PRINTER LINEARIZATION WITH 12-COLOR CANON PRINTERS

This document provides useful information on how to re-linearize Canon printers of the imagePROGRAF iPF5000/5100/6100/8000/9000 series.



You require the add-on option Color Manager if you want to go on to create a media profile.

Printer inks

The twelve-ink printers imagePROGRAF iPF5000/5100/6100/8000/9000 have the following ink colors: CMYcmRGB, plus four different black inks, comprising two types of dark black, medium black (GY) and light black (PGY). Which dark black ink is used (photo black or matte black) is determined by the choice of media. Thus, the printer has twelve inks all together, of which a maximum of eleven can be used at any one time.

NOTE: The imagePROGRAF iPF 5100/6100 printer models use different types of black ink. The gray inks (GY and PGY) have been improved to reduce the effects of graininess and bronzing which can be caused by diffused light reflection. Please note, therefore, that media profiles created for other printers of the imagePROGRAF series are not suitable for use with these two models.

Color mode, resolution and halftoning

The printers support two different color modes: CMYK (plus cmkk) and CMYKRGB (plus cmkk).

You should be aware of the important correlaton between color mode, resolution and halftoning method. The choice of resolution determines which color mode and which halftoning method are applied. This is illustrated clearly in the table below:

Resolution[1]	Halftoning method	Color mode
300 x 300 dpi	Printer Halftone	CMYK (plus cmkk)
600 x 600 dpi	Printer Halftone	CMYK (plus cmkk)
1200 x 1200 dpi	Error diffusion (SE1)	CMYKRGB (plus cmkk)
2400 x 1200 dpi	Error diffusion (SE1)	CMYKRGB (plus cmkk)

1 The resolution refers to the input resolution. Even if the you select a low input resolution, the printer uses an internal algorithm to output images at the highest possible resolution of 2400 x 1200 dpi.

The following settings are recommended:

- For four-color printing (CMYK, plus cmkk), select an input resolution of 600 x 600 dpi. This ensures that you achieve a good relationship of speed and quality.
- For seven-color printing (CMYKRGB, plus cmkk), select an input resolution of 2400 x 1200 dpi.

Preparing the printer

Before performing a printer linearization, make sure that you select the media inserted in the printer at the printer control panel. In the folder of many EFI profiles you will find a text file which tells you which media setting to make.

NOTE: Although the control panel offers the paper type "Proofing Paper", this is based on Japanese 127g paper and is not suitable for EFI proofing media. The following settings are recommended:

Resolution	Media setting at control panel	Color mode
300 x 300 dpi	Plain paper	CMYK (plus cmkk)
600 x 600 dpi	Special 1	CMYK (plus cmkk)
1200 x 1200 dpi	Not recommended	CMYKRGB (plus cmkk)
2400 x 1200 dpi	Special 1	CMYKRGB (plus cmkk)

Based on the media setting you make at the printer control panel, the printer settings for pre-calibration and distance to print head are adjusted.



Please note that it is important that you select the same media setting later in EFI LinTool/ Color Manager.

Output speed versus output quality

The output speed varies in importance, depending on whether the printer is being used for proofing or for production purposes. Proofing calls for top-quality output with a high degree of color accuracy. For production printing, speed is the more important factor, with color accuracy usually being of secondary importance.

You can manipulate the output speed by making the following settings in Fiery XF. Refer to your user manual for information on where to find the settings, if necessary.

Setting	Proofing	Production
High-priority workflow	Off	On
Bi-directional printing	On	On
RIP and print on the fly	Off	On
RIP resolution	Quality/Standard	Standard/Speed

In EFI LinTool/Color Manager, you can affect the speed of output by altering the print mode setting as follows:

Setting	Proofing	Production
Print mode	High Quality	Normal ("Draft" is also available for CMYKcmkk)

The settings you make in Fiery XF determine the speed at which the RIP processes the data and transfers it to the printer, whereas changing the print mode in EFI LinTool/Color Manager affects how quickly the printer actually outputs the in-coming data. For comparison, the setting for high quality uses twelve passes, whereas the normal print mode uses only eight.

Settings in EFI LinTool/Color Manager

The following settings are recommended:

Setting	Color mode	
	CMYK (plus cmkk)	CMYKRGB (plus cmkk)
Paper	EFI Offset Proof Paper 9100/ 9200 Semimatt EFI Gravure Proof 4245 Semimatt	EFI Offset Proof Paper 9100/ 9200 Semimatt EFI Gravure Proof 4245 Semimatt
Resolution	600 x 600 dpi	2400 x 1200 dpi
Bi-directional printing	On	On
Media type setting	Special 1	Special 1
Ink limit per channel	Standard	CMYKRG = Standard Blue = 60%
Dot gain	Standard	CMYKRG = Standard Blue = 20%
Black generation	Black length = 14 Black width = 10	Black length = 14 Black width = 10

Quality Control

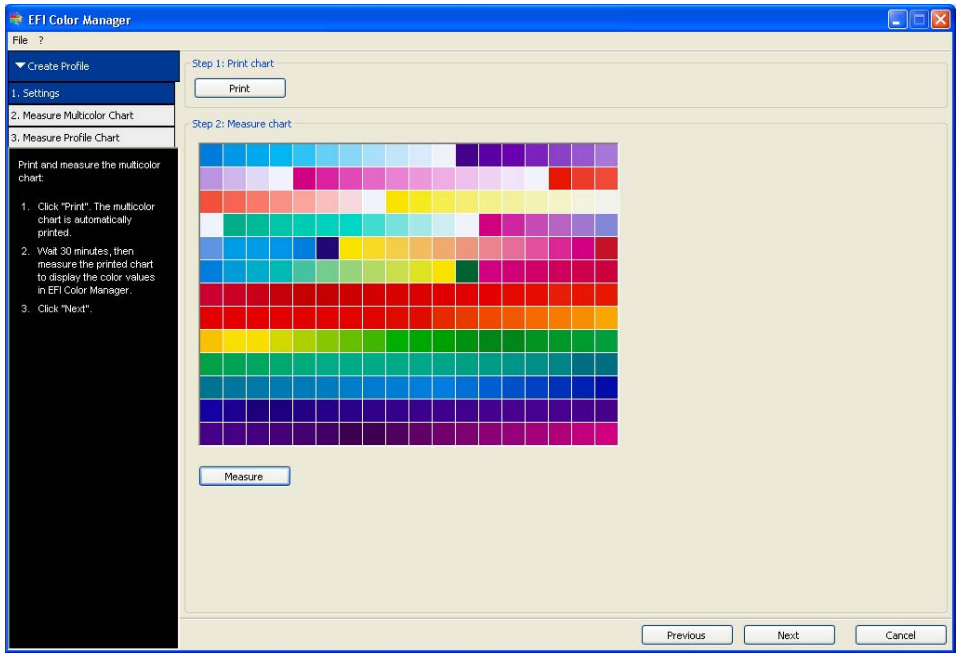
After you have created a base linearization, print out the quality control chart and check the following:

- CMYK gradations and three-color (CMY) black stripe. If you notice that the ink saturation is not high enough, increase the total ink limit until you achieve a good result. You can change the total ink limit in the Profile Connector tool. The correct percentage depends on the media you are using, but is usually more than 300%. However, when increasing the TIL make sure that no cockling or bleeding occurs.
- Dot gain. Make sure that all the dot gain curves show positive values. If any color has a negative curve, try increasing the dot gain for that particular color. Particularly in the CMYKRGB color mode, make sure to check the dot gain for blue ink.

Creating a media profile for CMYKRGB in EFI Color Manager

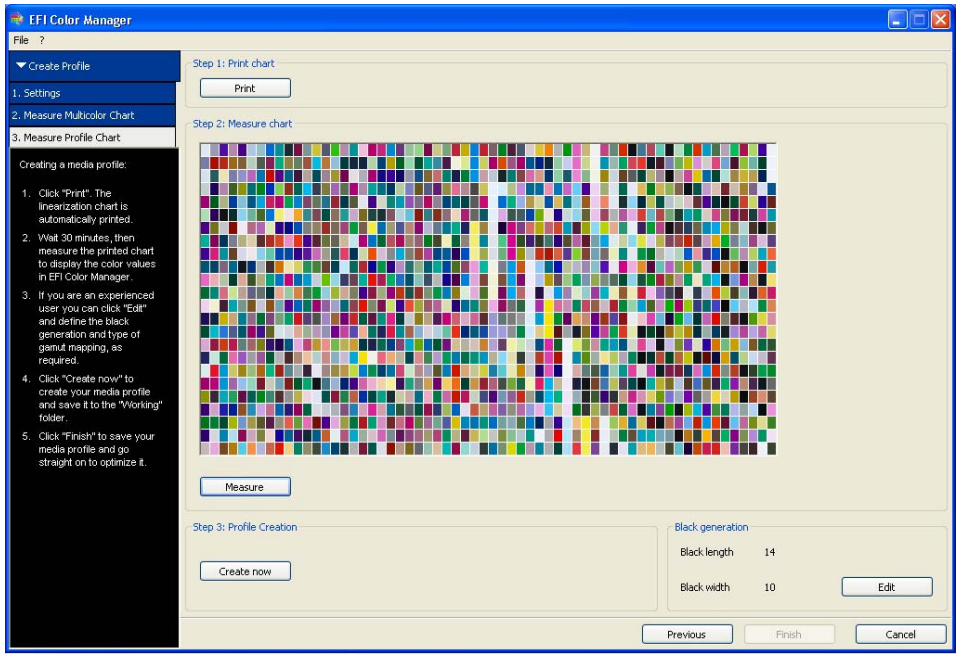
The printed chart that is output during the first step of profile creation contains a mixture of CMY and RGB color patches. This chart is important because it lets EFI Color Manager know which combinations of Cyan/Magenta, Magenta/Yellow and Cyan/Yellow can be replaced by Red, Green and Blue. This result is a device link profile that converts CMYK values to CMYKRGB.

Profile creation step 1



During the second step of profile creation, the device link profile is applied to output, for example, the ECI2002 chart. Color management is activated to output the chart and the printout uses RGB inks.

Profile creation step 2



When you measure the chart, the color results are mapped to the colors available in the device link profile in order to create a proper seven-color media profile.

Q & A

This section contains some useful additional information about using a twelve-color printer with Fiery XF.

Q	How do I print a profiling chart if I want to use a third-party profiling software?
A	You require either a seven-channel TIFF chart (CMYKRGB) or a PDF/PS/EPS/DCS file with the colors CMYKRGB. Make sure that Fiery XF recognizes that the chart is CMYK + RGB. **NOTE:** You should deactivate color management before printing the chart. No input profile is required.
Q	Why does the total ink limit not work properly with 600 x 600 dpi?
A	At low resolutions, Fiery XF uses printer screening. This means that the printer is responsible for limiting the ink and halftoning.
Q	Can Fiery Dot Creator be used in conjunction with twelve-ink printers?
A	No, because in four-color modes with low resolutions the printer screening is used. Screening files from Fiery Dot Creator cannot be applied as well. In eleven-ink mode, the halftoning would need seven different screen angles — CMYKRGB.
Q	How can I view a seven-color profile?
A	There is no direct and easy way to load a seven-color profile. However, there are two workaround solutions: • Load the created *.it8 chart from the Working folder in Fiery Color Verifier. • Load the temporary CMYK profile from the Working folder in Fiery Color Verifier. **NOTE:** You should not try to open a seven-color profile in a third-party software, such as Gretag ProfileMaker. ProfileEditor will display an incorrect color gamut because there are colors missing in the A2B table, which can, therefore, not be used for printing. Furthermore, seven-color profiles should not be used as reference profiles.