ElecRoc 6

Color Tools

in Founder ElecRoc Workflow Solution

User Guide

August 2014

Beijing Founder Electronics Co., Ltd.

FOUNDER

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This manual provides a complete introduction to all the functions and features of Founder ElecRoc Workflow Management System. However, some of them are available upon additional payment, the user interface and functions may vary accordingly. For more information, contact Founder's sales personnel.

Printed in the People's Republic of China

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Chapter 1 About Color Tools

1.1 Scope of Application

The Color Tools in Founder ElecRoc 6 workflow is applied in two directions: digital proof and digital print.

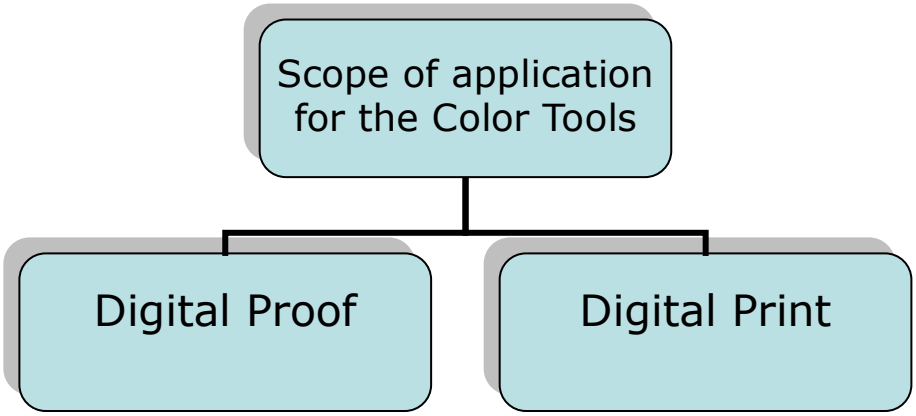


Figure 1

Chapter 2 Installation and Un-installation

2.1 Install the Software

The Color Tools is always installed on your ElecRoc client machine, irrespective of whether your ElecRoc Client is running on ElecRoc server or on a separate computer. It doesn't have to be installed with the proof device or the digital printer either, i.e. the Tools and the device are allowed to run on different computers.

The steps for installing the Color Tools are as follows:

1. Double-click the file **setup.exe** under ElecRoc's install DVD directory Options\Color Tools\, or choose **Install Color Tools** if you have entered in ElecRoc's autorun window.

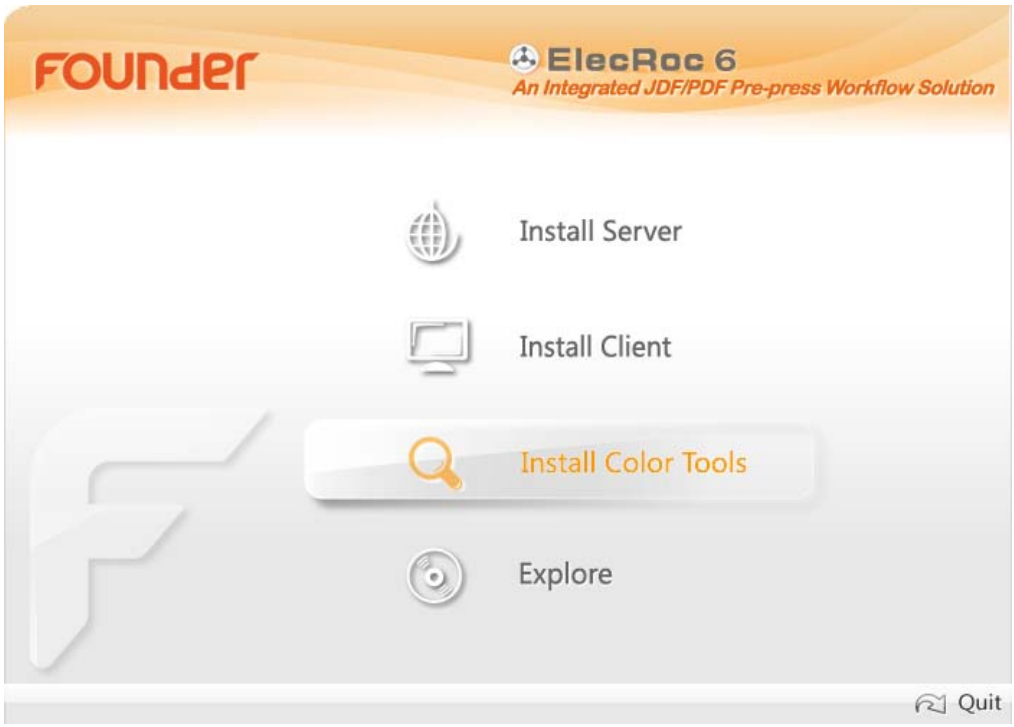


Figure 2

2. The install program starts up, displaying first the welcome window.

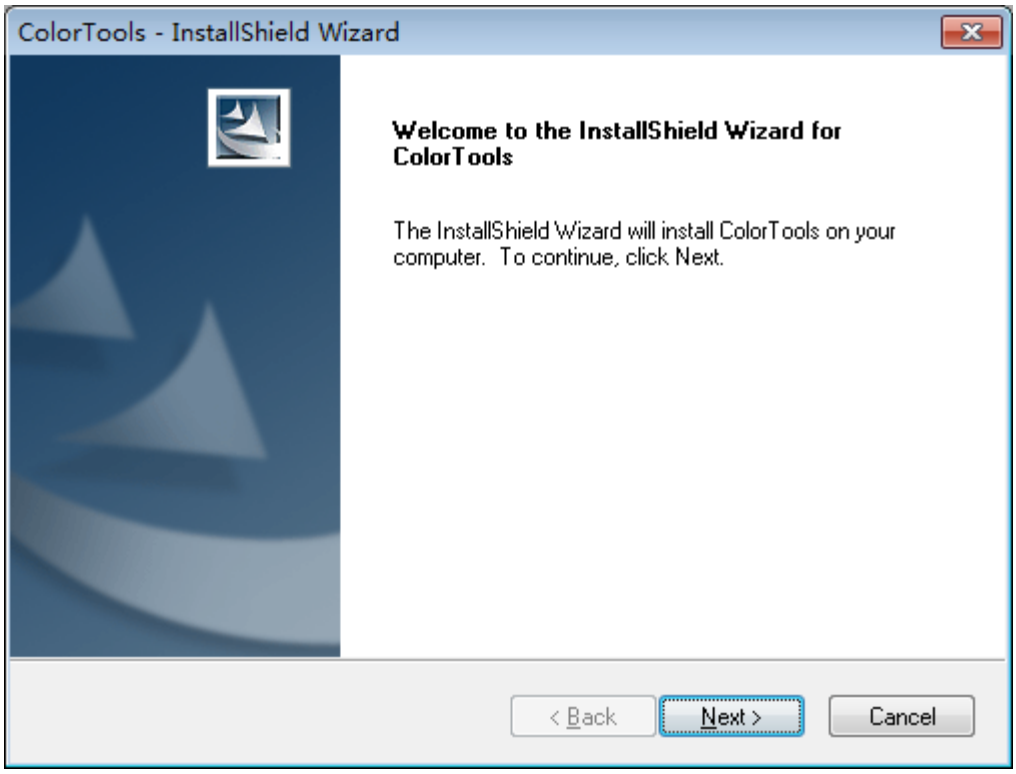


Figure 3

3. Click **Next** to enter in the customer information window.

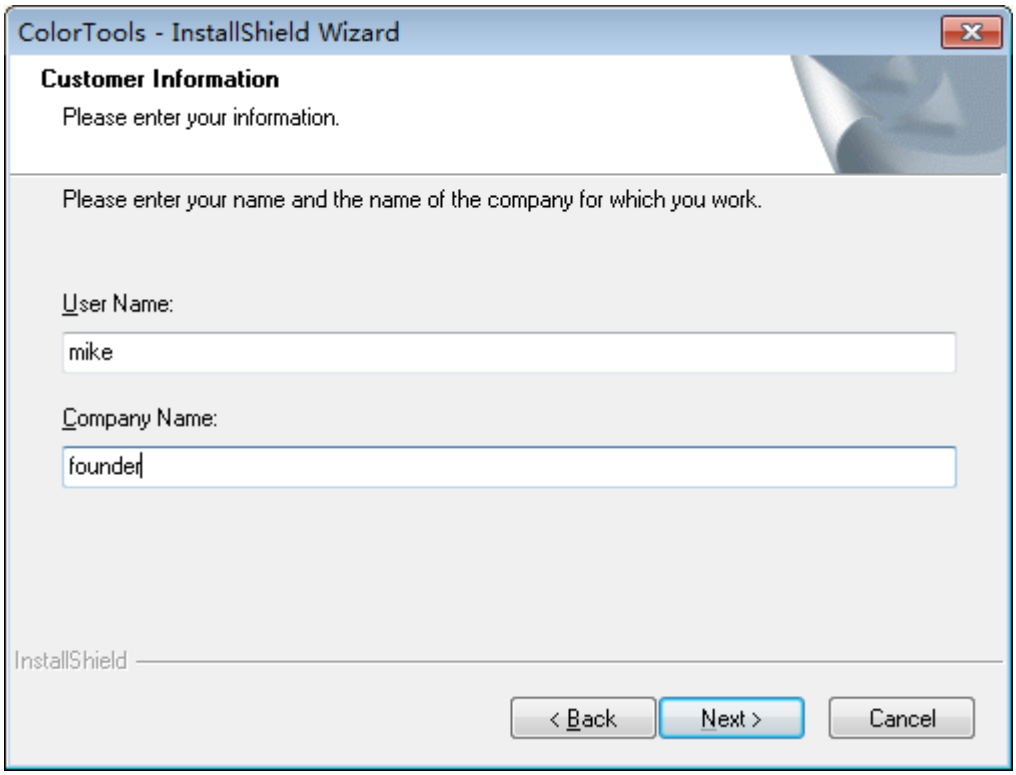


Figure 4

4. Input your information and then click **Next**, to enter in the setup type window.

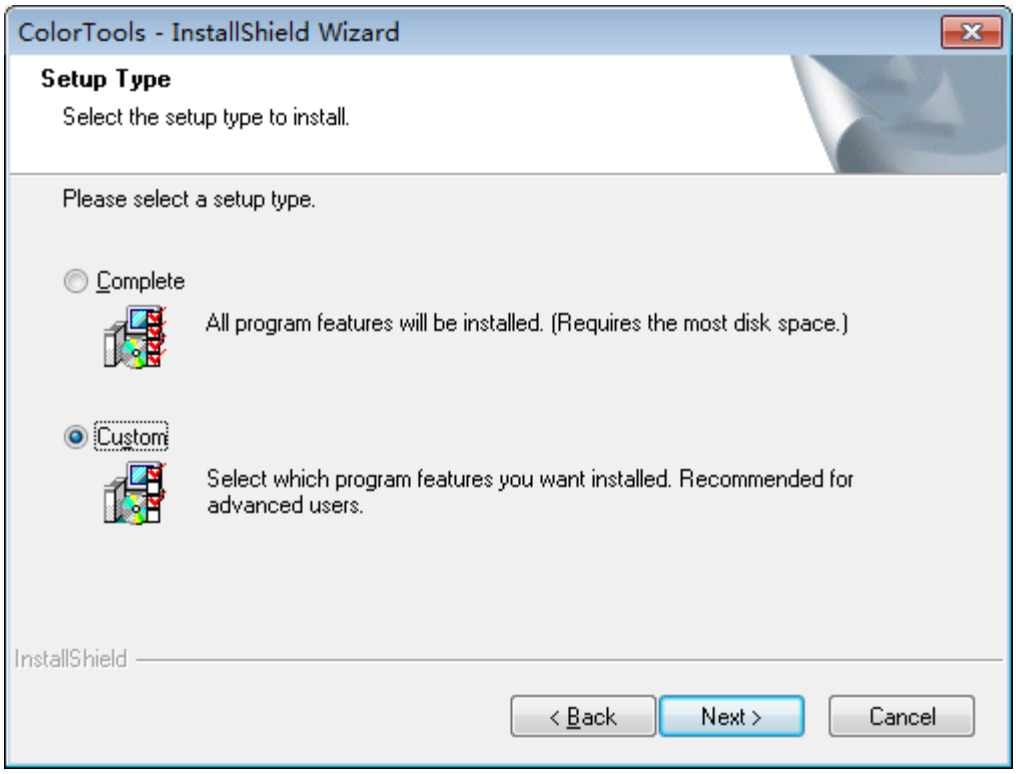


Figure 5

5. Choose **Custom** and click **Next**, and then you can see the following window, designed for you to choose the destination folder. If needed, you can click **Browse** to customize the destination folder.

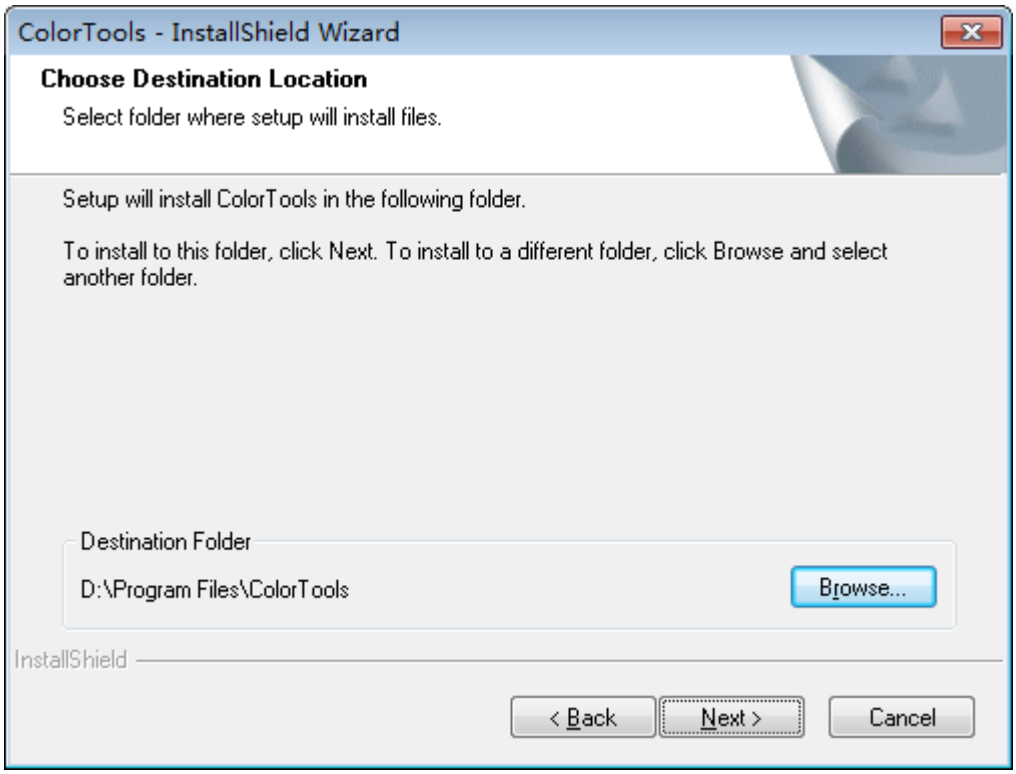


Figure 6

6. And after that, click **Next** to open the dialog box below. Check **Color** and click **Next**.

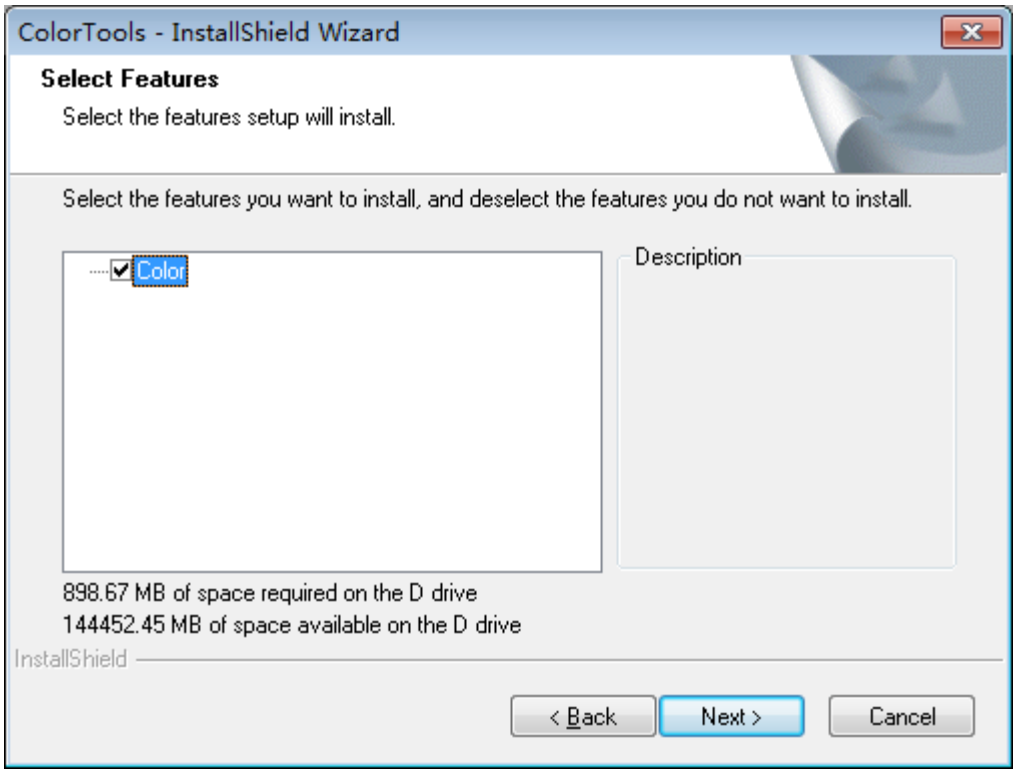


Figure 7

7. In the pop-up window, click **Install**.

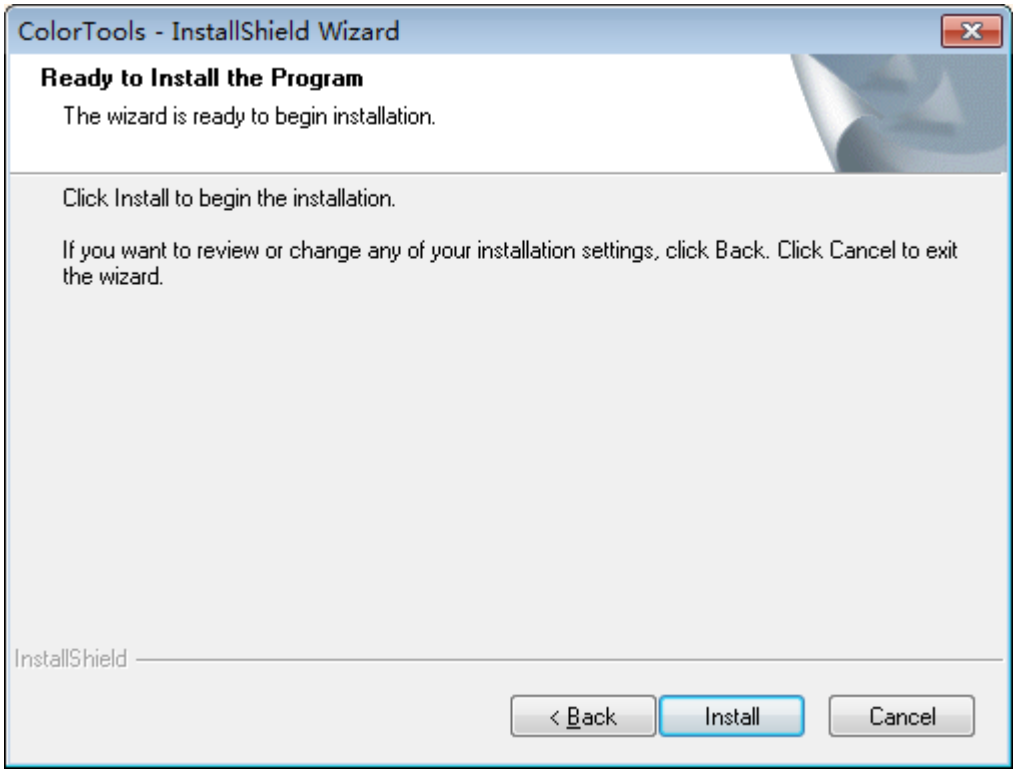


Figure 8

8. It then pops up the status window, showing the progress of the installation.

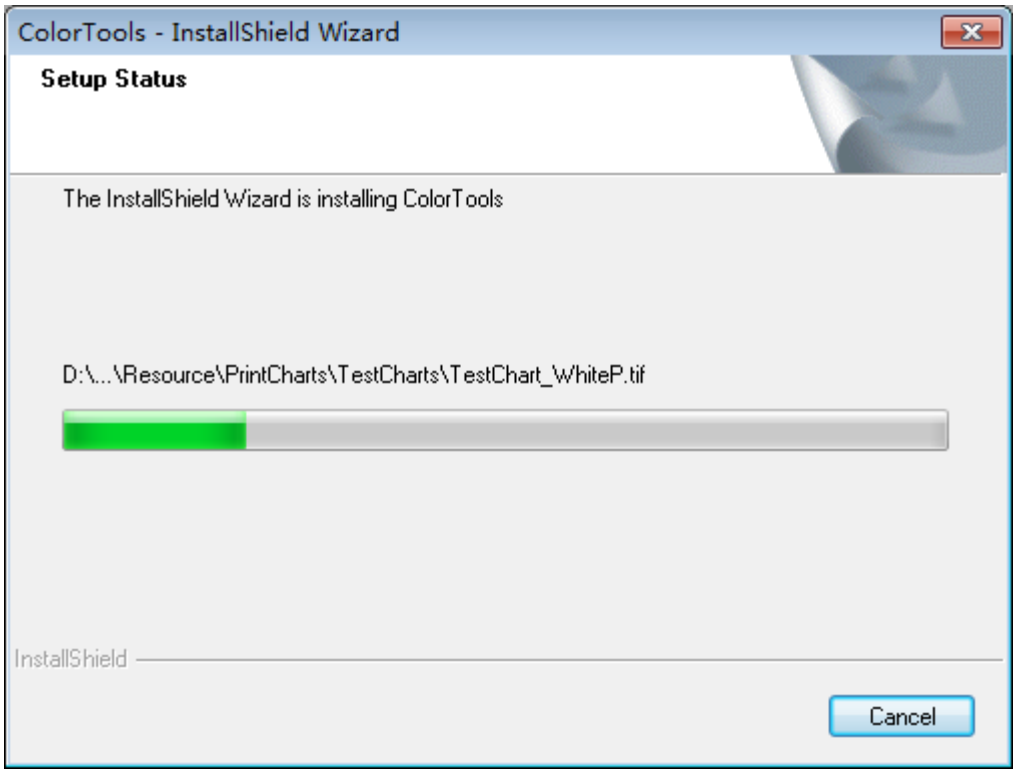


Figure 9

9. When the progress bar reaches 100%, the install program hints that the installation has been completed. Click **Finish** to exit.

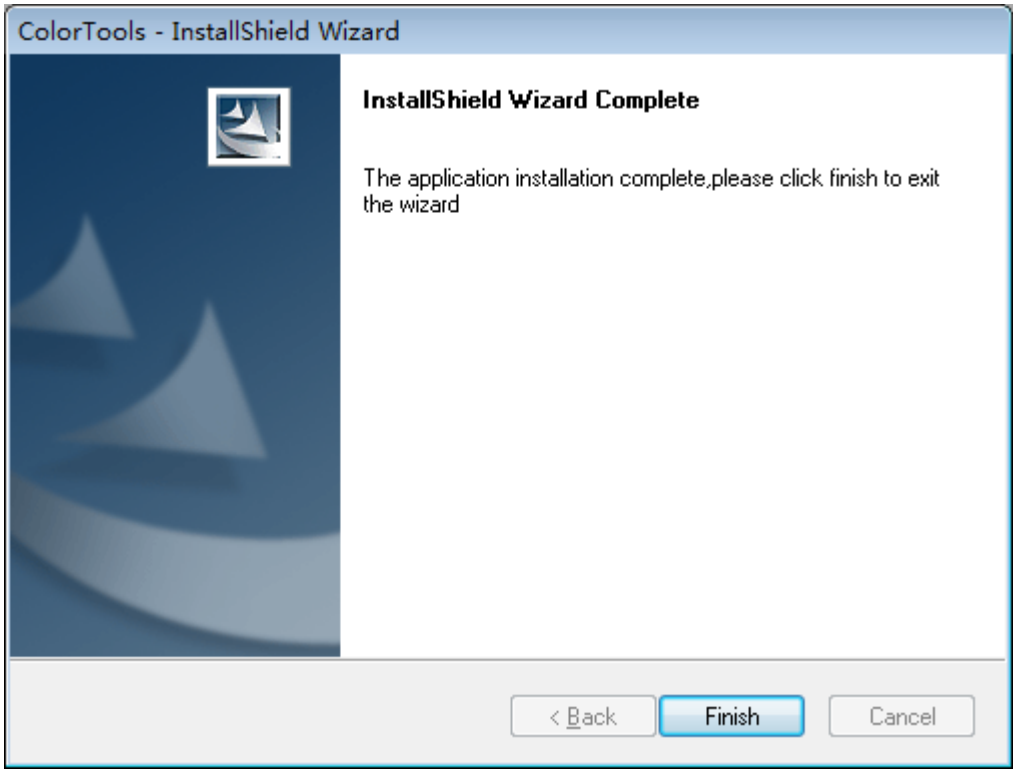


Figure 10

Note: *Due to that the Color Tools is designed to be started up from ElecRoc's Client, thus the startup icon for it is NOT available on your desktop or in your Start menu, where you can only see its uninstall icon.*

2.2 Uninstall the Software

1. Choose **Start** > **All Programs** > **Color Tools** > **Uninstall Color Tools** to open the following dialog box. This dialog box can also be opened by choosing **Start** > **Control Panel** > **Uninstall a program** > **Color Tools** > **Uninstall**.

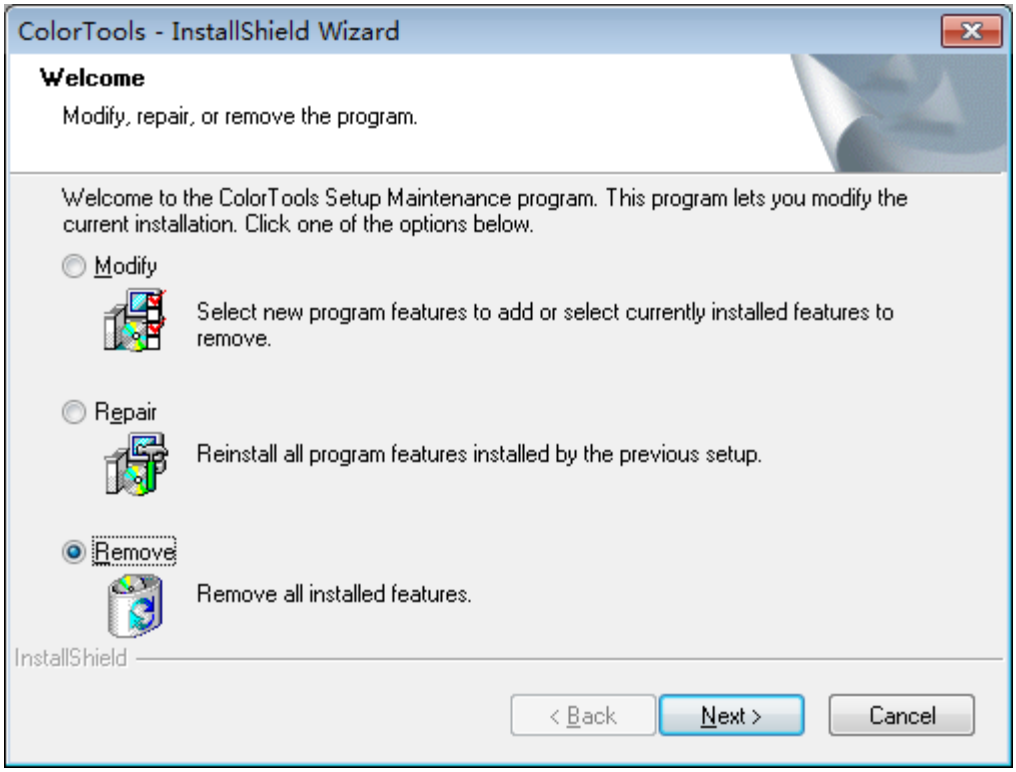


Figure 11

2. Choose **Remove** and then click **Next**. And then in the pop-up dialog box, choose **Yes** to confirm the removal.

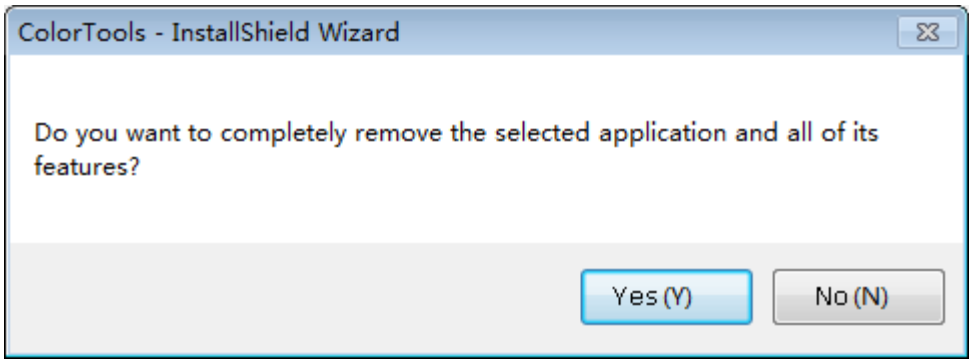


Figure 12

3. Click **Next** to begin the removal. The bar shows the progress.

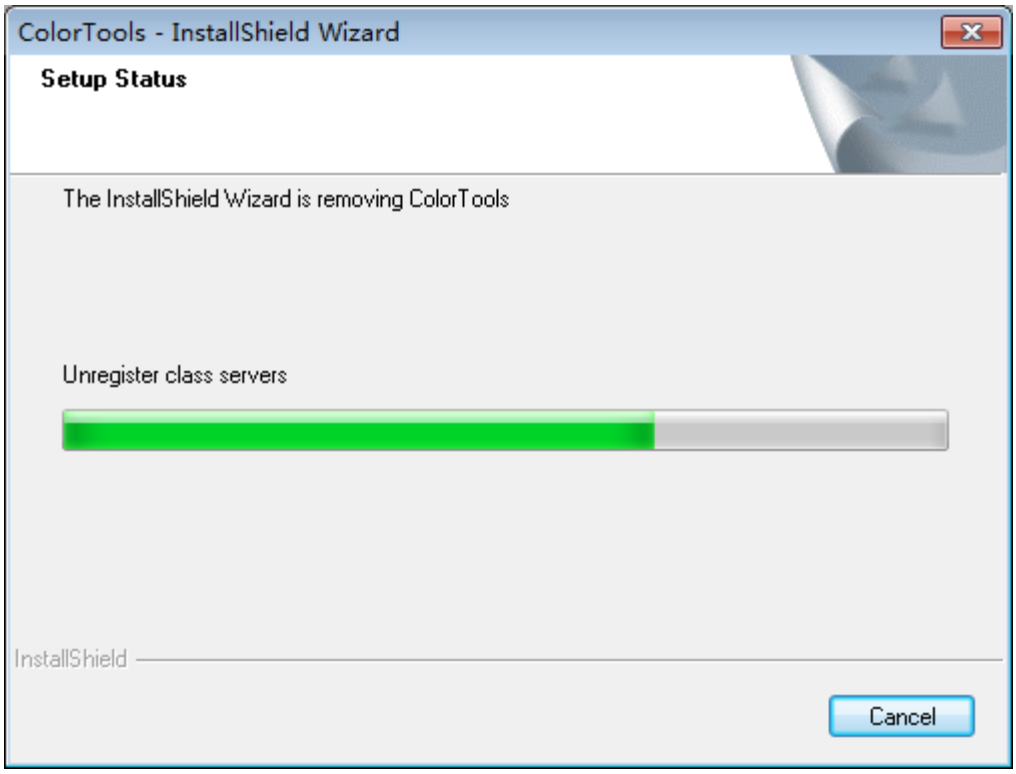


Figure 13

4. When the bar reaches 100%, click **Finish** to exit.

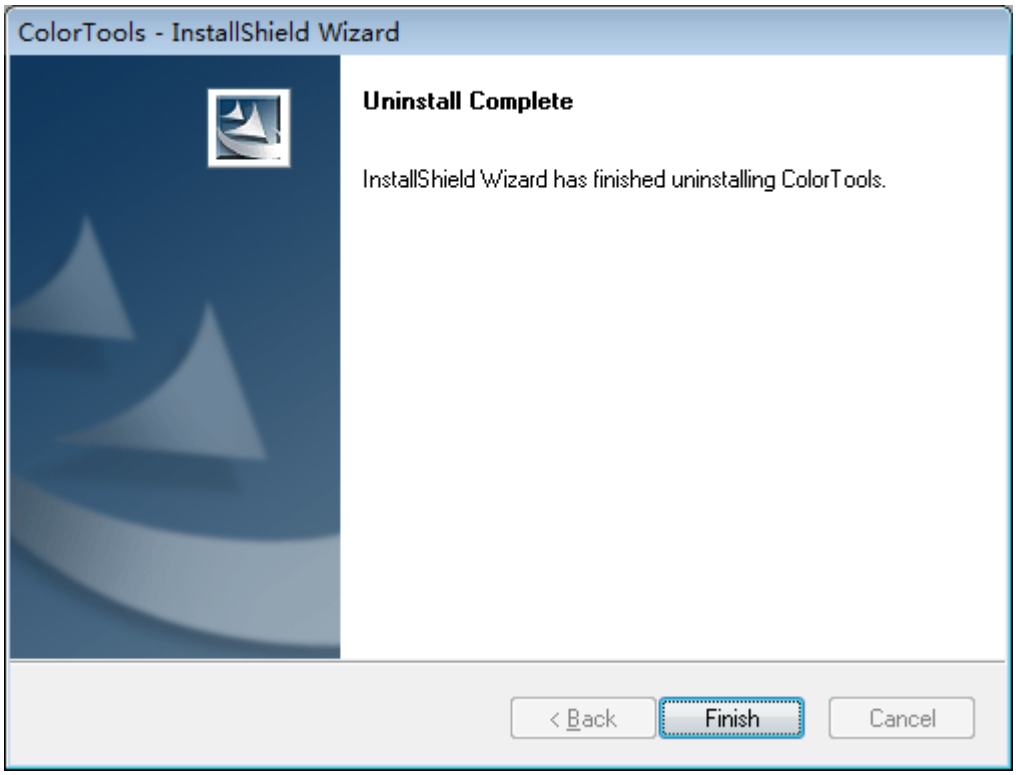


Figure 14

Chapter 3 For Digital Proof

3.1 Start up Color Tools

The Color Tools can NOT be started up independently. Instead, you need to start it from ElecRoc's Client. The steps are as follows:

1. Run your ElecRoc workflow system. On the ElecRoc server, double-click the short-cut icon on the desktop, to start up ElecRoc Server.

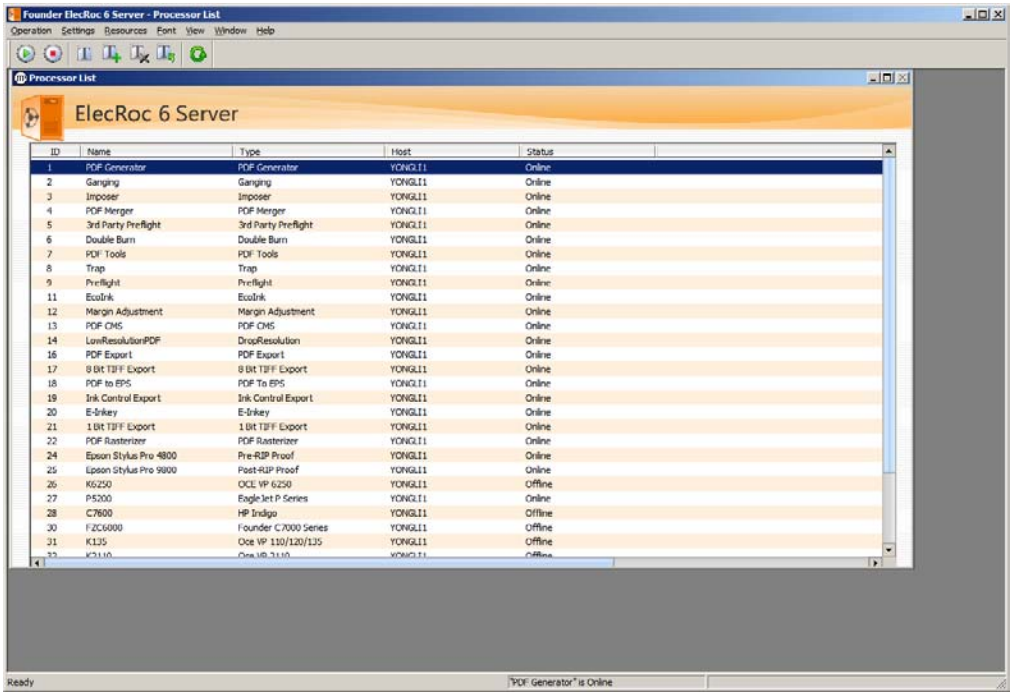


Figure 15

2. Start your proof processor you want to proof, making it online.

3. Start up ElecRoc Client and login the Server. Double-click the short-cut icon on the desktop, to start up ElecRoc Client.

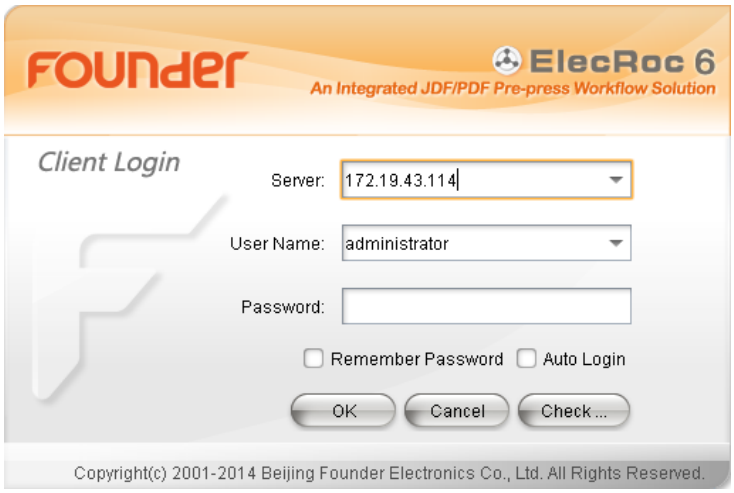


Figure 16

4. Input correctly the server name or its IP address, and then click **OK** to enter in the Client's user interface.

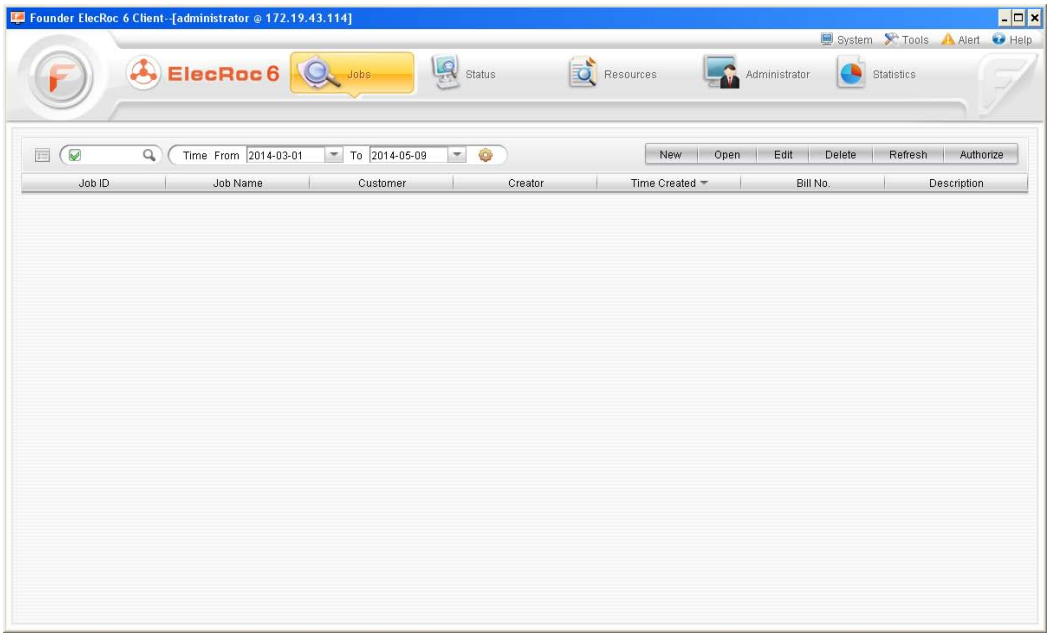


Figure 17

5. Choose the administrative module **Administrator** > **Processor Management**, find out and choose the proof processor, here we take Epson 7910 pre-RIP as example.

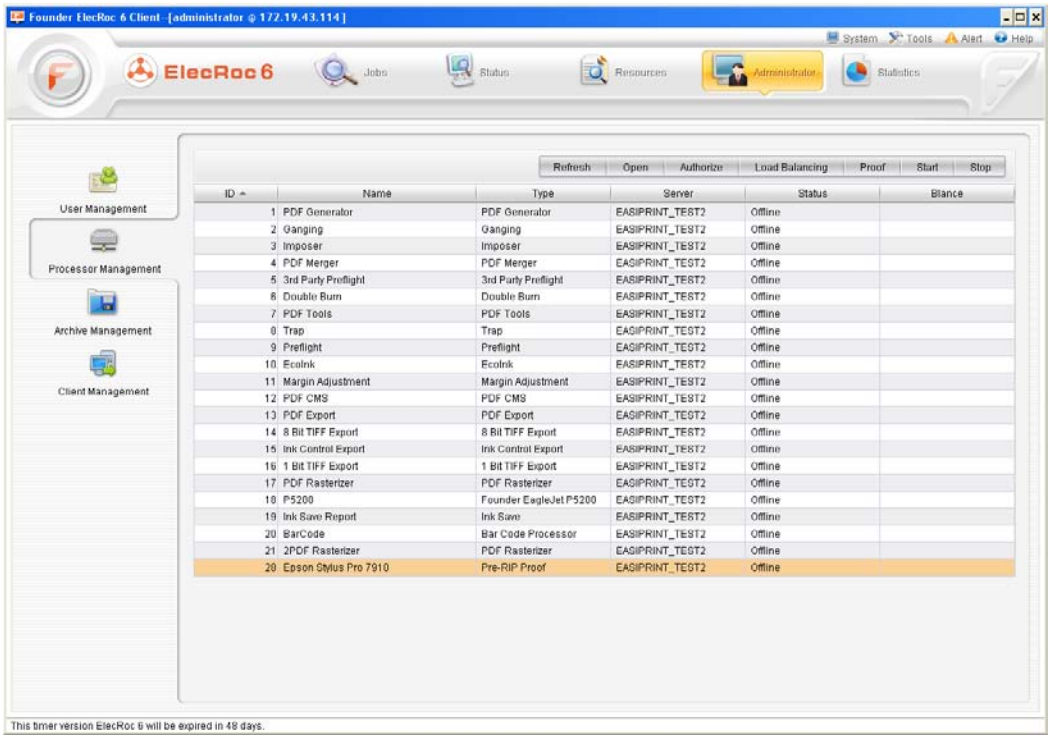


Figure 18

6. Click the **Proof** button, and then you can see that ElecRoc automatically creates a job, named as Proof_Epson Stylus Pro7910, dedicated for your proof operation.

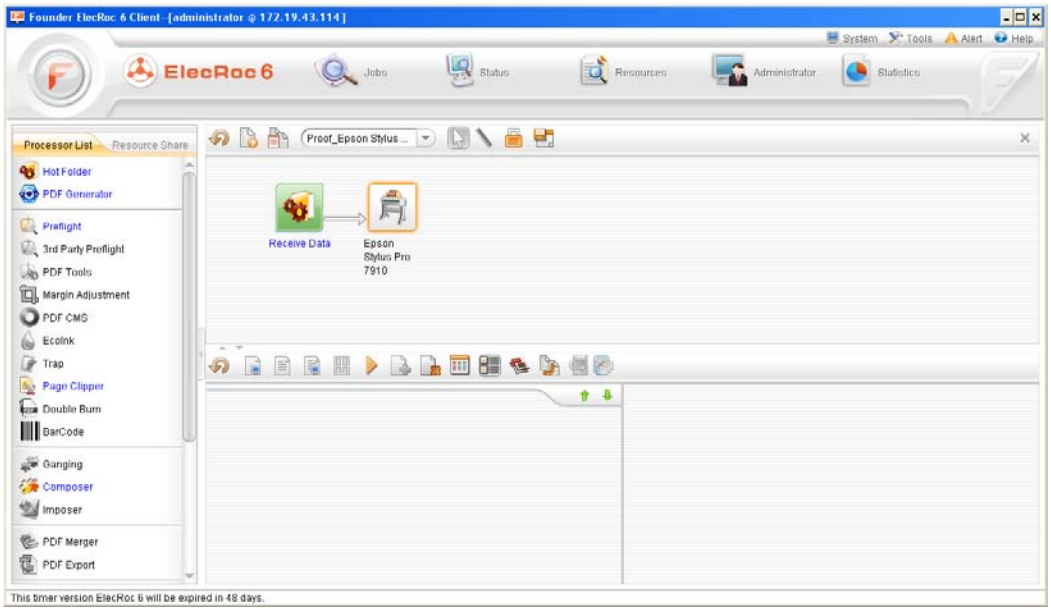


Figure 19

Note: *By default, this job contains only two processors, one is hot folder, used for receiving data, and the other is the proof processor, i.e. Epson 7910.*

7. Configure Epson 7910's processor parameters. As shown in the figure below, double-click the Epson 7910 node in the job, to open its parameter setup window.

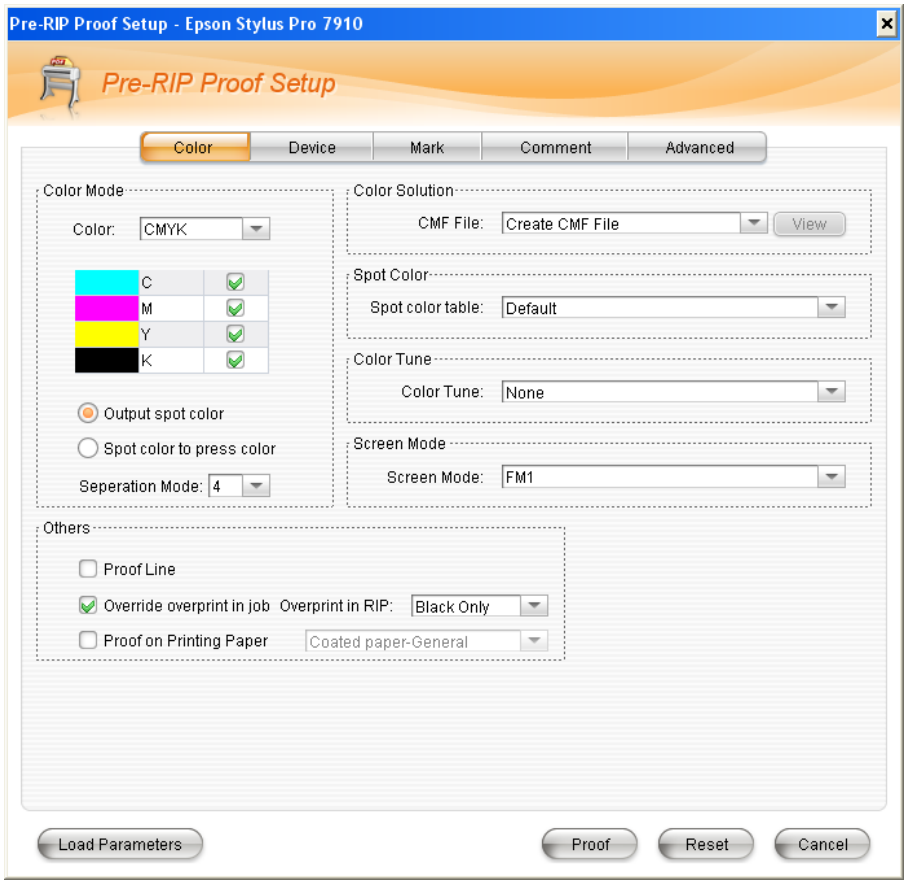


Figure 20

8. Properly configure the device-related parameters as you need, and then click the **Proof** button at the bottom of the setup window, to start up the Color Tools.

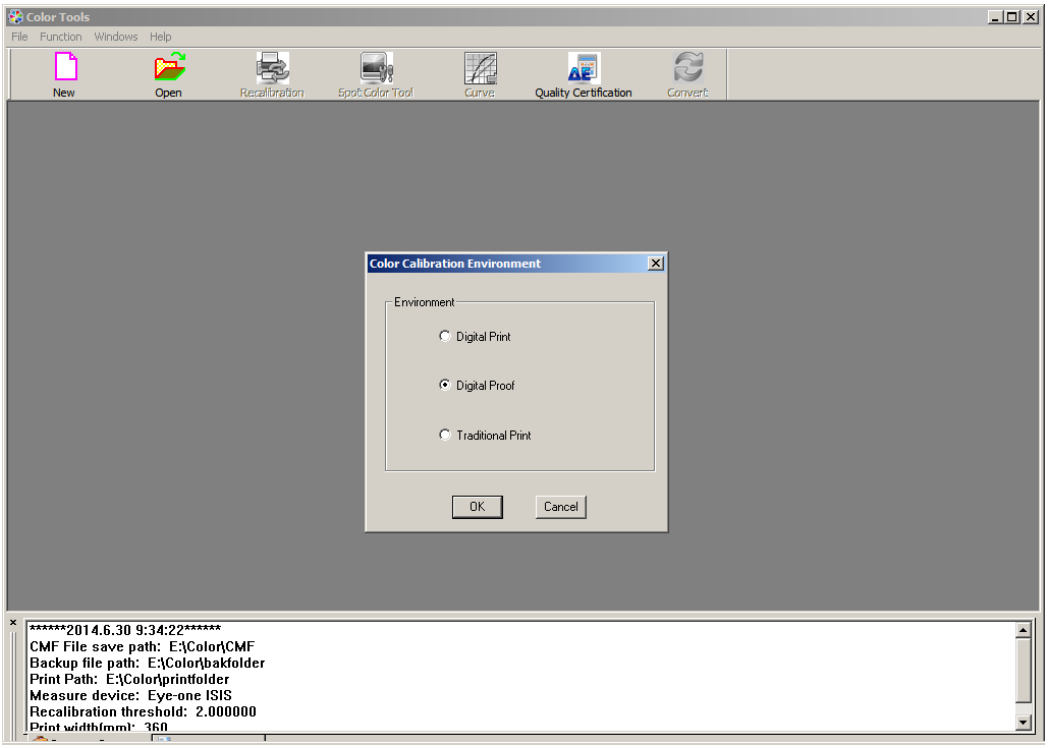


Figure 21

9. For use in digital proof, choose **Digital Proof**, and then click **OK**.

3.2 Create Proof CMF

In this section, we will introduce you the digital proof process. This process will produce a .cmf proof file.

The proof process for digital proof is composed of 8 steps:

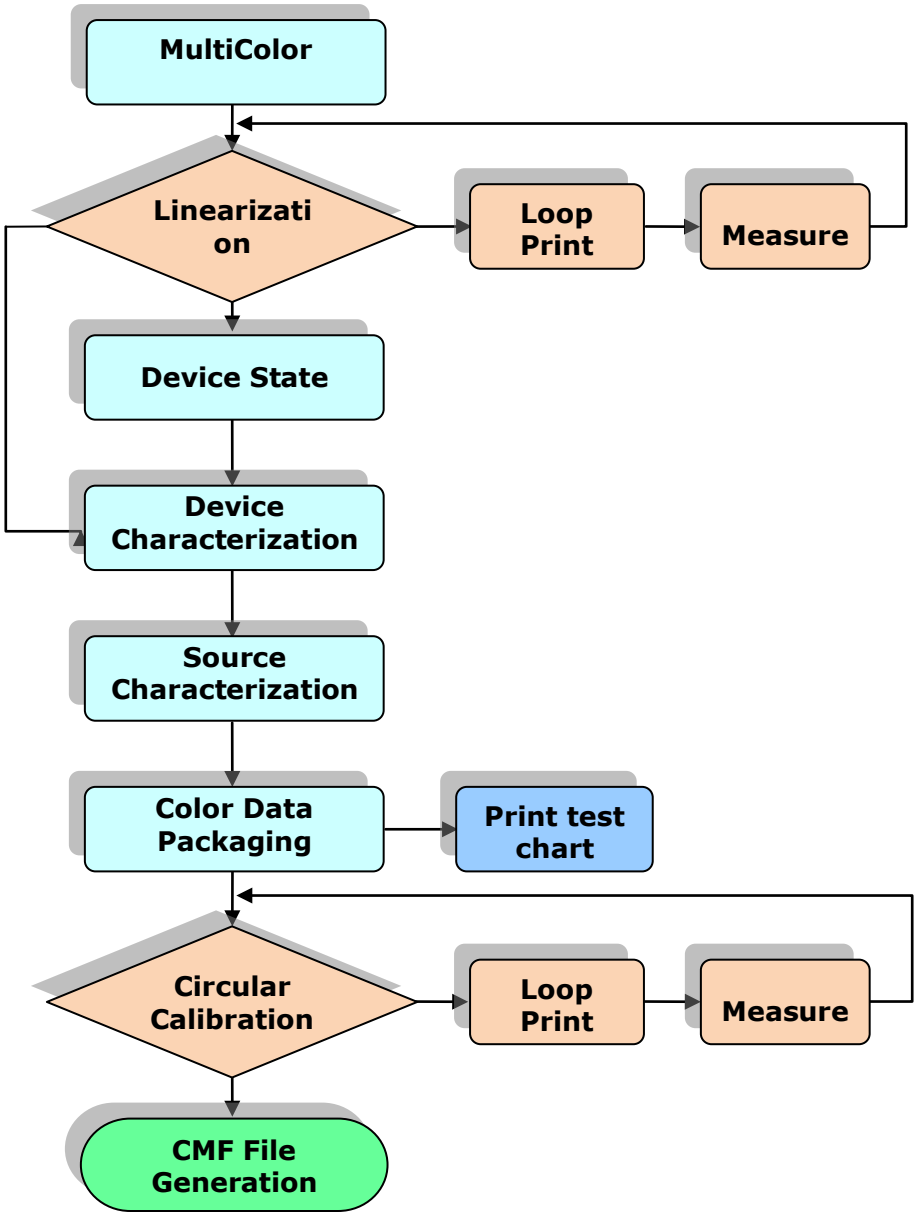


Figure 22

The main interface for the Color Tools is shown as follows.

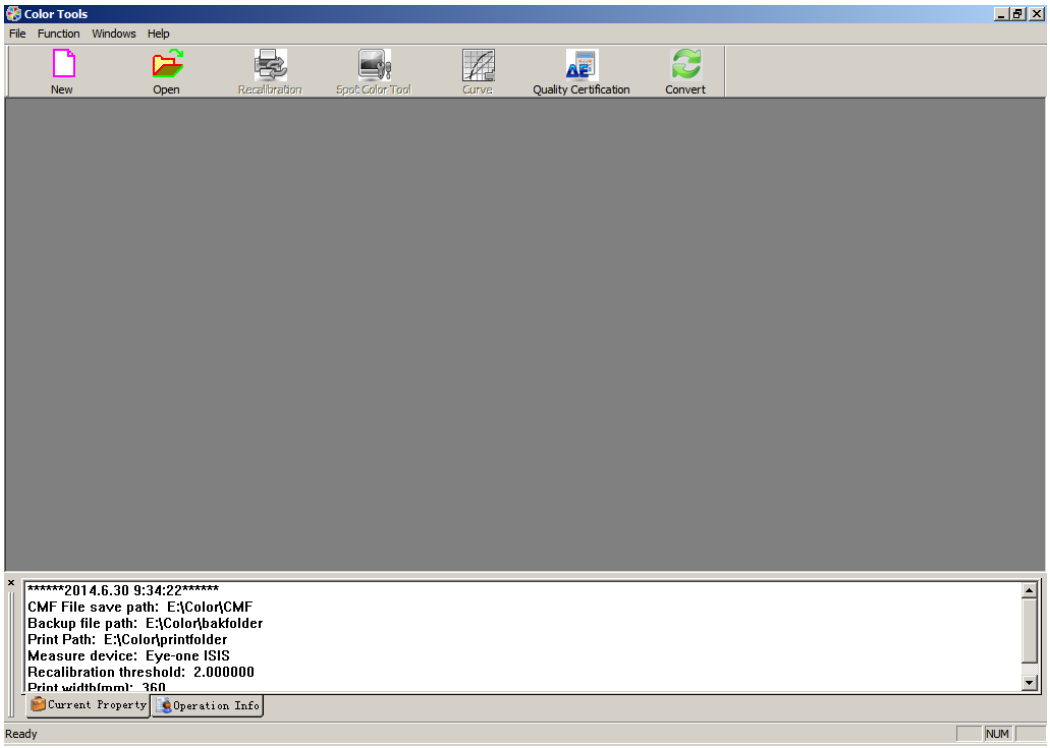


Figure 23

Click the toolbar icon, or choose the main menu **File** > **New CMF**, to start up the proof wizard. The program first pops up a parameter setup window.

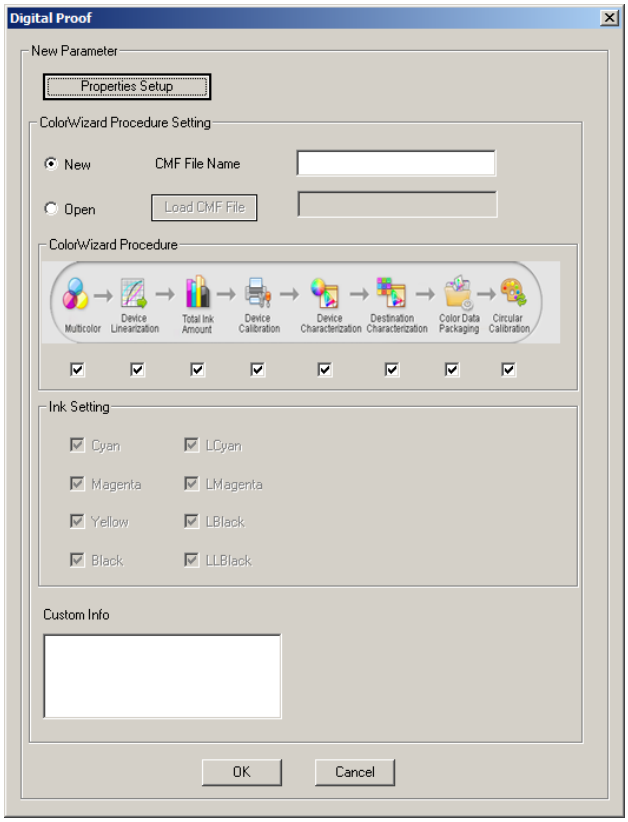


Figure 24

New / **CMF File Name**: The name of the new CMF file that you are going to create.

Open / **Load CMF File**: You can open a CMF file that has been interrupted or unfinished during its creation. A finished CMF file can NOT be opened here.

Color Wizard Procedure: Please tick the steps or procedures your proof contains. A complete proof wizard contains 8 steps.

Custom Info: Here you can input some text for identification, if needed.

Click the button **Properties Setup** at the top of the window, to define the following parameters.

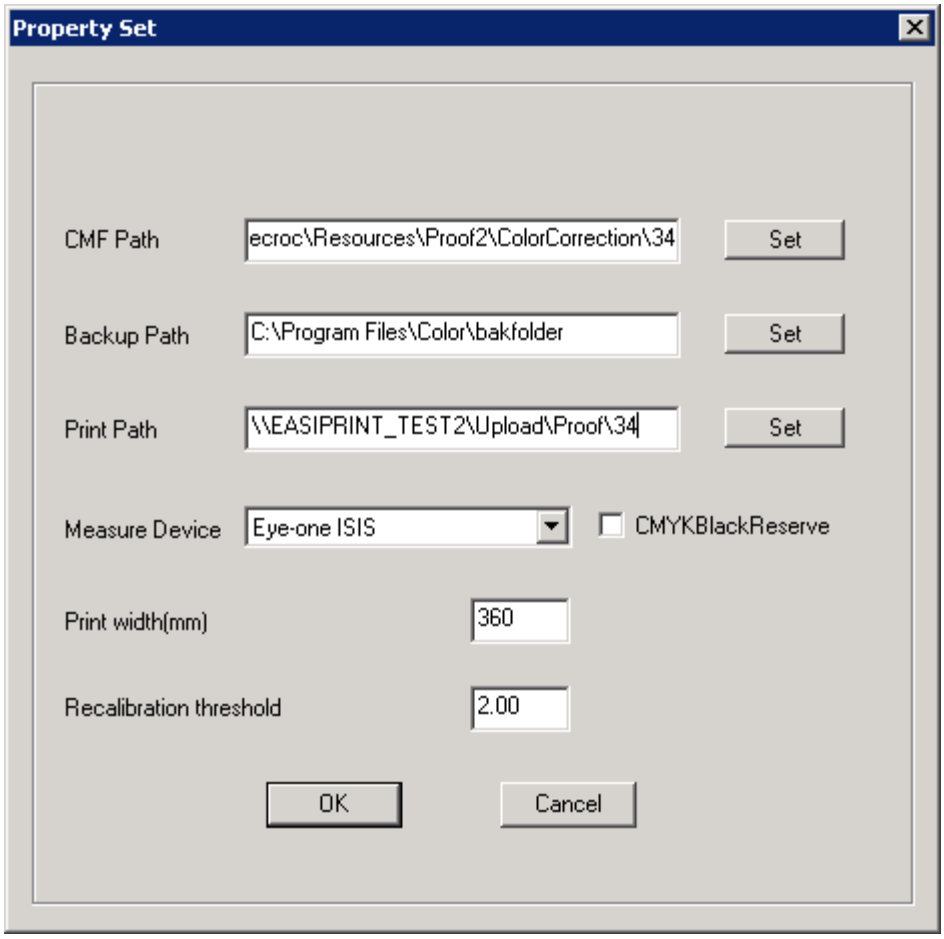


Figure 25

CMF Path: This path is designed for storing the generated .cmf files. We recommend you to use the directory \\172.19.xx.xx\Elecroc\Resources\Proof2\ColorCorrection\34, 172.19.xx.xx referring to the IP address or computer name of your ElecRoc server, 34 referring to the ID of the proof processor in your ElecRoc system. This directory is also the default path to store the .cmf files that are ready for use by your proof processor. Only finished CMF files can be generated under this path.

Backup Path: This path is used for storing the data resulted in case of any interruption or incompletion in the CMF file creation.

Print Path: This path is used for storing the files that are to be printed during the CMF file creation. The default path is \\172.19.xx.xx\Upload\Proof\34, 172.19.xx.xx referring to the IP address or computer name of your ElecRoc server, 34 referring to the ID of the

proof processor in your ElecRoc system. This path is also the path where the hot folder in your proof job detects for printing chart files.

Measure Device: Please choose the measuring device you are actually using. Color Tools supports you to use Eye-one ISIS, Eye-one, or Eye-one IO. In this manual, we take the Isis as example, the color charts will thus be based on this device.

CMYK Black Reserve: If checked, the system will directly use black ink to print the pure black process color (only the K in CMYK is NOT equal to 0 in this case). It's NOT suggested for digital proof.

Print Width: This refers to the width of the media that you are loading on your proof device. Please input the value as per that of the actual media.

Recalibration Threshold: It refers to the dE threshold for recalibration.

Step 1: Multicolor

This step is applied to some ink printers from Epson and HP. Its purpose is to generate a profile based on specific paper and printer, ensuring that CMYK colors can be properly output by multi-color inks of the printers.

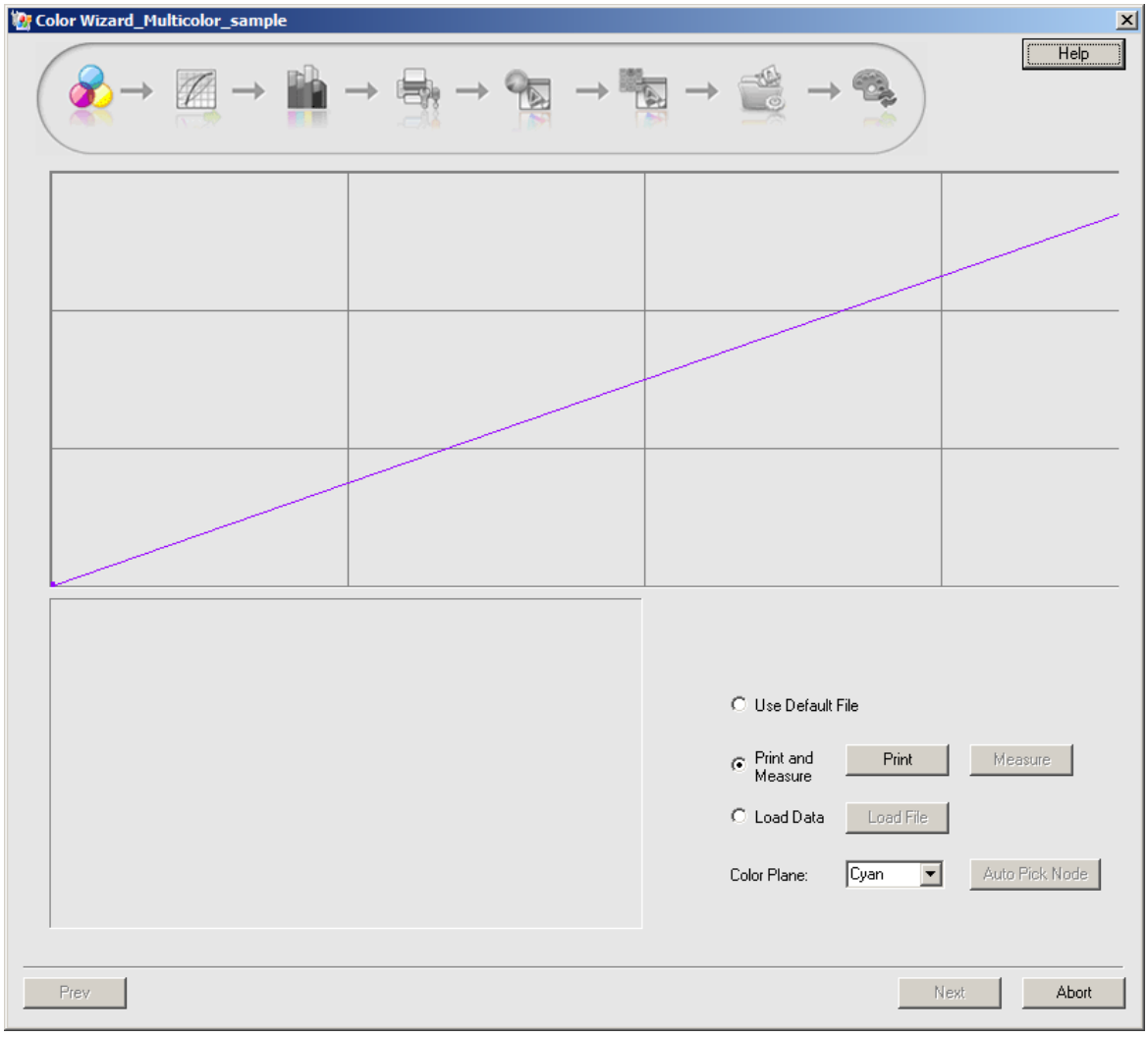


Figure 26

You can load an existing multicolor file, or choose to use the default one, or you can create a new file by way of printing & measuring.

If you choose to create a new file, we suggest you to click the button **Auto Pick Node** after the measurement. This clicking enables the wizard to automatically pick the nodes for you, a convenience for you in generating the multicolor file.

Step 2: Linearization

The second step is to create the linearization file.

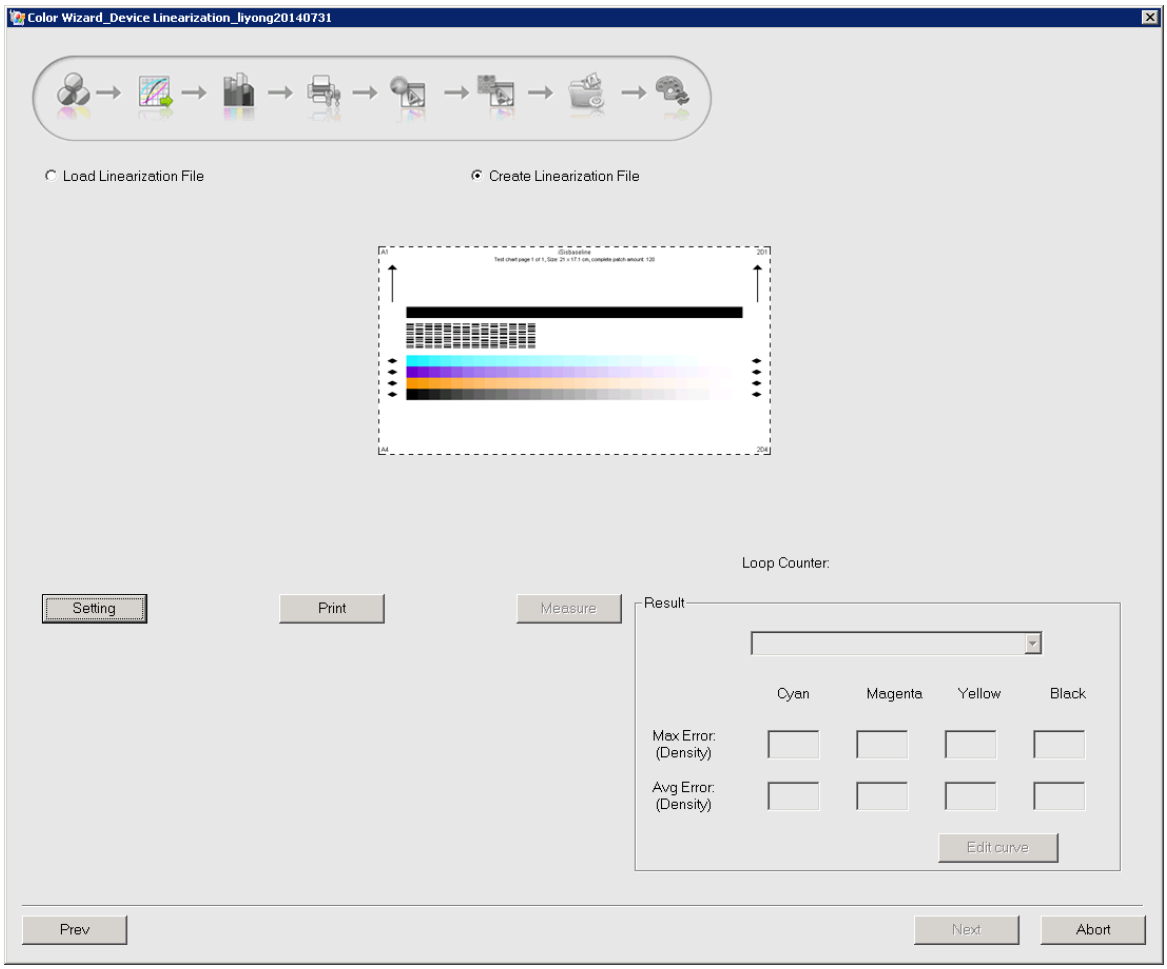


Figure 27

The linearization file can be loaded, or can be created by printing & measuring.

Click the button **Setting** to open the **Parameter Setting** window.

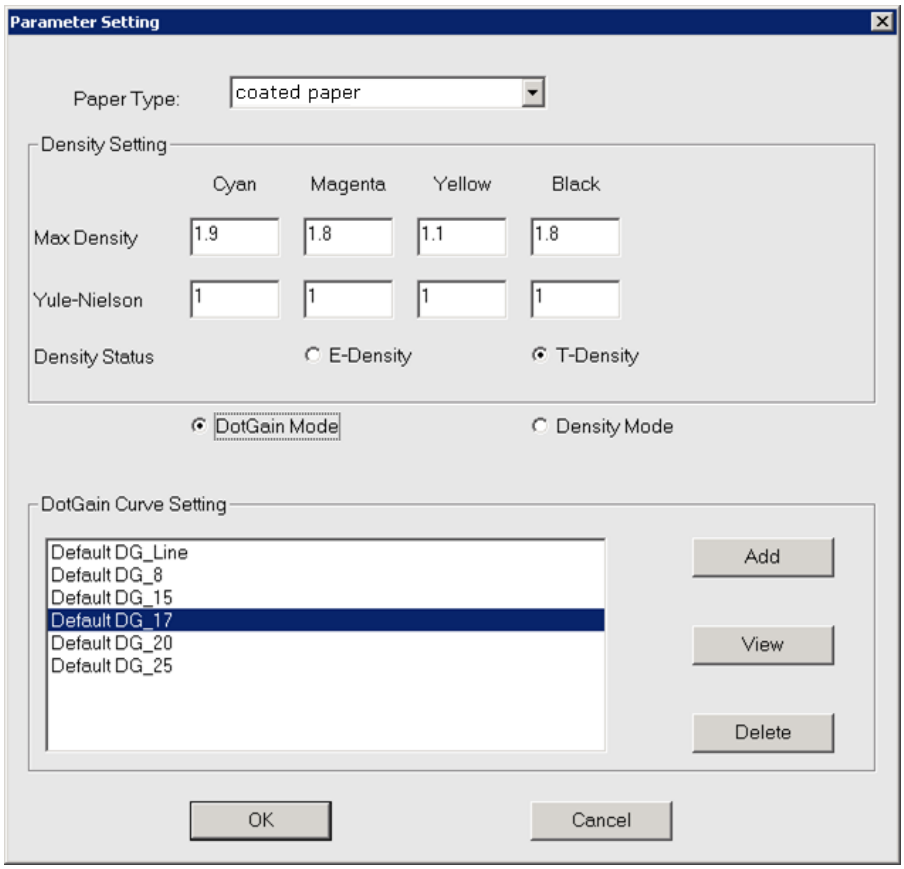


Figure 28

First, please choose the paper type according to the media type you are using.

Then, choose a mode for creating the linearization file: DotGain Mode or Density Mode.

Suggestion: *Choose **Density Mode** if you are using dedicated proof paper; **DotGain Mode** is applied for proofing on printing paper.*

When you have done the setting, click **OK** to return to the main window.

Click the **Print** button (the button **Measure** is then activated) to generate the corresponding linearization chart under the ***Print Path*** specified in the ***Property Setup*** window (opened by clicking **Property Setup** when you created the new CMF).

Note: *The generated chart file under the print path will then be scanned and submitted to the printing device by way of hot folder.*

Click **Measure** to enter in the measuring window.

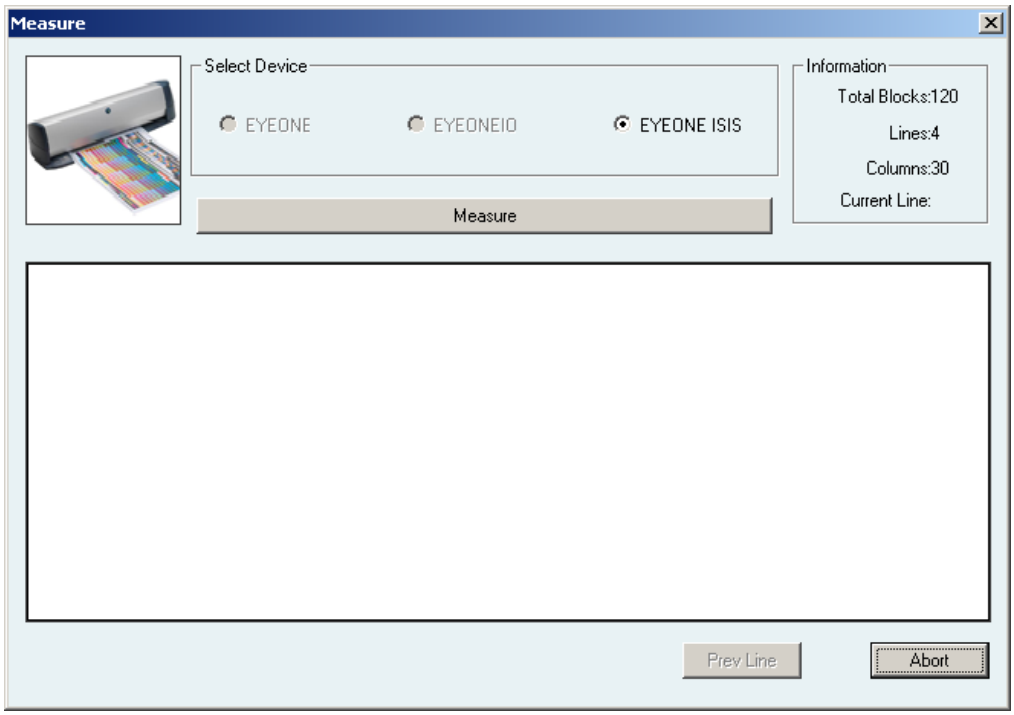


Figure 29

Measure the printed chart, and when you finish the measurement you will see the hint "Measured successfully! Press here to continue".

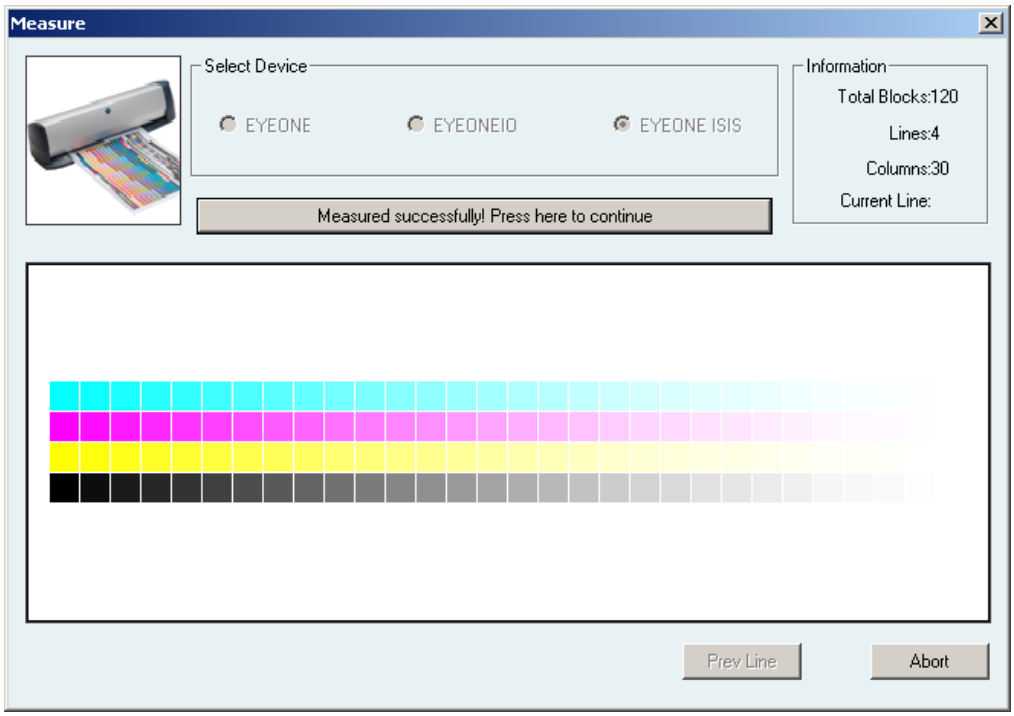


Figure 30

Click this hint to back to the main window.

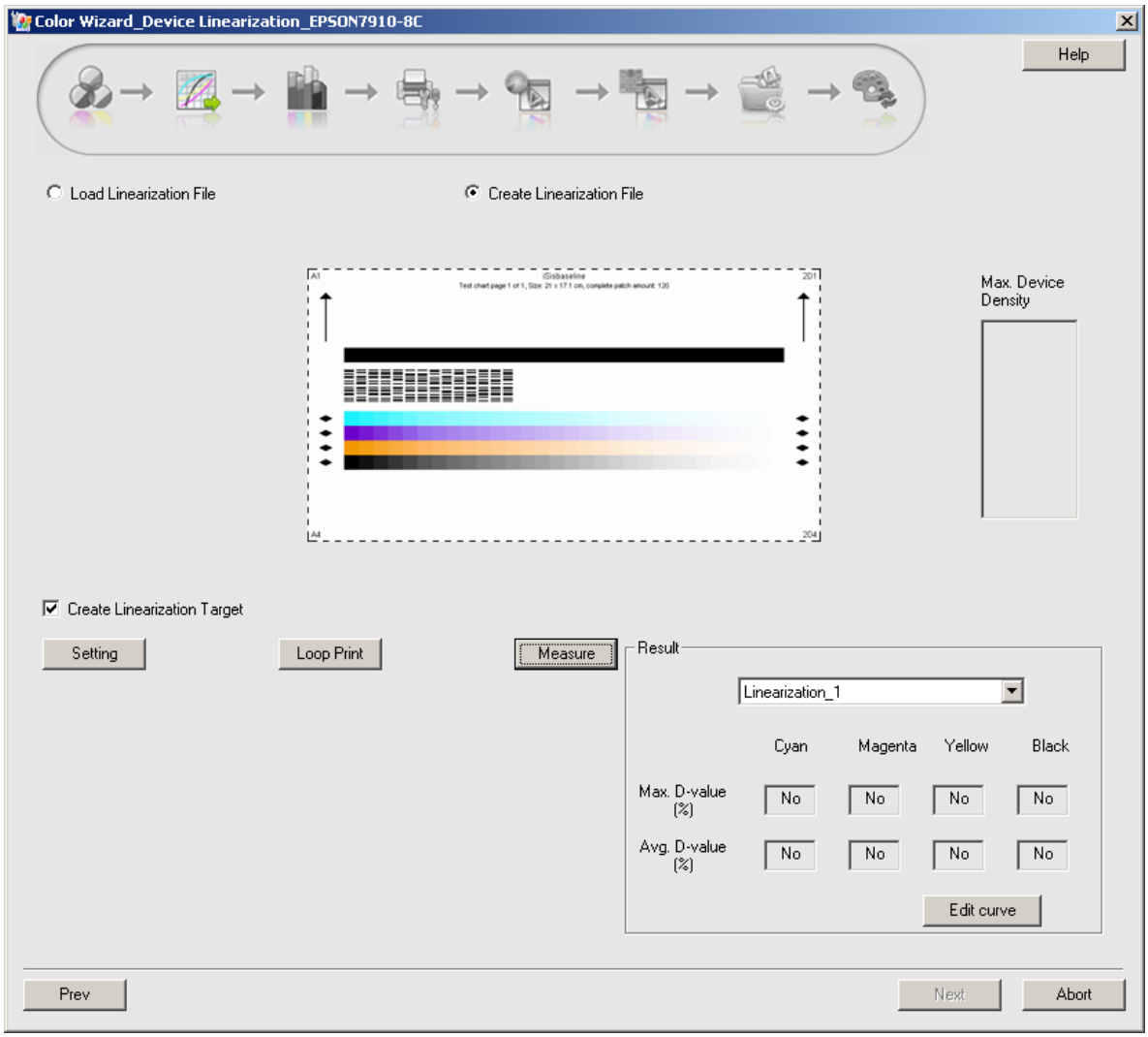


Figure 31

Now you can see that the **Print** button turning to **Loop Print**, and an option **Create Linearization Target** appearing (checked by default) on the interface.

Create Linearization Target: You need to create a target data in case that you want to perform a quick re-calibration operation in the future. When your device has been used for a period of time or its state has been changed, you can make use of the **Re-calibration** > **Quick Calibration** to restore your device to the state it had when you made the color calibration solution.

Note: *1) The **Next** button is grayed when this option is being checked, but becomes activated when you print and measure once again. 2) In case that you choose to load a linearization file and the file contains target data, the target data will be loaded with the file together. And if the loaded file does NOT contain this data, if needed, you can print and measure to create it.*

Click the button **Loop Print**, and then repeat the measurement when the chart has been printed out, till that the color difference shown at the lower-right corner meets your requirement.

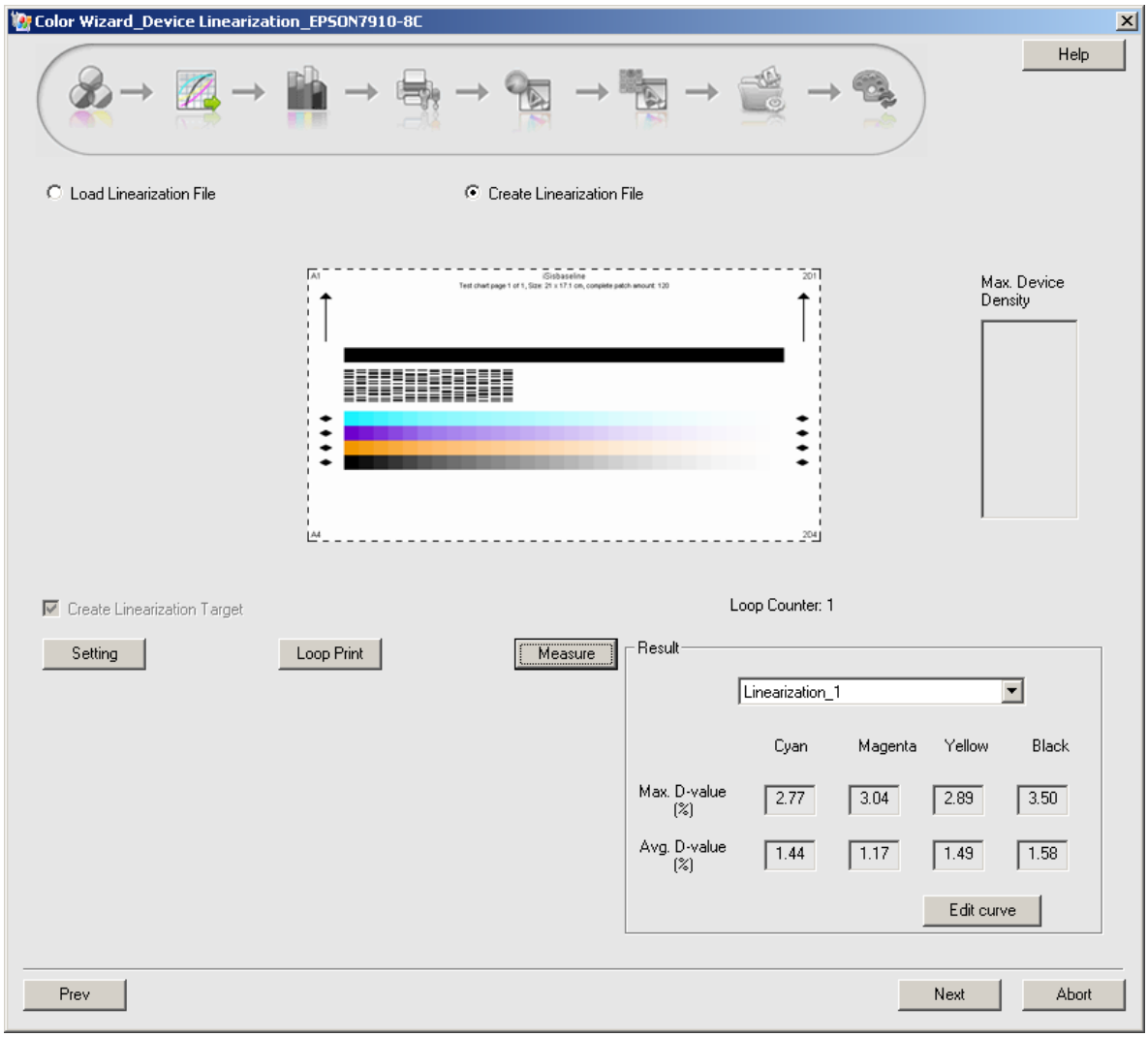


Figure 32

Files involved in the calibration wizard are saved automatically. At the **Result** column shows in turn the generated linearization files, Linearization_1 … Linearization_n. And meanwhile the maximum and average differences for each loop printing and measuring are shown on the interface as well.

After the generation of the linearization file, click **Next** to enter into the interface for total ink amount.

If you are NOT satisfied with the generated linearization file, you can edit it, although the editing operation is NOT suggested for most users, for that it is an advanced adjustment.

Click the **Edit Curve** button at the bottom of the window to open the editing window, in which you can view and edit the generated linearization curve file.

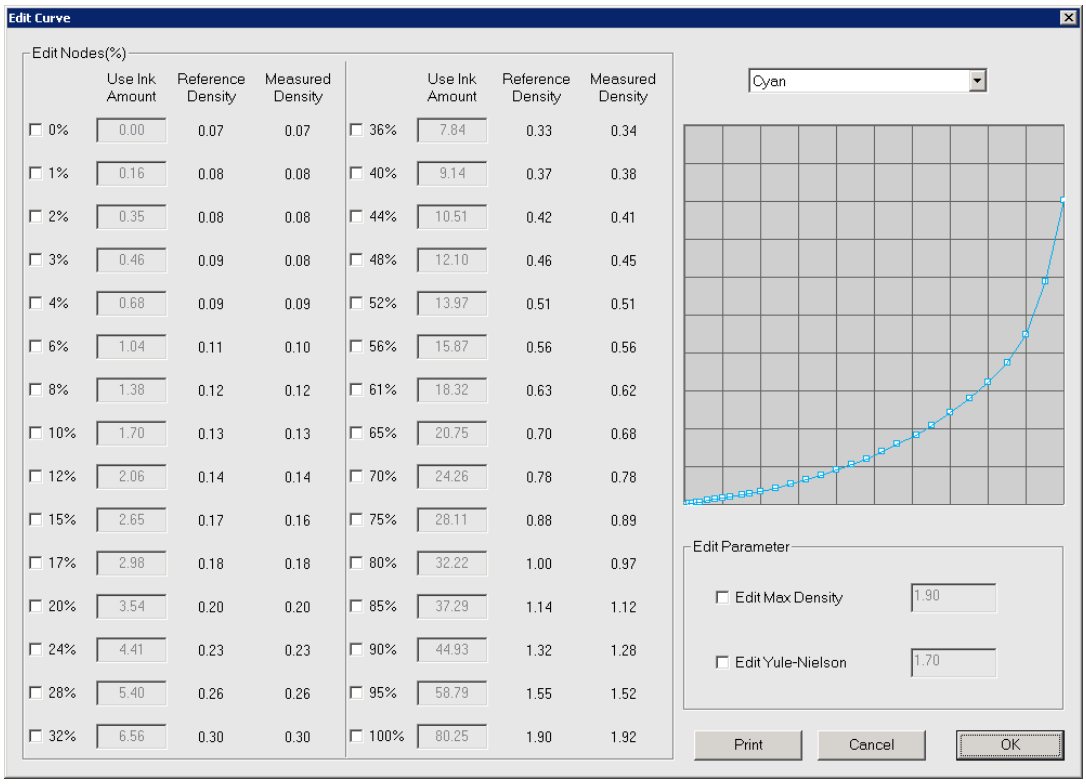


Figure 33

Note: *Aiming at re-defining specific ink percentage values, the editing becomes available only when you have checked the boxes in front of the percentages. Please note the monotonicity of the curve during the editing.*

If you have edited the curve, you can click **Print**, to apply the edited curve to print out a test chart, so as to check the actual linearization effect. Look over the printed chart with your eyes, a good linearization effect has the following characteristics: well-proportioned monochromatic color gradation, no mergence, composite colors of three equivalent color components at the bottom of the chart, no remarkable variance, and consistent hue. If you are NOT satisfied with the print result, you can continue to edit it. If satisfied, click **OK** to return.

Note: *If you have edited the curve and clicked **OK**, you will be hinted then that the target data created previously is no longer matching with the current device state, and that it's best for you to print and measure again. In this case, please print and measure again to get new linearization target data.*

Step 3: Total Ink Amount

This step is used for determining the total ink amount. The main window displays the chart used for deciding the total ink amount.

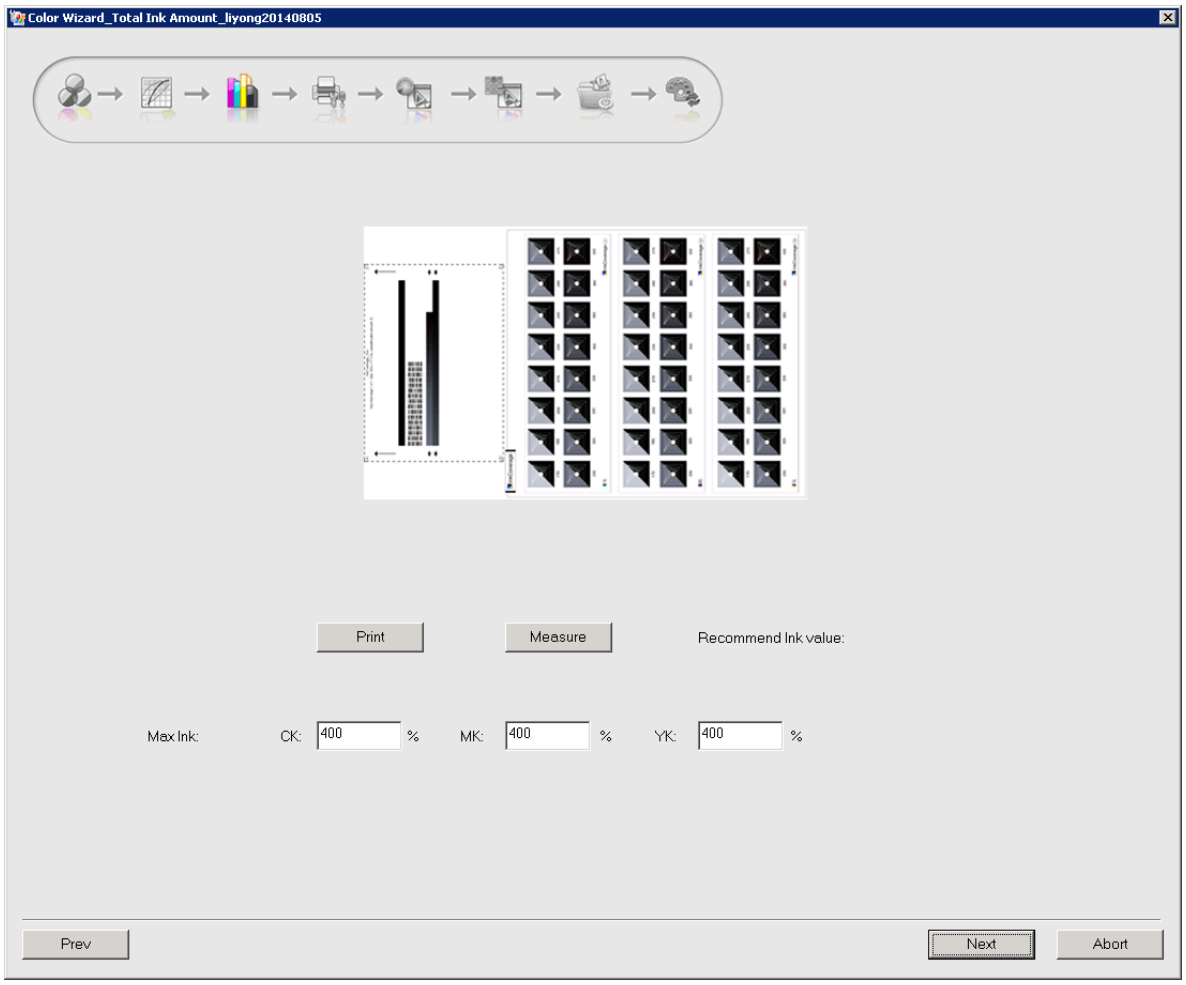


Figure 34

The chart consists of two halves, the upper half is used for auto measuring, and the lower half is used for you to make decision with your eyes. Please refer to the method below to choose a right color block, and then combine the value corresponding to the color block and the measured value to decide a suitable total ink amount.

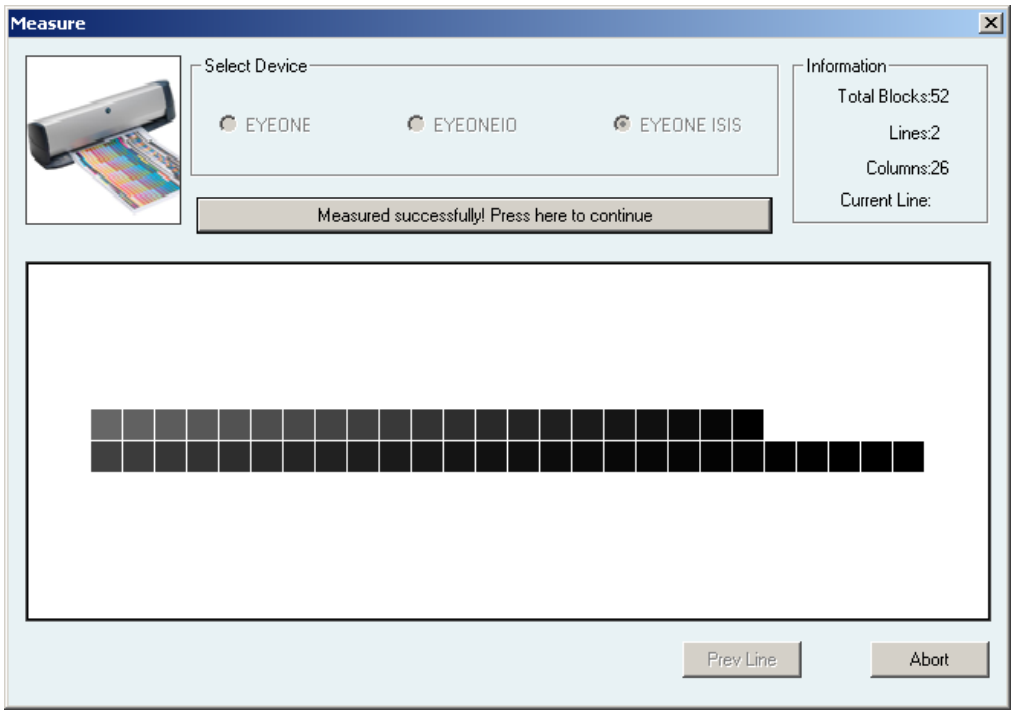


Figure 35

Click the **Print** button to print out this chart, and then measure the upper half of the chart. The measuring result is shown aside **Recommend Ink value**. And meanwhile, choose the right color block with your eyes from the lower half of the chart. Based on the recommend value and the value in front your chosen color block, input proper values into the **CK**, **MK**, and **YK** edit boxes.

Method to choose the color block: it is best to observe the chart just after it has been printed out. ①The color block without any flowing or heaping ink, and exactly in front of the semi-dry one. ②The thin white lines on the blocks are designed for inspecting the ink penetration. Heavy penetration usually causes the white lines to fragment or disappear. In case that the paper is of high quality, you'd better choose the one on which the white lines are clearly visible. ③In case that the paper is of coarse quality, you should inspect the ink penetration from the back side of the paper. The total ink amount is considered high if the ink penetration is so heavy that the paper has been obviously distorted. You can choose a block with neutral penetration.

Note: *the method above is used for reference only. In actual work, please make your decision flexibly according to the paper type, the measuring result and visual inspection.*

Click **Next** to enter into the main window for device calibration.

Step 4: Device Calibration

As an optional step, it is designed to create the device state file. Its main window is shown as follows.

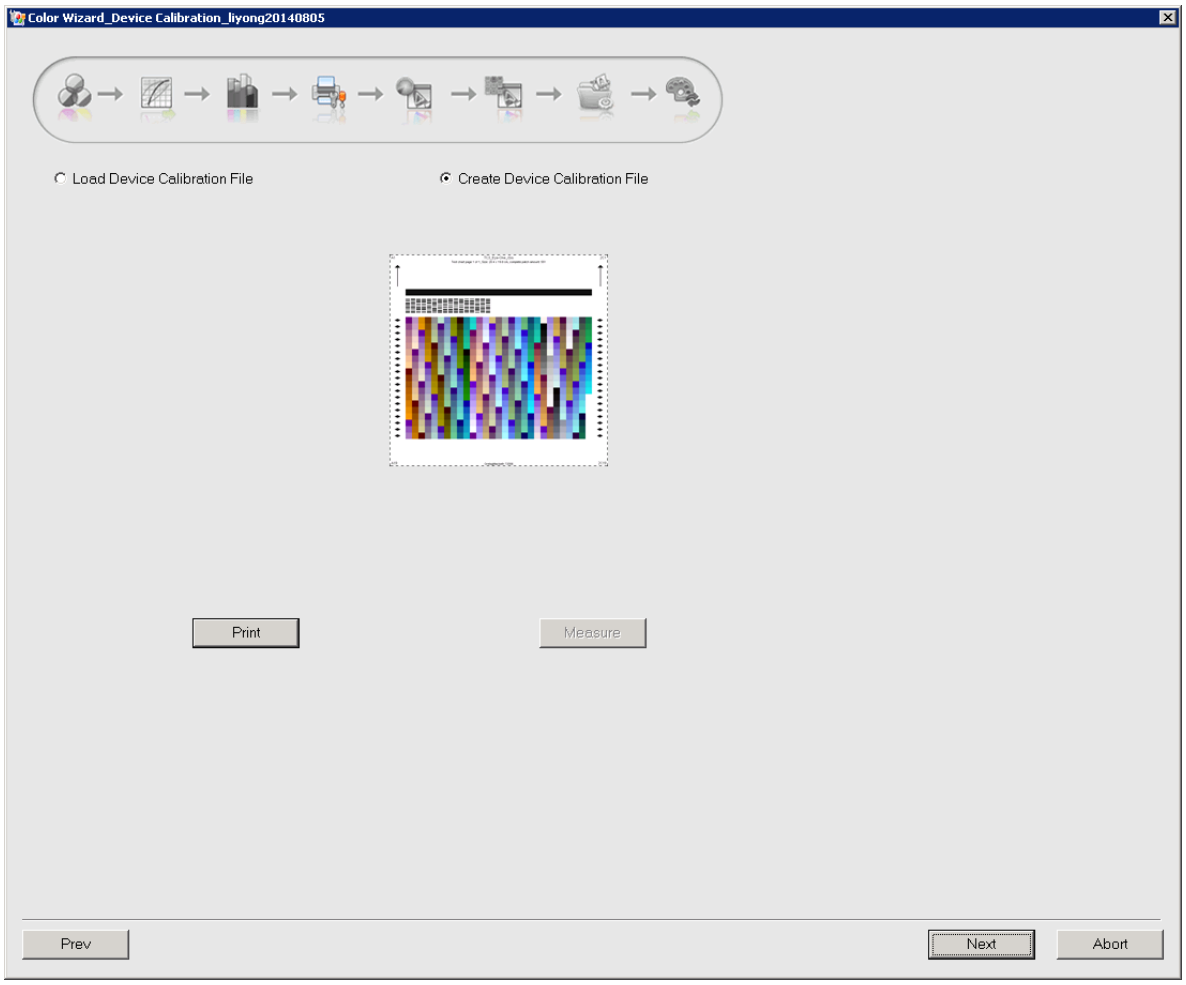


Figure 36

Only when you have created the device state file in this step, you can then make use of the module **Re-calibration** > **Entire Calibration**. The calibration file can be loaded, or be created by way of printing and measuring.

As to creating a new one, please click the **Print** button to print out the color chart and then measure it. After the measurement, click **Next** to enter into the main window of device characterization.

Step 5: Device Characterization

This step is designed to create the color characterization profile for your current digital proofing device. It also allows two methods, being loaded or created.

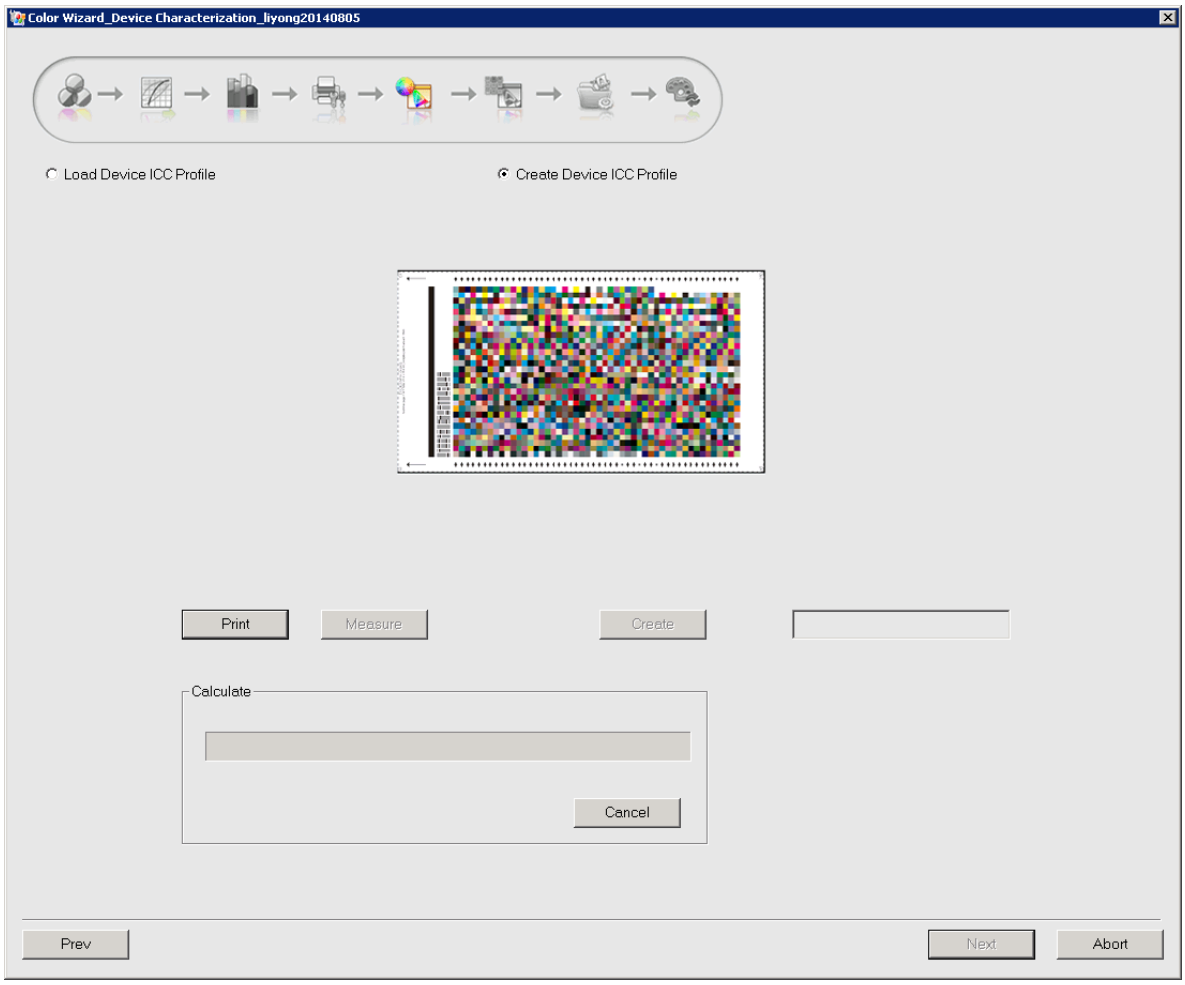


Figure 37

Take the creating of a device characterization profile as example. Click the **Print** button on the main window to let the printer output the ECI2002 chart, and then click **Measure** to measure it.

After the measurement, click **Create** to start creating the characterization profile. The **Calculate** progress bar shows the progress of the file generation. The generated profile will then be displayed, like ProfileD_0.tmp.

Click **Next** to enter into the main window for source characterization.

Step 6: Source Characterization

You can choose to load a characterization profile, or choose to create a new one by measuring the press sample of the ECI2002 color chart.

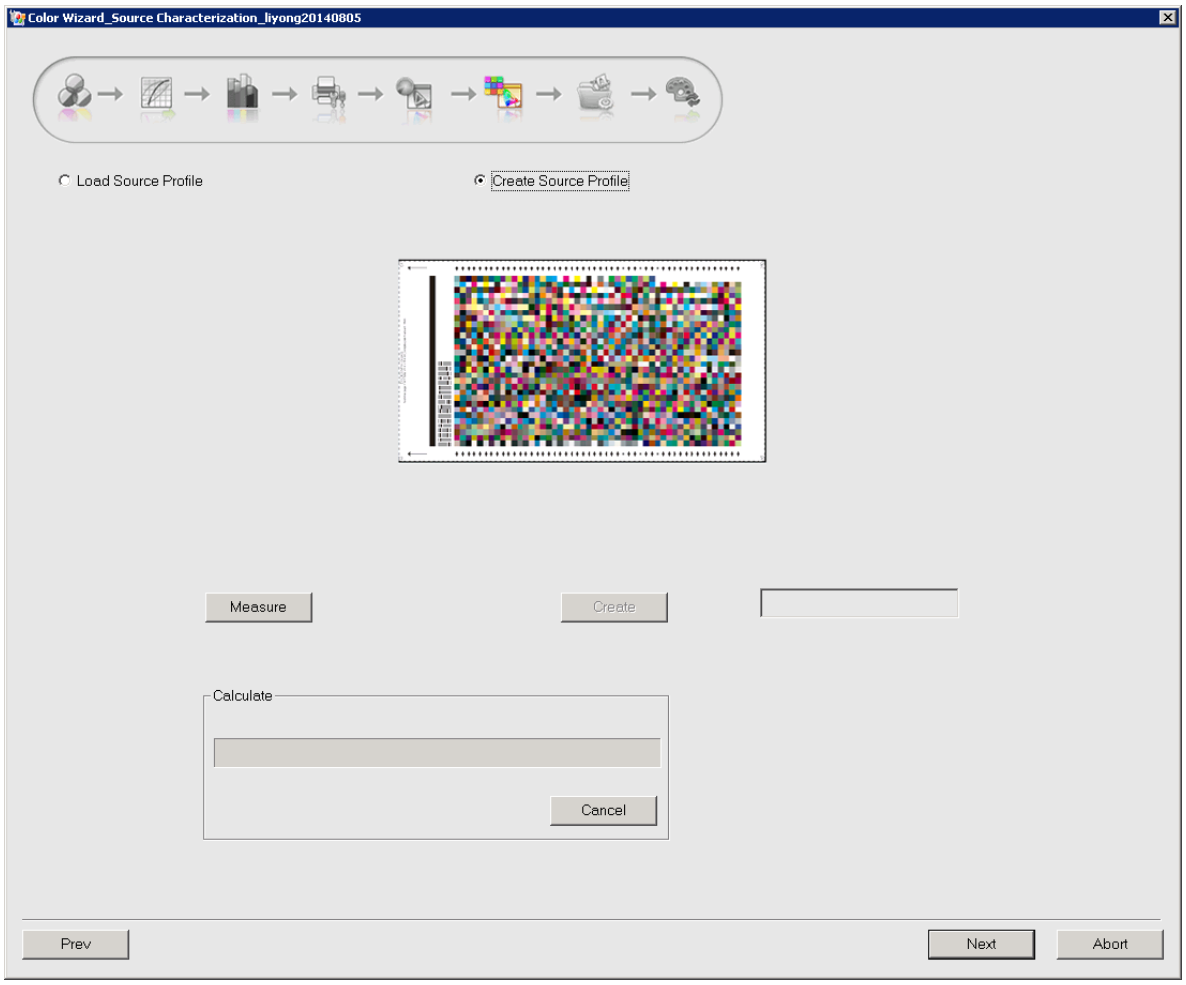


Figure 38

As shown on the interface, the Color Tools builds in several international standard source profiles for you to choose. After the loading, you can click the **Edit** button to modify the saturation of the loaded profile. The modifying operation is NOT recommended for general users.

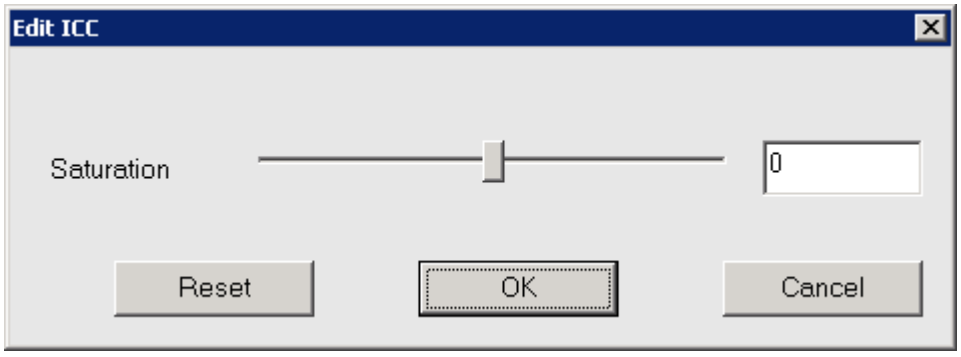


Figure 39

Click **Next** to enter into the interface for generating the data package.

Step 7: Color Data Packaging

This step is designed to package the proof data into a single proof file *.cmf.

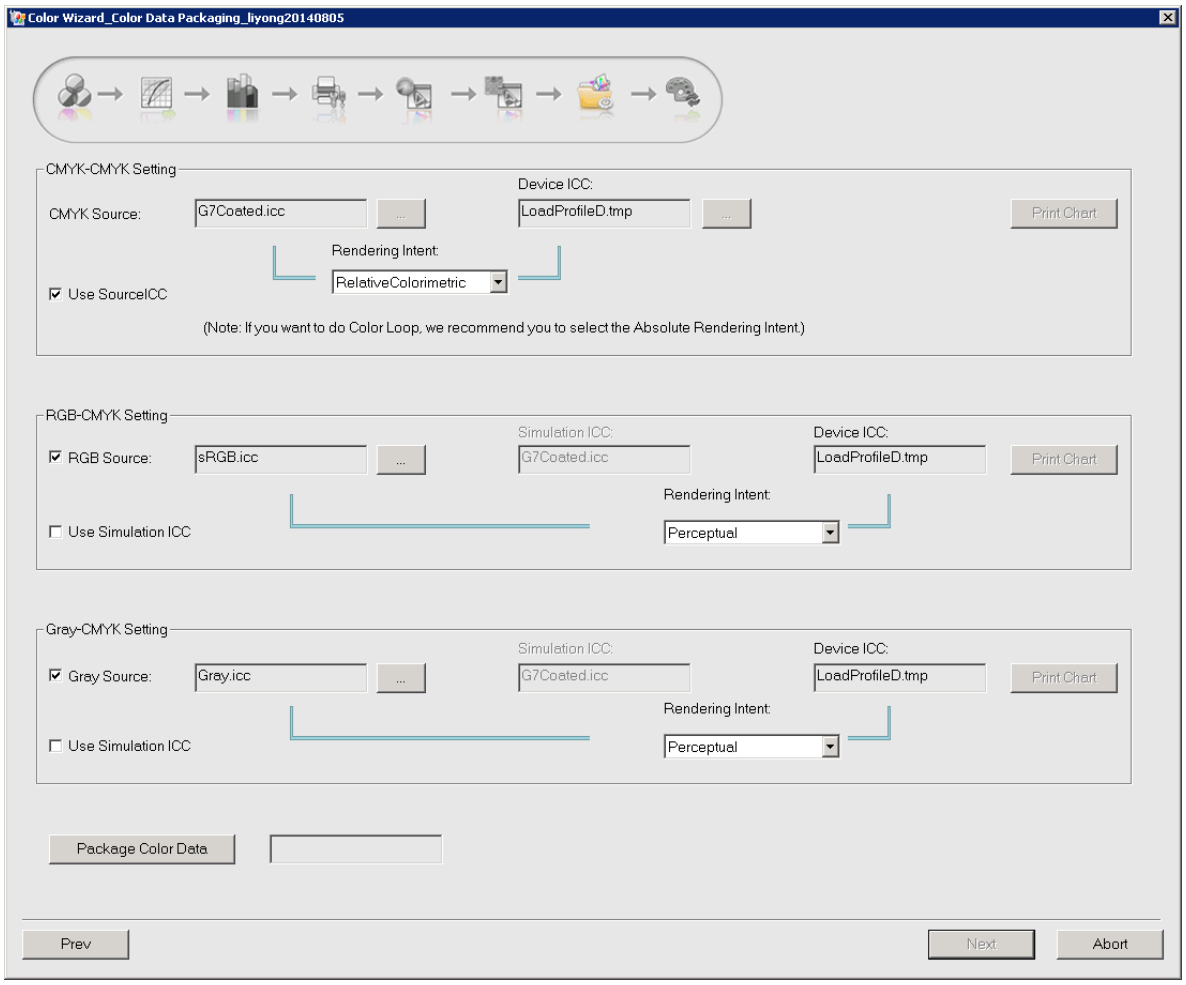


Figure 40

Note: *If you haven't set the source ICC in previous step, you can click the button* ... *aside the parameter* ***CMYK Source****, to specify a source ICC you will use.*

CMYK-CMYK Setting: To affect the color output of the CMYK entities in job.

RGB-CMYK Setting: To affect the color output of the RGB entities in job, enabling the RGB entities to be output as per the color effect specified by the **Simulation ICC** option.

Gray-CMYK Setting: To affect the color output of the Gray entities in job, enabling the Gray entities to be output as per the color effect specified by the **Simulation ICC** option.

Rendering Intent: It's a mode of color conversion and is available for each color space. Its four options enable different conversion results. Among them, the **Relative Colorimetric** is the most commonly-used option. **Absolute Colorimetric** is used when you want to simulate the paper white of the source device.

Click the button **Package Color Data** to generate the .cmf file when you have defined the above settings. After the generation, the three **Print Chart** buttons become activated, and by clicking them, you can print out respectively the test page for the CMYK, RGB, and Gray modes, for purpose to view the color output effect of the current proof data.

Click **Next** to enter into the main window for circular calibration.

Step 8: Circular Calibration

The purpose of this step is to enable a better match between the output result of current device and the source characterization profile, so as to achieve an accurate simulation and an optimization on the color effect.

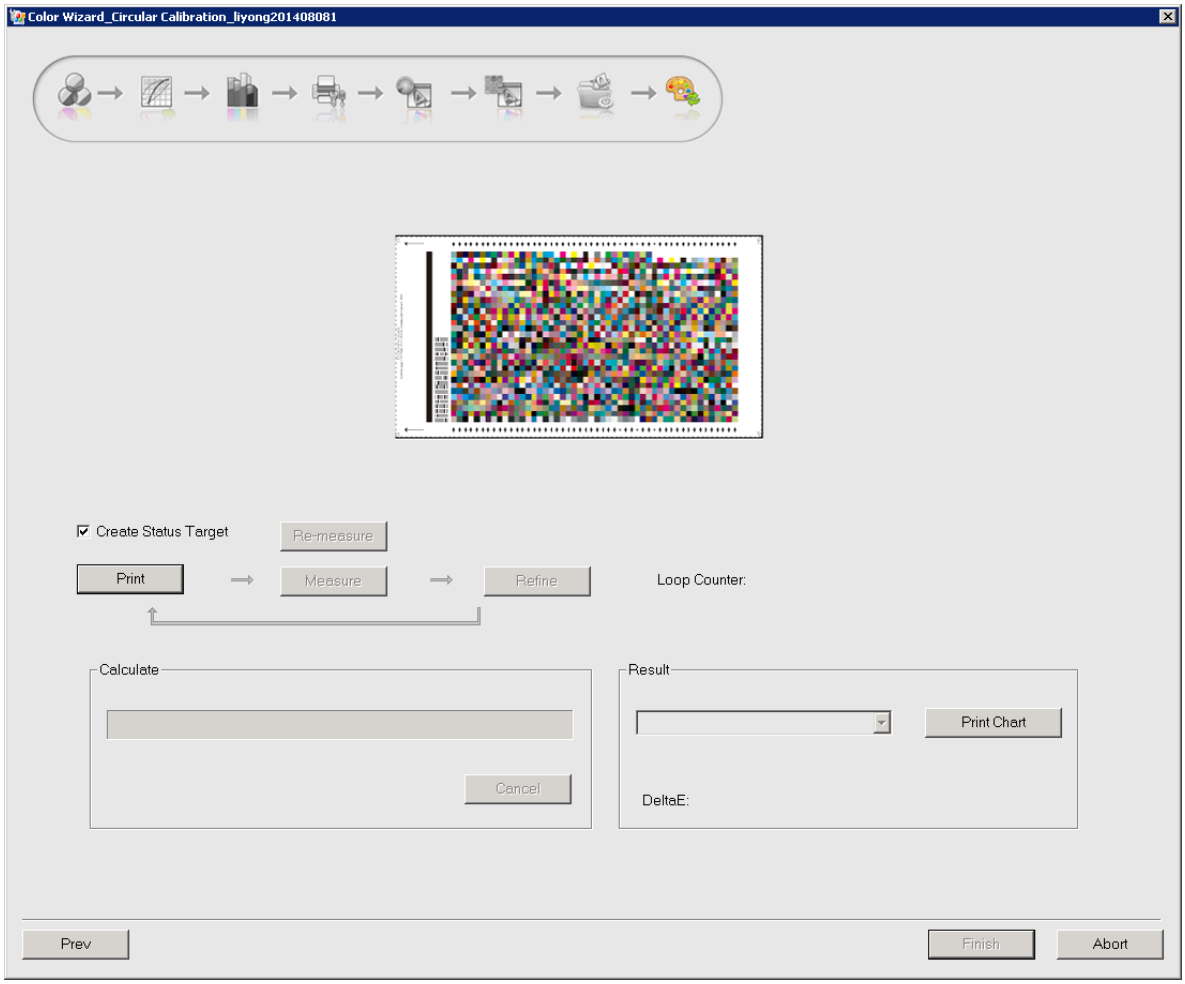


Figure 41

By default, the option **Create Status Target** on the main window is checked, and the button **Finish** is grayed. The purpose for creating status target is to get the device's status result data that are output with current proof file, as a basis for evaluating color output result. If you don't want to perform the circular calibration, you can uncheck **Create Status Target** to activate the **Finish** button.

Loop Counter counts the times you have repeated (circulated). The button **Print Chart** enables you to print out the effect of the current circular calibration each time when the calculation is completed.

Click **Print** to print out the ECI2002 color chart (at this time the chart is applied with proof data) and then measure it. Return to the main window when you finish the measurement, and you will see that the button **Calculate** becomes activated. Click it, and when the calculation is completed, you will see the average Delta E value being displayed at the **Result** column. This value at the first time is usually large. Now you can start the loop calibration, i.e. to repeat the **Print**, **Measure** and **Calculate** operations. In general, the Delta E will be reduced to a quite ideal value after two loops, and then you

can stop the circular calibration.

Please click **Finish** to exit the calibration wizard. The generated .cmf file is stored under the **CMF Path** defined in the **Properties Setup** window (opened by clicking **Properties Setup** at the beginning of the wizard). Meanwhile the status target data is recorded in the proof file.

3.3 Apply CMF File

1. Run your ElecRoc Client, and open or create a job. The job should contain the PDF Generator and the Proof nodes.

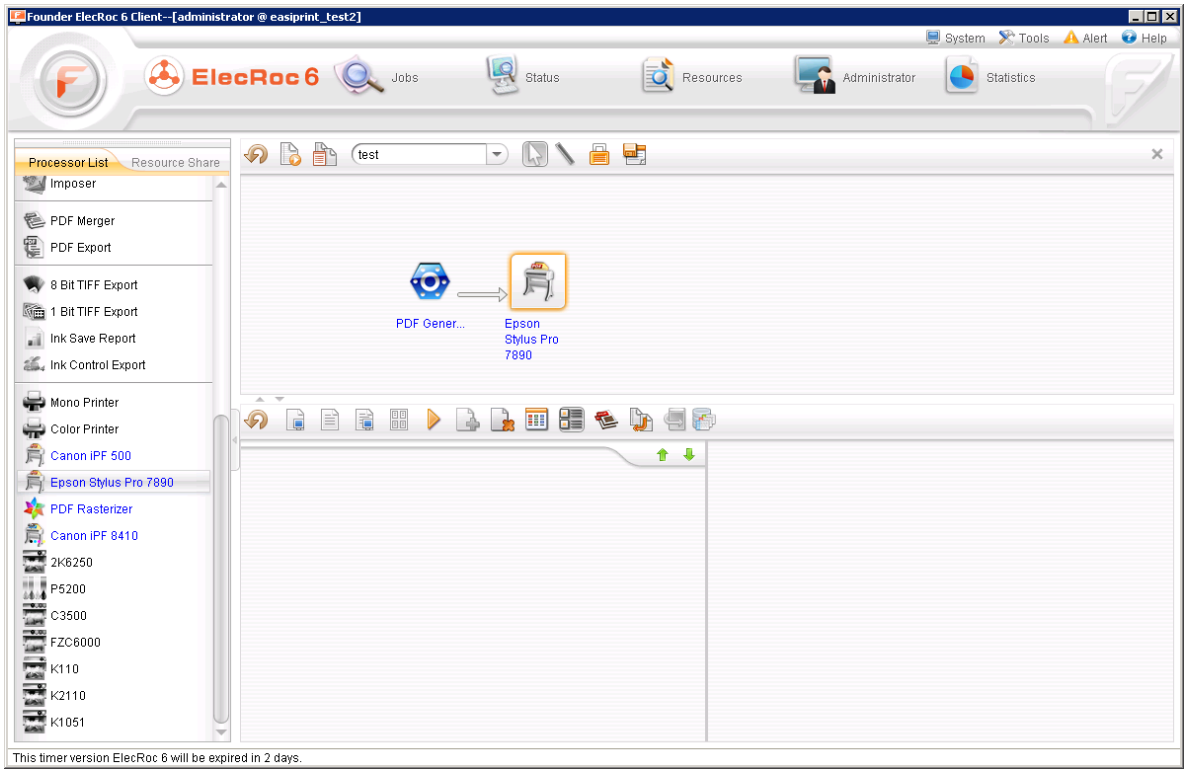


Figure 42

2. Configure the Proof node's processor parameters. At the CMF File dropdown list, choose the .cmf file you have just finished.

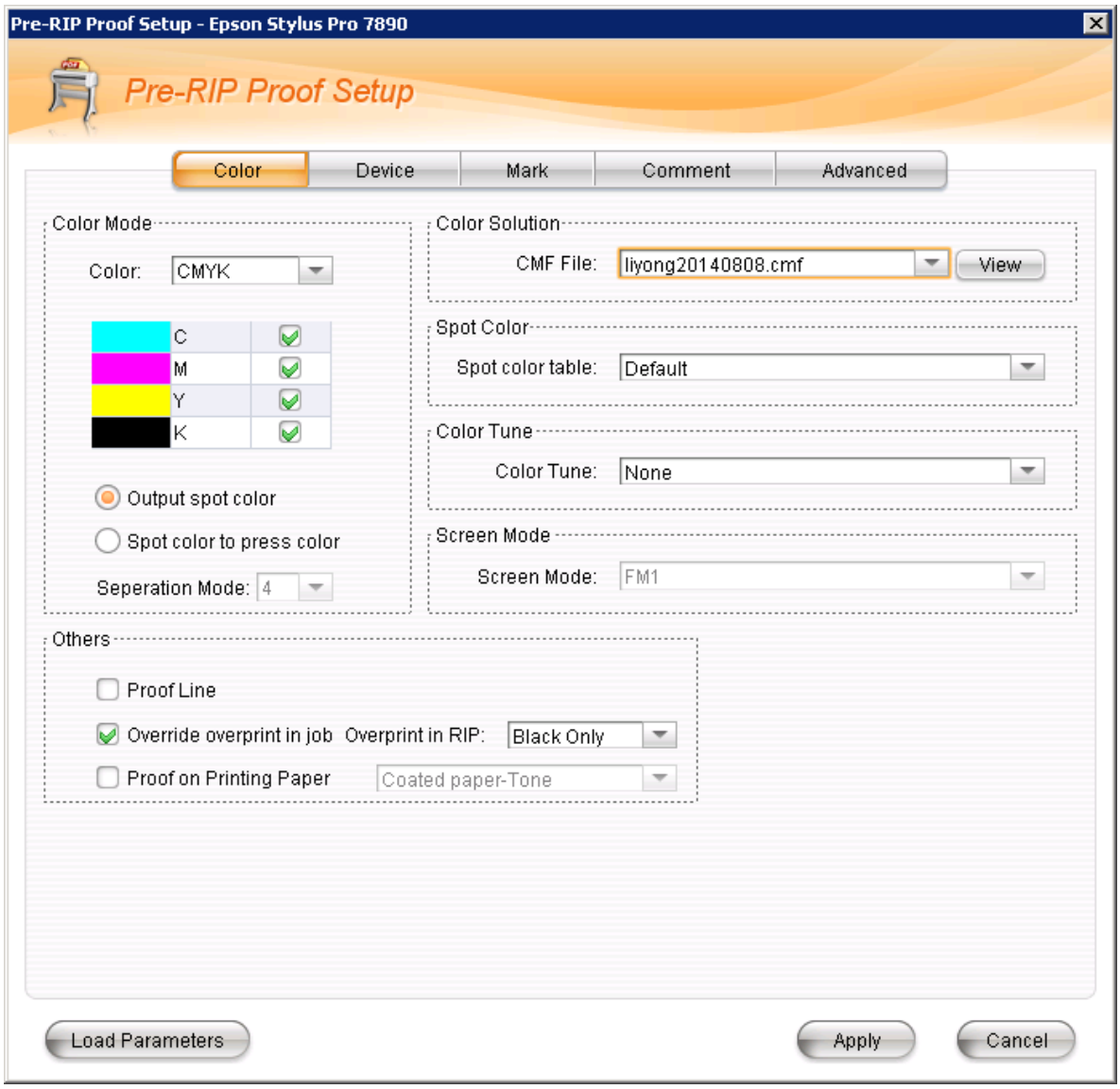


Figure 43

3. Submit pages to the Proof node when you have done the configuration. The Proof node can accept directly the output pages from PDF Generator.

Chapter 4 For Digital Print

4.1 Start up Color Tools

The Color Tools can NOT be started up independently. Instead, you need to start it from ElecRoc's Client. The steps are as follows:

1. Run your ElecRoc workflow system.

2. Start the digital printing processor you want to proof, making it online.

3. Start up ElecRoc Client and login the Server.

For details about the above three steps, please refer to Section 3.1.

4. Choose the administrative module **Administrator** > **Processor Management**, find out and choose the proof processor, here we take C6000 as example.

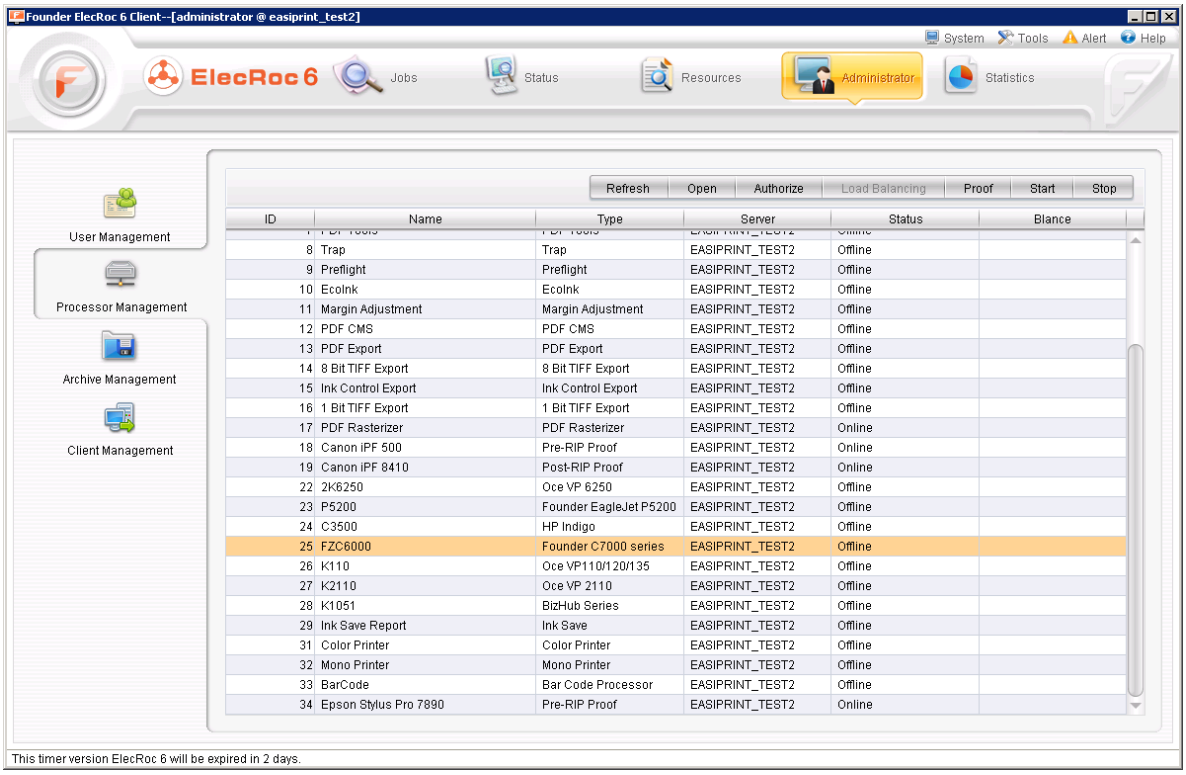


Figure 44

5. Click the **Proof** button, and then you can see that ElecRoc automatically creates a job, named as Proof_FZC6000, dedicated for your proof operation. Meanwhile, the Color Tools will be started up, please choose **Digital Print**.

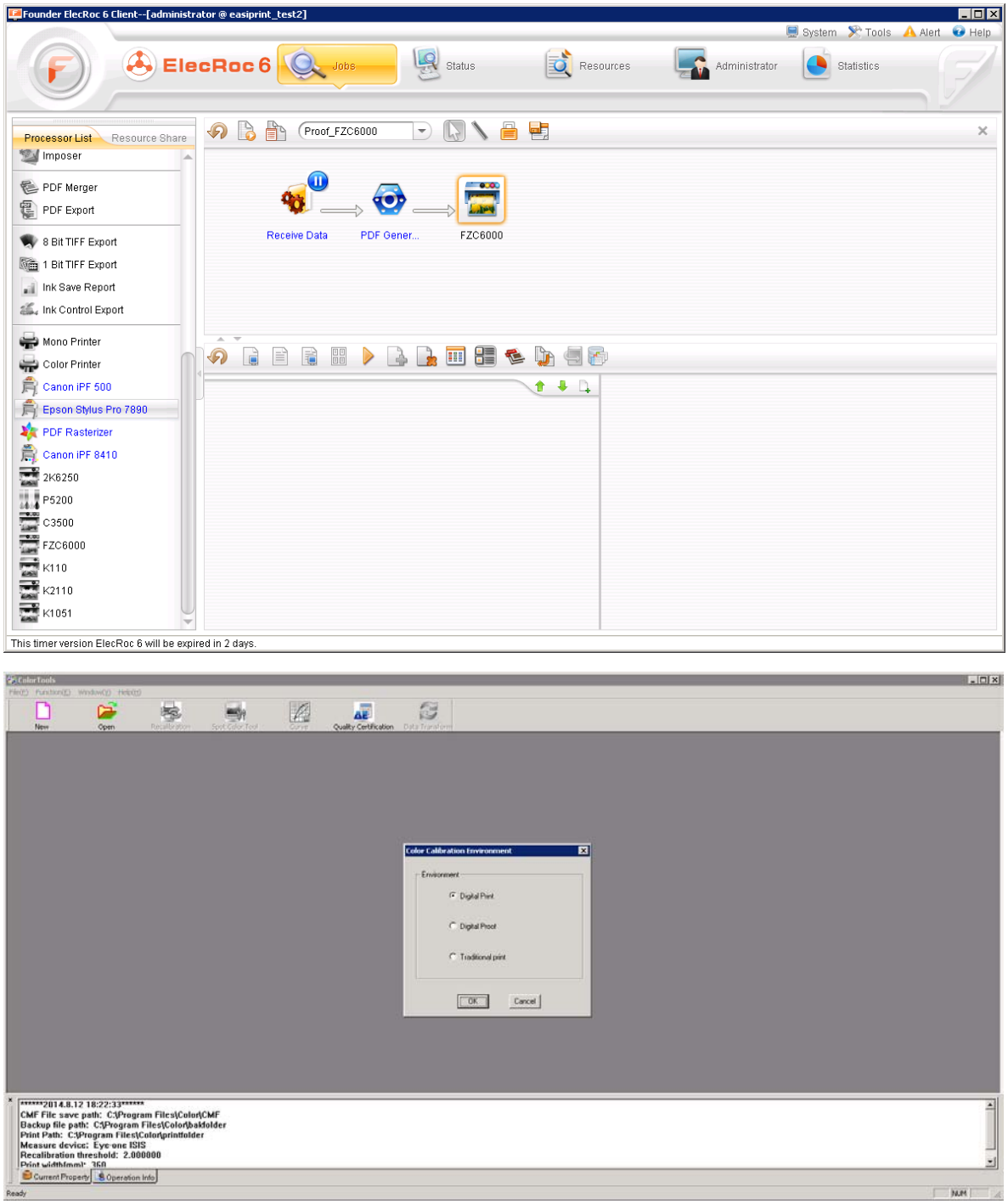


Figure 45

6. Configure FZC6000's processor parameters. The **Output** parameters are to be configured as per your actual needs, while the **Use CMF file** dropdown list under the **Color Calibration** tab needs to be set to **None**.

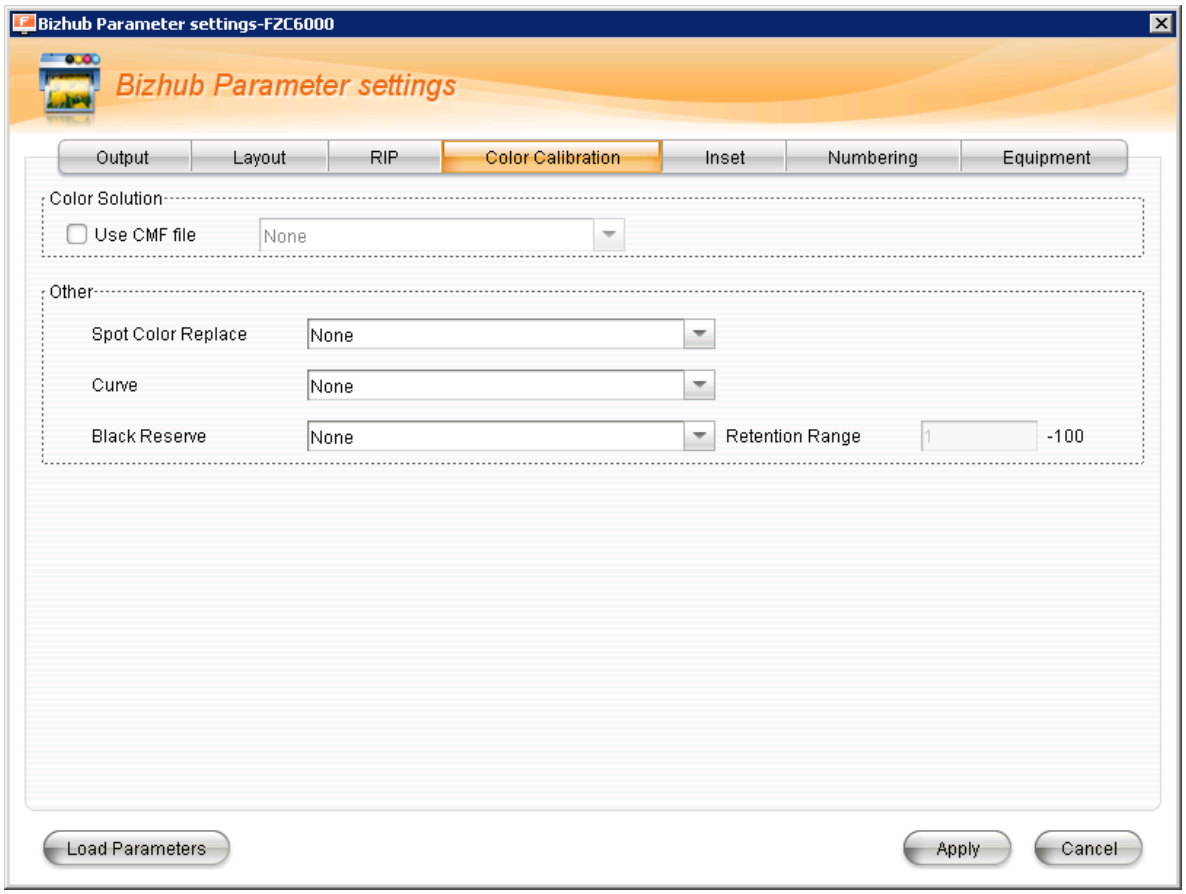


Figure 46

7. Now we can start the proof work.

4.2 Create Proof CMF

In this section, we will introduce you the proof process for digital print. This process will produce a CMF proof file.

The proof process for digital print is composed of 7 steps. Due to that most digital printers are 4-color devices, thus the multicolor step included in digital proof is not needed.

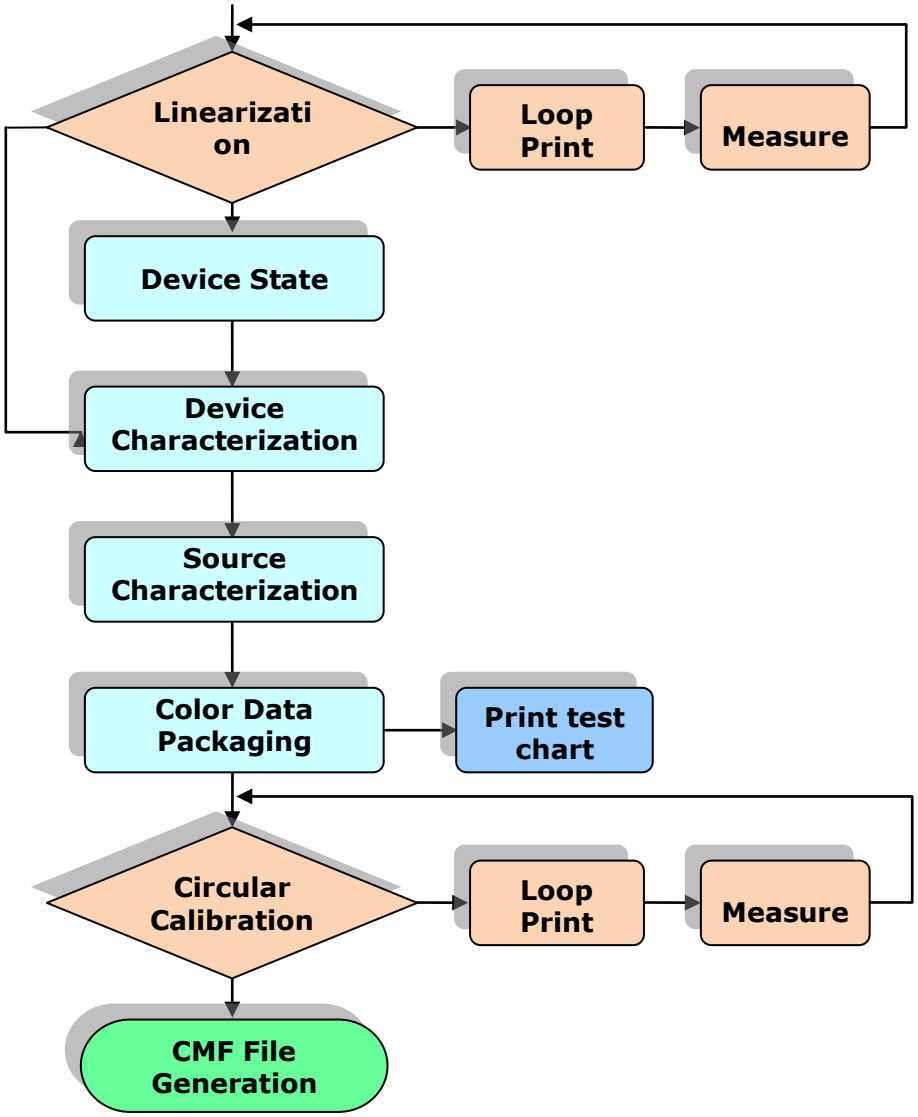


Figure 47

On the main interface of the Color Tools, click the toolbar icon, or choose the main menu **File** > **New CMF**, to start up the proof wizard. The program first pops up a parameter setup window.

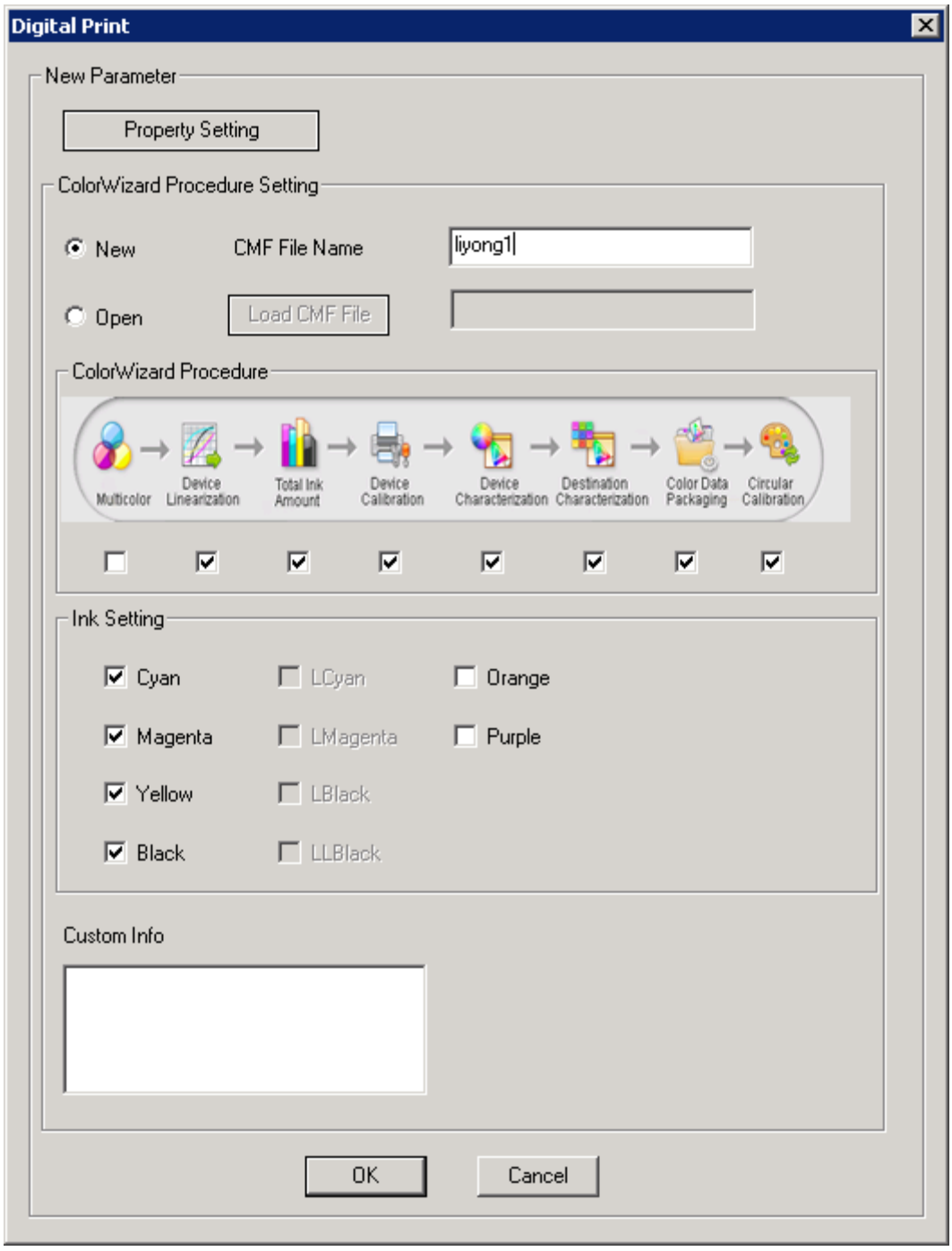


Figure 48

New / **CMF File Name**: The name of the new CMF file that you are going to create.

Open / **Load CMF File**: You can open a CMF file that has been interrupted or unfinished during its creation. A finished CMF file can NOT be opened here.

Color Wizard Procedure: Please tick the steps or procedures your proof contains. A complete proof wizard contains 8 steps. But for digital printers, the Multicolor is usually not needed.

Custom Info: Here you can input some text for identification, if needed.

Click the button **Properties Setup** at the top of the window, to define the following parameters.

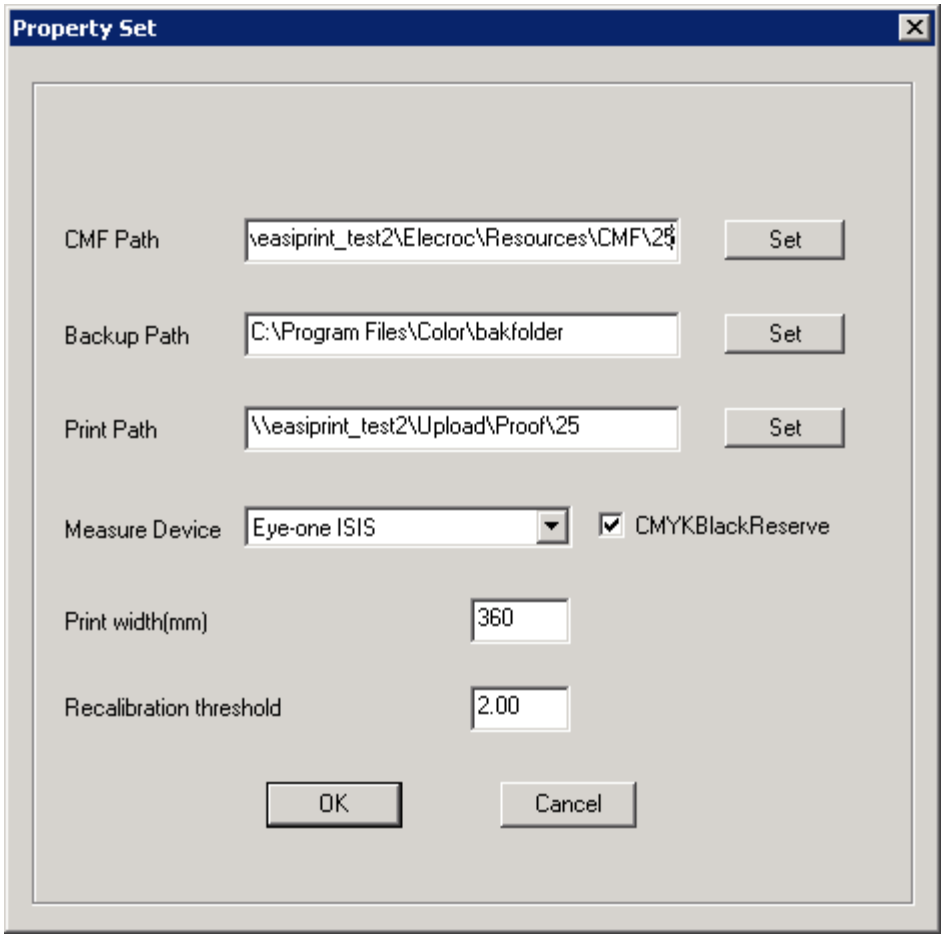


Figure 49

CMF Path: This path is designed for storing the generated .cmf files, we recommend you to use the directory \\172.19.xx.xx\Elecroc\Resources\CMF\25, 172.19.xx.xx referring to the IP address or computer name of your ElecRoc server, 25 referring to the ID of the digital printer processor in your ElecRoc system. This directory is also the default path to store the .cmf files that are ready for use by the digital printer processor. Only finished CMF files can be generated under this path.

Backup Path: This path is used for storing the data resulted in case of any interruption or incompletion in the CMF file creation.

Print Path: This path is used for storing the files that are to be printed during the CMF file creation.

Measure Device: Please choose the measuring device you are actually using. Color Tools supports you to use Eye-one ISIS, Eye-one, or Eye-one IO. In this section, we take the Isis as example, the color charts will thus be based on this device.

CMYK Black Reserve: If checked, the system will directly use black ink to print the pure black process color (only the K in CMYK is NOT equal to 0 in this case). It's suggested for digital print.

Print Width: This refers to the width of the media that you are loading on your proof device. Please input the value as per that of the actual media.

Recalibration Threshold: It refers to the dE threshold for recalibration.

Click **OK** after you have done the above settings. The following dialog box appears. Please make sure that your digital printer has already been adjusted before the proof.

Figure 50

Click **OK** to enter into the wizard.

Step 1: Linearization

The first step is to create the linearization file. The method is same as that for digital proof. The details are as follows.

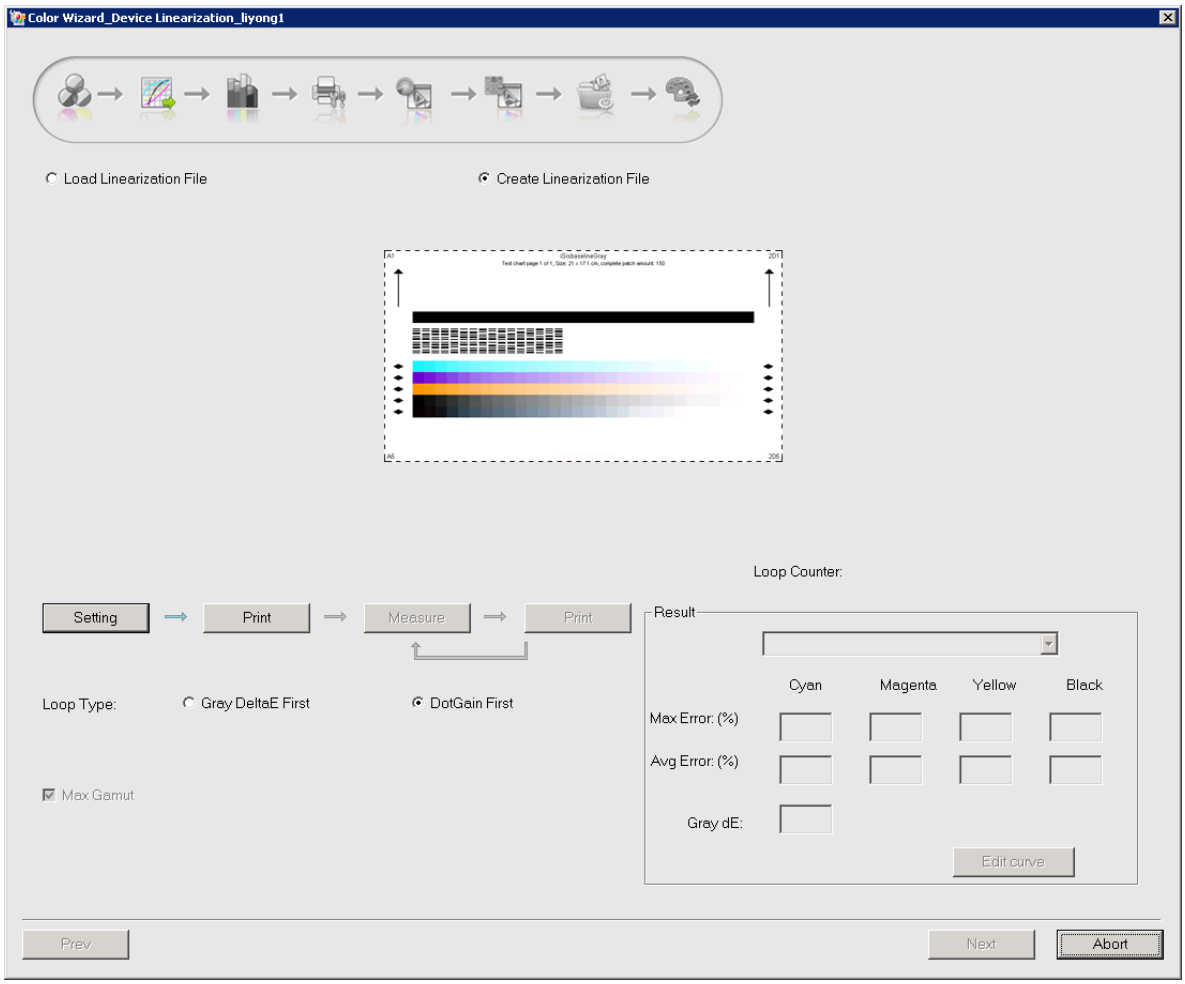


Figure 51

The linearization file can be loaded, or can be created by printing & measuring.

As shown on the interface, there are two loop types: **Gray Delta E First** and **DotGain**

First. Choose **DotGain First** if you want to make a complete proof file. **Gray Delta E First** is recommended in case that you want only to create Linearization curve. And if checked, you see that an option **Max Gamut** becomes activated. A checking on it is suggested.

Click the button **Setting** to open the **Parameter Setting** window.

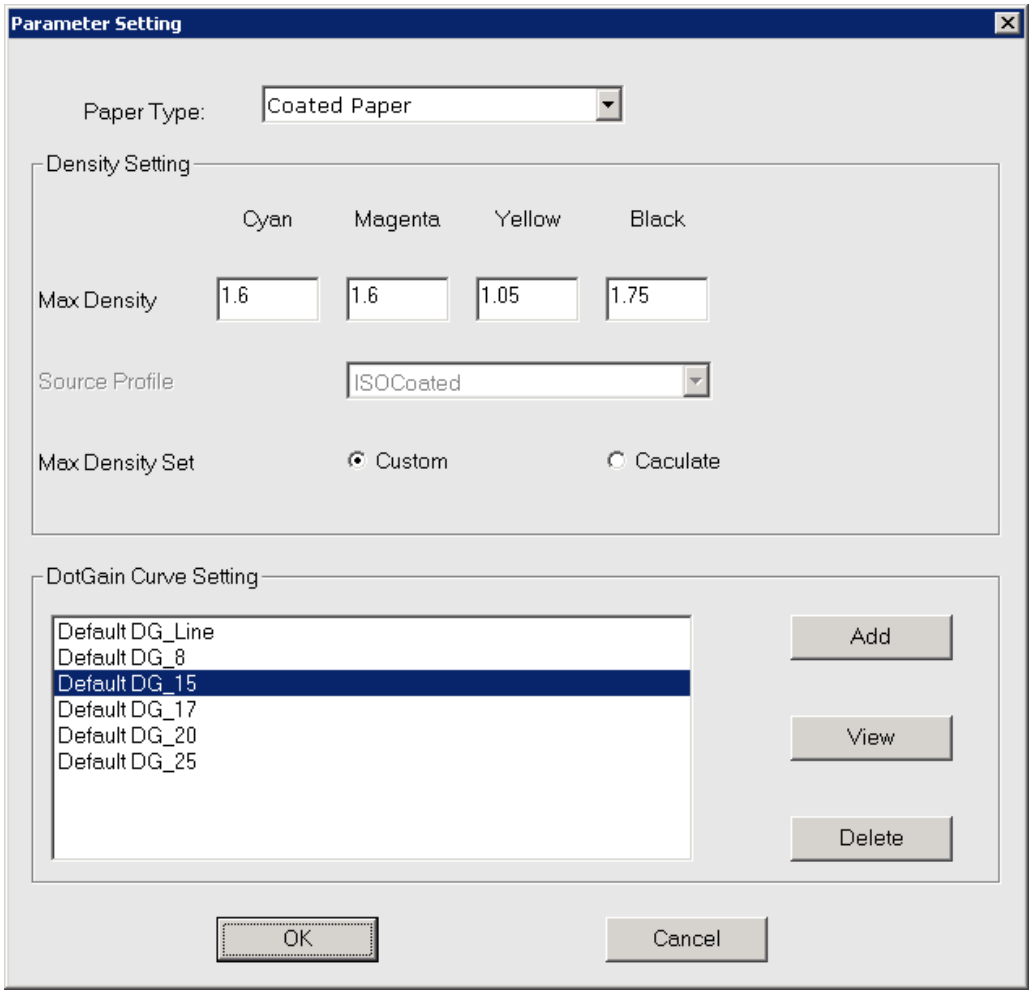


Figure 52

First, please choose the paper type according to the media type you are using.

Then, set **Max Density** values, you can set the parameter **Max Density Set** to **Calculate**, and then specify a proper **Source Profile** to calculate automatically the **Max Density** values.

As to the **DotGain** curve, the default setting is recommended.

When you have done the setting, click **OK** to return to the main window.

Click the **Print** button (the button **Measure** is then activated) to generate the corresponding linearization chart under the ***Print Path*** specified in the ***Property Setup*** window (opened by clicking **Property Setup** when you created the new CMF).

Note: *The generated chart file under the print path is a .tif file. Please use device's printer server to print, note that you need to disable the color control of the output software when you print the chart file.*

Click **Measure** to enter in the measuring window.

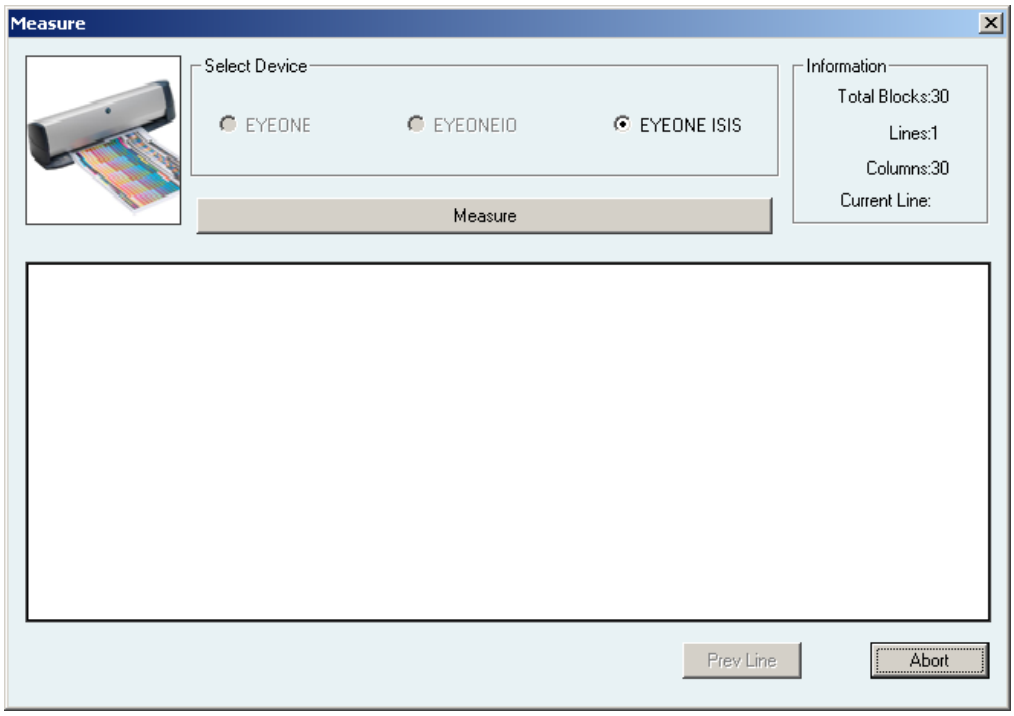


Figure 53

Measure the printed chart, and when you finish the measurement you will see the hint "Measured successfully! Press here to continue".

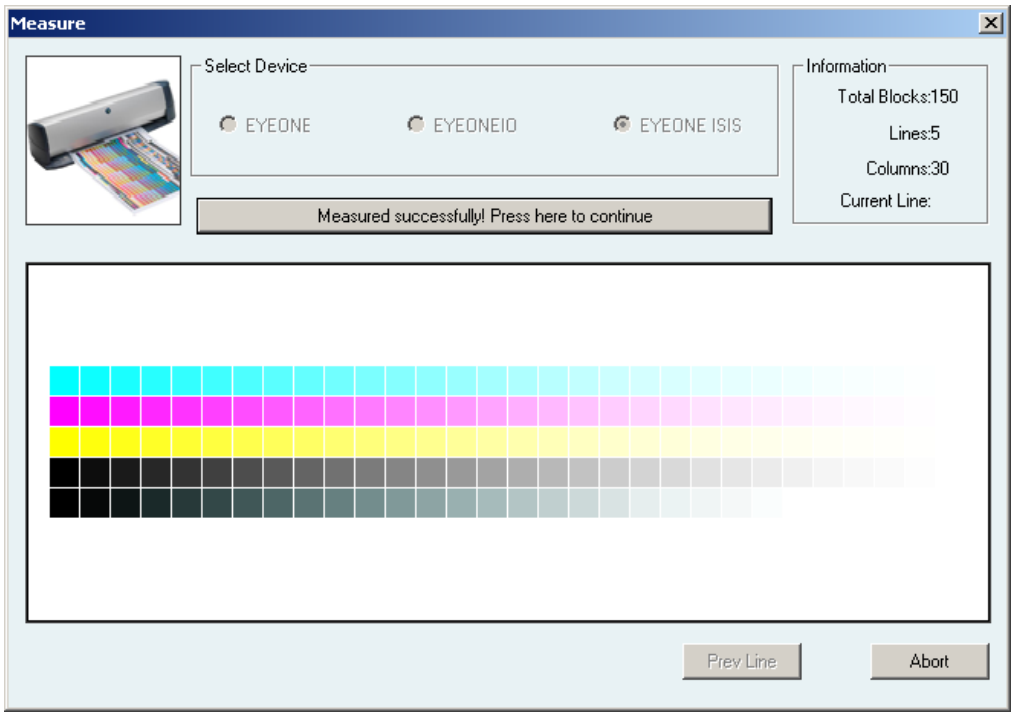


Figure 54

Click this hint to back to the main window. Now continue to print, as indicated by the arrows on the window, the printed chart at this time is shown as follows.

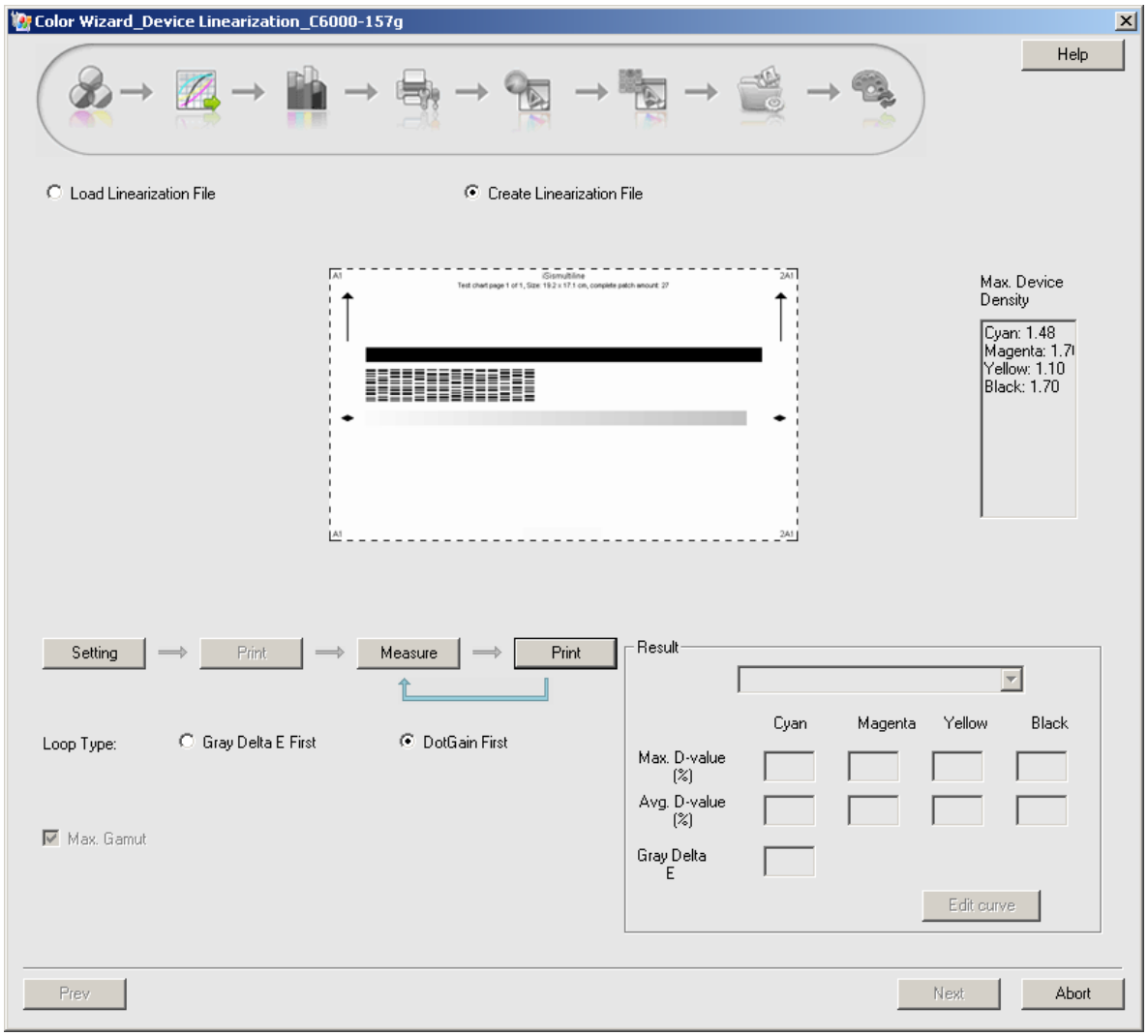


Figure 55

After the printing, continue to click **Measure**, to enter in the measuring window again. And return to the main window after the measurement.

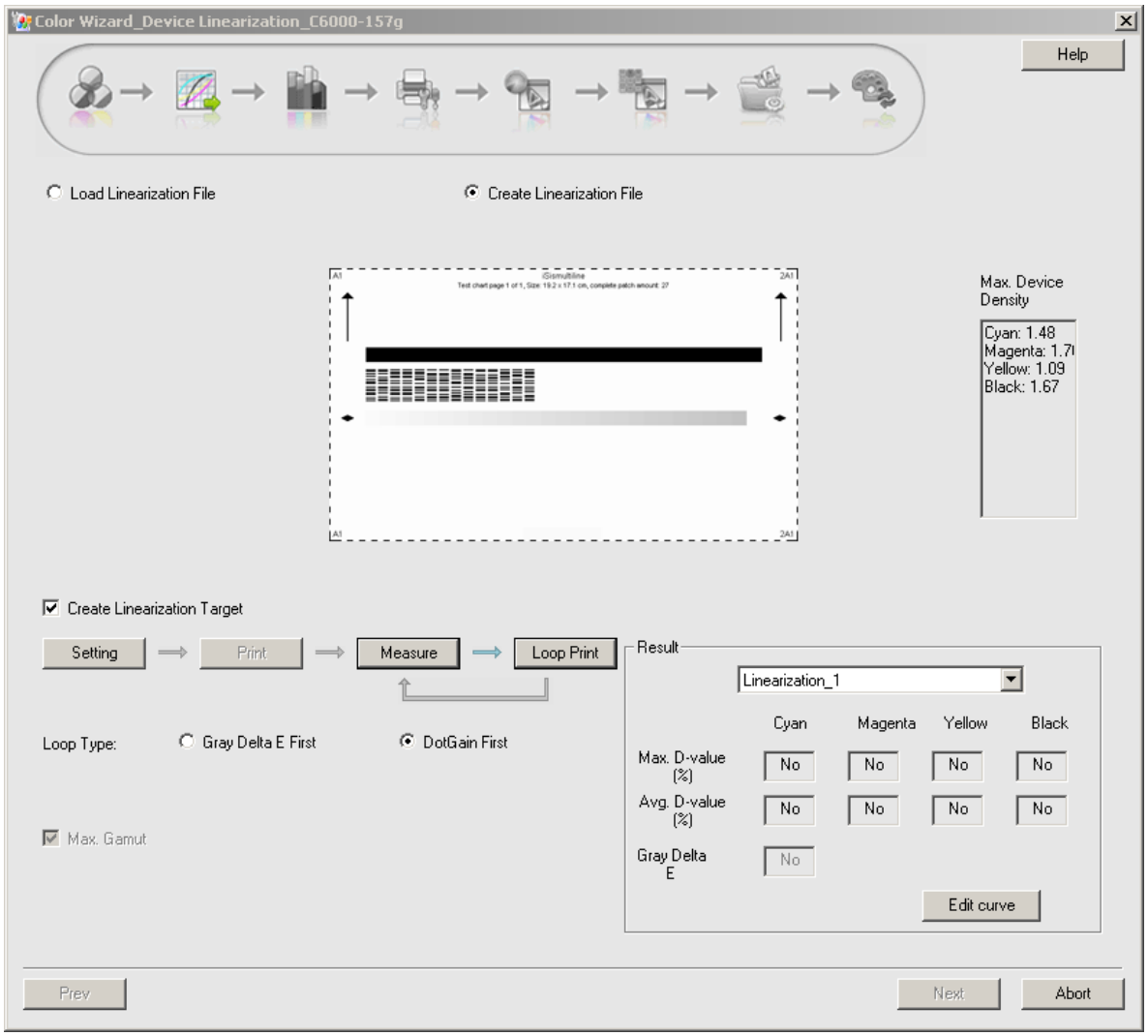


Figure 56

Now you can see an option **Create Linearization Target** appearing (checked by default) on the interface.

Create Linearization Target: You need to create a target data in case that you want to perform a quick re-calibration operation in the future. When your device has been used for a period of time or its state has been changed, you can make use of the **Re-calibration** > **Quick Calibration** to restore your device to the state it had when you made the color calibration solution.

Note: *1) The **Next** button is grayed when this option is being checked, but becomes activated when you print and measure once again. 2) In case that you choose to load a linearization file and the file contains target data, the target data will be loaded with the file together. And if the loaded file does NOT contain this data, if needed, you can print and measure to create it.*

Click the button **Loop Print**, and then repeat the measurement when the chart has been printed out, till that the color difference shown at the lower-right corner meets your requirement.

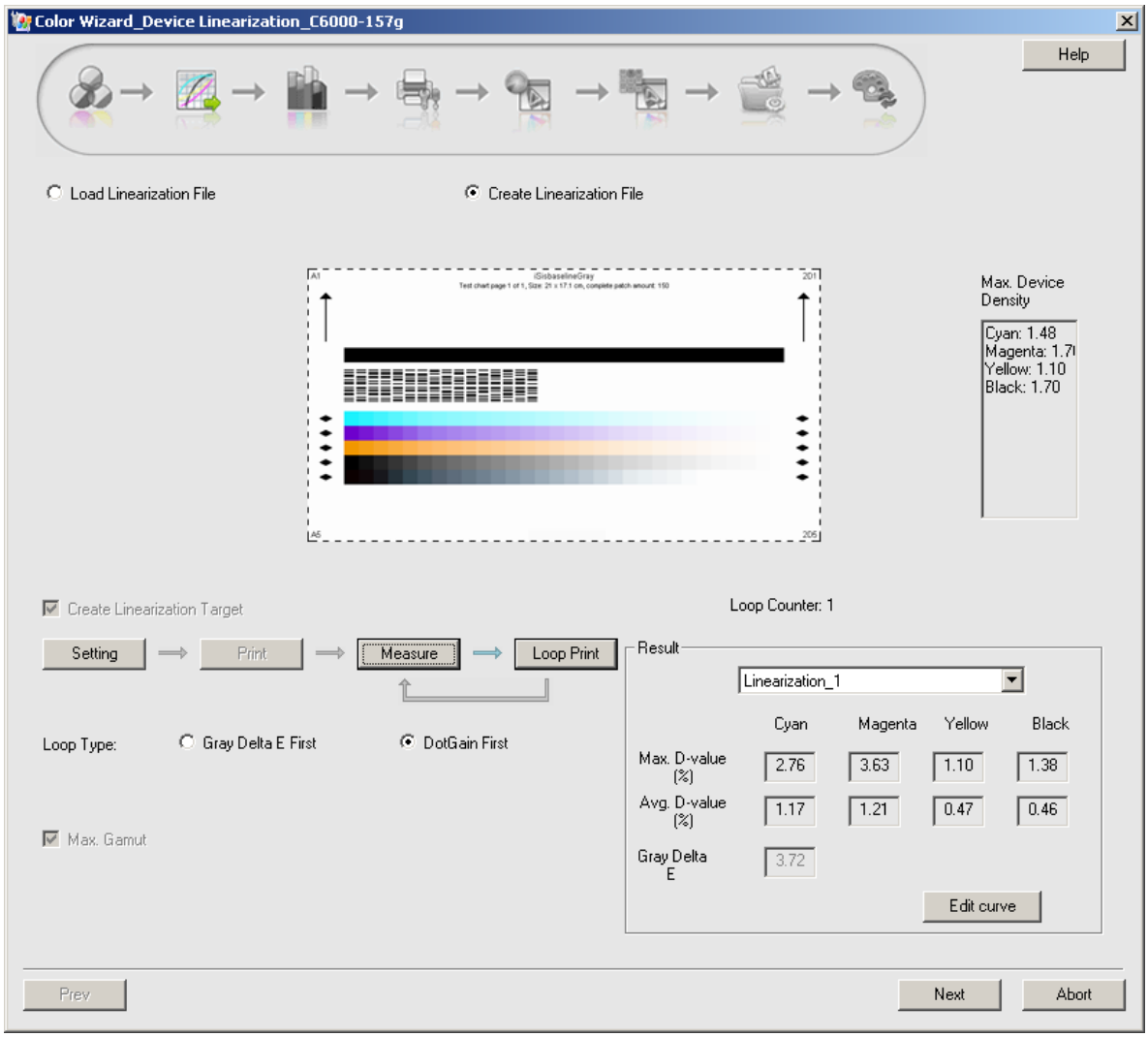


Figure 57

Files involved in the calibration wizard are saved automatically. At the **Result** column shows in turn the generated linearization files, Linearization_1 … Linearization_n. And meanwhile the maximum and average differences for each loop printing and measuring are shown on the interface as well.

After the generation of the linearization file, click **Next** to enter into the interface for total ink amount.

If you are NOT satisfied with the generated linearization file, you can edit it, although the editing operation is NOT suggested for most users, for that it is an advanced adjustment.

Click the **Edit Curve** button at the bottom of the window to open the editing window, in which you can view and edit the generated linearization curve file.

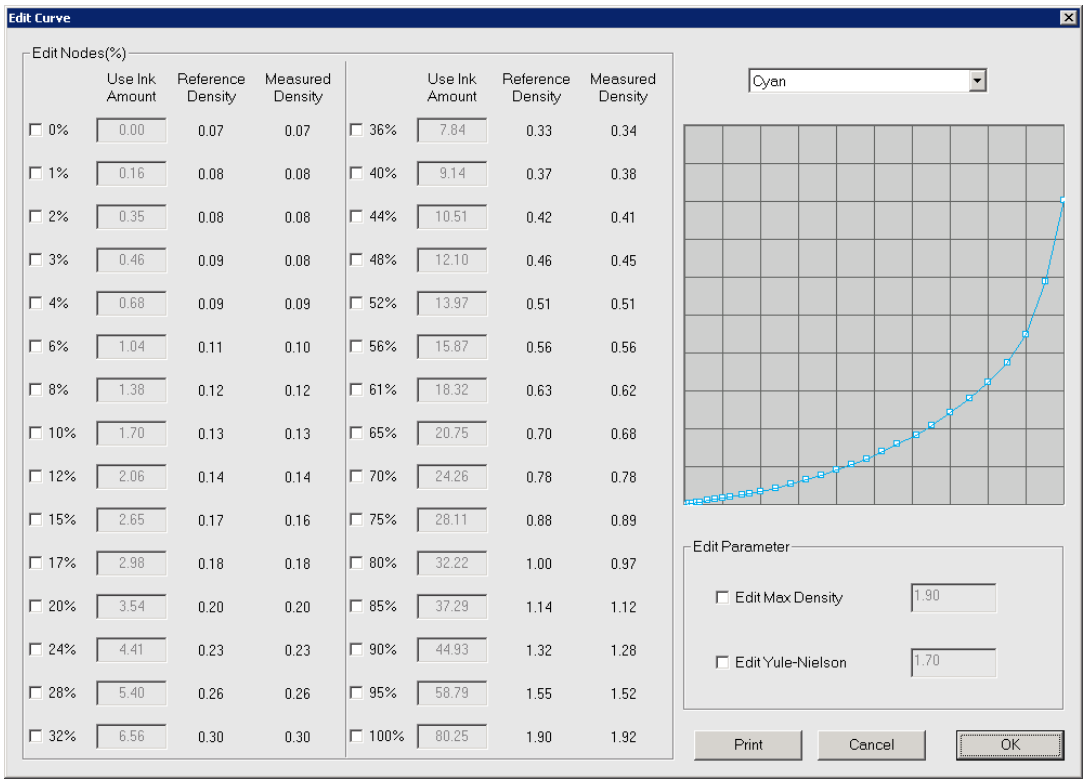


Figure 58

Note: *1) The Edit Max Density and Edit Yule-Nielson options are grayed when you are viewing or editing the curve. 2) Aiming at re-defining specific ink percentage values, the editing becomes available only when you have checked the boxes in front of the percentages. Please note the monotonicity of the curve during the editing.*

If you have edited the curve, you can click **Print**, to apply the edited curve to print out a test chart, so as to check the actual linearization effect. Look over the printed chart with your eyes, a good linearization effect has the following characteristics: well-proportioned monochromatic color gradation, no mergence, composite colors of three equivalent color components at the bottom of the chart, no remarkable variance, and consistent hue. If you are NOT satisfied with the print result, you can continue to edit it. If satisfied, click **OK** to return.

Note: *If you have edited the curve and clicked **OK**, you will be hinted then that the target data created previously is no longer matching with the current device state, and that it's best for you to print and measure again. In this case, please print and measure again to get new linearization target data.*

Step 2: Total Ink Amount

This step is used for determining the total ink amount. The main window displays the chart used for deciding the total ink amount. This step is the same as that for digital proof.

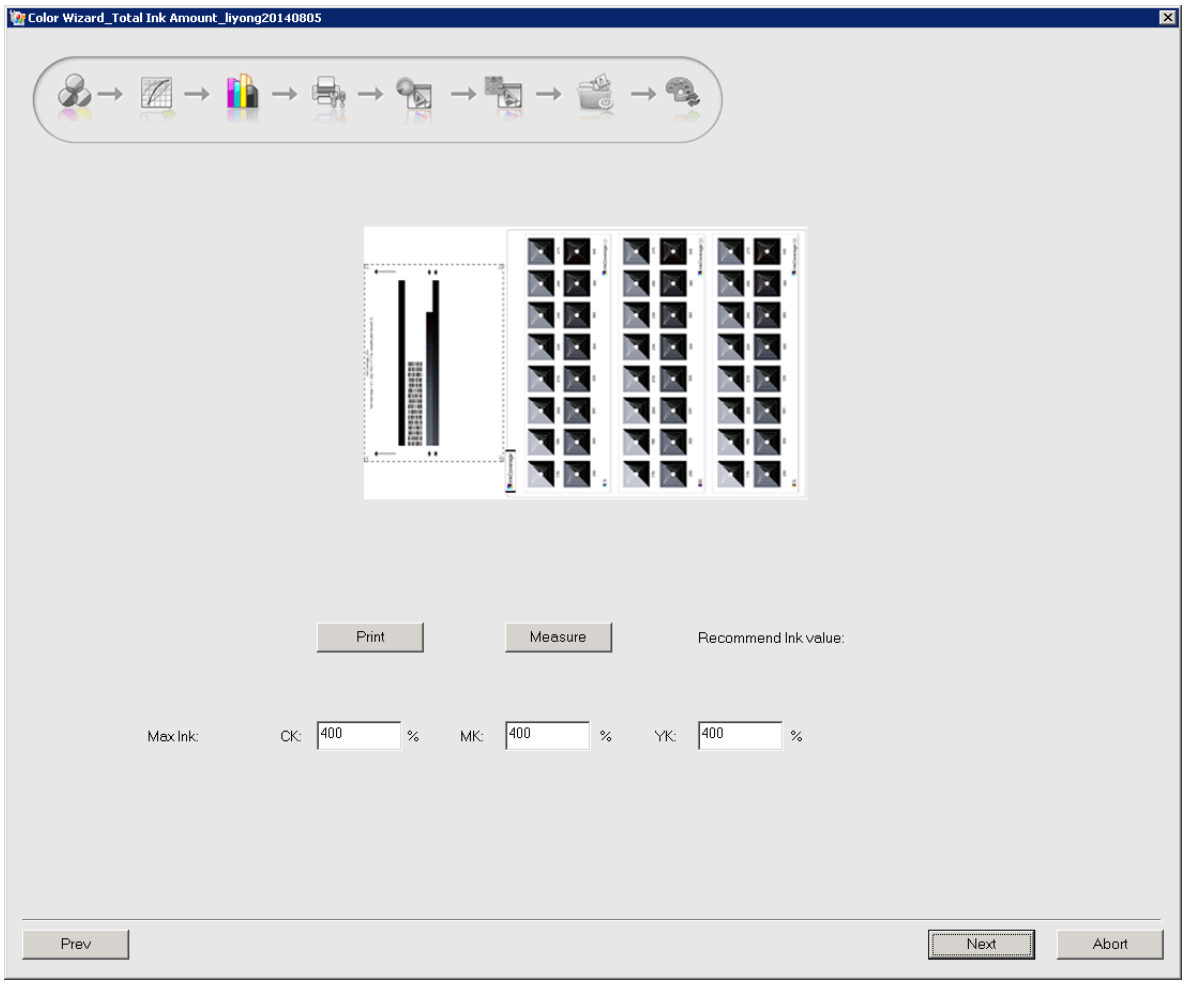


Figure 59

The chart consists of two halves, the upper half is used for auto measuring, and the lower half is used for you to make decision with your eyes. Please refer to the method below to choose a right color block, and then combine the corresponding value and the measured value to decide a suitable total ink amount.

Click the **Print** button to print out this chart, and then measure the upper half of the chart. The measuring result is shown aside **Recommend Ink value**. And meanwhile, choose the right color block with your eyes from the lower half of the chart. Based on the recommend value and the value in front your chosen color block, input proper values into the **CK**, **MK**, and **YK** edit boxes.

Method to choose the color block: it is best to observe the chart just after it has been printed out. ①The color block without any flowing or heaping ink, and exactly in front of the semi-dry one. ②The thin white lines on the blocks are designed for inspecting the ink penetration. Heavy penetration usually causes the white lines to fragment or disappear. In case that the paper is of high quality, you'd better choose the one on which the white lines are clearly visible. ③In case that the paper is of coarse quality, you should inspect the ink penetration from the back side of the paper. The total ink amount is considered high if the ink penetration is so heavy that the paper has been obviously distorted. You can choose a block with neutral penetration.

Note: *the method above is used for reference only. In actual work, please make your decision flexibly according to the paper type, the measuring result and visual inspection.*

Click **Next** to enter into the main window for device calibration.

Step 3: Device Calibration

As an optional step, it is designed to create the device state file. Its main window is shown as follows. This step is the same as that for digital proof.

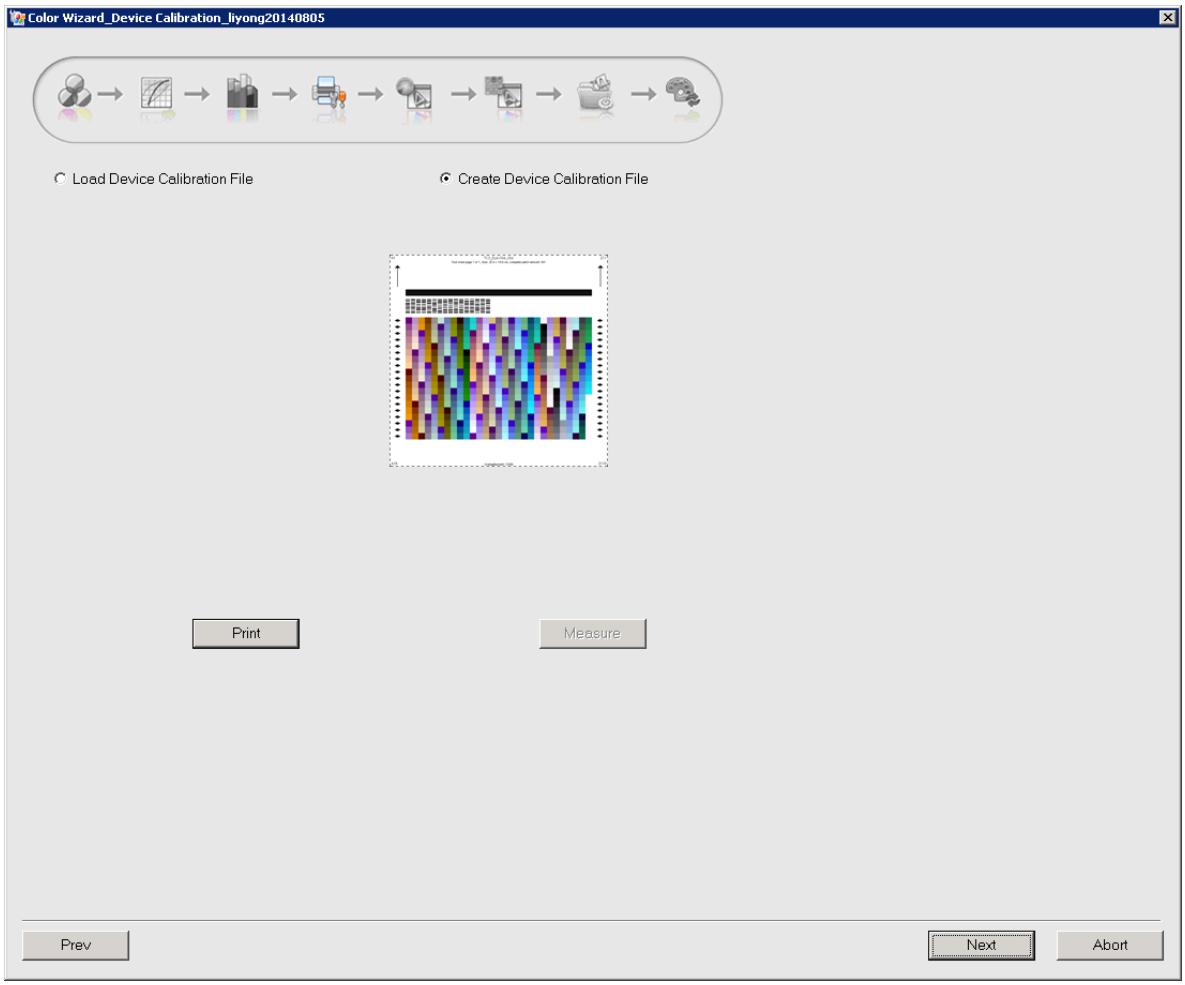


Figure 60

Only when you have created the device state file in this step, you can then make use of the module **Re-calibration** > **Entire Calibration**. The calibration file can be loaded, or be created by way of printing and measuring.

As to creating a new one, please click the **Print** button to print out the color chart and then measure it. After the measurement, click **Next** to enter into the main window of device characterization.

Step 4: Device Characterization

This step is designed to create the color characterization profile for your current digital printer. It also allows two methods, being loaded or created. This step is a little different from that for digital proof. There is an additional item **Setting** on the interface.

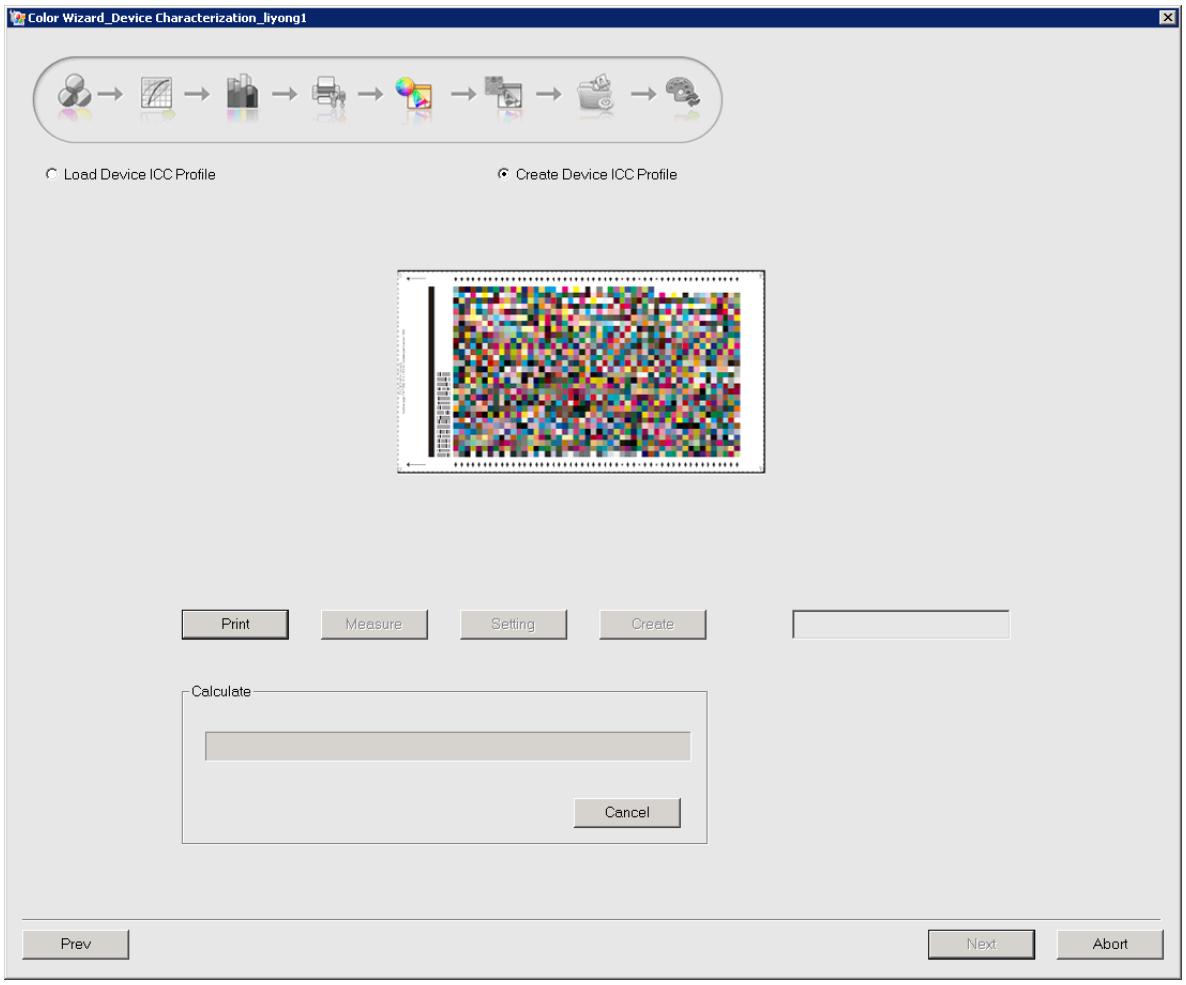


Figure 61

Take the creating of a device characterization profile as example. Click the **Print** button on the main window to let the printer output the ECI2002 chart, and then click **Measure** to measure it.

Return to the main window after the measurement. The buttons **Setting** and **Create** become activated. Click **Setting** if you want to modify parameters related to the generation of the device ICC file. Among them, the value displayed below **CMYK** is the value you specified in the step of total ink amount.

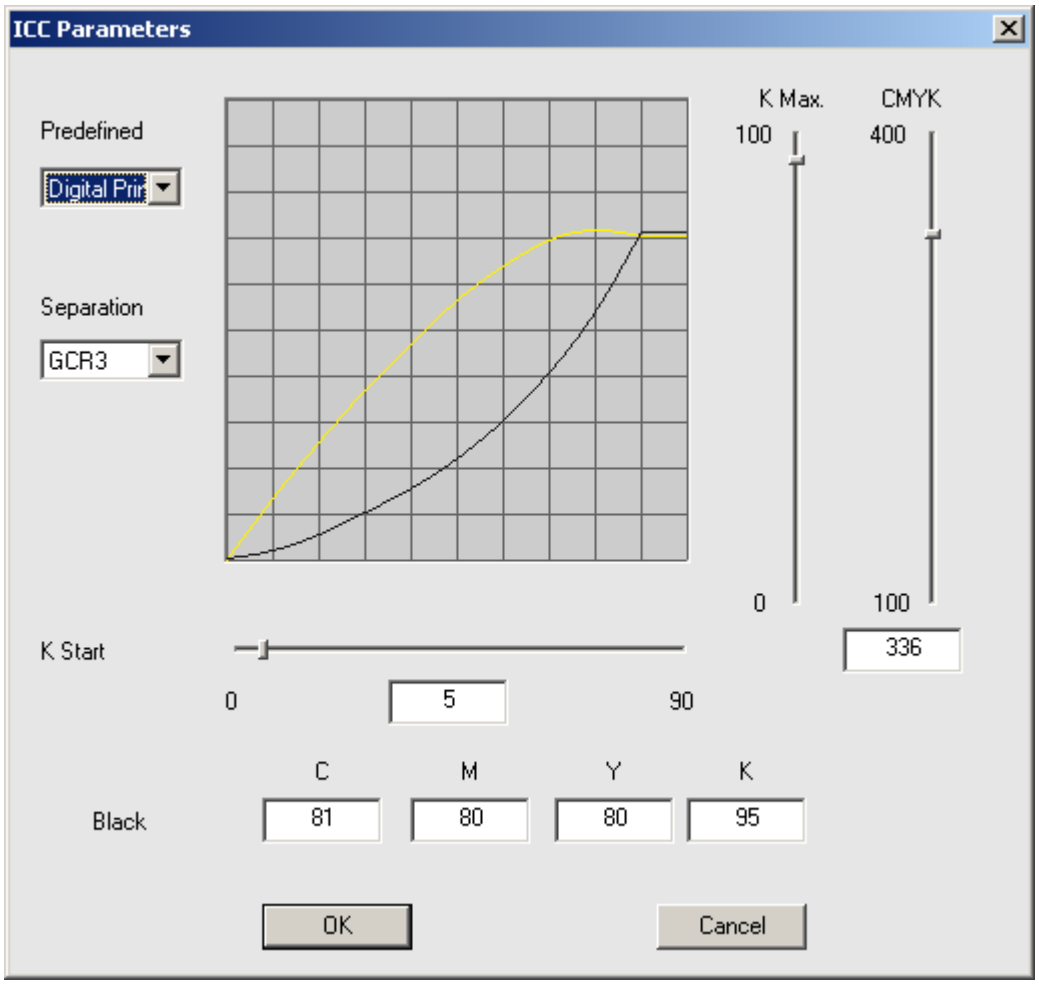


Figure 62

Click **OK** to return to the main window, when you have done the settings. Now click **Create** to start creating the characterization profile. The **Calculate** progress bar shows the progress of the file generation. The generated profile will then be displayed, like ProfileD_0.tmp.

Click **Next** to enter into the main window for source characterization.

Step 5: Source Characterization

If you want your digital printer to achieve the color output effect that is represented in a specific environment, you can define the profile of that environment.

If you already have this ICC profile, select **Load Source Profile**. If you want to measure the ECI2002 color chart printed in that environment, select **Create Source Profile** to create the profile.

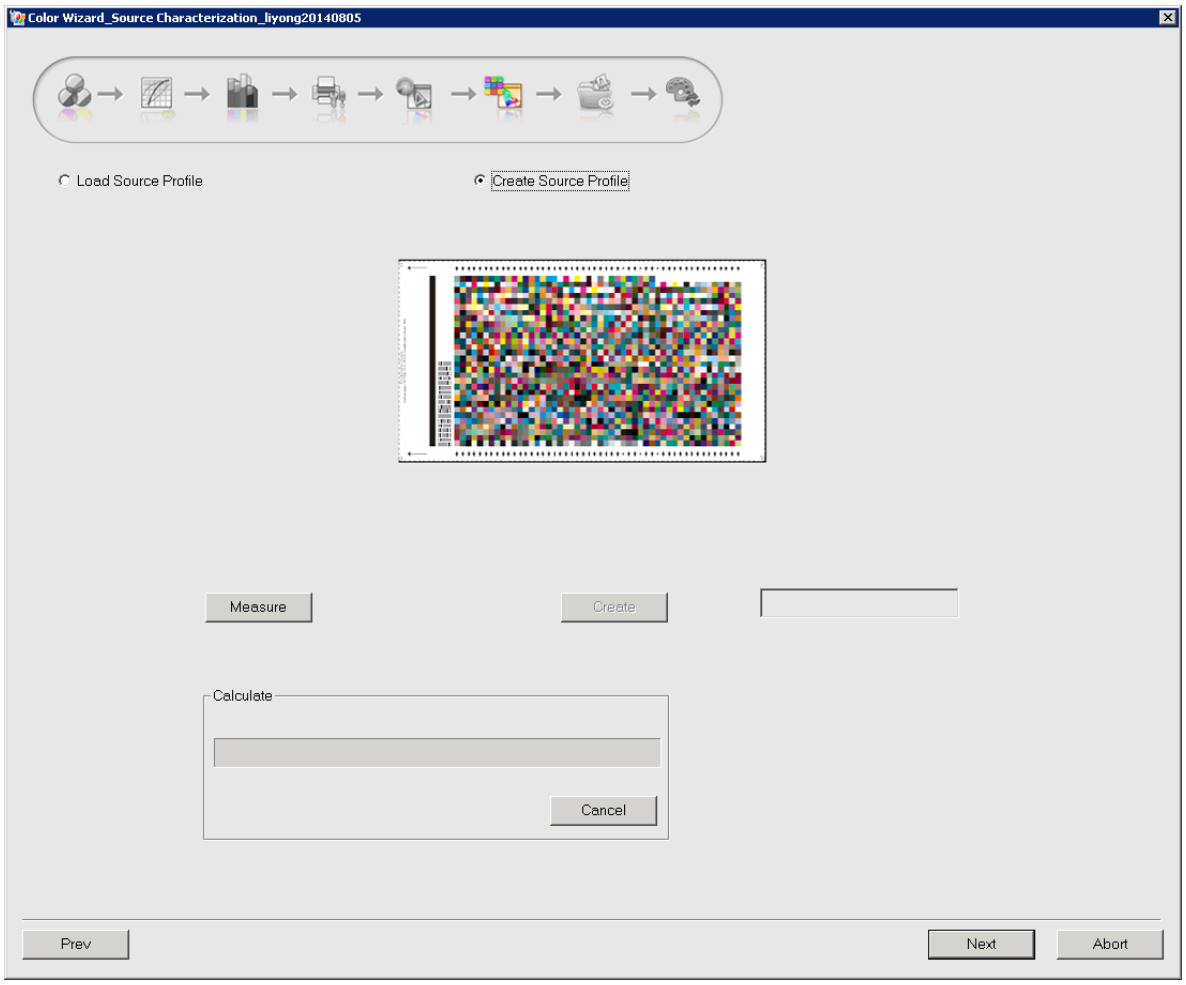


Figure 63

As shown on the interface, the Color Tools builds in several international standard source profiles for you to choose. After the loading, you can click the **Edit** button to modify the saturation of the loaded profile. The modifying operation is NOT recommended for general users.

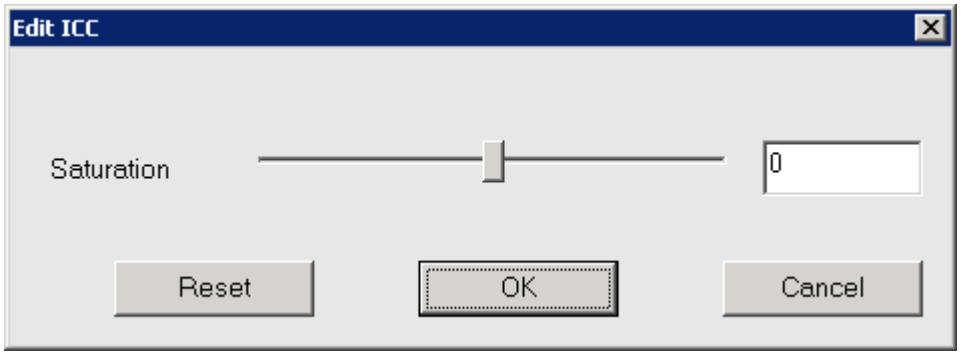


Figure 64

Click **Next** to enter into the interface for generating the data package.

Step 6: Color Data Packaging

This step is designed to package the proof data into a single proof file *.cmf.

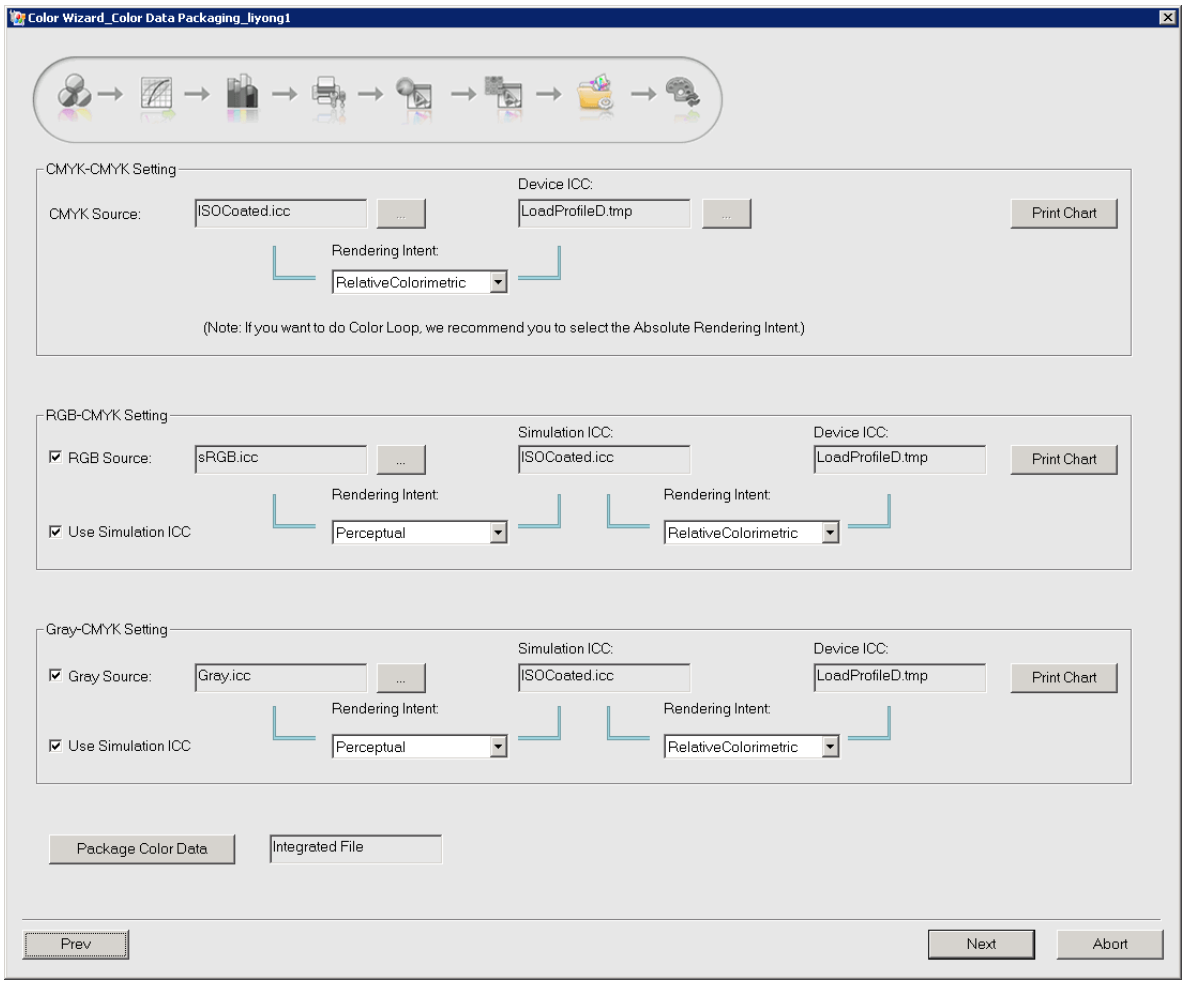


Figure 65

Note: *If you haven't set the source ICC in previous step, you can click the button* ... *aside the parameter* ***CMYK Source****, to specify a source ICC you will use.*

CMYK-CMYK Setting: To affect the color output of the CMYK entities in job.

RGB-CMYK Setting: To affect the color output of the RGB entities in job, enabling the RGB entities to be output as per the color effect specified by the **Simulation ICC** option.

Gray-CMYK Setting: To affect the color output of the Gray entities in job, enabling the Gray entities to be output as per the color effect specified by the **Simulation ICC** option.

Rendering Intent: It's a mode of color conversion and is available for each color space. Its four options enable different conversion results. Among them, the **Relative Colorimetric** is the most commonly-used option. **Absolute Colorimetric** is used when you want to simulate the paper white of the source device.

Click the button **Package Color Data** to generate the .cmf file when you have defined the above settings. After the generation, the three **Print Chart** buttons become activated, and by clicking them, you can print out respectively the test page for the CMYK, RGB, and Gray modes, for purpose to view the color output effect of the current proof data.

Click **Next** to enter into the main window for circular calibration.

Step 7: Circular Calibration

The purpose of this step is to enable a better match between the output result of current device and the source characterization profile, so as to achieve an accurate simulation and an optimization on the color effect.

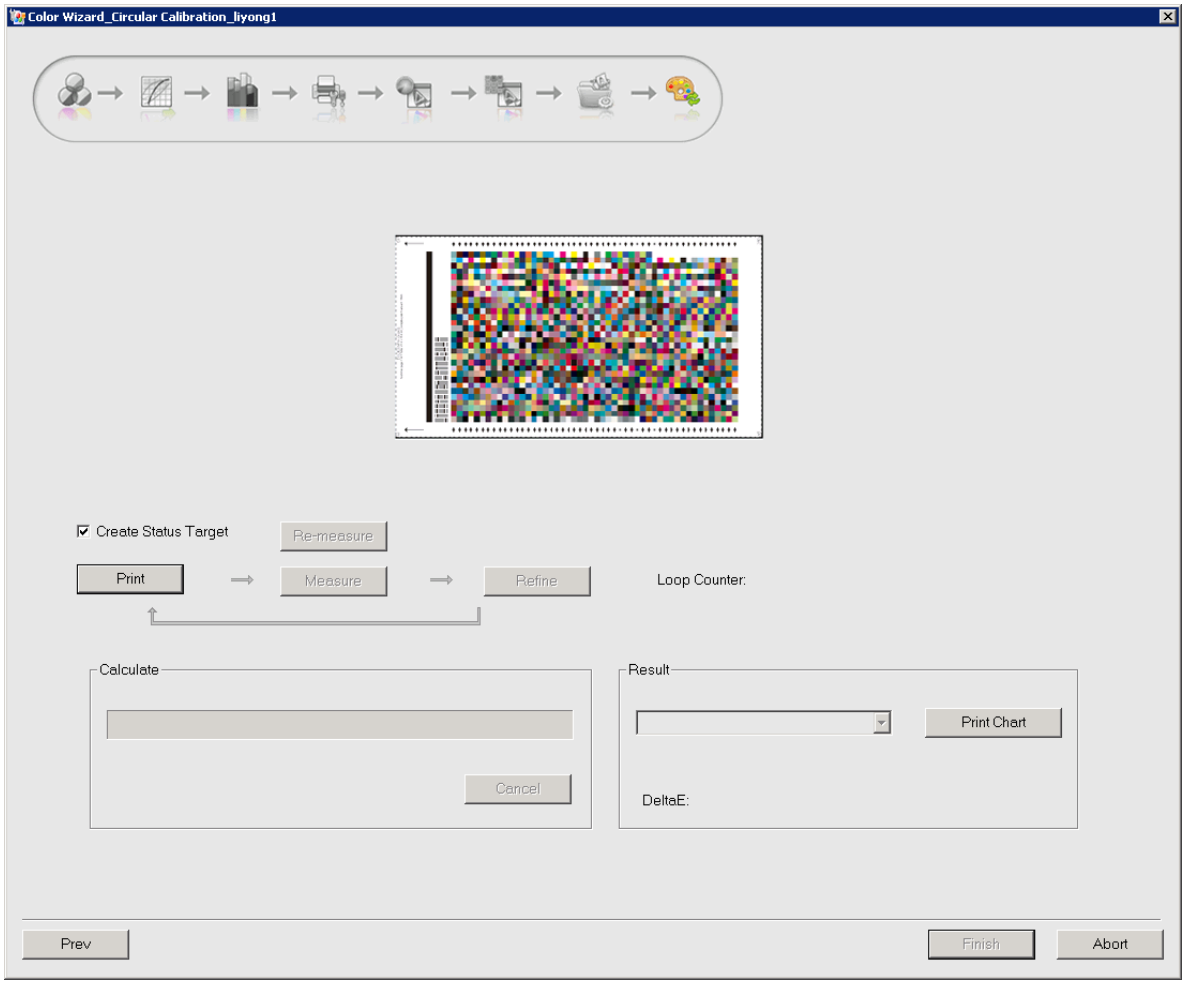


Figure 66

By default, the option **Create Status Target** on the main window is checked, and the button **Finish** is grayed. The purpose for creating status target is to get the device's status result data that are output with current proof file, as a basis for evaluating color output result. If you don't want to perform the circular calibration, you can uncheck **Create Status Target** to activate the **Finish** button.

Loop Counter counts the times you have repeated (circulated). The button **Print Chart** enables you to print out the effect of the current circular calibration each time when the calculation is completed.

Click **Print** to print out the ECI2002 color chart (at this time the chart is applied with proof data) and then measure it. Return to the main window when you finish the measurement, and you will see that the button **Calculate** becomes activated. Click it, and when the calculation is completed, you will see the average Delta E value being displayed at the **Result** column. This value at the first time is usually large. Now you can start the loop calibration, i.e. to repeat the **Print**, **Measure** and **Calculate** operations. In general, the Delta E will be reduced to a quite ideal value after two loops, and then you

can stop the circular calibration.

Please click **Finish** to exit the calibration wizard. The generated .cmf file is stored under the **CMF Path** defined in the **Properties Setup** window (opened by clicking **Properties Setup** at the beginning of the wizard). Meanwhile the status target data is recorded in the proof file.

4.3 Apply CMF File

1. Run your ElecRoc Client, and open or create a job. The job should contain the PDF Generator and the Digital Printer nodes.

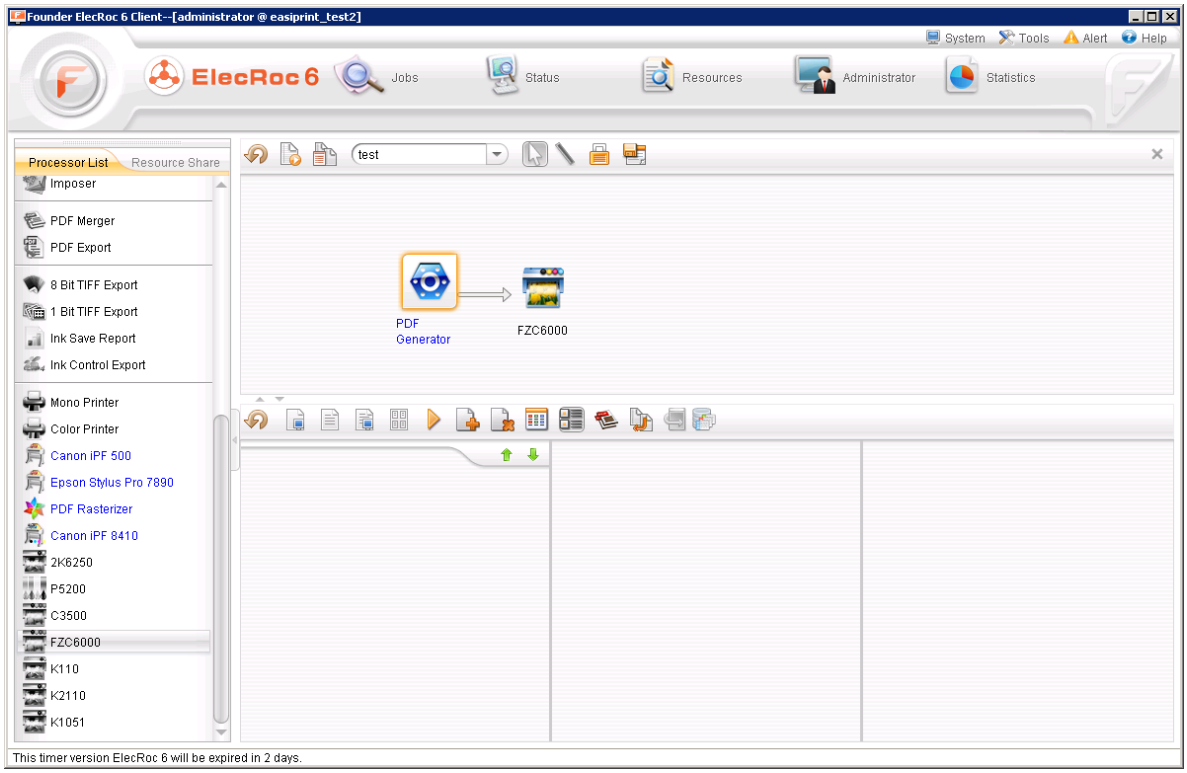


Figure 67

2. Configure the printer node's processor parameters. At the **Use CMF File** dropdown list under the **Color Calibration** tab, choose the .cmf file you have just finished.

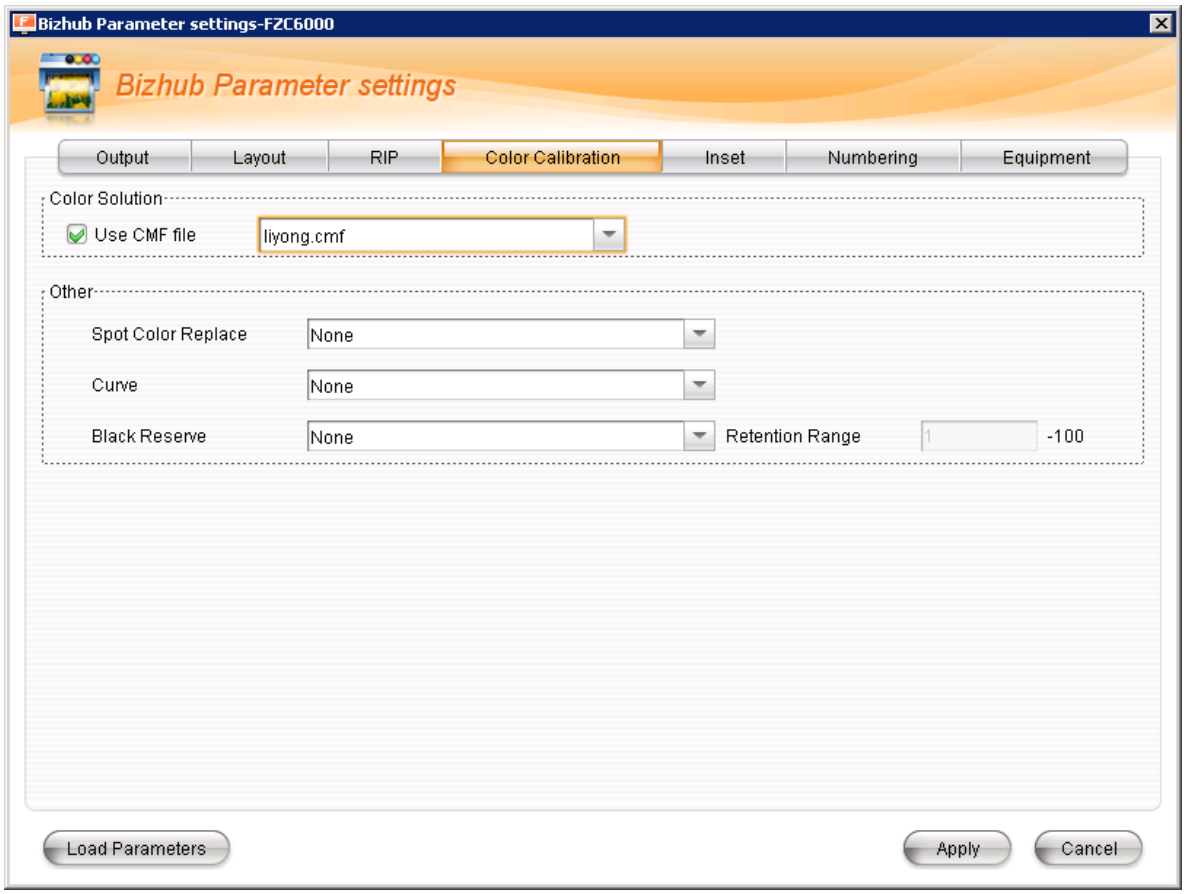


Figure 68

3. Submit pages to the printer node when you have done the configuration. The printer node can accept directly the output pages from PDF Generator.

Chapter 5 View & Edit CMF

In the Color Tools, by clicking the toolbar icon, or choose the main menu item **File** > **Open CMF**, you can open a .cmf file for purpose of viewing or editing.

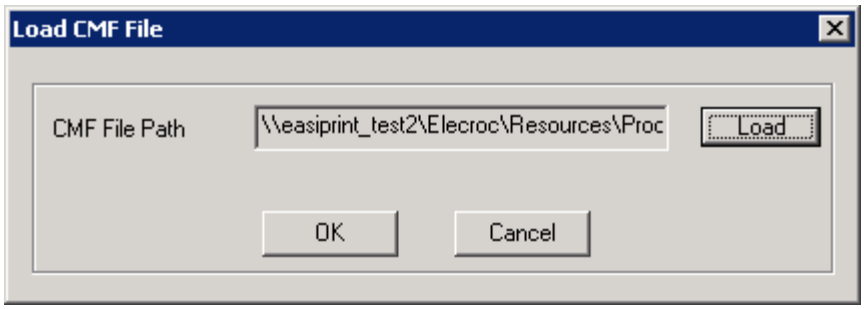


Figure 69

Click the **Load** button to choose the .cmf file you want to open. And after the loading, click **OK** to enter in the viewing/editing window.

5.1 View Data

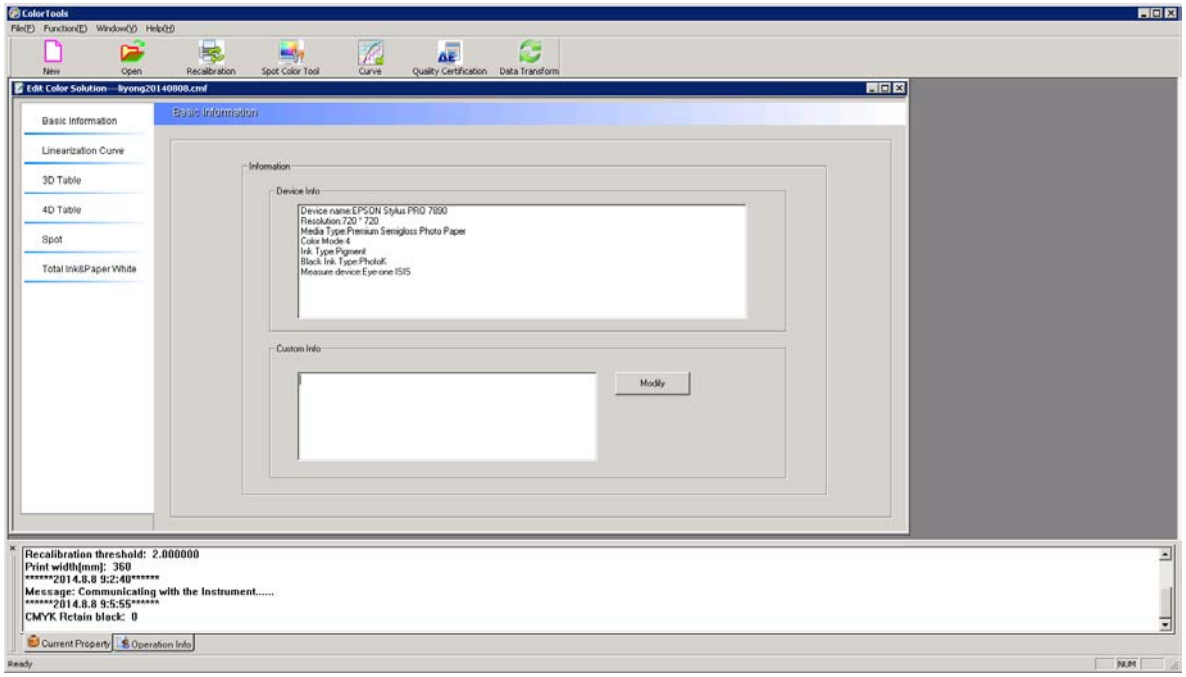


Figure 70

A .cmf file contains the following data, which can be expanded for view respectively by clicking the columns at the left of the window. Some data can even be edited.

1. Basic Information

Here shows the device information and other custom information given at the time you created the .cmf file. Basic information is generally used as sort of identifiers or notes. The custom information can be edited (click **Modify** to save the editing). For example, each time when you revise your .cmf file, you can write here the revision time and content, for ease in future reference.

2. Linearization Curve

Here shows the detailed data about the linear curve.

The linear data can be edited. Double-click the value in the **Out** column to turn it into an edit box, input new value and then press Enter key. You can also drag the right curve to edit the data. If needed, you can click **Print** to print out a chart, checking the editing effect. The button **Undo** enables you to return the curve to the state at the time you opened it.

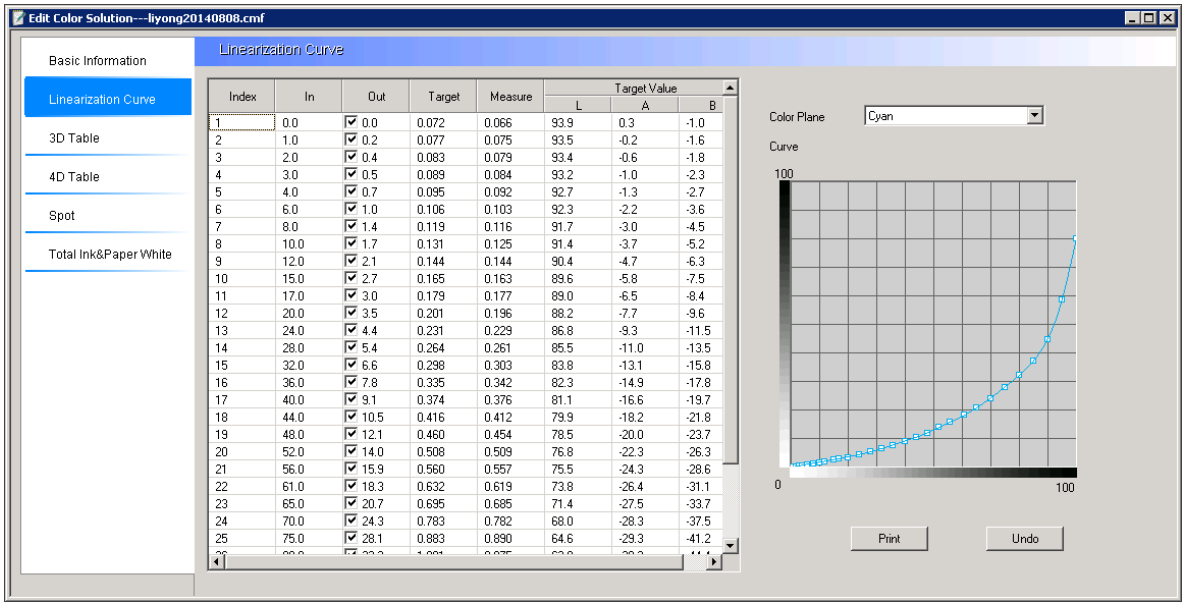


Figure 71

3. 3D Table

Here shows the detailed data about the device calibration file. This data can only be viewed.

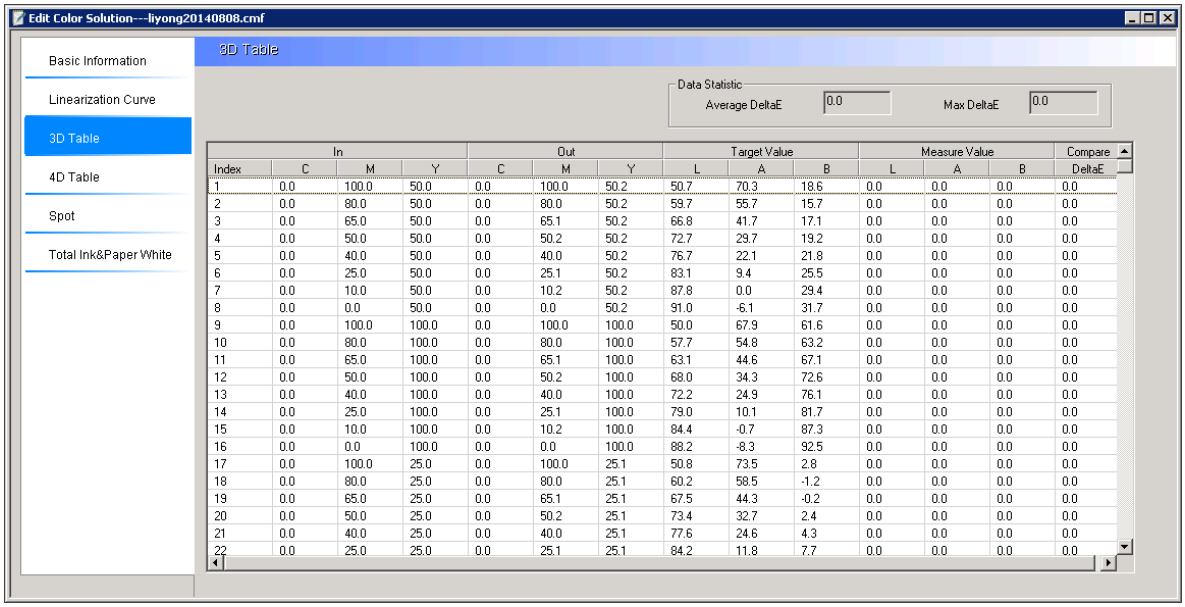
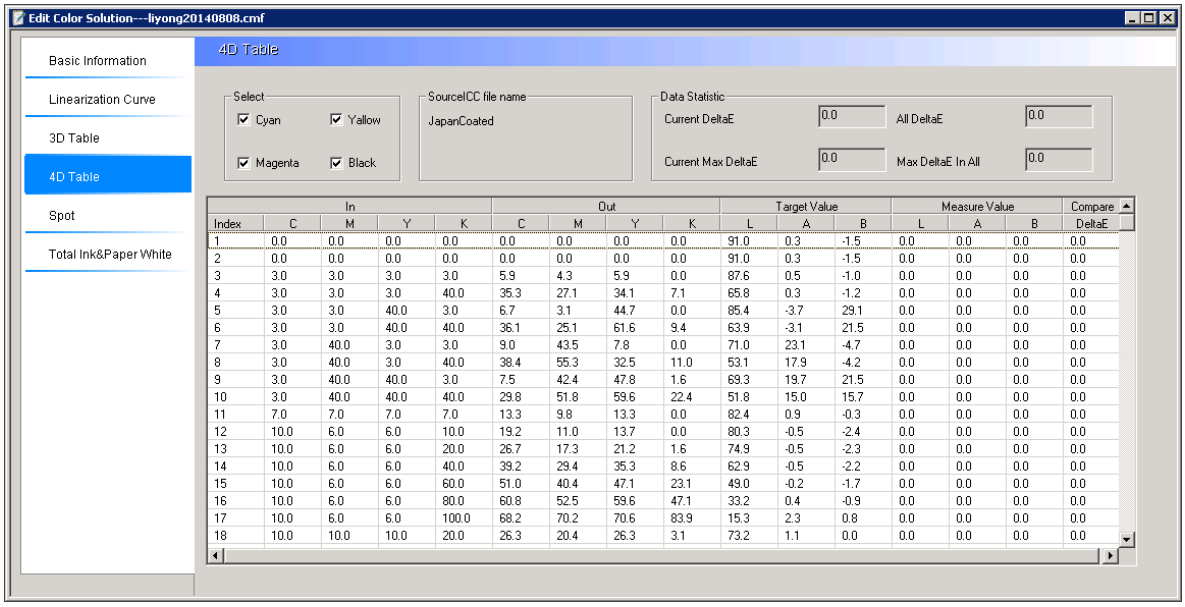


Figure 72

The **In** values refer to the initial CMY values of the color blocks in the device calibration chart. The **Out** values refer to the color values that are to be used for printing the chart after the calibration. **Target** values are the LAB values measured from the printed chart, i.e. the data from the device state file created in the .cmf file. The **Measure** values are measured data after re-calibration. **Statistic** is the color difference between measured and target values after re-calibration.

4. 4D Table

Here shows the output and color difference for the ECI2002 color chart in your .cmf file.



	In				Out				Target Value			Measure Value			Compare
Index	C	M	Y	K	C	M	Y	K	L	A	B	L	A	B	DeltaE
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.0	0.3	-1.5	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.0	0.3	-1.5	0.0	0.0	0.0	0.0
3	3.0	3.0	3.0	3.0	5.9	4.3	5.9	0.0	87.6	0.5	-1.0	0.0	0.0	0.0	0.0
4	3.0	3.0	3.0	40.0	35.3	27.1	34.1	7.1	65.8	0.3	-1.2	0.0	0.0	0.0	0.0
5	3.0	3.0	40.0	3.0	6.7	3.1	44.7	0.0	85.4	-3.7	29.1	0.0	0.0	0.0	0.0
6	3.0	3.0	40.0	40.0	36.1	25.1	61.6	9.4	63.9	-3.1	21.5	0.0	0.0	0.0	0.0
7	3.0	40.0	3.0	3.0	9.0	43.5	7.8	0.0	71.0	23.1	-4.7	0.0	0.0	0.0	0.0
8	3.0	40.0	3.0	40.0	38.4	55.3	32.5	11.0	53.1	17.9	-4.2	0.0	0.0	0.0	0.0
9	3.0	40.0	40.0	3.0	7.5	42.4	47.8	1.6	69.3	19.7	21.5	0.0	0.0	0.0	0.0
10	3.0	40.0	40.0	40.0	29.8	51.8	59.6	22.4	51.8	15.0	15.7	0.0	0.0	0.0	0.0
11	7.0	7.0	7.0	7.0	13.3	9.8	13.3	0.0	82.4	0.9	-0.3	0.0	0.0	0.0	0.0
12	10.0	6.0	6.0	10.0	19.2	11.0	13.7	0.0	80.3	-0.5	-2.4	0.0	0.0	0.0	0.0
13	10.0	6.0	6.0	20.0	26.7	17.3	21.2	1.6	74.9	-0.5	-2.3	0.0	0.0	0.0	0.0
14	10.0	6.0	6.0	40.0	39.2	29.4	35.3	8.6	62.9	-0.5	-2.2	0.0	0.0	0.0	0.0
15	10.0	6.0	6.0	60.0	51.0	40.4	47.1	23.1	49.0	-0.2	-1.7	0.0	0.0	0.0	0.0
16	10.0	6.0	6.0	80.0	60.8	52.5	59.6	47.1	33.2	0.4	-0.9	0.0	0.0	0.0	0.0
17	10.0	6.0	6.0	100.0	68.2	70.2	70.6	83.9	15.3	2.3	0.8	0.0	0.0	0.0	0.0
18	10.0	10.0	10.0	20.0	26.3	20.4	26.3	3.1	73.2	1.1	0.0	0.0	0.0	0.0	0.0

Figure 73

The **In** values are the initial CMYK values of ECI2002 chart's color blocks. **Out** values are the CMYK values conversed with the 4D table. The **Target** values are the lab values for the CMYK values with source ICC. The **Measure** values are the lab values measured from the printed chart. **Statistic** is the color difference between the target and measured values.

5. Spot colors

Here shows the spot color in your .cmf file, if any. Spot color information includes spot color name, color mode, color values. The color mode refers to the color mode for the color tune curve corresponding to the spot color. The curve is displayed at the right. The **Tone** slide bar and the output CMYK values below are closely correlated. By moving the slide bar, you can see corresponding CMYK output values.

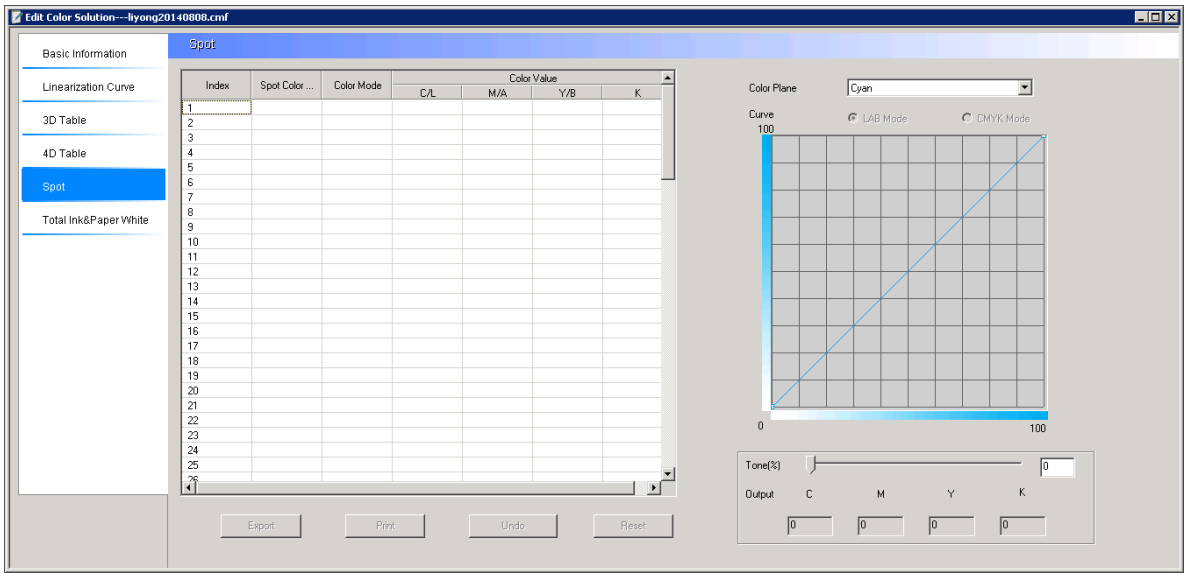


Figure 74

6. Total Ink & Paper White

Here you can see the total ink amount and the rendering intent used for generating the 4D table. If the intent is Absolute Colorimetric, you can then edit the paper white.

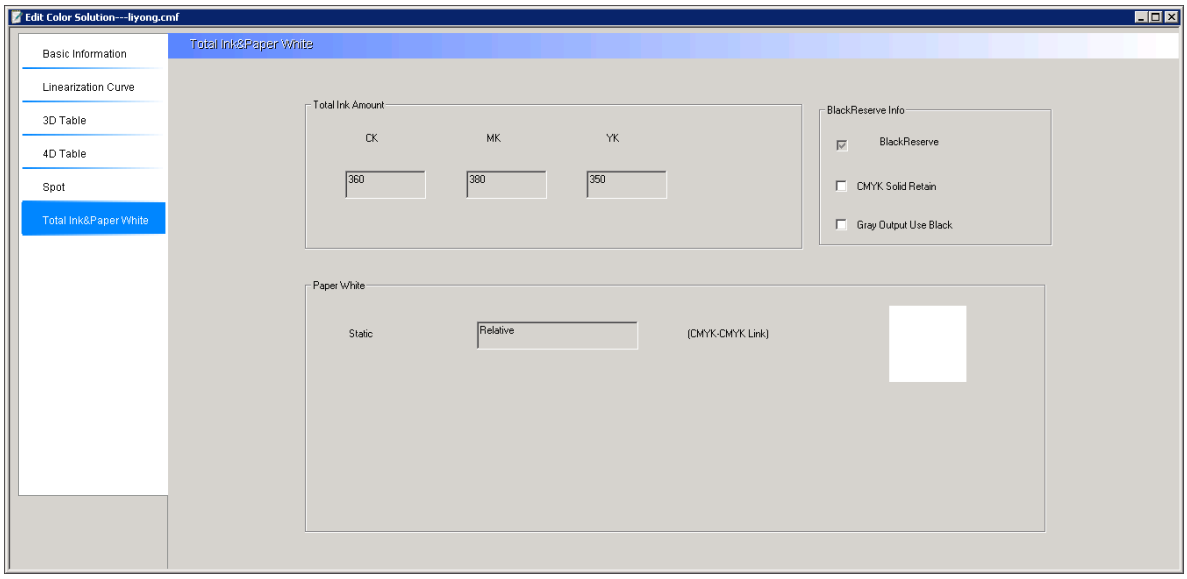


Figure 75

CMYK Black Reserve: If checked, the system will directly use black ink to print the pure black process color (only the K in CMYK is NOT equal to 0 in this case). This option was set in the **Properties Setup** window before you made the .cmf file, thus is displayed grayed here.

CMYK Solid Retain: If checked, the color of CMYK=100% will be remained unchanged. If not, such color will still be conversed by the .cmf file.

Gray Output Use Black: If checked, Gray graphic entity will be output with only the black ink. If not, such entity will be conversed by the .cmf file.

5.2 Re-calibration

When your device state or the environment where it is located has been changed, and consequently has affected the color output result, you can make use of the re-calibration to correct the output.

1. In the Color Tools, use the main menu item **File** > **Open CMF**, or the toolbar icon to open the .cmf you want to re-calibrate.

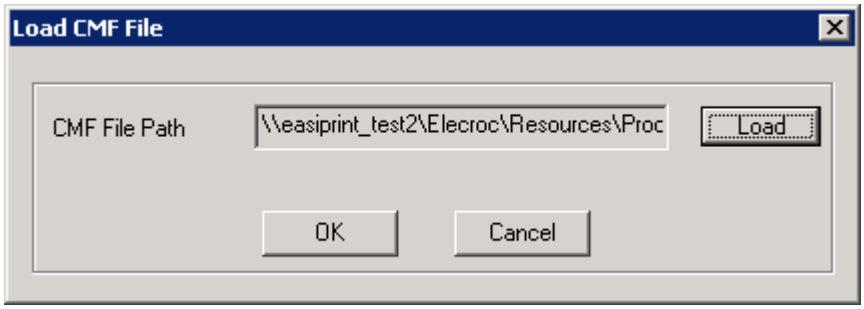


Figure 76

2. The toolbar icon **Re-calibration** becomes activated. Click it to enter in the user interface. Please ensure that your device is in normal working state before the re-calibration.

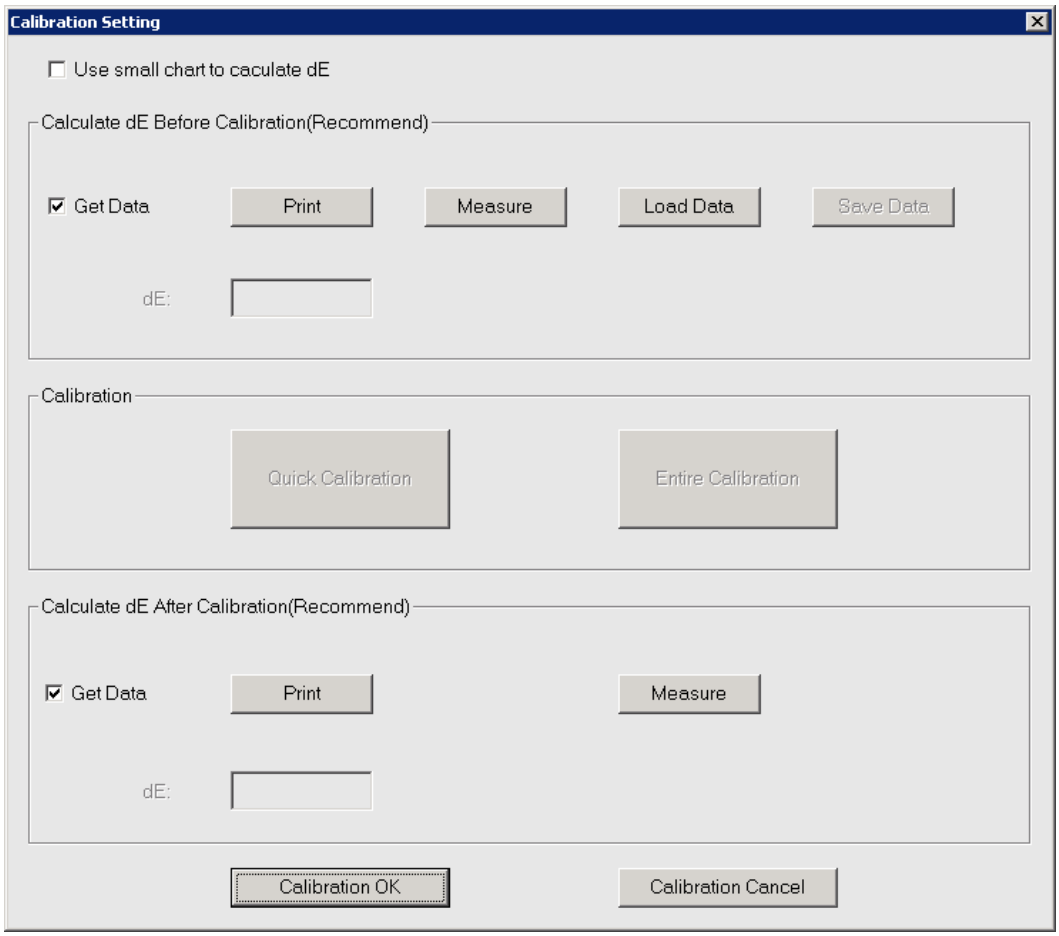


Figure 77

5.2.1 Calculate dE Before Calibration

Before the re-calibration, we recommend you to perform a color difference calculation, so as to know how big the difference is between the current device state and the state recorded in the .cmf file.

To perform the calculation, please check the box **Get Data**. Before you click **Print** to print out the color chart, you are recommended to check the option **Use small chart to calculate dE**, which means to print out a small chart, as shown in the below. If not checked, the ECI 2002 chart will then be printed.

Figure 78

After the printing, click **Measure** to measure the chart. The color difference between the current device state and that in the .cmf file will be then displayed aside **dE** parameter.

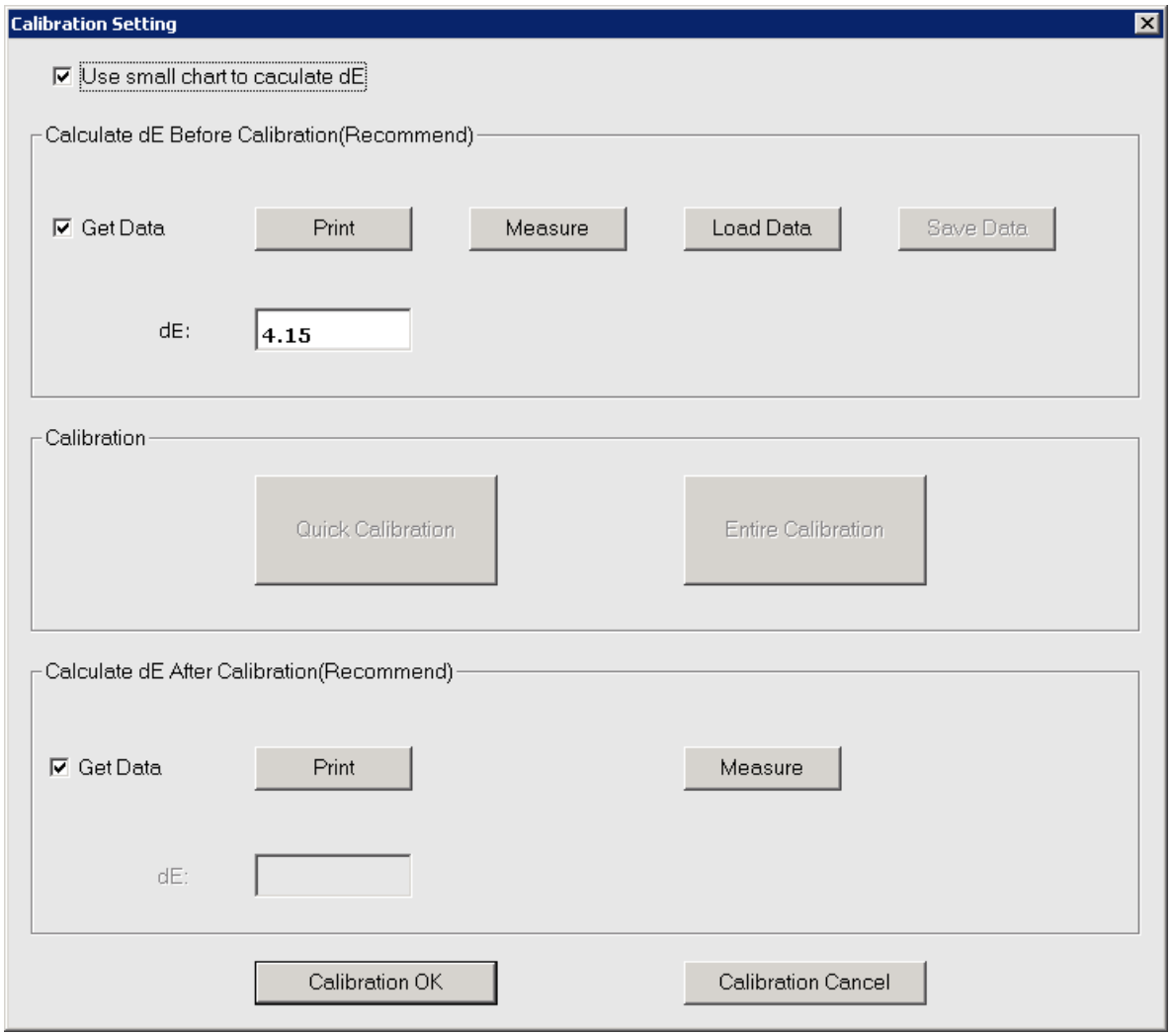


Figure 79

Take the above figure as example, the dE value of 4.15 is bigger than the pre-defined

threshold of 2, therefore a calibration becomes necessary.

The button **Save Data** enables you to save the measured result as a .txt file, while the button **Load Data** enables you to load such saved .txt file.

There are two modes for re-calibration: quick calibration and entire calibration. Each time when you enter in the re-calibration's user interface, you can choose only one of the two modes. Next, we will introduce them respectively.

5.2.2 Quick Calibration

This calibration requires that the current solution contains the linearization target data, which can be created in the *Linearization* step of the calibration wizard.

As a fast way of color calibration, it requires no repetition of printing & measuring.

Click the button **Quick Calibration** to enter in its user interface.

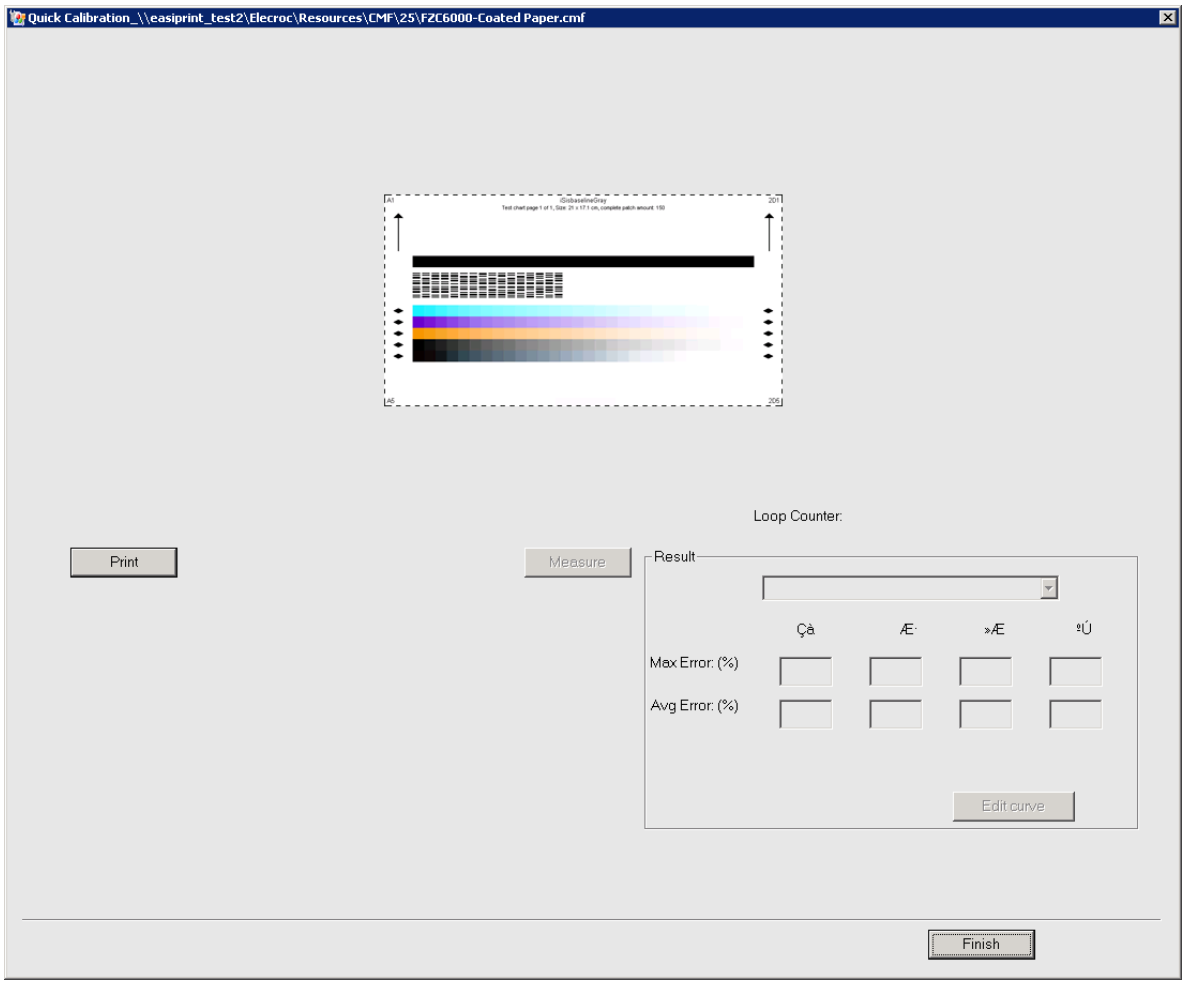


Figure 80

As indicated on the window, please click in turn the buttons **Print** and **Measure** to perform the printing and measuring operations, and after the measurement, click **Finish**.

5.2.3 Entire Calibration

This calibration requires that the current solution contains the device state file, which can

be created in the *Device Calibration* step of the calibration wizard.

This mode requires repetition of printing & measuring.

1. Click the button **Entire Calibration** to enter in its user interface.

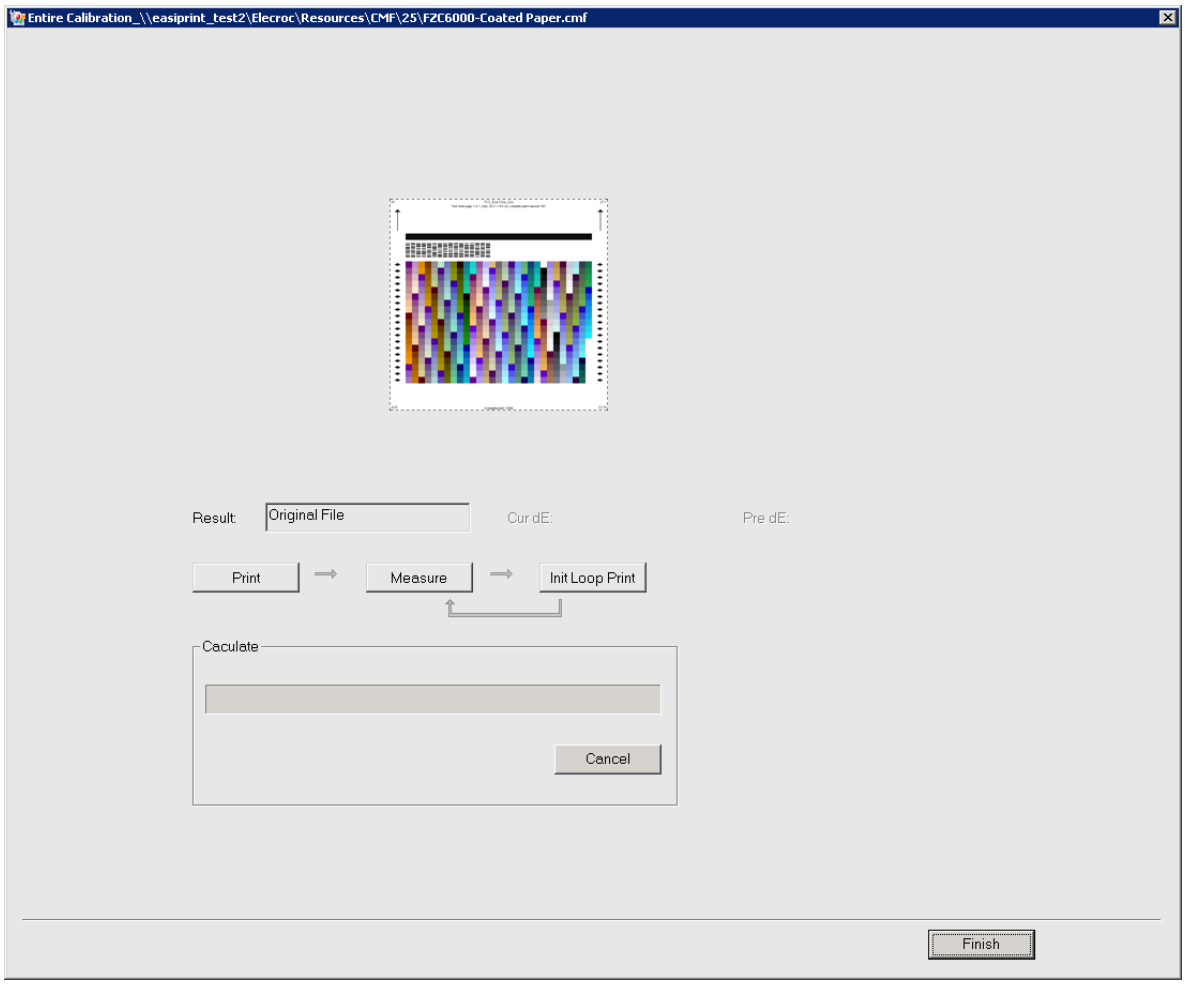


Figure 81

2. Click the button **Print** to print out the color chart. And then click **Measure** to enter in the measuring window, measuring the printed chart. After the measurement, click **Init Loop Print**. The Color Tools will then calculate and correct automatically in background.

3. As indicated by the arrows, continue to measure and loop print, and get the dE value. Repeat this operation till you are satisfied with the color difference.

4. Click **Finish** to complete.

5.2.4 Calculate dE After Calibration

After the recalibration, if needed, you can choose to perform a color difference calculation. When you have returned to the Calibration Setting window, use the buttons **Print** and **Measure** in the **Calculate dE After Calibration** area, to perform the printing and measuring operation, and then get the color difference value.

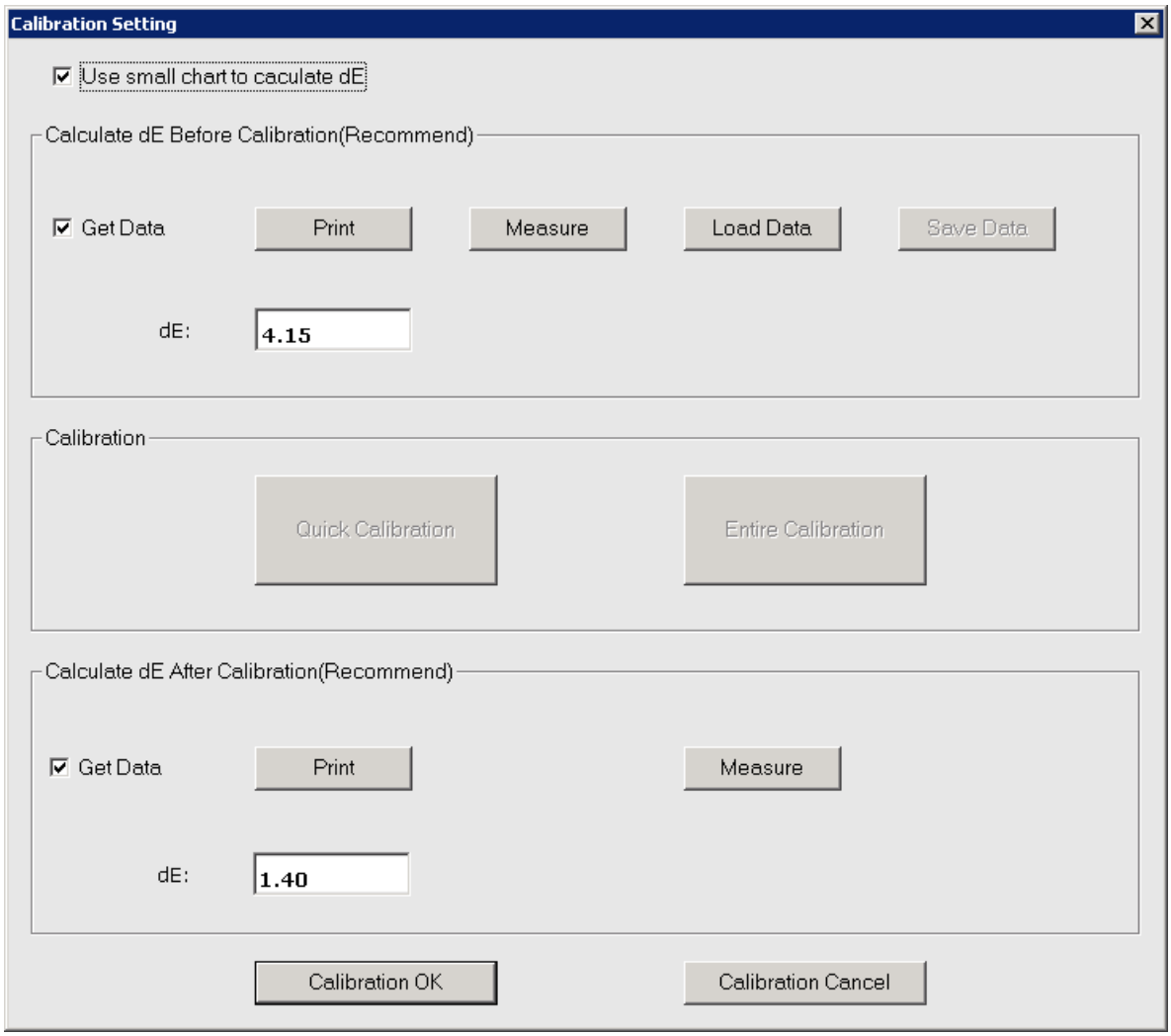


Figure 82

Note: *The color charts used before and in the re-calibration must be the same. If the color difference after the recalibration is smaller than that before the recalibration, choose **Calibration OK**; otherwise, you can choose **Calibration Cancel**.*

5.3 Spot Color Tool

Only when the spot color is contained in the .cmf file, it will then be conversed by the color logic in the .cmf file. Otherwise, it will be processed as per the RIP settings.

In case that the spot colors are NOT output accurately under the control of .cmf file, you can use the spot color tool in Color Tools to make a color calibration.

5.3.1 Basic Setting

1. Open the .cmf file that you want to calibrate.

2. Click the toolbar icon Spot Color Tool  to enter in its user interface.

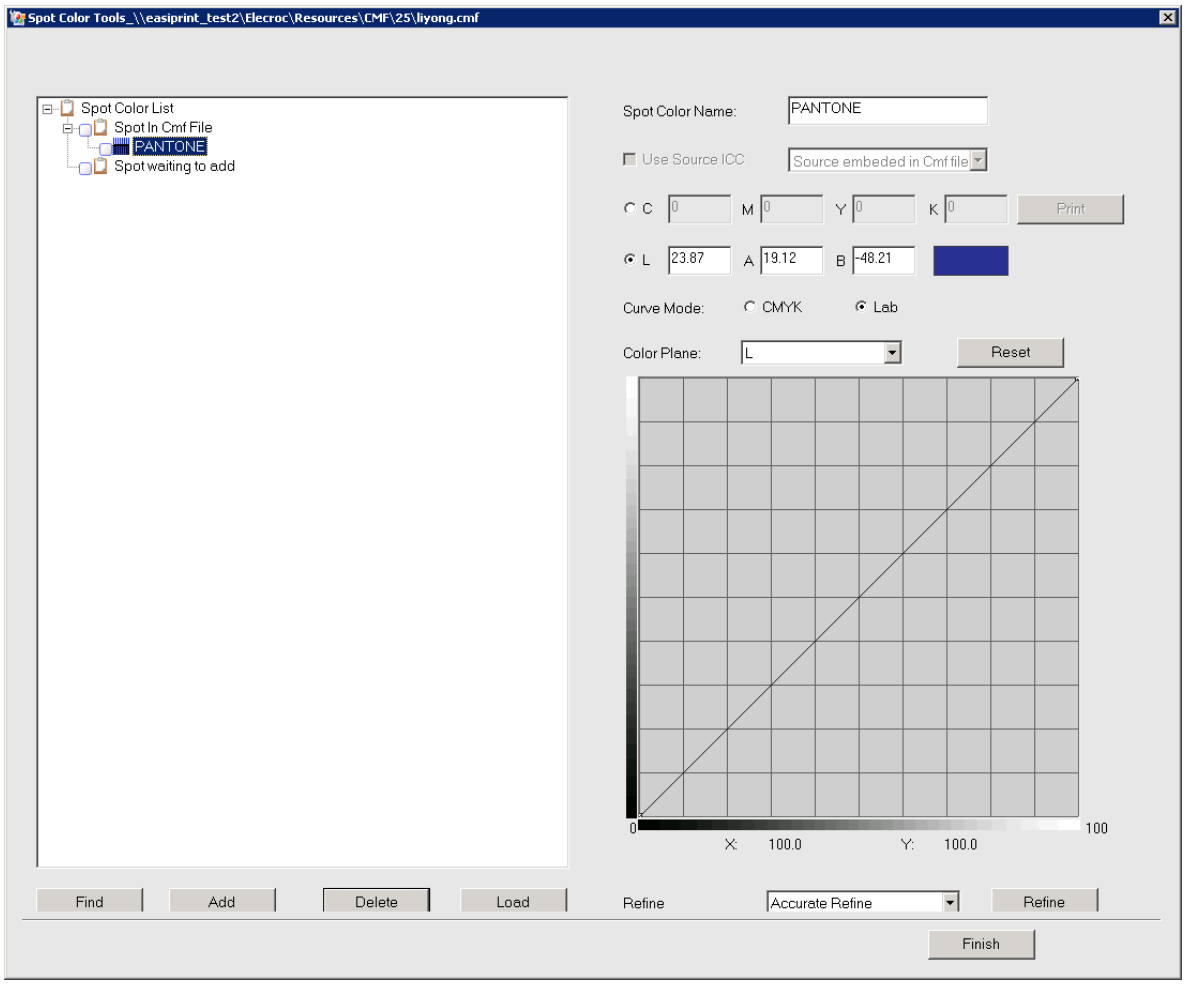


Figure 83

At the left of the window, the **Spot In Cmf File** list refers to the spot colors contained already in your .cmf file, while **Spot waiting to add** refers to the spot colors loaded after you have entered in the spot color tool. Choose a spot color and then you can see its detailed properties at the right.

Find: If there are many spot colors in your list, you can find your spot color easier by using the **Find** button.

Add: You can click the **Add** button to add a chosen spot color from the list **Spot waiting to add** to the list **Spot In Cmf File**. This button can also add the spot color you are inputting into the list. Clicking on the **Add** button is needed every time when you edit your spot color and want to save your modification.

Delete: Use this button when you want to delete a spot color from the list.

Load: This button is used to load spot colors from a .pdf file or a .spt file. The loaded spot colors will then be displayed in the list **Spot waiting to add**.

Spot Color Name: The name of the spot color.

Use Source ICC: This setting controls how CMYK spot colors are conversed. Options in the dropdown list are various source ICC profiles. If not checked, the printing device's color space will be used. If checked, source color space will be mapped into by way of color conversion.

CMYK/**Lab**: Here shows the detailed color values. Note that only spot colors defined in Lab mode can be refined.

Curve Mode: The mode of the spot color tune curves. Lab spot colors support CMYK or Lab modes, while CMYK spot colors support only CMYK mode.

Refine: There are two refine types, **General** and **Accurate**. The **Accurate** type is usually recommended. The refinement is applied only to Lab spot colors. For CMYK spot colors, if needed, you can choose a proper source ICC to convert into Lab mode, and then perform the refinement.

5.3.2 Add Spot Color

1. Create a spot color

Choose the spot color list **Spot In Cmf File**, and you can see that the edit box **Spot Color Name** becomes activated. Input a name, and its color values, and other properties if needed, and then click **Add**. In this way, you can create a spot color under the **Spot In Cmf File** list.

2. Add from the list **Spot waiting to add**

Click the **Load** button to open a .pdf file that contains spot colors. This action can load the spot colors from the PDF file into the list **Spot waiting to add**. And then choose a loaded spot colors, click Add to add it into the list **Spot In Cmf File**.

5.3.3 Spot Color Refinement

CMYK spot colors can be calibrated by simply changing the CMYK values. If needed, the CMYK values can turn to Lab values by applying a source ICC. Only Lab spot colors can be refined. There are two types, **General** and **Accurate**. They have the same purpose, i.e. by way of loop calibration, making the output result closer to the target.

1. General Refine

This type refines only one spot color each time, and supports only the Eye-One device.

In the main window of the spot color tool, tick the box in front of the spot color you want to refine, and choose the **General Refine** option in the **Refine** dropdown list, and then click the button **Refine**. The tool first hints that this type will use the Eye-One device. Please choose **Yes** to continue.

The spot color measuring window appears. At the right shows the target values for current spot color. This value, if needed, can be re-obtained by clicking the button **Measure Target** and then measuring.

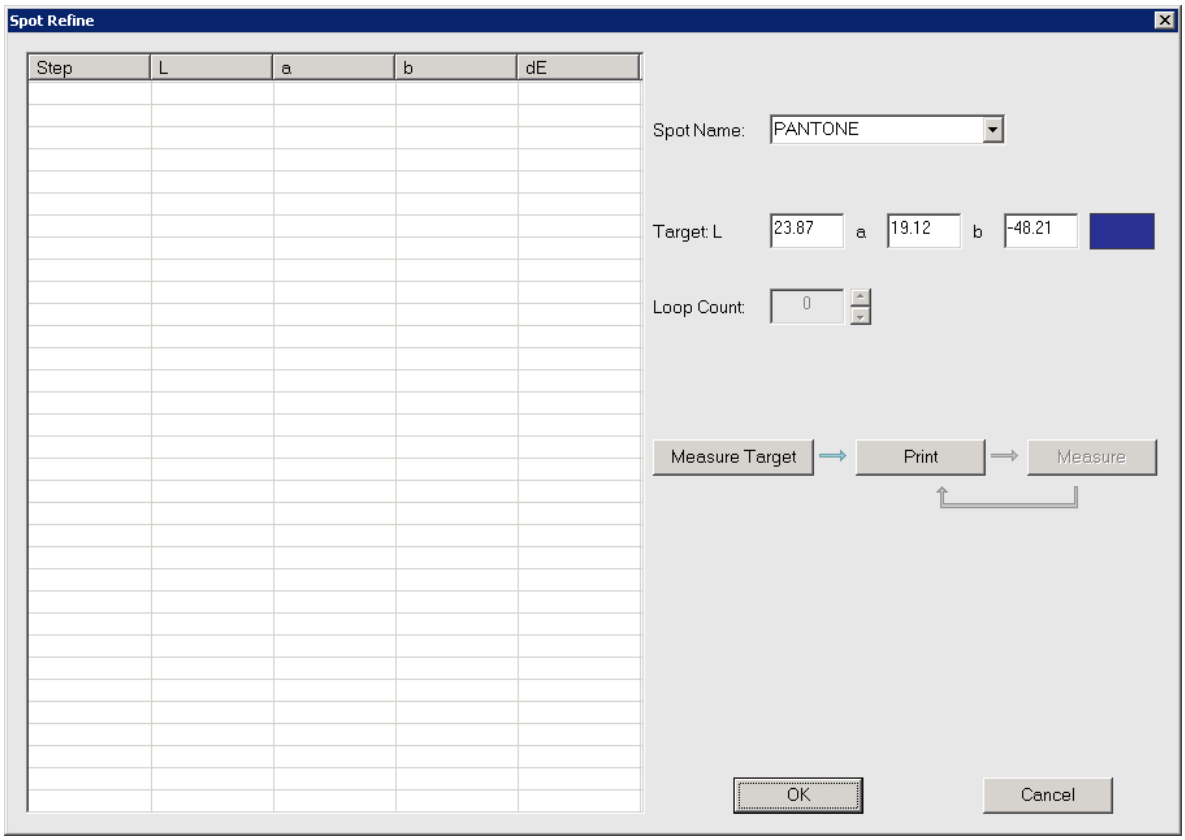


Figure 84

Click **Print** to print out a single color block of the current spot color. And then click **Measure** to measure the printed spot color block. After the measurement, both the measured color values and the color difference compared with the target values will be listed at the left table. Repeat the "print and measure" operation till you are satisfied with the color difference or the color difference rebounds. And then, choose the best result from the left table, and click **OK**.

Return to the main window of the spot color tool. Now the spot color values will be updated as per the result of the refinement. Click **Finish** to save and exit.

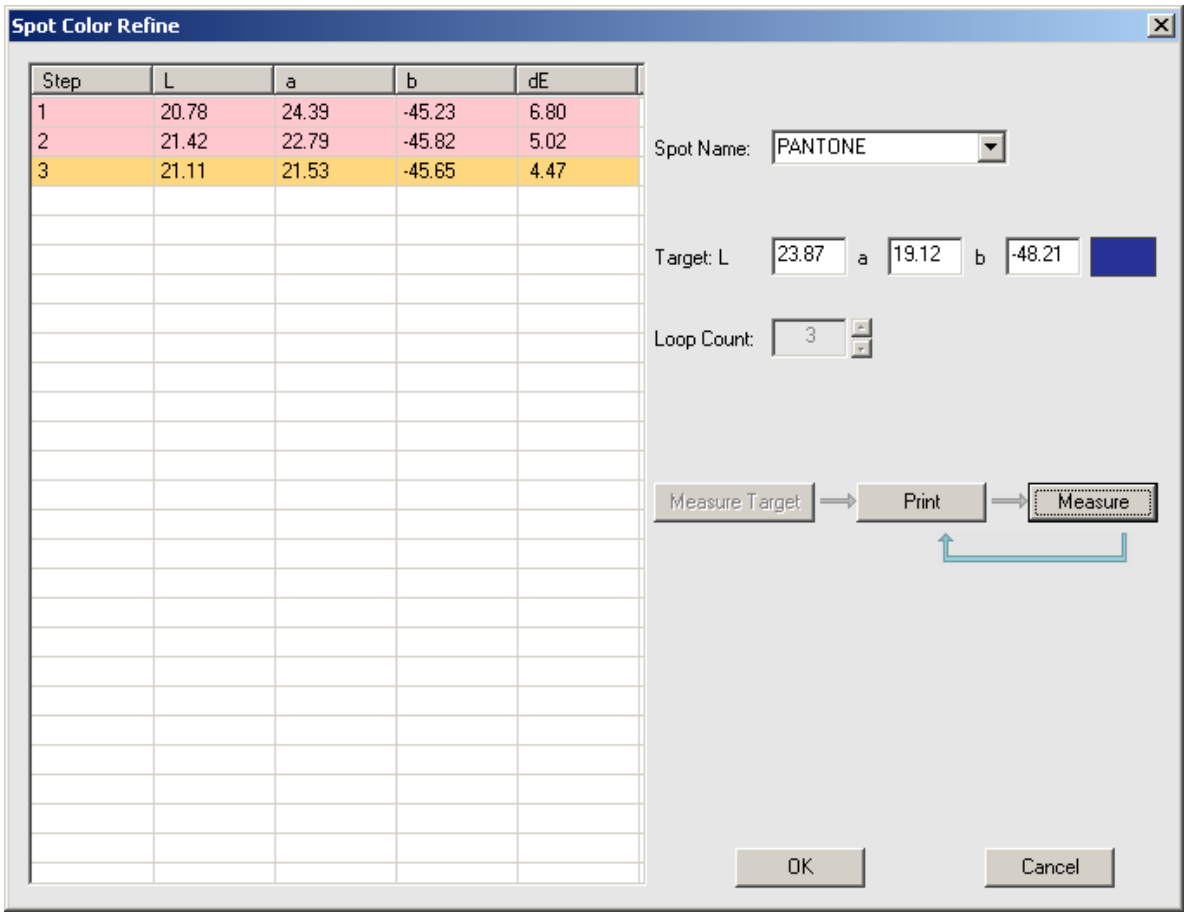


Figure 85

2. Accurate Refine

In the main window of the spot color tool, tick the box in front of the spot color you want to refine (three spot colors at most can be ticked this time), and choose the **Accurate Refine** option in the **Refine** dropdown list, and then click the button **Refine**.

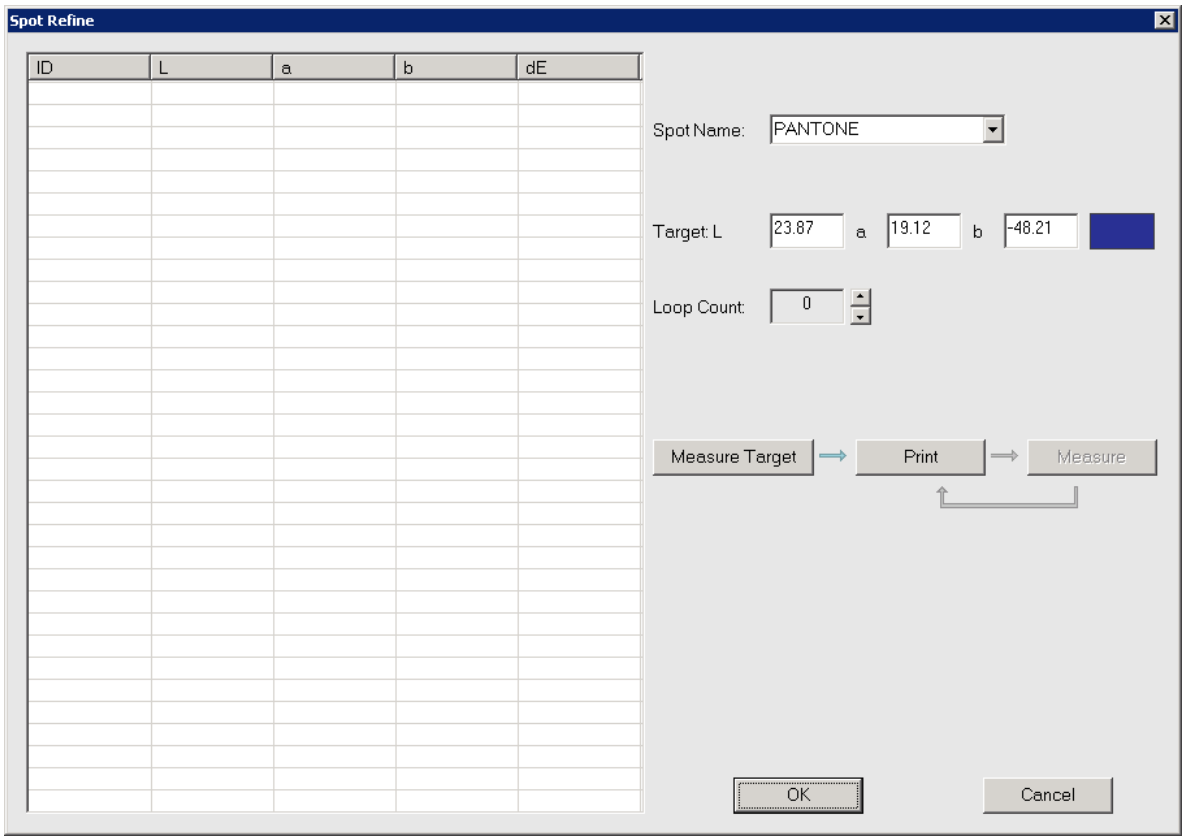


Figure 86

If you have chosen more than one spot color, and want to measure the target values of the spot colors first, please choose the spot color from the dropdown list, and click **Measure Target** to perform. The refinement operation can be continued after you get the target values. In case that you have already gotten the target values, you can ignore the measurement, and perform the refinement directly.

The refinement can be completed by clicking repetitiously the **Print** and **Measure** buttons, as indicated by the arrows, and performing corresponding printing and measuring operations, till you get the satisfied color difference value or the color difference value rebounds.

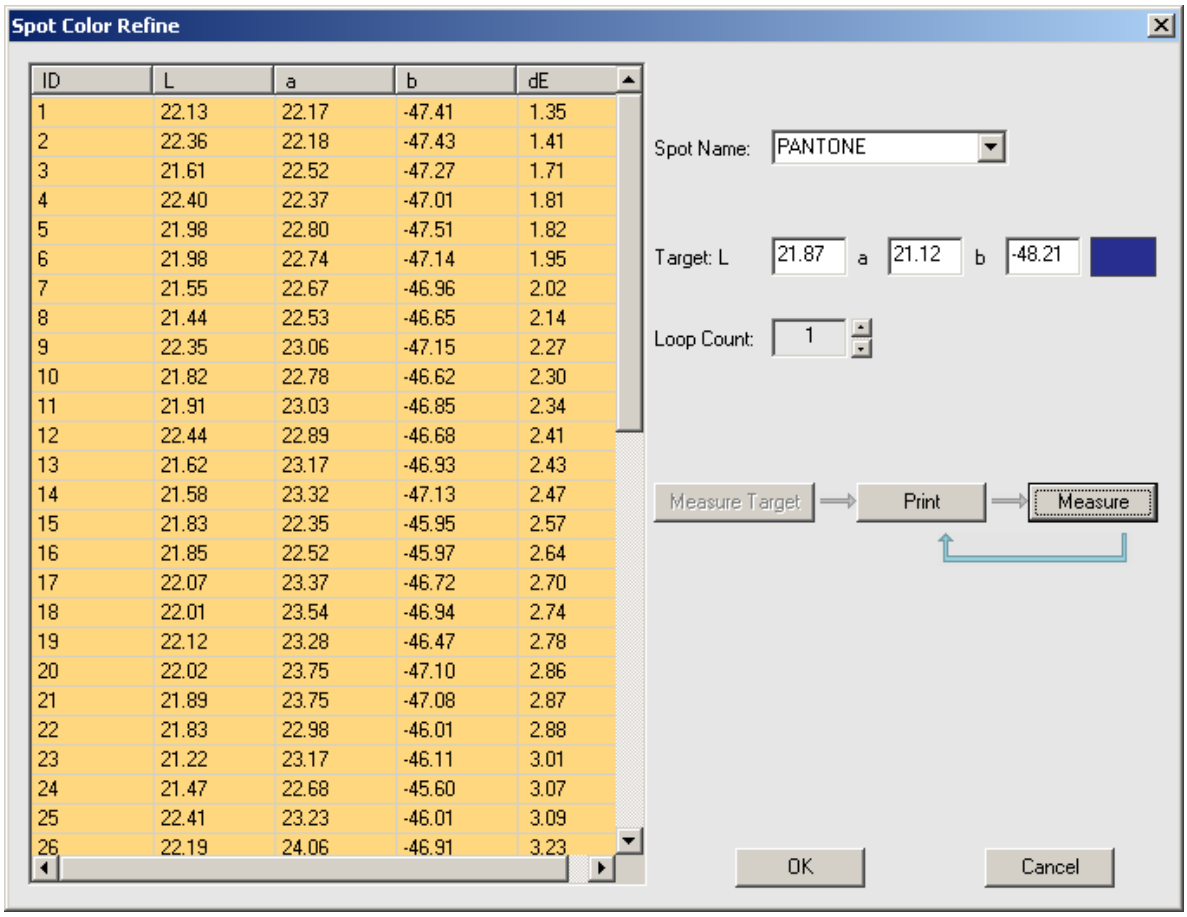


Figure 87

After the refinement operations, choose a best result from the left table, and click **OK**. Now, return to the main window of the spot color tool. The spot color values will be updated as per the result of the refinement. Click **Finish** to save and exit.

5.3.4 Spot Color Tune

The spot color tool supports the application of a color tune curve, which can control the spot color's middle tone.

The tune curve can be edited in the spot color tool, or in the viewing interface of the .cmf file.

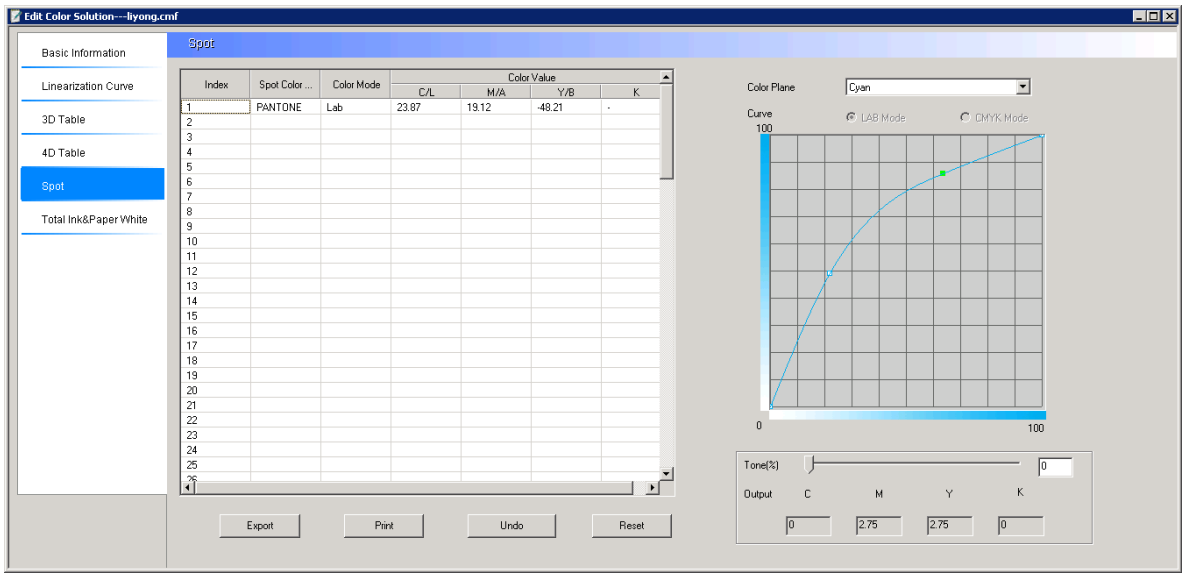


Figure 88

For Lab spot colors, the curve mode can be CMYK or Lab. For CMYK spot colors, the curve mode is CMYK. Edition can be made after a separation has been specified from the **Color Plane** dropdown list. The **Reset** button enables a restoring to the default curve state.

5.4 QA Tool

This tool is used as a color difference assessment tool, providing the data basis to assess if the color quality reaches the standard. The QA tool shows both the color difference between the actual and ideal values for each color block, and the distribution map of the ideal and actual color spaces.

5.4.1 Basic Setting

Click the toolbar icon  in Color Tools' main window to enter in this tool's user interface.

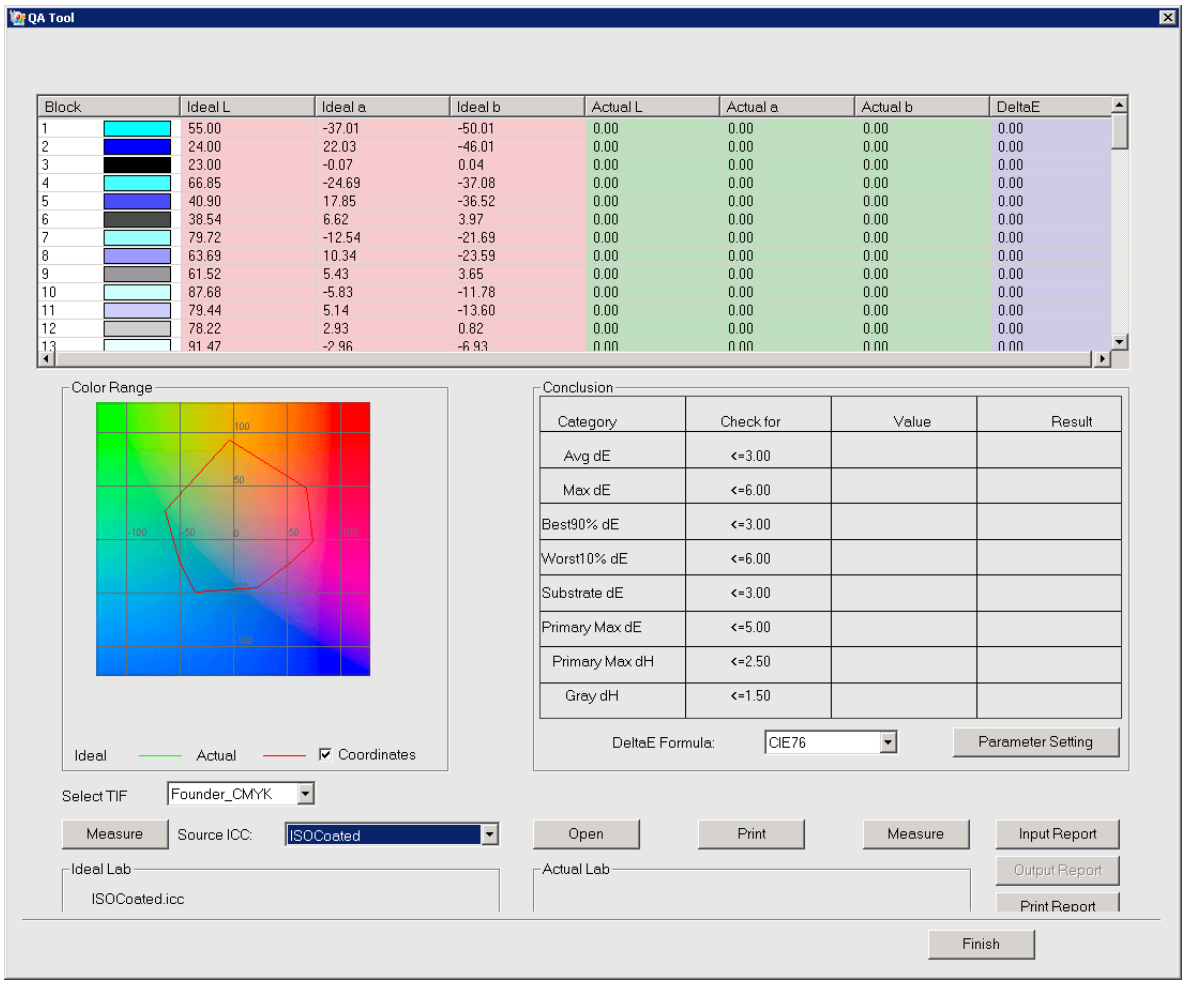
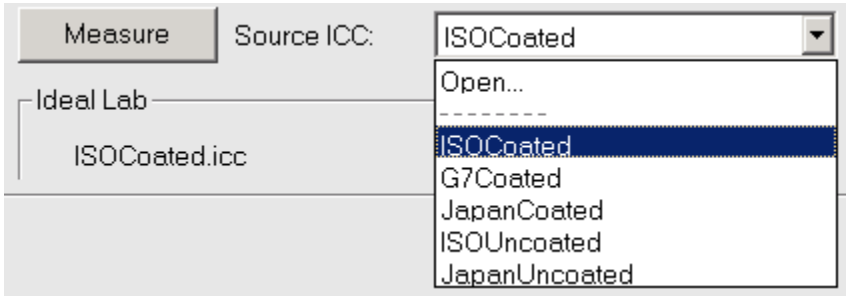


Figure 89

1. Choose a pattern. Currently two patterns are supported, ECI2002 and Founder_CMYK.

Source for ideal values: The **Source ICC** dropdown list builds in some standard source ICC files, any of them can generate the ideal lab values. The **Open** option in the dropdown list enables you to use values from .cmf file as ideal values.



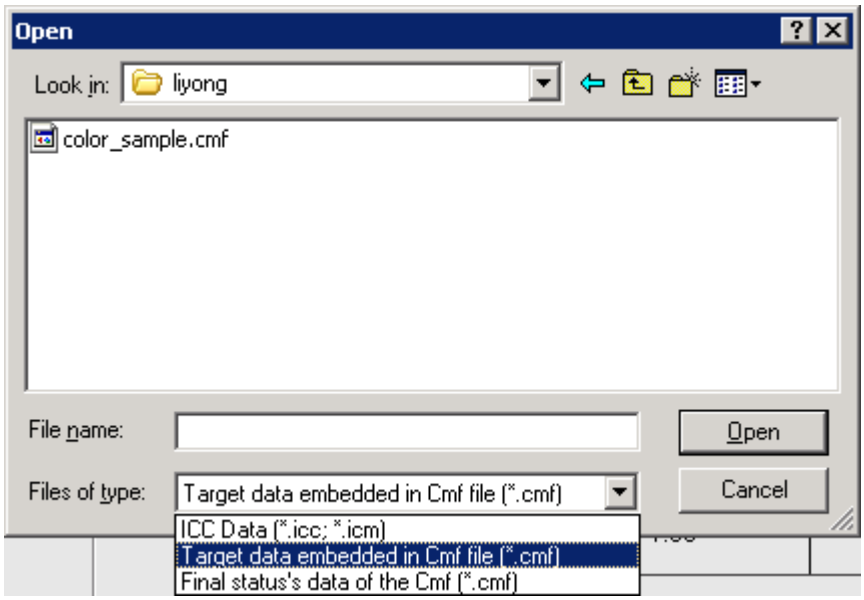


Figure 90

Source for actual values: The actual vales can be loading data, or measured data from an already existing color pattern, or measured data from a freshly-printed pattern by applying specified .cmf file.

2. Click the **Source ICC** dropdown list, and choose either ICC data or .cmf file that contains target data or state data.

Note: *In case that the data comes from measurement, please ensure the measured pattern is exactly the same as the selected pattern.*

3. Parameter setting. Click the button **Parameter Setting** to enter in the setup window, in which you can re-define the quality standards, i.e. the **Check for** values for all the dE categories. The standard is considered as *reached* when the calculated value becomes smaller than the **Check for** value; otherwise, means that the QA is failed. The default settings are used in general.

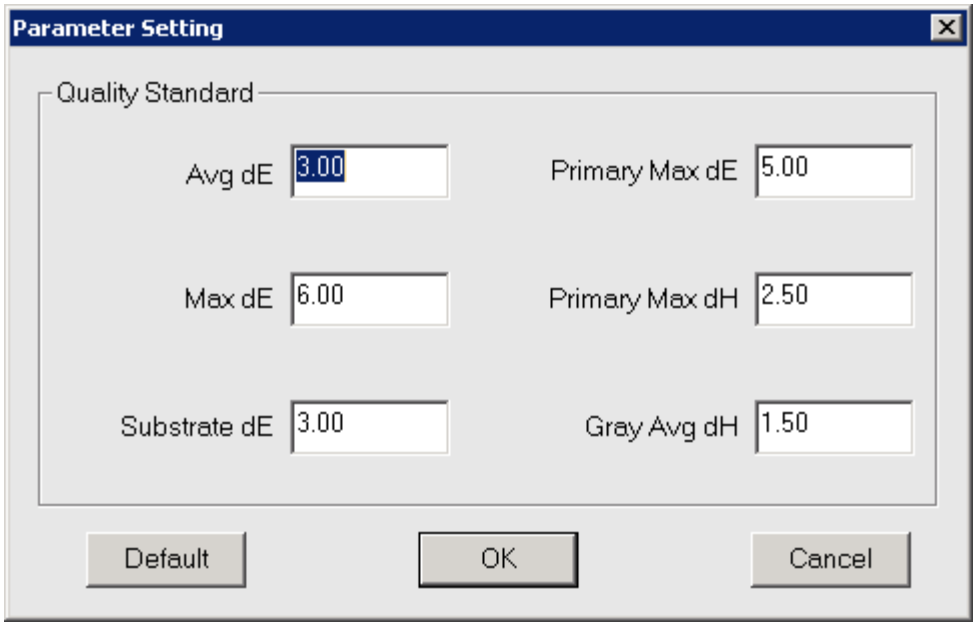


Figure 91

5.4.2 Data View

The color differences are displayed in the table **Conclusion**, when you have determined the ideal and actual values. If smaller than the **Check for** values, a tick mark ✔ will appear in the **Result** column.

Color blocks and their information, displayed at the top of the window, can be sorted by the lab values or color difference values.

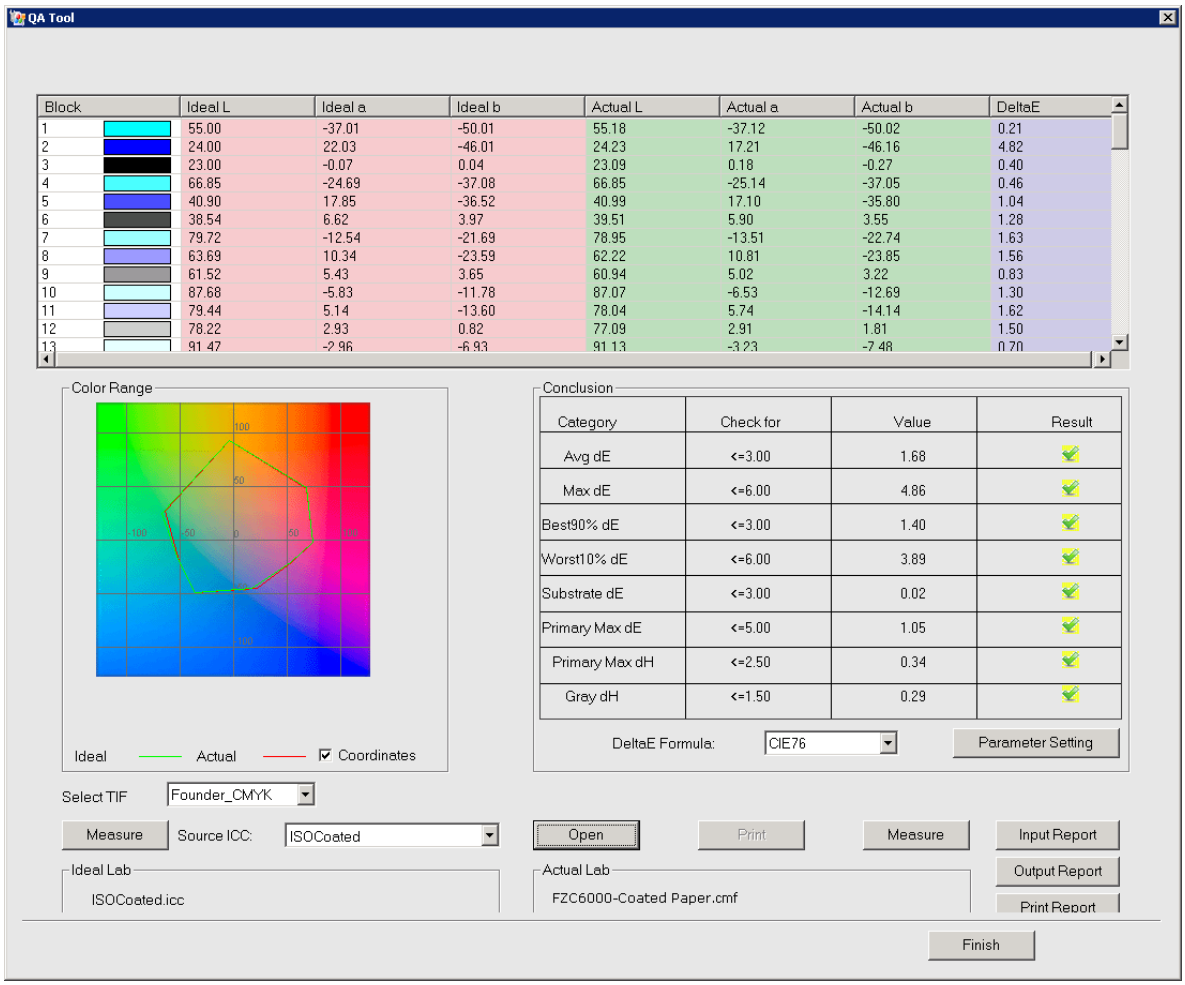


Figure 92

Various dE calculation formulae are available in the **DeltaE Formula** dropdown list.

The color difference assessment result can be exported by clicking the button **Output Report**. And such exported data can be loaded for view by clicking the button **Input Report**. The button **Print Report** is used to print out the currently-displayed result.

5.5 Tune Curve

Tune curve is designed to adjust slightly the whole tone or color, in case that tone or color related issues occur in the job output with .cmf file.

Click the toolbar icon  in Color Tools' main window to enter in this tool's user

interface.

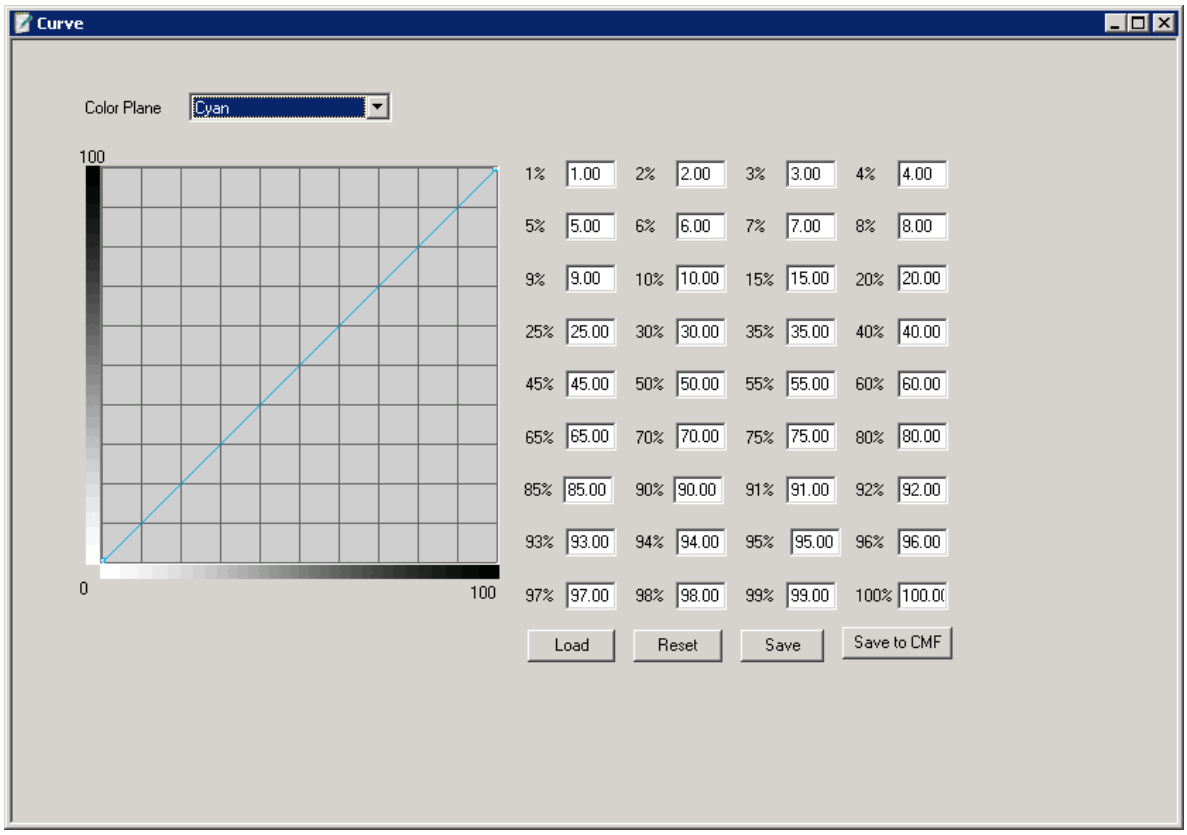


Figure 93

Define the curve respectively for the planes, according to actual need, and after that, click **Save to CMF**, to include the curve into the currently-opened .cmf file. Click **Save** and save the curve as a .duv file in case that the curve needs to be used in other .cmf file.

5.6 Data Transform

This tool is used to transform between the .cmf file generated by Color Tools and the proof package generated by earlier ElecRoc versions. It's available only for digital proof.

Click the toolbar icon  in Color Tools' main window to enter in this tool's user interface.

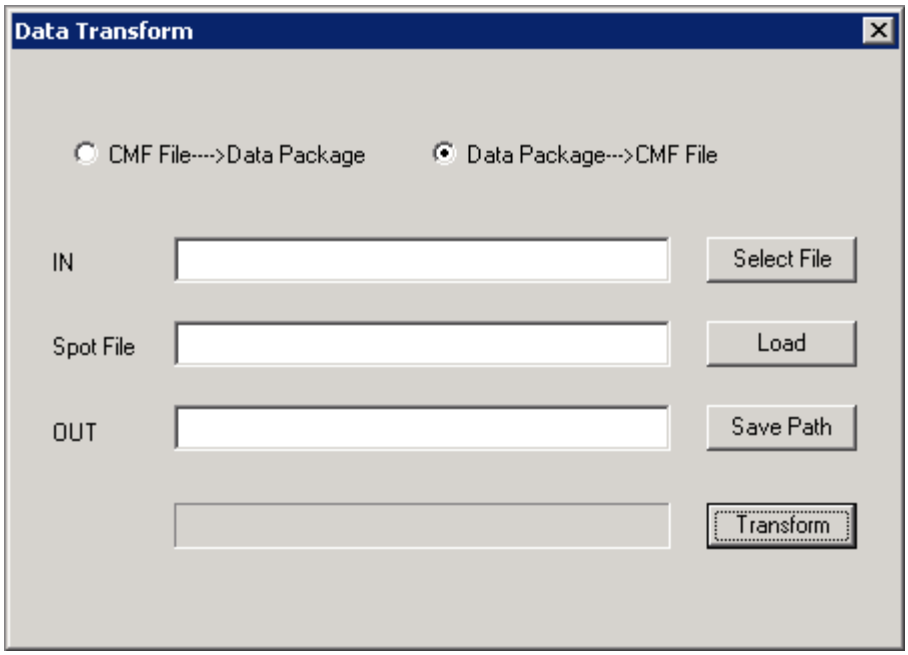


Figure 94

There are two modes, CMF File-->Data Package, Data Package-->CMF File.

Choose the transformation mode first, then choose file (click **Select File**) and specify the save path (click **Save Path** to specify), and then click **Transform**.

In the mode **CMF File-->Data Package**, only one .cmf file can be transformed each time. While in the mode **Data Package-->CMF File**, not only one package but also all the package files under a same folder can be transformed one time. And if there is .spt file made for the package, by loading such .spt file (click **Load**), the spot colors can be included into the transformed .cmf file as well.