

ColorGATE PRINT&CUT Module (PCM) for PRODUCTIONSERVER⁵

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1 Introduction

1.1 Preface

The optional **PRINT&CUT** Module adds a number of different new functions to **PRODUCTIONSERVER⁵** to control cutting plotters and give printed motifs a contour cut. Since printers and plotters work independently from one another, the **PRINT&CUT** Module can be used with virtually any printer supported in **PRODUCTIONSERVER⁵**. This means that a plotter can be easily integrated into an existing or a new production chain. A **PRODUCTIONSERVER⁵** equipped with a **PRINT&CUT** Module includes all the elements, thus eliminating the need for additional applications and work steps.

1.2 How it works

The cut path is directly integrated into the graphics file as a spot color. The **PRINT&CUT** Module recognizes the spot color and stores this cut path in a separate file that can be processed by the plotter. CutServer software establishes the connection to the plotter and allows the device to access the cutting data. Together with the print job, device-specific synchronization marks are printed to communicate the starting point to the plotter and enable the correct alignment of the medium. Hotfolder technology makes it possible to seamlessly link all the elements, thus creating an automated workflow, in which you can, of course, intervene at any time.

1.3 Software

The **ColorGATE PRINT&CUT** Module is available exclusively for **PRODUCTIONSERVER⁵** and reflects the familiar user interface to simplify operation and minimize the time it takes to learn how to use the system. In addition to the **PRINT&CUT** Module, you will also require CutServer software that comes from the manufacturer of the plotter. The CutServer software provides the plotter with the cutting data created by the **PRINT&CUT** Module.

1.4 Installation

Install and set up the plotter and the CutServer software on your RIP system. For more information, please refer to the manual or the manufacturer's website.

NOTE: **PRODUCTIONSERVER⁵** and the CutServer software can be installed on different systems as long as there is a data connection between those systems. **PRODUCTIONSERVER⁵** can use a network connection to write the cutting data created into the CutServer software archive. This means that the plotter does not necessarily have to be positioned in the immediate vicinity of the RIP system.

Then start **PRODUCTIONSERVER⁵** and check to see whether the **PRINT&CUT** Module is active. To do so, click **Help > About PRODUCTIONSERVER5... > Module Info...** (Fig. 1)

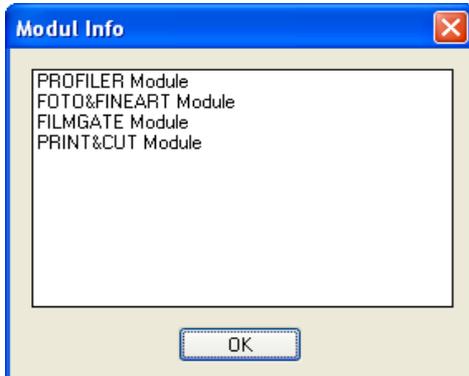


Fig. 1 - Module info in the program

The **PRINT&CUT** Module must appear on the list.

Please contact your **ColorGATE** partner if the **PRINT&CUT** Module is not available even though you have purchased it and the dongle update.

1.5 File formats

In the current version, the **PRINT&CUT** Module supports EPS and PDF files.

1.6 User interface

The **PRINT&CUT** Module adds an additional tab to the hotfolder, job and container settings. It can be used to adjust different settings on the synchronization of the printer and plotter.

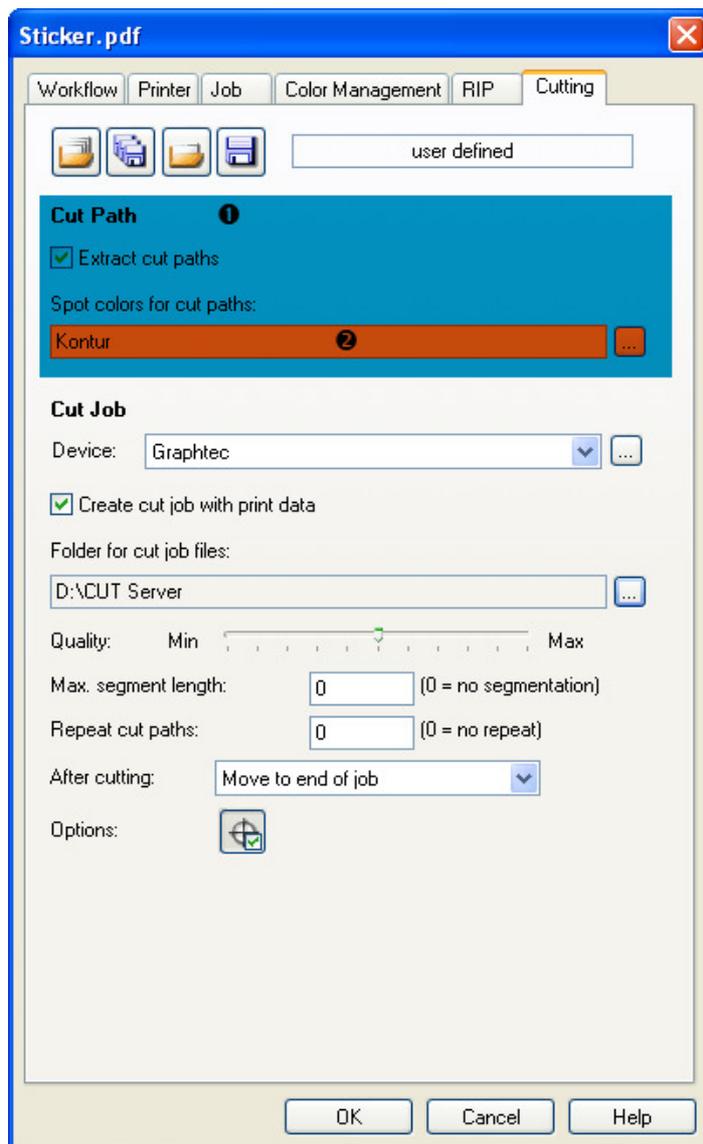


Fig. 2 - Job settings

The spot color of the cut path can be extracted and activated on the “Cut Path” file card.

Use the “Cut Job” file card to adjust the settings to process jobs and control the plotter.

The settings you can alter depend on the prerequisites you have selected to give you the following function modes. For more detailed information, refer to the section entitled “Functions” (see: 3 Functions: Cut Job page 9).

Job settings (Fig. 2):

All functions are available in the settings of a **separately selected job**.

Container settings:

Several jobs can be grouped into one container. To avoid any problems with different names for the cut paths in the files, the “Cut Path” (Fig. 2) file card is not available in the cutting settings. (See: 4.1 Containers page 19)

Hotfolder settings:

The “Spot color for cut paths” function (Fig. 2) cannot be selected in the settings of a hotfolder because there is not any data with embedded cut paths available to be extracted at this time.



2 Functions: Cut Path

The following screen shots map the “Cutting” tab in the settings for a print job.

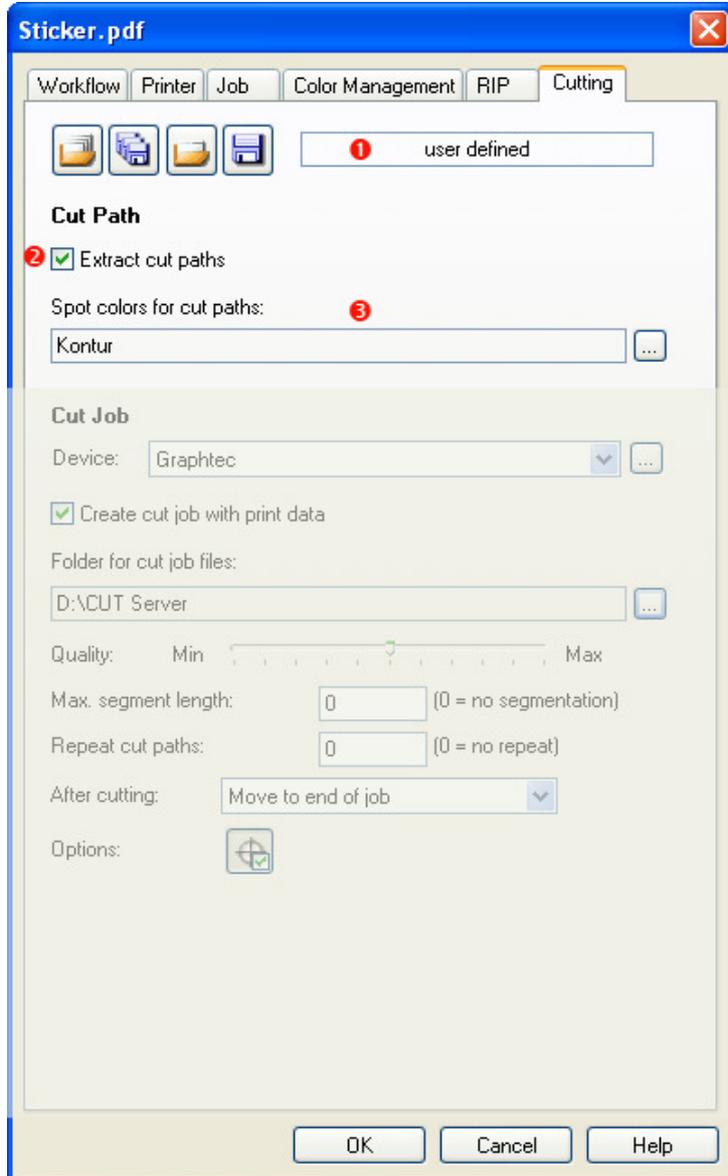


Fig. 3 - Cut Path file card

PRODUCTIONSERVER⁵ enables you to store and load settings.



Store the settings of all the tabs as a CSE file



Load CSE file



Store the settings of the “Cutting” tab as a CCU file



Load CCU file

2.1 Extract cut paths

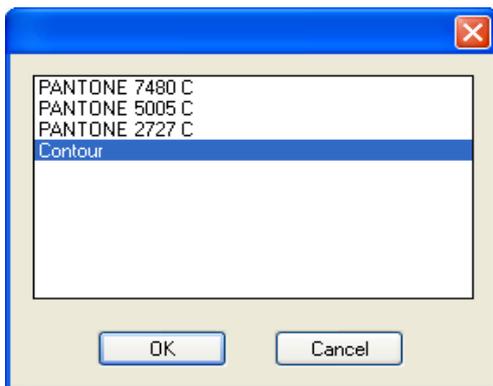
Before a cut path can be interpreted, the “Extract cut paths” function has to be activated. The path, which is stored as a spot color in the file, is removed from the job during the RIP process and is not printed with the job. The data that has been extracted forms the basis for the plot file, which is required for further processing and is stored in the **ColorGATE** printer archive. If necessary, this information can be used to automatically or manually create a plot file.

To avoid any problems with embedded spot colors, the function should be deactivated if the print job does not contain a cut path.

2.2 Spot colors for cut paths

The **PRINT&CUT** Module does not require any special name for the cut path. The user can select the cut path from a list of all the embedded spot colors. The advantage of this is that print jobs do not have to be corrected manually if the cut path spot color has been named incorrectly.

Click the selection button  to access a list of all the embedded spot colors (Fig. 4).



Select the spot color that was used to store the cut path.

Fig. 4 - Spot color for cutting data

3 Functions: Cut Job

The following screen shots map the “Cutting” tab in the settings of a print job.

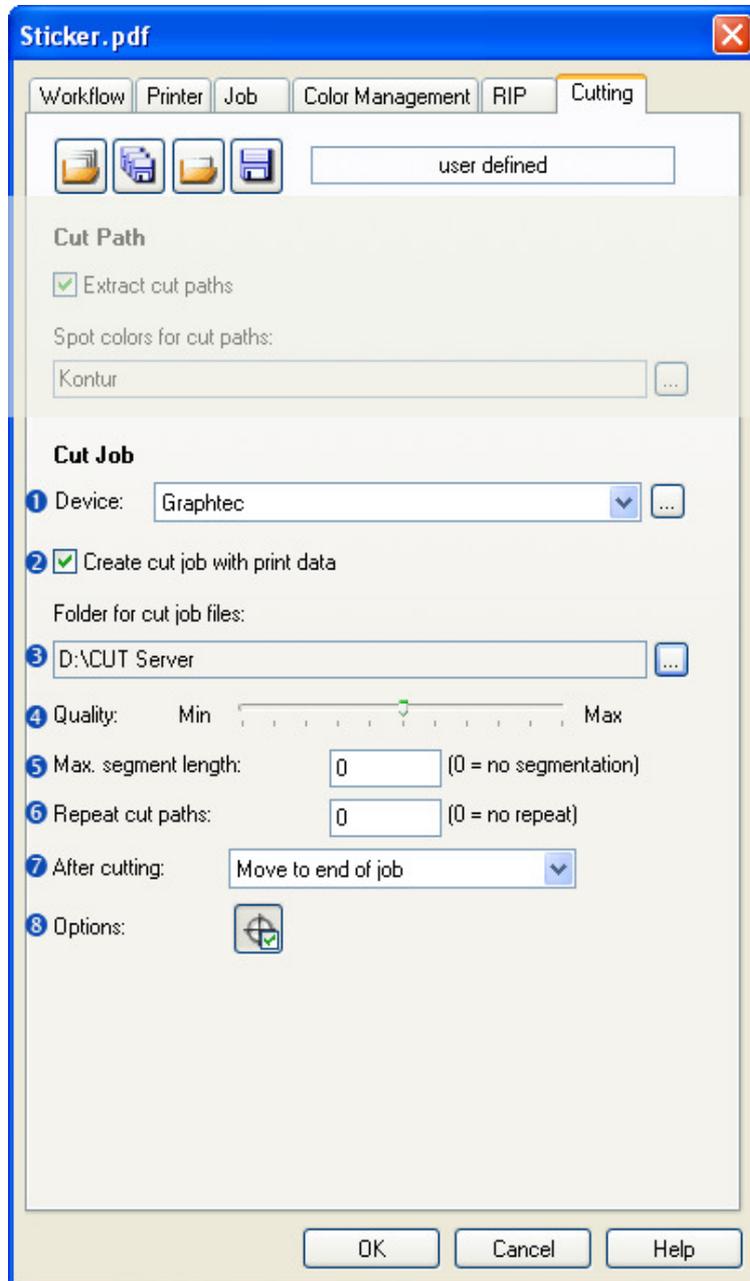


Fig. 5 - Cut Job file card

3.1 Plotters (Device)

Select a plotter from the menu. The cutting data will then be adapted to accommodate the printer selected. Click the select button  to access the device settings.

3.1.1 Device settings: Mutoh Ultima

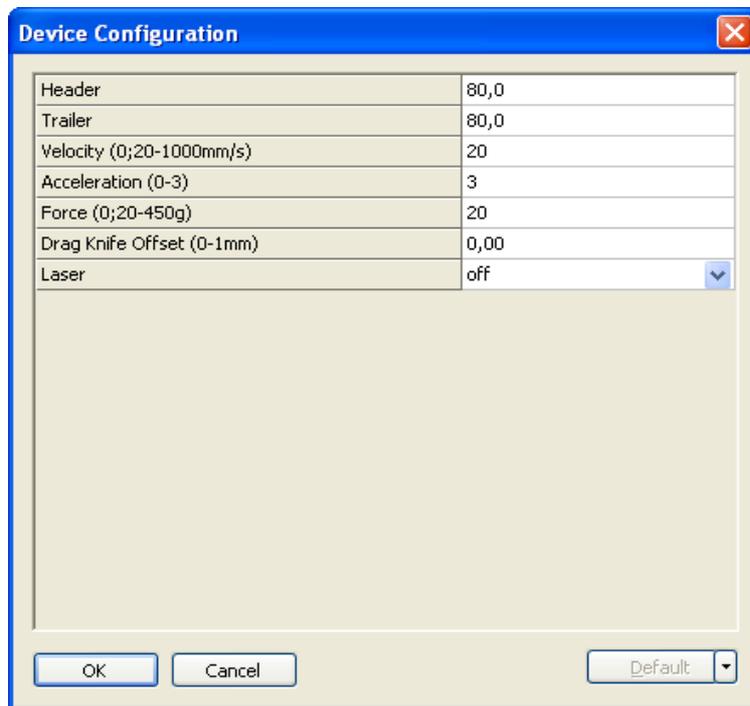


Fig. 6 - Mutoh Ultima device settings

A “header and trailer” can be inserted in the device settings to simplify the following processing with the plotter. This function corresponds to the header and trailer input boxes in the “Job” tab. Ultima plotters require a 10 to 250-mm header and a 30 to 250-mm trailer or enough space between two jobs to transport the medium correctly. We recommend a value between 65 and 80 mm.

The cutting speed can be adapted to the motif in the input box marked “Velocity”. While you can select a higher speed for larger motifs with many straight edges and few curves, you should choose a more moderate speed for fine motifs with short cutting distances. You can also control the transport of the medium by adjusting the value in the input box marked “Acceleration”.

The “Force” applied by the blade can vary between 20 to 450 g. This value depends on the thickness of the material used.

The plotter’s “Laser” can be activated in the device settings for demonstration and testing purposes. If this function is set to “On”, then the laser will trace along the cut path.

3.1.2 Device settings: Mimaki FX Series

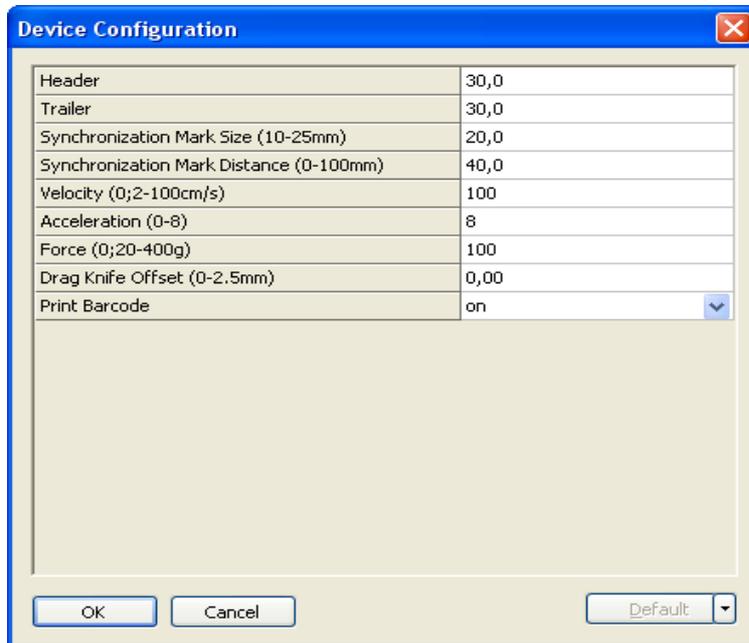


Fig. 7 - Mimaki FX Series device settings

Mimaki plotters require a 15-mm “Header” and “Trailer”. A value between 40 and 80 mm is the recommended length.

The option “Synchronization Mark Size” defines the side length of the synchronization marks. “Synchronization Mark Distance” affects the distance between the synchronization marks and the horizontal and vertical edges of the medium.

“Velocity” and “Acceleration” can be modified as for the Ultima to optimize the medium transport.

Depending on the thickness of the material used, the contact pressure “Force” of the blade can be set at between 20 and 400 g.

If the “Print Barcode” function has been activated, a job ID will be added to the printout. This job ID is also written in the name when the plot file is created. The cut server uses the job ID to identify the corresponding plot file (see: 5.1 ColorGATE CutServer page 23).

NOTE: The minimum output length of a job is 100 mm including synchronization marks. The output area between the synchronization marks of shorter jobs will be enlarged until the total output length is 100 mm.

3.1.3 Device settings: SummaSign

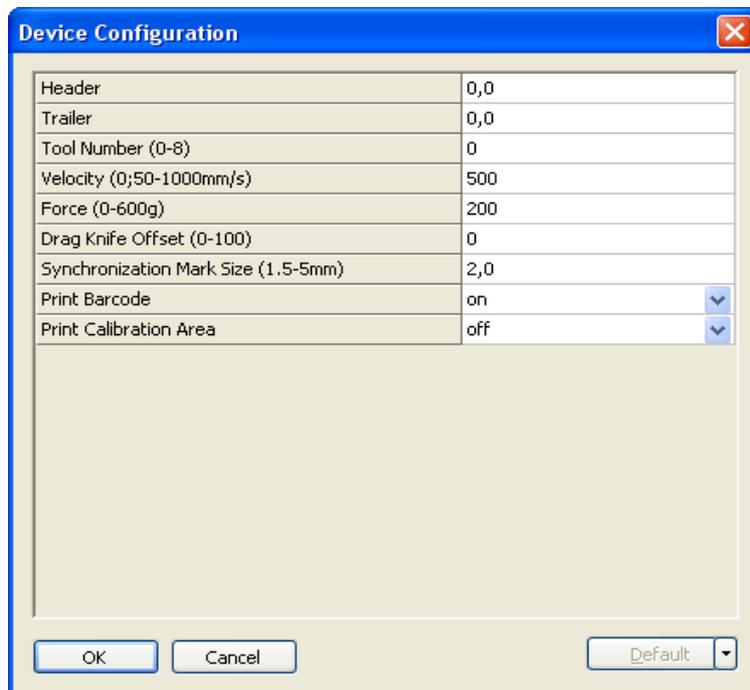


Fig. 8 - SummaSign device settings

The measurements for the “Header” and “Trailer” required have already been taken into consideration in the program. If sheetware or sheets separated from rollware are used, the header and trailer length should be set to 80 mm each.

Some models in the SummaSign series allow you to set up different user profiles. The “Tool Number” option makes it possible to select a specific user profile directly in the **PRINT&CUT** Module.

“Velocity” and “Force” can be adjusted to accommodate the medium and the motif.

The “Synchronization Mark Size” can also be adjusted on older Summa plotters. The value entered represents the edge length of the square synchronization marks. The “Print Barcode” function creates a job ID, which is printed out with the printing as a decimal number and as a barcode. It identifies the corresponding plot file and enables the plotter to automatically download the corresponding plot file from the **ColorGATE** CutServer (see: 5.1 ColorGATE CutServer page 23). The “Print Calibration Area” option adds a black square to the printout which can be used, if necessary, to perform a black dot adjustment on the plotter sensor (see: 3.7.3 SummaSign page 16).

3.1.4 Device settings: Graphtec

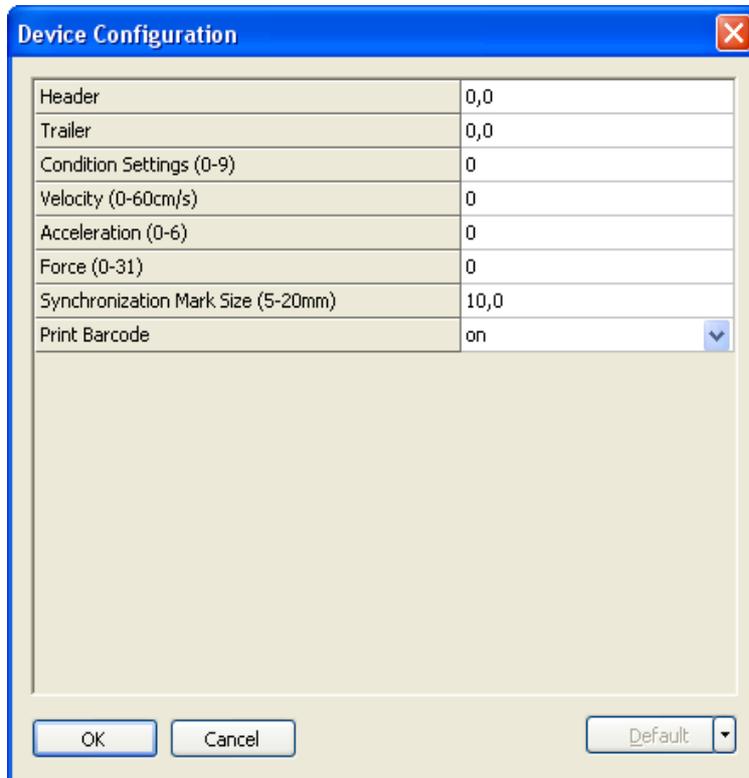


Fig. 9 - Graphtec device settings

3.2 Automatically create cut job with print data

The **PRINT&CUT** Module automatically creates PLT data when this function has been activated. Please note that you must have also selected the “Extract cut paths” function at the same time so that the selected cut path can be written into the PLT file. Deactivate this function if you want to create the PLT file at a later date.

3.3 Folder for cut job files

The information box that appears on the gray background indicates the current directory in which the PLT files are stored. Click on the Select button  to create a new directory or alter the existing one.

3.4 Quality

The distances between two points in the calculation of circles and Bezier curves in vectors can be defined by adjusting the “Quality” slider. This function can be used to process “softer” curves. The default setting for the slider is in a central position. This setting is ideal for most cut jobs.

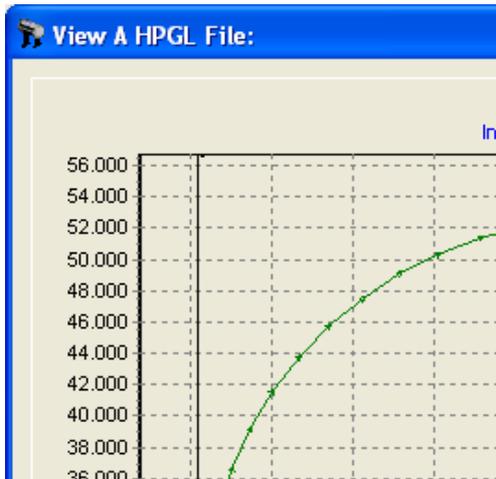


Fig. 10 - Minimum quality

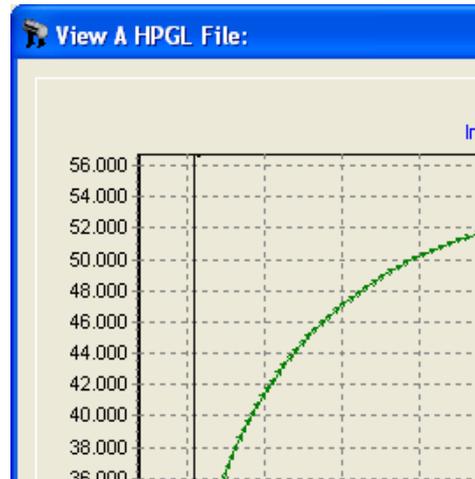


Fig. 11 - Maximum quality

3.5 Maximum segment length (Not available for Mimaki FX Series) ⑤

Jobs can be segmented to prevent inaccuracies in longer cutting jobs caused by medium transport. The plotter processes all the paths in a segment, realigns the medium and processes the next segment. Motifs that extend over two or more segments are also processed section by section.

3.5.1 Maximum segment length: Mutoh

Because of the registration marks, 350 mm is the minimum segment length. The maximum length should not exceed 500 mm. The **PRINT&CUT** Module divides the entire cut job into segments of equal size. This means that the actual segment length may be somewhat less than the value indicated, but it will not be exceeded. Enter a 0 if you do not want the job to be segmented.

3.5.2 Maximum segment length: SummaSign

When a SummaSign plotter is used, there is no correlation between the synchronization marks and the segment length. A job is divided according to the segmentation value. If a 1000-mm long job is being processed, for example, a segment length of 500 mm can be given. The contours of the first segment are cut completely first, before the second segment is processed, even when the entire motif extends over both segments. The minimum segment length for Summa plotters is 100 mm, the maximum length should not exceed 500 mm.

3.5.3 Maximum segment length: Graphtec

3.6 Repeat cut paths ⑥

In order to optimize the processing of thicker materials, the cut path can be traced over several times. Simply enter the desired number of repeats in the input box. Enter 0 if you want the cut path to be traveled just once. If you want the path cut three times, for example, enter a 2.

3.7 Synchronization marks 7

Based on the plotter selected, special marks are printed to synchronize the printer and the plotter. It is the synchronization marks that communicate the position of the motif and the cut path on the medium to the printer.

3.7.1 Mimaki FX Series

The **PRINT&CUT** Module creates “Synchronization Marks”. The sides of the angle are 20 mm long each (Fig. 11).

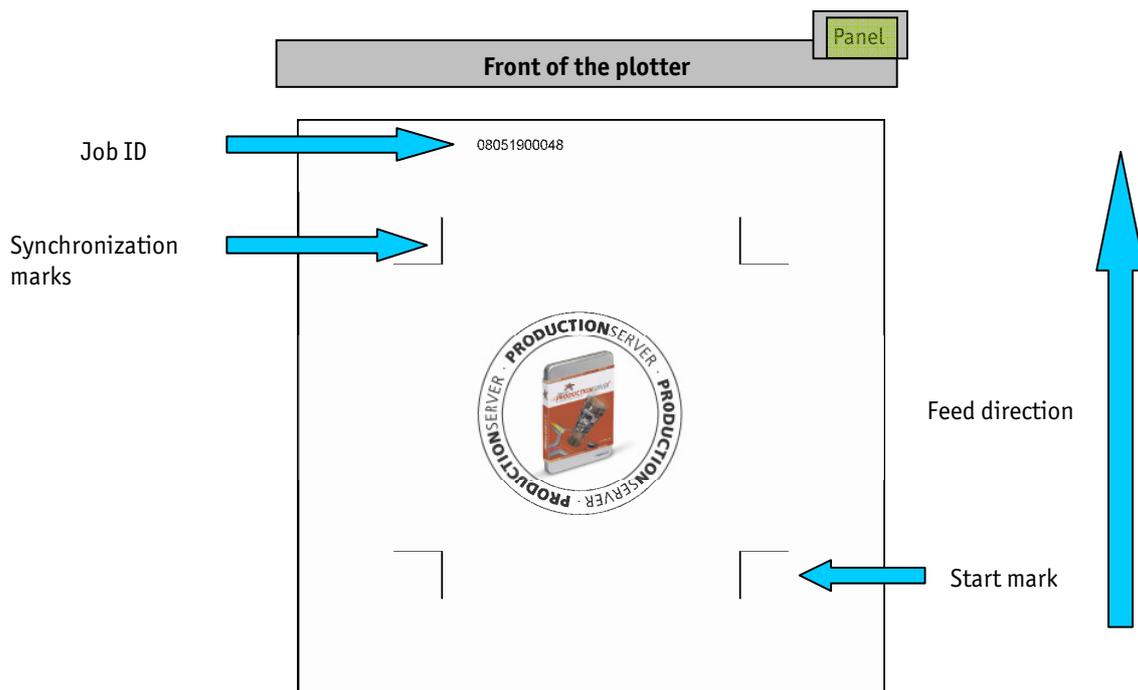


Fig. 12 - Mimaki synchronization marks

The print can be inserted into the Mimaki plotter, as illustrated in Fig. 11. Following the transmission of the corresponding plot file, the reception of the data or the feed page at the plotter panel must be confirmed. Then use the control buttons on the panel to position the laser above the intersection point of the start mark (bottom right). Now follow the directions that appear on the display of the plotter.

NOTE: The medium can also be inserted from the back of the plotter. In this case, please make sure that the print is facing in the right direction in the plotter.

3.7.2 Mutoh Ultima

The **PRINT&CUT** Module creates AL5 synchronization marks to use the Mutoh Ultima plotter’s entire range of functions. The marks consist of an EPOS box (Electronic Positioning System) and a bar code (Fig. 12).



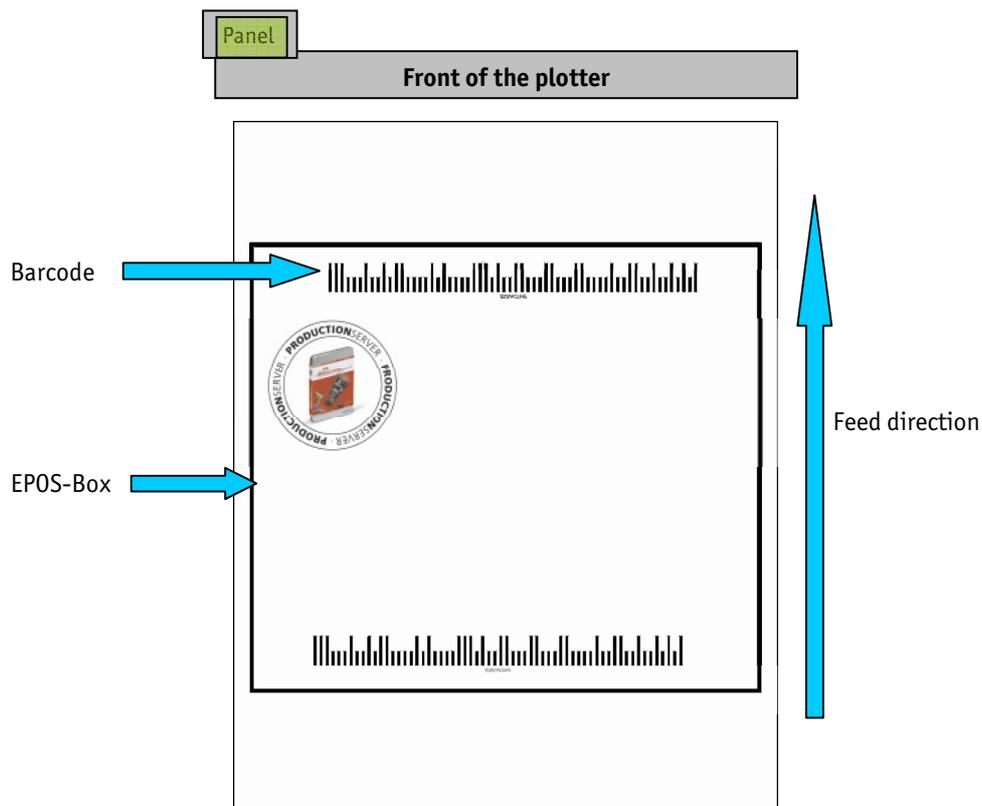


Fig. 13 - Mutoh synchronization marks and barcode

The EPOS box aligns the medium in the plotter. The bar code identifies the job and makes it possible to automatically retrieve the correct plot file from the cut server.

After the medium has been inserted, the plotter automatically scans the bar code and identifies the printing direction. As a result, the print can be inserted as illustrated in Fig. 12 or turned by 180 degrees.

NOTE: The Mutoh CutServer is required to control and use the Mutoh plotter's full range of functions (see: 5.2 Mutoh CutServer page 26).

3.7.3 SummaSign

The PRINT&CUT Module creates "OPOS" synchronization marks (compatible with X and 2.0). The size of the marks can be adjusted in the device settings of the SummaSign driver (see: 3.1.3 Device settings: SummaSign page 12).

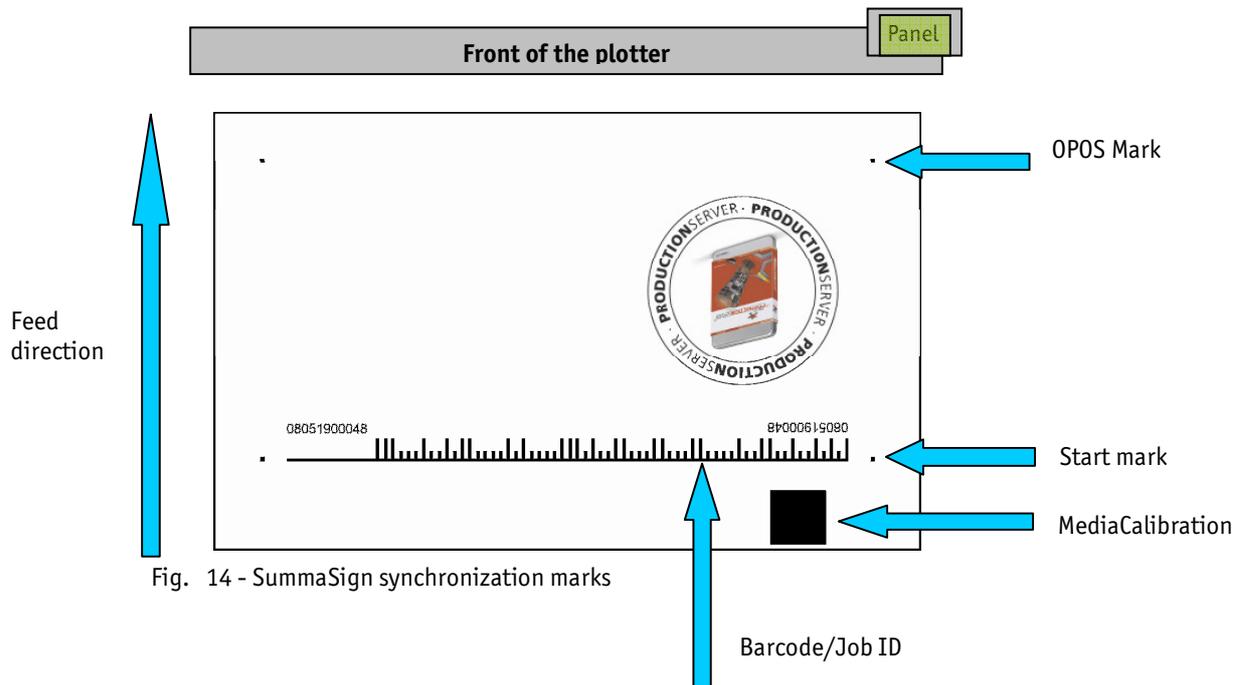


Fig. 14 - SummaSign synchronization marks

Cutting with a barcode

The barcode makes it possible to automatically download the corresponding plot file from the **ColorGATE CutServer**. The SummaSign plotter can scan the barcode and determine the job ID if the device supports this function. Then the **ColorGATE CutServer** automatically sends the corresponding plot files that belong to the job ID scanned.

The medium must be turned by 180 degrees as in Fig. 13 and inserted into the plotter. Then press the “Actions / Load / OPOS Barcode” buttons on the device and use the arrow buttons on the panel to move the tool head in front of the barcode (red marking in Fig. 14). Confirm the position on the device panel to start the scanning process. The plot file will be downloaded and the cutting process performed automatically as long as there is a connection between the plotter and the CutServer and the correct plot file can be found in the CutServer archive.

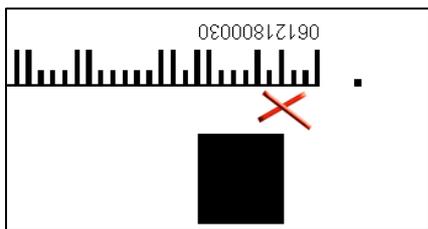


Fig. 15 - SummaSign Barcode

TIP: When inserting the medium, use the “MediaCalibration” field as a guide. If you are standing in front of the plotter, then the “MediaCalibration” field will be located on the bottom right of the print.



TIP: It is possible to process several different jobs in succession on rollware. Once the first job has been cut, the plotter will automatically scan the next barcode and download the corresponding plot file from the CutServer. In this case, the “MediaCalibration” area must be deactivated for the next jobs (see: 3.1.3 Device settings: SummaSign page 12).

Cutting without a barcode

The medium must be turned by 180 degrees before it is inserted in the plotter as in Fig. 13. Following the transmission of the corresponding plot file, use the control buttons on the panels to position the laser above the start mark (bottom right) and confirm the settings. The plotter will then automatically move to the other synchronization marks to compare their position with the coordinates of the plot file.

If problems should occur in identifying the OPOS marks when using special media (e.g. high-gloss paper), the “MediaCalibration” field can be used to adjust the plotter sensor to the black dot of the OPOS marks. For more information on “MediaCalibration”, please refer to the Mutoh Ultima manual or to the manufacturer’s website.

3.7.4 Graphtec

Sfgggf

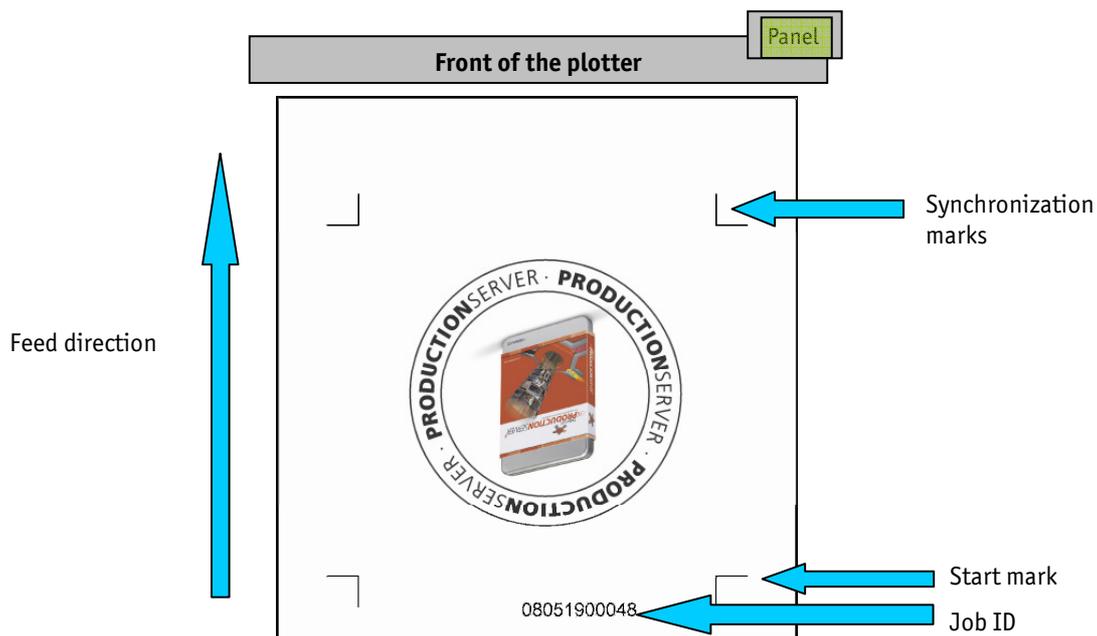


Abb. 1 - Graphtec synchronization marks

4 Other functions

To simplify the work with the **PRINT&CUT** Module and optimize production, familiar functions can be linked with the module.

4.1 Containers

Hold down the CTRL key to mark several jobs and click the right-hand mouse key to put them in one container. The properties of the container will open automatically (Fig. 15).

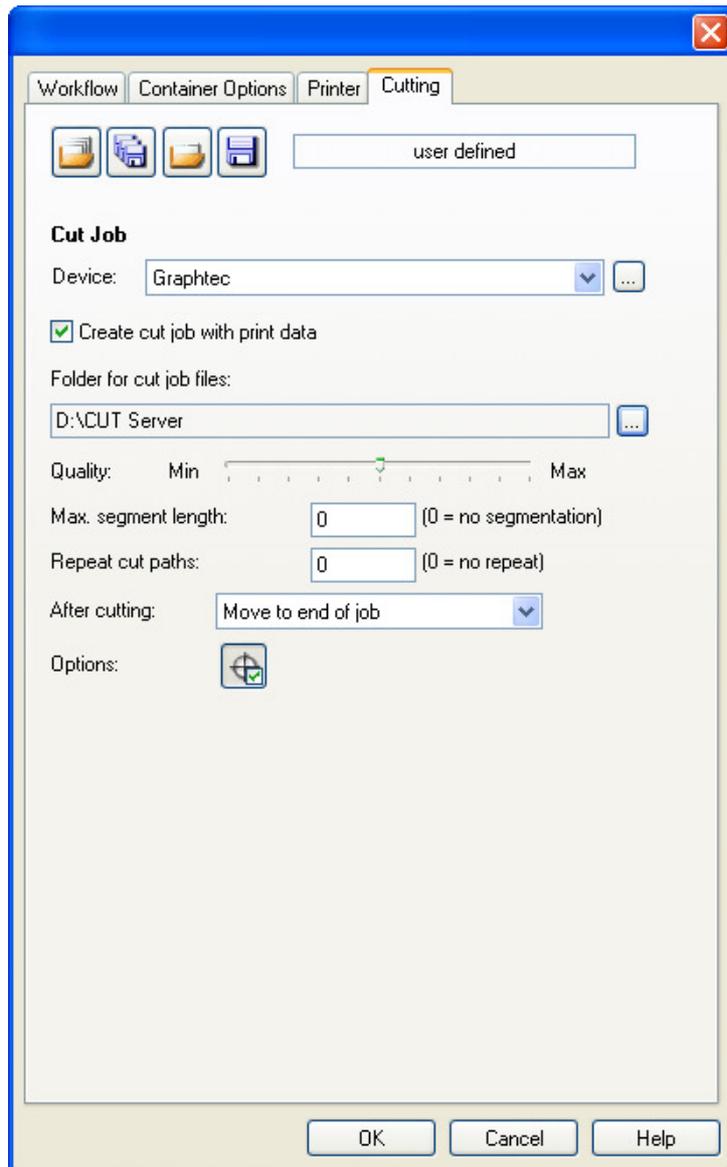


Fig. 16 - Container settings

PRODUCTIONSERVER⁵ automatically calculates and places the jobs, based on the width of the medium selected ("Printer" tab). The **PRINT&CUT** Module creates a box that includes all the jobs.

Because **PRODUCTIONSERVER**⁴ recognizes and supports different names for cut path spot colors, they have to be defined in the print files in the container. You can determine the spot colors either before or after you have created the containers. Double-click the container preview to start the layout function. Another double-click on an image will open the special job settings (see: 3 Functions: Cut Job page 9) of the file, which can then be adjusted accordingly.

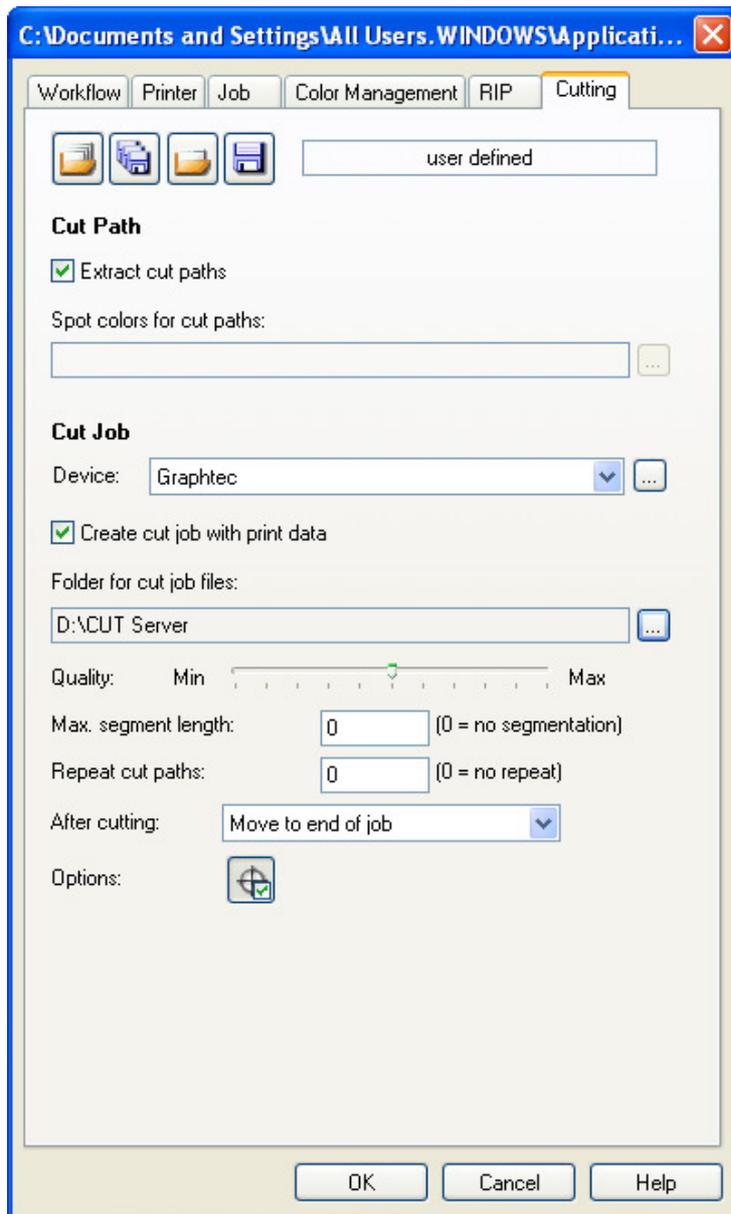
Multiple copies can also be integrated into containers.

4.2 Hotfolders

In order to automate the creation of cut jobs with printing, the **PRINT&CUT** Module is also available in the hotfolder settings (Fig. 16).

Access the settings from the main menu via **Printer > Properties > Tab Hotfolders**.





The cutting data for incoming jobs are extracted automatically.

PLT data is automatically created and stored for the plotter selected in a pre-defined directory.

Every print job is output with a printer-specific synchronization mark.

Fig. 17 - Hotfolder settings

The "Spot color for cut paths" function is only available in the job settings for a file because this is where the actual embedded spot colors can be read out. The **PRINT&CUT** Module defines the first spot color in the header of an incoming file as the cut path when the "Spot color for cut paths" is activated in the hotfolder.

4.3 Multiple output

Select the “Job” tab to reproduce a single job multiple times. Based on the width of the medium selected, **PRODUCTIONSERVER⁵** will calculate and place the copies automatically. The **PRINT&CUT** Module will automatically create a cut box to include all the copies (Fig. 17). This makes it possible to optimize production with just a few clicks of the mouse with respect to work time and medium savings.

4.4 Create cut job manually

The PLT data of a job can also be created manually afterwards. Go to the main menu and click the corresponding job with the right-hand mouse button. The “Create Cut Job” function (Fig. 18) uses the cutting data that has been extracted to create a PLT file in the “Folder for Cut Job Files” indicated.

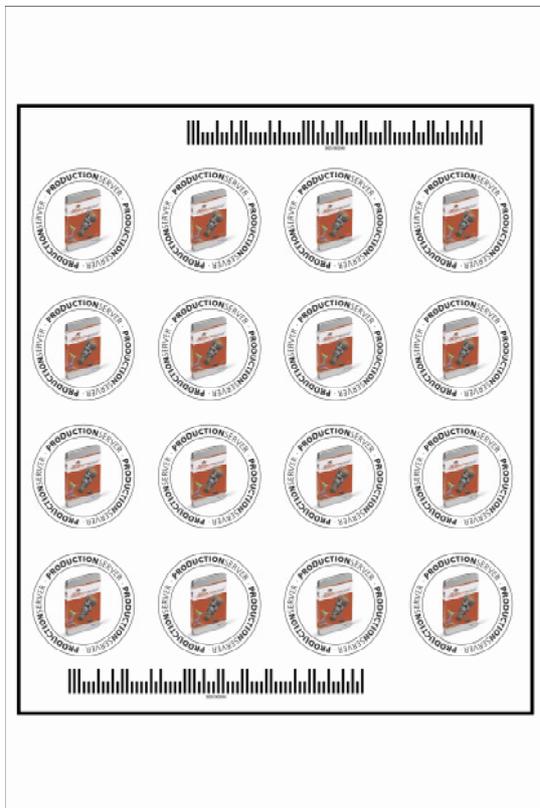


Fig. 18 - Multiple output

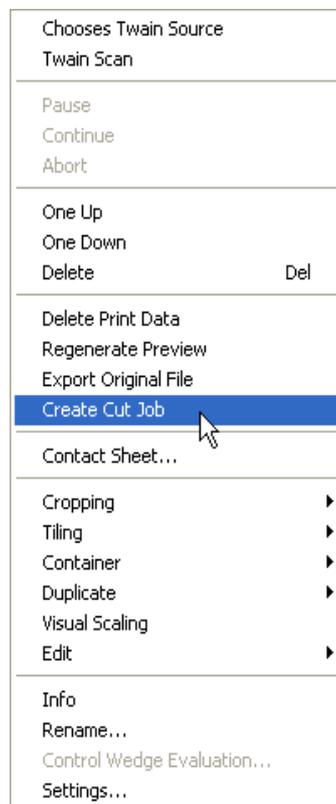


Fig. 19 – Create cutting job

TIP: This function can be used when settings in the “Cut” tab or in the plotter settings have been altered at a later date, such as “Repeat Cut Paths”, “Force” or “Velocity”. If you create the cut job manually, any changes will be taken over and you will not have to rip the job again.

5 External software

5.1 ColorGATE CutServer

The **ColorGATE CutServer** software comes with the **PRODUCTIONSERVER⁵**. It serves as an interface between the RIP on the computer and the plotter. The cut server automatically receives the plot files from the PRODUCTIONSERVER⁵ via a special hotfolder and can forward them to a plotter at the click of a button or automatically (Summa plotters with barcode scanners). In the latest version, the **ColorGATE CutServer** supports the Mimaki FX Series and the SummaSign. The Mutoh CutServer is required to control Mutoh devices (see: 5.3 Graphics applications page 27).

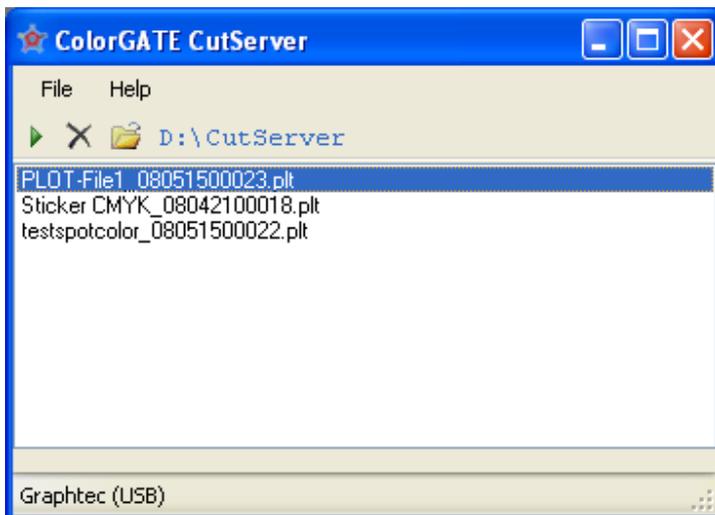


Fig. 20 - User Interface ColorGATE CutServer

5.1.1 Settings

The **File > Settings** menu can be used to select the plotter and the interface (Fig. 20).

NOTE: Generally speaking, it is advisable to use the newer USB interface. Once the device has been connected and switched on, the operating system will automatically recognize the plotter. The driver has to be installed before the device can be operated.



Fig. 21 – Settings for port

If the plotter is controlled via the serial interface, then the settings for the **ColorGATE CutServer** (Fig. 21) must be the same as those for the plotter. The plotters manufactured by Mimaki and Summa are equipped with a corresponding internal settings menu that can be accessed on the device panel. For more information, please refer to the plotter manual.



Fig. 22 - COM settings

Open the interface settings for the plotter and compare them to the settings in the **ColorGATE CutServer**.

“RequestToSend” is often called the hardware handshake and “XonXOff” the software handshake.

NOTE: If possible, you should use the manufacturer’s serial cable that comes with the plotter to avoid any problems that might arise due to different cable properties and types. For example: the hardware handshake “RequestToSend” will not work if the cable used is not equipped with the necessary control line. In this case, the “XonXOff” software handshake can be used as long as the plotter supports it.

5.1.2 File window

The **ColorGATE CutServer** shows all the plot files in the hotfolder. The name of the plot files is made up of the job name and a unique job ID. The job ID is also on the printout as long as the “Bard code” option has been activated in the device settings (see: 3.1 Plotters (Device) page 9).

TIP: The first six digits of the job ID are based on the creation date. The job ID 07121900005 indicates that this job was created on 19/12/2007 (19th of December 2007).

5.1.3 Delete job

This option must be selected to delete a job. Press down and hold the CTRL key to mark several jobs. Then delete the jobs by pressing the key illustrated above or use the following menu item: “File > Delete”.

5.1.4 Send job

Once a job has been marked, you can press the key illustrated above or click the menu item: “File > Send” to send it to the plotter. If there is no connection to the plotter, then the Send function will not be available or it will be grayed out (see: 5.1.6 Status display page 25).

5.1.5 Hotfolder

The **ColorGATE** CutServer automatically recognizes and imports plot files from a previously indicated directory. As a result, the “Folder for cut jobs” from the “Cut” tab (see: 3.3 Folder for cut job files page 13) should be set up as the incoming directory for plot files. Click on the button illustrated above or use the menu item **File > Folder for Cut Jobs ...** to open a navigation window, in which you can select or create a hotfolder (Fig. 22).



Fig. 23 - Hotfolder for incoming plot files

5.1.6 Status display

The **ColorGATE** CutServer is equipped with a status display. The plotter is ready when the status light is green. If it is red, it has not been possible to establish a connection to the plotter (Fig. 23). In this case, please check to make sure that all the cables are connected properly.



Fig. 24 - Status display

5.2 Mutoh CutServer

Mutoh plotters are equipped with an integrated barcode scanner, which is able to identify the print that has been inserted. In addition, the plotter is also able to use the bar code to identify the printing direction (0° or 180°). Then the plotter sends a query to the cut server and requests the corresponding plot data. If these files are available in the cut server, they will be sent to the plotter automatically. The Mutoh CutServer, which comes with the device, is required for this automatic data exchange. In principle, it functions in the same way as the **ColorGATE** CutServer. The following settings have to be made in the Mutoh CutServer software:

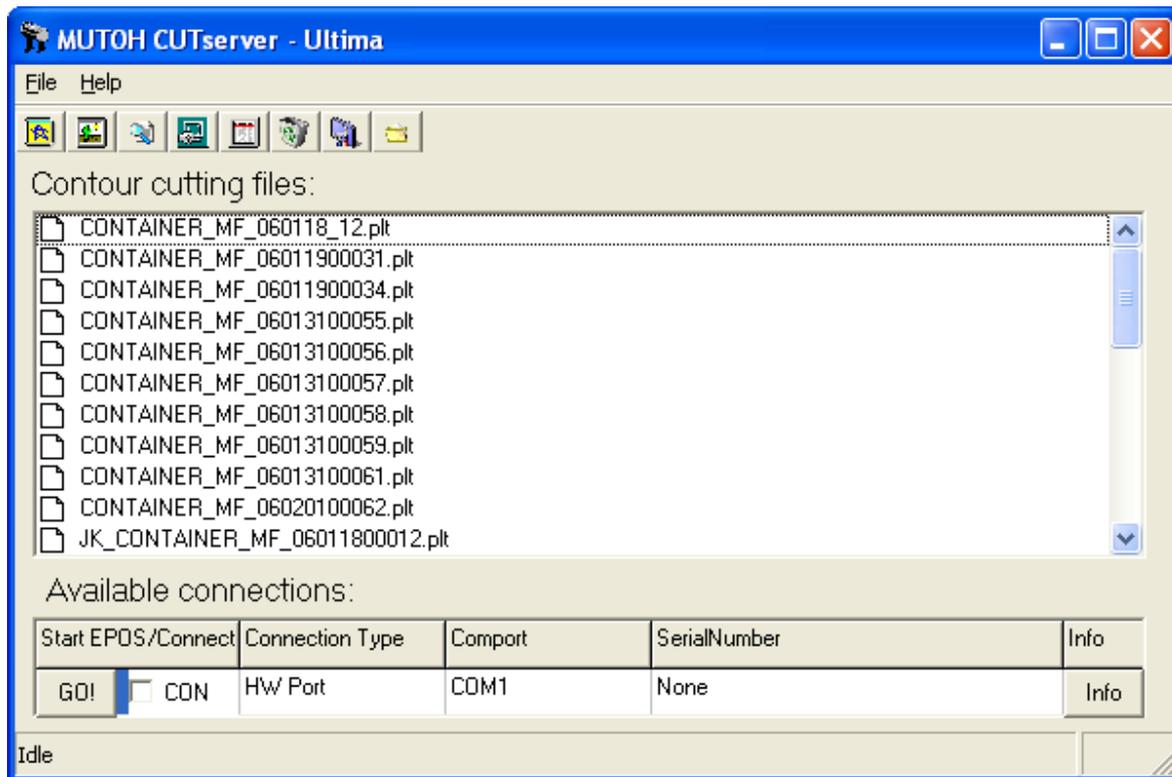


Fig. 25 - Mutoh CUTserver User Interface

Click on **File > Settings** to access the server settings.

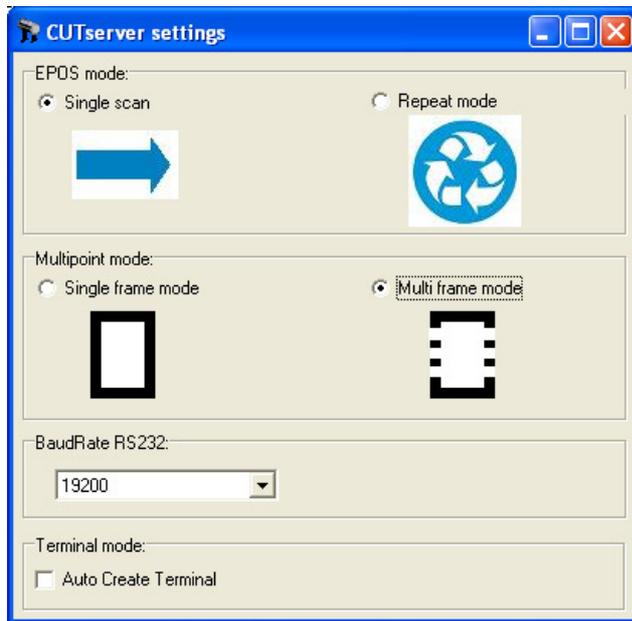


Fig. 26 - Mutoh CUTserver settings

EPOS Mode:

Select “Single scan” for individual jobs and “Repeat mode” for continuous jobs (e.g. from the roll). Once the first job has been completed, the next job will be processed automatically in Repeat mode as long as the corresponding PLT file has been stored in the CutServer.

Multipoint Mode:

With the segmentation function, the **PRINT&CUT** Module creates AL5 data that can only be sent to the plotter in multiframe mode. That’s why the “Multiframe mode” option should always (!) be activated.

5.3 Graphics applications

The cut path is stored in an external graphics application. Create a line around the motif with a spot color (Fig. 26). The name of the spot color is not important for the continued processing in **PRODUCTIONSERVER⁵** because any embedded spot color can be read out and defined as a cut path. Any color can also be chosen because the cut path is extracted from the print job and is not visible on the output. The cut path should be stored as a hairline (0.25 pt). Store the file as EPS (Encapsulated PostScript), so that the cut path can be read by **PRODUCTIONSERVER⁵**. Other file formats are not supported at the current time.

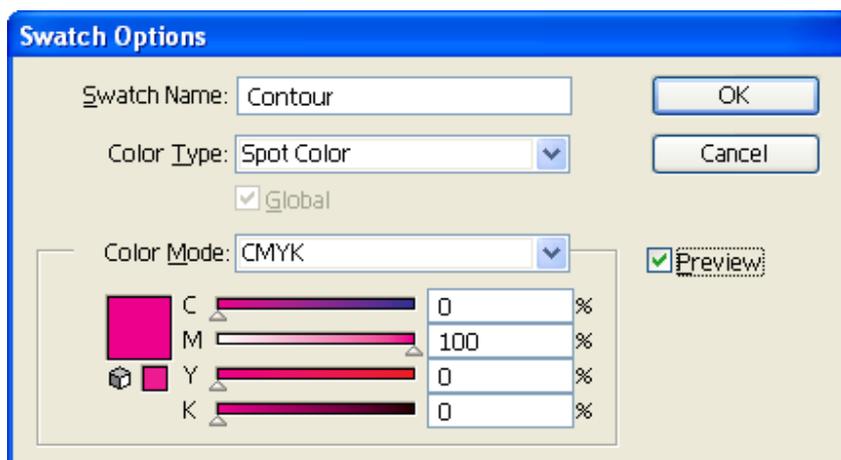


Fig. 27 - Cut path properties in Adobe Illustrator



6 Technical background

6.1 Workflow presentation

Any printer can be used to output the print job together with the synchronization marks. During the job process, **PRODUCTIONSERVER**⁵ writes another PLT file into another directory. This PLT file contains the cut path of the print job in machine-readable form. As a rule, you should choose the incoming directory of the CutServer program as the output directory for the PLT files. The CutServer application sends the PLT data to the plotter. This is where the completed output is deposited and the cutting process started with a single touch of the button (Fig. 27).

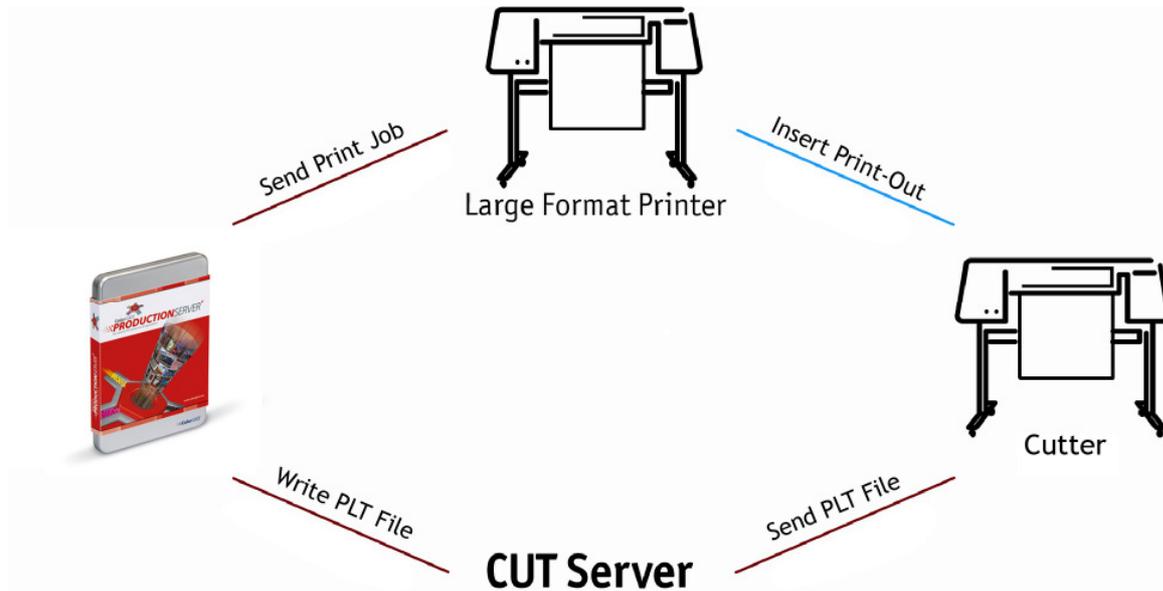


Fig. 28 - Workflow