FreeFlow® Print Server V9 SP1
May 2012
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FreeFlow® Print Server
What's New

Document version 1.0: May 2012

Contents

Common Features 1

GMC Inspire Designer

All printers that support FreeFlow® Print Server Intelligent Printer Data Stream® (IPDS) can receive jobs from GMC Inspire Designer.

Connectivity updates

Novell licenses are no longer available for FreeFlow Print Server software 9.0 and higher. AppleTalk now supports FX Font Downloading.

Embedded Banner Pages (all printers except the Xerox® CiPress™ 500 Production Inkjet System)

The Embedded Banner Pages feature enables the user to use the leading pages of the PDL data as the banner page(s) for the job. The following areas support Embedded Banner Pages:

- XPIF
- IPP
- Job Forwarding
- Save

A new collection attribute, job-sheets-col, has been introduced for this feature. The collection contains two members, job-sheets and job-sheet-count. Currently job-sheets supports 3 values, none, standard, and first-print-stream-page. If the job-sheets is set to first-print-stream-page, then the job-sheet-count value is the number of the pages of the data stream that are used as the banner page(s). If the job-sheets is set to first-print-stream-page, but the job-sheet-count is missing in the collection, the job-sheet-count is set to one as the default.

> NOTE If a user forwards a job from a system that supports embedded banner pages to a system that does not support them, the job-sheets-col is ignored. For jobs containing embedded banner pages, the banner pages are printed as part of the job.

Alternative Licensing Method (all printers except the Xerox CiPress 500 Production Inkjet System)

In order for the FreeFlow Print Server to be properly configured and tested, the system and a basic set of features must be activated. The purpose of this alternative licensing feature is to enable FreeFlow Print Server features to work for a grace period prior to requiring the installation of normal system and feature licenses. This ensures sufficient time for users to obtain long-term licenses once a system reaches their site.

During the grace period, all of the selected features are enabled for full use. Features that are not selected for activation under the grace period are not active.

While operating a system under a grace period the user is informed by a warning message about how many days are left in the period, and can go to **Setup > License Manager** to see which features are activated.

NOTE Days when the system is inactive do not count against the grace period time limit.

If any form of Normal License is properly loaded on the system, or the grace period expires, the grace period will no longer activate the system, and all features that require a license require a valid feature license to be loaded.

Updates for Native JDF/JMF

Native JDF/JMF

A new native FFPS gateway is introduced to support the Job Message Format (JMF) network protocol.

JMF is the bi-directional messaging feature of JDF. With this gateway, FreeFlow Print Server will be able to receive, process, and respond to JMF messages from JMF-capable clients.

JDF Media Query Support

A JDF client user may now query FreeFlow Print Server for media resource status using JMF (Resource Query).

JDF DFA Support - Job Submission

A JDF client user may now submit a job and specify the named DFA finishing profile to apply to the job.

JDF DFA Support - Acquire List of DFA Profiles

A JDF client user may now acquire the list of supported DFA finishing profiles from the printer. This is done as part of the Device Capabilities in the known devices query response.

Xerox Developer Program

For more information about using JDF, including these new capabilities, please contact the SDK Developer Program. This program provides documentation, examples and support. The Xerox Developer program is a simple means of leveraging Xerox-designed, Xerox-supplied open standards interfaces to streamline development efforts. It is applicable to all qualified integrated software vendors, system integrators, hardware vendors, and Xerox customers.

Further details on the Developer Program are available at:

https://www.xerox-solutions.net/Partners

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Outload Capture and Transfer

The FreeFlow Print Server now allows users to initiate the capture of an outload and transfer the outload to the Xerox Support Server.

This feature is accessed through the **System > Problem Reporting** menu. Enter the required data in the **Capture** tab. The capturing outload operation can take varying amounts of time, depending on the amount of data on the system at the time. The outload is stored under: /var/spool/XRXnps/outloads/. On the **Transfer** tab, select one outload, enter the required data, and Start the transferring outload operation. The progress of the transfer depends on the size of the data file and the speed of the connection. After a successful transfer, the outload is removed if the user selected the **Remove Outload After Transferred** option on the Transfer window.

Support for DFA

Support was added to the FreeFlow Print Server for Document Finishing Architecture (DFA). DFA profiles are created on the printer UI and then display on the FreeFlow Print Server UI in the Job, Queue, and Print from File areas under the finishing selections. User can select that profile as the finishing for a job. The following DFA devices are supported:

- GBC ebind
- Plotmatic Pro 30
- Xerox Tape Bind

Printer Log Support

When a user creates a FreeFlow Print Server outload, it signals the printer to create logs. Once the printer is finished, it restarts itself. The user is then able to pull the printer logs off the UI for debugging.

Pre-printed Stock Support

Support is now available for pre-printed heavy weight, pre-printed light weight, and pre-printed standard weight stock. These are now available stock selections.

Xerox® 800/1000 Color Press

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Dry Ink Estimation

A new job operation generates an estimate of how much dry ink a job will use. Basic workflow requires job to be estimated to be submitted to a Held Queue. A job menu option “Estimate Toner Usage” is then invoked to calculate and display dry ink usage. Usage is expressed in percent of the bottle for all the dry inks in the system (Cyan, Magenta, Yellow, Black and Clear, if installed).

For more details see *Xerox® FreeFlow Print Server Dry Ink Estimator* document which is included in the FreeFlow Print Server 9.0 –SP1 software and documentation kit

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XXL Paper and Stacker Selection

All FreeFlow Print Server systems check the stacker size limits before submitting a job. The printer displays the limits based on the stacker attached.

NOTE Jobs > 22.5 inches in width are not supported for offset stacking on this printer. Jobs exceeding this width will fault.

Enable Larger Stock Selection for DFE Profiling

FreeFlow Print Server now supports all stocks that are larger than 11 x 17 for DFE profiling

DFE Changes

Enhanced Halftone Selection

For the Xerox iGen 150 Press enhanced dot (180/250 dual dot), one of the requirements is to differentiate between small and large text based on size of the text. This is done by assigning different Engine Tags for small and large text sent to the printer. When the size goes above a certain threshold the text would be tagged differently.

Another requirement is to apply high frequency halftone for thin isolated lines, as a legacy requirement for the machine.

These features will provide for appropriate image quality adjustments at the Yukon printer.

The supported PDLs are: IPDS, Postscript (including VIPP), and PDF.

Extended from the original halftone selection, the Xerox iGen 150 Press continues to have four major halftone selections, including 160Dot, 180Dot, 210Dot, and 250Dot. These newly designed halftones correspond to the existing halftone selections 150Dot, 175Dot, 200Dot, and 300Dot, respectively. The system-specified halftone is equivalent to 180Dot.

In addition to these 4 new halftone dots, Xerox iGen 150 Press also introduces a new enhanced, 180/250 dual dot selection. Under this new dual dot selection, the base halftone is 180Dot, and for small fonts and thin isolated lines, 250Dot is applied.

> NOTE Although the 250Dot is used for small text and thin lines, the CMYK values are still generated through the same 180Dot profile that is used for the rest of the page.

Tags are data that get passed along with image data from DFE to the printer, that are used to render the object with the best possible image quality. They provide information/hints about the object such as the type of object (image, text, and graphics), spot color, etc. When a user creates a FreeFlow Print Server outload, it signals the printer to create logs. Once the printer is finished, it restarts itself. The user is then able to pull the printer logs off the UI for debugging.

Workflows

The jobs (IPDS, Postscript/VIPP, PDF) are processed as in any normal workflow. But due to some limitations about how Fonts are encoded in different PDLs and the availability of the font size information, some recommendation is provided as to how to create and process jobs in order to appropriately tag the text objects for the Xerox iGen 150 Press.

PDF

For PDF jobs, APPE does not currently provide a way to pass down Spot Color information. Although the CMYK values will still be appropriately generated, the tag values will be the tag values for non-spot color objects, instead of the tags for the spot color objects. If a user TRC is applied, the CMYK values will be affected. A case log is currently open with Adobe to address this issue.

IPDS

IPDS has the following issues:

Pointsize vs. Actual size - Unlike Postscript, IPDS does not pass down font pointsize information to the decomposer. The way the font size calculation is done currently in IPDS Decomposer is by calculating the bounding box of the largest character in the font set. The problem is that different typefaces differ in actual size even though they are the same point size. For example a Times Roman point size 18 is bigger in size than Courier New point size 18. Therefore for Times Roman we may switch to large text for 18 and above, but for Courier New the switch happens at 20 point. So even though we will be consistent as far as tagging a sentence of same point size, we can not guarantee that the switch to large text tag happens at an exact point size value for all fonts.

Detail Font Tagging

The printer's image path provides support for engine tags for text, image, and graphics objects. For text objects, there are 4 scenarios:

- Small Text, non-Spot Color
- Large Text, non-Spot Color
- Small Text, Spot Color
- Large Text, Spot Color

For small text, the goal is to preserve the fidelity of the edge quality of the text. The Spot color attribute is provided to prevent altering the color, or to disable User TRCs.

In the common imaging path for all PDLs there is a notion of Rendering Intent. This attribute provides hint/information about the objects as to how to best render the objects. The Rendering Intent provides information such as object type, color management hints and other special attributes. This information is used to appropriately tag the objects going to the printer. If the font information is available from the PDL then the text size can be calculated and tagged.

Detail on White Tagging for Lines

Detail on white tagging for lines is an existing feature on the iGen family. For lines, there are also 4 scenarios:

- Thin Line, non-Spot Color
- Thick Line, non-Spot Color
- Thin Line, Spot Color
- Thick Line, Spot Color

For thin lines, the goal is to preserve the sharp edges by utilizing a higher frequency halftone.

FreeFlow Print Server collects the object type and size information about a group of overlapped or connected objects. If they are all thin lines, a different halftone (with a frequency higher than the base halftone) will be applied to this group of isolated lines. Currently the line width threshold for thin lines is set at 6 (600dpi) pixels.

5.0 Color Version Package

With the introduction of new technologies with the Xerox iGen 150 Press, FreeFlow Print Server demonstrates continued leadership in digital color quality. Improved color management for RGB printing, continued benchmark CMYK printing standards accuracy, and highly accurate spot color rendition have been achieved with the FreeFlow Print Server color technology. The combination of proven calibration, benchmark ICC profile accuracy, benchmark profiling target and model accuracy, places FreeFlow Print Server as the benchmark where print and measure accuracy, accurate skin tone reproduction, and accurate CMYK reproduction is a goal.

In addition, the new Color Version 5.0 introduces new gamut mapping technology for RGB printing, greatly enhancing highly chromatic color mapping while maintaining natural skin tone reproduction.

As in past releases to the “iGen” platform, of which Yukon is included, FreeFlow Print Server does not offer the ability to generate a calibration TRC.

The Image Quality > Color Management settings now contain a reduced list of RGB and CMYK source spaces available for selection. The following list of obsolete profiles were retired / removed from the RGB and CMY Source Space selections:

- XCC RGB
- XCC RGB G1

- Europe ISO Coated FOGRA 27 CMYK
- FOGRA Gloss Coated CMYK
- FOGRA Matte Coated CMYK
- FOGRA Uncoated CMYK

Profiling Technology

D150 carries in-line spectrophotometer (ILS)-based profiling automation. With the Advanced profiling technology, ILS enables streamlined profiling updates.

Color Management

Using the same foundation of Advanced Profiling technology previously introduced in version 7 software for iGen4®, and Color1000 the FreeFlow Print Server color scientists have further refined the built in profiling capabilities in combination with the impressive color gamut of the Xerox iGen 150 Press. The measured accuracy of this new technology far exceeds the industry accepted standards, in order to confidently meet the color management requirements of the most demanding customers.

General Profiling Innovations

The following are some profiling innovations:

- Optimized profiling target provides High Accuracy Printer Model.
- Refined profile creation technology provides accuracy that exceeds industry standards.
- ILS based spectral input for automated updates.
- New RGB gamut mapping technology for better utilization of highly chromatic RGB colors while maintaining neutral skin tone and neutral rendition.

CMYK Advantages

CMYK rendering advantages include:

- Relative Colorimetric – for CMYK color matching. This minimizes measured error relative to emulated standards.
- Absolute Colorimetric – follows same strategy as with other Xerox printers; required when evaluating color matching capability relative to CGATS standards. Evaluations are typically made on paper types that do not match the paper type of the reference standard (such as GRACoL or ISO Coated). CGATS reports LAB values in absolute colorimetry, NOT relative colorimetry. If achieving the standard is the goal as opposed to assessing results to the standard with a random paper, you must use the paper that is the reference paper of the standard.
- Saturation – as with other Xerox printers, offers Relative Colorimetric results but preserves 100 % K (vs. matching black to the emulated color space, which is generally a less saturated black on Xerox printers)
- Simplified GCR options to just one – embedded in the default, matching all other CP.82 release.

RGB rendering advantages

- Perceptual Rendering for RGB Photo printing, when combined with the dynamic range of the press, delivers benchmark photo reproduction. This feature uses new gamut mapping strategy to enable better mapping of out of gamut chromatic, RGB colors. Newly tuned “shadow detail” results in the updated, reduced gloss look of the new Xerox iGen 150 Press toner set.
- Saturation Rendering delivers saturated primary colors for graphics, while maintaining reasonable color balance and tone reproduction for use in images
- Cyan, Magenta and Yellow RGB primaries map to saturated outcomes.
- Pure Rendering, consistent with FreeFlow Print Server v7 Color Workflow, insures R=G=B (grays/black).

Source Spaces

A reduced list of RGB and CMYK source spaces is available for selection. The following list of obsolete profiles were retired / removed from the RGB and CMY Source Space selections:

- XCC RGB
- XCC RGB G1
- Europe ISO Coated FOGRA 27 CMYK
- FOGRA Gloss Coated CMYK
- FOGRA Matte Coated CMYK
- FOGRA Uncoated CMYK

Spot Colors

The Pantone-licensed FreeFlow Print Server continues to support PMS Coated/Uncoated and Pantone GOE Coated lookup tables uniquely tuned for each color printer. The outstanding results from FreeFlow Print Server spot color tables are due to exclusive rendering technology, including gamut mapping method derived specially for generating spot color recipes.

Spot Colors for the Xerox iGen 150 Press Color Version 5.0 release now are based on license Lab values from Pantone Inc., processed at RIP time to optimally utilize the color gamut while, for in gamut colors, maintaining high accuracy.

In general, the Xerox iGen 150 Press offers five halftones – 160D, 180D, 210D, 250D, and 180/250D dual dots. For all halftones, very smooth rendering can be achieved.

Further enhancing the Xerox iGen 150 Press, is a color gamut that is changed relative to iGen4.

The direct CMYK path is of special interest for the Xerox iGen 150 Press. FreeFlow Print Server offers a post calibrated direct CMYK path (not color managed) that provides attractive CMYK printing results through the trichomic (not color managed) path. Those customers with CMYK workflows wishing to garner peak RIP performance may consider exploration of this trichomic path. In particular, the red, green and blue reproduction preserves the hue of common offset press types enabling, for most files, Direct Path printing with vibrant results and excellent neutral rendition for common files intended for Offset Press printing.

Advanced Profiling Offering Xerox AccuICC technology

Printer profiling with the ILS will automatically issue an appropriate target, scan the data, and produce a profile. The profile must be associated on the desired queue/s.

With Color Version 5.0, FreeFlow Print Server profiling technology continues to deliver its current state of the art, found in both iGen4 platform, and the Color 1000 platform.

AccuICC, only available with FreeFlow Print Server, offers an average profile error, for in color gamut colors, of a mere 0.8 dEab with a p95 of 1.9 is delivered as standard. Overall system error, print and measure, is currently industry benchmark. Custom profiles live up to this accuracy result in the customer profiling environment. By comparison, the industry standard GRACol ICC profile, produced by the GRACol standards organization, has an average profile accuracy of 1.5 dEab with a p95 of 4.9.

The Xerox iGen 150 Press does not have an ink limit requirement due to its xerographic nature.

Since the profiling target and the ICC profile both emit CMYK total ink up to 400 the hardware ink limit, this advanced technology delivers the full available color gamut of the printer.

Continuing with the delivery of industry benchmark ICC profiling technology, FreeFlow Print Server introduces the most accurate ICC profile, in the presence of ink limit, in the color digital printing industry.

Profiling Target

A highly optimized profiling target providing a high accuracy printer model with a comparably small number of patches (464 patches) has been derived for the FreeFlow Print Server release.

Relative Colorimetric Rendering

Relative Colorimetric rendering forms the basis for FreeFlow Print Server AccuICC technology. Additionally, to further improve CMYK color printing in a complex digital color workflow, FreeFlow Print Server introduces the CMYK SMART RCI (Relative Colorimetric) Intent. For the first time in an ICC profiling technology, CMYK, utilized as an emulation source space, but, whose color gamut does not exactly align with the Xerox iGen 150 Press, will automatically and adaptively minimize dE error. This new CMYK SMART, automatic, adaptive technology can reduce measured errors by, depending on color and source space, more than half, relative to other DFE vendor ICC profiles.

CMYK SMART RCI rendering coupled with AccuICC offer benchmark color accuracy for digital color printing of CMYK files. Again, these advances are only available with FreeFlow Print Server.

Differing from the former Xerox iGen 150 Press release is the absence of multiple GCR selections thereby simplifying the UI access during printing.

Perceptual Rendering

The Perceptual Rendering Intent is the FreeFlow Print Server default rendering intent for RGB source image content.

The Xerox iGen 150 Press Perceptual Rendering Intent uses the same Advanced Profiling technology utilized in the construction of the Relative Colorimetric Rendering Intent, with two main differences.

The first difference is in the selection of gamut mapping strategy. The new Perceptual Rendering Intent incorporates a gamut mapping approach that leverages advanced models of the human visual system while preserving detail in the mapping of out of dark gamut colors. The gamut mapping methodology utilized by the Perceptual Rendering Intent results in good color reproduction with a level of detail preservation often lost through other gamut mapping techniques.

The second difference is in the application of Dynamic Black Point Compensation or DBPC, to the Perceptual Rendering Intent. DBPC provides the ability to capture shadow detail in image content that falls below the min L* of the printer (or, alternately stated, map the dynamic range of the image to the dynamic range of the printer in a smooth way). The Dynamic aspect of the BPC capability enables the Perceptual Rendering Intent to maintain a visually similar level of shadow detail in the presence of printer variation, particularly min L* variation. The Xerox iGen 150 Press Perceptual Rendering Intent has been tuned with DBPC to achieve an optimized level of shadow detail for RGB source image content as compared to a reference monitor system, while minimizing impacts to other regions of the color space. Dynamic BPC was also previously been implemented for Xerox DC Color 1000.

Perceptual Rendering, on FreeFlow Print Server, closely maps the dynamic range of a calibrated monitor image to that of the printed image preserving visual “shadow detail” and color dynamic range.

Saturation Intent Rendering

Saturation intent rendering remains, as for the iGen4 family, producing the same outcome as the perceptual rendering intent.

Pure Intent

Pure intent color is based on the saturation intent with R=G=B mapped to k only. Except for a k only neutral axis, the pure intent and saturation intent are identical.

Spot Colors

FreeFlow Print Server continues its migration to Lab processing of Spot Colors during RIP with the Xerox iGen 150 Press color release.

FreeFlow Print Server supports comprehensive spot color look up tables, PMS Coated and Uncoated, and Pantone GOE Coated lookup tables. These lookup tables provide the customer the ability to reproduce highly accurate Pantone spot colors utilizing the full gamut of the Xerox iGen 150 Press. FreeFlow Print Server has derived a proprietary rendering, for spot colors, which includes a specially developed gamut mapping method. This new gamut mapping method offers highly chromatic and saturated colors relative to a typical Relative Colorimetric rendering.

Furthermore, for in gamut colors, FreeFlow Print Server has designed proprietary methods that offer very highly accurate results relative to CIE L*a*b* target values. These methods include a very accurate printer model, and very accurate search techniques to retrieve CMYK values that return a target Lab value.

The color aims for spot colors on the Xerox iGen 150 Press, are CIELab values provided by Pantone.

Monochrome and Color to Black only (0,0,0,k) with FreeFlow Print Server

Grayscale objects: For input monochrome, 8 Bit, file types, FreeFlow Print Server offers the equivalent reproduction with Gamma 1.8 or Gamma 2.2. Additionally, if the printer K only response is desired, rather than Gamma 1.8 or 2.2, then, that selection is also available.

RGB and CMYK can be printed to K only by selecting either Grayscale or Black Only in the Color Mode drop down list of the Color Management tab.

- RGB to k only, for the Xerox iGen 150 Press, preserves luminance with the same level of compression and shadow detail as that for color jobs.
- CMYK to k only, for the Xerox iGen 150 Press, preserves luminance accurately and faithfully to input CMYK L* value.

Relative Colorimetric Intent Rendering - the basis of FreeFlow Print Server AccuICC

Relative Colorimetric rendering is the default rendering for CMYK input data with FreeFlow Print Server. With the Xerox iGen 150 Press, FreeFlow Print Server has further optimized CMYK data with the relative colorimetric intent through the introduction of CMYK Smart RCI to make optimal use of the large gamut of the press itself.

CMYK Smart RCI locates the closest color on the printer gamut, relative to the source gamut. Implementation is coincident with an understanding that more and more customers utilize Delta E as a key metric in business decisions associated with acquiring printing equipment. CMYK Smart RCI, for out of gamut colors, will automatically minimize Delta E for those key out of gamut colors in emulation offset press space.

To enhance measured accuracy, relative to the Gracol gamut, which is the default source space for the Xerox iGen 150 Press, FreeFlow Print Server has developed CMYK Smart RCI rendering.

Commonly, in digital printing where different offset press types can be readily emulated, color gamuts can differ. These differences are not large, but, can contribute to measurement error and be amplified by using default, common gamut mapping techniques for Relative Colorimetric.

CMYK Smart RCI, introduced with FreeFlow Print Server for Xerox iGen 150 Press, utilizes adaptive rendering to match the out of gamut Gracol colors with those closest on the gamut of the Xerox iGen 150 Press. Simultaneously, in gamut color accuracy is benchmark within the Color Reproduction industry. If an updated profile is built, the color adaptation tracks with the updated colorimetry captured by the profiling target in order to minimize overall measurement error. In this manner, error introduced by out of gamut colors is minimized during printing.

Pantone Spot Color Lookup Table

The pantone spot color lookup tables, including Pantone PMS Coated, Pantone PMS Uncoated, and Pantone GOE Coated, are built and integrated into the color package.

As of Color Version 5.0, FreeFlow Print Server Spot Color processing now uses CIE L*a*b* values directly, rather than the previously derived CMYK values. The CIE L*a*b* aims utilized in the Color Version Spot tables are the Absolute CIE L*a*b* values provided by the Pantone Company.

The L*a*b* values are processed through the destination profile of the selected queue, either through the private Spot tag when using FreeFlow Print Server built printer profiles, or if no private tag is available, as with 3rd party printer profiles, it is processed through the Relative Colorimetric BtoA1 tag.

When the FreeFlow Print Server proprietary private Spot tag is available, unlike other DFE vendors where the Spot Colors are rendered through a simple Relative Colorimetric rendering, FreeFlow Print Server has derived a proprietary rendering which includes a specially developed gamut mapping method. This new gamut mapping method offers highly chromatic and saturated colors relative to a typical Relative Colorimetric rendering. Additionally, during gamut mapping, a constant hue is maintained between source color, and target color.

Spot Color List: Swatch Book Printing

As a result of the new L*a*b* processing of Spot Colors, when printing the Swatch Books from the Spot Color List, the user must now specify a queue for the printing process. The destination profile that is designated in the specified queue will be utilized in the conversion of the CIE L*a*b* values contained in the Spot tables to corresponding output printer CMYK values.

When submitting the spot color job from the UI, please make sure to select the queue with the profile you wish to test.

> NOTE If the spot color swatch tester is not sent to the appropriate queue, the job will print, but, the colors could be in error (wrong profile).

Spot Color GCR Type – High GCR for 400 PMS Series Colors

Historically, FreeFlow Print Server has followed Pantone Inc. methods for CMYK simulation of Spot Colors where GCR design is relevant. Specifically, a high GCR has been utilized to minimize the possibility of instability to illuminant, and to enable robustness to printer CMY drift.

For the new Xerox iGen 150 Press release the high option now again is the default. Practically speaking this enables more robustness to illuminant and printer instability in near neutral colors like the PMS 400 Series.

Profiling for Different Halftones

On Xerox iGen 150 Press, five halftone selections are available in the queue property, however, only four halftone selections are available during profiling, namely 160D, 180D, 210D, and 250D. 180/250 dual dot selection is not available. This is because when 180/250 dual dot is selected during RIP, only the 180 dot profile is used; 250 dot halftone is applied for object rendering rather than color conversion. Therefore, when profiling for 180D, 180/250 dual dot will be added or updated in the profile database.