Procedure of creating ICC Profile for the COLORIP Ver.2.x

Revision: 2004.10.4 (The process of Calibration for RCR2.2 has been added.)
Revision: 2004.5.12 (The process of Calibration for RCR2.1 has been corrected and Screen shot has been changed.)
First edition: 2003.10.15

Device to be used

OS: WindowsXP/2000

Application: COLORIP Ver.2.x, GretagMacbeth ProfileMaker Pro 4.1

Spectrophotometer: GretagMacbeth SpectroScan

Notes

Make sure to use RCR Ver.2.1 and above.

* The process of measuring calibration curves is different from RCR Ver.2.0 and below.

The process of setting for Ink Limit is different in case of using [Precision Stochastic Screen] at RCR Ver.2.2 and above.

This procedure explains in case that [GretagMacbeth ProfileMaker Pro4.1] or [GretagMacbeth SpectroScan] is used. It is different if other application for creating ICC Profile or other Densitometers. Make sure there might be a restriction of distributing the created ICC profiles depending on the application used.

Procedure for making a Profile for COLORIP Ver.2.x.

I.   Set the Imaging Configuration

II.   Set the Halftone Properties

III.   Adjust the total ink amount

IV.   Adjust the ink amount of each color

V.   Measure density curve

VI.   Output the color patch

VII.   Read the color patch

VIII.   Create an ICC profile

IX.   Set the ICC profile on COLORIP

X.   Embed the ICC profile into the Imaging Configuration

Create new Image Configuration for the desired media.

--- COLORIP2.x Setting ---

1. Click [Color] on the main menu and check [Show Color as Percentage].
Click [Print] on the main menu and select [Setup] to display the [Setup] window in Fig.1. Select an option under Printer Model and an option under Physical Connection. Make sure [Imaging Configuration] is [none].
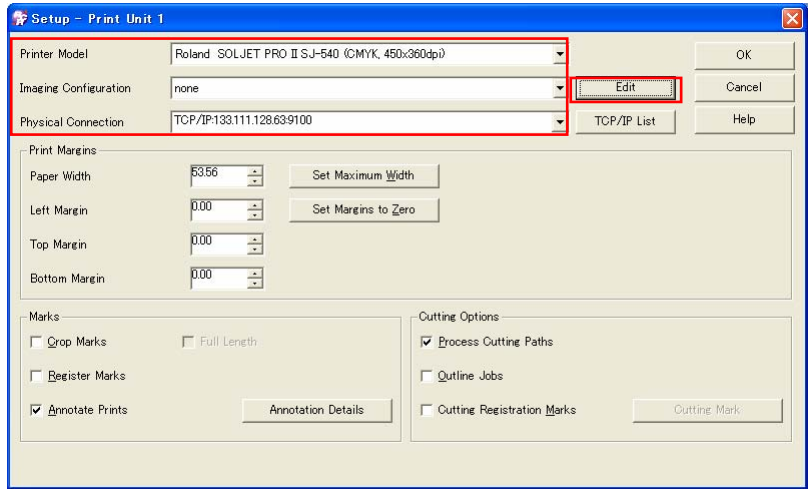
2. Click [Edit] to display the [Imaging Configuration] window in Fig. 2. Click [Properties] to display the [Printer Properties] window.
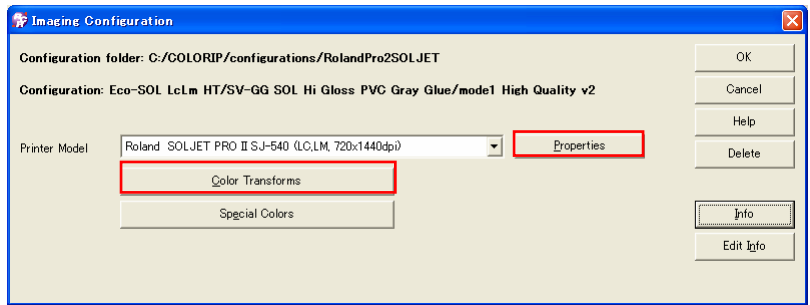
3. [Printer Properties] window in Fig.3 will be appeared. Click [Print Mode] tab and select the mode you want.

4. Click [OK] button to go back to [Imaging Configuration] window. And click [OK] Button to display the [Imaging Configuration -Save As:] window in Fig.4. And then, enter new name and click [OK] button. In this explanation, default name is used. Click [OK] button on [Setup] window.
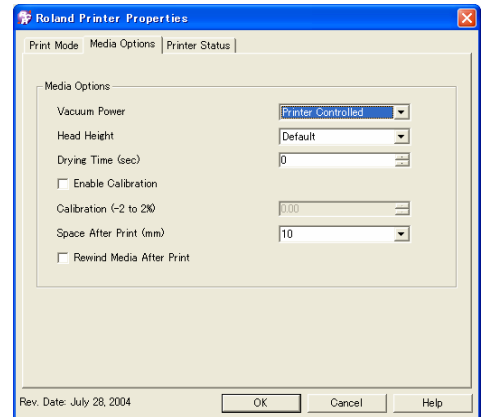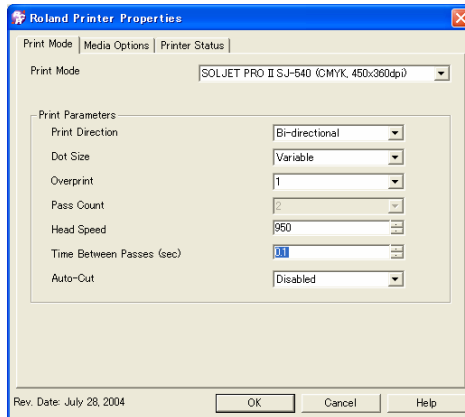
Fig. 1 Setup
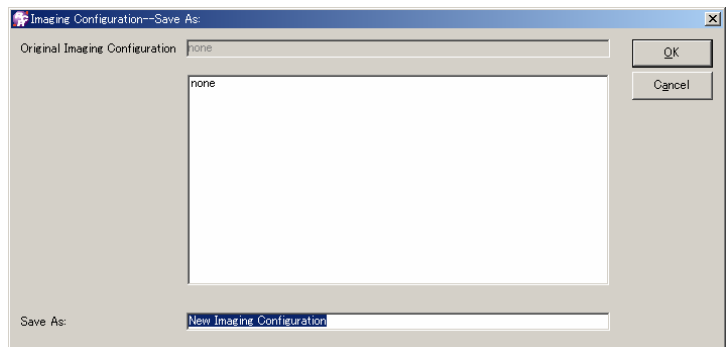
Fig.2 Imaging Configuration

Fig.3 Printer Properties

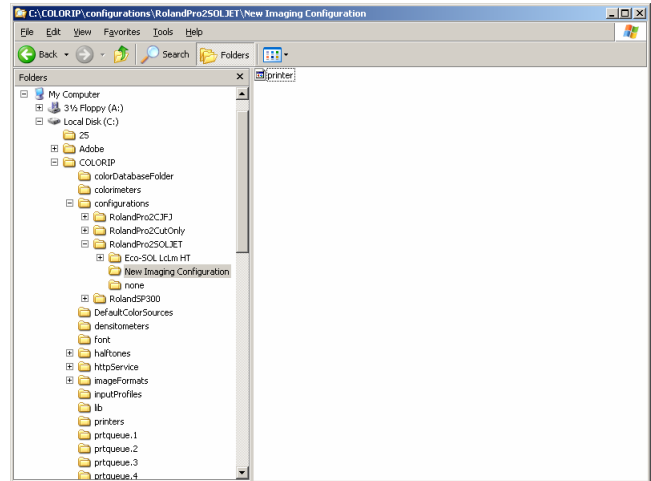Fig 4. Imaging Configuration-Save As:

5. [New Imaging Configuration] setting is stored in /COLORIP/Configuratios /RolandPro2SOLJET.

   I. In case that you would like to create a configuration for a new media, create a new folder under RolandPro2SOLJET/Eco-SOL LcLmHT. And then, move the created [New Imaging Configuration] folder, which is created at step 4, to the new folder.

   II. In case that you would like to create a configuration for a current media, move the created [New Imaging Configuration] folder, which is created at step 4, to current media name folder under RolandPro2SOLJET.

6. Select [Setup] from [Print] menu. You can see the created [New Imaging Configuration] setting under [New media] in Fig.5. Select [New Imaging Configuration] from [Imaging Configuration]. (e.g. [New Media] folder was created at step 5).

7. Click [Edit] button and then open [Printer Properties] in Fig.3. Then, set up [Print Parameters] and [Media Options].
   (In case that you create the configuration for SP-300, set up [Heater Controls] as well.)
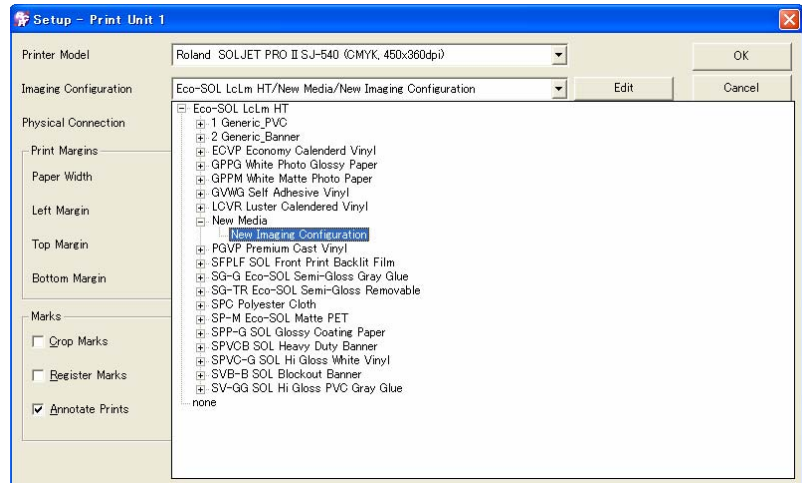

Fig.5 Select Imaging Configuration

8. Click [OK] button to leave [Printer Properties] and go back to [Setup] window in Fig.2, then [Imaging Configuration—Save As] window in Fig.4 is appeared with clicking [OK] button one more time. Overwrite the settings with the same name.

Halftone Setting

1. Click [Edit] button on [Setup] window.
   (Make sure that [New Imaging Configuration] is selected in [Imaging Configuration] box.)
   [Imaging Configuration] window in Fig 2 is appeared. Click [Color Transforms] button. [Color Transforms] window in Fig.6 is appeared.

2. If you would like to use Variable Dot, set the Halftone to [Digital Mezzotint – Variant B]. If you would like to use Fixed Dot, set the Halftone to [Digital Mezzotint].

   * [Precision Stochastic Screen] has been added in RCR Ver.2.2 and above. In case of using this Halftone, go to "Adjustment of the Ink Amount" without operating step 3 and 4.
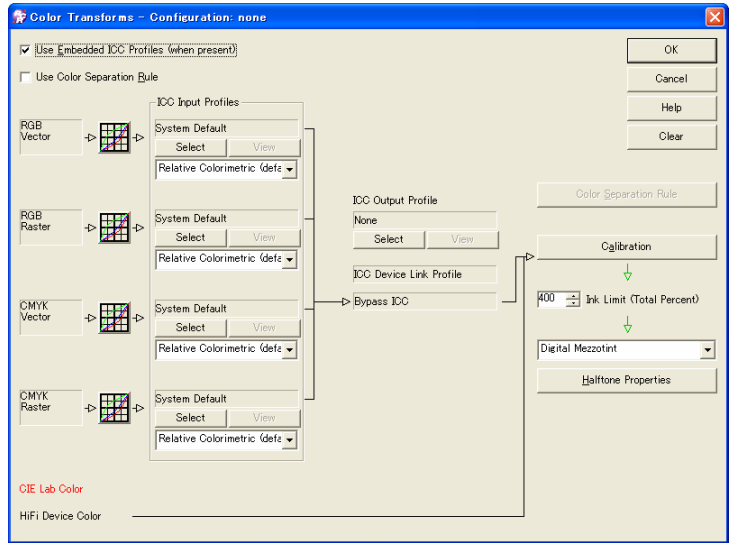
3. Then, click [OK] buttons until Top Screen is appeared.
   (In case that you change the setting in Color Transforms dialog, [Imaging Configuration—Save As] window is appeared in the way. Overwrite the settings as the same name.

4. Print [CMYKGradation.ps] file and adjust [Limit Control] in [Halftone Properties] window so that there is no white lines in the Printing result as shown in Fig.7.
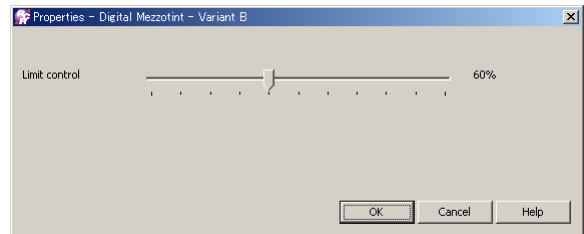

Fig. 6 Color Transforms

Fig.7 Halftone Properties

** Establish the [Limit control] value for [Digital Mezzotint – Variant B]. **
Following samples are printed on the SPVC-G with Sol Ink LcLm at Standard mode with different [Limit control] value. There are clearly white lines with each band in each color (especially in the black color). By comparing the 3 samples, you can find that you should set the value at 40% because the white lines are fairly visible.
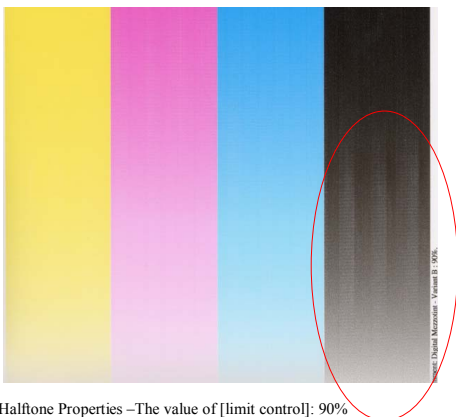
Halftone Properties –The value of [limit control]: 90%
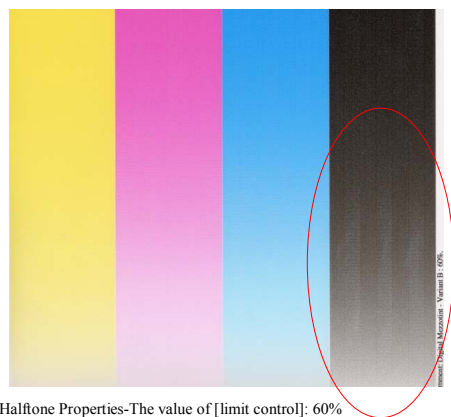
Halftone Properties-The value of [limit control]: 60%
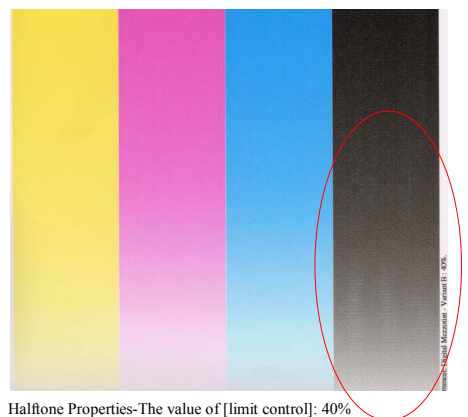
Halftone Properties-The value of [limit control]: 40%

Adjustment of the Ink Amount/Adjust the balance of the each ink

* Perform step I and II in case of using Halftone Properties of [Precision Stochastic Screen] at RCR Ver.2.2 or later.

1. Printout [CheckPureColor.ps]. Check the Red color you satisfied in this pattern and also check whether the ink is overflowed or not at C100%M100%Y100%. Set the correspond Ink Amount individually by the Red color. Check [Show Color as Percentage] from [Color] menu and adjust the Ink Amount in Calibration dialog. Click [Calibration] button at [Color Transforms] in Fig.6 to display [Calibration] in Fig.8.

   * In this example, click [Magenta] in Colorant and drag the 100% point to 80%. And also, click [Yellow] in Colorant and drag the 100% to 70% in Fig.8.
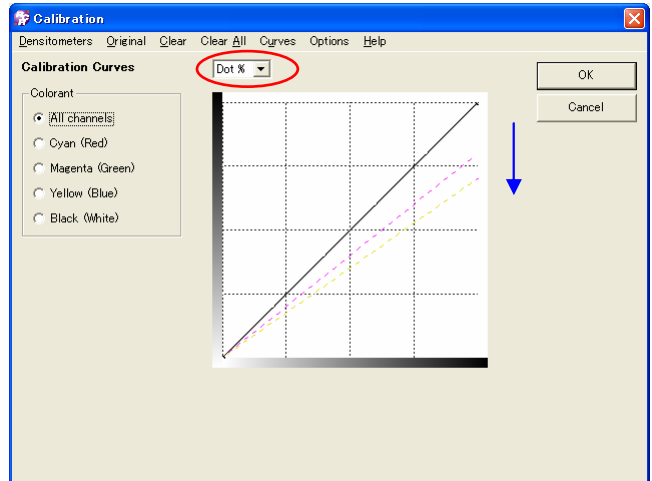

Fig.8 Calibration

   <TIPS>
   Basically, [Color Separation Rule] is not used.
   It is recommended that you check the ratio by comparing the result, which is printed each time after changing the Ink limit amount of M100%Y100%.
   However, be careful not to set the amount too low. The quality of gradation printing might be affected.

2. As for the ink overflow, it should be adjusted with [Ink Limit (Total Percentage)] in [Color Transforms] in Fig.6.

   <TIPS> How to adjust the maximum amount of each ink
   In this example, click [Yellow] in colorant and drag the 100% point to 75%.
   First, check [Show color as percentage] in [Color] menu. Then, change from [Light] to [Dot%] in Fig.8. (In case of unchecking the [Show color as percentage], the display on the graph will be [In-255 Out-255], which means the notation is [0~225] instead of [0~100], therefore it would be confusable when the set is changed.

   i.   Check [Yellow (Blue)] at Colorant.
   ii. Drag the Yellow line to set [In-0% Out-75%] in Fig.8.
   iii. Printout [CheckPureColor.ps.] again to check the result.

[In case of using [Precision Stochastic Screen] at RCR Ver.2.2 and above.]

I. Printout [CheckPureColor.ps]. Check the Red color you satisfied in this pattern and also check whether the ink is overflowed or not at C100%M100%Y100%. Set the correspond Ink Amount individually for adjusting the Red color. Fig.8-1 will be diaplayed by clicking [Halftone Properties] in Fig.6. Set the quantity consumed of the Ink by the slide bar at [Ink Reduction] in Fig.8-1.
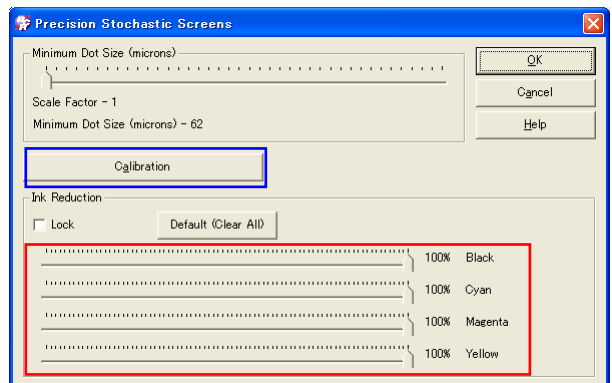

Fig.8-1 Halftone Properties in [Precision Stochastic Screen]

   <TIPS>
   Basically, [Color Separation Rule] is not used.
   It is recommended that you check the ratio by comparing the result, which is printed each time after changing the Ink limit amount of M100%Y100%.
   However, be careful not to set the amount too low. The quality of gradation printing might be affected.

II. As for the ink overflow, it should be adjusted with [Ink Limit (Total Percentage)] in [Color Transforms] in Fig.6.

   <TIPS> How to adjust the maximum amount of each ink
   In this example, click [Yellow] in colorant and drag the 100% point to 75%.
   First, check [Show color as percentage] in [Color] menu. Then, change from [Light] to [Dot%] in Fig.8. (In case of unchecking the [Show color as percentage], the display on the graph will be [In-255 Out-255], which means the notation is [0~225] instead of [0~100], therefore it would be confusable when the set is changed.

   i.   Check [Yellow (Blue)] at Colorant.
   ii. Drag the Yellow line to set [In-0% Out-75%] in Fig.8.
   iii. Printout [CheckPureColor.ps.] again to check the result.

* Click [Calibration] button in Fig.8-1 when you measure the Calibration curves.

Measuring Density Curves

1. Measure output density patching using the Densitometer. In case that the [Color Mode] is [CMYK] or [CMYKLcLm], print out spectroscan_4color.ps.
    In case that the [Color Mode] is [CMYKOrGr], print out spectroscan_6color.ps.

2. After density patches are output, go back to the [Calibration] window in Fig.8.

3. Select a densitometer from [Densitometers] menu as shown in Fig.9. In this case, select [GreatMacbeth SpectroScan] so that GratagMacbeth SpectroScan is used.

4. Select the port which is connected with the Densitometer and Click [Calibrate] button in Fig.9-1 to calibrate the Densitometer.
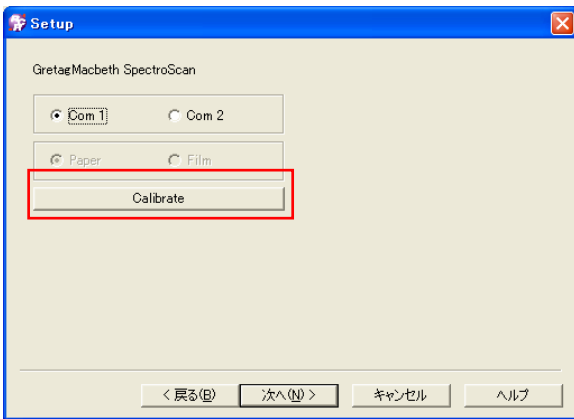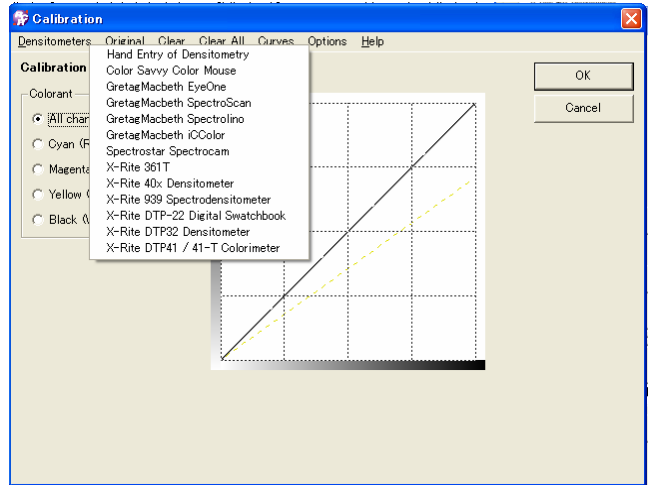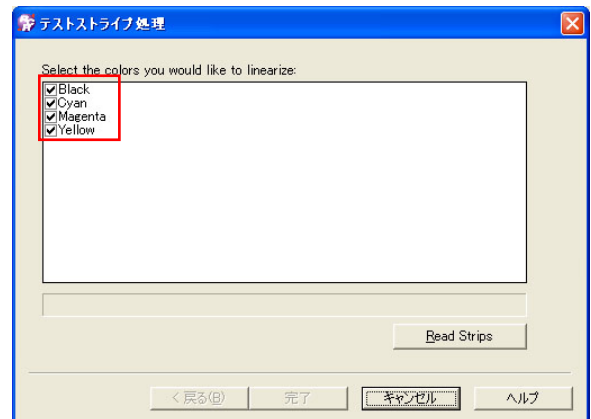

Fig. 9-1

Fig.9-2 Process Test Strips

5. After the calibration is completed, click [Next] to open [Process Test Strips] in Fig.9-2. Here, density patches is measured. Click [ReadStrips] to measure each color which is checked in Fig.9-2. In case of [CMYKOrGr] mode, 6 buttons will be displayed.

6. After reading all Density Strips, click [Finish] button.

    *If you click [Finish] when ink allocation has been changed at the time of setting the amount of ink (for example, Y is decreased to 75%), the window below is displayed. In this case, click [No] to reflect measured density data to changed ink allocation. (If you click [Yes], information of changed ink allocation will be deleted.)
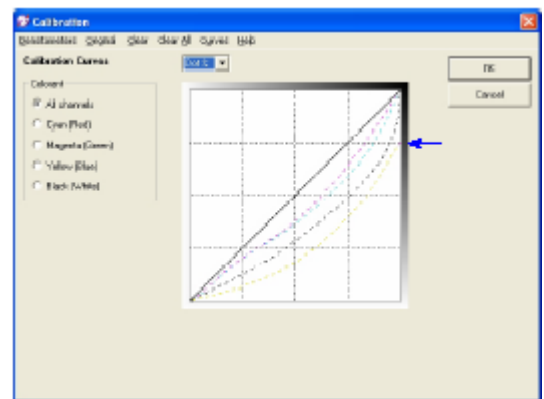
Calibration measurement completed
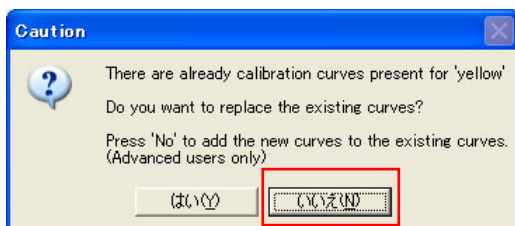
Output the Color Patch

The same procedure is used with any color mode, [CMYK], [CMYKLcLm] and [CMYKOrGr].

1. Output the Color Patch to create the ICC Profile.
   Print the [TC3.5 CMYK.tif] and set it to spectrophotometer (Gretag SpectroScan).
   Note: Scale it up to 130% with RCR when output the Color Patch in order to read it with a densitometer stably.

Read the Color Patch

Finish the COLORIP because the computer cannot communicate with the photometer if the COLORIP is running.

1. Start the GretagMacbeth ProfileMakerPro.

2. Click the [Printer] tab.

3. Select the [TC3.5 CMYK+Calibration Ref.txt] from Reference.
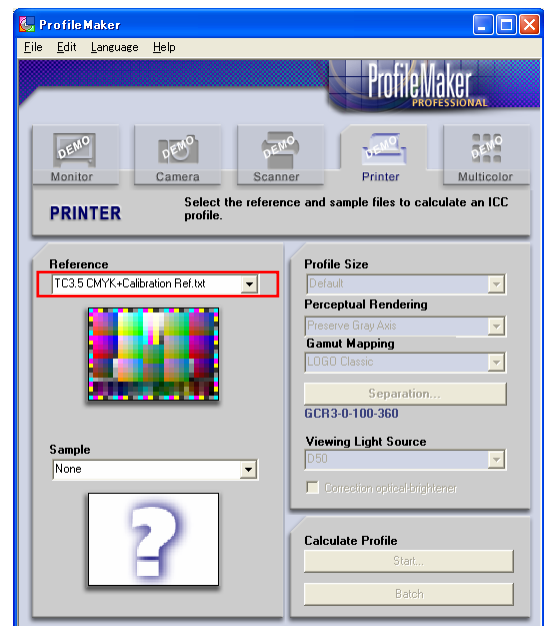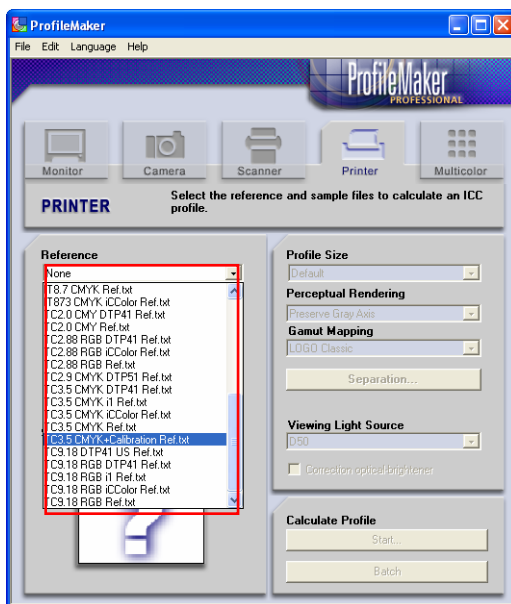
4. Here, select the [GretagMacbeth SpectroScan] from Sample.

5. The spectrophotometer starts the calibrating itself automatically and then [Measurement] menu in Fig.10 will appear.

6. Click [Start] to measure.

   *The window which is displaying about save will be appeared when it is completed. It is recommended to save the measured data. Because when you recreate the ICC profile, you can skip the step, which you measure practically.
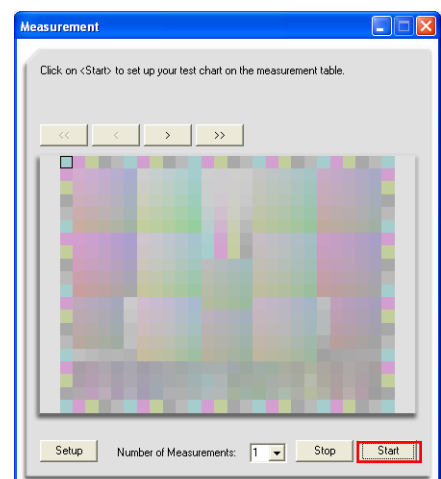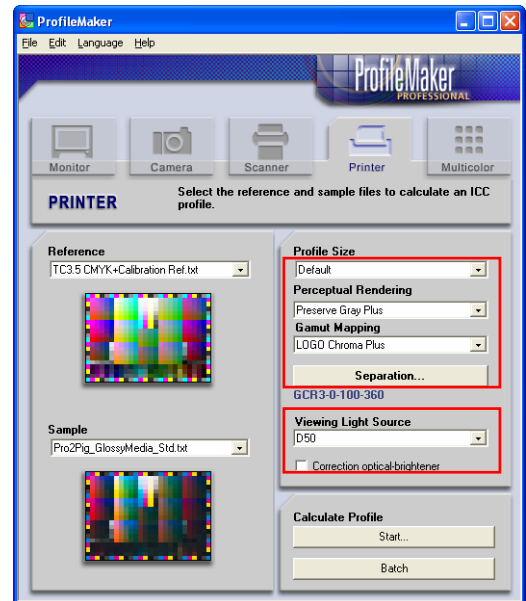

Fig.10 Measurement

Create ICC Profile
Setting ICC Profile

1. Set the parameters on the Profile Maker Pro as followings.
       Profile Size: Default
       Perceptual Rendering: Preserve Gray Plus
       Gamut Mapping: LOGO Chroma Plus
       Viewing Light Source: D50
   Correction optical-brightener: uncheck

   And then click [Separation…]


2. Set the parameters as followings. It might be necessary to change the setup depend on the situation.
       Predefined: Inkjet400
       Separation: GCR3
       Black: 100%
       Black Start: 40% ←Point
       Balance Black Point: Click [Balance] and balance CMYK.
       Black Width: 100

   - In case of brimming the ink even if you set [Ink Limit (Total Percentage)] on Color Transforms dialog, it will be improved slightly by reducing the value of the [CMYK Max] (It is recommended that the value is above 260%)
   - If you set the [Black Start] 40% at GCR, gray part, which is 0%~40%, will be printed by composite only. And it will be less grainy.
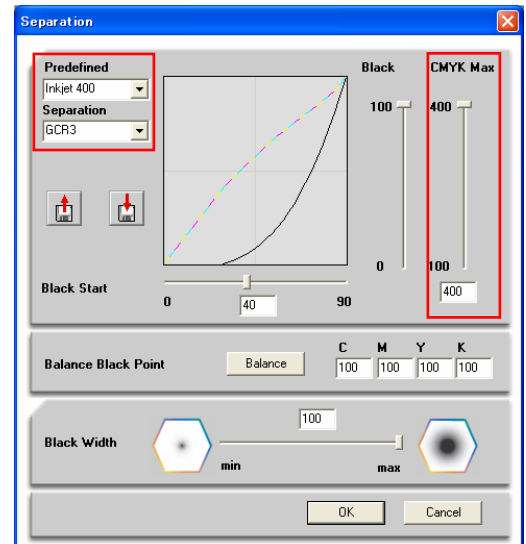

3. Click [Start] to create the ICC Profile.
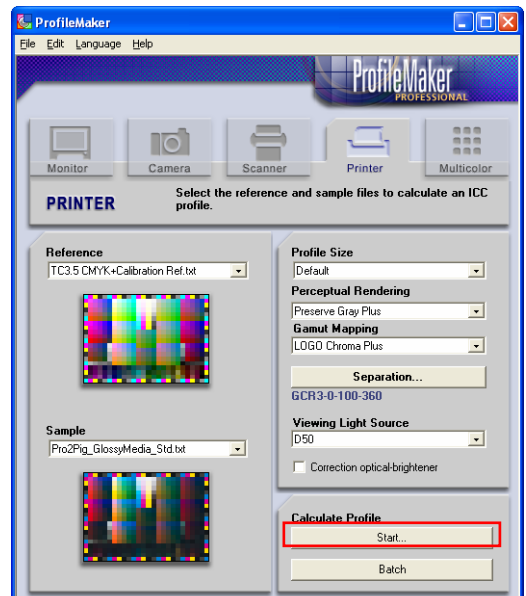
Fit the created ICC Profile in the Image Configuration

1. Select [Browse] by clicking [Select] button at ICC Output Profile.

2. [Select an ICM file] dialog is appeared. Select the created ICC Profile and click [OK] button.

3. Confirm that [none] changes to the selected ICC Profile name.

4. Check [Use Embedded ICC Profiles (when present)].

5. Click [OK] button to close [Color Transforms] window.
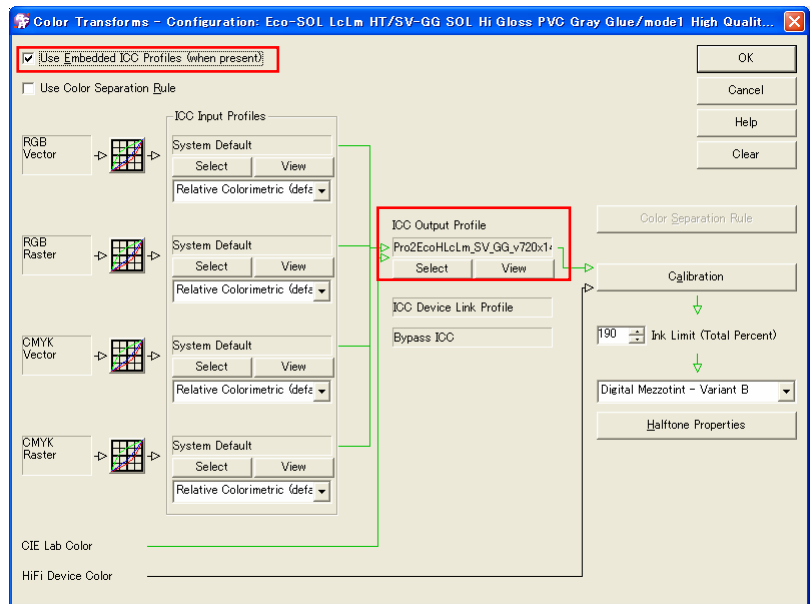
6. Click [OK] button to close [Image Configurations] window.

7. [Image Configuration—Save As] window is appeared. Click [OK] and overwrite it. After that, click [OK] button to close [Image Configuration] window.
   Creating ICC Profile and Setting Imaging Configuration has been completed.
   Using the imaging configuration, output test data for profile checks to check the quality.

   * If problems such as ink overflow are arisen, change the set value of [Ink Limit (Total Percent) on the [Color Transforms] window to make fine adjustment. However, if you have changed the set value, be sure to check the printing result because if you decrease the set value too low, print can fade.