



Print Media Academy

Prinect Color Solutions

ColorAssistant - Automatic optimization of the CP2000 characteristic curves for ink presetting



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Important sections of text

All important sections of text are accompanied by symbols in the margin. These symbols have the following meaning:



Note: Contains important general or additional information on a particular topic.



Prerequisite: Indicates prerequisites that must be fulfilled for the following action steps can be carried out.

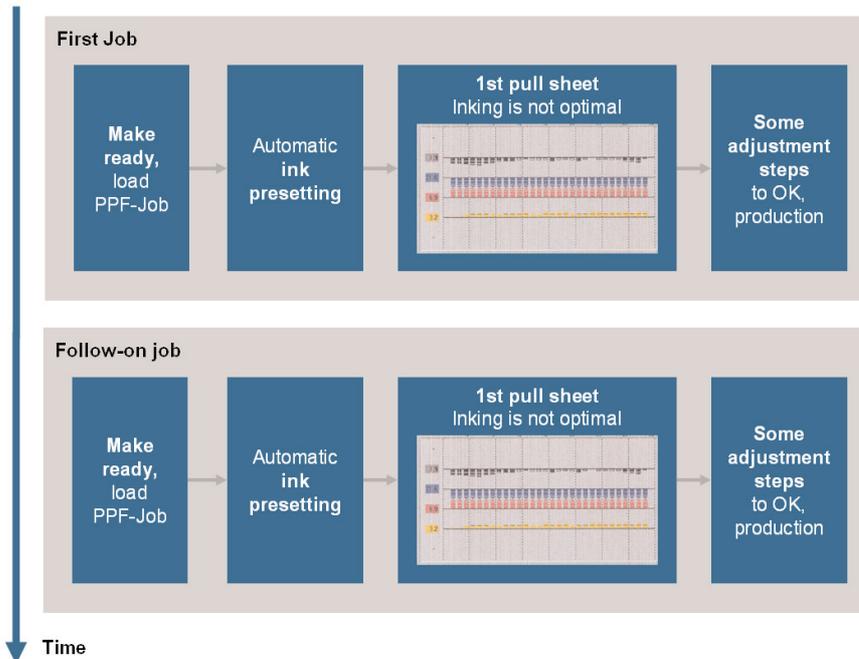


Chapter 1: ColorAssistant – Basics

The principle of optimizing ink presetting characteristic curves

The CP2000 PCS function ColorAssistant automatically optimizes ink presetting on the printing press. ColorAssistant can be enabled as a licensed option from software version V43 onward.

At present a typical production workflow is as follows:



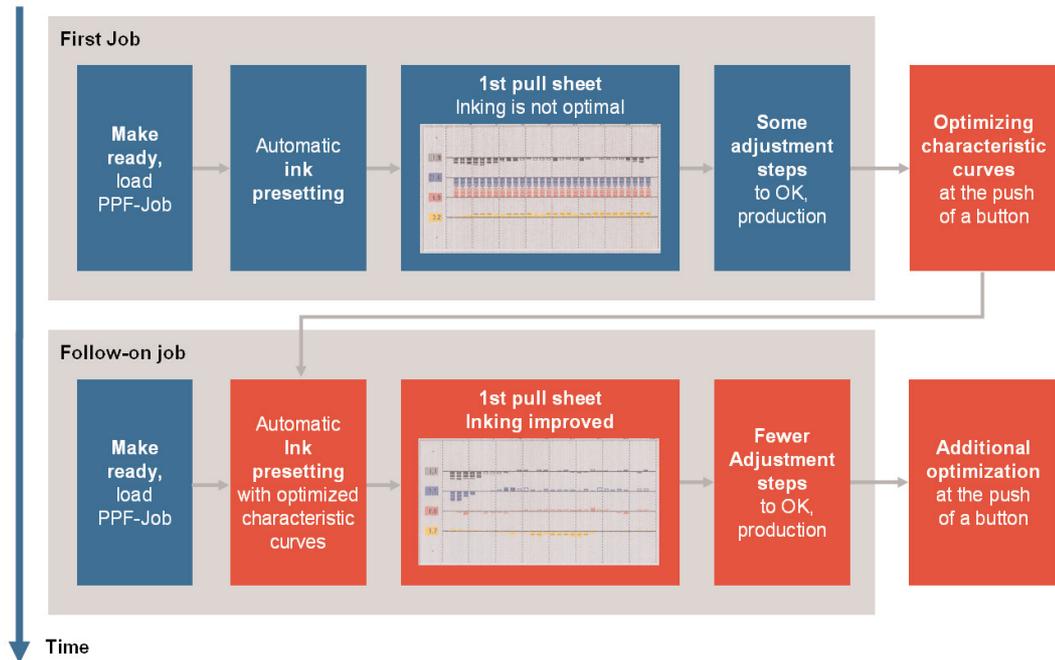
The inking of the first pull sheet reveals that the ink presetting was not optimal. This is also the case with all other follow-up jobs.

Production with ColorAssistant

ColorAssistant evaluates all changes that the printer makes to the ink settings from the transfer of the ink presetting data to achieving the desired inking (OK sheet).

CP2000 then offers you the option of optimizing the ink presetting characteristic curves, taking into account the control steps that were required to reach the OK sheet. Follow-on jobs use the optimized characteristic curves so that less control work is required to reach the OK sheet for the follow-on job.





This adjustment process can be carried out over several follow-on jobs. This involves continuously improving the presetting of the printing press - at least until the parameters (ink, paper, etc.) that influence the printing process remain stable. If an adjustment step does not result in the desired improvement, you can undo the adjustment using the *Reset* function.



Prerequisites for the use of ColorAssistant

- The printing press must be equipped with CP2000 V43 and the ColorAssistant option must be enabled.
- The jobs including area coverage values are loaded via the PrepressInterface (PresetLink or FlashCard).
- For optimum results, the prepress department should use the PCS workflow. This enables you to select the ink presetting characteristic curves automatically. If prepress is not equipped with the PCS workflow, you need to allocate the corresponding ink presetting characteristic curves to the job manually.



Prerequisites for a successful optimization step

- The printing form should have an uncritical design and area coverage values in as many tonal value ranges as possible, from highlights to deep tone values.
- Always start the optimization of the ink presetting characteristic curves at the same printing speed and not until the job has a sound color balance (stable inking level, stable ink zone control).
- Makeready and printing should take place with as constant an ink fountain roller feed as possible. Use the ink fountain roller preselection in CP2000.



Before you start - Functions of the characteristic curve database in CP2000

In addition to the characteristic curves for ink presetting, the characteristic curve database contains characteristic curves for the speed compensation of ink fountain rollers, dampening system water pan rollers and coating pan rollers.

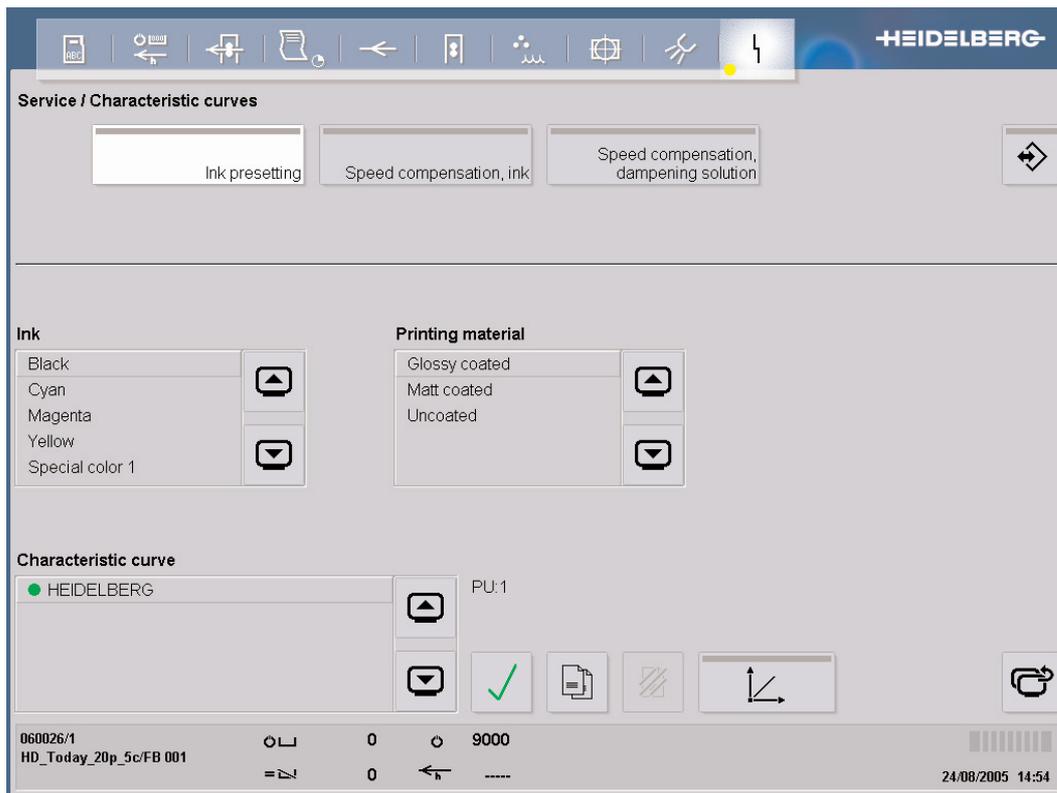
Note: Only the characteristic curves for ink presetting are of importance when working with ColorAssistant. The characteristic curves for speed compensation are not covered in this document.



Delivery condition of the characteristic curve database

Several characteristic curves for ink presetting are preset in the factory: For each of the 3 printing material classes, *glossy coated*, *matt coated* and *uncoated*, there are 7 colors (*black*, *cyan*, *magenta*, *yellow*, *special color 1*, *special color 2*, *special color 3*). These characteristic curves have the name *HEIDELBERG* and the *default flag (green dot)*. They can be copied but not changed or deleted.

Note: How to use the characteristic curve database is explained in chapter 3 and in the operating manual of the printing press



Menu design of ColorAssistant

ColorAssistant offers 3 functions for ink presetting characteristic curves

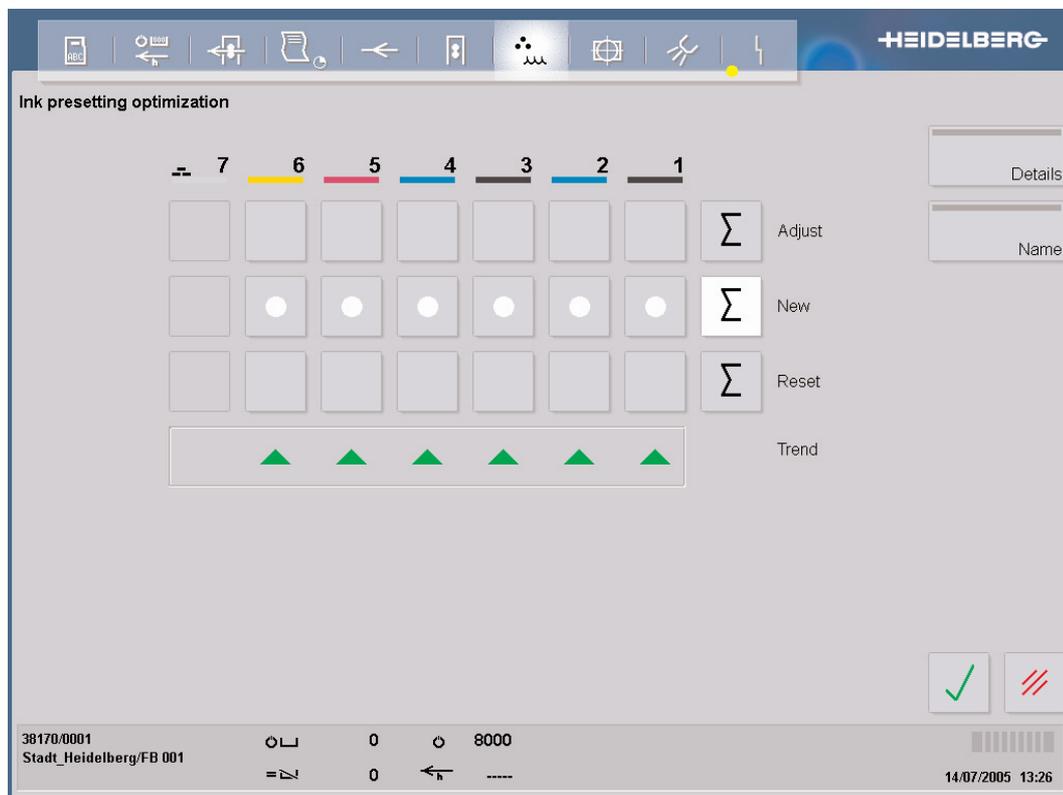
Adjust - optimize an existing characteristic curve

New - create a new characteristic curve

Reset - undo the last optimization step

ColorAssistant automatically suggests *New* or *Adjust* if the prerequisites for a characteristic curve optimization are fulfilled. A green arrow is displayed in the *trend* column beneath the corresponding colors. If no useful optimization is possible due to an unsuitable form design, CP2000 does not select any of the functions for the corresponding color/characteristic curve.

You can find the ColorAssistant functions in the menu **Ink, dampening / Ink profiles**. Click on the *Ink presetting optimization* button to go to the **Ink presetting optimization** menu.



This menu contains the buttons for the functions *Adjust*, *New* and *Reset*.

You can use one of the buttons to switch the corresponding function on (dot in the button) or off for a color. You can select a function separately for each color. The sum button switches a function on or off for all colors. You can also switch off all functions, either for individual colors or for all colors.



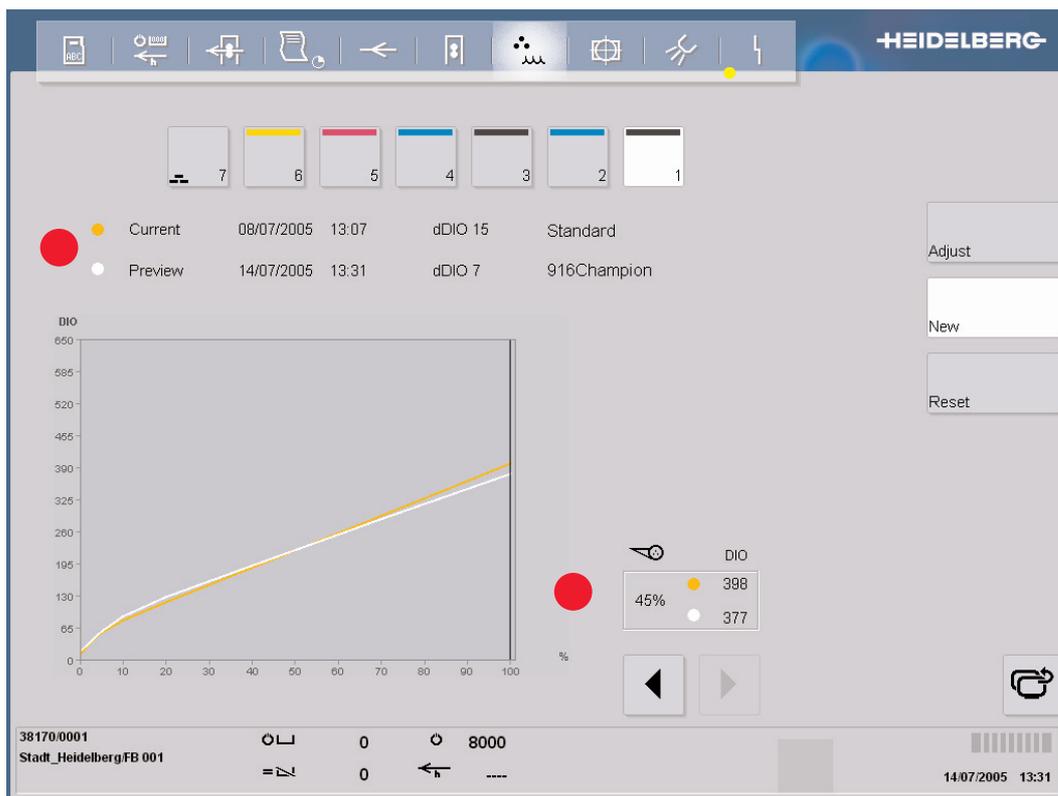
Note: The *trend* is displayed beneath the buttons:

Green arrow – the ink presetting characteristic curve for this color is improved by the optimization. If no green arrow is displayed, no improvement is expected.

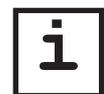


The selection is adopted (and the characteristic curves are modified according to the selected function) when you acknowledge this menu with the OK button (button with the green check mark).

Click on the *Details* button to go the menu **Ink presetting optimization / Details**. Here, the current characteristic curve (orange) and the preview of the modified characteristic curve (white) are displayed, depending on the function. If you press the buttons *Adjust*, *New*, *Reset*, you can see the effect of the function immediately. When you leave the menu, the function that was last displayed is adopted as the selection.



Note: The most important characteristic curve parameters (current) and the effects of the selected function (preview) are listed beneath the color buttons. You can compare the date of the last change, the average deviation and the characteristic curve name at a glance.



The coordinates window shows the current characteristic curve and the preview of the optimization at the current ink fountain roller value.



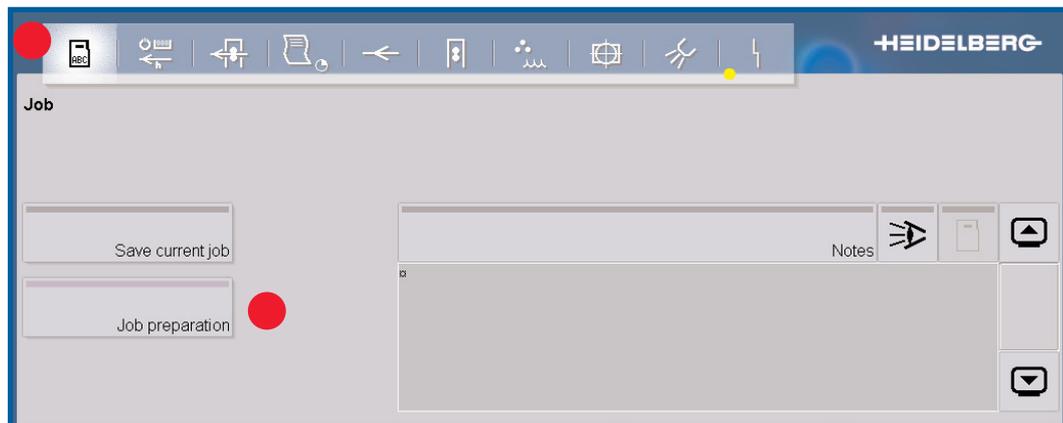
Chapter 2: Working with ColorAssistant

The process is illustrated on the basis of a four-color job (black, cyan, magenta, yellow and an optional special color, e.g. Pantone 281PC) with/without PCS workflow and for glossy coated paper. In this example, the characteristic curve database in CP2000 contains only HEIDELBERG characteristic curves. Reference will be made accordingly to differing steps if ink presetting characteristic curves that you have created yourself exist.

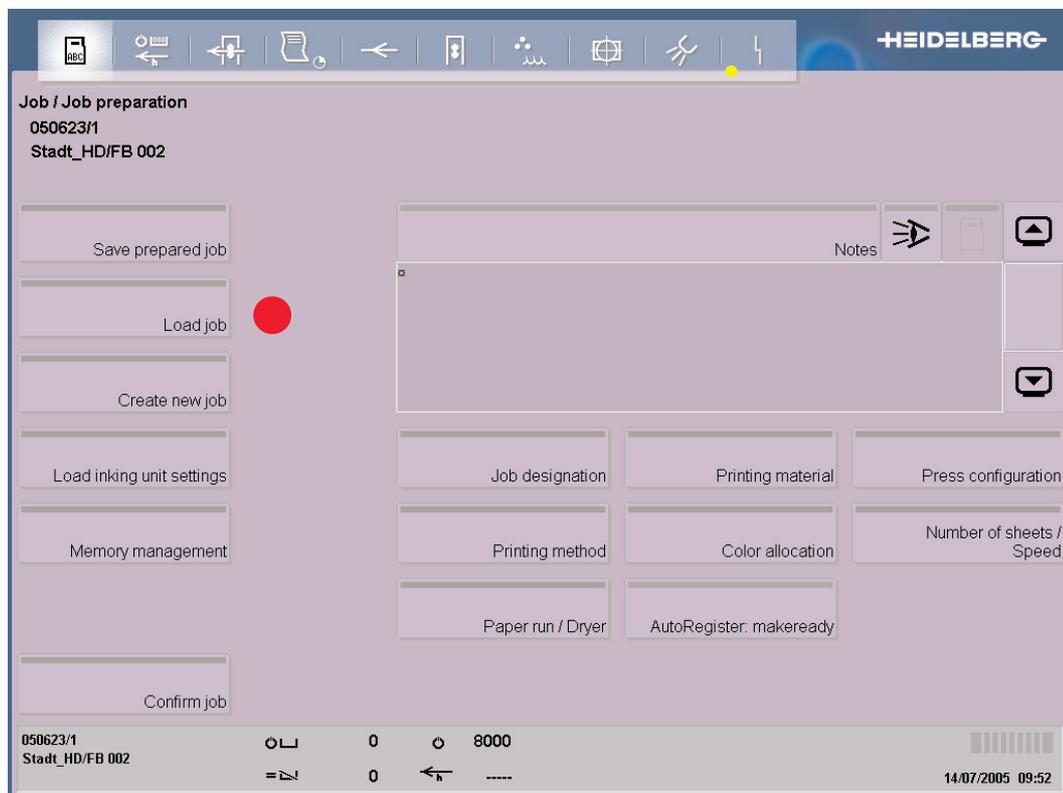
Step 1 – Loading presetting data for the first job

Load the first job including dot area values via Prepress Interface.

1. Press the *Job* button. The **Job** menu appears.



2. Press the *Job preparation* button. The menu **Job / Job preparation** appears.

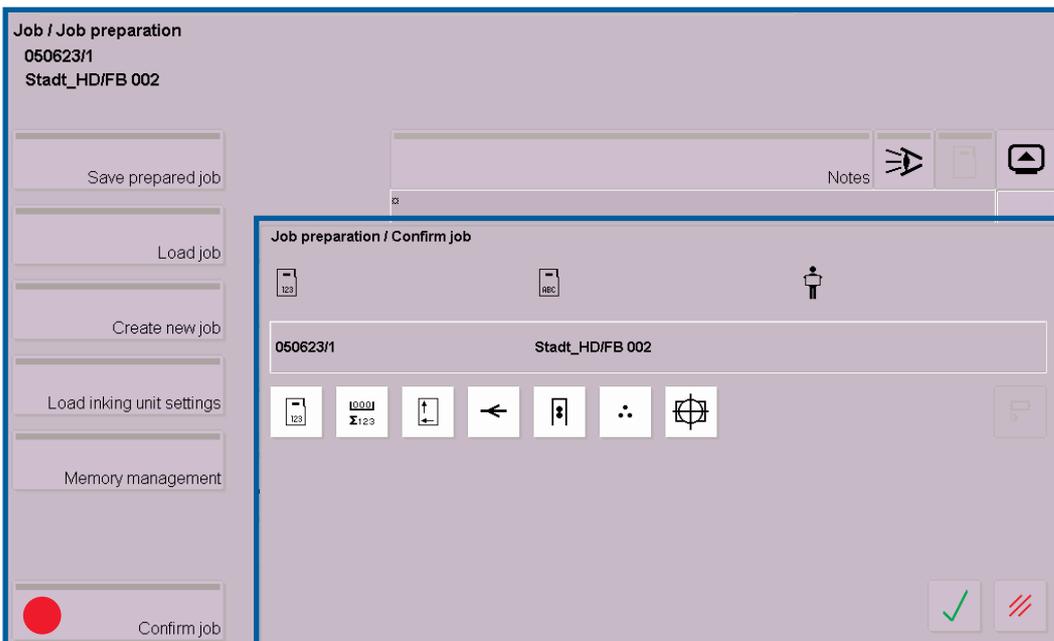


3. Press the *Load job* button. The menu **Job preparation / Load job** appears.



4. Select *PrepressInterface (PPF)* as the data source. The jobs available are displayed. Select the job that you wish to copy from the list. Press the OK button (green check mark) to load the job.

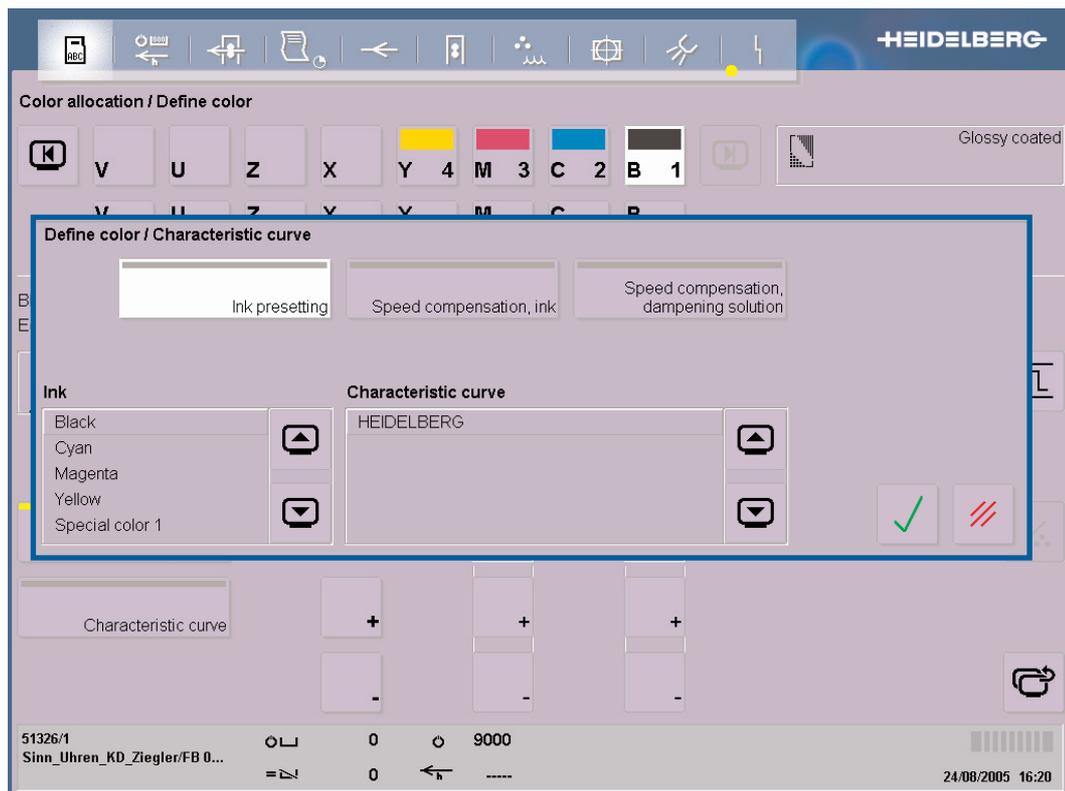
5. Press the *Confirm job* button. The window **Job preparation / Confirm job** appears. You can use the icon buttons to select the areas whose presetting value you wish to copy. Generally, everything is selected.



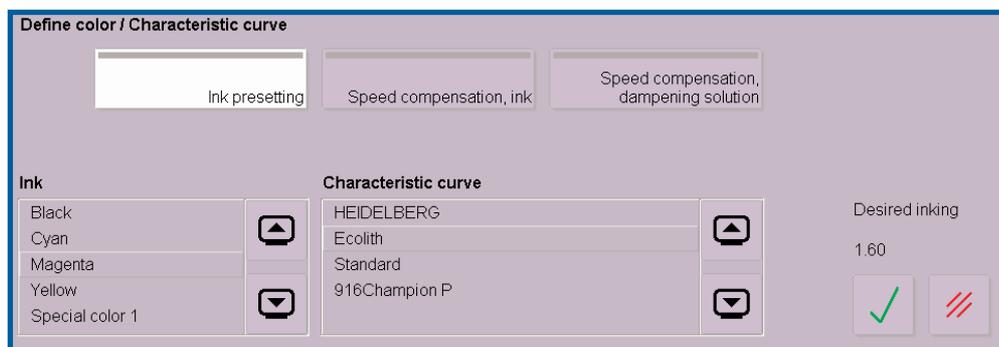
Depending on the job, the corresponding ink presetting characteristic curves are allocated automatically for process colors in accordance with the

- color (black, cyan, magenta, yellow, special color)
- paper (glossy coated, matt coated, uncoated)
- ink series (PCS workflow)
- desired inking (PCS workflow)

If no individual characteristic curves have been created yet, HEIDELBERG characteristic curves are allocated (as in the example).

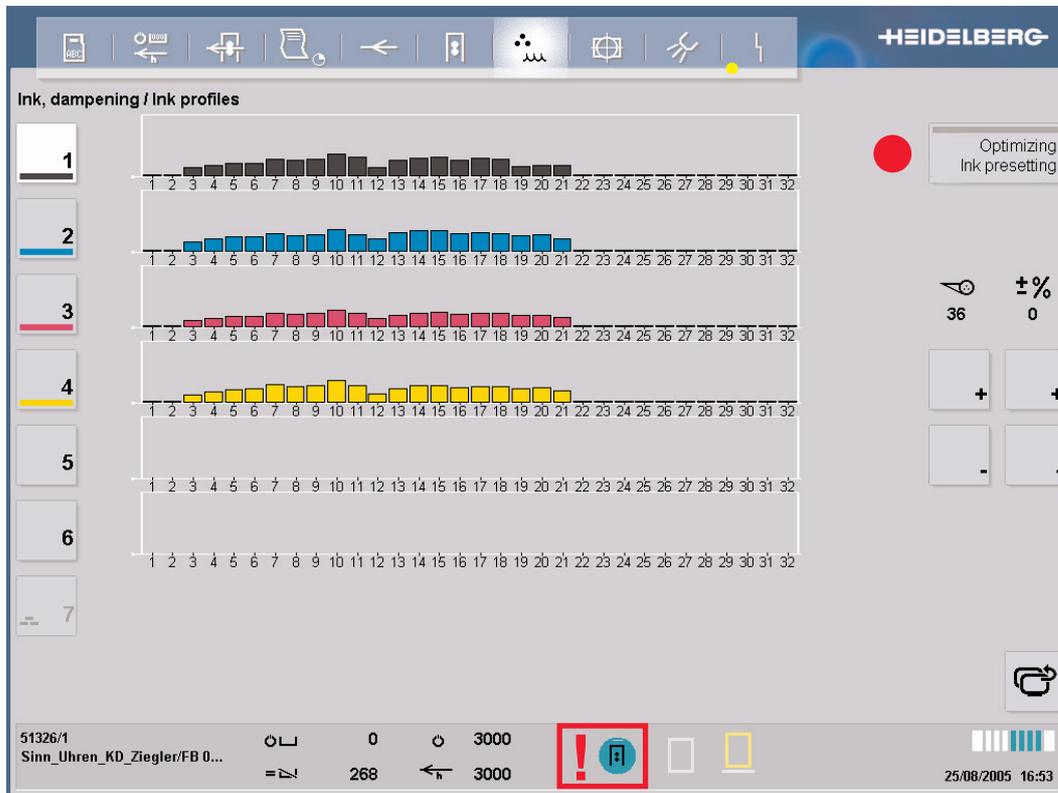


If suitable ink presetting characteristic curves are available in the database, these are allocated.



Step 2 – Preparing the first job and going to OK

Prepare this job and adjust the inking as usual until the inking has reached OK status and the ink zone presetting no longer needs to be altered.

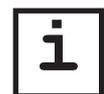


Step 3 – Optimizing the characteristic curves of the first job

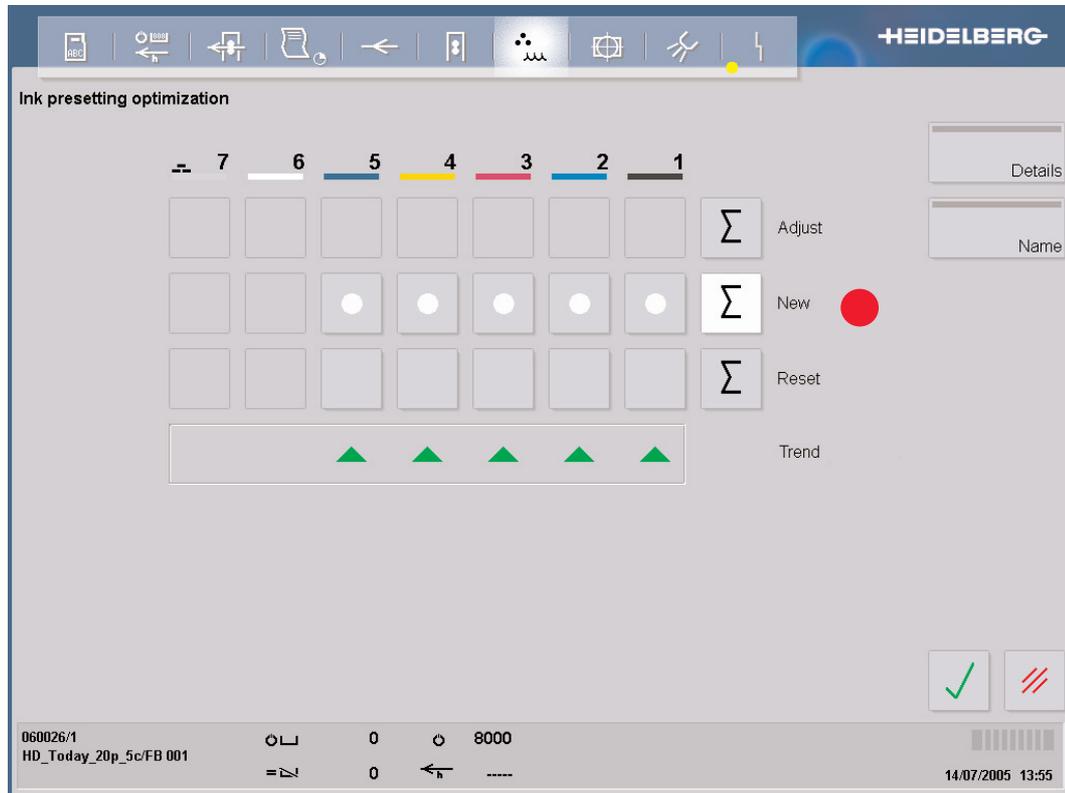
You can trigger the optimization of the ink presetting characteristic curves when the press is in a stationary condition (green light) and if the printing form is suitable.

1. Press the *Ink / dampening* button in the header. The **Ink, dampening** menu appears.
2. Press the *Ink profiles* button. The **Ink, dampening / Ink profiles** menu appears.
3. Press the *Ink presetting optimization* button. The **Ink presetting optimization** menu appears.

Note: Multiple optimization processes with identical values is not possible; you can only perform one optimization per job. Only optimize once the inking of the job is OK.



The **Ink presetting optimization** menu displays the possible alternatives in a matrix structure.



In the example, printing units 1–4 are allocated with black, cyan, magenta and yellow. Printing unit 5 is a special color; no color is allocated to printing units 6+7. In the three lines underneath, the actions to be carried out for *learning the characteristic curves* are displayed and can be edited there.

Behavior with HEIDELBERG characteristic curves

If a HEIDELBERG characteristic curve was used for presetting (as in the example), the curves cannot be adjusted or reset, as these characteristic curves are uneditable. CP2000 therefore preselects the *New* function/button for all printing units provided that the presetting can be improved with the current job.

You can decide separately for each printing unit whether a new optimized characteristic curve is to be created by switching the corresponding *New* function/button on or off.

Colors *black, cyan, magenta, yellow*:

If a color series name was transferred from the prepress workflow (from the PPF file of the PrepressInterface), the new characteristic curves are given this name.

If no name was transferred from the prepress workflow, the new characteristic curves are given the name *Standard*.

Special colors S1-S3: The characteristic curves are given the name of the respective special color.



Straight printing and perfecting: The characteristic curves for the printing units following the perfector are given the color series name with a “ P” at the end (the P stands for perfector).

This makes it possible to allocate separate characteristic curves for straight printing and perfecting in the PCS workflow. The name extension “ P” is added and managed by ColorAssistant. If a follow-on job with the same color series name is transferred, ColorAssistant automatically allocates the “ P” characteristic curves to the printing units following the perfector if they are available. If no “ P” characteristic curves are available, the straight printing characteristic curves of the corresponding color series are allocated. If only “ P” characteristic curves are available, these are also allocated to the printing units before the perfector.

Default flag (green dot): The newly created characteristic curves are marked with the default flag, which makes them preferred characteristic curves.

Note: The *default flag* is changed only once if only one HEIDELBERG characteristic curve exists for the corresponding color/printing material combination. For example, if you switch over the *default flag* later on, it is no longer changed automatically.

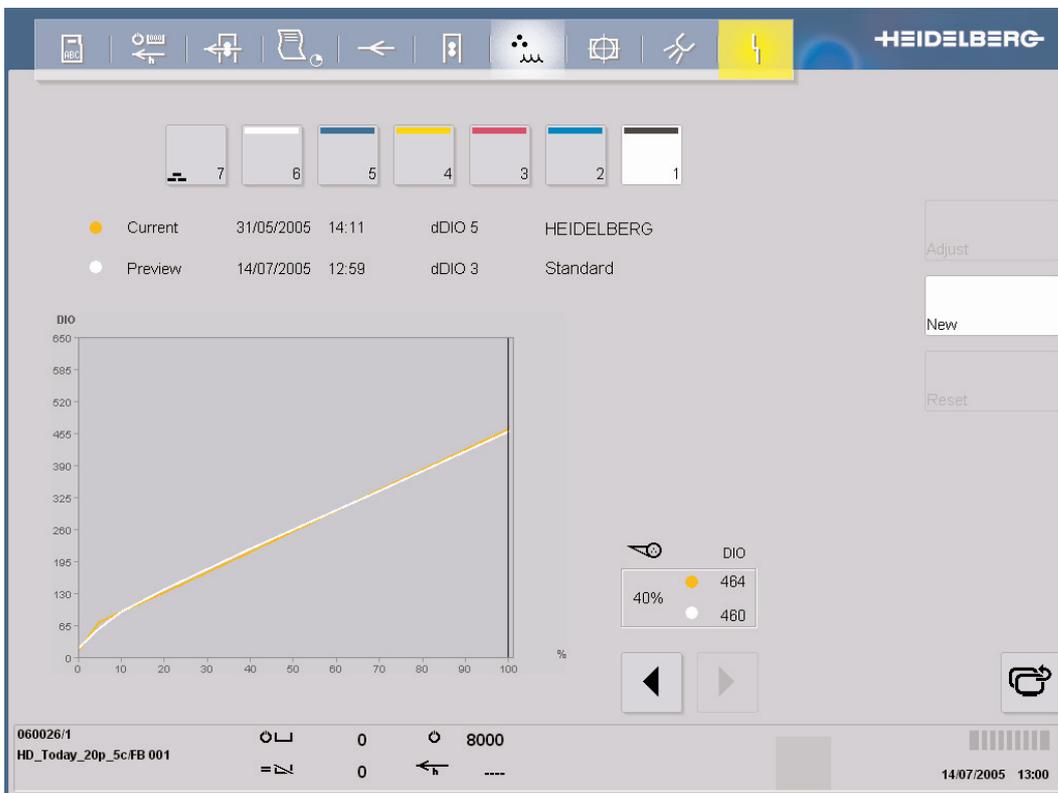


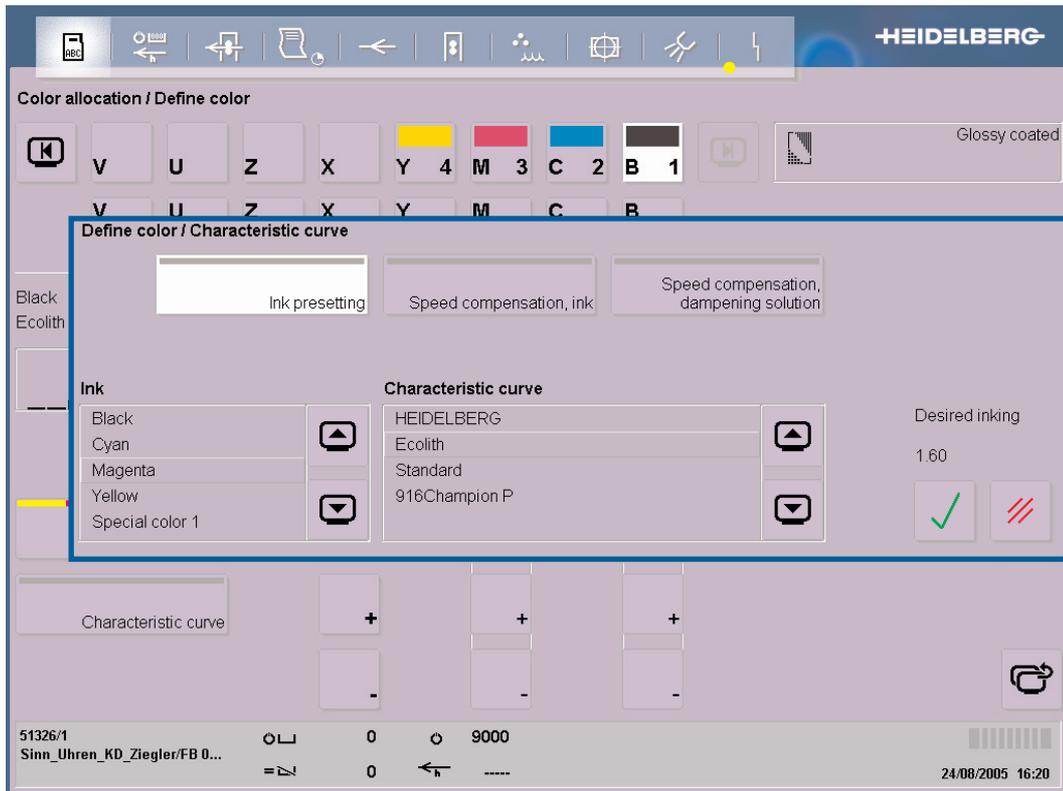
Behavior with editable characteristic curves

If an editable characteristic curve was preset, CP2000 preselects the *Adjust* function/button if this would result in an improvement.

Details

The current (HEIDELBERG) characteristic curve is shown in orange. The preview of the optimized characteristic curve is shown in white. The name of the optimized characteristic curve is also displayed.





Step 4 – Preparing a follow-on job with optimized characteristic curves

Load the corresponding follow-on job via PrepressInterface. For automatic characteristic curve allocation, the follow-on job must have the same process parameters (color series, paper, etc.) as the initial job.

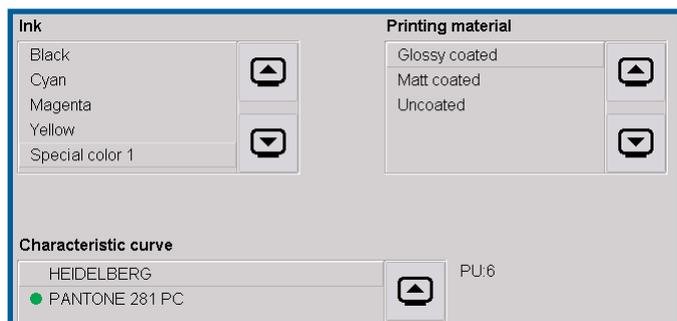
Check whether the optimized characteristic curves for the ink presetting have actually been allocated. You can check the characteristic curve allocation in the Define color menu.

If steps 1 to 3 have been carried out correctly and no manual changes have been made to the designations and default flags, the optimized characteristic curves should be allocated automatically. If not, you can correct the allocation here manually.

There are different rules for special colors. The characteristic curves are automatically allocated as follows:

- Color (special color 1-3)
- Paper (glossy coated, matt coated, uncoated)
- Color name

If a characteristic curve with the same name as the special color of the loaded job exists in the characteristic curve classes *Special color 1 - Special color 3* (in our example, *Pantone 281 PC*), then this characteristic curve is allocated automatically.



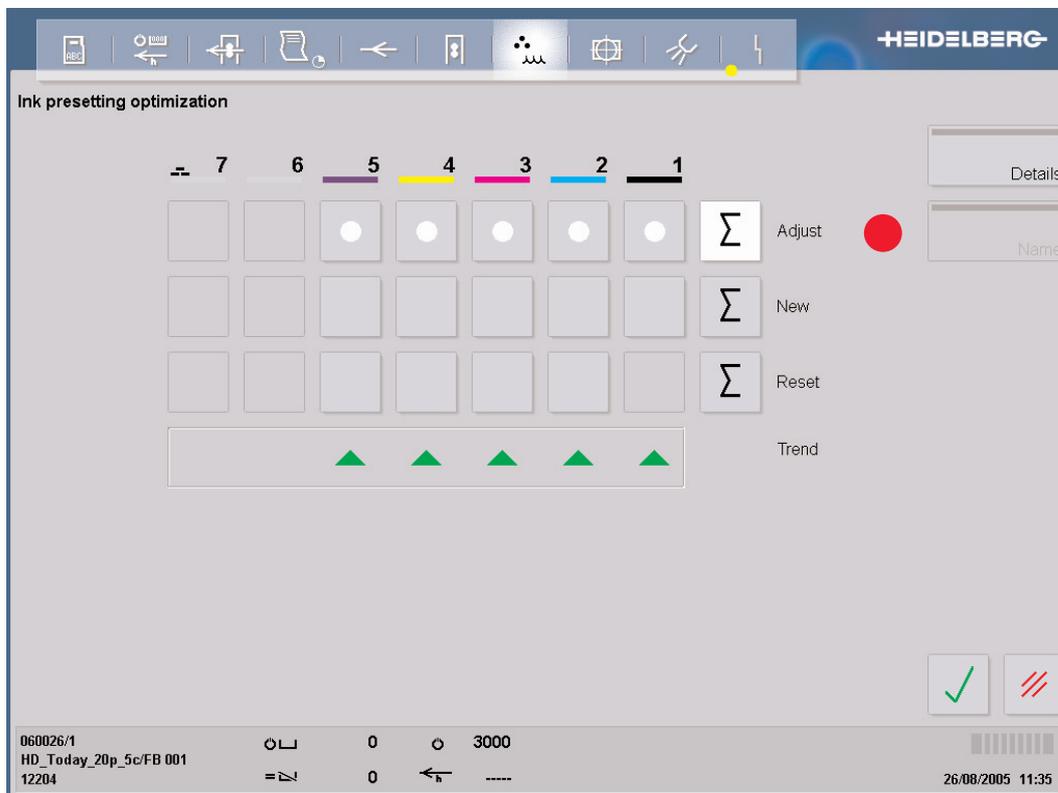
Step 5 – Preparing the follow-on job and going to OK

Prepare this job and adjust the inking as usual until the inking has reached OK status and the ink zone presetting no longer needs to be altered.

Step 6 – Optimizing characteristic curves on the basis of the follow-up job

The default characteristic curves can be subsequently learned when the press is in a stationary condition (green light), desired inking is set, and if the printing form is suitable. In the example, we assume that optimized (and thereby editable) characteristic curves are available and allocated for the follow-on job.

When optimizing an editable characteristic curve, one of the functions *Adjust*, *New*, *Reset* can be selected. If optimizations can be carried out with the current job, ColorAssistant always preselects the *Adjust* function, as this is used most often.



Adjust: The active characteristic curve is adjusted. The designation of the characteristic curve is not changed. The status of the characteristic curve before the adjustment is saved as a resetting step.

Select *Adjust* if you wish to improve this characteristic curve with the current job and do not wish to use the current status of the characteristic curve any further.

Designation of the adjusted characteristic curves: The designation of the adjusted characteristic curve is not changed, even if a different special color name or color series name was transferred in the PPF file of the follow-on job.

Default flag (green dot): The default flag is not changed. If the characteristic curve was allocated automatically before adjustment, it will also be allocated to follow-on jobs automatically after the adjustment.

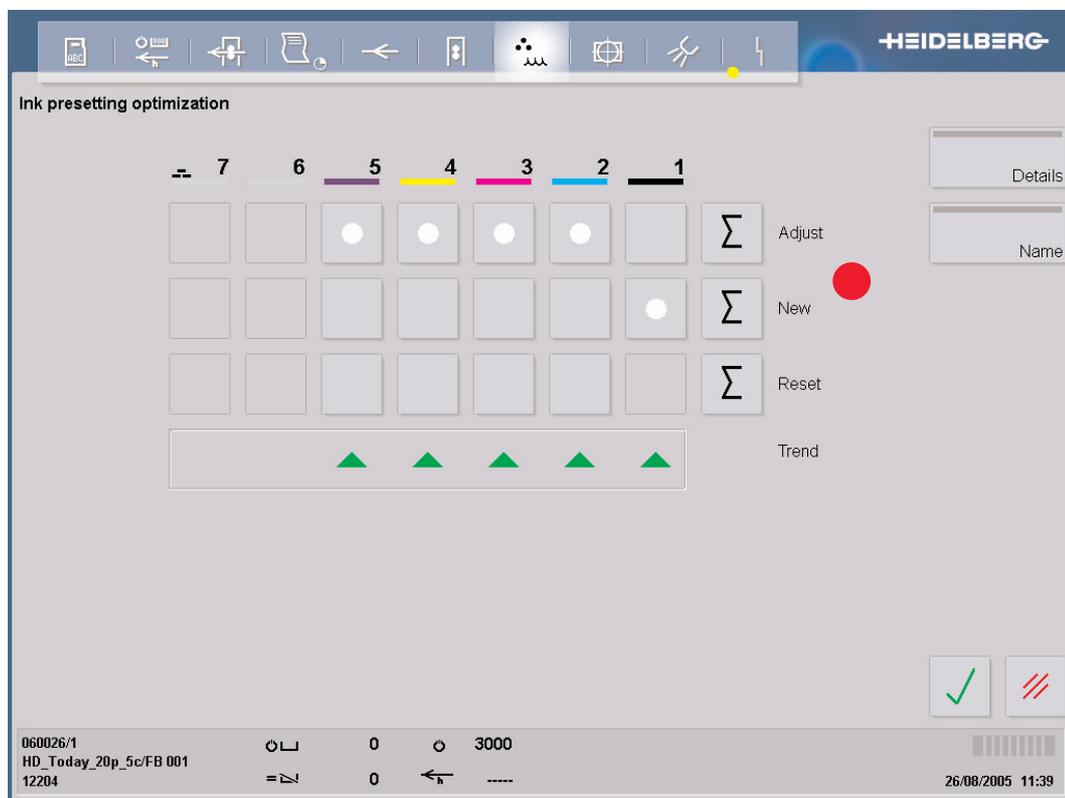


Note: The more often a characteristic curve is adjusted, the more reliable/better the presetting for the following jobs, provided the printing process does not change significantly.

New creation based on an editable characteristic curve

You can also create a new characteristic curve on the basis of the optimized characteristic curve.

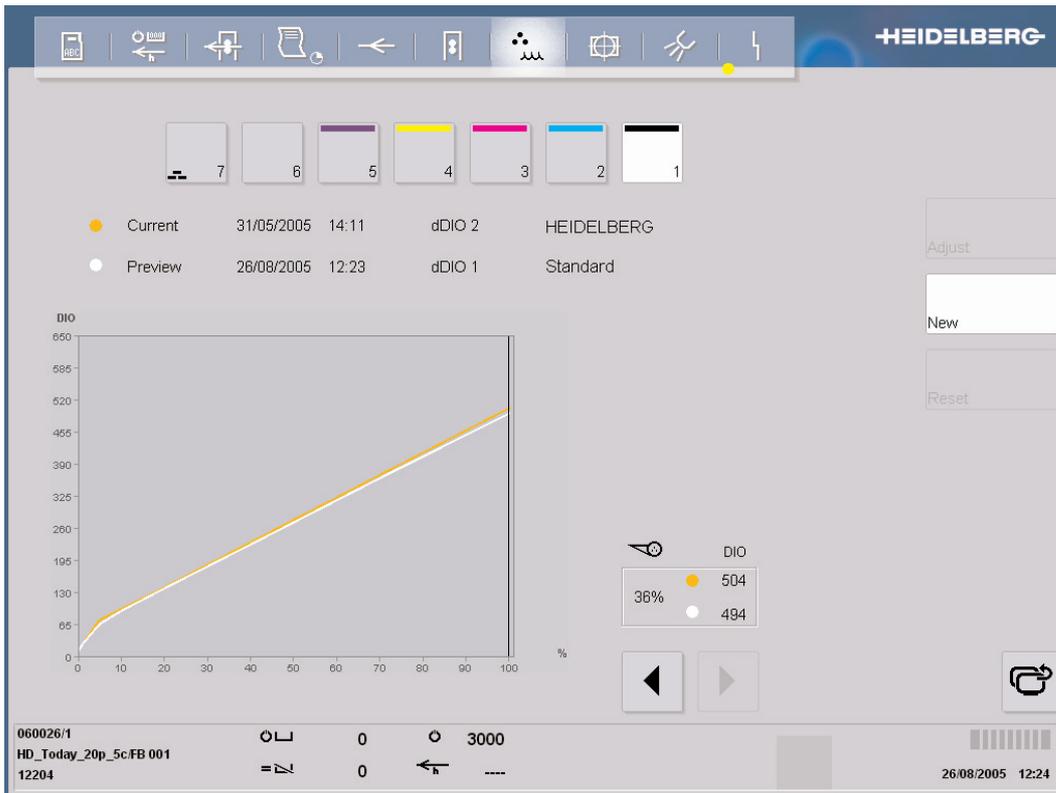
To do this, you have to select the *New* function (new creation).



New creation is useful if, for example, characteristic curves for printing processes with new parameters are to be optimized (e.g. new color series or new desired inking) and separate characteristic curves are managed for different process parameters (in the PCS workflow or manually).

During the new creation process, ColorAssistant copies the active characteristic curve and optimizes this copy. The original characteristic curve is not changed.



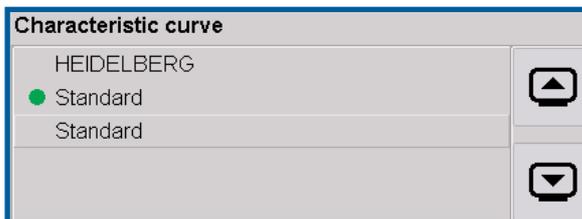


Designation of the new, optimized characteristic curves:

If a color series name was transferred from the prepress workflow, the new characteristic curves are given this name.

If no color series name was transferred, the name *Standard* is preset.

Note: In this case, you should always give the new characteristic curves a unique name. The characteristic curve database allows several entries with the same name, however, it is very difficult to tell which of these characteristic curves is the “right” one.



Default flag (green dot): The default flag is not changed and remains on the original characteristic curve.

Note: You can only select new characteristic curves automatically in the PCS workflow. Otherwise, you have to select the characteristic curve manually or switch over the default flag. If you forget to do this, the new characteristic curve - and thereby the optimization - has no effect on follow-on jobs!



Step 7 – Resetting optimization steps

Resetting is necessary if a characteristic curve optimization has not resulted in the desired improvement or if a parameter changes suddenly in the printing process.

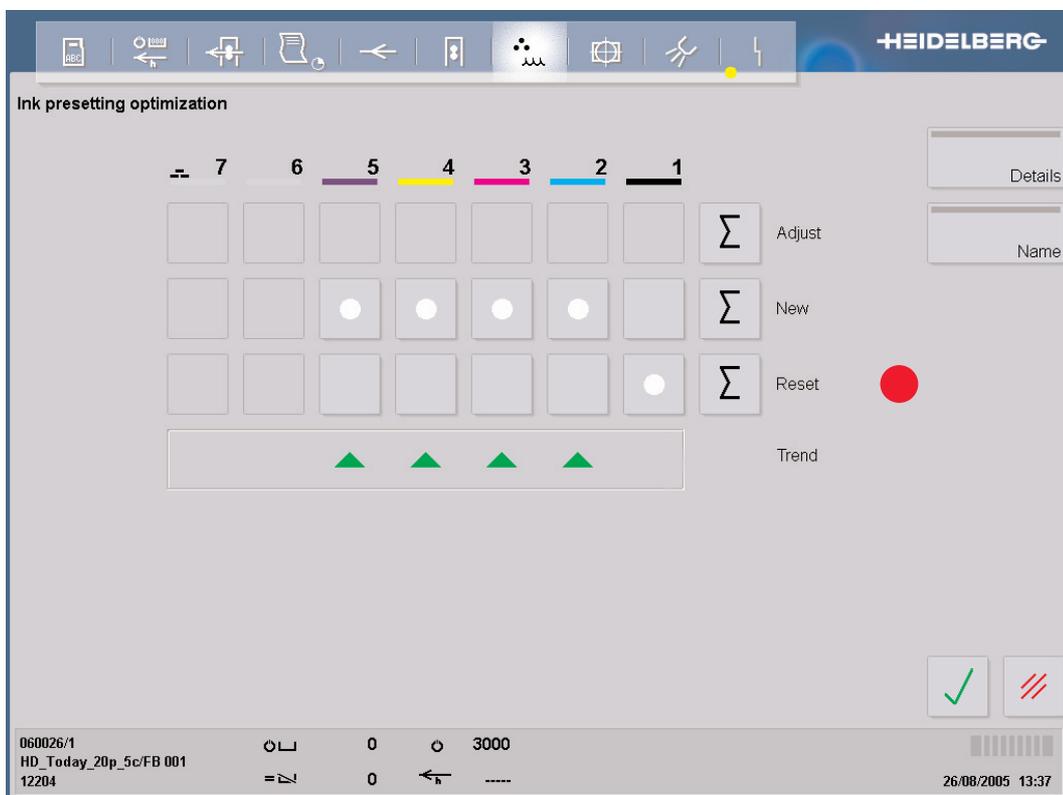
For each optimization, the previous status of the characteristic curve is saved as a resetting step. Resetting undoes the last optimization step carried out. If you use this function repeatedly, the characteristic curve is reset to its initial status.

To do this, select the *Reset* function.

You can view the effects of this action in the preview in the **Details** menu.

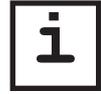


Note: After resetting, you can carry out a new optimization step. If all optimization steps for a characteristic curve are reset, then Reset can no longer be selected.



Chapter 3: Characteristic curve database and characteristic curve editor

Note: Only the functions that are important for the ink presetting characteristic curves are explained here. The operating manual of the printing press also contains detailed information on the characteristic curves for speed compensation.



HEIDELBERG characteristic curves and editable characteristic curves

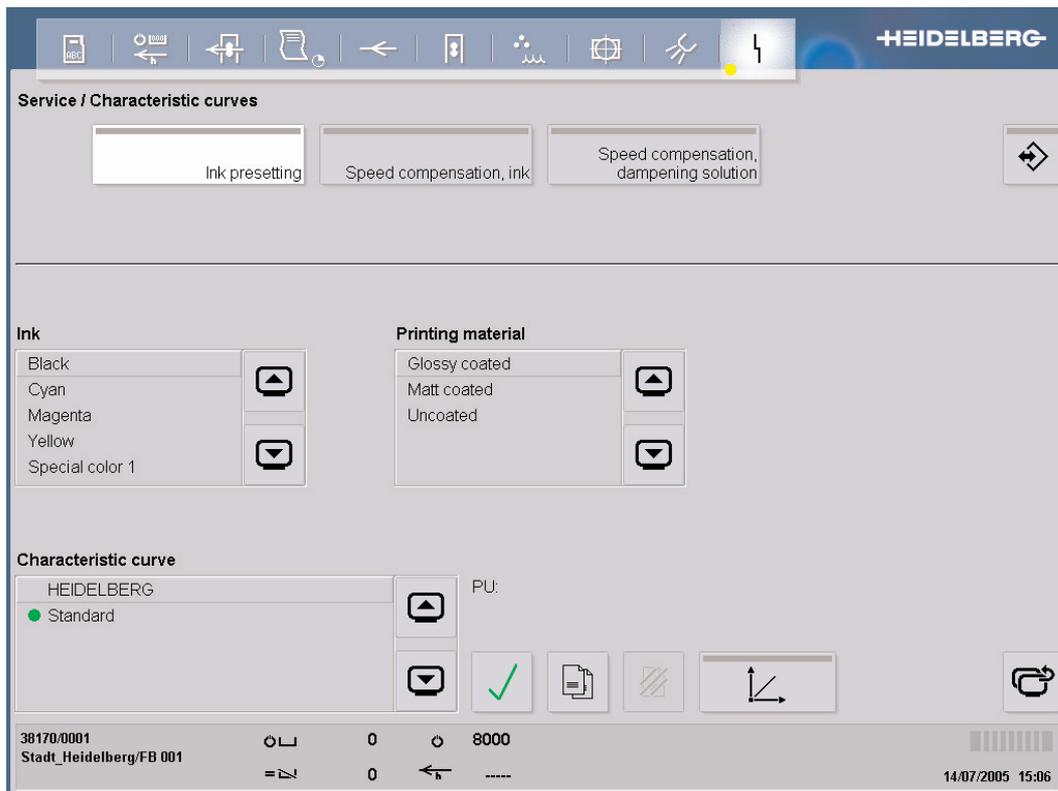
Delivery condition of the characteristic curve database

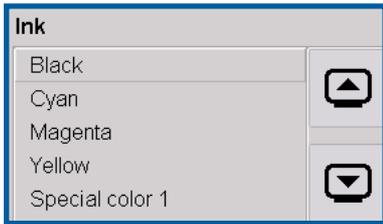
Several ink presetting characteristic curves are preset in the factory: For each of the 3 printing material classes, *glossy coated*, *matt coated* and *uncoated*, there are 7 colors (*black*, *cyan*, *magenta*, *yellow*, *special color 1*, *special color 2*, *special color 3*). These characteristic curves have the name *HEIDELBERG* and the *default flag (green dot)*. They can be copied but not changed or deleted.

Select the menu **Service/Characteristic curves/Ink presetting**

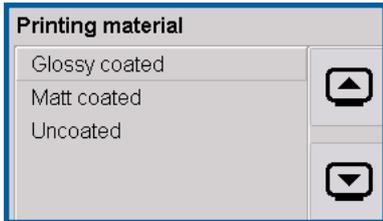
This menu gives you access to the characteristic curve database.

1. Press the *Malfunction* button in the header. The **Malfunction** menu appears.
2. Press the *Service* button. The **Service** menu appears.
3. Press the *Characteristic curves* button. The **Characteristic curves** menu appears.
4. Press the *Ink presetting* button. The setting options for the ink presetting area are displayed.

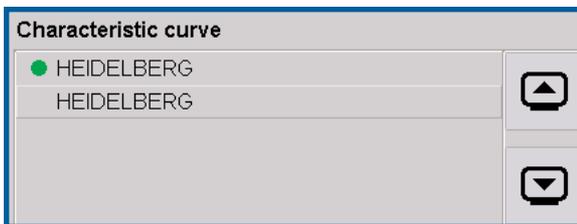




Ink list box: Here you select the color (black, cyan, magenta, yellow, special color 1, special color 2, special color 3).

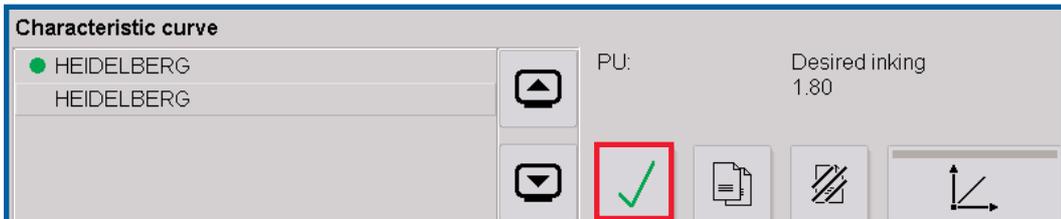


Printing material list box: Here you select the printing material class (glossy coated, matt coated and uncoated).



Characteristic curve list box: All ink presetting characteristic curves that are in the database for the selected combination of color and printing material are displayed here. On a new press, only the entry HEIDELBERG is available for the Heidelberg characteristic curve. The allocation to the

printing unit and the desired inking for the selected ink presetting characteristic curve are displayed next to this list box.

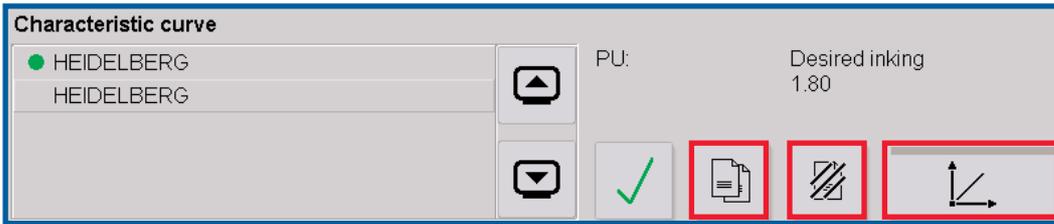


Standard characteristic curves (green dot)

The green dot in front of the name indicates the standard characteristic curve. For each combination of color and printing material there is one standard characteristic curve. This characteristic curve is selected if the prepress data does not contain any information that causes another characteristic curve to be automatically selected.

Press the Standard characteristic curve button (button with the green check mark) to mark the selected characteristic curve as the standard characteristic curve. As long as a characteristic curve is selected as standard characteristic curve, it cannot be deleted.





Creating/copying characteristic curves in the **Service/Characteristic curves** menu

1. Select the characteristic curve that you wish to copy.

2. Press the *Copy* button.

A copy is made of the selected characteristic curve.

Note: The copy is the last characteristic curve in the list box and has the same name as the original. Give the copy a different name so that you can tell it apart from the original.

You can copy, rename or delete the copied characteristic curve and export all editable characteristic curves via the network or import them into the CP2000 characteristic curve database for saving and transfer purposes.



Deleting characteristic curves

You can use the *Delete* button to delete a selected characteristic curve.

HEIDELBERG characteristic curves and characteristic curves with a green dot cannot be deleted. The button is grayed out in this case.

Note: You cannot undo deletion. Ensure that you only delete characteristic curves that you no longer need.



Editing the selected characteristic curve

Press the *Edit* button to edit the selected characteristic curve. The menu of the characteristic curve editor appears.

Notes:

- The HEIDELBERG characteristic curves can be displayed in the characteristic curve editor but not changed. To change a HEIDELBERG characteristic curve, you have to copy it.
- Ensure that you no longer need the current status of the characteristic curve when carrying out changes yourself. If you copy the characteristic curve before you change it, you can use this copy if your changes do not have the desired result.



When ColorAssistant optimizes the characteristic curve, the original status of the characteristic curve is saved and can be recovered by *Reset* button.





Functions in the editing menu

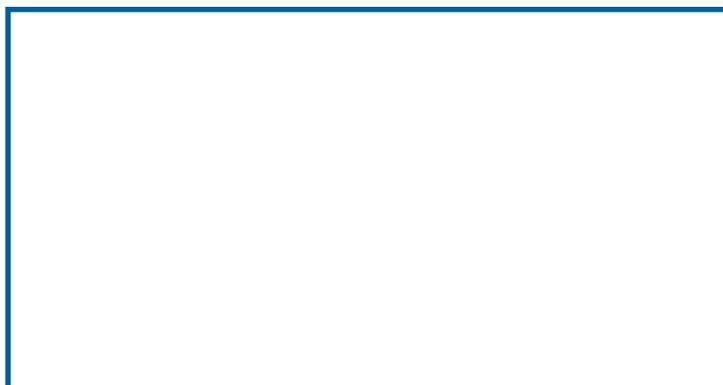
Here you can edit and rename a characteristic curve.

1. Name button

Press this button to open a screen keypad for renaming the characteristic curve. For automatic characteristic curve selection, the name of the characteristic curve must agree with the color series name that is delivered in the PPF file from PrepressInterface.

2. Solid ink density (CMYK) / Grammage (special colors) button

Press this button to open a dialog window for setting the solid ink density or the grammage for the characteristic curve. In a non-PCS workflow, these parameters serve as information only.



In the PCS workflow, the solid ink density is used as an additional selection criterion. If a solid ink density is given in the PPF file and there are several characteristic curves that can be selected, the one with the closest solid ink density is selected.



If the solid ink density of the selected characteristic curve differs from the solid ink density in the PPF file and the difference is less than 20%, the ink presetting is adjusted accordingly.

If the solid ink density in the PPF file differs by more than 20% or the measurement conditions (filter and density filter standard) do not agree, the corresponding characteristic curve is not selected. The standard characteristic curve (green dot) is selected instead.

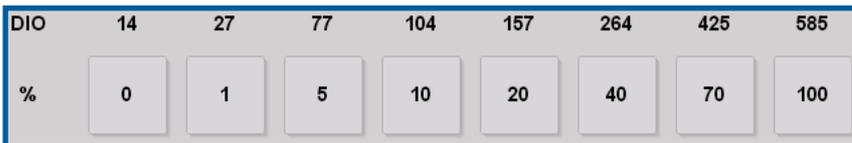
3. Setting the number of diodes



Use the +/- buttons to change the number of diodes for the selected support area.

Press the icon button to open a screen keypad for entering numerical values.

4. Selecting the support area

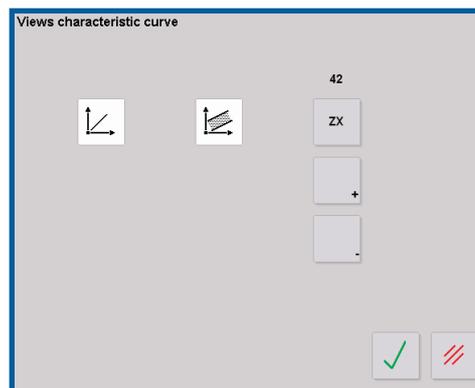


You can select the support area with this keypad (0, 1, 5, 10, 20, 40, 70, 100% area coverage). The buttons show the numbers of diodes for the selected characteristic curve.

5. Switching over the characteristic curve display



Press this button to open the menu for the display options. You can select whether just Zx is to be displayed, whether Z1 and Z2 are also to be displayed and whether the HEIDELBERG default values are to be displayed.



6. Selecting the characteristic curve

Press the *Select characteristic curve* button to switch between the characteristic curves Z1, Z2 and Zx. The selected characteristic curve is shown in orange.



