Color Data Software
SpectraMagic™ NX2

Ver. 1.60

En Instruction Manual

⚠ **Before using this software, please read this manual.**

KONICA MINOLTA

SpectraMagic NX2 is color data software designed to connect measuring instruments such as the CM-36dG to a computer and enable the measurement, graphic display, and management of sample data as well as various other operations.

Formal designations of application software used in this manual

(Designation in this manual)	(Formal designation)
Windows, Windows 11	Microsoft® Windows® 11 Pro Operating System

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Notes on this manual

- No part of this manual may be reprinted or reproduced in any form or by any means without the permission of Konica Minolta, Inc.
- The contents of this manual are subject to change without notice.
- Every effort has been made to ensure the accuracy of the contents of this manual. However, should you have any questions or comments, or find an error or missing section, please contact your local sales office.
- Konica Minolta accepts no responsibility for consequences resulting from failure to follow the instructions outlined in this manual, the condition above notwithstanding.
- The screen capture shots in this manual are examples and may be different from actual screens.

Safety Precautions

Before you use the SpectraMagic NX2 software, we recommend that you thoroughly read this manual as well as the instruction manuals of your PC and the instrument.

Software License Agreement

The terms of the license agreement of the SpectraMagic NX2 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

- SpectraMagic NX2 application software is designed to be used with the Windows 11 operating system. Note that no operating system is included with this software. The operating system must be installed on the PC before this software can be installed.

Notes Regarding USB Devices (Flash Memory, Dongle)

- 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.

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- Items marked with Ⓟ are supported only by SpectraMagic NX2 Professional Edition.

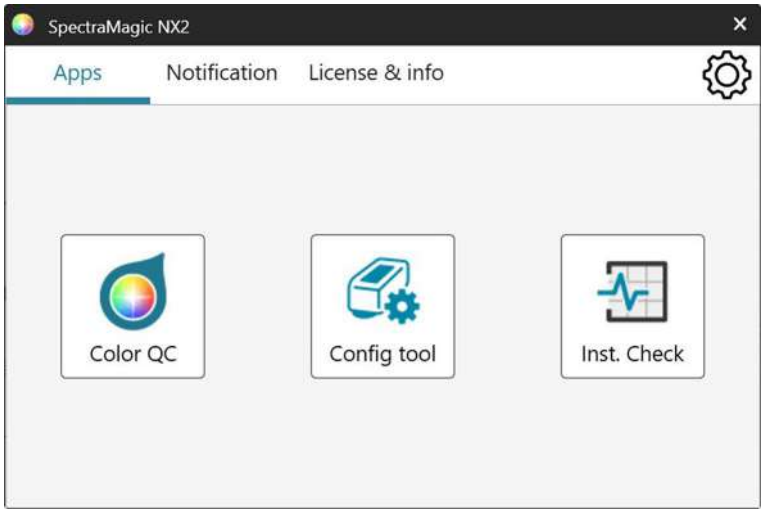
Quick Start Guide

The following sections show the basic flow of operation from startup through calibration and measurements to exiting the program to help you get started quickly.

Quick Start: 1 Starting SpectraMagic NX2

- For information on installing SpectraMagic NX2, refer to the Installation Guide
- If you have purchased a SpectraMagic NX2 license but have not activated it yet, see *1.1.3.4 License Activation on p. 9* .

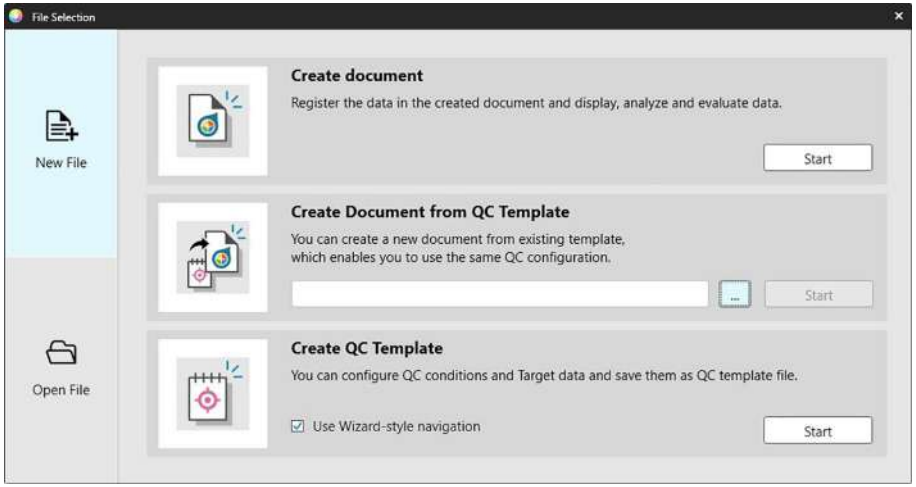
1. Select the SpectraMagic NX2 icon in the Windows Start menu or double-click on the icon on the desktop. The SpectraMagic NX2 Launcher will start.
- For information about Launcher items other than the Color QC button, see *1.1 SpectraMagic NX2 Launcher on p. 2* .
- If the dongle plugged into the computer or the dongleless (electronic) license installed on the computer includes a premium license, a message prompting you to activate the Premium license will appear when starting SpectraMagic NX2 for the first time or if the Premium license on the dongle or computer has not been activated. To activate the Premium license, click [Activate] and follow the procedure in *1.1.3.4 License Activation on p. 9* to activate the license. To continue without activating the license, click [Skip].



2. Click the [Color QC] button. The SpectraMagic NX2 QC App will start, and the File Selection dialog will appear.

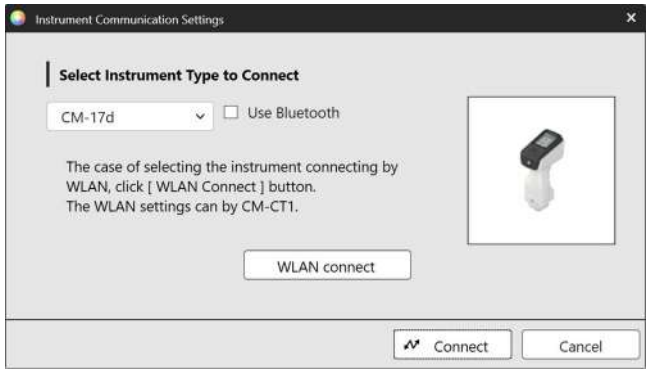
In this dialog, you can create a document or QC template, or open an existing document or QC template.

3. To create a document directly, click [Start] in the Create document section. The File Selection dialog will close and a new document will be created.
- For other functions of the File selection dialog, see *2.1.1 File Selection Dialog on p. 70* .



Quick Start: 2 Connecting an Instrument

- For more information on connecting an instrument, see *2.4 Connecting/Disconnecting an Instrument on p. 84* .



1. Click the Connect button in the toolbar or 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 clicking the toolbar Connect button or selecting *Instrument - Connect*. Continue with step 2 below.
2. Click on the drop-down 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, CM-25d, CM-23d, CM-25cG, or CM-M6 and Bluetooth will be used, click on the *Use Bluetooth* checkbox to make it checked if necessary.
   - If the instrument to be used is a CM-17d, CM-16d, CM-26dG, CM-26d, CM-25d, CM-25cG, or CM-M6, the [WLAN connect] button will be shown. To connect via WLAN, see *2.4.2.2 Connecting via WLAN on p. 89*
3. If the *Port No.* or *Baud Rate* items are shown in **Connection Settings**, click on the respective drop-down list and select the desired setting from the list that appears.
   - See *Checking the COM port number on p. 93* .
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 the scheduled instrument check for the connected instrument has not been perrformed, a warning message will appear. Clicking [OK] will disconnect the instument from the Color QC App, launch the Instrument Check App, and connect the instrument to the Instrument Check App to perform instrument check. See *3.6 Executing Instrument Check on p. 263* . This notification can be disabled in Other Settings of Application Settings in the Color QC App. See *2.22 Application Settings on p. 213* .

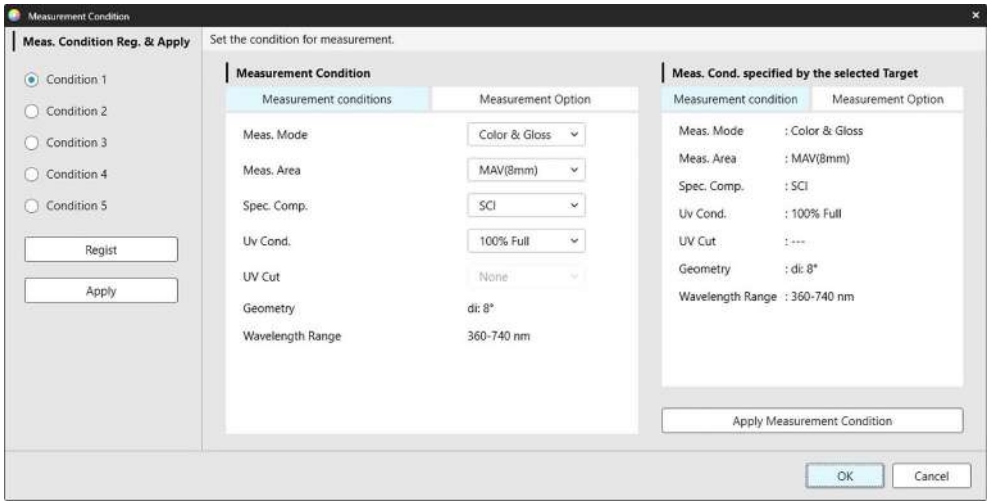
Quick Start: 3 Setting Measurement Condition Settings

Measurement condition settings such as measurement mode (reflectance, transmittance, etc.), measurement area, specular component, etc. should be set before performing calibration.

- For details of instrument settings, see *2.5 Setting Measurement Condition Settings on p. 96* .

1. To set instrument settings such as reflectance or transmittance, SCI/SCE, measurement area, etc, do any of the following:
   - Click the Measurement Condition Settings button in the toolbar.
   - Click Measurement Conditions or in the Instrument Window.
   - Select *Instrument - Measurement Conditions*.

   The Measurement Condition dialog will appear, with the Measurement Conditions tab selected.
   - If a target is selected in the Data List window, the Measurement Conditions and Measurement Options tabs with the settings for that target will be shown in the right side of the dialog. To set instrument measurement conditions to the measurement conditions of the target, click [Apply Measurement Conditions].



2. For each changeable item, click on the current setting and select the desired setting.
   - Some settings are shown as information only and cannot be changed.
   - The specific settings which are shown will depend on the connected instrument.

3. To change Measurement Options (such as averaging settings, etc.), click on the Measurement Options tab to switch to it.

4. For each changeable item, click on the current setting and select the desired setting.
   - The specific settings which are shown will depend on the connected instrument.

5. When all setting have been set as desired, click [OK].

Quick Start: 4 Performing Calibration

To ensure accurate measurement, calibration should be performed at the current settings after switching the instrument on. Depending on the instrument, SpectraMagic NX2 can be used to take reflectance or transmittance measurements. Follow the procedure below to perform calibration for the type of measurement selected in Measurement Conditions.
For more information on calibration, see *2.6 Calibration on p. 109* .

Quick Start: 4.1 For reflectance or opacity measurements

For reflectance or opacity measurements, zero calibration and white calibration will be performed. If the selected measurement conditions include gloss, gloss calibration will also be performed.

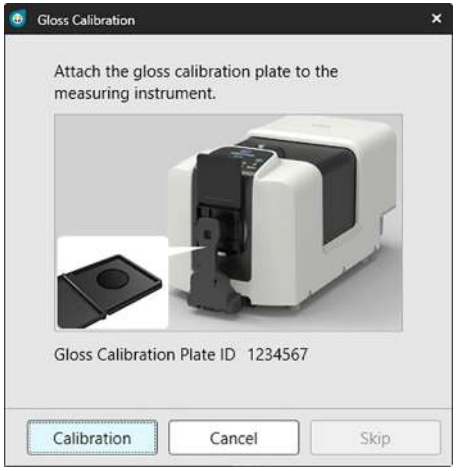
1. To start calibration, do any of the following:
- Click the Calibration button in the toolbar.
- Click Calibration or in the Instrument Window.
- Select *Instrument - Calibration*.

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-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 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.



Quick Start: 4.2 For transmittance or haze measurements

For transmittance or haze measurements, 0% calibration and 100% calibration will be performed. For transmittance measurements of solids, 100% calibration is performed to air (with nothing in the instrument's transmittance chamber). For transmittance measurements of liquids, 100% calibration is performed to water (with a cell containing distilled water in the instrument's transmittance chamber).

- When performing transmittance measurements, the white calibration plate must always be placed over the reflectance measurement port for both calibration and measurements.
- For haze measurements, the white calibration plate must always be placed over the reflectance measurement port for calibration; for measurements, follow the instructions in the dialogs that will be shown during measurements.

1. To start calibration, do any of the following:
   - Click the Calibration button in the toolbar.
   - Click Calibration or in the Instrument Window.
   - 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 100% Calibration dialog will appear.

<u>For 100% calibration to air (transmittance measurements of solids):</u>

Make sure that there is nothing in the instrument's transmittance chamber.

<u>For 100% calibration to water (transmittance measurements of liquids):</u>

Use a cell with parallel sides and having the same optical path length (distance between the sides) as the cell which will be used to hold samples for measurements. Pour distilled (or pure) water into the selected cell and place the cell in position inside the transmittance chamber.

- The depth of the water in the cell must be higher than the top of the illumination window (the window on integrating sphere side of transmittance chamber).

Click [Calibration]. 100% calibration will be performed.

Quick Start: 5 Measurements

SpectraMagic NX2 can be used to take both absolute color measurements which quantify a color without reference to a target, and color-difference measurements which determine the difference between a measurement and a target.

Quick Start: 5.1 Absolute Color Measurements

1. In the Tree Window, check that Absolute is selected.
2. Position the sample and instrument for measurement, and do any of the following:
   - Click the Sample Measurement button in the toolbar.
   - Click Sample Measurement or in the Instrument Window.
   - Select *Instrument - Measurement - Sample Measurement*.
   - Press F4.

   The Measurement Data Setting dialog will appear.
3. Fill in the desired information and click [OK]. A measurement will be taken and the data will be registered as sample data.

Quick Start: 5.2 Color-Difference Measurements

Color-difference measurements are used to determine the difference in color between a measured sample and a target color, and are often used for quality control.
In order to take color-difference measurements, a target must be set. In addition, tolerances can be set to allow the software to perform pass/fail judgments.

Quick Start: 5.2.1 Setting Target

A basic way to set a target is to measure the target sample.

- SpectraMagic NX2 offers various ways to set the target, including a Target Color Wizard to guide you through setting the target and performing various other settings related to color-difference measurements. For more information on targets, see *2.9 Targets on p. 148* .

1. To measure a target, position the target and instrument for measurement, and do any of the following:
   - Click the Target Measurement button in the toolbar.
   - Click Target Measurement or in the Instrument Window.
   - Select *Instrument - Measurement - Target Measurement*.
   - Press F3.

   The Measurement Data Setting dialog will appear.
2. Fill in the desired information and click [OK]. A measurement will be taken and the data will be registered as target data.

Quick Start: 5.2.2 Setting Tolerances

In order to perform pass/fail judgments, it is necessary to set the tolerances to be used.

- When a target measurement is first taken, the default tolerance values are applied.
- For more information on editing tolerances, see *2.9.8.1 Editing Tolerances on p. 159* .

To change the tolerance values for a target

1. Select the target in the Tree Window, and do either of the following:
   - Select *Instrument - Edit Target - Tolerance ...* .
   - Right-click on the target, select "Edit Target" from the right-click menu, and select Tolerance ... from the popout menu that appears.

   The Create Target dialog will appear, with the Tolerance Settings step displayed.
2. Click on the checkbox for the condition and then on the checkbox next to each tolerance value that will be used, and set the desired value for each tolerance value.
   - To change the tolerance items shown in the table, click . The Item Setting dialog will open, with only the Color/Index and Spectral item categories shown. For information on selecting items, see *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .
3. When all tolerances have been set as desired, click [Save] to save the values.
4. Click [Exit] to close the dialog.

Quick Start: 5.2.3 Measuring Color Difference

1. In the Tree Window, in Classification by Target select the target to be used.
2. Position the sample and instrument for measurement, and do any of the following:
   - Click the Sample Measurement button in the toolbar.
   - Click Sample Measurement or in the Instrument Window.
   - Select *Instrument - Measurement - Sample Measurement*.
   - Press F4.

   The Measurement Data Setting dialog will appear.
3. Fill in the desired information and click [OK]. A measurement will be taken and the data will be registered as sample data under the target selected in step 1.

Quick Start: 6 Saving the Document

1. To save the currently active document under its current name, do any of the following:
- Click the Save button in the toolbar.
- Select *File - Save*.
- Press Ctrl + S.

The document will be saved.
- If the file has never been saved, the Save As dialog will appear. Input the desired file name and click [Save]. The file will be saved and the dialog will close.

1. To save the currently active document under a new name, or if the document has never been saved:

1-1. Select *File - Save As ...*. The Save As dialog will appear.

1-2. Input the desired file name and click [Save]. The file will be saved and the dialog will close, and the file name shown in the document tab or title bar will change to the title which was input.

Quick Start: 7 Disconnecting the Instrument

1. Click the Disconnect button in the toolbar or select “Disconnect” in the Instrument menu.
SpectraMagic NX2 will disconnect from the instrument. The Instrument Window will close and the Disconnect toolbar button will change to Connect.

Quick Start: 8 Exiting from SpectraMagic NX2

1. To exit from SpectraMagic NX2, do any of the following:
- Click on the [x] in the upper right corner of the software window.
- Select *File - Exit*.
- Press Alt + F4.

The SpectraMagic NX2 QC App will close and the SpectraMagic NX2 Launcher will be shown.
- If there are open documents which have not been saved since their last change, a dialog asking whether to save the document will appear for each document. Click [OK] to save the document. If the document has never been saved, the Save As dialog will appear. Input the desired file name and click [OK] to save and close the document.

2. Click on the [x] in the upper right corner of the Launcher window.

Overview

- Items marked with Ⓟ are supported only by SpectraMagic NX2 Professional Edition.

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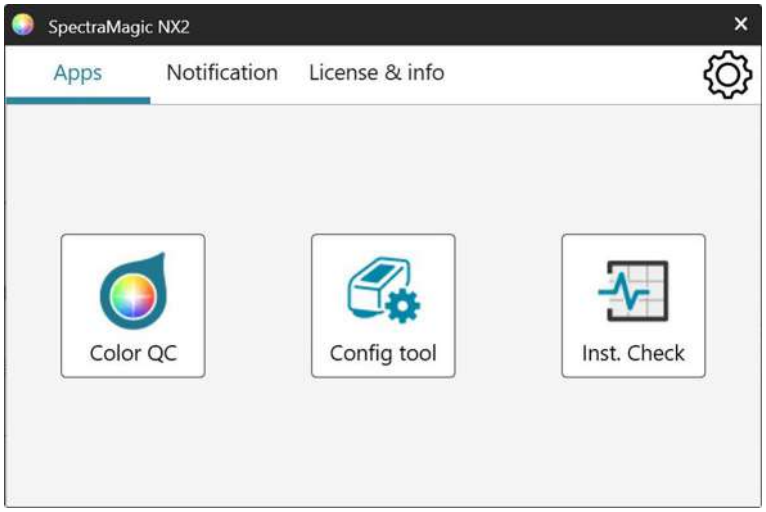
1.1 SpectraMagic NX2 Launcher

The SpectraMagic NX2 Launcher opens when the SpectraMagic NX2 icon in the Windows Start menu is clicked or the SpectraMagic NX2 icon on the desktop is double-clicked. The SpectraMagic NX2 Launcher is where you can select the app you want to launch and where you can access information common to all SpectraMagic NX2 apps, such as license information or security settings.

- Yellow exclamation point marks indicate something that needs attention. Click on the item for details.

1.1.1 Apps screen

The Apps screen is the screen that is shown when the SpectraMagic NX2 Launcher is first opened. It can also be selected by clicking Apps in the screen selection bar.



Color QC	Launches the SpectraMagic NX2 Color QC App. How to use the Color QC App is explained in this manual.
Config Tool	Launches the Spectrophotometer Configuration Tool CM-CT1 for setting instrument standalone settings, etc. on Konica Minolta portable spectrophotometers. For information on the settings available in CM-CT1 and how to use it, refer to the Spectrophotometer Configuration Tool CM-CT1 Instruction Manual. • Installation of Spectrophotometer Configuration Tool CM-CT1 required.
Inst. Check	Launches the Instrument Check App for checking and monitoring instrument performance, etc. See *Instrument Check App on p. 236* .

1.1.2 Notifications screen

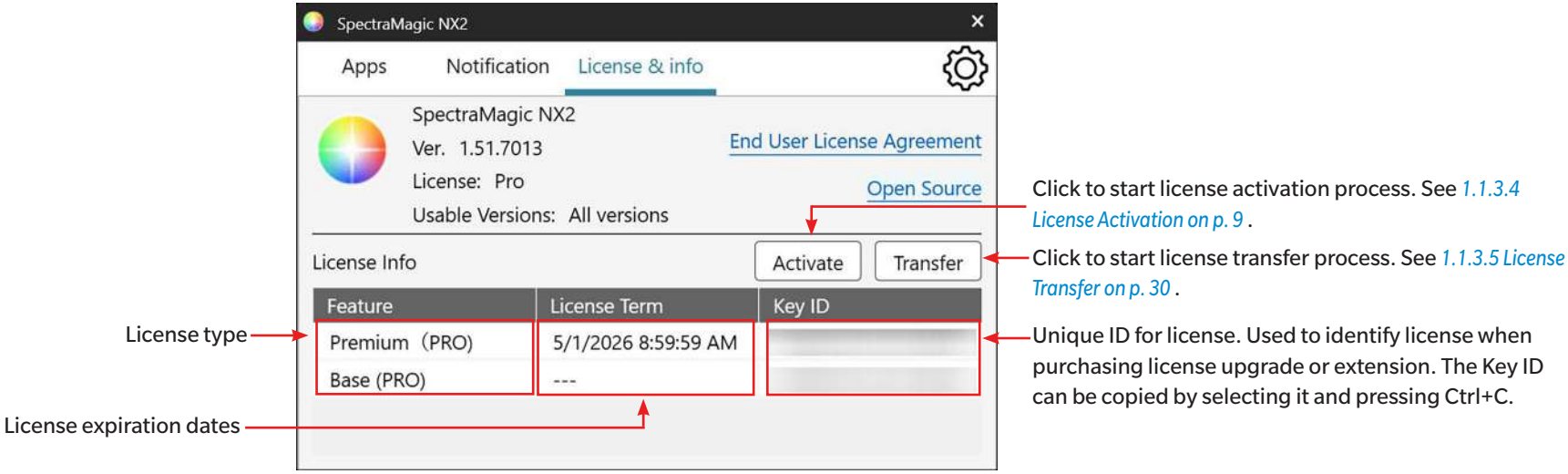
Shows notifications from Konica Minolta, such as notification of release of a new version of the software.

- The area to receive notifications from can be set in User Setting of the Application Settings dialog. See *1.1.4.1 User Setting (Display Language, Area for Notification) on p. 36* .

1.1.3 License & Info screen

Shows the installed software version, license type, license term (expiration date), update conditions, and license ID.

- If the trial period / license period has expired, the SpectraMagic NX2 Color QC App can be used in Viewer Mode. In Viewer Mode, previously stored files can be viewed and printed but it is not possible to connect instruments, take new measurements, or change file settings.



Version Info

Ver.	Shows the version of the currently installed software.
License:	Shows the Base license edition.
Usable Versions:	Shows which versions can be used with the license. One of the following three values will be shown. **All versions**: The Base license and Premium license are valid. Any released version can be used. **X.xx (*number*)**: The Base license is valid but the Premium license has expired, or there is no Premium license. Any released version up to versions with the same first decimal place can be updated to and used. For example, if the number is "1.5x", any released version from 1.50 to 1.59 can be updated to and used. • If the Premium license has expired, the software should be updated to the last version released prior to Premium license expiration before updating to the most recent version with the same first decimal place. For example, if the Premium license expired after ver. 1.51 was released and then later ver. 1.55 was released, ver. 1.55 can be used but the software should be updated to ver. 1.51 before updating to ver. 1.55. **Viewer only**: SpectraMagic NX2 is operating in Viewer mode because the installed version is higher than the version that can be used with the Base license and Premium license. Previously stored files can be viewed and printed but it is not possible to connect instruments, take new measurements, or change file settings.

Hyperlinks:

End User License Agreement	Click the link to show the SpectraMagic NX2 End User License Agreement.
Open Source	Click the link to open the folder for viewing the licenses of Open Source Software used by SpectraMagic NX2.

License Info

Shows a table of the installed licenses.
The Feature column shows the type of licence.

Base (PRO)/(LITE)	The license for the SpectraMagic NX2 edition (Professional or Lite) which you purchased. • Expiration date will be shown for Base license only if the Base license is a time-limited license.
Premium (PRO)/(LITE)	(Shown only if a Premium license has been installed and activated on the dongle or computer.) The license which allows you to perform version update for the specified edition (Professional or Lite) until the end of the Premium license term. • A Premium license must be used with a Base license. • In certain regions, a one-year Premium license is included with the initial purchase of SpectraMagic NX2. . • A Premium license is required to use the Instrument Check App. To continue using the Instrument Check App after the first year, a Premium license extension must be purchased using the Key ID shown in the License & Info screen. Contact your Konica Minolta salesperson or dealer for details.
Trial	The license which allows all functions to be used for a trial period 30 days from first installation of SpectraMagic NX2 on the computer.

The License Term column shows the expiration date for each license.
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.

[Activate]	Launches the process for activating a new license. See *1.1.3.4 License Activation on p. 9* .
[Transfer]	Launches the process for transferring the license to a different computer. See *1.1.3.5 License Transfer on p. 30* .

1.1.3.1 License types

Base license

The standard Base license is a perpetual license which enables use of most of the SpectraMagic NX2 functions available with the purchased edition (Pro or Lite).

- The Instrument Check App cannot be used with only a Base license.
- The Base license by itself (with no activated Premium license) can be updated only to versions with the same first decimal place digit. For example, if the Base license is ver. 1.51, updates to any released ver. 1.5x is possible, but updating to a released ver. 1.6x is not possible.
- If the license is a Base-license-only dongle license, the license was activated prior to shipment from Konica Minolta and no further actions by the user are required.
- If the purchased license includes both Base and Premium licenses, activation of the Premium license is required.
- Time-limited Base licenses are also available.

Premium license

A Premium license cannot be used by itself. An installed Base license is required.

- A valid Premium license enables the following:
  - Use of the Instrument Check App
  - Updating of the Base license to any version (including versions with different first decimal place or higher digits) released prior to the expiration date of the Premium license.
- In certain regions, a 1-year Premium license is included with newly purchased Base licenses. The Premium license will be activated together with the Base license activation.
- Premium license extensions can be purchased to continue to enable updating SpectraMagic NX2 to new versions and to enable continued use of the Instrument Check App.

1.1.3.2 License formats

There are two main license formats as described below. Premium licenses must be activated online in order to continue using certain SpectraMagic NX2 functions after the trial period.

Dongle license

With a dongle license, the Base license and Premium license are stored in the dongle, which must be plugged into the computer when using SpectraMagic NX2. Since the licenses are stored in the dongle, the licenses can be activated on any computer connected to the internet, and they can be used on different computers that have SpectraMagic NX2 installed by just plugging the dongle into the computer when SpectraMagic NX2 is being used on that computer.

- If the dongle Base license is a perpetual Base license, the Base license will be activated before shipment from Konica Minolta. However, if the purchased dongle license includes a Premium license, activation of the Premium license is required.
- If the dongle Base license is a time-limited Base license, activation is required and will be performed at the same time as activation of the Premium license.

■ 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 NX2 will be used**
1.	Plug dongle into computer.	Install SpectraMagic NX2.
2.	Install SpectraMagic NX2 or License Activation Tool CM-LAT1.	
3.	Follow the procedure in *Initial activation of a dongle license on p. 9* for Premium license initial activation or the procedure in *Activation of a Premium license extension on p. 25* for activation of a Premium license extension.	
4.	Unplug license-activated dongle from computer.	Plug license-activated dongle into computer.
5.		Start SpectraMagic NX2.

Dongleless license

With a dongleless license, the Base license and Premium license are locked to the computer on which the licenses were activated. Therefore, activation of the licenses must be performed on the computer on which the licenses will be used.
To use the licenses on a different computer, it is necessary to transfer the licenses from the current computer to the other computer according to the procedure in *1.1.3.5 License Transfer on p. 30*.

■ Important Note Regarding Dongleless (Electronic) Licenses

Dongleless (electronic) licenses are written to the computer on which they are installed and activated. When moving SpectraMagic NX2 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 NX2 from the old computer.
See *1.1.3.5 License Transfer on p. 30*.
If there are problems, contact your Konica Minolta salesperson or dealer.

1.1.3.3 About License Activation Tool CM-LAT1

In addition to the usual method of activating a license from within SpectraMagic NX2, the utility program License Activation Tool CM-LAT1 is available for activating SpectraMagic NX2 licenses wthout using SpectraMagic NX2. In the case of dongle licenses, it is not necessary to have SpectraMagic NX2 installed on the computer which will be used to activate the license.

- For dongle licenses, CM-LAT1 can be used to activate a dongle Premium license or dongle Premium license extension on any computer connected to the internet
- For dongleless licenses, since dongleless licenses are locked to the computer on which they are activated, when using CM-LAT1 instead of SpectraMagic NX2 to perform activation of a dongleless Base license, dongleless Premium license or dongleless Premium license extension, activation must be performed on the computer on which the dongleless license will be used.

License Activation Tool CM-LAT1 can be found in the \License Activation Tool folder on the software dongle when SpectraMagic NX2 was supplied on a dongle, in the \License Activation Tool folder inside the zip file when SpectraMagic NX2 has been downloaded from the internet, or by downloading License Activation Tool CM-LAT1 from the Konica Minolta website (https://www.konicaminolta.com/instruments/download/software/color/smnx2/latindex.html).

- If the License Activation Tool is inside a downloaded zip file, unzip the file into a folder before use.

1.1.3.4 License Activation

Licenses can be activated either from SpectraMagic NX2 or by using the License Activation Tool CM-LAT1.

- Dongleless licenses MUST be activated on the computer on which the license will be used.

Initial license activation

■ Initial activation of a dongle license

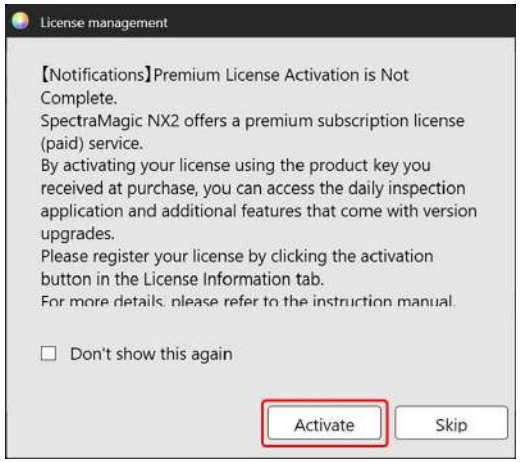
- License activation is not required for Base-license-only dongle licenses with no Premium license.
- Plug the dongle into the computer before performing the procedure below.
- The computer must be connected to the internet to activate the license.
- To activate a Premium license extension, see *Activation of a Premium license extension on p. 25* .

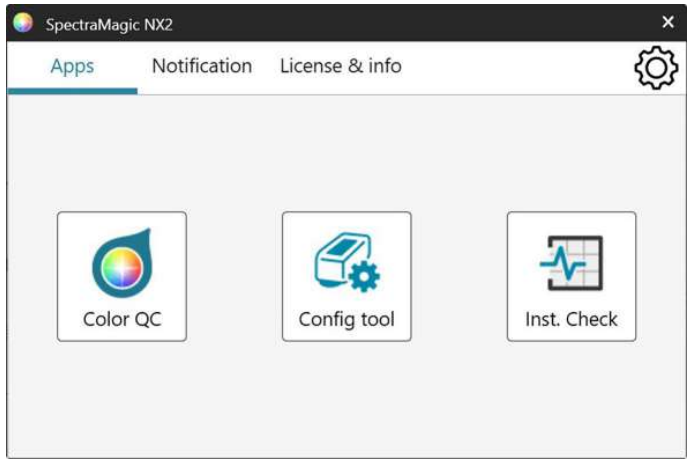
The license activation process can be started from either SpectraMagic NX2 (see below) or License Activation Tool CM-LAT1 (see *p. 11*).

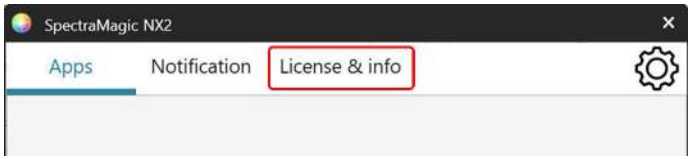
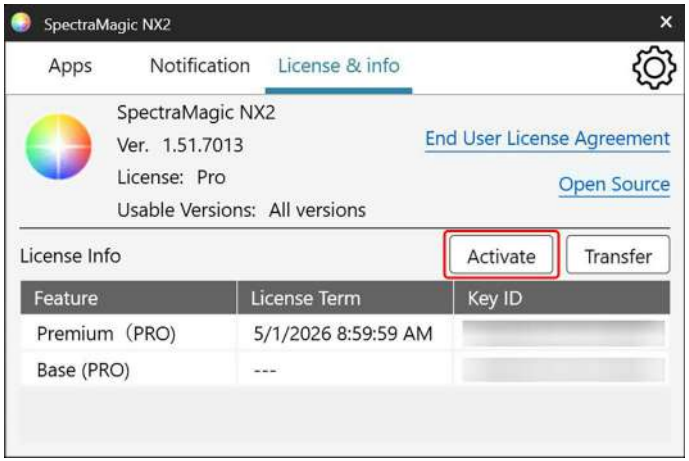
■ Starting license activation process from SpectraMagic NX2

1-a) Start SpectraMagic NX2. The SpectraMagic NX2 Launcher will start.

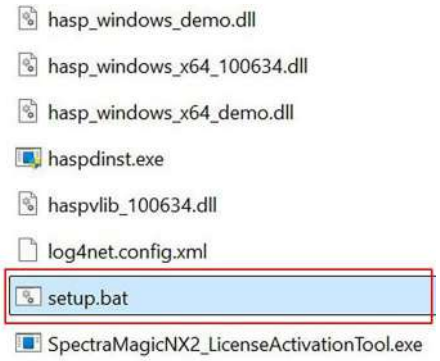
- If the dialog below is shown before the SpectraMagic NX2 Launcher appears, click [Activate] and go to step 2 in *License Activation Wizard (dongle license initial activation) on p. 12* .



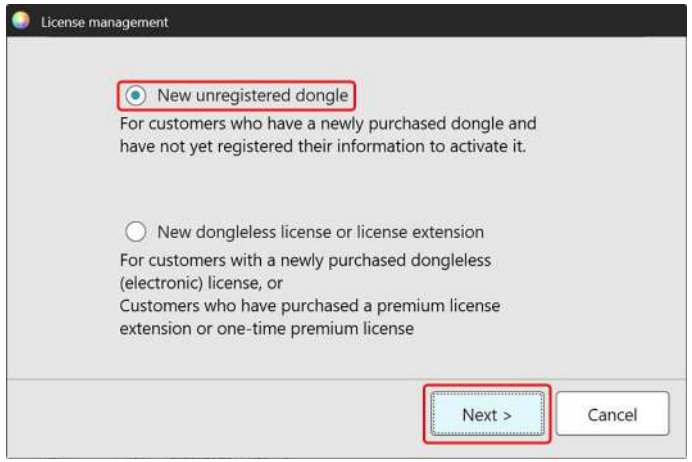


1-b) Select the License & info tab.	
1-c) Click [Activate]. The License Activation Wizard will start. Continue with step 2 in *License Activation Wizard (dongle license initial activation) on p. 12* .	

■ Starting license activation process from License Activation Tool CM-LAT1

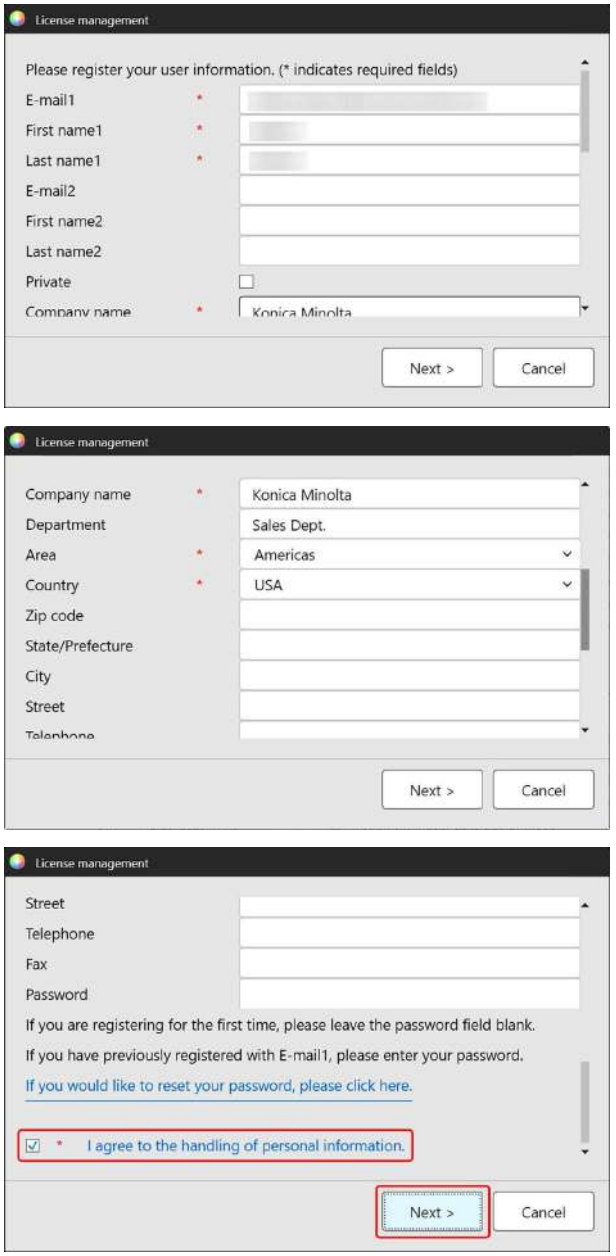
1-a) Run setup.bat in the License Activation Tool CM-LAT1 folder to install the Sentinel Run-time Environment. • setup.bat must be run with Administrator privileges. • If a User Account Control dialog appears, click [Yes].	
1-b) When installation is complete and "Operation is successfully completed" appears, click [OK]. The License Activation Wizard will start. Continue with step 2 in *License Activation Wizard (dongle license initial activation) on p. 12* .	

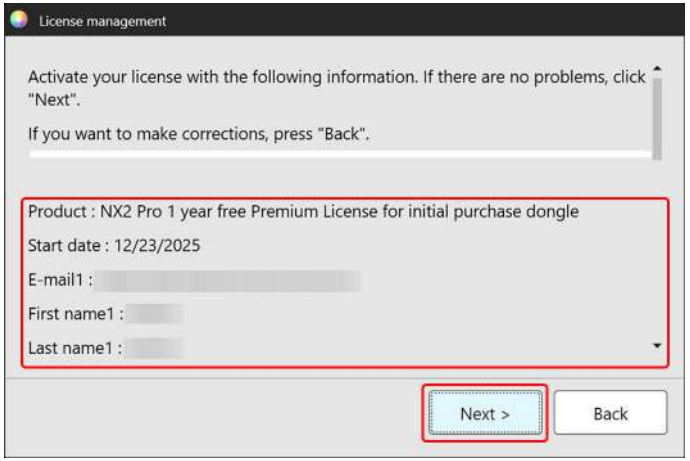
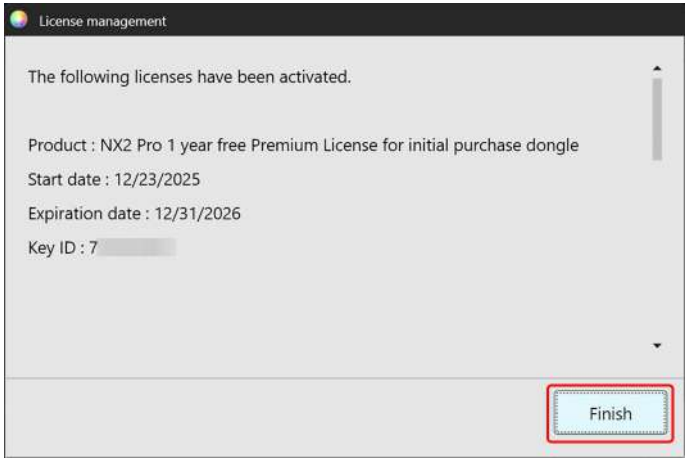
■ **License Activation Wizard (dongle license initial activation)**

2. Select “New unregistered dongle” and click [Next].	

3. 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.
- If *Private* is checked, *Company name* is not required.
- 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 *Email1*, input your password into the *Password* textbox.
    - If you have forgotten your password, it can be reset by clicking "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.



4. 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.	
5. After a few seconds, the dialog confirming that license activation has been completed will appear, showing your license information: Product, Start date (date of first launch of SpectraMagic NX2), Expiration date, and Key ID. Click [Finish] to close the dialog.	

■ Initial activation of a dongleless license

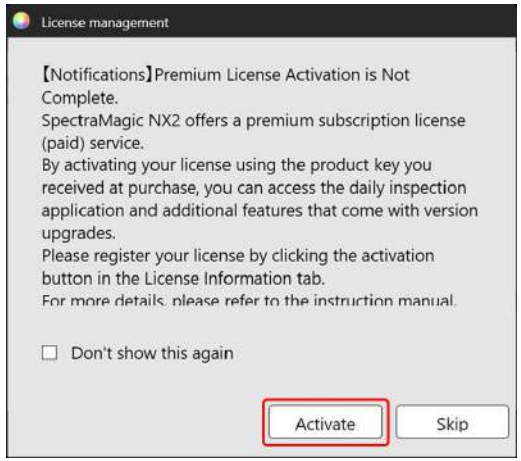
- Activation of a dongleless license must be performed on the computer on which it will be used.
- The computer must be connected to the internet to activate the license.
- To activate a license extension, see *Activation of a Premium license extension on p. 25* .

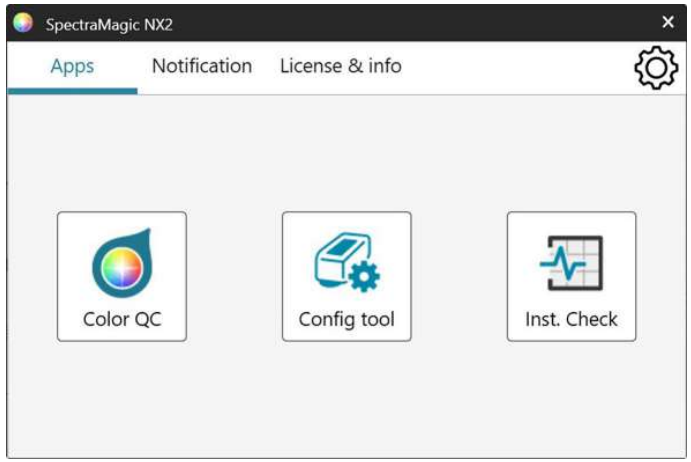
The license activation process can be started from either SpectraMagic NX2 (see below) or License Activation Tool CM-LAT1 (see *p. 17*.)

■ Starting license activation process from SpectraMagic NX2

1-a) Start SpectraMagic NX2. The SpectraMagic NX2 Launcher will start.

- If the dialog below is shown before the SpectraMagic NX2 Launcher appears, click [Activate] and go to step 2 in *License Activation Wizard (dongleless license initial activation) on p. 18* .

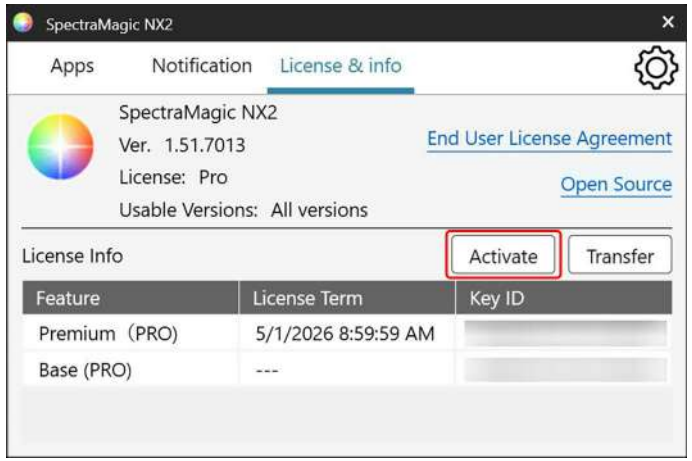




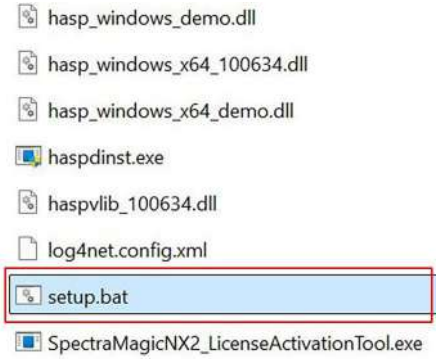
1-b) Select the License & info tab.

1-c) Click [Activate]. The License Activation Wizard will start.

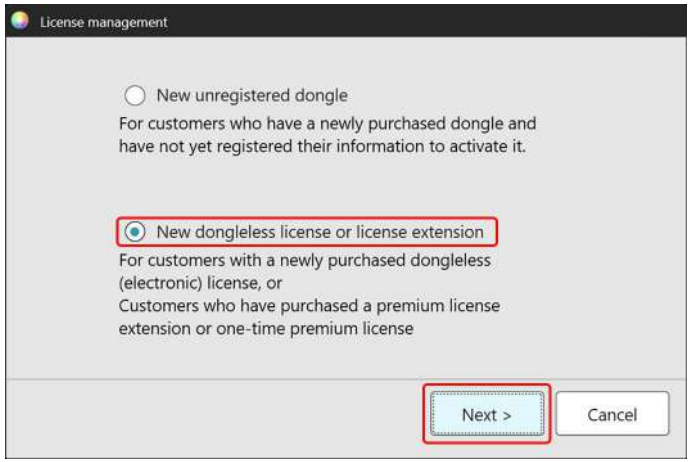
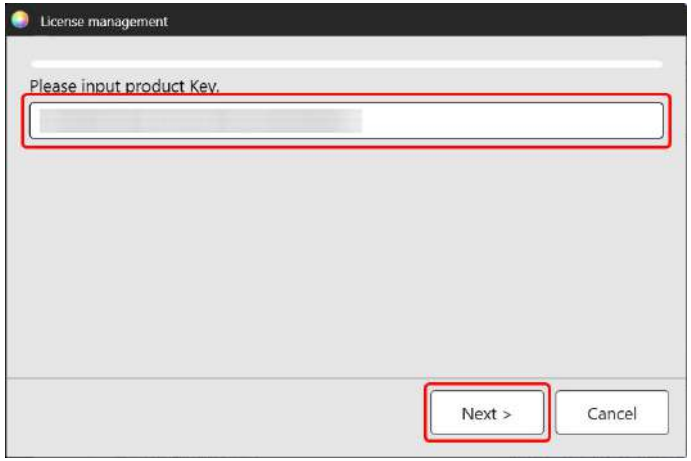
Continue with step 2 in *License Activation Wizard (dongleless license initial activation) on p. 18* .



■ Starting license activation process from License Activation Tool CM-LAT1

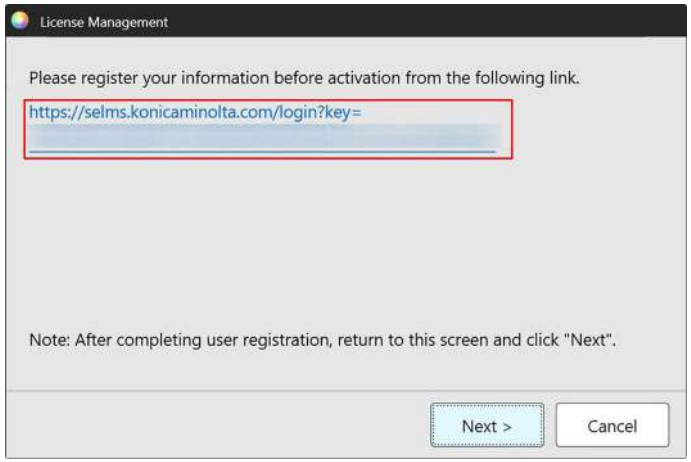
1-a) Run setup.bat in the License Activation Tool CM-LAT1 folder to install the Sentinel Run-time Environment. • setup.bat must be run with Administrator privileges. • If a User Account Control dialog appears, click [Yes].	
1-b) When installation is complete and "Operation is successfully completed" appears, click [OK]. The License Activation Wizard will start. Continue with step 2 in *License Activation Wizard (dongleless license initial activation) on p. 18* .	

■ **License Activation Wizard (dongleless license initial activation)**

2. In the selector dialog that appears, select “Dongleless license or license extension” and click [Next].	
3. Input the Base license Product Key (shown on your License Certificate) and click [Next].	

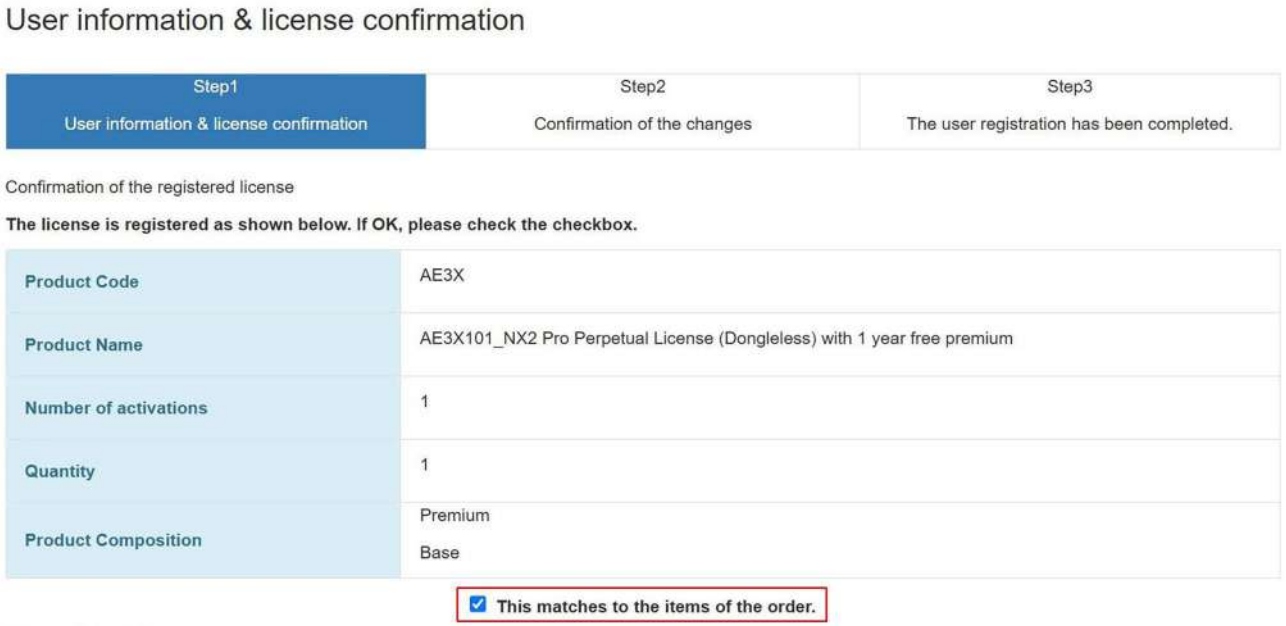
4. If you have not yet registered your information on the license server, a link to register your information will be shown. Click on the user registration link. Your browser will open to the Konica Minolta License Server User Registration page.

- If you have already registered your information, proceed to *step 11 on p. 23* .



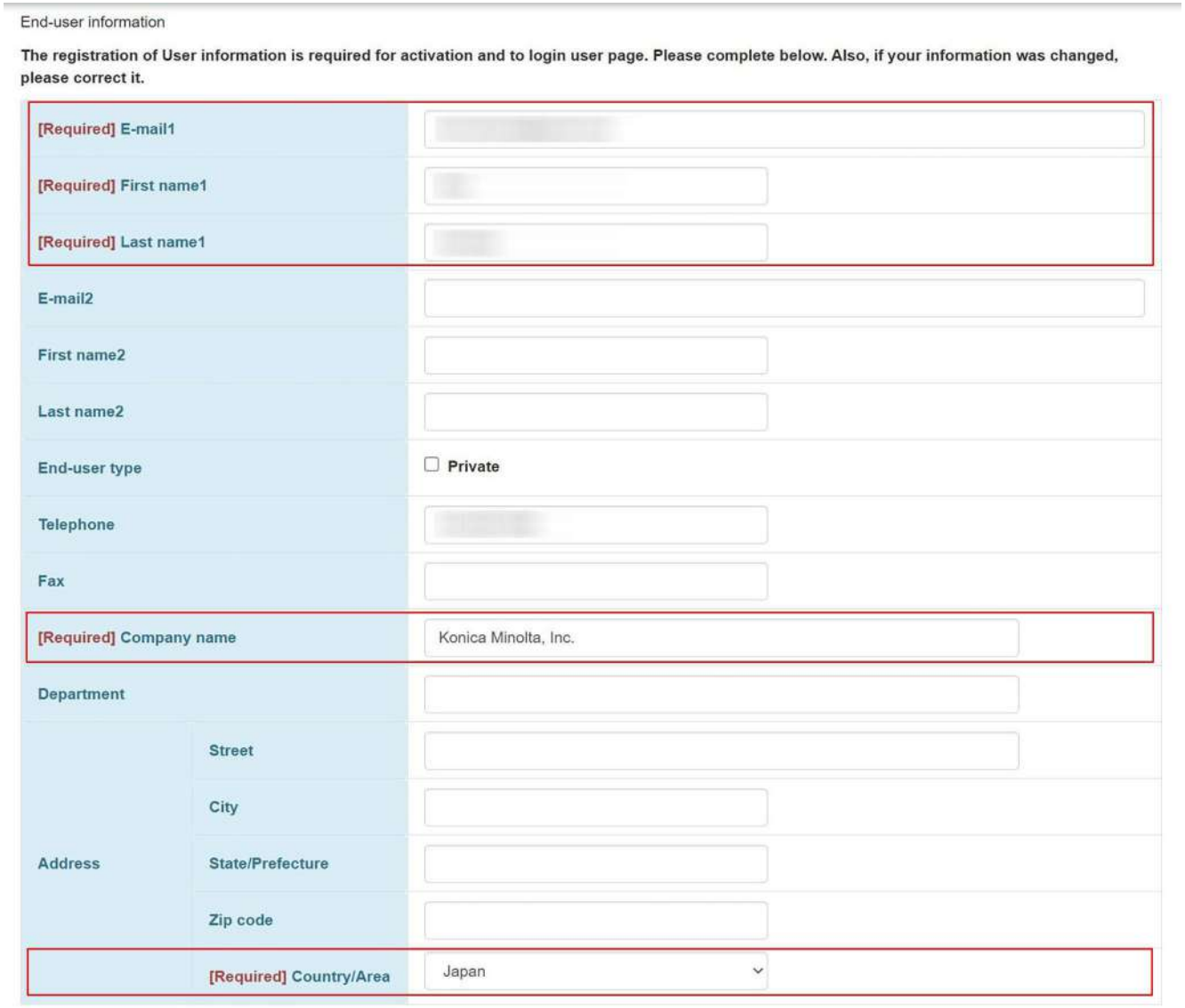
5. Check that the license information shown in the upper part of the screen matches your order. If it matches your order, click on “This matches to the items of the order” to put a check in the checkbox.

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



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

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

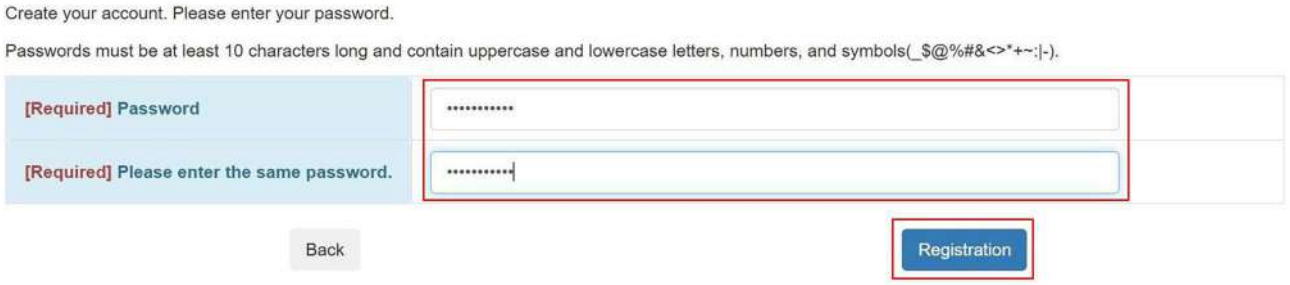


7. If you agree with the site's privacy policy, click on the checkbox next to "I agree about the handling of personal information" to put a check in the checkbox and click [Confirmation and registration].

- 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.

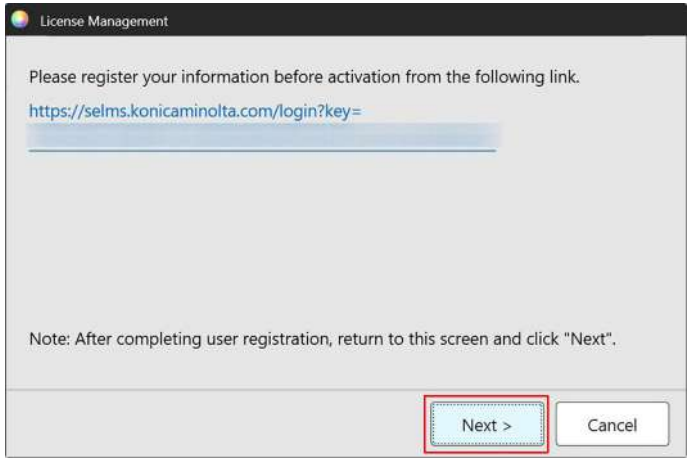
8. Check that all of the information is correct. If it is, input the password you would like to use in the "Password" textbox and input it again in the "Please enter the same password." textbox to reconfirm it, and then click [Registration].

- 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.

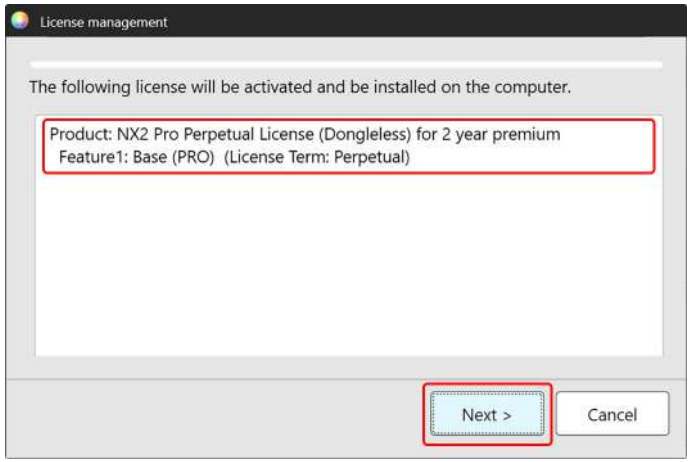


9. When the message “The user registration has been completed.” appears in the upper left of the screen, the user registration process is complete and you can close your browser.

10. The License management dialog of step 4 will be shown. Click [Next].

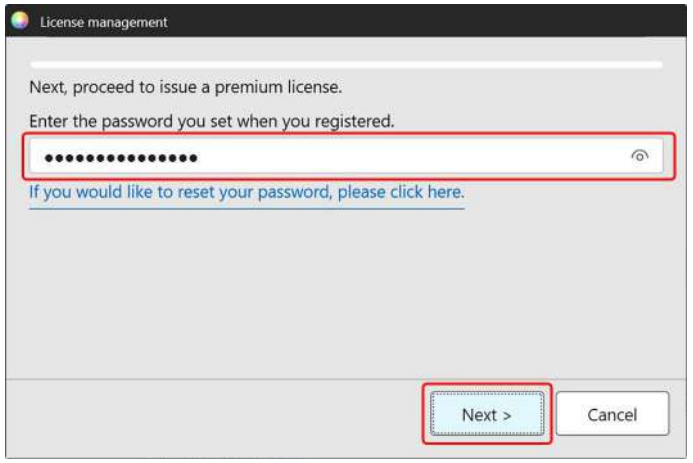


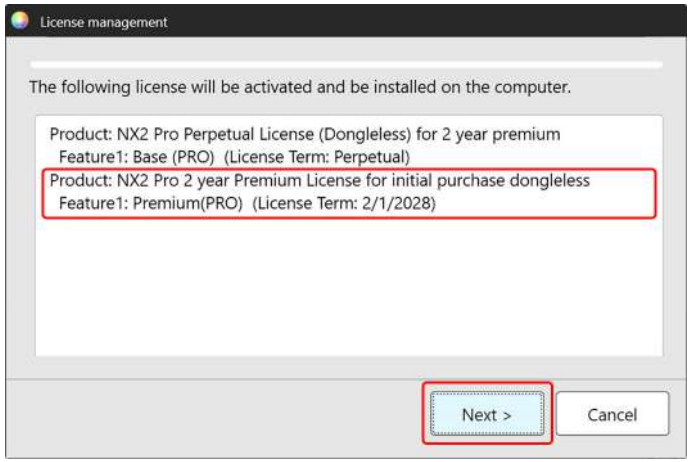
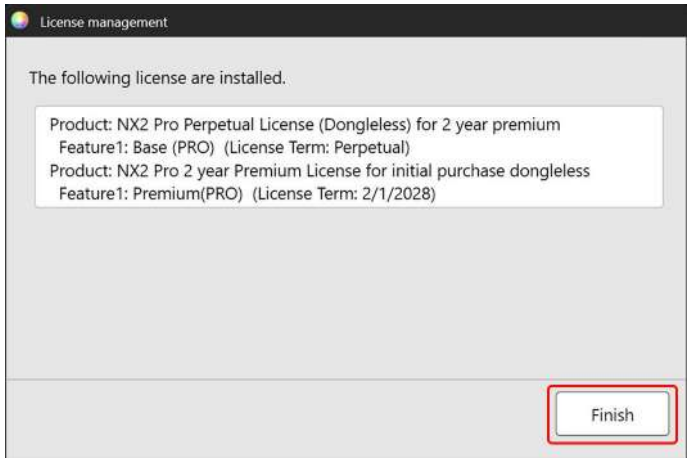
11. Check the license Product, Features, and License Term (expiration date) and click [Next] to install the Base license.



12. The Base license will be installed and the screen at right will appear. Input the password you used when registering on the SE-LMS Website and click [Next].

- If you have forgotten your password, it can be reset by clicking "If you would like to reset your password, please click here".



13. The screen at right will appear. Check the license Product, Features, and License Term (expiration date) for the Premium license and click [Next] to install the Premium license.	
14. After a few seconds, the dialog confirming that license installation and activation has been completed will appear. Click [Finish] to close the dialog.	

Activation of a Premium license extension

- The computer must be connected to the internet to activate the Premium license extension.
- A valid activated Base license must already be present to activate a Premium license extension. It is not possible to use a Premium license without a valid activated Base license.

Dongle Premium license extension

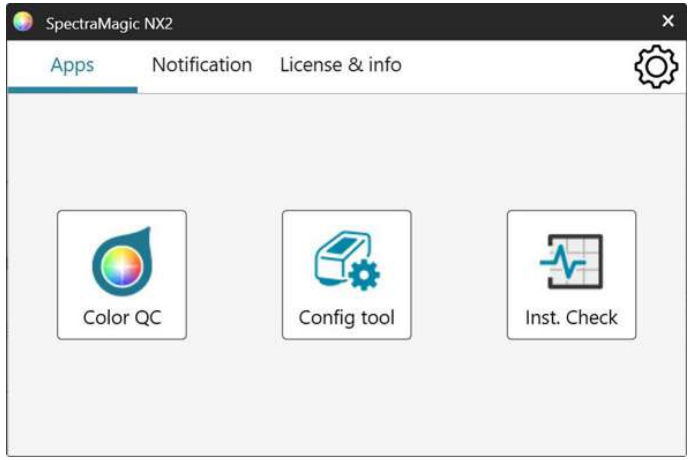
- A dongle Premium license extension can be activated on any computer connected to the internet.
- Plug the dongle into the computer before performing the procedure below.

Dongleless Premium license extension

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

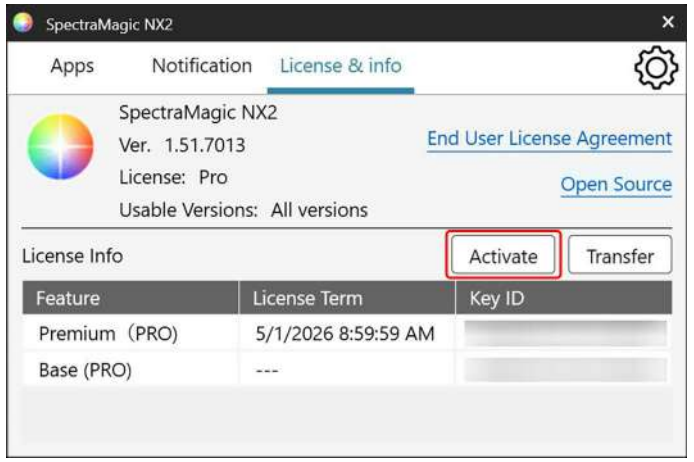
The license activation process can be started from either SpectraMagic NX2 (see below) or License Activation Tool CM-LAT1 (see *p. 27*).

■ Starting license activation process from SpectraMagic NX2

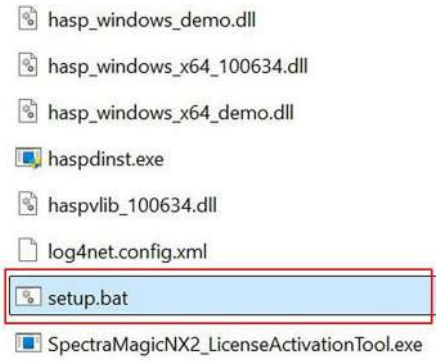
1-a) Start SpectraMagic NX2. The SpectraMagic NX2 Launcher will start.	
1-b) Select the License & info tab.	

1-c) Click [Activate]. The License Activation Wizard will start.

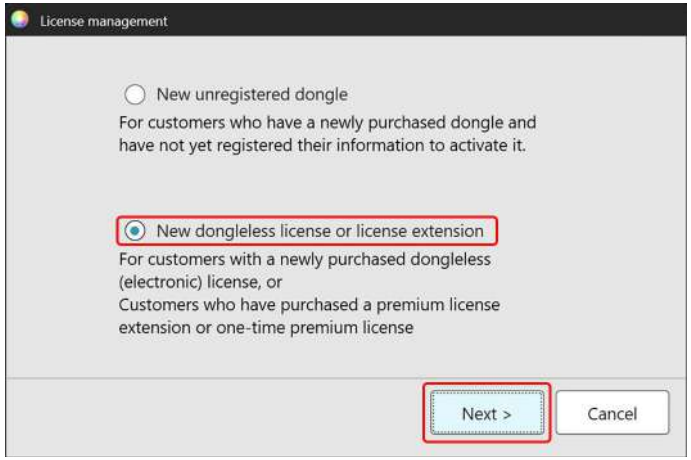
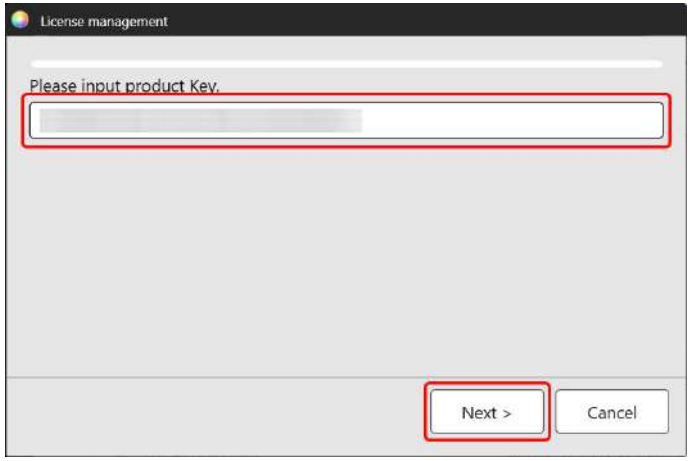
Continue with step 2 in *License Activation Wizard (Premium license extension activation) on p. 28* .

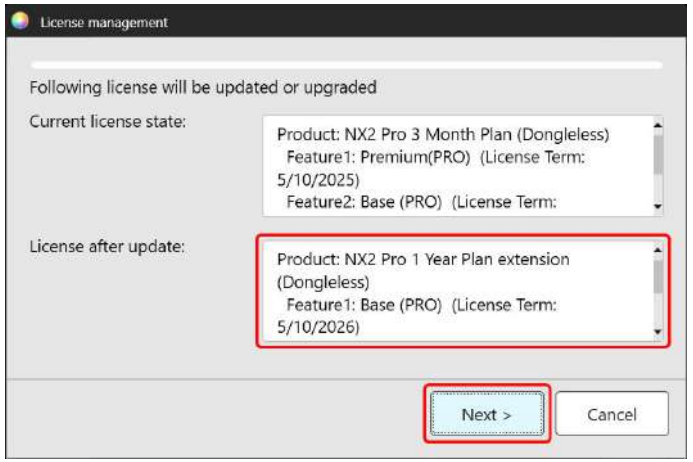
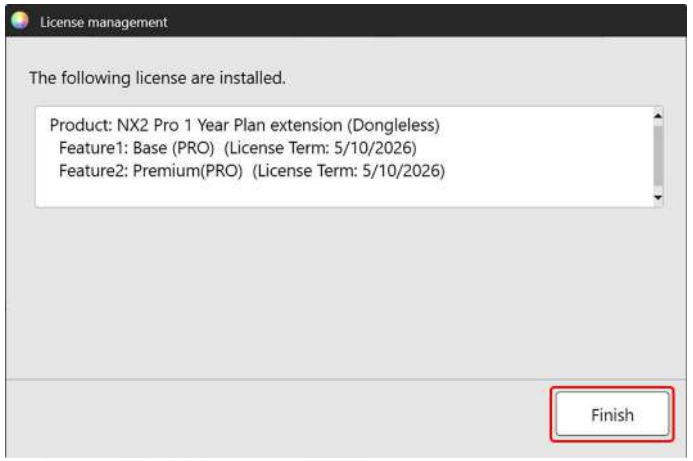


■ Starting license activation process from License Activation Tool CM-LAT1

1-a) Run setup.bat in the License Activation Tool CM-LAT1 folder to install the Sentinel Run-time Environment. • setup.bat must be run with Administrator privileges. • If a User Account Control dialog appears, click [Yes].	
1-b) When installation is complete and "Operation is successfully completed" appears, click [OK]. The License Activation Wizard will start. Continue with step 2 in *License Activation Wizard (Premium license extension activation) on p. 28* .	

■ License Activation Wizard (Premium license extension activation)

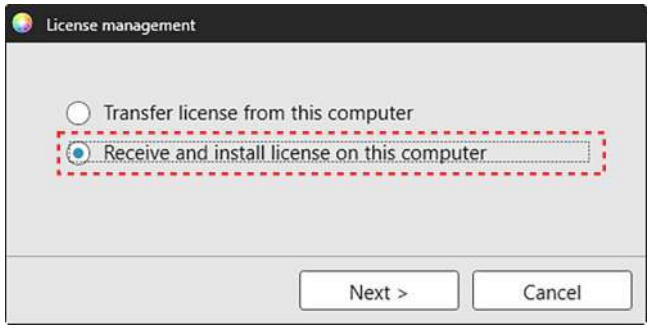
2. In the selector dialog that appears, select “Dongleless license or license extension” and click [Next].	
3. Input the Premium license extension Product Key (shown on your License Certificate) and click [Next].	

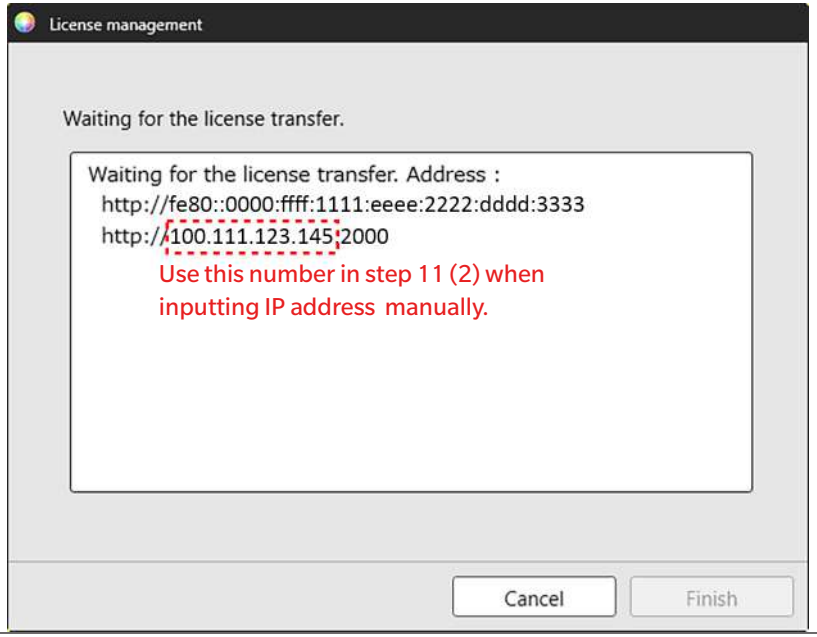
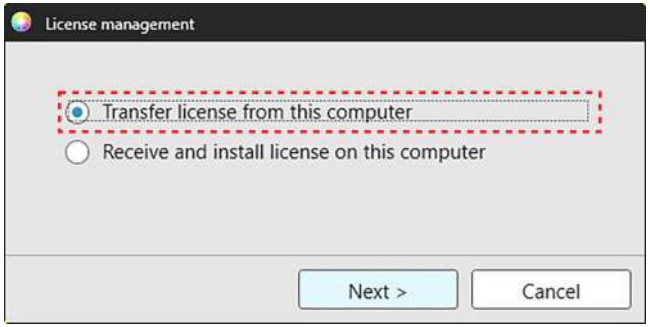
4. The **Current license state** (currently activated license information) and **License after update** (license information after activation of the Premium license extension) will be shown. Check the Product, Feature, and License Term (expiration date) information shown in **License after update** and click [Next] to install the Premium license.	
5. After a few seconds, the dialog confirming that Premium license extension installation and activation has been completed will appear. Click [Finish] to close the dialog.	

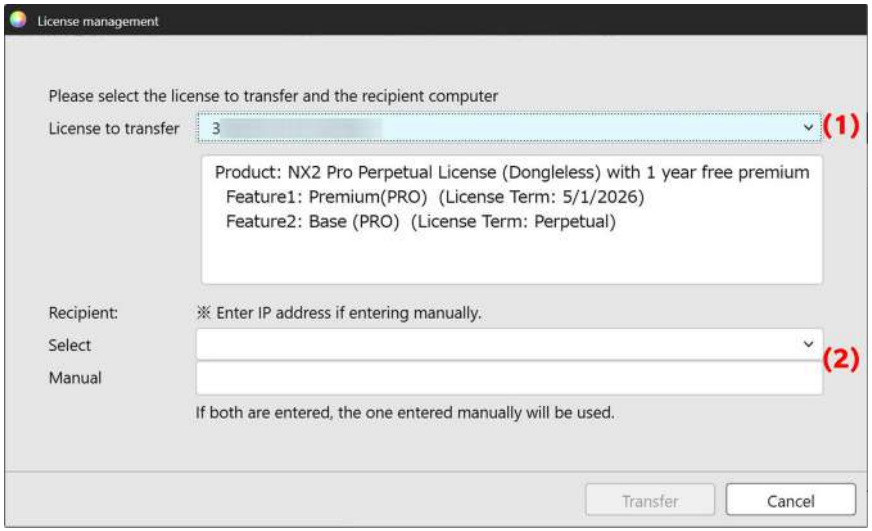
1.1.3.5 License Transfer

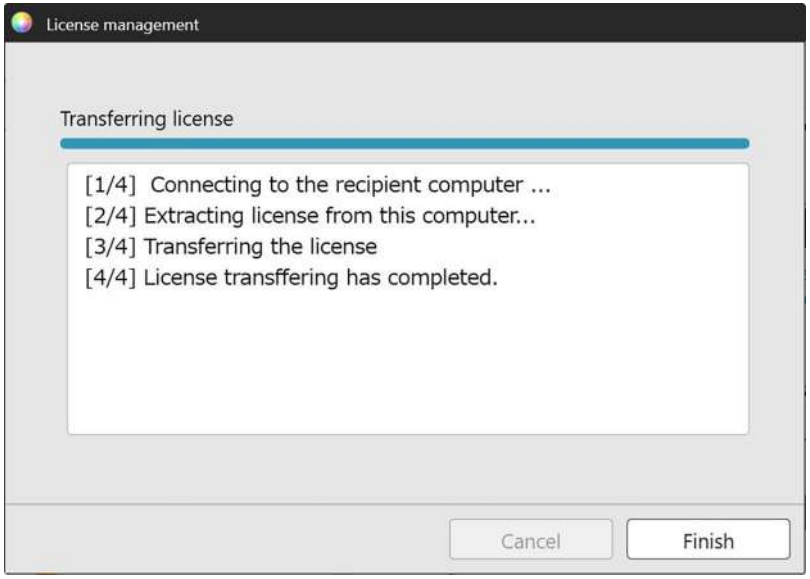
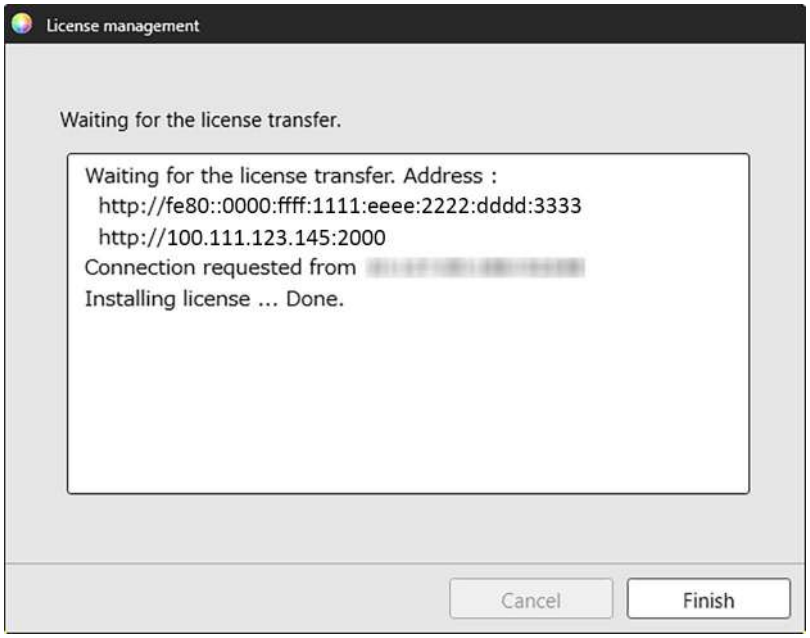
It is possible to transfer a dongleless Base license and dongleless Premium license from one computer to another using the Konica Minolta SpectraMagic License Transfer Tool.

- You must be logged into the computer with Administrator rights to perform license transfer.
- License transfer will be performed via the network. Check the IP address or computer name of the destination computer before continuing.

	Source computer	Destination computer
1		Install SpectraMagic NX2 on the destination computer (the computer to which the license will be transferred).
2		On the destination computer, launch the SpectraMagic NX2 Launcher. • If the SpectraMagic NX2 Launcher cannot be launched, launch the license transfer tool directly from Explorer. The license transfer tool can be found at: C:\Program Files\KONICA MINOLTA\SpectraMagic NX2\KonicaMinolta.Hathor.Apps.SpectraMagic.LicenseTransferTool.exe If the User Account Control dialog appears asking whether to run the License Transfer Tool, click [Yes]. Continue with step 5 below.
3		Select License & Info to change to the License & Info screen.
4		Click [Transfer]. The License Management dialog will appear. • If the User Account Control dialog appears asking whether to run the License Transfer 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. 
7	On the source computer, launch the SpectraMagic NX2 Launcher.	
8	Select License & Info to change to the License & Info screen.	
9	Click [Transfer]. The License Management dialog will appear. • If the User Account Control dialog appears asking whether to run the License Transfer Tool, click [Yes].	
10	Select Transfer license from this computer and click [Next >]. 	

	Source computer	Destination computer
11	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. • If the listed Features show both Base and Premium licenses, the two licenses will be transferred at the same time. If only one license is shown, it will be necessary to repeat the transfer process for each llcense separately. Select the license corresponding to the Base license from the drop-down list, and then after completing transfer of the Base license, repeat the procedure from step 1 to transfer the Premium license. (2) In Recipient, click on the Select drop-down 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”.	

	Source computer	Destination computer
12	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. 
13	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.

- If the license selected in step 11 was only the Base license, repeat the above procedure to transfer the Premium license.

1.1.3.6 SE-LMS Website Operations

The SE-LMS website is a website for managing your SpectraMagic NX2 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

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 *1.1.3.4 License Activation on p. 9*) 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 p. 34* .
   - 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.

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

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 shown 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

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

After logging onto the SE-LMS website, you can change your password 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].

1.1.4 Application Settings (Launcher)

1. Click ⚙ on the right end of the SpectraMagic NX2 Launcher menu. The Application Settings dialog will appear.
2. Click on the category on the left side of the dialog to select the category to perform settings in.
   User Setting (Display Language, Area for Notification): Set software display language and notification area.
   User Management : Manage user groups and the functions that they can use.
3. After all settings have been performed as desired, click [OK] to confirm the settings and close the dialog.
   - To apply settings without closing the dialog, click [Apply].
   - To close the dialog without applying setting changes, click [Cancel].

1.1.4.1 User Setting (Display Language, Area for Notification)

1. To open the User Settings category, click on User Setting in the left side of the dialog.
2. To set the display language for the SpectraMagic NX2 Launcher, Color QC App, and Instrument Check App, click the current setting of Display Language and select the desired language from the drop-down list that appears.
   - The setting will take effect the next time the SpectraMagic NX2 Launcher is launched.
   - The setting for language will determine the characters used for decimal symbol, digit grouping symbol, and list separator in the display and when exporting data. The default Windows settings for the selected language will be used.
3. To set the Area for Notification (the area for which notifications will be received in the Notifications screen of the Launcher), click the current setting for Area for Notification and select the desired area from the drop-down list that appears.
4. When all settings have been set as desired, click [OK] to confirm the settings and close the dialog.
   - To apply the settings without closing the dialog, click [Apply].
   - To close the dialog without applying the settings, click [Cancel].

1.1.4.2 User Management Ⓟ

- This function is supported by SpectraMagic NX2 Professional Edition only.

User management can be used to control access to the functions of SpectraMagic NX2. When User Management function is set to On, the user will need to log on when starting SpectraMagic NX2 and the functions available to the user will depend on that user's Group. Three Groups are available: Administrator, Manager, and Worker. The functions available to each Group can be set in the Edit Group dialog.

1. To open the User Management category, click on User Management on the left side of the dialog.

Enabling/Disabling User Management

To enable user management, set the switch of *Use User Management function* to On.

- Users will be required to log in and functions available to users will be according to the logged-in user's Group settings.
- The default password for the Administrator user is "Administrator". It is recommended that the Administrator password be changed when Use User Management function is enabled.

To disable user management, set the switch of *Use User Management function* to Off.

- Users will not need to log in, and all functions will be available to all users.

Adding New Users

- Adding new users can be performed only when the *Use User Management function* has been enabled.

1. Click [Add New User]. The Edit User Data dialog will appear.

2. If users will be managed by using Windows Active Directory, click on Authenticate using your operating system's user authentication settings to put a check in the checkbox.

3. Input the User Name and password.
If Authenticate with Active Directory is checked, input the user name used in the Active Directory for the User Name. The password for the user will be the password they use for Active Directory so it is not necessary to input a password and the Password and Password (Repeat) textboxes will be disabled.
- If the input User Name is not found in the Active Directory, an error message will appear and it will not be possible to add the user.
- Maximum length of the name including domain name is 100 characters.
- Usable characters: The following single-byte characters
  `ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789!#$%&'()*+,-./;<=>?@[]^_`{|}~\`
  The characters (space), :, and " cannot be used.

If Authenticate using your operating system's user authentication settings is not checked, input the User Name, and then input the password for the user to use in Password, and input the same password in Password (Repeat).
- Maximum length of the name is 20 characters. There is no limit on the password length, and no password complexity requirements.
- Usable characters: The following single-byte characters
  `ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789`

4. Click on the current Group setting and select the desired setting from the drop-down list that appears. Three roles are available:
   Administrator: All functions are enabled and cannot be changed.
   Manager: By default, all functions are enabled but they can be changed.
   Worker: By default, a very limited number of functions are enabled but they can be changed.
   - To change the functions enabled for Manager or Worker roles, see *Editing Group Settings on p. 38* .

5. Click [OK]. The user will be added.
   - If Authenticate using your operating system's user authentication settings is checked, the name input in User Name will be checked against the Active Directory. If the input User Name exists in Active Directory, the user will be added. If the input User Name does not exist in Active Directory, an error message will appear and the user cannot be added. Confirm the correct name for the user in Active Directory.
   - To cancel adding a user, click [Cancel] instead of OK.

6. Repeat steps 1 through 8 to add other users as desired.

Editing User Information

To edit the user's Password or Group:

- User Name cannot be edited. If you need to change the user name, create a new user with the new name and delete the existing user with the old name.

1. Select the user to edit by clicking on them in the user list.
2. Click [Edit]. The Edit User Data dialog will appear.
3. Edit the desired information.
4. Click [OK] to confirm the information and close the dialog.

Deleting a User

- If a user is deleted and *Use User Management function* is set to *On*, the user will not be able to use the software.

1. Select the user to delete by clicking on them in the user list.
2. Click [Delete]. A confirmation dialog will appear.
3. Click [Yes] to delete the user.
   - To cancel deleting the user, click [No] instead of [Yes].

Editing Group Settings

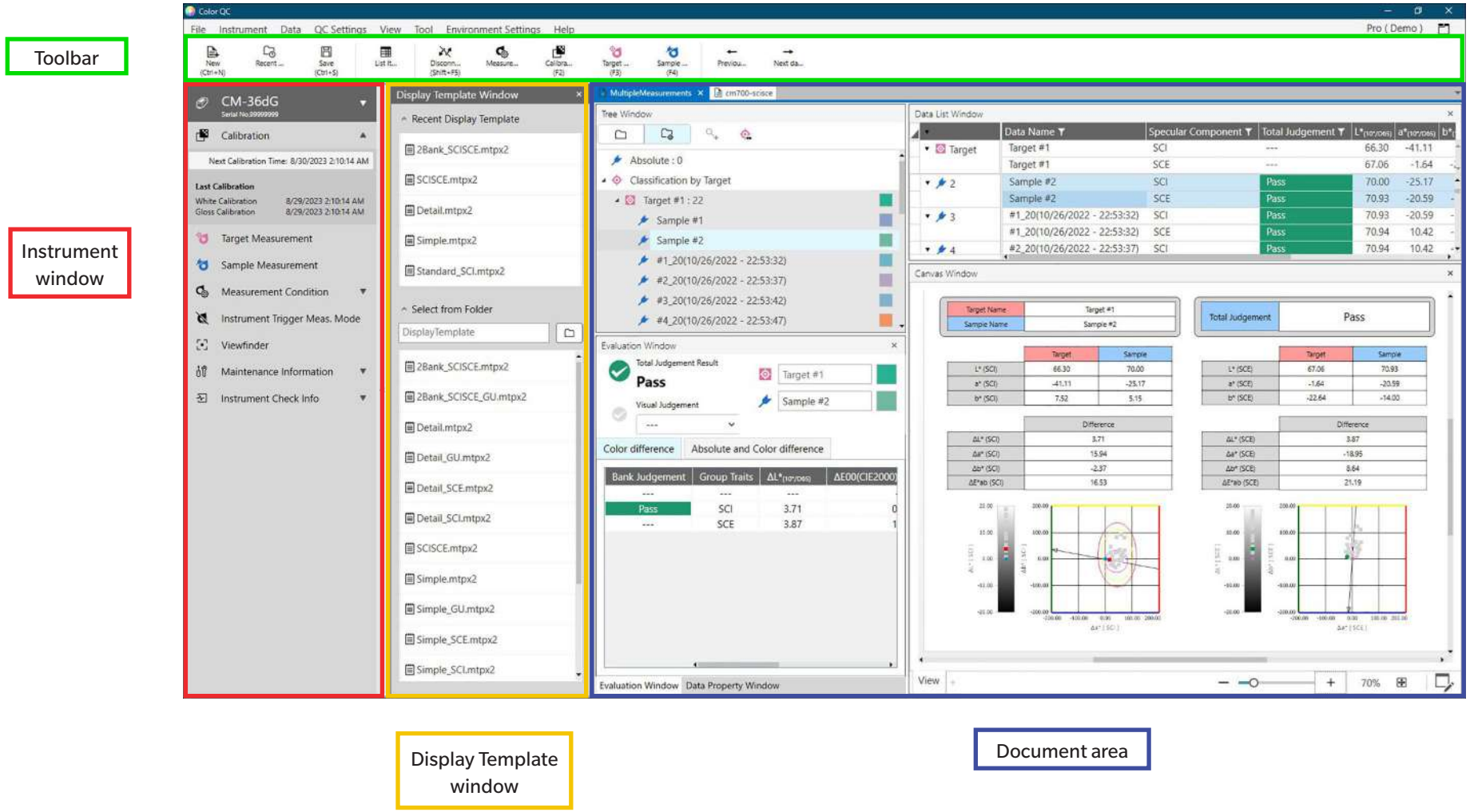
To edit the functions available to Manager or Worker group members:

- Functions available to Administrator group members are all functions. This cannot be changed.

1. Click [Edit Group]. The Edit Group dialog will appear.
2. Functions available to the members of each group will be checked in the column for that group.
3. Checkboxes can be changed between checked and unchecked by clicking on the checkbox.
   To enable a function, make sure the checkbox for that function in the desired column is checked.
   To disable a function, make sure the checkbox for that function in the desired column is empty.
4. After all functions have been set as desired, click [OK] to confirm the settings and close the dialog.

1.2 Screen Configuration

The standard screen configuration for SpectraMagic NX2 is shown below.



1.2.1 Menu

File

Document	New	Ctrl+N	74
	New Document from QC Template ...		74
New QC Template	New QC Template Wizard ...		78
	Save as QC Template ...		78
Open ...		Ctrl+O	76
Recent Files ...			76
Save		Ctrl+S	77
Save as ...			77
Import from File ...			225
Export to File ...			225
Export All Data ...			226
Display Template	Export ...		82
	Apply ...		82
Print Report ...		Ctrl+P	202
Print DataList	Print ...		205
	Print Settings ...		204
Exit		Alt+F4	

Instrument

Connect (when instrument is not connected)			86
Disconnect (when instrument is connected)			95
Instrument Communication Settings			87
Measurement condition ...			96
Calibration F2			109
Calibration Settings	UV Adjustment ...		115
	User Calibration ...		114
	Calibration Option Setting ...		122
	Calibration Data ...		123
Measurement	Target Measurement	F3	152
	Sample Measurement	F4	163
	Viewfinder		142
	Interval Measurement ...		143
Instrument trigger mode ...			144
Remote Color Difference Display Mode			146
Read/Write	Read Samples ...		196
	Write Target ...		197
	Read/Edit Target ...		200
Instrument environment settings	Job Settings ...		181
	Write User Illuminant ...		193
	User Index Settings ...*		194
	Instrument Settings ...*		194
	Instrument Initialization ...*		195

* Shown only when a CR-400 series instrument is connected.

Data

Create Target		148
Edit Target	Tolerance ...	159
	Additional information ...	161
	Sample Measurement Condition ...	162
Auto search target settings ...		164
Previous data	Selects previous measurement in the document.	
Next data	Selects next measurement in the document.	

QC Settings

Default Data Settings	Default Data Name ...	166
	Default Additional Information ...	167
	Default Tolerance ...	168
Judgement Settings ...		169
User Defined Information Settings .		171
Register User Illuminant ...		176
User Equation Settings ...		173
Manage Master Data	Manage User Illuminant Master ...	179
	Manage User Defined Information Master ...	179

View

Customize Document Window	Data List Window ...	49
	Evaluation Window ...	
	Data Property Window ...	
	Canvas Window ...	
	Display Template Window ...	
List Items Settings ...		124
List Window Option Settings ...		139
Switch Canvas Mode		230
Toolbar Settings ...		45

Tool

Printing to Serial Printer	Print Selected Data ...	207
	Settings ...	206
Work with Other System	Settings	208
Macro	Register ...	209
	Start: Opens popout list of registered macros. Clicking on a macro in the list will start the macro.	

Environment Settings

Application Settings ...		..... *213*
Shortcut Key Settings ...		..... *216*

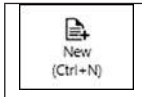
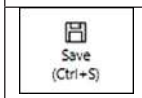
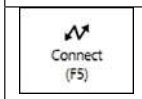
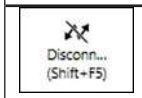
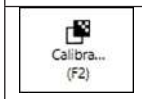
Help

Manual ...	F1	Opens this manual.
Precise Color Communication ...		Opens *Precise Color Communication*, a booklet explaining color theory and color measurement concepts.
Version Information ...		Opens a dialog showing version information.

1.2.2 Toolbar

The toolbar contains buttons for performing frequently used functions. The default toolbar includes the buttons shown below.

- Place the mouse pointer over a button to display a brief description of its function.
- The toolbar can be edited to add/remove buttons or to show/hide the toolbar itself. See *1.2.2.1 Toolbar Settings on p. 45* .

	New: Creates a new document. See *2.2.1 Creating a new document directly on p. 74* .
	Recent: Opens the File Selection dialog to the Open File tab showing the list of recently used documents and templates. See *2.2.3 Opening an existing document on p. 76* .
	Save: Saves the currently active document under its current name. If the document has never been saved, opens the Save As dialog for inputting the name and saving the document. See *2.2.4 Saving the Document on p. 77* .
	List Items: Opens the List Items dialog for setting the items to be shown in the List Window. See *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124*
	Connect (shown only when no instrument is connected): Connects NX2 to an instrument. See *2.4.2 Connecting to an Instrument on p. 86*
	Disconnect (shown only when an instrument is connected): Disconnects the connected instrument. See *2.4.4 Disconnecting an instrument on p. 95* .
	Measurement Conditions: Opens the Measurement Conditions dialog for setting measurement conditions. See *2.5 Setting Measurement Condition Settings on p. 96* .
	Calibration: Starts instrument calibration. See *2.6 Calibration on p. 109*
	Target Measurement: Takes a target measurement. See *2.9.2 Creating a Target by Measurement Without the Wizard on p. 152* .
	Sample Measurement: Takes a sample measurement. See *2.10.1 Measuring a Sample on p. 163* .

	Previous data: Selects the previous measurement in the document.
	Next data: Selects the next measurement in the document.

1.2.2.1 Toolbar Settings

Whether or not the toolbar is displayed and what buttons are displayed on the toolbar in what order can be set in the Toolbar Settings dialog.

1. Select *View - Toolbar Settings ...* . The Toolbar Settings dialog will appear.

2. To show or hide the toolbar, click on the Display Toolbar switch. When it is set to On, the toolbar will be shown. When it is set to Off, the toolbar will not be shown.
- Default setting: On

3. To add a function to the toolbar:
- **a)** Click on the current Category and select the desired category (menu category) from the drop-down list that appears. The list of menu items for that category will be shown.
  - Category: Other contains Separator Line which can be added between items to divide the toolbar into sections.
- **b)** Select the function to be added from the Available Functions list. If the selected function does not exist yet in the Functions list, [Add] will be enabled.
  - Only the Separator Line can be added more than once to the Functions list. If the selected function already exists in the Functions list, [Add] will be disabled.
  - A short description of the function will be shown in the Description area.
- **c)** In the Functions list, select the function at the position just above where you want to add the function selected in step 4. The function will be added to the Functions list below the selected function.

4. To delete a feature from the Functions list:
- **a)** Select the function to delete in the Functions list.
- **b)** Click [Delete]. The function will be deleted from the Functions list.

5. To move features up or down within the Functions list
- **a)** Select the function or functions to move and use the arrow buttons to the right of the Functions list.
  - Multiple consecutive functions can be selected by selecting the first function to move, hold the Shift key pressed, and select the last function to move.
  - Multiple separated functions can be selected by holding Ctrl pressed while selecting the functions to move. When multiple separated functions are selected, they will become moved in the desired direction and become consecutive functions.
- **b)** Use the buttons to the right of the Functions list to move the selected function(s):

Moves the selected function(s) to the top of the Functions list (left end of toolbar).

Moves the selected function(s) up 1 space in the Functions list (1 space to left in toolbar).

Moves the selected function(s) down 1 space in the Functions list (1 space to right in toolbar).

Moves the selected function(s) to the bottom of the Functions list (to right end of toolbar).

6. To restore the toolbar to the default settings, click [Restore default settings]

7. After the toolbar has been set as desired, click [OK] to confirm the settings and close the dialog.

1.2.3 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 buttons to perform some operations with the instrument.

1.2.3.1 Collapsing/expanding Instrument Window

Clicking will minimize the Instrument Window to provide more space for the document window.

- Even when the Instrument Window is collapsed, the icons can be clicked to perform their respective functions.

Clicking will expand the collapsed window.

- The width of the expanded Instrument Window cannot be changed.

1.2.3.2 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 registered name and serial number of the instrument when collapsed, and when expanded, also shows the instrument model name and instrument firmware version. Click to expand, and 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 *2.6 Calibration on p. 109* .

- If calibration has not yet been performed at the current measurement conditions, the calibration icon will blink and yellow exclamation marks will be shown next to the icons for Target Measurement, Sample Measurement, and Measurement Condition.

Target Measurement

Clicking Target Measurement or the icon will start the target measurement procedure. See *2.9.2 Creating a Target by Measurement Without the Wizard on p. 152* .

Sample Measurement

Clicking Sample Measurement or the icon will start the sample measurement procedure. See *2.10 Sample Measurements on p. 163*

Measurement Conditions

Clicking Measurement Condition or [icon] will open the Measurement Conditions Settings dialog. See *2.5 Setting Measurement Condition Settings on p. 96* .

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 Measurement

(shown only for instruments equipped with a measuring button)

Clicking Instrument Trigger Measurement changes the setting of the instrument trigger mode in the following order, with the icon changing to show the current setting:

(Trigger OFF) ➜ (Trigger measurement (Target)) ➜ (Trigger measurement (Sample)) ➜ (Trigger OFF) ➜ ...

Viewfinder

(shown only when CM-36dG, CM-36dGV, CM-36d, CM-17d (USB/WLAN connection only), or CF-300 (with optional 1.3MP USB Camera Set CF-A32 installed) is connected)

Opens the Viewfinder dialog showing the image of the measurement subject as seen by the instrument's camera. See p. *2.8.4 Viewfinder on p. 142* .

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.

Instrument Check Info

Clicking ▼ will expand the section to show instrument check information, such as the results and date/time of the most recent instrument check.

- If no instrument check information is available, or if the Instrument Check App is not compatible with the connected instrument, information will be shown as "----".

1.2.3.3 Display Template Window

The Display Template Window shows a list of display templates which can be applied by simply clicking on the display template name.

- The Display Template Window is not shown by default. To enable display of the DIsplay Template Window, select *View - Customize Document Window*, and then check *Display Template Window* in the popout menu that appears. The Display Template Window will be shown.
- Standard templates for the different instrument types are installed in the following folders

Instrument	Folder
CM instruments with SCI/SCE settings	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate
CM-512m3A	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate\3Bank
CM-M6	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate\6Bank
CR-400 series	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate\CR
CM-25cG	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate\Other
Opacity, Haze	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate\Other

It is recommended that a template for the instrument type being used be selected. If a template for a different instrument type is selected, data may not be shown in the canvas window due to differences between measurement data traits and canvas window object data traits. If no data is shown in the canvas window after applying a template, select a different template and be sure that the selected template is one for the instrument type being used.

Recent Display Template

Shows a list of recently used display templates.

Select from Folder

Shows a list of display templates in the selected folder.

To change the selected folder, click , browse to the desired folder, and click [OK]. The display templates in thee selected folder will be shown.

The Recent Display Template and Select from Folder sections can be collapsed and expanded by clicking on the section name.

1.2.4 Document Window

The Document Window shows the measurement data in the document in up to 5 different windows:

Tree Window	Shows document measurements organized into absolute and target measurements, or organized under the targets with which sample measurements are associated.
Data List Window	Shows the measurement data for the selected branch in the Tree Window.
Evaluation Window	Shows the evaluation results and measurement data for the selected sample.
Data Property Window	Shows the data properties for the selected sample.
Canvas Window	An area in which various graphic elements such as spectral graphs, trend graphs, data tables, etc. displaying data can be placed.
Display Template Window	Shows a list of display templates which can be applied to the active document by clicking on the display template name.

- The maximum number of documents which can be open at one time is 10.

1.2.4.1 Customizing Document Window

Whether or not the Data List Window, Evaluation Window, Data Property Window, Canvas Window, and Display Template Window are shown in the Document Window can be set.

1. Select *View - Customize Document Window*, and then check or uncheck each window in the popout menu that appears. As each window is checked or unchecked, it will appear in or disappear from the Document Window.
   - The Tree Window is always shown and cannot be removed.

1.2.4.2 Document Window Operations

■ Document Window Arrangement

At the right end of the menu is the document window arrangement button. Click on the button to switch between document window arrangements.

Document windows are shown in tabs.

Document windows are shown cascaded.

■ Resizing Windows

The windows in the Document Window can be resized by positioning the cursor over the border of a window so that the cursor becomes a double-headed arrow, and then dragging the border to the desired position.

■ Floating Windows

The windows of the Document Window can be floated and freely positioned in front of other windows by clicking on the window title bar and dragging it out of its normal position. The

window will then become free-floating and can be positioned anywhere within the program window.

- Floated windows will always be displayed in front of the main program window.

■ Docking Floated Windows

When a window has been floated, it can be docked within the Document Window by positioning the cursor over any of the docking icons which are shown. As the cursor is moved over each docking icon, the position of the floating window if that icon is clicked will be shown by a shaded area.
The docking icons shown individually at the top, sides, and bottom of the Document Window are used for docking the floating window at that edge of the Document Window.
The cross-shaped docking icons shown at the center of a currently docked window are for docking the floating window to the respective position relative to the docked window.
Selecting the center icon of the cross-shaped docking icons will cause the floating window to be shown as a tab within the docked window area.

1.2.4.3 Tree Window

The Tree Window shows the measurement data in a tree format.
The tree format can be switched between All data and Classification by Target views by clicking on the corresponding tab at the top of the tree window.

: All data

Shows all measurement data in the document, with measurements listed as a target or sample.

Target(s): (number of targets)

Lists all targets in the document.

Sample(s): (number of samples)

Lists all samples in the document, regardless of whether or not they are associated with a target.

: Classification by Target

Classifies sample data into groups according to the target data to which sample data are linked.

Absolute: (number of samples)

Lists data that is not linked to any target data. When a document is first created, an "Absolute data" data group is created automatically.

Classification by Target

Lists targets as branches, and under each target branch, lists the samples associated with that target.
When a new target is registered, a new branch with the name of the new target is created automatically.
When master targets and working targets are defined, the working target branch will be a sub-branch under the master target branch, and samples associated with the working target will be listed under the working target sub-branch.

: Create new search

Opens the dialog for creating a new search. See *2.24.7.1 Creating a New Search on p. 222* .
When at least one search has been created, Search will be added as a main branch, with sub-branches having the Search Name as the branch name.

/ : Evaluation target buttons (shown only for Classification by Target view)

- This function is available only when using a Professional Edition license.

Switches target used for evaluation between master target ( ) and working target ( ).

Groups

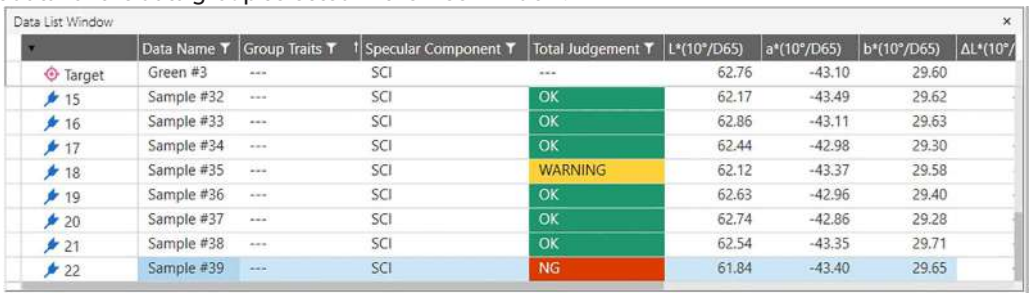
In addition to the above main branches and sub-branches, when a group has been created (see *2.24.6 Data groups on p. 221*), a sub-branch with that group name will be added under the branch under which the group was created.

■ Collapsing/Expanding Branches

To collapse a branch in the tree diagram, click on the ▼ next to the branch.
To expand a collapsed branch, click on the ▶ next to the branch.

1.2.4.4 Data List Window

The Data List Window lists the measurement data for the data group selected in the Tree Window.



	Data Name	Group Traits	Specular Component	Total Judgement	L*(10°/D65)	a*(10°/D65)	b*(10°/D65)	ΔL*(10°/
Target	Green #3	---	SCI	---	62.76	-43.10	29.60	
15	Sample #32	---	SCI	OK	62.17	-43.49	29.62	
16	Sample #33	---	SCI	OK	62.86	-43.11	29.63	
17	Sample #34	---	SCI	OK	62.44	-42.98	29.30	
18	Sample #35	---	SCI	WARNING	62.12	-43.37	29.58	
19	Sample #36	---	SCI	OK	62.63	-42.96	29.40	
20	Sample #37	---	SCI	OK	62.74	-42.86	29.28	
21	Sample #38	---	SCI	OK	62.54	-43.35	29.71	
22	Sample #39	---	SCI	NG	61.84	-43.40	29.65	

The items (information, values, etc.) that will be displayed in the Data List for the measurements can be selected.
See *2.25 List Window Operations on p. 227* ,
2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124
and
2.7.2 List Window Option Settings on p. 139

1.2.4.5 Data Property Window

Shows the data properties for the currently selected measurement.
To edit the name, click in the name area and change it as desired.

ID	ID assigned by SpectraMagic NX2 to the measurement when the data is added to the document by measurement, reading from instrument memory, manual input, or copying/pasting from another document.
Creation Date	Date/time on which data was created in this document by either measurement, uploading from instrument or copying from other document
Updated Date	Date/time on which data was last edited.
Tag	A new tag can be added by clicking in the Tag area and typing in directly, or by clicking [+] to show a list of tags used in the document and selecting the desired tag from the list. A tag can be deleted by clicking on the × next to the tag to delete.

[History] Opens the history dialog showing a history of all changes, including changes made in the Evaluation Result tab and Additional Information tab.

[Save] Saves any changes made in this window. If changes are not saved, a confirmation dialog will appear asking whether to save changes before moving to a different measurement when a different measurement is selected.

Data tab

Shows information regarding the measurement, including measurement conditions, etc. and information regarding the instrument, such as model, serial number, etc.

Data attribute Indicates source of data: Measured Data (measured from SpectraMagic NX2 using instrument), Uploaded (read from instrument memory), Manual Input Data (manually input), Demo Data (measured in Demo mode). If data was copied from another document, "(Copied)" will be added at the end.
Timestamp Date/time data was created by measurement. Not shown for data which was manually input.

■ Color/Gloss

Values shown will be the measurement conditions set in SpectraMagic NX2 at the time of measurement or during manual input, or if data is uploaded from instrument memory, the measurement conditions set on the instrument at the time of measurement.

- Items for which multiple values have been set will show the values separated with commas.
- Items for which values are set will depend on the instrument. Items for which no value is set will be shown as "---".

The table below shows those items not included in measurement conditions, or descriptions

Meas. ID	Unique ID assigned by the measurement at the time of measurement. If the instrument does not assign an ID or the data is input manually, SpectraMagic NX2 will assign an ID at the time of measurement, reading from instrument memory, or manual input. If data is copied to another document, this ID will not change.
Illumination area	Illumination area used for measurement. • Illumination area may be different than the illumination area specified for a mask if the measurement area set on the instrument does not match the mask measurement area.
Data Status	Status of measurement data at time of measurement. OK (within instrument's measurement range), Warning (outside instrument's measuring range), Error (measurement error)

Calibration standard	White calibration plate or user white calibration plate ID, Gloss calibration plate ID. • "---" for transmittance or haze measurements
Sample Temperature	Temperature of sample at time of measurement. For averaged measurements, it will be the average of the temperatures of the samples which were measured. (CM-3700A Plus/CM-3700A-U Plus only)

■ Device Information

Instrument status	Calibration status (whether recalibration due to elapsed time or factory calibration is recommended) at time of measurement.
Inst. Check Result	The results of the most recent instrument check. If no instrument check has been performed for the connected instrument, "---" will be shown.
Inst. Check Date	The date/time of the most recent instrument check. If no instrument check has been performed for the connected instrument, "---" will be shown.
Temperature of the Instrument	Internal temperature of instrument at time of measurement (CF-300 only)
Environment Temperature	Ambient temperature at time of measurement (CM-3700A Plus/CM-3700A-U Plus only)
Environment Humidity	Ambient humidity at time of measurement (CM-3700A Plus/CM-3700A-U Plus only)
Data No. of the Instrument	Number assigned to data in instrument memory. Shown only for data uploaded from instrument memory. (Portable instruments and CM-5/CR-5 only)

Evaluation Condition tab (shown when a target is selected)

Shows the sample measurement conditions, measurement options, and tolerance settings for the selected target.

Evaluation Result tab (shown when a sample is selected)

The Visual Judgement result can be set by clicking on the current result and selecting the desired result from the drop-down menu that appears.

Additional Information tab

Shows additional information regarding the measurement.

■ User Defined Information

List-type user defined information can be changed by *clicking* on the current setting and selecting the desired setting from the drop-down list that appears.

Numeric-type user defined information can be changed by clicking on the current value and setting the new value by typing in directly or by using the up/down buttons.

[Add] Opens the User Defined Information Settings dialog. Click on the combo box and select the desired item from the drop-down list that appears.
[Delete] Deletes the selected User Defined Information item.

■ Comment

Shows the comment set for the measurement.

To edit the comment or add a new one, click in the textbox and edit the current comment or input a new comment.

■ Image

Shows the image currently set for the instrument.

To add or change the image:

1. Click [Set image]. The Edit image dialog will open.
2. Click [Browse Image File]. The Open dialog will appear.
3. Browse to the desired image and click [Open]. A preview of the image will appear in the Edit image area.
   - *.bmp, *.jpeg,,*.jpg, and *.png image files can be selected.
4. To add a marker, click [Add marker]. A circular marker will appear on the image preview.
   - The Marker color and Marker thickness can be set using the corresponding controls.
   - The size and shape of the marker can be changed by clicking on the marker in the preview window and dragging the handles to the desired size/shape.
   - Only 1 marker can be set on the image.
   - To delete a set marker, click [Clear marker].
5. Click [OK]. The image will be added to Additional information.
   - To delete a linked image, click [Clear image].

1.2.4.6 Evaluation Window

Shows evaluation results for the selected measurement.

- For absolute measurements, no data will be shown.
- To modify the list items shown in the Evaluation Window, change the Tolerance settings. See *2.9.8.1 Editing Tolerances on p. 159*

1. To edit the sample name, click in the name area and change it as desired.
   - The target name cannot be edited.
2. To set the *Visual Judgement* result, click on the current result and select the desired result from the drop-down menu that appears.
3. To switch between *Color difference* and *Absolute and Color difference* tabs, click on the tab to show.

1.2.4.7 Canvas Window

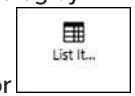
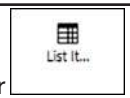
The Canvas Window consists of up to 10 canvases on which graphic objects such as graphs, plots, etc. are placed. Each canvas can also be printed out.

For operations in the Canvas Window, see *2.26 Canvas Window Operations on p. 229* .

1.3 Transition guides

1.3.1 Transition guide for Users of SpectraMagic NX

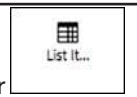
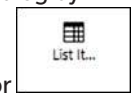
Previous users of SpectraMagic NX can refer to the following tables to help them find commonly used functions in SpectraMagic NX2.

Function	**SpectraMagic NX**	**SpectraMagic NX2**
(Window name)	SpectraMagic NX	Color QC
Observer/illuminant settings	*Data - Observer and Illuminant...*	Open List Items Settings dialog by  *View - List Items Settings...* or and set in Observer Condition tab in lower part of dialog *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124*
List Items settings	*Data - List Items...*	 *View - List Items Settings...* or *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124*
Judgement settings	*Data - Judgement Format...*	*QC Settings - Judgement Settings...*
Decimal places (Digit settings)	*Data - Decimal Places....*	Open List Items Settings dialog by *View - List Items Settings...* or and set in Digit tab in lower part of dialog *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124*
Manual averaging	*Instrument - Averaged Measurement - Target Averaged Measurement...* or *Instrument - Averaged Measurement - Sample Averaged Measurement...*	Open Measurement Condition dialog by *Instrument - Measurement Condition...* or and set in Measurement Option tab of Measurement Condition section. *Measurement Options on p. 108*
Auto averaging	*Instrument - Measurement Options...*	Open Measurement Condition dialog by *Instrument - Measurement Condition...* or and set in Measurement Option tab of Measurement Condition section. *Measurement Options on p. 108*

Interval measurement	*Instrument - Measurement Options...*	*Instrument - Measurement - Interval Measurement...* *2.8.5 Interval Measurements on p. 143*
Remote measurement (Instrument trigger mode)	*Instrument - Remote Measurement - Target Remote Measurement* or *Instrument - Remote Measurement - Sample Remote Measurement*	*Instrument - Instrument Trigger Mode ...* or switch between trigger modes by clicking in instrument window: (Trigger OFF) ➞ (Trigger measurement (Target)) ➞ (Trigger measurement (Sample)) ➞ (Trigger OFF) ➞ ... *2.8.6 Instrument Trigger Mode (Remote Measurement) on p. 144*
Upload target data from instrument	*Instrument - Upload/Download - Upload Target...*	*Instrument - Read/Write - Read/Edit Target ...* *2.9.3.1 Registering Targets into Document while Editing Targets in Instrument on p. 153*
Default tolerance settings	*Data - Default Tolerance Setting..*	*QC Settings - Default Data Settings - Default Tolerance...* *2.11.3 Setting Default Tolerance on p. 168* • Default tolerances for list items not in the List Window can also be set.
Target tolerance settings	*Data - Tolerance Setting..*	*Data - Edit Target - Tolerance...* *2.9.8.1 Editing Tolerances on p. 159* • Tolerances for list items not in the List Window can also be set.
Judgement color settings	*Data - Judgement Format...*	*QC Settings - Judgement Setting...* *2.12 Judgement Settings on p. 169*
Upload sample data from instrument	*Instrument- Upload/Download - Upload Samples...*	*Instrument - Read/Write - Read Samples...* *2.18.1 Reading Samples on p. 196*
Data properties	*Data - Data Property...*	Data Property Window *1.2.4.5 Data Property Window on p. 54*
Adding visual evaluation to data	Open Data Property dialog by *Data - Data Property...* and select from Visual Judgement drop-down list in Color tab.	Select from Visual Judgement drop-down list in Evaluation Result tab of Data Property Window *1.2.4.5 Data Property Window on p. 54* or Select from Visual Judgement drop-down list in Evaluation Window. *1.2.4.6 Evaluation Window on p. 57*
Adding image to data	Open Data Property dialog by *Data - Data Property...* and add the image in the Image tab.	Set image in Image section of Additional Information tab of Data Property Window *1.2.4.5 Data Property Window on p. 54*
Data search	*Edit - Search...*	In Tree Window, select a branch with sub-branches and click . After setting search conditions, the search will be added to Tree Window. *2.24.7 Searching for Data on p. 222*

1.3.2 Transition guide for Users of SpectraMagic DX

Previous users of SpectraMagic DX can refer to the following tables to help them find commonly used functions in SpectraMagic NX2.

Function	**SpectraMagic DX**	**SpectraMagic NX2**
(Window name)	SpectraMagic DX	Color QC
Observer/illuminant settings	*Data - Observer and Illuminant...*	Open List Items Settings dialog by *View - List Items Settings...* or and set in Observer Condition tab in lower part of dialog *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124*
List Items settings	*Data - List Items...*	 *View - List Items Settings...* or *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124*
Judgement settings	*Data - Judgement Format...*	*QC Settings - Judgement Settings...*
Decimal places (Digit settings)	*Data - Decimal Places....*	Open List Items Settings dialog by  *View - List Items Settings...* or and set in Digit tab in lower part of dialog *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124*
Manual averaging	*Instrument - Manual Average Measurement - Target...* or *Instrument - Manual Average Measurement - Sample...*	Open Measurement Condition dialog by *Instrument - Measurement Condition...* or and set in Measurement Option tab of Measurement Condition section. *Measurement Options on p. 108*
Auto averaging	*Instrument - Measurement Options...*	Open Measurement Condition dialog by *Instrument - Measurement Condition...* or and set in Measurement Option tab of Measurement Condition section. *Measurement Options on p. 108*
Interval measurement	*Instrument - Measurement Options...*	*Instrument - Measurement - Interval Measurement...* *2.8.5 Interval Measurements on p. 143*

Remote measurement (Instrument trigger mode)	*Instrument - Remote Measurement - Target* or *Instrument - Remote Measurement - Sample*	*Instrument - Instrument Trigger Mode ...* or switch between trigger modes by clicking in instrument window: (Trigger OFF) ➞ (Trigger measurement (Target)) ➞ (Trigger measurement (Sample)) ➞ (Trigger OFF) ➞ ... *2.8.6 Instrument Trigger Mode (Remote Measurement) on p. 144*
Upload target data from instrument	*Instrument - Read/Write - Read Target...*	*Instrument - Read/Write - Read/Edit Target ...* *2.9.3.1 Registering Targets into Document while Editing Targets in Instrument on p. 153*
Default tolerance settings	*Data - Default Tolerance Setting..*	*QC Settings - Default Data Settings - Default Tolerance...* *2.11.3 Setting Default Tolerance on p. 168* • Default tolerances for list items not in the List Window can also be set.
Target tolerance settings	*Data - Tolerance Setting..*	*Data - Edit Target - Tolerance...* *2.9.8.1 Editing Tolerances on p. 159* • Tolerances for list items not in the List Window can also be set.
Judgement color settings	*Data - Judgement Format...*	*QC Settings - Judgement Setting...* *2.12 Judgement Settings on p. 169*
Upload sample data from instrument	*Instrument- Read/Write - Read Samples...*	*Instrument - Read/Write - Read Samples...* *2.18.1 Reading Samples on p. 196*
Data properties	*Data - Data Property...*	Data Property Window *1.2.4.5 Data Property Window on p. 54*
Adding visual evaluation to data	Open Data Property dialog by *Data - Data Property...* and select from Visual Judgement drop-down list in Color tab.	Select from Visual Judgement drop-down list in Evaluation Result tab of Data Property Window *1.2.4.5 Data Property Window on p. 54* or Select from Visual Judgement drop-down list in Evaluation Window. *1.2.4.6 Evaluation Window on p. 57*
Data search	*Edit - Search...*	In Tree Window, select a branch with sub-branches and click . After setting search conditions, the search will be added to Tree Window. *2.24.7 Searching for Data on p. 222*

CHAPTER 2

Operation Guide

- Items marked with Ⓟ are supported only by SpectraMagic NX2 Professional Edition.

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2.1 Starting/Exiting SpectraMagic NX2

- For information on installing the SpectraMagic NX2 software, refer to the Installation Guide.

Starting SpectraMagic NX2

1. Select the SpectraMagic NX2 icon in the Windows Start menu or double-click on the icon on the desktop. SpectraMagic NX2 will start and the splash screen will appear for a few seconds.
2. The splash screen will then be replaced by the SpectraMagic NX2 Launcher.
   - For information about Launcher items other than the Color QC button, see *1.1 SpectraMagic NX2 Launcher on p. 2* .
   - If the dongle plugged into the computer or the dongleless (electronic) license installed on the computer includes a premium license, a message prompting you to activate the Premium license will appear when starting SpectraMagic NX2 for the first time or if the Premium license on the dongle or computer has not been activated. To activate the Premium license, click [Activate] and follow the procedure in *1.1.3.4 License Activation on p. 9* to activate the license. To continue without activating the license, click [Skip].
3. Click the Color QC button. The SpectraMagic NX2 QC module will start, and the File Selection dialog will appear.
   - If the instrument selected as default is connected to the computer and switched on, and "Check the connection of the measuring instrument at the same time as starting up" is enabled in Start with Instrument mode of the Startup Options section of Other Settings category in the Application Settings dialog, the software will automatically attempt to connect to the instrument and show any instrument-related messages before opening the File Selection dialog.

- For more information on Startup Options, see *2.22 Application Settings on p. 213* .

Exiting SpectraMagic NX2

1. Click on the [x] in the upper right corner of the software window, select Exit from the File menu, or press Alt + F4. The SpectraMagic NX2 QC module will close and the SpectraMagic NX2 Launcher will be shown.
   - If there are open documents which have not been saved since their last change, a dialog asking whether to save the document will appear for each document. Click [OK] to save the document. If the document has never been saved, the Save As dialog will appear. Input the desired file name and click [OK] to save and close the document.
2. Click on the [x] in the upper right corner of the Launcher window.

2.1.1 File Selection Dialog

When the SpectraMagic NX2 QC module starts, the File Selection dialog will appear. In this dialog, you can create a document or QC template, or open an existing document or QC template.

- Return to *Quick Start Guide: Starting SpectraMagic NX2 on p. QS-2* .

2.1.1.1 Create Document section

To create a new document, click [Start]. A new document will be opened.

2.1.1.2 Create Document from QC Template section

To create a document based on a previously created QC template:

1. Click [...]. The Open dialog will appear.
2. Browse to the desired QC template (*.qctp file) and click [Open]. [Start] will be enabled.
3. Click [Start]. A new document based on the selected QC template will be opened.

2.1.1.3 Create QC Template section Ⓟ

- This function is available only when using a Professional Edition license.

A QC template is a project that includes the instrument type, one or more targets and their respective tolerances, and the display layout.

Creating a new QC template directly

To create a new QC template directly, uncheck *Use wizard-style navigation* and click [Start]. A new QC template will be opened. You can then proceed to add targets and their tolerances, change the display layout, etc. After you have finished, click the Save button in the toolbar or select Save or Save As ... from the File menu.

- Instrument settings will not be saved in QC templates that are created directly. To save instrument information in the QC template, create the template using the QC Template Wizard.

Creating a QC Template using the QC Template Wizard

1. If *Use wizard-style navigation* is not checked, click on the checkbox to check it, and then click [Start]. The New Project Wizard will start.
2. In the QC Settings tab, you can set the following information to store in the QC template by clicking on the corresponding button to open the dialog for making those settings:
   - **2-1** [User Defined Information] For adding user-defined information to measurements to help you categorize measurements. See *2.13 User Defined Information Settings Ⓟ on p. 171* .
   - **2-2** [User Illuminant] For setting user illuminants for measurements. See *2.15 Registering User Illuminants Ⓟ on p. 176* .
   - **2-3** [User Equation] For setting equations for user-defined indexes. See *2.14 User Equation Settings Ⓟ on p. 173* .

2-4 [QC Measurement Conditions] For setting instrument, measurement conditions, and measurement options.
- When QC Measurement Conditions settings are set, the QC template can be used only with the instrument which was set.
- For information on instrument measurement conditions, see *2.5 Setting Measurement Condition Settings on p. 96* .

a) In the Measurement Conditions tab, click on the down arrow and select the instrument from the drop-down list that appears. The measurement conditions available for the selected instrument will be shown.

b) Set the measurement conditions.

c) Click on the Options tab to change to that tab and set the option settings.

3. After completing desired settings, click [OK] to continue with Target Registration.

4. In Target Registration, select the method for setting the target data and continue with the corresponding Setting target data section below.

5. Setting target data
- Only a single target can be set while using the QC Template Wizard to create the QC template. Additional targets can be added to a QC template by saving it once, opening the stored QC template file (*.qctp file) by selecting *File - Open* and selecting the file in the Open dialog, and then adding the additional targets by measurement or manual input.

Setting target data by measurement

5-1 Click [By Measurement] in the Target Registration tab. The Create Target dialog will appear.
- If no instrument is connected, the software will attempt to connect to the last-connected instrument. After connection has been successfully performed, the Create Target dialog will appear. If connection is unsuccessful, an error message will appear. Check that the instrument is switched on and connected to the computer, and try again.

5-2 To change the target name, click in the target name textbox and edit the target name.

5-3 In the Measurement conditions section, set the desired measurement conditions for target measurement.
- Measurement conditions available will depend on the instrument. For details of measurement conditions, see p. 96.

5-4 To calibrate the instrument at the selected settings, click [Calibrate].
- For information on calibration, see *2.6 Calibration on p. 109* .

5-5 Position the target for measurement and click [Measure]. A measurement will be taken and the measurement results will be shown in the Measurement Results section.
- If calibration at the selected settings has not been performed, the calibration procedure will start when [Measure] is clicked. For information on calibration, see *2.6 Calibration on p. 109* .

5-6 Click [OK] and continue with step 6 below to set the sample measurement conditions.

Setting target data by manually inputting data

5-1 Click [Input Manually] in the Target Registration tab. The Create Target dialog will appear.

5-2 To change the target name, click in the target name textbox and edit the target name.

5-3 Click on the Color Data list and select the data type (Spectral or Colorimetric) to input from the drop-down list that appears.

5-4 To also input a gloss value, click the Characteristics slide button and set it to On.

5-5 Click on the Group Trait list and select the group trait for the target to be input from the drop-down list that appears.
- Some items in Measurement Conditions may be automatically set according to the selected Group Trait.

5-6 In the Measurement conditions section, set the desired measurement conditions for the target.
- Measurement conditions available will depend on the Group Trait selected.

5-7 If "Spectral" was selected as the data type in step 5-3:

a) Click on the Wavelength list and select the desired wavelength range (360-740 or 400-700) from the drop-down list that appears. When a wavelength range has been selected, [Reflectance Settings] will be enabled.

b) Click [Reflectance Settings]. The Reflectance Settings dialog will appear.

c) Input the spectral data for each wavelength in each tab. To switch tabs, click on the tab.

d) After all data have been input as desired, click [OK] to close the dialog.

If "Colorimetric" was selected as the data type in step 5-3:

a) Click on the Color Space list and select the desired color space (L*a*b*, Hunter Lab, or XYZ) from the drop-down list that appears.

b) Click [Observation Condition]. The Observation Condition Settings dialog will appear.

c) Select the desired Observer and Illuminant for Observation Condition 1 by clicking on the corresponding list and selecting from the drop-down list that appears.

- To use a user illuminant, select User Illuminant in the Illuminant drop-down list and select the desired user illuminant in the User Illuminant list.

d) If desired, set the slide button next to Observation Condition 2 and Observation Condition 3 to On and select the desired Observer and Illuminant settings for each condition.

e) After all conditions have been set as desired, click [OK] to close the dialog.

f) Input the target colorimetric values. To switch between tabs for different observation conditions, click on the tab.

5-8 If Characteristics was set to On in step 5-4, input the gloss value for the target.

5-9 Click Next> and continue with step 6 below to set the sample measurement conditions.

6. Set the sample measurement conditions. The Measurement Conditions tab is for setting instrument-related conditions and the Options tab is for optional settings such as averaging method, etc.

- If you don't want to set the sample measurement conditions separately and want to use the target measurement conditions for sample measurements, set the on/off slide button at the upper right off the dialog to Off.
- For more information on measurement conditions, see *2.5 Setting Measurement Condition Settings on p. 96* .

7. Click [OK] and continue with Tolerance settings.

7-1 Set the desired tolerances and Warning Level to be used for Pass/Fail judgment.

7-2 Click the checkbox next to a Condition to enable setting tolerances for that condition, and then click the checkbox next to each tolerance for each item to enable that tolerance and set the desired tolerance by direct input or by using the up/down arrows.

7-3 Repeat step 7-2 to set other tolerances as desired.

7-4 Set the desired Warning Level (%) by direct input or by using the up/down arrows.

8. Click [OK] and continue with Data Tag and Additional information settings.

8-1 If you want to add a data tag to the target, input the desired tag into the Data Tag text box.

8-2 To add an item from a user defined list, click [Add] in the User Defined List area. The User Defined Information Settings dialog will open.

a) Click on the user defined information list and select the desired item from the drop-down list that appears.

b) Click [OK]. The selected item will be added to the User Defined List.

c) Select the added item and click on the Value for that item to set the desired value.

8-3 If you want to link an image with the target, click [Set image]. The Edit image dialog will open.

a) Click [Browse Image File]. The Open dialog will appear.

b) Browse to the desired image and click [Open]. A preview of the image will appear in the Edit image area.

- *.bmp, *.jpeg, *.jpg, and *.png image files can be selected.

c) To add a marker, click [Add marker]. A circular marker will appear on the image preview.

- The Marker color and Marker thickness can be set using the corresponding controls.
- The size and shape of the marker can be changed by clicking on the marker in the preview window and dragging the handles to the desired size/shape.
- Only 1 marker can be set on the image.
- To delete a set marker, click [Clear marker].

d) Click [OK]. The image will be added to Additional information.

- To delete a linked image, click [Clear image].

8-4 If you want to add a comment to the target, input the desired comment into the Comment text box.

9. Click [OK]. A confirmation message will appear. To save the target information, click [OK]. The wizard will proceed to Display Layout Selection.

10. To set the display layout

10-1 Select the desired display template by clicking on the display template name. If a standard template is selected, a preview of the template will be shown.

- To select a folder containing display templates, click the button with a folder image in the Select from Folder section. The Browse to Folder dialog will appear. Browse to the desired folder and click [OK]. A list of display templates in that folder will be shown.

10-2 Click [OK]. The selected display template will be applied to the QC template.

11. To save the QC template, click Save in the toolbar or select Save or Save As ... from the File menu.

- Measurements cannot be saved in a QC template, and it is not possible to save a QC template as a document. Before starting measurements, close the QC template and open a new document from the QC template. See *2.2.2 Creating a New Document from QC Template on p. 74* .

2.2 Creating a New Document or Opening an Existing Document

Measurements can be taken and various settings can be made only when a document is open. If a file was not created from the File Selection dialog which appeared when SpectraMagic NX2 was launched, follow the procedure below to create a document.

2.2.1 Creating a new document directly

To create a new document directly, do one of the following:

1. To create a new document directly from the main SpectraMagic NX2 screen
   Click the New button in the toolbar
   or
   Select *File - Document - New* in the popout menu that appears.

   If the File Selection dialog is shown, click [Start] in the Create Document section of the New File tab.

2. A new document will be opened.
   - If Apply when creating a new document in **Display Template** in the Other Settings category of the QC App Application Settings is checked, the display template selected there will be automatically applied when the new document is created.

2.2.2 Creating a New Document from QC Template

QC templates can be used to standardize work flows. They include target data and tolerance settings, target and sample measurement conditions, display layout, instrument settings, etc. To use a QC template, a new document should be opened from the QC template.

- Sample measurement data cannot be stored in a QC template. To use a QC template for measurements, always open a document from the QC template instead of opening the QC template itself.
- The default file path will be as specified in the Application Settings dialog. See *2.22 Application Settings on p. 213* .

If the main SpectraMagic NX2 screen is shown:

1. Select *File - Document - New Document from QC Template ...* from the popout menu that appears. The Open dialog will appear.
2. Browse to the desired QC template (*.qctp file) and click [Open]. A new document based on the selected QC template will be opened.
   - If Apply when creating a new document in **Display Template** in the Other Settings category of the QC App Application Settings is checked, the display template selected there will be automatically applied when the new document is created.

If the File Selection dialog is shown:

1. In the Create Document from QC Template section of the New File tab, click [...]. The Open dialog will appear.
2. Browse to the desired QC template (*.qctp file) and click [Open]. [Start] will be enabled.

3. Click [Start]. A new document based on the selected QC template will be opened.
   - If Apply when creating a new document in **Display Template** in the Other Settings category of the QC App Application Settings is checked, the display template selected there will be automatically applied when the new document is created.

2.2.3 Opening an existing document

- Existing *.mesx2, *.qctp, *.mes, or *.mea files can be opened using the procedure below.
- Existing SpectraMagic DX files need to be converted using the DX2NXConverter before they can be opened. The DX2NXConverter is installed in the following folder: C:\Program Files\KONICA MINOLTA\SpectraMagic NX2\DataConvertTool

If the main SpectraMagic NX2 screen is shown:

1. Select *File - Open*. The Open dialog will appear.

2. Browse to the desired file and click [Open]. The selected file will be opened.

If the File Selection dialog is shown:

- The File Selection dialog can also be opened to the Open File tab by clicking on the Recent Files button in the toolbar, or by selecting *File - Recent Files*.

1. If the Open File tab is not selected, click on the Open File tab to switch to that tab. A list of recently used documents and templates will be shown.

2. If the desired file is in the list:

2-1 Click on the file to select it and then click [Open]. The selected file will be opened.

If the desired file is not in the list:

2-1 Click [Browse] in the Open selected document section. The Open dialog will appear.

2-2 Browse to the desired file and then click [Open]. The selected file will be opened.

2.2.4 Saving the Document

1. To save the currently active document under its current name, do any of the following:
- Click the Save button in the toolbar.
- Select *File - Save*.
- Press Ctrl + S.

The document will be saved.
- If the document has never been saved, the Save As dialog will appear. Input the desired file name and click [OK]. The document will be saved and the dialog will close.

1. To save the currently active document under a new name, or if the document has never been saved:

1-1. Select *File - Save As ...*. The Save As dialog will appear.

1-2. Input the desired file name and click [OK]. The file will be saved and the dialog will close, and the file name shown in the document tab or title bar will change to the title which was input.

2.3 Templates

2.3.1 QC Templates

QC templates can be used to standardize work flows. They include target data and tolerance settings, target and sample measurement conditions, display layout, instrument settings, etc.

2.3.1.1 Creating a QC Template directly (Saving an existing document as a QC template) Ⓟ

- This function is available only when using a Professional Edition license.

The currently active document can be saved as a QC template. Saving the document as a QC template will include all of the document's target and tolerance settings, user-defined information, user illuminant information, and measurement conditions but will not save information regarding the connected instrument.

To save the currently active document as a QC template:

1. Select *File - New QC Template - Save as QC Template ...* in the popout menu that appears. The Save As dialog will appear.
2. Browse to the folder to save the QC template to and input the desired name for the QC template.
3. Click [Save]. The QC template will be saved.

2.3.1.2 Creating a QC Template using the QC Template Wizard Ⓟ

- This function is available only when using a Professional Edition license.

1. If the File Selection dialog is not shown, select *File - New QC Template - New QC Template Wizard ...* in the popout menu that appears.

   If the File Selection dialog is shown, in the Create QC Template section, make sure that *Use wizard-style navigation* is checked (if it is not checked, click on the checkbox to check it) and then click [Start]. The New Project Wizard will start.

2. In the QC Settings tab, you can set the following information to store in the QC template by clicking on the corresponding button to open the dialog for making those settings:
   - **2-1** [User Information] For adding user-defined information to measurements to help you categorize measurements. See *2.13 User Defined Information Settings Ⓟ on p. 171* .
   - **2-2** [User Illuminant] For setting user illuminants for measurements. See *2.15 Registering User Illuminants Ⓟ on p. 176* .
   - **2-3** [User Equation] For setting equations for user-defined indexes. See *2.14 User Equation Settings Ⓟ on p. 173* .
   - **2-4** [QC Measurement Conditions] For setting instrument, measurement conditions, and measurement options.
     - When QC Measurement Conditions settings are set, the QC template can be used only with the instrument which was set.
     - For information on instrument measurement conditions, see *2.5 Setting Measurement Condition Settings on p. 96* .

     a) In the Measurement Conditions tab, click on the down arrow and select the instrument from the drop-down list that appears. The measurement conditions available for the selected instrument will be shown.

- It is not possible to select CR-5, CR-400, or CR-410 as the instrument.

b) Set the measurement conditions.

c) Click on the Options tab to change to that tab and set the option settings.

3. After completing desired settings, click [OK] to continue with Target Registration.

4. In Target Registration, select the method for setting the target data and continue with the corresponding Setting target data section below.

5. Setting target data

- Only a single target can be set while using the QC Template Wizard to create the QC template. Additional targets can be added to a QC template by saving it once, opening the stored QC template file (*.qctp file) by selecting *File - Open* and selecting the file in the Open dialog, and then adding the additional targets by measurement or manual input.

Setting target data by measurement

5-1 Click [By Measurement] in the Target Registration tab. The Create Target dialog will appear.

- If no instrument is connected, the software will attempt to connect to the last-connected instrument. After connection has been successfully performed, the Create Target dialog will appear. If connection is unsuccessful, an error message will appear. Check that the instrument is switched on and connected to the computer, and try again.

5-2 To change the target name, click in the target name textbox and edit the target name.

5-3 In the Measurement conditions section, set the desired measurement conditions for target measurement.

- Measurement conditions available will depend on the instrument. For details of measurement conditions, see p. 96.

5-4 To calibrate the instrument at the selected settings, click [Calibrate].

- For information on calibration, see *2.6 Calibration on p. 109* .

5-5 Position the target for measurement and click [Measure]. A measurement will be taken and the measurement results will be shown in the Measurement Results section.

- If calibration at the selected settings has not been performed, the calibration procedure will start when [Measure] is clicked. For information on calibration, see *2.6 Calibration on p. 109* .

5-6 Click [OK] and continue with step 6 below to set the sample measurement conditions.

Setting target data by manually inputting data

5-1 Click [Input Manually] in the Target Registration tab. The Create Target dialog will appear.

5-2 To change the target name, click in the target name textbox and edit the target name.

5-3 Click on the Color Data list and select the data type (Spectral or Colorimetric) to input from the drop-down list that appears.

5-4 To also input a gloss value, click the Characteristics slide button and set it to On.

5-5 Click on the Group Trait list and select the group trait for the target to be input from the drop-down list that appears.

- Some items in Measurement Conditions may be automatically set according to the selected Group Trait.

5-6 In the Measurement conditions section, set the desired measurement conditions for the target.

- Measurement conditions available will depend on the Group Trait selected.

5-7 If "Spectral" was selected as the data type in step 5-3:

a) Click on the Wavelength list and select the desired wavelength range (360-740 or 400-700) from the drop-down list that appears. When a wavelength range has been selected, [Reflectance Settings] will be enabled.

b) Click [Reflectance Settings]. The Reflectance Settings dialog will appear.

c) Input the spectral data for each wavelength in each tab. To switch tabs, click on the tab.
d) After all data have been input as desired, click [OK] to close the dialog.

If "Colorimetric" was selected as the data type in step 5-3:
a) Click on the Color Space list and select the desired color space (L*a*b*, Hunter Lab, or XYZ) from the drop-down list that appears.
b) Click [Observation Condition]. The Observation Condition Settings dialog will appear.
c) Select the desired Observer and Illuminant for Observation Condition 1 by clicking on the corresponding list and selecting from the drop-down list that appears.
- To use a user illuminant, select User Illuminant in the Illuminant drop-down list and select the desired user illuminant in the User Illuminant list.

d) If desired, set the slide button next to Observation Condition 2 and Observation Condition 3 to On and select the desired Observer and Illuminant settings for each condition.
e) After all conditions have been set as desired, click [OK] to close the dialog.
f) Input the target colorimetric values. To switch between tabs for different observation conditions, click on the tab.

5-8 If Characteristics was set to On in step 5-4, input the gloss value for the target.

5-9 Click Next> and continue with step 6 below to set the sample measurement conditions.

6. Set the sample measurement conditions. The Measurement Conditions tab is for setting instrument-related conditions and the Options tab is for optional settings such as averaging method, etc.
- If you don't want to set the sample measurement conditions separately and want to use the target measurement conditions for sample measurements, set the on/off slide button at the upper right off the dialog to Off.
- For more information on measurement conditions, see *2.5 Setting Measurement Condition Settings on p. 96* .

7. Click [OK] and continue with Tolerance settings.

7-1 Set the desired tolerances and Warning Level to be used for Pass/Fail judgment.

7-2 Click the checkbox next to a Condition to enable setting tolerances for that condition, and then click the checkbox next to each tolerance for each item to enable that tolerance and set the desired tolerance by direct input or by using the up/down arrows.

7-3 Repeat step 7-2 to set other tolerances as desired.

7-4 Set the desired Warning Level (%) by direct input or by using the up/down arrows.

8. Click [OK] and continue with Data Tag and Additional information settings.

8-1 If you want to add a data tag to the target, input the desired tag into the Data Tag text box.

8-2 To add an item from a user defined list, click [Add] in the User Defined List area. The User Defined Information Settings dialog will open.
a) Click on the user defined information list and select the desired item from the drop-down list that appears.
b) Click [OK]. The selected item will be added to the User Defined List.
c) Select the added item and click on the Value for that item to set the desired value.

8-3 If you want to link an image with the target, click [Set image]. The Edit image dialog will open.
a) Click [Browse Image File]. The Open dialog will appear.
b) Browse to the desired image and click [Open]. A preview of the image will appear in the Edit image area.
- *.bmp, *.jpeg, *.jpg, and *.png image files can be selected.

c) To add a marker, click [Add marker]. A circular marker will appear on the image preview.

- The Marker color and Marker thickness can be set using the corresponding controls.
- The size and shape of the marker can be changed by clicking on the marker in the preview window and dragging the handles to the desired size/shape.
- Only 1 marker can be set on the image.
- To delete a set marker, click [Clear marker].

d) Click [OK]. The image will be added to Additional information.

- To delete a linked image, click [Clear image].

8-4 If you want to add a comment to the target, input the desired comment into the Comment text box.

9. Click [OK]. A confirmation message will appear. To save the target information, click [OK]. The wizard will proceed to Display Layout Selection.

10. To set the display layout

10-1 Select the desired display template by clicking on the display template name. If a standard template is selected, a preview of the template will be shown.

- To select a folder containing display templates, click the button with a folder image in the Select from Folder section. The Browse to Folder dialog will appear. Browse to the desired folder and click [OK]. A list of display templates in that folder will be shown. Select the desired display template.

10-2 Click [OK]. The selected display template will be applied to the QC template.

11. To save the QC template, click Save in the toolbar or select Save or Save As ... from the File menu.

- Measurements cannot be saved in a QC template, and it is not possible to save a QC template as a document. Before starting measurements, close the QC template and open a new document from the QC template. See *2.2.2 Creating a New Document from QC Template on p. 74* .

2.3.2 Display Templates

Display templates can be used to set how data is displayed on the screen. They include only the display layout and list items.

2.3.2.1 Saving the active document layout as a display template

The layout of the currently active document can be saved as a display template.

1. Select *File - Display Template - Export ...* in the popout menu that appears. The Save As dialog will appear.
2. Browse to the folder to save the display template to and input the desired name for the display template.
3. Click [Save]. The display template will be saved.

2.3.2.2 Specifying display template to be applied to newly created documents

The display template to be automatically applied to newly created documents can be specified.

1. Select *Environment Settings - Application Settings...* . The Application Settings dialog will appear.
2. Select *Other Settings* in the left side of the dialog. The Other Settings category will be shown.
3. If Apply when creating a new document is not checked, click on it to make it checked. Display Template will be enabled.
4. Click on [Browse]. An Open dialog will appear.
5. Browse to the folder containing the desired display template file (*.mptx2 file).
6. Select the file, and click [Open]. The Open dialog will close and the selected display template will be automatically applied to any new document when it is created.

2.3.2.3 Applying a display template to the active document

Applying a display template to the currently active document will change the display layout and list items according to the settings in the display template.

- Standard templates for the different instrument types are installed in the following folders

Instrument	Folder
CM instruments with SCI/SCE settings	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate
CM-512m3A	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate\3Bank
CM-M6	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate\6Bank
CR-400 series	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate\CR
CM-25cG	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate\Other
Opacity, Haze	C:\Users\Public\Documents\SpectraMagic NX2\DisplayTemplate\Other

It is recommended that a template for the instrument type being used be selected. If a template for a different instrument type is selected, data may not be shown in the canvas window due to differences between measurement data traits and canvas window object data traits. If no data is shown in the canvas window after applying a template, select a different template and be sure that the selected template is one for the instrument type being used.

Applying a display template from the Display Template Window

1. If the Display Template Window is open, click on the desired display template in that window. The selected display template will be applied to the currently active document immediately.
   - To select a different folder containing display templates, click 🗀 in the Select from Folder section. The Browse to Folder dialog will appear. Browse to the desired folder and click [OK]. A list of display templates in that folder will be shown. Select the desired display template.

Applying a display template using the menu

1. Select *File - Display Template - Apply ...* in the popout menu that appears. The Apply Display Template dialog will appear.
2. Select the desired display template by clicking on the display template name. If a standard template is selected, a preview of the template will be shown.
   - To select a different folder containing display templates, click 🗀 in the Select from Folder section. The Browse to Folder dialog will appear. Browse to the desired folder and click [OK]. A list of display templates in that folder will be shown. Select the desired display template.
   - To apply the selected display template when creating new documents, check Apply when creating a new document.
3. Click [OK]. The selected display template will be applied to the currently active document.

2.4 Connecting/Disconnecting an Instrument

- This procedure is available only when the software license is valid (either electronically or by using a dongle attached to the computer).
- Return to *Quick Start Guide: Connecting an Instrument on p. QS-3* .

2.4.1 Before connecting

Before connecting SpectraMagic NX2 to the instrument, the instrument must be connected to the computer and the instrument power must be switched on.

- 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 NX2.
- 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 NX2 to the instrument. For the procedure, refer to the instruction manuals of the instrument and Bluetooth adapter.
- If "Check the connection of the measuring instrument at the same time as starting up" is enabled in Start with Instrument mode of the Startup Options section of Other Settings category in the Application Settings dialog, the software will automatically attempt to connect to the default instrument when the software is started and display any instrument-related messages if connection is successful.
- Up to four CM-700d series units can be connected simultaneously using either USB connection or Bluetooth communication. See *2.4.2.3 Connecting with multiple CM-700d series instruments on p. 92* for more information.

■ Compatible instrument firmware versions

SpectraMagic NX2 is compatible with instruments having the following or later firmware versions.

Instrument	Minimum firmware version
CM-3700A Plus/CM-3700A-U Plus, CM-36dG/CM-36d/CM-36dGV, CF-300, CM-17d/CM-16d, CM-26dG/CM-26d/CM-25d/CM-23d, CM-M6, CM-25cG	All
CM-3700A	2.05.0001
CM-3700A-U	2.06.0001
CM-5/CR-5	1.20.0006
CM-700d/CM-600d/CM-700d-U	1.23.0005
CR-400/CR-410	1.14.0000
DP-400	1.16.0000
CM-3600A/CM-3610A	1.08.0000
CM-2600d/CM-2500d	1.42.0000
CM-2500c	5.11.0000
CM-512m3A	1.04.0001

- If the instrument to be connected has firmware older than the version listed above, an error message will appear and connection will not be possible. Contact the nearest Konica Minolta authorized service facility about updating the firmware.

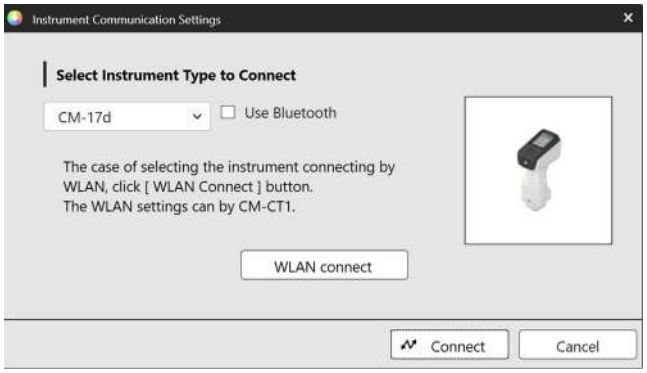
■ When using instruments with internal camera

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.

2.4.2 Connecting to an Instrument

1. Click the Connect button in the toolbar or 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 clicking the toolbar Connect button or selecting *Instrument - Connect*. Continue with step 2 below.
2. Click on the drop-down 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, CM-25d, CM-23d, CM-25cG, or CM-M6 with the optional WLAN/Bluetooth Module installed and Bluetooth will be used, see *2.4.2.1 Connecting via Bluetooth on p. 88*
   - If the instrument to be used is a CM-17d, CM-16d, CM-26dG, CM-26d, CM-25d, CM-25cG, CM-23d, or CM-M6, the [WLAN connect] button will be shown. To connect via WLAN, see *2.4.2.2 Connecting via WLAN on p. 89*
   - 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.* or *Baud Rate* items are shown in **Connection Settings**, click on the respective drop-down list and select the desired setting from the list that appears.
   - See *Checking the COM port number on p. 93* .
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 *2.4.3 Notes on connection on p. 93* .
   - If the scheduled instrument check for the connected instrument has not been performed, a warning message will appear. Clicking [OK] will disconnect the instrument from the Color QC App, launch the Instrument Check App, and connect the instrument to the Instrument Check App to perform instrument check. See *3.6 Executing Instrument Check on p. 263* . This notification can be disabled in Other Settings of **Application Settings** in the Color QC App. See *2.22 Application Settings on p. 213*

Instrument Communication Settings dialog



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

- Buttons/settings shown will depend on selected instrument.

Use Bluetooth — Check if communicating with instrument via Bluetooth. See *2.4.2.1 Connecting via Bluetooth on p. 88*

[WLAN Connect] — Opens the Connect wireless instrument dialog. See *2.4.2.2 Connecting via WLAN on p. 89*

Port No. — Click on drop-down and set desired setting. See *Checking the COM port number on p. 93* .

Baud Rate — Click on drop-down and set desired setting.

Dialog buttons

[Connect] — Connects to instrument.

[Multiple] — Opens the Instrument Multiple Connection dialog for simultaneously connecting multiple CM-700d series instruments. See *2.4.2.3 Connecting with multiple CM-700d series instruments on p. 92* .

2.4.2.1 Connecting via Bluetooth

Connection to a CM-17d, CM-16d, CM-26dG, CM-26d, CM-25d, CM-23d, CM-25cG, or CM-M6 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 NX2.

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 Windows ***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 NX2

1. Select *Instrument - Instrument Communication Settings...* . The Instrument Communication Settings dialog will open.
2. Click on the drop-down box 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.
   - If the scheduled instrument check for the connected instrument has not been performed, a warning message will appear. Clicking [OK] will disconnect the instrument from the Color QC App, launch the Instrument Check App, and connect the instrument to the Instrument Check App to perform instrument check. See *3.6 Executing Instrument Check on p. 263* . This notification can be disabled in Other Settings of **Application Settings** in the Color QC App. See *2.22 Application Settings on p. 213*

2.4.2.2 Connecting via WLAN

Connection to a CM-17d, CM-16d, CM-26dG, CM-26d, CM-25d, CM-23d, CM-25cG, or CM-M6 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 NX2.
- 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 NX2.

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

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 NX2

1. Select *Instrument - Instrument Communication Settings...* . The Instrument Communication Settings dialog will open.
2. Click on the drop-down box in **Select Instrument Type to Connect** and select the desired instrument from the list that appears.
3. Click [WLAN connection]. 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.
   - If the scheduled instrument check for the connected instrument has not been performed, a warning message will appear. Clicking [OK] will disconnect the instrument from the Color QC App, launch the Instrument Check App, and connect the instrument to the Instrument Check App to perform instrument check. See *3.6 Executing Instrument Check on p. 263* . This notification can be disabled in Other Settings of **Application Settings** in the Color QC App. See *2.22 Application Settings on p. 213*

■ 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 NX2.

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

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 NX2

1. Select *Instrument - Instrument Communication Settings...* . The Instrument Communication Settings dialog will open.
2. Click on the drop-down box 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.

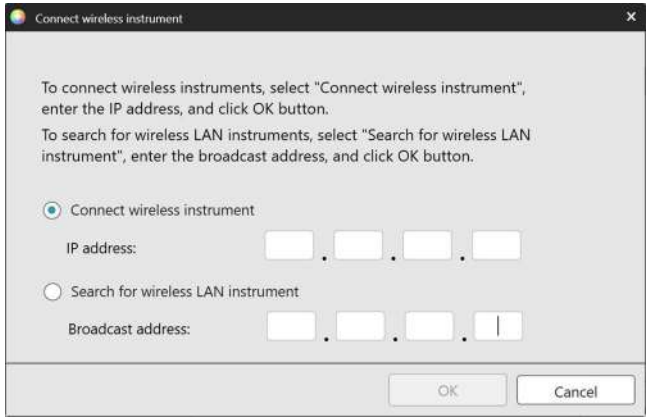
   To connect to an instrument by searching for it on the network:
   - **4-1** Select the *Connect wireless instrument* radio button by clicking on it and input the broadcast address of the network to which the device is connected.
     - Inputting "255" for all 4 values of the broadcast address will search 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 the scheduled instrument check for the connected instrument has not been performed, a warning message will appear. Clicking [OK] will disconnect the instrument from the Color QC App, launch the Instrument Check App, and connect the instrument to the Instrument Check App to perform instrument check. See *3.6 Executing Instrument Check on p. 263* . This notification can be disabled in Other Settings of **Application Settings** in the Color QC App. See *2.22 Application Settings on p. 213*

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.

2.4.2.3 Connecting with multiple CM-700d series instruments

Up to four CM-700d series units can be connected simultaneously using either USB connection or Bluetooth communication as follows:

- Before connecting the instruments simultaneously, be sure to calibrate each instrument from within SpectraMagic NX2.

1. Select *Instrument - Connect*. The Instrument Communication Settings dialog will open.
2. Click on the drop-down in **Select Instrument Type to Connect** and select a CM-700d series instrument from the list that appears. An image of the selected instrument will be shown, and a [Multiple] button will appear.
3. Click [Multiple]. After a few seconds, the Instrument Multiple Connection dialog will appear, showing a list of CM-700d series instruments connected to the computer.
4. Select the instruments to be connected by clicking on the checkbox next to each instrument to make it checked.
   - The first instrument whose checkbox is checked will become the main instrument and a checkmark will appear in the Main instrument column.
5. Click [Connect]. SpectraMagic NX2 will connect with the selected instruments.

When multiple instruments are connected:

- The Instrument Window will apply only to the instrument set as the Main instrument.
- Full operation from the toolbars and menus is possible only for the instrument selected as the Main instrument. For the remaining instruments, only items related to remote measurement (trigger mode), including showing measurement results in instrument display after remote measurements, can be used. See *2.8.6 Instrument Trigger Mode (Remote Measurement) on p. 144* .
- The instrument settings (specular component and measurement area) set for the first instrument will be used for all of the connected instruments.

2.4.3 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 box.
  - 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.
- Check that the instrument is set to remote communication mode. (Spectrophotometer CM-2600d/CM-2500d/CM-2500c, Chroma Meter CR-400/CR-410, or Data Processor DP-400 only)
- If the instrument allows the selection of communication settings, check that the communication settings specified in the Instrument Communication Settings dialog box are the same as the communication settings specified with the instrument.

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/CR-5, kmsecm700 for CM-700d/600d, or kmsecmcr for CM-3600A/CM-3610A/CM-3700A) under the folder where SpectraMagic NX2 has been installed.
- For the CM-2600d series and CR-400 series, use the driver included with the USB-Serial Converter Cable.

When the instrument operates on batteries

If you attempt communication with the instrument and the instrument's remaining battery power is low, SpectraMagic NX2 may suspend operation when waiting for the response from the instrument. In such a case, turn off the instrument. When a dialog box appears with a message "No response from instrument", click [OK]. Replace the batteries with new ones or connect the AC adapter, and then connect from SpectraMagic NX2 again.

When using a PC with power saving mode, standby settings, or similar

If the PC enters power saving mode when connected to the instrument, it may sometimes not be able to communicate after recovering. In the event that this occurs, first disconnect the instrument from SpectraMagic NX2, disconnect and reconnect the cable if used, and connect from SpectraMagic NX2 again.

2.4.4 Disconnecting an instrument

1. Click the **Disconnect** button in the toolbar or select *Instrument - Disconnect*. SpectraMagic NX2 will disconnect from the instrument. The Instrument Window will close and the **Disconnect** toolbar button will change to the **Connect** toolbar button.

2.5 Setting Measurement Condition Settings

- This procedure is available only when an instrument is connected and a document is open. If an instrument is connected and no document is open, the measurement conditions currently set on the instrument can be viewed by clicking ▼ next to Measurement Conditions in the Instrument Window.

1. Do one of the following:
- Click the Measurement Conditions button in the toolbar.
- Click "Measurement Conditions" or in the Instrument Window.
- Select *Instrument - Measurement Conditions ...*.

The Measurement Conditions Settings dialog will appear.
- If a target is selected in the Data List window, the Measurement Conditions and Measurement Options tabs with the settings for that target will be shown in the right side of the dialog. To set instrument measurement conditions to the measurement conditions of the target, click [Apply Measurement Conditions]
- Measurement Conditions can also be set in the Interval Measurement dialog. See *2.8.5 Interval Measurements Ⓟ on p. 143* .

2. Specify the settings for the instrument. Only those items that apply to the currently connected instrument are displayed.
- Click on the link at right for the settings for each instrument.
- 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.

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].

Return to *Quick Start Guide: Setting Measurement Condition Settings on p. QS-4* .

CM-3700A Plus/CM-3700A-U Plus	*(97)*
CM-3700A / CM-3700A-U	*(98)*
CM-36dG / CM-36dGV	*(99)*
CM-36d	*(100)*
CM-5 / CR-5	*(101)*
CM-3600A / CM-3610A	*(102)*
CM-26dG / CM-26d	*(103)*
CM-25d / CM-23d	*(103)*
CM-25cG	*(104)*
CM-17d / CM-16d	*(104)*
CM-M6	*(104)*
CF-300	*(105)*
CM-700d / CM-600d / CM-700d-U	*(105)*
CR-400 / CR-410 / DP-400	*(105)*
CM-2600d	*(106)*
CM-2500d	*(106)*
CM-2500c	*(107)*
CM-512m3A	*(107)*
Measurement Options	*(108)*

2.5.1 Meas. Conditions Reg. & Apply

Sets of measurement conditions can be registered as Condition 1 through Condition 5.
The registered Condition will include the instrument model and the settings in the Measurement conditions and Measurement Option tabs under Measurement Condition in the middle of the Measurement Condition dialog.
The contents of each condition can be viewed by hovering the cursor over the Condition name.

To register the currently set instrument and measurement conditions, click [Regist].

To apply a previously registered Condition, click on the Condition to apply so that the radio button next to it is selected, and click [Apply].
- Only Conditions registered for the currently connected instrument can be applied. If a Condition for a different instrument is selected, an error message will appear when [Apply] is clicked.

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

Measurement Mode	***Reflectance***; ***Transmittance***; ***Opacity***; ***Haze***
	• When ***Transmittance*** or ***Haze*** is selected, Measurement Area will be automatically set to ***Approx. 20mm*** and cannot be changed. • ***Transmittance*** and ***Haze*** are not available on CM-3700A-U Plus.
Select Meas. Area Auto.	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.
Meas. Area	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 Measurement Area setting.
Specular Component	(Disabled when Measurement Type is set to ***Transmittance*** or ***Haze***) ***SCI***; ***SCE***; ***SCI + SCE***
UV Setting	(Disabled when Measurement Type is set to ***Transmittance*** or ***Haze***) ***100% Full*** ***UV Adjust*** (UV cut filter position is adjusted for measurements including the effects of UV on fluorescent materials in samples.)
UV Light Intensity	(Disabled when UV Setting 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)
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.

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-3700A / CM-3700A-U

Measurement Mode — ***Reflectance***; ***Transmittance***; ***Opacity***; ***Haze***

- When ***Transmittance*** or ***Haze*** is selected, Measurement Area will be automatically set to ***Approx. 20mm*** and cannot be changed.
- ***Transmittance*** and ***Haze*** are not available on CM-3700A-U.

Specular Component — (Disabled when Measurement Type is set to ***Transmittance*** or ***Haze***)
SCI; ***SCE***

Measurement Area — CM-3700A-U ***USAV (1*3mm)*** (Unchangeable)
CM-3700A ***SAV (3*5mm)***; ***MAV (8mm)***; ***LAV (25.4mm)***

- Target mask attached to instrument should match or be larger than Measurement Area setting.

UV Setting — (Disabled when Measurement Type is set to ***Transmittance*** or ***Haze***)
100% Full
UV Adjust (UV cut filter position is adjusted for measurements including the effects of UV on fluorescent materials in samples.)

UV Light Intensity — (Disabled when UV Setting 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)

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-36dG / CM-36dGV

Measurement Mode	***Color & Gloss***; ***Color only***; ***Opacity***; ***Haze*** • When ***Color & Gloss*** or ***Opacity*** is set, Measurement Type will be automatically set to ***Reflectance*** and cannot be changed. • When ***Haze*** is set, Measurement Type will be automatically set to ***Transmittance*** and cannot be changed.
Measurement Type	***Reflectance***; ***Transmittance*** • When ***Transmittance*** is set, Measurement Area will be automatically set to ***17 mm*** and cannot be changed.
Select Meas. Area Auto.	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)***; ***LMAV (16mm)***; ***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	(Disabled when Measurement Type is set to ***Transmittance***.) ***SCI***; ***SCE***; ***SCI + SCE***
UV Condition	(Disabled when Measurement Type is set to ***Transmittance***.) 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 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. When Specular Component is set to ***SCI*** *or* ***SCE***, measurements for multiple above settings can be calculated simultaneously (not available when Specular Component is set to ***SCI + SCE***): ***100% Full + 400nm Cut Normal***, ***100% Full + 400nm Cut Low***, ***100% Full + 420nm Cut Normal***, ***100% Full+ 420nm Cut Low***, ***100% Full + 400nm Cut Normal + 400nm Adjust Normal***, ***100% Full + 400nm Cut Low + 400nm Adjust Low***, ***100% Full + 420nm Cut Normal + 420nm Adjust Normal***, ***100% Full + 420nm Cut Low + 420nm Adjust Low***
UV Cut	(Disabled when Measurement Type is set to ***Transmittance*** or 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.
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.

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-36d

Measurement Mode	***Color only***; ***Opacity***
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.

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-5 / CR-5

Measurement Type	***Reflectance***; ***Transmittance***; ***Petri Dish***; ***Liquid***; ***Opacity***; ***Haze***; ***Opacity (Petri Dish)***; ***Haze (Liquid)***
	• When ***Transmittance***, ***Liquid***, ***Haze***, or ***Haze (Liquid)*** is selected, Measurement Area will be automatically set to ***20mm*** and cannot be changed. • When ***Petri Dish*** or ***Opacity (Petri Dish)*** is selected, Specular Component will be automatically set to ***SCE*** and cannot be changed.
Get transmittance index	When checked, enables values for transmittance indexes (such as Iodine Color Value) calculated by the instrument to be read by SpectraMagic NX2.
Specular Component	(Disabled when Measurement Type is set to ***Transmittance***, ***Petri Dish***, ***Liquid***, ***Haze***, ***Opacity (Petri Dish)***, or ***Haze (Liquid)***) ***SCI***; ***SCE***; ***SCI + SCE***
Measurement Area	***SAV (3mm)***; ***MAV (8mm)***; ***LAV (30mm)***
	• Target mask attached to instrument should match or be larger than Measurement Area setting. • ***MAV (8mm)*** not available when Measurement Type is set to ***Petri Dish*** or ***Opacity (Petri Dish)***.

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-3600A / CM-3610A

Measurement Type — ***Reflectance***; ***Transmittance***; ***Opacity***; ***Haze***

- When ***Transmittance*** or ***Haze*** is selected, Measurement Area will be automatically set to ***Approx. 17mm*** and cannot be changed.

Specular Component — (Disabled when Measurement Type is set to ***Transmittance*** or ***Haze***)
SCI; ***SCE***; ***SCI + SCE***

- SCI + SCE not available when Measurement Mode is set to ***Opacity***.

Measurement Area — ***LAV (25.4mm)***; ***MAV (8mm)***; ***SAV (4mm)***

- Target mask attached to instrument should match or be larger than Measurement Area setting.

UV Condition — (Disabled when Measurement Type is set to ***Transmittance*** or ***Haze***.)
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, ***420nm Cut***: 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, ***420nm Adjust***: 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.

When Specular Component is set to ***SCI*** *or* ***SCE***, measurements for multiple above settings can be calculated simultaneously (not available when Specular Component is set to ***SCI + SCE***):

100% Full + 400nm Cut, ***100% Full + 420nm Cut***, ***100% Full + 400nm Cut + 400nm Adjust***, ***100% Full + 400nm Cut Low + 400nm Adjust Low***, ***100% Full + 420nm Cut + 420nm Adjust***, ***100% Full + 420nm Cut Low + 420nm Adjust Low***

UV Cut — (Disabled when Measurement Type is set to ***Transmittance*** or ***Haze***, or 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.

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-26dG / CM-26d

Measurement Mode — ***Color only***; ***Color & Gloss***; ***Opacity***
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 below 400nm excluded.
400nm Adjust: Measurements are calculated with effects of illumination 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.

When Specular Component is set to ***SCI*** *or* ***SCE***, measurements for multiple above settings can be calculated simultaneously (not available when Specular Component is set to ***SCI + SCE***):

100% Full + 400nm Cut
100% Full + 400nm Cut + 400nm Adjust

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.

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-25d / CM-23d

Measurement Mode — ***Color only***; ***Opacity***

Specular Component — ***SCI***; ***SCE***; ***SCI + SCE***

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-25cG

Measurement Mode — ***Color & Gloss***; ***Color only***

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.

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-17d / CM-16d

Measurement Mode — ***Color***; ***Opacity***

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***

- ***SCI + SCE*** not available when Measurement Type is set to ***Opacity***.

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.

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-M6

Direction — ***Left***; ***Left + Right***; ***Double Path***

- Performance when Direction is set to ***Left*** or ***Left + Right*** may be lower than when Direction is set to ***Double Path***. Measurements performed when Direction is set to ***Left*** or ***Left + Right*** should be performed only on flat surfaces and care should be taken to ensure that the instrument is exactly perpendicular to the surface.

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CR-400 / CR-410 / DP-400

- All instrument settings such as measurement area, etc. are unchangeable and are shown for information only.
- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CF-300

Measurement Method	***Non contact***; ***Contact***
Mask Detection	***AUTO***; ***MAV***; ***XUSAV***
Measurement Area	***MAV (8mm)***; ***XUSAV (0.75 × 1mm)***
Specular Component	***SCI***; ***SCE***; ***SCI + SCE***

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-700d / CM-600d / CM-700d-U

Measurement Type		***Reflectance***; ***Opacity***
Measurement Area	CM-700d	***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-600d	***MAV (8mm)*** (Unchangeable)
	CM-700d-U	***USAV (2.4mm)*** (Unchangeable)
Specular Component		***SCI***; ***SCE***; ***SCI + SCE***
		• ***SCI + SCE*** not available when Measurement Type is set to ***Opacity***.

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-2600d

Measurement Type — ***Reflectance***; ***Opacity***

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 below 400nm excluded.
400nm Adjust: Measurements are calculated with effects of illumination 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.

When Specular Component is set to ***SCI*** *or* ***SCE***, measurements for multiple above settings can be calculated simultaneously (not available when Specular Component is set to ***SCI + SCE***):

100% Full + 400nm Cut
100% Full + 400nm Cut + 400nm Adjust

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.

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-2500d

Measurement Type — ***Reflectance***; ***Opacity***

Specular Component — ***SCI***; ***SCE***; ***SCI + SCE***

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-2500c

Measurement Type ***Reflectance***; ***Opacity***

- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

CM-512m3A

- All instrument settings such as measurement area, etc. are unchangeable and are shown for information only.
- Go to *Measurement Options on p. 108* .
- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

Measurement Options

Auto average times	Sets how many measurements will be automatically taken and averaged when target or sample measurement is performed from SpectraMagic NX2. 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. ***SMC***: Manual averaging using Statistical Measurement Control will be performed and the measurement sequence will be automatically ended when the σΔE*ab value for the number of measurements set in Valid data required has been achieved.
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***
Threshold	(Shown only when Manual average method is set to ***SMC***.) Sets the threshold σΔE*ab value which must be achieved when performing manual averaging with Manual average method set to ***SMC***. Range: ***0.01*** to ***9.99***
Valid data required	(Shown only when Manual average method is set to ***SMC***.) Sets the number of valid data which must be taken within the Threshold value when performing manual averaging with Manual average method set to ***SMC***. Range: ***3*** to ***10***

- Auto averaging and manual averaging can be combined.

(Shown only when a CM-3700A Plus/CM-3700A-U Plus, CM-36dG series, CM-17d (USB/WLAN connection only), or CF-300 (with optional 1.3MP USB Camera Set CF-A32 installed) instrument is connected.)

Save viewfinder image with measurement	When checked, the viewfinder image at the time of measurement will be automatically saved with the measurement data.
Add a pointer image to the saved image	(Shown only when a CF-300 with optional 1.3MP USB Camera Set CF-A32 installed is connected) When checked, the saved viewfinder image will include the pointer image.
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.

- Return to *2.5 Setting Measurement Condition Settings on p. 96* .

2.6 Calibration

- This procedure is available only when the instrument is connected and the software license is valid (either electronically or by using a dongle is attached to the computer).

To ensure accurate measurement, calibration should be performed after turning the instrument on or after changing instrument settings. If the Instrument Window calibration icon is blinking or if a yellow exclamation mark is shown next to the target measurement, sample measurement, or measurement condition settings icons, calibration must be performed.

- If calibration was performed without using SpectraMagic NX2, such as when calibration of a portable instrument was performed from the instrument itself without being connected to SpectraMagic NX2, SpectraMagic NX2 may consider the instrument to be uncalibrated and may require calibration starting from zero calibration.
- Return to *Quick Start Guide: Performing Calibration on p. QS-5* .

■ About calibration times displayed in the Instrument Window

The calibration status information is retrieved from the instrument and the display in the Instrument Window is updated to reflect the change. If the instrument has been calibrated without using SpectraMagic NX2 software, the software might not be able to determine the time of the calibration performed by the instrument itself. Consequently, the Instrument Window displays the times of the last calibrations performed with the SpectraMagic NX2 software.

2.6.1 For reflectance or opacity measurements

For reflectance or opacity measurements, zero calibration and white calibration will be performed. If the selected measurement conditions include gloss, gloss calibration will also be performed.

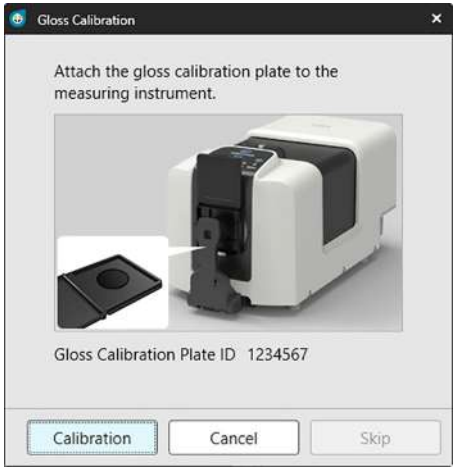
- If user calibration will be performed, set the user calibration data in the instrument and set "Use User Calibration" in the User Calibration dialog to On before starting this procedure. See *2.6.3 User Calibration Ⓟ on p. 114* for more information on user calibration.
- When using a CM-5/CR-5 with an external white calibration plate instead of the internal white calibration plate, user calibration should be performed with the white calibration data for the external white calibration plate set as the user calibration data. See *2.6.3 User Calibration Ⓟ on p. 114* for more information on user calibration.

1. Click the Calibration button in the toolbar, click Calibration or in the Instrument Window, or select *Instrument - Calibration* in the Instrument menu. 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.
- Using the Zero Calibration Box (standard accessory for some instruments, optional accessory for others; check instrument instruction manual for details) allows more reliable zero calibration unaffected by the surrounding environment.
- If the connected instrument is a CR-400/CR-410, there is no zero calibration. Proceed with step 2.

2. The White Calibration dialog will appear.
Follow the instructions in the dialog and click [Calibration] to perform white calibration.
- If "Use User Calibration" in the User Calibration dialog is set to On, the User Calibration dialog will be shown instead of the White Calibration dialog. Follow the instructions in the dialog and click [Calibration] to perform user calibration. See *2.6.3 User Calibration Ⓟ on p. 114* for more information on user 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.



2.6.2 For transmittance or haze measurements

For transmittance or haze measurements, 0% calibration and 100% calibration will be performed. For transmittance measurements of solids, 100% calibration is performed to air (with nothing in the instrument's transmittance chamber). For transmittance measurements of liquids, 100% calibration is performed to water (with a cell containing distilled water in the instrument's transmittance chamber).

- When performing transmittance measurements, the white calibration plate must always be placed over the target mask port for both calibration and measurements.
- When performing haze measurements, the white calibration plate must always be placed over the target mask port for calibration; for measurements, follow the instructions in the dialogs that will be shown during measurements.
- If user calibration will be performed, set the user calibration data in the instrument and set "Use User Calibration" in the User Calibration dialog to On before starting this procedure. See p. 114 for more information on user calibration.

1. Click the Calibration button in the toolbar, 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 100% Calibration dialog will appear.

- If "Use User Calibration" in the User Calibration dialog is set to On, the User Calibration dialog will be shown instead of the 100% Calibration dialog. Follow the instructions in the dialog and click [Calibration] to perform user calibration. See *2.6.3 User Calibration Ⓟ on p. 114* for more information on user calibration.

For 100% calibration to air (transmittance measurements of solids):
Make sure that there is nothing in the instrument's transmittance chamber.

For 100% calibration to water (transmittance measurements of liquids):
Use a cell with parallel sides and having the same optical path length (distance between the sides) as the cell which will be used to hold samples for measurements. Pour distilled (or pure) water into the selected cell and place the cell in position inside the transmittance chamber.

- The depth of the water in the cell must be higher than the top of the illumination window (window on integrating sphere side of transmittance chamber).

Click [Calibration]. 100% calibration will be performed.

2.6.3 User Calibration Ⓟ

- This function is supported by SpectraMagic NX2 Professional Edition only.
- This procedure is available only when the instrument is connected and the software license is valid (either electronically or by using a dongle is attached to the computer).
- This function cannot be used when the connected instrument is a CM-23d.

User calibration can be performed when using a reference standard other than the white calibration plate supplied by Konica Minolta, or when using a CM-5 and calibrating to an external white plate.
To perform user calibration, it is necessary to input the calibration data for the reference standard plate to be used as the user calibration plate and to enable user calibration in the User Calibration Settings dialog.

1. Select *Instrument - Calibration Settings - User Calibration ...* .
The User Calibration Setting dialog will appear, showing the user calibration data currently stored in the instrument.

2. To enable user calibration, click the slide switch next to Use User Calibration to set it to On.
- Settings are enabled only when Use User Calibration is set to On.

3. If the User Calibration Plate ID text box is enabled, input the User Calibration Plate ID. Up to 8 characters can be input. This ID will be shown in the User Calibration dialog during the calibration process.

4. Select the instrument settings (measurement mode, specular component setting, and measurement area) for which calibration data will be written. The instrument settings available depend on the instrument.

5. Input the user calibration data for each wavelength and instrument setting combination.
- To read user calibration data from a previously saved *.ucds, *.ucm or *.ucs (user calibration data) file, click [Read from File] to open the Open dialog, browse to the file to read, and click [Open] to read the user calibration data from the file into the dialog.
- To save user calibration data to a file, click [Write to File] to open the Save As dialog, browse to where you want to save the calibration data file, input a file name, and click [Save]. The user calibration data set in the User Calibration Setting dialog for all instrument setting combinations will be saved to the file.

6. After all user calibration data and settings have been set, click [Write to the Instrument] to write user calibration for the checked settings to the instrument.
- A confirmation dialog asking whether to overwrite existing user calibration data in the instrument will appear. Click [Yes] to write the changes to the instrument.
- To close the confirmation dialog without writing the data, click [No]. The confirmation dialog will close and the program will return to the User Calibration Setting dialog.
- If there are no user calibration data in the instrument for settings other than those selected, a confirmation dialog asking whether to write default user calibration data for those settings to the instrument will appear. User calibration data must exist in the instrument for all settings to be able to use user calibration.

7. Click [OK] to close the dialog.
- If data or settings were changed and those changes were not written to the instrument, a confirmation dialog asking whether to close the dialog without writing the data will appear. Click [Yes] to close the dialog without writing the data or [No] to return to the dialog and write the changes to the instrument according to step 6.
- To close the User Calibration Setting dialog without writing the changes to the instrument, click [Cancel]. A confirmation dialog will appear. Click [Yes] to close the User Calibration Setting dialog or [No] to close the confirmation dialog and return to the User Calibration Setting dialog.

2.6.4 UV Adjustment Ⓟ

- This procedure is available only when a CM-3700A Plus/CM-3700A-U Plus, CM-3700A/CM-3700A-U, CM-36dG/CM-36dGV, CM-3600A/CM-3610A, CM-26dG/CM-26d, or CM-2600d is connected and the software license is valid (either electronically or by using a dongle is attached to the computer).
- This function is supported by SpectraMagic NX2 Professional Edition only.

UV adjustment is used to obtain more accurate measurements when measuring subjects such as paper that include fluorescent materials or optical brightening agents (OBA). Such materials appear brighter when viewed under light sources such as normal daylight that include UV because they absorb energy in the UV region and re-emit it in the visible region.

- UV adjustment adjusts how much UV energy affects measurement values, which depends on the specific fluorescent material or OBA in the measurement subject. For this reason, fluorescent standards used for UV adjustment should be selected to closely match the measurement subject.

1. Select *Instrument - Calibration Settings - UV Adjustment ...* .
The UV Adjustment dialog will appear, showing the screen for selecting the UV adjustment method.

Refer to the page for the method to be used.

UV Adjustment to New Standard (Registering a new fluorescent standard) (See p. 116.)	UV Adjustment to Registered Standard (See p. 119.)	Write Adjustment Results to Instrument (See p. 121.)
The standard values for a new fluorescent standard are set and UV adjustment is performed by measurement of the standard.	The standard values for a fluorescent standard which was previously registered in the database or stored in an exported file are read and used for performing UV adjustment by measurement of the standard.	The results of a previously performed UV adjustment are read from a UV results file and written to the instrument to complete UV adjustment without performing new measurements.

2.6.4.1 UV Adjustment to New Standard (Registering a new fluorescent standard)

A new fluorescent standard must be registered by performing UV Adjustment to New Standard. The standard values will be stored in the database only after UV adjustment has been successfully completed.

1. Click [UV Adjustment to New Standard]. The screen for setting UV Adjustment Conditions will be shown.

2. Select the UV Adjustment Conditions to be used.
- Available settings depend on the instrument.

UV Adjustment Mode	Profile	Adjustment to spectral profile.
	WI	Adjustment to CIE Whiteness Index. 10° Observer, Standard Illuminant D65
	Tint	Adjustment to CIE Tint. 10° Observer, Standard Illuminant D65
	WI & Tint	Adjustment to CIE Whiteness Index and Tint. 10° Observer, Standard Illuminant D65
	ISO Brightness	Adjustment to ISO Brightness according to ISO 2470.
	Ganz & Griesser 4	Adjustment to Ganz & Griesser WI & Tint using 4 samples. 10° Observer, Standard Illuminant D65
	Ganz & Griesser 5	Adjustment to Ganz & Griesser WI & Tint using 5 samples. 10° Observer, Standard Illuminant D65
Specular Component	SCI, SCE, SCI + SCE	
Measurement Area	SAV, MAV, LMAV, LAV • Be sure to set the appropriate target mask for the selected measurement area on the instrument.	
UV Condition	400nm Cut Normal, 400nm Cut Low, 420nm Cut Normal, 420nm Cut Low "Normal": The xenon lamp will be flashed at normal intensity. "Low": The xenon lamp will be flashed at low intensity to suppress triplet effect.	

3. Click [Next]. The screen for setting the calibration values for the fluorescent standard will be shown.
- If the instrument has not been calibrated at the selected Specular Component, Measurement Area and UV Condition settings, the procedure for zero calibration and then white calibration will be performed before the screen for setting the standard values is shown. If zero calibration and white calibration are canceled, UV adjustment will also be canceled.

Continue with step 4 on the page corresponding to the selected UV Adjustment Mode.
Profile, ***WI***, ***Tint***, ***WI + Tint***, or ***ISO Brightness***: See p. 117
Ganz & Griesser 4 or ***Ganz & Griesser 5***: See p. 118

UV Adjustment Mode: Profile, WI, Tint, WI + Tint, or ISO Brightness

4. If desired, input Fluorescent Standard Information.

Name	Any desired name to identify the fluorescent standard can be input.
Calibration Date	The date on which the fluorescent standard was calibrated to determine its standard values.
Expiration Date	The date on which the fluorescent standard calibration expires and recalibration of the fluorescent standard is required.
Comment	Other information about the standard that you want to include.

5. Input the calibration values and tolerances for the fluorescent standard.
- If Specular Component was set to SCI + SCE, calibration values and tolerances must be set for both SCI and SCE. Switching between SCI and SCE can be performed by clicking on the corresponding tab.

6. To export the calibration data to a file (*.flstd) when UV adjustment is completed, check "Export Standard data".
To export the results data to a file (*.krdx) when UV adjustment is completed, check "Export Results data".

7. Position the fluorescent standard for measurement and click [UV Adjustment]. The measurements for UV adjustment will be taken, UV adjustment will be performed, and the results will be written to the instrument.

8. A message box with "UV Adjustment has been completed!" will be shown. Click [OK] to close the message box.

UV Adjustment Mode: Ganz & Griesser 4 or Ganz & Griesser 5

4. If desired, input Fluorescent Standard Information.

Name	Any desired name to identify the fluorescent standard can be input.
Calibration Date	The date on which the fluorescent standard was calibrated to determine its standard values.
Expiration Date	The date on which the fluorescent standard calibration expires and recalibration of the fluorescent standard is required.
Comment	Other information about the standard that you want to include.

5. Input the WI and Tint values for the Ganz & Griesser fluorescent standard #1.
- If Specular Component was set to SCI + SCE, WI and Tint values must be set for both SCI and SCE.

6. Position the Ganz & Griesser fluorescent standard #1 for measurement and click [Measurement]. When the measurement has been completed, the software will automatically switch to the next tab.

7. Repeat steps 5 and 6 for the remaining Ganz & Griesser fluorescent standards.
- To repeat the measurement of a previous standard, click [Back] or click directly on the desired tab.
- When all necessary Ganz & Griesser fluorescent standards have been measured, the [UV Adjustment] button will be enabled.

8. To export the calibration data to a file (*.flstd) when UV adjustment is completed, check “Export Standard data”.
To export the results data to a file (*.krdx) when UV adjustment is completed, check “Export Results data”.

9. Click [UV Adjustment]. UV adjustment will be performed and the results will be written to the instrument.

10. A message box with “UV Adjustment has been completed!” will be shown. Click [OK] to close the message box.

2.6.4.2 UV Adjustment to Registered Standard

UV adjustment to a fluorescent standard whose values were previously registered in the database or stored in a file can be performed.

- UV adjustment will be performed at the UV Adjustment Conditions and to the standard values and tolerances registered or stored when the fluorescent standard was first registered in the database. It is not possible to change these settings or values.

1. Click [UV Adjustment to Registered Standard]. The screen for selecting the method for importing data will be shown.

2. Importing from Database

2-1 Click [Import data from database]. The screen for selecting the fluorescent standard data from the database will be shown.

2-2 Select the standard to be used.

- If the expiration date for the standard has passed, the row for that standard will be highlighted in pink.
- To filter the list and show only standards meeting filter criteria, click [Set data filter] to show the Data Filter Settings dialog, set the desired data filter settings, and click [Apply].
- To clear an applied filter, click Clear data filter.

2-3 Click [Next].

- If the instrument has not been calibrated at the Specular Component, Measurement Area and UV Condition settings for the selected standard, the procedure for zero calibration and then white calibration will be performed. If zero calibration and white calibration are canceled, UV adjustment will also be canceled.

Importing from Output File

2-1 Click [Import data from output file]. The Open dialog will be shown.

2-2 Browse to the folder containing the UV standard file (*.flstd, *.pri, *.pre) to be used.

- "*.flstd" files are files exported by this software.
- "*.pri" and "*.pre" are files exported by SpectraMagic NX.

2-3 Select the desired file, click [Open], and continue with step 3 according to the UV Adjust Mode of the selected standard.

- If the instrument has not been calibrated at the Specular Component, Measurement Area and UV Condition settings for the standard in the selected file, the procedure for zero calibration and then white calibration will be performed. If zero calibration and white calibration are canceled, UV adjustment will also be canceled.

3. Continue with step 4 according to the UV Adjust Mode of the selected standard
Profile, ***WI***, ***Tint***, ***WI + Tint***, or ***ISO Brightness***: See p. 120.
Ganz & Griesser 4 or ***Ganz & Griesser 5***: See p. 120.

■ UV Adjust Mode: Profile, WI, Tint, WI + Tint, or ISO Brightness

4. The UV Adjustment Condition and Fluorescent Standard Information for the selected standard will be shown.
- To see the calibration data, click Show Calibration Data.

5. To export the standard data to a file (*.flstd) when UV adjustment is completed, check Export Standard data.
To export the results data to a file (*.krdx) when UV adjustment is completed, check Export Results data.

6. Position the fluorescent standard for measurement and click UV Adjustment. The measurements for UV adjustment will be taken, UV adjustment will be performed, and the results will be written to the instrument.

7. A message box with "UV Adjustment has been completed!" will be shown. Click [OK] to close the message box.

■ UV Adjust Mode: Ganz & Griesser 4 or Ganz & Griesser 5

4. The UV Adjustment Condition and Fluorescent Standard Information for the selected standard will be shown, and the tab for Ganz & Griesser fluorescent standard #1 showing its calibration values will be shown.

5. Position the Ganz & Griesser fluorescent standard #1 for measurement and click Measurement. When the measurement has been completed, the software will automatically switch to the next tab.

6. Repeat steps 5 and 6 for the remaining Ganz & Griesser fluorescent standards.
- To repeat the measurement of a previous standard, click Back or click directly on the desired tab.
- When all necessary Ganz & Griesser fluorescent standards have been measured, the UV Adjustment button will be enabled.

7. To export the standard data to a file (*.flstd) when UV adjustment is completed, check Export Standard data.
To export the results data to a file (*.krdx) when UV adjustment is completed, check Export Results data.

8. Click UV Adjustment. UV adjustment will be performed and the results will be written to the instrument.

9. A message box with "UV Adjustment has been completed!" will be shown. Click [OK] to close the message box.

2.6.4.3 Write Saved Adjustment Results to Instrument

The results of a previously performed UV adjustment can be written to the instrument. This allows UV calibration of the instrument to be completed without having to take new measurements of the fluorescent standard.

- It is recommended that only adjustment results file created with the same instrument unit be written to the instrument.

1. Click [Write Adjustment Results to Instrument].
2. Click [Import data from output file]. The Open dialog will be shown.
3. Browse to the folder containing the UV adjustment results file (*.krdx, *.krd) to be used.
   - "*.krdx" files are files exported by this software.
   - "*.krd" files are files exported by SpectraMagic NX.
4. Select the desired file and click [Open]. The file will be imported and a confirmation dialog will appear.
5. Click [Write]. The UV adjustment results will be read from the file and written to the instrument.

2.6.5 Calibration Option Setting

The Calibration Option Setting enables/disables periodic notification that calibration should be performed again and sets the interval period for that notification.

1. Select *Instrument - Calibration Settings - Calibration Option Setting ...* from the popout menu that appears.
   The Calibration Option Setting dialog will appear.
2. To enable calibration notification, click on the slide button to set it to On. The value of "Interval to the next calibration notification" will be enabled.
   - To disable calibration notification, click on the slide button to set it to Off.
   - For CM-36d series instruments, periodic notification is set to always on in the instrument and the On/Off slide button is not shown.
3. Set the "Interval to the next calibration notification" value by either inputting the value directly or by using the up/down arrows.
4. Click [OK] to confirm the settings and close the dialog.
   - To close the dialog without changing settings, click [Cancel] instead of [OK].

2.6.6 Calibration Data

Calibration Data shows the calibration data currently set on the instrument. Calibration data can be read from a file (such as the files included when a new white calibration plate has been purchased), written to a file, or written to the instrument.

- It is not possible to directly edit white calibration data in this dialog.

1. Select *Instrument - Calibration Settings - Calibration Data ...* from the popout menu that appears.
The Calibration Data dialog will appear.

2. Select the type of calibration data to show by clicking on the current Measurement Mode and selecting the desired type from the drop-down list that appears.

3. Select the measurement condition to show data for by clicking on the tab for that condition.

4. Writing calibration data to the instrument

- Be careful when writing calibration data to the instrument. The following procedure will overwrite all calibration data for the selected Measurement Mode. Check that the calibration data on every tab in this dialog is correct before proceeding.

4-1 Click [Write to the instrument]. A confirmation dialog will appear.

4-2 Click [Yes] to write the calibration data to the instrument.

- To cancel writing data, click [No].

Reading calibration data from file

4-1 Click [Read from File]. The Open dialog will appear.

4-2 Browse to the folder containing the calibration data files to read and select the desired calibration data file.

- Even though only files with the file extension corresponding to the currently selected tab (for example, *.cwl if LAV:SCI or LAV:SCE tab is selected) will be shown in the Open dialog, the calibration data for all measurement conditions for the Measurement Mode selected in step 2 above will be read into the dialog when the following step is performed.

4-3 Click [Open]. The calibration data will be read into the dialog.

Writing calibration data to file

4-1 Click [Write to File]. The Save As dialog will appear.

4-2 Browse to the folder to save data to and input the desired file name.

4-3 Click [Save]. The calibration data for all measurement conditions for the Measurement Mode selected in step 2 above will be saved to files.

- One file will be saved for each measurement area. For example, for the CM-36dG, 4 files will be saved: *.cwl for LAV, *.cwlm for LMAV, *.cwm for MAV, and *.cws for SAV.

2.7 Preparing for Measurement

2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.)

The items which will be shown in the Data List Window can be selected and arranged in the desired order.

- Settings such as the number of digits, observer and illuminant settings, and other parameters to be used for an item will appear in the lower part of the dialog when the item is selected.
- Observer/illuminant settings will become settable when an item (such as a colorimetric value) for which such settings apply is selected.

1. Select *View - List Item Settings ...* . The List Item Settings dialog will open.

2. Select the item category from the list on the left side of the dialog.
- Items are arranged in categories according to their type and application. Since some items are used for more than one application, they may be listed in multiple categories. The items in each category are listed in tables on the following pages.
- You can also search for an item by inputting the item in the search box and clicking the magnifying glass icon.

3. Select the desired item from the Available Items list.
- Multiple items can be selected as follows:
  - To select multiple consecutive items, select the first item, hold the Shift key pressed, and select the last item. All items between the first and last item will be highlighted to indicate that they are selected.
  - To select multiple non-consecutive items, select an item and hold the Ctrl key pressed while selecting additional items. Each item will be highlighted to indicate that it is selected
  - To select all items shown in the list, press [Ctrl] + [A]. All items will be highlighted to indicate that they are selected.
- To switch between Absolute and Difference items, click on the corresponding tab.
- Items marked with Ⓟ are available only when using a Professional Edition license.
- It is not possible to add exactly the same item twice. However, if different observer/illuminant settings or parameter settings are used, the item is treated as a different item and can be added.
- For numerical items, the Digit tab will be shown in the lower part of the dialog. Use the up/down arrows to set the desired number of digits below the decimal point (0 to 8).
- For items with "*obs.*" and "*ill.*" in parenthesis after the item in the tables on the following pages, the Observation Conditions tab will be shown in the lower part of the dialog. Click on the corresponding setting and select the desired Observer or Illuminant from the list that appears. If a specific Observer or Illuminant is stated for an item in the tables below, it cannot be changed. If MI(DIN) is selected, Observer/Illuminant 1 and Observer Illuminant 2 can be set.
- For items with other parameters (such as *l*:c for CMC, *l*:c:*h* for ΔE*00, etc.), the Parameter tab will be shown in the lower part of the dialog. Use the up/down arrows to set the desired values for the parameters.
- For Signal Color Index 1 to 8, the [Modify] button in the Parameter tab will become enabled only after the Signal Color Index has been added to the Selected Items list.

4. After an item has been selected and the various settings for that item have been set as desired, click [Add] to add that item to the Selected Items list.
- To change the number of digits, observer and illuminant settings, or the parameters for items in the Selected Items list, select the item. The tabs for performing settings for that item will appear in the lower part of the dialog.
- It is not possible to change parameter settings (such as *l*:c for CMC, *l*:c:*h* for ΔE*00, etc.) for items in the Selected Items list. If the parameter settings need to be changed, click [Delete] to remove the item from the Selected Items list, and then select the item in Available Items, make the desired parameter settings, and click [Add] to add it to the Selected

Items list again.

- To change the order of items in the Selected Items list, which is the order in which items will be shown starting from the left in List View, use the buttons to the right of the Selected Items list.

Moves the selected item(s) to the top of the Selected Items list (left end of Data List Window)..

Moves the selected item(s) up 1 space in the Selected Items list (1 space to left in Data List Window).

Moves the selected item(s) down 1 space in the Selected Items list (1 space to right in Data List Window).

Moves the selected item(s) to the bottom of the Selected Items list (to right end of Data List Window).

- To delete items from the Selected Items list, select the item to delete and click [Delete].
- Multiple items can be selected as follows:
  - To select multiple consecutive items, select the first item, hold the Shift key pressed, and select the last item. All items between the first and last item will be highlighted to indicate that they are selected.
  - To select multiple non-consecutive items, select an item and hold the Ctrl key pressed while selecting additional items. Each item will be highlighted to indicate that it is selected
  - To select all items shown in the list, press the Ctrl and A keys. All items will be highlighted to indicate that they are selected.

5. After all items have been added as desired, click on [OK] to close the dialog. The Data List Window will be updated with the new settings.

- SpectraMagic NX2 software enhances calculation accuracy by performing internal calculations with numbers having more decimal places than those actually displayed. Consequently, the least significant digit displayed may differ from that of the instrument by one digit due to rounding or color space conversion.

Return to *2.11 Setting Default Settings on p. 166* .

■ Color Spaces & Equations

Absolute

X (*obs./ill.*) Ⓟ
Y (*obs./ill.*) Ⓟ
Z (*obs./ill.*) Ⓟ
L* (*obs./ill.*)
a* (*obs./ill.*)
b* (*obs./ill.*)
C* (*obs./ill.*)
h (*obs./ill.*)
L99 (*obs./ill.*)
a99 (*obs./ill.*)
b99 (*obs./ill.*)
C99 (*obs./ill.*)
h99 (*obs./ill.*)
L99o (*obs./ill.*)
a99o (*obs./ill.*)
b99o (*obs./ill.*)
C99o (*obs./ill.*)
h99o (*obs./ill.*)
x (*obs./ill.*) Ⓟ
y (*obs./ill.*) Ⓟ
u* (*obs./ill.*) Ⓟ
v* (*obs./ill.*) Ⓟ
u' (*obs./ill.*) Ⓟ
v' (*obs./ill.*) Ⓟ
L (Hunter) (*obs./ill.*)
a (Hunter) (*obs./ill.*)
b (Hunter) (*obs./ill.*)
Munsell Hue (JIS Z 8721 1964) (2°/C)
Munsell Value (JIS Z 8721 1964) (2°/C)
Munsell Chroma (JIS Z 8721 1964) (2°/C)
Munsell Hue (JIS Z 8721 1964) (2°/D65)
Munsell Value (JIS Z 8721 1964) (2°/D65)
Munsell Chroma (JIS Z 8721 1964) (2°/D65)

Difference

ΔX (*obs./ill.*) Ⓟ		CMC (*obs./ill.*) (*l*:*c*)
ΔY (*obs./ill.*) Ⓟ		ΔL-CMC (*obs./ill.*) (*l*:*c*)
ΔZ (*obs./ill.*) Ⓟ		ΔC-CMC (*obs./ill.*) (*l*:*c*)
ΔL* (*obs./ill.*)		ΔH-CMC (*obs./ill.*) (*l*:*c*)
Δa* (*obs./ill.*)		ΔE*94 (*obs./ill.*) (*l*:*c*:*h*)
Δb* (*obs./ill.*)		ΔL- ΔE*94 (*obs./ill.*) (*l*:*c*:*h*)
ΔC* (*obs./ill.*)		ΔC- ΔE*94 (*obs./ill.*) (*l*:*c*:*h*)
ΔH* (*obs./ill.*)		ΔH-ΔE*94 (*obs./ill.*) (*l*:*c*:*h*)
ΔL (Hunter) (*obs./ill.*)		ΔE*94 (special) (*obs./ill.*) (*l*:*c*:*h*) Ⓟ
Δa (Hunter) (*obs./ill.*)		ΔL- ΔE*94 (special) (*obs./ill.*) (*l*:*c*:*h*) Ⓟ
Δb (Hunter) (*obs./ill.*)		ΔC- ΔE*94 (special) (*obs./ill.*) (*l*:*c*:*h*) Ⓟ
ΔL99 (*obs./ill.*)		ΔH-ΔE*94 (special) (*obs./ill.*) (*l*:*c*:*h*) Ⓟ
Δa99 (*obs./ill.*)		ΔE00 (CIE2000) (*obs./ill.*) (*l*:*c*:*h*)
Δb99 (*obs./ill.*)		ΔL- ΔE00 (*obs./ill.*) (*l*:*c*:*h*)
ΔC99 (*obs./ill.*)		ΔC- ΔE00 (*obs./ill.*) (*l*:*c*:*h*)
Δh99 (*obs./ill.*)		ΔH-ΔE00 (*obs./ill.*) (*l*:*c*:*h*)
ΔL99o (*obs./ill.*)		ΔEab (Hunter) (*obs./ill.*)
Δa99o (*obs./ill.*)		ΔE99 (*obs./ill.*)
Δb99o (*obs./ill.*)		ΔE99o (*obs./ill.*)
ΔC99o (*obs./ill.*)		FMC2 (*obs./ill.*) Ⓟ
Δh99o (*obs./ill.*)		ΔL (FMC2) (*obs./ill.*) Ⓟ
Δx (*obs./ill.*) Ⓟ		ΔCr-g (FMC2) (*obs./ill.*) Ⓟ
Δy(*obs./ill.*) Ⓟ		ΔCy-b (FMC2) (*obs./ill.*) Ⓟ
Δu* (*obs./ill.*) Ⓟ		NBS100 (*obs./ill.*) Ⓟ
Δv*(*obs./ill.*) Ⓟ		NBS200 (*obs./ill.*) Ⓟ
Δu'(*obs./ill.*) Ⓟ		ΔEc (deg.) (*obs./ill.*) Ⓟ
Δv' (*obs./ill.*) Ⓟ		ΔEp (deg.) (*obs./ill.*) Ⓟ
Lightness (*obs./ill.*)	[*1]	ΔEc (Audi2000) (*obs./ill.*) Ⓟ
Saturation (*obs./ill.*)	[*1]	ΔEp (Audi2000) (*obs./ill.*) Ⓟ
Hue (*obs./ill.*)	[*1]	ΔEcMax (Audi2000) (*obs./ill.*) Ⓟ
a* Evaluation (*obs./ill.*)	[*1]	ΔEpMax (Audi2000) (*obs./ill.*) Ⓟ
b* Evaluation (*obs./ill.*)	[*1]	mΔEc (Audi2000) (*obs./ill.*) Ⓟ
ΔE*ab (*obs./ill.*)		mΔEp (Audi2000) (*obs./ill.*) Ⓟ

■ Whiteness, Tint & Yellowness Ⓟ

Absolute	Difference
WI (CIE1982) (*obs.*/D65) Ⓟ	ΔWI (CIE1982) (*obs.*/D65) Ⓟ
WI (ASTM E313-73) (2°/C) Ⓟ	ΔWI (ASTM E313-73) (2°/C) Ⓟ
WI (Hunter) (2°/C) Ⓟ	ΔWI (Hunter) (2°/C) Ⓟ
WI (TAUBE) (2°/C) Ⓟ	ΔWI (TAUBE) (2°/C) Ⓟ
WI (STENSBY) (2°/C) Ⓟ	ΔWI (STENSBY) (2°/C) Ⓟ
WI (BERGER) (*obs.*/D65) Ⓟ	ΔWI (BERGER) (*obs.*/D65) Ⓟ
WI (ASTM E313-98) (*obs.*/C) Ⓟ	ΔWI (ASTM E313-98) (*obs.*/C) Ⓟ
WI (ASTM E313-98) (*obs.*/D50) Ⓟ	ΔWI (ASTM E313-98) (*obs.*/D50) Ⓟ
WI (ASTM E313-98) (*obs.*/D65) Ⓟ	ΔWI (ASTM E313-98) (*obs.*/D65) Ⓟ
WI (Ganz) (10°/D65) Ⓟ	ΔWI (Ganz) (10°/D65) Ⓟ
Tint (CIE) (*obs.*/D65) Ⓟ	ΔTint (CIE) (*obs.*/D65) Ⓟ
Tint (ASTM E313-98) (*obs.*/C) Ⓟ	ΔTint (ASTM E313-98) (*obs.*/C) Ⓟ
Tint (ASTM E313-98) (*obs.*/D50) Ⓟ	ΔTint (ASTM E313-98) (*obs.*/D50) Ⓟ
Tint (ASTM E313-98) (*obs.*/D65) Ⓟ	ΔTint (ASTM E313-98) (*obs.*/D65) Ⓟ
Tint (Ganz) (10°/D65) Ⓟ	ΔTint (Ganz) (10°/D65) Ⓟ
YI (ASTM D1925) (*obs.*/C) Ⓟ	ΔYI (ASTM D1925) (*obs.*/C) Ⓟ
YI (ASTM E313-73) (2°/C) Ⓟ	ΔYI (ASTM E313-73) (2°/C) Ⓟ
YI (ASTM E313-98) (*obs.*/C) Ⓟ	ΔYI (ASTM E313-98) (*obs.*/C) Ⓟ
YI (ASTM E313-98) (*obs.*/D65) Ⓟ	ΔYI (ASTM E313-98) (*obs.*/D65) Ⓟ
YI (DIN6167) (2°/C) Ⓟ	ΔYI (DIN6167) (2°/C) Ⓟ
YI (DIN6167) (*obs.*/D65) Ⓟ	ΔYI (DIN6167) (*obs.*/D65) Ⓟ
B (ASTM E313-73) (2°/C) Ⓟ	ΔB (ASTM E313-73) (2°/C) Ⓟ

■ Paint & Plastic

Absolute

FF (*obs./ill.*) Ⓟ	Blackness (My) (ISO 18314-3/DIN 55979) (*obs./ill.*) Ⓟ
WI (CIE1982) (*obs.*/D65) Ⓟ	
WI (ASTM E313-73) (2°/C) Ⓟ	Jetness (Mc) (ISO 18314-3) (*obs./ill.*) Ⓟ
WI (TAUBE) (2°/C) Ⓟ	Undertone (dM) (ISO 18314-3) (*obs./ill.*) Ⓟ
WI (ASTM E313-98) (*obs.*/C) Ⓟ	
WI (ASTM E313-98) (*obs.*/D50) Ⓟ	
WI (ASTM E313-98) (*obs.*/D65) Ⓟ	
Tint (CIE) (*obs.*/D65) Ⓟ	
Tint (ASTM E313-98) (*obs.*/C) Ⓟ	
Tint (ASTM E313-98) (*obs.*/D50) Ⓟ	
Tint (ASTM E313-98) (*obs.*/D65) Ⓟ	
YI (ASTM D1925) (*obs.*/C) Ⓟ	
YI (ASTM E313-73) (2°/C) Ⓟ	
YI (ASTM E313-98) (*obs.*/C) Ⓟ	
YI (ASTM E313-98) (*obs.*/D65) Ⓟ	
YI (DIN6167) (2°/C) Ⓟ	
YI (DIN6167) (*obs.*/D65) Ⓟ	
B (ASTM E313-73) (2°/C) Ⓟ	
Opacity (ISO 2471) (2°/C) [*2]	
Haze (ASTM D1003-97) (2°/A) Ⓟ [*2]	
Haze (ASTM D1003-97) (2°/C) Ⓟ [*2]	
Rx (2°/C) Ⓟ	
Rx (*obs.*/D65) Ⓟ	
Rx (*obs.*/A) Ⓟ	
Ry (2°/C) Ⓟ	
Ry (*obs.*/D65) Ⓟ	
Ry (*obs.*/A) Ⓟ	
Rz (2°/C) Ⓟ	
Rz (*obs.*/D65) Ⓟ	
Rz (*obs.*/A) Ⓟ	
Gardner [*3]	
Hazen/APHA [*3]	
Iodine Color Number [*3]	

Difference

ΔFF (*obs./ill.*) Ⓟ	ΔRz (2°/C) Ⓟ
ΔE99o (*obs./ill.*)	ΔRz (*obs.*/D65) Ⓟ
ΔEc (deg.) (*obs./ill.*) Ⓟ	ΔRz (*obs.*/A) Ⓟ
ΔEp (deg.) (*obs./ill.*) Ⓟ	K/S Strength (ΔE*) (2°/C) Ⓟ
ΔEc (Audi2000) (*obs./ill.*) Ⓟ	K/S Strength (ΔE*) (10°/D65) Ⓟ
ΔEp (Audi2000) (*obs./ill.*) Ⓟ	K/S Strength (MaxAbs) Ⓟ
ΔEcMax (Audi2000) (*obs./ill.*) Ⓟ	K/S Strength (Apparent) Ⓟ
ΔEpMax (Audi2000) (*obs./ill.*) Ⓟ	K/S Strength (User) (*wavelength*) Ⓟ
mΔEc (Audi2000) (*obs./ill.*) Ⓟ	K/S Strength (ΔL*) (2°/C) Ⓟ
mΔEp (Audi2000) (*obs./ill.*) Ⓟ	K/S Strength (ΔL*) (10°/D65) Ⓟ
ΔWI (CIE1982) (*obs.*/D65) Ⓟ	K/S Strength (ΔC*) (2°/C) Ⓟ
ΔWI (ASTM E313-73) (2°/C) Ⓟ	K/S Strength (ΔC*) (10°/D65) Ⓟ
ΔWI (TAUBE) (2°/C) Ⓟ	K/S Strength (ΔH*) (2°/C) Ⓟ
ΔWI (ASTM E313-98) (*obs.*/C) Ⓟ	K/S Strength (ΔH*) (10°/D65) Ⓟ
ΔWI (ASTM E313-98) (*obs.*/D50) Ⓟ	K/S Strength (Δa*) (2°/C) Ⓟ
ΔWI (ASTM E313-98) (*obs.*/D65) Ⓟ	K/S Strength (Δa*) (10°/D65) Ⓟ
ΔTint (CIE) (*obs.*/D65) Ⓟ	K/S Strength (Δb*) (2°/C) Ⓟ
ΔTint (ASTM E313-98) (*obs.*/C) Ⓟ	K/S Strength (Δb*) (10°/D65) Ⓟ
ΔTint (ASTM E313-98) (*obs.*/D50) Ⓟ	K/S Strength (MaxAbs) [nm] Ⓟ
ΔTint (ASTM E313-98) (*obs.*/D65) Ⓟ	ΔOpacity (ISO 2471) (2°/C) [*2]
ΔYI (ASTM D1925) (*obs.*/C) Ⓟ	ΔHaze (ASTM D1003-97) (2°/A) Ⓟ [*2]
ΔYI (ASTM E313-73) (2°/C) Ⓟ	ΔHaze (ASTM D1003-97) (2°/C) Ⓟ [*2]
ΔYI (ASTM E313-98) (*obs.*/C) Ⓟ	MI (DIN) (*obs.1/ill.1*) (*obs.2/ill.2*)
ΔYI (ASTM E313-98) (*obs.*/D65) Ⓟ	ΔBlackness (ΔMy) (ISO 18314-3/DIN 55979) (*obs./ill.*) Ⓟ
ΔYI (DIN6167) (2°/C) Ⓟ	
ΔYI (DIN6167) (*obs.*/D65) Ⓟ	ΔJetness Mc (ISO 18314-3) (*obs./ill.*) Ⓟ
ΔB (ASTM E313-73) (2°/C) Ⓟ	ΔUndertone dM (ISO 18314-3) (*obs./ill.*) Ⓟ
ΔRx (2°/C) Ⓟ	
ΔRx (*obs.*/D65) Ⓟ	
ΔRx (*obs.*/A) Ⓟ	
ΔRy (2°/C) Ⓟ	
ΔRy (*obs.*/D65) Ⓟ	
ΔRy (*obs.*/A) Ⓟ	

■ Paper & Print

Absolute

WI (CIE1982) (*obs.*/D65) Ⓟ	
WI (ASTM E313-73) (2°/C) Ⓟ	
WI (Hunter) (2°/C) Ⓟ	
WI (BERGER) (*obs.*/D65) Ⓟ	
WI (ASTM E313-98) (*obs.*/C) Ⓟ	
WI (ASTM E313-98) (*obs.*/D50) Ⓟ	
WI (ASTM E313-98) (*obs.*/D65) Ⓟ	
WI (Ganz) (10°/D65) Ⓟ	
Tint (CIE) (*obs.*/D65) Ⓟ	
Tint (ASTM E313-98) (*obs.*/C) Ⓟ	
Tint (ASTM E313-98) (*obs.*/D50) Ⓟ	
Tint (ASTM E313-98) (*obs.*/D65) Ⓟ	
Tint (Ganz) (10°/D65) Ⓟ	
B (ASTM E313-73) (2°/C) Ⓟ	
Brightness (TAPPI T452) Ⓟ	[*4]
Brightness (ISO 2470) Ⓟ	[*4]
Opacity (ISO 2471) (2°/C)	[*2]
Opacity (TAPPI T425 89%) (2°/A)	[*2]
Status A [B] Ⓟ	[*4]
Status A [G] Ⓟ	[*4]
Status A [R] Ⓟ	[*4]
Status T [B] Ⓟ	[*4]
Status T [G] Ⓟ	[*4]
Status T [R] Ⓟ	[*4]

Difference

ΔWI (CIE1982) (*obs.*/D65) Ⓟ	
ΔWI (ASTM E313-73) (2°/C) Ⓟ	
ΔWI (Hunter) (2°/C) Ⓟ	
ΔWI (BERGER) (*obs.*/D65) Ⓟ	
ΔWI (ASTM E313-98) (*obs.*/C) Ⓟ	
ΔWI (ASTM E313-98) (*obs.*/D50) Ⓟ	
ΔWI (ASTM E313-98) (*obs.*/D65) Ⓟ	
ΔWI (Ganz) (10°/D65) Ⓟ	
ΔTint (CIE) (*obs.*/D65) Ⓟ	
ΔTint (ASTM E313-98) (*obs.*/C) Ⓟ	
ΔTint (ASTM E313-98) (*obs.*/D50) Ⓟ	
ΔTint (ASTM E313-98) (*obs.*/D65) Ⓟ	
ΔTint (Ganz) (10°/D65) Ⓟ	
ΔB (ASTM E313-73) (2°/C) Ⓟ	
ΔBrightness (TAPPI T452) Ⓟ	[*4]
ΔBrightness (ISO 2470) Ⓟ	[*4]
ΔStatus A [B] Ⓟ	[*4]
ΔStatus A [G] Ⓟ	[*4]
ΔStatus A [R] Ⓟ	[*4]
ΔStatus T [B] Ⓟ	[*4]
ΔStatus T [G] Ⓟ	[*4]
ΔStatus T [R] Ⓟ	[*4]
ΔOpacity (ISO 2471) (2°/C)	[*2]
ΔOpacity (TAPPI T425 89%) (2°/A)	[*2]

■ Textile

Absolute

WI (CIE1982) (*obs.*/D65) Ⓟ
WI (ASTM E313-73) (2°/C) Ⓟ
WI (Hunter) (2°/C) Ⓟ
WI (STENSBY) (2°/C) Ⓟ
WI (BERGER) (*obs.*/D65) Ⓟ
WI (ASTM E313-98) (*obs.*/C) Ⓟ
WI (ASTM E313-98) (*obs.*/D50) Ⓟ
WI (ASTM E313-98) (*obs.*/D65) Ⓟ
WI (Ganz) (10°/D65) Ⓟ
Tint (CIE) (*obs.*/D65) Ⓟ
Tint (ASTM E313-98) (*obs.*/C) Ⓟ
Tint (ASTM E313-98) (*obs.*/D50) Ⓟ
Tint (ASTM E313-98) (*obs.*/D65) Ⓟ
Tint (Ganz) (10°/D65) Ⓟ
B (ASTM E313-73) (2°/C) Ⓟ
Standard Depth (ISO 105.A06) (10°/D65) Ⓟ
Signal Color Index 1 Ⓟ [*9]
Signal Color Index 2 Ⓟ [*9]
Signal Color Index 3 Ⓟ [*9]
Signal Color Index 4 Ⓟ [*9]
Signal Color Index 5 Ⓟ [*9]
Signal Color Index 6 Ⓟ [*9]
Signal Color Index 7 Ⓟ [*9]
Signal Color Index 8 Ⓟ [*9]

Difference

CMC (*obs./ill.*) (*l:c*)	Grey Scale Rating (ISO 105.A05) (2°/C) Ⓟ
ΔL-CMC (*obs./ill.*) (*l:c*)	Grey Scale Rating (ISO 105.A05) (10°/D65) Ⓟ
ΔC-CMC (*obs./ill.*) (*l:c*)	K/S Strength (ΔE*) (2°/C) Ⓟ
ΔH-CMC (*obs./ill.*) (*l:c*)	K/S Strength (ΔE*) (10°/D65) Ⓟ
NBS100 (*obs./ill.*) Ⓟ	K/S Strength (MaxAbs) Ⓟ
NBS200 (*obs./ill.*) Ⓟ	K/S Strength (Apparent) Ⓟ
ΔWI (CIE1982) (*obs.*/D65) Ⓟ	K/S Strength (User) (*wavelength*) Ⓟ
ΔWI (ASTM E313-73) (2°/C) Ⓟ	K/S Strength (ΔL*) (2°/C) Ⓟ
ΔWI (Hunter) (2°/C) Ⓟ	K/S Strength (ΔL*) (10°/D65) Ⓟ
ΔWI (STENSBY) (2°/C) Ⓟ	K/S Strength (ΔC*) (2°/C) Ⓟ
ΔWI (BERGER) (*obs.*/D65) Ⓟ	K/S Strength (ΔC*) (10°/D65) Ⓟ
ΔWI (ASTM E313-98) (*obs.*/C) Ⓟ	K/S Strength (ΔH*) (2°/C) Ⓟ
ΔWI (ASTM E313-98) (*obs.*/D50) Ⓟ	K/S Strength (ΔH*) (10°/D65) Ⓟ
ΔWI (ASTM E313-98) (*obs.*/D65) Ⓟ	K/S Strength (Δa*) (2°/C) Ⓟ
ΔWI (Ganz) (10°/D65) Ⓟ	K/S Strength (Δa*) (10°/D65) Ⓟ
ΔTint (CIE) (*obs.*/D65) Ⓟ	K/S Strength (Δb*) (2°/C) Ⓟ
ΔTint (ASTM E313-98) (*obs.*/C) Ⓟ	K/S Strength (Δb*) (10°/D65) Ⓟ
ΔTint (ASTM E313-98) (*obs.*/D50) Ⓟ	K/S Strength (MaxAbs) [nm] Ⓟ
ΔTint (ASTM E313-98) (*obs.*/D65) Ⓟ	NC# (2°/C) Ⓟ
ΔTint (Ganz) (10°/D65) Ⓟ	NC# (10°/D65) Ⓟ
ΔB (ASTM E313-73) (2°/C) Ⓟ	NC# Grade (2°/C) Ⓟ
ΔStandard Depth (ISO 105.A06) (10°/D65) Ⓟ	NC# Grade (10°/D65) Ⓟ
Stain Test (ISO 105.A04E) (2°/C) Ⓟ	Ns (2°/C) Ⓟ
Stain Test (ISO 105.A04E) (10°/D65) Ⓟ	Ns (10°/D65) Ⓟ
Stain Test Rating (ISO 105.A04E) (2°/C) Ⓟ	Ns Grade (2°/C) Ⓟ
Stain Test Rating(ISO 105.A04E) (10°/D65) Ⓟ	Ns Grade (10°/D65) Ⓟ
Grey Scale (ISO 105.A05) (2°/C) Ⓟ	MI (DIN) (*obs.1/ill.1*) (*obs.2/ill.2*)
Grey Scale (ISO 105.A05) (10°/D65) Ⓟ	555 (*obs./ill.*) (*ΔL* size: Δa* size: Δb* size*) Ⓟ [*6]

■ Chemical & Pharmaceutical

Absolute

WI (CIE1982) (*obs.*/D65) Ⓟ	
WI (Hunter) (2°/C) Ⓟ	
WI (STENSBY) (2°/C) Ⓟ	
YI (ASTM E313-73) (2°/C) Ⓟ	
YI (ASTM E313-98) (*obs.*/C) Ⓟ	
YI (ASTM E313-98) (*obs.*/D65) Ⓟ	
YI (DIN6167) (2°/C) Ⓟ	
YI (DIN6167) (*obs.*/D65) Ⓟ	
Haze (ASTM D1003-97) (2°/A) Ⓟ	[*2]
Haze (ASTM D1003-97) (2°/C) Ⓟ	[*2]
Gardner	[*3]
Hazen/APHA	[*3]
Iodine Color Number	[*3]
Ph. EU [AUTO]	[*3]
Ph. EU [B]	[*3]
Ph. EU [BY]	[*3]
Ph. EU [Y]	[*3]
Ph. EU [GY]	[*3]
Ph. EU [R]	[*3]
US Pharmacopeia	[*3]

Difference

ΔWI (CIE1982) (*obs.*/D65) Ⓟ	
ΔWI (Hunter) (2°/C) Ⓟ	
ΔWI (STENSBY) (2°/C) Ⓟ	
ΔYI (ASTM E313-73) (2°/C) Ⓟ	
ΔYI (ASTM E313-98) (*obs.*/C) Ⓟ	
ΔYI (ASTM E313-98) (*obs.*/D65) Ⓟ	
ΔYI (DIN6167) (2°/C) Ⓟ	
ΔYI (DIN6167) (*obs.*/D65) Ⓟ	
ΔHaze (ASTM D1003-97) (2°/A) Ⓟ	[*2]
ΔHaze (ASTM D1003-97) (2°/C) Ⓟ	[*2]

■ Food

Absolute

WI (CIE1982) (*obs.*/D65) Ⓟ	
WI (ASTM E313-73) (2°/C) Ⓟ	
WI (Hunter) (2°/C) Ⓟ	
WI (ASTM E313-98) (*obs.*/C) Ⓟ	
WI (ASTM E313-98) (*obs.*/D50) Ⓟ	
WI (ASTM E313-98) (*obs.*/D65) Ⓟ	
Tint (CIE) (*obs.*/D65) Ⓟ	
Tint (ASTM E313-98) (*obs.*/C) Ⓟ	
Tint (ASTM E313-98) (*obs.*/D50) Ⓟ	
Tint (ASTM E313-98) (*obs.*/D65) Ⓟ	
Gardner	[*3]
Hazen/APHA	[*3]
Iodine Color Number	[*3]

Difference

ΔWI (CIE1982) (*obs.*/D65) Ⓟ	Stain Test Rating (ISO 105.A04E) (2°/C) Ⓟ
ΔWI (ASTM E313-73) (2°/C) Ⓟ	Stain Test Rating(ISO 105.A04E) (10°/D65) Ⓟ
ΔWI (Hunter) (2°/C) Ⓟ	Strength (*obs./ill.*) Ⓟ [*5]
ΔWI (ASTM E313-98) (*obs.*/C) Ⓟ	Strength X (*obs./ill.*) Ⓟ [*5]
ΔWI (ASTM E313-98) (*obs.*/D50) Ⓟ	Strength Y (*obs./ill.*) Ⓟ [*5]
ΔWI (ASTM E313-98) (*obs.*/D65) Ⓟ	Strength Z (*obs./ill.*) Ⓟ [*5]
ΔTint (CIE) (*obs.*/D65) Ⓟ	Pseudo Strength (*obs./ill.*) Ⓟ [*5]
ΔTint (ASTM E313-98) (*obs.*/C) Ⓟ	Pseudo Strength X (*obs./ill.*) Ⓟ [*5]
ΔTint (ASTM E313-98) (*obs.*/D50) Ⓟ	Pseudo Strength Y (*obs./ill.*) Ⓟ [*5]
ΔTint (ASTM E313-98) (*obs.*/D65) Ⓟ	Pseudo Strength Z (*obs./ill.*) Ⓟ [*5]
Stain Test (ISO 105.A04E) (2°/C) Ⓟ	
Stain Test (ISO 105.A04E) (10°/D65) Ⓟ	

■ Special

Absolute

FF (*obs./ill.*) Ⓟ	
GU	[*7]
Dominant Wavelength (*obs./ill.*) Ⓟ	
Excitation Purity (*obs./ill.*) Ⓟ	
Signal Color Index 1 Ⓟ	[*9]
Signal Color Index 2 Ⓟ	[*9]
Signal Color Index 3 Ⓟ	[*9]
Signal Color Index 4 Ⓟ	[*9]
Signal Color Index 5 Ⓟ	[*9]
Signal Color Index 6 Ⓟ	[*9]
Signal Color Index 7 Ⓟ	[*9]
Signal Color Index 8 Ⓟ	[*9]
8° Gloss (2°/C) Ⓟ	[*8]

Difference

ΔFF (*obs./ill.*) Ⓟ	
ΔGU	[*7]
Δ8° Gloss (2°/C) Ⓟ	[*8]

Spectral

■ Spectral

Absolute

360[nm] to 740[nm]

Difference

Δ360[nm] to Δ740[nm]

■ K/S Ⓟ

Absolute

K/S val. 360[nm] to K/S val. 740[nm] Ⓟ

Difference

ΔK/S val. 360[nm] to ΔK/S val. 740[nm] Ⓟ

■ Absorbance Ⓟ

Absolute

Absorbance 360[nm] to Absorbance 740[nm] Ⓟ

Difference

ΔAbsorbance 360[nm] to ΔAbsorbance 740[nm] Ⓟ

Properties

Data Name	Name set for sample
Data Attribute	Indicates whether data was measured, input, or is demo data.
User Name	Name of user operating the software when the measurement was taken.
Created Date	Date/time when data was created.
Timestamp	Date/time when measurement was taken.
Group Traits	Group traits corresponding to instrument settings. For example, “45°:as-15°(DP)”, “45°:as15°(DP)”, “SCI”, “SCE”, “UV0”, “UV100”, etc. Will be “------” if there is no applicable trait to be shown.
Data Comment	Comment input for measurement
Visual Judgement Ⓟ	Result of visual judgement
Measurement Type	“Reflectance”; “Transmittance”
Geometry	Geometry used for measurement. For example, “di:8°”, “de:8°”, “45°:as-15°(DP)”, etc.
Specular Component	Specular component setting (applicable only to instruments with di:8, de:8 Geometry): “SCI”, “SCE”
Measurement Area	Measurement area setting. For example, “SAV (3 mm)”, “6 mm”, etc.
UV Setting	UV setting. For example, “UV100”, “UVAdj”, “400nm Cut”, etc.
UV Light Intensity	UV light intensity in percent
Backing (Opacity)	“White Backing”, “Black Backing”
Backing (Haze)	“White Backing”, “Black Backing”
White Calibration Plate ID	ID of white calibration plate
User Calibration Plate ID	ID of user calibration plate
Gloss Calibration Plate ID	ID of gloss calibration plate
White Calibrated Date	Date/time of most recent white calibration prior to measurement
User Calibrated Date	Date/time of most recent user calibration prior to measurement
Gloss Calibrated Date	Date/time of most recent gloss calibration prior to measurement
Sample Temperature	Temperature of sample at time of measurement (CM-3700A Plus/CM-3700A-U Plus only)
Temperature of the Instrument	Instrument internal temperature (CF-300 only)
Environment Temperature	Ambient temperature at time of measurement (CM-3700A Plus/CM-3700A-U Plus only)
Environment Humidity	Ambient humidity at time of measurement (CM-3700A Plus/CM-3700A-U Plus only)
Color Observation Condition	(Only for colorimetric data measured with CR-5 or CR-400/CR-410, or input manually) Observer and illuminant conditions
Instrument Name	Name of instrument which measured data. For example, “CM-25cG”, “CM-M6”, etc. Not shown if data were input.
Variation	Instrument variation code
Serial No.	Instrument serial number
Firmware Version	Instrument firmware version
Data Number	Data number used on instrument for measurement uploaded from instrument to SpectraMagic NX2
User defined info. Ⓟ	(Shown only if User Defined Information items have been set) Name of User Defined Information item selected in Parameter tab shown when this list item is selected.
Inst. Check Date	Shows the date/time of the most recent instrument check.
Inst. Check Result	Shows the results of the most recent instrument check.

Environment Temperature at Calib.	Ambient temperature at time of calibration
Environment Humidity at Calib.	Ambient humidity at time of calibration

Others

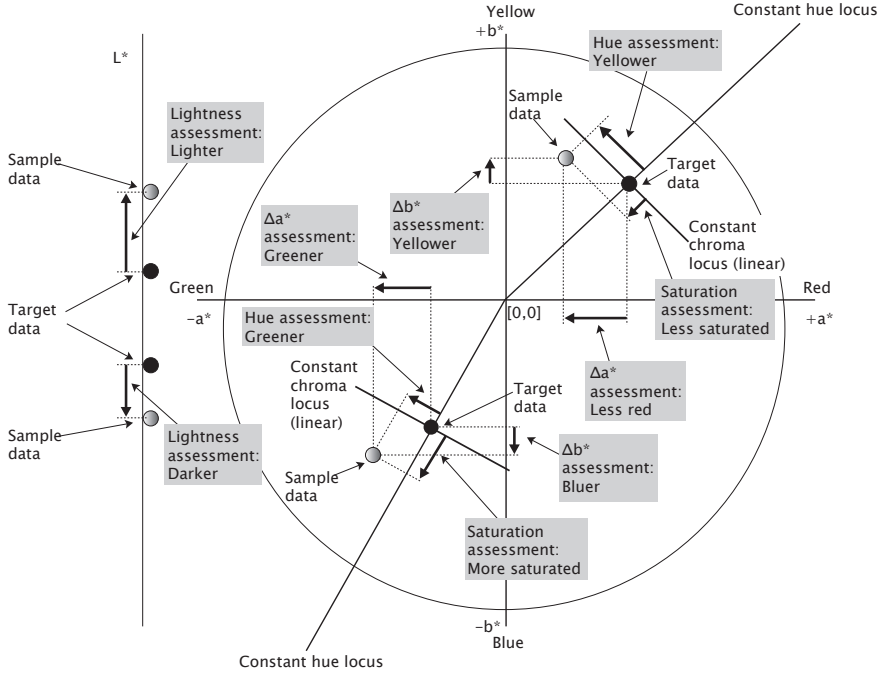
Target Name	Name of the target linked with the sample
Total Judgement	Overall judgement
Bank Judgement	Judgement for each bank in a multi-bank measurement (2-bank measurements for SCI/SCE instruments, 3-bank measurements for CM-512m3A, 6-bank measurements for CM-M6)
Pseudo Color (*obs./ill.*)	Fills the cell in the Data List Window with simulated color calculated by converting the XYZ values of the data to sRGB.
User equation Ⓟ	(Shown only when a user equation has been set.) The names of user equations set in the document will be shown in the Available Items list.

Observation Condition Settings

Observer Settings	2°, 10°
Illuminant Settings	(None), A, C, D50, D65, F2, F6Ⓟ, F7Ⓟ, F8Ⓟ, F10Ⓟ, F11, F12Ⓟ, D55Ⓟ, D75Ⓟ, U50Ⓟ, ID50Ⓟ, ID65Ⓟ, LED-B1Ⓟ, LED-B2Ⓟ, LED-B3Ⓟ, LED-B4Ⓟ, LED-B5Ⓟ, LED-BH1Ⓟ, LED-RGB1Ⓟ, LED-V1Ⓟ, LED-V2Ⓟ, User IlluminantⓅ (Items marked with Ⓟ are supported only by SpectraMagic NX2 Professional Edition.)

Notes on List Items

[*1] Color assessment such as Lightness, Saturation, a* Evaluation, etc. is the description of the differences in lightness, hue, or other factors from the target color. See the conceptual diagram at right.



[*2] Opacity and haze values are displayed only when the opacity measurement mode or haze measurement mode are specified respectively.

[*3] The transmittance indices are displayed only when the CM-5/CR-5 is connected, Get transmittance indexes is checked in Measurement Conditions, and measurement is performed. The values are calculated by the CM-5/CR-5 and uploaded from the instrument to SpectraMagic NX2 immediately after measurement. They are not calculated by SpectraMagic NX2.

[*4] Brightness and density (ISO Status A, ISO Status T) are not displayed ("------" is displayed instead) when sample data and target data include colorimetric values only.

[*5] Strength and Pseudo Strength are displayed only when target data and the sample data associated with the target data exist.

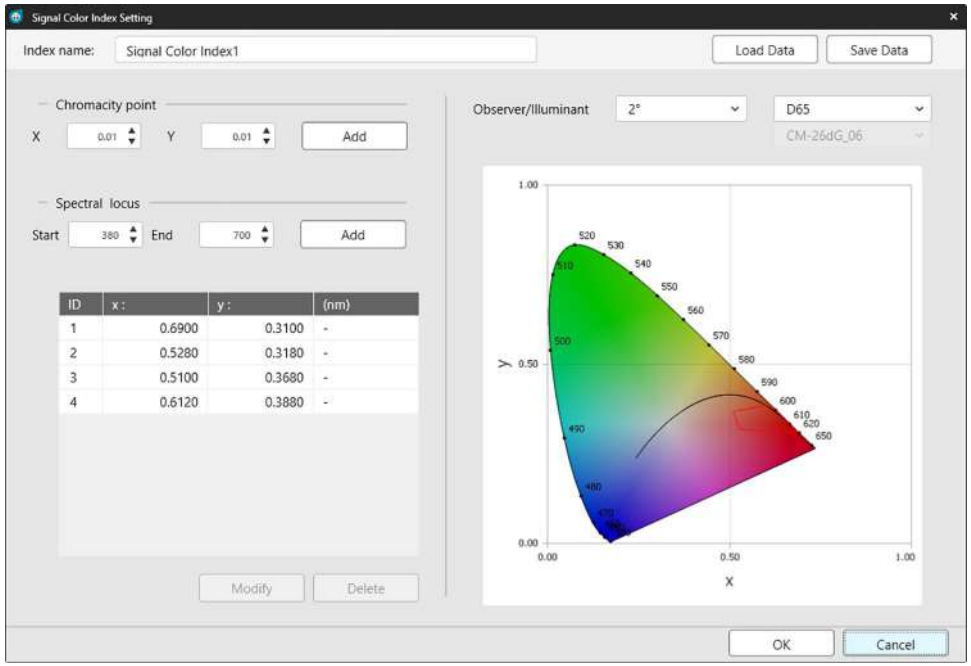
[*6] "555" is recognized as a character, and its statistical value is not calculated. When using "555", be sure to specify Block sizes for ΔL*, Δa*, and Δb* in the Parameter tab.

[*7] GU and ΔGU values will be shown only when measurements are taken with a CM-36dG, CM-36dGV, CM-25cG or CM-26dG with the Measurement Mode in Measurement

Conditions set to Color & Gloss.

[*8] “8 degree gloss” is displayed in the list window only when the Specular Component in Measurement Conditions is set to SCI + SCE.

[*9] When a Signal Color Index is added to the Selected Items list, the default values are used. To modify the default values, click [Edit] in the Parameters tab. The Signal Color Index Setting dialog will open.



Index Name: Input the desired name. This is the name that will be shown in the Selected Items list and in the Data List Window.

[Load Data]: Opens the Open dialog for loading a previously saved Signal Color Index (*.otrx for files created in SpectraMagic NX2, *.otr for files created in SpectraMagic NX)

[Save]: Opens the Save As dialog for saving the current Signal Color Index settings to a file (*.otrx). Default file name will be the Index Name.

Observer/Illuminant: Click on the current settings for Observer and Illuminant, and select the desired settings. The graph will reflect the new settings.

- To select a user-defined illuminant, select USER from the Illuminant list and then select the desired user-defined illuminant from the list that becomes active under the Illuminant list.

The table in the lower left of the dialog shows the chromaticity points and spectral loci for the tolerance polygon.

Chromaticity point: To add a chromaticity point, set the desired x and y values by inputting them directly or using the up/down arrows, and then click [Add]. The new point will be added to the points in the table.

Spectral locus: To add a spectral locus, set the desired Start and End wavelengths by inputting them directly or using the up/down arrows, and then click [Add]. The wavelengths

specified at Start and End are added to the data list as dominant wavelengths, and the intersection of the wavelengths and the spectral locus are added to the data list as chromaticity points.

To modify a chromaticity point in the table, select the point to modify and click [Edit]. The Edit Chromaticity point's Coordinate dialog will open. Edit the x and y values of the point by inputting them directly or using the up/down arrows, and then click [OK]. The point will be modified in the table.

- Spectral loci and their associated chromaticity points cannot be modified.

To delete a chromaticity point or spectral locus from the table, select the chromaticity point or one of the points of the locus to delete, and click [Delete]. The selected chromaticity point or the chromaticity points of the selected locus will be deleted.

When all settings have been set as desired, click [OK]. The dialog will be closed and the settings applied to the Signal Color Index item.

- The format (string, foreground color, and background color) for showing the results of Signal Color Index judgment and whether to use the results in the total judgement for the measurement can be set in the Signal Color Index category of Judgement Color Settings dialog. See *Signal Color Index on p. 170* .

2.7.2 List Window Option Settings

List Window Options Settings let you select whether to show statistical values and pass rate in the Data List Window, and whether to show data for multiple observer conditions or a single observer condition.

1. Select *View - List Window Options Settings ...* . The List Window Options Settings dialog will appear.

2. Statistical value settings

2-1 Enable/disable display of statistical values by clicking on the checkbox next to *Display statistical value*s to change between enabled (checked) and disabled (unchecked). When it is enabled, other items in **Statistical value settings** can be selected.

2-2 Select/unselect the items to show by clicking on the checkbox for each item to change between checked and unchecked. Checked items will be shown.

3. Pass rate

3-1 Enable/disable display of pass rate information by clicking on the checkbox next to *Display pass rate* to change between enabled (checked) and disabled (unchecked). When it is enabled, other items in **Pass rate** can be selected.

3-2 Select/unselect the items to show by clicking on the checkbox for each item to change between checked and unchecked. Checked items will be shown.

4. Observer Condition Settings

4-1 Select between Multiple observation conditions and Identical observation conditions by clicking on the circle next to the setting you want to use.

Multiple observation conditions — List items will use the observation conditions (observer/illuminant) settings set when the list item was selected.

Identical observation conditions — All list items will be shown using the observer and illuminant selected here. After selecting Identical observation conditions, select the desired observer and illuminant by clicking on the current setting and selecting the desired setting from the drop-down list that appears. When the dialog is closed, the selected observer and illuminant will be applied to all list items.

- If the same list item has been added to the List Window multiple times with different observer/illuminant conditions, only one item with the observer and illuminant conditions selected here will remain when the dialog is closed.
- The observer and illuminant for list items with unchangeable observer/illuminant conditions will remain unchanged.
- To select a user-defined illuminant, select USER in the Illuminant drop-down list. The user illuminant drop-down list will be enabled and the desired user illuminant can be selected.

For information on list items, see *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124*

5. Copy and paste setting

5-1 Enable/disable copying of header information together with measurement data by clicking on the checkbox next to *Output headers* to change between enabled (checked) and disabled (unchecked).

6. After all items have been set as desired, click [OK] to confirm the settings and close the dialog.

- To close the dialog without applying the settings, click [Cancel].

2.8 About Measurements

Target measurements and sample measurements can be taken from SpectraMagic NX2 by clicking on the corresponding button in the toolbar, clicking on the corresponding item in the Instrument Window, or selecting the corresponding item from the popout menu that appears when Measurement is selected in the Instrument menu.
Measurements are possible only if the instrument has been calibrated at the current measurement conditions.

2.8.1 Opacity Measurements

Opacity measurements are taken to determine the material's opacity (how much the material blocks light). Opacity measurements are often taken of materials such as paper.
For opacity measurements, two consecutive measurements of the material at the same position are taken for both target measurements and sample measurements. On-screen instructions are shown during measurements.

- Measurement 1 (white backing): Place the material over a stack of the same material sufficiently thick so that no light penetrates during measurement, or if sufficient material is not available, over a white background with a high reflectance, and click [Measure].
- Measurement 2 (black backing): Place the material over a background with a reflectance of 0.5% or less (such as the zero calibration box), and click [Measure].

- Depending on the instrument, the measurement geometry (illumination/observation system) may not exactly match the geometry requirements specified in the opacity standard.
- Opacity Jig CM-A134 which enables easy switching between white and black backgrounds is available for the CM-36dGV.

2.8.2 Haze Measurements

Haze measurements are taken to determine how much the material scatters light during transmission. Haze measurements are often taken of sheet materials such as plastics, or of liquids.
For haze measurements, a total of four measurements are taken. The first two measurements determine the reference characteristics of the measuring instrument itself, and the last two measurements determine the scattering of the material. On-screen instructions are shown during measurements.

- Measurement 1 (haze reference measurement with white backing): Check that there is nothing in the instrument's transmittance chamber, place the white calibration plate at the instrument's reflectance measurement aperture, and click [Measure].
- Measurement 2 (haze reference measurement with black backing): Check that there is nothing in the instrument's transmittance chamber, place the zero calibration box at the instrument's reflectance measurement aperture, and click [Measure].
- Measurement 3 (material measurement with white backing): Place the material in the instrument's transmittance chamber, place the white calibration plate at the instrument's reflectance measurement aperture, and click [Measure].
- Measurement 4 (material measurement with black backing): With the material in the same position in the instrument's transmittance chamber as for Measurement 3, place the zero calibration box at the instrument's reflectance measurement aperture, and click [Measure].

- Depending on the instrument, the measurement geometry (illumination/observation system) may not exactly match the geometry requirements specified in the haze standard. However, this should not pose a problem if measurements using the same instrument are used as relative values for comparison purposes.

When taking repeated measurements of similar materials using the same measurement conditions, the reference characteristic measurements (Measurement 1 and Measurement 2) can be taken at the start of measurements and then omitted for successive measurements. However, if the measurement conditions or material is changed, it is recommended that the reference characteristic measurements (Measurement 1 and Measurement 2) be taken again by clicking [Haze reference] in the Measure haze data (White backing) or Measure haze data (Black backing) dialog.

2.8.3 Manual Averaging Measurement

When Manual average method in Measurement Conditions is set to Manual or SMC, the Manual Averaging Measurement dialog will open when a measurement is started.

1. To take a measurement for manual averaging, position the measurement subject and instrument, and click [Measure]. A measurement will be taken. The measurement results will be added to the results table and the average (Avg.) and standard deviation (Std.Dev.) of checked measurements in the results table will be calculated.
2. Continue to take measurements until the requirements set in Measurement Conditions (Manual average times when Manual average method is set to Manual, Valid data and Threshold when Manual average method is set to SMC) are met and [Complete] becomes enabled.
3. Click Complete to complete measurements and add the average to the List Window, and close the dialog.
   - If *Show Measurement data settings dialog at time of measurement* in the *Default data name* category of Default Data Settings is checked, the Measurement Data Setting dialog will appear.
   - If Keep original data is checked, individual checked measurements in the results table will also be added to the List Window with *_n* (where *n* is a sequential number starting with 1) added to the end of the measurement name.

Dialog settings

- To change the measurement name, click on the name and edit it.
- To exclude a measurement from average and standard deviation calculations, uncheck the checkbox next to the measurement. Unchecking a measurement will also exclude it from the Valid data count for SMC.
- To check or uncheck all measurements, click on the checkbox at the top of the checkbox column.
- To change the measurement items shown in the results table, click . The Item Setting dialog will open, with only the Color/Index and Spectral item categories shown. For information on selecting items, see *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .
- To keep the original individual measurement data in addition to the average data when [Complete] is clicked to close the dialog, check Keep original data.
- [Complete] will be disabled until the requirements set in Measurement Conditions (Manual average times when Manual average method is set to Manual, Valid data and Threshold when Manual average method is set to SMC) are met.

Return to *2.9.1 Creating a Target Using the Create Target Wizard on p. 148*
Return to *2.9.2 Creating a Target by Measurement Without the Wizard on p. 152*

2.8.4 Viewfinder

- This function is available only when using a CM-3700A Plus/CM-3700A-U Plus, CM-36dG, CM-36dGV, CM-36d, CM-17d (USB/WLAN connection only), or CF-300 (with optional 1.3MP USB Camera Set CF-A32 installed).
- This function is not available if Manual average method in the Measurement Options tab of Measurement Conditions is set to Manual or SMC.
- This function is not available when using a CM-17d if Trigger measurement (Target) or Trigger measurement (Sample) 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.

The viewfinder function lets you see the instrument's view of the sample for accurate sample positioning. Target and sample measurements can then be taken from within the Viewfinder dialog.

1. Select *Instrument - Measurement - Viewfinder* ... . The Viewfinder dialog will appear, showing the instrument's view of the measurement.

2. To copy the image to the Windows clipboard so that you can paste it into another program, click the camera mark in the upper right corner of the viewfinder area.

3. To take a target measurement, click [Target Measurement].

4. To take a sample measurement, click [Sample Measurement].

5. To close the dialog, click [Close] or click the [x] in the upper right corner of the dialog.

2.8.5 Interval Measurements Ⓟ

- This function is supported by SpectraMagic NX2 Professional Edition only.

SpectraMagic NX2 can be set to automatically take a specific number of measurements at specific intervals.

- Instrument must be calibrated before starting interval measurements.
- Interval measurement cannot be performed for opacity or haze measurements.
- Interval measurements cannot be performed when using a CF-300 with optional USB Camera Set installed and Save viewfinder image with measurement in Measurement Conditions is checked.

1. Select *Instrument - Measurement - Interval Measurement ...* . The Interval Measurement dialog will appear.
- Interval Measurement ... will be disabled if Manual average method in Measurement Conditions is set to Manual or SMC, if Trigger Measurement (Sample) or Trigger Measurement (Target) is enabled, or if instrument has not been calibrated at the current measurement conditions.

2. In Interval Conditions, set Measurement Count (range: 2 to 10000) and Interval Period (00:00:00 to 12:00:00).
- If Interval Period is set to a period shorter than the instrument's minimum measurement interval, measurements will be taken at as short a period as possible and a warning message will be shown in the Interval Measurement Progress dialog.

3. In Data Name, set the data name by clicking on the current name and editing it. Variables which can be used in the name and their meanings are shown in Formats. A sample of how the name will appear when actually used is shown below the data name.

4. In Target, select the target to associate interval measurements with from the targets available in the document, or select (Absolute) to take absolute measurements.
- To use the first measurement of interval measurements as the target and associate the remaining interval measurements with that target, check Take first measurement as a Target.

5. In Measurement Conditions, set the measurement conditions to use for interval measurements by clicking on the current setting and selecting the desired setting from the drop-down list that appears.
- For information on instrument measurement conditions, see *2.5 Setting Measurement Condition Settings on p. 96* .

6. In Measurement Option, set the Auto average times by using the up/down buttons or by inputting the value directly. Range: 1 to 30.

7. To perform calibration, click [Calibration] and follow the on-screen instructions.
- For more information on calibration, see *2.6 Calibration on p. 109* .

8. To start measurements, click [Start measurement]. Measurements will be started and the results from each measurement will be added to the document after it is taken. The interval Measurement Progress dialog will be shown, showing the progress of interval measurements.
- If calibration has not yet been performed at the measurement conditions set in step 5, the calibration process will start instead of measurements when [Start measurement] is clicked. Follow the on-screen instructions to perform calibration and then click [Start measurement] again to start measurements. For more information on calibration, see *2.6 Calibration on p. 109* .
- To cancel interval measurements which are in progress, click [Cancel]. Even if interval measurement is canceled, measurements taken up to when [Cancel] was clicked will remain in the document. To delete measurements taken during interval measurement from the document when interval measurements are canceled, check Delete data when canceled. in the Interval Measurement Progress dialog before clicking [Cancel].

9. When interval measurements have been completed, click [Complete] to close the Interval Measurement Progress dialog.

2.8.6 Instrument Trigger Mode (Remote Measurement)

- This function is available only when an instrument which has a measurement button is connected and has been calibrated.
- This function is not available when using a CM-3700A/CM-3700A-U, CM-3600A/CM-3610A, or CF-300.

Trigger mode enables you to take target or sample measurements using the instrument's measurement button.

- When using instrument trigger mode with a CM-17d, the SpectraMagic NX2 viewfinder function cannot be used. Instead, the viewfinder image can be seen on the instrument display by pressing the instrument's Viewfinder key or by holding the measurement button pressed for more than 0.5 s. Pressing the measurement button while the viewfinder image is displayed will take a measurement. If Save viewfinder image with measurement in Measurement Options is checked, the viewfinder image will be saved with the measurement.

To cycle between trigger mode settings:
Click Instrument Trigger Measurement in the Instrument Window. Each time it is clicked, the setting of the instrument trigger mode will change in the following order, with the icon changing to show the current setting:

(Trigger OFF) ➜ (Trigger measurement (Target)) ➜ (Trigger measurement (Sample)) ➜ (Trigger OFF) ➜ ...

To enable trigger mode from the menu:

1. Select *Instrument - Instrument Trigger Mode ...* . The Instrument Trigger Mode dialog will be shown.
2. Select the instrument trigger mode to be used:
   - To enable trigger mode for sample measurements, click Trigger measurement (Sample).
   - To enable trigger mode for target measurements, click Trigger measurement (Target).
   - To disable trigger mode for both sample measurements and target measurements, click Trigger OFF.
   - It is not possible to select multiple settings such as both Trigger measurement (Sample) and Trigger measurement (Target) at the same time. Clicking on one setting will disable the other settings.
3. When using a CM-700d/CM-600d, the [Option settings] button for changing settings related to showing measurement results on the instrument display after each remote measurement will be shown. For information on setting instrument screen display settings, see *2.8.6.1 Showing Measurement Results on Instrument Display after Instrument Trigger Measurements (CM-700d/CM-600d only) on p. 145* .
4. When all settings have been set as desired, click [OK] to apply the settings and close the dialog.
   - To close the dialog without changing settings, click [Cancel] instead of [OK].

2.8.6.1 Showing Measurement Results on Instrument Display after Instrument Trigger Measurements (CM-700d/CM-600d only)

When taking instrument trigger measurements, the measurement results can be sent from SpectraMagic NX2 to the instrument display after each remote measurement.

- Measurements will not be shown in the display for measurements taken from within SpectraMagic NX2 using the menu, toolbar buttons, or Instrument Window.

To enable screen display:

1. If the Instrument Trigger Mode dialog is not shown, select *Instrument - Instrument Trigger Mode ...* .
2. Click [Option settings]. The Instrument screen display settings dialog will appear.
3. To enable showing measurement results in the screen display after each instrument trigger measurement, set Display results in instrument screen to On by clicking on the Off/On switch.
   When Display results in instrument screen is set to On, the other settings in the dialog will be enabled.
   - Settings can be changed by clicking on the current setting and selecting the desired setting from the drop-down list that appears.
   - Clicking [Load default settings] sets all settings to the default settings.
   - Clicking [Load] will open the Open dialog for opening a previously saved *.rof or *.rofx2 file containing Instrument screen display settings.
   - Clicking [Save] will open the Save As dialog for saving the currently set Instrument screen display settings to a file.
4. When all settings have been set as desired, click [OK] to apply the settings and close the dialog.
   - To close the dialog without changing settings, click [Cancel] instead of [OK].
5. To close the Instrument Trigger Mode dialog, click [OK].

2.8.7 Remote Color Difference Display Mode

- This function is available only when a CM-17d/CM-16d (firmware ver. 1.2 or later), CM-26dG/CM-26d/CM-25d (firmware ver. 1.5 or later), CM-25cG (firmware ver. 1.4 or later), or CM-M6 (firmware ver. 1.3 or later) is connected and has been calibrated.

In this mode, measurements and target selection are controlled from the instrument, and the measurement results are displayed on both the instrument and within SpectraMagic NX2.

1. Select *Instrument - Remote Color Difference Display Mode*. SpectraMagic NX2 will enter Remote Color Difference Display Mode. An Exit Remote Color Difference Display Mode dialog will be shown, and all other operations in SpectraMagic NX2 will be disabled.

- The Remote Color Difference Display Mode menu item will not be shown in the menu if the mode cannot be used with the connected instrument.
- The Remote Color Difference Display Mode menu item will be disabled (greyed out) if the connected instrument has not been calibrated or if there is no active document.
- If Instrument Trigger Mode is enabled when Remote Color Difference Display Mode is selected, a confirmation dialog asking whether or not to disable Instrument Trigger Mode will be displayed. Clicking [Yes] will disable Instrument Trigger Mode and enter Remote Color Difference Display Mode; clicking [No] will cancel entering Remote Color Difference Display Mode and continue using Instrument Trigger Mode.
- Target data will be synced from the instrument to the active document using the UUIDs (universally unique identifiers) of the targets, so even if different targets have the same name, the targets can be properly identified when syncing.
  - If a target is not currently in the active document, it will be uploaded from the instrument together with its tolerance settings
  - If a target with the same UUID as a target on the instrument already exists in the active document, it will not be uploaded from the instrument.
  - If multiple targets with the same UUID already exist in the active document (such as if the target was copied and pasted into the document), a dialog asking which of the duplicate UUID targets to associate with measurements will be displayed. Select the desired target from the pull-down list in the dialog and click [OK]. Clicking [Cancel] in this dialog will cancel entering Remote Color Difference Display Mode.
- The active target for the document will be set to the target with the same UUID as the target currently active on the instrument.
- The following instrument functions cannot be used and will be temporarily disabled on the instrument while in Remote Color Difference Display Mode:
  - Simple mode
  - Auto target
  - Auto average, manual average, or SMC (Average times will be set to 1.)
- The following SpectraMagic NX2 functions cannot be used while in Remote Color Difference Display Mode:
  - Measurement Mode: Opacity
  - Interval measurement
  - Auto target
  - Auto average or manual average (Average times will be set to 1.)
  - Use viewfinder when measuring

2. Position the instrument for measurement and press the measurement button. A measurement will be taken. The measurement results will be shown in the instrument's LCD screen and also uploaded to SpectraMagic NX2, associated with the same target as the target selected on the instrument.

- Measurements taken in Remote Color Difference Mode will not be stored on the instrument.

3. To change the target for the next measurement, use the instrument keys as follows:

3-1. Press [ESC]. A list of targets stored on the instrument will be shown.

3-2. Use [▲] or [▼] to move the cursor up or down the list to select the desired target. Use [◀] or [▶] to move to the previous or next page of the target list.

3-3. When the cursor is on the desired target, press [ESC] again or press [Enter]. The target will be selected.

3-4. When the next measurement is taken, the active target in the active document in SpectraMagic NX2 will be set to the target selected above and the measurement will be associated with that target.
- The targets associated with previous measurements will not be changed.

4. Repeat steps 2 and 3 to take additional measurements.

5. When measurements have been completed, click [OK] in the Exit Remote Color Difference Display Mode dialog. Remote Color Difference Display Mode will be canceled.
- instrument settings for Simple mode, Auto target, Auto average/Manual average/SMC will be restored to their settings prior to entering Remote Color Difference Display Mode.
- SpectraMagic NX2 Instrument Trigger Mode setting will not be restored.

2.9 Targets

Targets are used when measuring color difference.
Targets can be created by:

- Using the Create Target Wizard by measurement or manual input of target data. See *2.9.1 Creating a Target Using the Create Target Wizard on p. 148* .
- By measurement without using the Create Target Wizard. See *2.9.2 Creating a Target by Measurement Without the Wizard on p. 152* .
- By using the first measurement of interval measurements as a target. See *2.8.5 Interval Measurements Ⓟ on p. 143* .
- By reading targets from instrument memory. See *2.9.3 Creating Target by Reading from Instrument on p. 153* .
- By copying an existing target or sample and pasting as a new target. See *2.9.4 Creating Target by Copying/Pasting Existing Target or Sample on p. 156* .
- By changing an existing sample to a target. See *2.9.6.1 Changing Sample to Target on p. 157* .

- A target can be created only when there is an active document.
- Return to *Quick Start Guide: Setting Target on p. QS-9* .

2.9.1 Creating a Target Using the Create Target Wizard

Targets and other settings for measuring color difference can be easily set using the Create Target Wizard, which guides you in creating the target and setting tolerances necessary for pass/fail judgment.

1. Select *Data - Create Target ...* .
If an instrument is connected, the Select Registration Method dialog will appear. Continue with the section corresponding to the desired registration method below.
If no instrument is connected, the Wizard will open to the Input Manually dialog. Continue with step 2-2 in Registering target data by manually inputting data below.

2. **Registering Target Data**
Registering target data by measurement

2-1 Click [Measurement] in the Target Registration tab. The Create Target dialog will appear.

2-2 To change the target name, click in the target name textbox and edit the target name.

2-3 In the Measurement conditions section, set the desired measurement conditions for target measurement.
- Measurement conditions available will depend on the instrument. For details of measurement conditions, see *2.5 Setting Measurement Condition Settings on p. 96* .
- For details of averaging settings in Options, see *Measurement Options on p. 108* .

2-4 To calibrate the instrument at the selected settings, click [Calibrate].
- For information on calibration, see *2.6 Calibration on p. 109* .

2-5 Position the target for measurement and click [Measure]. A measurement will be taken and the measurement results will be shown in the Measurement Results section. The square next to the target name will change to the color which was measured.
- Follow the on-screen directions to perform calibration, and then repeat step 4.
- Measurements will be taken according to the measurement conditions and averaging settings. If Manual average method is set to Manual or SMC, the Manual averaging Measurement dialog will be shown. See *2.11 Setting Default Settings on p. 166* .

2-6 If the measurement results are correct, click [OK] and continue with step 3 below to set the sample measurement conditions.
- If the measurement results are not acceptable, check the positions of the instrument and target, and click [Measure] again to take another measurement and replace the measurement data with the data from the new measurement.

Registering target data by manually inputting data

2-1 Click [Input Manually] in the Target Registration tab. The Create Target dialog will appear.

2-2 To change the target name, click in the target name textbox and edit the target name.

2-3 Click on the Color Data list and select the data type (Spectral or Colorimetric) to input from the drop-down list that appears.

2-4 To also input a gloss value, click the Characteristics slide button and set it to On.

2-5 Click on the Group Trait list and select the group trait for the target to be input from the drop-down list that appears.
- Some items in Measurement Conditions may be automatically set according to the selected Group Trait.

2-6 In the Measurement conditions section, set the desired measurement conditions for the target.
- Measurement conditions available will depend on the Group Trait selected.

2-7 If "Spectral" was selected as the data type in step 2-3:
- For Group Trait settings other than "---", tabs for each bank of data will be shown. To set the data for each bank, click on the respective tab. if data are not set for a specific tab, the data will be set to the default values.

a) Click on the Wavelength list and select the desired wavelength range (360-740 or 400-700) from the drop-down list that appears. When a wavelength range has been selected, [Reflectance Settings] will be enabled.

b) Click [Reflectance Settings]. The Reflectance Settings dialog will appear.

c) Input the spectral data for each wavelength in each tab. To switch tabs, click on the tab.

d) After all data have been input as desired, click [OK] to close the dialog.

If "Colorimetric" was selected as the data type in step 2-3:
- For Group Trait settings other than "---", tabs for each bank of data will be shown. To set the data for each bank, click on the respective tab. if data are not set for a specific tab, the data will be set to the default values.

a) Click on the Color Space list and select the desired color space (L*a*b*, Hunter Lab, or XYZ) from the drop-down list that appears.

b) Click [Observation Condition]. The Observation Condition Settings dialog will appear.

c) Select the desired Observer and Illuminant for Observation Condition 1 by clicking on the corresponding list and selecting from the drop-down list that appears.

d) To use a user illuminant, select User Illuminant in the Illuminant drop-down list and select the desired user illuminant in the User Illuminant list.
- For information on user illuminants, see *2.15 Registering User Illuminants Ⓟ on p. 176* .

e) If desired, set the slide button next to Observation Condition 2 and Observation Condition 3 to On and select the desired Observer and Illuminant settings for each condition.

f) After all conditions have been set as desired, click [OK] to close the dialog.

g) Input the target colorimetric values. To switch between tabs for different observation conditions, click on the tab.

2-8 If Characteristics was set to On in step 2-4, input the gloss value for the target.

2-9 Click [OK] and continue with step 3 Setting Sample Measurement Conditions below.

3. Setting Sample Measurement Conditions

- If you don't want to set the sample measurement conditions separately and want to use the target measurement conditions for sample measurements, set the On/Off slide button at the upper right off the dialog to Off.
- To switch between tabs, click on the desired tab.

3-1 In the Measurement Conditions tab: Click on the current Instrument setting and select the desired instrument from the drop-down list that appears. The instruments in the list will be the instruments that are set as Usable Instruments for this document or which have already been used in this document.

3-2 Select the desired measurement conditions in the Measurement Conditions tab. The measurement conditions available will depend on the selected instrument. For information on measurement conditions, see *2.5 Setting Measurement Condition Settings on p. 96* .

3-3 In the Options tab, set the desired averaging conditions. For information on averaging settings, see *Measurement Options on p. 108* .

3-4 Click [OK] and continue with step 4 Setting Tolerance Settings below.

- To go back to the previous screen, click [Back].

4. Setting Tolerance Settings

- For Group Trait settings other than "---" with multiple banks of data, it is recommended that tolerances not be set if the data for a specific bank of data was left as the default values in step 2-7.

4-1 Click the checkbox next to a Condition to enable setting tolerances for that condition.

4-2 Click the checkbox next to each tolerance to be set to enable that tolerance.

4-3 Set the desired tolerance by direct input or by using the up/down arrows.

4-4 Repeat steps 4-1 to 4-3 to set other tolerances as desired.

4-5 Set the desired Warning Level (%) by direct input or by using the up/down arrows.

4-6 Click [OK] and continue with step 5 Setting Document Settings below.

- To go back to the previous screen, click [Back].

5. Setting Document Settings

5-1 To add data tags to the target:

- To set a tag directly, click in the Data Tag box and input the desired tag directly. After input of a tag has been completed, press Enter on the computer keyboard. The background of the tag will change to light gray and an "x" will appear to the right of the tag.
- To set a tag already used in the document as a default tag, click [+] to the right of the Data Tag box. A list of tags already used in the document will appear. Select the desired tag from the list. It will be added to the Tag box with a light gray background and an "x" will appear to the right of the tag.
- To delete a tag from the Data Tag box, click on the "x" to the right of the tag.

5-2 To set a comment, click in the Comment box and input the comment.

5-3 To link an image with the target, click [Set image]. The Edit image dialog will open.

a) Click [Browse Image File]. The Open dialog will appear.

b) Browse to the desired image and click [Open]. A preview of the image will appear in the Edit image area.

- *.bmp, *.jpeg, *.jpg, and *.png image files can be selected.

c) To add a marker, click [Add marker]. A circular marker will appear on the image preview.

- The Marker color and Marker thickness can be set using the corresponding controls.
- The size and shape of the marker can be changed by clicking on the marker in the preview window and dragging the handles to the desired size/shape.

- Only 1 marker can be set on the image.
- To delete a set marker, click [Clear marker].

d) Click [OK]. The image will be added to Additional information.

- To delete a linked image, click [Clear image].

5-4 To add an item from a user defined list, click [Add] in the User Defined List area. The User Defined Information Settings dialog will open.

a) Click on the user defined information list and select the desired item from the drop-down list that appears.

- Only items which have previously been added to the User Defined Information List will be shown in the drop-down list. See *2.13 User Defined Information Settings* Ⓟ *on p. 171* .

b) Click [OK]. The selected item will be added to the User Defined List.

c) Select the added item and click on the Value for that item to set the desired value.

- To go back to the previous screen, click [Back].

6. Click [OK] to save the target information. The Create Target dialog will close.

2.9.2 Creating a Target by Measurement Without the Wizard

- This function is available only when the connected instrument has been calibrated.

A target can be created directly without using the Create Target Wizard by measuring the target.
It is also possible to measure the target as the first measurement of an interval measurement series. See *2.8.5 Interval Measurements Ⓟ on p. 143* .

1. To measure a target color, position the target and instrument for measurement, and do any of the following:
   - Click the Target Measurement button in the toolbar.
   - Click Target Measurement or in the Instrument Window.
   - Press F3.
   - Select *Instrument - Measurement - Target Measurement*.
   - When using the Viewfinder function with a CM-36dG/CM-36dGV/CM-36d, CM-17d, or CF-300, click [Target Measurement] in the Viewfinder dialog. See *2.8.4 Viewfinder on p. 142* .
   - Use the instrument measurement button after enabling Trigger Measurement (Target). See *2.8.6 Instrument Trigger Mode (Remote Measurement) on p. 144* .
     - When using instrument trigger mode with a CM-17d, the SpectraMagic NX2 viewfinder function cannot be used. Instead, the viewfinder image can be seen on the instrument display by pressing the instrument's Viewfinder key or by holding the measurement button pressed for more than 0.5 s. Pressing the measurement button while the viewfinder image is displayed will take a measurement. If Save viewfinder image with measurement in Measurement Options is checked, the viewfinder image will be saved with the measurement.
2. The Measurement Data Setting dialog will appear.
   - If *Show Measurement data settings dialog at time of measurement* in the *Default data name* category of Default Data Settings is unchecked, the default name will be used and the Measurement Data Setting dialog will not be shown. The measurement will be taken immediately when any of the actions in step 1 is performed.
3. Fill in the desired information.
   - To change default data name settings, click [Change default settings]. The Default Data Settings dialog will be shown, with the Default data name category selected.
4. Click [OK]. A measurement will be taken.
   - Measurements will be taken according to the settings in the Measurement Conditions dialog.
   - If Manual average method is set to Manual or SMC, the Manual averaging Measurement dialog will be shown. See *2.11 Setting Default Settings on p. 166* .
5. The measured data will be registered as target data and added to the List Window.

2.9.3 Creating Target by Reading from Instrument

When using a CM-26dG/CM-26d/CM-25d, CM-25cG, CM-5/CR-5, CM-17d/CM-16d, CM-512m3A, CM-700d/CM-600d/CM-700d-U, CM-2600d/CM-2500d, CM-2500c, or CR-400/CR-410, targets stored in the instrument's memory can be read into SpectraMagic NX2.

2.9.3.1 Registering Targets into Document while Editing Targets in Instrument

The tolerance values of targets stored in the instrument can be edited and the targets can be read into the document.

1. Select *Instrument - Read/Write - Read/Edit Target ...* .

2. The Edit Target dialog will appear, showing a list of targets stored in the instrument.

3. To see a target, click on it in the list. Information for the target will be shown in the right side of the dialog.

4. To delete the selected target, click [Delete].

5. To change the target name, click on the current name and edit it.

6. When the Measurement Data and Property tab is selected, the measurement conditions (when Measurement condition tab is selected) or properties (when Property tab is selected) and measurement results will be shown.
- Information and data values in the Measurement data and Property tab are for information only, and cannot be edited.
  - The items shown in the Colorimetric Values/Indexes table can be changed by clicking at the upper right of the table. The Item Setting dialog will open, with only the Color/Index and Spectral item categories shown. For information on selecting items, see *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .
  - To see the spectral data for the target, click [Data]. The Spectral Data dialog will appear. Click on the tab for each group trait to see the data for each group trait.
    - Spectral data are not available when using a CR-5 or CR-400/CR-410.

7. When the Tolerance tab is selected, the tolerance values set on the instrument can be edited.
  - The items shown can be changed by clicking at the upper right of the table. The Item Setting dialog will open. For information on selecting items, see *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .

  7-1 To set the tolerance for a Condition, check the checkbox next to the condition. When a condition is selected, the tolerance items for that condition will be enabled.

  7-2 To set a tolerance value, check the checkbox next to the value and set the value using the up/down arrows or by inputting the value directly.
    - The upper value is the + tolerance and the lower value is the - tolerance.

  7-3 Repeat steps 7-1 and 7-2 to set all desired tolerances.

  7-4 To set parametric coefficients, click [Parametric coefficient setting]. The Parametric Coefficient Settings dialog will appear. Set the desired coefficient values by using the up/down buttons or by inputting the value directly. When all values have been set as desired, click [OK].
    - [Parametric coefficient setting] is not shown for some instruments.

8. To save changes to the instrument, click [Save].

9. To discard changes without saving them to the instrument, click [Discard].

10. To read a target from the instrument into the document, check the checkbox next to the target name and click [Register].

- To select all targets for reading into the document, check the Select All checkbox.

11. When all desired actions have been completed, click [Close] to close the dialog.

2.9.3.2 Reading Targets with Samples

When samples are read from the instrument, the associated targets are also read.

- Targets not associated with samples will not be read.

1. Select *Instrument - Read/Write - Read Samples ...* .

- If a user illuminant has been set on the instrument, the user illuminant must be read into the document before reading samples can be performed. See *2.15.3 By reading illuminant data from the measuring instrument on p. 177* .

2. The Read Samples dialog will appear.

3. Set the desired range for Data to Read.

- **All data**: All data stored in the instrument.
- **Today's data**: Data measured on the current date
- **Time period**: Data between the initial date and end date. Set the initial date and end date by clicking on the calendar icon at the right of the date and select the desired date on the calendar that appears.

- To show a list of the data matching the set range so that you can select specific data to upload, check Check details before adding to the document. If Check details before adding to document is not checked, all data matching the set range will be uploaded to the document when [OK] is clicked.

4. Set the desired Option settings.

- Set additional information for all samples: The Set Additional Information dialog for setting additional information for all data being uploaded will be shown before data are uploaded.
- Delete the registered Samples from the measuring instrument: When data are uploaded, they will be deleted from the instrument.
- Do not register Samples which are already in the document (Not shown for some instruments): If a sample with the same information already exists in the document, it will not be registered.

5. After settings have been set as desired, click [OK]. If both Check details before adding to the document and Set additional information for all samples were not checked, the samples matching the set range will be read into the document, together with any associated targets, and the dialog will close.

6. If Check details before adding to the document was checked, the Read Samples dialog will appear, showing a list of samples and associated targets in the instrument's memory.

- Targets with no associated samples will not be shown.

6-1 To show all data categorized into targets and samples, click . Clicking the triangle next to Target will open the target list, and selecting a target will show only the samples associated with that target.
To show data classified by target, click . Clicking the triangle next to Target will open the target list, and selecting a target will show only the samples associated with that target.

6-2 To select data to read into the document, check the checkbox next to each desired sample. To select all samples, check the checkbox at the top of the list. Unchecking the checkbox at the top of the list after it has been checked will uncheck all samples.

6-3 If you want to delete the checked samples from the instrument after reading them into the document, check Delete the registered Samples from the measuring instrument.

6-4 After all desired samples have been checked, click [OK]. If Set additional information for all samples was not checked, the selected samples will be read into the document, together with any associated targets, and the dialog will close.

7. If Set additional information for all samples was checked, the Set Additional Information dialog will appear.

- Information which is set will be added to all uploaded samples and targets.

7-1 To set data tags:

- To set a tag directly, click in the Data Tag box and input the desired tag directly. After input of a tag has been completed, press Enter on the computer keyboard. The background of the tag will change to light gray and an "x" will appear to the right of the tag.
- To set a tag already used in the document as a default tag, click [+] to the right of the Data Tag box. A list of tags already used in the document will appear. Select the desired tag from the list. It will be added to the Tag box with a light gray background and an "x" will appear to the right of the tag.
- To delete a tag from the Data Tag box, click on the "x" to the right of the tag.

7-2 To set user defined information, click [Add] in the User Defined Information area. The User Defined Information Settings dialog will open.

a) Click on the user defined information list and select the desired item from the drop-down list that appears.
b) Click [OK]. The selected item will be added to the User Defined List.
c) Select the added item and click on the Value for that item to set the desired value.

7-3 After additional information has been set as desired, click [OK]. The samples will be read into the document, together with any associated targets, and the dialog will close.

2.9.4 Creating Target by Copying/Pasting Existing Target or Sample

1. In the Tree Window or Data List Window, right-click on the target or sample to be copied and pasted as a target and select *Copy*.
2. Right-click in the Tree Window or Data List Window and select *Paste data with specified conditions...* . The Data Paste dialog will appear.
3. In Paste as, select *Target*.
   • If the measurement right-clicked on in step 1 is a target, *Target* will be automatically selected and cannot be changed.
4. In Select Group Traits, select the desired group traits to paste as.
   • Select Group Traits is not shown for single-bank measurements.
5. Click [OK]. The measurement will be pasted into the document as a new target.

2.9.5 Protecting Targets

Targets can be protected against accidental editing or deletion.

1. In the Tree Window, right-click on the target to be protected and select *Protect/Unprotect Target ...* .
   If the target is not currently protected, the target will be protected and a small lock icon will be added to the current icon:
   Target: . Master target: . Working target:
   If the target is currently protected, it will be unprotected and the icons will not have the lock:
   Target: . Master target: . Working target:

When a target is protected:

- Target data (including tolerance data and additional information) cannot be edited.
- Target cannot be deleted.
- Target cannot be changed to a sample.

Even when the target is protected, the following operations are possible:

- Changing between target and master target or target and working target.
- Associating samples with target

2.9.6 Changing Data Between Sample and Target

2.9.6.1 Changing Sample to Target

1. In the Tree Window or Data List Window, right-click on the sample to be copied and pasted as a target and select *Change Sample to Target ...* . A confirmation dialog will appear.
2. Click [Yes]. The sample will be changed into a target.

2.9.6.2 Changing Target to Sample

1. In the Tree Window or Data List Window, right-click on the target to change to a sample and select *Change Target to Sample...* . A confirmation dialog will appear.
   - If the target has samples associated with it, an error message will appear instead of the confirmation dialog. Targets with associated samples cannot be changed to a sample.
2. Click [Yes]. The target will be changed to a sample.

2.9.7 Master Target/Working Target Ⓟ

- This function is available only when using a Professional Edition license.

Several target data can be organized into a group consisting of several working targets under one master target. Sample measurements taken when the master target or any of the working targets in the group will be associated with that group.

2.9.7.1 Changing a Target to a Master Target

To change a target to a master target:

1. In the Tree Window or Data List Window, right-click on the target to change to a master target and select *Master Target...* - *Change Target to Master Target...* . The selected target will be changed to a master target and the icon will change from to .

2.9.7.2 Changing a Master Target to a Regular Target

To change a master target to a regular target (a target that is not a master target or working target):

1. In the Tree Window or Data List Window, right-click on the master target to change to a regular target and select *Master Target...* - *Change Master Target to Target...* . The selected master target will be changed to a regular target and the icon will change from to .
   - If there were working targets under the master target, they will also be changed to regular targets.

2.9.7.3 Changing a Target to a Working Target

To change a target to a working target under a master target:

1. In the Tree Window or Data List Window, right-click on the target to change to a working target and select *Master Target...* - *Change Target to Working Target...* . The Master Target Setting dialog will appear.
2. Click on the drop-down and select the master target under which the target selected in step 1 will be a working target.
3. Click [OK]. The selected target will be changed to a working target under the selected master target and the icon will change from to .

2.9.7.4 Changing a Working Target to a Regular Target

To change a master target to a regular target (a target that is not a master target or working target):

1. In the Tree Window or Data List Window, right-click on the working target to change to a regular target and select *Master Target...* - *Change Working Target to Target...* . The selected working target will be changed to a regular target and the icon will change from to .

2.9.8 Editing Target

2.9.8.1 Editing Tolerances

- To edit default tolerances, go to *2.11.3 Setting Default Tolerance on p. 168* .

1. To edit the tolerances for a target, do either of the following:
   - Select the target for which to edit the tolerances, select *Data - Edit Target - Edit Tolerances ...* .
   - Right-click on the target name and select *Edit Target - Edit Tolerances ...* .

   The Edit Target Dialog will appear, with the Tolerance Settings step shown.
   - For Tolerance Auto Adjust, see the following section.
2. If the tolerances for a Condition are not yet enabled, click the checkbox next to the condition to enable setting tolerances for that condition.
   - To change the tolerance items shown in the table, click . The Item Setting dialog will open, with only the Color/Index and Spectral item categories shown. For information on selecting items, see *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .
3. If a tolerance to be set is not yet enabled, click the checkbox next to the tolerance to enable that tolerance.
4. Set the desired tolerance by direct input or by using the up/down arrows.
5. Repeat steps 2 to 4 to set other tolerances as desired.
6. Set the desired Warning Level (%) by direct input or by using the up/down arrows.
7. After all tolerances have been set, click [OK]. A confirmation message will appear.
8. Click [Yes]. The tolerance settings will be applied and the Edit Target dialog will close.

- Return to *Quick Start Guide: Setting Tolerances on p. QS-10* .

■ Tolerance Auto Adjust

Tolerance Auto Adjust can be used to automatically adjust tolerances according to the samples linked to the target.

- [Tolerance Auto Adjust] will be enabled when at least 10 samples are linked to the target.

1. Click [Tolerance Auto Adjust]. The Tolerance Auto Adjust dialog will appear.
2. Select the Auto Adjust method to use
   Auto Adjust by difference equation
   - **2-1** Click [Auto Adjust by difference equation]. The Tolerance setting by difference equation dialog will appear.
   - **2-2** Select the Group Traits by clicking on the current setting and selecting from the drop-down list that appears.
   - **2-3** If the Condition selected in Group Traits is not selected, click on the checkbox next to the condition to enable setting tolerances for that condition.

2-4 Click on the checkbox next to each equation to automatically adjust tolerances for.

- Auto adjust by difference equation can be performed only for the following difference equations: ΔE*ab, ΔE00, ΔE*94, CMC.
- If multiple equations are selected, tolerances will be adjusted for each selected equation.
- To change the tolerance items shown in the table, click . The Item Setting dialog will open, with only the Color/Index and Spectral item categories shown. For information on selecting items, see *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .

2-5 If any of the color difference equations use parametric coefficients, the parametric coefficients can be set.

a) To adjust parametric coefficients automatically, select the color difference equation to adjust parametric coefficients for and click [Auto Adjust]. The parametric coefficients will be calculated based on the samples associated with the target to fit all samples within a color difference equation value of 1. If it is not possible to fit all samples within a color difference equation value of 1, the parametric coefficient will be set to the maximum value of 9.99.

b) To input parametric coefficients manually, select the color difference equation to adjust parametric coefficients for and click [Input Manually]. The Parametric coefficient (Manual Input) dialog will appear. Input the parametric coefficient value directly or use the up/down arrows to set the value, and click [OK].

2-6 Click [Adjust]. The tolerance for each selected color difference equation will be calculated based on the samples associated with the target to fit all samples within the tolerance and the ellipses for each calculated tolerance will be shown in the graphs on the right side of the dialog. If it is not possible to fit all samples into the maximum tolerance value of 20, the tolerance value will be set to 20.

2-7 If tolerances for multiple observer/illuminant conditions have been set, the graphs for each observer/illuminant combination can be checked by clicking on the Observer/Illuminant setting and selecting from the drop-down list that appears, and then clicking [Update graph].

2-8 Set the Warning Level by inputting the value directly or using the up/down arrows to set the value.

2-9 After all tolerances have been set, click [OK].

Auto Adjust by sample distribution

A tolerance ellipsoid that encloses all samples associated with the target can be calculated and set. This tolerance ellipsoid is not related to a specific color difference equation.

2-1 Click [Auto Adjust by sample distribution]. The Tolerance Auto Fitting from Sample distribution dialog will appear.

2-2 Select the Group Traits by clicking on the current setting and selecting from the drop-down list that appears.

2-3 Select the Observer and Illuminant by clicking on the current setting for each item and selecting from the drop-down list that appears.

2-4 Click [Run]. A tolerance ellipsoid that encloses all samples will be calculated and shown in the graphs and an Auto Adjust (*Observer/Illuminant*) item will be added to the tolerance items.

2-5 Set the Warning Level by inputting the value directly or using the up/down arrows to set the value.

2-6 Click [OK].

2.9.8.2 Editing Additional Information

1. To edit the additional information for a target, do either of the following:
   - Select the target for which to edit the additional information, select *Data - Edit Target - Edit Additional Information ...* .
   - Right-click on the target name and select *Edit Target - Edit Additional Information ...* .

   The Create Target Dialog will appear, with the Document Settings step shown.

2. To change data tags for the target:
   - To set a tag directly, click in the Data Tag box and input the desired tag directly. After input of a tag has been completed, press Enter on the computer keyboard. The background of the tag will change to light gray and an "x" will appear to the right of the tag.
   - To set a tag already used in the document as a default tag, click [+] to the right of the Data Tag box. A list of tags already used in the document will appear. Select the desired tag from the list. It will be added to the Tag box with a light gray background and an "x" will appear to the right of the tag.
   - To delete a tag from the Data Tag box, click on the "x" to the right of the tag.

3. To add a comment to the target or change the existing comment, click in the Comment box and input the desired comment.

4. To change the linked image or link a new image with the target, click [Set image]. The Edit image dialog will open.

   4-1 Click [Browse Image File]. The Open dialog will appear.

   4-2 Browse to the desired image and click [Open]. A preview of the image will appear in the Edit image area.
   - *.bmp, *.jpg, and *.png image files can be selected.

   4-3 To add a marker, click [Add marker]. A circular marker will appear on the image preview.
   - The Marker color and Marker thickness can be set using the corresponding controls.
   - The size and shape of the marker can be changed by clicking on the marker in the preview window and dragging the handles to the desired size/shape.
   - Only 1 marker can be set on the image.
   - To delete a set marker, click [Clear marker].

   4-4 Click [OK]. The image will be added to Additional information.
   - To delete a linked image, click [Clear image].

5. To add an item from a user defined list, click [Add] in the User Defined List area. The User Defined Information Settings dialog will open.

   5-1 Click on the user defined information list and select the desired item from the drop-down list that appears.
   - Only items which have previously been added to the User Defined Information List will be shown in the drop-down list. See *2.13 User Defined Information Settings* Ⓟ *on p. 171* .

   5-2 Click [OK]. The selected item will be added to the User Defined List.

   5-3 Select the added item and click on the Value for that item to set the desired value.

6. After all settings have been set as desired, click [Save] to save the changes.

7. Click [Close] to close the Create Target dialog.

2.9.8.3 Editing Sample Measurement Conditions

1. To edit the sample measurement conditions for a target, do either of the following:
   - Select the target for which to edit the additional information, select *Data - Edit Target - Edit Sample Measurement Conditions ...* .
   - Right-click on the target name and select *Edit Target - Edit Sample Measurement Conditions ...* .

   The Edit Target Dialog will appear, with the Sample Measurement Conditions step shown.
   - If you don't want to set the sample measurement conditions separately and want to use the target measurement conditions for sample measurements, set the On/Off slide button at the upper right off the dialog to Off.
   - To switch between tabs, click on the desired tab.
2. In the Measurement Conditions tab: Click on the current Instrument setting and select the desired instrument from the drop-down list that appears. The instruments in the list will be the instruments that are set as Usable Instruments for this document or which have already been used in this document.
3. Select the desired measurement conditions in the Measurement Conditions tab. The measurement conditions available will depend on the selected instrument. For information on measurement conditions, see p. 96.
4. In the Options tab, set the desired averaging conditions. For information on averaging settings, see *Measurement Options on p. 108* .
5. After all settings have been set as desired, click [OK] to close the Edit Target dialog.

2.10 Sample Measurements

2.10.1 Measuring a Sample

- Measurements can also be taken by performing interval measurements instead of performing the following procedure. See *2.8.5 Interval Measurements Ⓟ on p. 143* .

1. To take an absolute measurement, select Absolute or an absolute measurement in the Tree Window or Data List Window.
To take a color difference measurement, select the target to be associated with in the Tree Window or Data List Window.

2. To measure a sample, position the sample and instrument for measurement, and do any of the following:
- Click the Sample Measurement button in the toolbar.
- Click Sample Measurement or in the Instrument Window.
- Press F4.
- Select *Instrument - Measurement - Sample Measurement*.
- When using the Viewfinder function with a CM-36dG/CM-36dGV/CM-36d, CM-17d or CF-300, click [Sample Measurement] in the Viewfinder dialog. See *2.8.4 Viewfinder on p. 142* .
- Use the instrument measurement button after enabling Trigger Measurement (Sample). See *2.8.6 Instrument Trigger Mode (Remote Measurement) on p. 144* .
  - When using instrument trigger mode with a CM-17d, the SpectraMagic NX2 viewfinder function cannot be used. Instead, the viewfinder image can be seen on the instrument display by pressing the instrument's Viewfinder key or by holding the measurement button pressed for more than 0.5 s. Pressing the measurement button while the viewfinder image is displayed will take a measurement. If Save viewfinder image with measurement in Measurement Options is checked, the viewfinder image will be saved with the measurement.

3. The Measurement Data Setting dialog will appear.
- If *Show Measurement data settings dialog at time of measurement* in the *Default data name* category of Default Data Settings dialog is unchecked, the default name will be used and the Measurement Data Settings dialog will not be shown. The measurement will be taken immediately when any of the actions in step 1 is performed.

4. Fill in the desired information.
- To change default data name settings, click [Change default settings]. The Default Data Settings dialog will be shown, with the Default data name category selected.

5. Click [OK]. A measurement will be taken.
- Measurements will be taken according to the settings in the Measurement Conditions dialog.
- If Manual average method is set to Manual or SMC, the Manual averaging Measurement dialog will be shown. See *2.11 Setting Default Settings on p. 166* .

6. The measured data will be registered as sample data and added to the List Window.
- If Absolute or an absolute measurement was selected in step 1, the measurement will be registered as a sample measurement. If a target was selected in step 1, the measurement will be registered as a color-difference measurement associated with the selected target.
- To set the visual judgement results for the measurement, do one of the following:
  - In the Evaluation Window, click on the current setting of Visual Judgement and select the desired setting from the drop-down list that appears.
  - In the Data Property Window, select the Evaluation Result tab, click on the current setting of Visual Judgement and select the desired setting from the drop-down list that appears.

2.10.2 Auto Search Target (Closest Color Search) Ⓟ

- This function is available only when using a Professional Edition license.

Auto target search can be used to find targets within the document which are close to the sample measurement and meet other search criteria. The target to be associated with the measurement can then be selected from the list of those targets.

2.10.2.1 Setting Auto Search Criteria

1. Select *Data - Auto search target settings...* . The Closest Color Search Settings dialog will appear.

2. If the *Enable Closest Color Search* switch is not set to On, click on it to set it to On.
- To stop using closest color search, click on the *Enable Closest Color Search* switch to set it to Off.

3. Select Group Traits:

3-1 Click on the current setting in the upper Group Traits box and selecting the desired setting from the drop-down list that appears. The setting in the upper box will determine what settings are available in the lower box.

3-2 Click on the current setting in the lower Group Traits box and select the desired setting from the drop-down list that appears.

4. Select the Data Tag by clicking on the current setting and selecting the desired setting from the drop-down list that appears. The data tags shown in this list are all tags used by targets in the document. Tags used by samples will not be included.

5. Select the Color Equation to use for calculating the color difference for closest color search:

5-1 Click on the current Color Equation setting and select from the drop-down list that appears, or click Select another list item... at the bottom of the list to open the List Items Settings dialog.

5-2 Only color difference equations that can be used for closest color search will be shown. Selecting *Color/Index - Color Spaces & Equations* will provide a complete list of color difference equations that can be used. If a category which does not include such color difference equations is shown, no items will be shown in the Available Items list.

5-3 Only one color difference equation can be used. If the color difference equation in the Selected Items list is not the one you want to use, click [Delete] to remove the current item from Selected Items, select the color difference equation you want to use in Available Items, and click [Add] to add it to Selected Items.

5-4 Select the desired Observation Condition by selecting the current respective settings for Observer and Illuminant and selecting the desired setting from the drop-down list that appears.

5-5 If the Parameter tab is shown, click on that tab to open it and then set the desired parameters by using the up/down arrows or by directly inputting the value.

5-6 Click [OK] to confirm the setting and close the dialog.

6. Set the Threshold by using the up/down arrows or by directly inputting the value. Range: 0 to 20

7. Set the Number to Search (the maximum number of targets which will be shown in the list when a measurement is taken) by using the up/down arrows or by directly inputting the value. Range: 1 to 10

8. Click [OK] to confirm the settings and close the dialog.

2.10.2.2 Auto Search Target operation during measurements

When Auto Search Target is enabled and a measurement is taken, the measurement will be compared to all targets in the document according to the search criteria, and the results shown in a dialog with a list of targets meeting the search criteria shown in order of increasing color difference with graphs of spectral reflectance/reflectance difference and color difference for the target selected in the list. Select the target to be associated with the measurement from the list and click [OK].

- If there are no targets that meet the search criteria, the sample will be labeled an absolute measurement and will not be associated with any target.
- If there is only one target meeting the search criteria, a dialog stating that only one target has been found will be shown, and that target will be automatically selected and associated with the measurement.

2.10.3 Sample Target Association

2.10.3.1 Adding Associated Targets

1. Right-click on the sample and select *Associate with Target...* . The Associate with Target dialog will be shown, showing a list of targets already associated with the sample.
2. Select the target for the sample to associate with by clicking on the target list and selecting the desired target.
   - To maintain existing target associations and add a new one, check "Maintain associations".
     If "Maintain associations." is not checked, the current associated target will be removed and replaced with the new target association.
3. Click [OK]. The sample will be associated with the selected target and the Associate with Target dialog will close.
   - If the sample was originally taken as an absolute measurement, it will be changed to a color-difference measurement and will be displayed under the associated target in the Tree Window.
   - A sample can be associated with multiple targets by repeating the above procedure and selecting additional targets.

2.10.3.2 Removing an Associated Target

1. If Tree Window is not set to Classify by Target, click on to change the Target Window to Classify by Target.
2. In the Tree Window, do either of the following:
   - Click on the target whose association you want to remove from the sample so that the target and its associated samples are shown in the Data List Window.
   - Click ► next to the target whose association with the sample you want to remove to expand the list of samples associated with the target in the Tree Window.
3. In the Tree Window or Data List Window, right-click on the sample whose association with the target you want to remove and select *Remove association with Target ...* .A confirmation dialog will appear.
4. Click [OK]. The association with the target will be removed.
   - If the sample was associated with only this target, the sample will become an absolute data sample.
   - If the sample was associated with multiple targets, only the association with the target under which the sample was right-clicked on will be removed. Associations with other targets will not be changed.

2.11 Setting Default Settings

The default settings for data name, additional information, and tolerance can be set for each document.

2.11.1 Setting Default Data Name

1. Select *QC Settings - Default Data Settings - Default Data Name* from the popout menu. The Default data settings dialog will open, with the *Default data name* category selected.
2. A total of 5 default names each can be set for target and sample.
   - To change the default target name, click on the Target tab.
   - To change the default sample name, click on the Sample tab.
3. The first two names in the list are the default names supplied by SpectraMagic NX2. The text of these names cannot be changed.
   - For the first name, the initial number (the start value of the variable $N in the name) can be changed using the up/down arrow.
4. To change the text for the last 3 names, click on the radio button next to the name to enable it, and then click on the name text to edit it.
   - The meanings of the name variables ($N, $Y, $M, etc.) are shown in the right side of the dialog. These variables can be used in the name and will be replaced by the corresponding value when the name is used in a measurement. An example of how the name will look is shown in the Examples section of the dialog.
   - To set other default names, repeat steps 2 through 4.
5. To show the Measurement data settings dialog at the time of each measurement, check *Show measurement data settings dialog at time of measurement*.
   To not show the Measurement data settings dialog at the time of measurement, uncheck *Show measurement data settings dialog at time of measurement*.
6. When all settings have been set as desired, click [OK].
   - To apply the settings without closing the dialog, click [Apply].
   - To close the dialog without applying any changed settings, click [Cancel]. The dialog will be closed without applying any setting changes made since [Apply] was clicked or since the dialog was opened if [Apply] was not clicked.
   - To continue with setting default additional information or default tolerances, click on the corresponding category.
   - For setting default additional information, see *2.11.2 Setting Default Additional Information on p. 167* .
   - For setting default tolerance, see *2.11.3 Setting Default Tolerance on p. 168* .

2.11.2 Setting Default Additional Information

Default tags and user defined information can be set for the document.
Tags can be used for classifying and searching for data.
User defined information can be used to set additional items whose values will be input or selected with each measurement.

1. Select *QC Settings - Default Data Settings - Default Additional Information*. The Default data settings dialog will open, with the *Default additional information* category selected.
2. Setting Data Tags
   - To set a tag directly, click in the Data Tag box and input the desired tag directly. After input of a tag has been completed, press Enter on the computer keyboard. The background of the tag will change to light gray and an "x" will appear to the right of the tag.
   - To set a tag already used in the document as a default tag, click [+] to the right of the Data Tag box. A list of tags already used in the document will appear. Select the desired tag from the list. It will be added to the Tag box with a light gray background and an "x" will appear to the right of the tag.
   - To delete a tag from the Data Tag box, click on the "x" to the right of the tag.
3. Setting User Defined Information
   - To add a user defined information item, click [Add] and select the desired item from the list.
     - Only user defined information which has already been set can be added as default user defined information. See *2.13 User Defined Information Settings Ⓟ on p. 171* .
   - To delete a user defined information item, select the item in the list and click [Delete].
4. To show the Measurement data settings dialog at the time of each measurement, check *Show the measurement data settings dialog at time of measurement*.
   To not show the Data Name Settings dialog at the time of measurement, uncheck *Show the measurement data settings dialog at time of measurement*.
5. When all settings have been set as desired, click [OK].
   - To apply the settings without closing the dialog, click [Apply].
   - To close the dialog without applying any changed settings, click [Cancel]. The dialog will be closed without applying any setting changes made since [Apply] was clicked or since the dialog was opened if [Apply] was not clicked.
   - To continue with setting default additional information or default tolerances, click on the corresponding category.
   - For setting default data name, see *2.11.1 Setting Default Data Name on p. 166* .
   - For setting default tolerance, see *2.11.3 Setting Default Tolerance on p. 168* .

2.11.3 Setting Default Tolerance

The default tolerances to be used for all targets in the document can be set.

- Default tolerances which are set will be applied to all new targets created after default tolerances have been set, unless the target is created using the Create Target Wizard and different tolerances are set in the wizard.

1. Select *QC Settings - Default Data Settings - Default Tolerance*. The Default data settings dialog will open, with the *Default tolerance* category selected.
2. Select the Group Traits to set the default tolerance for. The settings shown in the Condition column will change according to the Group Traits setting.
3. To set the default tolerance for a Condition, check the checkbox next to the condition. When a condition is selected, the tolerance items for that condition will be enabled.
   - To change the tolerance items shown in the table, click . The Item Setting dialog will open, with only the Color/Index and Spectral item categories shown. For information on selecting items, see *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .
4. To set a default tolerance value, check the checkbox next to the value and set the value using the up/down arrows or by inputting the value directly.
   - The upper value is the + tolerance and the lower value is the - tolerance.
5. Repeat steps 2 to 4 to set all desired tolerances.
   - It is possible to set default tolerances for multiple Group Traits settings. When settings for multiple Group Traits have been set, the default tolerances applied to a target will be the tolerances for the group traits of the target.
6. Set the Warning Level (%) value using the up/down arrows or by inputting the value directly.
7. When all settings have been set as desired, click [OK].
   - To apply the settings without closing the dialog, click [Apply].
   - To close the dialog without applying any changed settings, click [Cancel]. The dialog will be closed without applying any setting changes made since [Apply] was clicked or since the dialog was opened if [Apply] was not clicked.
   - To continue with setting default additional information or default tolerances, click on the corresponding category.
   - For setting default data name, see *2.11.1 Setting Default Data Name on p. 166* .
   - For setting default additional information, see *2.11.2 Setting Default Additional Information on p. 167* .

2.12 Judgement Settings

How the software shows the results of judgement against tolerances, visual judgement, color assessment, and signal color indexes can be set.

1. Select *QC Settings - Judgement Setting...* The Judgement color settings dialog will appear.
2. Click on the category name in the left side of the dialog to select the category containing the settings to be changed. See below for the settings in each category.
3. Set the settings as desired.
4. Click [OK] to apply the settings and close the dialog.
   - To apply the settings without closing the dialog, click [Apply].
   - To close the dialog without applying changes, click [Cancel]. Any changes applied by clicking [Apply] will remain applied, but any changes made after clicking [Apply] will be canceled.

Judgement Color

■ Numerical Judgement

a) Set the Foreground Color and Background Color for how values will be shown for each judgement result (Pass, Fail, Warning) by clicking on the current color for each item and selecting the desired color from the color selection menu that appears.
b) The cell in the Example column will change to reflect the selected colors.

■ Total Judgement

a) Set the String to be shown for each judgement result (Pass, Fail, Warning) by clicking in the edit box for the current string and editing the string.
b) Set the Foreground Color and Background Color for how values will be shown for each judgement result (Pass, Fail, Warning) by clicking on the current color for each item and selecting the desired color from the color selection menu that appears.
c) The cell in the Example column will change to reflect the selected colors.

- To return all settings in this category to their default settings, click [Restore Default Settings].

Visual Judgement

Click on the radio button to select the desired setting:

Prefer Visual Judgement: Total Judgement Results will be the same as the visual judgement results.
Prefer Judgement using Tolerance: Total Judgement Results will be the same as the total results of tolerance-based judgement.
Judge from both Visual Judgement and Tolerance: Total Judgement Results will be the worse of visual judgement results and total results of tolerance-based judgement.
Examples:

Visual judgement results	Tolerance-based judgement results	Total judgement results
Fail	Pass	Fail
Pass	Warn	Warn

Color Assessment

a) To show only the evaluation text (for example, “Lighter”, “Darker”, etc.), make sure that “Display only evaluation text” is checked. To display the difference value in addition to the evaluation text (for example, “0.20 Lighter”, etc.), uncheck “Display only evaluation text”.

b) Set the Foreground Color and Background Color for how the results for color assessment items (Lightness, Saturation, a* Evaluation, etc.) will be shown by clicking on the current color for each item and selecting the desired color from the color selection menu that appears.

c) The cell in the Example column will change to reflect the selected colors.

- To return all settings in this category to their default settings, click [Restore Default Settings].

Signal Color Index

■ Signal Color Index

a) Set the String to be shown for each signal color judgement result (Within Range, Out of Range) by clicking in the edit box for the current string and editing the string.

b) Set the Foreground Color and Background Color for how values will be shown for each judgement result (Within Range, Out of Range) by clicking on the current color for each item and selecting the desired color from the color selection menu that appears.

c) The cell in the Example column will change to reflect the selected colors.

■ Judgement

a) To include the results of signal color index judgements in the Total Judgement, check “Include the result of the signal color index judgement in the total judgement”.

b) Then select which Signal Color Index judgements should be included in the Total Judgement by checking each Signal Color Index to include.

- Only Signal Color Indexes which have already been added to the List Items will be enabled and can be checked.

- To return all settings in this category to their default settings, click [Restore Default Settings].

2.13 User Defined Information Settings Ⓟ

- This function is available only when using a Professional Edition license.

User-defined information can be used to add information to measurements for further identifying measurements beyond the measurement name alone. Such information can be displayed in the Data List Window and in the Additional Info tab of the Data Property Window.

User Defined Information items are set at the document level, and must be set for the document before they can be added to measurements. Setting User Defined Information Items according to the following procedure adds the items to the document, and makes it possible for the items to be added to measurements at the time of measurement (when the measurement data setting screen is shown at the time of measurement) or afterwards in the Additional Info tab of the Data Property Window.

- To automatically add a User Defined Information item to the measurement at the time of measurement, set it as a Default User Defined Information after adding it to the document according to the following procedure.
- If the same User Defined Information Item will be used in multiple documents, it can be defined in the User Defined Information Master Database before performing the procedure below. See *2.16.2 Managing Master User Defined Information Ⓟ on p. 179* .

1. Select *QC Settings - User Defined Information Settings*. The User Defined Information Settings dialog will appear.

■ Adding items directly

2. To add items directly, click [Add New Item]. The User Defined Information Item Settings dialog will appear.

3. Input the desired item name.

4. Click on the current item type and select the desired type from the drop-down list that appears.

Numeric	Enables input of a numerical value for the item.
String	Enables input of a text string for the item.
List	Enables selecting from a predefined list (for example, a list of customer names, etc.) for the item.

5. When List is selected as the Item Type, the Selection List Items section will be enabled.

a) Input a list item in the text box.

b) Click [Add Item]. The list item will be added to the Item Name list.

c) Repeat a) and b) until all desired list items have been added.

- To delete a list item from the Item Name list, select the item to delete and click [Delete].

d) Select the default value by clicking on the Default value drop-down and selecting from the list that appears.

6. Click [OK]. The User Defined Information Items Setting dialog will close and the item will be added to the User Defined Information List.

7. Repeat steps 2 to 6 until all items to be added directly have been added.

8. Click [OK] to complete adding User Defined Information items to the document and close the dialog.

- To close the dialog without adding items, click [Cancel]. If [Apply] was clicked to confirm the addition of an item to the User Defined Information List, items added before [Apply] was clicked will be kept, but any items added after [Apply] was clicked will be canceled.

Adding items from the User Defined Information Database

2. Select the item to add from the User Defined Information Database list.
   - To see the details of an item in the User Defined Information Database list, select the item and click [View Details]. A dialog showing the details of the item, including when it was created, any explanatory comments, and if the Item Type is List, the selection list items.
   - Items in the User Defined Information Database cannot be edited here. To edit items in the User Defined Information Master, see *2.16.2 Managing Master User Defined Information Ⓟ on p. 179* .
   - To update the User Defined Information Database list with any changes that may have been made by others, click [Refresh]. The list will be updated.
3. Click [Add]. The selected item will be added to the User Defined Information Item list.
   - Items added to the User Defined information List from the User Defined Information Database will be indicated by a checkmark next to that item in the Database column.
   - It is not possible to add the same item from the User Defined Information Master twice.
   - If an item in the User Defined Information List which was added from the User Defined Information Database (and has a checkmark in the Database column) is selected in the User Defined Information Database list, the [Add] button label will change to [Update]. If [Update]is enabled (not greyed out), it means that the item in the User Defined Information Database has been changed. Click [Update] to update the item with the latest information from the User Defined Information Master.
4. Click [OK] to complete adding User Defined Information items to the document and close the dialog.
   - To close the dialog without adding items, click [Cancel]. If [Apply] was clicked to confirm the addition of an item to the User Defined Information List, items added before [Apply] was clicked will be kept, but any items added after [Apply] was clicked will be canceled.

Editing items in the User Defined Information List

2. Select the item to be edited in the User Defined Information List and click [Edit]. The User Defined Information Item Settings dialog will appear.
3. For User Defined Information items added directly, the Item Name can be edited.
4. For Item Type: List items:
   - To add an item to the Selection List items, input the desired item and click [Add item].
   - To delete an item from the Selection List items, select the item to delete in the Selection items List and click [Delete].
   - To select the default value, click on the Default value drop-down and select the desired value from the list that appears.
   - For Item Type: List items added from the User Defined Information Database, changes to the Selection List items will apply only to this document. The changes will not be applied to the User Defined Information Database. To make changes to the item in the User Defined Information Database, see *2.16.2 Managing Master User Defined Information Ⓟ on p. 179* .
5. After the item has been edited as desired, click [OK]. The User Defined Information Item Settings dialog will close and the changes will be applied to the User Defined Information List.
   - To close the User Defined Information Item Settings dialog without applying changes, click [Cancel].
6. Click [OK] to complete editing of User Defined Information items and close the dialog.
   - To close the dialog without adding items, click [Cancel]. If [Apply] was clicked to confirm the addition of an item to the User Defined Information List, items added before [Apply] was clicked will be kept, but any items added after [Apply] was clicked will be canceled.

2.14 User Equation Settings Ⓟ

- This function is available only when using a Professional Edition license.

User equations can be used to add your own equation using the values of items in the list items.

1. Select *QC Settings - User Equation Settings ...* . The User Equation Settings dialog will appear.

2. To add a new equation, click + above the equation list in the left part of the dialog.

3. The Select Input Method dialog will appear.

4. To input an equation by manual input:

4-1 Click [Manual Input]. A new equation will be added to the equation list with a default name, and the equation editing screen will be shown in the right side of the dialog.
- To edit an existing equation, select the equation to edit in the equation list in the left part of the dialog. The content of the existing equation will be shown in the equation editing screen in the right side of the dialog.

4-2 Click in the equation name textbox and input the desired equation name. This is the name that will be shown for the equation in the List Items list, List Items Window, etc.

4-3 The equation can be input directly in the equation text box, or by using the keyboard with numbers, parentheses, and mathematical functions below the equation text box.
- To add a measurement item such as L*, click the down arrow to the left of [Insert Item], select the desired item from the drop-down list that appears, and click [Insert Item].
- See *2.14.1 Mathematical Functions For User Equations on p. 174* for mathematical functions which can be used in user equations.
- If the desired measurement item is not currently shown in the drop-down list, click on "Select another list item ..." at the bottom of the drop-down list. The List Items Settings dialog will appear. Select the desired items to add to the drop-down list in Available Items and set desired parameters such as Observer Condition if necessary, click [Add] to add the items to Selected Items, and click [OK] to close the List Items Settings dialog and return to the User Equations Settings dialog. (For more information on measurement items, see *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .) Then click the down arrow to the left of [Insert Item], select the desired item from the drop-down list that appears, and click [Insert Item].
- See *2.14.2 Group Traits for User Equations on p. 175* for the characters used to set group traits for list items.
- To clear the equation text box entirely, click [CLR]. A confirmation dialog will appear. Click [Yes] to continue with clearing the equation text box, or [No] to cancel clearing.
- Measurement items in equations are enclosed in brackets []. When deleting an item, be sure to delete the entire item starting with [and ending with]. Do not delete only part of an item; doing so will result in a syntax error.
- Sample equations are shown in *2.14.3 Sample User Equations on p. 175* .

4-4 After inputting of the equation has been completed, click [OK]. A confirmation dialog asking whether to apply the edited contents will appear. Click [Yes] to apply the edited contents.
- To return to editing the equation without applying the edited contents, click [No].
- If [Cancel] is clicked instead of [OK], a confirmation dialog asking whether to cancel will appear. Click [Yes] to cancel any changes to the equation.

4-5 To save the equation to a file, click [Output] next to the equation name. The Save As dialog will appear. Browse to the folder in which to save the equation and click [Save]. The equation will be saved and the dialog will close.

4-6 When editing of the equation has been confirmed as completed, [Close] will be enabled.
- To add another equation, repeat steps 2 to 4-4.
- To copy an equation, select the equation in the equation list and click . The equation will be copied and given a default name.
- To delete an equation from the equation list, select the equation to delete and click . A confirmation dialog will appear. Click [Yes] to delete the equation or [No] to

cancel deletion.

4-7 To complete equation editing and close the dialog, click [Close].
- To close the dialog without saving the changes, click on the [x] in the upper right corner of the dialog.

To input an equation by loading from a previously saved file:

4-1 Click [Input from File]. The Open dialog will appear, showing a list of user equation (*.uedx2) files.

4-2 Select the file to load.

4-3 Click [Open]. The user equation will be loaded from the file and added to the user equation list,and the equation will be shown in the equation editing screen in the right side of the dialog.
- If a user equation with the same name as the file already exists in the user equation list, an error message will appear. It is not possible to load a file having the same name as an existing user equation.

4-4 To complete equation editing and close the dialog, click [Close].
- To close the dialog without saving the changes, click on the [x] in the upper right corner of the dialog.

2.14.1 Mathematical Functions For User Equations

The following functions can be used in user equations.

Command	Format	Meaning
+	A+B	Addition: $A + B$
-	A-B	Subtraction: $A - B$
*	A*B	Multiplication: $A \times B$
/	A/B	Division: A/B
^	A^B	A to the power of B: A^B
POW	POW(A,B)	A to the power of B: A^B
SQRT	SQRT(A)	Square root of A: $\sqrt{A}$
ABS	ABS(A)	Absolute value of A: $\lvert A \rvert$

Command	Format	Meaning
SIN	SIN(A)	Sine A: $\sin A$
COS	COS(A)	Cosine A: $\cos A$
TAN	TAN(A)	Tangent A: $\tan A$
ASIN	ASIN(A)	Arcsine A: $\sin^{-1} A$
ACOS	ACOS(A)	Arccosine A: $\cos^{-1} A$
ATAN	ATAN(A)	Arctangent A: $\tan^{-1} A$
EXP	EXP(A)	Exponent; *e* to the power of A: e^A
LN	LN(A)	Natural log of A: $\ln A$
LOG	LOG(A)	Log of A: $\log A$

2.14.2 Group Traits for User Equations

Group traits for measurement items can be specified if desired. The format is as follows:

[*Measurement item***{***Observer/Illuminant if applicable***}***Group trait***]**

- If no group trait is specified or if $0 *(None)* is set as the group trait, the group trait for the row in List View will be used.
- If no data for the specified group trait exists for the measurement, the data will be shown as "---".

Group trait	Format
(None)	$0
SCI	$SCI
SCE	$SCE
UV100	$UVF
UV0	$UVC
UVadj	$UVA
White	$WHT
Black	$BLK
25° *1	$25D
45° *1	$45D

Group Trait	Format
75° *1	$75D
-15°(L) *2	$-15DL
15°(L) *2	$15DL
25°(L) *2	$25DL
45°(L) *2	$45DL
75°(L) *2	$75DL
110°(L) *2	$110DL
-15°(R) *2	$-15DR
15°(R) *2	$15DR
25°(R) *2	$25DR

Group Trait	Format
45°(R) *2	$45DR
75°(R) *2	$75DR
110°(R) *2	$110DR
-15°(DP) *2	$-15DDP
15°(DP) *2	$15DDP
25°(DP) *2	$25DDP
45°(DP) *2	$45DDP
75°(DP) *2	$75DDP
110°(DP) *2	$110DDP

*1 CM-512m3A only
*2 CM-M6 only

2.14.3 Sample User Equations

To calculate average of L*(10deg/D65) SCI value and L*(10deg/D65) SCE value:

([L*{10/D65}$SCI]+[L*{10/D65}$SCE])/2

To calculate the value of ΔE*94(1:1:1)(10deg/D65) SCI cubed:

POW([dE*94(1,1,1){10/D65}$SCI],3)

2.15 Registering User Illuminants Ⓟ

- This function is available only when using a Professional Edition license.

When a user illuminant is defined, it is registered only in the currently active document.
To use the same user illuminant in multiple documents, upload it to the database after registration as described in step 5.
To use the user illuminant for standalone measurements with an instrument (CM-17d, CM-16d, CM-26dG, CM-26d, CM-25d, CM-25cG or CM-M6 only), write it to the connected instrument after registration as described in step 6.

1. Select *QC Settings - Register User Illuminant ...* . The User Illuminants dialog will appear.
2. To add a new user illuminant, click + above the illuminant list in the left part of the dialog. The Select method for defining illuminant dialog will appear.
3. Define the illuminant using one of the methods in the following sections:
   2.15.1 By measuring with illuminance meter on p. 176
   2.15.2 By inputting illuminant data manually on p. 177
   2.15.3 By reading illuminant data from the measuring instrument on p. 177
   *2.15.4 By reading illuminant data from an *.lr5 file on p. 178*
   2.15.5 By downloading illuminant data from the database on p. 178
4. To add another user illuminant, repeat steps 2 and 3 above.
5. To upload the user illuminant currently selected in the User Illuminant list to the User Illuminant Master database so that it can be used in other documents, click [Upload to the database].
6. To write the user illuminant currently selected in the User Illuminant list to the connected CM-17d, CM-16d, CM-26dG, CM-26d, CM-25d, CM-25cG or CM-M6 instrument, click [Write to the instrument].
7. To edit the name of the user illuminant currently selected in the User Illuminant list, click on the current User Illuminant name, edit the name as desired, and click [OK], and then click [Yes] in the confirmation dialog that appears.
8. To delete the user illuminant currently selected in the User Illuminant list, click and then click [Yes] in the confirmation dialog that appears.
9. After all desired user illuminants have been registered, click [Close]. A confirmation dialog will appear. Click [Yes] to complete registering user illuminants and close the dialog.

2.15.1 By measuring with illuminance meter

A light source can be measured with a Konica Minolta CL-500A and the spectral irradiance data set as a user defined illuminant.

1. Click [Measure with illuminance meter]. The Measure with illuminance meter dialog will open.
2. Click in the User Illuminant Name textbox and set the desired name.
3. Check that the CL-500A is connected and switched on, and click [Connect]. The software will connect with the CL-500A.
4. Aim the CL-500A toward the light source and click [Measure illuminant]. A single measurement of the light source will be taken and the measured irradiance will be shown in thee

Spectral irradiance data table and Spectral irradiance waveform graph.

5. If the data are acceptable, click [OK].A confirmation dialog will appear. Click [Yes] to add the user illuminant to the user illuminant list and close the dialog.
   - To return to the dialog without adding the user illuminant to the user illuminant list, click [No].
   - To overwrite the just-measured data with a new measurement, repeat the procedure from step 7.

2.15.2 By inputting illuminant data manually

1. Click [Input illuminant manually]. The Input illuminant manually dialog will appear.
2. Click in the User Illuminant Name textbox and set the desired name.
3. Set the spectral irradiance for each wavelength in the Spectral irradiance data table by clicking on the current value and inputting directly or by using the up/down arrows.
   - Range: 0.00 to 100.00
   - The Spectral irradiance waveform graph will be updated as each value is set.
4. When all values have been set as desired, click [OK]. A confirmation dialog will appear. Click [Yes] to add the user illuminant to the user illuminant list and close the dialog.
   - To close the dialog without adding the user illuminant to the user illuminant list, click [Cancel].

2.15.3 By reading illuminant data from the measuring instrument

If the connected CM-17d/CM-16d, CM-25cG, CM-26dG/CM-26d/CM-25d (firmware version 1.10 or later), or CM-M6 (firmware ver. 1.30 or later) contains user illuminant data, an illuminant can be created by reading the user illuminant data stored in the measuring instrument.

- For CM-17d/CM-16d, CM-25cG (firmware ver. 1.4 or later), CM-26dG/26d/25d (firmware ver. 1.5 or later), and CM-M6 (firmware ver. 1.4 or later, the instrument can have up to 3 user illuminants in memory. For CM-25cG (firmware ver. 1.3x or earlier), CM-26dG/26d/25d (firmware ver. 1.10 to 1.4x), or CM-M6 (firmware ver. 1.10 to 1.3x), the instrument memory can have only 1 user illuminant.

1. Click [Read illuminant data from the measuring instrument]. The Read illuminant data from the measuring instrument dialog will appear.
   - When using a CM-17d/CM-16d, a dialog for selecting the user illuminant data to read will appear before the Read illuminant data from the measuring instrument dialog will appear. The details of a selected instrument user illuminant data can be viewed by clicking [Show Detail]. Select the instrument user illuminant data to read and click [OK].
2. Click [Read stored data]. A confirmation message will appear.
3. Click [OK] to continue. The Select user illuminant data to read dialog will appear, showing a list of the user illuminants stored in the instrument.
   - When using a CM-25cG (firmware ver. 1.3x or earlier), CM-26dG/26d/25d (firmware ver. 1.10 to 1.4x), or CM-M6 (firmware ver. 1.10 to 1.3x), the list of instrument user illuminants will not be shown and the data for the single user illuminant stored in the instrument will be read into the Spectral irradiance data table and shown in the Spectral irradiance waveform graph. Continue with step 6.
4. Select the instrument user illuminant to read into SpectraMagic NX2.
   - To view the details of the selected instrument user illuminant, click [Show Detail].
5. Click [OK]. The dialog will close and the user illuminant data stored in the instrument for the selected number will be read into the Spectral irradiance data table and shown in the

Spectral irradiance waveform graph.

6. Click in the User Illuminant Name textbox and set the desired name.
   - To upload the read data to the database, click [Upload to the database].
7. Click [OK]. A confirmation dialog will appear.
8. Click [Yes] to add the user illuminant to the user illuminant list and close the dialog.
   - To close the dialog without adding the user illuminant to the user illuminant list, click [Cancel].

2.15.4 By reading illuminant data from an *.lr5 file

An illuminant can be created by reading user illuminant data stored in an *.lr5 file created using SpectraMagic NX.

1. Click [Read from .lr5 file]. The Read from .lr5 file dialog will appear.
2. Click in the User Illuminant Name textbox and set the desired name.
3. Click [Open]. The Open dialog will appear.
4. Browse to the *.lr5 file to read user illuminant data from and click [Open]. The user illuminant data stored in the instrument will be read into the Spectral irradiance data table and shown in the Spectral irradiance waveform graph.
5. After the values have been read, click [OK]. A confirmation dialog will appear. Click [Yes] to add the user illuminant to the user illuminant list and close the dialog.
   - To close the dialog without adding the user illuminant to the user illuminant list, click [Cancel].

2.15.5 By downloading illuminant data from the database

An illuminant can be created by reading illuminant data from the database.

1. Click [Download from Database]. The User Illuminants stored in the Database dialog will appear, showing a list of user illuminants stored in the database.
   - If no user illuminants are stored in the database, the list will be blank.
2. Select a user illuminant from the list.
   - To see the spectral irradiance data, spectral irradiance waveform, and comment for the selected user illuminant, click [Show Detail]. The User illuminant data (Detail) dialog will appear. Information in this dialog cannot be changed.
   - To copy spectral irradiance data shown in User illuminant data (Detail) dialog to the Windows clipboard, click [Copy].
3. Click [Read stored data]. The user illuminant data stored in the instrument will be read into the Spectral irradiance data table and shown in the Spectral irradiance waveform graph.
4. After the values have been read, click [OK]. A confirmation dialog will appear. Click [Yes] to add the user illuminant to the user illuminant list and close the dialog.
   - To close the dialog without adding the user illuminant to the user illuminant list, click [Cancel].

2.16 Managing Master Data

SpectraMagic NX2 uses a database to store master data for user illuminants and user-defined information so that they can be easily shared among documents.

2.16.1 Managing Master User Illuminants Ⓟ

- This function is available only when using a Professional Edition license.

User illuminants can be added to the master database from the User Illuminants dialog by clicking [Upload to the Database] when a user illuminant is selected.
Once user illuminants have been added to the master database, they can be managed as follows:

1. Select *QC Settings - Manage Master Data - Manage User Illuminant Master*. The User Illuminant Database dialog will appear, with a list of the user illuminants stored in the master database.
2. To refresh the list, such as when the user illuminant master has been edited, click [Refresh]. The user illuminant list will be refreshed.
3. To show the details of the selected user illuminant, click [Show Detail]. The User Illuminant Data (Detail) dialog will be shown, showing the spectral irradiance data, spectral irradiance graph, and comment of the user illuminant.
   3-1 To change the User Illuminant name, click in the name textbox and edit the name as desired.
   3-2 To change the Comment, click in the comment textbox and edit the comment as desired.
   - It is not possible to edit the Spectral irradiance data.

   3-3 To save changes and close the dialog, click [OK].
   - To close the dialog without saving changes, click [Cancel] instead of [OK].
4. To delete the selected user illuminant, click [Delete]. A confirmation dialog will appear. Click [Yes] to delete the selected illuminant or [No] to cancel deleting.
5. When all operations have been completed, click [Close] to close the dialog.

2.16.2 Managing Master User Defined Information Ⓟ

- This function is available only when using a Professional Edition license.

Master user defined information can be set to allow the same user defined information to be easily used in multiple documents. When master user information has been defined, it can be selected when setting user-defined items for the document. See *2.13 User Defined Information Settings Ⓟ on p. 171* .

1. Select *QC Settings - Manage Master Data - Manage User Defined Information Master*. The Manage User-defined Information Database dialog will appear, with a list of the user-defined information items stored in the master database.
2. To refresh the list, such as when the user-defined information master has been edited, click [Refresh]. The user-defined information list will be refreshed.
3. To add an item:
   3-1 Click [Add]. The User Defined Information Item Settings dialog will appear.

3-2 Click on the Item Name and input the desired item name.

3-3 Click on the current item type and select the desired type from the drop-down list that appears.

Numeric Enables input of a numerical value for the item.
String Enables input of a text string for the item.
List Enables selecting from a predefined list (for example, a list of customer names, etc.) for the item.

3-4 When List is selected as the Item Type, the Selection List Items section will be enabled.

a) Input a list item in the text box.

b) Click [Add Item]. The list item will be added to the Item Name list.

c) Repeat a) and b) until all desired list items have been added.

- To delete a list item from the Item Name list, select the item to delete and click [Delete].

3-5 Click on the Comment and input the desired comment. This comment can be viewed when setting document user-defined items.

3-6 Click [OK]. The User Defined Information Items Setting dialog will close and the item will be added to the User Defined Information table.

4. To edit an item:

4-1 Click on the item to edit in the User Defined Information table to select it and click [Edit]. The User Defined Information Item Settings dialog will appear.

4-2 To edit the Item Name, click on the current name and edit it.

- The Item Type cannot be edited.

4-3 If the Item Type is List, the Selection List Items section will be enabled and items can be added or deleted.

a) Input a list item in the text box.

b) Click [Add Item]. The list item will be added to the Item Name list.

c) Repeat a) and b) until all desired list items have been added.

- To delete a list item from the Item Name list, select the item to delete and click [Delete].

4-4 To edit the Comment, click on the current Comment and edit it.

4-5 Click [OK]. The User Defined Information Items Setting dialog will close and the item will be updated in the User Defined Information table.

5. To delete an item:

5-1 Click on the item to delete in the User Defined Information table to select it and click [Delete]. A confirmation dialog will appear.

5-2 Click [Yes] to delete the item.

- Click [No] to cancel deleting the item.

6. Click [Close] to close the dialog.

2.17 Instrument Environment Settings

2.17.1 Job Settings

- This function is available only for the CM-17d/CM-16d, CM-25cG (firmware ver. 1.2 or later) and CM-26dG/26d/25d.

The Job function enables workflows including texts and pictures to be predefined and stored on the instrument. These workflows can then be selected on the instrument and used for standalone measurement work. Up to 5 jobs can be stored on the instrument.

2.17.1.1 Creating/Editing a Job

Jobs can be defined only when an instrument is connected. When editing has been completed, the edited job will be saved back to the instrument when [OK] is pressed.

- When performing Job settings, communication via USB is recommended. Although Job settings can be performed via Bluetooth communication, it will take a longer time to transfer settings and images between the computer and instrument.

1. Select *Instrument - Instrument Environment Settings - Job Settings*. The list of jobs currently stored on the instrument will be read and the Job List dialog box will be shown.
   - The names in the Job List dialog are the names which are shown in the instrument's Job screen.
   - The names of jobs which have not been set yet will be shown as "---".
2. Select the job to be edited, and click [Edit]. The Job Settings dialog box will open.
   - If job settings exist for the selected job, those settings will be read from the instrument and shown.
3. Make the necessary settings in the Job Settings dialog box. See *2.17.1.3 Job Settings dialog box on p. 183* .
   - Settings can also be loaded from a file by clicking [Load] and specifying the file. See *2.17.1.3 Job Settings dialog box on p. 183* .
4. After all settings have been completed, click [OK]. A confirmation message will appear, asking whether to write the changes.
   - Settings can be saved to a file if desired by clicking [Save] and specifying the file name and location.
   - To close the Job Settings dialog box without saving the job to the instrument, click [Cancel] instead of [OK].
5. Click [Yes] to write the changes to the instrument and close the Job Settings dialog box.
6. Click [Close] in the Job List dialog box to close the dialog box.

2.17.1.2 Deleting a job from the instrument

1. With the instrument connected, select *Instrument - Instrument Environment Settings - Job Settings*. The list of jobs currently stored on the instrument will be read and the Job List dialog box will be shown.
   - The names in the Job List dialog are the names which are shown in the instrument's Job screen.
2. Select the job to be deleted, and click [Delete]. A confirmation message will appear.
   - It is not possible to select multiple jobs at once.
3. Click [Yes] to complete the deletion of the job from the instrument.
   - To cancel deletion of the job, click [No].
   - When a job is deleted, the targets used for that job will also be deleted from the job target memory area of the instrument.

2.17.1.3 Job Settings dialog box

1. Make the desired settings in each section of the dialog for each step.
2. When all settings for all steps have been completed, click [OK] to write the job to the instrument and close the dialog.

■ Setting the Job Name

Click in the Job name textbox and input the desired name for the job. This name will be shown in the Job screen of the instrument.

- Up to 20 alphanumeric characters can be used for the name.

■ Loading a job file

A previously saved job file containing job settings can be loaded by following the procedure below.

1. Click [Load]. The Open dialog box for opening a job file (extension: *.m17Job for CM-17d/CM-16d, *.m25cGJob for CM-25cG, *.m26job for CM-26dG/26d/25d) will be shown.
2. Browse to the job file to be opened, and click [Open]. The selected job file will be opened and the job settings loaded from the file will be shown in the Job Settings dialog box.
   - If the file was created using a different model or an instrument with newer firmware than the connected instrument, an error message may appear and the file may not be loaded in some cases.

■ Saving a job file

The settings and target data set for the job currently open in the Job Settings dialog box can be saved to a file for later use.

1. Click [Save]. The Save As dialog box for saving a job file (extension: *.m17Job for CM-17d/CM-16d, *.m25cGJob for CM-25cG, *.m26job for CM-26dG/26d/25d) will be shown.
2. Browse to the location to which the job file should be saved, input the desired job file name, and click the [Save]. The settings and target data set for the job currently open in the Job Settings dialog box will be saved to the specified file.

■ Enabling user to select whether or not to repeat job at end of job

1. To enable the user to repeat a job, put a check in the checkbox next to *"Ask whether to repeat the job after the last step"* at the bottom of the dialog by clicking on it if the checkbox is empty.
   - Clicking on the checked checkbox will remove the check and the popup will not appear after the last step when running the job.

Step List Area

The Step List Area is shown in the upper left of the dialog. This is the area where steps can be added, copied, deleted, and moved, and where steps can be selected for editing.
The steps are shown in the order in which they will be performed when the job is run on the instrument.

The type of each step is also shown. Two types of steps are available:

Operation: For performing a measurement.
Result: For displaying the results for the most recent measurement taken in an Operation step.

Steps can be selected by clicking on the step.
When a step is selected:

- The settings for the selected step will be shown in the Settings Area on the right side of the dialog and can be edited.
- A preview of how the step will be shown in the instrument screen is shown in the Preview Area.

■ Buttons

Adds a step below the currently selected step.

Copies the currently selected step and adds the copy to the bottom of the step list.

Deletes the currently selected step.

Moves the currently selected step up 1 space.

Moves the currently selected step down 1 space.

■ Adding a step

- Up to a maximum of 20 steps can be set for a job.
- The first step of a job must be an Operation step.

1. Click in the Step List Area. A dialog box asking whether the step should be an Operation step or Result step will appear.
   Operation: For performing a measurement.
   Result: For displaying the results for the most recent measurement taken in an Operation step.
2. Select the desired step type and click [OK]. The step will be added after the current last step in the Step List, and the settings for the selected step type will be shown in the Settings Area and can be edited.
   - For the available settings, see the following pages.

Editing an existing step

1. In the Step List, select the step to edit. The current settings for the selected step will be shown in the Settings Area and can be edited.
   - For the available settings, see the following pages.
   - It is not possible to edit the Image name or Keep aspect ratio setting after a job has been saved to the instrument. Changing the image selected in the image list or adding/deleting an image can be performed.

Copying a step

1. In the Step List, select the step to copy. The current settings for the selected step will be shown in the Settings Area.
   - It is not possible to select multiple steps at once.
2. Click . The selected step will be copied and added after the current last step in the Step List. The current settings for the selected step will be shown in the Settings Area and can be edited.
   - For the available settings, see the following pages.

Rearranging the order of steps

1. In the Step List, select the step to move up or down.
   - It is not possible to select multiple steps at once.
2. Click or button to move the step as desired. The step will be moved one row each time a button is clicked.
   - will be disabled when the selected step is the first step, and will be disabled when the selected step is the last step.

Deleting a step

1. In the Step List, select the step to delete.
   - It is not possible to select multiple steps at once.
2. Click . A confirmation message will appear.
3. Click [Yes] to complete the deletion of the selected step.
   - To cancel deletion of the step, click [No].

Settings Area (Operation Step Type)

Settings are applied to the step as soon as they are made, but they are not written to the instrument until [OK] at the bottom of the dialog is clicked after settings for all steps have been completed.

■ Button display settings

Whether or not Back (<< on instrument screen) or Next (>> on instrument screen) buttons will be shown on the instrument screen can be selected.
The button will be shown when the checkbox to the left of the button name is checked.
To switch between checked and unchecked, click on the checkbox.

- The button will be enabled only if a job step exists in the step list in the button direction. For example, Next will be enabled only if there is a step after the current step in the step list.

■ Image settings

The Image Settings section is used to set the image to show for an Operation step.

■ Adding an image to the image list

- The first row of the image list is “None” (to show no image in the instrument screen) and cannot be changed.
- The image list can include up to 10 images.
- The same image can be used for multiple steps.

1. Click [Add]. The Open dialog box for selecting images will be shown.

2. Browse to the desired *.bmp,*. jpg, *.jpeg, *.png , *.dib, *.jpe, or *.jfif image file and click [Open] to select the image and close the dialog.
- The image will be automatically resized, and the file name (without the extension) will be set as the default image name.
- If Keep aspect ratio is checked, the image will be resized and centered while keeping the height-to-width ratio of the original image.
  If Keep aspect ratio is not checked, the image will be stretched to 240 (w) x 128 (h).

3. To edit the Image name, click on the current name and edit as desired.

■ Specifying the image for the current Operation step

1. In the Image settings section, click on the circle next to the image to be used. It will change to a filled circle and a preview of the image will be shown in the instrument screen preview.
- To show no image for the step, click on the radio button in the first row (None).

■ Deleting an image from the Image Settings table

1. In the Image settings section, click on the circle next to the image to be deleted. It will change to a filled circle and a preview of the image will be shown in the instrument screen preview.

- It is not possible to select multiple images at once.
- It is not possible to delete the first row (None).

2. Click [Delete]. A confirmation message will appear.

3. Click [Yes] to complete the deletion of the selected image from the Image Settings table.
   - To cancel deletion of the image, click [No].

■ Comment settings

Input the comment to be shown in the instrument display for this step.
- Up to 100 alphanumeric characters can be input.

■ Target data information

Associate with target Select this setting when you want measurements taken for this operation step to be color difference measurements associated with a target. When this is selected, click [Select target data] to open the Target List for Job dialog to select the target to be associated with measurements. See *Target List for Job dialog on p. 189* .

Absolute measurements Select this setting when you want measurements taken for this operation step to be absolute measurements.

- Information such as Data name, Measurement mode, etc. in the Target data information section are those of the currently selected target. For absolute measurements, no values will be shown for the information.

■ Measurement data information

Set the Data name and measurement conditions to be used when taking sample measurements for this operation step.

Data name

Input the name to be attached to the measurement taken in this step.
- Up to 30 alphanumeric characters can be input.

Measurement Mode

Click on the currently selected item in the drop-down list to open the list and select the measurement mode to use for this step.

Color & Gloss (CM-26dG, CM-25cG only)
Color
Gloss only (CM-26dG, CM-25cG only)

Measurement Area

Click on the currently selected item in the drop-down list to open the list and select the measurement area to use for this step.

MAV(8mm)

SAV(3mm) (CM-17d, CM-26dG, CM-26d, CM-25cG only)

Specular Component (not shown for CM-25cG)

Click on the currently selected item in the drop-down list to open the list and select the specular component setting to use for this step.

SCI
SCE
SCI+SCE

• If "100% Full + 400nm cut" is selected for UV Settings, "SCI+SCE" cannot be selected.

UV Condition (not shown for CM-17d/CM-16d or CM-25cG)

Click on the currently selected item in the drop-down list to open the list and select the UV setting to use for this step.

100% Full
400nm cut
UV Adjust
100% Full + 400nm cut

• If "SCI+SCE" is selected for Specular Component, "100% Full + 400nm cut" cannot be selected.

Auto average times

Set the number of measurements to be automatically taken and averaged when the measuring button is pressed.

Settable range: *1* to *10*

• Auto average times and Manual average times can be combined.

Manual average times

Set the number of measurements to be taken and averaged for this step.

Settable range: *1* to *30*

• Auto average times and Manual average times can be combined.

■ Target List for Job dialog

■ Target list (left side of dialog)

1. To select the target to be used as the target to be used for this operation step, click on the circle next to the target so that it changes to a filled circle. The information for the target will be shown in the right side of the dialog.

- If a user illuminant has been written to the instrument, it is necessary to read that user illuminant data into the active document before the targets stored in the instrument can be read. See *2.15.3 By reading illuminant data from the measuring instrument on p. 177* .
- Clicking on the target row will also show the target information in the right side of the dialog but will not select the target as the target to be used for this operation step.
- The target list is shown in pages. The buttons under the list can be used to move between pages.

  [<<] Moves to the first page of targets.
  [<] Moves to the previous page of targets.
  [1], [2],... Moves to the page of targets specified by the number.
  [>] Moves to the next page of targets.
  [>>] Moves to the last page of targets.

2. Click [OK]. The Target List for Job dialog will close and the target which was selected will be set as the target for the operation step.

- The measurement conditions (Measurement Mode, Measurement Area, Specular Component, and UV Settings) of the selected target will be shown in the Target data information section, and will be automatically set as the settings for sample measurements the Measurement data information section.

Explanation of numbers in target list

If the connected instrument has firmware version 1.2 or later:

- The list of targets read from the instrument will include the targets in memory for job use (Jxxx) as well as the targets available for normal standalone use (xxxx) .
- On instruments with firmware version 1.2 or later, target memory is arranged as follows:

  Targets for normal standalone use: 1 to 1000

  Job targets: 20 target spaces (one for each job step) per job.

  CM-17d/CM-16d, CM-26dG/26d/25d:
  Job 1: J001 (Step 1 target) to 1020 (Step 20 target),
  Job 2: J021 (Step 1 target) to 1040 (Step 20 target),
  etc.

  CM-25cG:
  Job 1: J501 (Step 1 target) to 2520 (Step 20 target),
  Job 2: J521 (Step 1 target) to 2540 (Step 20 target),
  etc
- No target will be stored for a step and the memory space for that step will not be shown in the list of targets in the following cases:
  - If the step is a Result step.
  - If "Absolute" for absolute-value measurements is checked.

  For example, memory use for Job 2 with the following 6 steps on a CM-26dG would be as follows:

Step	Step type	Target memory
Step 1	Operation step	J021: Target data for step 1
Step 2	Results step	Not used, not shown
Step 3	Operation step with "Absolute" checked	Not used, not shown
Step 4	Results step	Not used, not shown
Step 5	Operation step	J025: Target data for step 5
Step 6	Results step	Not used, not shown

■ Target information (right side of dialog)

The right side of the dialog will show the information for the target selected in the target list.
This information is only for reference, and values cannot be changed.

Measurement data + Property tab

Measurement condition sub-tab

Shows measurement conditions of the selected target, such as Measurement Mode, Measurement Area, etc.

Property sub-tab

Shows properties of the selected target, such as Timestamp, Instrument Name, etc.

Measurement results section

Colorimetric Values/Indices

Shows the colorimetric values and indices for the selected target.
To change the items shown, click at the right end of the labels. The List Item Settings dialog will appear. See *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .

Spectral Graph

Shows the spectral graph for the selected target.
To see the numerical spectral data, click [Data]. The Spectral Data dialog will appear, showing the spectral data.
In the Spectral Data dialog, the spectral data can be copied by clicking on the start and end wavelengths and selecting the desired wavelength from the drop-down list that appears, and then clicking [Copy] . The spectral data for the selected range will be copied to the clipboard.

Tolerance tab

Shows the tolerances set for the target.

Group list tab

Shows the groups on the instrument to which the target belongs.

Settings Area (Result Step Type)

Settings are applied to the step as soon as they are made, but they are not written to the instrument until [OK] at the bottom of the dialog is clicked after settings for all steps have been completed.

■ Button display settings

Whether or not Back (<< on instrument screen) or Next (>> on instrument screen) buttons will be shown on the instrument screen can be selected.
The button will be shown when the checkbox to the left of the button name is checked.
To switch between checked and unchecked, click on the checkbox.

- The button will be enabled only if a job step exists in the step list in the button direction. For example, Next will be enabled only if there is a step after the current step in the step list.

■ Data view settings

Observer/Illuminant1, Observer/Illuminant2

Click on the currently selected item in the drop-down list to open the list and select the observer/illuminant combination to use for this step.

CM-17d/CM-16d, CM-26dG/CM-26d/CM-25d (firmware ver. 1.4 or later), CM-25cG (firmware ver. 1.4 or later):

2°/A	*2°/F8*	*2°/LED-BH1*	*10°/A*	*10°/F8*	*10°/LED-BH1*
2°/C	*2°/F10*	*2°/LED-RGB1*	*10°/C*	*10°/F10*	*10°/LED-RGB1*
2°/D50	*2°/F11*	*2°/LED-V1*	*10°/D50*	*10°/F11*	*10°/LED-V1*
2°/D65	*2°/F12*	*2°/LED-V2*	*10°/D65*	*10°/F12*	*10°/LED-V2*
2°/ID50	*2°/LED-B1*	*2°/User1*	*10°/ID50*	*10°/LED-B1*	*10°/User1*
2°/ID65	*2°/LED-B2*	*2°/User2*	*10°/ID65*	*10°/LED-B2*	*10°/User2*
2°/F2	*2°/LED-B3*	*2°/User3*	*10°/F2*	*10°/LED-B3*	*10°/User3*
2°/F6	*2°/LED-B4*		*10°/F6*	*10°/LED-B4*	*(None)*
2°/F7	*2°/LED-B5*		*10°/F7*	*10°/LED-B5*	

- "(None)" is shown and can be selected only for Observer/Illuminant2.

CM-26dG/CM-26d/CM-25d (firmware ver. below 1.4), CM-25cG (firmware ver. below 1.4):

2°/A	*2°/ID65*	*2°/F10*	*10°/A*	*10°/ID65*	*10°/F10*
2°/C	*2°/F2*	*2°/F11*	*10°/C*	*10°/F2*	*10°/F11*
2°/D50	*2°/F6*	*2°/F12*	*10°/D50*	*10°/F6*	*10°/F12*
2°/D65	*2°/F7*	*2°/User*	*10°/D65*	*10°/F7*	*10°/User*
2°/ID50	*2°/F8*		*10°/ID50*	*10°/F8*	*(None)*

- "(None)" is shown and can be selected only for Observer/Illuminant2.

Specular Component: (not shown for CM-25cG)

Click on the currently selected item in the drop-down list to open the list and select the specular component setting to use for this step.

SCI
SCE
SCI+SCE

- Measurement results can be calculated and shown in the instrument display only for Specular Component settings included in the Operation step for which results are being shown. For example, if the Operation step Specular Component setting was set to "SCI", even if the Results step Specular Component setting was set to "SCE" or "SCI+SCE", the SCE results will be shown as "---" in the instrument display.

■ Custom item settings

1: to 7:

Click on the currently selected item in the drop-down list to open the list and select the item to be shown in the instrument display for this step. The instrument display for this step will show the items selected for 1: to 7: in a single screen.

(None)	*X*	*ΔE*ab*	*ΔYI(ASTM D1925)*	*ΔCy-b(FMC2)*[*5]
*L**	*Y*	*CMC*	*Brightness(ISO 2470)*	*Δ8° gloss*[*6]
*a**	*Z*	*ΔE*94(CIE 1994)*	*ΔBrightness (ISO 2470)*	*Blackness(My)*[*7]
*b**	*Strength*[*1]	*ΔE00 (CIE 2000)*	*ΔE99o*	*ΔBlackness(ΔMy)*[*7]
*ΔL**	*Strength X*[*1]	*ΔEab(Hunter)*	*Grey Scale (ISO 105.A05)*[*1]	*Jetness(Mc)*[*7]
*Δa**	*Strength Y*[*1]	*MI(DIN)*	*8° gloss*[*3]	*ΔJetness(ΔMc)*[*7]
*Δb**	*Strength Z*[*1]	*GU*[*2]	*WI(Ganz)*[*4]	*Undertone(dM)*[*7]
*C**	*ΔX*	*ΔGU*[*2]	*ΔWI(Ganz)*[*4]	*ΔUndertone(ΔdM)*[*7]
h	*ΔY*	*WI(ASTM E313-73)*	*Tint(Ganz)*[*4]	*ΔE*94*(special)*[*6]
*ΔC**	*ΔZ*	*ΔWI(ASTM E313-73)*	*Tint diff.(Ganz)*[*4]	*Ravg_400-700 (mR)*[*8]
*ΔH**	*x*	*WI(CIE 1982)*	*K/S Strength(ΔE*)*[*5]	*Ravg_360-740 (mRf)*[*9]
L(Hunter)	*y*	*ΔWI(CIE 1982)*	*K/S Strength(Max Abs)*[*5]	*UserEquation1*
a(Hunter)	*Δx*	*Tint (CIE)*	*K/S Strength(Apparent)*[*5]	*UserClass1*
b(Hunter)	*Δy*	*ΔTint (CIE)*	*Stain Test(ISO105-A04)*[*5]	*UserEquation2*
ΔL(Hunter)	*Munsell Hue(JIS Z 8721 1964)*	*YI(ASTM E313-73)*	*FMC2*[*5]	*UserClass2*
Δa(Hunter)	*Munsell Value(JIS Z 8721 1964)*	*ΔYI(ASTM E313-73)*	*ΔL(FMC2)*[*5]	*UserEquation3*
Δb(Hunter)	*Munsell Chroma(JIS Z 8721 1964)*	*YI(ASTM D1925)*	*ΔCr-g(FMC2)*[*5]	*UserClass3*

- When "*(None)*" is selected, the item label will be shown as "---" in the instrument display and the values will be blank.

*1 CM-26dG/26d/CM-25d only

*2 CM-26dG, CM-25cG (firmware ver. 1.2 or later) only

*3 CM-17d/CM-16d, CM-26d/25d only

*4 CM-26dG/26d with firmware ver. 1.10 or later only. If Ganz & Griesser 4 or Ganz & Griesser 5 UV calibration has not been performed for the instrument, values for WI(Ganz), dWI(Ganz), Tint(Ganz), and ΔTint diff.(Ganz) will be shown as "---".

*5 CM-26dG/26d/CM-25d with firmware ver. 1.2 or later only

*6 CM-17d/CM-16d only

*7 CM-17d/CM-16d, CM-26dG/26d/CM-25d (firmware ver. 1.5 or later), CM-25cG (firmware ver. 1.4 or later) only

*8 CM-17d/CM-16d (firmware ver. 1.2 or later), CM-26dG/26d/CM-25d (firmware ver. 1.5 or later) only

*9 CM-26dG/26d (firmware ver. 1.5 or later) only

2.17.2 Writing User Illuminant to Instrument

- This function is available only for the CM-17d/CM-16d, CM-25cG (firmware ver. 1.2 or later), CM-26dG/26d/25d, and CM-M6 (firmware ver. 1.1 or later).

User illuminants can be written to the instrument and used for measurements.

- For CM-17d/CM-16d, CM-25cG (firmware ver. 1.4 or later), CM-26dG/26d/25d (firmware ver. 1.5 or later), and CM-M6 (firmware ver. 1.4 or later), up to 3 user illuminants can be stored on the instrument. For CM-25cG (firmware ver. 1.3x or earlier), CM-26dG/26d/25d (firmware ver. 1.10 to 1.4x), or CM-M6 (firmware ver. 1.10 to 1.3x), only 1 user illuminant can be written to the instrument.

1. Select *Instrument - Instrument Environment Settings - Write User Illuminant ...* .The Document User Illuminants dialog will appear, showing a list of the user illuminants in the document.

2. Select the illuminant to write to the instrument in the list.
- To view the details (spectral data and graph) of the selected illuminant, click [Show Detail].

3. Click [OK]. A dialog for selecting the destination instrument user illuminant number will appear.
- When using a CM-25cG (firmware ver. 1.3x or earlier), CM-26dG/26d/25d (firmware ver. 1.10 to 1.4x), or CM-M6 (firmware ver. 1.10 to 1.3x), a confirmation dialog will appear instead of the dialog for selecting the destination instrument user illuminant number. Continue with step 6.

4. Select the desired destination instrument user illuminant number.
- To view the details (spectral data and graph) of the selected instrument user illuminant, click [Show Detail].

5. Click [OK]. The dialog for selecting the destination user illuminant number will close and a confirmation dialog will appear.

6. Click [Yes] to write the illuminant to the instrument. A message confirming that the illuminant has been written will appear.
- To cancel writing the illuminant to the instrument, click [No]. The software will return to the Document User Illuminants dialog.

7. To write additional user illuminants to the instrument, repeat steps 2 through 6.

8. Click [OK] to close the message. The Document User Illuminants dialog will also be closed.

2.17.3 User Index Settings (CR-400 series only)

- This procedure is available only for CR-400 series instruments. For other instruments which have user index functions, use Configuration Tool CM-CT1.

1. Select *Instrument - Instrument environment settings - User Index Settings ...* . The User Index dialog will appear.
2. Select the User Index to set by clicking on it and then click [Edit]. The User Index Setting dialog will appear.
3. Input the User Index Name.
4. Input the User Index Formula using the on-screen keyboard or the computer keyboard.
5. To use measurement values in the formula, click on the combo box to the left of [Insert Item] and select the desired measurement value from the drop-down list that appears, and then click [Insert Item].
6. To set User Class:
   - **6-1** Set the User Class Number by inputting the value directly or by clicking the up/down buttons to change the value. If classes will not be used, set the value to 0 or delete the value.
   - **6-2** Input the Threshold value for each class by the value directly or by clicking the up/down buttons to change the value. Thresholds for each class must be less than the threshold for the next higher class.
   - **6-3** Input the Class name for each class.
7. Click [OK] to write the User Index to the instrument and close the dialog.

2.17.4 Instrument Settings (CR-400 series only)

- This procedure is available only for CR-400 series instruments. For other instruments which have standalone settings, use Configuration Tool CM-CT1.

1. Select *Instrument - Instrument environment settings - Instrument Settings ...* . The Instrument Settings dialog will appear.
2. Set each instrument setting as desired.
   - **2-1** For instrument settings selectable by radio button, click on the desired setting.
   - **2-2** For numerical instrument settings, input the value directly or click the up/down buttons to change the value.
   - **2-3** For instrument settings with checkboxes, click on the setting to switch between checked and unchecked.
   - **2-4** For instrument settings with combo boxes, click on the combo box and select the desired setting from the drop-down list that appears.
   - **2-5** Light source cannot be changed if calibration has already been performed or if the instrument memory contains measurements. If Light source needs to be changed, initialize the instrument (all data will be deleted). See *2.17.5 Instrument Initialization (CR-400 series only) on p. 195* .
   - **2-6** To set the date and time to the same date and time as the computer, click [Set to PC date and time].
3. Click [OK] to write the settings to the instrument and close the dialog.

2.17.5 Instrument Initialization (CR-400 series only)

Instrument initialization is necessary if the instrument's light source needs to be changed. Changing the instrument light source is not possible if the instrument memory contains measurement data.

1. Select *Instrument - Instrument environment settings - Instrument initialization ...* . A confirmation message will appear.
   - WARNING: Instrument initialization deletes all data from the instrument memory. Continue only if you are sure that deleting data is acceptable.
2. To continue with initialization, click [OK]. Instrument initialization will be performed.

2.18 Instrument Memory Functions

2.18.1 Reading Samples

- This function is available only when a document is open and a CM-26dG/CM-26d/CM-25d/CM-23d, CM-25cG, CM-17d/CM-16d, CM-M6, CM-5/CR-5, CM-700d/CM-600d/CM-700d-U, CM-2600d/CM-2500d, CM-2500c, CM-512m3A, CR-400/CR-410, or DP-400 is connected.

1. Select *Instrument - Read/Write - Read Samples ...* . The Read Samples dialog will appear.
- If a user illuminant has been set on the instrument, the user illuminant must be read into the document before reading samples can be performed. See *2.15.3 By reading illuminant data from the measuring instrument on p. 177* .

2. The Read Samples dialog will appear.

3. Set the desired range for Data to Read.
- **All data**: All data stored in the instrument.
- **Today's data**: Data measured on the current date
- **Time period**: Data between the initial date and end date. Set the initial date and end date by clicking on the calendar icon at the right of the date and select the desired date on the calendar that appears.
- To show a list of the data matching the set range so that you can select specific data to upload, check Check details before adding to the document. If Check details before adding to document is not checked, all data matching the set range will be uploaded to the document when [OK] is clicked.

4. Set the desired Option settings.
- Set additional information for all samples: The Set Additional Information dialog for setting additional information for all data being uploaded will be shown before data are uploaded.
- Delete the registered Samples from the measuring instrument: When data are uploaded, they will be deleted from the instrument.
  - Not selectable when using CM-2600d/2500d or CR-400/CR-410/DP-400
- Do not register Samples which are already in the document (Not shown for some instruments): If a sample with the same information already exists in the document, it will not be registered.

5. After settings have been set as desired, click [OK]. If both Check details before adding to the document and Set additional information for all samples were not checked, the samples matching the set range will be read into the document, together with any associated targets, and the dialog will close..

6. If Check details before adding to the document was checked, the Read Samples dialog will appear, showing a list of samples and associated targets in the instrument's memory.
- Targets with no associated samples will not be shown.

6-1 To show all data categorized into targets and samples, click . Clicking the triangle next to Target will open the target list, and selecting a target will show only the samples associated with that target.
To show data classified by target, click . Clicking the triangle next to Target will open the target list, and selecting a target will show only the samples associated with that target.

6-2 To select data to read into the document, check the checkbox next to each desired sample. To select all samples, check the checkbox at the top of the list. Unchecking the checkbox at the top of the list after it has been checked will uncheck all samples.

6-3 If you want to delete the checked samples from the instrument after reading them into the document, check Delete the registered Samples from the measuring instrument.

6-4 After all desired samples have been checked, click [OK]. If Set additional information for all samples was not checked, the selected samples will be read into the document, together with any associated targets, and the dialog will close.

7. If Set additional information for all samples was checked, the Set Additional Information dialog will appear.
- Information which is set will be added to all uploaded samples and targets.

7-1 To set data tags:
- To set a tag directly, click in the Data Tag box and input the desired tag directly. After input of a tag has been completed, press Enter on the computer keyboard. The background of the tag will change to light gray and an "x" will appear to the right of the tag.
- To set a tag already used in the document as a default tag, click [+] to the right of the Data Tag box. A list of tags already used in the document will appear. Select the desired tag from the list. It will be added to the Tag box with a light gray background and an "x" will appear to the right of the tag.
- To delete a tag from the Data Tag box, click on the "x" to the right of the tag.

7-2 To set user defined information, click [Add] in the User Defined Information area. The User Defined Information Settings dialog will open.
- **a)** Click on the user defined information list and select the desired item from the drop-down list that appears.
- **b)** Click [OK]. The selected item will be added to the User Defined List.
- **c)** Select the added item and click on the Value for that item to set the desired value.

7-3 After additional information has been set as desired, click [OK]. The samples will be read into the document, together with any associated targets, and the dialog will close.

2.18.2 Writing Targets

Targets in the document can be written to the instrument.

1. Select *Instrument - Read/Write - Write Target ...* . The Write Target to Instrument dialog will appear, showing a list of targets in the document.
- Available memory shows how much of the instrument memory is already used.

2. Click on the checkbox next to a target to select it for download. When a target is selected, the information for that target will be shown in the target information area on the right side of the dialog.
- Selecting the target row without checking the checkbox will also show the information for that target but will not select that target for download.
- To select all targets for download, check the Select All checkbox. When Select All is checked, the right side of the dialog will show the information for the most recently selected target.
- If the target has already been written to the instrument, a dialog asking whether to write the target as a different target on the instrument will be shown.

3. In the **Destination** tab, set the Target Number on the instrument by inputting a value directly or by using the up/down arrows.
- If target data already exists on the instrument for the selected target number, it will be overwritten when the target is written to the instrument.
- To check whether target data already exists on the instrument for the set target number, click [Check]. If target data already exists for that number on the instrument, the information for that target will be read from the instrument and displayed.
- A different destination number should be set for each target to download.

4. In the **Measurement data + Property** tab, check the information for the selected target.
- The information and data shown in this tab and its sub tabs are for reference and cannot be changed, although the items shown for Colorimetric values/Indices can be changed.

5. In the **Tolerance Settings** tab, set the tolerances that will be set for the selected target when it is written to the instrument.
   - If the instrument's default tolerance items are the same as the target tolerance items in the document, the target tolerance values of the document will be set. Otherwise, the initial values are the instrument's default tolerances.

   For instruments other than CR-400 series:

   5-1 Enable/disable tolerance settings by clicking on the checkbox next to each tolerance.

   5-2 Set the tolerance values by directly inputting a value or by using the up/down arrows.
   - When two tolerance values are shown in a column, the upper value is the positive tolerance value and the lower value is the negative tolerance value.
   - To change the tolerance items, click / at the right end of the labels. The List Item Settings dialog will appear. Only difference values will be shown.
   - Tolerances can be set only for items which allow tolerance setting on the instrument. If an item selected in the List Items Settings dialog is not available on the instrument, a warning message will appear when [OK] is clicked in the List Items Settings dialog and that item will not be set in the tolerance table.

   For CR-400 series instruments:

   5-1 Select the Color space / Equation / Custom index by clicking on the combo box and selecting from the drop-down list that appears.

   5-2 Select the Tolerance Judgement Method by clicking on the combo box and selecting from the drop-down list that appears. Available settings: "Elliptical type", "Box type", "ΔE*", "Box type, ΔE*", or "None"

   5-3 Set the tolerance values by directly inputting a value or by using the up/down arrows.
   - When two tolerance values are shown in a column, the upper value is the positive tolerance value and the lower value is the negative tolerance value.
   - Tolerances can be set only for items which allow tolerance setting on the instrument. If an item selected in the List Items Settings dialog is not available on the instrument, a warning message will appear when [OK] is clicked in the List Items Settings dialog and that item will not be set in the tolerance table.

6. In the **Group list** tab, set the groups on the instrument that the target will be attached to by clicking on a current group name and selecting the desired group from the drop-down list that appears.
   - Selecting the blank top row in the drop-down list will attach the target to no group.
   - The **Group list** tab will be shown only for instruments that support groups in instrument memory.

7. Repeat steps 2 to 6 for all targets to be downloaded.

8. Click [Write]. The selected targets will be written to the instrument and the dialog will close.
   - If Target Number on the instrument has not been set for one or more of the selected targets, a dialog asking for the initial destination to write to will appear. Targets for which no Target Number on the instrument was set will be written to the instrument for sequential target numbers starting with the initial destination which was set. Targets for which Target Number on the instrument was set will be written to the set target number on the instrument.
   - To cancel writing targets to the instrument, click [Cancel] instead of [Write].

■ Target information area (right side of dialog)

Destination tab

Target Number on the instrument

Select the target number on the instrument in which to write the target.

Measurement data + Property tab

Measurement condition sub-tab

Shows measurement conditions of the selected target, such as Measurement Mode, Measurement Area, etc.

Property sub-tab

Shows properties of the selected target, such as Timestamp, Instrument Name, etc.

Measurement results section

Colorimetric Values/Indices

Shows the colorimetric values and indices for the selected target.

To change the items shown, click / at the right end of the labels. The List Item Settings dialog will appear. See *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .

- When using a CM-23d, if the selected target includes manually input Hunter Lab values, those values will be automatically converted to L*a*b* values when the target is written to the instrument.

Spectral Graph

Shows the spectral graph for the selected target.

To see the numerical spectral data, click [Data]. The Spectral Data dialog will appear, showing the spectral data.

In the Spectral Data dialog, the spectral data can be copied by clicking on the start and end wavelengths and selecting the desired wavelength from the drop-down list that appears, and then clicking [Copy] . The spectral data for the selected range will be copied to the clipboard.

Tolerance tab

Shows the tolerances that will be set for the target when it is written to the instrument.

- The initial values are the instrument's default tolerances, not the tolerances set for the target in the document.
- Tolerance settings can be enabled/disabled by clicking on the checkbox next to each tolerance.
- The tolerance values can be changed by directly inputting a value or by using the up/down arrows.
- When two tolerance values are shown in a column, the upper value is the positive tolerance value and the lower value is the negative tolerance value.
- To change the tolerance items, click / at the right end of the labels. The List Item Settings dialog will appear. Only difference values will be shown.
- Tolerances can be set only for items which allow tolerance setting on the instrument. If an item selected in the List Items Settings dialog is not available on the instrument, a warning message will appear when [OK] is clicked in the List Items Settings dialog and that item will not be set in the tolerance table.
  - When using a CM-23d, tolerances cannot be set for the following items: dL(Hunter)/da(Hunter)/db(Hunter)/dEab(Hunter), dE99o, dWI(CIE 1982), Tint diff.(CIE), dYI(ASTM E313-73), Brightness diff.(ISO 2470), Strength/Strength X/Strength Y/Strength Z, Grey Scale

Group list tab

Select the target groups on the instrument to add the target to by clicking on the current setting and selecting the group from the drop-down list that appears.

To edit groups on the instrument, click [Edit Group]. A list of target groups on the instrument will be shown. Edit the group names as desired and click [OK]. Changes to group names will be written immediately to the instrument.

2.18.3 Reading/Editing Target

The tolerance values of targets stored in the instrument can be edited and the targets can be read into the document.

1. Select *Instrument - Read/Write - Read/Edit Target ...* .

2. The Edit Target dialog will appear, showing a list of targets stored in the instrument.
- The target list is shown in pages. The buttons under the list can be used to move between pages.

[◄◄] Moves to the first page of targets.
[◄] Moves to the previous page of targets.
[1], [2],... Moves to the page of targets specified by the number.
[►] Moves to the next page of targets.
[►►] Moves to the last page of targets.

3. To see a target, click on it in the list. Information for the target will be shown in the right side of the dialog.

4. To delete the selected target, click [Delete].

5. To change the target name, click on the current name and edit it.

6. When the Measurement Data and Property tab is selected, the measurement conditions (when Measurement condition tab is selected) or properties (when Property tab is selected) and measurement results will be shown.
- Information and data values in the Measurement data and Property tab are for information only, and cannot be edited.
  - The items shown in the Colorimetric Values/Indexes table can be changed by clicking / at the upper right of the table. The Item Setting dialog will open, with only the Color/Index and Spectral item categories shown. For information on selecting items, see *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .
  - To see the spectral data for the target, click [Data]. The Spectral Data dialog will appear. Click on the tab for each group trait to see the data for each group trait.
    - Spectral data are not available when using a CR-5 or CR-400/CR-410.

7. When the Tolerance tab is selected, the tolerance values set on the instrument can be edited.
<u>For instruments other than CR-400 series:</u>

7-1 To set the tolerance for a Condition, check the checkbox next to the condition. When a condition is selected, the tolerance items for that condition will be enabled.

7-2 To set a tolerance value, check the checkbox next to the value and set the value using the up/down arrows or by inputting the value directly.
- The upper value is the + tolerance and the lower value is the - tolerance.

7-3 Repeat steps 5-1 and 5-2 to set all desired tolerances.

7-4 To set parametric coefficients, click [Parametric coefficient settings]. The Parametric Coefficient Settings dialog will appear. Set the desired coefficient values by using the up/down buttons or by inputting the value directly. When all values have been set as desired, click [OK].

<u>For CR-400 series instruments:</u>

7-1 Select the Color space / Equation / Custom index by clicking on the combo box and selecting from the drop-down list that appears.

7-2 Select the Tolerance Judgement Method by clicking on the combo box and selecting from the drop-down list that appears. Available settings: “Elliptical type”, “Box type”, “ΔE*”, “Box type, ΔE*”, or “None”

7-3 Set the tolerance values by directly inputting a value or by using the up/down arrows.

- When two tolerance values are shown in a column, the upper value is the positive tolerance value and the lower value is the negative tolerance value.
- Tolerances can be set only for items which allow tolerance setting on the instrument. If an item selected in the List Items Settings dialog is not available on the instrument, a warning message will appear when [OK] is clicked in the List Items Settings dialog and that item will not be set in the tolerance table.

8. To save changes to the instrument, click [Register].

9. To discard changes without saving them to the instrument, click [Discard].

10. To read a target from the instrument into the document, check the checkbox next to the target name and click [Register].
- To select all targets for reading into the document, check the Select All checkbox.

11. When all desired actions have been completed, click [Close] to close the dialog.

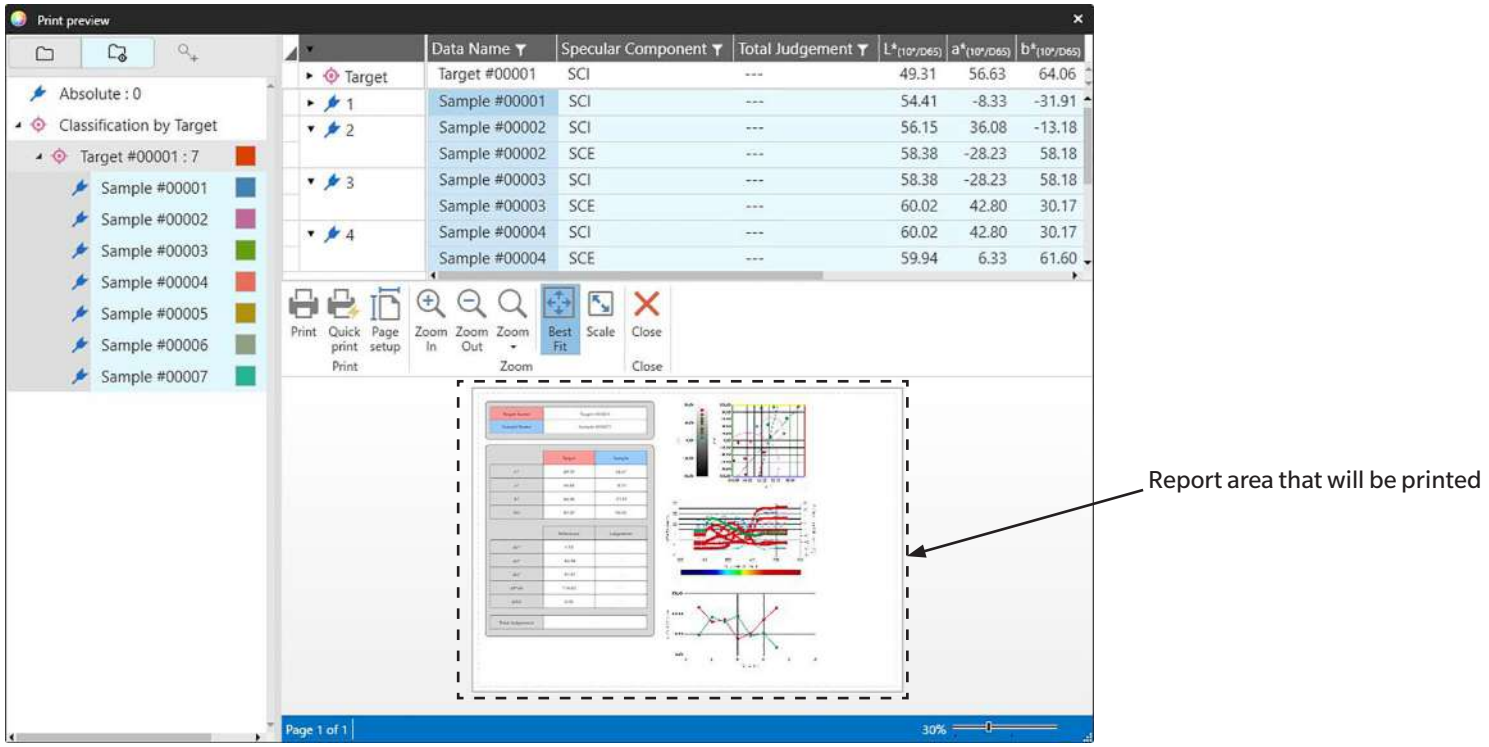
2.19 Printing

2.19.1 Printing Report

The currently active canvas window can be printed out as a report.

1. Select File - Print Report ... . The Print Preview dialog will appear, showing a preview of the report to be printed in the lower part of the right side.
2. Select the data to include in the report using the standard tree window and data list window operations.
3. Use [Scale] to scale the report to fit on a specified number of pages or to scale it to a specific percentage.
4. After the report display has been set as desired, click [Print]. The standard Windows Print dialog will open, showing the currently selected printer and various print settings.
   • Clicking [Quick Print instead of [Print] in the Document Preview dialog box will bypass the Windows Print dialog and start printing immediately.
5. After checking settings and making any necessary changes, click [Print] in the standard Windows Print dialog.

■ Print Preview dialog



[Print]	Opens standard Windows Print dialog.
[Quick print]	Bypasses Windows Print dialog and prints at current settings.
[Page setup]	Opens Page Settings dialog.
[Zoom In]	Increases magnification of preview image.
[Zoom Out]	Decreases magnification of preview image.
[Zoom ▼]	Opens drop-down list of magnifications for preview image.
[Best Fit]	Fits entire printout preview image to preview window.
[Scale]	Opens the Scale dialog for setting the report scale to fit on a specific number of pages horizontally or vertically, or for setting a specific scale percentage to adjust to.
[Close]	Closes preview without printing.

2.19.2 Printing Data List

The contents of the Data List Window can be printed out.
Printer settings (orientation, size, and margins) can be set in the Print DataList Settings dialog box.

2.19.2.1 Data List Printing Settings

The paper orientation, size, and margins should be set before printing the data list.

1. Select *File - Print DataList - Print Settings ...* . The Print DataList Settings dialog will appear.
2. Select the desired ***Orientation*** (*Vertical* or *Horizontal*) by clicking on the corresponding radio button.
3. Select the desired ***Size*** by clicking on the current setting and selecting the desired paper size from the drop-down list that appears.
   - Be sure to select a paper size that is supported by the printer.
4. Set the desired ***Margins*** by inputting each value directly or by using the up/down arrows next to each value.
5. After all settings have been set, click [OK] to apply the settings and close the dialog.
   - To apply the settings without closing the dialog, click [Apply].
   - To close the dialog without applying the settings, click [Cancel] instead of [OK]

2.19.2.2 Data List Print

1. Select *File - Print DataList - Print ...* . The Print dialog will appear, showing a preview of the first page of the printout.

2. To view previews of other pages, input the desired page number directly or use the arrow buttons.
Go to first page.
Go to previous page.
Go to next page.
Go to last page.

3. Select the ***Printer*** by clicking on the current printer and selecting the desired printer from the drop-down list that appears.
- Printer preferences set by clicking [Preferences] and making settings in the dialog that appears will not be applied.

4. Select the ***Number of copies*** to print by inputting the value directly or by using the up/down arrows next to the value.
- If collation is desired when printing more than 1 copy, click on the ***Collate*** checkbox to select it if necessary,

5. Select the Page range by clicking on the corresponding radio button to select it.

All pages	All pages will be printed.
Current	Only the current page will be printed.
Some pages	The specified range of pages will be printed. Pages to print can be specified as single page numbers or a range of pages (n-n). Multiple pages/page ranges can be specified by separating them with a comma.

6. After all settings have been completed, click [OK] to print.

2.19.3 Printing with Serial Printer

A serial printer can be used to print out measurement data on demand or automatically after each measurement.
The data to be printed out and the format of the printout (header/footer content) as well as printer communication settings can be set in the Serial Printer Settings dialog box.

2.19.3.1 Serial Printer Settings

Before printing to a serial printer, it is necessary to set the printer settings and what should be printed.

1. Select *Tool - Printing to Serial Printer - Settings ...* . The Serial Printer Settings dialog will appear.

2. Print Settings

2-1 Set the port to which the printer is connected by clicking on the current setting for Printer port and selecting the desired setting from the drop-down list that appears.

2-2 To print a test page, click [Print].

2-3 To automatically print after each measurement, check *Print after Measurement*.

3. Header

3-1 To print a header, check the checkbox next to the header textbox. The header textbox and header No. will become active.
- Formats for header variables are shown in the lower left of the dialog.

3-2 If $N is included in the header, set the desired start number in No. by inputting a value directly or by using the up/down arrows.

4. Footer

4-1 To print a footer, check the checkbox next to the footer textbox. The footer textbox and footer No. will become active.
- Formats for footer variables are shown in the lower left of the dialog.

4-2 If $N is included in the footer, set the desired start number in No. by inputting a value directly or by using the up/down arrows.

5. Items to Print

5-1 To change the items which will be available in the drop-down lists, click [Settings]. The List Item Settings dialog will appear. See *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .

5-2 To print target data as well as measurement data:
a) Check *Print Target*. The drop-down lists in the Target section will become active.
b) Click on the current item setting and select the desired item in the drop-down list that appears.
c) Repeat step b) for the remaining items in the Target section.

5-3 To select the items to print for measurement data:
a) Click on the current item setting and select the desired item in the drop-down list that appears.
b) Repeat step a) for the remaining items in the Measurement data section.

6. After all settings have been set, click [OK] to apply the settings and close the dialog.
- To close the dialog without applying the settings, click [Cancel] instead of [OK].

2.19.3.2 Printing Selected Data to Serial Printer

To print data to the serial printer:

1. Select the data to print in the Tree Window or Data List Window by clicking on it.
   - To select multiple consecutive measurements, click on the first measurement, hold the Shift key pressed, and click on the last measurement.
   - To select multiple separated measurements, hold the Ctrl key pressed while clicking on each measurement.
2. Select *Tool - Printing to Serial Printer - Print Selected Data*. The selected data will be printed to the serial printer.

2.20 Working with Other Systems (automatic export)

For working with other systems, SpectraMagic NX2 can automatically export measurement data to a *.csv file after each sample measurement. The other system can then read that file. The file name and location can be set as desired.

- Only sample measurements will be output. Target measurements will not be output.
- The format of the *.csv file (the characters used for decimal symbol, digit grouping symbol), and list separator depends on the SpectraMagic NX2 display language setting. The default Windows settings for the selected language will be used.

1. Select *Tool - Working with other system - Settings...* . The Work with other system dialog will appear.

2. To enable automatic export of measurement data, set the *File output at the time of sample measurement* switch to On by clicking on it if necessary.
- Each time the switch is clicked it will switch between Off and On.

3. Set the *Folder to output to* by clicking [Browse]. The Folder Select dialog will appear. Browse to the desired folder and click Select folder to select the folder and close the dialog.

4. Set the desired prefix for the file name by clicking in the File name textbox and inputting the desired file name. A sample of the file name will be shown in the Example section. The full file name will be:

prefix_monthdayyearhourminutesecond.csv

For example, if File name is set to “Line3” and the measurement was taken on November 1, 2022 at 14:30:15 (2:30:15 PM), the file name would be:

Line3_11012022143015.csv

5. Click [OK] to apply the settings and close the dialog.
- To close the dialog without applying the settings, click [Cancel] instead of [OK].

2.21 Macro Ⓟ

- This function is supported by SpectraMagic NX2 Professional Edition only.

Macros can be used to perform repetitive procedures automatically.

2.21.1 Macro Registration

Macros are stored in macro files (*.qcmacro). Once a macro file has been created, it can be registered in the macro list and can then be executed from the menu.

- Registered macro files can be used with all open documents.

1. Select *Tool - Macro - Register ...* . The Macro Registration dialog will appear.

2. Perform the desired action.

■ To register a previously saved macro file:

2-1 In the row to register the macro file in, click [Browse]. The Open dialog will appear.

2-2 Browse to the desired macro file (*.qcmacro) and select the file.

2-3 Click [Open]. The file will be opened and the path will be shown.

■ To unregister a macro:

2-1 In the row containing the macro file to unregister, click [Delete]. A confirmation message will appear.

2-2 Click [Yes] to unregister the macro file.
- Unregistering a macro file removes it from the macro list, but it does not delete the file from the computer.
- To cancel unregistering the macro file, click [No] instead of [Yes].

■ To create a new macro file:

2-1 In the row to create a new macro file in, click [New]. The Macro Settings dialog will appear.
- *Macro File Path* shows the full path of the macro file being shown once a macro file has been created. When creating a new macro file, no path will be shown.

2-2 Select the desired item in the Available Items list and click [Add]. The selected item will be added to the bottom of the Registered Items list.

2-3 The order of items in the Registered Items list can be changed using the buttons to the right of the list.

2-4 After the macro items have been set and are in the desired order, click [OK]. The Save As dialog will appear.

2-5 Browse to the folder where you want to store the macro file.

2-6 Input the desired file name and click [Save]. The macro will be saved using the specified file name and *Macro File Path* will show the full file path.

2-7 Click [Cancel] to close the Macro Settings dialog.

■ To edit a registered macro file:

2-1 In the row for the macro file to edit, click [Edit]. The Macro Settings dialog will appear.
- *Macro File Path* shows the full path of the macro file being shown once a macro file has been created. When creating a new macro file, no path will be shown.

2-2 To add items, select the desired item in the Available Items list and click [Add]. The selected item will be added to the bottom of the Registered Items list.

2-3 To edit settings for Select target, Jump, Wait Time, or Message, select the item in the Registered Items list and click [Settings]. The dialog for editing the settings for that item will appear. Edit the settings as desired and click [OK] to close the settings dialog.

2-4 The order of items in the Registered Items list can be changed using the buttons to the right of the list.

2-5 After the macro items have been edited as desired, click [OK]. The changes will be applied and [OK] will be disabled.

2-6 Click [Cancel] to close the Macro Settings dialog.

■ To execute a macro file from the Macro Registration dialog:

2-1 In the row containing the macro file to execute, click [Execute]. The Macro Registration dialog will close and the macro will be executed.

2-2 When execution of the macro has been completed, the Macro Registration dialog will appear again.

3. When all desired actions have been completed, click [Close] to close the dialog.

Macro Settings dialog

■ Macro items

Macro items are divided into three tabs. Most macro items are similar to menu items. Special macro items are described below.

File tab

The File tab contains file-related items such as Create new document, Open document, Save document, etc.

- The *Save a document (specified file)* item lets you specify the file name for saving measurement results. When it is added, the Save As dialog will be shown. Browse to the location to save the file, input the desired file name, and click [Save].

Instrument tab

The instrument tab contains instrument -related items such as Calibration, Target Measurement, Sample Measurement, etc.

Command tab

The Command tab contains commands for macro operation.

Select target {Target name}

When this is added, the Select Target dialog for specifying the target from targets available in the document will appear. Click on the drop-down and select the desired target from the list of document targets that appears, and click [OK]. The item will be added to Registered Items list.

- To take absolute measurements, select Absolute instead of a target in the Select Target dialog.
- After the item has been added to the Registered Items list, the selected target can be changed by selecting Select target {Target name} in the Registered Items list and clicking [Settings] to open the Select Target dialog again.

Set Tag {Tag name}

Sets a named tag to be used as a jump destination. When this is added, the Tag Name Settings dialog for inputting the tag name will appear. Input the desired tag name and click [OK]. The item will be added to Registered Items list.

Jump {Jump destination, Repeat}

Specifies the jump destination (tag to jump to) and the number of times to repeat that jump. When [Add] is clicked, the Tag Jump Settings dialog will appear.

1. Set the Jump destination by clicking on the drop-down and selecting from the list of tags that appears.
2. Set the number of times to repeat the jump by clicking on the current Repeat value and inputting the desired number or by using the up/down arrows. (Range: 1 to 100)
3. Click [OK]. The item will be added to Registered Items list.

- After the item has been added to the Registered Items list, the Jump destination and Repeat number can be changed by selecting Jump {Jump destination, Repeat} in the Registered Items list and clicking [Settings] to open the Tag Jump Settings dialog again.

Wait Time {Time}

Sets the time to wait before proceeding to the next item in the macro. When [Add] is clicked, the Wait Time Settings dialog for setting the wait time will appear. Set the desired values for Min.(minutes; range: 0 to 9) and Sec. (seconds; range: 0 to 59) by inputting values directly or by using the up/down arrows and click [OK]. The item will be added to Registered Items list.

- After the item has been added to the Registered Items list, the wait time can be changed by selecting Wait Time {Time} in the Registered Items list and clicking [Settings] to open the Wait Time Settings dialog again.

Wait for key

Pauses the macro until a keyboard key is clicked.

Message {text}

Shows a dialog containing a user-defined message. When [Add] is clicked, the Message Settings dialog for setting the message (maximum length: 200 characters) will appear. Input the desired message and click [OK]. The item will be added to Registered Items list.

- After the item has been added to the Registered Items list, the message can be changed by selecting Message {text} in the Registered Items list and clicking [Settings] to open the Message Settings dialog again.

■ Buttons for changing order of macro items

Moves the selected item to the top of the Registered Items list.

Moves the selected item up 1 row in the Registered Items list.

Moves the selected item down 1 row in the Registered Items list.

Moves the selected item to the bottom of the Registered Items list.

- Multiple sequential items in the Registered Items list can be selected by selecting the first item and then hold the Shift key pressed while selecting the last item.

- Multiple separate items in the Registered Items list can be selected by holding the Ctrl key pressed while selecting the items. When multiple separate items are moved, they will be put together in their new position.

■ Creating a loop to repeat a sequence of macro items

A loop can be used to repeat a sequence of macro items without adding the same macro items to the Registered Items list several times.
In SpectraMagic NX2 macros, you can also specify the number of times the sequence should be repeated.
To create a loop:

1. Place a Set Tag item at the beginning of the sequence by adding Set Tag {Tag name} to the Registered Items list and using the buttons to move it to the desired position.

2. Add a Jump {Jump destination, Repeat} item to the Registered Items list. In the Tag Jump Settings dialog that appears when adding the item:

2-1 Click on the Jump destination drop-down and select the tag set in step 1 for the destination.

2-2 Set the number of times to repeat the sequence by clicking on the current Repeat value and inputting the desired number or by using the up/down arrows. (Range: 1 to 100)

2-3 Click [OK] to apply the settings and close the Tag Jump Settings dialog. The item will be added to the Registered Items list.

3. Use the buttons to move the Jump {Jump destination, Repeat} item to the end of the sequence.

2.21.2 Executing a Macro

Once a macro file has been registered, it can be executed in either of the following ways:

■ Executing from menu

Select *Tool - Macro - Start - (Macro file name)*. The macro file will be executed.

■ Executing from Macro Registration dialog

1. Select *Tool - Macro - Register ...* . The Macro Registration dialog will appear.

2. In the row containing the macro file to execute, click [Execute]. The Macro Registration dialog will close and the macro will be executed.

3. When execution of the macro has been completed, the Macro Registration dialog will appear again.

2.22 Application Settings

1. Select *Environment Settings - Application Settings...* . The Application Settings dialog will appear.
2. Select the settings category to set by clicking on the desired category in the left side of the dialog.
3. Set the settings as desired. See below for the details of each category.
   Sound Settings
   External Software Settings Ⓟ
   File Paths
   Other Settings (Auto Save, Startup Options)
4. Click [OK] to confirm the settings and close the dialog.

■ Sound Settings

4-1 To play sounds during operation, set the **Play sounds** switch to On. The setting will change between On and Off each time the switch is clicked. When **Play sounds** is set to On, the sound file settings will be enabled.

a) To set a sound file for each event, click [Browse] for the event. The Open dialog will appear.

b) Browse to the desired sound (*.wav) file and select it, and click [Open]. The selected sound file will be set for that event.

- The selected file can be tested by clicking [►] in that row.
- To remove the selected sound file from the event, click [Delete].

c) Repeat for the other events.

■ External Software Settings Ⓟ

- This function is supported by SpectraMagic NX2 Professional Edition only.

4-1 To enable executing external software from SpectraMagic NX2, set the **Execute external software** switch to On. The setting will change between On and Off each time the switch is clicked. When **Execute external software** is set to On, the external software settings will be enabled.

a) To select the software to execute for each event, click [Browse] for the event. The Open dialog will appear.

b) Browse to the desired software (*.exe, *.bat) file and select it, and click [Open]. The selected software will be set for that event.

- It is not possible to set command line switches for the software.
- The selected software can be tested by clicking [►] in that row.
- To remove the selected sound file from the event, click [Delete].

c) Repeat for the other events.

■ File Paths

The paths for saving or loading Documents/QC Templates, and Other Files can be set.

4-1 To change the current path, check the checkbox for the file path to set. The status will change between checked and unchecked each time the checkbox is clicked. When the checkbox is checked, the file path will be enabled.

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

4-3 Browse to the desired folder and click [Select].

4-4 Repeat for other paths as desired.

• To restore a path to its default value, check the checkbox to enable the path, and then click [Restore]. A confirmation dialog will appear. Click [Yes] to restore the default path.

Other Settings (Auto Save, Startup Options)

Auto Save Settings

Perform automatic backup

When checked, the active document will be automatically backed up at the interval set for Interval (minutes).

Interval (minutes) (Enabled only when Perform automatic backup is checked.)

Click on the current value and input the desired value directly, or use the up/down arrows to set the desired value. (Range: 1 to 120 minutes)

Save document after each measurement

When checked, the active document will be saved after each measurement.

Display Template

Apply when creating a new document

When checked, the display template selected in Display Template will be automatically applied when creating a new document.

Display Template (Enabled only when Apply when creating a new document is checked.)

Click on [Browse]. An Open dialog will appear. Browse to the folder containing the desired display template file (*.mptx2 file), select the file, and click [Open]. The Open dialog will close and the selected display template will be automatically applied to any new created document.

Startup Options

Start in Instrument mode

SpectraMagic NX2 will start in instrument mode. Registration and connection will be performed with actual measuring instruments that can be connected.

Check the connection of the Instrument when starting up.

When checked, SpectraMagic NX2 will attempt to connect to the default instrument when starting up.

Display the calibration dialog after the connection has been established.

When checked, if connection to the default instrument during startup succeeds, the calibration dialog will be shown.

Start in Demo mode

SpectraMagic NX2 will start in demo mode. In demo mode, SpectraMagic NX2 can be operated as if an instrument were connected even when the instrument is not actually connected. Registration and connection to demo simulations for various instruments can be performed to allow the various functions of SpectraMagic NX2 to be used without an actual measuring instrument. When measurements are taken, random measurement results will be displayed.

• Switching between *Instrument mode* and *Demo mode* can be performed while the software is running.

■ **Instrument Connection Options**

Show instrument check warning when connecting to an instrument with expired instrument check

When checked, a warning dialog will be shown when connecting to an instrument if that instrument's instrument check has expired. Clicking [OK] will disconnect the instrument from the QC App and open the Instrument Check App.

2.23 Shortcut Key Settings

Shortcut keys can be set to enable quick access to frequently used functions.
The default shortcut keys are shown below.

1. Select Environment Settings - Shortcut Key Settings. The Shortcut Key Settings dialog will appear.
2. Select the category containing the function to set a shortcut key for by clicking on the Category drop-down and selecting the desired category from the list that appears. The list of functions in that category and their current shortcut key settings will be shown.
3. Select the function to set a shortcut key for in the Function list. The Shortcut key drop-downs will be enabled.
4. Click on the current setting of the left drop-down and select the key combination (Shift, Ctrl, Shift + Ctrl, etc.) to be used in combination with keyboard character keys or function keys.
5. Click on the current setting of the right drop-down and select the keyboard character key or function key to use in combination with the key combination selected in the left drop-down.
   - When “None” or “Shift” is selected in the left drop-down, only function keys will be available in the right drop-down.
   - When “Ctrl” is selected in the left drop-down, the right drop-down will not include the characters for Windows standard editing key combinations such as Ctrl + C, Ctrl + A, Ctrl + Z, etc.
6. Click [Apply] to apply the shortcut key setting.
7. Repeat steps 2 to 6 to set all shortcut keys as desired.
   - To reset all shortcut keys to their default values, click [Restore default settings].
8. Click [Close] to close the dialog.

■ Default shortcut keys

Menu item	Shortcut key
File - Document - New	Ctrl+N
File - Open	Ctrl+O
File - Save	Ctrl+S
File - Print Report	Ctrl+P
File - Exit	Alt+F4

Menu item	Shortcut key
Instrument - Connect	F5
Instrument - Disconnect	Shift+F5
Instrument - Calibration	F2
Instrument - Target Measurement	F3
Instrument - Sample Measurement	F4

Menu item	Shortcut key
Help - Manual	F1

2.24 Data Operations

2.24.1 Averaging Measurements

Two or more measurements can be averaged to create a new measurement.

1. In the Tree Window or Data List Window, select the measurements to be averaged.
   To select consecutive measurements, click on the first measurement and hold the Shift key pressed while selecting the last measurement.
   To select non-consecutive measurements, click on the first measurement and hold the Ctrl key pressed while selecting all additional measurements.
   - It is not possible to select targets and samples for averaging at the same time.
2. Right-click on the selected measurements and select *Average ...* .A confirmation dialog will appear.
3. Click [Yes]. The measurements will be averaged and added to the document. The measurement will be named “Averaged_” + default data name.
   - If the selected measurements were targets, the averaged measurement will be added as a target. If the selected measurements were samples, the averaged measurement will be added as a sample.

2.24.2 Copying/Pasting Measurements within SpectraMagic NX2

Measurements can be copied and pasted within the same document or between documents.

1. In the Tree Window or Data List Window, select the measurement to copy and paste.
- It is possible to select multiple measurements to copy.
  To select consecutive measurements, click on the first measurement and hold the Shift key pressed while selecting the last measurement.
  To select non-consecutive measurements, click on the first measurement and hold the Ctrl key pressed while selecting all additional measurements.

2. Right-click on the selected measurements and select *Copy...* .

3. Paste the measurements into the destination document.
- To paste the copied measurements into the destination document as the same type of measurement (Target or Sample) and with the same group traits as the original measurements:
  a) Right-click in the Tree Window or Data List Window in the destination document and select *Paste data ...* . The copied measurements will be pasted into the document. The pasted measurements will be named "Copied_" + original name.
- To paste copied sample measurements into the destination document as a specific type of measurement (Target or Sample):
  a) Right-click in the Tree Window or Data List Window in the destination document and select *Paste data with specified conditions...* . The Paste Data Dialog will appear.
  b) In Paste as, select the desired measurement type (*Target* or *Sample*).
  - If the measurements selected in step 1 were targets, they can be pasted only as targets.

  c) If Select Group Traits is shown, select the desired group traits.
  d) Click [OK]. The copied measurements will be pasted into the document. The pasted measurements will be named "Copied_" + original name.

2.24.3 Copying/Pasting Data from SpectraMagic NX2 to Other Applications

Selected measurement data can be copied from SpectraMagic NX2 to other applications such as Excel.

1. In the Data List Window, select the cells to copy by clicking and dragging the cursor over the cells. The cell color will change to show that the cells are selected.
- The entire row can be selected by clicking on the cell at the leftmost end of the row.
- Selecting the measurement in Tree Window or Data List Window by clicking on the row will not select cells for copying using Ctrl + C.

2. Press Ctrl + C. The selected cells will be copied to the Windows clipboard, together with the column titles of the header row and the measurement number in the document (the first column on the left) for the selected cells.

3. Select the destination application and press Ctrl + V or select *Paste* from the application's menu or right-click menu.

2.24.4 Deleting Measurements

1. In the Tree Window or Data List Window, select the measurement to delete.
   - It is possible to select multiple measurements to delete.
     To select consecutive measurements, click on the first measurement and hold the Shift key pressed while selecting the last measurement.
     To select non-consecutive measurements, click on the first measurement and hold the Ctrl key pressed while selecting all additional measurements.
2. Right-click on the selected measurements and select *Delete...* . A confirmation dialog will appear.
3. Click [Yes]. The selected data will be deleted.
   - If the deleted data was a target, the association with the target will be removed and the data will become sample data.

2.24.5 Renaming Measurement

The measurement can be renamed either in the Data Property Window or by using the right-click menu of Tree Window or Data List Window.

2.24.5.1 Renaming measurement in Data Property Window

1. In the Tree Window or Data List Window, select the measurement to rename. The properties of the selected measurement will be shown in the Data Property Window.
2. Click in the name textbox in the Data Property Window and edit the name as desired.
3. Click [Save]. The new name will be applied to the measurement.

2.24.5.2 Renaming measurement using right-click menu of Tree Window or Data List Window

1. In the Tree Window or Data List Window, right-click on the measurement to rename and select *Rename Data...* . The Rename Data dialog will appear.
2. Click in the name textbox and edit the name as desired.
3. Click [OK]. The new name will be applied to the measurement and the dialog will close.

2.24.6 Data groups

2.24.6.1 Grouping Data

Data can be grouped by user-defined information or by data tag.

- User-defined information or data tags can be added to a measurement at the time of measurement.
- User-defined information or data tags can be changed or added after measurement in the Data Property window. See *1.2.4.5 Data Property Window on p. 54* .

1. If Tree Window is set to All Data ( ), right click on *Target(s)* to group targets or on *Sample(s)* to group samples and select *Group the Data...* . The Data Grouping Settings dialog will appear.
   If Tree Window is set to Classification by Target ( ), right-click on *Absolute* to group absolute measurements, on Classification by Target to group targets, or on a target in *Classification by Target* to group samples associated with a target and select *Group the Data...* . The Data Grouping Settings dialog will appear.
2. Select the item to group data by (User-defined information or Data Tag). The corresponding drop-down will be enabled.
3. Click on the drop-down and select the desired item from the list that appears.
4. Click [OK]. The group will be created and shown in the Tree Window.

2.24.6.2 Deleting a Group

1. If Tree Window is set to All Data ( ), right click on *Target(s)* to delete a group of targets or on *Sample(s)* to delete a group of samples and select *Delete Group...* . The group will be deleted.
   If Tree Window is set to Classification by Target ( ), right-click on *Absolute* to delete a group of absolute measurements, on Classification by Target to delete a group of targets, or on the target in *Classification by Target* containing the group to delete and select *Delete Group...* . The group will be deleted.

2.24.7 Searching for Data

You can search for data using various parameters such as date/time of measurement, judgement results, measurement conditions, specific list item values, etc. The search results will then be added as a branch in Tree Window.

- Once a search has been created, the search results will be updated to include any later measurements meeting the search conditions.

2.24.7.1 Creating a New Search

1. In Tree Window, select a branch that has sub-branches (a branch with ► or ◢ to the left of it) and do either of the following:
- Click .
- Right-click and select *Add Search Condition ...* .

The Search Data Setting dialog will appear.

2. In Scope, click on the drop-down and select the desired scope of the search:
- If Tree Window is set to All Data ( ), select from:

All data	All data in the document will be searched.
Target	All target data will be searched.
Sample	All sample data will be searched.

- If Tree Window is set to Classification by Target ( ), select from:

All data	All data in the document will be searched.
Absolute	All absolute data will be searched.
(target name 1)	All data associated with that target will be searched.
(target name 2)	All data associated with that target will be searched.

3. Click on the textbox for **Search Name** and input a name for the search. This is the name that will be shown in the Tree Window for the search results.

4. Set search parameters.

4-1 Data Name: Set the Condition and Search string for the search.

a) Condition

Contains	Results will be measurements whose data name includes the search string.
Doesn't contain	Results will be measurements whose data name does not include the search string.
Matches	Results will be measurements whose data name exactly matches the search string.
Doesn't match	Results will be measurements whose data name does not exactly match the search string.

b) Search string: The string to be searched for according to the Condition setting.

4-2 Date: Set the date/time range to search.

a) To set the date, input the date directly or click on the calendar mark and select the date from the pop-up calendar that appears.

b) To set the time, click on the hour, minute, and second sections and input the desired time.
- Time should be set based on a 24-hour clock. For example, 1:00:00 PM would be set as "13:00:00".
- If no date/time is set, measurements taken at any time will be included in search results.
- If only the beginning date/time is set, any measurements taken after that date/time would be included in search results.
- If only the end date/time is set, any measurements taken up to that date/time would be included in search results.

4-3 Judgement Results
- This search condition can be used only when Tree Window is set to Classification by Target ( ) and Scope is set to All data or to a target name

a) Check the checkbox for each result to include in search results.

4-4 Measurement Condition

a) Click on the down mark to expand the section.

b) Check the checkbox for each condition to include in search results.

4-5 Display / Evaluation Items

a) Click on the down mark to expand the section.

b) Click [Add]. The List Items Settings dialog will appear.

c) In the List Items Settings dialog, add a desired list item to Selected Items and click [OK]. The dialog will close and the added item will appear in the Display /Evaluation Items of the Search Data Setting dialog.

- For more information on list items, see *2.7.1 Setting List Items and Their Settings (Number of Digits, Observer, Illuminant, Parameters, etc.) on p. 124* .
- Only 1 list item can be selected each time. To add more list items, repeat steps b) and c).

d) For each item added in steps b) and c), set the values to be used in the search.

- For items with numerical values, set the lower and upper limits by clicking on the value boxes and inputting values directly or by using the up/down buttons.
- For items with text values, click on the left drop-down to select the condition (*Contains*, *Doesn't contain*, *Matches*, *Doesn't Match*) and click on the right textbox and input the text.

4-6 User defined information

a) Click on the down mark to expand the section.

b) Click [Add]. the User Defined Information Settings dialog will appear.

c) Click on the drop-down and select the desired item from the list that appears.

- Only user defined information available in the document can be selected. See *2.13 User Defined Information Settings Ⓟ on p. 171* .

d) Click [OK]. The dialog will close and the selected user defined information will be added to the User defined information list.

e) Repeat steps a) to c) to add other user defined information if desired.

- It is possible to set the same user defined information more than once with different search values.

f) For each item in the User defined information list, set the values to be used in the search.

- For numeric items, set the lower and upper limits by clicking on the value boxes and inputting values directly or by using the up/down buttons.
- For string items, click on the left drop-down to select the condition (*Contains*, *Doesn't contain*, *Matches*, *Doesn't Match*) and click on the right textbox and input the text.
- For list items, click on the drop-down and select the selection list item to search for.

4-7 Data tag

a) Click [+] on the left side of the box and select the desired data tag from the list that appears.

b) Only data tags used in the document will be shown.

c) Repeat step a) to set other tags if desired.

d) If multiple tags are selected, select how the tags will be combined by clicking [AND] or [OR].

AND Only data with all selected tags will be included in the search results.
OR Data with at least one of the selected tags will be included in the search results.

5. Click [Search]. The search will be performed and the search results will be added to the Tree Window under a branch with the Search Name input in step 3.

2.24.7.2 Editing Search Conditions

1. In Tree Window, right click on the search name for the search you want to change conditions for and click *Edit Search Conditions...* .The Search Data Setting dialog will appear, with the current conditions for the search set.
2. Edit the search conditions in the same way as in *2.24.7.1 Creating a New Search on p. 222* .
3. Click [Search] to apply the new search conditions. The search results will be updated.

2.24.7.3 Deleting a search

1. In Tree Window, right click on the search name for the search you want to change conditions for and click *Delete Search Conditions...* .A confirmation dialog will appear.
2. Click [Yes]. The search will be deleted.

2.24.8 Importing/Exporting Data

2.24.8.1 Importing Data

Data from *.mesx2, *.mes, *.qctp, *.mea, *.bdt, or *.cxf files can be imported into the active document.

1. Select *File - Import from File ...* . The Open dialog will appear.
2. Browse to the file to import and select it.
   - It is not possible to select multiple files.
3. Click [Open]. The file will be imported into the active document.
   - Depending on the file size, it may take several minutes to import the data.

2.24.8.2 Exporting Data

Selected data can be exported to a *.csv or *.cxf file.

1. Select the data to export in the Tree Window or Data List Window by clicking on it.
   - To select multiple consecutive measurements, click on the first measurement and then hold the Shift key pressed while clicking on the last measurement.
   - To select multiple separated measurements, hold the Ctrl key pressed while clicking on each measurement.
2. Do either of the following:
   - Right-click on the selected data and select *Export Data...* .
   - Select *File - Export to File ...* . The Save As dialog will appear.
3. Click on the *Save as type:* drop-down and select the type of file to save to (*.csv or *.cxf).
   - The format of the decimal symbol, digit grouping symbol, and list separator depends on the SpectraMagic NX2 display language setting. The default Windows settings for the selected language will be used.
4. Input the file name to save to.
5. Click [Save]. The selected data will be exported to the file.

2.24.8.3 Exporting All Data

All data in a document can be exported to a *.csv file.

1. Select *File - Export All Data ...* . The Export All Data dialog will appear.
2. Select the data to output.
   All targets: All targets in the document will be output.
   All samples: All samples in the document will be output.
   Data tree of samples associated with all targets: All targets and all samples associated with targets will be output, grouped by each target and its associated samples.
3. Click [OK]. The Save As dialog will appear.
   - The format of the decimal symbol, digit grouping symbol, and list separator depends on the SpectraMagic NX2 display language setting. The default Windows settings for the selected language will be used.
4. Input the file name to save to.
5. Click [Save]. The data will be exported to the file.

2.25 List Window Operations

2.25.1 Zooming In/Out

To zoom the List Window in (increasing character size) or out (decreasing character size), click anywhere in the List Window and hold the Ctrl key pressed while moving the mouse scroll wheel.

2.25.2 Adjusting Column Width

To adjust the width of columns, move the cursor over the line between columns. The cursor will become a double-headed arrow. Click and hold the left mouse button pressed while dragging the line to the desired width.

2.25.3 Sorting Data

To sort data in List Window, click on the label row at the top of the column to sort data by. The first time the label is clicked, the column will be sorted in ascending order. Thereafter, sorting will switch between ascending and descending order each time the column is clicked.

2.25.4 Filtering Data

List items in the *Properties* and *Other* categories can be filtered in the List Window. If the list item can be filtered, will be shown next to the item name in the label row at the top of the column.

2.25.4.1 Setting a filter

1. Click . A popout dialog will appear.

2. Set the filter. Filters are applied immediately when set.
- When a filter has been set for a column, the label for that column will be shown darker than other columns.

2-1 To select whether or not to display a value, click on the FILTER VALUES tab and check the checkbox for each value that you want to display, or check "All" to show all values.
- To search for a value in the FILTER VALUES tab, input the value to search for in the Search textbox.

2-2 To set filter rules, click on the FILTER RULES tab and select a rule condition in the first drop-down, and then input a value if necessary in the second drop-down.

2.25.4.2 Clearing a filter

To clear a filter set for a column:

1. Click . A popout dialog will appear.

2. Click [Clear Filter]. The filter for the column will be cleared and the label for the column will return to the normal color.

2.25.5 Selecting Data

Rows of data can be selected in the following ways:

- To select a single row of data, click on the leftmost cell of the row. The row will be highlighted to show it is selected.
- To select multiple consecutive rows, click on the leftmost cell of the first row and hold the Shift key pressed while selecting the last row. Each selected row will be highlighted.
- To select multiple non-consecutive rows, hold the Ctrl key pressed while clicking on the leftmost cell of each row. Each selected row will be highlighted.
- To select all rows, click on ◢ in the upper left corner or press the Ctrl and A keys. All rows will be highlighted to show they are selected.

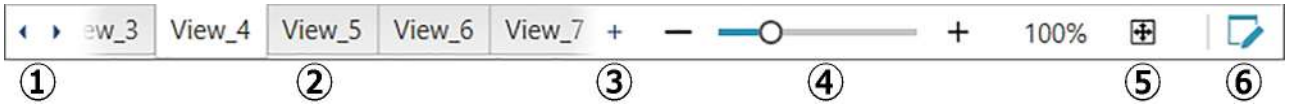
2.26 Canvas Window Operations

The Canvas Window displays one or up to 10 canvases (Professional Edition)/2 canvases (Lite Edition) on which objects such as graphs, labels, etc. have been placed. SpectraMagic NX2 provides various types of objects that can be placed on the canvases as desired.

- When a file created in Professional Edition with 3 or more canvases is used in Lite Edition, only the first 2 canvases can be edited. The remaining canvases can be viewed but not edited.

2.26.1 Canvas Window Toolbar

The canvas window toolbar is located at the bottom of the Canvas Pane, and is used to select the canvas to show, to add/delete canvases, to set canvas magnification, and to change canvas mode between view mode and edit mode.



① For moving between canvas tabs if Canvas Window Toolbar space is too narrow to show all canvas tabs.
② Canvas tabs. Click to select the tab to show.
③ (Enabled only when Canvas Window is in edit mode) Adds a canvas. Up to 10 canvases (Professional Edition)/2 canvases (Lite Edition) can be created.
④ Magnification slider. Slide or use the -/+ buttons to adjust the magnification of the currently selected canvas. Magnification value is shown at right of slider.
⑤ Fit canvas to window. Adjusts magnification of currently selected canvas so that the entire canvas fits inside the window containing that canvas.
⑥ Switch Canvas Window between view mode (button will be gray) and edit mode (button will be green). In edit mode, a grid and rulers will be shown on the currently selected canvas, and the object toolbar and positioning toolbar will be shown.

2.26.2 Switching Canvas Window between View Mode and Edit Mode

View mode is the mode used for normal operation. In this mode, data will be shown in the objects, but the objects cannot be moved and their properties cannot be changed.
Edit mode is used to edit the canvas by adding objects to it, positioning those objects, and setting their respective properties. In addition, the settings for the canvas itself can be made.

1. To switch between view mode and edit mode, do either of the following:
   - Click on at the right end of the Canvas Window Toolbar.
   - Select *View - Switch Canvas Mode*.

   The Canvas Window mode will switch between view mode and edit mode each time the button is clicked or the menu is selected.
   - In view mode, at the right end of the canvas window toolbar will be gray.
   - In edit mode, at the right end of the canvas window toolbar will be green,a grid will be shown in the canvas window indicating the area inside page margins and rulers will be shown at the top and left of the Canvas Window. In addition, the editing toolbars (object toolbar, positioning toolbar, and undo/redo/settings toolbar) will be shown, and the [+] in the Canvas Mode toolbar for adding canvases will be enabled.

2.26.3 Canvas Operations

- Canvases can be added, removed or renamed only when Canvas Window is in edit mode.

2.26.3.1 Adding a canvas

1. To add a canvas, do either of the following:
   - Click [+] in the Canvas Window Toolbar
   - Right-click on any of the canvas tabs and select *Add Canvas ...* .
2. A new canvas will be added.
   - The maximum number of canvases which can be open is 10.

2.26.3.2 Removing a canvas

1. To remove a canvas, right-click on the canvas to be deleted, and select *Remove Canvas...* . A confirmation dialog box will appear.
2. Click [Yes] to confirm canvas deletion.

2.26.3.3 Renaming a Canvas

1. Right-click on the tab to be renamed and select *Rename Canvas...* or double-click on the tab name. The current canvas name will be shown in a textbox.
2. Edit the canvas name and click anywhere outside the textbox. The edited name will be applied and the tab appearance will return to normal.

2.26.4 Object Operations

Object operations (adding, resizing, deleting, or changing settings of objects) can be performed only when Canvas Window is in edit mode.

2.26.4.1 Object Toolbar

The object toolbar is used to add objects to the canvas. Click on a category to open the category menu to select the desired object.

① Object selection cursor. Used to select objects.

② Graph object category
Opens a popout for selecting from ΔL*a*b* color-difference graph, L*a*b* graph, trend graph, multi-channel graph, ΔHunter Lab color-difference graph, spectral graph, 2-axis graph, histogram, xy graph, or Hunter Lab graph objects.

③ Shape/label object category
Opens a popout for selecting from line or rectangle objects.

④ Information object category
Opens a popout for selecting from label, statistics, pseudo color, information label, list item, image, or data list objects.

Object Popouts

■ **Graph Object Popout**

① ΔL*a*b* graph
② L*a*b* graph
③ Trend graph
④ Multi-channel graph
⑤ ΔHunter Lab graph
⑥ Spectral graph
⑦ 2-axis graph
⑧ Histogram
⑨ xy graph
⑩ Hunter Lab graph

■ Shape/Label Object Popout

① Line object
② Rectangle object

■ Information Object Popout

① Label (Text)
② Statistics Label
③ Pseudo Color
④ Information Label
⑤ Label (List Item)
⑥ Image
⑦ Data List

2.26.4.2 Adding an Object to the Canvas Pane

1. Click on the button in the Canvas toolbar for the desired type of graphic object. A popout with buttons for the various objects in the selected category will appear.
2. Click on the button for the desired object.
3. Place the object on the canvas.
   - To place the object at its default size, click on the canvas where you want the upper left corner of the object to be. The object will be placed there at its default size.
   - To place the object at a specific size, click and drag to select a space at the desired size. When the click is released, the object will be placed there at the specified size.
     - Some objects have minimum sizes. If the selected area is smaller than the minimum size, the object will be placed at its minimum size.

2.26.4.3 Selecting/Deselecting Objects

■ Selecting

To select an object, click within the area of the object. When the cursor is over the area of an object, the cursor shape will change to a crossed 4-headed arrow. When an object has been selected, the object frame will be shown, with handles for resizing the object.

To select two or more objects, click on one to select it and then hold the Shift key pressed while clicking on the remaining objects to be selected.
Two or more objects can also be selected by clicking and dragging over an area that includes the object to be selected.

■ Deselecting

To deselect a selected object, do any of the following:

- Click on the object again.
- Click outside the object's area.
- Press Esc on the keyboard.

The object frame will disappear.

2.26.4.4 Resizing an Object

1. Select the object or objects to be resized. The frames of the selected object will be shown, with handles for resizing. If multiple objects are selected, a frame that encloses all selected objects will be shown, with handles for resizing.

2. Move the cursor over one of the frame handles (the cursor shape will change to a double-headed arrow) and click and drag the handle to resize the object to the desired shape.
   - When multiple objects have been selected, clicking and dragging the handle of the area frame will resize all selected objects by the same ratio.
   - When resizing an object, green guidelines will be shown to help with alignment to the edge or center of other objects, or for matching object size.

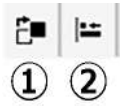
2.26.4.5 Moving Objects

To move an object, select it and drag it to the desired location.

- When moving an object, green guidelines will be shown to help with alignment to the edge or center of other objects.

2.26.4.6 Positioning Toolbar

The positioning toolbar is used to move objects forward/backward on the canvas or to align multiple objects.

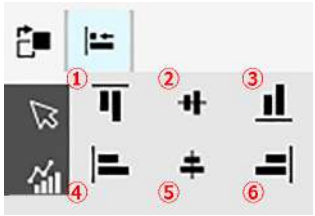


① Opens a pullout menu for moving objects forward and backward on the canvas to arrange the order of overlapped objects.

② Opens a pullout menu for aligning the tops or sides of objects.

■ Aligning Objects

Multiple objects can be aligned by their edges or centers.



① Vertical alignment of top edges of objects

② Vertical alignment of centers of objects

③ Vertical alignment of bottom edges of objects

④ Horizontal alignment of top edges of objects

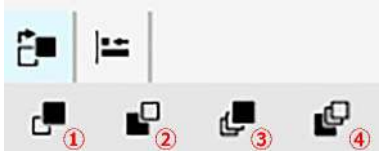
⑤ Horizontal alignment of centers of objects

⑥ Horizontal alignment of bottom edges of objects

1. Select the objects to align.
2. Click on . The object alignment popout will appear.
3. Click on the button in the popout for the type of alignment to perform. The objects will be aligned.

■ Changing Order of Graphic Objects

When objects overlap on the canvas, the order of the objects can be changed.



① Bring Forward: Move object up one layer.

② Send Backward: Move object down one layer.

③ Bring to Front: Move object to the topmost layer.

④ Send to Back: Move object to the bottommost layer.

1. Select the object to move forward or back.

2. Click on . The move object forward/back popout will appear.

3. Click on the button in the popout for how you want to move the object forward or back. The object will be moved accordingly.

2.26.4.7 Copying/Cutting/Pasting Objects

■ Copying objects

To copy an object, do either of the following:

- Right-click on the object and select *Copy*.
- Select the object and press Ctrl + C on the keyboard.

The object will be copied to the Windows clipboard.

■ Cutting objects

To cut an object, do either of the following:

- Right-click on the object and select *Cut*.
- Select the object and press Ctrl + X on the keyboard.

The object will be cut from the canvas to the Windows clipboard.

■ Pasting objects

To paste a copied or cut object, do either of the following:

- Right-click on the canvas where you want to paste the object and select *Paste*.
- Click on the canvas and press Ctrl +V on the keyboard.

The object will be pasted from the Windows clipboard to the canvas.

■ Deleting objects

To delete an object, select the object and press the Delete key. When two or more objects are selected, all the selected objects are deleted simultaneously.

2.26.4.8 Undo/Redo/Settings Toolbar

① Undo the most recent Canvas Window action.
② Redo the most recent undone Canvas Window action.
③ Opens the Canvas Settings dialog.

CHAPTER 3

Instrument Check App

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3.1 Introduction

- A valid Premium License is required to use the Instrument Check App.
- The Instrument Check App can only be used with CM-3700A Plus/CM-3700A-U Plus, CM-3700A/CM-3700A-U, CM-36dG/CM-36dGV/CM-36d, CM-17d/CM-16d, CM-26dG/CM-26d/CM-25d/CM-23d, CM-25cG, CM-700d/CM-700d-U/CM-600d, or CF-300.

The Instrument Check App can be used to perform a simple check of the condition of your instrument. It measures various performance factors and compares them to previous measurements of such factors. On-screen guidance is provided throughout the Instrument Check App.

Periodic use of the Instrument Check App will help to assure you and your customers that the instrument is operating properly and taking accurate measurements, and since trends are monitored, it can help you to forecast when servicing by a Konica Minolta authorized facility will be needed in the future.

3.1.1 Instrument Check Operation Flow

Connect/register instrument.
Create instrument check condition set
- Read from file (if available)
- Set instrument check items
- Set instrument check conditions
  - Calibration items: Types of calibration
  - Measurement Conditions: Measurement conditions (measurement area, SCI/SCE, etc.)
  - Observation Conditions: Illuminant/Observer
- Set test conditions
  - Light source test: Number of measurements, fail/warn tolerances
  - Repeatability test: Number of measurements, measurement target information, tolerance and warning levels
  - Reproducibility test: Number of measurements to average, color-difference formula, tile data (tile information, tile target values, tile tolerance values)
  - Repeatability test (Gloss): Number of measurements, measurement target information, tolerance and warning levels
  - Reproducibility test (Gloss): Number of measurements to average, tile data (tile information, tile target values, tile tolerance values)
- Complete setting
  - Save to file if desired.

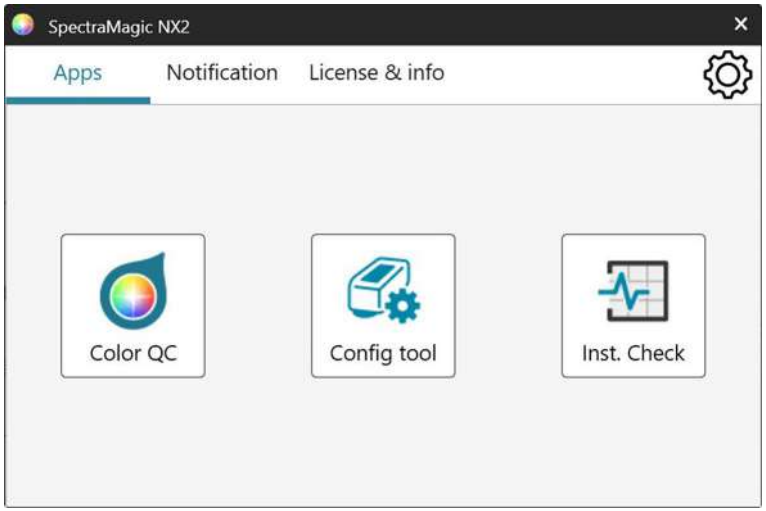
Execute instrument check
- Save results to file if desired.

3.2 Starting/Exiting Instrument Check App

- For information on installing the SpectraMagic NX2 software including the Instrument Check App, refer to the SpectraMagic Installation Guide.

3.2.1 Starting Instrument Check App

1. Select the SpectraMagic NX2 icon in the Windows Start menu or double-click on the icon on the desktop. SpectraMagic NX2 will start and the splash screen will appear for a few seconds.
2. The splash screen will then be replaced by the SpectraMagic NX2 Launcher.

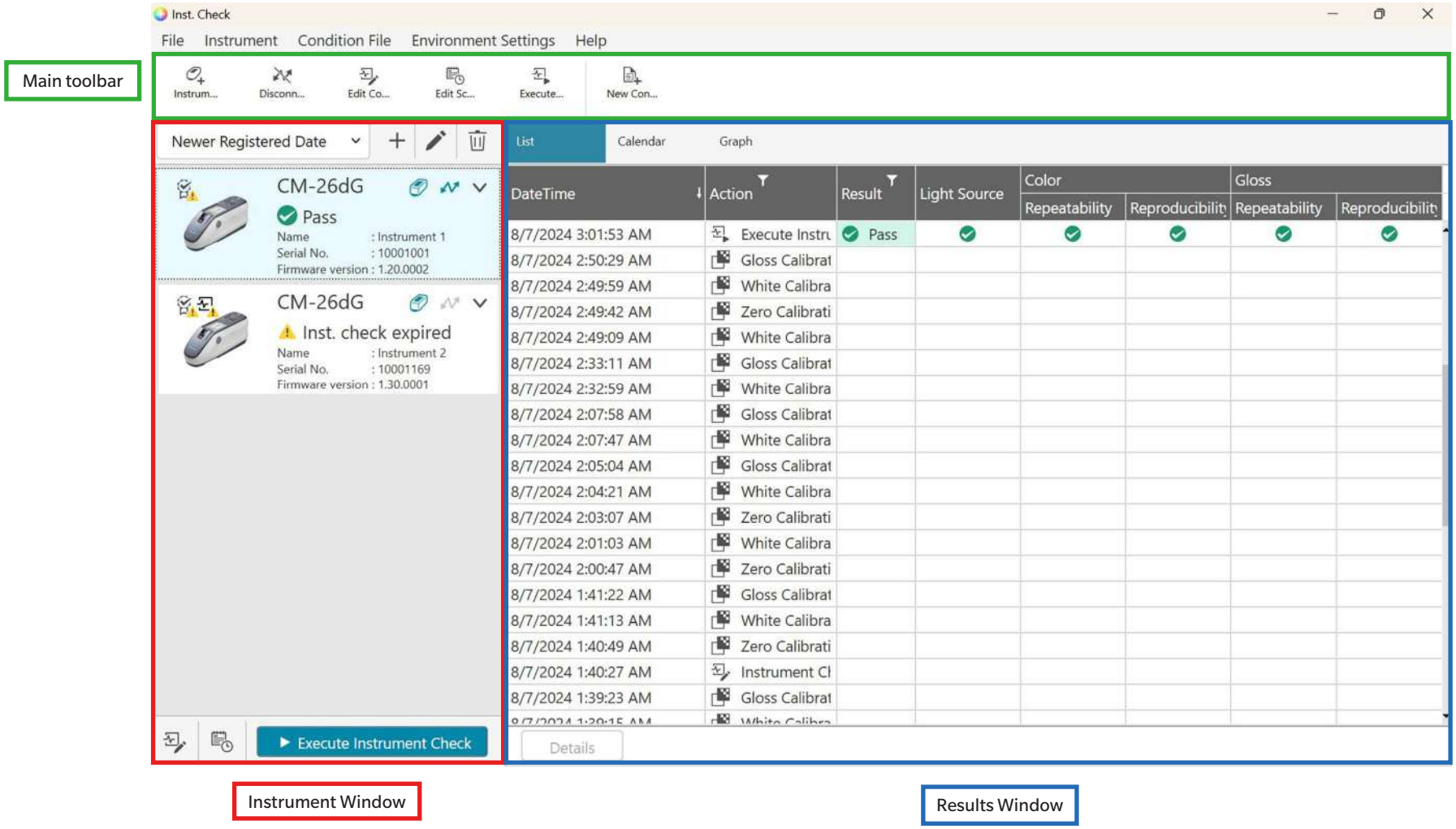


3. Click the Inst. Check button. The Instrument Check App will start.
   - If "Enable startup message" in Other Settings of Environment Settings is checked, a message stating that a Premium license is required to use the Instrument Check App will appear. Click [OK] to continue.
   - If the Premium License will expire soon, a warning message will appear instead of the startup message. Click [OK] to continue.
   - If there is no valid Premium License or of the Premium License has expired, a message stating that no license could be found will appear. Clicking [OK] will close the message box and return to the SpectraMagic NX2 Launcher. It will not be possible to start the Instrument Check App until a valid license has been installed.

3.2.2 Exiting Instrument Check App

1. Click on the [x] in the upper right corner of the software window, select Exit from the File menu, or press Alt + F4. The Instrument Check App will close and the SpectraMagic NX2 Launcher will be shown.
2. Click on the [x] in the upper right corner of the Launcher window.

3.3 Instrument Check App Screen Configuration



3.3.1 Menu

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Instrument

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Connect (when instrument is not connected) 249
Disconnect (when instrument is connected) 257
Edit Condition Set ... 258
Edit Schedule ... 266
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Condition File

New Condition File ... 258

Environment Settings

Application Settings ... 267

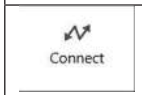
Help

Manual ...	Opens this manual.
Precise Color Communication ...	Opens *Precise Color Communication*, a booklet explaining color theory and color measurement concepts.
Version Information ...	Opens a dialog showing version information.

3.3.2 Main toolbar

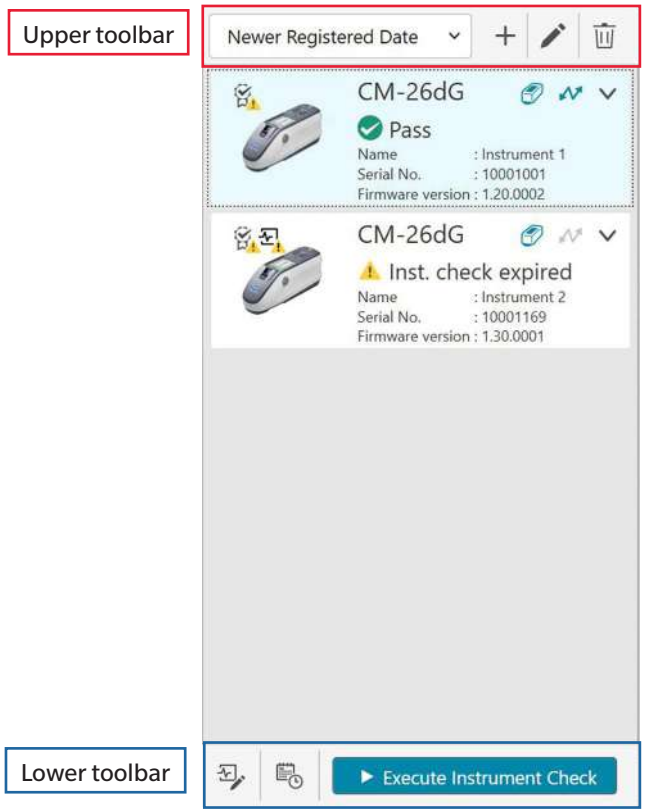
The toolbar contains buttons for performing frequently used functions. The default toolbar includes the buttons shown below.

- Place the mouse pointer over a button to display a brief description of its function.

	Instrument Registration. See *3.4.2 Connecting with an Instrument on p. 249* .
	Connect (shown only when no instrument is connected): Connects the Instrument Check App to an instrument. See *3.4.2 Connecting with an Instrument on p. 249* .
	Disconnect (shown only when an instrument is connected): Disconnects the connected instrument. See *3.4.3 Disconnecting an instrument on p. 257* .
	Edit Condition Set. See *3.5 Creating/Editing Instrument Check Condition Set on p. 258* .
	Edit Schedule. See *3.8 Editing the Instrument Check Schedule on p. 266* .
	Execute Instrument Check. See *3.6 Executing Instrument Check on p. 263* .
	New Condition File. See *3.5 Creating/Editing Instrument Check Condition Set on p. 258* .

3.3.3 Instrument Window

The instrument Window shows all instruments which have been registered, together with their current status.



■ Upper toolbar

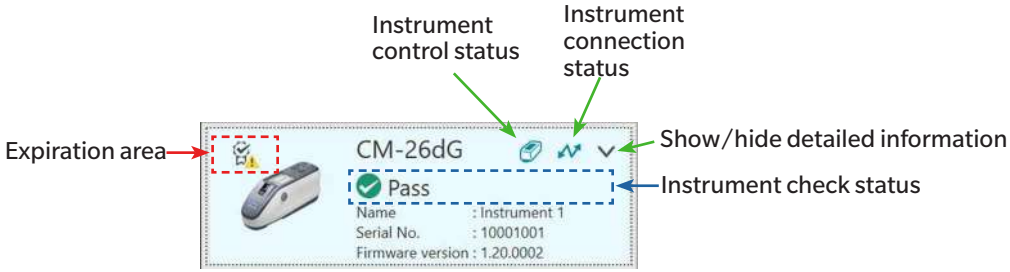
Newer Registered Date	Click on the combo box and select the sort order for the Instrument List. Older Registered Date: Instruments are sorted by date of registration with oldest date first. Newer Registered Date: Instruments are sorted by date of registration with newest date first. Older Inst. Check Date: Instruments are sorted by most recent instrument check for that instrument with oldest date first. Newer Inst. Check Date: Instruments are sorted by most recent instrument check for that instrument with newest date first. Status (Pass First): Instruments are sorted by status with Pass status first. Status (Pass Last): Instruments are sorted by status with Pass status last.
+	Instrument Registration. See *3.4.2 Connecting with an Instrument on p. 249* .
	Update Instrument. Opens dialog for changing instrument information. See *3.4.2.4 Changing Registered Instrument Information on p. 256* .
	Instrument Deletion. See *3.4.2.5 Deleting a Registered Instrument on p. 256* .

■ Lower toolbar

	Edit Condition Set. See *3.5 Creating/Editing Instrument Check Condition Set on p. 258* .
	Schedule Registration. See *3.8 Editing the Instrument Check Schedule on p. 266* .
▶ Execute Instrument Check	Execute Instrument Check. See *3.6 Executing Instrument Check on p. 263* .

■ Status indicators

Each registered instrument will be shown with symbols and words indicating the instrument status and its instrument check status.
To see the meaning of each symbol, hover the cursor over the symbol.



Expiration area: Symbols indicating that annual calibration and/or instrument check have expired and need to be performed will be shown in this area.

Instrument control status: When the symbol is blue, the instrument instrument check data are monitored and used by the Instrument Check App and Color QC App. When the symbol is grey, the instrument instrument check status will be "Unmonitored", instrument check status and date/time will not be shown in the Color QC App, and no warning marks will be shown in the Launcher. Status can be changed by clicking on the symbol.

Instrument connection status: When the symbol is blue, the instrument is connected. When the symbol is grey, the instrument is not connected. Status can be changed by clicking on the symbol.

Show/hide detailed information: If detailed information (Registered Date, Next Inst. Check Date, Last Inst. Check Data, Annual Calibration Date, Comment) are not shown, click on the down arrow to show the detailed information. If detailed information are shown, click on the up arrow to hide the detailed information.

Instrument check status: Shows the instrument check status of the instrument.

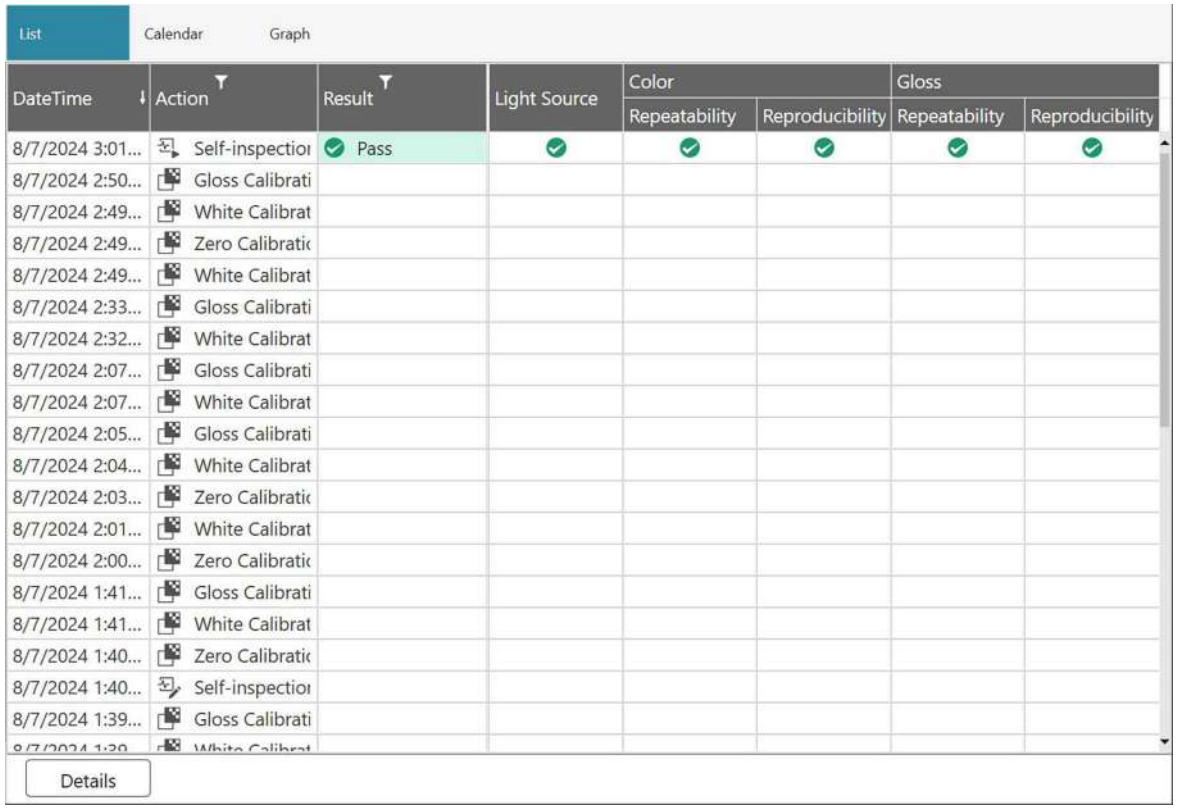
Pass/Warn/Fail	Instrument check has not expired and the symbol and word indicate the results of the most recent instrument check.
Instrument check expired	The most recent instrument check has expired (the time for performing the next scheduled instrument check has arrived).
Ready for instrument check	The instrument check condition set has been registered for the instrument but instrument check has not been performed yet.
Not ready	No instrument check condition set has been registered for the instrument.
Unmonitored	Instrument check status and date/time will not be shown in the Color QC App, and no warning marks will be shown in the Launcher.

3.3.4 Results Window

The results window shows the date/time of various types of calibration and instrument check. For instrument check, the results are also shown.

To select the Results Window view to show, click on [List], [Calendar], or [Graph].

3.3.4.1 List View



To change the results order between newest first and oldest first, click on the top of the Date/Time column.

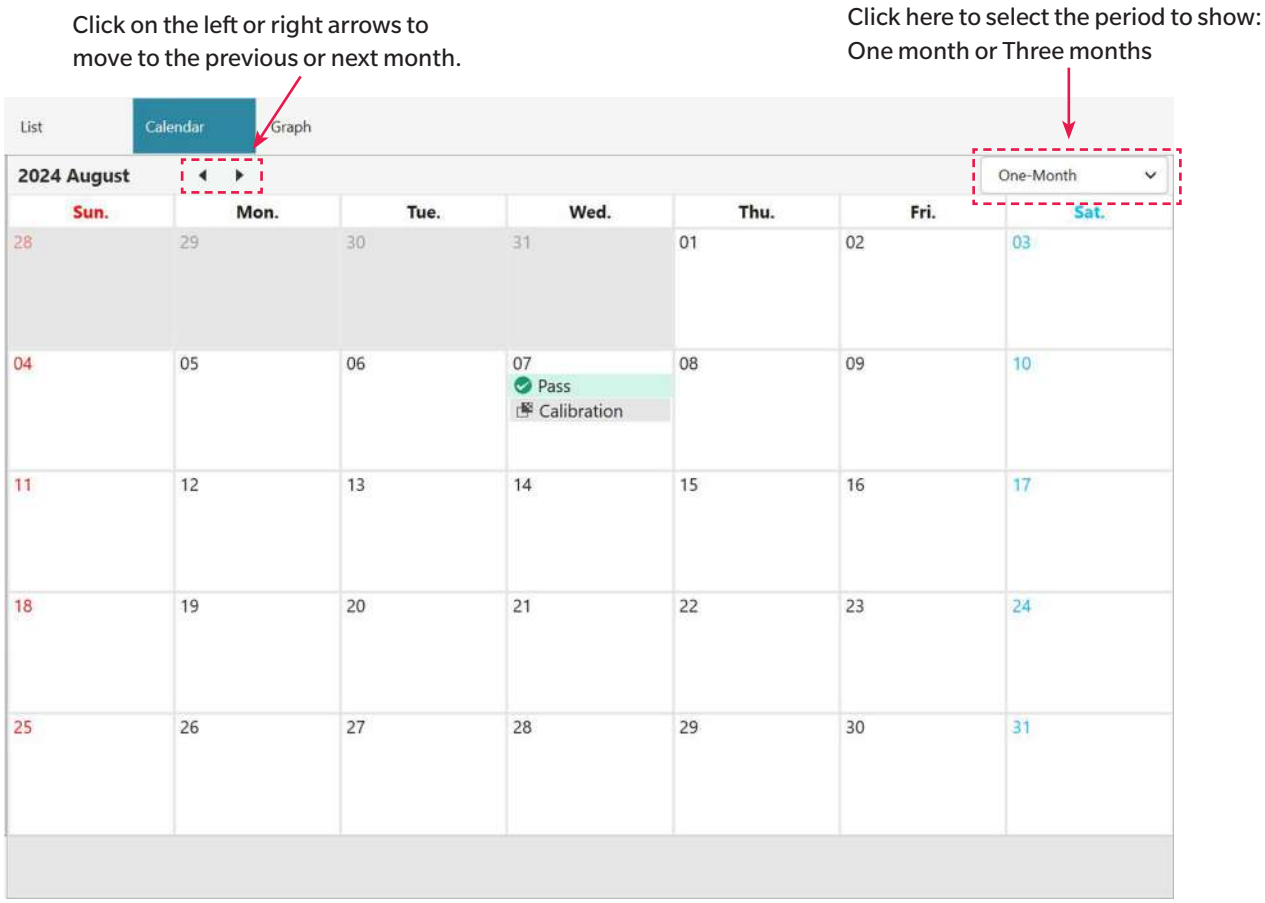
To filter the results by the action, click on in the Action column. The Filter dialog will open. Select the values to show in the Values tab, or set filter rules in the Filter Rules tab. When a filter has been applied, the header cell will be black instead of grey. To clear filters and show all results, click [Clear Filter].

To filter the results by the instrument check result, click on in the Result column. The Filter dialog will open. Select the values to show in the Values tab, or set filter rules in the Filter Rules tab. When a filter has been applied, the header cell will be black instead of grey. To clear filters and show all results, click [Clear Filter].

To see a detailed report of an instrument check, select the instrument check to view and click [Details]. The Instrument Check Report dialog for that instrument check will be shown.

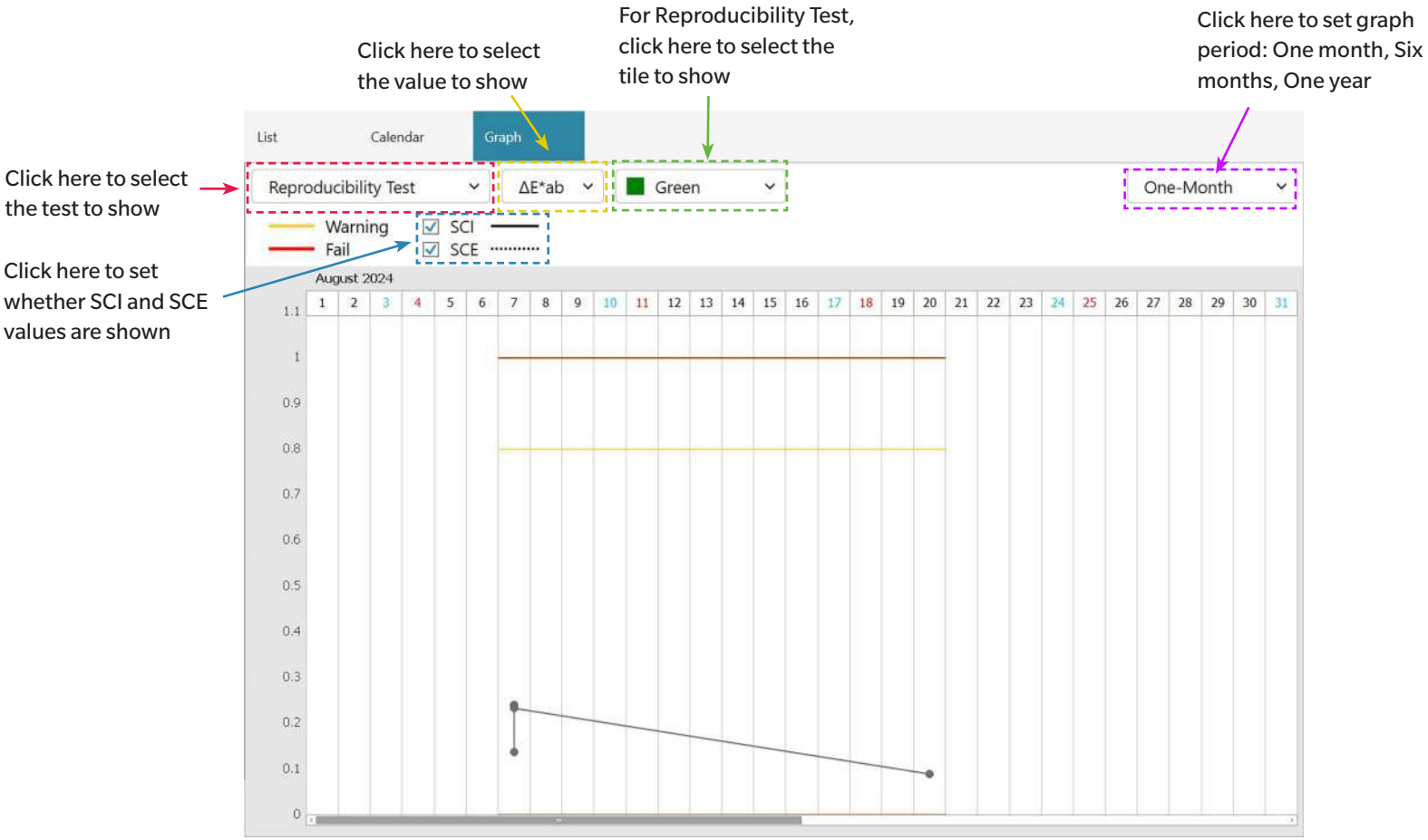
3.3.4.2 Calendar View

The Calendar View shows the actions and instrument check results for each day on which an action (calibration) or instrument check was performed.



3.3.4.3 Graph View

The Graph View shows trend graphs of values for the various tests conducted during instrument check. The test and value to be shown can be selected, and failure/warning tolerance lines are also shown.



3.4 Connecting/Disconnecting an Instrument

- This procedure is available only when the software license is valid (either electronically or by using a dongle attached to the computer).

3.4.1 Before connecting

Before connecting the Instrument Check App to the instrument, the instrument must be connected to the computer and the instrument power must be switched on.

- 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 Instrument Check App.
- 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 Instrument Check App to the instrument. For the procedure, refer to the instruction manuals of the instrument and Bluetooth adapter.

■ Compatible instrument firmware versions

The Instrument Check App is compatible with instruments having the following or later firmware versions.

Instrument	Minimum firmware version
CM-3700A Plus/CM-3700A-U Plus, CM-36dG/CM-36d/ CM-36dGV, CF-300, CM-17d/CM-16d, CM-26dG/CM-26d/ CM-25d/CM-23d, CM-25cG	All
CM-3700A	2.05.0001
CM-3700A-U	2.06.0001
CM-700d/CM-600d/CM-700d-U	1.23.0005

- If the instrument to be connected has firmware older than the version listed above, an error message will appear and connection will not be possible. Contact the nearest Konica Minolta authorized service facility about updating the firmware.

3.4.2 Connecting with an Instrument

3.4.2.1 Connecting with a previously registered instrument

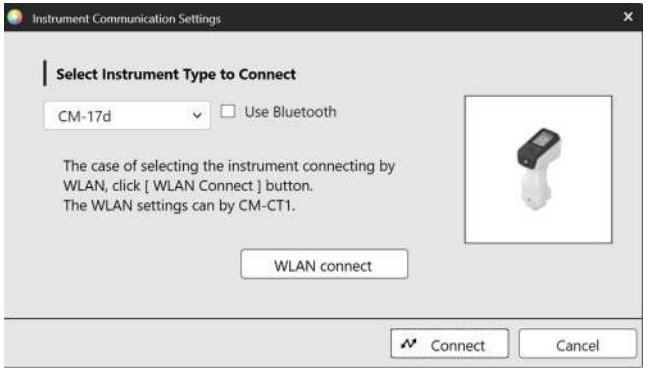
1. To connect with a previously registered instrument, select the instrument in the Instrument Window and click the Connect button in the toolbar or select *Instrument - Connect*. Connection with the instrument will be performed.

3.4.2.2 Connecting with a new instrument

- When using a new instrument, it is necessary to connect with the instrument and register it.

1. Click the Instrument Registration button in the main toolbar or the [+] button in the Instrument Window upper toolbar, or select *Instrument - Register...* . The Instrument Communication Settings dialog will open.
2. Click on the drop-down 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, CM-25d, CM-23d, or CM-25cG with the optional WLAN/Bluetooth Module installed and Bluetooth will be used, see *Connecting via Bluetooth on p. 251*
   - If the instrument to be used is a CM-17d, CM-16d, CM-26dG, CM-26d, CM-25d, CM-23d, or CM-25cG, the [WLAN connect] button will be shown. To connect via WLAN, see *Connecting via WLAN on p. 252*
   - 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.* or *Baud Rate* items are shown in **Connection Settings**, click on the respective drop-down list and select the desired setting from the list that appears.
   - See *Checking the COM port number on p. 255* .
4. When settings have been completed, click [Connect]. The instrument will be connected to and the Instrument Registration dialog will appear.
   - If connection fails, see *Notes on connection on p. 255* .
5. Continue with Instrument Registration.

Instrument Communication Settings dialog



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

- Buttons/settings shown will depend on selected instrument.

Use Bluetooth — Check if communicating with instrument via Bluetooth. See *Connecting via Bluetooth on p. 251* .

[WLAN Connect] — Opens the Connect wireless instrument dialog. See *Connecting via WLAN on p. 252* .

Port No. — Click on drop-down and set desired setting. See *Checking the COM port number on p. 255* .

Baud Rate — Click on drop-down and set desired setting.

Dialog buttons

[Connect] — Connects to instrument.

Connecting via Bluetooth

Connection to a CM-17d, CM-16d, CM-26dG, CM-26d, CM-25d, CM-23d, or CM-25cG 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 Instrument Check App.

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 Windows ***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 Instrument Check App

1. Select *Instrument - Instrument Communication Settings...* . The Instrument Communication Settings dialog will open.
2. Click on the drop-down box 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 Registration dialog will appear.
   - 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, CM-25d, CM-23d, or CM-25cG 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 Instrument Check App.
- 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 Instrument Check App.

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

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 Instrument Check App

1. Select *Instrument - Instrument Communication Settings...* . The Instrument Communication Settings dialog will open.
2. Click on the drop-down box in **Select Instrument Type to Connect** and select the desired instrument from the list that appears.
3. Click [WLAN connection]. 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 Registration dialog will appear.

■ 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 Instrument Check App.

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

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 Instrument Check App

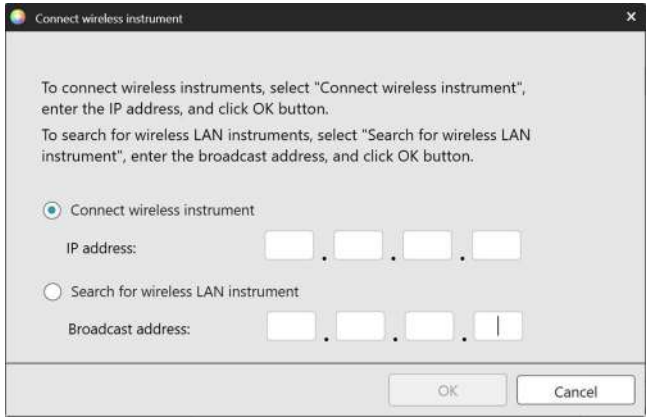
1. Select *Instrument - Instrument Communication Settings...* . The Instrument Communication Settings dialog will open.
2. Click on the drop-down box in **Select Instrument Type to Connect** and select the desired instrument from the list that appears.
3. Click [WLAN connect]. The Connect wireless instrument 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 *Search for wireless LAN 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 Registration dialog will appear.

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 box.
  - 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.

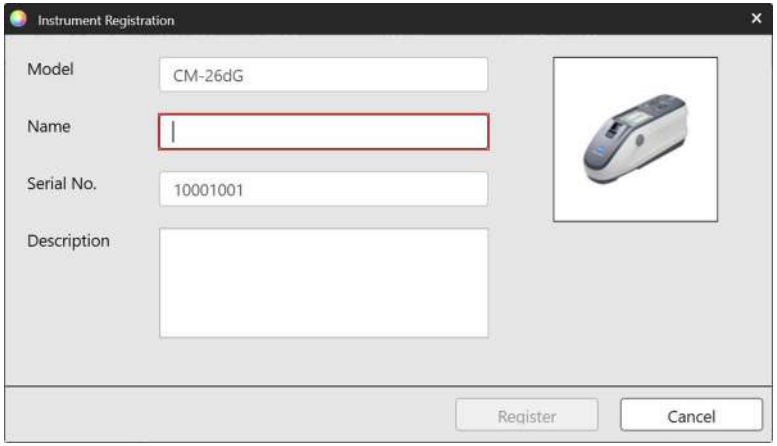
■ Checking the COM port number

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, kmsecm700 for CM-700d/600d, or kmsecmcr for CM-3700A) under the folder where SpectraMagic NX2 has been installed.

3.4.2.3 Instrument Registration

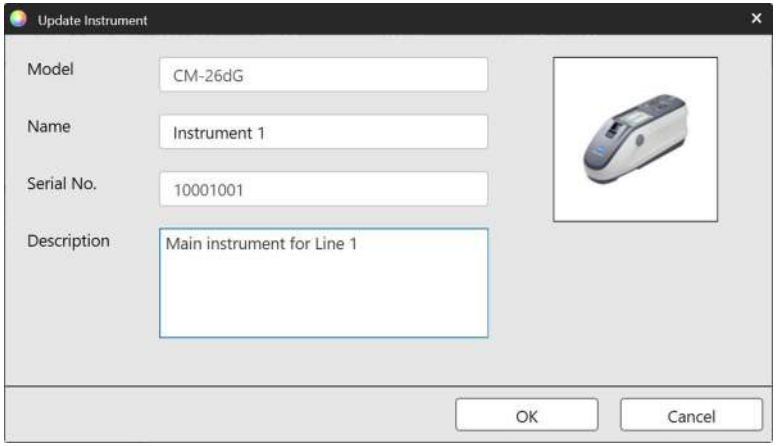
1. Input a name for the instrument. (Required)
   - The Model will be the model which was selected when connecting the instrument, and the Serial No. will be the serial number of the connected instrument. The Model and Serial No. cannot be changed.
2. Input Description information if desired. (Optional)
3. Click [Register]. The instrument will be registered and added to the Instrument Window.
   - When an instrument is added to the Instrument Window, instrument information such as calibration information will be read from the instrument and shown in the Results Window.



3.4.2.4 Changing Registered Instrument Information

The Name and Description of a registered instrument can be changed.

1. Select the instrument for which registration information will be changed in the Instrument Window.
2. Click the Update Instrument (pencil) button in the Instrument Window upper toolbar. The Update Instrument dialog will appear.
3. Edit the Name and/or Description as desired.
4. Click [OK]. The information will be updated and the dialog will close.



3.4.2.5 Deleting a Registered Instrument

1. Select the instrument to delete in the Instrument Window.
2. Click the Instrument Delete (trash can) button in the Instrument Window upper toolbar. A Confirmation dialog will appear.
3. Click [Yes] to delete the instrument or [No] to cancel deletion.

3.4.3 Disconnecting an instrument

1. Click the **Disconnect** button in the toolbar or select *Instrument - Disconnect*. The Instrument Check App will disconnect from the instrument.

3.5 Creating/Editing Instrument Check Condition Set

An instrument check condition set is a collection of settings that include the tests to be performed, the conditions for the tests, and the standard values and tolerance values.

- When creating an instrument check condition set, items for which settings have been changed since entering that screen will be indicated by (*).

1. Creating a new instrument check condition set

<u>To create an instrument check condition set for a registered instrument</u>

1-1 Select the instrument in the Instrument Window and click the Edit Condition Set button in the main toolbar or the Edit Condition Set button in the Instrument Window lower toolbar, or select *Instrument - Edit Condition Set ...* . The Instrument Check Condition Setting dialog will appear.

1-2 Continue with step 2 below.

<u>To create an instrument check condition set file</u>

- When creating an instrument check condition file, even if an instrument is selected in the Instrument Window and connected, that selection will be ignored and the file will be for the Instrument Type selected in step 1-2 below.

1-1 Click the New Condition File button in the main toolbar or select *Condition File - New Condition File ...* . The Instrument Check Condition Setting dialog will appear.

1-2 Click on the drop-down in **Select Instrument Type** and select the desired instrument from the list that appears. An image of the selected instrument will be shown.

- Instrument check condition files can be used only with the instrument model for which they were created.

1-3 Click [Next >] and continue with step 2 below.

<u>To edit an existing instrument check condition set for a registered instrument</u>

1-1 Select the instrument in the Instrument Window and click the Edit Condition Set button in the Instrument Window lower toolbar, or select *Instrument - Edit Condition Set ...* . The Instrument Check Condition Setting dialog will appear.

1-2 Continue with step 2 below.

2. File Import

<u>To load a previously saved instrument check condition set file</u>

2-1 Click [Load]. The Open dialog will appear.

2-2 Browse to the file to be loaded.

- Only instrument check condition files for the connected instrument or the instrument selected in step 1-2 can be loaded. If the file is for a different model, an error message will be shown.

2-3 Click [Open]. The path to the file selected in step 2-2 will be shown in the file textbox.

2-4 Click [Next >]. The file will be loaded and the settings in it applied to the instrument check condition set.

<u>To continue without loading a previously saved file</u>

2-1 Click [Next >].

3. Instrument Check Items

3-1 Click on the combo box next to each item and select "Mandatory" (item must be performed), "Optional" (item can be skipped by user), or "Skip" (item will not be performed).

Light Source Test	Checks the output of the instrument's xenon lamp compared to the initial service information value.
Repeatability Test	Checks the short-term variation of several color measurements of the same sample taken in rapid succession.
Reproducibility Test	Checks long-term stability of color measurement by comparing measured values with initial values of tiles set when creating instrument check condition set.
Repeatability Test (Gloss)	Checks the short-term variation of several gloss measurements of the same sample taken in rapid succession.
Reproducibility Test (Gloss)	Checks long-term stability of gloss measurement by comparing measured values with initial values of tiles set when creating instrument check condition set.

- Items available depend on the instrument model.
- (Gloss) items available only for CM-36dG, CM-36dGV, CM-26dG, and CM-25cG.

3-2 Click [Next >].

4. Instrument Check Conditions

4-1 Calibration Items

a) Zero Calibration: Fixed at "Optional" (can be skipped by user).
b) White Calibration/User Calibration: Fixed at "Mandatory" (must be performed).
c) Gloss Calibration (CM-36dG, CM-36dGV, CM-26dG, and CM-25cG only): Fixed at "Mandatory" (must be performed).
d) Click [Next >].

4-2 Measurement Conditions

- Available settings will depend on the instrument.

a) Meas. Method (CF-300 only): Click on the combo box and select "Contact" or "Non contact".
b) Measurement Area: Click on the combo box and select the measurement area. Available measurement areas will depend on the instrument.
c) Specular Component: Click on the combo box and select "SCI", "SCE", or "SCI + SCE".
  - Fixed at "----" for CM-25cG.

d) Measurement Type: Fixed at "Reflectance".
e) UV Setting: Fixed at "100% Full".
f) Click [Next >].

4-3 Observation Conditions

a) Illuminant: Click on the combo box and select "A", "C", "D50", "D65", "F2", "F6", "F7", "F8", "F10", "F11", "F12", "D55", "D75", "U50", "ID50", "ID65", "LED-B1", "LED-B2", "LED-B3", "LED-B4", "LED-B5", "LED-BH1", "LED-RGB1", "LED-V1", or "LED-V2",
b) Observer: Click on the combo box and select "2°" or "10°".
c) Click [Next >].

5. Test Conditions

- Screens shown will depend on the settings set in step 3. Screens for items set to "Skip" or which do not apply to the current instrument will not be shown.

5-1 Light Source Test

a) Measurement Times: Input directly or click on the up/down buttons to increase/decrease the value. Range: 1 to 5. Default: 1
b) Fail Tolerance (%): Set the percentage of the original light source value which will be judged as "Fail". Input directly or click on the up/down buttons to increase/decrease

the value. Range: 1 to 99

c) Warning Tolerance (%): Set the percentage of the original light source value which will be judged as "Warning". Input directly or click on the up/down buttons to increase/decrease the value. Range: 1 to 99
- Warning Tolerance must be greater than Fail Tolerance.

d) Click [Next >].

5-2 Repeatability Test

a) Measurement Times: Input directly or click on the up/down buttons to increase/decrease the value. Range: 5 to 30. Default: 10

b) Measurement Target: Input the name of the target which will be used for the repeatability test. Using the white calibration plate is recommended.

c) Serial No.: Input the serial number of the target which will be used for the repeatability test.

d) Tolerance:
- Standard Deviation: Set the standard deviation which will be judged as "Fail". Input directly or click on the up/down buttons to increase/decrease the value. Range: 0.01 to 1000. Default: 0.1
- Warning Level (%): Set the percentage of the Standard Deviation value which will be judged as "Warning". Input directly or click on the up/down buttons to increase/decrease the value. Range: 1 to 99. Default: 80

5-3 Reproducibility Test
- Number of averaging and Color difference settings apply to all tiles used for the reproducibility test.

a) Number of averaging: Input directly or click on the up/down buttons to increase/decrease the value. Range: 1 to 5. Default: 1

b) Color difference: Click on the combo box to select from ΔE*ab, ΔE*94, or ΔE*94(Special). Default: ΔE*ab

c) Add/edit the tiles and their standard values and tolerances to be used for the reproducibility test.

To add a tile, click [+] in the tile list section on the left side of the dialog.
- Color Plates (available as optional accessories) are recommended.
- At least one tile must be set.

01: Tile (when creating an instrument check condition set or instrument check condition file) or Tile (when editing an instrument check condition set or instrument check condition file)

Set/edit tile information.

1) Type: Click on the combo box and select the type of Color Plate to be used as a tile.
2) Name: Input the name of the tile.
3) Serial No.: Input the serial number of the tile.
4) Description (optional): If desired, input a description of the tile
5) Skip: Click "Enable" to allow measurements of the tile to be skipped or "Disable" to always require measurements of the standard.
6) When creating an instrument check condition set or instrument check condition file, click "Next >" at the bottom of the tab to move to the 02: Target tab. When editing an instrument check condition set or instrument check condition file, click the Target tab to move to the Target tab.

02: Target (when creating an instrument check condition set or instrument check condition file) or Target (when editing an instrument check condition set or instrument check condition file)

Set/edit tile standard values. Tile standard values are used as the baseline for reproducibility measurements.

1) To set the standard L*a*b* colorimetric values of the tile directly, input each value or click the up/down buttons to increase/decrease each value.
2) To set the standard L*a*b* colorimetric values of the tile by measurement, position the instrument and tile for measurement and click [Measure].
   - To perform calibration before measurement, click [Calibration] and follow the on-screen instructions.
   - Setting the standard values by measurement is not possible when creating an instrument check condition set file.

3) When creating an instrument check condition set or instrument check condition file, click "Next >" at the bottom of the tab to move to the 03: Tolerance tab. When editing an instrument check condition set or instrument check condition file, click the Tolerance tab to move to the Tolerance tab.

03: Tolerance (when creating an instrument check condition set or instrument check condition file) or Tolerance (when editing an instrument check condition set or instrument check condition file)

Set/edit tile tolerances for judging "Pass"/"Warn"/"Fail".

1) Set the upper and lower tolerances for each value by inputting the tolerance directly or by clicking the up/down buttons to increase/decrease each value.
2) Set the Warning Level (%) by inputting the value directly or by clicking the up/down buttons to increase/decrease the value.
3) If shown, click "Complete" in the lower right of the tab.

d) To add another tile, repeat step c) above.

- To delete a tile, select the tile to delete in the tile list on the left side and click the trash can icon. A confirmation message will appear. Click [Yes] to delete the tile or [No] to cancel deletion.

e) When all tiles have been added, click [Next >].

5-4 Repeatability Test (Gloss)

a) Measurement Times: Input directly or click on the up/down buttons to increase/decrease the value. Range: 5 to 30. Default: 10

b) Measurement Target: Input the name of the target which will be used for the repeatability test. Using the gloss calibration plate is recommended.

c) Serial No.: Input the serial number of the target which will be used for the repeatability test.

d) Tolerance:

- Standard Deviation: Set the standard deviation which will be judged as "Fail". Input directly or click on the up/down buttons to increase/decrease the value. Range: 0.01 to 1000. Default: 0.1
- Warning Level (%): Set the percentage of the Standard Deviation value which will be judged as "Warning". Input directly or click on the up/down buttons to increase/decrease the value. Range: 1 to 99. Default: 80

5-5 Reproducibility Test (Gloss)

- Number of averaging setting applies to all tiles used for the reproducibility test.

a) Number of averaging: Input directly or click on the up/down buttons to increase/decrease the value. Range: 1 to 5. Default: 1

b) Add/edit the tiles and their standard values and tolerances to be used for the reproducibility test.

To add a tile, click [+] in the tile list section on the left side of the dialog.

- At least one tile must be set.

01: Tile (when creating an instrument check condition set or instrument check condition file) or Tile (when editing an instrument check condition set or instrument check condition file)

Set/edit tile information.

1) Type: Click on the combo box and select the type of Color Plate to be used as a tile.
2) Name: Input the name of the tile.
3) Serial No.: Input the serial number of the tile.
4) Description (optional): If desired, input a description of the tile
5) Skip: Click "Enable" to allow measurements of the tile to be skipped or "Disable" to always require measurements of the standard.
6) When creating an instrument check condition set or instrument check condition file, click "Next >" at the bottom of the tab to move to the 02: Target tab. When editing an instrument check condition set or instrument check condition file, click the Target tab to move to the Target tab.

02: Target (when creating an instrument check condition set or instrument check condition file) or Target (when editing an instrument check condition set or instrument check condition file)

Set/edit tile standard GU value. Tile standard value is used as the baseline for reproducibility measurements.

1) To set the standard GU value of the tile directly, input each value or click the up/down buttons to increase/decrease the value.
2) To set the standard GU value of the tile by measurement, position the instrument and tile for measurement and click [Measure].
   - To perform calibration before measurement, click [Calibration] and follow the on-screen instructions.
   - Setting the standard values by measurement is not possible when creating an instrument check condition set file.
3) When creating an instrument check condition set or instrument check condition file, click "Next >" at the bottom of the tab to move to the 03: Tolerance tab. When editing an instrument check condition set or instrument check condition file, click the Tolerance tab to move to the Tolerance tab.

03: Tolerance (when creating an instrument check condition set or instrument check condition file) or Tolerance (when editing an instrument check condition set or instrument check condition file)

Set/edit tile tolerance for judging "Pass"/"Warn"/"Fail".

1) Set the upper and lower GU tolerance by inputting the tolerance directly or by clicking the up/down buttons to increase/decrease the value.
2) Set the Warning Level (%) by inputting the value directly or by clicking the up/down buttons to increase/decrease the value.
3) If shown, click "Complete" in the lower right of the tab.

c) To add another tile, repeat step b) above.

- To delete a tile, select the tile to delete in the tile list on the left side and click the trash can icon. A confirmation message will appear. Click [Yes] to delete the tile or [No] to cancel deletion.

d) When all tiles have been added, click [Next >].

6. Complete

A report screen showing all of the settings in the instrument check condition set will be shown.

- To output the report to a file, click on "File output on completion" to make it checked.

6-1 Click [Complete]. Setting of the instrument check condition set will be finished and the dialog will close.

- When creating or editing an instrument check condition set for a registered instrument, if "File output on completion"is checked, the "Save As" dialog will appear. Browse to the folder where you want to save the instrument check condition set file and set the desired file name, and click [Save]. The file will be saved and the dialog will close.
- When creating an instrument check condition set file, "File output on completion"is not shown and the "Save As" dialog will always appear. Browse to the folder where you want to save the instrument check condition set file and set the desired file name, and click [Save]. The file will be saved and the dialog will close.

3.6 Executing Instrument Check

Instrument check according to the instrument check condition set which was set for an instrument can be performed according to the following steps.

- The following steps are an example of executing instrument check with a CM-26dG with all tests enabled. Steps may be different depending on the settings in the instrument check condition set file being executed.
- If the results for any of the test items is "Fail", check the following and repeat the test item.

Point to check	Countermeasure
Are there any foreign materials or stains on the measurement subject?	For the white calibration plate, etc., clean as directed in the instrument instruction manual.
Is the ambient temperature the same as when the test conditions were set?	It is recommended that instrument check always be performed at the same temperature. The recommended range for ambient temperature is 23°C ±3°C.
Was measurement performed properly?	Perform measurement as directed in the instrument instruction manual.
Are the tolerances set too tightly?	It is recommended that tolerances not be set too much smaller than the default values.

If failure continues to occur after checking the above points and taking the suggested countermeasures, contact the nearest Konica Minolta service facility.

1. Select the instrument to execute instrument check for in the Instrument Window and click [▶ Execute Instrument Check] in the Instrument Window lower toolbar or select *Instrument - Execute Instrument Check ...* . Instrument check will start and the Zero Calibration dialog will appear.
- If the instrument settings are different than the registered instrument check conditions, a message to set the instrument to the instrument check conditions will be shown.

2. Perform zero calibration.
- To skip zero calibration, click [Skip].

3. The White Calibration dialog will appear. Perform white calibration.

4. If the Gloss Calibration dialog appears, perform gloss calibration.

5. The Execute Instrument Check dialog will appear, with the screen for the Light Source Test shown. Position the zero calibration box and instrument, and click [Measure]. Measurements will be taken and the results will be shown.
- If an error was made during measurement, the test can be repeated before proceeding to the next test.

6. Click [Next >] to proceed to the next test.

7. The screen for the Repeatability Test will be shown. Position the white calibration plate and instrument, and click [Measure]. Measurements will be taken and the results will be shown.
- If an error was made during measurement, the test can be repeated before proceeding to the next test.
- To return to the previous test, click [Back].

8. Click [Next >] to proceed to the next test.

9. The screen for the Reproducibility Test will be shown.

9-1 Position the tile and instrument, and click [Measure]. Measurements will be taken and the results will be shown, and the cursor will automatically move to the next tile.

9-2 Repeat step 9-1 until all tiles have been measured.

- To skip measurement of a tile, click [Skip]. The cursor will move to the next tile.
- If an error was made during measurement, the test can be repeated before proceeding to the next test.
- To return to the previous test, click [Back].

10. Click [Next >] to proceed to the next test.

11. The screen for the Repeatability Test (Gloss) will be shown. Position the gloss calibration plate and instrument, and click [Measure]. Measurements will be taken and the results will be shown.
- If an error was made during measurement, the test can be repeated before proceeding to the next test.
- To return to the previous test, click [Back].

12. Click [Next >] to proceed to the next test.

13. The screen for the Reproducibility Test (Gloss) will be shown.

13-1 Position the tile and instrument, and click [Measure]. Measurements will be taken and the results will be shown, and the cursor will automatically move to the next tile.

13-2 Repeat step 13-1 until all tiles have been measured.
- To skip measurement of a tile, click [Skip]. The cursor will move to the next tile.
- If an error was made during measurement, the test can be repeated before proceeding to the next test.
- To return to the previous test, click [Back].

14. Click [Next >]. The Instrument Check Results screen will appear, showing a summary of the results.
- To return to the previous test, click [Back].

15. Click [Complete]. The instrument check will be completed, the [Back] button will be disabled, and the [Show Report] button will be enabled.
- To show the full report, click [Show Report]. The Instrument Check Report dialog will appear.
- If the instrument settings before performing instrument check were different than the instrument check conditions, a message to return the instrument to the previous settings will be shown when [Complete] is clicked.

16. Click [Close]. The Execute Instrument Check dialog will close.

3.6.1 Instrument Check Report Dialog

The Instrument Check Report dialog shows the full results of instrument check in several pages. You can scroll through the pages.
To save the report as a pdf, click the Save As button in the upper left.
To move to the top of the next page, click the down button.
To move to the top of a previous page, click the up button.
To move to the top of a specific page, input the desired page number in the textbox and press the computer's Enter button.

3.7 Exporting/Importing Instrument Check Files

Registered instruments, their instrument check condition sets, and their instrument check results can be exported to a file and that file can then be read on another computer to enable easy transfer of instrument check data.

3.7.1 Exporting an Instrument Check File

1. Select *File - Export ...* . The Save As dialog will appear.
2. Browse to where the exported file will be saved and input the file name. The file extension will be *.inbk.
3. Click [Save]. All instrument check data for all registered instruments will be saved to the file.

3.7.2 Importing an Instrument Check File

1. Select *File - Import from File ...* . The Open dialog will appear.
2. Browse to the folder containing the file to be imported and select the file. The file extension is *.inbk.
3. Click [Open]. The instrument check data in the file will be imported.

3.8 Editing the Instrument Check Schedule

How often to perform instrument check can be set for each registered instrument. If instrument check for an instrument is not performed by the scheduled day, the status for that instrument in the instrument window will indicate that instrument check has expired.

1. Select the instrument to set the instrument check schedule for in the Instrument Window.
2. Select *Instrument - Edit Schedule...*, click [Edit Schedule] in the main toolbar, or click [Edit Schedule] in the Instrument Window lower toolbar. The Instrument Check Schedule dialog will appear.
3. In Pattern Setting, click on the desired schedule.
   Daily: Instrument check will be required every day.
   Weekly: Click on the days of the week to require instrument check. Instrument check will be required on each checked day.
   Monthly: Click on the combo box and select the day of the month on which to require instrument check.
4. Click [Register] to register the schedule. The dialog will close.

3.9 Setting Application Settings

File paths, auto save file names, and startup options can be set.

1. Select *Environment Settings - Application Settings ...* . The Application Settings dialog will appear.

2. To set the default file path for saving instrument check reports when the Save As button in the Instrument Check Report dialog is clicked, select File Paths in the left side of the dialog. The Instrument Check Report screen will be shown.

2-1 Click "Save" to put a check in the checkbox. The file path textbox will be enabled.

2-2 Click [Browse]. The Select Folder dialog will appear.

2-3 Browse to the desired default folder for saving instrument check reports.
- To create a new folder, click "New folder" in the upper right of the dialog, input the desired folder name, and click on it to open the folder..

2-4 Click [Select Folder]. The folder will be selected and the dialog will close.

3. To enable automatic saving of instrument check reports every time an instrument check is performed, select Auto Save Settings in the left side of the dialog. The Instrument Check Report screen will be shown.

3-1 Click "PDF" to put a check in the checkbox. The Folder to output and File name textboxes will be enabled.

3-2 Click [Browse]. The Select Folder dialog will appear.

3-3 Browse to the desired default folder for automatically saving instrument check reports.
- To create a new folder, click "New folder" in the upper right of the dialog, input the desired folder name, and click on it to open the folder..

3-4 Click [Select Folder]. The folder will be selected and the dialog will close.

3-5 To add a prefix to the auto save file name, click in the File name textbox and input the desired prefix. An example of what the auto save file name will look like will be shown under Example.

4. To set Startup Options and Startup Message settings, select Other Settings in the left side of the dialog. The Startup Options and Startup Message screen will be shown.

4-1 To start the Instrument Check App in instrument mode to use it for controlling actual measuring instruments, click "Start in Instrument mode".
To start the Instrument Check App in demo mode so that you can use it without being connected to actual measuring instruments, click "Start in Demo mode".

4-2 If "Enable startup message" is checked, a message stating that a Premium license is required to use the Instrument Check App will appear every time the Instrument Check App is started. If it is not checked, the message will not be shown.
- If the Premium license will expire within 45 days, a message stating the days remaining will be shown even if "Enable startup message" is not checked.
- If the Premium license is expired, a message stating that the license is expired will be shown even if "Enable startup message" is not checked.

5. After all desired settings have been made, click [OK] to confirm the settings and close the dialog.

< CAUTION >

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