gmg color

GMG ColorServer
User Manual

Imprint

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This documentation refers to the GMG software version No. 4.9.

1. First Use

1.1 System Requirements

Our recommendations and minimum system requirements are meant to provide general guidelines for running GMG ColorServer. We recommend systems that meet or exceed the following requirements.

Processor: Intel dual core CPU

Memory: 4 GB RAM, 250 GB hard disk drive

Hardware components: Video card (supporting DirectX 10), enabled Direct 3D acceleration, updated driver (**not** Windows default driver), minimum resolution 1024 x 786 dpi, USB 2.0 port

Operating system:

- Windows 8 (32-bit/64-bit version)
- Windows 7 (32-bit/64-bit version)
- Windows Server 2008 R2 SP1 (32-bit/64-bit version)

Software components:

- Microsoft Internet Explorer 8.0 or higher
- DirectX 10 or higher (required for the GMG GamutViewer feature in GMG ProfileEditor)

Maximum processing performance

For maximum processing performance, we recommend the following computer configuration.

Processing power: 4–8 CPU cores (2 GHz or higher)

Memory: fast HDD RAID with 6–8 GB RAM, SSD for temporary data

When using a RAID system, that is, combining **separate** hard disk drives into a system, we recommend to divide the data transfer according to the following schemes.

- Disk drive for GMG ColorServer + RAID 0 for hotfolders and temporary folder
- Disk drive for GMG ColorServer and hotfolders + SSD for temporary folder
- Disk drive for GMG ColorServer + RAID 0 for hotfolders + SSD for temporary folder

See also:

- "PDF Processing Performance" on page 90
- "Creating a Hotfolder Manually" on page 23

1.1.1 Graphics Card Configuration for Gamut Viewer

For using the gamut viewer included in GMG ProfileEditor, you need to use a graphics card that supports the required drivers and software components.

Hardware recommendations: Graphics card supporting DirectX 10, with activated Direct3D acceleration, with up-to-date driver (not Windows default driver)

How to check the DirectX settings

→ Open the **Windows Control Panel** and check that the video card driver provided by the manufacturer of the video card is used. Check also that the driver is up to date.

→ Install **DirectX 10** or higher.

→ In the **Start/Run** box of the Windows operating system, type in "**dxdiag**" and press Enter.
The **DirectX Diagnostic Tool** dialog box is displayed.

→ Click the **Display 1** tabbed page.

→ Check that the following DirectX features are enabled: **DirectDraw Acceleration**, **Direct3D Acceleration**, and **AGP Texture Acceleration**. Enable them if this is not the case. If it is not possible to activate these features, the graphics card might not support them and you might need to use a different card.

How to check the hardware acceleration settings

1. Open the **Display Settings** of the Windows operating system.

2. Open the **Advanced Settings**.

3. Click the **Troubleshoot** tab.

4. Click the **Change Settings** button.
   (If your current display driver does not allow you to change the settings, you will see the Change Settings button grayed out, and you will not be able to change the settings.)

5. Set **Hardware Acceleration** to **Full**.

1.2 Program Installation

1.2.1 Installation Overview

GMG ColorServer Suite comes with several components you can select in the feature list of the installation wizard. The following table will provide you with information on the different components followed by a description of the possible client/server structures.

Feature/Component	Description	See also
ColorServer	Main color management application.	
ConnectManager	GMG ConnectManager is a utility program that monitors all GMG Connect components.	
ConnectServer	Part of the GMG Connect system that links GMG applications such as GMG ColorServer and GMG SmartProfiler or GMG WebConnect across different computers. Central data management of the Connect system, needs to be run in the background.	
Ink Saving Report Tool	Tool that analyzes your output and calculates the ink savings you could realize with GMG InkOptimizer.	"Creating an Ink Saving Report" on page 79
SmartProfiler	Calibration and profiling wizard. GMG SmartProfiler can also be installed as a client component on a different computer for information exchange with GMG ColorServer via your local network.	See GMG-SmartProfiler_Manual_en.pdf
WebConnect Server	Web server for remote data management that allows to set up users for remote use of GMG ColorServer hotfolders.	"Installing and Configuring the GMG WebConnect Web Server" on page 8 "WebConnect" on page 86
ProfileEditor / SpotColorEditor	Profiling and spot color editing tool.	GMG-ProfileEditor_CS_Readme_en.pdf

Client/Server configuration possibilities

All components of GMG ColorServer Suite can either be installed on one system and used just locally or distributed across several computers, allowing for a networked, but centrally controllable cross-platform color management. For example, you can install GMG SmartProfiler on several computers within your network and create hotfolders with color management files in GMG ColorServer via remote access. Web-Connect also follows the client/server model, but as the client only needs a web browser to access GMG ColorServer hotfolders, there is no installation required from the client side.

◀ Client-server configuration: Installation on **two** separate computers (**server**, **client**), as shown in the table below.

Workstation	Installation
Server	GMG ColorServer, GMG ConnectServer, GMG WebConnect
Client	GMG SmartProfiler

Note The number of client programs you can install on different computers depends on the purchased license. All client computers must have access to the server with **Full Control** permissions.

Note GMG SmartProfiler licenses are managed by GMG ConnectServer. You need to install GMG ConnectServer on the **same** computer as GMG ColorServer. Otherwise, it will not be possible to run the client software.

0.0.1 Before You Install

To ensure a safe installation, please check the following list before starting the process.

→ Check the **system requirements** for the software you want to install.

→ Make sure a valid **license** required for the software version you want to install is available on the target computer.

→ Unplug all **measuring devices** connected to the computer (if any). Otherwise, device drivers will not be properly installed.

→ Make sure you are logged on as a user with **full administrator rights**.

→ Make sure **no** Microsoft system updates are running in the background. This could lead to an installation failure.

1.2.2 Installing GMG ColorServer

Note The GMG ColorServer Suite installer offers an **update** functionality. If you have already installed GMG ColorServer**4.7 or later**, you do **not** need to uninstall an existing version before installing the new version. If you have installed an **earlier** version, you will need to **uninstall** an existing version before installing the new version.

GMG ColorProof o4, DotProof o4, FlexoProof o4

If you have a dongle with a combined license for GMG ColorServer and GMG ColorProof o4, DotProof o4, or FlexoProof o4, you will **not** be able to use proof printers anymore after installing the GMG ColorServer 4.7 setup. This functionality is only supported up to version 4.6.

How to uninstall the previous version

Existing hotfolder configurations or application data from the user are **not** changed by the installer. Still, it is recommended to make an **environment backup** to save all workflows and settings before uninstalling the software to avoid any potential data loss.

1. Start your currently installed version of GMG ColorServer.

2. On the **Options** menu, point to **Environment Backup**, and click **Create**.

3. After the **Environment Backup** has been successfully created, close all GMG applications.

4. Uninstall GMG ColorServer from the Windows Control Panel (**Start** > **Control Panel** > **Programs and Features**). Do **not** delete the main program folder (default folder for version 4.6 or lower: *c:\Colorproof*) manually before the new installation as the folder contains all printer calibrations, profiles, and other system files and application data related to the software.

5. After the uninstall operation is complete, restart the computer.

How to install the new version

Note Even if the installer appears to be **unresponsive**, it is still working in the background. Do **not** cancel the installation, end the process, or restart the computer until the installation is **finished**.

1. For a successful installation of device drivers, unplug all spectrophotometers connected to the computer.

2. You can install the program directly from the purchased DVD.

3. If you downloaded the program from the GMG website, copy the **ZIP** file to a local directory on the computer you want to install the program on.

4. Extract all compressed files and double-click the **setup.exe** file to start the installation.
   (**x86** to run the software on a 32-bit system and **x64** for compatibility with a 64-bit system. Please note that this only concerns the ability of the application to run on a 64-bit system, GMG ColorServer as such remains unchanged.)

5. Follow the instructions of the installation assistant. (If upgrading from an earlier version than 4.7, please install the program to a different folder than the one you installed the previous version to.)

6. Under **Setup Type**, you can select the **Custom** option if you want to install only the main components required for a specific program.

7. Deselect the features you do not want to install on the computer.

8. If you want to run GMG SmartProfiler on a remote client and not on the same computer as GMG ColorServer, select only the **Server** features (i. e. GMG ColorServer, GMG ColorServer Connector, and GMG ConnectServer) for the installation on the server computer and select only the **Client** features (i. e. GMG SmartProfiler) for the installation on the client computer.

9. Please wait while the installer is running.
   The installer needs to extract the installation package, install the program, and copy all application data to the hard disk. These actions may take a while.

10. Restart the computer if you are prompted to do so.
    The installation procedure will be automatically resumed after the restart.

11. The installation assistant will inform you when the installation is complete. Click the **Finish** button to exit the wizard.

1.2.3 Installing and Configuring the GMG WebConnect Web Server

GMG WebConnect is included in the GMG ColorServer Suite package. Run the main installation as described in "Installing GMG ColorServer" on page 7 and select **WebConnect** on the feature list as described below.

You only need **one** GMG WebConnect web server. You can then set up any number of client users (depending on license) for submitting jobs from a browser. Client users do **not** need to install GMG WebConnect and just need a standard web browser with the Microsoft Silverlight plug-in.

How to install GMG WebConnect

1. Run the GMG ColorServer Suite installer and follow the instructions of the installation wizard.

2. Deselect all features you do not want to install. Make sure the **WebConnect** feature is selected. (Click on the hard drive icon and select **This feature will be installed on local hard drive**.)

3. Click **Next** and complete the installation.
   With the completion of the installation, the **WebConnect Configuration Wizard** is automatically started.

Configuring the GMG WebConnect web server with the Configuration Wizard

After the installation of the web server has been completed, **GMG WebConnect Configuration Wizard** is automatically started and guides you through the configuration of the server settings.

If you want to configure GMG WebConnect at a later point of time, you can start the **Configuration Wizard** any time from the Windows **Start Menu** (**All Programs** > **GMG** > **Connect**: **GMG WebConnect Configuration**).

After selecting the configuration mode (easy or expert), you will be prompted to create an **administrator account**. The user name and password you enter are required whenever you logon to GMG WebConnect from your browser to set up users or to change any settings.
E-mail settings are required for sending **e-mail notifications** to the users, for example for sending a welcome mail with login data. On the finalizing page of the wizard, you will see a **summary** of all entered parameters.

Opening your web server to the outside world

Depending on your configuration, you might need to **unblock** the following **ports** to be able to show your web server to the outside world:

▼ Standard **http** connection: 80

▼ Secure connection via **https**: 443

If you are using the Windows Firewall, you can unblock the required ports by adding an exception to the firewall.

See also:

- "WebConnect" on page 86

1.3 Starting GMG ColorServer

Note Make sure the license dongle is connected to a USB port.

How to start GMG ColorServer

1. Double-click the GMG ColorServer program icon on the Windows desktop or click GMG ColorServer on the Windows **Start** menu.
   The program verifies the license information on the dongle and then starts the application automatically.

2. Optional: If you had a previous version of GMG ColorServer installed and have an environment backup, you can restore it now. On the **Options** menu, point to **Environment Backup**, and click **Restore**.

1.4 First Program Start

If you start GMG ColorServer for the first time, the main window (named **Overview**) is empty. This is because no printers and hotfolders have been configured yet. If you had a previous version installed, your existing hotfolders and installed printers will show up automatically.
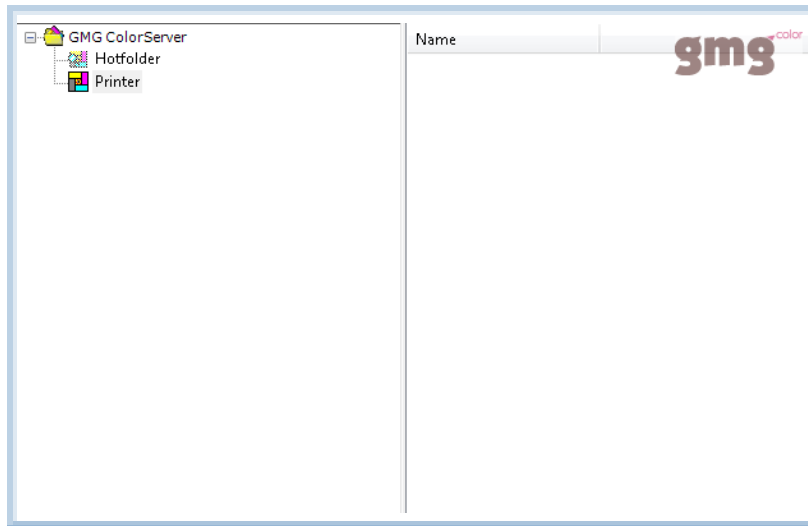
Fig. 1 Main program window with empty hotfolder list after first start.

You can create a **new** hotfolder now. Even if you want to create a manual job, you will first need to create at least one **hotfolder** as a kind of template for the manual job.

With GMG SmartProfiler, you can create ready-to-use hotfolders with all required application data such as color profiles for applications in the field of digital printing.

1.5 License Information

All available features are controlled by the license information on the connected USB dongle. Please make sure that you have all licenses required for the actions you want to perform with the software.

For example, trial or temporary program versions can be limited either by the **number of actions** the user can perform or by an **expiration time**.

Licenses can be updated via the software. For more information on available license packages, please contact your local dealer.

Please keep the license information and serial number at hand when contacting the support.

How to check the currently available licenses

1. Start the main GMG ColorServer application.

2. On the **Help** menu, click **Update License**.
   A list with all licenses installed on the connected USB dongle is displayed.

2. Getting Started

2.1 About the Help and User Manual

The help integrated into the software and the user manual contain all important information about GMG ColorServer to help you learn about and use its basic features.

It is assumed that you already have a basic understanding of computer and software terms, but no special skills are required to read this document.

The GMG ColorServer Help provides a fast and convenient way to look for information. Compared to the printed manual, it gives you the advantage of scrolling through the text in a non-linear fashion, picking up all the information you need.

The GMG ColorServer software is part of an ongoing developmental process. Please understand that the provided documentation is not always up to date. The latest information can usually be found in the Help.

2.2 What's New?

This chapter summarizes all major changes that have been applied to the program since the latest release. It is recommended to take the time to read the information provided in this chapter carefully, so that you can take full advantage of all new software features. Please follow the links for more information.

2.2.1 What's New in Version 4.9

GMG ColorServer **4.9** provides an ongoing stream of improvements and new features to further stabilize the PDF-to-PDF processing and leverage productivity. In addition to this, a completely new set of profiles has been integrated to support the latest international printing standards.

Advantage	New feature	See also
Increased productivity	**PDF-to-PDF**: Support of **PDF/VT-1** processing. PDFs that contain **variable content** can now be processed in GMG ColorServer while maintaining the data structure of the variable content in the output PDF file. PDF/VT is a new standard developed by the International Organization for Standardization (ISO) which deals with the reliable data exchange for **variable** data and **transactional** printing. **Note:** It is recommended **not** to **flatten** PDF/VT-1 files as the **Adobe Transparency Flattener** integrated in GMG ColorServer is not able to maintain variable content.	
Faster processing	**PDF-to-PDF**: Intelligent flattening of **black overprint** objects (**Advanced Flattening Settings** > **Preserve Overprinting Black**). PDFs that contain overprinting black and spot color objects only and no transparent objects can be processed much faster now due to the new pre-flattening validation.	"Advanced Flattening Settings" on page 58
Consistent image databases	**Image-to-Image**: New **CMYK-to-RGB** conversion profiles. With the new CMYK-to-RGB MX profile type, you can easily and automatically **normalize** CMYK image databases to a process-neutral **AdobeRGB** color space. The hotfolder technology used in GMG ColorServer automates all required steps. **Note:** The color roundtrip provides a perfect starting point for the **GMG ColorMaster** RGB workflow, re-converting images to AdobeRGB to store and modify them in a device independent color space.	"CMYK-to-RGB Conversion" on page 19 *GMG-ColorMaster-Concept_en.pdf*

Advantage	New feature	See also
Enhanced white point conversions	**Paper Adaption Tool**: Support of **custom** characterization data. In addition to various standardized color spaces, you can now also use gamut files (*.csc) of custom printing conditions to create paper adaptation profiles. The profiles are tailored to the custom media **white point** and can be applied in GMG ColorServer for accurately matching the media white point of the final print product.	"Paper Adaption Tool" on page 88

New profiles to support the following printing standards:

- GRACol 2013 Coated (CRPC 6)
- GRACol 2013 Uncoated (CRPC 3)
- SWOP 2013 C3 (CRPC 5)
- SWOP 2013 C5

2.3 Welcome to GMG ColorServer

GMG ColorServer is a versatile program for a broad range of color management applications.

Customized software packages and flexible licensing options support different levels of complexity. Thus, GMG offers an ideal solution exactly for your specific requirements. The main GMG ColorServer application and all possible add-on programs available for GMG ColorServer are referred to as GMG ColorServer Suite in the documentation.

Note Some of the features described in the following are not included in the standard GMG ColorServer version and require an additional license (GMG InkOptimizer, GMG SmartProfiler, GMG FlawFinder or GMG ProfileEditor). Please contact your local dealer for details.

2.3.1 Main General Features

High-quality color management
- **Normalizing** multiple color spaces
- Automated **color space conversions** optimized for the target printing condition
- **RGB-to-CMYK** separation
- **CMYK-to-CMYK** conversion or reseparation
- **Spot colors** can be converted to **CMYK**. Databases with DeviceLink spot color profiles for several commercial providers such as PANTONE®, HKS, and DIC Color Guide® are included.
- Create your own custom spot color databases with the expert tool GMG SpotColor Editor.
- **High-quality** colors **matching** the original colors as intended by the creator of the document
- High degree of **reproducibility**
- Perfectly **smooth gradients**
- Print deep, dark color tones to bring out **detail in the shadows**
- Print **bright** and **colorful** images
- Avoid unintended tints or color drifts
- Browser-based **remote access** to all main functions (GMG WebConnect)

Supported print standards are:
- Offset (PSO)
- Newspaper
- PSR
- GRACoL
- SWOP
- 3DAP
- JMPA
- JPC
- PPA

PDF Optimization for print production

- Automated analysis of embedded ICC profiles and subsequent MX4 based color management
- Flatten transparencies, layers, and overprinting in PDFs
- Flattened and color managed output PDFs that can be directly sent to the printer or press
- User-defined warning system that keeps you informed and helps you keeping everything under control

Control and connectivity with GMG WebConnect

GMG ColorServer comes with GMG WebConnect, a web interface which enables multiple users to access the software and create jobs directly from any standard web browser and track them from anywhere in the world.

Automated workflows with GMG ColorProof

If you want to also automatically **proof** your output PDFs, GMG ColorServer can team up with GMG ColorProof by using cascaded hotfolders. Simply link hotfolders from GMG ColorServer to a specific GMG ColorProof workflow. This way, you can set up integrated and completely automated workflows for all kind of different applications and proofers.

2.4 Product Variants

GMG provides solutions for high-quality color management in the print production business. Each solution is specialized for one of the following main applications.

- **Conventional Printing**: GMG ColorServer or GMG InkOptimizer
- **Large Format and Digital Printing**: GMG ColorServer Digital, together with GMG SmartProfiler for Digital Printing or GMG SmartProfiler for Large Format Printing.

You can scale the scope of the package according to the requirements of your production environment.

Please note that the provided software documentation describes all options the software offers in general. Please check whether the license you purchased supports the described feature.

Both product lines are briefly described in the following. For further information, please contact your local GMG dealer.

2.4.1 Conventional Printing

This product variant was specifically designed with Offset and Gravure Printing in mind. In addition to the general benefits of GMG ColorServer, it offers the following advantages.

- Increase your production output
- Save valuable ink and print media
- Get to know the unique MX4 DeviceLink technology and by-pass the L*a*b* color space to prevent contamination by other colors: 50% black stays 50% black.
- Comes ready-to-use with profiles optimized for the target printing condition and tested by GMG ColorExperts.
- The **Hotfolder Creation Wizard** guarantees a simple and fail-proof setup.
- Create your own custom profiles with GMG ProfileEditor (optional).

Use effective ink saving strategies with GMG InkOptimizer

Use GMG InkOptimizer profiles for automated UCR/GCR conversions while at the same time increasing the print quality and production stability. Using GMG InkOptimizer can save you up to 20% ink (depending on the printing process and on the used medium). To clearly see the benefits of this technology, you can generate **Ink Saving Reports** which calculate your ink consumption and your potential savings.

- ◀ Cost reduction
- ◀ Excellent and stable gray balance
- ◀ Higher printing quality
- ◀ Avoid overinking for an improved image quality and fail-proof production, especially for **Newspaper printing**

2.4.2 Large Format and Digital Printing

The products GMG ColorServer Digital and GMG SmartProfiler form an ideal combination for Digital and Large Format Printing.

In addition to the general benefits of GMG ColorServer, this product combination offers the following advantages.

- ◀ **Reproducible** colors: **Standardize** your print production, within tolerances defined for standard color spaces such as Fogra39.
- ◀ **Color consistency** between different devices: Achieve **color matching** results across a diversity of substrates, ink types, printing technology, and industry standards.
- ◀ **Flexibility** and **load balancing**: Choose the output device according to your **production requirements**. Don't worry about color results.
- ◀ Especially useful for **mixed production environments**
- ◀ GMG SmartProfiler will safely and quickly guide you through the process of profiling your printing system.

You will need the main color management application GMG ColorServer on a central server. Printers are profiled and recalibrated with the separate application GMG SmartProfiler, which can be run from a client. You can choose between two separate versions of GMG SmartProfiler available for **LFP** and for **Digital Printing**.

The number of printer–medium combinations you can profile is limited by the number of hotfolders you can use. The maximum number of hotfolders is defined by the purchased license.

Automated workflows with production printers

Our hotfolder technology allows you to use GMG ColorServer **output** folders as **input** folders for any output device supporting an automated print workflow. This way, you can set up integrated color management print workflows, independent of the type of used output device and driver.

2.5 Software Components

The product GMG ColorServer comprises multiple components as described in the following.

Note Some of the features described in the following are not included in the standard GMG ColorServer version and require an additional license (GMG InkOptimizer, GMG SmartProfiler, GMG FlawFinder or GMG ProfileEditor). Please contact your local dealer for details.

GMG ColorServer

Main program, for automated color space transformations of image data and PDFs with hotfolder technology.

GMG SmartProfiler

Easy-to-use tool for creating new custom color profiles and printer calibration files for GMG ColorServer hotfolders. You can also use GMG SmartProfiler to calibrate digital presses on a regular basis. Regular calibrations counterbalance undesired printer deviations caused by varying environment conditions such as temperature and humidity. Requires an additional license. Please see the separate documentation on GMG SmartProfiler for further information.

GMG ProfileEditor

Expert tool for creating and editing MX4 profiles. Requires an additional license.

GMG GamutViewer

Analyzer tool for a visualization of gamut files (*.csc or *.txt) in a 2D or 3D view, integrated into GMG ProfileEditor.

GMG SpotColor Editor

Expert tool for creating and editing spot color databases and gradation correction files.

2.6 Program Overview
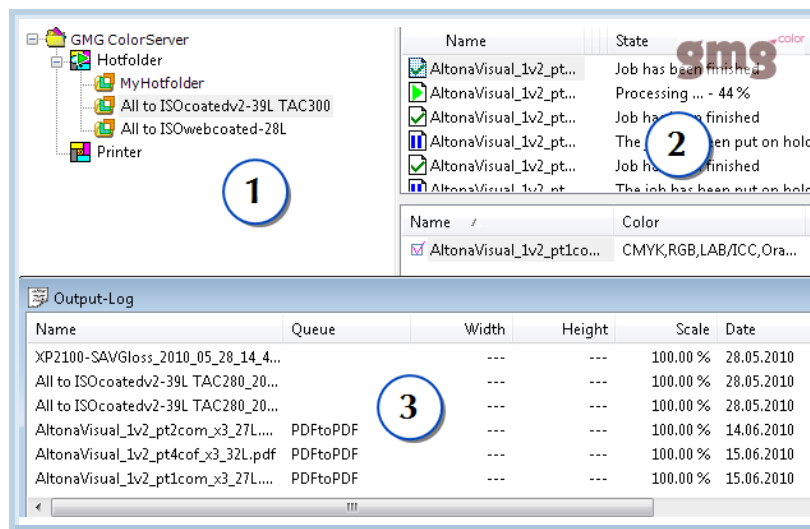
Fig. 2 Main program window of GMG ColorServer.

The **Overview** window provides an overview on your hotfolder configuration (1). You can **double-click** a **hotfolder** to show the processing settings. You can use a hotfolder command from the **context menu**. You can **select** a hotfolder with the mouse to create a **manual job**. (The **Printer** configuration is important only if you are using **Image Hotfolders**. **Image Hotfolders** require a **ColorServer** printer.)
On the right pane, you can see all **jobs** generated by the selected hotfolder (2). You can select a job and use a job command from the context menu, for example, to manually start printing.
The **Output Log** window (3) shows a list with all **processed** jobs. (You can activate the **Output Log** window from the **Options** menu.)

See also:

- "PDF Hotfolder Basics" on page 25
- "Creating a Manual PDF Job" on page 85
- "Hotfolder List View" on page 28

2.7 PDF Processing

With GMG ColorServer you can automatically process PDFs according to the hotfolder settings allowing you to normalize color spaces, use flattening, MX color processing according to the target printing condition, image compression, resampling, and so on.

The following provides you with an overview on how input PDFs are processed and which processing steps can be performed by the program.

PDF Processing with Flattening and Normalizing
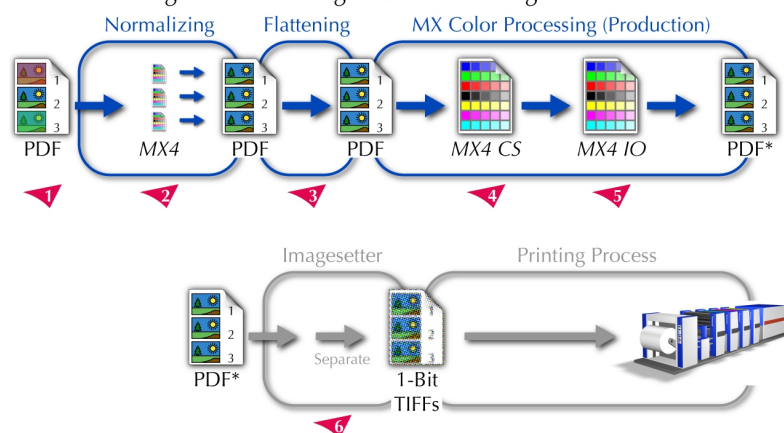
All color management steps described in the following can be fully integrated and automated by a unique hotfolder technology, without manual user interference required. Note that all steps are **optional** and can be **combined** with each other. You choose the steps required for optimizing the PDFs according to your specific workflow.

A PDF file delivered from your client may contain several images that are still in their **original** color spaces (1), that is, have not yet been converted to the target color space. Each object can be tagged with an **embedded ICC** profile describing its **current** color space. The **output intent** of the PDF describes the **target** color space.

For printing business applications, **RGB** objects need to be separated to **CMYK**. Some objects might also be in **different** CMYK color spaces not matching the PDF output intent. These objects need to be normalized to the **same** CMYK color space. These color space conversions are performed in the **Normalizing** step (2). The color space conversion can be made with ICC profiles, but it is recommended to use Device-Link MX4 profiles. After the normalizing step, all images and objects are in the **same** color space.

In the **Flattening** step (3), all **transparent** and **overprinting** objects are resolved, resulting in an optimized PDF without any transparent and overprinting objects.

The main MX4 based color management is performed in the **MX Color Processing** step (4, 5). You can choose between different processing modes.

The color managed output PDF* is **optimized** for the target printing process. The PDF **output intent** can be updated to reflect the color space changes performed in the hotfolder. You also have additional options for optimizing the PDF such as a compression or resampling of images.

MX4 based color management in GMG ColorServer

With GMG ColorServer, you can color convert each object in the input PDF file based on a high-quality MX4 color profile (**conversion**, **separation**, or **reseparation** profile).

An MX4 profile is a DeviceLink profile. As such, it is optimized for the specific input color space of an input object and for the target printing process or standard. (Different MX4 profiles can be assigned to different ICC profiles embedded in the PDF objects by defining an **MX4 Normalizing Rule Set**.) MX4 based color management also leads to a very high level of standardization because it does not rely on the interpretation of ICC engines, which can produce slightly different results depending on the engine used.

See also:

- "Normalizing Colors" on page 62
- "Flattening" on page 57
- "About MX Color Processing" on page 77

3. Profile Types

Note Some of the features described in the following are not included in the standard GMG ColorServer version and require an additional license (GMG InkOptimizer, GMG SmartProfiler, GMG FlawFinder or GMG ProfileEditor). Please contact your local dealer for details.

Type	Usage	Where to find	See also
CMYK-to-CMYK Conversion	Used in the **MX Processing** step, for conventional printing. Used for normalizing colors in the **Normalizing** step. For color conversions of CMYK objects from one standard to another, including a gamut mapping, for example, from ISO coated to ISO uncoated.	*reference profiles\ColorServer Profiles\CMYK Conversion Profiles*	"CMYK-to-CMYK Conversion" on page 19
CMYK-to-CMYK Reseparation	Used in the **MX Processing** step, for conventional printing. For harmonizing GCR/UCR for different output processes under the respective printing conditions (without using an InkOptimizer profile).	*reference profiles\ColorServer Profiles\Reseparation Profiles*	"CMYK-to-CMYK Reseparation" on page 19
RGB-to-CMYK Separation	Used in the **MX Processing** step, for conventional printing. Used for normalizing colors in the **Normalizing** step. For transformations of RGB objects into CMYK.	*reference profiles\ColorServer Profiles\Separation Profiles*	"RGB-to-CMYK Separation" on page 19
RGB-to-RGB Conversion	Used in the **MX Processing** step, for conventional printing. For transformations of RGB objects from one standard RGB color space to another, for example, from Adobe RGB (1998) to eciRGB v2.	*reference profiles\ColorServer Profiles\RGB Conversion Profiles*	"RGB-to-RGB Conversion" on page 19
InkOptimizer	Used in the **MX Processing** step. Optimized GCR/UCR settings, available in three different levels (G3, G2, G1).	*reference profiles\InkOptimizer Profiles*	"InkOptimizer Profiles" on page 20
CMYK-to-RGB Conversion	Used in **Image Hotfolders**, as **Additional Profile**, for transformations of CMYK objects into RGB.	*reference profiles\ColorServer Profiles\CMYK-RGB Conversion Profiles*	"CMYK-to-RGB Conversion" on page 19
Digital Production	Used in the **MX Processing** step, for digital printing and LFP. Optimizes the colors used in the original document for the color space of the printer–medium combination.	Created in GMG SmartProfiler	"Digital Production Profiles" on page 20
Printer Calibration	Used in the **MX Processing** step, for digital printing and LFP. Counterbalancing undesired printer deviations caused by varying environment conditions such as temperature and humidity.	Created in GMG SmartProfiler	"Using a Printer Calibration" on page 80

GMG Color GmbH & Co. KG provides MX4 profiles and spot color databases (db3) for all major print standards world-wide. All GMG color profiles were created and tested by GMG ColorExperts.

To suit different use cases, GMG ColorServer provides you with different types of color profiles (MX4 DeviceLink profiles). MX4 profiles installed with the setup can be found in the **reference profiles** subfolder of the main program folder (default path: *<installation path>\reference profiles*). The folder names correspond to the basic color conversions as described in the preceding table.

Not all GMG ColorServer profiles are installed with the setup. The PDF document **ColorServer Profiles.pdf** located in the software directory in the */reference profiles/ColorServer Profiles/* folder gives an overview of the installed profiles.

You can always find the latest profiles on the GMG website, in the **Support** section.

www.gmgcolor.com

For digital printing applications, MX3 printer calibration files need to be created for your specific printer–medium combination.

You can use GMG SmartProfiler to create a **custom** color profile or printer calibration linked to a hotfolder. Please see GMG SmartProfiler documentation for further information.

3.1 CMYK-to-CMYK Conversion

A CMYK-to-CMYK conversion means an automated color conversion from a print standard such as PSR, ISO, GRACoL, and 3DAP to another print or in-house standard. Outgoing data will be optimized for different output processes (for example, for offset or gravure printing) with the respective printing conditions.

As GMG ColorServer uses four-dimensional MX4 DeviceLink profiles, the source and target values are computed directly in CMYK—without using CIELab as an intermediate color space. The black channel separation from the original data is preserved when transforming into the target CMYK color space, maintaining the visual impression of the document.

3.2 CMYK-to-CMYK Reseparation

A CMYK-to-CMYK reseparation means an automated reseparation of CMYK data prepared for one print standard. This is suitable for a harmonization of files having different UCR/GCR settings to achieve a consistent color channel separation. Standardized separations help to establish a stable print result.

3.3 RGB-to-CMYK Separation

The increasing use of digital cameras and RGB-based workflows is driving more and more RGB data use. However, the RGB data supplied is often in a not finalized status, meaning the resolution of image data has still to be scaled to the final size and to be sharpened in accordance with the changed resolution. The data is then subsequently separated into the **CMYK** color space required for printing.

The hotfolder technology used in GMG ColorServer automates all required steps. Image data placed into a hotfolder can be scaled, sharpened, and separated in accordance with the parameters assigned to the hotfolder. This automatic process makes a manual editing in an image editor obsolete.

Separation profiles delivered together with the program use special UCR settings and algorithms for a more effective **gamut mapping**. An effective gamut mapping is required for minimizing visual changes when reducing the larger RGB color space to the **smaller CMYK** color space.

3.4 RGB-to-RGB Conversion

A RGB-to-RGB conversion means an automated color conversion of RGB data from one standard RGB color space into another standard RGB color space such as Adobe RGB (1998), sRGB, and eciRGB.

This conversion is particularly useful for standardizing RGB data in the prepress business. A conversion with MX4 RGB-to-RGB conversion profiles leads to a **smooth** gamut boundary.

3.5 CMYK-to-RGB Conversion

Note CMYK-to-RGB conversions are applied in **Image Hotfolders** because they are primarily (if not exclusively) applied to images. They are **not** supported for **PDF-Hotfolders**.

A CMYK-to-RGB conversion means an automated color conversion from a print standard such as ISO or GRACoL to a print process neutral AdobeRGB color space. This conversion is particularly useful for normalizing CMYK images in different color spaces to a common color space.

Supported input and output color spaces

Profile type	Input color space	Output color space
CMYK-to-RGB	◄ ISO coated v2 (39L)	AdobeRGB
	◄ GRACoL2006 Coated Commercial Sheet (#1)	
	◄ SWOP Publication Sheet (#3)	
	◄ SWOP Groundwood (#5)	

Tip Further profiles for other input and output color spaces are available on the GMG website and integrated in the GMG ColorMaster workflow package.

3.6 InkOptimizer Profiles

InkOptimizer profiles (*.mx4) are four-dimensional device-link profiles for CMYK-to-CMYK reseparation and UCR/GCR optimization.

They reseparate the incoming data, applying GMG's specialized GCR settings as defined within each profile. Using InkOptimizer profiles will reduce the application of the CMY inks and increase the K ink in their place. Intelligent algorithms allow this change without visible effects on the four color printed results.

GMG InkOptimizer profiles are tamper-proof with an embedded CRC control code and write protection.

Generally, the GMG InkOptimizer product includes, next to the installation CD, GMG InkOptimizer profiles G1, G2, and G3, which employ different optimization levels.

Profiles of the **G1** type use the **highest** possible GCR level. The **G2** level uses **medium** optimization, and **G3** profiles use the **lowest** optimization level, thus leading to the lowest ink reduction.

3.7 Digital Production Profiles

Digital production profiles are DeviceLink MX4 profiles used for color managing a specific combination of a digital press / large format printer and a print medium. With GMG SmartProfiler, you can create a digital production profile for your specific printer–medium combination.

Digital production profiles can be of type CMYK-to-CMYK or RGB-to-CMYK, which is used for photo printing of RGB images.

In GMG ColorServer, a digital production profile is used in the **MX Processing** step. The profile optimizes the colors used in the original document for the color space of the printer–medium combination.

In contrast to a conversion or separation profile, a digital production profile does not normalize or convert the separations of the original document to a print standard such as ISO Coated v2 (39L). If you want to standardize your print production, you will need to apply a conversion or separation profile during the **Normalizing** step.

Note Digital Production profiles cannot be edited in GMG ProfileEditor.

3.8 Supported Profile Combinations

The automated color management workflow in GMG ColorServer allows you to perform an automated **normalizing** of different input color spaces (as defined by the embedded ICC profile of a PDF object) to the same output color space. Additionally, you can apply a color space **conversion/reseparation** (RGB-to-RGB or CMYK-to-CMYK) and **optimize** CMYK separations for the target printing process with an **InkOptimizer** profile. All steps are **optional** and can be **combined** with each other.

However, there are technical dependencies between the mentioned color management steps. For example, some profile types expect an **RGB** input color space and others expect a **CMYK** input color space.

The intelligent color management algorithms in GMG ColorServer make sure PDF objects are processed **only** with **matching** color profiles: If you are using an **RGB-to-CMYK** separation profile in the **MX Color Processing** step, the profile will be applied only to **RGB** data. (If, however, you have defined a **Normalizing** step with a **CMYK Output ICC Profile**, you cannot define an **RGB-to-CMYK** separation profile in the **MX Color Processing** step, because RGB data will already be normalized to CMYK during the **Normalizing** step. You will be informed by a validation message.)

To give you another example, an **InkOptimizer** profile can accept only a **CMYK** input color space. There-fore, it is not possible to apply an InkOptimizer profile to an RGB object. It would be required to separate this object to CMYK first (either in the **Normalizing** or in the **ColorServer** step). If you think about it, this makes sense: Both InkOptimizer profiles and printer calibrations are intended for print business appli-cations, for which CMYK data is required.

The following table gives you an overview which profile types can be combined with each other in GMG ColorServer. Please make sure that the color space settings are consistent throughout all pages of the hot-folder dialog box. If you missed something, resulting in a color space mismatch, you will be informed by a validation message.

Note All CMYK-to-CMYK MX4 profiles and MX3 printer calibration files used in GMG ColorServer must use the following internal parameter: In GMG ProfileEditor, **Common** tabbed page > **Profile Properties** > **Type** = **CMYK Conversion Profile**. A **CMYK Proof Profile** type is **not** supported. RGB-to-CMYK MX4 profiles must be of type **RGB Separation Profile**. RGB-to-RGB MX4 profiles must be of type **RGB Conversion Pro-file**; type **Digital Photo Proof Profile** is **not** supported.

Intended Purpose	Original/Normalizing Output	ColorServer Profile	InkOptimizer Pro-file	Printer Calibration file
RGB-to-RGB conversion:	**RGB**	**RGB-to-RGB** MX4	—	—
RGB-to-CMYK separation:	**RGB**	**RGB-to-CMYK** MX4	InkOptimizer MX4	MX3/MX4 printer cal-ibration
CMYK-to-CMYK conversion or resep-aration:	**CMYK**	(CMYK-to-CMYK MX4)	InkOptimizer MX4	MX3/MX4 printer cal-ibration

The **Intended Purpose** column lists color management applications supported by the program. Depending on the purpose, you will need different color profile combinations. For example, you will need an RGB-to-CMYK profile for achieving an RGB-to-CMYK separation. The **Original/Normalizing Output** column states the color space required for the MX Processing step. If any objects are not originally in this color space, they need to be normalized first.

Depending on the **profile type**, ColorServer profiles support RGB **or** CMYK data.

InkOptimizer profiles and MX3/MX4 printer calibrations support only **CMYK** data. Therefore, a RGB-to-CMYK separation step is **required** for RGB data that should be processed with an InkOptimizer profile.

All other processing steps shown in the table are optional, as indicated by the parentheses.

For using InkOptimizer profiles, you also need a separate GMG InkOptimizer license.

4. About Hotfolders

Hotfolders are generally used whenever a larger number of files need to be converted according to the same rules and output settings. Setting up hotfolders also leads to a higher degree of consistency and reproducibility. You can assign any number of input folders to a single hotfolder.

Each file copied into the specified hotfolder that successfully passed the **File Filter** will create a separate job that is added to the jobs list.

All **processing** parameters such as color management and output parameters are defined in the **hotfolder**.

It is possible to set up various hotfolders according to different input data or to different print standards.

Information on all files currently present in a hotfolder is shown in the info pane on the right side of the main window. The info pane also shows which hotfolder is currently processing which input files.

4.1 Hotfolder Types

GMG ColorServer offers two different types of hotfolders: **Image Hotfolders** and **PDF Hotfolders**. As the name indicates, **Image Hotfolders** are basically used to color-convert images or to convert the image file format (e.g. from TIFF to JPEG). **PDF Hotfolders**, on the other hand, allow for far more functionalities and can be used to process both images and PDFs, automatically converting images to PDF format.

Note This **documentation** focuses on the **PDF Module** and the use of **PDF Hotfolders** describing **Image-to-PDF** and **PDF-to-PDF Conversions**.

Image-to-PDF and PDF-to-PDF Conversion

Processing PDF documents demands extended functionalities due to the fact that PDFs can contain a mix of images and vector-based objects in **multiple** color spaces. Usually, each PDF object is tagged with an ICC profile that describes the color space of the object. GMG ColorServer automatically identifies these profiles and uses them as a starting point for the subsequent color management.

◄ **Image-to-PDF Conversion**: All supported document formats (TIFF, JPEG) are converted to PDF.

◄ **PDF-to-PDF Conversion**: For native PDF documents. You can choose to apply CMYK-to-CMYK conversion profiles or ink optimization profiles (GMG InkOptimizer).

See also:

- "Image-to-PDF Conversion" on page 33

4.2 PDF Module
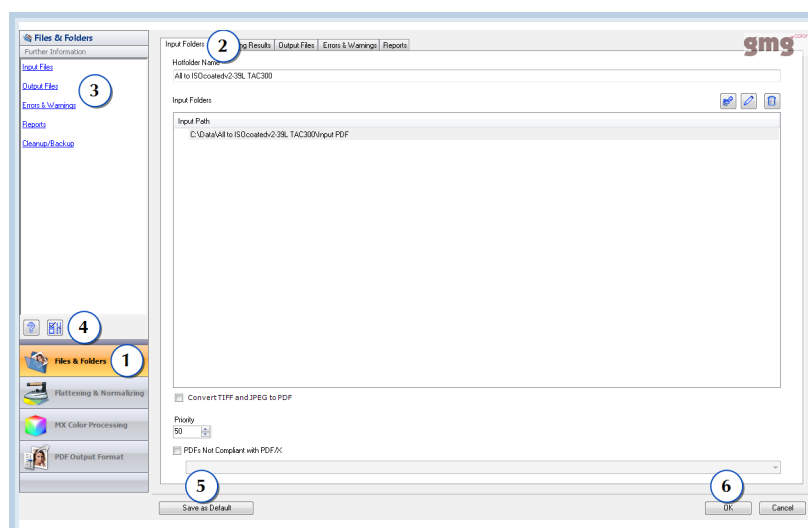
Fig. 3 PDF Hotfolder.

A **PDF Hotfolder** is divided into four main sections, where you can define processing parameters for all PDFs processed by the hotfolder. On the navigation panel on the left side of the hotfolder interface are accordion bars (1) you can click to bring a section to the front. In the screenshot, the **Files & Folders** section (1) is currently in front.

On the right side (2), you can see the tabbed pages for each section. Click a tab to bring another tabbed page to the front. In the screen shot, the **Input Folders** page is currently open (2).

The help links (3) and the info button 🔲 on the left side provide detailed information on all features of the PDF module.

If hotfolder settings are missing or are not valid for some reason, the invalid parameter will be indicated by an exclamation mark icon 🔴 right next to the control element, for example, next to the edit box or list.

You can click the **Validate All Settings** button 🔲 on the left side (4) to check your hotfolder settings.

You can save the current hotfolder settings as **presets** by clicking the **Save as Default** button (5). Next time you create a **new** hotfolder, the presets will be used as default settings. By doing this, you need to enter settings you want to use in multiple hotfolders only once, saving set up time.

Finally, you can click the **OK** button (6) to confirm and save the hotfolder settings. The hotfolder will be ready-to-use.

4.3 Creating a New PDF Hotfolder

Note Some of the features described in the following are not included in the standard GMG ColorServer version and require an additional license (GMG InkOptimizer, GMG SmartProfiler, GMG FlawFinder or GMG ProfileEditor). Please contact your local dealer for details.

Reflecting the different needs of our customers, **PDF Hotfolders** can be created in different ways in GMG ColorServer.

The quick and very easy way to create hotfolders is to use our **Hotfolder Creation Wizard**. As hotfolders created by the wizard already contain presets for all major printing conditions, you only need to select very basic parameters such as the target color space.

With GMG SmartProfiler, you can easily create hotfolders based on templates optimized for **digital** print applications.

If you need custom settings or want to define all settings yourself, you can also create a new hotfolder from scratch, ranging from the very simple to the highly complex.

See also:

- "Creating a Hotfolder Manually" on page 23
- "Creating a Hotfolder with the Hotfolder Wizard" on page 23
- "Importing / Exporting Hotfolders" on page 29

4.3.1 Creating a Hotfolder with the Hotfolder Wizard

The quickest and easiest way to create a PDF hotfolder for conventional printing processes is to use the Hotfolder Creation Wizard, which can be started from the **Hotfolder** menu.

Every step you are going through is explained in detail and will not require any extra knowledge. As soon as you created a new hotfolder, it will show up in the **Hotfolder List View** on the left side of the main window.

4.3.2 Creating a Hotfolder Manually

Note Hotfolders can be added, modified, or deleted only in **Administrator Mode** (**Options** menu > **Administrator Mode**).

When setting up a hotfolder from scratch, you first need to define input folder(s) for the input files and an output folder for the processed files.

How to manually set up a hotfolder

1. On the **Hotfolder** menu, click **New PDF Hotfolder**.
   The **PDF Hotfolder** dialog box opens.

2. Click the **Files & Folders** button on the navigation panel on the left side of the dialog box.

3. Click the **Input Folders** tab.

4. Type any name into the **Hotfolder Name** box.

5. On top of the **Input Folders** list, click the **Add Input Folder** button [icon].

6. Browse to the desired folder, or create a new folder, and confirm by **clicking OK**.
   The selected folder is added to the **Input Folders** list.

7. Optional: If you want to assign multiple input folders to the same hotfolder, repeat steps 5 and 6.

8. Optional: You can delete hotfolders by clicking the **Remove Input Folder** button [icon].

9. Optional: If you want to convert image file formats to PDF, select the option **Convert TIFF and JPEG to PDF**.
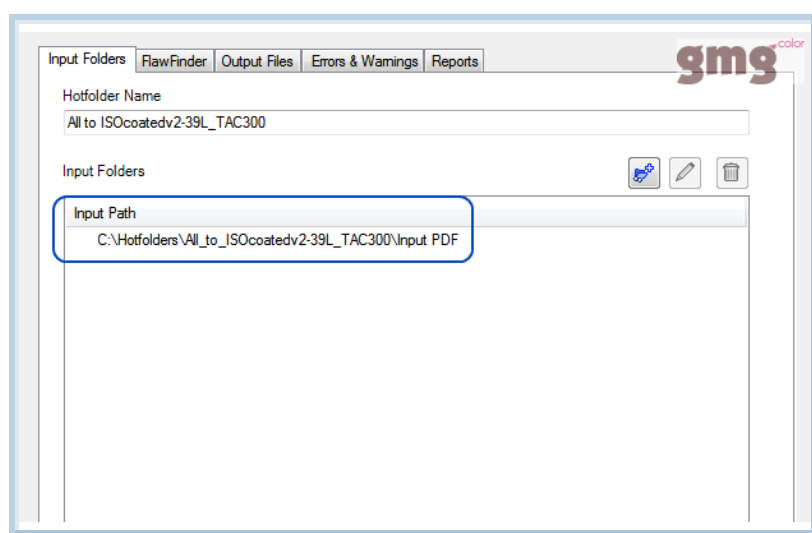
Fig. 4 Hotfolder Input settings.

Defining an Output Method

You can send the processed PDF files to an output folder or to a Windows printer connected to a real printer. If you decide for the print option, the PDFs are saved temporarily and then directly send to the printer, using the defined printer properties.

How to set up a Windows printer

Note The output PDF files are stored to a temporary folder (**File** menu > **General Settings**: **Temporary Folder**) until the associated jobs are removed from the job list.

1. On the navigation panel of the **PDF Hotfolder** dialog box, click **Files & Folders**.

2. Click the **Output Files** tabbed page.

3. Under **Output Method**, select **Send to Windows Printer**.

4. Under **Name**, select the printer you want to output your files to.

5. Optional: Click the **Properties** button to open and edit the printer properties.
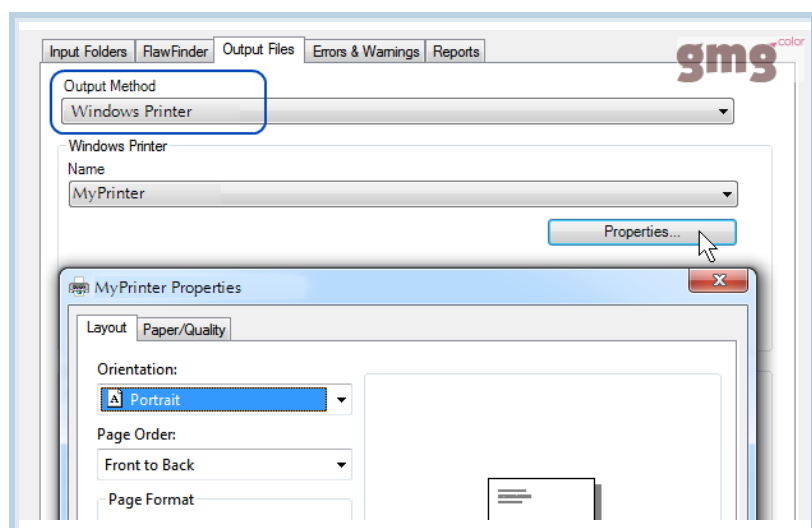
Fig. 5 Output to a Windows printer.

How to set up an output folder

Tip If you want to use PDF **and** Image Hotfolders, you can set up two separate **input** folders, but a common **output** folder. This makes it very easy to use GMG ColorServer output folders as input folders for your work-flow system, printer, or press.

1. On the navigation panel of the **PDF Hotfolder** dialog box, click **Files & Folders**.
2. Click the **Output Files** tabbed page.
3. Under **Output Method**, select **Hotfolder**.
4. Under **Output Folder**, click the browse button ⬚ on the right side of the edit box.
5. Browse to the desired folder, or create a new folder, and confirm by clicking **OK**.
6. Select the option **Keep File Name of Input File** and enter a **Suffix** or **Prefix** so that you can easily distinguish between the input and processed output files.
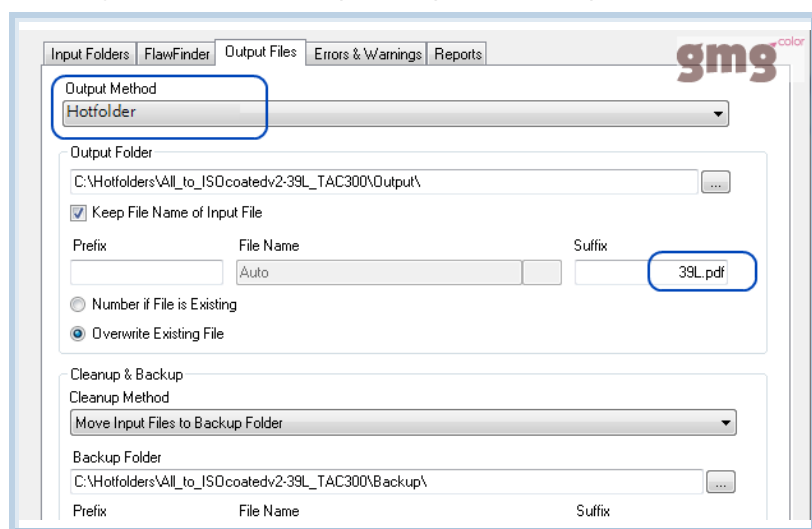
Fig. 6 Output to an output folder.

PDF Hotfolder Basics

This chapter will give you a quick overview on main hotfolder settings, without going into much detail. Please follow the links for further information.

Folder Structure

1. Double-click a hotfolder to open the **PDF Hotfolder** dialog box.

2. On the navigation panel of the **PDF Hotfolder** dialog box, click **Files & Folders**.

The **Input Folders** page shows the **Input Folders**, into which you will copy all files that you want to process with the hotfolder.

Processed PDFs that do not generate a warning will be saved to the **Output Folder** defined on the **Output Files** page.

The **Output Folder** should be connected to the **printer frontend**. All processed PDFs will then be automatically printed.

PDFs that generate a warning or unprocessed PDFs are sent to the **Warning** and **Error** folders defined on the **Errors & Warnings** page.

Reports are saved to the **Reports** folder defined on the **Reports** page.

Flattening settings

1. On the navigation panel of the **PDF Hotfolder** dialog box, click **Flattening & Normalizing**.

2. Click **Flattening**.
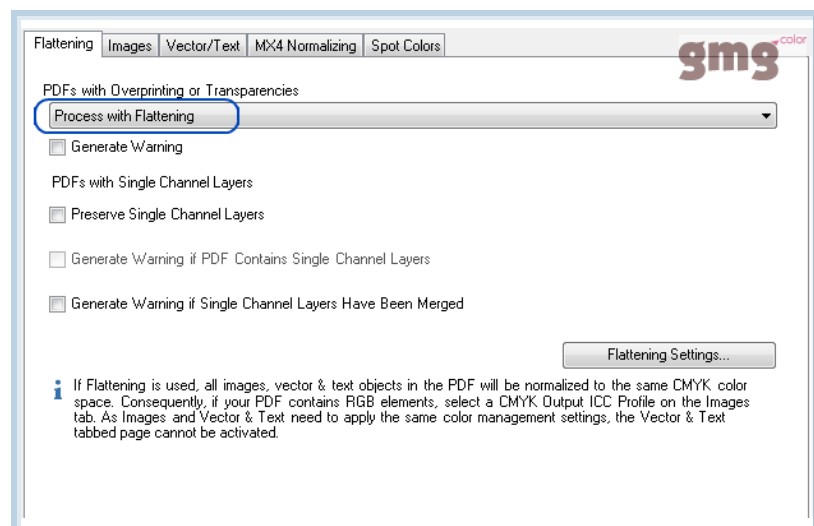
Fig. 7 Hotfolder using flattening.

The hotfolder shown in the screenshot uses flattening. You can select **Process without Flattening** from the drop-down list to switch off flattening.

See also:

- "Flattening" on page 57
- "Introduction to Transparencies and Flattening" on page 38

Normalizing output color space

1. On the navigation panel of the **PDF Hotfolder** dialog box, click **Flattening & Normalizing**.

2. Click **Images**.
   The most important parameter on this page is the **Output ICC Profile**, which defines the Normalizing color space.
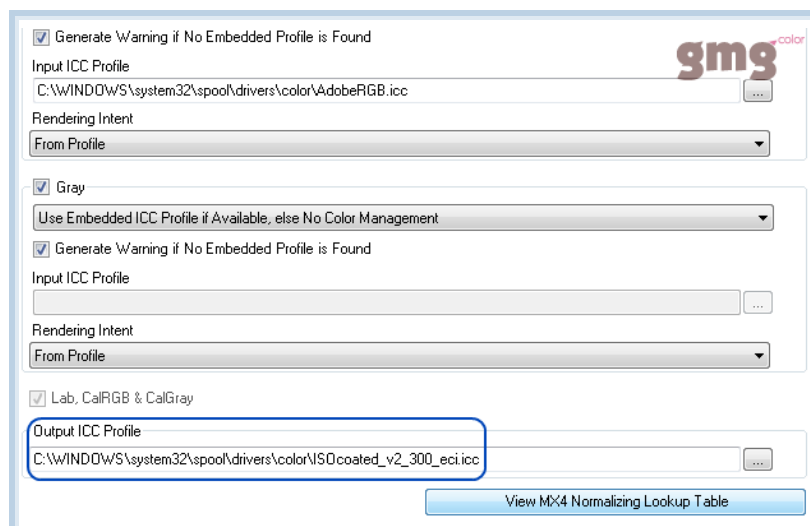
Fig. 8 Output color space of the Normalizing step.

All PDF objects in the input color spaces selected on the **Images** and **Vector & Text** tabbed pages will be normalized to the color space defined by the **Output ICC Profile**.

See also:

- "Normalizing Colors" on page 62

MX4 based normalizing

1. On the navigation panel of the **PDF Hotfolder** dialog box, click **Flattening & Normalizing**.
2. Click **MX4 Normalizing**.
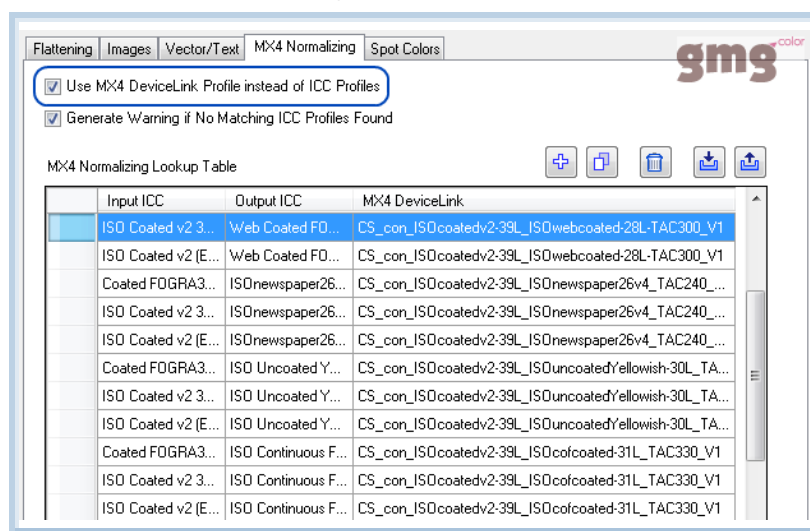
Fig. 9 Hotfolder using MX4 Normalizing.

The hotfolder uses **MX4 Normalizing**. This means that instead of ICC profiles, MX4 DeviceLink profiles are used for normalizing. The program automatically selects the correct conversion profile with respect to the **embedded ICC profile** of the PDF object and the **Output ICC Profile** defined on the **Images** and **Vector & Text** tabbed pages.
You can deselect the option **Use MX4 DeviceLink Profile instead of ICC Profiles** if you want to use only ICC profiles for flattening (not recommended).

See also:

- "Normalizing Colors" on page 62
- "MX Based Normalizing" on page 65

MX Color Processing (main color management step)

➜   On the navigation panel of the **PDF Hotfolder** dialog box, click **MX Color Processing**.
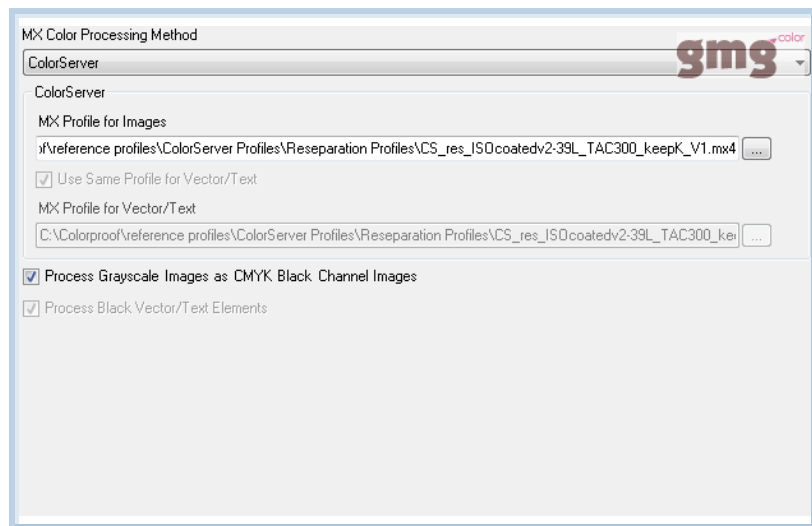
Fig. 10 CMYK-to-CMYK conversion.

The color space conversion and the TAC limitation is defined by the **ColorServer** conversion profile selected in the **MX Profile for Images** (and **Vector/Text**) box.
The hotfolder applies a **CMYK-to-CMYK conversion** from the **ISO Coated v2 (39L)** print standard to **ISO Web-Coated (28L)**, including a limitation of the **TAC** to **300**%.
If you want to use another conversion or reseparation type, you can simply select another profile.

See also:

- "About MX Color Processing" on page 77
- "Profile Types" on page 18

4.4 Hotfolder List View

Selecting a hotfolder

A hotfolder can be selected in the list with the mouse or by pressing the ARROW UP or DOWN key. A selected hotfolder or workflow is highlighted by a different border and background color.

When a hotfolder from the left window frame is marked by using the mouse, the window on the right will show the dedicated images or PDF jobs. Selecting such an image, the lower window will display the associated job. Selecting the PDF job, the lower window displays the associated PDF document properties.

Hotfolder commands

Hotfolder commands such as editing or creating a manual job can be selected from the **Hotfolder** menu or from the context menu (which appears when you right-click on a hotfolder) and are applied to the selected item.

The command **Hold Images**, which may be selected from the context menu by right-clicking on a hotfolder, puts the automatic processing of jobs by the hotfolder on hold. New files will still be recognized in the hotfolder and will be added to the file list in the hotfolder. These new documents will remain in status **Hold Images** until the command **Hold Images** is switched off again by the user.
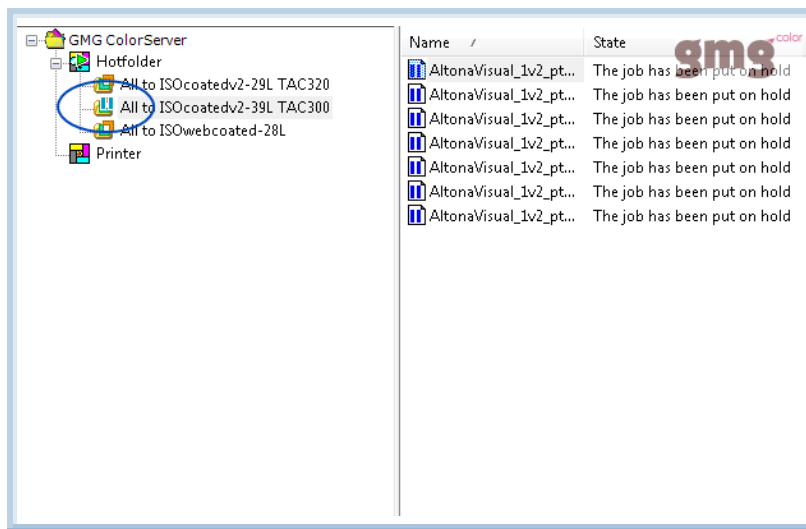
Fig. 11 Hotfolder put on hold.

As you can see in the screen shot, jobs have been created from all PDFs recognized by the hotfolder. Jobs are in status on hold as long as the hotfolder is on hold (indicated by the blue **Hold** icon). After activating the hotfolder, you need to **manually** start the processing of each job by using the **Print** command.

Job commands

Right-clicking on an image or PDF job opens the context menu. There you are able to **Print** or **Delete** an image or PDF job, or to show a **Preview**.
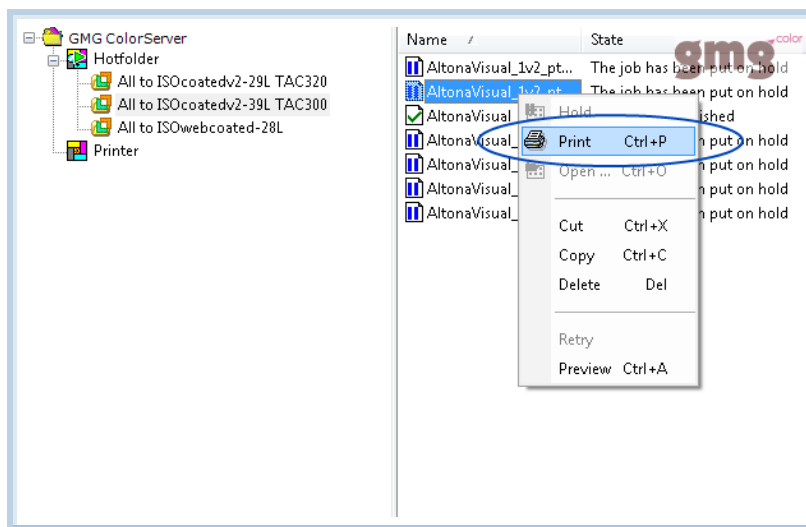
Fig. 12 Start processing a job on hold.

➡ On the job context menu, click **Print** to start the processing of jobs on hold.

4.5 Importing / Exporting Hotfolders

You can export hotfolders and all linked files into a ZIP archive and import the ZIP archive again. The export/import functionality allows an easy workflow exchange in-between separate workstations, for example, if you want to share a certain configuration with a colleague or department.

All files linked to the hotfolder will be imported to your computer. All folders defined in the hotfolder will be created. You will be informed by a warning message if any conflicts with files or folders already existing on your computer should occur. You can resolve any conflicts by either keeping the original file/folder or replacing it with the imported file/folder from the ZIP archive.

Note Hotfolders can be added, modified, or deleted only in **Administrator** mode.

How to export a hotfolder

1. On the **Hotfolder** menu, click **Export Hotfolders**.
   The **Select Hotfolder for Export** dialog box opens, which shows you a list of all hotfolders.

2. Select all hotfolders you want to export.

3. Optional: If the hotfolders contain Normalizing Rule Sets, you can **embed** the referenced normalizing profiles (> **Embed Profiles Linked to MX4 Normalizing Rule Set**).
   Please note that embedding the profiles (especially when including all GMG profiles) may result in a large export archive.

4. Click **Export** to export all selected hotfolders.
   The **Save As** dialog box opens.

5. Browse for a target location and enter a name for the hotfolder archive.

6. Click **Save**.
   All selected hotfolders are compressed into a ZIP file and saved to the selected target location.

How to import a hotfolder

1. On the **Hotfolder** menu, click **Import Hotfolders**.
   The **Open** dialog box is displayed.

2. Browse your folders and select the hotfolder archive (*.zip) you want to import. You can select multiple files.

3. Click the **Open** button.
   The **Select Hotfolder to Import** dialog box opens, showing you a list of all hotfolders found in the opened archive.

4. Select the hotfolders you want to import.

5. Optional: Under **Path**, check the (automatically created) **input folders**. To change the path, click the browse button [...] and browse for another location.

6. Click **Import** to import all selected hotfolders and linked files.
   All data folders defined in the hotfolder will be created.
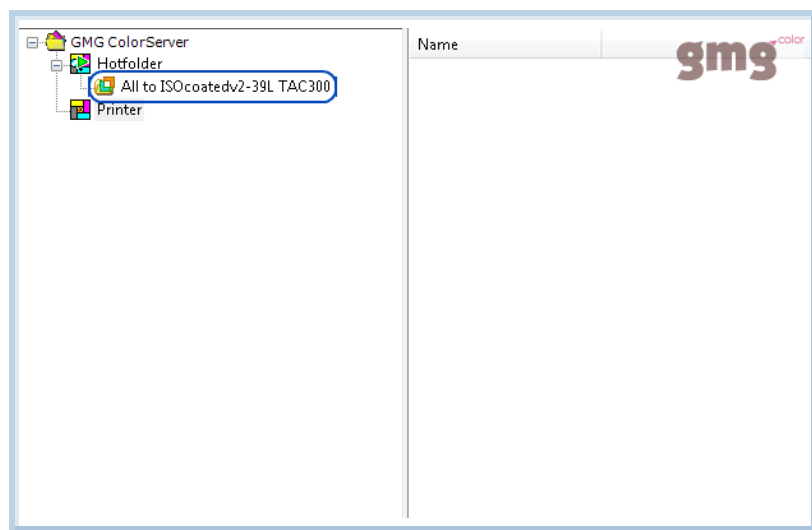
Fig. 13 Imported hotfolder.

You can also duplicate the hotfolder, for example, for different printing conditions or for different customers.

5. About Files and Folders

Note Some of the features described in the following are not included in the standard GMG ColorServer version and require an additional license (GMG InkOptimizer, GMG SmartProfiler, GMG FlawFinder or GMG ProfileEditor). Please contact your local dealer for details.

◄ Set up input folders for your hotfolder on the **Input Folders** tabbed page. You can define different file filters for each input folder.

◄ On the **FlawFinder** tab, you can optionally scan your input files before processing and 'quarantine' files which might generate problems when printed to a separate folder**.**

◄ On the **Output Files** tabbed page, select a location path for all **processed** files.

◄ You can also set up cleanup and backup routines for **input** files on the **Output Files** tabbed page.

◄ If you want to save jobs with warnings and errors to **separate** folders, click the **Error & Warnings** tabbed page.

◄ To create reports, use the options on the **Reports** tabbed page.

The following table shows the underlying mechanisms of the folder structure. Depending on the status an input file is attributed with and your settings, the **processed output file** may be saved to different locations. The row order reflects the processing priorities, for example, files with **warning** AND **error** status are moved to the specified Error folder and **not** to the Warning folder.

File Status	Output File Location	Description
Error	-	In this case, there is no output file, as input files that trigger an error are **not** processed. If you define an Error folder, unprocessed error files are moved to this folder which helps you to keep track of your files.
With Flaws	FlawFinder Folder	Input files filtered out by GMG FlawFinder are processed and then saved to the specified **FlawFinder** folder. Repaired files are also saved to this folder and **not** to the specified **Output Folder**.
Warning	Warning Folder	Input files that trigger a warning are processed and are moved to the specified **Warning** folder. If you do not define a Warning folder, files with a warning status are moved to the specified **Output Folder**.
Okay	Output Folder	Input files that do not trigger any errors and warnings and are not 'quarantined' by GMG FlawFinder are saved to the specified **Output Folder**.

5.1 Input

Hotfolder: Create a list of input folders for the hotfolder on the **Input Folders** tabbed page. You can define different file filters for each input folder separately.

Manual job: Create a list of input PDFs for the job on the **Input Files** tabbed page.

Tip As the default priority when creating a hotfolder is 50, you can firstly set up all hotfolders with the default priority. After all hotfolders have been set up and you have a better overview on your workflow configuration, you can decide which hotfolders should have a higher priority and which a lower.

Group	Short description	See also
Hotfolder Name / **Job Name**	Name of the hotfolder / manual job as shown in the **Overview** window.	
Input Folders (hot-folder only)	You need at least one input folder. Choose an existing or create a new folder. You can define a **File Filter** to process only matching input files.	"Input Folder Settings" on page 32
Files (manual jobs only)	Select all PDFs you want to process in the job.	

Group	Short description	See also
Convert TIFF, JPEG to PDF	Input files with a supported file format that have passed the **File Filter** will be converted to PDF as the very first step before any further processing.	"Image-to-PDF Conversion" on page 33
Priority	You can assign a **priority** to the job. Jobs are processed in order of priority, that is, the higher the priority number of a job in the queue, the earlier the job is processed. The highest priority is **99**. Jobs with the same priority are processed in the order in which they were created.	
PDFs Not Compliant with PDF/X	The program can automatically check whether the document information of incoming PDFs contains a **PDF/X tag**. The program can either create a warning (**Generate Warning**) or reject PDFs without a PDF/X tag (**Generate Error**). Please note that GMG ColorServer does not check whether the document **content** complies with the standard's requirements.	

Further information on PDF/X:

- *Adobe® PDF in a Print Production Workflow*, 2008, www. adobe.com

5.1.1 Input Folder Settings

PDFs that are copied into the specified input folder are automatically processed by the hotfolder the input folder is assigned to. Each PDF recognized by a hotfolder automatically generates a separate **job**. All processing parameters such as flattening and color management profiles are defined in the hotfolder.

Available options	Description
Folder Path	Folder path of the input folder. You need to choose an existing or create a new input file folder. PDFs in this input folder will be **filtered** by the **File Filter** defined in the **Add Input Folder** dialog box.
Search Subfolders	Not only the input folder itself, but also **subfolders** of the input folder will be scanned for input files. You can define the level, how deep in the folder hierarchy will be looked for input files. For example, with **Recursion Levels** of **2**, the following folder path would be scanned: *C:\Data\All PDF to Isocoated v2 (39L)\Input\level1\level2*, whereas *C:\Data\All PDF to Isocoated v2 (39L)\Input* is the defined input folder, and *level1* is subfolder of the hotfolder, and *level2* is subfolder of *level1*. If the option **Use Same Folder Structure in Output Folder** is selected, the output folder will contain the same subfolder structure as the input folder, for example, *C:\Data\All PDF to Isocoated v2 (39L)\Output\level1\level2*.
File Filters	You can use **File Filters** to process only specific files from a folder. **Only** input files having the defined characters or text strings in the **file name** will be processed. Characters not supported in (Windows) file names (such as "?" or "*") are also not supported in file name filters.
Ignore File Creation Time	This option is recommended for processing files on a UNIX file systems from **Apple** and **SUN** (UNIX or Mac OS operating system). It avoids that input files are processed twice. If this option is not selected, input files are regarded as new and will be processed when the name, creation date, or modification date is changed. If this option is selected, the **Created** date of files is ignored.
Ignore File Modification Time	Similar to the option **Ignore File Creation Time**. If this option is selected, the **Modified** date of files is ignored. Please note that if this option is selected, files that were changed intentionally by the user will also be **ignored** and need to be renamed before processing.

Password-protected PDFs

Password-protected PDFs can only be processed in GMG ColorServer if the password is available.

You can set up a password list as a txt file and save it under **password.txt** into the **PDF** subfolder of the main program folder (default path: *<installation path>\PDF\password.txt*). Write each password into a **separate** line in the **password.txt** file.
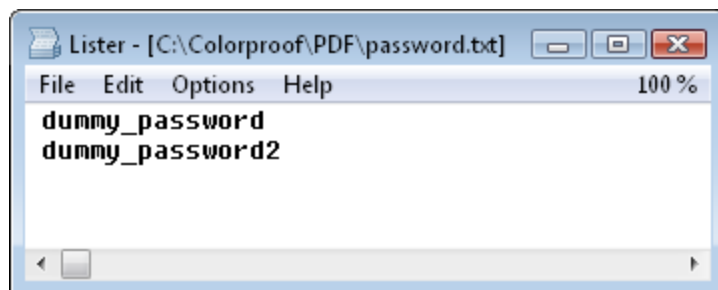
See also:

- "PDF Could not be Processed" on page 94

5.1.2 Image-to-PDF Conversion

If you want to standardize your document formats and use the same technology for all printing machines, regardless of the original file format, you can convert all supported document formats (TIFF, JPEG) to **PDF**. For example, this feature helps to avoid that different file formats give different results in the printer or imagesetter RIP.

If the option **Convert TIFF and JPEG to PDF** is activated, input files with a supported file format that have passed the **File Filter** will be converted to PDF as the very first step before any further processing. The created PDF is then handled as **input PDF** for the **PDF-to-PDF** conversion defined by the hotfolder settings.

PDF Creation

PDF parameters used by GMG ColorServer are as follows:

◄ PDF version **1.3**

◄ **ZIP** Compression

◄ File format, resolution, and compression of image objects are **not** altered.

5.1.3 Setting up Backup and File Removal Routines

The options provided in GMG ColorServer to **delete** or **backup** input files after processing allow for a smooth workflow without interruptions caused by a limited capacity of hard disk.

We recommend **backing up** the files first before deleting them (either manually or automated), ideally to a high volume network drive on a connected server.

Tip You can use backup folders also for setting up more complex workflows. If a **backup** folder is selected as an **input** folder of **another** hotfolder, you can automatically convert a single source PDF into **multiple** output files, for example, optimized for offset and gravure printing.

If you want to use the automated file deletion routine in GMG ColorServer, you should try to adjust the **time** between backup and deletion to the throughput of all workflows on the computer, so that files are kept in the backup folder for a maximum time (for example, to be able to process them again with different parameters if required), while avoiding a full hard disk at the same time.

Note Files deleted by GMG ColorServer will **not** be moved to the **Windows Recycle Bin**, but **permanently** removed from the hard disk. Therefore, please set up these routines in GMG ColorServer with great care. You can omit these options and choose a manual removal of files from the hard disk to avoid unintended data loss. In this case, please make sure that data is deleted before the maximum capacity of the hard disk is reached.

How to set up backup and file removal routines for input PDFs

1. On the navigation panel of the **PDF Hotfolder** dialog box, click **Files & Folders**.

2. Click the **Output Files** tabbed page.

3. From the **Cleanup Method** list, select the option **Move Input Files to Backup Folder**.

4. Select the desired **Backup Folder** or create a new one, for example, *C:\Data\All PDF to Isocoated v2 (39L) TAC300\Backup*.
   All input files processed by this hotfolder will be moved from their respective input folders to the backup folder when finished.

5. Select the option **Number if File is Existing**.
   This option prevents already existing files from being overwritten by new files with the same name via adding an incremented number to the name of each file.

6. Optional: Select the option **Delete Backup Files** and enter the number of hours after which a file moved to the backup folder will be deleted from the hard disk.
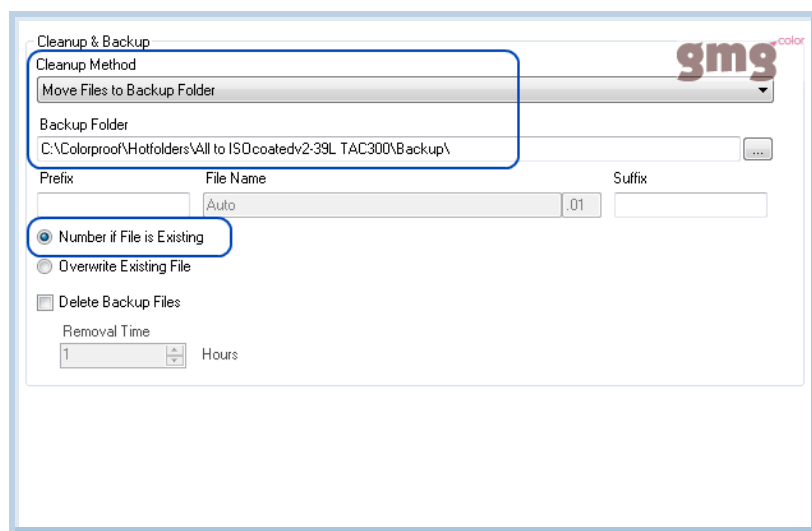
5.2 GMG FlawFinder

As an open file format specification, PDF is available to anyone who wants to create, view, or manage PDF documents. The more tools and programs come to the market generating PDF documents, the more potential flaws and **internal** errors can occur.

GMG FlawFinder is a module for ColorServer/InkOptimizer which scans your PDFs for potential issues that may cause problems in the printing process. It computes the images of the input PDF before and after checking the data against the Adobe PDF Library, comparing them pixel by pixel to detect significant differences like missing images or graphic elements that have changed their shape.

As soon as GMG FlawFinder detects problematic areas in a document, the document is automatically moved to the specified **FlawFinder** folder after processing, and **not** to the **Output Folder**. To help you find out what is actually wrong with an input document, the application creates a **difference image** which highlights the problematic areas, so that even small objects can be identified at first glance. The difference image can be found in the specified **FlawFinder** folder together with the processed output PDF.

Note GMG FlawFinder is no preflight tool in the sense that it detects flaws in the resolution, missing fonts or hairlines and repairs such issues. It is primarily designed to add extra production safety by filtering out structural flaws.

How can I fix a document filtered out by GMG FlawFinder?

Apart from finding 'flaws', GMG FlawFinder features a function to **repair** files which might cause problems when printed (**Files & Folders** > **FlawFinder** tab > **Try to Repair Files**). If you enable this option, GMG FlawFinder optimizes critical files and resolves transparencies **prior** to the defined processing chain. To enable you to assess the quality of the repaired file, GMG FlawFinder creates a **second difference**

image which shows the difference between input and repaired file. The second difference image can be found in the specified **FlawFinder** folder together with the processed file.

The PDF you find in the **FlawFinder** folder is the processed **output** PDF. This PDF is converted with the hot-folder settings and is fully color-managed. If you find that the difference image contains acceptable differences, you can use this file for printing. If you enable the Repair function, the PDF you find in the **FlawFinder** folder is the **repaired** and then processed **output** file.

Note Repairing a file involves highly complex computations and may under certain circumstances lead to undesired side-effects when processing the file. Therefore, it is generally recommended to check the repaired file before further use.

When comparing the two difference images, you may find that the first difference image shows fewer differences than the second difference image and it may be preferable not to repair the PDF. In such a case, you need to disable the Repair function and once again copy the input file to the hotfolder to be processed without being repaired.

In case the Repair function does not deliver the desired result, you can also try the following to manually fix a file.

If you have the original source file, try one of the following approaches:

➜   Export the PDF as PS and use Acrobat Distiller to create the document as PDF again.

➜   Save the PDF in a different PDF version.

➜   Create the PDF via the Adobe PDF printer.

If you do **not** have the original source file, try the following to fix the issue:

➜   Export the file as a TIFF image with a high resolution.

5.3 Output Files

Set up an **Output Folder** for all **processed** files. The output files can be further differentiated on the **Errors & Warnings** tab. On the **Output Files** tab, you can also define the **Cleanup** and **Backup** settings.

See also:

- "Setting up Backup and File Removal Routines" on page 33

5.4 Errors and Warnings

On the **Errors & Warnings** tabbed page you can define separate folders for files with a **warning** status (which are nevertheless processed) or with an **error** status (which are **not** processed). This way, you can efficiently organize and control your files.

An alternative way to structurally organize your files is to use the same folder as Output Folder, Warning and Error folder, but differentiate the file by using different **prefixes**. This can, however, only be recommended if you are not using the output folder as an input folder for direct printing.

5.5 Reports

For later reference, you can automatically create a report for **each** job.

The report is saved under the file name defined on the **Reports** tabbed page into the specified **Report Output Folder**. By using the default settings **Keep File Name of Input File**, the report file name will be identical to the input file name, so that it will be easy to match the reports with the processed PDFs.

Using a Report Transformation File to create an HTML report

You can use an **XSLT** file to transform the XML report into another file **format**, using a custom **layout**. Example XSLT files can be found in the **Data** subfolder of the main program folder (default path: *<instal-lation path>\Data*).

Under **Report Transformation File**, you can select an **XSLT** file. All reports will then be transformed by the selected XSLT file. Make sure that the specified **file name extension** matches the output generated by the XSLT. Otherwise, it might be difficult to open the file on a Windows operating system.

Fig. 14 Using an example XSLT.

In the screenshot, the example *PDF2PDFShortReport2Html.xslt* is selected.

The XSLT will transform the XML report into a short HTML report, as shown in the following screenshot. As the output file will be an HTML file, the **Suffix** is defined as **.htm**.

Fig. 15 Report file transformed to HTML.

This screenshot shows the generated HTML report opened in a standard web browser. You see that by using the XSLT, only basic information on **Input Files**, **Output Files**, and **Error** and **Warning** messages is shown. All other content of the report file is hidden.
The content is formatted in HTML table layout, as defined in the XSLT file selected in the **Report Transformation File** box.
Warnings will be highlighted by a yellow background, errors by a red background.

Furthermore, advanced users can **customize** the reports by using a custom **XSLT** file.

Creating XML reports

If no **Report Transformation File** is used, the job report is saved in an **XML** file format. This file format has the advantage that it can be used very flexibly. For example, you can open an XML report in Microsoft

Excel and use all features offered by a standard spreadsheet program such as filtering, calculations, graphs, and so on.

Fig. 16 Report file opened in Microsoft Excel.

Report files contain all hotfolder settings, used profiles, error and warning messages, and so on. This way, you can easily document all processing steps.

Of course, you could also customize an XML report by using a custom **XSLT** file.

See also:

- "Report Transformation File" on page 37

5.6 Report Transformation File

The following information is intended for advanced users only. It is assumed that you already have a basic understanding of **XML**, **XSL** (Extensible Stylesheet Language), and **XSLT** (Extensible Stylesheet Language Transformations).

You can use a custom **XSLT** file to transform the XML report into another file **format**, using a custom **layout**. Example XSLT files can be found in the **Data** subfolder of the main program folder (default path: *<installation path>\Data*).

XSL is a stylesheet language for XML files, defining the layout, styles, colors, etc. of how the XML file will be shown in the application in which it is opened. By using an XSLT file, GMG ColorServer transforms the XML report file into a custom format. You can show **only** the content that is important for you, **hiding** information that is not required.

If you open the *PDF2PDFShortReport2Html.xslt* in a basic text editor, you will see that the layout is defined by HTML tables within **xsl:template** elements. By modifying the XSLT file, you can display the job report in any layout you like, with custom fonts, colors, and so on.

The output format is defined by the **output method** of the XSLT. Apart from **HTML**, the report file can, of course, also be shown as unformatted **text** or just as an **XML** tree.

As the **shown content** is also defined in the XSLT file, you can show and hide any information available in the job report by using a **style="visibility: hidden"** attribute.

XML and XSLT are international standards. Please have a look at the web sites http://www.w3.org/XML/ and http://www.w3.org/TR/xslt for further information.

GMG ColorServer supports **XSL Transformations (XSLT) Version 1.0**.

6. Introduction to Transparencies and Flattening

This short tutorial provides you with the basics for getting started with transparencies and flattening in GMG ColorServer. If you would like to take a deeper look into certain aspects of this issue, just follow the literature recommendations at the end of some chapters. The tutorial describes when and why flattening should be used to optimize PDFs, including some typical examples of use.

6.1 What does Transparency Mean?

In the graphic art industry, **transparency effects** are increasingly used. Transparent objects are objects that are not fully (100%) opaque. In other words, you can see underlying objects through transparent objects.
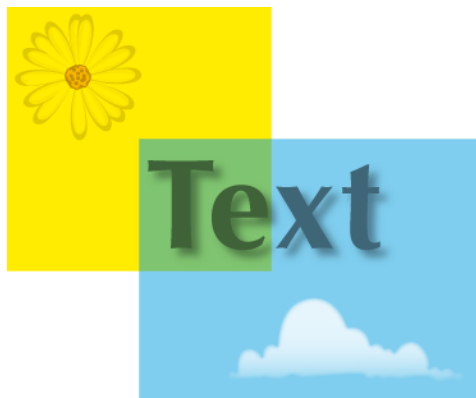
Fig. 17 Transparency effects.

The above illustration shows some typical examples of transparency effects applied to vector and text objects:

▼ A blue transparent rectangle (50% **opacity**) overlapping with a yellow square.

▼ Transparent text with **soft drop shadow** on top of both objects.

▼ A white daisy with a **Multiply** blending mode on top of the yellow square. The white daisy appears yellow because the white color is blended with the yellow color from the underlying square.

▼ A cloud with **feathered edges** on top of the blue rectangle.

Transparency effects are applicable to all kind of objects, for example, **images** (pixel based objects), **vector** and **text** elements, **patterns** and **gradients**. They can also be applied to a **group** of objects or **layers**.

The complexity of the interaction of transparency effects increases with the number of **overlapping** objects. The higher the complexity, the more time consuming it can be to process the PDF, for example, by a printer, imagesetter, or flattener. Problems are unlikely if transparency effects are only applied to isolated objects not overlapping with other objects.

When saving or exporting a document with transparent objects, the transparencies will either be **preserved** or **flattened**.

If you save a document with transparent objects by using the **Save As** command in your graphics software, for example, as an Adobe Illustrator PDF, transparencies will generally be **preserved** (except if the PDF is saved as PDF 1.3, as this format does not support transparencies).

If you convert a document to PDF by selecting the **Print** command when using a **PDF printer** or using **Adobe Distiller**, transparencies will generally be **flattened**.

In GMG ColorServer, when processing a PDF, you are free to decide whether you would like transparent objects to be preserved or flattened. The information in this chapter is intended to help you making the right choice for your needs.

Further information on this topic:

● *Getting Started with Transparency*, Adobe Systems Incorporated, 2005, www. adobe.com

6.2 Why are Transparencies Used?

Transparencies may be used by a designer for several reasons:

- ◀ **Esthetic** benefit: Enables the designer to create awesome optical effects that would otherwise not be possible.
- ◀ **Flexibility**: Only a few parameters are required to define a transparency effect. Transparency effects can be changed easily without "redrawing" the whole illustration.
- ◀ **Minimized file size**: The resulting file size will be much lower as in the case when creating the same optical effect without transparencies.

6.3 Then What's the Matter with Transparencies?

"If transparencies are such a great feature, why should I worry about it?"

Whenever a PDF is sent to a printer or imagesetter, it needs to be translated into a language the printer or imagesetter is able to "understand". Thus, the PDF is rasterized by a so called Raster Image Processor (RIP).

Some RIPs, however, are not able to handle transparencies. In this case, to maintain transparencies and have them printed properly, they need to be **flattened** first.

Even if your device or the device your print provider uses **is** able to process transparencies, you will, nevertheless, have no control over the process and on the final result. Different printers can interpret the same transparency effect in a slightly different way. In the worst case, problems occurring in the RIP at this late stage might not even be noticed and could lead to an incorrect production. And even when noticed, it might be too late to make the required changes or the changes might entail extra costs that could have been easily avoided at an earlier stage.

Color management should always be applied **after** flattening, as the last step before printing. Without needing to take **transparencies** into account, you have much **more control** on the final colors. Even **minor** changes in the original color of **overprinting** objects might have **major** effects on the resulting color tones and even on the object layout, and thus could lead to unpredictable results and undesired effects. The color result will be much more reproducible and fail-proof.

On the other hand, if the PDF is flattened "too early", changes to the layout or to transparency effects are not possible anymore. You would need to go back to the original PDF to apply any changes. Obviously, this could result in double work.

In an ideal workflow, the illustration is kept in its **native** format (and color space) as long as **changes** to the content might be **required**. The **final** version is then saved as **PDF**. The PDF is then **color managed** and **optimized** under **standardized** conditions, for example, in GMG ColorServer. The finalized output file can then be **proofed**, for example, by using GMG ColorProof. After approval by the customer, the PDF is sent to the print service provider together with the proof.

See also:

- "Color Management and Transparency" on page 45
- "Color Management and Overprinting" on page 48

6.4 When and Why Should I Flatten Transparencies?

If you process a file in GMG ColorServer using the flattening function, all layers, all transparencies, and all overprint attributes are resolved. All hidden layers and objects are removed. You accurately maintain the visual appearance of transparent objects so the output PDF looks the same as the original PDF. To achieve this effect, the flattener breaks up all transparent objects into smaller non-transparent objects that are visually equivalent to the original transparent objects.

Flattening—Yes or No?

Please note that the following information is to be considered as a recommendation. To avoid possible problems, it is always best to discuss and define the required PDF processing with your print service provider. Be sure to inform your print service provider about whether the PDF has been flattened (using which settings) or not.

In general, you should **not** flatten the PDF in the following cases.

◄ If you are sure the PDF does **not** contain any transparencies or overprinting elements. In this case, flattening in GMG ColorServer would not hurt, but would lead to an unnecessary longer processing time. Example: You are the PDF creator and you did not use any transparency effects. Or the PDF has already been flattened in another program.

In general, it is recommended to **flatten** the PDF in the following case.

◄ The PDF contains **transparencies** or **overprinting** elements. The PDF is intended to be **printed**. It will **not** be edited anymore before printing.

Advantages of flattening

◄ Greater control **prior to** printing. You have more control on the final print result when handing your print service provider an already flattened PDF. You can check and proof the PDF before sending it to the imagesetter. Possible problems can be spotted at an earlier stage, avoiding extra costs.

◄ Flattening is a prerequisite to achieve highly stable and reproducible **color management** results.

◄ You will achieve a high degree of **standardization** if you always use the **same** program for flattening, for example, GMG ColorServer. Different flatteners work with different technologies and flattening choices which can lead to varying results.

How much time needs GMG ColorServer for Flattening? Do I need a faster computer?

Flattening is a complex calculation process. Processing PDFs with **flattening** is more **time consuming** then processing PDFs without flattening.

The processing time does not correlate with the file size, the page size, or the image resolution of a document, but it depends on the **number** and **complexity** of transparent objects in a document. If your input files contain a higher number of complex transparent or overprinting objects, you will benefit from a higher computer performance. If the majority of your PDFs do not contain transparencies or overprinting elements, the processing time in GMG ColorServer 4.6 will be much shorter than in GMG ColorServer 4.5 (provided the same hardware is used).

6.5 Which Flattening Settings do I Need?

The GMG ColorServer default settings for flattening can be applied to a wide range of applications involving high-resolution printing. However, you should always ask your print service provider to define the flattening settings to avoid incompatibilities with the imagesetter or print quality problems. The print service provider will specify the flattening settings according to the resolution of the final output device and to the workflow used in their company. Good communication between you and your service provider will help you achieve the expected results.

For print service providers or advanced users, flattening settings are discussed in detail under "Advanced Flattening Settings" on page 58.

Special cases to be considered

The following cases are related to the procedure of flattening and should be considered when defining the flattening settings.

Object type	Considerations	Possible drawbacks	See also
Text objects	You might want to convert all text objects to outlines to avoid type problems in the RIP such as font mismatches.	File size is increased; "last minute" text changes are not possible, possible resolution/quality problems.	"Advanced Flattening Settings" on page 58
Spot colors	Spot colors do generally not present any problems as long as they are not on top of other objects and either transparent or overprinting. If they are, flattening and color management gets a bit tricky. If spot colors are converted to CMYK, they are blended with the underlying objects. If not, spot colors are preserved.	Blending spot colors with process colors might not produce the desired print result, which is a general known technical issue. Therefore, the PDF layout and all converted spot color objects should be checked carefully before printing.	"Spot Colors" on page 68
Single channel layers	You might want to keep layers that would result in only one (easily replaceable) plate. Example: Black text with drop-shadows (K channel) on a background image.	If single channel layers are not flattened (but all other layers are), the stacking order might be changed, possibly changing the visual appearance of the document.	"Single Channel Layers" on page 61
Objects with attributes such as trapping or overprinting	Sometimes, such attributes may have been defined by accident and you might want to ignore them in the RIP. As flattening will convert these attributes into fixed object properties, they cannot be removed anymore after flattening.	After flattening, these attributes are fixed properties and cannot be ignored or deselected anymore.	"Advanced Flattening Settings" on page 58

6.6 Tips for Designers or PDF Providers

"Flattening solves all problems, so with GMG ColorServer, I do not need to worry about transparencies at all, right?"

Yes and No. In theory, you could flatten all incoming PDFs in GMG ColorServer, regardless of whether the PDF has any transparencies in the first place and regardless of any other PDF parameters such as color space models, kinds of objects, and so on. In practice, this could entail some disadvantages you should be aware of, as explained in the following.

◄ The **processing time** in GMG ColorServer increases with the number of transparent objects and the level of complexity involved. Especially if you have a high throughput of PDFs, processing time might be an issue.

◄ Depending on the settings, flattening can add to the **file size** of the PDF, especially if the input PDF contains plenty of transparent and stacked objects. In rare cases, this can cause processing errors in PDF processing programs. In such a case, you can reduce the **Raster/Vector Balance** level (**Flattening & Normalizing** > **Flattening** > **Flattening Settings**) to reduce the complexity of the flattened file.

◄ Even though the visual appearance is generally not altered by the flattening process, **visible changes** or **artifacts** cannot be 100% excluded. The risk is directly proportional to the number of transparent objects and complexity levels involved.

Therefore, it might be wise to consider the following recommendations.

◄ Use transparencies **only** if **required** to achieve the desired visual effect.

◄ Do **not** use transparency effects that look fairly good on screen, but might be difficult if not impossible to **print** (e.g. feathering the edges of a small type with fine serifs).

◄ Generally, it is better **not** to place transparent objects against a **white** background. For example, instead of setting the **Opacity** of an object to 50%, you could achieve the same visual effect by directly changing the color tone of the object.

◄ Move transparent objects **as far** to the background (the stacking order) as possible. The more objects are behind a transparent object, the more complex (and time consuming) the flattening process will be. If you could place a transparent object to the background, consider to replace the transparent object with an opaque object.

◄ Placing opaque text frames and spot colors on the **top** of the stacking order will help keep them from being involved in transparency flattening. Spot color objects should also generally not have an **Overprint** attribute. Spot color inks are generally used to exactly match a particular color value, thus it is not desired to change or to color manage spot colors. It can be difficult to predict the color resulting from blending overprinting spot colors. Color management of overprinting spot colors is also subject to technological limitations and could produce undesired results.

◄ **Minimize** the **complexity** of the PDF structure. For example, apply identical transparent effects to a **group** of objects rather than to each object separately. Strip the native document from **hidden** layers and objects. Instead of using a clipping mask, **crop** a placed image or object. This also helps to reduce the file size.

◄ Be careful when using **multiple** color spaces, especially mixed RGB and CMYK objects, inside a document. Resolving overlapping RGB and CMYK objects might lead to undesired color effects.

◄ Use the **flattener preview** in your image editor or graphics software (if available) to look for transparencies in the document. Proof documents on-screen with an overprint and separations preview to ensure the output turns out as intended. Use printed proofs for a final approval of documents.

◄ To avoid possible problems during flattening, it is also recommended to deselect the option **Preserve Illustrator Editing Capabilities** when saving Adobe Illustrator PDF files from Adobe Illustrator.

Further information on this topic:

- *A Designer's Guide to Transparency for Print Output*, Adobe Systems Incorporated, 2007, www. adobe.com

- *Adobe® PDF in a Print Production Workflow*, 2008, www. adobe.com

6.7 Introduction to PDF

Nowadays, practically everybody knows what a PDF is. But not many people know how a PDF does look like "inside". Generally, you do not need to worry about these things. But when it comes to flattening, a basic understanding of the PDF technology might come in handy. The following information provides you with all basic aspects relevant for flattening and transparency issues.

PDF Objects

A plain pixel based image (TIFF) is a very simple kind of a file: It has fixed dimensions, some parameters such as the resolution, and some meta tags such as the color space or an embedded ICC profile. A PDF can be the same—a container with a single TIFF image inside and that's it. But in most cases, a PDF document is much more complex and consists of several objects that can be grouped or organized in layers. Each object can be in a different color space or can have additional object **attributes** such as **overprint**.

PDF objects can be divided into different classes:

◄ **Images**: **Pixel based** (contone) objects, such as **TIFF** or **JPEG** images. **Rasterized** objects, which might originally have been vector graphics, text, gradients, or patterns, are also regarded as images. Images have a certain resolution and can be compressed (for example, ZIP or JPEG compression). To optimize PDFs, you can change the image **resolution** and **compression** in GMG ColorServer.

◄ **Vector** objects (also called lineworks or line art)

◄ **Text** objects (also called type)

◄ **Gradients**: Object filled with color. The color tone varies continuously with the position, producing smooth color transitions with no visible steps. The gradient is defined by at least two color tones and vectors describing the gradient focus and the direction.

◄ **Patterns**: Object filled with repeating graphic elements, for example, created from swatches in Adobe Illustrator

All these object types can be transparent, that is, have an opacity value < 100%.

Multiple objects can be grouped inside a PDF and transparency effects can be applied to whole groups.

Of course, some PDF formats also support additional stuff such as linked files, movies or audio files. But as these objects have little or no relevance in printing and are for this reason not supported in GMG ColorServer, they will not be discussed here.

Stacking order

Objects can be placed not only next to each other, but also on top or below other objects. The stacking order defines which objects are printed on top and which objects are underlying. The order is essential for the visual impression and for the printed color.

The stacking order is not only relevant for objects; layers (which can contain multiple objects) are also organized in a stacking order.

Note The option **Preserve Single Channel Layers** can change the stacking order of objects and thus the visual impression. In special cases, background objects can be moved to the front.

Additional information:

◄ "Single Channel Layers" on page 61

PDF Layers

Inside a PDF, there can be any number of overlaying objects. Furthermore, objects can be organized in multiple layers inside a PDF. Layers add an additional level of complexity to a PDF structure, similar to a group of objects.

When you flatten a PDF with transparencies, all objects need to be extracted from the individual layers to be disassembled and then again reassembled to create the visual effect of the original object(s) without using any transparencies.

Note Flattening in GMG ColorServer **always** eliminates the layer information.

Overprint attribute

In many graphics programs, you can apply an **overprint** attribute to an object. The **overprint** attribute is generally maintained when saving the document as a PDF. An object with the attribute **overprint** is printed on top of background objects. (An opaque object without this attribute knocks out the area underneath and is thus printed directly on the medium. Overprint is generally used for small dark elements such as text. It avoids visible white gaps that can occur if plates are not exactly aligned in the printing machine.)

Additional information:

◄ "Overprinting Objects" on page 47

6.8 Flattening—Step by Step

Consider a simple case—two overlapping objects, the top one transparent, for example, with an opacity of 50%.

When the transparency is flattened, the Flattener proceeds as follows.

- ◤ The two shapes are divided.
- ◤ A **new** object is created in the **overlapping region** of the top and bottom object. The **Fill** color is defined by the blended color tones of the original objects.
- ◤ The overlapping region is **subtracted** from the top object. The color tone of the remaining object (i. e. the non-overlapping region) is changed to match the transparent color (i. e. it is blended with paper white). (The saturation of the color is reduced and the brightness is increased.)
- ◤ The **opacity** of all objects is set to **100%**.

Note If the **Raster/Vector Balance** (**Flattening Settings**) is set to 100%, the objects remain vector based after flattening. They will **not** be rasterized.

Transparency   Flattened Transparency

C: **100**%, M: 0%,
Y: 0%, K: 0%
Opacity = **50**%

C: **50**%, M: 0%,
Y: 0%, K: 0%
Opacity = **100**%

2 objects: 3 objects:

Fig. 18 Flattening of two transparent objects.

On the top left side, you see the original transparent objects: A 50% **transparent** rectangle (100% Cyan) with an underlying opaque rectangle (100 % Yellow).

The top right side shows the same objects after flattening. As you can see, the visual impression has **not** changed, but the **document structure** and the **object properties** have been modified to achieve the same visual appearance with **opaque** objects instead of transparent objects.

The non-overlapping region of the blue rectangle is blended with the white background, resulting in an opaque color tone of 50% Cyan.

By blending the overlapping region of the two original objects, a **new** object has been created, as indicated by the red border in the bottom illustration. The blue rectangle was blended with the underlying yellow rectangle, resulting in a green color tone of 50 % Yellow, 50% Cyan.

This is a simplified example intended to give you a basic understanding of flattening. Generally, transparent objects are much more complex. Depending on the complexity of the transparency effect and the number of overlapping objects, flattening sometimes has to almost atomize the original objects into many new objects. This may cause a significant increase in the file size of the document.
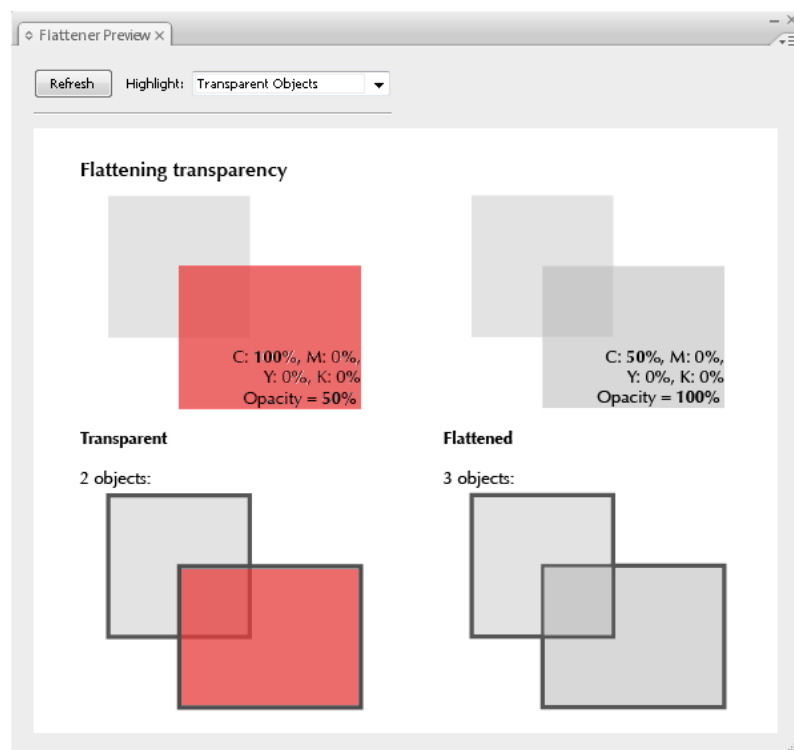
Fig. 19 Flattener preview available in Adobe programs.

The **Flattener Preview** highlights transparent objects with a red color. You see that the rectangular object is transparent on the left side, but flattened on the right side. You can use this feature to manually check a PDF for transparent objects. Please see the official documentation from Adobe for further information on the **Flattener Preview**.

The sample file **Flattening_Basics.pdf** used in this chapter can be found in the **Documentation\Sample Files** subfolder of the main GMG ColorServer program folder (default path: *<installation path>\Documentation\Sample Files*).

See also:

- "Overprinting Objects" on page 47

6.9 Color Management and Transparency

Here we describe a practical example that shows why it is generally recommended to **flatten** transparencies first **before** applying a **color conversion**. We will have a look at a soft proof simulation in Adobe Acrobat. We will compare the color management results on the same PDF objects, **before** and **after** flattening.

This documentation refers to Adobe products of the Adobe Creative Suite CS3, including Adobe Acrobat 8 Professional. Described features might be unavailable or different in other versions of Adobe programs. For more information, please refer to the corresponding documentation from Adobe.

1. Start **Adobe Acrobat** (version 7 or higher).

2. Browse to the **Documentation\Sample Files** subfolder of the main GMG ColorServer program folder (default path: *<installation path>\Documentation\Sample Files*).

3. Open the sample file **Transparency+Flattening.pdf** in Adobe Acrobat.
   The green box on the left hand side still contains **transparent** objects, the green box on the right has already been **flattened**.
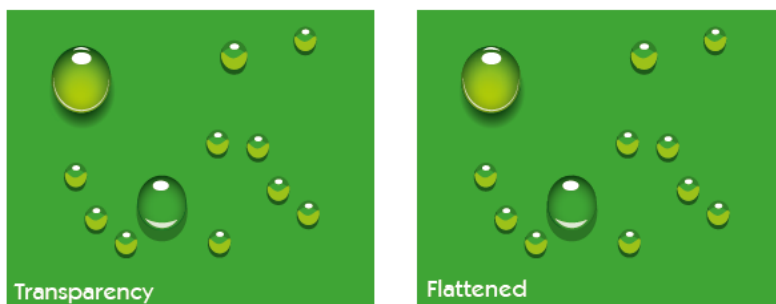
4. On the **Advanced** menu, point to **Print Production**, and then click **Output Preview**.

5. In the **Simulation Profile** box, select **ISOnewspaper26v4**.
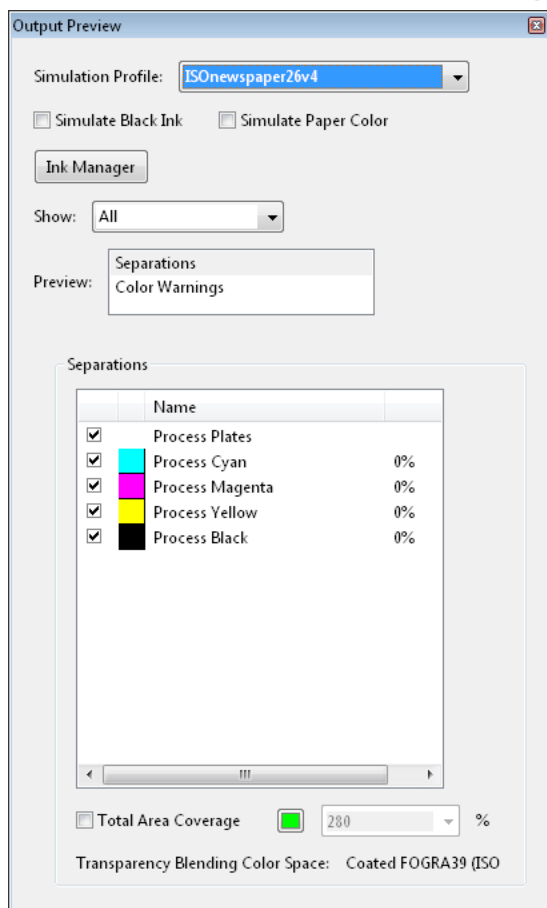
6. Compare the color of the water drops.
   The transparent drops appear rather yellowish, while the flattened drops maintained the original green color.
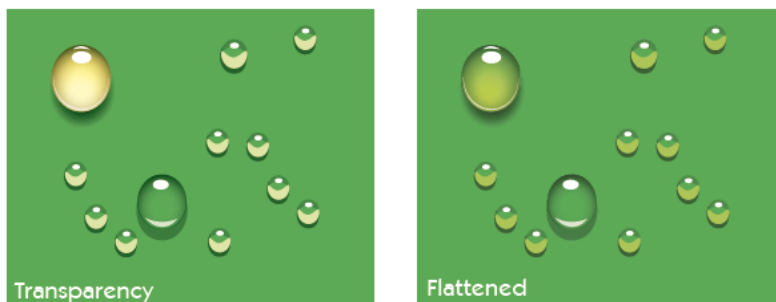
You could also select another ICC profile as simulation profile. You will notice that the transparent drops always show a strong yellow color shift.

What caused this effect?

The water drops use a transparency effect: A **Color Dodge** blend mode. **Color Dodge** brightens the color of the underlying object to reflect the color of the top object.

If an object with transparencies is not flattened **before** color management is performed, the specified transparency effect will be applied to the color-managed colors, which may lead to undesired color shifts. Minor color changes applied during the color management step might have major effects, depending on the blend mode used.

If an object with transparencies is flattened first before any color conversion takes place, the output is much more likely to maintain the colors intended by the creator of the original document.

What we now have simulated in the soft proof is also true when processing files in GMG ColorServer. If the PDF is **flattened** before the **MX Color Processing** is applied, the color result is much more reproducible and fail-proof.

6.10 Overprinting Objects

Overprinting objects can result in similar problems as transparencies and are therefore also discussed in this document.

An overprinting object is printed on top of the underlying object. The top and bottom objects will be **blended**, resulting in a mixed color tone. Overprint is generally used for small dark elements such as text. It avoids visible white gaps that can occur if plates are not exactly aligned in the printing machine. Even if overprinting objects are opaque (that is, no transparencies are involved), a different interpretation of overprinting objects by different devices could cause visible problems in the print output.

A non-overprinting object is printed directly onto the medium (**knocks out** underlying objects). The underlying object will only be printed where it is **not** overlapping with the top object.

Consider a simple case—two overlapping objects, the top one 100% opaque, but overprinting.

When the transparency is flattened, the following is done by the Flattener, as shown in the illustration.

▼ The two shapes are divided.

▼ A **new** object is created in the **overlapping region** of the top and bottom object. The **Fill** color is defined by the blended color tones of the original objects.

▼ The overlapping region is **subtracted** from the top object. If the overprint fill is not transparent (as in the example explained here), the **Fill** color is **not** blended or changed.

▼ The **Overprint** attribute is **removed** from the top object.

Note If the **Raster/Vector Balance** (**Flattening Settings**) is set to 100%, the objects remain vector based after flattening. They will **not** be rasterized.
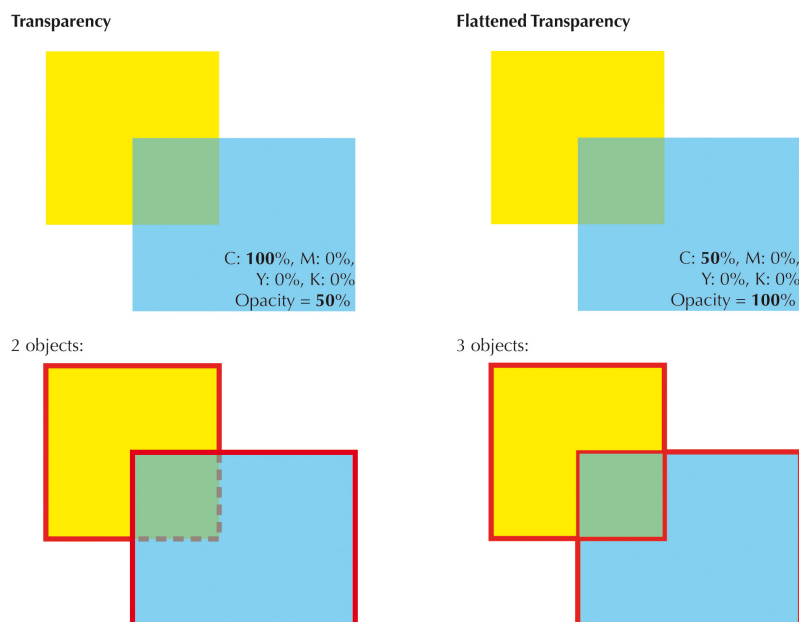
Overprinting
Flattened Overprinting
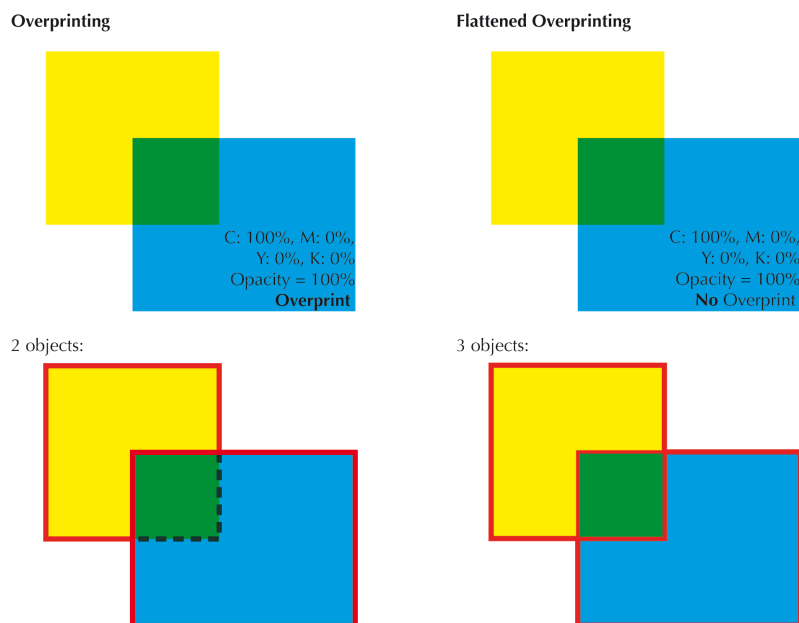
Fig. 20 Flattening of two overprinting objects.

On the top left side, you see the original overprinting objects: A rectangle (100% Cyan, **overprint**) with an underlying opaque rectangle (100 % Yellow).

The top right side shows the same objects after flattening. As you can see, the visual impression has **not** changed, but the **document structure** and the **object properties** have been modified to achieve the same visual appearance **without** overprinting.

By blending the overlapping region of the two original objects, a **new** object has been created, as indicated by the red border in the bottom illustration. The blue rectangle was blended with the underlying yellow rectangle, resulting in a green color tone of 100 % Yellow, 100% Cyan.

See also:

- "Color Management and Overprinting" on page 48
- "Flattening—Step by Step" on page 44

6.11 Color Management and Overprinting

Here we describe a practical example that shows why it is generally recommended to **flatten** overprinting objects first **before** applying a **color conversion**. We will have a look at a color conversion in Adobe Acrobat. We will compare the color management results on the same PDF objects, **before** and **after** flattening.

This documentation refers to Adobe products of the Adobe Creative Suite CS3, including Adobe Acrobat 8 Professional. Described features might be unavailable or different in other versions of Adobe programs. For more information, please refer to the corresponding documentation from Adobe.

Color space conversion of overprinting objects

1. Start **Adobe Acrobat** (version 7 or higher).

2. Browse to the **Documentation\Sample Files** subfolder of the main GMG ColorServer program folder (default path: *<installation path>\Documentation\Sample Files*).

3. Open the sample file **Overprinting.pdf** in Adobe Acrobat.

4. Make sure the **Overprint** preview is active (**Advanced** > **Print Production** > **Overprint Preview**). The top object on the left hand side still has the **Overprint** attribute, the objects on the right have already been **flattened**.

Overprinting   Flattened Overprinting

5. On the **Tools** menu, point to **Advanced Editing**, and then click the **TouchUp Object Tool**.

6. Right-click the left top (blue) rectangle at the left hand side (labeled with **Overprinting**). From the context menu, select **Properties**.
   The **TouchUp Properties** dialog box is displayed.

7. Click the **Color** tab.

8. From the **Convert To** list, select **ISO Uncoated**.

9. From the **Rendering Intent** list, select **Relative Colorimetric**.

10. Select the **Embed Profile** option.

11. Click the **Convert Colors** button.
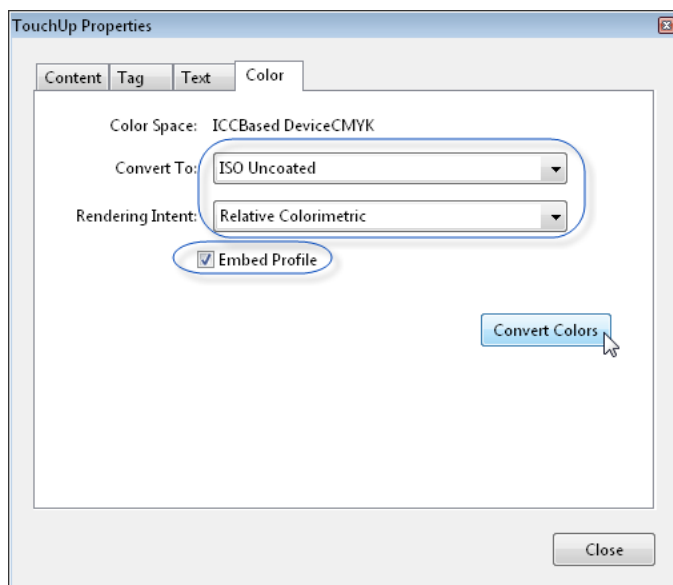
The overlapping area does not appear green anymore.

Resulting colors

1. On the **Advanced** menu, point to **Print Production**, and then click **Output Preview**.

2. In the **Simulation Profile** box, select **ISO Uncoated**.

3. Move the mouse pointer over the blue object to update the color values in the **Separations** preview.
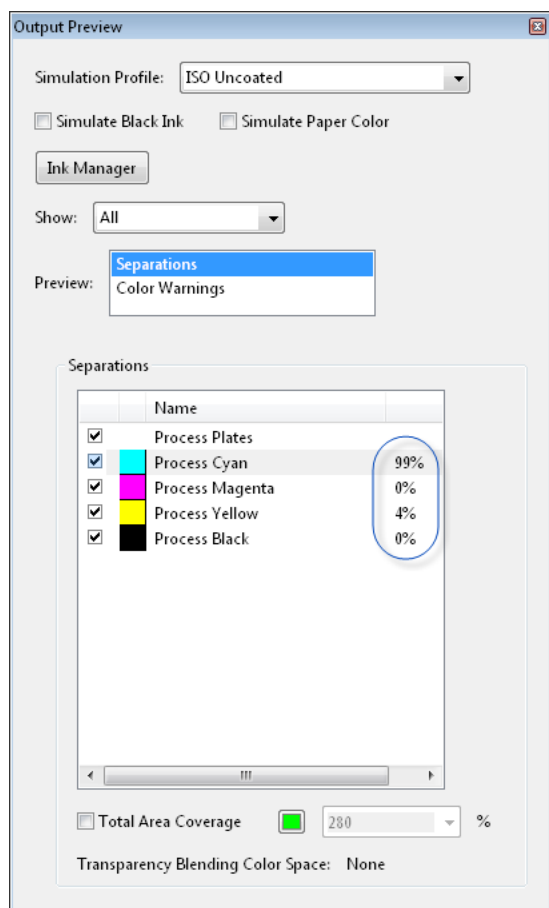
Fig. 21 New color values after color space conversion.

In the step described above, the original color space of the object (DeviceCMYK) has been converted to ISO Uncoated (based on ICC profiles) in Adobe Acrobat. Accordingly, the color of the blue overprinting object has changed from CMYK 100/0/0/0 to 99/0/**4**/0. The fill color of the blue object now contains **4% Yellow**.

Color space conversion of the same objects after flattening

1. Now, right-click the left top (blue) rectangle at the right-hand side (labeled with **Flattened Over-printing**). From the context menu, select **Properties**.
    The **TouchUp Properties** dialog box is displayed.

2. Repeat steps 4–10 of the Color space conversion of overprinting objects to convert the color space of the object to ISO Uncoated.

The overlapping area remains green.

1. On the **Advanced** menu, point to **Print Production**, and then click **Output Preview**.
2. In the **Simulation Profile** box, select **ISO Uncoated**.
3. Move the mouse pointer over the blue object to update the color values in the **Separations** preview.

Resulting colors

After the color space conversion, the color has changed from CMYK 100/0/0/0 to 99/0/**4**/0. The fill color of the blue object now contains 4% Yellow. The color result of the blue object is exactly the same as it was when the overprinting object was converted, but the green color in the "overlapping" region has **not** changed.

What caused the different behavior?

If the blue overprinting object is **color managed** before flattening, 4% Yellow is added to the fill color according to the color profile, which is technically correct. Objects with an **Overprint** attribute do **not** knock out underlying objects unless the underlying objects contain the **same** color **channel** (or plate). As Yellow has been added to the overprinting object, the Yellow channel is now used by both the over-printing and the underlying object. Therefore, the underlying object is **knocked out** (even though the blue object still has the **Overprint** attribute). As a result, the green square in the overlapping region disappears, which dramatically changes the visual appearance of the two objects. Even if the PDF would now be flat-tened after the color management, the Flattener would preserve the **current** visual appearance, that is, without the green area.

If the PDF is **flattened** before the color management, the Flattener will create a new object from the green overlapping area: A green square in the overlapping area of the blue and yellow objects. After flattening, the Green color does **not** result from an overprint effect of blended yellow and blue anymore. The green object is now a **separate** object, which can be color managed individually.

As you can see, even **minor** changes in the original color of overprinting objects can have **major** effects on the resulting color tones and even on the object layout, and can thus lead to unpredictable results and undesired effects.

In flattening the overprinting objects first, you have much **more control** on the colors. If the PDF is flat-tened **before** the **MX Color Processing** is applied, the color result is much more reproducible and fail-proof.

6.12 Flattening and TAC

In most cases, the TAC of PDF objects will not be changed during flattening. However, there might be certain circumstances where the flattener adds color to the channels after normalizing and thus increases the TAC. Therefore, it is recommended to always apply a CMYK-to-CMYK **reseparation** in the **MX Color Processing** step, except in cases where you are using an InkOptimizer profile, which already includes a TAC limitation.

Here we describe a practical example that shows why.

This documentation refers to Adobe products of the Adobe Creative Suite CS3, including Adobe Acrobat 8 Professional. Described features might be unavailable or different in other versions of Adobe programs. For more information, please refer to the corresponding documentation from Adobe.

1. Start **Adobe Acrobat** (version 7 or higher).

2. Browse to the **Documentation\Sample Files** subfolder of the main GMG ColorServer program folder (default path: *<installation path>\Documentation\Sample Files*).

3. Open the sample file **Flattening_TAC.pdf** in Adobe Acrobat.

4. On the **Advanced** menu, point to **Print Production**, and then click **Output Preview**.

5. In the **Simulation Profile** box, select **ISO Coated v2 (ECI)**.

6. Select the option **Total Area Coverage** and enter **330%**.
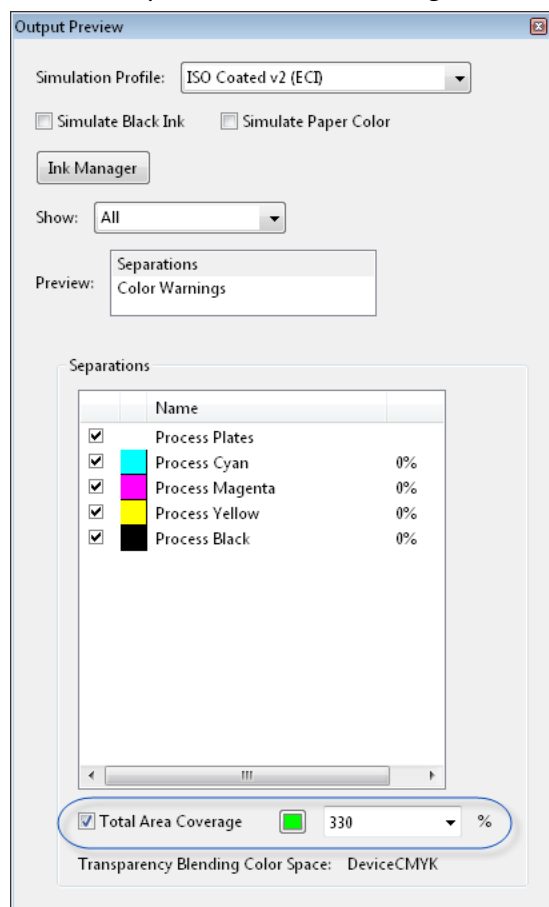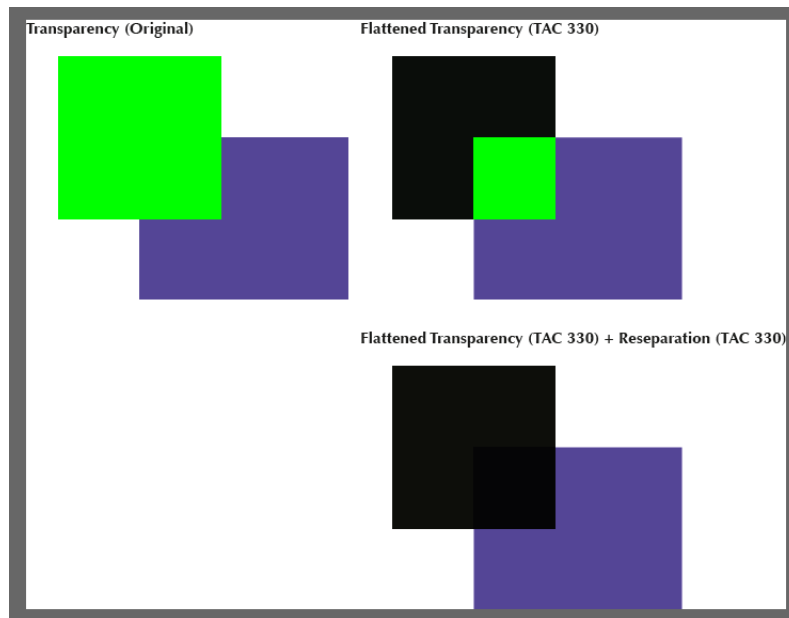
Fig. 22 Screenshot from Adobe Acrobat Output Preview.

The objects on the left side are **transparent** objects that have not been processed by GMG ColorServer, the objects on the right side have been processed by GMG ColorServer.
The **top right** objects have been **normalized** with an MX reseparation profile (Isocoated v2 (39L), **TAC 330**) and **flattened**.
The **bottom right** objects have been normalized with the same profile and also flattened, but then **reseparated** again with the same profile (**MX Color Processing**).
Areas where the total ink coverage exceeds the entered limit of 330% are depicted in **green**. As you can see, the TAC of the original square object exceeds the limit. After normalizing and flattening in GMG ColorServer, both objects are within the TAC limit, but the **overlapping** area is not. After a following reseparation with exactly the same profile, **all** areas are within the limit.
In Adobe Acrobat, you can move the mouse pointer over the objects in the **Output Preview** to show the ink coverage percentages of the color channels.

What caused this effect?

The dark blue rectangle (C 100%, M 100%; 80% transparency) is on top of another very dark object (C 85%, M 75%, Y 80%, K 90%). The top object uses the blending mode **Multiply**.

During the **Normalizing** step, all original objects have been reseparated with the MX reseparation profile **CS_res_Iso39_TAC330_KeepK_V1.mx4**. The resulting TAC of both **individual** objects is limited to **330** as defined in the profile. Chromatic colors have been replaced by K, as shown in the following screenshot. (Note that using a reseparation profile during the Normalizing step generally does not make much sense; this is done in this tutorial only for demonstration purposes.)
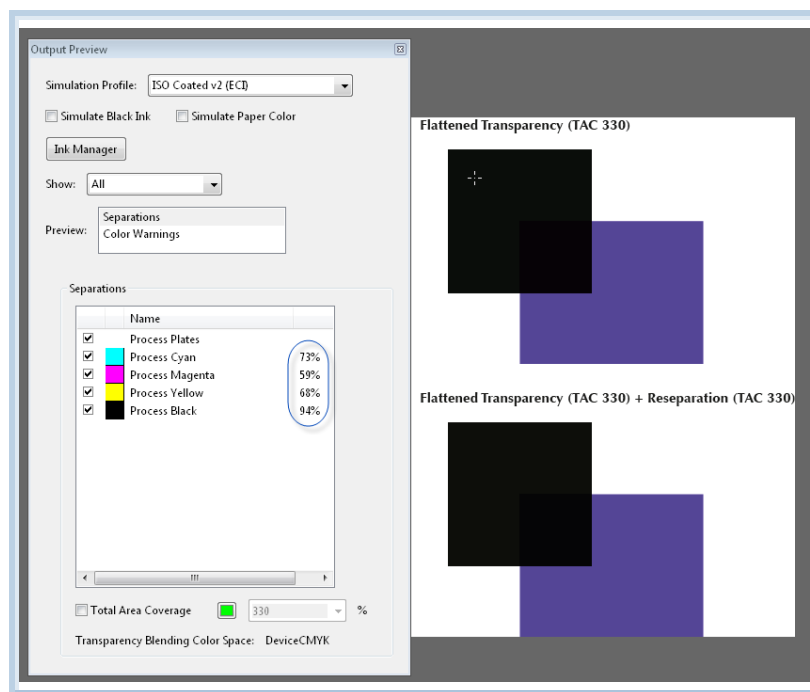
Following the **Normalizing** step, the **flattener** now multiplies the two fill colors of the two separate objects in the **overlapping** region. As a result, Cyan and Magenta is **added** to the overlapping region, as shown in the following screenshot.
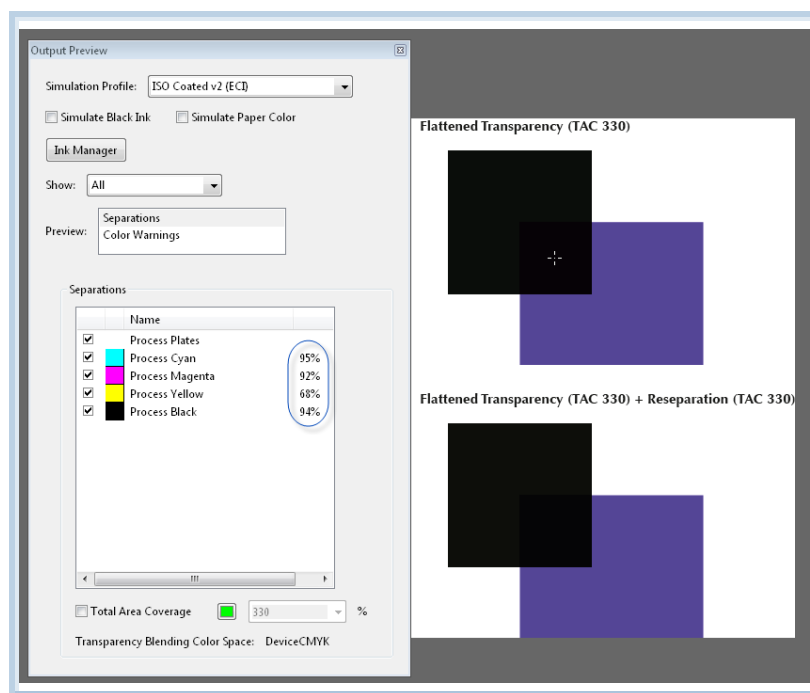
Due to the color addition during the **Flattening** step, the overlapping region now **exceeds** the TAC limit.

If the same reseparation profile is applied again in the following **ColorServer** (**MX Color Processing**) step, the TAC of the overlapping region is reduced, providing the desired TAC result in the output file.

Therefore, it is recommended to **always** apply a CMYK-to-CMYK reseparation in the **MX Color Processing** step. You can find factory-default reseparation profiles for all widely used print standards in the **Reseparation Profiles** subfolder (default path: *<installation path>\reference profiles\ColorServer Profiles\Reseparation Profiles*).

See also:

- "About Flattening and Normalizing" on page 56
- "Normalizing Colors" on page 62
- "About MX Color Processing" on page 77

7. About Flattening and Normalizing

To ensure a fail-proof print production, GMG ColorServer automatically **detects overprinting** or **transparent** objects in a PDF.

Processing of transparent PDFs in GMG ColorServer

You can configure GMG ColorServer hotfolders to automatically **reject** files containing transparent or over-printing objects. For example, to send the PDF back to its creator. If you prefer an enhanced automation with minimum user interaction, the hotfolder can alternatively be configured to **preserve** overprinting or transparent objects or to **flatten** the PDF by using the integrated **Adobe Transparency Flattener**, the same technology that is used in Adobe programs such as Adobe Acrobat 9.0, Adobe Illustrator, and Adobe InDesign.

Key message: You have three general hotfolder options for PDFs with transparent or overprinting objects: **Reject**, **preserve** transparencies, and **flatten**.

Normalizing color spaces and spot color handling

PDFs can contain objects in **multiple** color spaces: mixed RGB, CMYK, grayscale, Lab, and spot colors. With GMG ColorServer, inconsistent color spaces can be **normalized** to the **same** target color space. This ensures a stream-lined workflow, without delaying the PDF processing due to a "forgotten" object in the "wrong" color space.

You can either use an **ICC based** color management or apply high-quality DeviceLink **MX profiles** which can be used instead of input and output ICC profiles (**MX4 Normalizing Rule Sets**).

Note To get the most out of your GMG ColorServer installation, it is preferable to use the high-quality MX DeviceLink technology rather than using an ICC based color management.

Dependencies between flattening and normalizing

To ensure reproducible results, there are some technical dependencies between flattening and normalizing.

If **Flattening** is used, all images, vector and text objects in the PDF will be normalized to the **same CMYK** color space. Therefore, normalizing must be activated for the **RGB** color space. This is necessary because a PDF can have **overlapping** objects in **different** color spaces, for example, an RGB object on top of a CMYK object. These color space mismatches need to be resolved during flattening, as the new object created from the overlapping region can only be in a **single** color space.

Note Flattening in GMG ColorServer requires a conversion of RGB data to CMYK. Therefore, you can use flattening **only** when normalizing to CMYK. If you use flattening, you can **only** use a **CMYK-to-CMYK** (and not an RGB-to-CMYK profile) in the **MX Processing** step.

Images and **Vector/Text** must use the **same** color management settings, which is why the **Vector/Text** tabbed page cannot be activated. This is necessary because flattening can result in a **rasterization** of transparent vector/text objects (as defined in the **Flattening Settings**). If you selected different normalizing settings for images and vector and text, this could lead to unpredictable results. For example, if part of a vector element will be rasterized during flattening and the rest will not, there would be a visible edge between the two resulting parts after normalizing.

Note There is technically no difference between a flattened PDF and a PDF that has never contained any transparent objects. Therefore, it is not possible for GMG ColorServer to detect whether a PDF has already been flattened in an external application. If it has, there might be a chance that separate color management settings for **Images** and **Vector/Text** could lead to visible artifacts. It is therefore recommended to use separate normalizing settings only with care and only if you can make sure the input PDFs have not been flattened before processing in GMG ColorServer.

Spot color channels can be **preserved** and color managed separately from the process colors. If flattening is used, spots can also be converted to **CMYK**. This limitation helps to avoid undesired effects, because the visual impression of stacked objects might be changed dramatically when overprinting spot colors are converted to CMYK.

7.1 Flattening
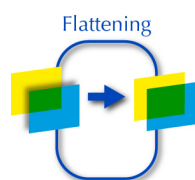
Input PDFs are scanned for **transparent** objects and/or objects with the **Overprint** attribute. If any object with such an attribute is detected, the PDF is processed as defined on the **Flattening** page (**Flattening & Normalizing** > **Flattening**). If flattening is used, layers, transparencies, and overprinting objects are resolved.

What happens when a PDF is flattened?

When a PDF is flattened (**Process with Flattening**), the Adobe Flattener (PDF library 9) integrated in GMG ColorServer performs the following tasks.

▸ **Layers** are flattened. The output PDF will not contain any layers. (Exception: **Preserve Single Channel Layers** is selected.) Note that if an input PDF contains **no** transparent objects and/or objects with the **Overprint** attribute, no flattening will be performed (thus the layers will remain as before).

▸ **Transparent** objects are flattened as defined in the **Flattening Settings** (**Flattening & Normalizing** > **Flattening**). The output PDF will not contain any transparencies.

▸ Objects with the **Overprint** attribute are flattened as defined in the **Flattening Settings** (**Flattening & Normalizing** > **Flattening**). The output PDF will not contain any overprinting objects. (Exception: **Preserve Overprint** is selected. If **Preserve Overprint Black** is selected, black objects with the **Overprint** attribute are not flattened. Overprinting **spot colors** always **keep** the **Overprint** attribute.)

▸ Transparent objects are split up into smaller objects that can be blended with underlying objects. **New** objects are created in the **overlapping region** of transparent objects. The **Fill** color is defined by the blended color tones of the original objects.

▸ Some (or all) vector and text elements might be rasterized according to the **Flattening Settings**.

▸ Objects not in the target color space are **normalized** according to the settings on the **Images** page (**Flattening & Normalizing** > **Images**). (Exception: **Spot colors**.)

Even though the PDF looks (and prints) the same, it might **not** be editable anymore. It might not be possible anymore to change a certain object after flattening, because this object might now be split up into several objects. Therefore, it is recommended to only flatten ready-for-printing PDFs.

See also:

7.1.1 Flattening Settings

Available options	Description
Cancel Job (Error)	Input PDFs containing **transparent** objects and/or objects with the **Overprint** attribute are **rejected** and not processed. The job will be considered an **Error Job** and the unprocessed input PDF will be handled as defined under **Files & Folders** > **Errors & Warnings**.
Process without Flattening	**Transparent** objects and/or objects with the **Overprint** attribute are **preserved** in the output PDF.
Process with Flat-tening	**Transparent** objects and/or objects with the **Overprint** attribute are **flattened** in the output PDF. As a consequence, the output PDF does not contain objects with such properties anymore (possible exceptions: **Preserve Overprint**, spot colors.) If the option **Preserve Overprint** is selected, **Overprinting** objects are **not** flattened.
Preserve Single Channel Layers	Single channel layers are **not** normalized, **not** flattened, **not** color managed (**MX Color Processing**), **not** sharpened and **not** resampled (**PDF Output Format** > **Images**).

Note Even when flattening is **not** used (**Process without Flattening**), the native **document structure** might be **modified** by GMG ColorServer. This could reduce the editing capabilities of the document in the application, where the document was originally created. To avoid data loss, you should always save copies of the original (unflattened) files. To avoid possible problems during flattening, it is also recommended to deselect the option **Preserve Illustrator Editing Capabilities** if saving Adobe Illustrator PDF files from Adobe Illustrator.

Generate Warning

◀ You can generate a warning if any overprinting or transparent objects are detected in the input PDF. The warning message will tell you whether transparencies have been flattened or not, as defined on the **Flattening** page.

◀ You can generate a warning if single channel layers are detected in the input PDF. The warning message will tell you whether the single channel layers have been preserved or merged, according to the **Preserve Single Channel Layers** option on the **Flattening** page.

How to flatten PDFs

1. Click the **Flattening & Normalizing** button on the navigation panel on the left side of the dialog box.
2. Click the **Flattening** tab.
3. On the drop-down list, select **Process with Flattening**.
4. Optional: (Optional) If you select the option **Generate Warning**, all flattened output PDFs will be saved to the **Warnings** folder (defined under **Files & Folders** > **Errors & Warnings**). (PDFs that do not require flattening will be saved to the **Output** folder.)

See also:

- "When and Why Should I Flatten Transparencies?" on page 39
- "Which Flattening Settings do I Need?" on page 40
- "Flattening" on page 57
- "Single Channel Layers" on page 61

7.1.2 Advanced Flattening Settings

The GMG ColorServer default settings for flattening can be applied to a wide range of applications involving high-resolution printing.

Note To avoid **incompatibilities** with the imagesetter or print quality problems, you should ask your print service provider to define the flattening settings.
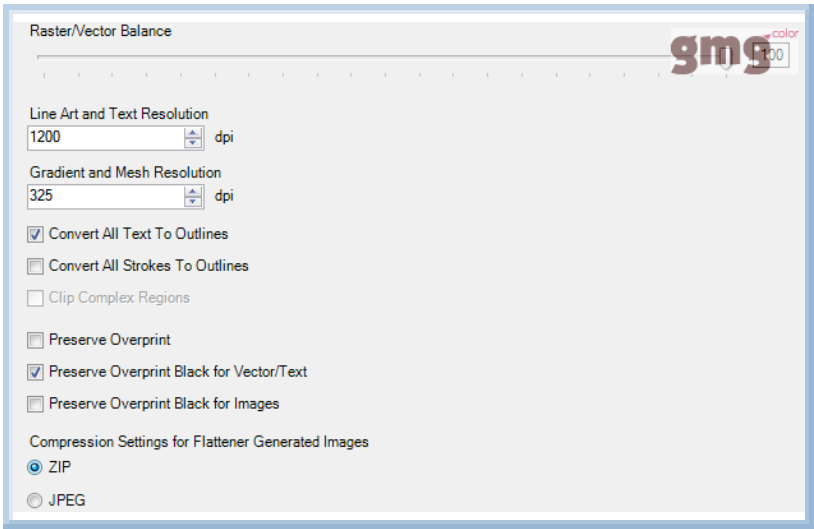
Fig. 23 Default flattening settings.

The default settings are recommended for final press output and for high-quality proofs.
Generally, line art and text is printed at a higher resolution than images or filled objects. It is recommended to preserve overprint black for vector/text elements, because it avoids the risk of a chromatic composition of black vector and text elements during the color management step.

Flattening and file size

Depending on the complexity of transparent artwork in the document, flattening can increase the file size. For example, if you have transparent text on a high-resolution background image, flattening would duplicate part of the background image. The overlapping region would result in one object and the non-overlapping region in a separate object. The higher the complexity of the transparency effects and document structure, the higher the number of objects (and thus the file size) after flattening. Rasterizing artwork (**Raster/Vector Balance**) can reduce the complexity and thus the file size.

Note In rare cases, complex artwork could lead to processing errors. In this case, you can reduce the **Raster/Vector Balance** level to reduce the complexity of the flattened file.

Available options	Description
Raster/Vector Balance	Specifies the amount of vector information in the PDF that will be preserved during flattening. Higher settings preserve more vector objects, while lower settings rasterize more vector objects. Intermediate settings preserve simple areas in vector form and rasterize only complex ones. If set to 0, all objects will be rasterized, that is, the output PDF will contain only image data, no vector and text objects. If set to 100, the Flattener will try to preserve all vector/text elements. (Some objects, however, might need to be rasterized despite the balance being set to full vector.)

In the process of rasterizing, vector/text objects are rasterized according to the resolution defined under **Line Art and Text Resolution**. Other transparent objects are rasterized according to the resolution defined under **Gradient and Mesh Resolution**. Transparent objects overlapping with images are rasterized according to the resolution of the **underlying image** (that is, the resolution settings are ignored for such objects), which helps to avoid stitching problems and edges at the border between the two objects. You can reduce the **Raster/Vector Balance** to reduce the complexity of the flattened file. If the input PDF contains **complex** transparent artwork, lowering the **Raster/Vector Balance** can **reduce** the **file size** of the output file. |
| **Line Art and Text Resolution** | According to the **Raster/Vector Balance**, vector/text objects are rasterized to the specified resolution. GMG ColorServer supports a maximum of 2400 dpi for both line art and gradient mesh. The resolution affects the precision of intersections when flattened. **Line Art and Text Resolution** should generally be set to 600–1200 dpi to provide high-quality rasterization, especially on serif or small point sized type. |

Available options	Description
Gradient and Mesh Resolution	Same as **Line Art And Text Resolution**, but for gradient and mesh objects. If you use GMG ColorServer also for image resampling, it might be safest to use the same resolution for rasterization of gradient and mesh objects and for resampling the images (**PDF Output Format** > **Images** > **Output Resolution**). This helps to avoid stitching problems and edges at the border between two objects.
Convert All Text to Outlines	Converts all type objects (point type, area type, and path type) to outlines (i. e. vector objects) and discards all type glyph information (whether the type interacts with transparency or not). This option is **not** available if the **Raster/Vector Balance** is set to 0 (because all objects are rasterized, including text). **Convert All Text to Outlines** ensures that the width of text stays consistent during flattening. It can eliminate flattening artifacts that might be apparent on-screen and when printing to lower resolution output devices such as desktop printers. For example, with this option deselected, some type may be converted to outlines, while other type remains unaffected. On low resolution output devices, the outlined type may appear heavier than the unaffected type. Note that **Convert All Text to Outlines** will cause small fonts to appear slightly thicker on the screen or when printed on lower resolution printers. It does not affect the quality of the type printed on high-resolution printers or imagesetters. **Convert All Text to Outlines** can also help to avoid RIP problems with True Type Fonts in the imagesetter.
Convert All Strokes to Outlines	Converts all strokes to simple **filled paths** (whether the strokes interact with transparency or not). This option is **not** available if the **Raster/Vector Balance** is set to 0 (because all objects are rasterized, including strokes). **Convert All Strokes to Outlines** ensures that the width of strokes stays consistent during flattening. It can eliminate flattening artifacts that might be apparent on-screen and when printing to lower resolution output devices such as desktop printers. Note that enabling this option causes thin strokes to appear slightly thicker and may degrade flattening performance.
Clip Complex Regions	Ensures that the boundaries between vector artwork and rasterized artwork fall along object paths. This option is **not** available if the **Raster/Vector Balance** is either set to 0 or 100, because complex regions will only be created during flattening if some part of an object is rasterized and another is not. **Clip Complex Regions** reduces stitching artifacts that might result when part of an object is rasterized while another part of the object remains in vector form by creating clipping paths around these parts of a transparent design. However, selecting this option may result in paths that are too complex for the printer or imagesetter to handle.
Preserve Overprint	**All** objects with the **Overprint** attribute are **not** flattened. The **Overprint** attribute is **not** resolved. For most print business applications, using this option is **not** recommended, as there might be different interpretations of the **Overprint** attribute by different imagesetters. This option is **not** available if the **Raster/Vector Balance** is set to 0 (because all objects are rasterized, including overprinting objects).
Preserve Overprint Black for Vector/Text	Black **vector/text** objects, that is, objects containing only **K** channel information (100% K or C0, M0, Y0, K100 or grayscale) are **not** flattened. The **Overprint** attribute is **not** resolved. For most print business applications, using this option is **recommended**, because it avoids the risk of a chromatic composition of black vector and text elements during the color management step, which could in turn lead to registration problems. Even if the **Raster/Vector Balance** is set to 0, black **vector/text** objects with the **Overprint** attribute are **not** flattened or rasterized.
Preserve Overprint Black for Images	The same as **Preserve Overprint Black for Vector/Text**, but for **Image** objects. Even if the **Raster/Vector Balance** is set to 0, black **Image** objects with the **Overprint** attribute are **not** flattened or rasterized.
Compression Settings ZIP / JPEG	Determines how images affected by flattening are encoded. Depending on the complexity of a PDF, flattening can significantly increase your file size. To keep the file size down and tie up valuable processing resources, you can compress your files into a ZIP or JPEG format. The compression is only applied to objects generated by way of rasterizing, not to images already existent in the input file. **Note:** JPEG is a lossy compression method resulting in a tradeoff between storage size and image quality. As JPEG compression eliminates data from an image, it can generally achieve a smaller file size than ZIP compression. The quality level is automatically selected by the flattener.

Further information on this topic:

- *Transparency in Adobe Applications: A Print Production Guide*, Adobe Systems Incorporated, 2005, www. adobe.com

7.1.3 Single Channel Layers

A **single channel layer** is a PDF layer producing only a **single** plate in an imagesetter. For example, a single channel layer contains only 100% black or grayscale objects, or spot color objects. PDFs with single channel layers might be used for multi-language support: If all other contents are the same across all languages, the language can be changed by replacing only one plate (with the text) during the printing process.

Preserve Single Channel Layers

If the option **Preserve Single Channel Layers** is selected (**Flattening & Normalizing** > **Flattening**), the program scans input PDFs for single channel layers. A PDF layer is recognized as single channel layer if the following requirements are fulfilled:

◄ All objects in the layer use only **one** color channel, for example, **CMYK** objects using only Cyan (C50, M0, Y0, K0), **100% K**, **grayscale** objects, **spot color** objects (all objects using the same spot color). Even if just one pixel is using another color channel (and be it only at 1%), the layer will **not** be recognized as a single channel layer anymore. (If you need to use, for example, two spot colors or two process colors, group the two colors in two **separate** layers.)

Layers with **RGB** or **Lab** objects will **never** be recognized as single channel layers.

Single channel layers are handled as follows during flattening:

◄ The whole layer and all objects in this layer are **not** flattened. Transparencies and overprint attributes are **preserved**.

◄ The whole layer and all objects in this layer are **not** normalized, **not** flattened, **not** color managed (**MX Color Processing**), **not** sharpened and **not** resampled (**PDF Output Format** > **Images**). Spot color objects in single-channel layers are kept **unchanged** (even if the option **Convert Spots to CMYK** is selected).

◄ In other words, single channel layers are **not** processed at all. However, the PDF structure of single channel layers might be changed in the output PDF.

◄ All **other** layers (with more than one channel) are flattened and processed as defined in the hotfolder settings. For example, if an input PDF contained four layers, two single-channel layers and two normal layers, the output PDF would contain three layers: Two unprocessed single-channel layers and one merged layer.

Flattening with Preserve Single Channel Layers
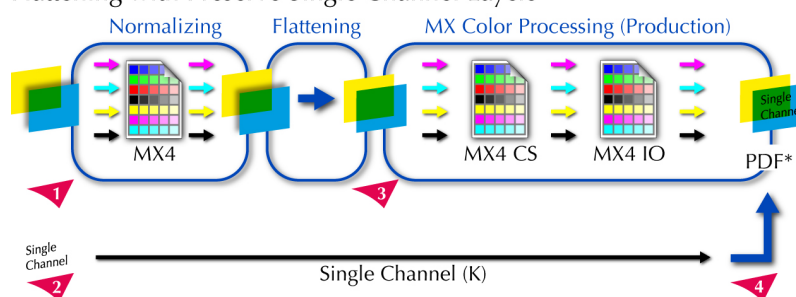
Fig. 24 Flattening with option Preserve Single Channel Layers selected.

In the illustrated example, the **input** PDF contains transparent CMYK objects (1) and a separate layer with black text. As this layer contains **only** K objects, it will consequently be recognized as a **single channel layer** (2).
The single channel layer will be **excluded** from all following processing steps.
The CMYK objects will be flattened (3) and then color managed with the selected ColorServer (CS) and InkOptimizer (IO) profiles.
The single channel layer will **not** be color managed.
The output PDF (4) will contain the flattened and processed CMYK objects and the unprocessed single channel layer.

7.2 Normalizing Colors
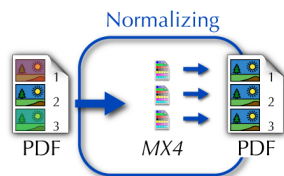
A PDF can contain elements and images in **multiple** color spaces. Before the **MX Color Processing** step, colors can be normalized to the **same** color space.

You can either use **ICC** based color management or define **rules** for mapping ICC and **MX** profiles (**MX4 Normalizing Rule Sets**). To ensure a fail-safe conversion, you can automatically apply different MX profiles according to the embedded ICC profile of the PDF object / output ICC defined in the hotfolder (**Normalizing**). GMG ColorServer also detects spot colors and is able to handle spots separately from process colors.

- ◄ Normalizing is applied to images that are not already in the target color space (as defined by the **Output ICC Profile**). Normalizing can mean a **separation** from **RGB to CMYK** or a **CMYK to CMYK** conversion from the current CMYK color space to the input color space (**Normalizing Color Space**) for the following **MX Color Processing** step.
- ◄ Normalizing can be based on **DeviceLink MX** profiles or on standard **ICC** profiles.
- ◄ Normalizing settings can be defined separately for **Images** and **Vector & Text** elements.

Note If **Normalizing** is not used for an input color space, for example for RGB, or for the whole PDF, objects in the "wrong" color space will **not** be color managed. For example, if you have defined a hotfolder with a CMYK-to-CMYK conversion profile and **without** normalizing, all **RGB** objects will **not** be processed. Only CMYK objects will be processed with the selected ColorServer profile.

Note If flattening is used, RGB objects overlapping with CMYK objects will be resolved. Therefore, normalizing must be selected for **RGB**. **Images** and **Vector & Text** must use the **same** color management settings, so the **Vector & Text** tabbed page cannot be activated.

Note To avoid unnecessary color conversions, GMG ColorServer validates the input and output color space. Normalizing is **only** applied if the output color space is **different** from the input color space. This check is made based on a checksum comparison of the **Input ICC Profile** and **Output ICC Profile**. If the checksums are matching, the normalizing step is skipped. Example: The output color space of the **Normalizing** step is defined by the **Output ICC Profile**: Isocoated_v2_eci.icc. A PDF object has an embedded Isocoated_v2_eci.icc profile (with a matching checksum). As this object is already in the correct color space, it will **not** be normalized, even if a matching **MX Normalizing Rule** is found.

Embedded ICC profiles

PDF/X files: Objects that are already in the target color space as defined by the **output intent** of the PDF do not have an embedded ICC profile. As a consequence, the **PDF output intent** can be considered as the **embedded ICC profile** of PDF objects that do **not** have an embedded ICC profile. (GMG ColorServer regards the output intent of a PDF as an embedded ICC profile only if the output intent has been defined by an **ICC profile**, not only by a text string.)

Note Note that the output intent of the **Normalizing** step in GMG ColorServer is always defined by the **Output ICC Profile**, **not** by the output intent of the input PDF.)

7.2.1 ICC Based Normalizing

The **input profile** specifies the transformation from the **original** color space to the **LAB** color space, and the **output profile** specifies the transformation from the **LAB** color space to the **target** color space. Standard ICC profiles are installed into the Windows default folder for ICC profiles (generally

C:\Windows\System32\spool\drivers\color) together with GMG ColorServer. (Already existing ICC profiles with the same name in this folder are **not** overwritten.) Generic or process color profiles are also typically installed together with graphic programs and can be found on the internet.

7.2.2 ICC Normalizing Settings

You can either load a **custom** ICC profile into GMG ColorServer or use the ICC profile that is **embedded** into the PDF object.

The normalizing settings can be defined individually for each input color space (**CMYK**, **RGB**, or **Gray**). The output color space is defined by the **Output ICC Profile**.

You can also define different normalizing settings for **Images** and **Vector/Text** objects. (**Patterns** and **gradients** are handled as **Vector/Text** objects.)

Note It is possible, but generally **not** recommended, to use different **Output ICC Profile** settings for **Images** and **Vector/Text**. If you are using different profiles, please make sure to also define separate profiles for **Images and Vector/Text** in the **MX Color Processing** step, the input color space matching the **Output ICC Profile**.
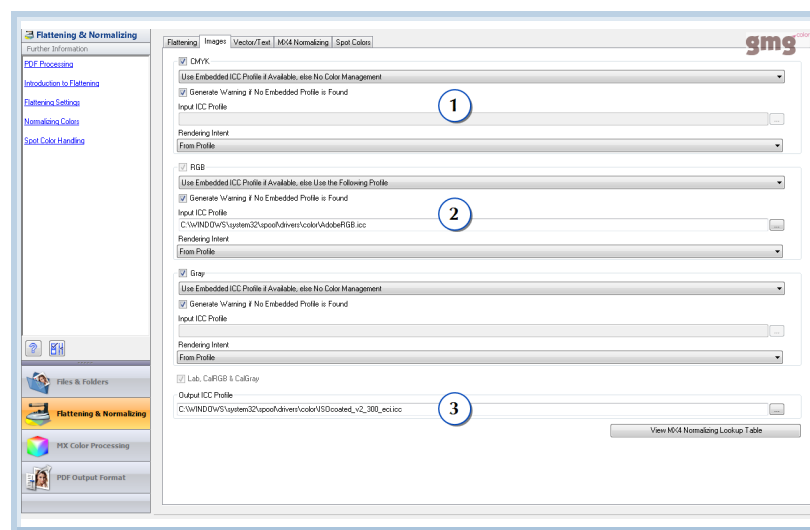
Fig. 25 Normalizing settings (Flattening & Normalizing > Images or Vector/Text).

On this page, you define a separate color conversion for each color space in which the PDF objects might be: **CMYK** (1) and **RGB** (2).
In the example shown in the screenshot, an ICC profile embedded in a PDF object will be used for normalizing. If a **CMYK** object does not have an embedded ICC profile, it is considered to be already in the correct color space for the following **MX Color Processing** step. Thus no normalizing is used (option **Use Embedded ICC Profile if Available, Else No Color Management**) (1). If an **RGB** object does not have an embedded ICC profile, an Adobe RGB profile is used as a fallback (option **Use Embedded Profile if Available, Else Use the Following Profile**) (2).
If an object does not have an embedded ICC profile, the job will be processed in status **Warning**.
The **Output ICC Profile** (3) defines the **output** color space of the **Normalizing** step (**Normalizing Color Space**) that should match the **input** color space of the **MX Color Processing** step.
In the example shown in the screenshot, all PDF objects are normalized to ISO Coated v2 (39L).

Group	Short description	See also
Color space input profiles (**CMYK**, **RGB**, **Gray**)	Color management is only applied to the color spaces that are selected on the **Images** and **Vector & Text** pages. You can use an embedded ICC profile or load a custom ICC profile. If **flattening** is used, **RGB** objects are **always** normalized to CMYK. Flattened output PDFs will **not** contain any RGB objects anymore.	"Input Profile Options for Normalizing" on page 64

Group	Short description	See also
Lab, CalRGB & Cal-Gray	The Lab color space (and color spaces based on Lab) defines already the Lab values. Therefore, an input profile (defining the conversion from the input color space to Lab) is not required. **Lab, CalRGB & CalGray** objects are converted directly with the **Output ICC Profile**.	"Input Profile Options for Normalizing" on page 64
Output ICC Profile	The **Output ICC Profile** specifies the transformation from the Lab color space to the color space that is required for the **MX Color Processing**. (If no **MX Color Processing** is used, it defines the output color space.) You can use an embedded ICC profile or load a custom ICC profile.	"About MX Color Processing" on page 77

7.2.3 Input Profile Options for Normalizing

The input profile can be defined by the following rules. The output color space is defined by the **Output ICC Profile**.

Available options	Description
Use Embedded ICC Profile if Available, Else No Color Management	The embedded ICC profile is used to define the input color space. If an object does not have an embedded ICC profile, no normalizing is applied. If normalizing is mandatory (for example, when flattening RGB objects) the job will not be processed (status **Error**).
Use Embedded ICC Profile if Available, Else Cancel Processing	The embedded ICC profile is used to define the input color space. If any object inside the PDF does not have an embedded ICC profile, the job will not be processed (status **Error**).
Use Embedded Profile if Available, Else Use the Following Profile	The embedded ICC profile is used to define the input color space. If the image does not have an embedded ICC profile, the selected ICC profile is used. The output color space is defined by the **Output ICC Profile**.
Use the Following Profile	The selected ICC profile defines the input color space. The output color space is defined by the **Output ICC Profile**.

Generate Warning

You can generate a warning if an object does **not** have an embedded ICC profile. This option can be selected for each input color space separately.

Note To make sure color management has produced correct results, it is recommended to carefully check all output PDFs created from input PDFs that contained objects without embedded ICC profile.

Separation of RGB Gray vector and text objects

In RGB documents, gray objects will be made out of equal percentages of color on each of the RGB channels. In most cases, it is desirable to print gray vector and text objects by using **only** black ink.

If you activate the option **Process RGB Gray Objects as CMYK Black Channel Objects**, RGB Gray objects will be separated to CMYK objects with a pure K channel, that is, without using CMY. The resulting K value will be linear to the input RGB value.

This separation step is a pre-processing step, **before** the **Normalizing** and the **MX Processing** steps are applied. Resulting CMYK objects will not be tagged with an ICC profile, that is, it will be assumed that they are in the color space defined by the PDF output intent. The **Normalizing** rules as defined for vector and text objects in the hotfolder settings are fully applied, as for all other CMYK objects.

Note Do **not** use this option if you want to use an **RGB-to-CMYK** profile in the **MX Processing** step. In this case, if the option **Process RGB Gray Objects as CMYK Black Channel Objects** is **not** used, all RGB objects will be separated directly to the output color space by the RGB-to-CMYK profile. If the option is used and all RGB objects are separated to CMYK **before** processing, they will be **ignored** during the **MX Processing** step.

What does RGB Gray mean?

RGB Gray means that the **same** percentage is used on each channel.

Examples:

▼ [RGB = 0, 0, 0] converted to [CMYK = 0%, 0%, 0%, 100%]

▼ [RGB = 1, 1, 1] converted to [CMYK = 0%, 0%, 0%, 99%]

▼ [RGB = 128, 128, 128] converted to [CMYK = 0%, 0%, 0%, 50%]

The following color is **not** considered as RGB Gray, because not all channels have equal values:

▼ [RGB = 38, 37, 38] maintained as [RGB = 38, 37, 38]

7.2.4 Using ICC Based Normalizing

How to apply an ICC based normalizing

1. Create a new **job** or set up a new **hotfolder** (or edit the **Properties** of an existing job or hotfolder).

2. Click the **Flattening & Normalizing** button on the navigation panel on the left of the **PDF Hotfolder/Job** dialog box.

3. Click either the **Images** or the **Images** and **Vector & Text** tab. Generally, you will use the same settings for both **Images** and **Vector & Text**, that is, setting up **Images** is sufficient for most applications.

4. Select the color spaces of the input files for which you want to use the color management. Deselect the color spaces that you want to keep unchanged.
   Please note that a color conversion is not performed for color spaces that were not selected.

5. Select conversion rules for each selected input color space.

6. If you selected either option **Use the Following profile** or **Use Embedded Profile if Available, Else Use the Following Profile**, click the browse button and load the desired ICC profile.

7. Select the **Rendering Intent** for each profile. Default is **Perceptual**.

8. Select an **Output ICC Profile** for defining the target color space.

9. If you want to use different settings for the conversion of **Vector & Text**, click the **Vector & Text** tab and deselect the option **Use Same Settings as Images**. Repeat steps 4–8. (Not available if flattening is used.)

7.2.5 MX Based Normalizing

A **DeviceLink** profile such as an MX4 profile has been specifically designed for a color transformation from a defined **input** color space to a defined **output** color space. As the profile is created for one specific combination of an input and output device, the color transformation generally provides a very high quality. Information on the **black** channel is **maintained** during the transformation.

In contrast, standard **ICC profiles** use a device-independent intermediate color space, usually Lab, to link two device-dependent color spaces. In other words, standard ICC profiles are device independent. Two ICC profiles must be combined with each other to convert one color space to another. Information on the **black** channel is **lost** due to the use of the intermediate Lab space.

In the **Normalizing** step in GMG ColorServer, the **input** color space is the **original** color space of a PDF object, which can be defined by an **embedded ICC profile**. The normalizing **output** color space is defined by the **Output ICC Profile**. A **pair** of two distinct ICC profiles, for example, "Adobe RGB (1998)" and "ISO Coated v2 (39L)" is **device dependent**. Thus, a **pair** of ICC profiles could be replaced with **one** DeviceLink profile.

For doing this, select the option **Use MX4 DeviceLink Profiles instead of ICC Profiles** (**Flattening & Normalizing** > **MX4 Normalizing**). The software provides you with predefined **MX4 Normalizing Rule Sets** for all typical ICC profile combinations. You can also create your own rule sets or modify the predefined rule sets.

Rule sets are defined **globally** in GMG ColorServer and are available to all hotfolders. You also have the flexibility to define **different** rule sets for different hotfolders.

You can access and edit the rule sets from any hotfolder. If a rule set is updated, changes are applied to **all** hotfolders using the set.

Note An MX based normalizing requires ICC based normalizing settings on the **Images** page (**Flattening & Normalizing** > **Images**) as a fallback in case no matching rule set has been defined.

Generate Warning

You can generate a warning, if a PDF object has an **embedded** ICC profile, but no **matching** rule could be found in your MX4 normalizing rule sets. In this case, an ICC based normalizing as defined on the **Images** and the **Vector/Text pages** will be applied to the object.

See also:

- "MX4 Normalizing Rule Sets" on page 66

7.2.6 MX4 Normalizing Rule Sets

An MX4 normalizing rule set consists of fixed combinations of ICC profile pairs (input and output profiles) and analog DeviceLink MX profiles, which can be defined as 'rules'. You can, for example, define the rule, that all objects with the ICC input profile "Adobe RGB" and the output profile "ISO Coated v2 (39L)" are normalized with the MX separation profile "CS_sep_AdobeRGB_2_ISO39_TAC330_V3.mx4" as shown on the below screen shot.
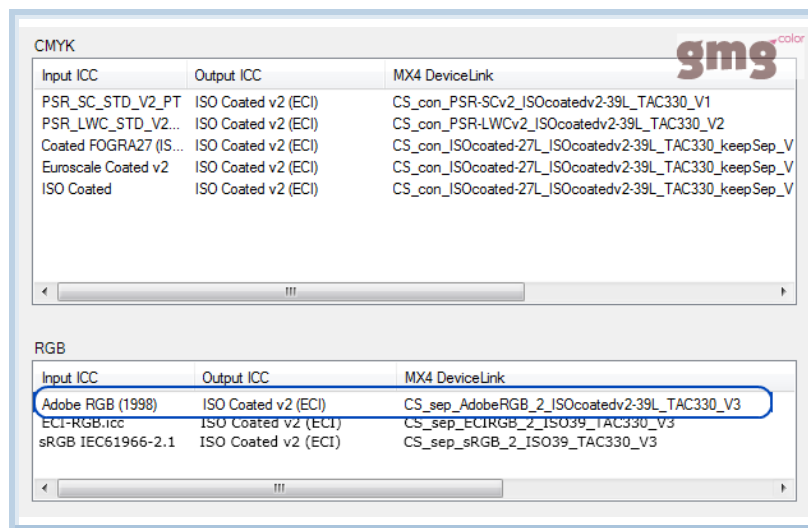
Fig. 26 MX4 Normalizing Rule Sets.

By using the above normalizing rule set, PDF objects in different input color spaces are all normalized to the same CMYK output color space: ISO Coated v2 (39L). Instead of using ICC profiles, **DeviceLink MX4 profiles** are used.

How do rule sets work?

Let us have a look at the **Images** tab (**Flattening & Normalizing** > **Images**), where the **Normalizing** settings are defined.
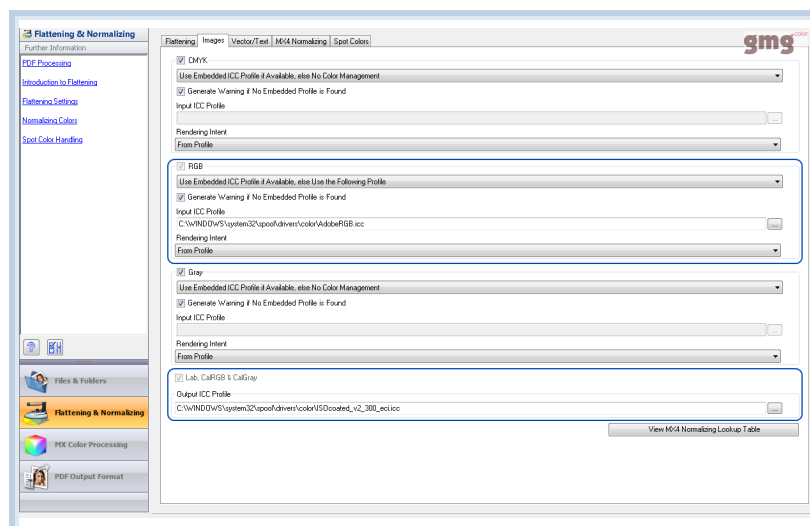
The normalizing rule for RGB objects defines that firstly, the program checks whether the object has an embedded ICC profile. The **embedded** profile defines the **input** color space. The **output** color space is defined by the **Output ICC Profile** (at the bottom of the **Images** page). In the screenshot, the output color space is "Isocoated v2 (39L)".

There are three different cases to be considered:

a. An RGB object has an **embedded** ICC profile, for example, **eciRGB**. The input and output ICC profiles now form a linked pair: "eciRGB–Isocoated v2 (39L)". The program checks whether a rule has been defined for that profile pair: In our preceding example table, this is true. Instead of using the two ICC profiles, the MX4 profile "CS_sep_ECIRGB_2_ISO39_TAC330_V3.mx4" is used for normalizing.

b. An RGB object has **no** embedded ICC profile, it is assumed that it is in the color space selected in the **Input ICC Profile** box (**Else Use the Following Profile**): **Adobe RGB (1998)**. The input and output ICC profiles now form a linked pair: "Adobe RGB (1998)–Isocoated v2 (39L)". The program checks whether a rule has been defined for that profile pair: In our preceding example table, this is true. Instead of using the two ICC profiles, the MX4 profile "CS_sep_AdobeRGB_2_ISO39_TAC330_V3.mx4" is used for normalizing. (If the option **Generate Warning if no Embedded Profile is Found** is selected on the **Images** page, the resulting job will be in the status **Warning**.)

c. An RGB object has an **embedded** ICC profile, for example, **eciRGB v2**. The input and output ICC profiles now form a linked pair: "eciRGB v2–Isocoated v2 (39L)". The program checks whether a rule has been defined for that profile pair: In our preceding example table, this is **not** true. Therefore, the two ICC profiles are used for normalizing. (If the option **Generate Warning if No Matching ICC Profiles Found** is selected on the **MX4 Normalizing** page, the resulting job will be in the status **Warning**.)

Note In the preceding example, it is assumed that the same normalizing settings are defined for **Images** and **Vector/Text**. As GMG ColorServer offers the flexibility to use different normalizing settings, please keep in mind that you might need to define further **MX Normalizing** rules to cover also the ICC profile pairs defined on the **Vector/Text** page.

Exporting / importing rule sets

Normalizing rule sets can be exported / imported together with a hotfolder or separately, from the **Hotfolder** menu (> **MX4 Normalizing Rule Sets**).

When exporting a rule set, you can either **link** or **embed** the referenced profiles. Embedding the profiles means that all MX profiles used within the rule set are added to the export archive. If you select the option **Link to Color Profiles**, no profiles are added to the archive and only the rule set is exported.

See also:

- "ICC Profile Pairs and Matching MX DeviceLink Profiles" on page 68
- "Normalizing Colors" on page 62
- "Spot Color Rule Sets" on page 69
- "Importing / Exporting Hotfolders" on page 29

7.2.7 ICC Profile Pairs and Matching MX DeviceLink Profiles

The following table gives you an overview which profile types can be combined with each other in **MX4 Normalizing Rule Sets**. If you missed a combination, resulting in a color space mismatch, you will be informed by a validation message.

Normalizing Purpose	Input ICC	Output ICC	MX4 DeviceLink
RGB-to-RGB conversion:	RGB	RGB	RGB-to-RGB MX4
RGB-to-CMYK separation:	RGB	CMYK	RGB-to-CMYK MX4
CMYK-to-CMYK conversion or reseparation:	CMYK	CMYK	CMYK-to-CMYK MX4

Note You could achieve the same MX4 based RGB-to-RGB conversion, RGB-to-CMYK separation, or CMYK-to-CMYK conversion or reseparation either in the **Normalizing** step (by using the **MX4 Normalizing Rule Sets** or in the **MX Color Processing** step (by using a **ColorServer** profile). For print business applications, it is generally recommended to separate all objects to the same CMYK color space, for example, "ISO Coated v2 (39L)", during the **Normalizing** step by using the **MX4 Normalizing Rule Sets**. Apply a CMYK-to-CMYK conversion or reseparation (if required) in the **MX Color Processing** step.

The option **Use Printer Calibration** is **not** supported in MX4 profiles used for **normalizing**, because no printer calibration is used during the normalizing step. If a validator message informs you about such an issue, you need to select another profile for normalizing.

Advanced Info You could open the profile in GMG ProfileEditor to check for the status of the **Use Printer Calibration** option. (Please note that if you deactivate this option, this will change the behavior of the profile, resulting in an invalid profile.)

Matching with embedded ICC profiles

To ensure a fail-safe conversion, an **exact** match of an **embedded** profile with an ICC profile specified in the **rule sets** is required. The values in the profile are checked via a checksum. If the profile was changed in any way and differs from the standard profile, it will not be matched with the profile in the rule set, even though, for example, the profile name is the same.

For an easy exchange of rule sets between different computers, only ICC profile checksums are saved in the rule sets. As the selected ICC profile is not used for color management, the file itself and its file path are not required anymore once a rule has been created. You can export rule sets and import them on another computer. As the MX profiles are actually used for color management, the MX profile path must be available on the target computer.

7.3 Spot Colors

Spot colors can be left **unchanged** or converted to **CMYK**. Usually, you convert a spot color to CMYK if you do four color process printing (instead of spot color printing).

With the option **Use Spot Color Rule Set**, you can define rules how special spot colors should be handled **before** they are processed. You can also define spot colors that should be excepted from any processing.

Available options	Short description	See also
Cancel Job (Error)	Input PDFs containing **spot color** objects are **rejected** and not processed. The job will be considered an **Error Job** and the unprocessed input PDF will be handled as defined under **Files & Folders** > **Errors & Warnings**.	
Keep Spot Colors Unchanged	Spot color objects are **not** normalized, **not** flattened, **not** color managed (**MX Color Processing**), **not** sharpened and **not** resampled (**PDF Output Format** > **Images**).	
Use Gradation Correction for Spot Colors	A **Gradation Correction** (sfg file) is applied to all spot colors. You will only need one print sample and one iteration of the profile. This option is ideal if all spot colors show a similar dot gain behavior.	"Using a Gradation Correction for Spot Colors" on page 70
Convert Spot Colors to CMYK (Normalizing Color Space) using Spot Color Sets	For **conventional printing** methods. Spot colors are converted to CMYK **before** the **Flattening** step. Spot colors are converted to the **Normalizing** color space as defined in the spot color database and are then processed together with the original process colors. Make sure the **Gamut** used in the spot color database matches the **Normalizing** color space, for example, "Fogra39L_IsoCoated_V2_eci.csc".	"Converting Spots to CMYK Using Spot Color Sets" on page 72
Convert Spot Colors to CMYK (Output Color Space) using Spot Color Sets	For **digital printing** methods. Spot colors are converted to CMYK **following** the **Normalizing** step. The **MX Processing** step is skipped, i.e. spot colors are converted directly to the output CMYK as defined in the spot color database. The selected **Printer Calibration** (if any) is applied. Make sure the **Gamut** used in the spot color database matches the output color space, which is generally described by the **printer's gamut**.	"Converting Spots to CMYK Using Spot Color Sets" on page 72
Convert Spot Colors to CMYK Using CMYK Values from PDF	Spot colors are converted to CMYK by using the alternative CMYK values stored in the original PDF.	

See also:

- "Spot Color Rule Sets" on page 69
- "Converting Spot Colors to CMYK" on page 71

7.3.1 Spot Color Rule Sets

Special handling of spot colors by using a rule set

A spot color rule set allows you to define multiple rules how special spot colors should be handled before the **Normalizing** step.

If the option **Use Spot Color Set Rule** on the **Flattening & Normalizing** > **Spot Colors** page is selected, the input PDF will be scanned for spot color objects using the spot color channel names defined in the selected rule set. All affected objects are modified according to the rules specified in the set.

Following this, the (new) spot color objects in the PDF will be processed as defined on the **Flattening & Normalizing** > **Spot Colors** page. For example, if the option **Keep Spot Colors Unchanged** is selected, spot colors are not processed any further. If the option **Convert Spot Colors to CMYK (Normalizing Color Space) using Spot Color Sets** is selected, spot colors will be converted to CMYK. Spot colors to which the rule **Keep Unchanged** applies are not processed, regardless of the selected processing options.

Available rules	Description
Keep Unchanged	Objects using this spot color are **not** normalized, **not** flattened, **not** color managed (**MX Color Processing**), **not** sharpened and **not** resampled (**PDF Output Format** > **Images**).
Remove	Objects using this spot color are removed from the PDF.
Replace with	The spot color is mapped to an alias color. For example, you can map a spot color named "Blue" to "Pantone Reflex Blue". The spot color is then processed as defined on the **Flattening & Normalizing** > **Spot Colors** page.

Creating spot color rule sets
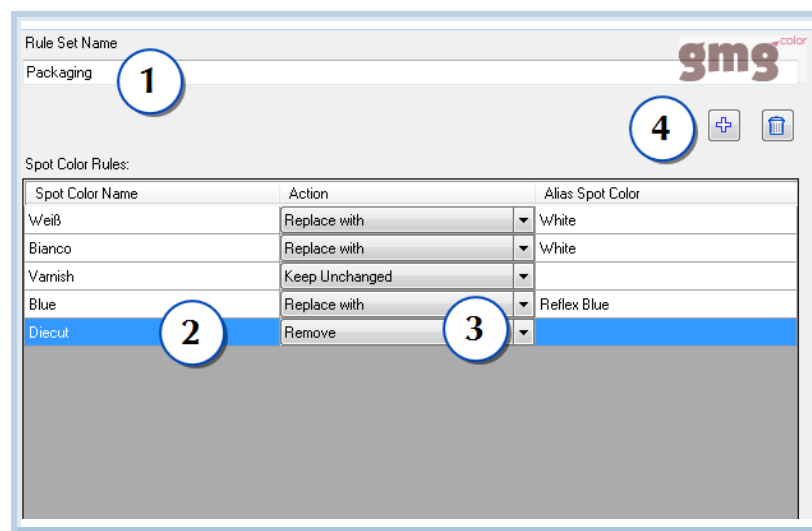
Fig. 27 Creating a spot color rule set.

The example screen shot shows a spot color rule set for a packaging application. The rule set is used in combination with the option **Convert Spot Colors to CMYK (Normalizing Color Space) using Spot Color Sets**.
You can define multiple sets. The top left shows the name of the spot color rule set (1).
The list shows the rules defined in the set. The **Spot Color Name** (2) is the spot color channel name as it appears in the input PDF. The **Rule** (3) defines how the spot color should be handled before the **Normalizing** step.
If you want to add further rules or delete existing rules, you can use the buttons on the right side (4).
According to the **Packaging** spot color rule set, all objects with the spot color "Diecut" will be removed from the PDF. These objects are no printable objects, but information only for the cutter.
The printing machine can print gloss. Gloss is defined by the color "Varnish". Of course, a varnish needs no color management, so the color "Varnish" should not be processed at all. Therefore, the color "Varnish" will be kept unchanged. (Even if it should be matching with a spot color from the spot color database.)
The printing machine is also able to print white ink. Therefore, the colors "Weiß" and "Bianco" are replaced with the color "White". As the selected spot color database does not contain a spot color named "White", the spot color will not be processed.
The rather unspecific spot color name "Blue" will be replaced with "Reflex Blue". There is a match for "Reflex Blue" in the selected spot color database. Therefore, "Reflex Blue" will be converted to CMYK.

Using spot color rule sets

Rule sets are defined **globally** in GMG ColorServer and are available to all hotfolders. You also have the flexibility to define **different** rule sets for different hotfolders.

You can access and edit the rule sets from any hotfolder. If a rule set is updated, changes are applied to **all** hotfolders using the set.

One hotfolder can use one rule set. You can select a spot color rule set for a hotfolder on the **Flattening & Normalizing** > **Spot Colors** page.

See also:

- "Spot Colors" on page 68

7.3.2 Using a Gradation Correction for Spot Colors

For most spot color applications, it is only required to print the spot color as full-tone (100%) color. If you, however, want to print spot color gradations, you can do so by easily linking a spot color gradation file to the hotfolder.

A gradation correction file can be created in GMG SpotColor Editor and is saved as an sfg file.

How to a link a gradation correction to a hotfolder

1. On the navigation panel of the **PDF Hotfolder** dialog box, click **Flattening & Normalizing**. Click the **Spot Colors** tab.

2. From the drop-down list, select the option **Use Gradation Correction for Spot Colors**.

3. Click the browse button on the right side of the edit box and select the sfg file.
   The selected gradation file is now applied to all spot colors.

7.3.3 Converting Spot Colors to CMYK

Note If spot colors are converted to CMYK, all **Preserve Overprint** options (> **Flattening Settings**) are not available anymore to prevent potential undesired flattening effects.

Two different methods are available for converting spot colors to CMYK.

Conventional printing

You can convert spot color objects to the **Normalizing** color space and apply **MX Color Processing** to all objects.

In the illustrated example, the **input** PDF contains transparent CMYK objects (1) and spot color objects (2). Spot colors are handled separately from process colors.
RGB and CMYK objects are normalized.
Spot color objects with the **Overprint** attribute are converted to **transparent** objects using the blending mode **Multiply** of the Flattener (not shown in the illustration). Following this, spot colors are converted to CMYK (3) either by using spot color sets (SC) as shown in the illustration or by using alternative CMYK values from the PDF.
After normalizing (process colors) and conversion to CMYK (spots), all objects are **CMYK** objects. The CMYK color channels from the spot colors are merged together (4) with the original process color channels before the flattening step.
After flattening, **all** CMYK objects will be color managed with the selected ColorServer (CS) and InkOptimizer (IO) profiles.
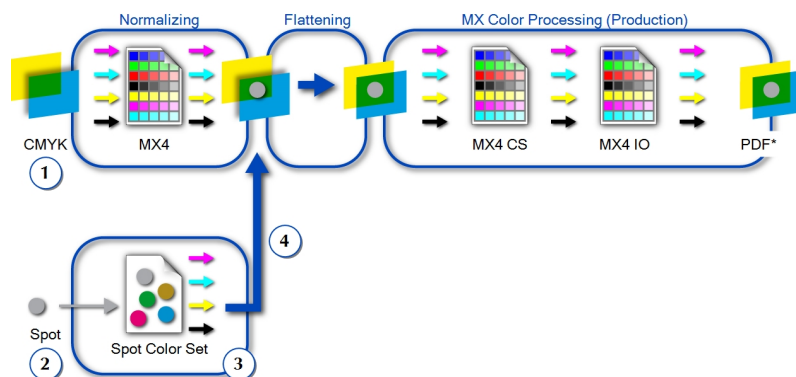
Fig. 28 Options: Convert Spot Colors to CMYK (Normalizing Color Space) using Spot Color Sets / Convert Spot Colors to CMYK Using CMYK Values from PDF.

Digital printing

You can convert spot color objects directly to the output color space (= color space of the printer) instead of restricting the conversion to the normalizing color space. The **MX Color Processing** step is applied only to process color objects.

In the illustrated example, the **input** PDF contains transparent CMYK objects (1) and spot color objects (2). Spot colors are handled separately from process colors.

The spot color conversion mode **Convert Spot Colors to CMYK (Output Color Space) using Spot Color Sets** has been selected. Spot color objects are maintained until the final processing step. Spot colors are converted to the **output CMYK** color space, **after** the **MX Color Processing** step. Spot color objects with the **Overprint** attribute are converted to **transparent** objects using the blending mode **Multiply** of the Flattener (not shown in the illustration). Following this, spot colors are converted to CMYK (3) by using spot color sets (SC) as shown in the illustration. (The feature is not available for alternative CMYK values from the PDF, as these values do not take the printer color space into account, which is important for digital printing.)

To flatten the former spot color objects, an **additional** flattening step is required. The CMYK color channels from the spot colors are merged together (4) with the original process color channels.
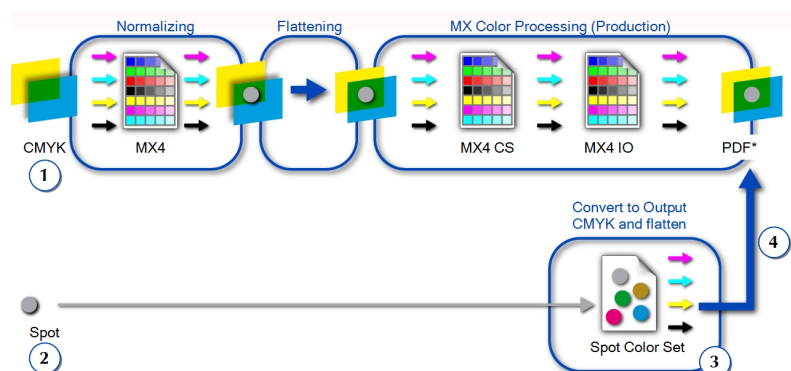
Fig. 29 Option: Convert Spot Colors to CMYK (Output Color Space) using Spot Color Sets.

7.3.4 Converting Spots to CMYK Using Spot Color Sets

A **Spot Color Set** holds all information required for converting **spot colors** to **CMYK** according to a certain **print standard**. For example, the spot color set **PANTONE® GOE coated - ISOcoatedv2-39L** includes all spot colors of the **PANTONE® GOE coated** set for **ISOcoatedv2-39L**.

Different spot colors are organized in different spot color sets (PANTONE® GOE coated, DIC Color Guide®, HKS, etc.). Spot color sets are saved to **db3** spot color databases.

You can set up your own spot color sets and spot color profiles in the separate program GMG SpotColor Editor.

In GMG ColorServer, db3 spot color databases are **linked** to a hotfolder. This presents a very flexible method of spot color handling. When you update a db3 spot color database, **all** hotfolders linked to the database are updated **immediately**. Thus, you can globally manage your spot colors in a central database.

Conventional printing methods

Factory-default spot color databases for conventional printing methods can be found in the **ColorServer SpotColors** subfolder of the main program folder (default path: *<installation path>\ColorServer SpotColors*). All spot color sets for a specific print standard can be found in one **db3** spot color database. For example, the spot color database **SpotColors_ISOcoatedv2-39L.db3** contains all spot color sets for **ISOcoatedv2-39L**.

Advanced Info The print standard is defined by the **Gamut** used by the spot color profile in the spot color database, for example, "Fogra39L_IsoCoated_V2_eci.csc".

If you are using a **CMYK-to-CMYK Conversion** profile in the following **MX Color Processing** step, select the spot color database matching the **input** color space of the conversion profile, that is, the **Normalizing** color space you have defined in the hotfolder. On the **Flattening & Normalizing** > **Spot Colors** page, select the option **Convert Spot Colors to CMYK (Normalizing Color Space) using Spot Color Sets**.

Example: If you are using a ColorServer profile for a conversion from **ISO Coated v2 (39L)** to **ISO Web-Coated (28L)** (**CS_con_ISO39_2_ISO28_TAC300_V1.mx4**), use **ISOcoatedv2-39L** spot color sets for converting spots to CMYK. The spot colors will be converted to **ISO Coated v2 (39L)** before flattening and will then be processed by the conversion profile in the **MX Color Processing** step.

Digital printing methods

If you are using GMG SmartProfiler, a **db3** spot color database is created automatically when you are creating a new printer–medium combination.

One **db3** spot color database holds all information required for the color management of **spot colors** for a certain printer–medium **combination**. This means that you will need a separate db3 for each printer–medium combination.

Advanced Info The printer–medium combination is defined by the **Gamut** used by the spot color profile in the spot color database, which generally is described by the **printer's gamut**.

Select the spot color set for the print standard you want to simulate on your digital printing machine, that is, the **Normalizing** color space you have defined in the hotfolder. On the **Flattening & Normalizing** > **Spot Colors** page, select the option **Convert Spot Colors to CMYK (Output Color Space) using Spot Color Sets**. The **Normalizing** and **MX Processing** steps are skipped, but the selected **Printer Calibration** (if any) is applied.

Note When using the option **Convert Spot Colors to CMYK (Output Color Space) using Spot Color Sets**, input files will **always** be flattened **twice** (once during the **Normalizing** step, once when resolving spot colors). Flattening will **increase** the processing time.

Spot color mapping

Spot color objects are matched with spot colors from the selected spot color sets (matching by name). Each spot color is thus converted to CMYK utilizing the spot color profile of the matching spot.

GMG ColorServer tries to map a channel name in a document to a spot color name in a spot color set. The **Spot Color Priority** defines the order of sequence in which the spot color libraries are searched.

The first exact match is used. If no exact match exists, GMG ColorServer tries to map the channel name to a similar spot color name and uses the "best match". For example, a PANTONE **CVC** color will be mapped to a PANTONE **C** color.

Note Using the "best match" increases the automation of GMG ColorServer. However, it could potentially lead to undesired effects and colorimetrically incorrect results. Please always check the spot color mapping.

Note If the option **Use Alternative CMYK Value from PDF if Spot Color not Found in Spot Color Sets** has not been selected and **no** matching spot color is found in the spot color sets assigned to the hotfolder, the processing of the PDF will be **canceled** (job status: **Error**).

See also:

- "Converting Spot Colors to CMYK" on page 71
- "Linking Spot Color Sets to a Hotfolder" on page 73
- "Creating a New Spot Color Set" on page 74

7.3.5 Linking Spot Color Sets to a Hotfolder

You can conveniently link multiple spot color sets from multiple spot color databases to a hotfolder.

All spot color sets in the **Spot Color Sets** list must be **unique**, that is, the same spot color set from the same spot color database (db3) file cannot be listed twice. If the same spot color database is imported a second time, only new (unlisted) spot color sets are added to the list. (It is, however, possible to add spot color sets with the same name from two **different** db3 files.)

The order of sequence in the **Spot Color Sets** list is also the order of **priority**. When a spot color is converted to CMYK, GMG ColorServer automatically searches the spot color sets linked to the hotfolder for matching spot color **channel names**. This matching procedure adheres to the sequence in which the sets are listed (from top to bottom), using the first exact match.

How to link spot color sets to a hotfolder

1. From the drop-down list, select the option **Convert Spot Colors to CMYK (Output Color Space) Using Spot Color Sets** (1).

2. Click the + button (2) on the right side and select a db3 file.
   All spot colors sets in the db3 file will be listed.

3. Deselect all spot color sets you do not want to use for this hotfolder and click **OK** to link the spot color sets to the hotfolder.
   All selected spot color sets will be added to the **Spot Color Sets** list.

4. Select a spot color set from the list (3) to change its priority or to delete it.

5. Use the arrow buttons on the left (4) to move the list items up or down, thus changing the priorities according to which the sets are searched.

6. As a fallback option, you can also define that unmatched spot colors will be converted to CMYK by using the alternative CMYK values from the PDF (5).
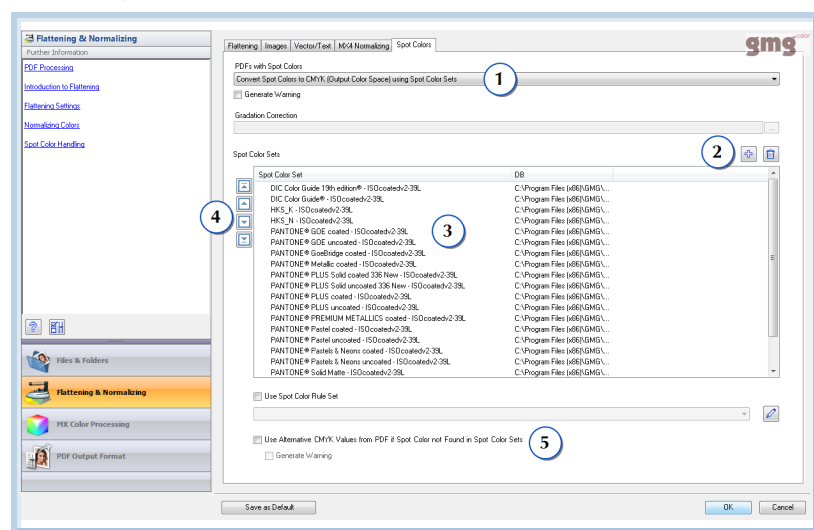
Fig. 30 Option Convert Spot Colors to CMYK (Output Color Space) Using Spot Color Sets.

7.3.6 Creating a New Spot Color Set

This chapter outlines the creation of a new spot color set. For each spot color in the set, you need to create a spot color profile in GMG SpotColor Editor.

How to create a spot color set

1. On the **Options** menu, click **SpotColor Editor** to start GMG SpotColor Editor.

2. Load an existing db3 spot color database into GMG SpotColor Editor (**File** > **Open External Database**).

3. On the **Edit** menu, click **Add New Spot Color Set**.

4. Click the set name (default name: Set_1) in the tree view of the database until the insertion point appears and **rename** the spot color set. It might be useful to mention the supported medium in the name.

5. If you want to use the advantages of a printer calibration for this spot color set, select the option **Calibrated Spot Color Set**.
   The new spot color set is empty and you can now add any number of spot colors you like.

How to create a spot color

1. Select the spot color set you want to add spot colors with the mouse. On the context menu, click

Add New Spot Color.

2. Repeat step 1 until the spot color set is complete.

How to create a spot color profile

A spot color profile needs to be calculated for **each** spot color in the set.

Note As the spot colors converted to CMYK by using spot color sets are merged together with the original process color channels **before** the **MX Color Processing** step, the spot color sets need to convert spot colors to the **input** color space of the **MX Color Processing** step.

Note The separation mode **Inkjet Mode** should be used for **all** spot color sets for use with GMG ColorServer.

1. For **each** spot color in the set, enter the characterization data (provided by the spot color manufacturer or measured from a print sample) as **Target Values** for all required fulcrums. A single fulcrum at 100 is sufficient for most use cases.

2. Delete all unused fulcrums.

3. To each spot color, link the **gamut** file corresponding to the **input** color space for the **MX Color Processing** step, for example, Fogra39L_IsoCoated_V2_eci.csc.

4. From the **Separation** mode list, select **Inkjet Mode**.

5. Calculate the **output** values (**Calculate with Target Values**).

6. **Save** the (db3) database file.

How to optimize the profile by an iteration cycle

Optional step: For **each** spot color in the set, you could optimize the profile in an **iterative** process (cycle) to achieve an even higher profile quality. However, the profile quality achieved by calculation alone in GMG SpotColor Editor is generally sufficient for most applications. To save costs, GMG Color GmbH & Co. KG recommends **not** optimizing spot color profiles for use with GMG ColorServer. We want to mention this procedure only as an advanced option.

If you decide to optimize the profile, you will need to process the test chart with **exactly** the same settings you will use later for production. It is recommended to set up a **hotfolder** with all required **MX Color Processing** settings and with the new spot color set first.

Note The appearance of a spot color is defined by the spot color profile from the set, the **MX4** profile used in the **MX Color Processing** step, and the **printer calibration** file (if used). Please calibrate the printer and check the quality of the MX4 profile and of the printer calibration **before** optimizing a spot color profile.

1. In GMG ColorServer, create a job with the spot color test chart GMG_SpotColor_<measuring device>.tif from the **Testcharts** subfolder with the new spot color (or last version of the spot color). (Use the **MX Color Processing** settings and profiles you want to use together with the spot color set.)

2. Print the **processed** PDF on the target printer or press.

3. In GMG SpotColor Editor, measure the test chart with an external measuring device: On the **Measure** menu, click **All Current Values**. (You can also measure individual patches by pressing the M key.)

4. If **Delta E** values are too high, recalculate the profile: On the **Measure** menu, click **Calculate with Target and Current Values**.
   The measured values will be compared to the target values. Output values will be adjusted accordingly.
   The target values will be computed with the gamut file to produce the output values of the profile.

5. **Save** the (db3) database file.

6. Repeat steps 1 to 5 until the deviation (Delta E) between **Target Values** and **Current Values** meets your requirements.

See also:

- "Converting Spot Colors to CMYK" on page 71
- "Converting Spots to CMYK Using Spot Color Sets" on page 72
- "Profile Types" on page 18

8. About MX Color Processing
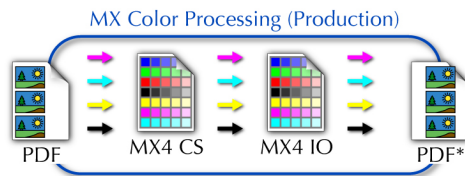
The MX color management is the core of the GMG ColorServer program.

An MX4 DeviceLink profile is optimized for the specific input color space (after normalizing) of an object and for the color accurate output on the printer or press as defined by the target printing process or standard.

Select an **MX Color Processing Method** to convert the normalized color space into the final target color space.

Available options	Short description	See also
ColorServer	**ColorServer** performs fully automatic color space conversions from one color standard to another. Profile types: **CMYK-to-CMYK Conversion**, **RGB-to-CMYK Separation**, **RGB-to-RGB Conversion**, or **CMYK-to-CMYK Reseparation**.	"GMG ColorServer" on page 78
InkOptimizer	Using sophisticated ink reduction algorithms, a DeviceLink transformation (CMYK-to-CMYK) is applied. In contrast to ICC solutions, the integrity of the black channel is preserved. The quantity of CMY inks is reduced and the proportion of black ink simultaneously increased, while maintaining an identical color impression. Profile type: **InkOptimizer**.	"InkOptimizer" on page 78
Conventional Printing	You can **combine** ColorServer **and** InkOptimizer conversions in a **single** hotfolder. In addition, you can also use a **Compensation Curve** to compensate normal deviations of the CTP RIP.	"GMG ColorServer" on page 78 "InkOptimizer" on page 78 "Dot Gain Compensation" on page 81
Digital Printing	You can **combine** ColorServer **and** InkOptimizer conversions in a **single** hotfolder using two processing steps (two different profiles). In addition, you can also use a **Printer Calibration** to compensate normal printer deviations. **Note:** This is only possible within GMG ColorServer. If the hotfolder is used with GMG SmartProfiler, only the profile loaded under **Processing Step 1** can be applied.	"GMG ColorServer" on page 78 "InkOptimizer" on page 78 "Using a Printer Calibration" on page 80

Note To keep objects using only the K channel pure, using the options **Process Grayscale Images as CMYK Black Channel Images** or **Process Black Vector/Text Elements** is generally **not** recommended. Please take into consideration that **Normalizing** or **Flattening** processing might already have lead to a chromatic composition of K objects. As a result, these options would not apply anymore to those objects. You can select the option **Preserve Overprint Black for Vector/Text** elements in the **Flattening Settings** (on the **Flattening & Normalizing** page) to make sure black overprinting vector/text elements will remain unchanged.

You can use a separate profile for color managing images and vector/text objects.

Advanced Info If you do **not** want to color manage vector/text objects, you can always select a **linear** profile for processing. A linear profile does not change the input color values. Default path for linear ColorServer profiles: *<installation path>\reference profiles\ColorServer Profiles\Profiles_Linear*

8.1 GMG ColorServer

GMG ColorServer offers high-quality color management for **offset**, **gravure**, and **digital printing** using DeviceLink MX4 profiles for multiple applications.

◀ **CMYK-to-CMYK** conversion or reseparation, digital production

◀ **RGB-to-CMYK** separation, digital production

◀ **RGB-to-RGB** conversion

Note GMG ColorServer Digital supports using ColorServer profiles only of the type **digital production profile** in the **MX Processing** step.

Note When using an RGB-to-CMYK or an RGB-to-RGB profile, all CMYK objects will be ignored. When using a CMYK-to-CMYK profile, all RGB objects will be ignored. You can use normalizing to normalize all objects to a common color space before the **MX Processing** step.

Note As a PDF does not contain any RGB objects anymore after **flattening**, an **RGB-to-CMYK** separation or an **RGB-to-RGB** conversion is only possible **without** flattening. (However, you can define an MX based **RGB-to-CMYK** separation during the **Normalizing** step by using **MX4 Normalizing Rule Sets**.)

See also:

- "Profile Types" on page 18
- "CMYK-to-CMYK Conversion" on page 19
- "CMYK-to-CMYK Reseparation" on page 19
- "RGB-to-CMYK Separation" on page 19
- "RGB-to-RGB Conversion" on page 19
- "Digital Production Profiles" on page 20
- "MX Based Normalizing" on page 65

8.1.1 TAC Limitation

You can apply a **CMYK-to-CMYK reseparation** by using a TAC limiting profile in the **MX Color Processing** step.

If you are using **flattening**, it is recommended to **always** apply a **CMYK-to-CMYK reseparation** in the **MX Color Processing** step to compensate a potential TAC increase when transparencies are resolved during the **Flattening** step.

You can find factory-default reseparation profiles for all widely used print standards in the **Reseparation Profiles** subfolder (default path: *<installation path>\reference profiles\ColorServer Profiles\Reseparation Profiles*).

InkOptimizer profiles always include a TAC limitation. So if you are using an InkOptimizer profile, an additional TAC limitation by using a **ColorServer** profile is not required.

See also:

- "Flattening and TAC" on page 52

8.2 InkOptimizer

With GMG InkOptimizer, you can optimize the **color composition** of printing data for a specific **printing condition**, for example, ISO Coated v2 (39L) and for a specific **Total Area Coverage** (TAC).

UCR/GCR settings defined within a InkOptimizer profile are applied. CMY color components are replaced by black while exactly retaining the color impression.

When and why should I use an InkOptimizer profile?

We recommend using an InkOptimizer profile for **web** and **sheetfed offset**, and **gravure** printing applications for the following reasons.

- Up to 20% **ink savings** (depending on the printing process and the medium)
- ◀ Improved and stabilized **gray balance**
- ◀ If documents from different sources are **combined** on the press, InkOptimizer makes it easier to **harmonize** the colors. Tweaking a single color channel will have only minor effects on the gray balance.
- ◀ Improved **drying times** and run **performance**, allowing for a higher printing **speed**, especially for newspaper printing or for printing on media with a lower ink uptake

See also:

- "Profile Types" on page 18
- "InkOptimizer Profiles" on page 20
- "Ink Saving Report" on page 79

8.2.1 Ink Saving Report

Note Some of the features described in the following are not included in the standard GMG ColorServer version and require an additional license (GMG InkOptimizer, GMG SmartProfiler, GMG FlawFinder or GMG ProfileEditor). Please contact your local dealer for details.

Ink saving solutions usually guarantee to reduce the ink consumption up to a certain degree, depending on the printing process and the used media, but what is the actual monetary benefit for the printing process and media you are using? Find out with our **Ink Saving Report Tool**.

The GMG Ink Saving Report Tool is a small external tool that calculates the savings you can achieve with GMG InkOptimizer. You can track these savings and create **Ink Saving Reports** for all PDF hotfolders in GMG ColorServer.

8.2.2 Creating an Ink Saving Report

In a PDF hotfolder, you can check the monetary benefit of GMG InkOptimizer profiles by selecting the option **Calculate Ink Savings**. If enabled, this option automatically creates ink saving calculations of all files processed by this hotfolder. These calculations are loaded and presented by the GMG Ink Saving Report Tool and can be individually managed and printed.

Note Using this option requires ripping of vector objects and intense calculations, depending on the number and complexity of vector or PDF objects. The processing time is **increased**. Jobs will stay longer in the job list, even though the output PDF might already be sent to the output folder. This option also affects the **overall computer performance**.

Note Processing steps following GMG ColorServer such as gradation corrections applied in CTP RIP software might also affect ink consumption. The ink saving report can provide **only** an **approximation** of the actual ink savings.

How to create Ink Saving Files

1. From the Windows Start Menu, start GMG ColorServer.
2. **Open** the hotfolder which you want to use to determine your potential ink savings.
3. Click the **MX Color Processing** button on the navigation panel on the left of the **PDF Hotfolder** dialog box.
4. Select an **MX Color Processing Method** which features GMG InkOptimizer profiles.

5. Click the browse button and load the desired **InkOptimizer** profile.

6. Enable the option **Calculate Ink Savings**.
    As long as the option is enabled, all input files undergo an ink saving calculation. After having processed the desired quantity of files, you can use the GMG Ink Saving Report Tool to view your potential savings and create an **Ink Saving Report**.

How to create an Ink Saving Report

1. From the Windows Start Menu, start the GMG Ink Saving Report Tool.
    The main page of the tool is displayed showing a statistics table with all processed jobs of the day.

2. Use the **calendar** caption on the toolbar to modify the **time range**.

3. Click the **Hotfolder Filter** on the right side of the toolbar and select the hotfolder which you want to assess.

4. On the **Edit** menu, select **Settings**.
    The **Settings** dialog box is displayed, containing the parameters on which the ink saving calculations are based.

5. **Edit** the default settings according to your specific situation to render the calculations more accurate.

6. Click **Save** to confirm your changes.

7. On the main page of the tool, click the **Create Report** button.
    The data of the statistics table is computed and channeled into an informative cost calculation.

For each job, the statistic shows the amount of ink used for each separation **without** GMG InkOptimizer profiles (C/M/Y/K orig) and **with** GMG InkOptimizer profiles (C/M/Y/K opt). The **Savings** are listed in percent and in the selected currency.

8.3 Using a Printer Calibration

For **digital printing**, we recommend calibrating your digital presses on a regular basis. Combined with MX4 color management profiles, a regular printer calibration ensures a consistent representation of colors. Undesired printer deviations caused by varying environment conditions such as temperature and humidity are counterbalanced.

An MX3 printer calibration fine-tunes the CMY channels so that normal printer deviations are **compensated** and print results are **stabilized**.

When using the **Printer Calibration** option (PDF hotfolder: **MX Color Processing** > **Digital Printing >>** **Printer Calibration**), you need to create one printer calibration file for each printer–medium combination you are going to use. You can then easily recalibrate your printer on a regular basis.

If you do not want to use an MX3 printer calibration, you can also calibrate the **ColorServer** MX4 profile used in the **MX Color Processing** step.

Note **InkOptimizer** profiles cannot be used to calibrate a printer.

Note The MX3 printer calibration must be of the profile type **CMYK Conversion Profile**.

Note Information for advanced users: The option **Use Printer Calibration** needs to be selected in the MX4 profile (**Common** > **Profile Properties**) used together with the MX3 printer calibration. If no printer calibration file is used, the **Printer Gradation** from the MX4 profile (**more Parameters** > **Printer Gradation**) is used instead. If you are using GMG SmartProfiler, GMG SmartProfiler will make sure that the profile settings are correct.

- "Supported Profile Combinations" on page 20

8.3.1 When and Why Should I use a Printer Calibration?

We recommend using a printer calibration for **digital printing** applications in general for the following reasons.

◄ You can use a **single** printer calibration file together with multiple MX4 color profiles. This means, you only need to calibrate your printer–medium combination once and then use it in **multiple** hotfolders. This helps to save valuable time and media.

◄ As test charts for printer calibrations have fewer patches, they are **smaller** than test charts for color profiles. Thus, you need less time and media to calibrate a printer than to iterate a profile.

◄ The **gray balance** is already optimized in the printer calibration, leading to a very stable gray axis.

In general, you should **not** use a printer calibration in the following cases.

◄ For **validation prints** on **toner-based** printers: The color space of the printer–medium combination is larger without a printer calibration.

◄ For **offset** or **gravure** printing, you might consider to use GMG PrintControl for process control.

8.4 Dot Gain Compensation

If the **Conventional Printing** processing method has been selected, you can use a **compensation curve** created by GMG PrintControl to compensate for any normal deviations of the CTP RIP (PDF hotfolder: **MX Color Processing** > **Conventional Printing** > **Compensation Curve**).

This way, you do not need to import compensation curves into the RIP anymore, as GMG ColorServer will now take care of the entire color management process. Furthermore, you will be much more flexible because you can use **different** compensation curves optimized for different printing conditions by using multiple GMG ColorServer hotfolders without changing any RIP settings.

The link to the compensation curve file is a **live** link, meaning that any changes applied to the file are immediately effected in GMG ColorServer.

Supported compensation curves use the file name extension ".txt".

9. About PDF Output Format

In this section, you can define settings to **optimize** your PDFs and reduce the file size by **compressing images**.

All images within the input resolution range can be resampled to a custom output resolution. Choose between three interpolation methods: **Nearest Neighbor**, **Bilinear** or **Bicubic** Interpolation.

Use the slider to apply **3D Sharpness**. 3D Sharpness is a resolution dependent sharpening tool providing you with high-quality sharpening effects.

Furthermore, you can specify the **PDF version** of the created file (e.g. 1.4).

On the **PDF** tabbed page, you can add a PDF/X output intent as defined by ISO standards. Augment your metadata by adding information on the output condition of the PDF or any other useful information.

9.1 Image Processing

GMG ColorServer provides many settings for **optimizing** PDFs and reducing the file size by **compressing** or **resampling** images in the document. You can define an input resolution range to identify all images that should be resampled.

Available options	Description	See also
Image Compression	Method used for image compression in the output PDF.	"Compressing Images" on page 82
Resample All Images in the Following Range	Changes image resolutions in the range defined by **Minimum** and **Maximum** to the specified **Output Resolution** by using the specified **Interpolation** method.	"Resampling Images" on page 83
Interpolation	Method used for removing pixels from an image when **downsampling** or for adding pixels when **upsampling** an image.	"Resampling Images" on page 83
Sharpen	Easy-to-use and highly efficient sharpening tool. It works **resolution dependent** and in **multiple steps** for producing high-quality sharpening effects. You can define the sharpening level **separately** for RGB and CMYK/Gray images.	"Sharpening Images" on page 83
Use Dither	If **Use Dither** is enabled, a small amount of **noise** is added during the conversion process to ensure smoother transitions between the colors. Especially images with 8 bits per channel often trigger errors which are no more than the inevitable rounding errors accumulating when computing the conversion. These are hardly noticeable on textured parts of an image, but can be seen in smooth gradations which can appear blocky or banded without dithering. **Note:** Dithering is applied **only** to conversions with **MX profiles**, not with ICC profiles. It is therefore recommended to use MX based normalizing.	

9.1.1 Compressing Images

The **Image Compression** options on the **Images** tabbed page specify if and how **image** objects in a PDF should be **compressed**.

Tip As **ZIP** is a **lossless** compression method, it does not affect the image quality. As compression can dramatically decrease the **file size** (depending on the image objects and structures), using a compression is generally recommended.

Available options	Description
No Compression	Images are **not** compressed in the output PDF, resulting in a **higher** file size.
Retain Existing	Preserves the image compression settings from the input PDF.
ZIP	**Lossless** compression method. Works well on images with large areas of single colors or repeating patterns, and for black-and-white images containing repeating patterns.
JPEG	Lossy compression method, which means that it removes image data and may reduce image quality; however, it attempts to reduce file size with a minimum loss of information. Because **JPEG** compression eliminates data from an image, it can generally achieve a smaller file size than **ZIP** compression.

9.1.2 Resampling Images

The **Resampling Images** options on the **Images** tabbed page specify if and how **image** objects in a PDF should be resampled. Resampling takes place **after** the MX4 profile in the **MX Color Processing** step, **before** sharpening images as defined on the **Images** page.

When you downsample (by defining an **Output Resolution** that is lower than the **Input Resolution**), the number of pixels in the image is **decreased**. When you upsample, new pixels are added. You specify an **Interpolation** method to determine how pixels are added or deleted.

Images with resolutions not within the specified range of input resolution will **not** be resampled.

You may want to experiment with these options to find an appropriate balance between file size and image quality. The resolution should be 1.5 to 2 times the line screen ruling at which the file will be printed.

Please keep in mind that resampling may affect the image quality. Generally, **sharpening** resampled images can help refocus the image details.

Available options	Description
Nearest Neighbor	The **Nearest Neighbor** algorithm selects the value of the nearest point and does not consider the values of other neighboring points. A fast but less precise method that replicates the pixels in an image. This method is for use with images containing edges that are not anti-aliased, to preserve hard edges and produce a smaller file. However, this method can produce jagged effects, which become apparent when you distort or scale an image or perform multiple manipulations on an image.
Bilinear	**Bilinear** is a method that adds pixels by averaging the color values of surrounding pixels. It generally produces medium quality results.
Bicubic	**Bicubic** uses a weighted average instead of a simple average to determine pixel color. This method is slowest but generally produces the smoothest tonal gradations.

See also:

9.1.3 Sharpening Images

Note Please note that sharpening always affects the visual impression of images and can also have an impact on the colors, especially on the edges of objects. A sharpening level that is too high can cause unwanted side effects, especially if objects show fine structures, such as can be seen in fabrics. For proofing and validation prints, use of sharpening is **not** recommended.

Sometimes printed images result in an unsharp impression for various reasons, for example, because the gamut mapping led to a loss of contrast or because the used printer or press is not able to produce a very sharp print. You can sharpen images to compensate for those effects.

The sharpening works resolution dependent and in multiple steps for producing high-quality sharpening effects. You can set the **Sharpness Level** from 0.1 to 20.

Sharpening is applied **after resampling** images as defined on the **Images** page, **during** the **MX Color Processing** step. The defined sharpening level is applied for the **output** color space. The **Sharpness Levels** can be defined separately for different output color spaces (RGB and CMYK/Grayscale). The **Sharpness Level for RGB Output Color Space** is applied **only** to **RGB-to-RGB** conversions.

How to use the Sharpen functionality in PDF Hotfolders

1. On the **Hotfolder** menu, click **New PDF Hotfolder** or open an existing hotfolder from the hotfolder list.

2. On the navigation panel on the left, click the **PDF Output Format** button.

3. On the **Images** tab > **Sharpen**, activate the sharpening for RGB / CMYK output color space and enter a **Sharpness Level**.

9.2 PDF Options

You can write the compliance to a specific standard, the output intent (ICC file), and other information to the metadata of the output PDF. Please note that GMG ColorServer does not check whether the document content of the output PDF complies with the standard's requirements.

Further information on PDF/X:

- *Adobe® PDF in a Print Production Workflow*, 2008, www. adobe.com

9.3 Internal PDF Options

The following PDF processing settings are always used for all PDF jobs. These are program internal settings and cannot be changed by the user.

◀ The output PDF is saved with the Adobe PDF option **Optimize for Fast Web View**. Text and line art are compressed. The file is restructured for faster access from web servers or other programs and devices such as imagesetters or printers.

◀ **Embedded** ICC profiles are **removed** from all objects. Keeping the embedded profiles would be technically wrong, as the original color space information would not be appropriate anymore for the objects after color management.

10. Creating a Manual PDF Job

After you have set up a PDF hotfolder, you can now also create **manual** jobs. This is convenient if you want to process only a few documents with slightly different settings than defined in the hotfolder. Still, as the hotfolder settings are used as a kind of template for manual jobs, you will only need to fill in a few parameters.

How to create a manual job

1. From the **Overview**, select a hotfolder as a template for the manual job.
2. Right-click the hotfolder to open the context menu.
3. Click **New PDF Job**.
   The **PDF Manual Job** dialog box opens.
4. Click the **Files & Folders** button on the navigation panel on the left side of the dialog box.
5. Click the **Input Files** tab.
6. Type any name into the **Job Name** box.
7. On top of the **Files** list, click the **Add File** button ⊞.

8. Browse your folders, select the desired input files, and confirm by **clicking OK**.
   The selected PDFs are added to the **Files** list.
9. You can remove files from the list by clicking the **Remove File** button 🗑.

Fig. 31 Creating a manual PDF job as described in the preceding instructions.

11. WebConnect

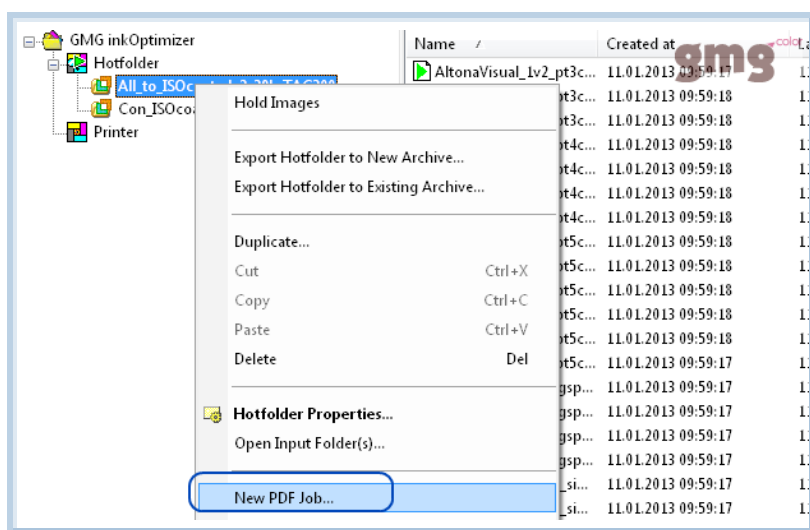GMG WebConnect is a Microsoft Silverlight based **web interface** which enables multiple users to access GMG ColorServer and create jobs from any standard web browser. Files can be directly dropped onto the displayed hotfolders icons. After processing, the output files can be either **downloaded** or saved to an **Output Folder**.

As administrator, you can create user accounts on the **Users** view. To give a new user access to GMG ColorServer, the e-mail notification system automatically sends login data to the specified e-mail address. Users can take different **roles**, as described in the following table.

User Role	Description
Job Viewer	A user with a job viewer role is able to see and track all active or failed jobs from any connected GMG ColorServer instance, but cannot create jobs. Job viewers can only see the **Jobs** and **History** lists and the **Hotfolders**.
Job Creator	As a job creator, a user is allowed to create jobs by dropping files onto the displayed hotfolders. Job creators have no access to the **Users** and **System** view and cannot change any settings.
Administrator	As administrator, a user has full access to all views and settings. Administrators can create jobs, set up new users (or remove existing ones), change Hotfolder icons, determine the download type or change the **System** settings.

How to set up a new user

1. Login to GMG WebConnect as administrator.
2. Click the **Users** view.
3. Click the **Create New User** icon in the upper left corner.
   The **User Details** dialog is displayed.
4. Enter user information such as the name, user role and e-mail address.
5. Click **Ok** to confirm your settings.
   The WebConnect system automatically sends a welcome mail with login data to the e-mail address of the new user.

How to create jobs

1. Only Server: Start GMG WebConnect from the Windows Start Menu.
2. Start a web browser.
3. Only Client: Enter the GMG WebConnect URL you received with your welcome e-mail.
   A GMG WebConnect login screen is displayed.
4. Enter your user name and the password.
   GMG WebConnect is started showing the **Jobs** view. On the upper section of this view, hotfolder icons are displayed for all hotfolders you can use.

5. **Drag and drop** your files directly onto a hotfolder icon or click an icon to bring up the **Create Job** dialog.
   The files are uploaded to the GMG WebConnect. After processing, your jobs will be listed in the **History** view.
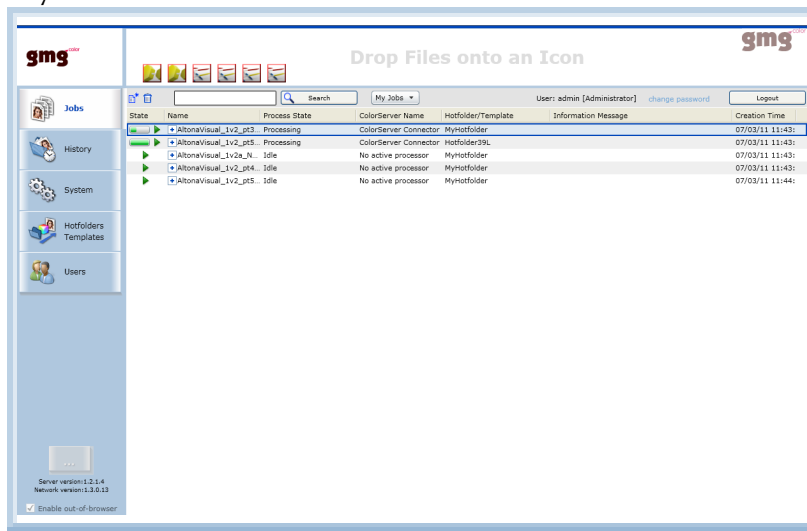
Jobs list in GMG WebConnect.

See also:

- "Installing and Configuring the GMG WebConnect Web Server" on page 8

12. Paper Adaption Tool

Thanks to the standalone **Paper Adaption Tool**, you can easily shape a print standard or custom profile to your specific print media, bridging the gap between printing according to a print standard and printing visually consistent colors. The conversion keeps all colors as close as possible to the selected color space, only adapting the media white point. For example, you can calculate a profile for ISO Coated v2 (39L) to ISO Coated v2 (39L) doing a perceptual conversion with regard to the media white point difference between the theoretical standardized world and the real world of the printer.

The **Paper Adaption Tool** is designed as a wizard and will take you through the process step by step, taking care of the correct settings to create the profile. The resulting conversion profile can be used in a GMG ColorServer hotfolder.

Steps for creating a white point optimized profile

1. Start the Paper Adaption Tool from the Windows Start Menu.
2. Select the color space you want to print, for example ISO Coated v2 (39L).
3. Optionally define a maximum TAC.
4. Measure or define the white point to personalize the profile.
   (Supported measuring device: **X-Rite i1**.)
5. Evaluate the media white point.
6. Select a location for the profile.
7. Start the calculation.

Evaluating the white point

The Lab white point values are displayed in a table and a graphic view. In the table, you can see the target Lab values (1) compared to the measured or entered values (2). The **Difference** column shows the difference (Delta E) between target and actual values. This difference is also visually depicted using the two a* and b* color space coordinates and the lightness scale L*. The green circle / green range (3) shows the **tolerance range** defined by the selected print standard whereas the black cross shows the measured white point. The color of the white point is displayed in a **preview** (4) on the right side of the value table. To **change** the values, you can click the **Back** button and modify the values in the spin boxes.
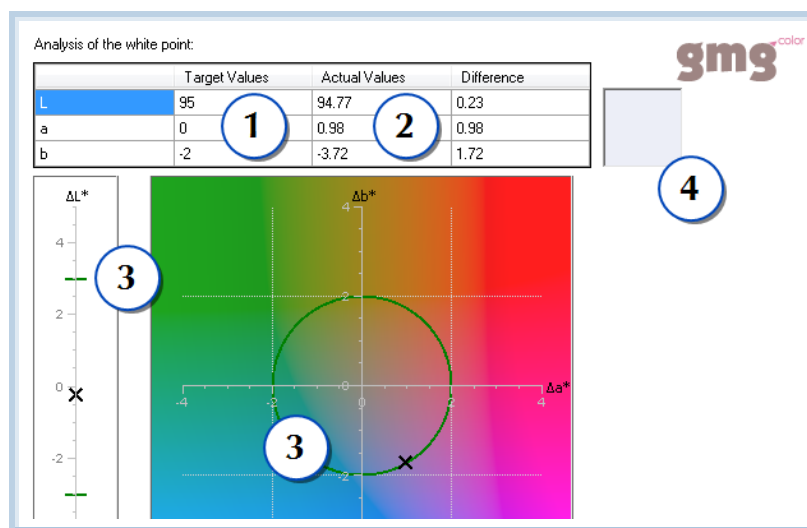

Fig. 32 Evaluating the media white point in the Paper Adaption Tool.

13. System

13.1 Options Menu

You can toggle between standard and **Administration** mode and password-protect the **Administration** mode in the **Options** menu.

Note Changes are possible only in **Administration Mode**.

Tip Main program features are accessible by different methods, so that users can choose which way is most convenient to them. This documentation generally refers only to the toolbar or menu, even though there may be alternative methods.

→ Click a button on the **toolbar**. Move the mouse over a button (without clicking) to display a tooltip.

→ Click a command on a **menu**.

→ **Right-click** on an item and click a command on the **context menu**.

→ Press a **shortcut key**. Shortcut key combinations are listed next to the corresponding command on the menu.

→ **Double-click** an item (for example, a job or a workflow) to open the corresponding dialog box and edit settings.

System command	Description
Log	Opens the **Output Log** window (corresponding to all processed jobs). You can export the log file as a text file.
Administration Mode	Switches from the standard (non-secure) operating mode to **Administration Mode**. Users can change system settings and workflows only in **Administration Mode**.
Administrator Password	You can set up or change the password for **Administration Mode** here.
Language	You can change the language of the program here. The user interface will be updated after **program restart**.

13.2 Administrator Mode

In GMG ColorServer, users can set up hotfolders or change hotfolder settings only in **Administrator Mode**. This way, unintended changes can be easily avoided. This is especially useful if different teams have access to the same computer. You can secure the administrator mode by using a password.

Note We recommend setting up a password directly after program installation. If no password is set up at the beginning, any user can enter the **Administrator Mode** and set up a password, thus locking the program settings for all other users.

Note If you **uninstall** GMG ColorServer, the password information is **not** deleted from the registry. The password protection (using the old password) will still apply when reinstalling the program later.

How to set up or change the password

1. On the **Options** menu, click **Administrator Password**.
   The **Change Password** dialog box is displayed.

2. Type the appropriate password (if required) into the **Old Password** box. Type the new password into the **New Password** and **Confirm Password** boxes.

How to switch operating modes

1. On the **Options** menu, click **Administrator Mode**.

If a password has been set up, a dialog box is displayed asking you for the password. If no pass word has been set up, the operating mode is switched to **Administrator Mode** at once.

2. Enter the appropriate password (if required).
   You can now set up or change workflows.

13.3 PDF Processing Performance

The processing time of a PDF file depends on the complexity of the PDF, the hotfolder configuration (e.g. the flattening settings and the spot color conversion), the hardware (CPU and storage medium) and the number of concurrent PDF jobs.

You can tweak the performance by setting up a temporary folder on a fast storage medium (SSD) and by defining the optimum number of concurrent jobs (**File** menu > **General Settings**).

Defining a temporary folder for faster PDF processing

Due to many processing steps, the temporary folder should be set to a drive with high data throughput to decrease total processing time for PDF jobs. Per default, the Windows user temporary folder is used for the PDF processing.

Defining the number of concurrent PDF jobs

Modern CPUs have four or more cores so that one PDF job can be processed per core. Basically and per default, GMG ColorServer uses all available cores. Depending on your hardware configuration, however, this can lead to a bottleneck, increasing the overall processing time.

It is therefore recommended to make a test run on your system to figure out the optimum balance between hardware and the number of concurrent jobs. For example, a PDF file on a quad core system with a hard disk drive (HDD) may be best working with three or four concurrent jobs whereas the same system with a solid state drive (SSD) reaches its best performance with seven concurrent jobs.

14. Maintenance

14.1 Environment Backup

GMG ColorServer features a full backup of hotfolders and the environment. Moreover, it is possible to export and import specific hotfolders, for example, if you want to share a certain configuration with a colleague.

The **environment backup** saves and restores all **folder paths** (hotfolders, backup folders) and all **program settings**. It also saves **linked files** such as color profiles.

Note To avoid data loss, we recommend that an administrator saves a backup on a **regular** basis (for example, once a month), especially if you have a larger number of workflows and/or each time before performing a software update. An environment backup is also a very convenient feature if you need to set up the program on a **new computer**. If you follow a very strict security protocol in your company, it might also be worth consideration of using the **Restore Backup** feature for restoring the settings at the begin of each working day, to make sure that no manual changes were applied to any folders or workflows, and thus to guarantee the full productivity of your workflow setup.

Note Before restoring a backup file, make sure that you did not make any important changes to your hotfolder configuration after the last backup had been created. Restoring a backup will **overwrite** all **current** settings.

How to save a backup

1. On the **Options** menu, point to **Environment Backup**, and click **Create**.
2. Browse to the desired folder and save the backup under any file name.

How to restore a backup

Please make sure that you have **full write access** on all directories where folders are linked to GMG ColorServer. Otherwise, the **Restore Environment Backup** command might not be able to restore all folders.

1. On the **Options** menu, point to **Environment Backup**, and click **Restore**.
2. Browse your folders and select a backup (**env**) file.

15. Troubleshooting

GMG ColorServer is a well-tested high-quality product. Nevertheless, there are potential sources of trouble in every software. The Troubleshooting section provides you with descriptions and troubleshooting steps to solve your issue.

If the cause of trouble remains unclear or if a problem occurs that is not mentioned in this document, contact your local dealer. Please understand that information on your hardware and software configuration is necessary to analyze and fix the problem you encountered.

A list of local dealers for GMG products can be found on the GMG web site.

To speed up the process of finding a solution, please keep the following information at hand:

◄ **Description** of the error (the error message text or any other useful information) and of the context in which the error occurred. Try to remember all steps taken before the error occurred. The more information on the actual situation you can provide, the easier and faster it will be for us to track the problem.

◄ The **serial number** of GMG ColorServer and the **version numbers** of its modules. On the **Help** menu in GMG ColorServer, click **About** GMG ColorServer to display the serial number and versions. Expand the dialog box and take a screen shot.

◄ The **operating system** you use.

◄ The hardware configuration (microprocessor, frequency, main memory, hard disk) of the **computer**.

◄ Any **additional programs** that might interfere with the software such as a firewall or a virus scanner. Programs you generally run in the background when using GMG ColorServer.

◄ Printers and other devices **connected** to the computer.

15.1 General Issues

15.1.1 License Token not Found

When trying to start GMG ColorServer, the error message "license token not found" is displayed, even though the dongle is properly connected to the computer.

Possible causes:

? USB driver not properly installed.

→ Check the driver installation (in the **System Settings** of the operating system).

? The energy saving settings deactivated the USB ports, especially when using a laptop computer.

→ Change or deactivate the energy saving settings of the computer.

? Interference or incompatibility with another USB device (another dongle, for example).

→ Unplug all other USB devices from the computer.

? USB port has no power, especially when using a hub.

→ Use another USB port on the computer.

15.2 Validation of Hotfolder Settings

15.2.1 Error Messages

If hotfolder settings are missing or are not valid for some reason, the invalid parameter will be indicated by an exclamation mark icon 🔶 right next to the control element, for example, next to the edit box or list.

GMG ColorServer provides you with a comprehensible short message in the form of a **tooltip**, helping you to locate the problem.

→ **Move** the mouse pointer **over** the exclamation mark icon 🔶 to display a short error message.
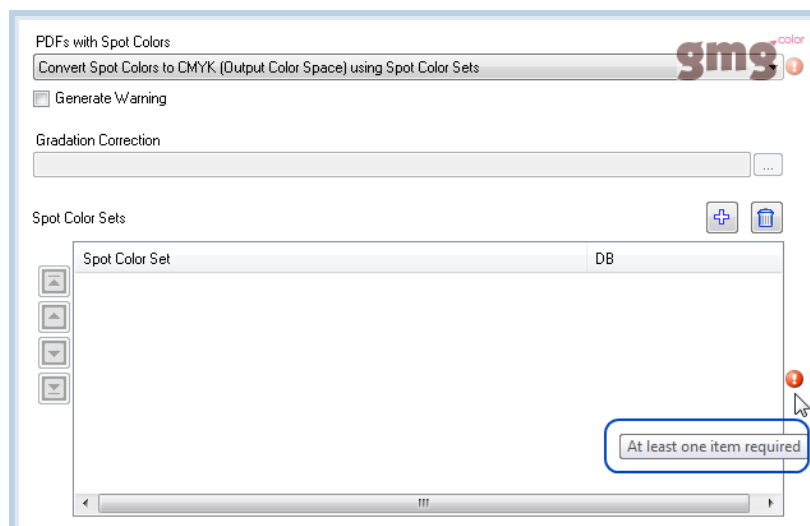
→ Click the **Validate All Settings** button ▦ on the left side of the main window to see on which page the error occurred.

→ You can **click** error messages with a blue underline to jump to a Help topic providing further information on the problem and how to solve it.
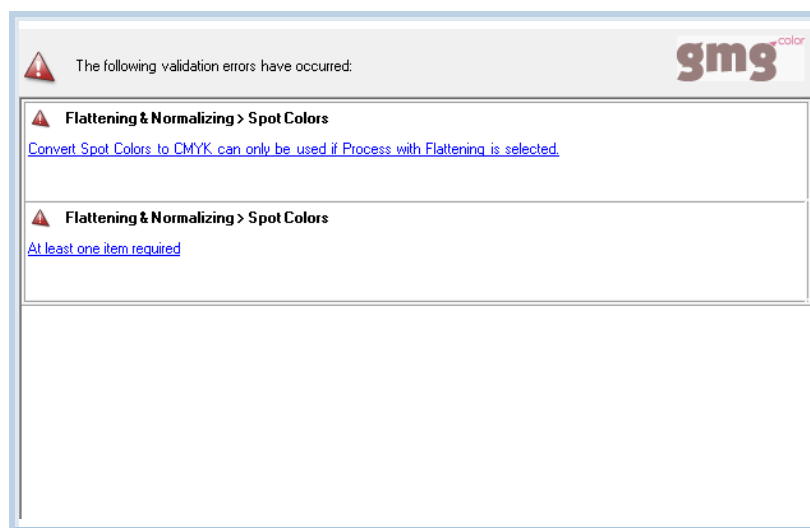
The icon displayed at the left of every message presents the message type as listed in the following table.

Message	Icon	Description
Error		Some settings are not valid and need to be changed by the user. **Errors** need to be **resolved** before the dialog box can be closed. Therefore, the hotfolder cannot be saved by clicking the OK button until **all** errors have been resolved.
Warning		All settings are valid, but some settings could have side effects impairing the operation or negatively affecting the outcome. You might consider changing the settings that produced the warning messages.

Messages are listed in the order of priority, that is, errors are listed first, followed by warnings and then by information messages. Messages of the same priority are listed in the order, in which the missing or invalid parameters occur in the dialog box. A missing parameter at the top of the dialog box is listed before a missing parameter at the bottom of the dialog box.

The error message convention is explained in the following example. Message components are explained in brackets.

Message 1 [message **number**] / 3 [**total number** of messages]: Input Settings [**page view** or context where the required parameter is missing or invalid]: Name required [short error **message**]

15.3 PDF Related Issues

15.3.1 PDF Could not be Processed

A PDF was not processed and is kept in the jobs list as an error file. The log contains the message "PDF uses Adobe Security features and cannot be processed.".

Possible causes:

? The PDF is **password** secured. Document restrictions do not permit printing or modifying the document.

→ Check the PDF properties in a PDF editor and change the security settings of the document.
—OR—

→ Add the required password to the password list used by GMG ColorServer.

See also:

- "Input Folder Settings" on page 32

15.3.2 Visible Edges inside an Object

After processing in GMG ColorServer, some objects show edges. Flattening was not selected in the hotfolder settings.

Possible causes:

? Different **Normalizing** settings are used in GMG ColorServer for **Images** and **Vector/Text**. The input PDF originally contained transparencies, but was **flattened** in an **external application** before being processed in GMG ColorServer. Flattening can result in a **rasterization** of transparent vector/text objects. For example, if part of a vector element is rasterized in the flattening process and the rest is not, there will be a visible edge between these two areas after the color management. This is not possible when using the flattening function in GMG ColorServer, because the program does not allow to use different normalizing settings for **Images** and **Vector/Text**.

→ Use **identical** normalizing settings for **Images** and **Vector/Text** (**Flattening & Normalizing** > **Vector/Text** > option **Use Same Settings as Images**) in GMG ColorServer.
—OR—

→ Process only input PDFs that have **not** been flattened with these hotfolder settings.

16. Where to Find Further Information

You will always find the latest versions of user manuals on the GMG website.

www.gmgcolor.com > SupportArea

Further information:

- GMG ColorServer **User Manual**:
  GMG-ColorServer_PDF-to-PDF_Manual_en.pdf
  GMG-ColorServer_PDF-to-PDF_Manual_de.pdf

- GMG ColorServer **Quick Start Guide**:
  GMG-ColorServer_QuickStartGuide_ConventionalPrinting_en.pdf
  GMG-ColorServer_QuickStartGuide_ConventionalPrinting_de.pdf

- Creating new MX4 ColorServer profiles in GMG ProfileEditor:
  GMG-ColorServer_Tutorial_MX4_en.pdf
  GMG-ColorServer_Tutorial_MX4_de.pdf

17. Glossary

3

3DAP

(Digital Data Delivery for Australian Publications, 3DAP) Proofing standard for the magazine publishing industry in Australia, initiated by an industry group committee. GMG ColorProof also provides 3DAP profiles for color management approved by the 3DAP Committee for various printers and media.

A

Adobe PDF Library

The PDF-to-PDF module in ColorServer and InkOptimizer uses the Adobe® PDF Library from Adobe Systems Incorporated, including the Adobe PDF Transparency Flattener technology. Being based on the same PDF technology as Adobe Acrobat® and Adobe Creative Suite software, this takes advantage of optimized PDF processing and of full compatibility with the latest PDF specification.

Alternative CMYK Value

For each spot color object, an alternative CMYK (or Lab) value might be defined in a PDF. By using the alternative CMYK values, spot colors can be converted to CMYK.

B

Blending Mode

Transparent PDF objects are objects that are not fully (100%) opaque. In other words, you can see underlying objects through transparent objects. The blending mode defines how two stacked PDF objects are blended into each other, that is, what the resulting (printed) color tone of each pixel will be.

C

CalGray

Device-independent color space, specified for PDF 1.1. Rendered obsolete by the introduction of ICC based color space for PDF 1.3.

CalRGB

Device-independent color space, specified for PDF 1.1. Rendered obsolete by the introduction of ICC based color space for PDF 1.3.

Chromatic Composition

Color separation rule. In contrast to GCR/UCR, all colors (including shadows and black) in a printed image are only or mainly composed of chromatic colors (CMY), which increases the total ink application and the drying time.

CMYK Colors

In CMYK printing processes, colors are separated into CMYK process colors. CMYK or process color printing is usually contrasted with spot color printing, in which certain spot color inks are

used to produce the desired colors. Some printing presses can print with both four-color process inks and additional spot color inks.

CMYK Object

Object in a CMYK color space.

CMYK-to-CMYK Conversion

Same as "reseparation", but in GMG software, the term "CMYK conversion" is used when a CMYK image is again separated from one CMYK standard to another, including a gamut mapping from one color space to another, for example, from ISO coated to ISO uncoated.

Color Conversion

Image conversion mode, for processing contone images such as TIFF and JPEG, pages like TIFF/IT with CT/LW elements. Color transformations, without changing any file properties. Spot color channels will be left unchanged.

Color Gamut

Subset of colors that can be accurately represented in a given color space or by a certain output device, for example, a printer. The term gamut is often used when referring to the mapping of two color spaces (gamut mapping). If colors are out-of-gamut, they cannot be adequately represented by the target output device.

Color Management

Color management is the controlled conversion of colors between the original gamut and the target gamut. The device-dependent MX technology used in GMG products provides optimized results for a broad range of high-quality printers and media.

Color Space

Range of colors defined by the input or output device, for example, a screen, or a printer. In mathematical color models, a certain color is represented as a coordinate in a three-dimensional (e. g. RGB) or four-dimensional (e. g. CMYK) color space.

ColorServer

ColorServer automatically converts image files and PDFs (PDF-to-PDF) into a target color space. All conversions can be done in a batch based on the GMG hotfolder technology. Hotfolders can be easily integrated into your custom workflow. All information regarding ColorServer also applies to InkOptimizer, unless stated otherwise.

Continuous Forms Printing

Printing process used by business forms presses for the production of business forms, for example, newsletters. A continuous roll of paper is fed through the printing press. Pages are separated and cut to size after they have been printed. ColorProof also provides proof profiles for continuous forms printing according to Fogra standards for various printers and media.

Contone

(continuous tone, CT) A printing technique that produces photographic-like output resolution. Contone printers achieve so many levels of shades that the difference between one shade and the next is imperceptible to the human eye.

Control Strip

Strip with defined color patches printed together with the job for quality assurance. Color values are measured with a spectral photometer and compared to reference or target values.

Conventional Production

MX Processing method in PDF-to-PDF hotfolders and jobs. With this method, you can use a ColorServer profile to optimize data for a target printing condition, for example, ISO Coated v2. You can use a compensation curve generated by PrintControl Pro to compensate press deviations and ensure a consistent representation of colors. With an InkOptimizer license, you can also optimize UCR/GCR to reduce the application of the CMY inks and increase the K ink in their place.

Conversion Profile

ColorServer profile type. Conversion profiles are MX4 profiles used for gamut mapping or other automated color conversions for conventional printing methods in ColorServer. See also Separation, Reseparation, RGB-to-RGB Conversion, CMYK-to-CMYK Conversion.

Create Outlines

Converting text objects (type) into vector graphic objects.

CTF

(Computer to Film, CTF) Imaging technology used in lithographic printing. An image file is output to a photographic film which is then used to expose a printing plate. Opposite to Computer to Plate (CTP), where an image file is output directly to a printing plate.

CTP

(Computer to Plate, CTP) Imaging technology used in modern printing processes. An image file is output directly to a printing plate. Opposite to Computer to Film (CTF), where an image file is output to a photographic film which is then used to expose a printing plate.

D

DeviceCMYK

Device-dependent color space, specified for PDF 1.0. Color space of the output device that is used to reproduce an image. For example, the color space of a monitor (in case of DeviceRGB) or a printer (in case of DeviceCMYK). This default color space is applied to PDF or PS objects without an embedded target color space ICC profile.

DeviceGRAY

Device-dependent color space, specified for PDF 1.0. Color space of the output device that is used to reproduce an image. For example, the color space of a monitor (in case of DeviceRGB) or a printer (in case of DeviceCMYK). This default color space is applied to PDF or PS objects without an embedded ICC profile (which would define the target color space).

DeviceLink

A DeviceLink profile is designed for color transformations from a defined input color space to a defined output color space. A DeviceLink profile links the color spaces of two distinctive devices. The input color space is defined by the gamut of the input device, for example, a camera. The output color space is defined by the gamut of the output device, that is, a specific printer or press and print medium. MX profiles are DeviceLink profiles. DeviceLink color transformations generally provide a higher quality and have the advantage that information on the black channel is maintained during the transformation. In contrast, ICC profiles use a device-independent intermediate color space, usually Lab, to link two device-dependent color spaces.

DeviceN

Device-dependent color space, specified for PDF 1.3. A DeviceN color space can comprise up to eight separations. It is used mainly for spot colors, but can also include process color separations.

DeviceRGB

Device-dependent color space, specified for PDF 1.0. Color space of the output device that is used to reproduce an image. For example, the color space of a monitor (in case of DeviceRGB) or a printer (in case of DeviceCMYK). This default color space is applied to PDF or PS objects without an embedded ICC profile (which would define the target color space).

Digital Printing

The reproduction of digital images on a print medium by use of a digital printing machine. It is generally used for short print runs, and for the customization of print media. Digital printing offers a high flexibility and is cost-effective whenever small quantities should be printed. The creation of printing plates is not required, as in traditional methods, and the initial set up time is greatly reduced, resulting in low one-time costs. The operating and material costs are generally higher than in traditional printing production.

Digital Production

MX Processing method in PDF-to-PDF hotfolders and jobs. With this method, you can use a ColorServer profile to optimize data for a target printing condition, for example, ISO Coated v2. You can use a printer calibration to compensate printer deviations and ensure a consistent representation of colors.

Digital Production Profile

Digital production MX4 profiles are used for color managing a specific combination of a digital press and print medium. This term is used in contrast to separation or conversion profiles, which optimize separations for conventional printing methods. You can also create digital production profiles for validation prints matching the expected print result on a conventional printing press as closely as possible, similar to a printed proof.

Drop Shadow

Transparency effect that can be applied to a PDF object. Looks like the shadow of an object, giving the impression that the object is raised above the objects behind it.

E

ECI

(ECI European Color Initiative) The ECI was founded in June 1996 on the initiative of the publishing houses Bauer, Burda, Gruner+Jahr, and Springer in Hamburg. It is a group of experts with the objective to standardize color management, proofing, and printing. The ECI publishes reference printing conditions and standards for quality control used in the printing process.

Extensible Stylesheet Language Transformation

(Extensible Stylesheet Language Transformation, XSLT) XSLT can be used to transform an XML document via an XSLT processor. The XML document can be transformed into another XML document or into another document type such as HTML or XHTML. With XSLT, you can rearrange, add and remove XML elements and attributes to or from the output file. In Connect, you can use XSLT to transform job tickets from 3rd party systems into a format that can be processed by Connect. Additionally, you can use XSLT to transform log files created by the system into custom reports, for example, an e-mail or an HTML file.

F

Feathered Edges

Transparency effect that can be applied to a PDF object. The effect lends the border of an object a smooth appearance, with a smooth transition of the foreground to the background color.

File Conversion

Image conversion mode, for processing contone images such as TIFF and JPEG, pages like TIFF/IT with CT/LW elements. File properties can be changed, for example, normalizing image formats, resolution, dimensions, and so on.

Flattening

PDF objects and layers have to be flattened before sending a PDF to the target output device (for example, inkjet printer or printing machine). ColorServer detects overprinting or transparent objects in a PDF. You can either cancel the processing, preserve the layers and transparency, or flatten the PDF. If flattening is used, layers, transparencies, and overprinting objects are resolved.

FOGRA

(FOGRA Graphic Technology Research Association) Association of representatives of the printing industry and suppliers, with the objective to promote print engineering and its technologies in the fields of research, development, and application. The FOGRA publishes reference printing conditions and standards for quality control used in the printing process such as media wedges.

Four Color Process Printing

In CMYK printing processes, colors are separated into CMYK process colors. Spot colors channels need to be converted to CMYK before printing. ColorServer can perform an automated conversion of RGB and multi-color files into a CMYK output color space optimized for your specific printing condition.

Frontend RIP

A frontend RIP rasterizes (RIPs) the documents and sends the rasterized documents to the printer or digital press.

G

G1

Optimization level of an InkOptimizer profile. Available types: G1, G2, G3. G1 uses the highest possible GCR level.

G2

Optimization level of an InkOptimizer profile. Available types: G1, G2, G3. G2 uses a medium optimization.

G3

Optimization level of an InkOptimizer profile. Available types: G1, G2, G3. G3 profiles use the lowest optimization level, thus concomitant with the lowest reduction of ink.

GCR/UCR

Abbreviation for Gray Component Replacement/Under Color Removal. A technique used to reduce the amount of cyan, magenta, and yellow, replacing them with an equal amount of black ink. Reduces the total ink application and the drying time. Avoids color blurs and artifacts, especially when printing small elements such as fonts. InkOptimizer automates and optimizes

GCR/UCR settings for specific printing processes and media while preserving the visual impression of images.

GMG Workflow

GMG provides a perfect solution for all color management applications in commercial printing. The GMG workflow covers the entire production process, starting from normalization of incoming data, separations optimized for a target printing condition, digital proofing, and standardization of printing processes.

GRACoL

(General Requirements for Applications in Commercial Offset Lithography, GRACoL) Printing standard initiated by the GRACoL Committee. GMG ColorProof also provides proof profiles approved by the GRACoL Committee for various printers and media.

Gradation Correction

For most spot color applications, it is only required to print the spot color as a full-tone (100%) color. If you, however, want to print spot color gradations, you can do so by linking a spot color gradation file to a PDF-to-PDF hotfolder. With a spot color gradation, it is possible to perform a global correction for multiple spot colors showing a similar behavior. Spot color gradation profiles are created in sfg file format in SpotColor Editor.

Gray Balance

Gray balancing means to reproduce a neutral gray color by printing specific ratios of Cyan, Magenta, and Yellow. Gray colors, midtones, and skin tones are easily affected by color casts. To balance the color behavior in the gray areas in the best possible way, ProfileEditor runs sophisticated gamut mapping algorithms effecting separations with an excellent gray balance. In InkOptimizer, a highly consistent color behavior in the gray areas and in the tertiary colors is achieved by GCR/UCR algorithms, reducing the CMY inks and increasing the proportion of black ink, while maintaining an identical color impression.

Gray Component Replacement

(GCR) A technique for replacing gray tones otherwise produced by yellow, cyan, and magenta separations with black ink. Reduces the total ink application and the drying time. Avoids color blurs and artifacts, especially when printing small elements such as fonts. InkOptimizer automates and optimizes GCR/UCR settings for specific printing processes and media while maintaining the visual impression of images.

GRAY Object

Object in a grayscale (K) color space.

H

HexaChrome

HexaChrome is a registered trademark of Pantone, Inc. and uses six colors for printing. In addition to four special process colors, HexaChrome adds orange and green inks to expand the color gamut. It is also often referred to as CMYKOG printing.

Highlights

Color tone giving the visual impression of a high lightness of the corresponding color channel. See also Midtone and Shadows.

Hotfolder

A file folder for automated image or PDF-to-PDF conversions. Each file physically present in a hot-folder and passing the filter settings generates a new job. Input and output settings, for example, a specific output folder, as well as color management profiles, can be assigned to a hotfolder.

I

Image

In the context of ColorServer, image refers to pixel based (contone) objects, such as TIFF or JPEG images, without text or vector graphics elements. Rasterized objects, which might originally have been vector graphics, text, gradients, or patterns, are also regarded as images. Images have a certain resolution and can be compressed (for example, ZIP or JPEG compression). Images can be processed in Image Hotfolders. Images can also be converted to PDFs in PDF-to-PDF hot-folders.

Image Hotfolder

The application offers three different operating modes: Two operating modes (color conversion and file conversion) for processing images in image hotfolders, one for processing PDF documents and for converting image file formats into PDFs in PDF hotfolders.

Image Metadata

Information about a file which can be stored in the same file. Image metadata can include the color depth, the image resolution, the date of creation, information on the author, and other data, such as an embedded ICC profile.

InkOptimizer

Advanced ColorServer license. Enables you to use InkOptimizer profiles which save ink by applying automated GCR/UCR algorithms.

InkOptimizer Profile

InkOptimizer profiles are special MX4 profiles that are used for an automated and optimized GCR/UCR for specific printing processes and media.

Input ICC

Used in the context of normalizing color spaces from different sources, the input ICC profile defines the original color space of an image or object while the output ICC profile defines the common color space to which all objects are converted during the normalizing step. The input and output ICC profile form a pair which can be replaced by a matching MX4 DeviceLink profile (see MX4 Normalizing).

ISO

(International Organization for Standardization, ISO) The ISO defines world-wide industrial and commercial standards, for example, for printing processes.

J

Job

Processing one or multiple files together in GMG software products. Jobs can be generated manually by loading a file into the software or in an automated fashion by moving files into a hot-folder.

L

Lab

(CIELab, Lab) CIE (Commission Internationale d'Eclairage) 1976 (L*, a*, b*) Three-dimensional color space that is considered to be perceptually linear. A change of a certain amount in a color value produces a change of about the same visual importance to the human eye. CIELab describes colors as perceived by a human observer (or measured by a photometer). The L* value closely matches human perception of lightness, a* describes the magenta and green axis, and b* the blue and yellow axis. The gamut of the CIELab color space is much larger than the color space of most input and output devices, including the human eye. The CIELab color space has been created to serve as a device-independent reference standard. It is therefore often used as a profile connection space (PCS) in color management.

Large Format Printing

(large format printing, LFP) Printing technologies used for printing large formats such as banners and truck covers on various media types. LFP comprises methods based on the following technologies: Inkjet, UV, thermo transfer.

LFP

(large format printing, LFP) Printing technologies used for printing large formats such as banners and truck covers on various media types. LFP comprises methods based on the following technologies: Inkjet, UV, thermo transfer.

M

Media Neutral Workflow

Images in PDF files are kept in an RGB color space as long as possible. Directly before printing, they will be separated into a CMYK color space optimized for the target printing condition by ColorServer or InkOptimizer. This means increased flexibility for different print substrates and printing processes. For example, the same PDF could be automatically optimized for both a newspaper and a glossy magazine.

Media Size

Width and height of a print medium, basically paper size. For paper rolls, only the width is defined.

Medium

Printers and printing machines print on different media or printing substrates, generally different paper types, but also, for example, flexible foils for flexographic applications.

Metadata

Information about a file which can be stored in the same file. Image metadata can include the color depth, the image resolution, the date of creation, information on the author, and other data, such as an embedded ICC profile.

Midtone

Color tone giving the visual impression of a middle lightness of the corresponding color channel. See also Highlights and Shadows.

Multicolor File

Image file that includes a separate channel for each color, including spot color channels.

Multicolor Printing

In multi color printing, spot colors are used additional to or instead of standard CMYK process colors, resulting in a larger (or different) gamut of the printing machine.

Multi-language PDF

PDF with single-channel layers containing (usually black) text in multiple languages. As all non-text content is the same across all languages in the document, the language can be changed by replacing only one plate (with the text) during the printing process.

MX Technology

DeviceLink color management technology developed by GMG. Device-dependent alternative to an ICC based color management. MX DeviceLink profiles achieve the highest color management quality and can maintain color separations, thus preserving the black channel of the source profile. Profile types are MX3, MX4, and MX5.

MX Color Processing

The processing of colors with MX profiles, the unique GMG device link profile format. A GMG MX4 DeviceLink profile is optimized for the specific input color space of an object and for the color accurate output on the printer or press as defined by the target printing process or standard.

MX4 Normalizing

As an alternative to ICC profiles, DeviceLink MX profiles can be used to normalize PDF objects to a common color space. The MX4 normalizing works via an MX4 Normalizing Lookup Table in which ICC profile pairs (input and output profile) are each linked to a DeviceLink GMG MX profile.

N

Nearest Neighbor

Resampling algorithm. Selects the value of the nearest point and does not consider the values of other neighboring points. A fast but less precise method that replicates the pixels in an image. This method is for use with images containing edges that are not anti-aliased. It preserves hard edges and produces a smaller file. It can produce jagged effects, which become apparent when you distort or scale an image or perform multiple manipulations on an image.

Normalizing

PDF content such as images with multiple color spaces can be normalized to a common color space before the main color management step (MX Processing).

O

Object Type

Object types categorize PDF objects by their color space (RGB, CMYK, GRAY) and graphic type (image, vector/text).

Out-of-gamut

Out-of-gamut colors cannot be adequately represented by the target output device, i. e. they are out of the gamut of the output device.

Output Condition

PDF metadata information. Describes the standard printing condition, for example "FOGRA39L", defined in the PDF output intent.

Output ICC

Used in the context of normalizing color spaces from different sources, the input ICC profile defines the original color space of an image or object while the output ICC profile defines the common color space to which all objects are converted during the normalizing step. The input and output ICC profile form a pair which can be replaced by a matching MX4 DeviceLink profile (see MX4 Normalizing).

Output Intent ICC

Device-dependent ICC profile describing the color space of the specific printing condition the document was created for, for example, ISO Coated v2. Defined in a PDF-to-PDF hotfolder. You will need one hotfolder per target printing condition. You can normalize documents from multiple sources to a common output intent.

P

Pattern

Object filled with repeating graphical elements, such as can be created from swatches.

PCS

(Profile Connection Space, PCS) Device-independent reference color space that is used as an interface between different input and output devices. ICC Color management is based on a transformation to the PCS (generally Lab color space) first and then to the color space of the target device; colors are calculated based on the profile for the respective input or output device. A relationship between two devices is defined by the relationships of the two devices to the PCS. This way, a direct relationship between the two devices does not need to be known or defined. The higher variability often comes at the price of quality loss.

PDF Hotfolder

The application offers three different operating modes: Two operating modes (color conversion and file conversion) for processing images in image hotfolders, one for processing PDF documents and for converting image file formats into PDFs in PDF hotfolders.

PDF-to-PDF

Automated PDF processing based on GMG MX4 technology in ColorServer or InkOptimizer. Optional flattening based on the PDF Transparency Flattener technology from Adobe Systems Incorporated. Automated normalizing of color spaces. Optionally different settings for images and vector/text elements. PDFs can also be optimized, including image compression and resampling.

Perceptual - No Black Point Compensation

MX rendering intent. Similar to Perceptual, but without black point compensation, this rendering intent aims at gamuts with a similar lightness of the paper tint and a similar black point, avoiding undesired shifts of the in-gamut colors.

Ppm

[ppm, points per millimeter] Resolution unit.

Primary Colors

In the printing industry, the primary colors typically refer to the four inks Cyan, Magenta, Yellow and Black. Any color tone can be reproduced by combining the primary colors or by printing screens of primary colors on top of each other. See also CMYK colors.

Print Mode

Depending on the printer type, the print mode defines the color mode and number of inks used, the print resolution, and other print parameters. You can enter information on the print mode when creating a printer calibration file or MX color profile in SmartProfiler.

Printer

In ColorServer and InkOptimizer, a software printer of the printer type "ColorServer" is required to process image files in "Color Conversion" or "File Conversion" mode. The printer defines default values for manual jobs and image hotfolders. It is not required for PDF-to-PDF processing.

Printer Frontend

Usually either a RIP or a workflow system. A printer frontend rasterizes (RIPs) the documents and sends the rasterized documents to the printer or digital press.

Printer–medium Combination

A DeviceLink MX4 digital production profile always defines the color management settings for a specific printer–medium combination, including printing parameters such as print mode, resolution, and used inks.

Printing Substrate

Printers and printing machines print on different media or printing substrates, generally different paper types, but also, for example, flexible foils for flexographic applications.

Process Colors

In CMYK printing processes, colors are separated into CMYK process colors. CMYK or process color printing is usually contrasted with spot color printing, in which certain spot color inks are used to produce the desired colors. Some printing presses can print with both four-color process inks and additional spot color inks.

PSR

(Process Standard Rotogravure, PSR) The Reference Color Space Gravure standard for publication gravure printing, as initiated by the European Color Initiative (ECI). GMG ColorProof also provides proof profiles for PSR approved by ECI for various printers and media.

R

Rasterization

Converting vector objects or type into pixel based image objects (bitmaps) with a defined resolution. Rasterizing artwork during the flattening process can reduce the complexity and thus the file size after flattening. The "Raster/Vector Balance" is defined in the "Advanced Flattening Settings" in a PDF-to-PDF hotfolder.

Relative Colorimetric

MX rendering intent. As with Absolute Colorimetric, out-of-gamut colors are clipped, while maintaining the visual impression of the original image as best as possible. Contrast and detail might still be lost. In contrast to the absolute colorimetric rendering intent, relative colorimetric aligns the white point to the target color space, leading to a color compensation when printing on tinted paper. As a result, all in-gamut colors are modified with respective to the new white point. Same usage as Absolute Colorimetric, but for tinted print media.

Relative Colorimetric With Black Point Compensation
MX Rendering intent. Similar to Relative Colorimetric, but image detail in the shadows is preserved by minimizing the clipping in the shadows. Thus, the full dynamic range of the output color space is used in the shadows. Same usage as Relative Colorimetric, for images with a lot of detail.

Reseparation
In the context of "separation", but in GMG software, the term "reseparation" is used when a CMYK image is separated again, for example, for harmonizing GCR/UCR settings for different output processes under the respective printing conditions. Other transformations are referred to as "separation", "CMYK-to-CMYK conversion", and "RGB-to-RGB conversion".

RGB Object
Object in an RGB color space.

RGB-to-RGB Conversion
Image transformation from one standard RGB color space into a target standard RGB color space. Other transformations are referred to as "separation", "reseparation", and "CMYK-to-CMYK conversion".

RIP
(Raster Image Processor, RIP) File transformation into a contone or 1-bit image format that can be read by an output device (e. g. a printer or an imagesetter). For example, transforming vector graphics into rasters. Generally, a color transformation is also required to match the color space of the output device.

S

Shadows
Color tone giving the visual impression of a low lightness of the corresponding color channel. See also Midtone and Highlights.

Single Channel Layer
PDF layer producing only a single plate in an imagesetter. For example, a single channel layer contains only 100% black or grayscale, or spot color objects. PDFs with single channel layers might be used for multi-language support: If all other contents are the same across all languages, the language can be changed by replacing only one plate (with the text) during the printing process.

Spot Color
In contrast to CMYK or process colors, a specific colored ink is used in spot color printing to produce a certain color. Spot colors extend the gamut of a printing machine. In multi-color printing, spot colors are used in addition to or instead of CMYK process colors.

Spot Color Gradation
Spot color gradation profiles are created in sfg file format in SpotColor Editor. For most spot color applications, it is only required to print the spot color as full-tone (100%) color. If you, however, want to print spot color gradations, you can do so by linking a spot color gradation file to a PDF-to-PDF hotfolder. With a spot color gradation, it is possible to perform a global correction for multiple spot colors showing a similar behavior.

Spot Color Printing

In contrast to CMYK or process colors, a specific colored ink is used in spot color printing to produce a certain color. Spot colors extend the gamut of a printing machine. In multi-color printing, spot colors are used in addition to or instead of CMYK process colors.

Stacking Order

PDF objects can be placed not only next to each other, but also on top or below other objects. The stacking order defines which objects are displayed on top and which objects are underlying. The order is essential for the visual impression and for the printed color. The stacking order is not only relevant for objects; layers (which can contain multiple objects) are also organized in a stacking order.

SWOP

(Specifications Web Offset Publications, SWOP) Printing standard for web offset printing in the United States initiated by an industry group committee, updated now by IDEAlliance Inc. GMG ColorProof also provides proof profiles approved by the SWOP committee for various printers and media.

T

Toner-based

Laser printer or digital press.

U

Under Color Addition

(Under Color Addition, UCA). In contrast to UCR, which replaces colored inks in selected areas with black ink, UCA adds small amounts of CMY to these areas to achieve a more saturated, darker appearance.

Under Color Removal

(Under Color Removal, UCR) A technique for reducing the density of the different color separations in the midtone and shadow areas and replacing them with a controlled amount of black. Reduces the total ink application and the drying time. Avoids color blurs and artifacts, especially when printing small elements such as fonts. InkOptimizer automates and optimizes GCR/UCR settings for specific printing processes and media while maintaining the visual impression of images.

W

White Gap

Visible white gaps (without ink) in a printed image that can result if plates are not exactly aligned (are out of registration) in the printing machine. A method to avoid white gaps is Overprinting.

White Point

Color value of a white object viewed under a standard illuminant through a standard observer angle. The white point depends on the printer gamut and the print medium.

Wildcards

Wildcards are used to search for text strings, such as particular characters or patterns of characters. A wildcard character may be substituted for any of a defined subset of characters. In

FlowConnect, you can use filters to process only specific files. For example, if you use "*.xml" as a filter, only files with the file extension ".xml" will be processed.

X

XML

(XML, Extensible Markup Language) A new standard developed by the World Wide Web Consortium (W3C). XML is not a fixed set of elements like HTML, but rather a meta-language (a language for describing languages). XML enables authors to define their own tags.

XSL

(Extensible Stylesheet Language, XSL) XSL is a stylesheet language for XML documents, defining the layout, styles, colors, etc. of how the XML document will look like in the application in which it is displayed.

XSLT

(Extensible Stylesheet Language Transformation, XSLT) XSLT can be used to transform an XML document via an XSLT processor. The XML document can be transformed into another XML document or into another document type such as HTML or XHTML. With XSLT, you can rearrange, add and remove XML elements and attributes to or from the output file. In ColorServer, you can use XSLT to transform report files created by the system into custom reports.