factory-supplied output profiles yields acceptable color with your paper, you must create a custom calibration set in Calibrator and a custom profile using profile-generating software such as Fiery Color Profiler Suite (see scenario 4 in the table under [“Using the output profiles and calibration sets”](#) on page 46).

**NOTE:** Before creating a custom calibration set and custom output profile, make sure that the press is calibrated (if calibration is supported on the press). For information about performing press calibration, see the documentation that accompanies the press.

Calibration on the EX Print Server requires that each output profile contains a calibration target. If an output profile does not contain a calibration target, when you import the output profile to the EX Print Server, the calibration target from the default output profile is added to the imported profile. The procedures in this section describe how to make sure that an appropriate calibration target is added to your custom output profile when you import it to the EX Print Server and associate it with a custom calibration set.

To create the calibration target, you print a page of color patches on the EX Print Server using your paper and measure the page using Calibrator. Next, you copy the calibration target to a temporary output profile and set this profile as the default output profile. When you import your custom output profile, the calibration target is added from the temporary output profile.

Follow these procedures to use custom calibration sets and output profiles.

- Print a measurement page.
- Measure the measurement page.
- Create a custom calibration set and a temporary output profile.
- Set up the calibration target in the temporary output profile.
- Create a custom output profile and save it to your computer.
- Import the custom output profile to the EX Print Server.
- Delete the temporary output profile.



---

**TO PRINT THE MEASUREMENT PAGE****1 Load your paper in the press.****2 Locate the file for the measurement page on the User Software DVD.**

Choose the file for your page size and measurement instrument. The files are located in the Photoshop and Other Applications folders inside the following folders on the User Software DVD:

- Windows Color Files\Calibration Files\Halftone Calibration Files
- Mac Color Files: Calibration Files: Halftone Calibration Files

**3 Start Command WorkStation and connect to the EX Print Server.****4 Import the measurement page file to the Hold queue of the EX Print Server.**

For instructions, see Command WorkStation Help.

**5 Double-click the job in the Job Center window.**

The Job Properties window appears.

**6 Select the following print settings and click OK.**

- Set the media settings appropriate for your paper.

For example, choose the media type that corresponds to your paper and the input tray that contains your paper.

- Set the CMYK/Grayscale Source option to ColorWise OFF.

With this setting, the job is printed without calibration.

- Set the desired halftone setting, if available.

**7 Right-click the job and choose Print.**

The measurement page is printed.



---

**TO MEASURE THE MEASUREMENT PAGE**

**1 In Command WorkStation, in Device Center, go to General > Tools and click Calibrate.**

**2 Make a note of the selected calibration set.**

For this procedure, you can use any existing calibration set.

**3 Select Expert mode, click Save to File, and save the measurements for the currently selected calibration set to a file on your computer.**

If you do not need to preserve the existing measurements (for example, you have not calibrated the EX Print Server using this calibration set), you can skip this step.

**4 Measure the measurement page.**



For instructions, see the section in Command WorkStation Help for your measurement device. Do not print the measurement page in Calibrator. Use the measurement page you have already printed.

**5 Click Apply to save the measurements.**

---

**TO CREATE A CUSTOM CALIBRATION SET AND TEMPORARY DEFAULT OUTPUT PROFILE**

**1 In Calibrator, create a custom calibration set.**



For instructions, see Command WorkStation Help. For the calibration set, select the same calibration set you used to measure the measurement page. The measurements are copied to the custom calibration set you create.

When you create a custom calibration set, you associate it with a copy of an existing output profile. You can choose any output profile; this association is temporary. You will not use the copied output profile to print.

**2 If you saved the current measurements to a file in the previous procedure, you can restore the measurements.**

- Select the correct calibration set.
- Click From File under Get Measurements, select the file, and then click Open.
- Click Apply to save the measurements.

**Alternatively, you can restore the factory default measurements.**

- Select the correct calibration set.
- Click Restore Device, and then click OK.

---

**TO SET UP THE CALIBRATION TARGET USING A TEMPORARY DEFAULT OUTPUT PROFILE**

- 1 In Calibrator, select Expert mode.
- 2 Make sure your custom calibration set is selected.
- 3 Choose Measurements vs. Target under View Measurements (Optional) and click View.
- 4 Make a note of the Measured D-Max values for C, M, Y, and K.

Be sure to note the Measured values, not the Target values.

- 5 In Command WorkStation, in Device Center, go to Resources > Profiles.
- 6 Select the output profile you created when you created the custom calibration set and click Edit.

You will use this profile as a temporary profile to set the D-Max values of your custom output profile.

- 7 Change the D-Max values to the values you recorded in [step 4](#).
- 8 Click Save, type the name if needed, and click Save again to save the edited profile.
- 9 In Device Center, go to Color Setup > Color Management.
- 10 For the Output Profile option, select the profile you just edited.

The profile becomes the default output profile.

---

**TO CREATE A CUSTOM OUTPUT PROFILE**

- 1 Print the color profiling patches.

Before printing the color profiling patches:

- Set the same print settings as in your custom calibration set.
- Set the output profile to be the temporary default output profile (the one you saved in the previous procedure).
- Set the CMYK/Grayscale Source option to None. This ensures that your patches print only with the proper correction from calibration, without any other CMYK conversions.

- 2 Measure the color profiling patches and create the new output profile using a profile-generating application.

For the procedures to create output profiles, see the documentation that accompanies the application.

**NOTE:** When using Fiery Color Profiler Suite, create output profiles without calibration targets.

- 3 Save the custom output profile to the default folder for profiles on your computer.

Windows XP/Server 2003/Vista/Server 2008: Windows\System32\spool\drivers\color  
Mac OS X: Library: ColorSync: Profiles

---

**TO IMPORT THE CUSTOM OUTPUT PROFILE TO THE EX PRINT SERVER**

- 1 In Device Center, go to Resources > Profiles.
- 2 Click Import and go to the location of your custom output profile.
- 3 Select your custom output profile, choose Output next to Import Profile As and then click Import.

The profile is imported to the EX Print Server, and the Output Profile Settings window appears.

The calibration target from the default output profile is copied to the custom output profile.

- 4 In the Output Profile Settings window, confirm that your custom calibration set is selected.

When the custom output profile is imported, the calibration set from the default output profile is associated with the custom output profile.

- 5 Click OK to save changes and close the Output Profile Settings window.

Your custom output profile now has the correct calibration target and is associated with your custom calibration set. You no longer need the temporary default output profile and can delete it from the EX Print Server.

---

**TO DELETE THE TEMPORARY DEFAULT OUTPUT PROFILE**

- 1 In Device Center, go to Color Setup > Color Management.
- 2 For the Output Profile option, select a profile that is not the temporary default output profile you are going to delete.

The profile becomes the default output profile.

- 3 In Device Center, go to Resources > Profiles.
- 4 Select the temporary output profile and click Delete.
- 5 Click Yes.

## Understanding calibration

The following sections describe important concepts and suggestions for understanding calibration.

### An overview of calibration

Calibration generates curves that adjust for the difference between the actual dry ink densities (measurements) and the response expected by the output profile.

- Measurements represent the actual color behavior of the press.
- Calibration sets are sets of measurements that represent the output of specific combinations of media-related options.
- Each output profile contains a calibration target that describes the expected behavior of the press.

After you calibrate the EX Print Server, a calibration set is stored. This calibration set is used when it is associated with an output profile. Every output profile has an associated calibration set. If you have not specified one, the calibration set associated with the default output profile is used.

If you change the calibration after a saved job has been processed (RIPped), you do not have to reprocess (reRIP) the job. The new calibration affects the job without reprocessing.

### How calibration works

Although the needs of most users are met by the default calibration set, the EX Print Server allows you to choose a calibration set to customize calibration for specialized jobs.

Calibration allows you to:

- Maximize the color reproduction capabilities of the EX Print Server.
- Ensure consistent color quality over time.
- Produce consistent output across EX Print Server servers.
- Achieve better color matches when reproducing **spot colors**, such as PANTONE colors or other **named color** systems.
- Optimize the EX Print Server for using ColorWise rendering intents, CMYK simulations, and ICC profiles.

Success in obtaining satisfactory print quality from the EX Print Server depends on many factors. Among the most important are establishing and maintaining optimal dry ink densities. The **density** is the measure of the light absorbed by a surface. By carefully regulating dry ink densities, you obtain consistent printed color.

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

Calibration works by creating calibration curves on the EX Print Server that compensate for the difference between actual (measured) and desired (target) density values. These calibration curves are the graphic equivalent of transfer functions, which are mathematical descriptions of changes that are made to the initial data. Transfer functions are often graphed as input or output curves.

The EX Print Server generates calibration curves after comparing measured values to the final target values for each of the four dry ink colors. The target values are based on the output profile specified.

### **Measurements**

Measurement files contain numerical values that correspond to the dry ink density produced by the press when it prints solid cyan, magenta, yellow, and black, and graduated tints of those colors.

To create a measurement file, print a page of color patches. Measure the patches using a color measurement instrument connected to a computer on the network. The new measurements are automatically downloaded to the EX Print Server.

### **Output profiles and calibration sets**

Output profiles and calibration sets define desired calibration results. One or more output profiles and calibration sets are provided with the EX Print Server. When you calibrate the EX Print Server, select the calibration set that corresponds to the typical printing jobs at your site. This same calibration set can be associated with one or more output profiles. For more information about output profiles, see [page 18](#).

## Scheduling calibration

Calibrate the EX Print Server at least once a day, depending on the volume of print jobs. If it is very important to maintain consistent color, or your press 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 EX Print Server after press maintenance. However, because the press may be less stable immediately after maintenance, wait until you have printed approximately 50 pages before you calibrate.

**NOTE:** Because printed output from the press is very sensitive to changes in temperature and humidity, do not install the press near a window, in direct sunlight, or near a heater or air conditioner. Paper is also sensitive to climate changes. Store it in a cool, dry, stable environment, and keep reams sealed until they are used.

To monitor print quality, print the following color pages:

- Color Charts (from Command WorkStation or the press touch panel)
- Color reference pages included in the User Software DVD (see [page 40](#))

These pages include 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 pages you print. If a noticeable change in appearance occurs, calibrate the EX Print Server.

When you examine the Test Page, 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 density patches (100% cyan, magenta, yellow, or black) look less saturated over time, show the pages to your press service technician to determine whether adjusting the press can improve output.

## Checking calibration status

To verify whether the EX Print Server is calibrated, which calibration set and output profile were used, and when the press was last calibrated, perform the following:

- Print a Configuration page or Test Page from the press touch panel or Command WorkStation.

For instructions on printing the Configuration page, see [Configuration and Setup](#).

- In the Calibrate feature of Command WorkStation, select a calibration set. The last calibration and the user who performed it are displayed.

## 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 dry ink of the press. 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 using the Spot-On spot color editor in Command WorkStation.

In addition to managing “named” colors, Spot-On allows you to 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-On color dictionary. This permits exact color control and overrides individual RGB and CMYK colors.

If Two-Color Print Mapping is enabled, Spot-On also allows you to assign spot colors and process colors to the generic colors that are used in a job. The Two-Color Print Mapping feature is designed for print shop operators to do the proofing for 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 information about Two-Color Print Mapping, see *Fierly Graphic Arts Package*.

### Using Spot-On

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 EX Print Server.

To use Spot-On, you must specify the output profile associated with the Spot Color Dictionary that you want to edit.

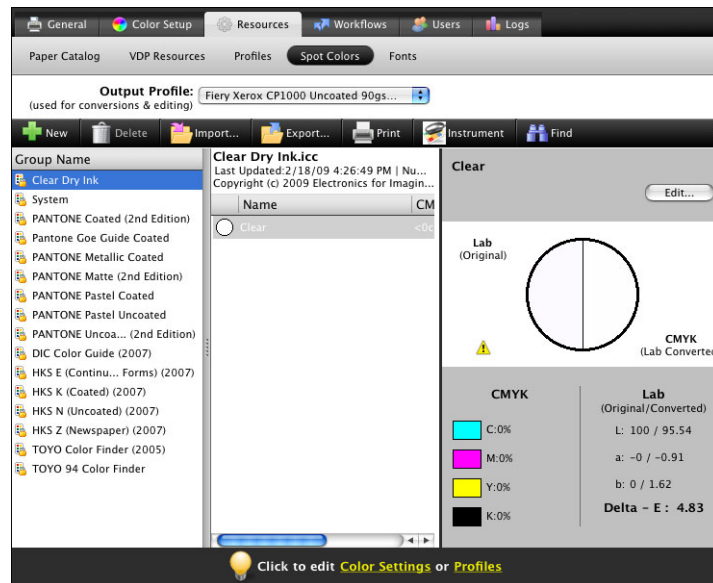
If you select Output profile X and redefine PANTONE 123 from 30%M to 50%M using Spot-On, you will get 50%M when you print a job with Output profile X. If you print a job with Output profile Y, you will get the original value.



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



The Spot-On feature is in the Spot Colors tab under the Resources tab in the Device Center. For more information about using Spot-On, see Command WorkStation Help.



**NOTE:** To use the Spot-On features with named colors, you must enable the Spot Color Matching print option. For more information about this option, see [page 23](#).

**NOTE:** Spot colors identified by names are printed with their defined CMYK values. Edits to an output profile made in Command WorkStation do not affect how spot colors print.

For more information about the Clear Dry Ink spot color group, which supports the Clear Dry Ink print option, see [Printing](#).

Some Spot-On features require 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 display according to the manufacturer's recommendations, and specify the correct monitor profile for your monitor.

Specify the following settings for the monitor display:

- At the monitor: Brightness, Contrast, and Color Temperature
- From the control panel of the operating system: Resolution, Refresh rate, and Number of colors

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

**NOTE:** The edits to a job made with the color adjustment features in ImageViewer affect all colors in the job, including spot colors. For more information about ImageViewer, see [Fiery Graphic Arts Package](#).

**NOTE:** You cannot use the Substitute Colors and Postflight features at the same time. These print options are constrained from the printer driver.

## IMPORTING DENSITY MEASUREMENTS

This chapter describes Simple ASCII File Format (SAIFF), which you can use to import density measurements from measurement devices into Command WorkStation for calibration. To use your own measurement data from an alternate measurement instrument, rather than make measurements directly in Command WorkStation, record your individual readings in a text file, structured as described in this chapter. You can then import the data by clicking From File under Get Measurements in the Calibrate feature of Command WorkStation.

### Simple ASCII Import File Format

This format describes [Status T](#) measurement data for import into Command WorkStation. The three possible file formats are:

- 1D Status T density for EFI 21 patch page
- 1D Status T density for EFI 34 patch page
- 1D Status T density for other pages (maximum of 256 patches per ink)

The file format is ASCII and has no tabs. A single space or multiple spaces are used as delimiters. Blank lines are not allowed. Each line in the file represents four patches (C, M, Y, K) of a specific ink value. Comments may be on any line in the file. Comment lines must start with a pound sign (#) followed by a space. (A line with a pound sign followed by any character other than a space has been reserved.) Comments must be on a line by themselves.

Each line of data contains five values. The first number is the sequential patch number (for EFI 21 and EFI 34 pages) or the ink value percentage (for other pages). The four values that follow are the density values of C, M, Y, and K of the corresponding patch. Lines are ordered either by increasing sequential patch numbers, or by increasing the ink percentage.

For Windows computers, the file extension must be .cm0 or cm1. For Mac OS computers, the file type must be 'TEXT'.

Measurement data in EFI 21 and EFI 34 are paper-relative. For other pages, if the first line corresponds to zero ink value, Command WorkStation assumes that the measurement data is absolute and adjusts it to become paper-relative by subtracting the density values of the first line from the remaining patches.

### Example of 1D Status T density for EFI 21 patch page

This file format is used to specify the Status T density measurements of the EFI 21 patch page. The value in the first column is the patch number. The first patch must be 1 and the last must be 21.

```
#!/EFI 3
# EFI ColorWise 2.0 Data
type: 1DST21
# Cyan Magent Yellow Black
1 0.0300 0.0400 0.0200 0.0400
2 0.0600 0.0700 0.0800 0.0700
3 0.1000 0.1000 0.1000 0.1000
(...more data...)
20 1.6700 1.3400 0.8900 1.6700
21 1.7200 1.4300 0.9300 1.7500
```

### Example of 1D Status T density for EFI 34 patch page

This file format is used to specify the Status T density measurements of the EFI 34 patch page. The value in the first column is the patch number. The first patch must be 1 and the last must be 34.

```
#!/EFI 3
# EFI ColorWise 2.0 Data
type: 1DST34
# Cyan Magent Yellow Black
1 0.0300 0.0400 0.0200 0.0400
2 0.0600 0.0700 0.0800 0.0700
3 0.1000 0.1000 0.1000 0.1000
(...more data...)
33 1.6700 1.3400 0.8900 1.6700
34 1.7200 1.4300 0.9300 1.7500
```

### Example of 1D Status T density for an arbitrary page

This file format is used to specify the Status T density measurements of a user-defined patch page. The value in the first column is the dry ink percentage of the patch. The first percentage must be 0 and the last percentage must be 100. The percentages must increase in between.

```
#!/EFI 3
# EFI ColorWise 2.0 Data
type: 1DST
# percent Cyan Magent Yellow Black
0.0000 0.0300 0.0400 0.0200 0.0400
0.3922 0.0600 0.0700 0.0800 0.0700
1.1765 0.1000 0.1000 0.1000 0.1000
(...more data...)
98.0000 1.6700 1.3400 0.8900 1.6700
100.0000 1.7200 1.4300 0.9300 1.7500
```



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