

Color Matching Software

SpectraMagic™ CMS

Ver. 1.00

En Instruction Manual



Be sure to read this manual before
using the software.



KONICA MINOLTA

Introduction

Thank you for purchasing our product.

SpectraMagic CMS is designed to predict recipes (mixture ratios of base material, colorants, etc.) that match the color of a target standard based on measurements of samples with known component ratios using a spectrophotometer such as the CM-36dG connected to a computer.

This instruction manual describes the operating environment, installation procedures, and operation methods required to use the software.

This software is available in two editions: Full and Standard.

Function Type	Function examples	Full	Standard
Management functions	User management	✓	
	Colorant library management	✓	
Operation functions	Template management	✓	✓
	Target management	✓	✓
	Color formulation/correction	✓	✓



Notes on Safety

Be sure to read this instruction manual as well as the instruction manuals for the measuring instrument and your computer carefully before use to ensure proper and safe operation.

A PDF version of this instruction manual will be installed at the same time the software is installed. To access the instruction manual while using the software, select [Help] – [Manual] from the software menu. A PDF reader is required to view the PDF file.

■ Notes on USB Devices

- When plugging the USB device into your computer, be sure that it is in the correct orientation. Do not forcibly plug it in.
- Do not touch the contacts of the USB flash drive.
- After using the USB device, return it to its case and store in a safe place.
- Avoid exposing the USB device to rapid temperature changes and condensation.
- Avoid leaving USB device in locations where it may be exposed to high temperatures from direct sunlight or heaters.
- Do not drop the USB device or subject it to strong impact.
- Keep the USB device away from water, alcohol, paint thinners, and other such substances.

■ Precautions When Taking Measurements

- When measuring paints or coatings, be sure to let the sample dry completely before taking measurements. If measurements are taken before the sample is dry, measured data may not be accurate and the measuring instrument could become stained or damaged.
- When measuring plastic materials (plates, etc.), be sure to let the sample cure completely and return to room temperature before taking measurements. Thermosetting plastics or plastic immediately after molding may appear different if measured before returning to room temperature due to thermochromism.

■ Terms of Use for This Software

The terms of the license agreement of the SpectraMagic CMS software are provided in the [Software License Agreement](#) dialog box displayed on-screen during the installation process. This software can be installed only if you agree to all the terms of the agreement.

■ Notes on Use

- This software is designed to be used with the Windows 11 operating system. Note that no operating system is included with this software.
- The operating systems must be installed on your computer before this software can be installed.

Note

- For details on the environment required to use the software, refer to [Operating Environment on page 3](#).

■ Notes on This Manual

- Unauthorized reproduction or duplication of the contents of this manual, in whole or in part, is prohibited.
- The contents of this manual are subject to future change without notice.
- The contents of this manual have been prepared with the utmost care. However, should you have any questions or comments, or if you notice any errors, omissions, or other such issues, please contact the nearest KONICA MINOLTA authorized service facility.
- KONICA MINOLTA bears no liability whatsoever for any accidents or damages resulting from use of this product in a manner that is not in accordance with the instructions in this manual.
- The screen images shown in this manual are for illustrative purposes only and may differ from the actual product screens.

■ Official Names of Software Used in This Manual

(Name used in this manual)	(Official Name)
Windows, Windows 11	Microsoft® Windows® 11 Pro Operating System

■ About Trademarks

- Microsoft, Windows, and Windows 11 are registered trademarks of Microsoft Corporation in the United States and other countries.
- "KONICA MINOLTA", the Konica Minolta logo and symbol mark, "Giving Shape to Ideas", and "SpectraMagic" are registered trademarks or trademarks of Konica Minolta, Inc.
- Intel is a registered trademark of Intel Corporation in the United States and other countries.
- All other company names and product names that appear in this manual are registered trademarks or trademarks of their respective owners.

Every effort has been made to ensure that this product works properly. However, should you have any questions or comments, please contact your KONICA MINOLTA support person.

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Operating Environment

■ System Requirements

OS Windows 11 Pro

- English, Japanese, German, French, Spanish, Italian, Portuguese, Russian, Turkish, Polish, Simplified Chinese, Traditional Chinese, and Korean versions of the above OS.
- The hardware of the computer system to be used must meet or exceed the greater of the recommended system requirements for the compatible OS being used or the specifications listed in the table below.

Item	Requirement
CPU	Intel Core i5 2.7 GHz equivalent or higher (recommended)
Memory	At least 8 GB (at least 16 GB is recommended)
Storage	At least 20 GB of free space
Monitor resolution	Display capable of a resolution of 1920 × 1080 or higher (recommended)
Connection to external networks	Required when obtaining (downloading) this software and when performing license activation procedures
USB port	Required for dongle license version. Required when connecting the instrument and your computer with a USB cable
Other	PostgreSQL Ver. 15 or later For PostgreSQL system requirements and licensing, see https://www.postgresql.org/docs/

■ Compatible Instruments

This software is compatible with the following instruments.

Instrument	Firmware Version
Spectrophotometer CM-3700A Plus / CM-3700A-U Plus	All firmware versions
Spectrophotometer CM-36dG / CM-36d / CM-36dGV	All firmware versions
Spectrophotometer CM-26dG / CM-26d / CM-25d	1.50 or later
Spectrophotometer CM-17d / CM-16d	1.20 or later
Spectrophotometer CM-3700A	2.05 or later
Spectrophotometer CM-3700A-U	2.06 or later
Spectrophotometer CM-3600A	1.08 or later
Spectrophotometer CM-700d / CM-600d	1.23 or later
Spectrophotometer CM-5	1.20 or later

- You can check the firmware version of the instrument on the instrument display. For how to check the firmware version, refer to the instruction manual for the instrument.
- If the firmware of the instrument to be connected is older than the above version, you will not be able to connect the instrument. For firmware updates, please contact your nearest KONICA MINOLTA service center.

■ Display Languages

English, Japanese, German, French, Spanish, Italian, Portuguese, Russian, Turkish, Polish, Simplified Chinese, Traditional Chinese, and Korean

- Display language can be changed after installation. See [Setting Display Language on page 131](#).

Installing the Software

■ Downloading SpectraMagic CMS

1. **Download this software from the KONICA MINOLTA website (located at the URL below).**
<https://www.konicaminolta.com/instruments/download/software/color/smcms/index.html>

To download the software, follow the instructions on the KONICA MINOLTA website.

Memo

To download the software, the following is required:

1. Read the End User License Agreement and click the "I Agree" button.
 2. Enter your Personal Information in English and click the "Submit" button.
 3. Check the information you entered and click the "Send" button.
 4. You will receive an email from GlobalCoreSite Administrator <sensing-gc@konicaminolta.com>. Open this email and download the software from the URL provided in the email.
2. **Extract the compressed file you have downloaded to a folder on your computer.**
 - The setup file is included in a *.zip compressed file.

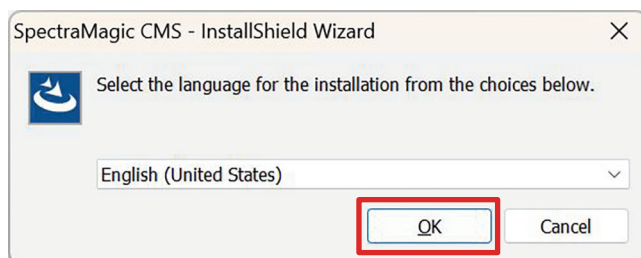
■ Installation Procedure

Install SpectraMagic CMS.

- To install this software, log on to Windows with a user account that has administrator privileges.
- If the instrument is connected to your computer, disconnect it.
- During the installation of the software or each driver, the screen for confirming User Account Control will be displayed several times. When this happens, select [Yes].

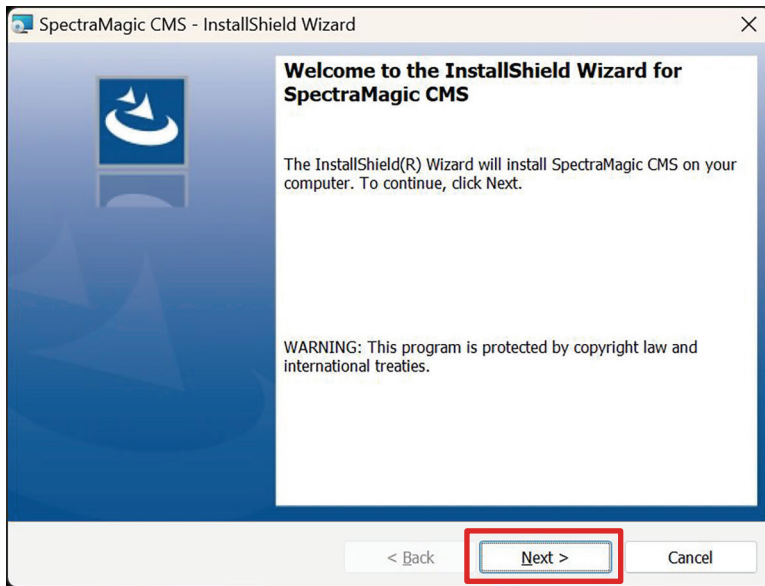
Procedure

1. **Start Windows.**
 - If Windows Update is running, wait until it is finished, restart your computer, and then install SpectraMagic CMS.
2. **Check the setup file.**
 - Confirm the destination folder for the unzipped files.
 - The file name is [setup.exe].
3. **Double-click the setup file.**
 - The installation program will start.
 - It may take several minutes for the setup screen to appear.
4. **The Installer Language Selection screen is displayed. In this screen you can select the language to use during installation.**
 - Select the language you want to use from the drop-down list.

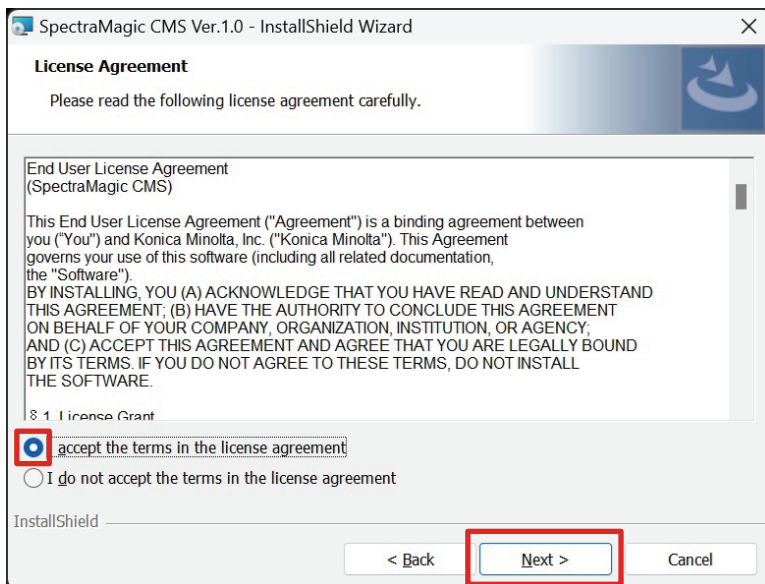


5. **Click the [OK] button.**
 - Depending on your computer environment and other software installed, SpectraMagic CMS installer may determine that Microsoft components (such as .NET 4.5.2 Framework) also need to be installed. In that case, installation of those components will begin.
 - You must agree to the license agreement(s) for the component(s) to be installed.
 - You may need to restart your computer. In that case, restart your computer and follow the above steps from Step 1.

6. Click [Next].

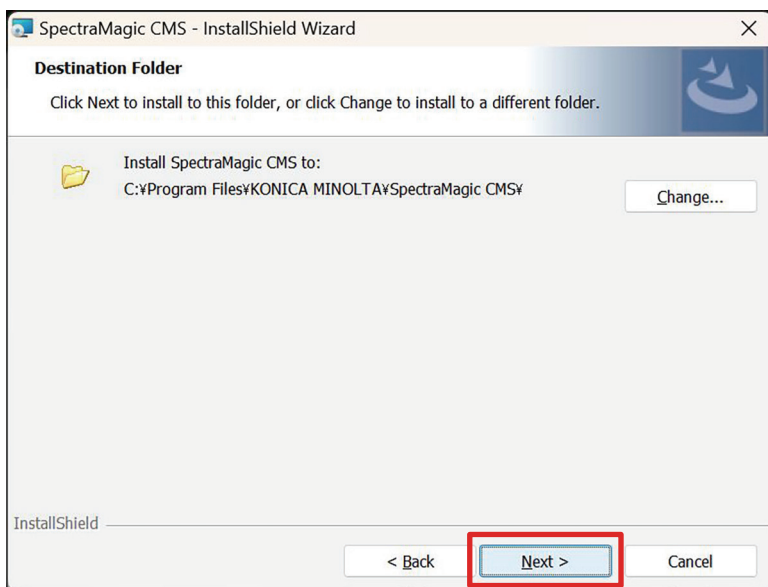


7. Read the License Agreement and, if you agree, select [I accept the terms in the license agreement], and then click [Next].



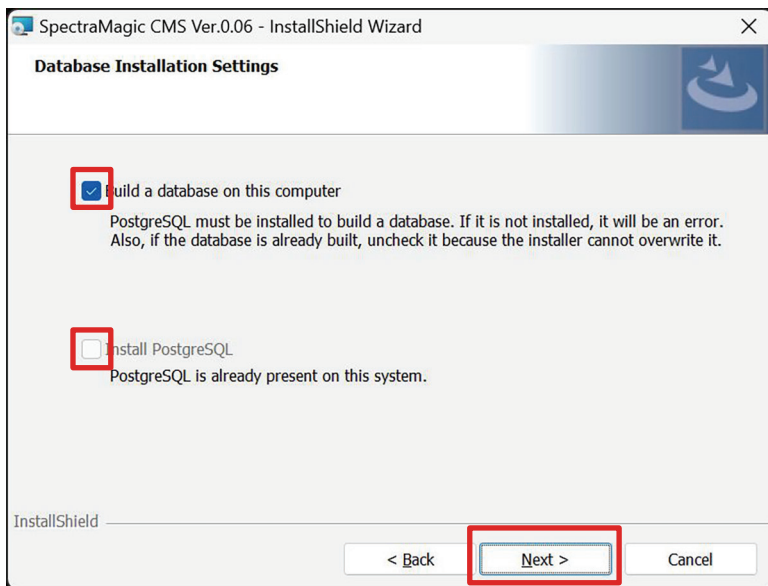
8. The installation program will confirm the destination folder. To install the software in that folder, click [Next].

- To install in a location other than the displayed folder, click the [Change...] button, select or enter a new path, and then click [Next].



9. A dialog asking whether to build a database on this computer and whether to install PostgreSQL will appear. Check or uncheck the appropriate boxes and click [Next].

- If the database to be used already exists on the computer, or if an existing database on a server will be used, uncheck "Build a database on this computer".
- **IMPORTANT:** If a database already exists on the computer from a previous installation, checking "Build a database on this computer" can trigger Error 1722 and cause the installation to fail.
- If PostgreSQL is already installed on the computer, "Install PostgreSQL" will be disabled (grayed out).



10. If "Build a database on this computer" was checked in step 9, a dialog for setting database information will appear, with default values already filled in. Check or fill in the appropriate information and click [Next].

- If a new database will be created, it is recommended to leave these default values unchanged. The default password is "postgres".
- If an existing database will be used, fill in the information for that database.

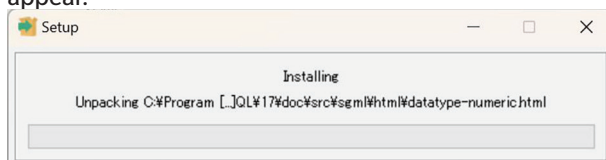
The screenshot shows the 'SpectraMagic CMS - InstallShield Wizard' window. The title bar includes the application name and a close button. The main area has a header 'Fill in the required information to configure the database.' and a blue arrow icon. Below this are several input fields: 'Server Name' (localhost), 'Port' (5432), 'Database Name' (cmsdb), 'Database Administrator User' (postgres), and 'Password' (masked with dots). At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'Next >' button is highlighted with a red rectangle.

11. Click [Install].

- Do not perform any other tasks on your computer until the installation is completed.

The screenshot shows the 'SpectraMagic CMS - InstallShield Wizard' window. The title bar includes the application name and a close button. The main area has a header 'Ready to Install the Program' and a blue arrow icon. Below this is the text 'The wizard is ready to begin installation.' and 'Click Install to begin the installation.' followed by instructions: 'If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.' At the bottom, there are three buttons: '< Back', 'Install', and 'Cancel'. The 'Install' button is highlighted with a red rectangle.

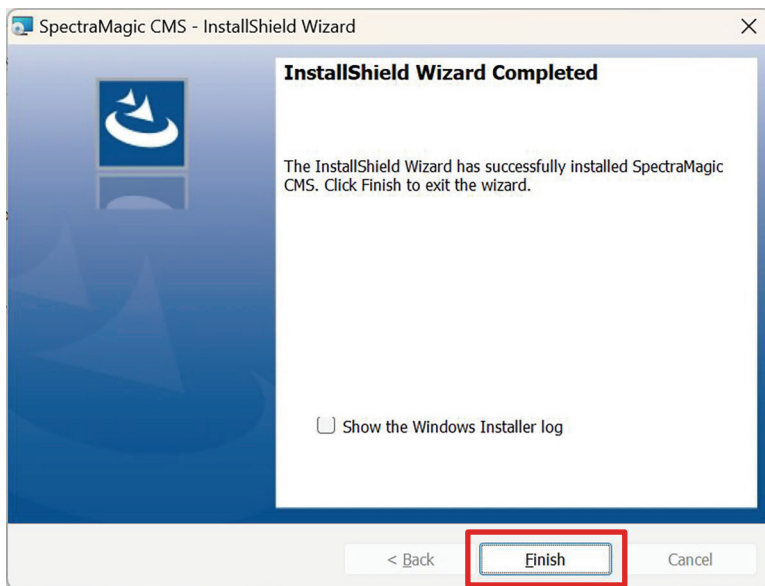
- If "Install PostgreSQL" was selected in step 9, a dialog box showing the progress of PostgreSQL installation will appear.



- A dialog box for driver installation may be displayed during installation. Be sure to install the driver. If driver installation is canceled, SpectraMagic CMS installation will also be canceled.
- If an error message appears and installation could not be performed, check the following:
 - ♦ If PostgreSQL is already installed on the computer, do not install it again. Repeat the above procedure from step 3 and be sure to uncheck "Install postgresQL" in step 9.
 - ♦ If a database with the same name already exists, do not create the database again. Repeat the above procedure from step 3 and be sure to uncheck "Build a database on this computer" in step 9.

- ♦ If connection to the database failed because the database information in step 10 was incorrect, obtain the correct information from your IT department or person responsible for the database. Repeat the above procedure from step 3 and be sure to input the correct information in step 10.

12. Installation is completed. Click [Finish].



- When installation is completed, a shortcut icon for [SpectraMagic CMS] will be displayed on your computer's desktop.
- A shortcut to SpectraMagic CMS will also be added to the Windows Start menu as [KONICA MINOLTA] - [SpectraMagic CMS].

■ Uninstalling the Software

SpectraMagic CMS can be uninstalled using the standard Windows uninstallation method.

Procedure

1. **Right-click the Start button located at the bottom of the screen.**
 - From the menu, click "Installed apps".
2. **Select [SpectraMagic CMS] from the list, then click [Uninstall].**
3. **A confirmation dialog box for uninstalling the application will appear. Click [Yes].**
4. **A dialog box for checking software updates will appear. Follow the instructions on the screen to complete the uninstallation.**

Note

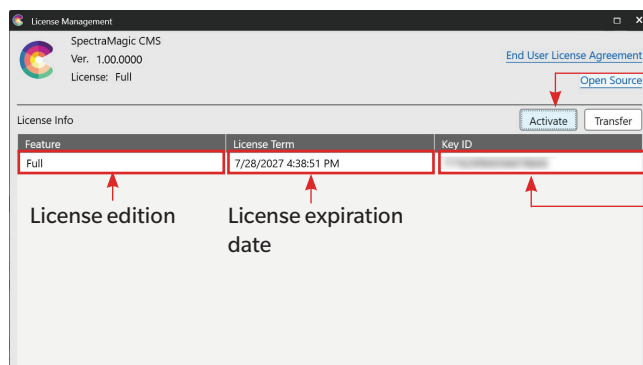
Microsoft components that were installed during the installation of SpectraMagic CMS will not be uninstalled when SpectraMagic CMS is uninstalled. Do not uninstall these Microsoft components, as they may be used by other software.

License

License Management Dialog

The [License Management](#) dialog shows the installed software version, license type, license term (expiration date, if applicable), and license ID.

To open the License Management dialog, select **License - License Management** in the main screen.



Click to start license activation process.

See [Activating the License on page 11](#)

Click to start license transfer process.

See [Transferring the License on page 21](#)

Unique ID for license. Used to identify license when purchasing license upgrade or extension. Key ID can be copied by selecting it and pressing Ctrl+C.

Version Info

Ver.	Shows the version of the currently installed software.
License	Shows whether the license is Full, Standard, or Demo.

Hyperlinks

End User License Agreement	Click the link to show the SpectraMagic CMS End User License Agreement.
Open Source	Click the link to open the folder for viewing the licenses of Open Source Software used by SpectraMagic CMS.

License Info

Shows a table of the installed licenses.

The **Feature** column shows the license edition. The license edition determines the functions available in the software.

License edition	Functions available
Full	Management functions: User management, Colorant library management
	Operation functions: Template management, Target management, Color formulation/correction
Standard	Operation functions: Template management, Target management, Color formulation/correction

The **License Term** column shows the expiration date for each license. For a perpetual license, the license term will be shown as "----".

The **Key ID** column shows the Key ID created for the specified license by the computer at the time the license was installed. This Key ID will continue to be used to identify this license even if the license is transferred to a different computer. This Key ID will also be used when purchasing a license upgrade or extension.

Buttons

[Activate]	Launches the process for activating a new license. See Activating the License on page 11 .
[Transfer]	Launches the process for transferring the license to a different computer. See Transferring the License on page 21 .

■ License Types

The following three types of licenses are available for SpectraMagic CMS:

Perpetual	One-time purchase license with no time limit
Annual	License valid for 1 year from first use. Valid period can be extended by purchasing a license extension.
Demo	License valid for 6 months from first use. Cannot be extended.

■ License Formats

There are two main license formats as described below. If the license is a dongleless license or is an annual dongle license, the license must be activated online.

- License activation is not required for perpetual dongle licenses or demo dongle licenses.

Dongle license

With a dongle license, the license is stored in the dongle, which must be plugged into the computer when using SpectraMagic CMS. Since the license is stored in the dongle, the license can be activated on any computer connected to the internet, and they can be used on different computers that have SpectraMagic CMS installed by just plugging the dongle into the computer when SpectraMagic CMS is being used on that computer.

Note

When using a dongle license on a computer not connected to the internet

To use a dongle license on a computer not connected to the internet, activate the license by following the procedure below. Once activated, a valid dongle license can be used on any computer which it is plugged into, regardless of whether or not the computer is connected to the internet.

	PC A: PC connected to internet	PC B: PC where SpectraMagic CMS will be used
1.	Plug dongle into computer.	Install SpectraMagic CMS.
2.	Install SpectraMagic CMS.	
3.	Follow the procedure on p. 9 for initial license activation or the procedure on p. 25 for activation of a license extension.	
4.	Unplug license-activated dongle from computer.	Plug license-activated dongle into computer.
5.		Start SpectraMagic CMS.

Dongleless license

With a dongleless license, the license is locked to the computer on which the license was activated. Therefore, activation of the license must be performed on the computer on which the license will be used.

To use the license on a different computer, it is necessary to transfer the license from the current computer to the other computer according to the procedure in [Transferring the License on page 21](#).

Note

Important Note Regarding Dongleless (Electronic) Licenses

Dongleless (electronic) licenses are written to the computer on which they are installed and activated. When moving SpectraMagic CMS to a different computer (such as when replacing the computer with a new one), be sure to transfer the license to the new computer before uninstalling SpectraMagic CMS from the old computer. See [Transferring the License on page 21](#). If there are problems, contact your Konica Minolta salesperson or dealer.

■ Activating the License

Note

The following is required to activate your license.

- A computer connected to the internet.

A product key is required for:

- Initial activation of a dongleless license
- Activation of a license extension.

Product key:

KONICA MINOLTA sales office or the distributor from whom you purchased the software will send you the product key by email or other means at the time of purchase.

□ Initial license activation

Initial activation of a dongle license

- License activation is not required for perpetual dongle licenses or demo dongle licenses.
- Plug the dongle into the computer before performing the procedure below.
- The computer must be connected to the internet to activate the license.
- To activate a license extension, see [Activation of a license extension on page 19](#).

Procedure

1. Start the software.

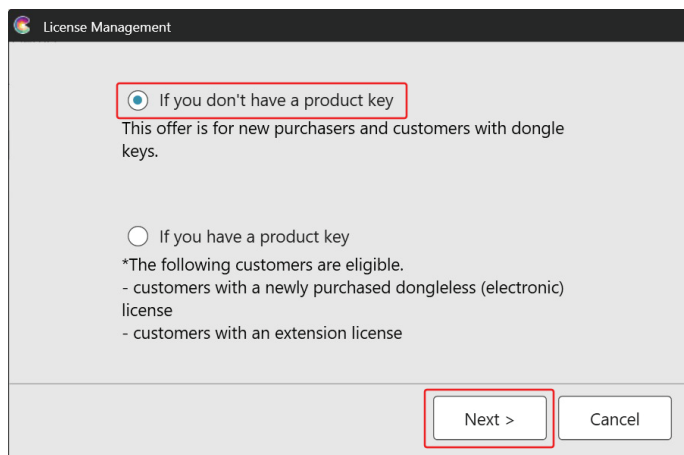
- Double-click the [SpectraMagic CMS] shortcut icon on your desktop or select [SpectraMagic CMS] in the [KONICA MINOLTA] folder in the Windows Start menu.

2. If the license has not been activated, the dialog stating "No valid license was found." will appear. Click [OK].

3. The License Management screen will appear. Click [Activate].



4. The License Management selector dialog will appear. Click on "If you don't have a product key" to select it and then click [Next >].



5. The dialog for registering your user information will appear. Fill in your information and click [Next].

- Items marked with a red * (E-mail1, First name1, Last name1, Company name, Area, Country) are required.

Please register your user information. (* indicates required fields)

E-mail1 *
First name1 *
Last name1 *
E-mail2
First name2
Last name2
Private ☒
Company name * Konica Minolta

Next > Cancel

Use the scroll bar to move down through the dialog to input all items.

If Private is checked, Company name is not required.

Company name * Konica Minolta
Department
Area * Americas
Country * USA
Zip code
State/Prefecture
City
Street
Telephone

Next > Cancel

Use the scroll bar to move down through the dialog to input all items.

Street
Telephone
Fax
Password

If you are registering for the first time, please leave the password field blank.
If you have previously registered with E-mail1, please enter your password.
[If you would like to reset your password, please click here.](#)

☒ * I agree to the handling of personal information.

Next > Cancel

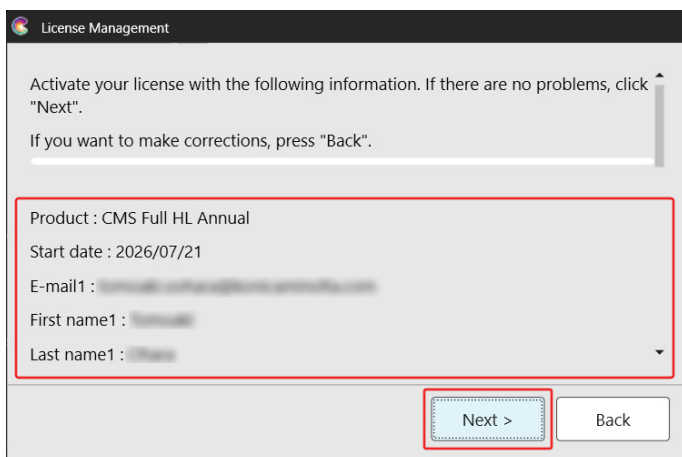
Use the scroll bar to move down through the dialog to input all items.

For Password,

- If you have already registered using the email address input in Email 1, input your password into the Password textbox.
 - ♦ If you have forgotten your password, it can be reset by clicking "If you would like to reset your password, click here".
 - ♦ If you are registering for the first time, leave the Password textbox blank. After registration, you will receive an email from webmaster@selms-mail.konicaminolta.com with instructions on how to log into the License Management System and reset your password.
- Check the checkbox next to "I agree to the handling of personal information." to agree to Konica Minolta's policy regarding the handling of personal information.
- To view Konica Minolta's policy regarding the handling of personal information, click on "I agree to the handling of personal information." Your browser will open, showing the policy.
- It is necessary to agree to the handling of personal information in order to register and activate your license.

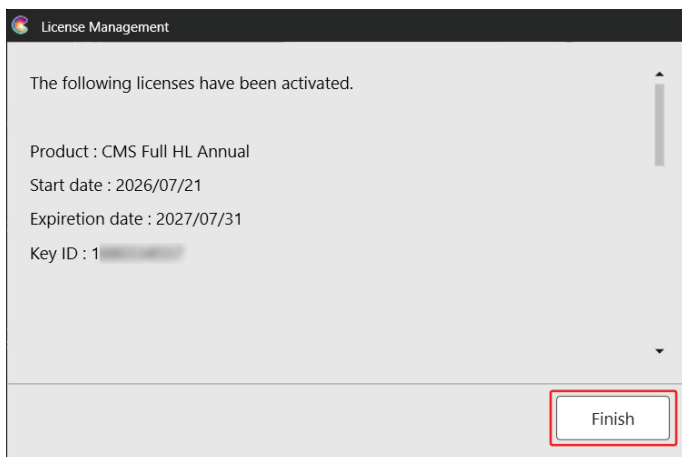
6. The dialog for verifying your information will appear. Scroll through the screen to check the information. If all information is correct, click [Next].

- If corrections are required, click [Back] and make the necessary corrections.



The screenshot shows a 'License Management' dialog box. At the top, it says 'Activate your license with the following information. If there are no problems, click "Next".' Below this, it says 'If you want to make corrections, press "Back".' A scrollable area contains the following information: 'Product : CMS Full HL Annual', 'Start date : 2026/07/21', 'E-mail1 : [redacted]', 'First name1 : [redacted]', and 'Last name1 : [redacted]'. At the bottom right, there are two buttons: 'Next >' and 'Back'. The 'Next >' button is highlighted with a red dashed border.

7. After a few minutes, the dialog confirming that license activation has been completed will appear, showing your license information: Product, Start date (date of first launch of SpectraMagic CMS), Expiration date, and Key ID. Click [Finish] to close the dialog.



The screenshot shows a 'License Management' dialog box. At the top, it says 'The following licenses have been activated.' Below this, it displays the following information: 'Product : CMS Full HL Annual', 'Start date : 2026/07/21', 'Expiration date : 2027/07/31', and 'Key ID : 1 [redacted]'. At the bottom right, there is a button labeled 'Finish', which is highlighted with a red dashed border.

Initial activation of a dongleless license

- Activation of a dongleless license must be performed on the computer on which it will be used.
- The computer must be connected to the internet to activate the license.
- To activate a license extension, see [Activation of a license extension on page 19](#).

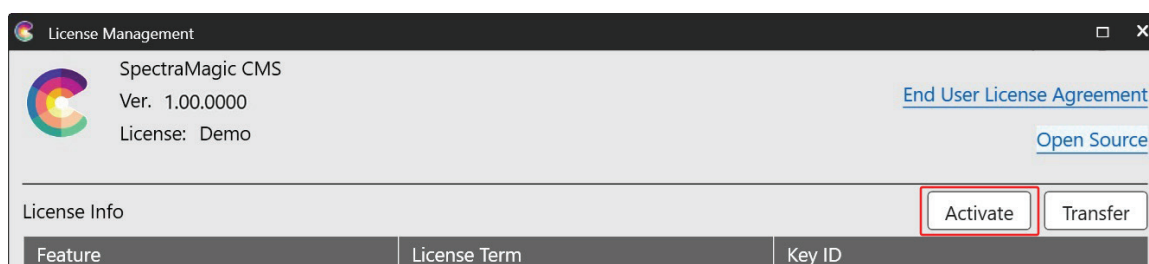
Procedure

1. Start the software.

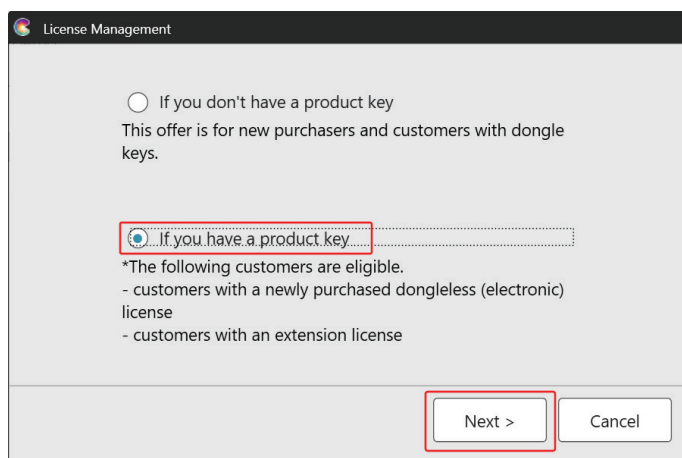
- Double-click the [SpectraMagic CMS] shortcut icon on your desktop, or select [SpectraMagic CMS] in the [KONICA MINOLTA] folder in the Windows Start menu.

2. If the license has not been activated, the dialog stating "No valid license was found." will appear. Click [OK].

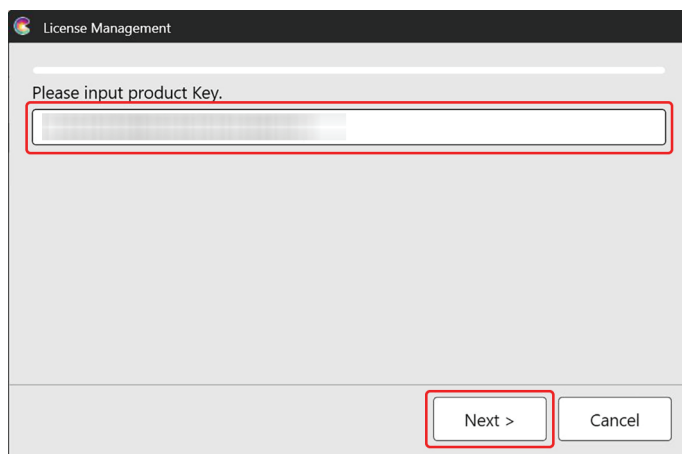
3. The License Management screen will appear. Click [Activate].



4. The License Management selector dialog will appear. Click on "If you have a product key" to select it and then click [Next >].

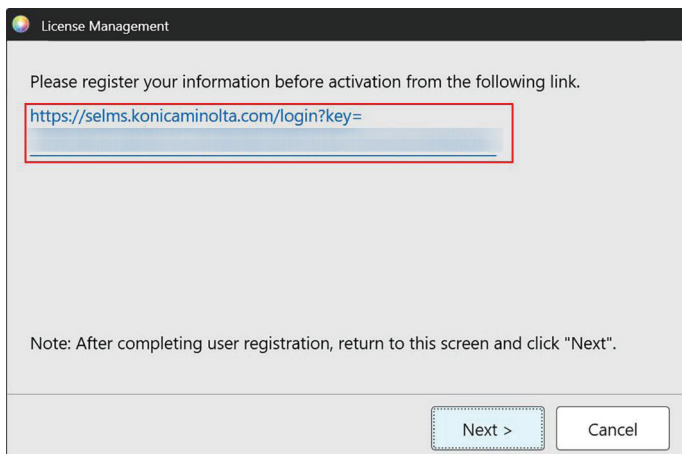


5. The dialog requesting your Product Key will appear. Fill in your Product Key and click [Next].



6. If you have not yet registered your information on the license server, a link to register your information will be shown. Click on the user registration link. Your browser will open to the Konica Minolta License Server User Registration page.

- If you have already registered your information, proceed to [step 13 on page 17](#).



The screenshot shows a window titled "License Management". Inside, it says "Please register your information before activation from the following link." Below this is a text box containing the URL <https://selms.konicaminolta.com/login?key=>, which is highlighted with a red rectangle. At the bottom, there is a note: "Note: After completing user registration, return to this screen and click 'Next'." and two buttons: "Next >" and "Cancel".

7. Check that the license information shown in the upper part of the screen matches your order. If it matches your order, click on "This matches to the items of the order" to put a check in the checkbox.

- If the information does not match your order, contact the salesperson from whom you purchased the software.

User information & license confirmation

Step1	Step2	Step3
User Information & license confirmation	Confirmation of the changes	The user registration has been completed.

Confirmation of the registered license

The license is registered as shown below. If OK, please check the checkbox.

Product Code	SpectraMagic CMS
Product Name	CMS Demo License
Number of activations	1
Quantity	1
Product Composition	Base

☒ This matches to the items of the order.

8. Fill in your information in the lower part of the screen. Items marked [Required] (E-mail1, First name1, Last name1, Company name, Country/Area) must be filled in.

- If Private is checked, Company name is not required.

End-user information

The registration of User information is required for activation and to login user page. Please complete below. Also, if your information was changed, please correct it.

[Required] E-mail1	
[Required] First name1	
[Required] Last name1	
E-mail2	
First name2	
Last name2	
End-user type	☐ Private
Telephone	
Fax	
[Required] Company name	
Department	
Address	Street
	City
	State/Prefecture
	Zip code
[Required] Country/Area	Japan

9. If you agree with the site's privacy policy, click on the checkbox next to "I agree about the handling of personal information" to put a check in the checkbox and click [Confirmation and registration].

- To see the privacy policy for this website, click on "I agree about the handling of personal information". A separate window showing the privacy policy will open.
- You must agree with the privacy policy in order to complete the registration process.

[Required] Country/Area	Japan
☒ I agree about the handling of personal information.	
Confirmation and registration	Close

10. Check that all of the information is correct. If it is, input the password you would like to use in the "Password" textbox and input it again in the "Please enter the same password." textbox to reconfirm it, and then click [Registration].

- If the information needs to be changed, click [Back] and repeat the procedure from step 8 above to correct the information.
- The password you input will be required when updating the software or making any changes to license information. Make sure you remember the password.

Create your account. Please enter your password.

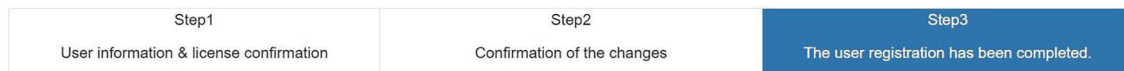
Passwords must be at least 10 characters long and contain uppercase and lowercase letters, numbers, and symbols(_\$@%#&<>*+~:~.).



The form consists of two input fields. The first field is labeled "[Required] Password" and the second is labeled "[Required] Please enter the same password." Both fields contain masked text (dots). Below the fields are two buttons: "Back" and "Registration". The "Registration" button is highlighted with a red box.

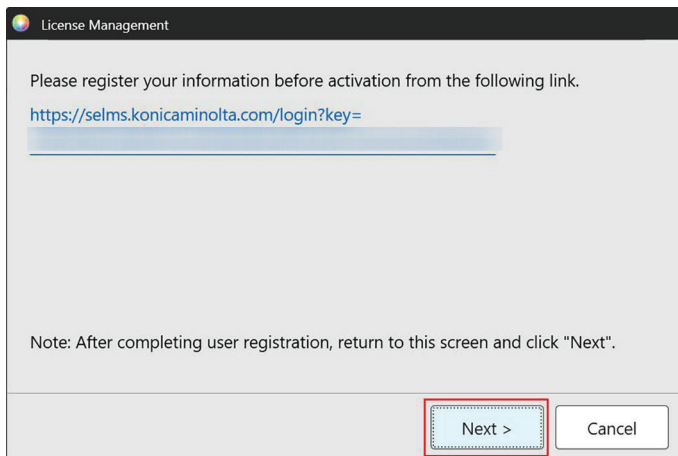
11. When the message "The user registration has been completed." appears in the upper left of the screen, the user registration process is complete and you can close your browser.

The user registration has been completed.



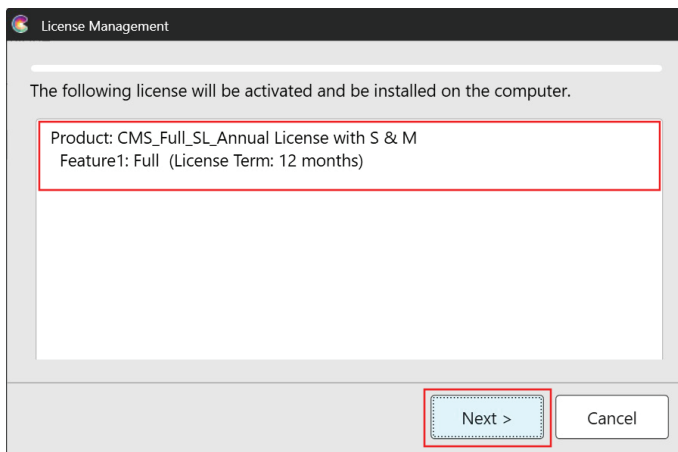
A horizontal progress bar with three steps. Step 1 is "User information & license confirmation", Step 2 is "Confirmation of the changes", and Step 3 is "The user registration has been completed." Step 3 is highlighted in blue.

12. The License Management dialog of step 4 will be shown. Click [Next].



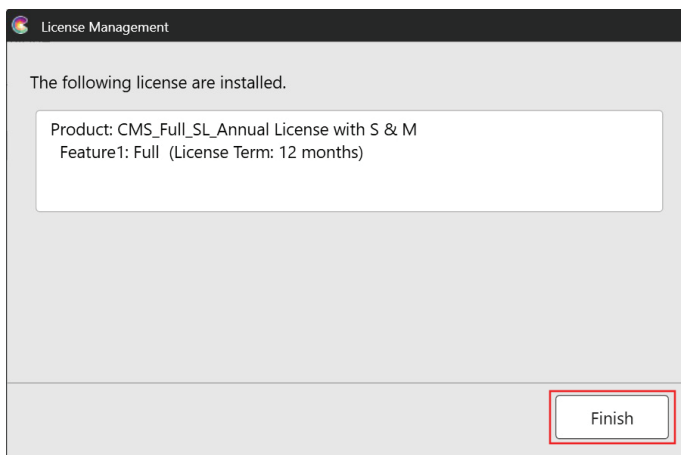
The dialog box has a title bar "License Management". The main text says "Please register your information before activation from the following link." followed by a URL: <https://selms.konicaminolta.com/login?key=>. Below the URL is a note: "Note: After completing user registration, return to this screen and click 'Next'." At the bottom are two buttons: "Next >" and "Cancel". The "Next >" button is highlighted with a red box.

13. Check the license Product, Features, and License Term (expiration date) and click [Next] to install the license.

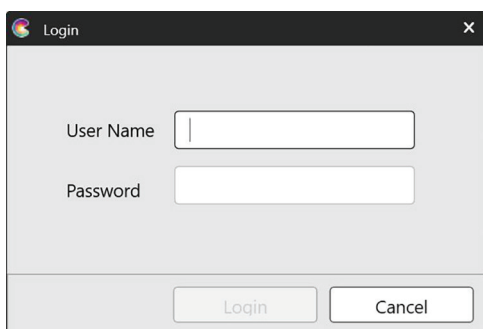


The dialog box has a title bar "License Management". The main text says "The following license will be activated and be installed on the computer." Below this is a box containing the license details: "Product: CMS_Full_SL_Annual License with S & M" and "Feature1: Full (License Term: 12 months)". At the bottom are two buttons: "Next >" and "Cancel". The "Next >" button is highlighted with a red box.

14. After a few minutes, the dialog confirming that license installation and activation has been completed will appear. Click [Finish] to close the dialog.



When the Login dialog appears, input your User Name and Password, and click [Login].



Memo

For details regarding logging in, see [Starting SpectraMagic CMS on page 26](#).

Activation of a license extension

- The computer must be connected to the internet to activate a license extension.

Dongle license extension

- A dongle license extension can be activated on any computer connected to the internet.
- Plug the dongle into the computer before performing the procedure below.

Dongleless license extension

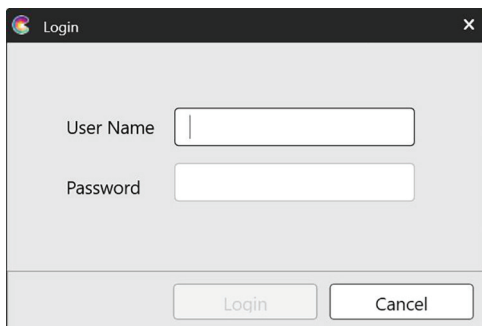
- Activation of a dongleless license extension must be performed on the computer on which it will be used.

Procedure

1. Start the software.

- Double-click the [SpectraMagic CMS] shortcut icon on your desktop, or select [SpectraMagic CMS] in the [KONICA MINOLTA] folder in the Windows Start menu.

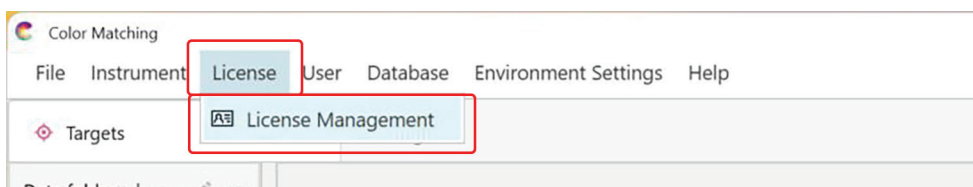
2. When the Login dialog appears, input your User Name and Password, and click [Login].

A screenshot of the 'Login' dialog box. It has a title bar with a close button. Inside, there are two input fields: 'User Name' and 'Password'. Below the fields are two buttons: 'Login' and 'Cancel'.

Memo

For details regarding logging in, see [Starting SpectraMagic CMS on page 26](#).

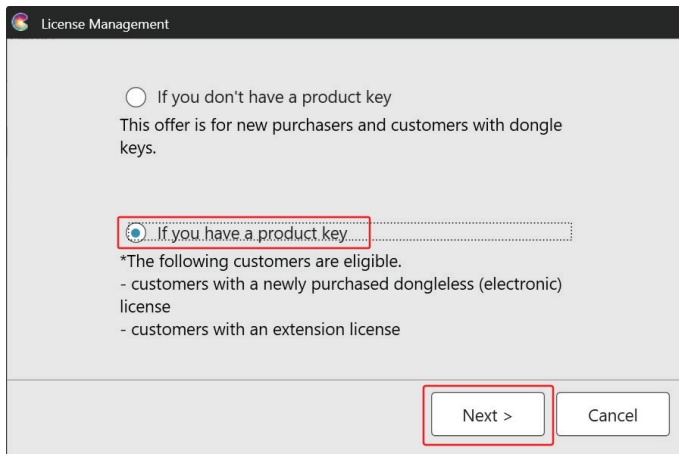
3. In the main screen, select *License - License Management*.



4. The License Management screen will appear. Click [Activate].

A screenshot of the 'License Management' screen. It shows the SpectraMagic CMS logo, version 'Ver. 1.00.0000', and license type 'License: Demo'. There are links for 'End User License Agreement' and 'Open Source'. At the bottom, there is a table with columns 'Feature', 'License Term', and 'Key ID'. The 'Activate' button is highlighted with a red box.

5. The **License Management** selector dialog will appear. Click on “If you have a product key” to select it and then click [Next >].



The dialog box titled "License Management" has a radio button selected for "If you have a product key...". Below this, it lists eligible customers: newly purchased dongleless (electronic) license and extension license. The "Next >" button is highlighted with a red box.

License Management

☐ If you don't have a product key
This offer is for new purchasers and customers with dongle keys.

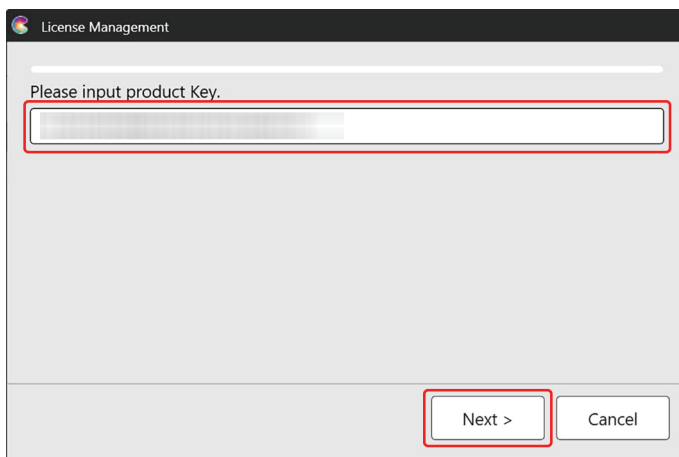
☒ If you have a product key...

*The following customers are eligible.

- customers with a newly purchased dongleless (electronic) license
- customers with an extension license

Next > Cancel

6. The dialog requesting your Product Key will appear. Fill in your Product Key and click [Next].



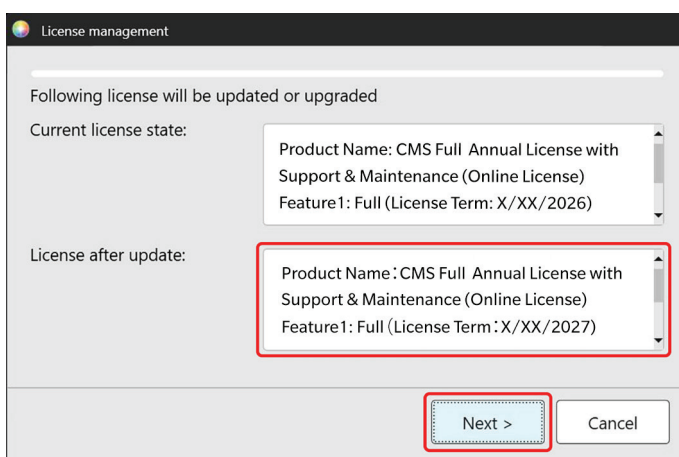
The dialog box titled "License Management" prompts the user to "Please input product Key." with a text input field. The "Next >" button is highlighted with a red box.

License Management

Please input product Key.

Next > Cancel

7. The **Current license state (currently activated license information)** and **License after update (license information after activation of the license extension)** will be shown. Check the **Product, Feature, and License Term (expiration date)** information shown in License after update and click [Next] to install the license extension.



The dialog box titled "License management" displays two sections: "Current license state" and "License after update". The "License after update" section is highlighted with a red box. The "Next >" button is also highlighted with a red box.

License management

Following license will be updated or upgraded

Current license state:

Product Name: CMS Full Annual License with Support & Maintenance (Online License)
Feature1: Full (License Term: X/XX/2026)

License after update:

Product Name: CMS Full Annual License with Support & Maintenance (Online License)
Feature1: Full (License Term: X/XX/2027)

Next > Cancel

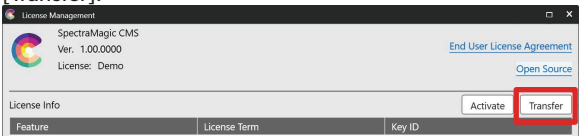
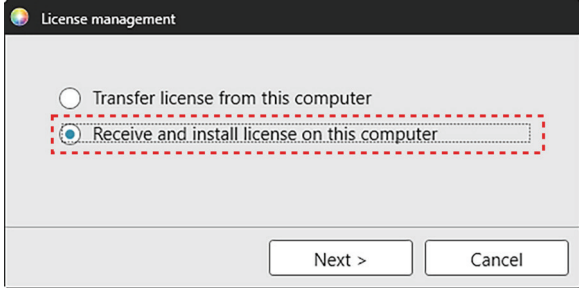
8. After a few seconds, the dialog confirming that license extension activation has been completed will appear. Click [Finish] to close the dialog.

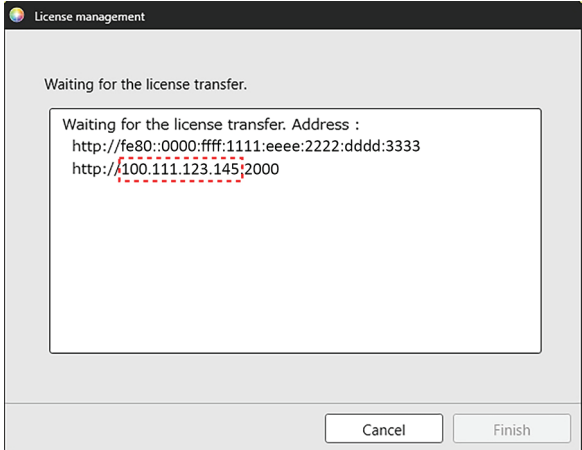
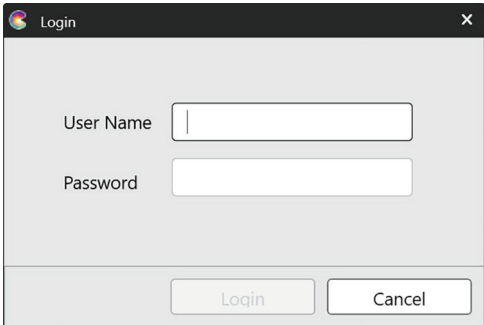
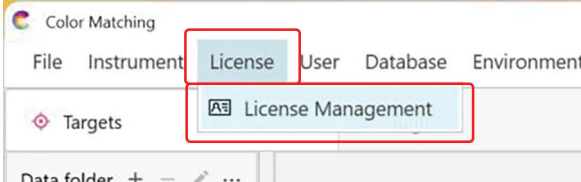
■ Transferring the License

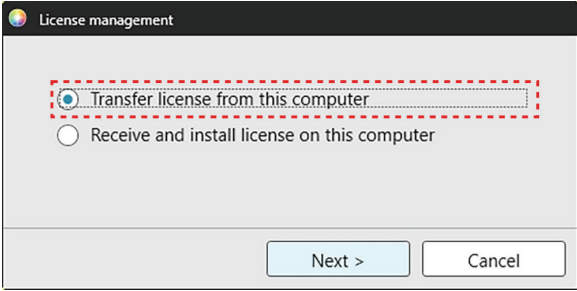
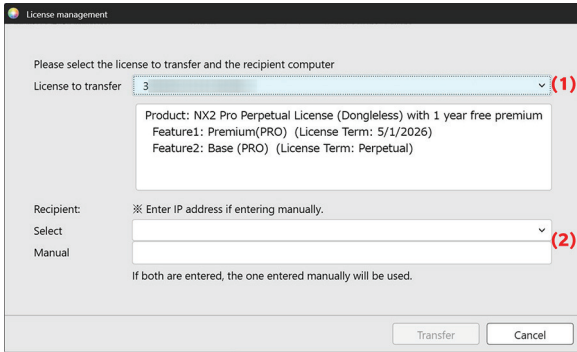
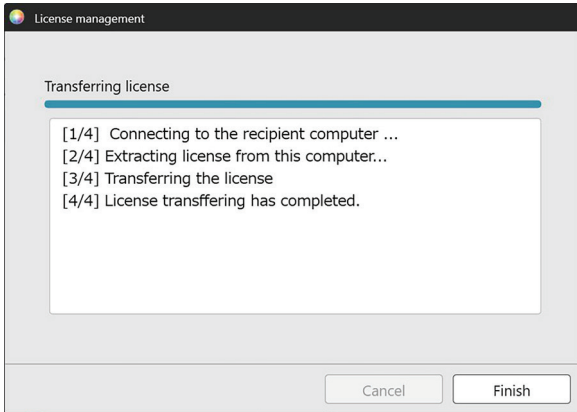
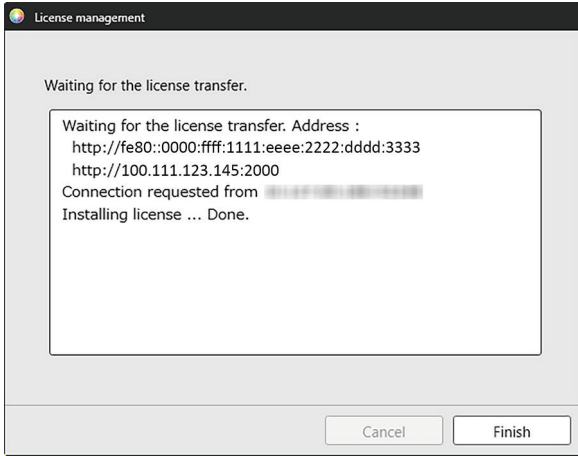
You can transfer your SpectraMagic CMS license from one computer to a different computer when necessary, such as when you buy a new computer.

Note

- To transfer your license, log on to Windows with a user account that has administrator privileges on both the source and destination computers.
- Licenses are transferred over the network. Both the source and destination computers must be on the same network.

Procedure		
	Source Computer	Destination Computer
1		Install SpectraMagic CMS on the destination computer (the computer to which you want to migrate the license).
2		Start SpectraMagic CMS on the destination computer. • If SpectraMagic CMS does not start, launch the license migration tool directly from Explorer. The license migration tool is located in the folder below. C:\Program Files\KONICA MINOLTA\SpectraMagic CMS\LicenseTransfer\KonicaMinolta.Hathor.Apps.SpectraMagic.LicenseTransferTool.exe If the <u>User Account Control</u> dialog box appears and asks whether you want to run the license migration tool, click [Yes] and proceed to Step 6 below.
3		If the license has not been activated, the dialog stating "No valid license was found." will appear. Click [OK].
4		The <u>License Management</u> screen will appear. Click [Transfer].  • If the <u>User Account Control</u> dialog box appears and asks whether you want to run the license migration tool, click [Yes].
5		Select Receive and install license on this computer  and click [Next >].

	Source Computer	Destination Computer
6		The License Management dialog will appear, showing the IP6 and IP4 addresses of the destination computer.  Waiting for the license transfer. Waiting for the license transfer. Address : http://fe80::0000:ffff:1111:eeee:2222:dddd:3333 http://100.111.123.145:2000 Cancel Finish Use the number outlined in red above when inputting the IP address manually in step 13.
7	Start SpectraMagic CMS on the destination computer.	
8	When the <u>Login</u> dialog appears, input your User Name and Password, and click [Login].  Memo For details regarding logging in, see <i>Starting SpectraMagic CMS on page 26</i>.	
9	In the main screen, select License - License Management. 	
10	The License Management screen will appear. Click [Transfer].  If the <u>User Account Control</u> dialog box appears and asks whether you want to run the license migration tool, click [Yes].	

	Source Computer	Destination Computer
11	Select Transfer license from this computer  and click [Next >].	
12	The next License Management dialog will be shown.  (1) Click on the current License to transfer and select the license to transfer from the drop-down list that appears. The information for the selected license will be shown. (2) In Recipient, click on the Select drop-down list and select the destination computer from the list that appears. If the destination computer does not appear in the list, input the IP4 address of the destination computer in the Manual textbox. When filling in the IP4 address manually, input only the xxx.xxx.xxx.xxx portion. exclude the "http://" at the beginning and the port number ":xxxx" at the end (the portion indicated by the red dotted-line frame in step 6). For example, if the dialog shows "http://100.111.123.145:2000", input only "100.111.123.145".	
13	Click [Transfer]. The computer will contact the destination computer and transfer of the license will start. The progress will be shown in the dialog. 	The progress will be shown in the dialog. 
14	When transfer of the license has finished, click [Finish] to close the dialog.	When transfer of the license has finished, click [Finish] to close the dialog.

■ SE-LMS Website Operations

The SE-LMS website is a website for managing your SpectraMagic CMS licenses. On this website, you can check your license information, download your license certificate, reset your SE-LMS password if it is forgotten, or change your SE-LMS website password or registered information.

□ Logging into SE-LMS

Procedure

1. Go to <https://selms.konicaminolta.com/>.
 - The language of the SE-LMS website can be changed by clicking the down triangle next to Select Language in the upper left of the screen and selecting the desired language. The website will then be automatically translated from English into the selected language.
2. Input your registered email address and password, and click [LOGIN]. A list of your licenses will be shown.
 - User information must be registered before you can log onto the SE-LMS website using the above URL. User information can be registered during the license activation process (see [Activating the License on page 11](#)) or by going to the link on your license certificate or in the email from your salesperson notifying you of your license information.
 - If you have forgotten your password, it can be reset by following the procedure in [Resetting forgotten password on page 24](#).
 - If you have registered licenses for several area roles, a list of the area roles will be shown.

□ Resetting forgotten password

If you have forgotten your password, you can reset it by following the procedure below.

Procedure

1. On the SE-LMS login screen, click “Forgot Password” on the right below the Password textbox. A web page requesting your MailAddress (registered email address) will be shown.
2. Input your registered email address and click [SEND]. The SE-LMS system will send an email with a link for resetting your password to your registered email address, and a notification web page will be shown.
3. Open the email and click on the link. The web page for inputting a new password will be shown.
4. Input the same password into both textboxes.
 - Passwords must be at least 10 characters long and contain uppercase and lowercase letters, numbers, and symbols (_\$@%#&<>*+~:|-.+).
5. Click [Reset]. The password will be reset, a notification web page will be shown, and an email notifying you that the password has been reset will be sent from the system to the registered email address.

□ Checking your license information

Procedure

1. When you log into the SE-LMS website, a list of your licenses will be shown.
 - If you have registered licenses for several area roles, a list of the area roles will be shown. Click on the + to the left of a listed Area to show the licenses for that area.
2. Click on the Product key to view the detailed information for that license.
 - To download the license certificate, click [Download Certification] and save the file on your computer.
 - To go back to the list and view the details for a different license, click [Get back to the list].

☐ Changing password

Procedure

After logging onto the SE-LMS website, you can change your password by following the procedures below.

1. Click “PasswordChange” at the upper right of the web page. The Change Password web page will be shown.
2. Input the current password in the OldPassword textbox.
3. Input the new password into the NewPassword and Please enter the same password. textboxes. The same new password should be input into both textboxes.
 - Passwords must be at least 10 characters long and contain uppercase and lowercase letters, numbers, and symbols (_\$@%#&<>*+~:|-.+).
4. Click [Reset]. The password will be reset, a notification web page will be shown, and an email notifying you that the password has been reset will be sent from the system to the registered email address.

☐ User Info Change

Procedure

After logging onto the SE-LMS website, you can change your user information by following the procedures below.

1. Click “User Info Change” at the upper right of the web page. The User information Change web page will be shown.
2. Change the information as desired.
 - It is not possible to change the registered E-mail1 address on this web page. If you need to change the registered E-mail1 address, please contact your salesperson.
3. Click [Confirmation]. A web page to confirm the information changes will be shown. If all changes are correct, click [Registration].
 - To cancel changes, click [Close]. The system will return to the main SE-LMS website page showing the list of licenses.
 - If the changes are incorrect or if additional changes are required, click [Back] to go back to the previous page and repeat step 2.
4. A web page notifying you that the user information changes have been completed will be shown.
 - To return to the main SE-LMS website page showing the list of licenses, click [Go to top].

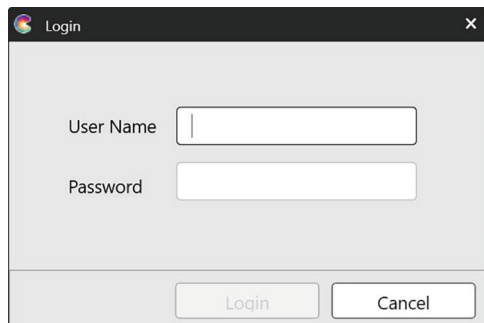
Starting/Exiting SpectraMagic CMS

Starting SpectraMagic CMS

Procedure

1. Double-click the [SpectraMagic CMS] shortcut icon on your desktop, or select [SpectraMagic CMS] in the [KONICA MINOLTA] folder in the Windows Start menu.

The splash screen will appear, and then the Login dialog will appear.

A login dialog box titled "Login" with a close button (X) in the top right corner. It contains two input fields: "User Name" and "Password". Below the fields are two buttons: "Login" and "Cancel".

Note

- If the Database Management dialog appears, set the database connection settings. See [Database Connection Settings on page 32](#).

2. Input your User Name and Password, and click [Login].

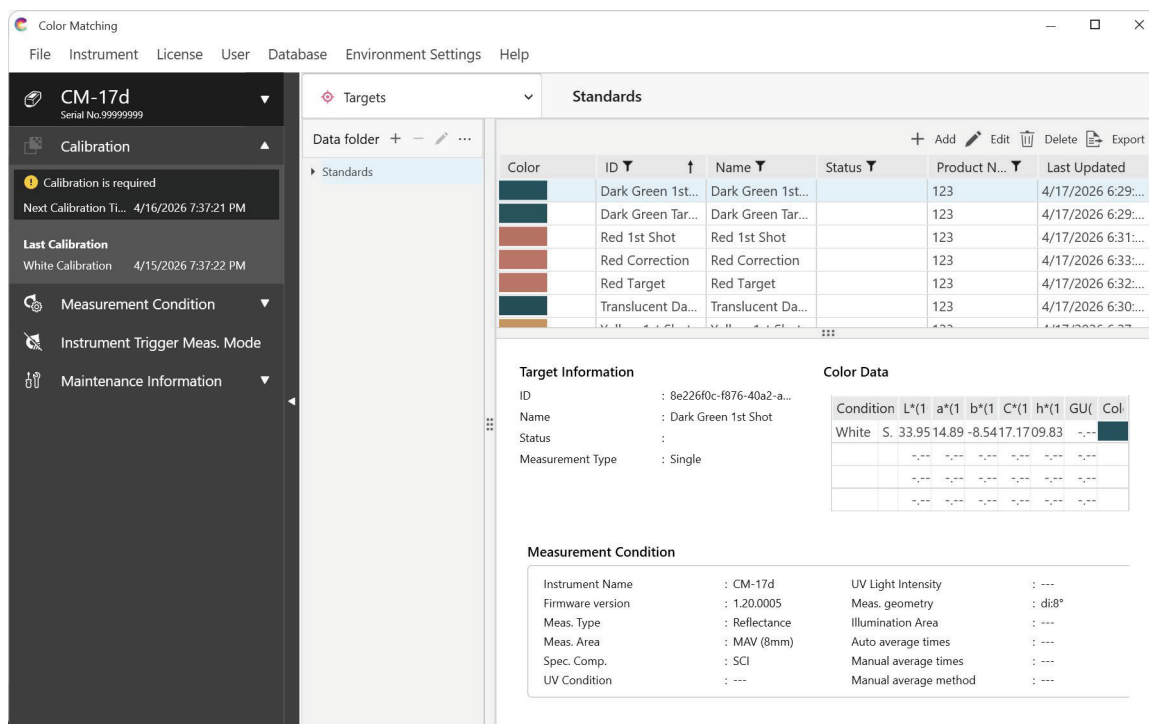
Memo

- The default User Name is "Administrator".
- The default Password is "Administrator".
- If login fails using the default User Name and Password, try the following:
 - Check that the User Name and Password are correct and try logging in again.
 - Contact your system administrator to see if they have changed the login information.

Note

- For security, change the User Name and Password from the initial values. See [Adding a New User on page 50](#). If you do not have the required administrator privileges, contact your system administrator.

3. The SpectraMagic CMS main screen will appear.

The main screen of the SpectraMagic CMS software. It features a menu bar (File, Instrument, License, User, Database, Environment Settings, Help) and a sidebar on the left with sections for "CM-17d" (Serial No. 99999999), "Calibration" (with a warning "Calibration is required" and "Next Calibration Time: 4/16/2026 7:37:21 PM"), "Last Calibration" (White Calibration, 4/15/2026 7:37:22 PM), "Measurement Condition", "Instrument Trigger Meas. Mode", and "Maintenance Information". The main area is divided into "Targets" and "Standards" tabs. The "Standards" tab shows a table of color standards with columns for Color, ID, Name, Status, Product No., and Last Updated. Below this, there are sections for "Target Information" (ID: 8e226f0c-f876-40a2-a..., Name: Dark Green 1st Shot, Status: , Measurement Type: Single) and "Color Data" (Condition: White, L*(1): 33.95, a*(1): 14.89, b*(1): -8.54, C*(1): 17.09, h*(1): 83, GU(1): , Col:). At the bottom, there is a "Measurement Condition" section with fields for Instrument Name (CM-17d), Firmware version (1.20.0005), Meas. Type (Reflectance), Meas. Area (MAV (8mm)), Spec. Comp. (SCI), UV Condition (---), UV Light Intensity (---), Meas. geometry (di8°), Illumination Area (---), Auto average times (---), Manual average times (---), and Manual average method (---).

■ Exiting SpectraMagic CMS

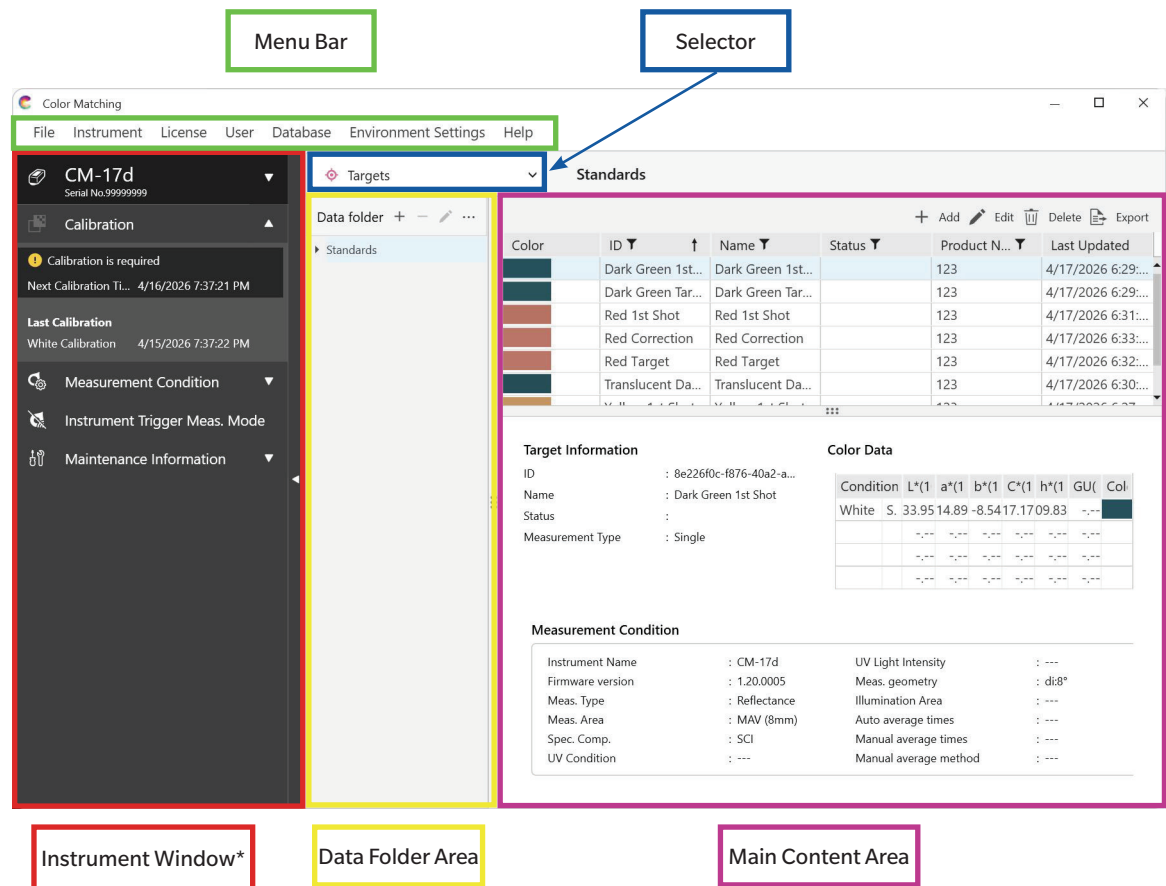
Procedure

To exit SpectraMagic CMS, do any of the following:

- Click the X in the upper right corner of the main screen.
- Select **File - Exit**.
- Press Alt + F4.

Screen Layout

The layout of the main SpectraMagic CMS screen is shown below.



* Instrument Window shown only when an instrument is connected, and it may be collapsed to conserve space.

Menu

File

Exit Exits the software.

Instrument

- Connect (when instrument is not connected) Connects previously connected instrument.
- Disconnect (when instrument is connected) Disconnects currently connected instrument.
- Instrument Communication Settings ... Opens Instrument Communication Settings dialog.
- Measurement Condition ... Opens Measurement Condition dialog.
- Calibration Starts instrument calibration.

License

License Management Opens License Management dialog. See [License on page 9](#).

User

User Management Opens User Management dialog.

Database

Database Management ... Opens Database Management dialog.

Environment Settings

Application Settings ... Opens [Application Settings](#) dialog.

Help

Manual ... Opens instruction manual (this document).
Precise Color Communication ... Opens the Konica Minolta Precise Color Communication website.
Version Information ... Opens [Version Information](#) screen.

■ Selector

Click on the down arrow on the right side to select the function to access:

- Targets
- Substrates
- Formulation
- Colorant Library
- Formulation Templates

■ Instrument Window

The Instrument Window is shown only when an instrument is connected. It shows various information about the currently connected instrument, and also includes icon buttons to perform some operations with the instrument.

Collapsing/Expanding Instrument Window

The Instrument Window size cannot be adjusted.

The Instrument Window can be collapsed to show only the icon buttons by clicking on . Even when the Instrument Window is collapsed, operations can be performed by clicking on the respective icon button.

When collapsed, the Instrument Window can be expanded by clicking on .

□ Instrument Window Sections

Some sections of the Instrument Window can be expanded by clicking  at the right of the section name, and expanded sections can be collapsed by clicking  at the right of the section name.

Title bar

The Instrument Window title bar shows the name and serial number of the connected instrument when collapsed, and when expanded, also shows the instrument firmware version and instrument model name. Click  to expand, and click  to collapse.



Calibration

The Calibration section is normally shown expanded, showing the most recent date and time for each type of calibration.

Clicking the section name or icon will start the calibration procedure. See [Instrument Calibration on page 69](#).

- If calibration has not yet been performed at the current measurement conditions, the calibration icon will blink.



Measurement Condition

Clicking Measurement Condition or the icon will open the Measurement Condition dialog. See [Setting Measurement Conditions on page 63](#).

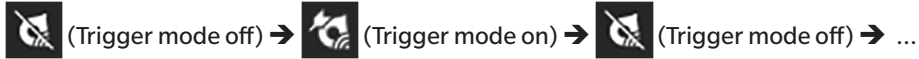
Clicking  to the right of Measurement Condition will expand the section to show the currently set measurement conditions.

- The settings shown will depend on the instrument.



Instrument Trigger Meas. Mode

Shows whether instrument trigger measurement mode is enabled or disabled. When enabled, measurements can be taken by pressing the instrument's measuring button. Clicking Instrument Trigger Meas. Mode switches the setting between enabled and disabled as shown below:



Maintenance Information

Clicking  will expand the section to show maintenance information, such as the date of the most recent annual calibration by a Konica Minolta authorized service facility, etc.

■ Data Folder Area

Shows the folder structure for the currently selected function. Folders can be added or deleted and access rights to each folder can be set.

- Other options may be available depending on the selected function.

■ Main Content Area

This area shows the data items stored in the currently selected folder for the current function. Operations for each function are started from this area.

Database Management

■ Database

SpectraMagic CMS uses a database to store and manage data.

Two database configurations are available:

Local Database:

This configuration uses a database built on the computer where the software is installed.

Server Database:

By creating a database on a server and configuring the necessary settings, the identical database can be shared across multiple computers simultaneously.

Memo

- A local database is automatically created when the "Build a database on this computer" checkbox is checked during the software installation.
- This software supports on-premise server configurations. Cloud computing environments are not supported.

□ Create a New Database on a Server

Creating a database on a server enables database sharing among multiple computers.

Required Condition: PostgreSQL 15 or later must be installed on the server to be used.

Note

- A separate software license must be purchased for each connected computer. Each computer must have the software installed and the license must be activated.
- The installation, configuration, and administration of PostgreSQL are solely the customer's responsibility. Please ensure that PostgreSQL is properly set up before proceeding.

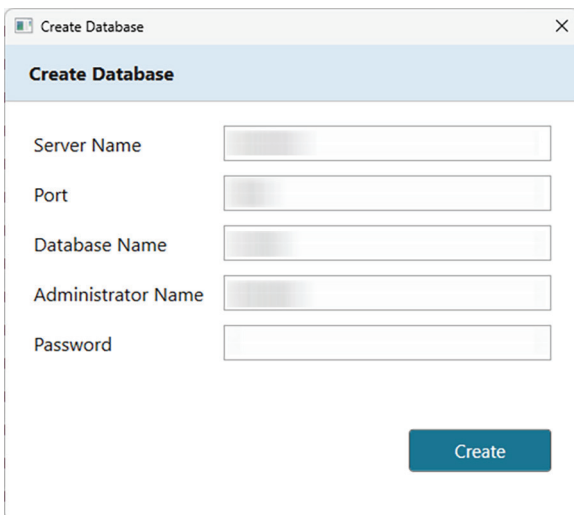
1. **Log in to the computer on which SpectraMagic CMS is installed.**

2. **Browse to the folder in which SpectraMagic CMS is installed.**

Memo

If the default installation path was left unchanged during installation, the installation folder will be:
C:\Program Files\KONICA MINOLTA\SpectraMagic CMS\.

3. **Open the \CreateDB subfolder and double-click on CreateDB.exe. The Create Database dialog will appear.**



4. **Fill in all fields:**

Server Name	Host name or IP address of the server.
Port	Port number of the database

<u>Database Name</u>	The desired name of the database to be created Maximum Length: 60 characters. Usable characters: The following single-byte characters -Letters (a-z, A-Z) -Numbers (0-9) -Underscore (_) Prohibited Characters: Spaces, double-byte (full-width) characters and special characters except underscore.
<u>Administrator Name</u>	The user name of the database administrator Usable characters: The following single-byte characters -Letters (a-z, A-Z) -Numbers (0-9) -Symbols and space Prohibited characters: Double-byte (full-width) characters
<u>Password</u>	The password required for database users to connect to this database. Usable characters: The following single-byte characters -Letters (a-z, A-Z) -Numbers (0-9) -Symbols and space Prohibited Characters: Double-byte (full-width) characters.

5. Click [Create]. The database will be created.

Memo

To connect to the database, fill in the information used in step 4 as the database connection settings in SpectraMagic CMS. See [Database Connection Settings on page 32](#).

☐ Database Connection Settings

To use SpectraMagic CMS, database connection settings are required as initial setup. After the initial setup, the connected database can be changed or switched as needed by changing the configuration settings.

Procedure

1. Start SpectraMagic CMS.

- If no database connection settings have been performed or when connection to a previously specified database cannot be achieved, the following dialog requesting database connection settings will appear:

Continue with step 4.

2. Select Database - Database Management ...

3. The Database Management dialog will appear, with the Connection Settings category selected on the left side.

The screenshot shows the 'Database Management' dialog box. On the left, the 'Connection Settings' category is selected. The 'Specify By File' radio button is selected. The 'Manual' radio button is also selected. The 'Connection Type' is set to 'Server'. The 'Database Access Settings' section shows fields for Server Name (XXXX), Port (XXXX), Database Name (XXXX), Administrator Name (XXXXXXXX), and Password (XXXXXX). Buttons for 'Connect', 'Export to File', 'OK', 'Cancel', and 'Apply' are visible.

4. Perform connection settings.

Specifying connection settings using a file

If a file with .keyfile extension containing the database connection settings has been provided by your database administrator or system representative and instructions are given to use that file for database connection settings.

The screenshot shows the 'Database Management' dialog box. On the left, the 'Connection Settings' category is selected. The 'Specify By File' radio button is selected. The 'Browse' button is highlighted with a red box. The 'Connection Type' is set to 'Server'. The 'Database Access Settings' section shows fields for Server Name (10.127.66.150), Port (5432), Database Name (ccmdb_hinshe), Administrator Name (postgres), and Password (XXXXXX). Buttons for 'Connect', 'Export to File', 'OK', 'Cancel', and 'Apply' are visible.

4-1. Select Specify By File.

4-2. Click [Browse]. The Open dialog will appear.

4-3. Browse to the received keyfile and click [Open] to open the file. The connection settings will be loaded from the file.

Specifying connection settings manually

If no keyfile is available, obtain the connection setting values from your database administrator or system representative and perform the settings manually.

To use the local database:

The screenshot shows the 'Database Management' window with the 'Connection Settings' tab selected. The 'Specify By File' option is unselected, and the 'Manual' option is selected. Under 'Connection Type', 'Local (this PC)' is selected and highlighted with a red box labeled '4-1'. The 'Server Name' field contains 'localhost' and the 'Port' field contains '5432'. Under 'Database Access Settings', the 'Database Name', 'Administrator Name', and 'Password' fields are highlighted with a red box labeled '4-2'. The 'Password' field contains a series of dots. At the bottom, there are 'Connect', 'Export to File', 'OK', 'Cancel', and 'Apply' buttons.

4-1. In Connection Type, select Local (this PC).

4-2. In Database Access Settings, enter the following values if the local database created during installation will be used:

Database Name	cmsdb
Administrator Name	postgres
Password	postgres

Note

- The above settings are the default settings after software installation. If the Database Name, Administrator Name, etc. has been changed, input the changed information in step 4-2.

To use a database created on a server:

Obtain the following information from your organization's database administrator or system representatives: Server Name, Port, Database Name, Administrator Name and Password

The screenshot shows the 'Database Management' window with the 'Connection Settings' tab selected. The 'Specify By File' option is unselected, and the 'Manual' option is selected. Under 'Connection Type', 'Server' is selected and highlighted with a red box labeled '4-1'. The 'Server Name' and 'Port' fields are highlighted with a red box labeled '4-2'. Under 'Database Access Settings', the 'Database Name', 'Administrator Name', and 'Password' fields are highlighted with a red box labeled '4-3'. The 'Password' field contains a series of dots. At the bottom, there are 'Connect', 'Export to File', 'OK', 'Cancel', and 'Apply' buttons.

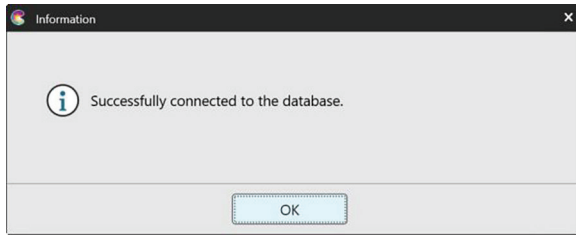
4-1. In Connection Type, select Server.

4-2. Enter the Port and then the Server Name.

4-3. In Database Access Settings, enter the Database Name, Administrator Name and Password.

5. Click [Connect]. The software attempts to connect to the database using the specified settings.

6. A message box will appear stating that connection was successful. Click [OK] to close the message box and return to the Database Management dialog.



7. Click [Apply]. The setting changes will be applied.
8. Click [OK] to close the Database Management dialog.

Note

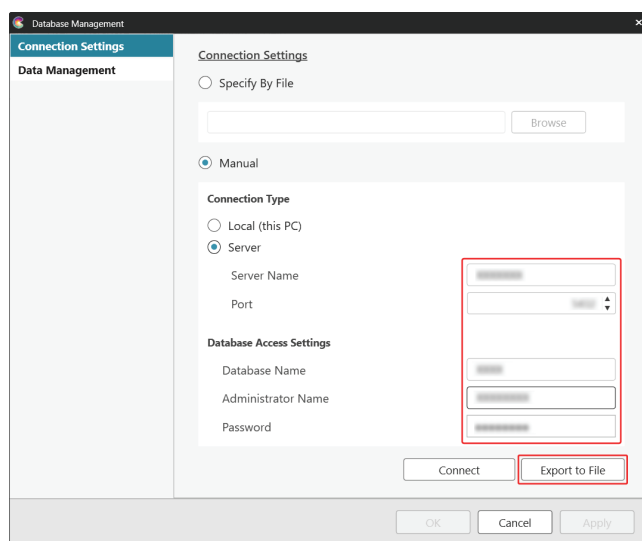
- Changes to these settings will not take effect until the software is restarted.

Exporting Database Connection Settings

The database connection settings can be exported to a file with .keyfile extension. This file can then be loaded to perform the settings without having to manually configure database connection settings. For example, database creators can export and share the .keyfile with other database users, who can then use the file to configure their database connection settings.

Procedure

1. **Start SpectraMagic CMS.**
2. **Select *Database - Database Management ...***
3. **The Database Management dialog will appear, with the Connection Settings category selected on the left side.**



4. **Confirm that all fields contain the information to be exported.**
5. **Click the [Export to File] button. The Save As dialog will appear.**
6. **Input the desired file name and click [Save]. The database connection settings will be saved as a file with the .keyfile extension.**

□ Backing Up a Database

A backup of the current database can be created.

Note

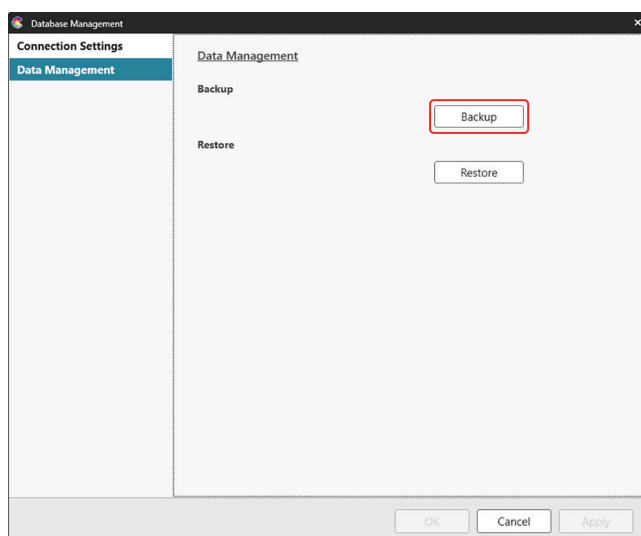
- Backups must be executed manually. Automatic backups are not supported.
- Perform database backups regularly.
- The destination folder must be specified for each backup. It is strongly recommended to store backups on a different storage device and network destination, separate from the computer or server where the active database is saved.
- Only full database backups are possible. Partial database backups are not available.
- It is highly recommended to keep multiple generations of backups, not just the latest backup.
- Access to backups must be restricted to authorized administrators only.

IMPORTANT:

- Postgres Version Requirement: Database restore may fail if the PostgreSQL version used when the backup was created is newer than the PostgreSQL version used during the restore process. Please ensure that the PostgreSQL version used for data restore is the same as or newer than the version used when the backup was created.
- If multiple PostgreSQL versions are installed on the same computer, backup and restore operations may fail.
- In a local database environment, install only PostgreSQL versions supported by this software. Installing unsupported or additional PostgreSQL versions may cause backup and restore failures.
- In a server database environment, install the same PostgreSQL version on the backup/restore computer as that used on the database server.

Procedure

1. **Start SpectraMagic CMS.**
2. **Select *Database - Database Management ...* .**
3. **The Database Management dialog will appear.**
4. **Select the Data Management category on the left side of the dialog. The dialog will change to the Data Management category.**



5. **Click [Backup]. The Save As dialog will appear**
6. **Select the destination folder for the backup file.**
7. **Enter a file name and click [Save].**
8. **Click [Cancel].**

Note

- After completion, always ensure that the backup file has been properly saved in the specified destination.

□ Restoring a Database

A previously saved database backup file can be used to restore the database.

Note

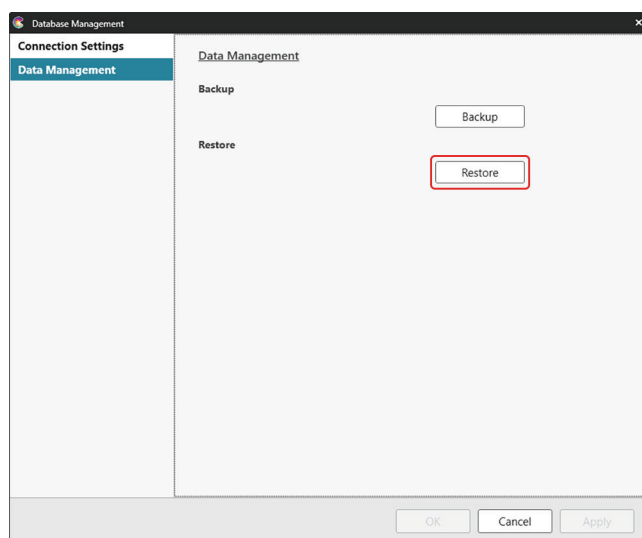
- Connection to the database is required.
- **Restore Type:** Only overwrite restore operation is possible.

IMPORTANT:

- The restore process will overwrite all data of the currently connected database. Before proceeding, ensure that a backup of the database is available or that the loss of current data is acceptable.
- Postgres Version Requirement: Database restore may fail if the PostgreSQL version used when the backup was created is newer than the PostgreSQL version used during the restore process. Please ensure that the PostgreSQL version used for data restore is the same as or newer than the version used when the backup was created.

Procedure

1. **Start SpectraMagic CMS.**
2. **Select *Database - Database Management ...***
3. **The Database Management dialog will appear.**
4. **Select the Data Management category on the left side of the dialog. The dialog will change to the Data Management category.**



5. **Click [Restore]. The Open dialog will appear.**
6. **Browse to the backup file to restore and click [Open].**
7. **Click [Cancel].**

□ Deleting a Database

The current database can be deleted.

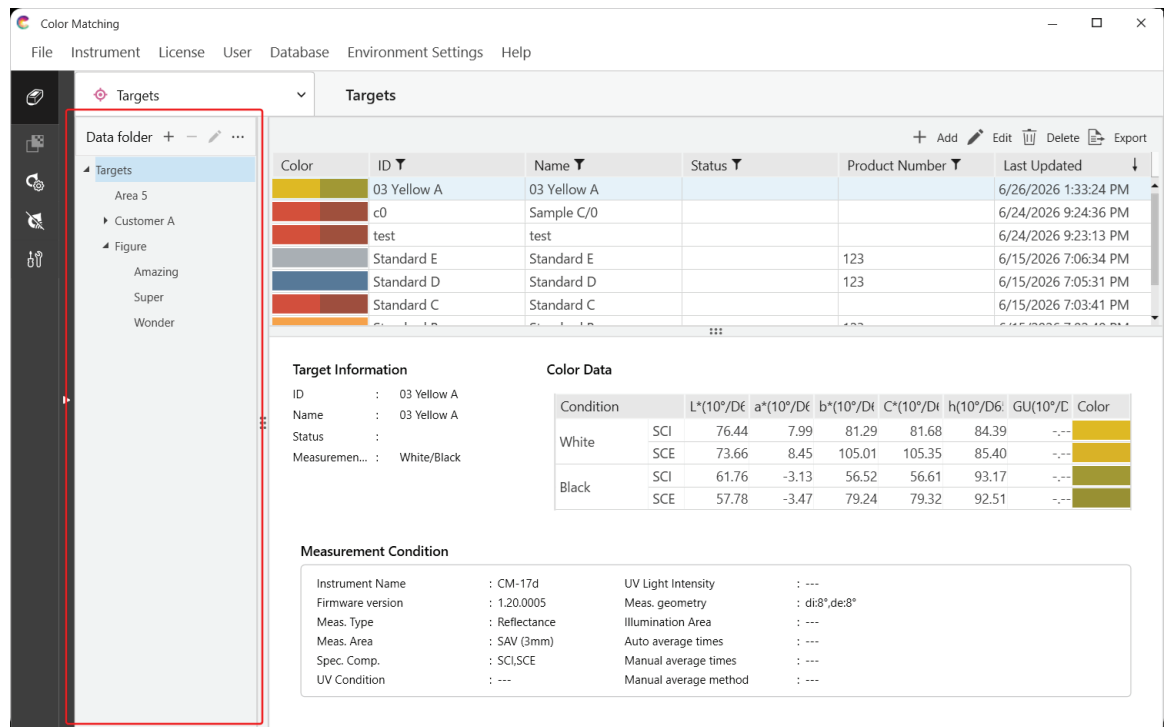
Procedure

1. **Log in to the computer on which SpectraMagic CMS is installed.**
2. **Browse to the folder in which SpectraMagic CMS is installed.**
Memo
If the default installation path was left unchanged during installation, the installation folder will be:
C:\Program Files\KONICA MINOLTA\SpectraMagic CMS\
3. **Double-click on DeleteDB.exe. The Delete Database dialog will appear.**

Data Management

Data Folder

Data stored in SpectraMagic CMS is managed within data folders in the configured database. The data folders can be accessed from the Data folder area.



Note

- When the screen is switched using the selector, only the root folder is displayed in the data folder area. To access subfolders, click the ► icon to the left of the folder.

Data Folder Structure

SpectraMagic CMS provides five default root folders. The root folders have the same names as the five functions that are accessed using the selector in the upper left of the main screen.

Note

- These root folders are fixed. They cannot be renamed or deleted.
- Subfolders can be created in a tree structure under these root folders.
- Data can be saved in a subfolder or directly in the root folder.

Accessing Data in a Folder

Procedure

- Click the selector dropdown arrow located at the top of the screen and select the desired function name.
- Select the desired folder in the Data folder area. The selected folder background will turn light blue.
- The data list for that folder will be displayed in the main content area to the right of the Data folder area.

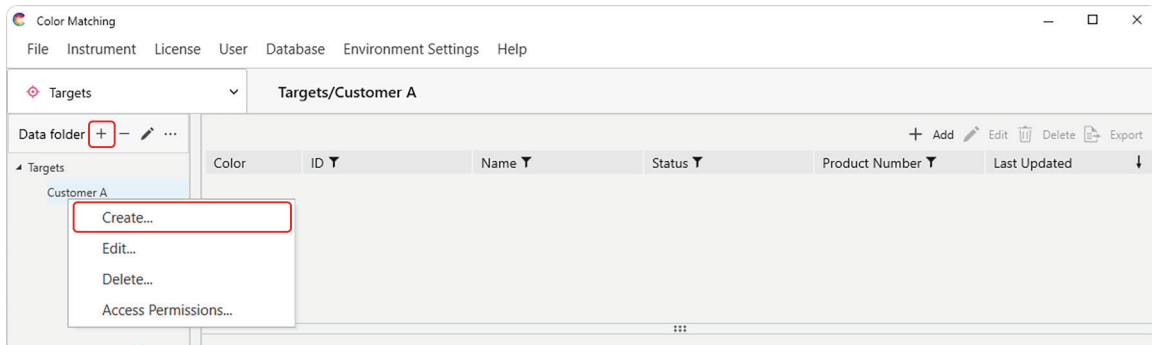
Creating a New Folder

Note

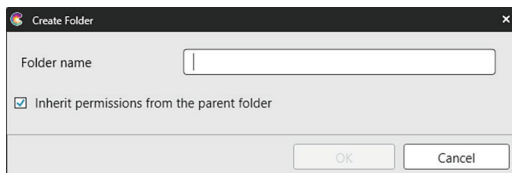
- Depending on assigned roles and permissions, this action may not be available.

Procedure

1. Select the parent folder to create a new subfolder under in the Data folder area.
2. Click **+** at the top of the Data folder area, or right-click the parent folder and select "Create..." from the displayed menu.



3. The Create Folder dialog will open.



4. Enter the Folder name.

Note

- Maximum Length: 50 characters
- The following characters are prohibited: ! @ # \$ % ^ & * () + = { } [] | \ ; : ' " < > ? /
- Tabs, line breaks, and leading or trailing spaces are also not allowed.

5. Check or uncheck the "Inherit permissions from parent folder" box.
 - Check the box to set the same access permissions as the parent folder. Uncheck the box to set the access permissions later, without inheriting from the parent folder.
6. Click [OK]. The new folder will be created.

Memo

When multiple folders are created within a single parent folder, they will be displayed in ascending order by folder name.

Renaming a Folder

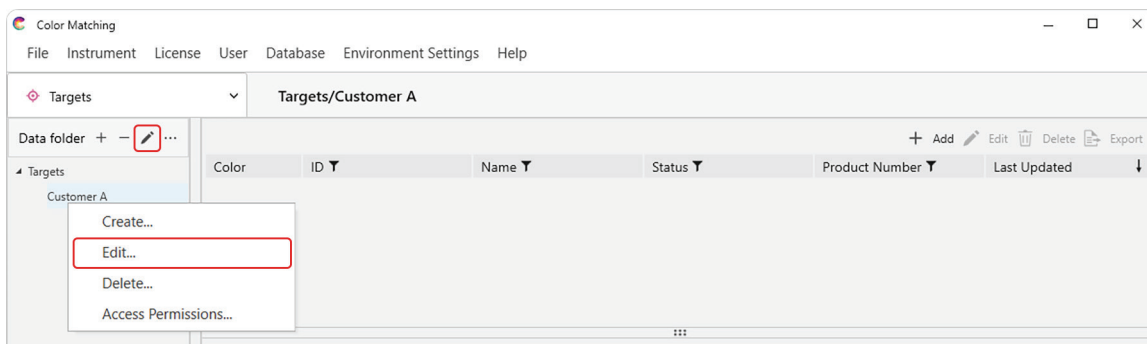
Existing folders, excluding root folders, can be renamed.

Note

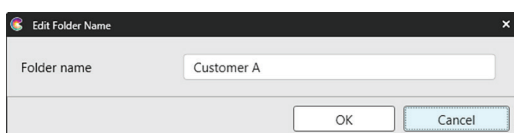
- Depending on assigned roles and permissions, this action may not be available.

Procedure

1. Select the folder to rename in the Data folder area.
2. Click , or right-click the folder and select "Edit..." from the displayed menu.



3. The Edit Folder Name dialog will open. Enter the new folder name.



4. Click [OK]. The folder will be renamed.

Deleting a Data Folder

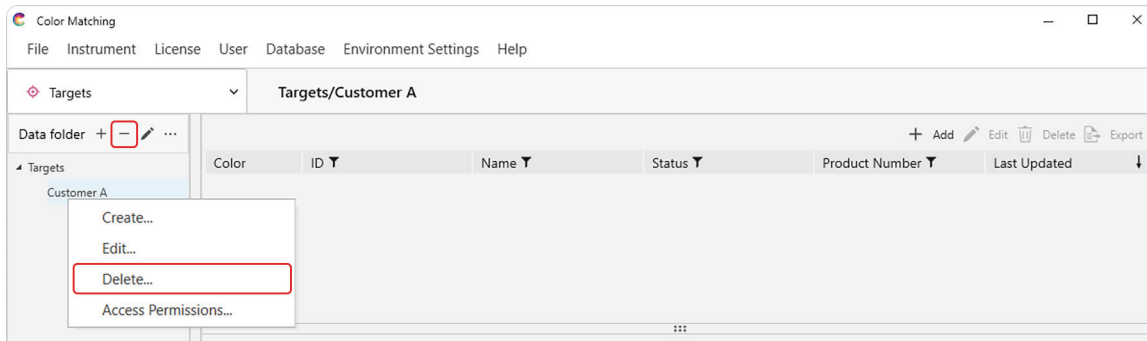
Existing folders, excluding root folders, can be deleted.

Note

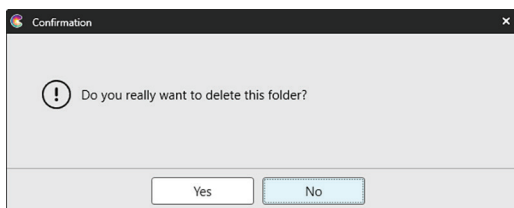
- Folders containing subfolders or data cannot be deleted. Move or delete all subfolders and data within the selected folder prior to this operation.
- Depending on assigned roles and permissions, this action may not be available.

Procedure

1. Select the folder to delete in the Data folder area.
2. Click , or right-click the folder and select "Delete..." from the displayed menu.



3. The Confirmation dialog will open.



4. Click [Yes] to delete the folder.

□ Setting Folder Permissions

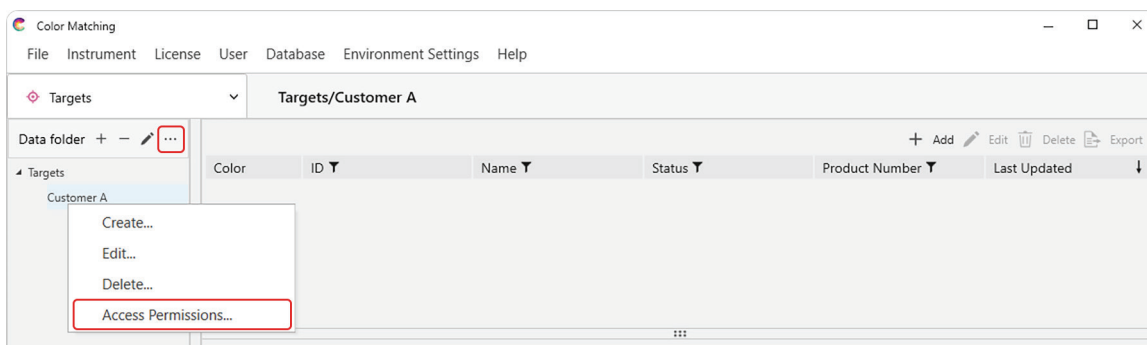
Whether or not a user can access a folder and the data it contains can be set according to the user group.

Note

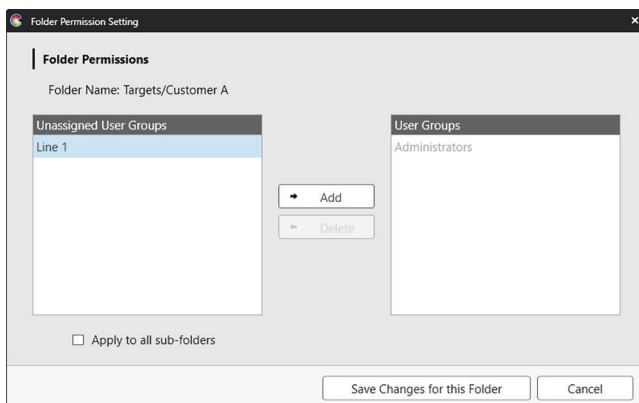
- Access permissions are granted on a per-user-group basis. User groups must be configured in advance. See [User Group Management on page 53](#).
- Depending on assigned roles and permissions, this action may not be available.

Procedure

1. Select the folder to set permissions for in the Data folder area.
2. Click [⋮] and select **Folder Access Settings...** from the displayed menu, or right-click the folder and select **"Access Permissions..."** from the displayed menu.



3. The Folder Permission Settings dialog will appear.



4. To give a user group access to the folder, select the user group in the list on the left side and click [➤ Add] to move that user group to the list on the right side.
To cancel a user group's access to the folder, select the user group in the list on the right side and click [⬅ Delete] to move that user group out of the list on the right side.

Memo

Check the Apply to all sub-folders box to apply the same access permissions to all subfolders within the folder.

5. Click the [Save Changes for this Folder] button to save the setting.

Note

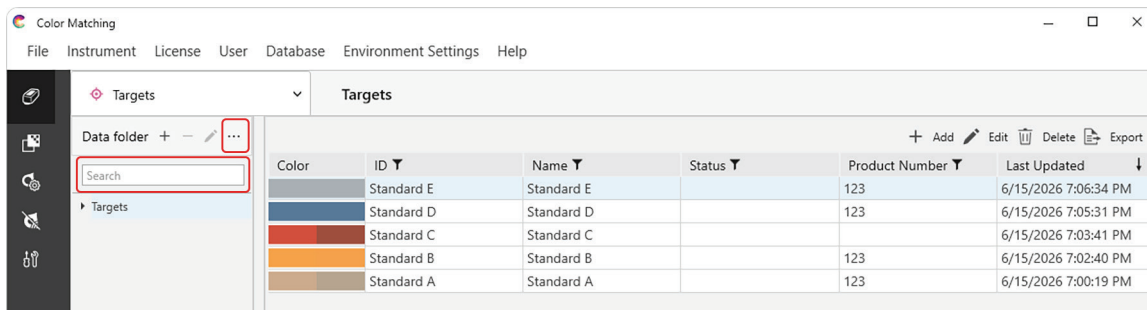
- Access permissions are required to view or edit data contained in the folder.

Searching for Folders

To search for folders, follow the procedure below.

Procedure

1. Click [...] and select Search Folder ... from the displayed menu.



The Search box will appear in the Data folder area.

2. Enter the folder name (or part of the folder name) in the Search box. Folders with names containing the entered text will be displayed in the Data folder area.

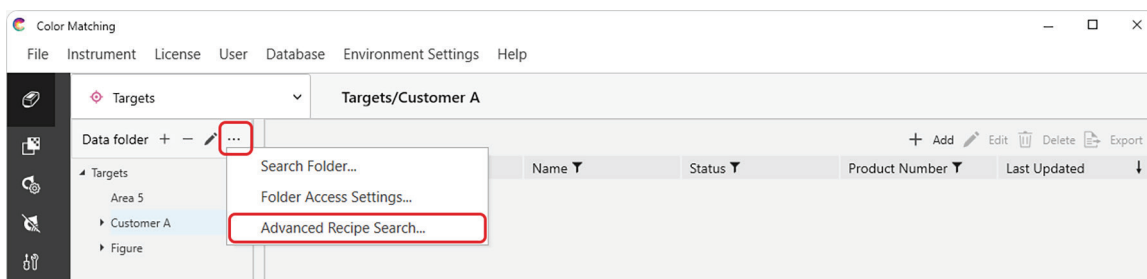
- To close the Search box, click [...] and select Search Folder ... from the displayed menu again.

□ Searching for Existing Recipes

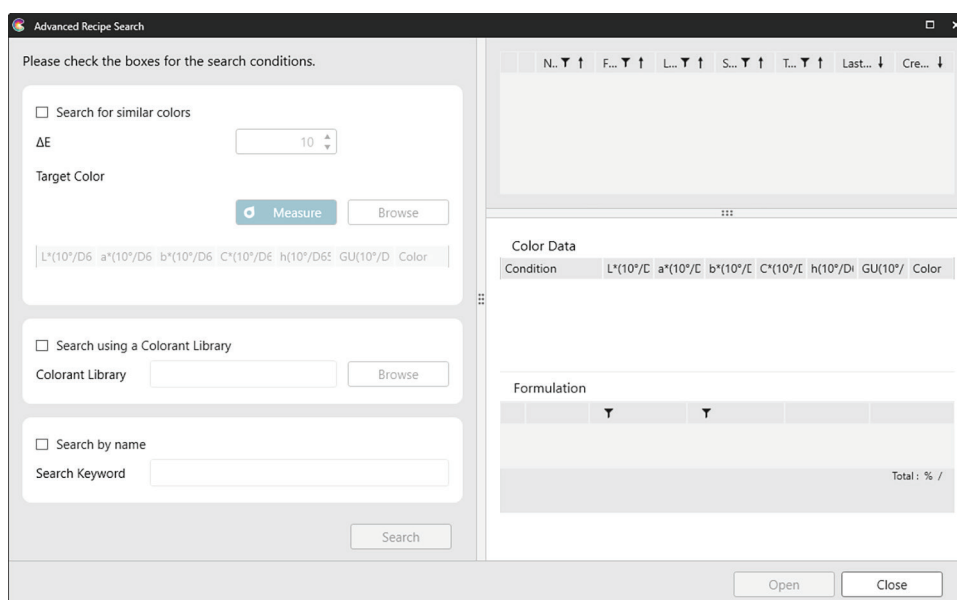
Specific recipes can be searched for in the connected database by setting search conditions. From the search results, it is possible to check the recipe or continue/start the formulation.

Procedure

1. Click [...] and select Advanced Recipe Search... from the displayed menu.



2. The Advanced Recipe Search dialog will appear.



3. Set the search conditions.

Search for similar colors

When checked, searches for recipes for a color similar to the target color and within the ΔE value.

ΔE The maximum allowable color difference from the target.
A value from 0 to 10 can be entered.

Target Color

- To search for recipes for a color similar to a newly measured target color, prepare the target sample and position the spectrophotometer, then click the [Measure] button.
- To search for recipes for a color similar to an existing target registered in the database, click the [Browse] button and select the desired target.

Search using a Colorant Library

Searches for recipes that use a specific Colorant Library.

Search by name:

Searches for recipes that include the Search Keyword in the Formulation Project Name.

4. Click the [Search] button.

The formulation projects containing recipes that match the search conditions will be listed in the upper right of the dialog.

The screenshot shows the 'Advanced Recipe Search' dialog. On the left, under 'Please check the boxes for the search conditions.', the 'Search for similar colors' checkbox is checked. The 'ΔE' value is set to 10. Below this, there are color measurement fields (L*, a*, b*, C*, h*) and a 'Target Color' section with 'Measure' and 'Browse' buttons. Further down, there are checkboxes for 'Search using a Colorant Library' and 'Search by name', each with a 'Browse' button and a 'Search Keyword' field. A 'Search' button is at the bottom of the left panel. The right panel displays a list of search results in a table with columns: N., F., L., S., T., Last., and Cre.. The first six rows are highlighted in red. Below the table, there are sections for 'Color Data' and 'Formulation'. The 'Formulation' section shows a table with columns: Color(S...), Group, Name, %, and Weight [Kg]. At the bottom of the right panel, there are 'Open' and 'Close' buttons.

N.	F.	L.	S.	T.	Last.	Cre.
0414	Hata	0.01	In Progr...	RED Tar...	4/15/20...	Admin
0414_2	a	0.01	In Progr...	RED Tar...	4/16/20...	Admin
0414_2	Hata	0.01	In Progr...	RED Tar...	4/15/20...	Admin
0415_5	a	19.32	In Progr...	RED Tar...	4/23/20...	Admin
0415-Si...	Hata	1.48	In Progr...	RED Tar...	4/16/20...	Admin
0415-Si...	Hata	0.39	In Progr...	RFD Tar...	4/17/20...	Admin

Note

- If an excessive number of recipes are found, the software will only display a limited number. Refine the search conditions to narrow down the results.

5. Select the desired recipe (formulation project) from the list and click [Open] to view the formulation project.

The screenshot shows the 'Advanced Recipe Search' dialog. The search conditions are the same as in the previous screenshot. The search results table now shows a different set of results. The row for '0415-Si... Hata 0.39 In Progr... RED Tar... 4/17/20... Admin' is highlighted in blue. Below the table, the 'Color Data' and 'Formulation' sections are visible. The 'Formulation' section shows a table with columns: Color(S...), Group, Name, %, and Weight [Kg]. At the bottom of the right panel, the 'Open' button is highlighted with a red box.

N.	F.	L.	S.	T.	Last.	Cre.
0415_5	a	19.32	In Progr...	RED Tar...	4/23/20...	Admin
0415-Si...	Hata	1.48	In Progr...	RFD Tar...	4/16/20...	Admin
0415-Si...	Hata	0.39	In Progr...	RED Tar...	4/17/20...	Admin
0415-Si...	Hata	0.39	In Progr...	RED Tar...	6/19/20...	Admin
0415-Si...	Hata	7.65	In Progr...	RED Tar...	6/1/202...	Admin
0421-Si...	Hata	1.48	In Progr...	RFD Tar...	4/22/20...	Admin

6. Select the recipe tab to access and check the recipe details.

- To resume the formulation in the currently open formulation project, proceed with the formulation on the same screen.
- To proceed with the formulation as a separate project, click [Save As] and assign a new project name.

Color Matching

File Instrument License User Database Environment Settings Help

Formulation Project 0415-Single after 1st Calc with Sample 2nd calc

+ Start New Correction Delete ... Finish Off

Count	Target	Recipe	Sample	Recipe										Sample		
				ΔE	ΔL^*	Δa^*	Δb^*	ΔC^*	ΔH^*	MI	Contrast Ratio	Contrast	ΔE	ΔL^*	Δa^*	
3				0.386	-0.246	-0.131	-0.267	-0.263	-0.140	0.000	0.000	0.000	64.418	---	---	---
2				0.001	0.000	0.000	-0.001	-0.001	0.000	0.000	0.000	0.000	64.760	1.482	-1.406	0.44
1				1.482	-1.406	0.447	0.132	0.440	-0.155	0.000	0.000	0.000	63.758	0.386	-0.246	-0.13

Target Recipe Sample

Setting

Calculate

Batch Correction Mode

Colo...	Group	Name	Old %	Old W...	New %	New...	A...
	0430H20617	Transparent...	99.152	99.152	99.152	99.152	0...
		Weiss UN 1...	0.540	0.540	0.540	0.540	0...
		Oxidrot UN...	0.143	0.143	0.143	0.143	0...
		Orange UN...	0.121	0.121	0.121	0.121	0...
		Rot UN 308	0.044	0.044	0.044	0.044	0...

Total (Old / New) : 100.000% / 100.000 / 100.000% / 100.000

Thickness [μm] 1000.000

Report Manual

Reflectance (%)

Wavelength (nm)

SCI

SCE

Target

White/SCI

Recipe

White/SCI

Sample

White/SCI

Spectral Curves Color $\Delta L^*a^*b^*$ Graph Data Table

Data Exchange with SpectraMagic NX2

Data can be exchanged between SpectraMagic CMS and SpectraMagic NX2 using CxF (Color Exchange Format) files.

Exporting Data

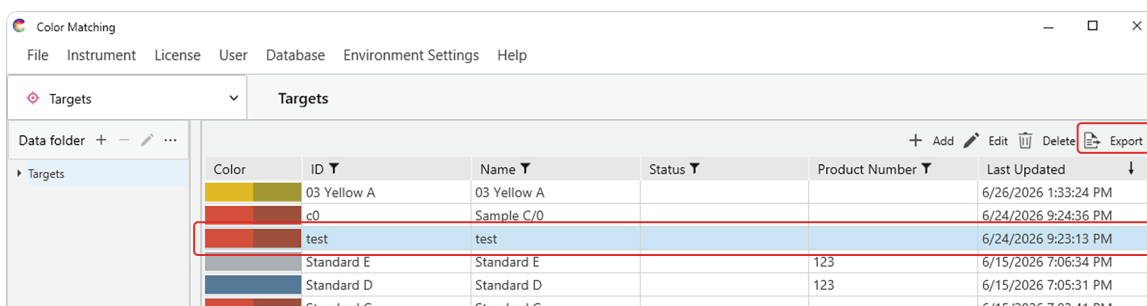
Data measured in SpectraMagic CMS can be exported and then imported into SpectraMagic NX2 for more detailed quality control.

Note

- Only measurements in Target or Substrate function screens can be exported. To export measurements taken in Colorant Library or Formulation function screens, first use Save as Target to save the measurement as a target and then export it from the Target function screen.

Procedure

- Click the selector dropdown arrow located at the top of the screen and select [Target] or [Substrate]. The screen for the selected function will open.
- In the Data Folder area, browse to the folder containing the data to be exported.
- Select the data to be exported in the list of samples and click [Export].



- The Export CxF file dialog will appear. Input the File name and click [Save]. The data for these selected file will be saved.

Note

- Only a single sample data can be exported at one time.
- For White/Black measurements, a total of 3 files will be exported: *_White.cxf (over-white measurement data), *_Black.cxf (over-black measurement data), and *_Opacity.cxf (over-white and over-black measurement data for import as an opacity measurement).

Importing Data

Data measured in SpectraMagic NX2 and exported from SpectraMagic NX2 as *.cxf files can be loaded into SpectraMagic CMS as measurement data for substrates, targets, colorant library samples, or formulation samples.

- In the screen for taking a measurement, click [Load from File]. If Measurement Type is set to Single, the Select the first CxF file dialog will appear.
If Measurement Type is set to White/Black, the Select the White CxF file dialog will appear.
- Browse to the file to import and click [Open].
 - For Measurement Type: Single
 - The data will be loaded and appear in the screen.
 - For Measurement Type: White/Black
 - If the CxF file is an opacity file, the data for both over-white and over-black measurements will be loaded and appear in the screen.
 - If separate over-white and over-black measurement data files are to be loaded, select the file for the over-white data first, and then select the file for the over-black data as indicated at the top of the displayed dialog. The data for both over-white and over-black measurements will be loaded and appear in the screen.

Note

- If the CxF file contains multiple measurement datasets, only the first dataset will be loaded.
- For CxF files from SCI+SCE measurements, the data will be loaded as SCI+SCE measurements.
- For CxF files from Color & Gloss measurements, only the color data will be loaded.

User Management

User management controls each user's access to software functions. The functions that a user can use depend on the user's Role.

In addition, users are placed in Groups which control their access to data.

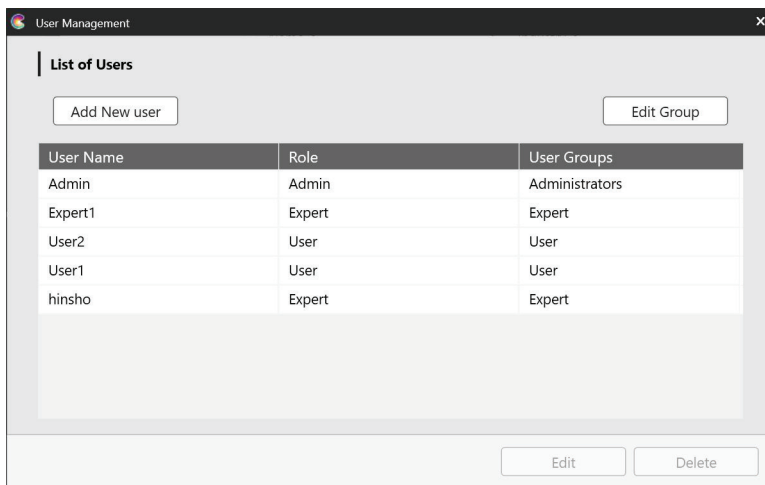
Memo

Role	Determines function access level.
User Group	Used to control access to data folders. User can be a member of multiple groups.

User Management Dialog

Procedure

1. **Select User - User Management ...** . The User Management dialog will appear.



Add New User	Opens dialog for adding a new user. See Adding a New User on page 50 .
Edit Group	Opens dialog for editing groups. See User Group Management on page 53 .
Edit	Opens dialog for editing the currently selected user. See Editing User Information on page 51 .
Delete	Deletes the currently selected user. See Deleting a User on page 52 .

Note

By default, the user "Administrator" is the only user registered in a new empty database, and the default password is "Administrator".

□ Adding a New User

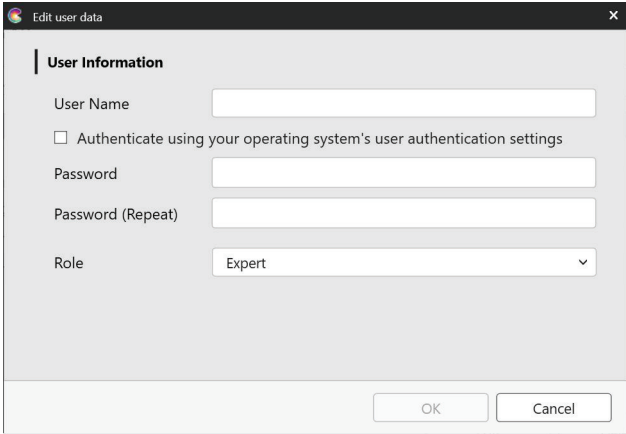
New users can be added from the User Management dialog.

Procedure

Memo

If user management will be performed using the Windows Active Directory, click on “Authenticate using your operating system’s user authentication settings” to put a check in the checkbox. When authentication is performed using Windows Active Directory, the Password and Password (Repeat) textboxes will be disabled because the password will be the password used for the Windows Active Directory.

1. In the User Management dialog, click [Add New User]. The Edit user data dialog will appear.



2. Input the User Name, Password, and Password (Repeat).

Note

When “Authenticate using your operating system’s user authentication settings” is checked:

input the user name used in the Active Directory as the User Name. The user name must meet the following conditions:

User Name	<u>Maximum Length:</u> 100 characters <u>Usable Characters:</u> The following single-byte characters • Letters (a-z, A-Z) • Numbers (0-9) • Symbols: !#\$%&'()*+,-./:;<=>?@[^_`{ }~\ <u>Prohibited Characters:</u> Tabs, line breaks, spaces, :, " (double quotes), and multi-byte characters
Password	The password for the user will be the password they use for Active Directory. The Password and Password (Repeat) textboxes will be disabled because it is not necessary to input the password here.

When “Authenticate using your operating system’s user authentication settings” is not checked:

input the User Name, and then input the password to be used by the user in Password and input the same password again in Password (Repeat). The User Name and Password must meet the following conditions:

User Name	<u>Maximum Length:</u> 20 characters <u>Usable Characters:</u> The following single-byte characters • Letters (a-z, A-Z) • Numbers (0-9)
Password	<u>Maximum Length:</u> 100 characters <u>Usable Characters:</u> The following single-byte characters • Letters (a-z, A-Z) • Numbers (0-9) • Symbols (symbols other than ¥)

3. Click on the down arrow at the right of the current Role and select the desired Role from the drop-down list that appears.

Note

For details on Roles, see *User Roles and Restrictions* on page 51.

5. When settings are complete, click [OK].

User Roles and Restrictions

This software features the following three user roles:

Admin	Full access to execute all operations.
Expert	No editing privileges for user/user group management or colorant library management.
User	Normal user profile with restricted set of permissions.

Function	Role		
	Admin	Expert	User
User registration and management	✓		
Colorant library creation and registration	✓		
Database management (for example, data backup creation)	✓		
Formulation template creation and management	✓	✓	
Target registration	✓	✓	✓
Substrate registration	✓	✓	✓
Formulation project creation and management	✓	✓	✓
Calculation of color matching recipes (initial formulation, sample measurement, correction calculation)	✓	✓	✓
Other common functions	✓	✓	✓

Editing User Information

The role and password (if user is not authenticated using Windows Active Directory) of existing users can be edited.

Procedure

1. In the User Management dialog, click [Edit]. The Edit user data dialog will appear.

2. Edit the information.

- It is not possible to edit the User Name. The User Name textbox will be disabled
- Password and Password (Repeat) can be edited only if "Authenticate using your operating system's user authentication settings" was not checked when the user was added. If "Authenticate using your operating system's user authentication settings" was checked when the user was created, Password and Password (Repeat) textboxes will be disabled.
- To edit the Role, click on the down arrow at the right of the current Role and select the desired Role from the drop-down list that appears.

3. After the information has been edited, click [OK].

☐ Deleting a User

Existing users can be deleted.

Procedure	
------------------	--

1. In the User Management dialog, click the name of the user to be deleted.
2. Click [Delete]. A confirmation dialog will appear.
3. Click [Yes]. The user will be deleted.

User Group Management

Creating a User Group

New user groups can be created from the User Management dialog.

Procedure

1. In the User Management dialog, click [Edit Group]. The Edit User Groups dialog will appear.

Dialog: Edit User Groups

User Group: Administrators

Manage Groups

Unassigned Users

- Expert1
- hinsho
- User1
- User2

Group Members

- Admin

Add

Delete

Save Changes for this Group

Cancel

2. Click [Manage Groups]. The User Group Management dialog will appear.

Dialog: User Group Management

Create New Group

Group Name	Actions
Administrators	Edit Delete
Line 1	Edit Delete

Close

3. Click [Create New Group]. A row will be added to the top of the Group Name list, with a blank textbox.

4. Fill in the name of the new group and click [Save].

Dialog: User Group Management

Create New Group

Group Name	Actions
Laboratory	Save Cancel
Administrators	Edit Delete
Line 1	Edit Delete

Close

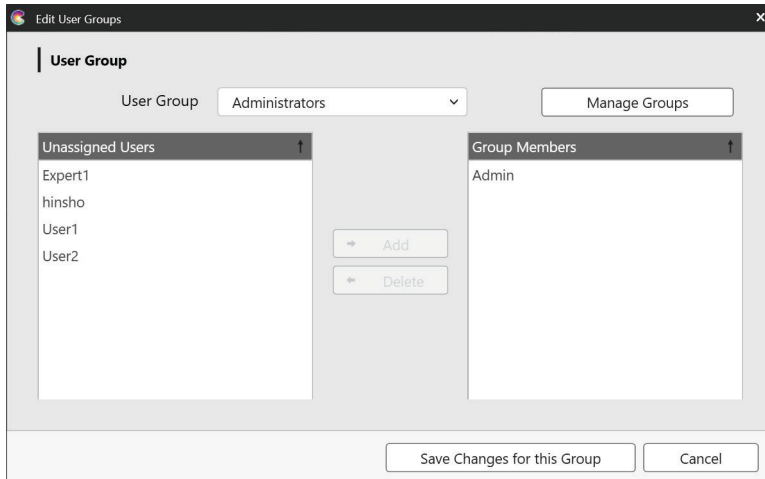
5. Confirm that the desired User Group has been added and click [Close].

☐ Deleting a User Group

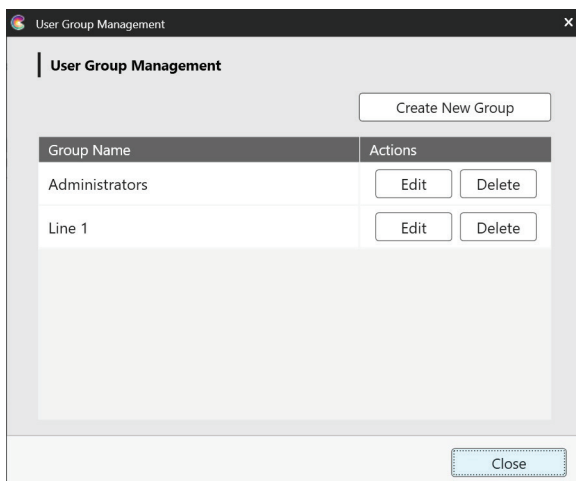
User groups can be deleted by following the procedure below.

Procedure

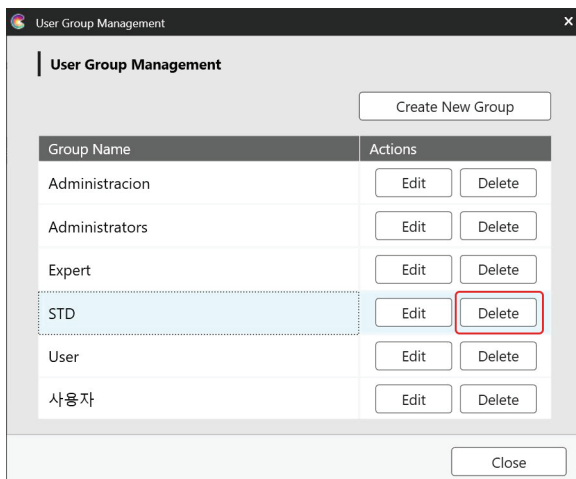
1. In the User Management dialog, click [Edit Group]. The Edit User Groups dialog will appear.



2. Click [Manage Groups]. The User Group Management dialog will appear.



3. Click the Group Name of the group to delete and click [Delete].

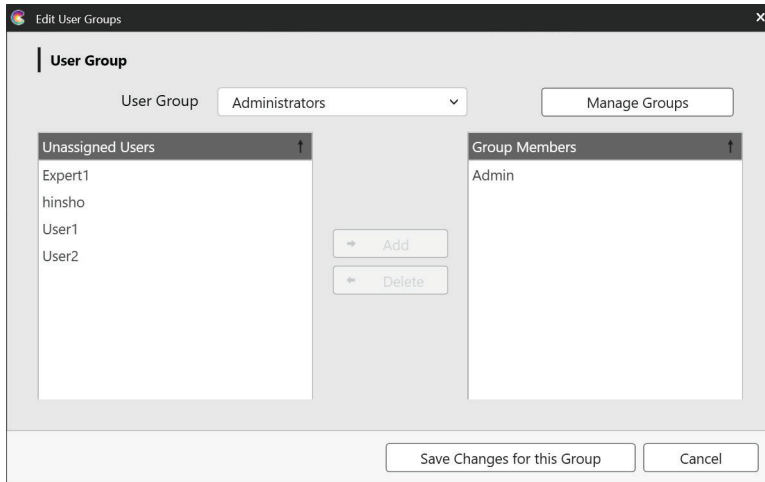


4. A confirmation dialog will appear. Click [Yes]. The selected group will be deleted.

□ Assigning Users to Groups

User groups are configured to manage data access rights for users.
A single user can be assigned to multiple user groups simultaneously.

1. In the User Management dialog, click [Edit Group]. The Edit User Groups dialog will appear.



2. Click the down arrow at the right of the current User Group and select the desired user group to assign users from the drop-down list that appears.
3. Select a user under Unassigned Users on the left side of the dialog, and click [➔ Add] to add the user to the selected user group.

Memo

Click [⬅ Delete] to delete the user from the selected user group.

4. Click [Save Changes for this Group] for each user group to save the user assignments.

Note

Selecting a different user group before saving will cancel any unsaved user assignments.
Be sure to save the changes for each user group individually.

Instruments

■ Connecting/Disconnecting an Instrument

□ Before connecting

Before connecting SpectraMagic CMS to the instrument, the instrument must be connected to the computer and the instrument power must be switched on.

Note

- For details on how to connect the instrument to a computer, refer to the instrument's instruction manual.
- When connecting via WLAN, instrument WLAN settings must be set using Configuration Tool CM-CT1 (ver. 1.5 or later) and the instrument must be connected to the network before trying to connect to the instrument from SpectraMagic CMS.
- When connecting to an instrument using Bluetooth communication, you need to establish the connection between the instrument and computer with the driver software supplied with the Bluetooth adapter before you can connect SpectraMagic CMS to the instrument. For the procedure, refer to the instruction manuals of the instrument and Bluetooth adapter.
- If "Check the connection of the instrument when starting up" is enabled in Connection Settings of Startup Options section of the Startup Options category in the Application Settings dialog, the software will automatically attempt to connect to the previously used instrument when the software is started and display any instrument-related messages if connection is successful.

When using instruments with internal camera

- When using an instrument equipped with an internal camera, such as a CM-3700A Plus series instrument, CM-36dG series instrument, or a CM-17d/CM-16d, the "Let apps access your camera" setting in Windows Settings > Privacy & Security > Camera must be set to On. If the setting is set to Off, some instrument functions may not operate properly.

□ Connecting an instrument

Procedure

1. Select *Instrument - Connect*.

- If an instrument has been previously connected, connection to the most recently connected instrument will be performed and the following steps can be omitted.
- If no instrument has been previously connected, the software will search for an instrument connected via USB and connect to that instrument if found. If connection to an instrument via USB cannot be made, an error message will appear. Click [OK]. The Instrument Communication Settings dialog will open. Continue with step 2 below.
- If a USB-connected instrument is found by the software but is different than the previously connected instrument, a warning message will appear. Click [OK] to close the warning message and continue operation with the new instrument. In such case, the following steps can be omitted. To cancel the connection, click [Cancel].
- To connect to an instrument via Bluetooth or WLAN or to specify connection to a different instrument than the previously connected one, open the Instrument Communication Settings dialog by selecting **Instrument - Instrument Communication Settings...** instead of selecting **Instrument - Connect**. Continue with step 2 below.

2. Click on the drop-down list in *Select Instrument Type to Connect* and select the desired instrument from the list that appears. An image of the selected instrument will be shown.

- If the instrument to be used is a CM-17d, CM-16d, CM-26dG, CM-26d, or CM-25d with the optional WLAN/Bluetooth Module installed and Bluetooth will be used, see [Connecting via Bluetooth on page 58](#).
- If the instrument to be used is a CM-17d, CM-16d, CM-26dG, CM-26d, or CM-25d, the [WLAN connect] button will be shown. To connect via WLAN, see [Connecting via WLAN on page 59](#).
- If multiple units of the selected model are connected to the computer, a dialog with a list of their serial numbers will appear. Select the desired serial number and click [OK].

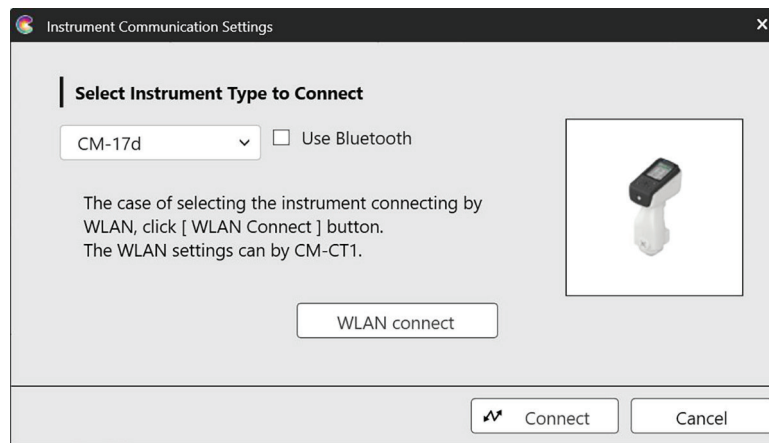
3. If the Port No. is shown in *Connection Settings*, click on the drop-down list and select the desired setting from the list that appears.

- See [Checking the COM port number on page 62](#).

4. When settings have been completed, click [Connect]. The instrument will be connected to and the Instrument Window will appear on the left side of the program screen.

- If connection fails, see [Notes on connection on page 62](#).

Instrument Communication Settings dialog



Select Instrument Type to Connect Click on drop-down list and select desired instrument.

- Buttons/settings shown will depend on selected instrument.

Use Bluetooth (Shown only for CM-17d/CM-16d, CM-26dG/CM-26d/CM-25d)
Check if communicating with instrument via Bluetooth. See [Connecting via Bluetooth on page 58](#).

[WLAN connect] (Shown only for CM-17d/CM-16d, CM-26dG/CM-26d/CM-25d)
Opens the Connect wireless instrument dialog. See [Connecting via WLAN on page 59](#).

Connection Settings

Port No. (Shown only when Use Bluetooth is checked or for CM-3700A/CM-3700A-U, CM-3600A, CM-5, CM-700d/CM-600d)
Click on drop-down list and set desired setting. See [Checking the COM port number on page 62](#).

[Connect] Connects to instrument.

Connecting via Bluetooth

Connection to a CM-17d, CM-16d, CM-26dG, CM-26d, or CM-25d via Bluetooth can be performed.

- To connect via Bluetooth, the instrument must have the optional WLAN/Bluetooth Module installed and the instrument firmware must be compatible with the WLAN/Bluetooth Module.
- Instrument Bluetooth settings must be set using Configuration Tool CM-CT1 (ver. 1.5 or later) or using instrument controls prior to connection with SpectraMagic CMS.

Procedure

Preparations

1. **Use Configuration Tool CM-CT1 or the instrument controls to set the instrument's Bluetooth PIN code. See the CM-CT1 or instrument instruction manual for details.**
2. **Enable Bluetooth on the instrument. See the instrument instruction manual for details.**
3. **In Windows, go to *Settings: Bluetooth & devices* and click [Add device]. The computer will search for nearby Bluetooth devices, and the instrument (shown as instrument name_ serial number) will appear in the list of found devices.**
 - If the instrument does not appear in the list of found devices, click on Devices in ***Settings: Bluetooth & devices*** and set Bluetooth devices discovery in the Settings section to "Advanced", and then click on [Add device] again.
4. **Double-click on the instrument in the list of found devices, input the instrument PIN code in the text box that appears, and click [Done]. The computer will connect with the instrument and the instrument will be shown in the list of devices.**
 - If connection fails, click on the 3 dots (· · ·) at the right of the instrument name and select Remove device, and then repeat step 3 above.
 - Although "Not connected" may appear under the instrument in the list of devices, this indicates that it is not in use by a program, not that it is not connected to the computer.

Connecting via Bluetooth from SpectraMagic CMS

1. **Select *Instrument - Instrument Communication Settings...* . The Instrument Communication Settings dialog will open.**
2. **Click on the drop-down list in Select Instrument Type to Connect and select the desired instrument from the list that appears.**
3. **Click on the "Use Bluetooth" checkbox to make it checked if necessary.**
4. **Select the Port No. and click [Connect]. The instrument will be connected to and the Instrument Window will appear on the left side of the program screen.**
 - If connection fails, check that the instrument is on and is properly connected to the computer via Bluetooth, and repeat the above procedure.

Connecting via WLAN

Connection to a CM-17d, CM-16d, CM-26dG, CM-26d, or CM-25d via WLAN (AdHoc or Infrastructure1 to Infrastructure4 on instrument) can be performed.

- To connect via WLAN, the instrument must have the optional WLAN/Bluetooth Module installed and the instrument firmware must be compatible with the WLAN/Bluetooth Module.
- Instrument WLAN settings must be set using Configuration Tool CM-CT1 (ver. 1.5 or later) prior to connection with SpectraMagic CMS.
- If both wired and wireless network connections are set in Windows, priority will be given to the wired network.
- If multiple wireless networks are set in Windows, priority will be according to the Windows settings.

AdHoc connection

When connecting via AdHoc, the instrument acts as a wireless access point. It is necessary to connect to this wireless access point prior to connecting with SpectraMagic CMS.

- When AdHoc connection is used, it is not possible to connect to the internet via WLAN from the same wireless adapter on the PC.

Procedure

Preparations

1. Use Configuration Tool CM-CT1 to set the instrument's AdHoc settings (IP address, network security key, etc.) See the CM-CT1 instruction manual for details.
2. Enable AdHoc on the instrument. See the instrument instruction manual for details.
3. On the PC, click on the Wi-Fi mark in the system tray, and click on the > (Manage Wi-Fi connections) next to the current Wi-Fi network. A list of available network access points will appear. The name of the instrument AdHoc access point will be instrument name_serial number.
4. Select the instrument AdHoc access point and click [Connect]. A box asking for the network security key will appear.
5. Input the security key set on the instrument and click [Next]. The PC will connect with the instrument AdHoc access point.

Connecting via AdHoc from SpectraMagic CMS

1. Select *Instrument - Instrument Communication Settings...*. The Instrument Communication Settings dialog will open.
2. Click on the drop-down list in Select Instrument Type to Connect and select the desired instrument from the list that appears.
3. Click [WLAN connect]. The Connect wireless instrument dialog will appear.
4. Select the "Connect wireless instrument" radio button by clicking on it and input the IP address that is set for AdHoc on the instrument.
 - The IP address can be checked by selecting WLAN Info. in Setting: Communication setup on the instrument.
 - It is not possible to perform WLAN device search when connecting via AdHoc.
5. Click [OK]. The instrument will be connected to and the Instrument Window will appear on the left side of the program screen.

Infrastructure1 to Infrastructure4 connection

When connecting via Infrastructure1 to Infrastructure4, it is necessary to connect the instrument to the wireless network and then connect the PC to the same wireless network prior to connecting with SpectraMagic CMS.

- The instrument must be connected to the same network as the PC.

Procedure

Preparations

1. Use Configuration Tool CM-CT1 to set the instrument's Infrastructure1 to Infrastructure4 settings (network SSID, authentication key, IP address, etc.) See the CM-CT1 instruction manual for details.
2. Enable the Infrastructure setting (Infrastructure1 to Infrastructure4) to use on the instrument, and check that the instrument completes the Infrastructure connection to the network. See the instrument instruction manual for details.

Connecting via Infrastructure1 to Infrastructure4 from SpectraMagic CMS

1. Select *Instrument - Instrument Communication Settings...* . The Instrument Communication Settings dialog will open.
2. Click on the drop-down list in Select Instrument Type to Connect and select the desired instrument from the list that appears.
3. Click [WLAN connect]. The Connect wireless instrument dialog will appear.
4. To connect by inputting the IP address directly:
 - 4-1. Select the "Connect wireless instrument" radio button by clicking on it and input the IP address that is set on the instrument for the enabled Infrastructure1 to Infrastructure4.
 - The IP address of the instrument can be checked by selecting "Setting" - "Communication setup" - "WLAN Info" on the instrument.
 - 4-2. Click [OK]. The instrument will be connected to and the Instrument Window will appear on the left side of the program screen.

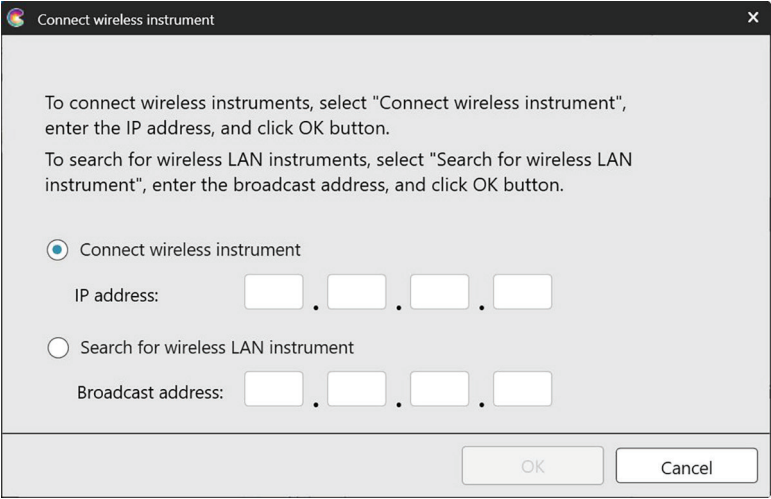
To connect to an instrument by searching for it on the network:

- 4-1. Select the "Connect wireless instrument" radio button by clicking on it and input the broadcast address of the network to which the device is connected.
 - Inputting "255" for all 4 values of the broadcast address will search the entire network for the instrument.
- 4-2. Click [OK]. The network will be searched for instruments that can be connected to, and the WLAN Instruments dialog will appear
- 4-3. Click on the Instruments textbox and select the desired instrument from the list that appears.
 - If the list is blank because no instruments have been found on the network, check that the instrument is switched on, that one of the Infrastructure settings (Infrastructure1 to Infrastructure4) is enabled, and that the broadcast address is correct, and try again.
- 4-4. Click [OK]. The instrument will be connected to and the Instrument Window will appear on the left side of the program screen.

If connection via Infrastructure1 to Infrastructure4 fails:

- Check that the instrument and the PC are connected to the same network.
- If the router's privacy separator, SSID separator, or network separation function is enabled, it may prevent connection between the instrument and the PC. Disable the function on the router and try to connect again.

Connect wireless instrument dialog



- Connect wireless instrument

Select and input the instrument’s IP address when connecting via AdHoc or via Infrastructure1 to Infrastructure4.
- Search for wireless LAN instrument

Select and input the broadcast address of the network to which the instrument is connected to search for the instrument when connecting via Infrastructure1 to Infrastructure4..
- [OK]

Connects to the instrument specified by the IP address or searches the network specified by the broadcast address.

□ Notes on connection

If the connection fails

If the connection cannot be established, the message “Failed to connect to the instrument” will appear.

Check the following:

- Check the settings in the Instrument Communication Settings dialog.
 - ◆ Check that the correct instrument is selected.
 - ◆ Check that the correct COM port (see [Checking the COM port number](#) below) and baud rate are set if those items are shown.
- If the instrument and computer are connected by cable, check that the cable is securely connected to the instrument and PC.
- If the WLAN/Bluetooth Module is being used for Bluetooth connection, check that the module is securely connected and that the instrument is properly connected to the PC via Bluetooth.
- If the WLAN/Bluetooth Module is being used for WLAN connection via AdHoc, check that the module is securely connected, that AdHoc is enabled on the instrument, and that the PC has properly connected to the AdHoc access point.
- If the WLAN/Bluetooth Module is being used for WLAN connection via Infrastructure1 to Infrastructure4, check that the module is securely connected, that the desired WLAN connection (Infrastructure1 to Infrastructure4) is enabled on the instrument, that the instrument has properly connected to the network, and that the PC has properly connected to the same network. Also, if the router’s privacy separator, SSID separator, or network separation function is enabled, it may prevent connection between the instrument and the PC. Disable the function on the router and try to connect again.
- Check that the instrument is turned on.

After checking all of these, click [Connect] again.

If connection still fails, unplug the connecting cable, switch off the instrument, wait a few seconds, switch it back on, and reconnect the cable. Then click [Connect] again.

Checking the COM port number

To check the COM port number which the instrument is connected to, right-click on the Windows “Start” button and click “Device Manager” the menu that appears to open Device Manager. Click “Ports (COM & LPT)” to expand the group, and the assigned COM port number will be displayed.

- If the connected instrument is not shown in “Ports (COM & LPT)” and appears as “Unknown device”, right-click on the “Unknown device”, select “Update driver” and select the appropriate subfolder (KMMIUSB for most instruments, kmsecm5 for CM-5, kmsecm700 for CM-700d/600d, or kmsecmcr for CM-3600A/CM-3610A/CM-3700A) under the folder where SpectraMagic CMS has been installed.

□ Disconnecting an instrument

Procedure

1. **Select *Instrument - Disconnect*. SpectraMagic CMS will disconnect from the instrument.**

The Instrument Window will close.

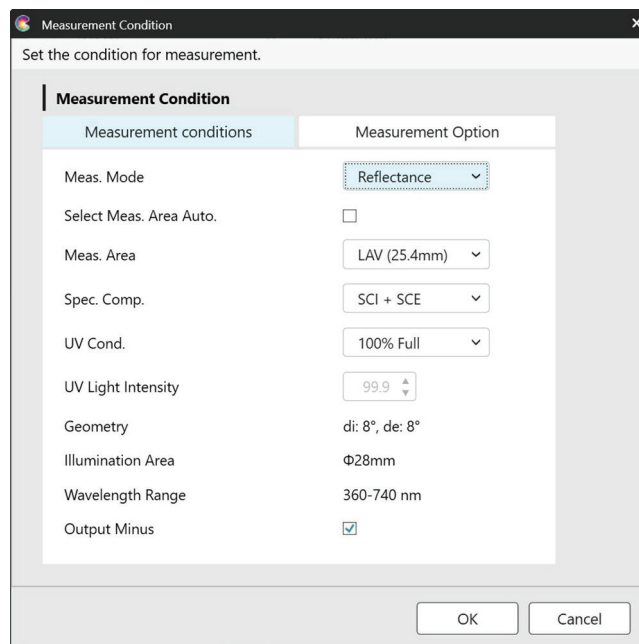
■ Setting Measurement Conditions

- This procedure is available only when an instrument is connected.

Procedure

1. Click **Measurement Conditions** or , or select **Instrument - Measurement Condition ...**. The **Measurement Condition** dialog will appear.
2. **Specify the settings for the instrument. Only those items that apply to the currently connected instrument are displayed.**
 - If an item is shown but not enabled, it is being shown as information and cannot be changed.
 - Items which have been changed since the dialog was opened will be indicated by (*) next to the item name.
 - Click on the tab name (**Measurement conditions** or **Measurement Option**) to switch between tabs and make settings in each tab. See below for Measurement Conditions settings; see [p. 68](#) for Measurement Option settings.
3. **After all settings have been set as desired, click [OK]. The settings will be applied and the dialog will close.**
 - For details of instrument settings, refer to the instruction manual for the instrument.
 - To close the dialog without applying the settings, click [Cancel].

□ Measurement Condition dialog: Measurement conditions tab



- Settings shown may be different depending on the connected instrument.

CM-3700A Plus/CM-3700A-U Plus

<u>Measurement Mode</u>	Reflectance; Transmittance; Opacity; Haze Modes other than Reflectance cannot be used in SpectraMagic CMS.
<u>Select Meas. Area Auto.</u>	When checked, the target mask attached to the instrument will be automatically detected, the <u>Measurement Area</u> for the detected mask will be set, and the setting for <u>Measurement Area</u> cannot be changed.
<u>Meas. Area</u>	CM-3700A Plus SAV (3×5mm); MAV (8mm); LMAV (16mm); LAV (25.4mm) CM-3700A-U Plus USAV (1×3mm); SAV (3×5mm) Target mask attached to instrument should match or be larger than <u>Measurement Area</u> setting.
<u>Specular Component</u>	SCI; SCE; SCI + SCE
<u>UV Setting</u>	100% Full UV Adjust UV cut filter position is adjusted for measurements including the effects of UV on fluorescent materials in samples.
<u>UV Light Intensity</u>	(Disabled when <u>UV Setting</u> is 100% Full) 0.0 to 99.9 Relative position of UV cutoff filter; Inversely proportional to amount of UV component in illumination not blocked by filter
<u>Output Minus</u>	When checked, spectral values calculated as negative will be output as negative. When not checked, negative values will be output as 0.01.

CM-36dG / CM-36dGV

<u>Measurement Mode</u>	Color & Gloss; Color only; Opacity; Haze Opacity and Haze cannot be used in SpectraMagic CMS.
<u>Measurement Type</u>	Reflectance; Transmittance Transmittance cannot be used in SpectraMagic CMS.
<u>Select Meas. Area Auto.</u>	When checked, the target mask attached to the instrument will be automatically detected, the <u>Measurement Area</u> for the detected mask will be set, and the setting for <u>Measurement Area</u> cannot be changed.
<u>Measurement Area</u>	LAV (25.4mm); LMAV (16mm); MAV (8mm); SAV (4mm) Target mask attached to instrument should match or be larger than <u>Measurement Area</u> setting.
<u>Specular Component</u>	SCI; SCE; SCI + SCE
<u>UV Condition</u>	When <u>Specular Component</u> is set to SCI, SCE, or SCI + SCE : 100% Full : Measurements are calculated with full UV component of light source. 400nm Cut Normal, 420nm Cut Normal : Measurements are calculated with effects of illumination from wavelengths below the cutoff wavelength (400nm or 420nm respectively) excluded. 400nm Cut Low, 420nm Cut Low : Measurements are taken with illumination flash intensity kept low to suppress triplet effect and calculated with effects of illumination from wavelengths below the cutoff wavelength (400nm or 420nm respectively) excluded. 400nm Adjust Normal, 420nm Adjust Normal : Measurements are calculated with effects of illumination from wavelengths below the cutoff wavelength (400nm or 420nm respectively) adjusted according to UV calibration. 400nm Adjust Low, 420nm Adjust Low : Measurements are taken with illumination flash intensity kept low to suppress triplet effect and calculated with effects of illumination from wavelengths below the cutoff wavelength (400nm or 420nm respectively) adjusted according to UV calibration. Adjust settings are available only when UV calibration has been performed and UV coefficients have been set on the instrument using SpectraMagic NX2. - Setting multiple <u>UV Condition</u> settings simultaneously cannot be used in SpectraMagic CMS.
<u>UV Cut</u>	(Disabled when <u>UV Condition</u> is set to 100% Full) Specifies how to calculate measurement values at wavelengths below cutoff wavelength. None : Measurement values at wavelengths below cutoff wavelength are set to 0.00. Cutoff wavelength copy : Measurement values at wavelengths below cutoff wavelength are set to the reflectance at cutoff wavelength.
<u>Output Minus</u>	When checked, spectral values calculated as negative will be output as negative. When not checked, negative values will be output as 0.01.

CM-36d

Measurement Mode

Color only; Opacity

- **Opacity** cannot be used in SpectraMagic CMS.

Measurement Type

Reflectance

Select Measurement Area Automatically

When checked, the target mask attached to the instrument will be automatically detected, the Measurement Area for the detected mask will be set, and the setting for Measurement Area cannot be changed.

Measurement Area

LAV (25.4mm); MAV (8mm); SAV (4mm)

When Measurement Area is set manually, the target mask attached to instrument should match or be larger than Measurement Area setting.

Specular Component

SCI; SCE; SCI + SCE

Output Minus

When checked, spectral values calculated as negative will be output as negative. When not checked, negative values will be output as 0.01.

CM-26dG / CM-26d

Measurement Mode

Color & Gloss; Color only; Opacity

- **Opacity** cannot be used in SpectraMagic CMS.
- **Color & Gloss** not available on CM-26d.

Measurement Area

MAV (8mm); SAV (3mm)

- Measurement Area will be set to the measurement area set on instrument at the time dialog is opened. If the setting is changed in this dialog, be sure to set the instrument's Measurement Area Switch to the new setting before clicking [OK] in this dialog.

Specular Component

SCI; SCE; SCI + SCE

UV Condition

When Specular Component is set to **SCI**, **SCE**, or **SCI + SCE**:

100% Full: Measurements are calculated with full UV component of light source.

400nm Cut: Measurements are calculated with effects of illumination from wavelengths below 400nm excluded.

400nm Adjust: Measurements are calculated with effects of illumination from wavelengths below 400nm adjusted according to UV calibration.

- **Adjust** settings are available only when UV calibration has been performed and UV coefficients have been set on the instrument using SpectraMagic NX2.
- Setting multiple UV Condition settings simultaneously cannot be used in SpectraMagic CMS.

UV Cut

(Disabled when UV Condition is set to **100% Full**)

Specifies how to calculate measurement values at wavelengths below cutoff wavelength.

None Measurement values at wavelengths below cutoff wavelength are set to 0.00.

Cutoff wavelength copy: Measurement values at wavelengths below cutoff wavelength are set to the reflectance at cutoff wavelength.

CM-25d

Measurement Mode

Color only; Opacity

- **Opacity** cannot be used in SpectraMagic CMS.

Specular Component

SCI; SCE; SCI + SCE

Note

- The CM-25d measurement mode must be set to "Color only." If a measurement is mistakenly taken in "Opacity" mode, the operation will proceed without an error message, but the software will not retrieve or display opacity data.

CM-17d / CM-16d

Measurement Mode

Color; Opacity

- **Opacity** cannot be used in SpectraMagic CMS.

Measurement Area

CM-17d: MAV (8mm); SAV (3mm)

- Measurement Area will be set to the measurement area set on instrument at the time dialog is opened. If the setting is changed in this dialog, be sure to set the instrument's Measurement Area Switch to the new setting before clicking [OK] in this dialog.

CM-16d: MAV (8mm) (Unchangeable)

Specular Component

SCI; SCE; SCI + SCE

Output Minus

When checked, spectral values calculated as negative will be output as negative. When not checked, negative values will be output as 0.01.

CM-3700A/CM-3700A-U

<u>Measurement Mode</u>	Reflectance; Transmittance; Opacity; Haze Modes other than Reflectance cannot be used in SpectraMagic CMS.
<u>Meas. Area</u>	CM-3700A SAV (3×5mm); MAV (8mm); LAV (25.4mm) CM-3700A-U USAV (1×3mm) (Unchangeable) Target mask attached to instrument should match or be larger than <u>Measurement Area</u> setting.
<u>Specular Component</u>	SCI; SCE
<u>UV Setting</u>	100% Full UV Adjust UV cut filter position is adjusted for measurements including the effects of UV on fluorescent materials in samples.
<u>UV Light Intensity</u>	(Disabled when <u>UV Setting</u> is 100% Full) 0.0 to 99.9 Relative position of UV cutoff filter; Inversely proportional to amount of UV component in illumination not blocked by filter

CM-3600A

<u>Meas. Cond. Mode</u>	Reflectance; Transmittance; Opacity; Haze Modes other than Reflectance cannot be used in SpectraMagic CMS.
<u>Spec. Comp.</u>	SCI; SCE; SCI + SCE
<u>Measurement Area</u>	LAV (25.4mm); MAV (8mm); SAV (4mm) Target mask attached to instrument should match or be larger than <u>Measurement Area</u> setting.
<u>UV Cond.</u>	When <u>Spec Comp</u> is set to SCI, SCE, or SCI + SCE : 100% Full : Measurements are calculated with full UV component of light source. 400nm Cut Normal, 420nm Cut Normal : Measurements are calculated with effects of illumination from wavelengths below the cutoff wavelength (400nm or 420nm respectively) excluded. 400nm Cut Low, 420nm Cut Low : Measurements are taken with illumination flash intensity kept low to suppress triplet effect and calculated with effects of illumination from wavelengths below the cutoff wavelength (400nm or 420nm respectively) excluded. 400nm Adjust Normal, 420nm Adjust Normal : Measurements are calculated with effects of illumination from wavelengths below the cutoff wavelength (400nm or 420nm respectively) adjusted according to UV calibration. 400nm Adjust Low, 420nm Adjust Low : Measurements are taken with illumination flash intensity kept low to suppress triplet effect and calculated with effects of illumination from wavelengths below the cutoff wavelength (400nm or 420nm respectively) adjusted according to UV calibration. Adjust settings are available only when UV calibration has been performed and UV coefficients have been set on the instrument using SpectraMagic NX2. - Setting multiple <u>UV Cond.</u> settings simultaneously cannot be used in SpectraMagic CMS.
<u>UV Cut</u>	(Disabled when <u>UV Condition</u> is set to 100% Full) Specifies how to calculate measurement values at wavelengths below cutoff wavelength. None Measurement values at wavelengths below cutoff wavelength are set to 0.00. Cutoff wavelength copy : Measurement values at wavelengths below cutoff wavelength are set to the reflectance at cutoff wavelength.

CM-700d / CM-600d

<u>Measurement Type</u>	Color; Opacity Opacity cannot be used in SpectraMagic CMS.
<u>Meas. Area</u>	CM-700d: MAV (8mm); SAV (3mm) <u>Measurement Area</u> will be set to the measurement area set on instrument at the time dialog is opened. If the setting is changed in this dialog, be sure to set the instrument's Measurement Area Switch to the new setting before clicking [OK] in this dialog. CM-600d: MAV (8mm) (Unchangeable)
<u>Spec. Comp.</u>	SCI; SCE; SCI + SCE

CM-5

Meas. Type

Reflectance; Transmittance; Petri Dish; Liquid; Opacity; Haze; Opacity (Petri Dish); Haze (Liquid)

- Meas. Types other than **Reflectance** or **Petri Dish** cannot be used in SpectraMagic CMS..

Get transmittance
index

Cannot be used in SpectraMagic CMS

Meas. Area

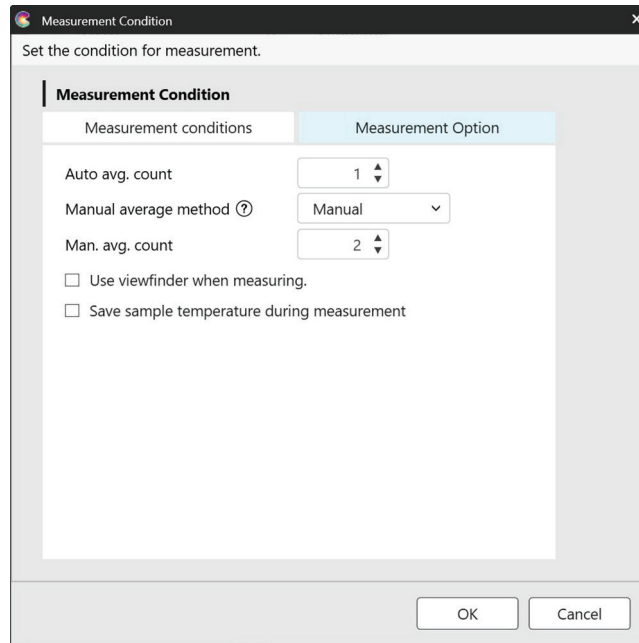
SAV (3mm); MAV (8mm); LAV (30mm)

- Target mask attached to instrument should match or be larger than Meas. Area setting.
- **MAV (8mm)** not available when Meas. Type is set to **Petri Dish**.

Spec. Comp.

SCI; SCE; SCI + SCE

☐ Measurement Condition dialog: Measurement Option tab



- Settings shown may be different depending on the connected instrument.

Auto average times Sets how many measurements will be automatically taken and averaged when measurement is performed from SpectraMagic CMS.
Range: **1** (no auto averaging) to **30**

Manual average method Sets how manual averaging will be performed.
None: No manual averaging will be performed.

Manual: Averaging of multiple measurements taken manually will be performed and the measurement sequence can be manually ended after the number of measurements set in Manual average times have been taken.

Manual average times (Shown only when Manual average method is set to **Manual**.)
Sets the minimum number of measurements to be taken for manual averaging. Range: 2 to 100

- Auto averaging and manual averaging can be combined.

(Shown only when a CM-3700A Plus/CM-3700A-U Plus, CM-36dG series, or CM-17d (USB/WLAN connection only) instrument is connected.)

Use viewfinder when measuring When checked, the Viewfinder dialog will appear when a target measurement or sample measurement is started. The measurement can then be taken from the Viewfinder dialog.

(Shown only when a CM-3700A Plus instrument is connected and Meas. Mode is set to **Reflectance**.)

Save sample temperature during measurement When checked, the sample temperature at the time of measurement will be automatically saved with the measurement data.

Instrument Calibration

To ensure accurate measurement, calibration should be performed after turning the instrument on or after changing instrument settings. In the calibration process, zero calibration and white calibration will be performed, and if the selected measurement conditions include gloss, gloss calibration will also be performed.

Note

If the Instrument Window calibration icon  is blinking, calibration must be performed.

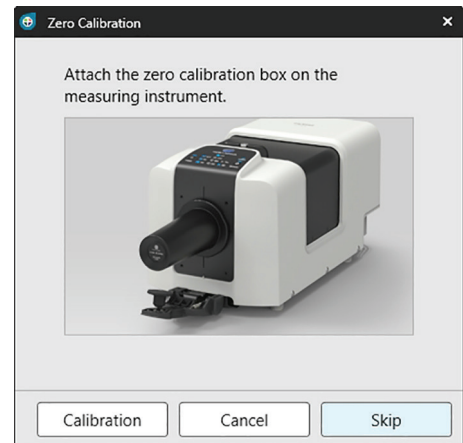
If calibration was performed without using SpectraMagic CMS, such as when calibration of a portable instrument was performed from the instrument itself without being connected to SpectraMagic CMS, SpectraMagic CMS may consider the instrument to be uncalibrated and may require calibration starting from zero calibration.

- The calibration times shown in the Instrument Window are the times of the most recent calibrations performed in SpectraMagic CMS.

Procedure

1. Click Calibration or  in the Instrument Window, or select **Instrument - Calibration**. The Zero Calibration dialog will appear. Follow the instructions in the dialog and click [Calibration] to perform zero calibration.

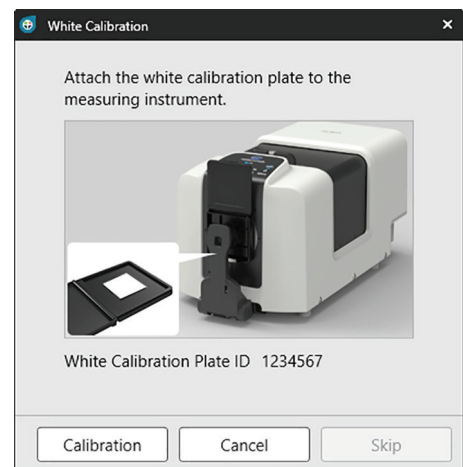
- If the [Skip] button is enabled because the instrument maintains previous zero calibration results, you can click [Skip] to proceed to the next step without performing zero calibration.



2. The White Calibration dialog will appear. Follow the instructions in the dialog and click [Calibration] to perform white calibration.

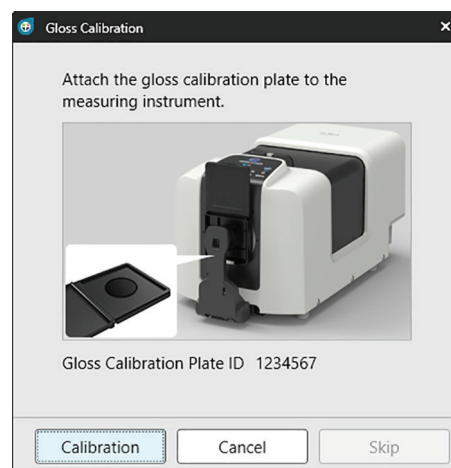
- If a CM-3700A Plus/CM-3700A-U Plus, CM-36dG series instrument or CM-17d/CM-16d with a valid Wavelength Analysis & Adjustment (WAA) license is being calibrated, progress bars for white calibration and WAA will be shown. Performing both processes will take several seconds.
- If the Wavelength Analysis & Adjustment (WAA) license of a CM-3700A Plus/CM-3700A-U Plus, CM-36dG series instrument or CM-17d/CM-16d will expire shortly or has already expired, a warning message will appear. The interval to the next display of this message if the license is not extended can be set.

If the instrument does not support gloss measurements or if Color & Gloss is not selected in Measurement Conditions, calibration is complete.



3. If Color & Gloss is selected in Measurement Conditions, the Gloss Calibration dialog will appear. Follow the instructions in the dialog and click [Calibration] to perform gloss calibration.

Calibration is complete.



■ About Measurements

□ Measurement Type

Two types of measurements are possible in SpectraMagic CMS.

Select the measurement type according to your purpose.

- **Single:** Used to match the color only, without regard for the opacity or hiding power. Substrate should be a single color, such as white.
- **White/Black:** Used to match both color and opacity or hiding power. Substrate should have light and dark sections, such as a Leneta charts.

□ Using Instrument Trigger Meas. Mode

When instrument trigger measurement mode is enabled (the icon for Instrument Trigger Meas. Mode is ) measurement can be taken using the instrument's measurement button.

Procedure

Note

If the icon for Instrument Trigger Meas. Mode is , click on  Instrument Trigger Meas. Mode to change it to  Instrument Trigger Meas. Mode (icon without the slash).

1. In the function screen, click [Measure].
2. For Measurement Type: Single
 - 2-1. A message box prompting you to measure the sample will appear.
 - 2-2. Position the instrument and sample, and click the instrument's measurement button. A measurement will be taken.
 - 2-3. Measurement is complete and the measurement data will be shown in the function screen.

For Measurement Type: White/Black

- 2-1. A message box prompting you to measure the sample over white will appear.
- 2-2. Position the instrument and sample over the white substrate and click the instrument's measurement button. A measurement will be taken.
- 2-3. A message box prompting you to measure the sample over black will appear.
- 2-4. Position the instrument and sample over the black substrate and click the instrument's measurement button. A measurement will be taken and the measurement data will appear in the function screen.

Manual Average Measurements

Manual average measurements lets you take a series of measurements while repositioning the sample relative to the instrument, and then using the average of those measurements as the measurement value. This can be useful for obtaining better measurement results with materials having some color variation in the surface.

Procedure

Note

To take manual average measurements, set Manual average method to **Manual** and set the desired number of measurements for Man. avg. count in the Measurement Option tab of the Measurement Condition dialog (see [p. 68](#)).

1. In the function screen, click [Measure].
2. For Measurement Type: Single
 - 2-1. A message box prompting you to measure the sample will appear.
 - 2-2. Click [Measure]. The Manual Averaging Measurement dialog will appear.
 - 2-3. Position the instrument and sample, and click [Measure] in the Manual Averaging Measurement dialog. A measurement will be taken and the measurement data and average of all selected measurements will be shown in the dialog's data table.
 - 2-4. Repeat step 2-3 to take the necessary number of measurements. When the number of measurements reaches the Man. avg. count setting, [Complete] will be enabled.
 - Additional measurements can be taken and included in the average if desired.
 - To exclude measurements from the average, uncheck the checkbox for that measurement.
 - To check or uncheck all measurements, click on the checkbox in the table header row.
 - 2-5. When the desired measurements to be averaged have been taken, click [Complete]. The dialog will close and the average will be set as the measurement value in the function screen.

For Measurement Type: White/Black

- 2-1. A message box prompting you to measure the sample over white will appear.
- 2-2. Click [Measure]. The Manual Averaging Measurement dialog will appear.
- 2-3. Position the instrument and sample over the white substrate and click [Measure] in the Manual Averaging Measurement dialog. A measurement will be taken and the measurement data and average of all selected measurements will be shown in the dialog's data table.
- 2-4. Repeat step 2-3 to take the necessary number of measurements. When the number of measurements reaches the Man. avg. count setting, [Complete] will be enabled.
 - Additional measurements can be taken and included in the average if desired.
 - To exclude measurements from the average, uncheck the checkbox for that measurement.
 - To check or uncheck all measurements, click on the checkbox in the table header row.
- 2-5. When the desired measurements to be averaged have been taken, click [Complete]. A message box prompting you to measure the sample over black will appear.
- 2-6. Position the instrument and sample over the black substrate and click [Measure] in the Manual Averaging Measurement dialog. A measurement will be taken and the measurement data and average of all selected measurements will be shown in the dialog's data table.
- 2-7. Repeat step 2-6 to take the necessary number of measurements. When the number of measurements reaches the Man. avg. count setting, [Complete] will be enabled.
- 2-8. When the desired measurements to be averaged have been taken, click [Complete]. The dialog will close and the average will be set as the measurement value in the function screen.

□ Using Viewfinder Image

When measuring targets, samples or substrates using a spectrophotometer equipped with a built-in or optional camera, the viewfinder image of the measurement area captured by the camera can be displayed on the software monitor. This function facilitates accurate sample positioning for measurement.

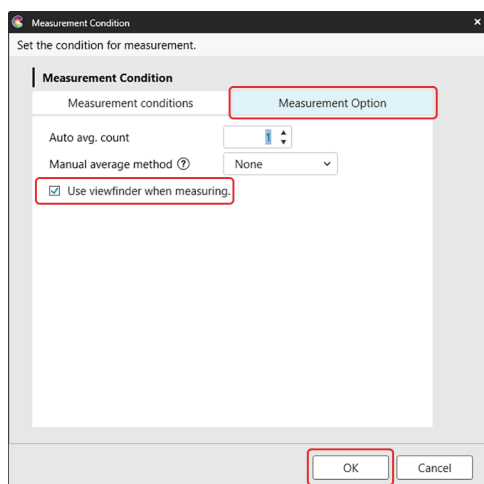
Note

- This function is available only on the following models:
 - CM-3700A Plus / CM-3700A-U Plus
 - CM-36dG / CM-36dGV / CM-36d
 - CM-17d (USB/WLAN connection only)
- For information on how to configure settings for these instruments and related precautions, refer to the instruction manual for the instrument.
- This function is not available when using a CM-17d if Instrument Trigger Meas.Mode is set.
- When using the Viewfinder function, check that the "Let apps access your camera" setting in Windows Settings > Privacy & Security > Camera is set to On. If the setting is set to Off, the Viewfinder functions will not operate properly.

Procedure

Preparations

1. **Connect the instrument to SpectraMagic CMS.**
2. **Click  (Measurement Condition icon) or select [Instrument] - [Measurement Condition...] in the menu. The Measurement Condition dialog box will open.**

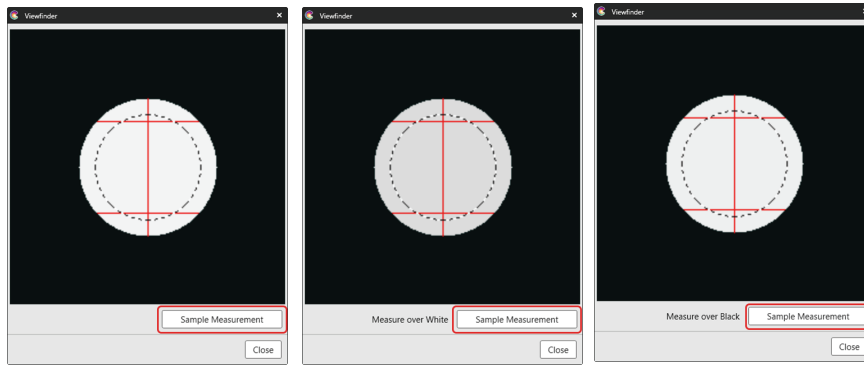


3. **Select the [Measurement Option] tab.**
4. **Check the "Use viewfinder when measuring" box, and then click [OK].**

Measurement with Viewfinder

5. **In the function screen, click [Measure].**
6. **A message box prompting you to measure the sample will appear.**

7. Click [Measure] in the dialog. The Viewfinder dialog will appear, showing the image viewed by the camera.



Single measurement

Measurement Type: White/
Black
Over-white measurement

Measurement Type: White/
Black
Over-black measurement

8. Position the instrument and sample, and click [Sample Measurement] in the dialog. A measurement will be taken and the measurement data will be shown in the function screen.

Note

- For White/Black measurements, steps 7 to 9 will be for the over-white measurement the first time and then will be repeated for the over-black measurement.

Substrates

Substrates are the materials over which the coloring material (paint, ink, etc.) is applied.

When creating colorant libraries, the substrate should be a standard material.

Substrates for **Single** measurements should be a single color, such as white.

Substrates for **White/Black** measurements should have light and dark sections, such as Leneta charts.

Memo

- When selecting substrates for colorant library creation, better results will be achieved if the final application is taken into consideration. For example, if the final application will be printing on brown cardboard, better results will be achieved if the light section of the substrate is similar to the brown cardboard.
- For plastics, although they are not applied to a substrate as in the case of paint or inks, it is recommended that a light-colored substrate be used for all measurements when creating the colorant library.

When performing formulation, the substrate should be the material on which the coloring material (paint, ink, etc.) will actually be used.

■ Registering and Measuring Substrates

Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Substrates]. The screen will change to the Substrates screen.
2. To register a new substrate, click [+Add]. The Substrate Settings screen will appear.
3. Enter the Substrate information.

ID

Information to identify the substrate

Name

Name of the substrate.

- Since the name registered here will be displayed on other screens, a name that is easy to identify and understand should be used.

Product Number

Additional information to identify the substrate, such as what product number it will be used for.

Measurement Type

Select the substrate type.

Select **Single** if the substrate is a single color.

Select **White/Black** if the substrate has light and dark sections (e.g. Leneta chart).

4. To measure the reflectance of the substrate, click [Measure].

- [Measure] will be disabled if no instrument is connected.
- Be sure that the instrument is calibrated and set to the correct measurement conditions before taking the measurement.

For Measurement Type: Single

4-1. A message box prompting you to measure the sample will appear.

4-2. Position the instrument and sample, and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

4-3. Measurement is complete and the measurement data will be shown in the Substrates screen.

For Measurement Type: White/Black

4-1. A message box prompting you to measure the sample over white will appear.

4-2. Position the instrument and sample over the white substrate and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

4-3. A message box prompting you to measure the sample over black will appear.

4-4. Position the instrument and sample over the black substrate and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

4-5. A measurement will be taken and the measurement data will appear in the Substrates screen.

To load substrate data from a file

For Measurement Type: Single

4-1. Click [Load from File]. The Select the first CxF File dialog will appear.

4-2. Select the *.cxf file to load and click [Open]. The file will be loaded and the data will appear in the screen.

For Measurement Type: White/Black

4-1. Click [Load from File]. The Select the White CxF File dialog will appear.

4-2. Select the opacity *.cxf file to load and click [Open]. The file will be loaded and the data will appear on the screen.

- If separate white and black measurement data CxF files are to be loaded, select the white data CxF file first. Then, select the black data CxF file in the Select the Black CxF file dialog. The data for both white and black measurements will be loaded and appear in the screen.

5. Click [Save] to save the substrate.

6. Repeat steps 2 through 6 to register and measure other substrates if desired.

7. Click [Close] to close the screen.

Colorant Library

SpectraMagic CMS software can calculate the mixing ratios of components (base materials, colorants, etc.) to be used to create a target color and present the recipe information.

For this purpose, information about all components that determine the final color of the product must be registered in the software. This information is stored in the colorant library. Samples of component mixtures need to be prepared, registered, and measured to define the behavior of various materials (base materials, colorants, etc.) in the product.

Note

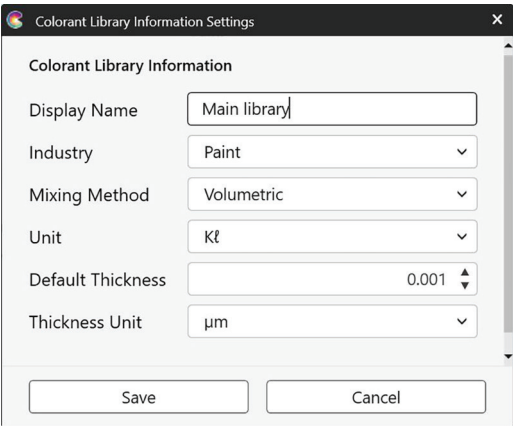
If measurement data that can be used with this software already exists, that data can be loaded into the software from files.

■ Creating a Colorant Library

The Colorant Library is a library for managing all components used in color matching. Data is registered by adding components and then adding component samples for calibration. After samples have been added, library calibration is performed to calculate the basic data (absorption and scattering) of the components.

Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Colorant Library]. The screen will change to the Colorant Library screen.
2. To create a new colorant library, click [+Add]. The Colorant Library Information Settings screen will appear.

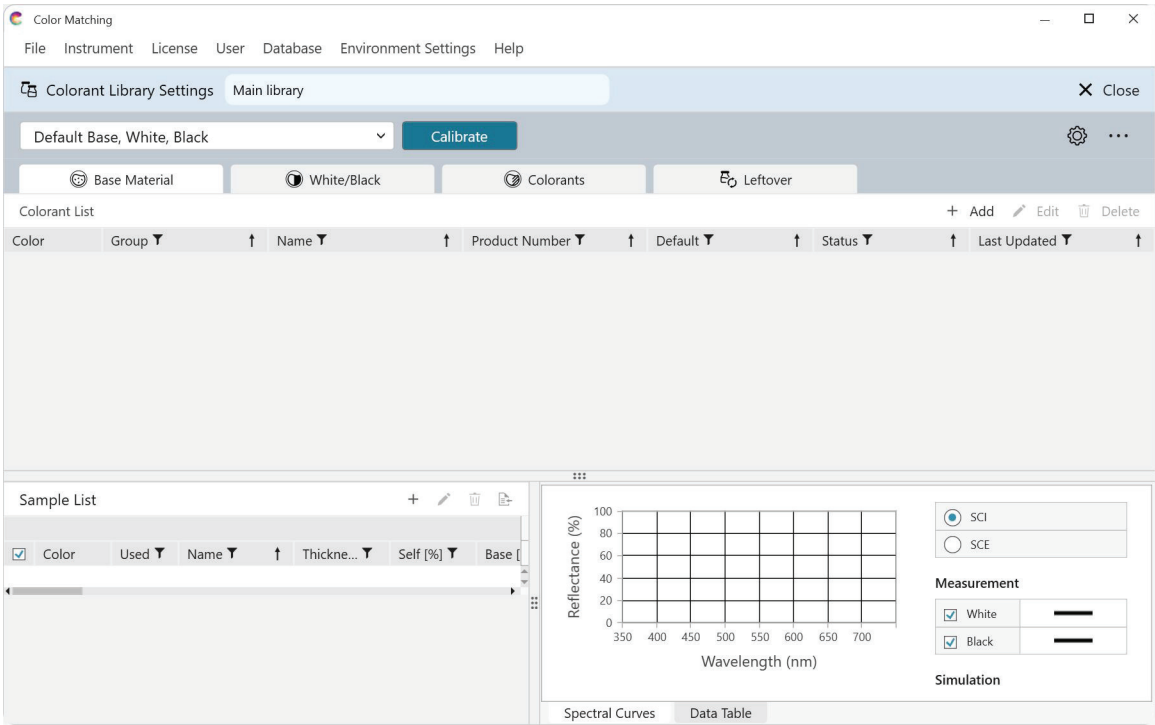


3. Input the Colorant Library Information.

<u>Display Name</u>	Name of Colorant Library
<u>Industry</u>	Application
<u>Mixing Method</u>	Select Gravimetric when setting the mixing amount by weight. Select Volumetric when setting the mixing amount by volume.
<u>Unit</u>	Unit of mixing amount
<u>Default Thickness</u>	Default thickness of the calibration sample. • Can be changed on each sample registration screen.
<u>Thickness Unit</u>	Thickness unit

4. Click [Save] to complete the setup.

The Colorant Library Settings screen will appear. Continue with Component Registration.



Component Registration

In this instruction manual, the materials used, such as base materials and colorants are referred to as "components." In this software, certain information about the components used for a colorant library need to be registered.

Registering Base Material, White/Black, and Colorant Components

Components are registered by clicking the corresponding tab in the Colorant Library Settings screen and clicking [+Add] to open the Settings dialog for each type of component.

- The following default components must be registered first:
- Default base material (base resin, binder, vehicle)
 - Default white colorant
 - Default black colorant
- After these default components have been registered, other colorants can be registered.

Procedure

To register the default base material:

1. Select the [Base Material] tab and click [+Add]. The Base Material Settings dialog will appear.
2. Input the dialog information and click [Save].
 - After the default base material has been registered, additional base materials can be registered by repeating steps 1 and 2 above.

To register the default white or default black

1. Select the [White/Black] tab and click [+Add]. The White/Black Colorant Settings dialog will appear.
2. Input the dialog information and click [Save].
 - After the default white and black colorants have been registered, additional white and black colorants can be registered by repeating steps 1 and 2 above.
 - Colorants which are close to white or black can also be registered in this tab.

To register other colorants

1. Select the [Colorants] tab and click [+Add]. The Colorant Settings dialog will appear.
2. Input the dialog information and click [Save].
3. Repeat steps 1 and 2 above to register additional colorants.

Settings Dialog (Base Material Settings, White/Black Colorant Settings, Colorant Settings)

Most items in the Settings dialogs are the same. Those settings available only in certain Settings dialogs are stated as such.

- White/Black Colorant Settings dialog is shown.

<u>ID</u>	ID that identifies the component.
<u>Name</u>	Name of the component.
<u>Product Number</u>	Additional information
<u>Default</u>	(Shown only in Base Material Settings and White/Black Colorant Settings dialogs. Cannot be changed manually.) In this software, the first base material, white colorant, and black colorant registered in the colorant set will be automatically set as the default base, default white, and default black.
<u>Type</u>	(Shown only in White/Black Colorant Settings dialog.) Select either White or Black .
<u>Cost</u>	The cost of the material. Used in determining recipe priority during Formulation and Correction.
<u>Density</u>	The density of the material. Used when converting between Volumetric and Gravimetric units.
<u>Strength</u>	Represents the intensity of the color. This setting is used to compensate for slight differences in color intensity between batches of the same component instead of having to remeasure all calibration samples. • When registering a component for the first time, set <u>Strength</u> to 100% (100.00). This becomes the reference value, and all subsequent adjustments are made relative to this reference. • When using a new batch of components, measure the color intensity and adjust the Strength value accordingly.
<u>Maximum Mix Ratio</u>	The maximum percentage (%) that can be used in a recipe. Used in Formulation and Correction.
<u>Minimum Mix Ratio</u>	The minimum percentage (%) that can be used in a recipe. Used in Formulation and Correction.

Use in Formulation

Select **Include** if this component can be used in calculating recipes for formulation.
Select **Exclude** if this component is not available or should not be used in calculating recipes for formulation.

Formulation Preference

A value to specify the priority of material selection during formula calculations. Please enter a value between **0** and **200**.*

Correction Preference

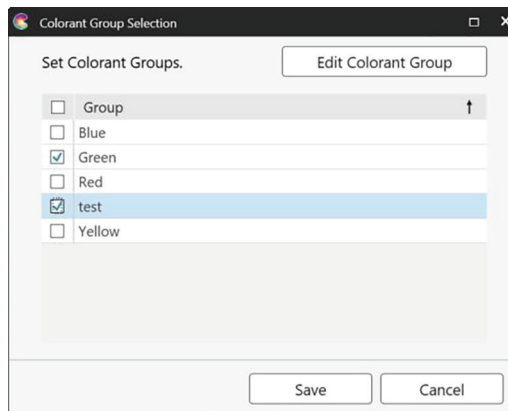
A value to specify the priority of material selection during correction calculations. Please enter a value between **0** and **200**.*

* For Formulation Preference and Correction Preference, if you enter **0** (zero), the colorant is defined as having no penalty and will be used with the highest priority. Conversely, if you enter **200**, the colorant will almost never be selected for calculations during formulation or correction.

Group

Input field for group name. Components can be grouped together for easy management.

- To select groups for the colorant, click [...]. The Colorant Group Selection screen will appear. Check the groups to apply to the colorant.



- To create a new group, open the Colorant Group Selection screen by clicking [...], click [Edit Colorant Group] to open the Colorant Group Management dialog, and then click [Create New Group]. A row with a blank group name will be added to the table of group names. Input the desired group name and click [Save] to confirm the name.
- To edit a group name, open the Colorant Group Selection screen by clicking [...] and then click [Edit Colorant Group] to open the Colorant Group Management dialog. Click [Edit] in the row of the group name to edit, edit the name as desired, and then click [Save] to confirm the editing.
- To delete a group, open the Colorant Group Selection screen by clicking [...] and then click [Edit Colorant Group] to open the Colorant Group Management dialog. Click [Delete] in the row of the group name to delete, and then click [Yes] in the confirmation dialog that appears.

Restricted Combinations

(Shown only in **White/Black Colorant Settings** and **Colorant Settings** dialogs.)

You can specify materials that cannot be used simultaneously with the current colorant by setting materials that should not be used together in this field.

To set such materials, click [...] button. The Restricted Combinations Settings screen will open, showing a list of the colorants in the colorant library.

Click the checkbox for each colorant that cannot be used together with the current colorant and click the [Save] button. The selected colorants will be shown in the field.

Note

Other information can be entered as a note.

Graph Area

After calibration is complete, a graph showing the absorption and scattering coefficients of the component will be displayed.

Registering Leftover Material

If you want to use leftover material for color matching, you can register the leftover material as a component.

Procedure

1. Select the [Leftover] tab and click [+Add]. The Leftover Settings screen will appear.

Leftover Settings

Leftover Information

ID

Name

Product Number

Remaining amount 0.01 [g]

Note

Wavelength (nm)

K S

Save Cancel

2. Input the Leftover Information.

<u>ID</u>	ID that identifies the component.
<u>Name</u>	Name of the component.
<u>Product Number</u>	Additional information
<u>Remaining amount</u>	Set the amount of leftover available. This will become the maximum amount to be used for formulation or correction.
<u>Note</u>	Other information can be entered as a note.

3. Click the [Save] button.

Registering and Measuring Component Calibration Samples

After registering the information for each component, calibration samples of various mixtures of components should be registered and measured. The measurement data from these calibration samples are used for component calibration to calculate the absorption and scattering coefficients of each component.

Note

The substrates used for calibration samples must be registered and measured before registering and measuring calibration samples.

Procedure

1. Select the tab for the component for which calibration samples will be registered and measured.

- To register and measure base material calibration samples, select the [Base Material] tab.
- To register and measure white/black calibration samples, select the [White/Black] tab.
- To register and measure colorant calibration samples, select the [Colorants] tab.
- To register and measure leftover calibration samples, select the [Leftover] tab.

2. Select the row of the component for which calibration samples will be registered and measured.

- Be sure to register and measure samples for the default base material, default white colorant, and default black colorant before registering and measuring other components.

3. Click [+] in the Sample List area in the lower left part of the screen. The Sample Settings screen for the type of sample will appear.

4. Input the sample information.

Name

Sample name.

Measurement Type

Select the type of substrate of the sample.

Select **Single** if the substrate is a single color.

Select **White/Black** if the substrate has light and dark sections (e.g. Leneta chart)

Thickness

Thickness of the sample.

Substrate

Click [Browse] and select the substrate of the sample.

Use In Calibration

Select **Include** if this sample data can be used in calibration of the colorant library.

Select **Exclude** if this sample data should not be used in calibration of the colorant library.

Formulation

(Not shown in Leftover Sample Settings dialog)

Input the formulation of the sample.

- For default base material and default white/black colorant samples, formula values for the default base material, default white colorant, and default black colorant should be input.
- For colorant samples, formula values for the colorant as well as the default base material, default white colorant, and default black colorant should be input.
- For additional (non-default) base materials or white/black colorants, the additional base material or white/black colorant is treated as a colorant and the value for that colorant as well as the default base material, default white colorant, and default black colorant should be input.

5. To measure the reflectance of the sample, click [Measure].

- [Measure] will be disabled if no instrument is connected.
- Be sure that the instrument is calibrated and set to the correct measurement conditions before taking the measurement.

For Measurement Type: Single

5-1. A message box prompting you to measure the sample will appear.

5-2. Position the instrument and sample, and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

5-3. Measurement is complete and the measurement data will be shown in the screen.

For Measurement Type: White/Black

5-1. A message box prompting you to measure the sample over white will appear.

5-2. Position the instrument and sample over the white substrate and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

5-3. A message box prompting you to measure the sample over black will appear.

5-4. Position the instrument and sample over the black substrate and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

5-5. A measurement will be taken and the measurement data will appear in the screen.

To load sample data from a file

For Measurement Type: Single

5-1. Click [Load from File]. The Select the first CxF File dialog will appear.

5-2. Select the *.cxf file to load and click [Open]. The file will be loaded and the data will appear in the screen.

For Measurement Type: White/Black

5-1. Click [Load from File]. The Select the White CxF File dialog will appear.

5-2. Select the opacity *.cxf file to load and click [Open]. The file will be loaded and the data will appear on the screen.

- If separate over-white and over-black measurement data CxF files are to be loaded, select the over-white data CxF file first.

Then, select the over-black data CxF file in the Select the Black CxF file dialog.

The data for both over-white and over-black measurements will be loaded and appear in the screen.

6. Click [Save] to save the sample.

7. Repeat from step 3 to register and measure other samples for the same component.

Memo

After measuring all samples for the component, check the data and graphs to see if any data is irregular. If irregular data is found, check that the sample information and formulation are correct, and remeasure the sample. If the new data also seems irregular, it is recommended that Use in Calibration for the irregular sample be set to **Exclude** so that it will not be used in calibration of the colorant library.

8. To measure samples for other components, repeat from step 1.

9. Click [Close] to close the screen.

■ Colorant Library Calibration

After the calibration samples for all components have been registered and measured, calibration (optical data calculation) of the colorant library must be performed.

During calibration, the K (absorption) and S (scattering) values at each wavelength are calculated for each component based on the sample data (spectral values, formulation, thickness, substrate, etc.). In addition, specular reflectance (surface reflectance) and internal reflectance values are also calculated. The measured spectral data of the registered samples are used for these calculations.

The colorant calibration process is essential for performing formulation and correction calculations.

Colorant library calibration is performed in 3 stages:

1. Calibration of default components
2. Calibration of individual colorant components
3. Calibration of entire colorant library

□ Calibration of Default Components

Calibration of the default components (default base material such as resin, binder, etc. and default white and black colorants) should be performed first. This is the initial calibration performed for a new colorant library.

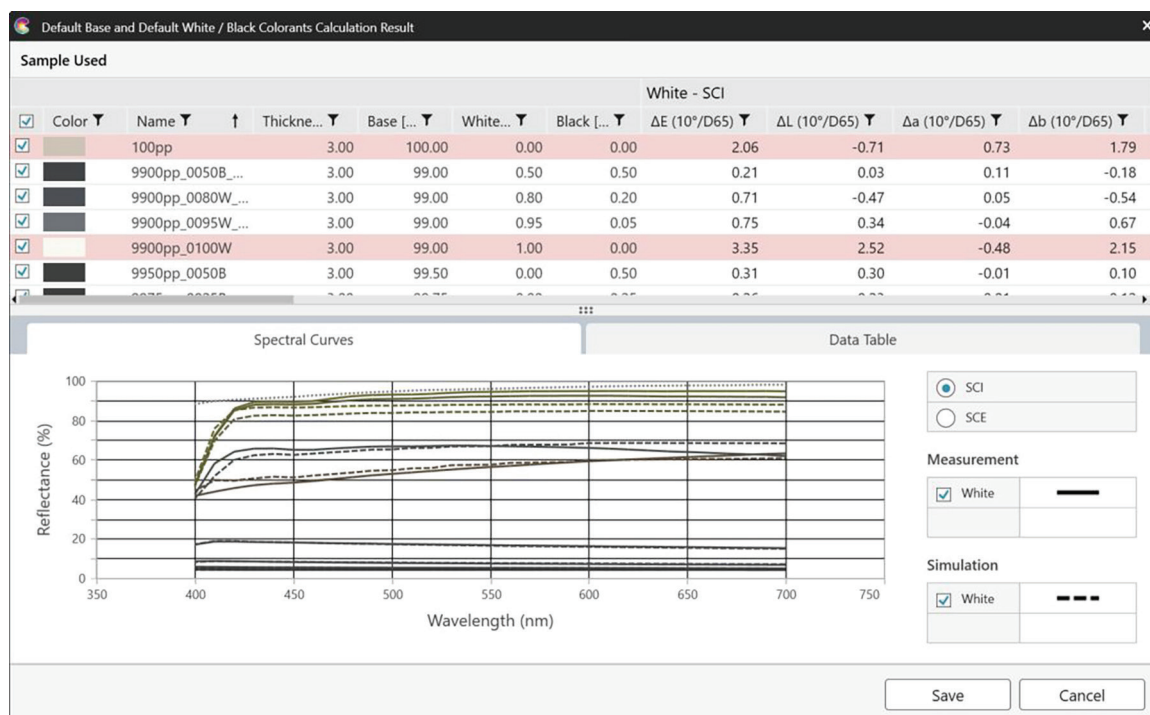
The software calculates K and S for the default base material, default white colorant, and default black colorant components. Samples containing only these components are used for this calculation.

Procedure

1. Click the drop-down arrow to the left of [Calibrate] in the upper part of the Colorant Library Settings screen.
2. Select **Default Base, White, Black** from the dropdown list.
3. Click [Calibrate].

When calibration is complete, the calibration result screen will be displayed.

- Samples that do not include any Default Base Material, Default White, or Default Black will not be calibrated. Calibration will only be performed on samples that include at least one of these default components.



If the color difference (ΔE) between the simulated and measured data exceeds a certain threshold, the corresponding row will be highlighted:

- $\Delta E \geq 1.0$ Yellow
- $\Delta E \geq 2.0$ Red

For samples with large color differences, the following actions can be taken:

- Check sample and measurement: Verify if the sample was produced correctly and measured accurately. Remake or remeasure the sample if necessary.
- Exclude data from calibration: Uncheck the box at the left of the row for the sample with large color difference to exclude the sample data from the calibration calculation.

After performing either action, perform the calibration again.

4. Click the [Save] button to save the calibration results and close the screen.

☐ Calibration of Individual Colorants

Next, perform calibration for each individual colorant. The software calculates K and S values for each individual colorant. Samples containing only Default Resin, Default White, Default Black and the selected colorant will be used for this calculation. Perform calibration for each individual colorant one by one.

Procedure

- 1. Select the colorant to be calibrated on the [Colorants] tab in the Colorant Library Settings screen. Confirm that samples are registered in the Sample List and that they have been measured.**
- 2. Click the drop-down arrow to the left of [Calibrate] in the upper part of the Colorant Library Settings screen.**
- 3. Select *Additional Colorant : [Registered Name]*.**
- 4. Click the [Calibrate] button.**

When calibration is complete, the calibration result screen will be displayed.

If the color difference (ΔE) between the simulated and measured data exceeds a certain threshold, the corresponding row will be highlighted:

$\Delta E \geq 1.0$ Yellow

$\Delta E \geq 2.0$ Red

For samples with large color differences, the following actions can be taken:

- Check sample and measurement: Verify if the sample was produced correctly and measured accurately. Remake or remeasure the sample if necessary.
- Exclude data from calibration: Uncheck the box at the left of the row for the sample with large color difference to exclude the sample data from the calibration calculation.

After performing either action, perform the calibration again.

5. Click the [Save] button to save the calibration results and close the screen.

☐ Total Calibration

Once the calibration of default components and all individual colorants is complete, proceed to the overall calibration of the colorant library. The software calculates K and S values for all colorants. All samples in the database will be used for this calculation. The K and S values, specular reflection, and internal reflection of all components are optimized.

Procedure

- 1. Click the drop-down arrow to the left of [Calibrate] in the upper part of the Colorant Library Settings screen.**
- 2. Select *All Colorants*.**
- 3. Click the [Calibrate] button.**

When calibration is complete, the calibration result screen will be displayed.

If the color difference (ΔE) between the simulated and measured data exceeds a certain threshold, the corresponding row will be highlighted:

$\Delta E \geq 1.0$ Yellow
 $\Delta E \geq 2.0$ Red

For samples with large color differences, the following actions can be taken:

- Check sample and measurement: Verify if the sample was produced correctly and measured accurately. Remake or remeasure the sample if necessary.
- Exclude data from calibration: Uncheck the box at the left of the row for the sample with large color difference to exclude the sample data from the calibration calculation.

After performing either action, perform the calibration again.

4. Click the [Save] button to save the calibration results and close the screen.

Memo

After calibration is complete, you can view the specular and internal reflection spectra.

To view, click the 3 dots (⋮) in the upper right corner of the Colorant Library Settings screen and select **Saunderson correction coefficients**.

☐ Additional Base Material Calibration

If additional base materials (resins, binders, etc.) other than the default base material have been registered and measured, their calibration should be performed individually.

Procedure

1. Select the additional base material to be calibrated on the [Base Material] tab in the Colorant Library Settings screen. Confirm that samples are registered in the Sample List and that they have been measured.
2. Click the drop-down arrow to the left of [Calibrate] in the upper part of the Colorant Library Settings screen.
3. Select **Additional base : [Registered Name]**.
4. Click the [Calibrate] button.
When calibration is complete, the calibration result screen will be displayed.
5. Click the [Save] button to save the calibration results and close the screen.

☐ Calibration of Leftover

Leftover calibration is performed using only one sample. Multiple samples cannot be used. If multiple samples are registered in a single Leftover, the most recent sample will be selected. If you want to specify which sample to use for calibration, select the sample in the sample settings.

Procedure

1. Select the leftover material to be calibrated on the [Leftover] tab in the Colorant Library Settings screen. Confirm that a sample has been registered and measured in the Sample List.
2. Click the drop-down arrow to the left of [Calibrate] in the upper part of the Colorant Library Settings screen.
3. Select **Additional Leftover : [Registered Name]**.
4. Click the [Calibrate] button.
When calibration is complete, the calibration result screen will be displayed.
5. Click the [Save] button to save the calibration results and close the screen.

Registering Target Colors

This chapter explains how to register and measure target colors. You can register color references, such as physical customer samples or standard color swatches (e.g., NCS, Pantone) by measuring them with a Konica Minolta spectrophotometer or by importing previously measured data.

Note

For a list of spectrophotometers that can be connected to and used with this software, see [Compatible Instruments on page 3](#).

Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Targets]. The screen will change to the Targets screen.
2. To register a new target color, click [+Add]. The Target Settings screen will appear.
3. Enter the Target Information and Tolerance values.

Target Information

ID

Information to identify the target.

Name

Name of the target.

- Since the name registered here will be displayed on other screens, a name that is easy to identify and understand should be used.

Product Number

Additional information to identify the target, such as what product number it will be used for.

Measurement Type

Select the substrate type.

Select **Single** if the substrate is a single color.

Select **White/Black** if the substrate has light and dark sections (e.g. Leneta chart).

Status

Approved or (blank)

Tolerance

Set the target color tolerance.

Color Difference

Select the color difference formula to use.

Formula

ΔE00(CIE2000); ΔE*94; CMC; ΔE*ab

- When **ΔE00(CIE2000)**, **ΔE*94**, or **CMC** is selected, also set the parametric coefficients.

Observer/

Illuminant

Select the observer and illuminant to use.

ΔE

Input the color difference tolerance value.

Warning Level (%)

Input the percentage of the tolerance at which warning should be displayed.

4. To measure the reflectance of the target, click [Measure].

- [Measure] will be disabled if no instrument is connected.
- Be sure that the instrument is calibrated and set to the correct measurement conditions before taking the measurement.

For Measurement Type: Single

4-1. A message box prompting you to measure the target will appear.

4-2. Position the instrument and target, and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

4-3. Measurement is complete and the measurement data will be shown in the screen.

For Measurement Type: White/Black

4-1. A message box prompting you to measure the target over white will appear.

4-2. Position the instrument and target over the white substrate and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

4-3. A message box prompting you to measure the target over black will appear.

4-4. Position the instrument and target over the black substrate and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

4-5. A measurement will be taken and the measurement data will appear in the screen.

To read target data from a file

Note

- When reading target data from a file, tolerance settings are not imported from the file. Enter the tolerance settings in the Tolerance section of the Target Settings screen.

For Measurement Type: Single

4-1. Click [Load from File]. The Select the first CxF File dialog will appear.

4-2. Select the *.cxf file to load and click [Open]. The file will be loaded and the data will appear in the screen.

For Measurement Type: White/Black

4-1. Click [Load from File]. The Select the White CxF File dialog will appear.

4-2. Select the opacity *.cxf file to load and click [Open]. The file will be loaded and the data will appear on the screen.

- If separate over-white and over-black measurement data CxF files are to be loaded, select the over-white data CxF file first.
Then, select the over-black data CxF file in the Select the Black CxF file dialog.
The data for both over-white and over-black measurements will be loaded and appear in the screen.

5. Click [Save].

Note

- When performing formulation by browsing to a target, target information can be modified in the lower left of the Formulation Project screen. However, any changes made there will be used only for formulation, and will not overwrite the original registered target information.

Formulation

In formulation, recipes (mixture ratios of base materials, colorants, and if available, leftovers) are calculated to attempt to match the color of a target. If a recipe is actually made and measured, corrections to the original recipe can also be calculated. Recipes which have been saved will be stored in the CCM database and retrieved later.

■ Performing Formulation

Formulation is performed in a formulation project.

The process consists of creating a new formulation project or editing an existing one, setting a target color for formulation, calculating recipes, preparing samples based on recipes, measuring the samples, and saving the results in the formulation project.

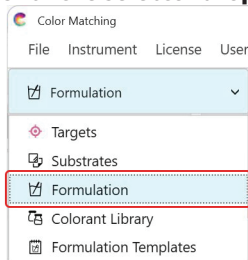
□ Creating a new formulation project

A formulation project is a dataset that contains all the information needed for the software to calculate color recipes for a specific target color and the results of calculations after formulation has been performed.

To calculate color recipes, a formulation project must be created, the target color defined, and the necessary conditions configured.

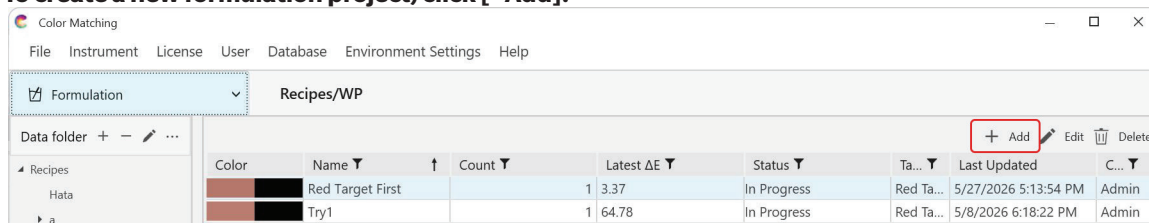
Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Formulation].



The screen will change to the Formulation screen.

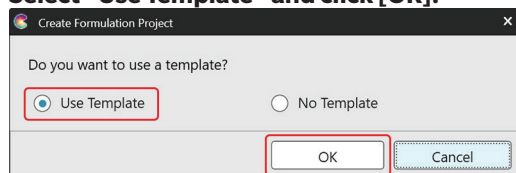
2. To create a new formulation project, click [+Add].



The Create Formulation Project dialog will appear.

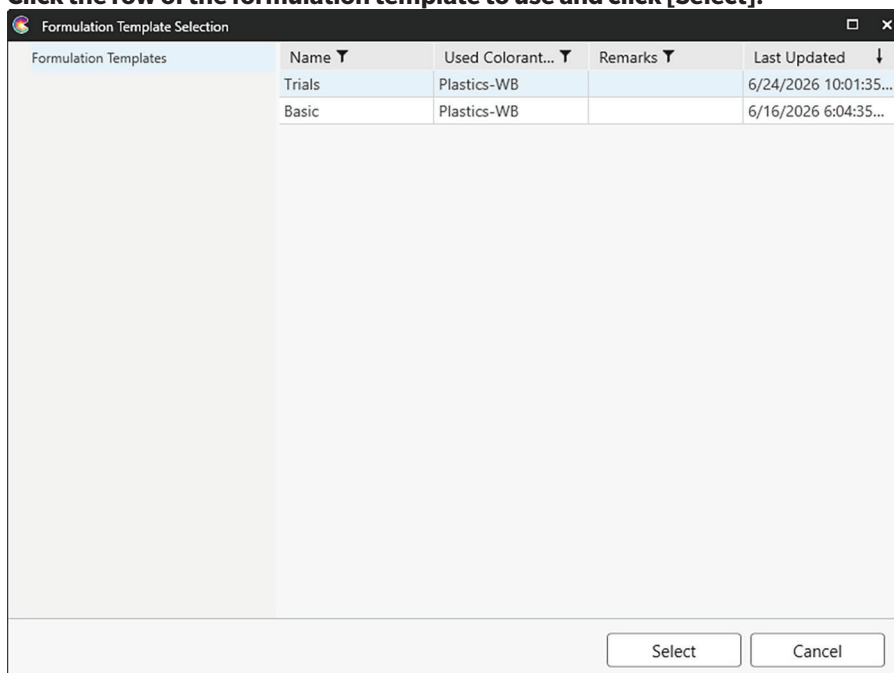
3. To create a formulation project based on a previously created formulation template

3-1. Select "Use Template" and click [OK].



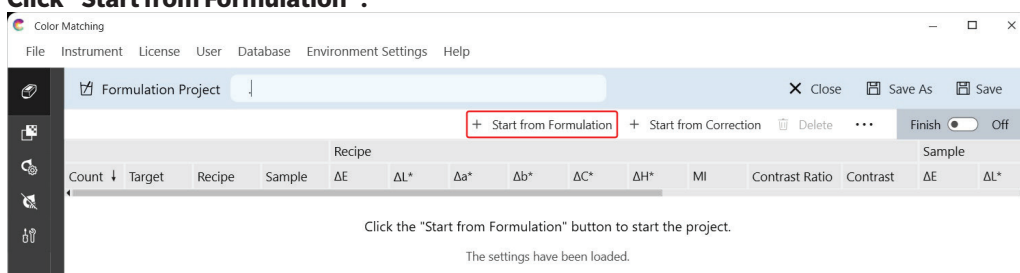
The Formulation Template Selection dialog will appear.

3-2. Click the row of the formulation template to use and click [Select].



The Formulation Project screen will appear.

3-3. Click "Start from Formulation".



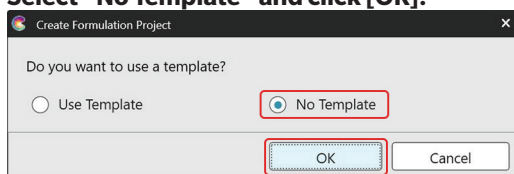
3-4. The lower part of the screen will change to the formulation Target screen.

- Formulation template settings can be viewed or changed for this formulation project by clicking [Settings] to open the Formulation Template Settings dialog. See [Formulation Template Settings dialog on page 109](#) for setting details. Any changes will apply only to this formulation project, and the original saved formulation template will not be affected.

3-5. Go to step 4.

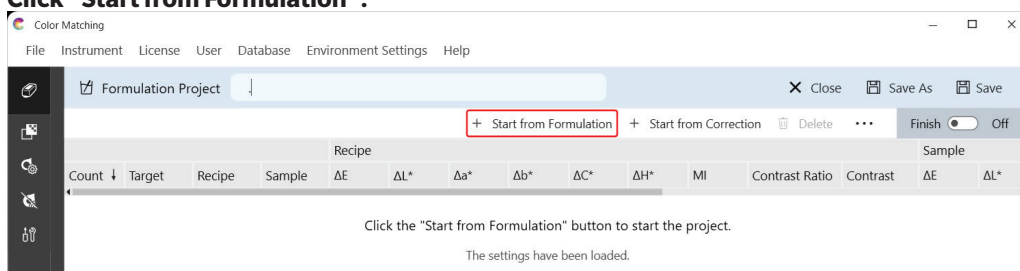
To create a formulation project without using a previously created formulation template

3-1. Select "No Template" and click [OK].



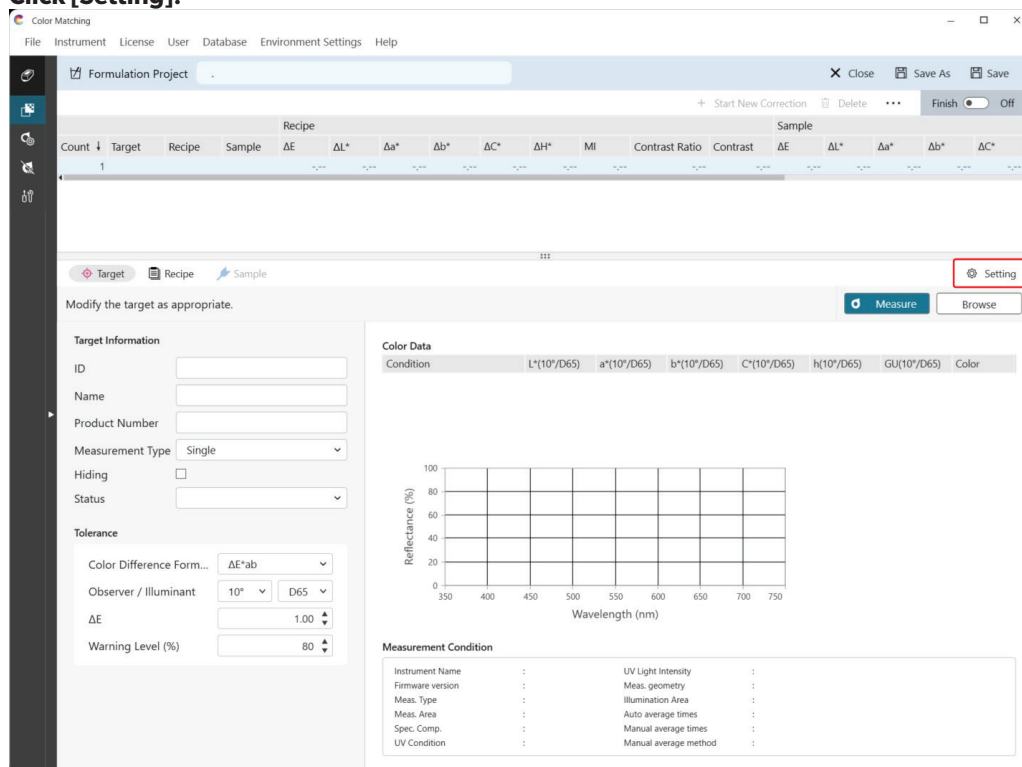
The Formulation Project screen will appear.

3-2. Click "Start from Formulation".

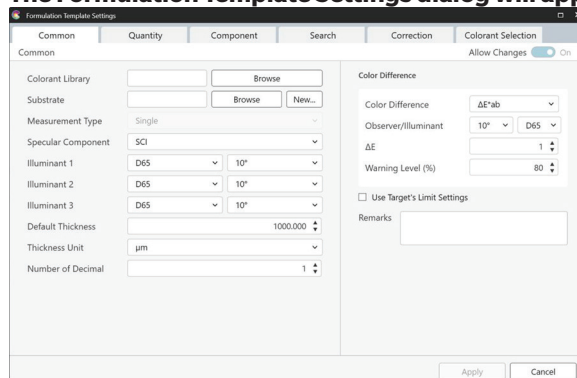


The lower part of the screen will change to the formulation Target screen.

3-3. Click [Setting].



3-4. The Formulation Template Settings dialog will appear.

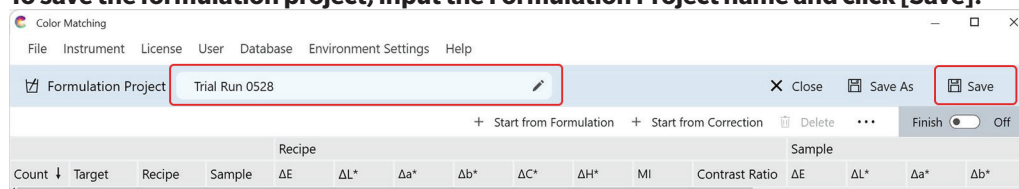


See [Formulation Template Settings dialog on page 109](#) for setting details.

3-5. Set the information in each tab of the Formulation Template Settings dialog and click [Apply] to complete the settings and close the dialog.

3-6. Go to step 4.

4. To save the formulation project, input the Formulation Project name and click [Save].



A message will appear when saving the Formulation Project has been completed.

- The formulation project can also be saved by clicking [Save As ...], inputting the formulation project name in the dialog that appears, and clicking [Save] in the dialog.

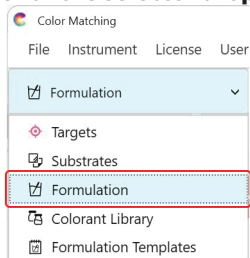
To continue with formulation, go to [Setting target color for formulation project on page 94](#).

Opening an existing formulation project

An existing formulation project can be opened to continue formulation, to perform correction, or to view recipe results.

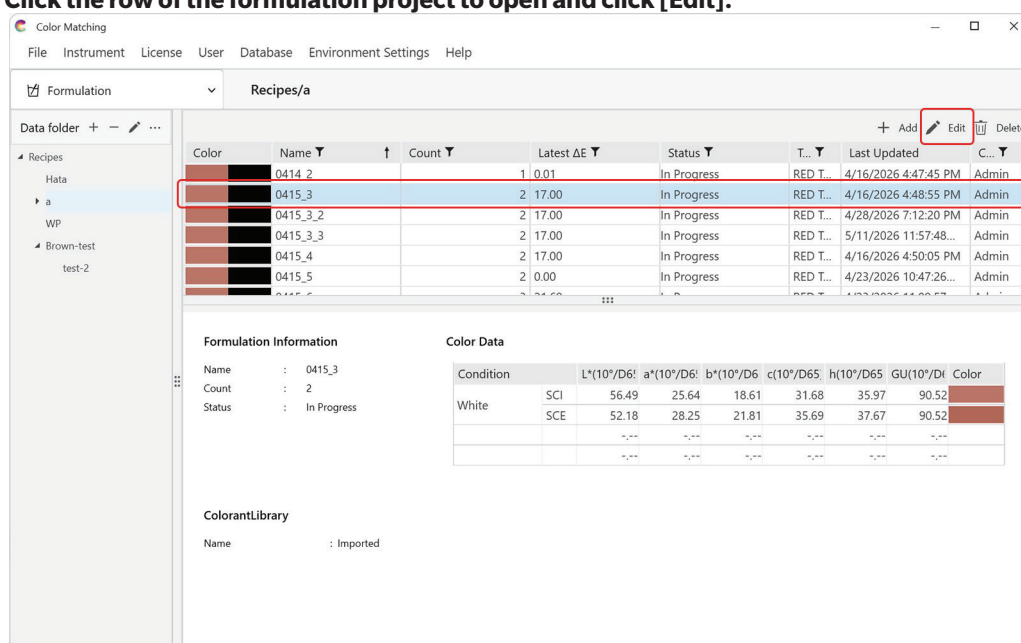
Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Formulation].



The screen will change to the Formulation screen.

2. Click the row of the formulation project to open and click [Edit].



The screenshot shows the 'Color Matching' application interface. The 'Formulation' tab is selected. A table of formulation projects is displayed, with the row for '0415_3' highlighted. The 'Edit' button is highlighted with a red box. Below the table, the 'Formulation Information' and 'Color Data' sections are visible.

Color	Name	Count	Latest ΔE	Status	T...	Last Updated	C...
	0414_2	1	0.01	In Progress	RED T...	4/16/2026 4:47:45 PM	Admin
	0415_3	2	17.00	In Progress	RED T...	4/16/2026 4:48:55 PM	Admin
	0415_3_2	2	17.00	In Progress	RED T...	4/28/2026 7:12:20 PM	Admin
	0415_3_3	2	17.00	In Progress	RED T...	5/11/2026 11:57:48...	Admin
	0415_4	2	17.00	In Progress	RED T...	4/16/2026 4:50:05 PM	Admin
	0415_5	2	0.00	In Progress	RED T...	4/23/2026 10:47:26...	Admin

Formulation Information

Name : 0415_3
Count : 2
Status : In Progress

Color Data

Condition	L*(10°/D65)	a*(10°/D65)	b*(10°/D65)	c(10°/D65)	h(10°/D65)	GU(10°/D65)	Color
White	SCI	56.49	25.64	18.61	31.68	35.97	90.52
	SCE	52.18	28.25	21.81	35.69	37.67	90.52
		-	-	-	-	-	-
		-	-	-	-	-	-

Colorant Library

Name : Imported

The selected formulation project will be opened.

- When the row for a formulation project is clicked, the information for that project will be shown in the lower part of the screen.

□ Setting target color for formulation project

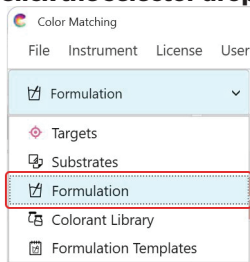
When a formulation project is open, the target color can be set either by measurement or by reading a target previously registered according to the procedure in [Registering Target Colors on page 88](#).

Procedure

1. If a formulation project is already open, go to step 2.

If no formulation project is open:

1-1. Click the selector dropdown arrow located at the top of the screen and select [Formulation].



The screen will change to the Formulation screen.

1-2. Click the row of the formulation project to open and click [Edit].

The selected formulation project will be opened.

2. To set the target color by measurement

- If no instrument is connected, connect the instrument (see [Connecting an instrument on page 56](#)) and perform calibration (see [Instrument Calibration on page 69](#)) before proceeding.

2-1. Enter the Target Information and Tolerance values.

A screenshot of the 'Color Matching' software interface. The 'Formulation Project' screen is open, showing a table with columns for Count, Target, Recipe, Sample, and various color difference metrics. The 'Target' tab is selected. The 'Target Information' section is highlighted with a red box, containing fields for ID, Name, Product Number, Measurement Type (set to 'Single'), Hiding (unchecked), and Status. The 'Tolerance' section is also highlighted with a red box, containing fields for Color Difference Form... (set to 'ΔE*ab'), Observer / Illuminant (set to '10° / D65'), ΔE (set to '1.00'), and Warning Level (%) (set to '80'). The 'Color Data' section shows a table with columns for Condition, L*(10°/D65), a*(10°/D65), b*(10°/D65), C*(10°/D65), h(10°/D65), GU(10°/D65), and Color. A graph of Reflectance (%) vs Wavelength (nm) is also visible.

Target Information

ID

Information to identify the target.

Name

Name of the target.

- Since the name registered here will be displayed on other screens, a name that is easy to identify and understand should be used.

Product Number

Additional information to identify the target, such as what product number it will be used for.

Measurement Type

Select the substrate type.

Select **Single** if the substrate is a single color.

Select **White/Black** if the substrate has light and dark sections (e.g. Leneta chart)

Hiding

When checked, the formulation recipe will be calculated to be hiding (opaque).

Tolerance

Set the target color tolerance.

Color Difference
Formula

Select the color difference formula to use.

$\Delta E_{00}(\text{CIE2000})$; ΔE^*_{94} ; **CMC**; ΔE^*_{ab}

- When $\Delta E_{00}(\text{CIE2000})$, ΔE^*_{94} , or **CMC** is selected, also set the parametric coefficients.

Observer/
Illuminant

Select the observer and illuminant to use.

ΔE

Input the color difference tolerance value.

Warning Level (%)

Input the percentage of the tolerance at which warning should be displayed.

2-2. Click [Measure].

- [Measure] will be disabled if no instrument is connected.
- Be sure that the instrument is calibrated and set to the correct measurement conditions before taking the measurement.

2-3. For Measurement Type: Single

- A message box prompting you to measure the target will appear.
- Position the instrument and target, and click [Measure] in the dialog. A measurement will be taken.
 - If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.
- Measurement is complete and the measurement data will be shown in the screen.

For Measurement Type: White/Black

- A message box prompting you to measure the target over white will appear.
- Position the instrument and target over the white substrate and click [Measure] in the dialog. A measurement will be taken.
 - If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.
- A message box prompting you to measure the target over black will appear.
- Position the instrument and target over the black substrate and click [Measure] in the dialog. A measurement will be taken.
 - If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.
- A measurement will be taken and the measurement data will appear in the screen.

2-4. Setting target color for formulation is complete.

To set the target color by reading a target previously registered according to the procedure in [Registering Target Colors on page 88](#)

2-1. Click [Browse].

The screenshot shows the 'Target Selection' dialog box. At the top, there are tabs for 'Target', 'Recipe', and 'Sample'. Below the tabs, there is a section for 'Modify the target as appropriate.' with a 'Measure' button and a 'Browse' button. The 'Browse' button is highlighted with a red rectangle. Below this, there is a 'Target Information' section with fields for 'ID', 'Name', and 'Product Number'. To the right, there is a 'Color Data' section with a table showing various color data points.

2-2. The Target Selection dialog will open.

2-3. Click the row of the target to read and click [Select].

The screenshot shows the 'Target Selection' dialog box with a list of targets. The 'Red Correc...' row is highlighted with a red rectangle. At the bottom of the dialog, there is a 'Select' button and a 'Cancel' button. The 'Select' button is highlighted with a red rectangle.

2-4. The target will be read and the data will appear in the screen.

- The Target Information and Tolerance values stored with the target will also be read.
- Target Information and Tolerance values can be edited if necessary. Changes will apply only in this formulation project, and will not affect the values that were originally set.

2-5. Setting target color for formulation is complete.

□ Calculating Recipes

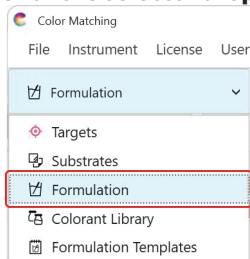
After all settings are completed and the target color has been set, recipes to match the target color can be performed.

Procedure

1. If a formulation project is already open, go to step 2.

If no formulation project is open:

- 1-1. Click the selector dropdown arrow located at the top of the screen and select [Formulation].



The screen will change to the Formulation screen.

- 1-2. Click the row of the formulation project to open and click [Edit].

The selected formulation project will be opened.

2. Select the [Recipe] tab..

3. Click [Calculate].

Note

- If an error message appears and the calculation cannot be completed, exit SpectraMagic CMS and restart the software, and then perform the calculation again.
- If the calculation still cannot be completed after restarting the software, verify that a valid connection to the database is available.

4. The software will calculate the recipe. When the calculation is complete, the Formulation Result dialog will appear, showing recipe candidates.

ID Serial numbers of the recipes in this formulation project

Source **Calculated:** Result of calculating a formula to reproduce the reflectance curve of the target

History: Result of selecting a sample with a color close to the target from the Colorant Library and modifying its formula

5. Review the details of the displayed recipe candidates, such as recipe components, mixing ratios, simulated color difference, simulated reflectance curves, etc.

Memo

The lower right of the screen has tabs showing Spectral Curves, Color (simulated color patches), $\Delta L^*a^*b^*$ Graph, and Data Table for the target and simulated results for the recipe. Click on the tabs at the bottom to switch between the tabs.

6. Select one recipe and click [Apply] to return to the Formulation Project screen.

Memo

- The Recipe column in the upper table will show the simulated color of the selected recipe
- To manually modify the component amounts in the recipe, click [Manual] on the [Recipe] tab. The Edit Formula dialog will appear, allowing the desired value to be entered into the New Weight field and simulation of the color that the recipe with the new weights would produce can be performed. If [Apply] in the Edit Formula dialog is clicked, the results of these manual adjustments will be reflected in the recipe on the [Recipe] tab.
- To output the selected recipe as a pdf file, click [Report].

7. Click [Save] in the upper right corner of the screen to save the selected and entered information.

Sample Registration

Prepare a sample according to the recipe and measure the color of the sample.

Procedure

1. In the formulation project, select the [Sample] tab.

The screenshot shows the Color Matching software interface. The 'Sample' tab is selected in the top navigation bar, indicated by a red box and a circled '1'. The main workspace displays a 'Please register the sample' section with input fields for 'Name', 'Measurement Type' (set to 'Single'), and 'Thickness' (set to '3000 [μm]'). A red box and a circled '2' highlight these input fields. Below this is a 'Formulation' table with columns for Color(SCI), Group, Name, %, and Weight [Kg]. The table lists components: 100pp (99.887119%), Default White (0.075640%), Red Iron Oxide (0.034829%), and Zinc Ferrite Tan (0.002412%). A red box and a circled '3' highlight the 'Weight [Kg]' column. To the right, a 'Measure' button is highlighted with a red box and a circled '4'. A spectral curve graph is visible on the right side of the interface.

2. Enter the name and the actual thickness of the sample.

3. Verify the selected recipe displayed in the tab. If changes are needed

- To change the amounts (volume or weight) with the actual amounts used to create the sample, select the amount and overwrite it directly or use the up/down buttons next to the amount to change it.
- To delete a component (such as when the amount is 0), select the component in the list and click .
- To add a component, click **+**. The Formula Selection dialog will open.

The screenshot shows the Formula Selection dialog box. The 'Colorants' tab is selected, indicated by a red box and a circled 'a'. The dialog displays a list of components to be added to the recipe. The 'Apply' button is highlighted with a red box and a circled 'd'. The list includes components like Blue, Red B, Yellow A, and Yellow B. A red box and a circled 'b' highlight the 'Yellow A' component. A red box and a circled 'c' highlight the up arrow button next to the 'Yellow A' component.

(a) Select the tab for the type of component ([Base Material], [White/Black], [Colorants], or [Leftovers]), (b) select the component to add from the list in the lower part of the dialog, and then (c) click the up arrow to add the selected component to the recipe component list in the upper part of the dialog. When the recipe

component list shows all components actually used, (d) click [Apply] to confirm the changes and close the dialog. Then set the actual amount used for the component in the recipe list of the [Sample] tab of the Formulation Project by inputting it directly or using the up/down arrows next to the value.

4. To measure the reflectance of the sample, click [Measure].

- To load reflectance data from a file instead of measuring, see [To read sample data from a file on page 99](#).
- [Measure] will be disabled if no instrument is connected.
- Be sure that the instrument is calibrated and set to the correct measurement conditions before taking the measurement.

For Measurement Type: Single

4-1. A message box prompting you to measure the sample will appear.

4-2. Position the instrument and sample, and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

4-3. Measurement is complete and the measurement data will be shown in the screen.

For Measurement Type: White/Black

4-1. A message box prompting you to measure the sample over white will appear.

4-2. Position the instrument and sample over the white substrate and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

4-3. A message box prompting you to measure the sample over black will appear.

4-4. Position the instrument and sample over the black substrate and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

4-5. A measurement will be taken and the measurement data will appear in the screen.

To read sample data from a file

For Measurement Type: Single

4-1. Click [Load from File]. The Select the first CxF File dialog will appear.

4-2. Select the *.cxf file to read and click [Open]. The file will be read and the data will appear in the screen.

For Measurement Type: White/Black

4-1. Click [Load from File]. The Select the White CxF File dialog will appear.

4-2. Select the opacity *.cxf file to load and click [Open]. The file will be loaded and the data will appear on the screen.

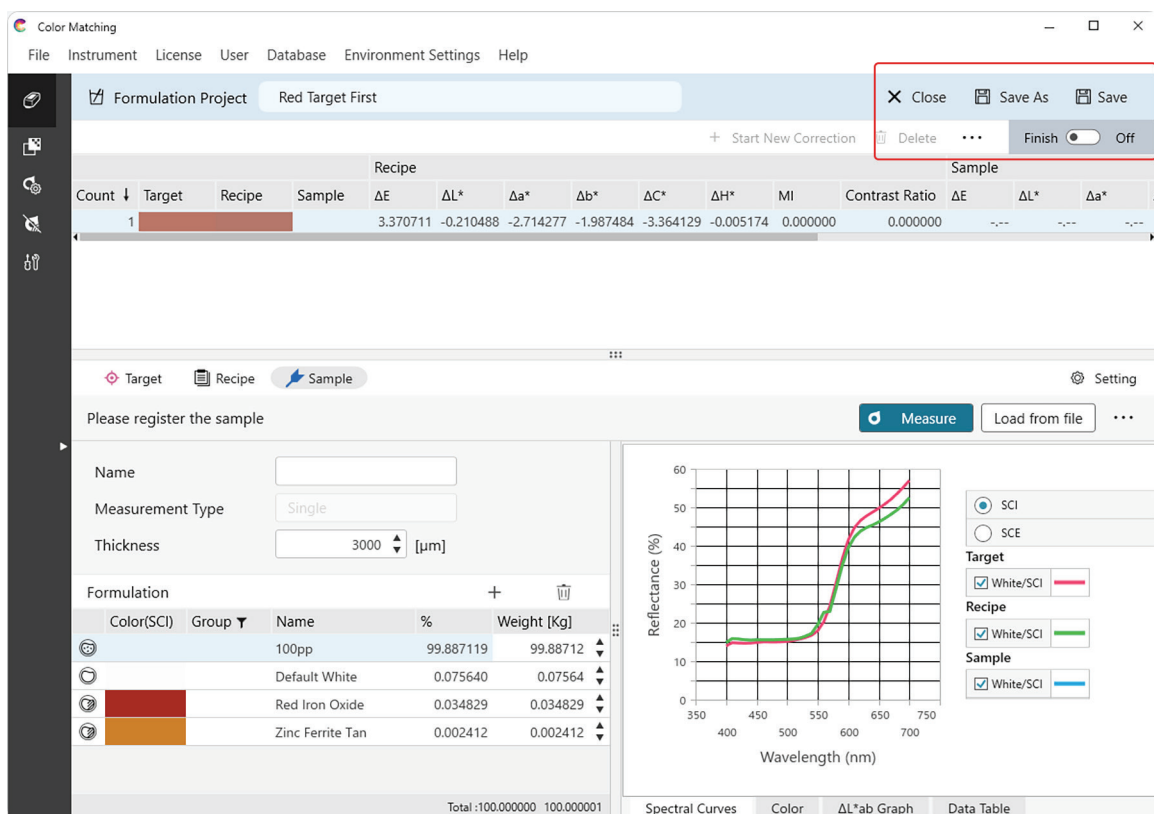
- If separate over-white and over-black measurement data CxF files are to be loaded, select the over-white data CxF file first.

Then, select the over-black data CxF file in the Select the Black CxF file dialog.

The data for both over-white and over-black measurements will be loaded and appear in the screen.

□ Saving Formulation Results

To save the formulation results for correction or future reference, click [Save] or [Save As].



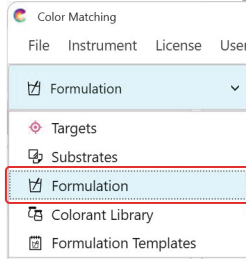
Save	Saves using the Formulation Project name to the folder selected during creation.
Save As	Saves as a new color matching result using the name input in the Save Formulation Project As dialog that appears when the button is clicked.
Close	Closes the color matching screen. • Data which has been changed since the last time save was performed will be lost.
Finish	Set to On when the recipe is acceptable and the coloring process is complete. This locks the entered and registered data, preventing accidental overwrites.

■ Performing Correction

In correction, the software compares the measured sample data with the simulated data from the recipe, calculates required adjustments, and displays a revised recipe. Unlike the initial formulation, only one adjusted recipe will be presented. A new sample based on the correction recipe should then be prepared and its reflectance registered. This correction process can be repeated any number of times as needed.

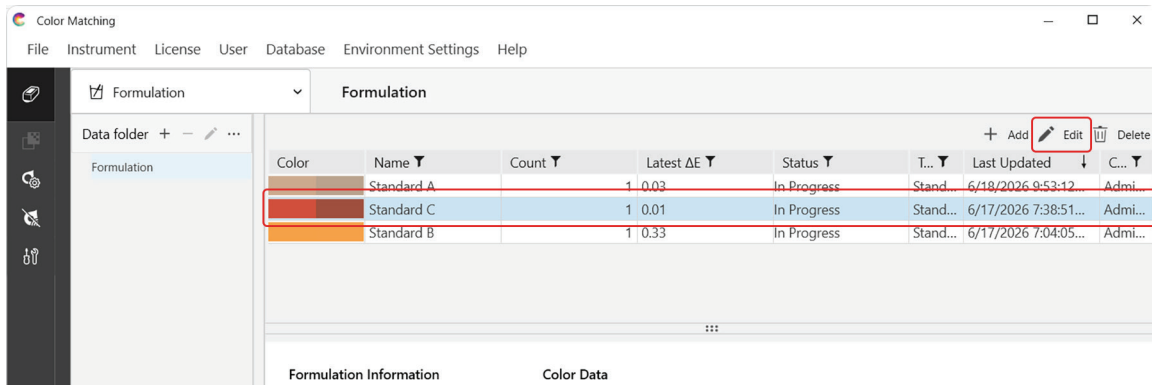
Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Formulation].



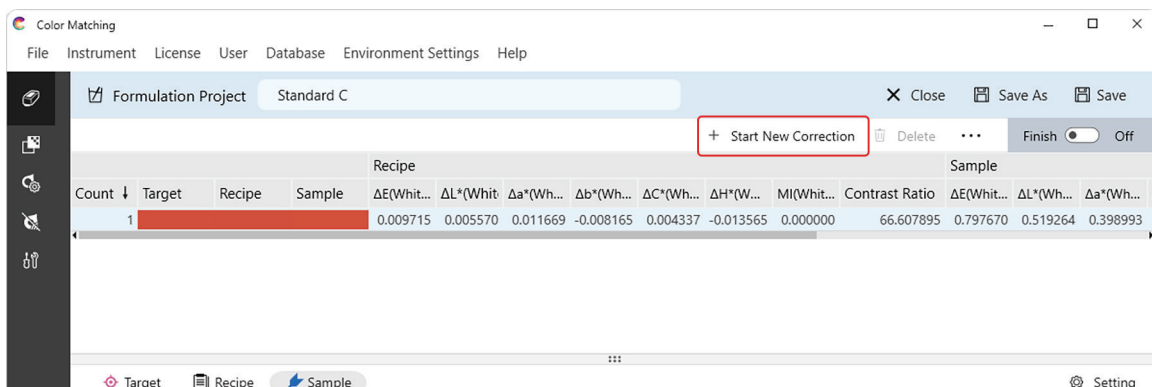
The screen will change to the Formulation screen, showing a list of currently saved formulation projects.

2. Click the row of the formulation project for which the correction will be performed from the list, and then click [Edit].



The Formulation Project screen for the selected formulation project will appear.

3. Click [+ Start New Correction].



Note

To perform correction, the reflectance of the actual sample created according to the previous formulation recipe must be registered in the [Sample] tab. If the reflectance of the actual sample has not been registered, [+ Start New Correction] will be disabled.

4. A new row is added to the list on the screen.

The screenshot shows the 'Color Matching' software interface. At the top, there's a menu bar with 'File', 'Instrument', 'License', 'User', 'Database', 'Environment Settings', and 'Help'. Below the menu bar, there's a 'Formulation Project' section with 'Standard C' selected. To the right of this are buttons for 'Close', 'Save As', and 'Save'. Below these are buttons for '+ Start New Correction', 'Delete', and 'Finish' (with a toggle switch set to 'Off').

The main area contains a table with columns: 'Count', 'Target', 'Recipe', 'Sample', and various color difference metrics. The table has two rows. The first row is highlighted in red. The second row is also highlighted in red. Below the table, there are three tabs: 'Target', 'Recipe', and 'Sample'. The 'Recipe' tab is selected. To the right of the tabs is a 'Setting' button, which is highlighted in red.

Below the tabs, there's a section for 'Modify the target as appropriate.' with an 'Edit Lock' toggle set to 'On'. To the right of this are 'Measure' and 'Browse' buttons. Below this is a 'Target Information' section with fields for 'ID', 'Name', 'Product Number', 'Measurement Type', and 'Status'. To the right of this is a 'Color Data' section with a table showing color data for 'White' and 'Black' conditions. Below this is a 'Measurement' section with a graph of 'Reflectance (%)' vs 'Wavelength (nm)' and checkboxes for 'White/SCE', 'Black/SCE', 'White/SCI', and 'Black/SCI'.

Note

- Basic information and calculation conditions are carried over from the previous color matching settings and results. To confirm the calculation conditions, click on [Settings] and verify the settings configured on each tab (particularly the [Correction] tab and [Colorant Selection] tab), and then click [Apply] to close the dialog. For details on the input items and contents of each tab, see [Formulation Template Settings dialog on page 109](#)
- Calculations involving three or more types of base materials are not possible.

5. (a) Select the [Recipe] tab and (b) click [Calculate] to perform the correction recipe calculation.

The screenshot shows the 'Color Matching' software interface. At the top, there's a menu bar with 'File', 'Instrument', 'License', 'User', 'Database', 'Environment Settings', and 'Help'. Below the menu bar, there's a 'Formulation Project' section with 'Standard C' selected. To the right of this are buttons for 'Close', 'Save As', and 'Save'. Below these are buttons for '+ Start New Correction', 'Delete', and 'Finish' (with a toggle switch set to 'Off').

The main area contains a table with columns: 'Count', 'Target', 'Recipe', 'Sample', and various color difference metrics. The table has two rows. The first row is highlighted in red. The second row is also highlighted in red. Below the table, there are three tabs: 'Target', 'Recipe', and 'Sample'. The 'Recipe' tab is selected. To the right of the tabs is a 'Setting' button. Below the tabs, there's a section for 'Click the Calculate button to create the recipe.' To the right of this is a 'Calculate' button, which is highlighted in red.

6. When calculations are complete, the correction recipe is displayed.

Note

- Only a single correction recipe will be calculated and displayed.

Memo

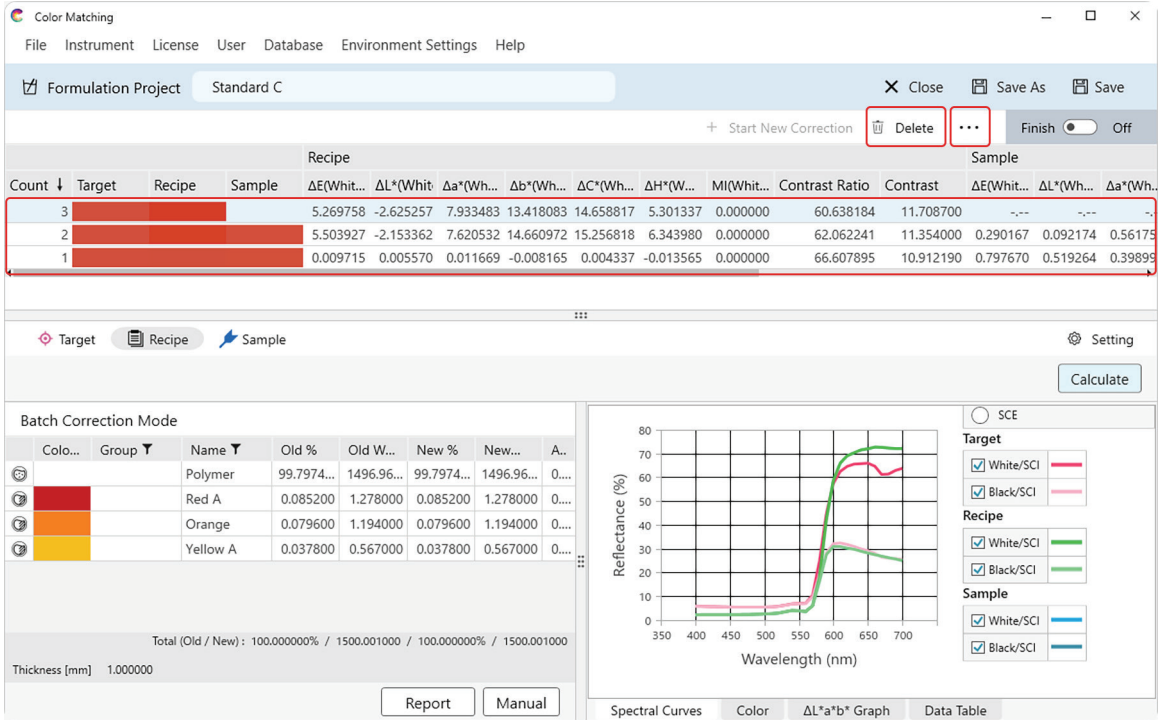
- The Recipe column in the upper table will show the simulated color of the recipe.
- To manually modify the component amounts in the recipe, click [Manual] on the [Recipe] tab. The Edit Formula dialog will appear, allowing the desired value to be entered into the New Weight field and simulation of the color that the recipe with the new weights would produce can be performed. If [Apply] in the Edit Formula dialog is clicked, the results of these manual adjustments will be reflected in the recipe on the [Recipe] tab.
- To output the selected recipe as a pdf file, click [Report].

7. Prepare and register a sample using the correction recipe according to the procedure in [Sample Registration on page 98](#).

8. Save the correction results for further correction or future reference by clicking [Save] or [Save As]. See [Saving Formulation Results on page 100](#) for details.

Formulation Recipe and Sample Data History

The Formulation Project screen displays formulation and correction results in order starting with the newest results in the upper part of the screen.



[Delete]	Enabled only if the top row (most recent result) is selected. Deletes the selected result to redo a correction calculation or adopt the previous result as the final recipe.
[...]	Opens a dropdown menu for selecting Formulation History . When Formulation History is selected, the Formulation History dialog showing the trend of formulation results will be shown.

Formulation History

This ΔE progression graph shows how the color difference evolved during the formulation process.

	1	2	3	4
Color				
Target	L*	52.045610	52.045610	52.045610
Target	a*	51.443250	51.443250	51.443250
Target	b*	39.181420	39.181420	39.181420
Target	C*	64.665220	64.665220	64.665220
Target	h	37.294480	37.294480	37.294480
Target	Contrast Ratio	---	---	---
Target	Contrast	11.114320	11.114320	11.114320
Recipe	ΔL^*	0.005570	-2.153362	-2.625257
Recipe	Δa^*	0.011669	7.620532	7.933483
Recipe	Δb^*	-0.008165	14.660972	13.418083
Recipe	ΔC^*	0.004337	15.256818	14.658817
Recipe	Δh^*	-0.013565	6.343980	5.301337
Recipe	Contrast Ratio	66.607895	62.062241	60.638184
Recipe	Contrast	10.912190	11.354000	11.708700
Sample	ΔL^*	0.519264	0.092174	---
Sample	Δa^*	0.398993	0.561751	---

Close

The yellow horizontal line in the graph is the tolerance setting.

The blue line shows the trend of ΔE for the successive samples.

■ Formulation Templates

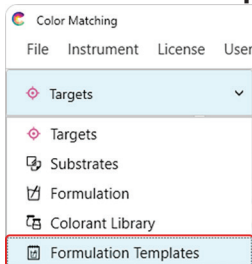
Formulation templates contain recipe calculation conditions such as which colorant library to use, which substrate to use, how quantity should be shown, etc.

Using previously defined formulation templates enables formulation to be performed with consistent conditions without having to set recipe calculation conditions each time.

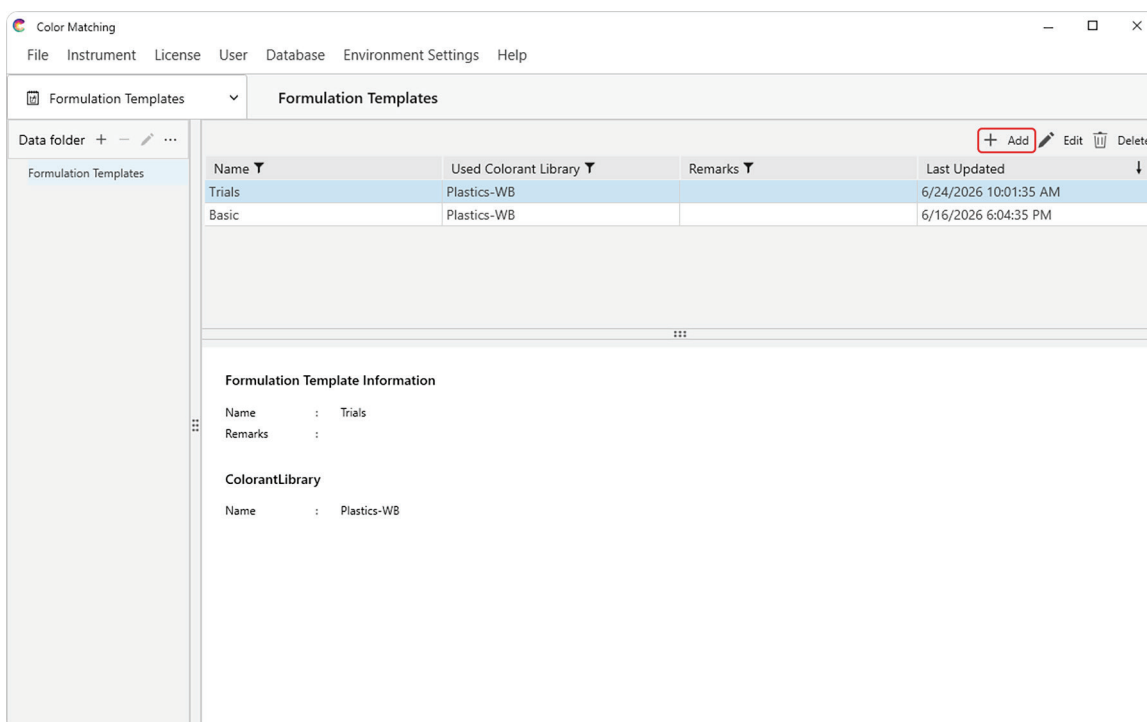
□ Creating a formulation template

Procedure

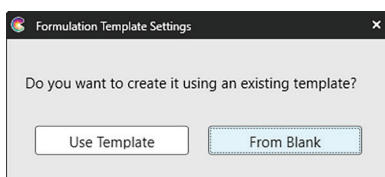
1. Click the selector dropdown arrow located at the top of the screen and select [Formulation Templates].



2. The screen will change to the Formulation Templates screen, showing a list of currently saved formulation templates. Click [+ Add].



3. A dialog asking whether to create the template based on an existing template or to create a completely new template from a blank template will appear.

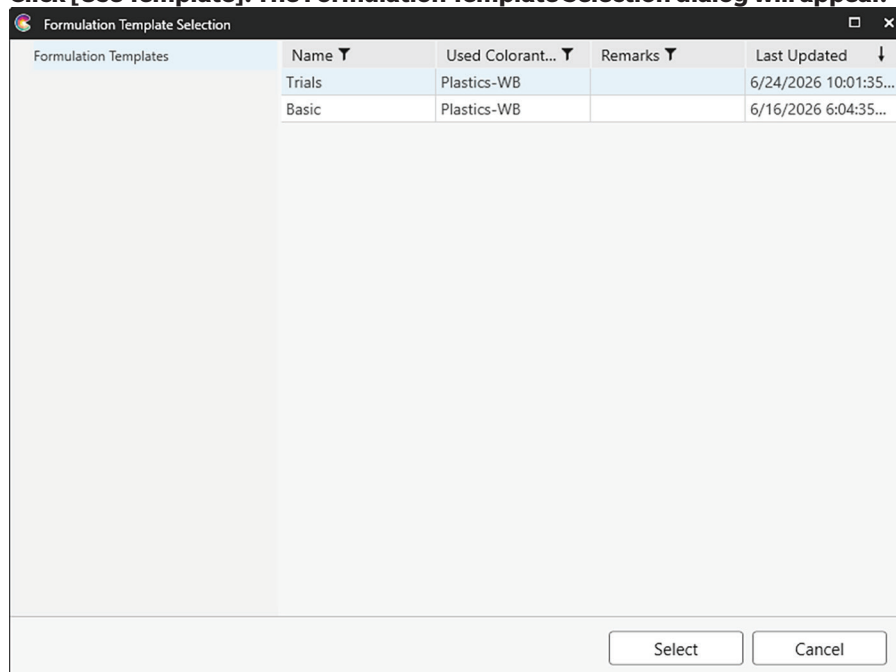


To create a completely new template

- 3-1. Click [From Blank] and go to step 5.

To create a template by copying an existing template and making necessary changes

3-1. Click [Use Template]. The Formulation Template Selection dialog will appear.



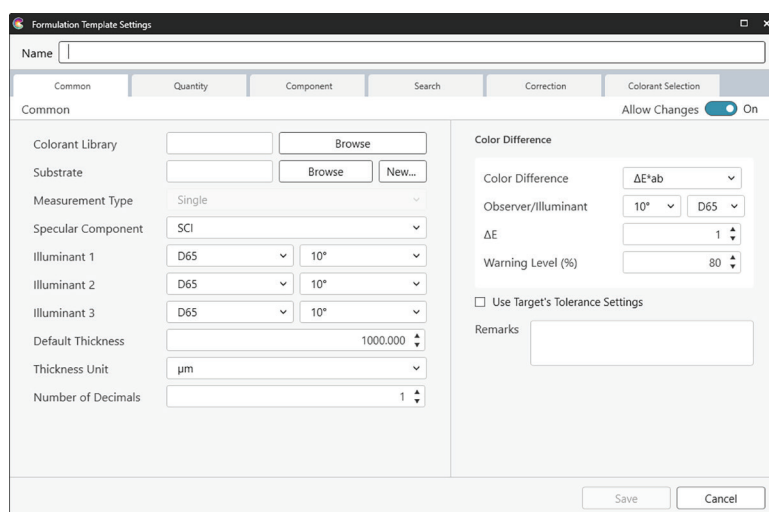
The dialog box titled "Formulation Template Selection" contains a table with the following data:

Formulation Templates	Name	Used Colorant...	Remarks	Last Updated
	Trials	Plastics-WB		6/24/2026 10:01:35...
	Basic	Plastics-WB		6/16/2026 6:04:35...

At the bottom right of the dialog are two buttons: "Select" and "Cancel".

3-2. Select the template to use as a base for the new template, and click [Select].

4. The Formulation Template Settings dialog will appear.



The dialog box titled "Formulation Template Settings" has a "Name" field at the top. Below it are tabs for "Common", "Quantity", "Component", "Search", "Correction", and "Colorant Selection". The "Common" tab is active, showing various settings:

- Colorant Library: [Field] [Browse]
- Substrate: [Field] [Browse] [New...]
- Measurement Type: Single
- Specular Component: SCI
- Illuminant 1: D65 10°
- Illuminant 2: D65 10°
- Illuminant 3: D65 10°
- Default Thickness: 1000.000
- Thickness Unit: μm
- Number of Decimals: 1

On the right side of the "Common" tab:

- Color Difference: ΔE*ab
- Observer/Illuminant: 10° D65
- ΔE: 1
- Warning Level (%): 80
- ☐ Use Target's Tolerance Settings
- Remarks: [Field]

At the bottom right are "Save" and "Cancel" buttons.

5. Input the desired name for the template.

6. Perform settings in the dialog tabs as needed.

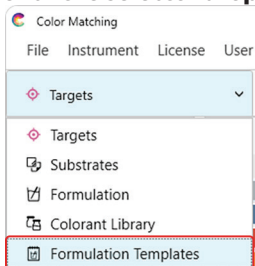
- For details on settings for each tab, see [Formulation Template Settings dialog on page 109](#).

7. Click [Save] to save the settings and close the dialog.

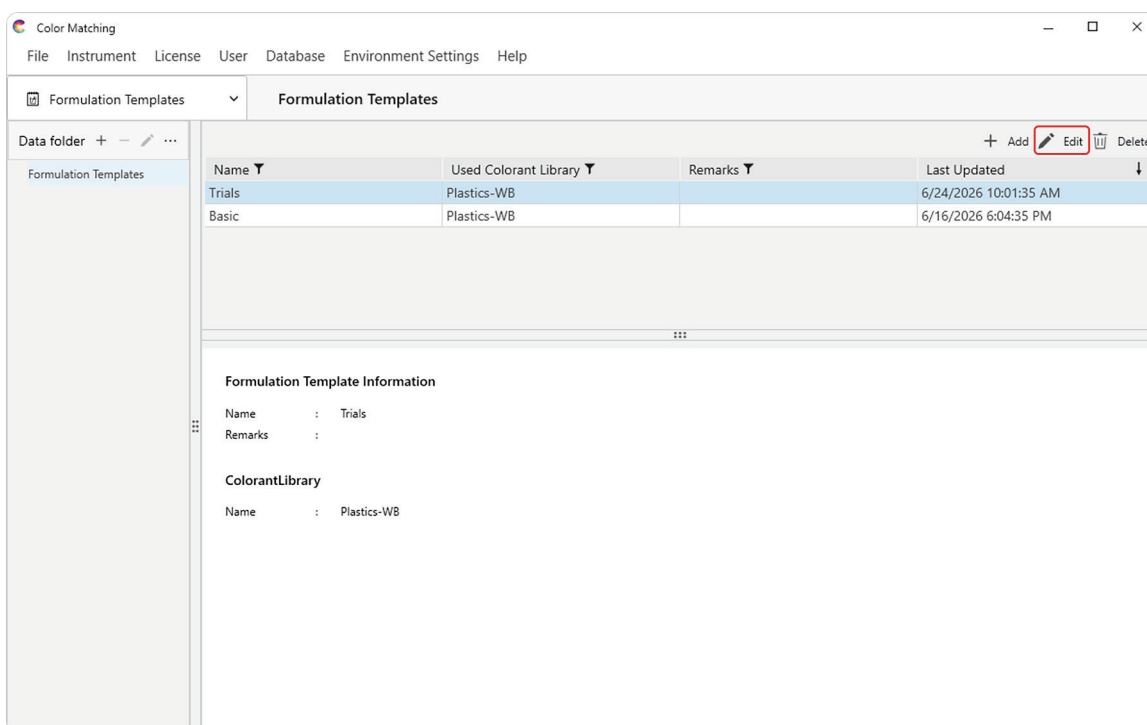
Editing an existing formulation template

Procedure

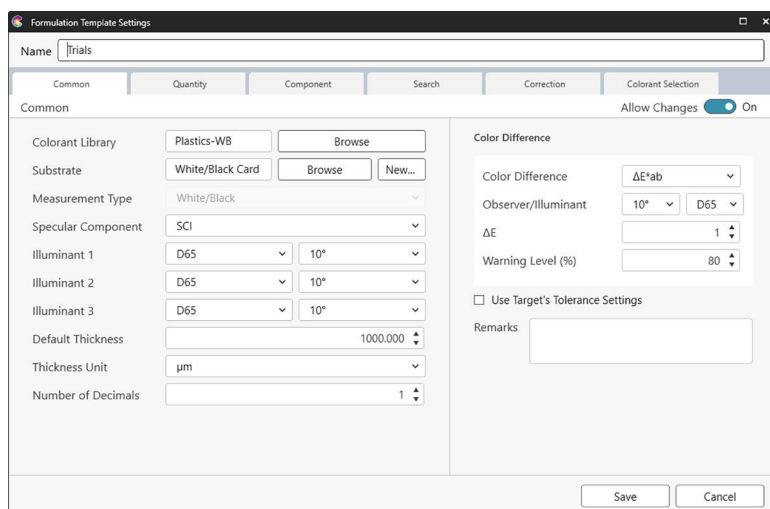
1. Click the selector dropdown arrow located at the top of the screen and select [Formulation Templates].



2. The screen will change to the Formulation Templates screen, showing a list of currently saved formulation templates. Select the formulation template to edit and click [Edit].



3. The Formulation Template Settings dialog for the selected formulation template will appear.



4. Perform settings in the dialog tabs as needed.

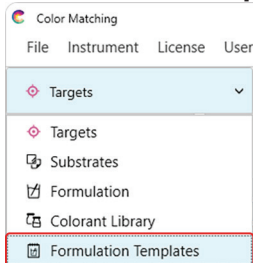
- For details on settings for each tab, see [Formulation Template Settings dialog on page 109](#).

5. Click [Save] to save the settings and close the dialog.

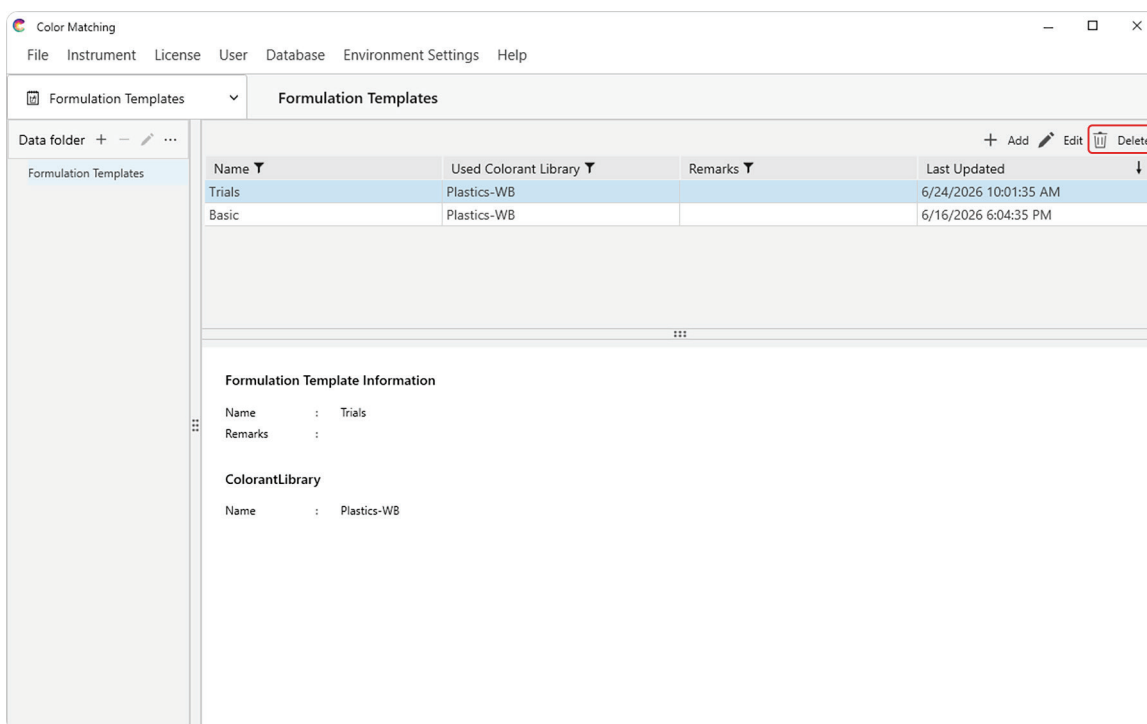
Deleting a formulation template

Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Formulation Templates].



2. The screen will change to the Formulation Templates screen, showing a list of currently saved formulation templates. Select the formulation template to delete and click [Delete].



3. A confirmation dialog will appear.
4. Click [OK]. The selected formulation template will be deleted.

□ Formulation Template Settings dialog

The Formulation Template Settings dialog is used to create or edit a formulation template, or to view or set settings when performing formulation or correction.

Allow Changes toggle switch (Shown at upper right of each tab. Switch setting is independent for each tab.)

ON Settings in the tab can be changed.

OFF Settings in the tab cannot be changed.

Note

- Toggle switch setting is saved when a formulation template is created or edited and then saved.
- The toggle switch setting cannot be changed when the Formulation Template Settings dialog is opened by clicking Settings in the Formulation screen.
- When "No Template" was selected in the Create Formulation Project dialog that appears when adding a new formulation project, the toggle switch will be set to ON for all tabs and cannot be changed.

[Apply]	(when the Formulation Template Settings dialog is opened by clicking [Settings] in the Formulation screen) Applies the settings and closes the dialog. • Changed settings are used only for this formulation or correction and are not saved in the formulation template.
[Save]	(when the Formulation Template Settings dialog is opened in the Formulation Template function) Saves the settings in the formulation template.

Common tab

<u>Colorant Library</u>	Colorant Library containing the colorant set to be used for formulation.
<u>Substrate</u>	Select the substrate to be used for measuring the sample of the formulation.
<u>Measurement Type</u>	Automatically set according to the selected substrate.
<u>Specular Component</u>	Select whether to use data calculated from SCI (Specular Component Included) or SCE (Specular Component Excluded) reflectance data for the Colorant Library data. Note • The measurement mode (SCI or SCE) selected for the initial formula calculation cannot be changed during subsequent formula corrections.
<u>Illuminant 1</u>	Primary illuminant and observer for color difference calculation.
<u>Illuminant 2,</u> <u>Illuminant 3</u>	Secondary and tertiary illuminants and observers for Metamerism Index calculation.
<u>Default Thickness</u>	Default thickness of the target sample
<u>Thickness Unit</u>	Select the unit of thickness to use: mm; µm; in
<u>Number of Decimals</u>	Number of decimal places for data display.
Tolerance Set the target color tolerance.	
<u>Color Difference</u> <u>Formula</u>	Select the color difference formula to use: ΔE00(CIE2000); ΔE*94; CMC; ΔE*ab • When ΔE00(CIE2000) , ΔE*94 , or CMC is selected, also set the parametric coefficients.

<u>Observer/Illuminant</u>	Select the observer and illuminant to use.
<u>ΔE</u>	Input the color difference tolerance value.
<u>Warning Level (%)</u>	Input the percentage of the tolerance at which warning should be displayed.
<u>Use Target's Tolerance Settings</u>	When checked for targets loaded by using [Browse], tolerance settings set for the target in the Target function will be used.
<u>Remarks</u>	Additional information, notes, etc. can be input here

Quantity tab

The screenshot shows the 'Formulation Template Settings' dialog box with the 'Quantity' tab selected. The 'Mixing Method' is set to 'Gravimetric', the 'Unit' is 'Kg', and the 'Batch Quantity' is set to 'Total Quantity' with a value of 100. The 'Allow Changes' toggle is turned 'On'. The 'Apply' and 'Cancel' buttons are visible at the bottom right.

<u>Mixing Method</u>	Gravimetric: Mixing amounts will be controlled by weight. Volumetric: Mixing amounts will be controlled by volume.
<u>Unit</u>	(Mixing Method: Gravimetric) Kg; g; mg (Mixing Method: Volumetric) Kl; l; ml
<u>Batch Quantity</u>	Total Quantity: Recipes will be calculated so that the total amount of all components, including base materials and colorants, will be the specified amount. Base Material Quantity Only: Recipes will be calculated to include the specified amount of base material, and the amount of colorants will be in addition to this base material amount.

Component tab

Formulation Template Settings

Common | Quantity | **Component** | Search | Correction | Colorant Selection

Component Allow Changes: On

Number of Components
 Max:

Fixed Components
☐ Fixed Concentration
☐ Max. Concentration
☒ No Fixed Components

Priorities
☒ Color Accuracy
☐ Cost
☐ Component Count

Additional Rules
☒ Enable Colorant Preference
☒ Enable Colorant Compatibility

Base Material Optimization
☒ Enable Base Material Optimization
 Max Color Difference (White):
 Max Color Difference (Black):
 Max MI (White):

Apply Cancel

Number of components

<u>Max</u>	Set the maximum number of components allowed in a recipe. If there is no limit on the number of components, set this number to 10.
------------	--

Fixed components

Sets how to handle the ratio of colorant to base material for recipe calculation. For recipes involving multiple colorants, this ratio applies to the total amount of all colorants used.

Note

- White and black are treated as colorants and included in the colorant ratio calculations. This applies to components registered in the White/Black tab of the Colorant Library, including Default White and Default Black.

<u>Fix Concentration</u>	Set the fixed ratio of colorants to base materials to use when calculating recipes.
--------------------------	---

<u>Max. Concentration</u>	Set the maximum ratio of colorants to base materials to use when calculating recipes.
---------------------------	---

<u>No Fixed Components</u>	Recipes are calculated without any conditions on ratio of colorants to base material.
----------------------------	---

Priorities

Sets the priority condition for recipes. This will affect the calculation of the recipe evaluation score.

<u>Color Accuracy</u>	Recipes with smaller color difference under Illumination 1 will be prioritized.
-----------------------	---

<u>Cost</u>	Recipes with lower cost will be prioritized
-------------	---

<u>Component Count</u>	Recipes that use fewer components will be prioritized.
------------------------	--

Additional Rules

<u>Enable Colorant Preference</u>	Recipe calculations will reflect preferences set in Colorant Library. The system prioritizes colorants with lower preference value.
-----------------------------------	---

<u>Enable Colorant Compatibility</u>	Recipe calculations will reflect "Restricted Combinations" settings (see Registering Base Material, White/Black, and Colorant Components on page 78) in the Colorant Library. The system will prevent mutually exclusive materials from being included in the same recipe.
--------------------------------------	---

Base Material Optimization

Base material optimization can be used to maximize the base material (resin, binder, etc.) content in the formula. This is useful when higher base material usage is preferred over minimizing color difference (ΔE).

<u>Enable Base Material Optimization</u>	When checked, base material optimization will be performed according to the conditions set for the following 3 items, which are shown only when <u>Enable Base Material Optimization</u> is checked. When unchecked, base material optimization will not be performed.
--	--

<u>Max Color Difference (White)</u>	Color difference tolerance for measurements over the white section of the substrate. This setting should also be used for single-color substrate measurements.
-------------------------------------	--

<u>Max Color Difference (Black)</u>	Color difference tolerance for measurements over the black section of the substrate. This setting is not used for single measurements.
-------------------------------------	--

<u>Max MI (White)</u>	The maximum allowable metamerism index on the white section of the substrate. This setting can also be used for single-color substrate measurements.
-----------------------	--

Search tab

The screenshot shows the 'Formulation Template Settings' dialog box with the 'Search' tab selected. The 'Search' tab contains two input fields: 'Search ΔE' and 'Optimization ΔE'. The 'Search ΔE' field has a value of 11, and the 'Optimization ΔE' field has a value of 1. To the right of these fields is an 'Allow Changes' toggle switch, which is currently turned on. At the bottom right of the dialog are 'Apply' and 'Cancel' buttons.

<u>Search ΔE</u>	Set the search range for samples to be used in "Search & Correction." Only samples within the specified color difference (ΔE) from the target will be included in the search and correction process.
<u>Optimization ΔE</u>	Set the search range for samples to be used in Search & Optimization. Only samples within the specified color difference (ΔE) from the target will be included in the search and optimization process.

Correction tab

Formulation Template Settings

Common Quantity Component Search Correction Colorant Selection

Correction

Allow Changes ☒ On

Correction Mode: Batch Correction

Initial Quantity: 100

Min. Allowed Quantity: 100

Target Quantity: 100

Color Difference Tolerance: 0

Allow Adding New Components: ☐ ON ☒ OFF

Allow Adding Base Material: ☐ ON ☒ OFF

Allow Adding Leftover: ☐ ON ☒ OFF

Fix Colorant Ratio: ☐ ON ☒ OFF

Apply Cancel

<u>Correction Mode</u>	Batch Correction: Correction recipes will be calculated by adding components (e.g., resin, colorants) to an existing batch. Amounts of components already included in the existing batch cannot be reduced. New Formula: Calculates a new recipe without using existing batch(es).
<u>Initial Quantity</u>	(Shown only for <u>Correction Mode</u>: Batch Correction) Set the amount of the existing batch to be used for correction.
<u>Min. Allowed Quantity</u>	(Shown only for <u>Correction Mode</u>: Batch Correction) Set the minimum production amount for the corrected batch. Note If <u>Min. Allowed Quantity</u> is greater than the current batch quantity, additions will occur even if the color difference is almost zero.
<u>Target Quantity</u>	Specify the total amount (batch weight or volume) to be produced using the correction recipe.
<u>Color Difference Tolerance</u>	(Shown only for <u>Correction Mode</u>: Batch Correction) Sets the maximum allowable color difference (ΔE) after correction. During the correction calculation process, the software will cease adding components once the ΔE reaches or falls below this threshold, preventing excessive component additions. Set to 0 (zero) if no specific tolerance setting is required.
<u>Allow Adding New Components</u>	ON New components not included in the original recipe are allowed to be added and used in correction calculations. OFF Only components included in the original recipe are allowed to be used in correction calculations.
<u>Allow Adding Base Material</u>	ON Addition of base material is allowed in correction calculations. OFF Only components other than base material can be added in correction calculations.
<u>Allow Adding Leftover</u>	(Shown only for <u>Correction Mode</u>: Batch Correction) ON Addition of new leftovers is allowed in correction calculations. OFF Addition of new leftovers is not allowed in correction calculations.
<u>Allow Addition of Fixed-Ratio Ingredients</u>	(Shown only for <u>Correction Mode</u>: Batch Correction) ON Addition of fixed usage ratio components while maintaining the fixed usage ratio is allowed in correction calculations. OFF Addition of fixed-ratio components is not allowed in correction calculations unless necessary. If these components are added to the formula, the pre-set usage ratios will not be maintained.
<u>Fix Colorant Ratio</u>	ON Correction recipe is calculated to maintain the same total colorant ratio as the initial formulation. Even if the total colorant ratio was not fixed during the initial formulation, this function forces the corrected recipe to match the same total colorant ratio. OFF Correction recipe is calculated with no restrictions on the total colorant ratio.

Colorant Selection tab

Color(SCI)	Group	Name	Product N...	Status	Last Updat...	Min Us...	Max U...	Fix Usa...
☒		Phthalo Blue	123	Calibrated	4/6/2026 4:20:25...	0.0000	100.00	0.0000
☒		Phthalo Green	123	Calibrated	4/6/2026 4:20:25...	0.0000	100.00	0.0000
☒		Red Iron Oxide	123	Calibrated	4/6/2026 4:20:25...	0.0000	100.00	0.0000
☒		Zinc Ferrite Tan	123	Calibrated	4/6/2026 4:20:25...	0.0000	100.00	0.0000

This tab contains 4 subtabs (Base Material, White/Black, Colorants, Leftover) corresponding to the tabs in the Colorant Library Settings screen.

The meaning of each column in the table is described below.

(checkbox)	When checked, the component is available for use in formulation and correction. When unchecked, the component is not available for use in formulation and correction. Note Checking/unchecking the checkbox in the top row will check/uncheck all component rows in the sub tab
<u>Color</u>	Shows the simulated color of the component.
<u>Group</u>	If the component has been added to a group, the group name will be shown.
<u>Name</u>	The name of the component.
<u>Product number</u>	The product number set for the component.
<u>Default</u>	(Shown only in Base Material and White/Black subtabs) When checked, the component is used as a default base material, default white colorant, or default black colorant respectively.
<u>Type</u>	(shown only in White/Black subtab) White Component is a white colorant. Black Component is a black colorant.
<u>Status</u>	Calibrated Calibration has been performed for the component. --- Calibration has not been performed for the component.
<u>Last updated</u>	The date/time when the component was last calibrated.
<u>Min Usage(%)</u>	Defines the minimum inclusion rates for components within recipes. This overrides the values set in the Colorant Library. Note Setting a minimum usage percentage (e.g., 10%) does not guarantee that the component will always be used in the recipe.
<u>Max Usage(%)</u>	Defines the maximum inclusion rates for components within recipes. This overrides the values set in the Colorant Library.
<u>Additional</u>	(shown only in Base Material subtab) When checked, the base material can be blended with other selected base materials when calculating recipes.
<u>Fix</u>	Click to change setting. (open lock) Component fixed usage value will not be used. (closed lock) Component fixed usage value will be used. Note - Fixing two or more components is not allowed. - This function is not available when "Fixed Components" is set in the Component tab (as restrictions on base material usage are already applied).
<u>Fix Usage</u>	Fixed usage amount for component. Value is used only when the Fix lock for the component is closed.

Buttons (shown only in [Leftover] subtab)

[+ Add]	Opens Leftover Settings dialog for registering leftovers in a colorant library as available components. See Registering Leftovers via the Formulation Template Settings screen on page 119 .
[Edit]	Opens the Leftover Settings dialog for the selected leftover.
[Delete]	Deletes the selected leftover.

Leftovers

Leftovers refer to unused or surplus mixed materials consisting of base materials and colorants. By registering leftovers in a colorant library database, these materials become component candidates for future color matching and formulation recipes.

There are two methods to register leftovers in the Colorant Library:

- Via the Formulation Project screen:
- Via the Formulation Settings screen:

Note

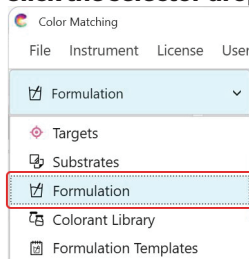
- Registration via the Formulation Settings screen can only be performed by SpectraMagic CMS Full Edition users who are registered with the "Admin" role.

Registering Leftovers via the Formulation Project screen

Samples created during formulation process can be registered as leftover.

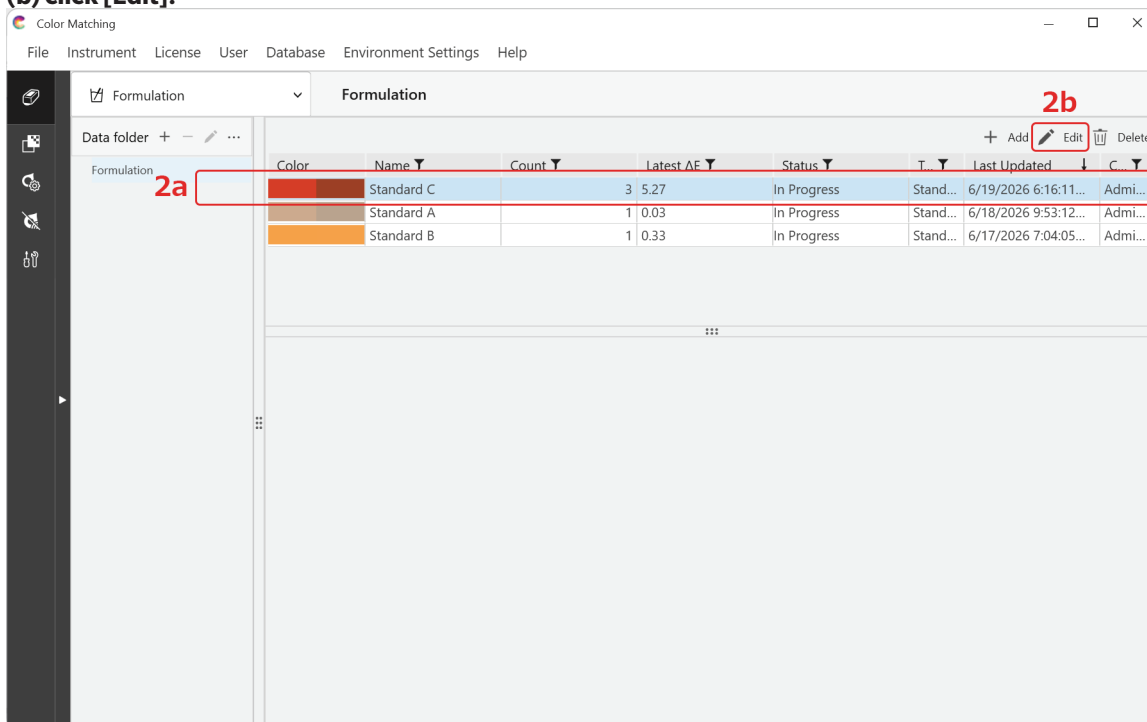
Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Formulation].



The screen will change to the Formulation screen. A list of currently saved formulation projects is displayed.

2. (a) Click the row in the list for the formulation project containing the recipe and sample of the leftover, and (b) click [Edit].



3. The Formulation Project screen for the selected formulation project will appear.
 - a) Select the row of the data set containing the recipe and sample of the leftover.
 - b) Select the [Sample] tab.

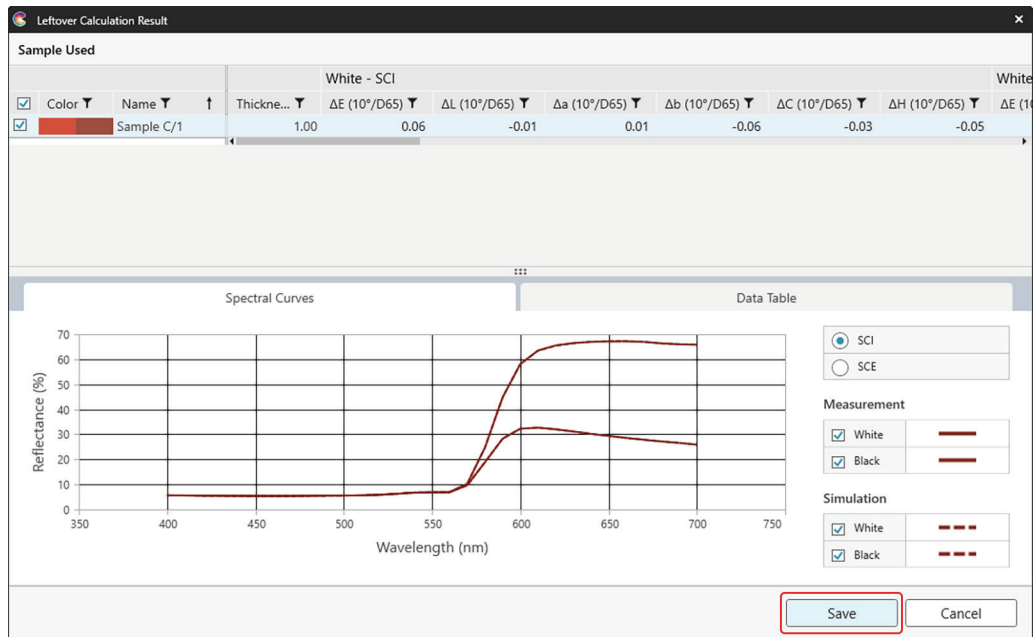
4. In the [Sample] tab
 - a) Click [...].
 - b) Select **Save As Leftover...** from the displayed options.
5. The Leftover Settings dialog will appear, with the measured data from the [Sample] tab of the Formulation project shown in the right side of the screen.

Memo

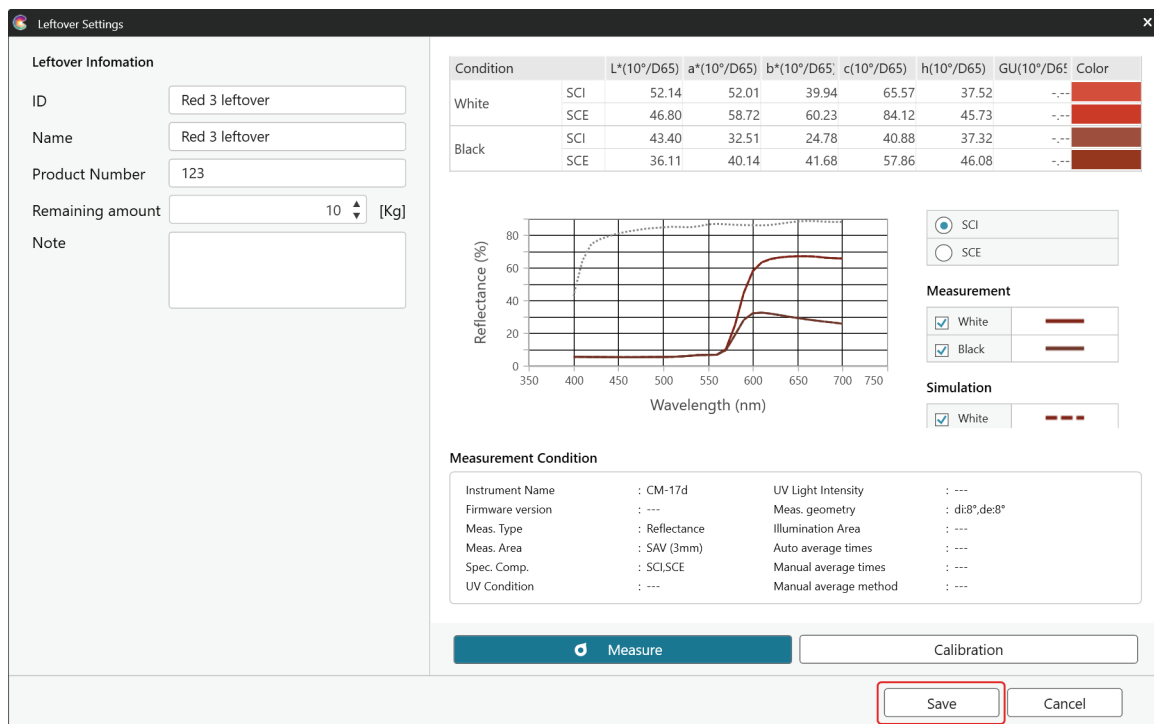
- Measurements can also be performed here if necessary.

6. Enter the Leftover information.
7. Click the [Calibration] button to calibrate the leftover.

8. The Leftover Calculation Result dialog will appear. Click the [Save] button.



9. The Leftover Settings dialog will appear again. Click the [Save] button to register the leftover to Colorant Library and close the dialog.

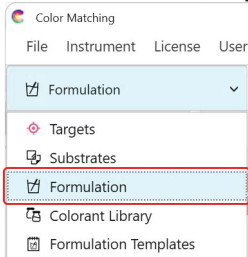


□ Registering Leftovers via the Formulation Template Settings screen

Surplus or unused mixed materials consisting of base materials and colorants, generated outside the formulation process, can also be registered as leftovers.

Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Formulation].



2. The screen will change to the Formulation screen. A list of currently saved formulation projects is displayed.
 - a) Click the row in the list for the formulation project that uses the colorant library to which the leftover will be added.
 - b) Click [Edit].

The screenshot shows the 'Color Matching' application window. The 'Formulation' dropdown is selected. The table displays three rows: Standard C, Standard A, and Standard B. The 'Standard A' row is highlighted with a red box and labeled '2a'. The 'Edit' button is highlighted with a red box and labeled '2b'.

Color	Name	Count	Latest ΔE	Status	T...	Last Updated	C...
Standard C	Standard C	3	5.27	In Progress	Stand...	6/18/2026 9:39:43...	Admi...
Standard A	Standard A	1	0.03	In Progress	Stand...	6/18/2026 9:53:12...	Admi...
Standard B	Standard B	1	0.33	In Progress	Stand...	6/17/2026 7:04:05...	Admi...

Formulation Information

Name : Standard A
Count : 1
Status : In Progress

ColorantLibrary

Name : Plastics-WB

Color Data

Condition	L*(10°/D6)	a*(10°/D6)	b*(10°/D6)	c*(10°/D6)	h(10°/D6)	GU(10°/D)	Color
White	SCI	72.71	8.79	19.57	21.46	65.83	---
Black	SCI	68.51	5.47	14.29	15.31	69.04	---

3. The Formulation Project screen for the selected formulation project will appear. Click [Setting].

Color Matching

FileInstrumentLicenseUserDatabaseEnvironment SettingsHelp

Formulation ProjectStandard A

CloseSave AsSave

+ Start New CorrectionDelete...

FinishOn

Recipe												Sample		
Count	Target	Recipe	Sample	$\Delta E(Whit...$	$\Delta L^*(Whit...$	$\Delta a^*(Wh...$	$\Delta b^*(Wh...$	$\Delta C^*(Wh...$	$\Delta H^*(W...$	MI(Whit...	Contrast Ratio	Contrast	$\Delta E(Whit...$	$\Delta L^*(Wh...$
1				0.027272	0.018554	-0.004648	0.035812	0.030761	0.018919	0.000000	86.477058	4.961856	---	---

TargetRecipeSample

Setting

Modify the target as appropriate.

MeasureBrowse

Target Information

IDStandard A

NameStandard A

Product Number123

Measurement TypeWhite/Black

Status

Tolerance

Color Difference Form... ΔE^*ab

Color Data

Condition		$L^*(10^\circ/D65$	$a^*(10^\circ/D65$	$b^*(10^\circ/D65$	$c(10^\circ/D65$	$h(10^\circ/D65$	$GU(10^\circ/D65$	Color
White	SCI	72.69	8.79	19.54	21.43	65.78	---	
	SCE	69.71	9.38	21.34	23.31	66.27	---	
Black	SCI	68.51	3.53	13.36	13.82	75.22	---	
	SCE	65.19	3.82	14.78	15.26	75.50	---	

reflectance (%)

Measurement

☒ White/SCI☒ White/SCE☒ Black/SCI☒ Black/SCE

4. The Formulation Template Settings dialog will appear.

- a) Select the [Colorant Selection] tab.
- b) Select the [Leftover] subtab.
- c) Click [+ Add].

Formulation Template Settings

CommonQuantityComponentSearchCorrectionColorant Selection

Colorant Selection

Allow ChangesOn

Base MaterialWhite/BlackColorantsLeftover

+ AddEditDelete

	Color(S...	Group	Name	Product...	Status	Last Upd...	Min Usage...	Max Usag...	Fix	Fix Usage[...
☐			Red 3 leftover	123	Calibrated	6/19/2026 5:40:...	0.000000	100.0000C		0.000000
☐			Red 3 leftover	123	Calibrated	6/19/2026 5:40:...	0.000000	100.0000C		0.000000

ApplyCancel

5. The Leftover Settings dialog will appear.

Leftover Settings

Leftover Information

ID

Tan 01 Leftover

Name

Tan 01 Leftover

Product Number

123

Remaining amount

10.

[Kg]

Note

Measure Sample

100

90

80

70

60

50

40

30

20

10

0

350

400

450

500

550

600

650

700

Wavelength (nm)

☒ S/SCI

☒ K/SCI

☒ S/SCE

☒ K/SCE

Save

Cancel

Enter the Leftover information.

ID	Information to identifies the leftover.
Name	Name of the leftover.
Product Number	Additional information to identify the leftover.
Remaining Amount	Usable remaining amount of the leftover.
Note	Other information can be entered as a note.

6. Click [Measure Sample].

7. The Leftover Sample Settings dialog will appear.

Leftover Sample Settings

Leftover Name Tan 01 Leftover

Leftover Sample Information

Name *

Tan 01 Leftover

Measurement Type

White/Black

Thickness

1

[mm]

Substrate *

White/Black Card

Browse

Use for Calibration

Include

Condition

L*(10°/D65) a*(10°/D65) b*(10°/D65) c*(10°/D65) h(10°/D65) GU(10°/D65) Color

100

80

60

40

20

0

350

400

450

500

550

600

650

750

Wavelength (nm)

☒ SCI

☐ SCE

Measurement

☒ White

☒ Black

Simulation

☒ White

☒ Black

Measurement Condition

Instrument Name

Firmware version

Meas. Type

Meas. Area

Spec. Comp.

UV Condition

UV Light Intensity

Meas. geometry

Illumination Area

Auto average times

Manual average times

Manual average method

Measure

Load from file

Calibration

Save

Cancel

Enter Leftover Sample Information.

Name	Name of the leftover.
Measurement Type	Select the type of substrate of the sample. Select Single if the substrate is a single color. Select White/Black if the substrate has light and dark sections (e.g. Leneta chart)
Thickness	Thickness of the sample.
Substrate	Click [Browse] and select the substrate of the sample.

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Use in Calibration	Select Include if this sample data can be used in calibration of the colorant library. Select Exclude if this sample data should not be used in in calibration of the colorant library.
--------------------	--

8. To measure the reflectance of the leftover sample, click [Measure].

- To load reflectance data from a file instead of measuring, see [To load leftover sample data from a file on page 122](#).
- [Measure] will be disabled if no instrument is connected.

For Measurement Type: Single

8-1. A message box prompting you to measure the sample will appear.

8-2. Position the instrument and sample, and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

8-3. Measurement is complete and the measurement data will be shown in the screen.

For Measurement Type: White/Black

8-1. A message box prompting you to measure the sample over white will appear.

8-2. Position the instrument and sample over the white substrate and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

8-3. A message box prompting you to measure the sample over black will appear.

8-4. Position the instrument and sample over the black substrate and click [Measure] in the dialog. A measurement will be taken.

- If Instrument Trigger Meas. Mode is enabled, measurement can also be performed by pressing the instrument's measurement button.

8-5. A measurement will be taken and the measurement data will appear in the screen.

To load leftover sample data from a file

For Measurement Type: Single

8-1. Click [Load from File]. The Select the first CxF File dialog will appear.

8-2. Select the *.cxf file to load and click [Open]. The file will be loaded and the data will appear in the screen.

For Measurement Type: White/Black

8-1. Click [Load from File]. The Select the White CxF File dialog will appear.

8-2. Select the opacity *.cxf file to load and click [Open]. The file will be loaded and the data will appear on the screen.

- If separate over-white and over-black measurement data CxF files are to be loaded, select the over-white data CxF file first.

Then, select the over-black data CxF file in the Select the Black CxF file dialog.

The data for both over-white and over-black measurements will be loaded and appear in the screen.

9. Click [Calibration].

Leftover Sample Settings

Leftover Name Tan 01 Leftover

Leftover Sample Information

Name: Tan 01 Leftover

Measurement Type: White/Black

Thickness: 1 [mm]

Substrate: White/Black Card

Use for Calibration: Available

Condition		L*(10°/D65)	a*(10°/D65)	b*(10°/D65)	c(10°/D65)	h(10°/D65)	GU(10°/D65)	Color
White	SCI	78.50	12.08	28.22	30.70	66.82	-	
	SCE	76.13	12.68	30.28	32.83	67.28	-	
Black	SCI	78.51	12.08	28.25	30.72	66.84	-	
	SCE	76.12	12.69	30.33	32.88	67.30	-	

Reflectance (%)

Wavelength (nm)

Measurement Condition

Instrument Name: CM-17d

Firmware version: -

Meas. Type: Reflectance

Meas. Area: SAV (3mm)

Spec. Comp.: SCLSC

UV Condition: -

UV Light Intensity: -

Meas. geometry: di8°, de8°

Illumination Area: -

Auto average times: -

Manual average times: -

Manual average method: -

Measurement

Simulation

Measure

Load from file

Calibration

Save

Cancel

10. The Leftover Calculation Result dialog will appear. Click [Save] to save the results.

Leftover Calculation Result

Sample Used

White - SCI

Color: Tan 01 Leftover

Thickne...: 1.00

$\Delta E(10^\circ/D65)$: 0.03

$\Delta L(10^\circ/D65)$: 0.01

$\Delta a(10^\circ/D65)$: -0.01

$\Delta b(10^\circ/D65)$: 0.02

$\Delta C(10^\circ/D65)$: 0.02

$\Delta H(10^\circ/D65)$: 0.02

$\Delta E(10^\circ/D65)$: 0.02

Reflectance (%)

Wavelength (nm)

Measurement

Simulation

Save

Cancel

11. The Leftover Sample Settings dialog will appear again. Click [Save].

12. The Leftover Settings dialog will appear again, showing the K and S of the sample. Click [Save] to save the leftover.

Leftover Settings

Leftover Information

ID: Tan 01 Leftover

Name: Tan 01 Leftover

Product Number: 123

Remaining amount: 10 [Kg]

Note:

Measure Sample

Graph: S (Solid line), K (Dashed line) vs Wavelength (nm)

Checkboxes: S/SCI, K/SCI, S/SCE, K/SCE

Buttons: Save, Cancel

Memo

- The registered leftovers will appear in the [Leftover] tab.
- Registered leftovers can be edited or deleted in the [Leftover] tab.

Formulation Template Settings

Colorant Selection

Allow Changes: On

Color(S...)	Group	Name	Product...	Status	Last Upd...	Min Usage...	Max Usage...	Fix	Fix Usage...
Red 3		Red 3 leftover	123	Calibrated	6/19/2026 5:40...	0.000000	100.000000		0.000000
Red 3		Red 3 leftover	123	Calibrated	6/19/2026 5:40...	0.000000	100.000000		0.000000

Buttons: Apply, Cancel

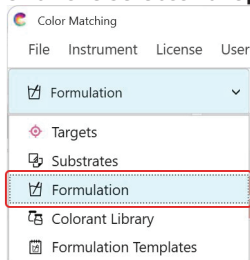
13. The Formulation Template Settings dialog will appear again. Click [Apply] to complete registration and close the Formulation Template Settings dialog.

Setting Registered Leftovers as a Component Candidate

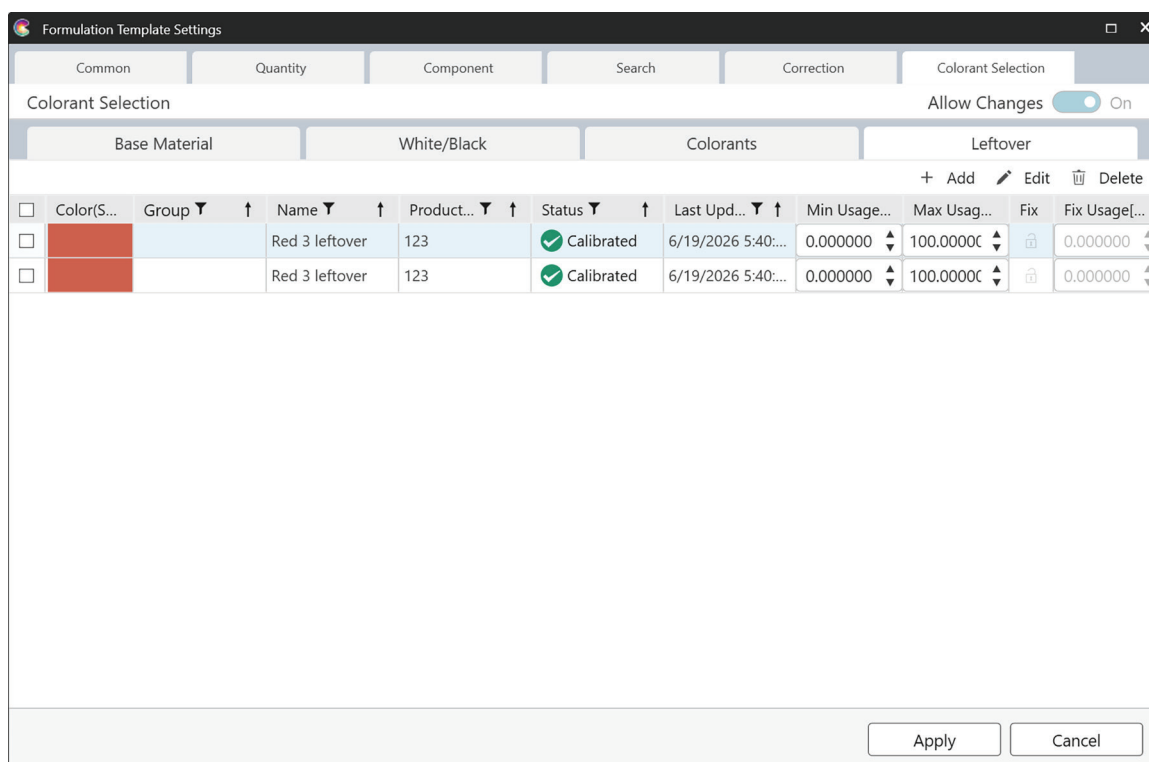
Registered Leftovers can be set as component candidates for future recipes.

Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Formulation].



2. The screen will change to the Formulation screen. A list of currently saved formulation projects is displayed.
 - a) Click the row in the list for the formulation project to which the leftover will be added as a component candidate.
 - b) Click [Edit].
3. The Formulation Project screen for the selected formulation project will appear. Click [Setting].
4. The Formulation Template Settings dialog will appear.
 - a) Select the [Colorant Selection] tab.
 - b) Select the [Leftover] subtab.
 - c) Click the checkbox at the left of the leftover to be used as a component candidate.



5. Click [Apply] to close the Formulation Template settings dialog.
6. Click [Save] to save the Formulation Project.

Note

- Leftovers may be excluded from recipes if a more optimal recipe without leftovers is found.

Exporting Recipes

Recipes can be exported as Formulation Reports.

These reports can be saved on the computer as PDF files.

Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Formulation]. The screen will change to the Formulation screen, showing a list of currently saved formulation projects.
2. Click the row in the list for the formulation project containing the recipe to be exported and click [Edit].
3. The Formulation Project screen for the selected formulation project will appear.

Color Matching

File Instrument License User Database Environment Settings Help

Formulation Project Standard C

Close Save As Save

+ Start New Correction Delete ... Finish Off

Count	Target	Recipe	Sample	$\Delta E^*(Whit...)$	$\Delta L^*(Whit...)$	$\Delta a^*(Wh...)$	$\Delta b^*(Wh...)$	$\Delta C^*(Wh...)$	$\Delta H^*(W...)$	MI(Whit...	Contrast Ratio	Contrast	$\Delta E^*(Whit...)$	$\Delta L^*(Wh...)$	$\Delta a^*(Wh...)$
3				5.269758	-2.625257	7.933483	13.418083	14.658817	5.301337	0.000000	60.638184	11.708700			
2				5.503927	-2.153362	7.620532	14.660972	15.256818	6.343980	0.000000	62.062241	11.354000	0.290167	0.092174	0.56175
1				0.001282	-0.000021	0.001571	-0.001553	0.000309	-0.002187	0.000000	66.598419	10.944150	0.797670	0.519264	0.39899

Target Recipe Sample Setting

Batch Correction Mode

Colo...	Group	Name	Old %	Old W...	New %	New...	A...
		Polymer	99.7798...	1496.70...	99.7798...	1496.70...	0...
		Orange	0.097466	1.462000	0.097466	1.462000	0...
		Red A	0.080267	1.204000	0.080267	1.204000	0...
		Yellow A	0.042467	0.637000	0.042467	0.637000	0...

Total (Old / New): 100.000000% / 1500.003000 / 100.000000% / 1500.003000

Thickness [mm] 1.000000

Report Manual

Spectral Curves Color $\Delta L^*a^*b^*$ Graph Data Table

Reflectance (%)

Wavelength (nm)

Target

White/SCI

Black/SCI

Recipe

White/SCI

Black/SCI

Sample

White/SCI

Black/SCI

4. Select the row of the data set containing the recipe to be exported.
5. Select the [Recipe] tab.
6. Click [Report]. The Formulation Report is generated.

Recipe Report - Standard C

1 / 1

Formulation Report

Report Create Date: 06/22/2026 10:20:00 AM Created by: Administrator

Formulation Name: Standard C

Target: Standard C

Substrate: White/Black Card Thickness: 1.000000 mm

Formulation

Group	Data Name	%	Weight [g]
	Polymer	99.779800	1496.700000
	Orange	0.097466	1.462000
	Red A	0.080267	1.204000
	Yellow A	0.042467	0.637000

■ D65/10°

	Target (White)	Recipe (White)	Difference (Recipe - Target) (White)	Sample (White)	Difference (Sample - Target) (White)
dE			5.503927		0.290167
L*	52.045610	49.892250	-2.153362	52.137790	0.092174
a*	51.443250	59.063780	7.620532	52.005000	0.561751
b*	39.181420	53.842390	14.660970	39.937320	0.755899
C*	64.665220	79.922040	15.256820	65.570640	0.905418
h	37.294480	42.352220	6.343980	37.522510	0.259163
Contrast ratio	66.596790	62.062240		66.261690	
Contrast	11.114320	11.354000		11.269220	

■ D65/10°

dE			5.503927		0.290167
L*	52.045610	49.892250	-2.153362	52.137790	0.092174
a*	51.443250	59.063780	7.620532	52.005000	0.561751
b*	39.181420	53.842390	14.660970	39.937320	0.755899
C*	64.665220	79.922040	15.256820	65.570640	0.905418
h	37.294480	42.352220	6.343980	37.522510	0.259163

7. To save the Formulation Report as a PDF file, click the [Save as] icon in the upper-left corner of the Recipe Report dialog or press Ctrl + S.
8. The Save As dialog will appear. Enter a file name and click [Save] to save the report.

Reference Sample Registration for Improving Matching Performance

Formulation accuracy can be improved by registering mixed sample data (formula and measured reflectance data) in colorant libraries. During formula calculation, the software can perform corrections based on these pre-measured sample records. Compared to calculating recipes solely from the basic data of each component (measured reflectance of calibration samples), using this historical measurement data can often yield more reliable results in the following cases:

Search & Correction Using Sample Data

The software searches for an existing sample similar to the target color, and then calculates a recipe to achieve the target by correcting the formula of the existing sample. This feature is particularly effective when a large number of past samples have been created using the same components.

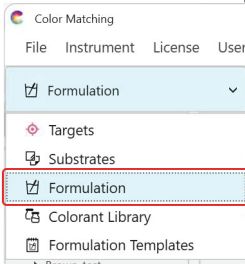
Trend Correction Using Sample Data

The software analyzes the trends between the estimated reflectance of recipes and the actual measured reflectance of formulated samples, and determines corrections to be made. By applying these corrections to recipe calculations, the software derives a recipe with reflectance closer to the target color, ultimately generating more accurate recipes. This method is effective even when the target recipe includes components that are not used in historical samples.

In both cases, the mixed sample data must be registered in the colorant library to improve matching performance by following the procedure below.

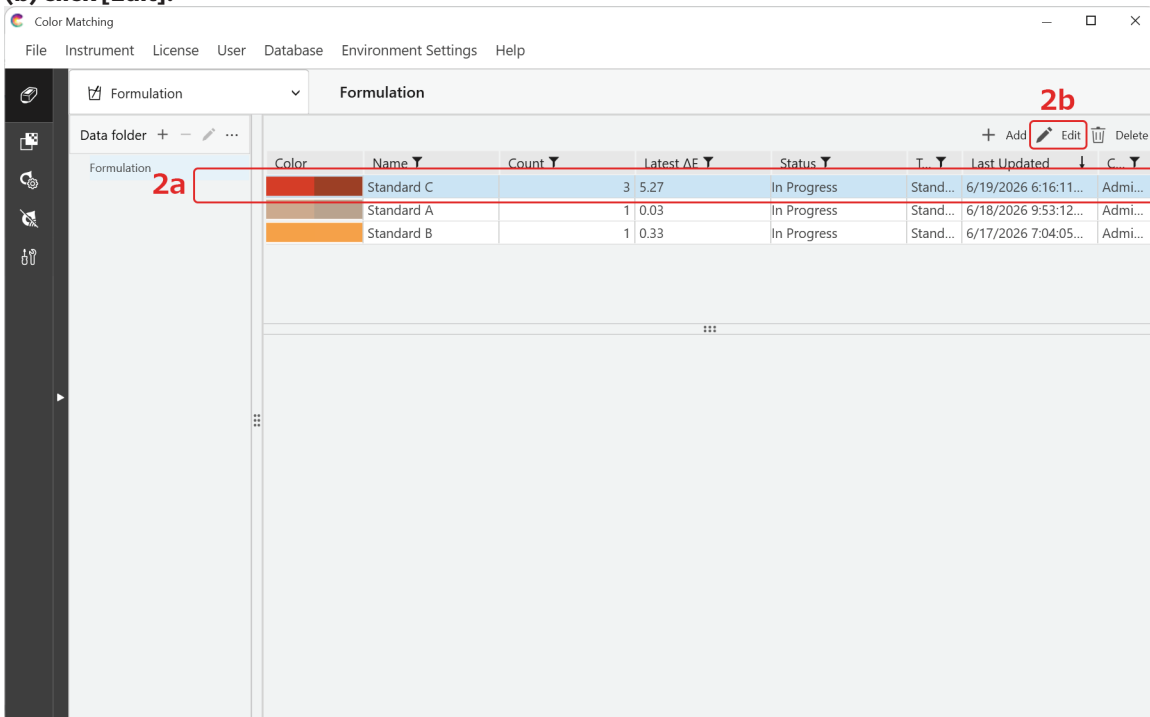
Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Formulation].



The screen will change to the Formulation screen, showing a list of currently saved formulation projects.

2. (a) Click the row in the list for the formulation project containing the recipe and sample of the leftover, and (b) click [Edit].



3. The Formulation Project screen for the selected formulation project will appear.
 - a) Select the row of the data set containing the recipe and sample of the leftover.
 - b) Select the [Sample] tab.

Color Matching

File Instrument License User Database Environment Settings Help

Formulation Project Standard C

Close Save As Save

Start New Correction Delete ... Finish On

Count	Target	Recipe	Sample	$\Delta E^*(Whit...)$	$\Delta L^*(Whit...$	$\Delta a^*(Wh...$	$\Delta b^*(Wh...$	$\Delta C^*(Wh...$	$\Delta H^*(W...$	MI(Whit...	Contrast Ratio	Contrast	$\Delta E^*(Whit...$	$\Delta L^*(Wh...$	$\Delta a^*(Wh...$
3				5.269758	-2.625257	7.933483	13.418083	14.658817	5.301337	0.000000	60.638184	11.708700	...	...	...
2				5.503927	-2.153362	7.620532	14.660972	15.256818	6.343980	0.000000	62.062241	11.354000	0.290167	0.092174	0.56175
1				0.009715	0.005570	0.011669	-0.008165	0.004337	-0.013565	0.000000	66.607895	10.912190	0.797670	0.519264	0.39899

3b

Target Recipe Sample

Modify the sample as appropriate

Name: Sample C/1

Measurement Type: White/Black

Thickness: 1 [mm]

Formulation

Color(SCI)	Group	Name	%	Weight [g]
		Polymer	99.797400	1496.962
		Red A	0.085200	1.278
		Orange	0.079600	1.194
		Yellow A	0.037800	0.567
Total:			100.000000	1500.001000

Spectral Curves Color $\Delta L^*a^*b^*$ Graph Data Table

Measure Load from file

4a

4b

Save As Target...

Save As Leftover...

Save Sample to Colorant Library...

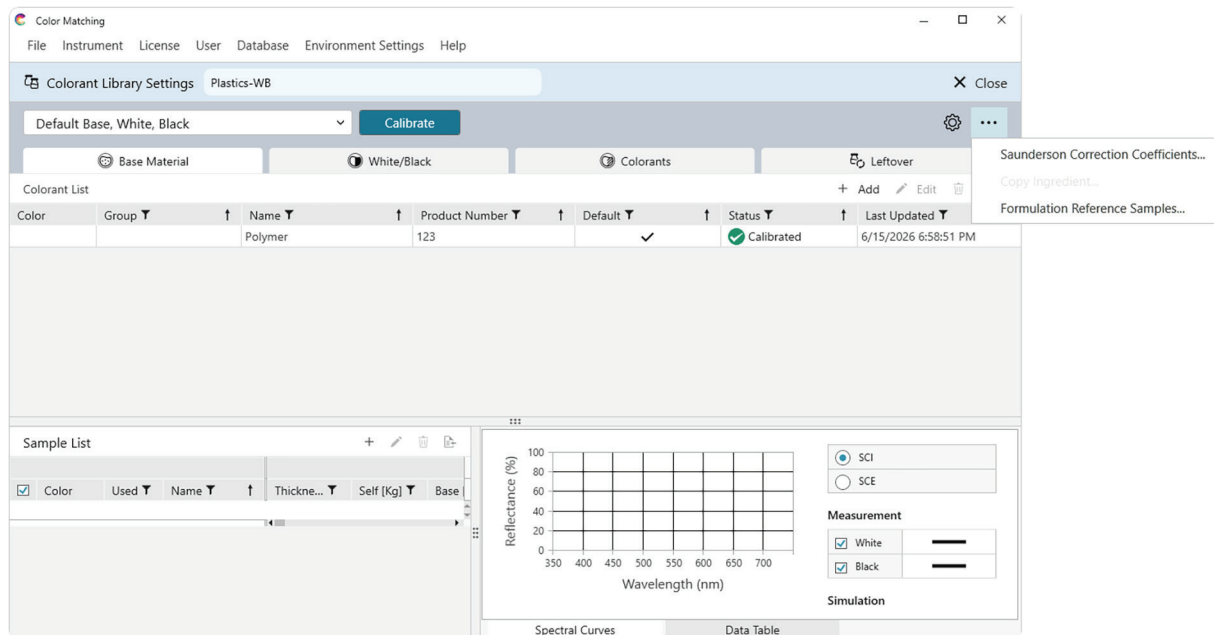
4. In the [Sample] tab
 - a) Click [...].
 - b) Select **Save Sample to Colorant Library...** from the displayed options.
5. Click [OK].

Viewing Registered Reference Samples

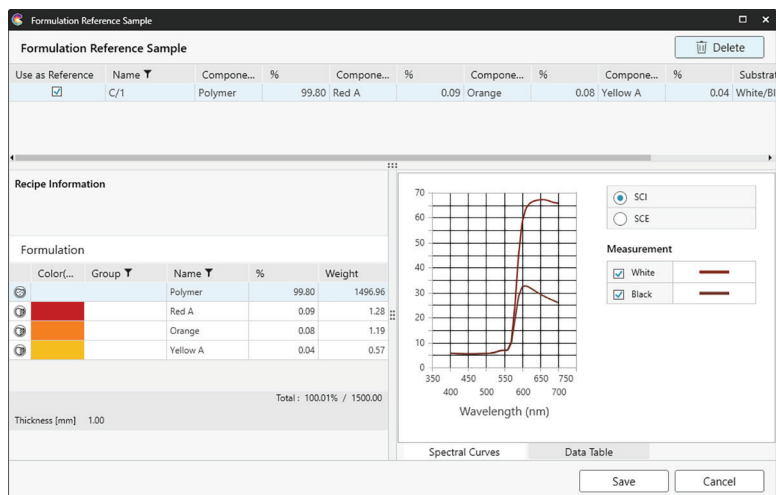
To view a registered reference sample, follow the procedures below.

Procedure

1. Click the selector dropdown arrow located at the top of the screen and select [Colorant Library]. The screen will change to the Colorant Library screen.
2. Select the colorant library containing the registered sample to view and click [Edit]. The Colorant Library Settings screen will be shown.



3. Click [...] in the upper right and click [Formulation Reference Sample...].
4. The Formulation Reference Sample dialog will appear.



Note

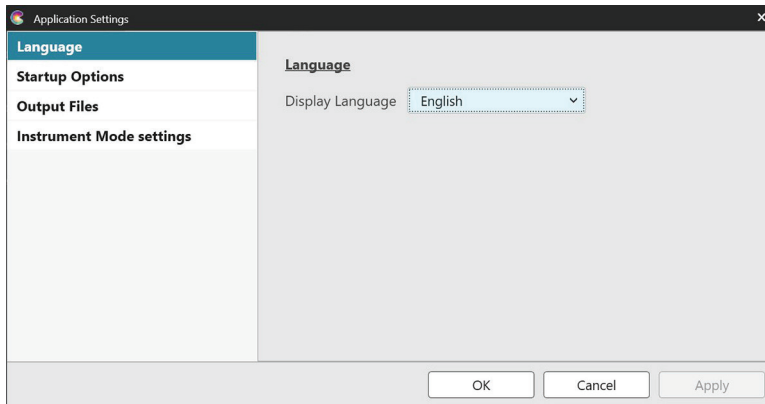
- Reference samples can be deleted by selecting the row of the sample to be deleted and then clicking [Delete].

Other Settings/Functions

■ Setting Display Language

Procedure

1. In the main screen, select *Environment Settings - Application Settings ...* . The Application Settings dialog will appear, with the [Language] category selected on the left side of the dialog.



2. Click on the current Display Language, and select the desired language from the drop-down list that appears.
3. Click [OK] to close the dialog.
4. Restart SpectraMagic CMS.



KONICA MINOLTA