

Data Management Software CS-S10w Standard

Ver.1.8

Instruction Manual



KONICA MINOLTA

Formal designations of application software used in this manual

(Designation in this manual) (Formal designation)

Windows, Windows 7	Microsoft [®] Windows [®] 7 Professional Operating System
Windows, Windows 8.1	Microsoft [®] Windows [®] 8.1 Pro Operating System
Windows, Windows 10	Microsoft [®] Windows [®] 10 Pro Operating System

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Introduction

The CS-S10w Standard Edition is data management software designed to connect the CS-200 instrument to a PC (personal computer) to enable measurement and management of measured data. The CS-S10w Professional Edition is also optionally available to provide various advanced functions.



Safety Precautions

Before you use the CS-S10w software, we recommend that you thoroughly read this manual as well as the instruction manuals of your PC and the instrument.

Package Contents

- Installation CD-ROM of CS-S10w (Qty: 1)

The Instruction Manual is also installed in PDF form with a shortcut in the start menu during the software installation.

Versions of the Instruction Manual in other languages are also included on the installation CD-ROM.

Software License Agreement

The terms of the license agreement of the CS-S10w 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

- The CS-S10w application software is designed to be used with the Windows 7, Windows 8.1 or Windows 10 operating system. Note that neither operating system is included with this software.
- One of these operating systems must be installed on the PC before this software can be installed.
- When inserting the CD-ROM into the CD-ROM drive, note the correct orientation of the disc. Insert it gently.
- Keep the CD-ROM clean and free from scratches. If the recorded surface becomes dirty or the label surface is scratched, a read error may result.
- Avoid exposing the CD-ROM to rapid temperature changes and condensation.
- Avoid leaving it in locations where it may be exposed to high temperatures from direct sunlight or heaters.
- Do not drop the CD-ROM or subject it to strong impact.
- Keep the CD-ROM away from water, alcohol, paint thinners, and other such substances.
- Remove the CD-ROM from the CD-ROM drive while the computer is turned on.

Notes on Storage

- After using the CD-ROM, return it to its case and store in a safe place.
- Avoid leaving the CD-ROM in locations where it may be exposed to high temperatures from direct sunlight or heaters.
- The CD-ROM should not be kept in areas of high humidity.

Every effort has been made to ensure the accurate operation of this software. However, should you have any questions or comments, please contact the nearest KONICA MINOLTA authorized service facility.

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CHAPTER 1

OVERVIEW

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Major
Functions

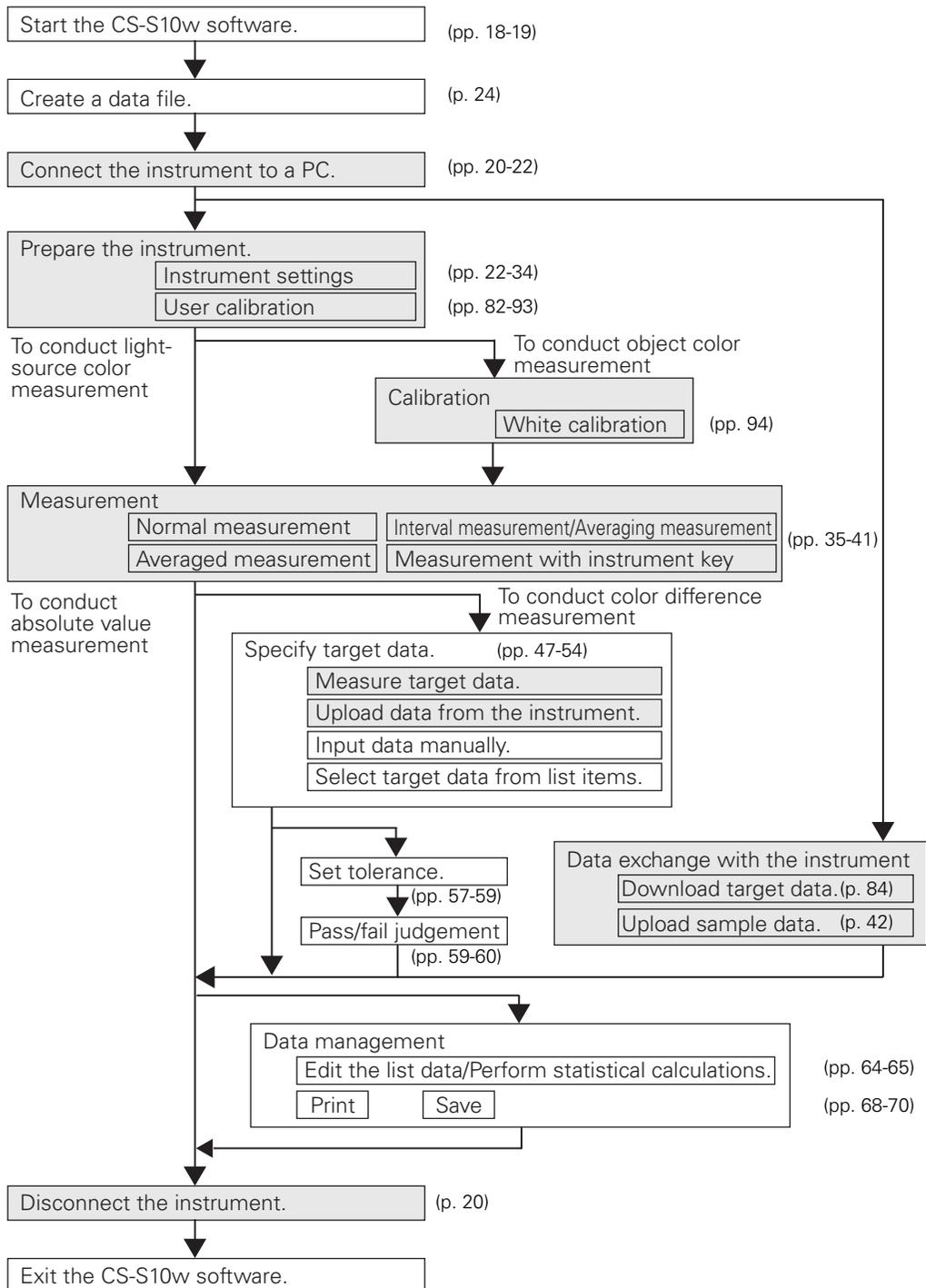
Operation
Flow

Window
Configuration

1.1 Major Functions

Color space mode	(Light-source color mode) $L_{v,xy}$, $L_{v,u'v'}$, $L_{v,T\Delta uv}$, XYZ, $L^*a^*b^*$, JND, Dominant Wavelength, Excitation Purity, Contrast, Square ratio
	(Object color mode) $L^*a^*b^*$, L^*C^*h , XYZ, Yxy, Hunter Lab, $L^*u'v'$, $L^*u^*v^*$, Dominant Wavelength, Excitation Purity
	Notes concerning displayed values: The CS-S10w software enhances calculation accuracy by performing internal calculations with numbers greater in magnitude 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. Because the tolerance judgement calculation and graph-plotted points are also processed with numbers greater in magnitude than those actually displayed, the judgement result or plotted points may differ from those obtained with the values displayed on the instrument.
Observer	2 degree , 10 degree
Illuminants (Object color mode)	A, B, C, D50, D55, D65, D75, D95, E, F2, F6, F7, F8, F10, F11, F12 Up to three illuminants can be displayed simultaneously.
Instrument control functions	Measurement/Calibration Averaging measurement: 2 to 1000 measurements Interval measurement: 2 to 1000 measurements/0 to 12 hours interval (in increments of 10 seconds) Remote measurement Downloading of configuration data to the instrument Uploading of data stored in instrument memory User calibration
Target	Two or more pieces of target data can be registered. Target data can be downloaded to the instrument.
Data list	Listing of target data and sample data Editing (delete, sort, average, copy & paste)
External I/O	Uploading/saving of data file(s) in original formats (with “.ces” file extension). Copying of lists in clipboard.

1.2 Operation Flow



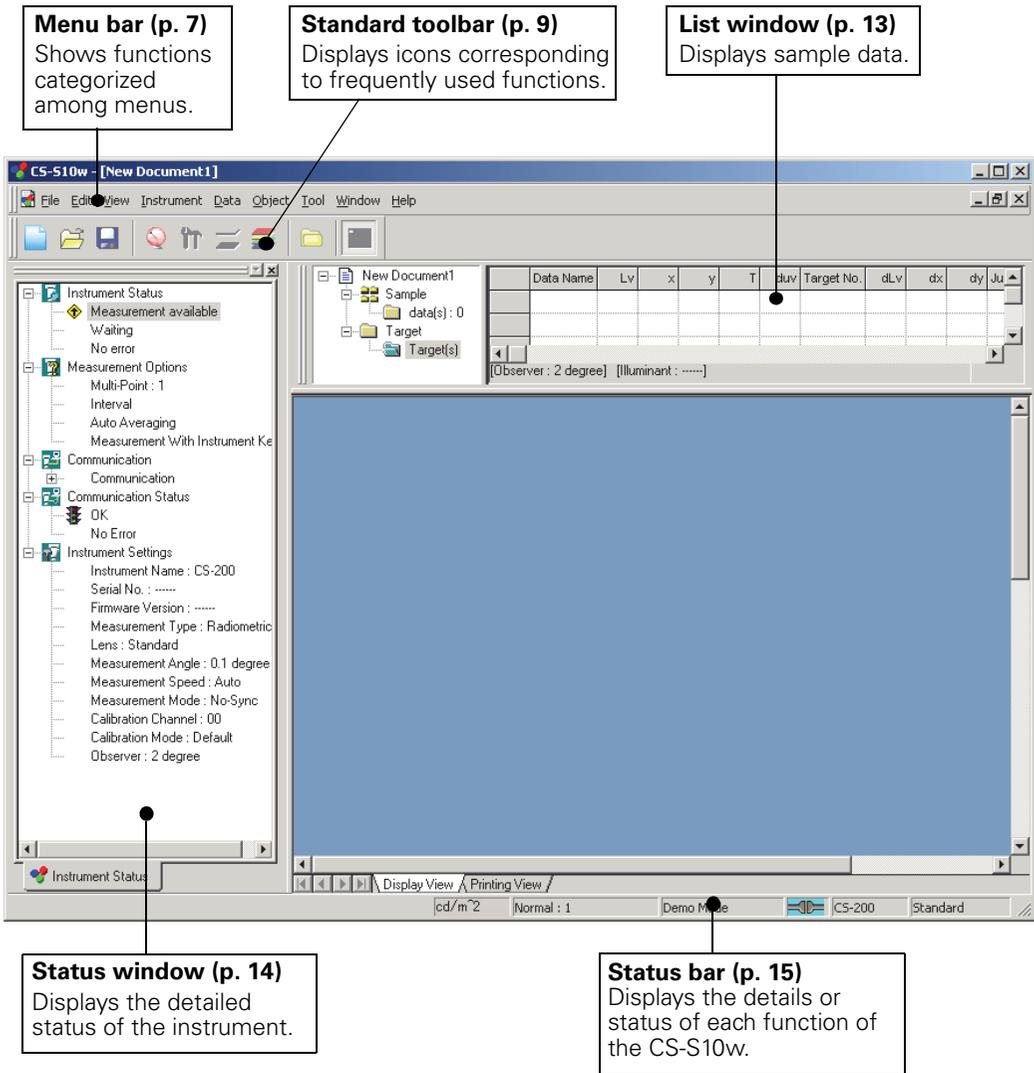
The shaded sections indicate functions available only when the instrument is connected.

1.3 Window Configuration

1.3.1 Operation Window

The CS-S10w software provides the following windows and bars.

Window Configurati



1.3.2 Menu Bar

When the CS-S10w software is started, a menu bar appears at the top of the window in a manner similar to other Windows-based software. This section lists the functions available in the menu bar and the manual pages on which these functions are described.

File

 New	Ctrl+N24
 Open	Ctrl+O75
Close		
 Save	Ctrl+S	
 Save As	71
Save Selection As Text	65
Template*		
Load Template*		
Save as Template*		
Page Setup	68
 Print Preview	70
 Print	Ctrl+P70
Startup Options	73
Send Mail	81
Documents recently opened with the CS-S10w software.8 (Up to five files are displayed.)		
 Exit	Shift+X	

Edit

 Cut	Ctrl+X64
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Delete	Del65
Bring Forward		
Send Backward		
Bring to Front		
Send to Back		

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<input checked="" type="checkbox"/> Standard Toolbar6, 9
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Input Colorimetric Target51
Edit Spectral Data95
Observer and Illuminant25
List Items27
Decimal Places32
▼ Next Data	
▲ Previous Data	
Data Property44

The commands under the *Instrument* menu are available only when the instrument is connected to the computer.

Items marked with * are supported only by CS-S10w Professional Edition.

Object *

- Select *

- Line *
- Rectangle *
- xy*
- u'v'*
- Spectral Graph*
- L*a*b* *
- Trend/Histogram *
- Image *
- Data Label *
- String Label *
- Line Graph *
- Property *

Tool

- Change Target 56
- Move to Target
- Average 66
- Sort 65

- View Settings 77

- Edit Mode *

- Option 79

Window

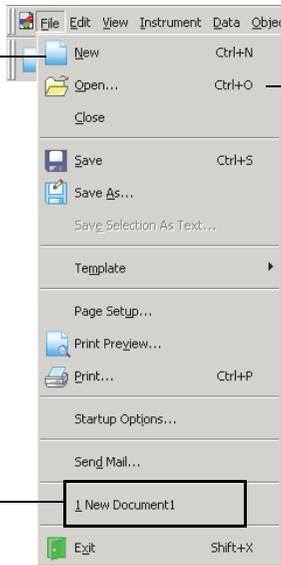
- Cascade 76
- Tile 76

- Documents currently open

Help

- About CS-S10w 18

In the standard toolbar, this icon represents the command. See page 9 for details.



Shortcut keys for this command. See page 12 for details.

Documents recently opened with the CS-S10w software. (Up to five files are displayed.)

1.3.3 Standard Toolbar

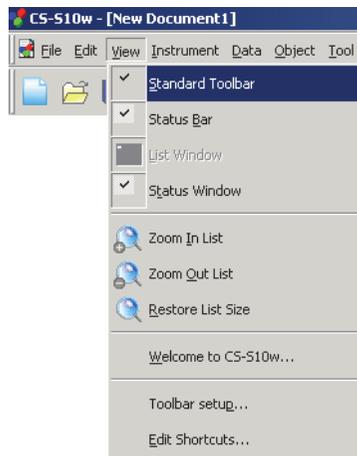
The standard toolbar contains buttons corresponding to frequently used functions. To invoke the command, simply click the button with the mouse.



- Place the mouse pointer over a button to display a brief description of its function.
- The buttons can be displayed in two different sizes and can be arranged in any order desired.

Showing/hiding the standard toolbar

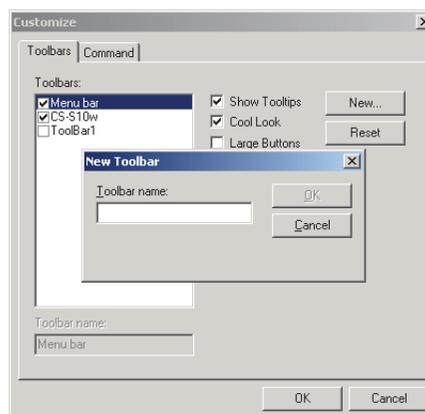
Click *View - Standard Toolbar* in the menu bar to show/hide the standard toolbar.



Customizing the standard toolbar

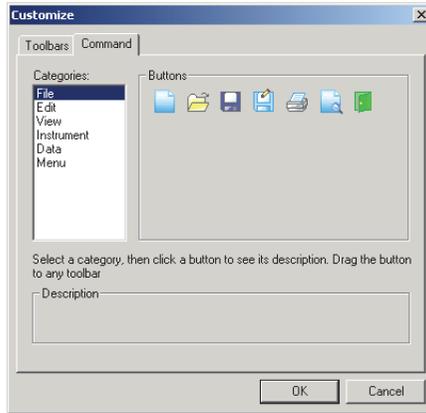
To customize your toolbar with a desired combination of icons, select *View - Toolbar setup* from the menu bar.

1. Click the New button.
2. Type the name of a toolbar and click the OK button.



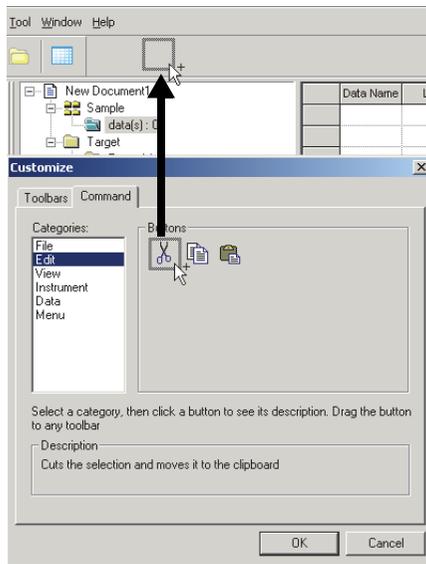
3. Select the Command tab and select the category of icon you want to add to the new toolbar from the list displayed below Categories.

The button icons for the selected category are displayed in the Buttons area.

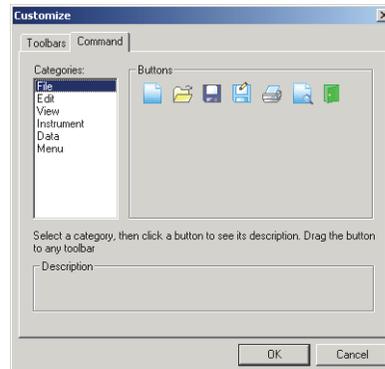
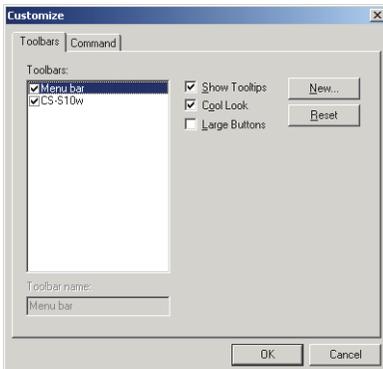


4. Drag-and-drop the button icon to the new toolbar.

The button appears in the toolbar.



■ Settings in the Customize dialog box



Toolbars tab

CS-S10w

This is the standard toolbar. When this item is checked, the standard toolbar appears. Uncheck this item to hide the toolbar.

To return to the initial setting, click the Reset button.

Show Tooltips

Position the mouse pointer over a button to see brief explanation of the function of the icon displayed as a tooltip.

Check this option to have a tooltip appear. Uncheck this item if you do not want a tooltip to appear.



Cool Look

The appearance of the icons shown on the toolbar can be changed.

When this option is checked, the icons normally appear flat but change to a three-dimensional button appearance when the mouse pointer is positioned over them.



Cool look display

Button display

Large Buttons

The default size of the icons in the toolbar can be increased to a larger size with a text description of each button displayed below the icon.



Command tab

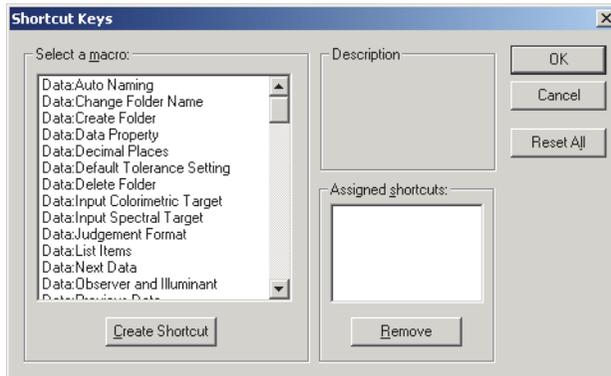
Select this tab to add or remove the buttons appearing in the toolbar.

1.3.4 Shortcut Keys

You can also access the menu commands of the CS-S10w software simply by pressing various shortcut keys.

Editing shortcut keys

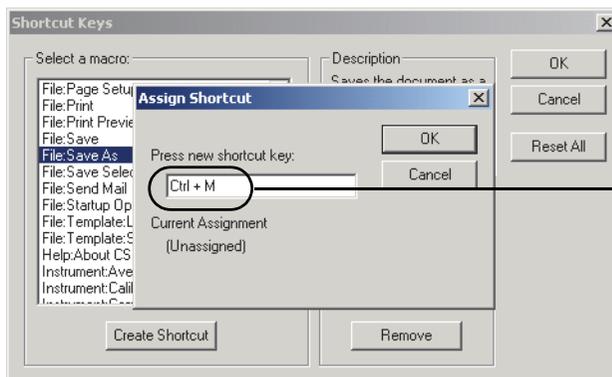
You can customize the shortcut keys by selecting *View - Edit Shortcuts* from the menu bar.



1. To create a shortcut or edit an existing shortcut key, select the desired process under “Select a macro.”
2. Click the Create Shortcut button.
3. The Assign Shortcut dialog box opens. Press the key(s) you want to assign to the shortcut.

In the box below “Press new shortcut key:”, “Ctrl” and the key(s) you pressed are displayed. If you pressed any key while holding down the Shift or Alt key, or if you pressed a function key, the key(s) you pressed will be displayed.

If the key(s) you pressed have already been assigned to another macro, the corresponding macro is displayed below “Current Assignment.” If the key is not assigned to any macro, “(Unassigned)” is displayed.



4. Click the OK button.

■ Shortcut Keys dialog box

Create Shortcut

Press this button to create a new shortcut.

Reset All

Press this button to reset all shortcuts that have been created. The CS-S10w software returns to the initial settings as shown on pages 7 and 8.

Remove

Select a macro whose shortcut you want to delete. Select its shortcut and click this button to delete it.

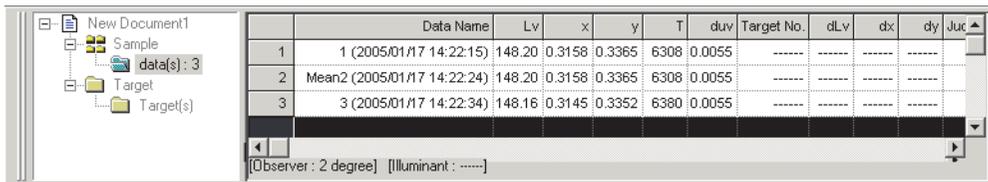
1.3.5 List Window

The list window lists the sample data.

Each document file has its own list window.

Data can be organized in folders for easy management. The list shows the data stored in the selected folder.

You can select the style in which lists are displayed in two ways: By row - where one piece of data is displayed per row, or by column - where one piece of data is displayed per column. For details on how to select list style, see page 73. The figure below shows an example of data displayed by row list.

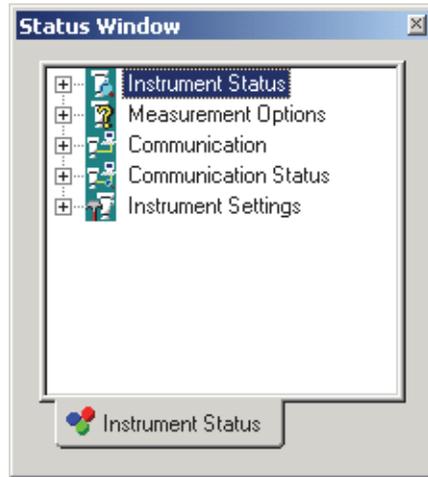


	Data Name	Lv	x	y	T	duv	Target No.	dLv	dx	dy	Juc
1	1 (2005/01/17 14:22:15)	148.20	0.3158	0.3365	6308	0.0055	-----	-----	-----	-----	
2	Mean2 (2005/01/17 14:22:24)	148.20	0.3158	0.3365	6308	0.0055	-----	-----	-----	-----	
3	3 (2005/01/17 14:22:34)	148.16	0.3145	0.3352	6380	0.0055	-----	-----	-----	-----	

[Observer : 2 degree] [Illuminant : -----]

1.3.6 Status Window

The status window displays the operating status and communication status of the instrument.



Examples of displayed comments are as follows:

Instrument Status

- └ Measurement available/ Not connected/ White Calibration is required.
- └ Measuring/ Calibrating/ Configuring/ Uploading/ Downloading
- └ Low Battery/ Low Luminance

Measurement Options

- └ Multi-Point
- └ Interval
- └ Auto Averaging
- └ Measurement With Instrument Key

Communication

- └ USB/RS-232C (with specified parameters such as COM and bps)

Communication Status

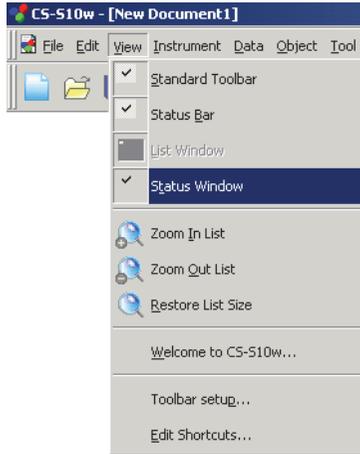
- └ OK/ Communicating/ Not connected/ Error

Instrument Settings

- └ Instrument Name
- └ Serial No.
- └ Firmware Version
- └ Measurement Type
- └

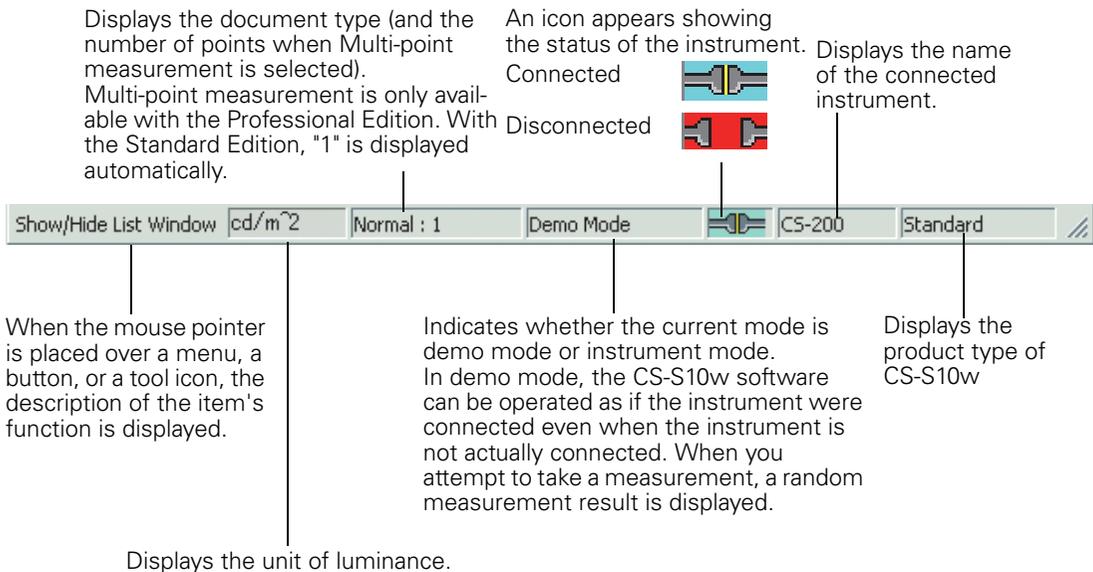
■ Showing/hiding the status window

You can show or hide the status window by selecting *View - Status Window* from the menu bar.



1.3.7 Status Bar

Displays the details or status of each function of the CS-S10w.



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Starting the
CS-S10w
software

Creating a New
Data File

Preparing for
Measurement

Measurement

Specifying
Target Data/
Tolerance

List Window
Operation

Printing

Saving Data

Other
Functions

2.1 Starting the CS-S10w software

For information on installing the CS-S10w software, refer to the Installation Guide.

Select the CS-S10w icon registered with the Start menu. You can also start the software by selecting the data file. When the CS-S10w software starts, the following splash screen appears.

■ Splash screen

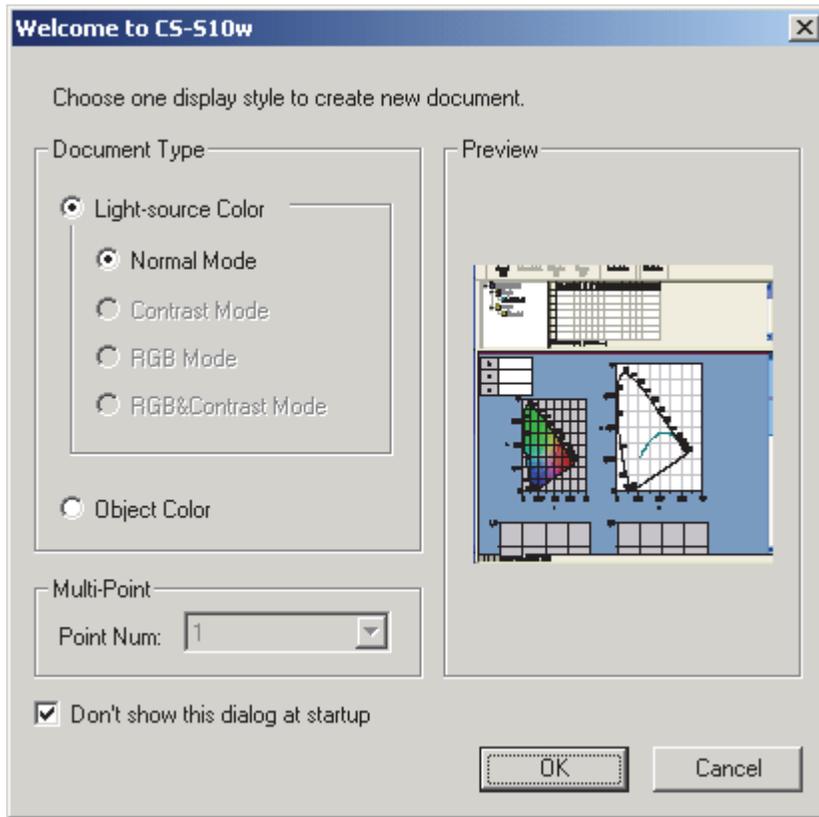


■ Version information

You can also display the splash screen by selecting *Help - About CS-S10w* from the menu bar. The current version of the CS-S10w software is shown at the upper left corner of the screen.

2.1.1 Starting the CS-S10w Software for the First Time

The first time the CS-S10w software starts, the “Welcome to CS-S10w” dialog box appears.



■ Welcome to CS-S10w dialog box

Document Type

Light-source Color - Normal Mode, Object Color

Select whether to perform light-source color measurement or object color measurement. Clicking one of the radio buttons displays the preview screen on the right.

- * Contrast Mode, RGB Mode, RGB&Contrast Mode, Multi-Point measurement, and a graphic display which is previewed on the screen are all only available with the Professional Edition.

Don't show this dialog at startup

Leave this box unchecked to view the Welcome to CS-S10w dialog box the next time you start the CS-S10w software. You can view this dialog box at any time by selecting *View - Welcome to CS-S10w* from the menu bar.

Clicking the OK button closes the dialog box.

2.1.2 Establishing Connection with the Instrument

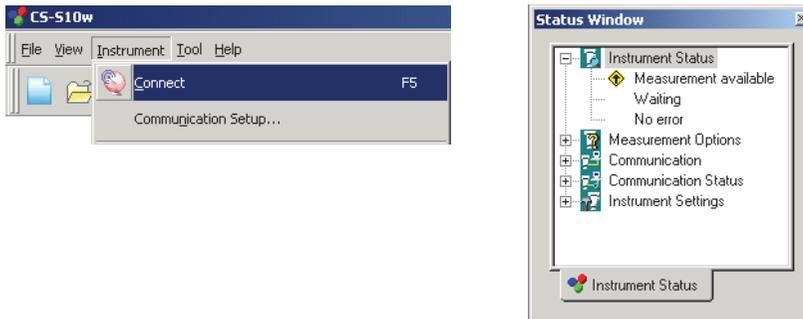
This procedure is available only when the instrument is connected.

To establish a connection with the instrument, select *Instrument - Connect* from the menu bar or click the icon in the toolbar. All detailed information about the connection is displayed in the status window.

Connecting to the instrument

1. Select *Instrument - Connect* from the menu bar.

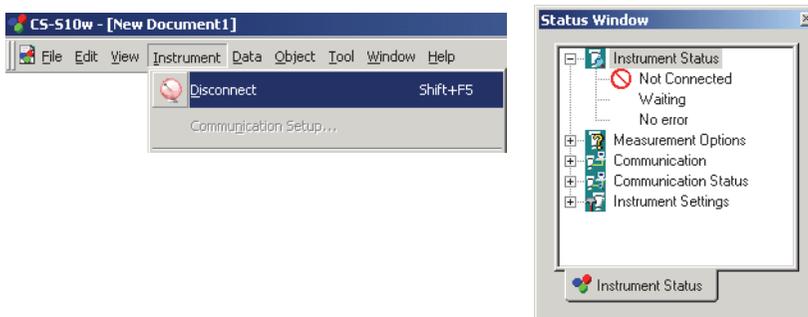
The CS-S10w software connects to the instrument and the status of the instrument is displayed in the status window. Once the connection is established, *Disconnect* appears in the *Instrument* menu instead of *Connect*.



Disconnecting from the instrument

1. Select *Instrument - Disconnect* from the menu bar.

The CS-S10w software is disconnected from the instrument and the status of the connection is displayed in the status window. Once the instrument is disconnected, *Connect* appears in the *Instrument* menu instead of *Disconnect*.



If the connection fails

If the connection cannot be established, a dialog box appears displaying the message “No response from instrument”. Check that the USB cable is securely connected and that the instrument is turned on, and then select *Connect* again.

Problems occurring during connection

Connection problems may occur even after the CS-S10w software has successfully connected to the instrument and established proper communication. In such a case, a dialog box opens and displays “No response from instrument.” When this message appears, click OK and check that the USB cable is securely connected and that the instrument is turned on before selecting *Connect* again.

When the instrument operates on batteries

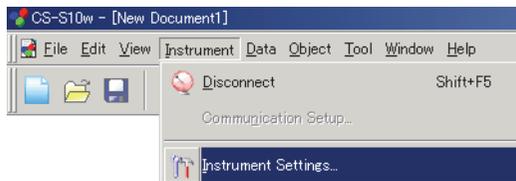
If you attempt communication with the instrument and the power supply voltage applied to the instrument is low, the CS-S10w may suspend the operation when waiting for the response from the instrument. In such a case, turn off the instrument. When a dialog box appears with a message “No response from instrument”, click OK. Replace the batteries with new ones or connect the AC adapter, and then select *Connect* again.

2.1.3 Setting Up the Instrument

This procedure is available only when the instrument is connected.

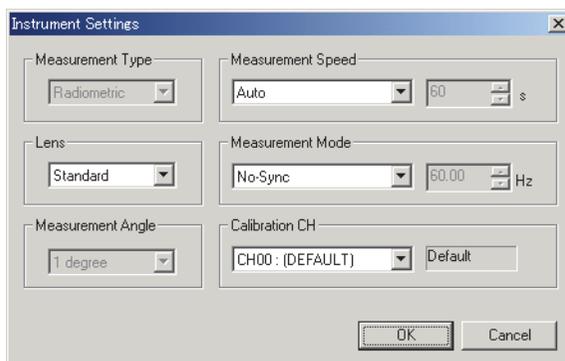
1. Select *Instrument - Instrument Settings* from the menu bar.

The Instrument Settings dialog box appears.

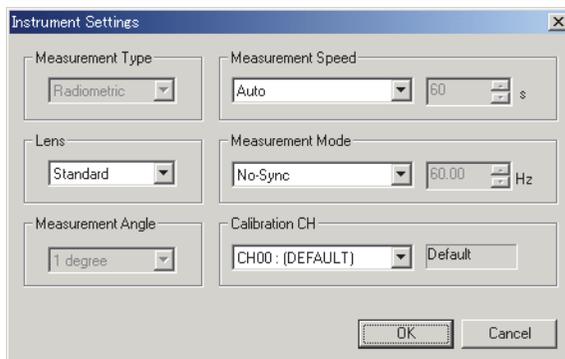


2. Specify the settings of the instrument.

After the settings are entered, the new settings are displayed in the status window. For details of instrument settings, refer to the instruction manual for the instrument.



■ Instrument Settings dialog box



Measurement Type

Radiometric is displayed when the document type is in the light-source color mode. [Selection disabled.] When the document type is in the object color mode, select either Reflectance or Transmittance.

Lens

Select the setting from Standard, Close up 1 (No. 107) and Close up 2 (No. 122). Select Close up 1 (No. 107) when close-up lens No. 107 (optional accessory) is attached, and select Close up 2 (No. 122) when close-up lens No. 122 (optional accessory) is attached.

When another lens such as an ND filter is attached and its correction factor is registered, User 1, User 2 and User 3 are added to the options. To register correction factors, refer to page 86.

Measurement Angle

Either 1° , 0.2° or 0.1° is displayed depending on the status of the instrument. [Selection disabled]

Measurement Speed

Select the setting from Auto, LTD. AUTO, S-Fast, Fast, Slow, S-Slow and Manual. When selecting Manual, enter the number of seconds between 1 and 60 in units of seconds in the box on the right.

Measurement Mode

Select either Internal or No-Sync. When selecting Internal, set the Hz value in the box on the right between 40.00 and 200.00 in units of 0.01 Hz.

Calibration CH

The combo box shows calibration channels in the form of “CH number : ID name”. Select a calibration channel between CH00 and CH20.

The calibration mode for the selected calibration channel is shown in the text box on the right. The calibration mode is Default or Single.

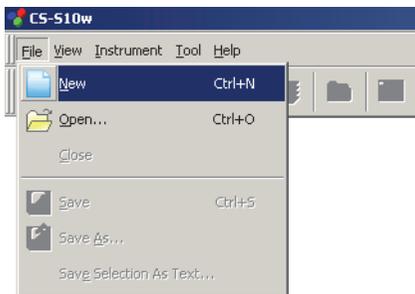
2.2 Creating a New Data File

Create a new document file (data file) to store measured data. A document file appropriate for the document type selected in the “Welcome to CS-S10w” dialog box will be created.

2.2.1 Creating a new data file

1. Select *File - New* from the menu bar.

A list window for the selected document type is displayed.



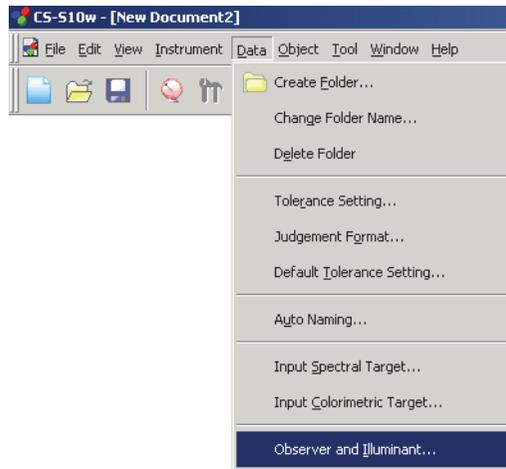
2.3 Preparing for Measurement

2.3.1 Setting the Observer and Illuminant

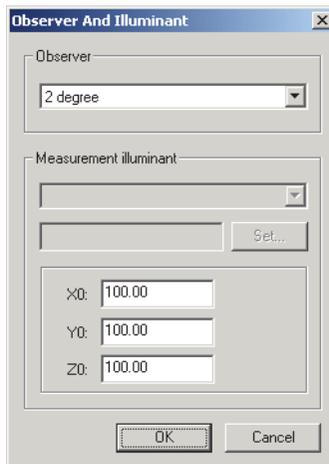
The observer and illuminant are important for calculating colorimetric data. The observer and illuminant must be identical to allow for comparison of colorimetric data from several samples. It is recommended that the observer and illuminant be specified beforehand. They should not be changed unnecessarily.

1. Select *Data - Observer and Illuminant* from the menu bar.

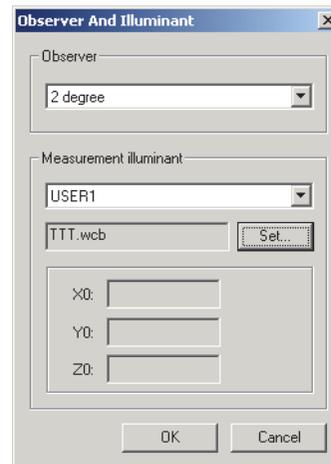
The Observer And Illuminant dialog box appears.



2. Specify the observer and illuminant.



When the light-source color mode is selected



When the object color mode is selected

Only one pair of observer and illuminant is saved for each document file. (A different pair of observer and illuminant can be used for each file.) The white point (X0, Y0, Z0) in light-source color mode is saved as an application setting. (Once the white point is set, the calculations of other files are also affected.) These settings do not affect the observer and illuminant that have been specified with the instrument.

Observer And Illuminant dialog box

Observer

Select either 2 degree or 10 degree.

Measurement illuminant

When the light-source color mode is selected

You can specify the desired white point which is used to calculate colorimetric data.

The available white point range is as follows:

X0/Y0/Z0: 0.01 to 99999000000.00

When the object color mode is selected

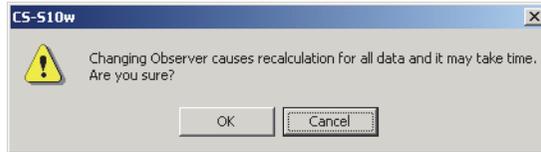
Select one from the following:

A, B, C, D50, D55, D65, D75, D95, E, F2, F6, F7, F8, F10, F11, F12, User 1, User 2 or User 3.

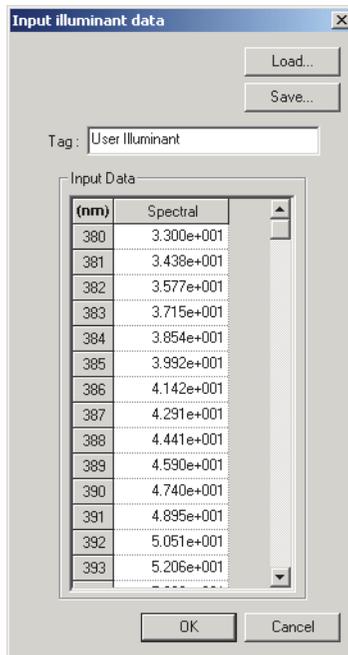
When selecting one of User 1 to 3, specify the user illuminant data file to be used. When the Set button is clicked, the Input illuminant data dialog is displayed.

The setting in this dialog box will be reflected in all data included in the document file.

When the observer or illuminant is changed, the CS-S10w software recalculates all data. When you attempt to change the observer or illuminant, the following message appears.



Input illuminant data dialog box



Tag

A tag of 60 characters or less can be specified for the illuminant data.

Load

The specified file (extension: .lrv) is loaded and reflected on the input data. After the file is loaded, the name of the file is automatically shown in the Tag field.

Save

The file is saved using the specified file path. The file extension is “.lrv”.

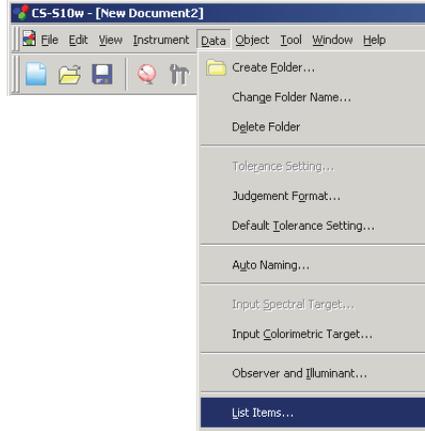
Input Data

The spectral data is displayed. You can edit the data by manually entering values directly.

2.3.2 Setting the List Items

Set the items shown in the list window such as data names and colorimetric data, and specify the order in which the items are to be listed.

1. Select *Data - List Items* from the menu bar.
The List Items dialog box appears.

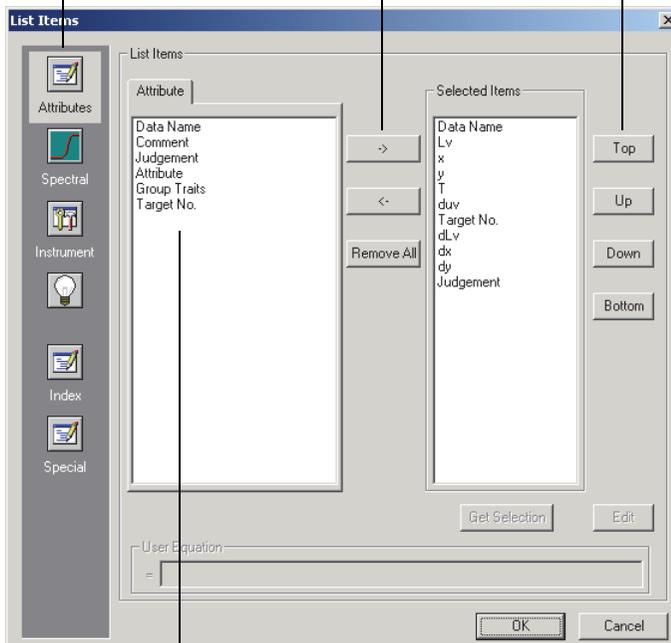


2. Specify the details of the items shown in the list window.

These icons indicate the groups into which the list items are to be classified.

Select an item in the left pane and click the \rightarrow button to add the item to the Selected Items pane on the right.
To delete an item from the Selected Items, select the item and click the \leftarrow button.

You can change the order in which the items are displayed in the list window. The item at the top of this pane is displayed at the left side of the list window. To change the order, select the item in the Selected Items and click the appropriate button.



The list items included in the group indicated by the icon on the left are displayed.

When all necessary items are specified, click the OK button.

■ List Items dialog box

The following tables show the items selectable as list items and the content of each item displayed in the list window.

		Content displayed in list window
 Attributes	Data Name	Name of data
	Comment	Comment
	Judgement	Pass / Fail (Available only for sample data)
	Attribute	Demonstration colorimetric data / Measured colorimetric data / Manually input colorimetric data / Uploaded colorimetric data / Averaged colorimetric data
	Group Traits	White / Black / Red / Green / Blue
	Target No.	No. assigned to linked target

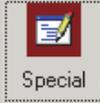
		Content displayed in list window
 Spectral		*1 380 to 780 nm (1 nm-increment)

		Content displayed in list window
 Instrument	Instrument Name	CS-200
	Variation	<Function reserved for future use. The current version of CS-S10w shows “----”>
	Serial No.	Serial No. of instrument
	Firmware Version	ROM version of instrument
	Timestamp	Day and time of measurement
	Measurement Type	Reflectance / Transmittance / Radiometric
	Lens	Standard / Close up 1 (No. 107) / Close up 2 (No. 122) / User 1 / User 2 / User 3
	Measurement Angle	1° / 0.2° / 0.1°
	Measurement Speed	Auto / LTD. AUTO / S-Fast / Fast / Slow / S-Slow / Manual Shown as “Manual xx.x(s)” when “Manual” is to be displayed. (Where “xx.x” is the measurement speed in seconds at the time when the data was measured.)
	Measurement Mode	No-Sync / Internal Shown as “Internal xxx.x(Hz)” when “Internal” is to be displayed. (Where “xxx.x” is the synchronization frequency in hertz at the time when the data was measured.) Note that the decimals are always displayed as “00” regardless of the actual synchronization frequency at the time of measurement.
	Calibration Channel	00 to 20
	Calibration Mode	Konica Minolta Standard / One-point calibration
	Observer	2 degree, 10 degree
	Illuminant	A/B/C/D ₅₀ /D ₅₅ /D ₆₅ /D ₇₅ /D ₉₅ /E/F ₂ /F ₆ /F ₇ /F ₈ /F ₁₀ /F ₁₁ /F ₁₂
Warning	Over (brightness) / Over (chromaticity) / Over (brightness & chromaticity) / Under (brightness) / Under (chromaticity) / Under (brightness & chromaticity)	

Preparing for Measurement

When the light-source color mode is selected				
	Absolute Data	Color Difference	Equation	Others
	X	ΔX	JND	Dominant Wavelength d [Dominant Wavelength] Excitation Purity (%) Peak Wavelength T Δuv Scotopic Vision Contrast Square ratio
	Y	ΔY		
	Z	ΔZ		
*2	L_v	*2 ΔL_v		
	x	*2 ΔL_v (%)		
	y	*2 % L_v		
	u'	Δx		
	v'	Δy		
	L^*	$\Delta u'$		
	a^*	$\Delta v'$		
	b^*	ΔL^*		
		Δa^*		
		Δb^*		
When the object color mode is selected				
	Absolute Data	Color Difference	Equation	Others
	X	ΔX	ΔE^*ab	Dominant Wavelength d [Dominant Wavelength] Excitation Purity (%) Peak Wavelength
	Y	ΔY		
	Z	ΔZ		
	x	Δx		
	y	Δy		
	u'	$\Delta u'$		
	v'	$\Delta v'$		
	L^*	ΔL^*		
	a^*	Δa^*		
	b^*	Δb^*		
	C^*	ΔC^*		
	h	ΔH^*		
	u^*	Δu^*		
	v^*	Δv^*		
	L (Hunter)	ΔL (Hunter)		
	a (Hunter)	Δa (Hunter)		
	b (Hunter)	Δb (Hunter)		

Index	Index	Index Difference
 Index	Ra R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 MIvis (D50) MIvis (D50) Grade MIvis (D55) MIvis (D55) Grade MIvis (D65) MIvis (D65) Grade MIvis (D75) MIvis (D75) Grade	

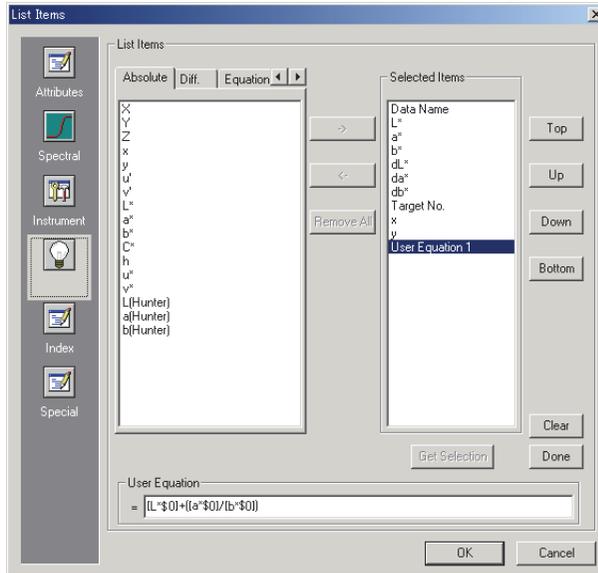
Special	Others
 Special	*3 User Equation 1 *3 User Equation 2 *3 User Equation 3

The items x , y , u' , v' , Δx , Δy , $\Delta u'$ and $\Delta v'$ are expressed to four decimal places. Other colorimetric data is expressed to two decimal places.

The number of decimal places can be changed. See page 32 for details.

The CS-S10w software enhances calculation accuracy by performing internal calculations with numbers greater in magnitude 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.

- *1 Selecting all waveforms of the spectral data will make the display speed slow. It is recommended to select necessary waveforms only.
- *2 When the observer is set to 10°, L_v is shown as “-----”.
- *3 When a user equation is added, the equation can be specified in the following procedure.



Select the user equation moved in the Selected Items pane and click the Edit button. The user equation input box appears below the pane.

The colorimetric data that can be used in a user equation are the data shown in the Selected Items pane above. Select the item in the pane and click the Get Selection button.

Example: To input “ $L^* + (a^*/b^*)$ ”

- 1) Select “L*” from Selected Items.
- 2) Click the Get Selection button.
- 3) Type “+”.
- 4) Type “(”.
- 5) Select “a*” from Selected Items.
- 6) Click the Get Selection button.
- 7) Type “/”.
- 8) Select “b*” from Selected Items.
- 9) Click the Get Selection button.
- 10) Type “)”.

Operation when “L*” is selected:

[L*\$0] is displayed in the text input box.

The section between “[” and “]” indicates the list item. If these symbols “[” and “]” are deleted, the CS-S10w software cannot recognize the list item. A user equation that does not include a list item is not effective. “\$0” indicates the group attribute of the data.

After inputting the user equation in the text input box, click the Done button.

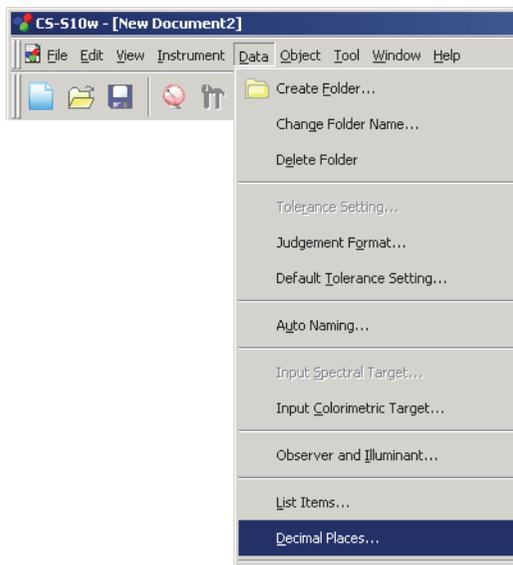
If the user equation is not correct, a message saying “Error!” or “Cycle!” is displayed. In this event, check that the user equation is correct and try again.

2.3.3 Setting the Number of Decimal Places for List Items

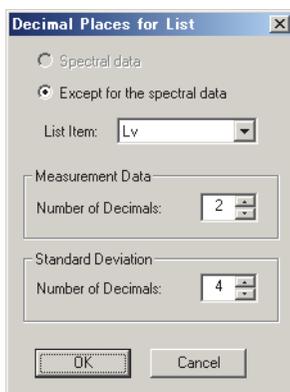
For list items that are represented by numbers, the number of decimal places can be specified individually.

1. Select *Data - Decimal Places* from the menu bar.

The Decimal Places for List dialog appears.



2. Specify the number of decimal places for the applicable list items.



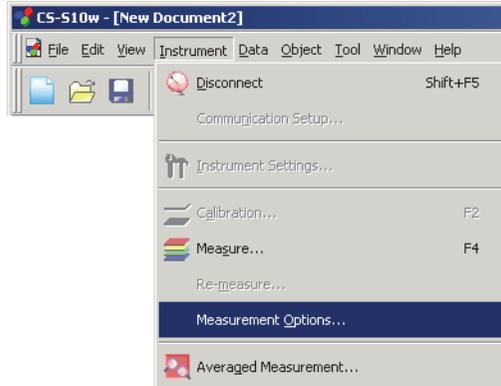
■ Decimal Places for List dialog box

- Spectral data** This option can be selected when spectral value is selected as a list item.
- Except for the spectral data** This switches between Spectral data and Except for the spectral data, and specifies the details for each option.
- List Item** Items specified as list items are displayed in the pull-down list box. To specify the number of decimal places for an item, select that item.
- Measurement Data**
Number of Decimals: Numerical values between 0 and 8 can be entered or selected.
- Standard Deviation**
Number of Decimals: Numerical values between 0 and 8 can be entered or selected.

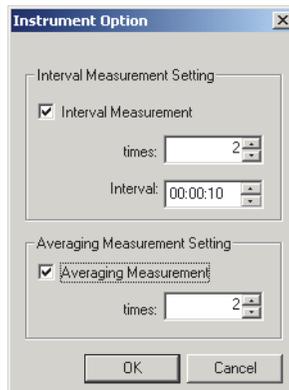
2.3.4 Setting the Measurement Options

1. Select *Instrument - Measurement Options* from the menu bar.

The Instrument Option dialog box appears.



2. Specify the parameters for Interval Measurement and Averaging Measurement.



■ Instrument Option dialog box

Interval Measurement Setting

Interval Measurement

When this option is checked, interval measurement is performed. For details of interval measurement, refer to page 37.

times

No. of measurements can be entered or selected between 2 and 1000.

Interval

Interval time can be entered or selected between 00:00:00 and 12:00:00 in increments of 10 seconds. Move the cursor to the hour, minute and second sections and set them individually.

Averaging Measurement Setting

Averaging Measurement

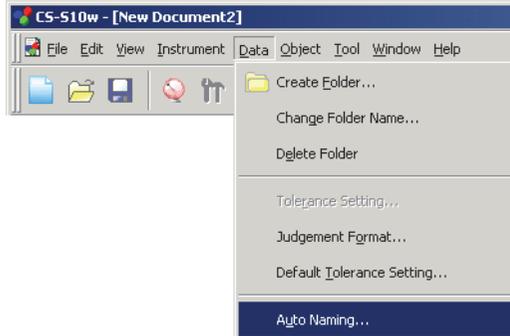
When this option is checked, averaging measurement is performed. For details of averaging measurement, refer to page 37.

times

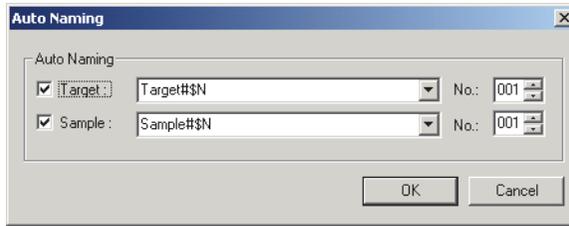
No. of measurements can be entered or selected between 2 and 1000.

2.3.5 Setting Auto Naming

1. Select *Data - Auto Naming* from the menu bar.



2. Specify the parameters for Auto Naming.



■ Auto Naming dialog box

Auto Naming

Target

When this box is checked, the name of target data is assigned automatically during measurement.

Sample

When this box is checked, the name of sample data is assigned automatically during measurement.

When this box is checked, data is automatically named during measurement. Specify the format of the name to be automatically assigned. The strings in the following tables are treated as special symbols. They are replaced with the string indicating the corresponding data.

String	Corresponding data
\$N	Automatically created number (serial number) assigned to a sample. (The first number in the series can be specified between 0 and 999.)
\$D	Day of measurement
\$M	Month of measurement
\$Y	Year of measurement
\$h	Hour of measurement
\$m	Minute of measurement
\$s	Second of measurement

Enter a combination of these strings in the text box. Up to 40 alphanumeric characters can be used. The following two strings are provided as sample formats and can be selected from the pull-down combo box.

Sample#\$N
\$D/\$M/\$Y-\$h:\$m:\$s

2.4 Measurement

To begin measurement, use one of the several methods available, as shown below.

Normal measurement:

Trigger the CS-S10w software to take a measurement and obtain the sample data.

Interval measurement:

Once the measurement operation is started from the CS-S10w, measurement is repeated the pre-defined number of times at the pre-defined time interval. You can receive sample data every time the measurement is performed.

The interval measurement is available only in Normal Mode under Light-source Color.

Averaging measurement:

Trigger the CS-S10w software once to begin measurement. After the specified number of measurements has been taken, the collected sample data is averaged to obtain one piece of sample data.

In Normal Mode under Light-source Color, you can use either the interval measurement or averaging measurement, or both.

Averaged measurement:

Select averaged measurement mode. Take repeated measurements for the desired number of times and exit the mode. The sample data collected during the period is averaged to obtain one piece of sample data.

Measurement with instrument key:

Perform measurement by pressing the measuring button of the instrument. The CS-S10w software receives the sample data.

The measurement with instrument key is available only in Normal Mode under Light-source Color.

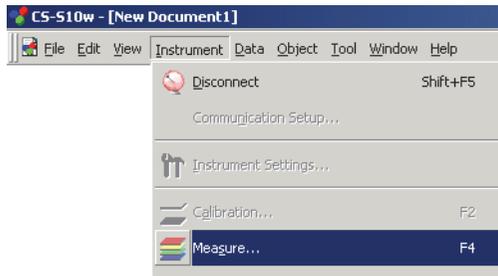
2.4.1 Performing Normal Measurement

This procedure is available only when the instrument is connected.

1. Select *Instrument - Measure* from the menu bar.

The Name dialog box appears.

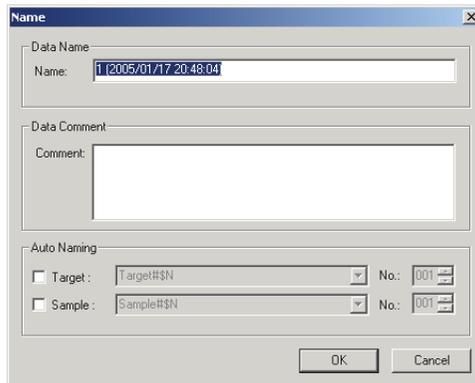
If Auto Naming is activated, the Name dialog box does not appear. Skip this process and go to step 3. To assign a comment to each piece of sample data, select *Data - Data Property* from the menu bar after the measurement and type the comment in the displayed dialog box. (See page 44.)



2. Enter a name for the data.

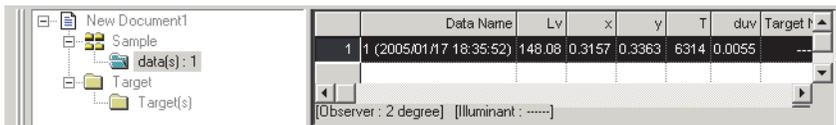
You can assign a name and comment to each piece of sample data.

Up to 64 and 256 alphanumeric characters can be used for each name and each comment, respectively. (See page 44.)



3. Click the OK button.

Data is added to the list window.

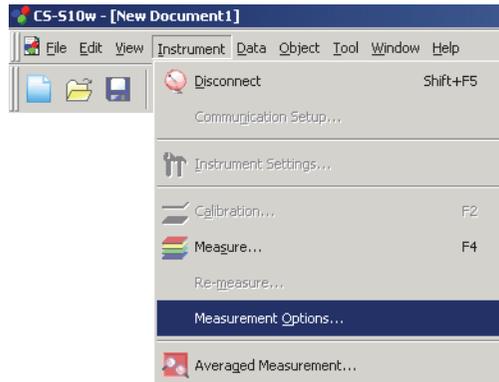


2.4.2 Performing Interval Measurement/Averaging Measurement

This procedure is available only when the instrument is connected.

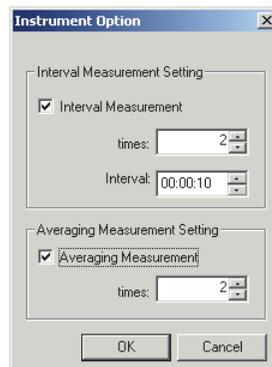
1. Select *Instrument - Measurement Options* from the menu bar.

The Instrument Option dialog box appears.



Check Interval Measurement to specify details for the interval measurement.

Check Averaging Measurement to specify details for the averaging measurement.



The interval measurement repeats the measurement by the number set for “times” at the time interval set for “Interval”. You can receive sample data every time the measurement is performed. If the measurement time is longer than the interval and the measurement does not finish before the point where the next measurement is to start, the following measurement will be skipped. In this situation, the number of times that measurements are performed will be lower than the set number of times to perform measurements.

The averaging measurement repeats the measurement by the number set for “times”, and then calculates the average of the sample data to obtain one result.

The interval measurement is available only in Normal Mode under Light-source Color. In this mode, you can use either the interval measurement or averaging measurement, or both.

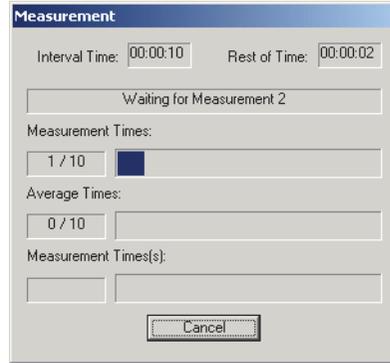
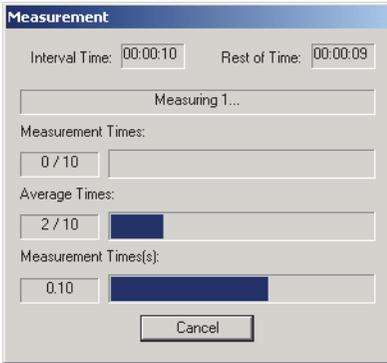
■ Instrument Option dialog box

Refer to the “Instrument Option dialog box” on page 33.

2. Click the OK button.

3. Start the measurement described on page 36.

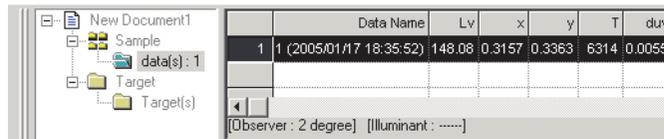
The Measurement dialog box appears and the interval/averaging measurement is performed. For the interval measurement, the resulting data is added to the list window every time the measurement is performed. For the averaging measurement, the data is added after the specified number of measurements have finished.



3. Click the OK button.

The average is added to the list window as one piece of sample data.

The averaging calculation performed here first averages XYZ data to obtain data that is then used in the calculation of colorimetric data. On the other hand, the averaging calculation that uses the statistical values described on page 63 averages the colorimetric data of each piece of data that was calculated individually according to its XYZ data. Consequently, the results of these two types of calculations may differ.



	Data Name	Lv	x	y	T	duv
1	1 (2005/01/17 18:35:52)	148.08	0.3157	0.3363	6314	0.0055

[Observer : 2 degree] [Illuminant : -----]

■ Target Averaged Measurement dialog box**Color space drop-down list box**

Select the color space to display in the list.

The selectable color spaces are: L_vxy , $L_vu'v'$ and XYZ for the light-source color mode; and $L^*a^*b^*$, L^*C^*h , Lab and XYZ for the object color mode.

Retrieve checked data besides averaged result

When this option is checked, the data with a check mark is added to the list window and to the graphic object in the canvas window as an individual piece of sample data.

Select All

All the sample data will be checked and selected.

Unselect All

All the sample data will be unchecked.

2.4.4 Performing Measurement With Instrument Key

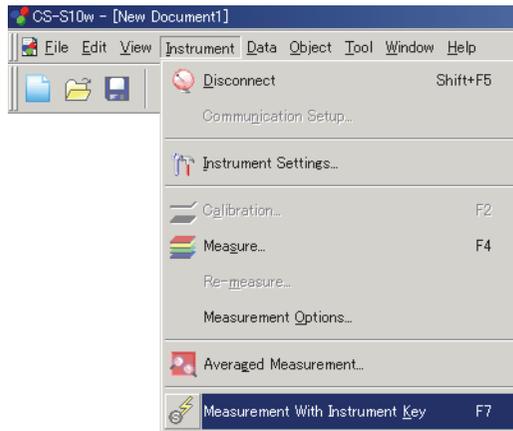
This procedure is available only when the instrument is connected in Normal Mode under Light-source Color.

1. Select *Instrument - Measurement With Instrument Key* from the menu bar.

Checking this option enables measurement with instrument key. When this option is selected, the measurement can be triggered either with the measuring button of the instrument or with the measuring command of the CS-S10w software.

When measurement with instrument key is enabled, only the measuring button can be operated in the instrument.

To operate the other keys, you need to select *Instrument - Measurement With Instrument Key* again from the menu bar to cancel the measurement with instrument key status.

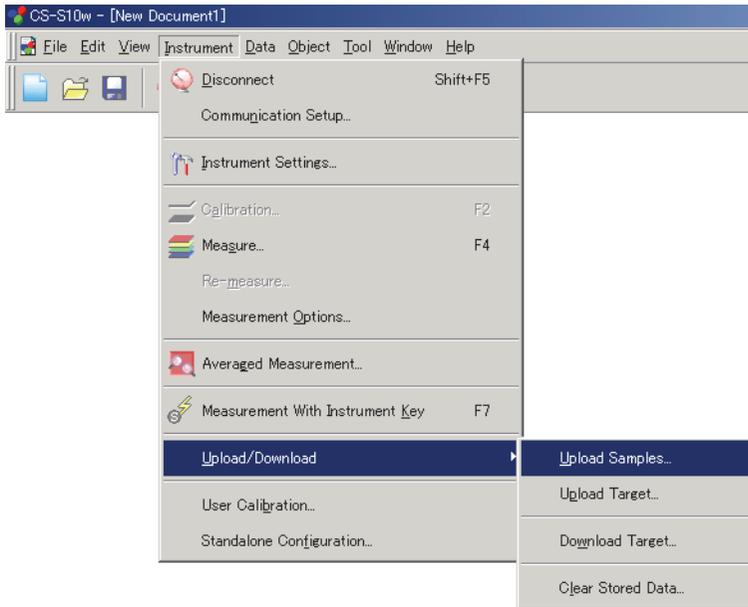


2.4.5 Uploading Sample Data from the Instrument

This procedure is available only when the instrument is connected.

The sample data stored in the memory of the instrument can be uploaded to the CS-S10w software. This procedure is enabled only when Normal Mode under Light-source Color is selected.

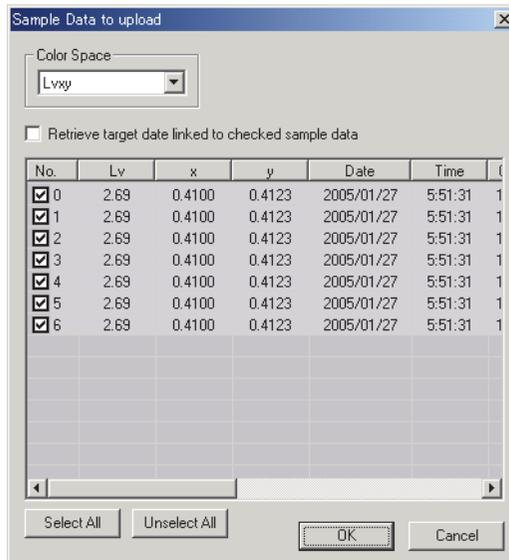
1. Select *Instrument - Upload/Download - Upload Samples* from the menu bar.



2. Uploading starts.

When the uploading is completed, the Sample Data to upload dialog box appears. Data with a check mark will be uploaded. Uncheck any unnecessary data.

Note that the data cannot be displayed when the observer setting is different from the value currently specified with the CS-S10w software.



3. When the OK button is clicked, the data is added to the list window.

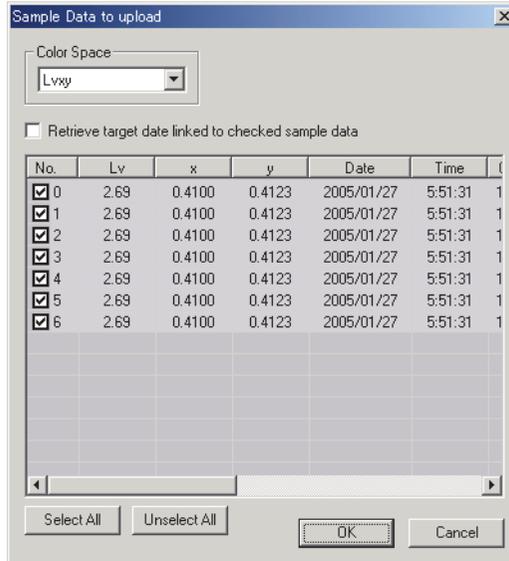
■ Sample Data to upload dialog box

Select All

All of the sample data will be checked and selected.

Unselect All

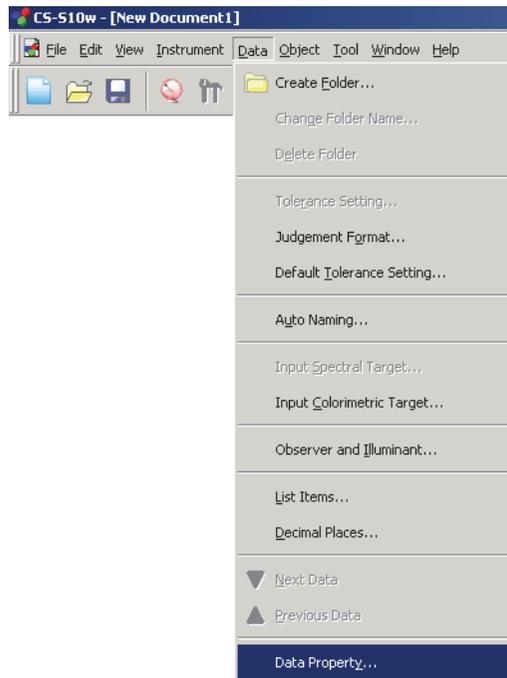
All of the sample data will be unchecked.



2.4.6 Displaying Data Properties

You can display the properties of the data selected in the list window.

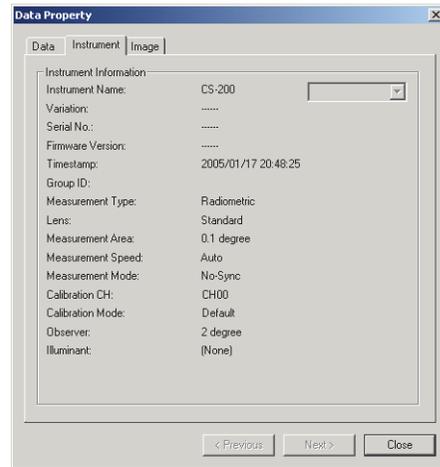
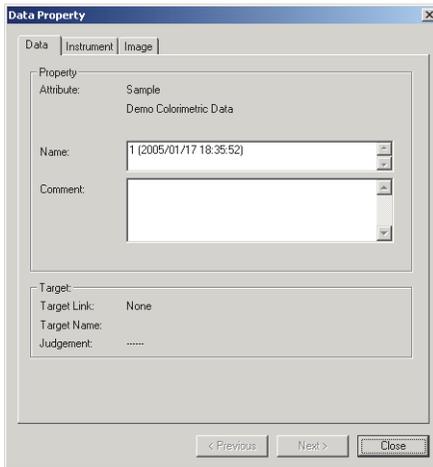
1. Select data in the list window.
To select the data to be listed, see page 64. To select the target data, select Target - Target(s) from the tree and choose the data in the displayed data group.
2. Select *Data - Data Property* in the menu bar.
The Data Property dialog box appears.



In addition to using the menu bar, you can select Data Property by right-clicking the data in the list window and selecting the command from the displayed context menu. When two or more pieces of data have been selected in the list window, you can navigate among the selected pieces of data one by one with the Previous and Next buttons.

3. Specify the data properties as required.

■ Data Property dialog box



The following properties can be edited or changed.

Data tab

- Name
- Comment

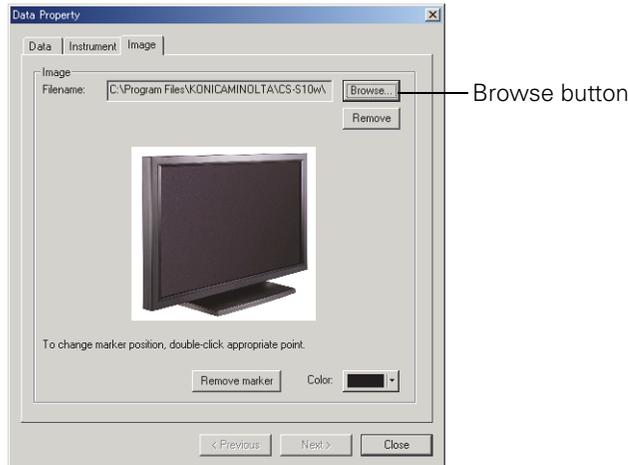
Image tab

- Image file
- Image position marker
- Marker color

2.4.7 Linking an Image to Data

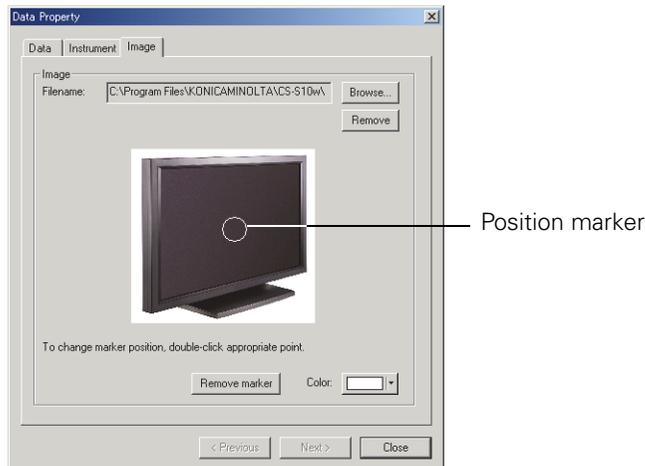
1. Click the Browse button in the Image tab of the Data Property dialog box. In the dialog box for selecting a file to be opened, select the image file directly.

The selected image file is displayed. You can select a file in either JPEG or BMP file format. Note that the CS-S10w software does not store the image file itself but only remembers the path to the file. Do not change the filename or the directory of the image file with Internet Explorer or other software.



Setting a position marker

Double-click the point where you want to set a marker in the image. A marker appears at that point. Only one marker can be set per image. If you try to set a second marker at a different point, the marker will move to that point. Note that the CS-S10w software does not actually draw a marker in the image file but only remembers the position of the marker.



■ Data Property dialog box

Remove

The specified image setting is canceled.

Remove marker

The marker is removed from the image.

Color

The color of the marker can be changed.
To specify a color, see page 78.

2.5 Specifying Target Data/Tolerance

2.5.1 Registering Target Data

Register the target data to be used for color difference measurement. When only absolute values are measured, it is unnecessary to register target data.

The several methods available for registering target data are shown below:

- **Registering target data by performing a measurement**

Perform a measurement and obtain the sample data as target data.

- **Manual data input**

Input data manually from the existing data sheet and use it as the target data.

- **Uploading target data from the instrument**

Upload the target data stored in the memory of the instrument to the CS-S10w software.

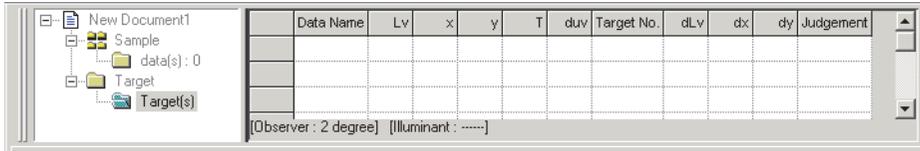
- **Copying target data from the existing data**

Copy sample data or target data in the same or different document file and use it as the target data.

2.5.1-a Performing Target Measurement

This procedure is available only when the instrument is connected to the computer.

1. Select *Target - Target(s)* from the tree in the list window.



2. Perform measurement.

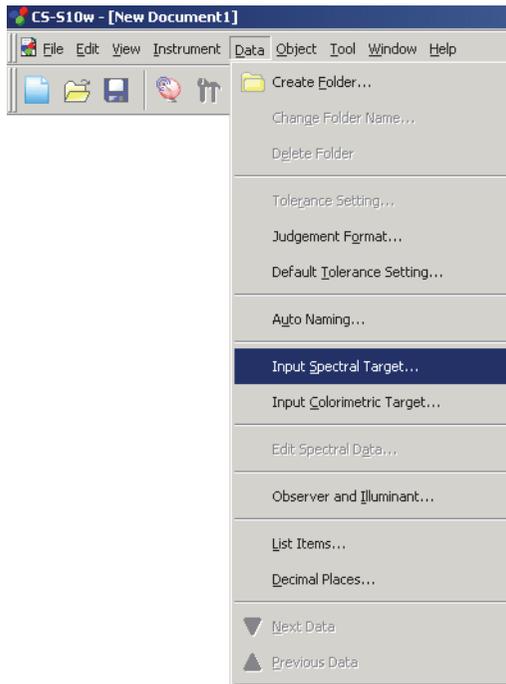
For the measurement method, refer to page 35.

2.5.1-b Registering Target by Manual Data Input

Entering Spectral Data

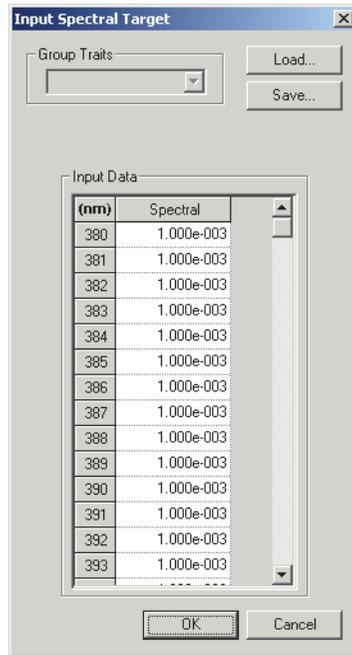
1. Select *Data - Input Spectral Target* from the menu bar.

The Input Spectrals Target dialog box appears.



2. Enter the spectral data.

You can also load a data file instead of manually entering data directly.



3. Click the OK button.

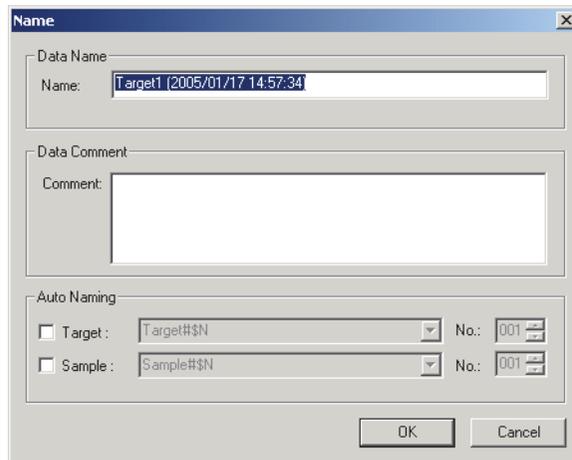
The Name dialog box appears.

If auto-naming is activated, the Name dialog box does not appear. Skip this process and go to step 5. To assign a comment, select *Data - Data Property* from the menu bar after registration and type the comment in the displayed dialog box. (See page 44.)

4. Enter the name of the data.

You can assign a name and comment for each piece of data.

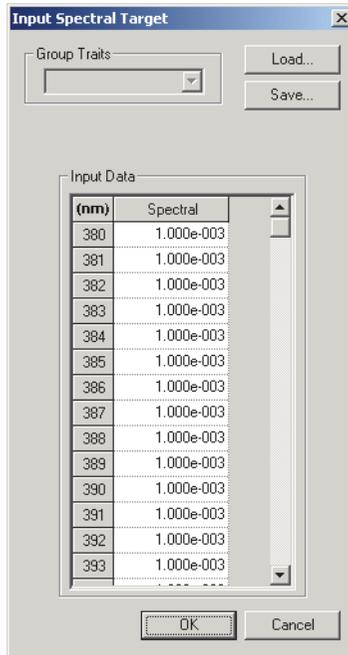
Up to 64 and 256 alphanumeric characters can be used for a name and a comment, respectively. (See page 44.)



5. The data is added to the list window.



Input Spectral target dialog box



Specifying Target Data/Tolerance

Load

The specified file (extension: “.lrv” for the light-source color mode and “.wcb” for the object color mode) is loaded and reflected on the input data.

Save

The file is saved using the specified file path. The file extension is “.lrv” for the light-source color mode and “.wcb” for the object color mode.

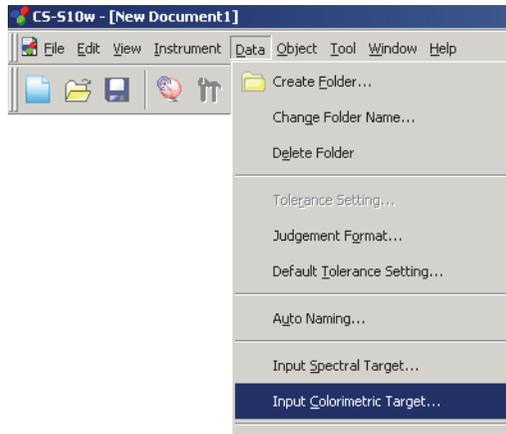
Input data

The spectral data is displayed. You can edit the data by manually entering values directly.

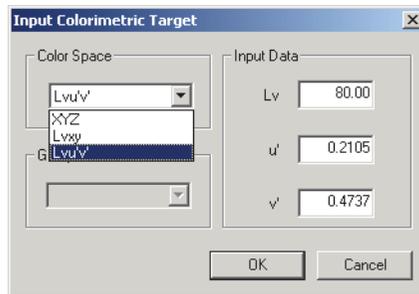
Entering Colorimetric Data

1. Select *Data -Input Colorimetric Target* from the menu bar.

The Input Colorimetric Target dialog box appears.



2. Select the color space and type the colorimetric data.



3. Click the OK button.

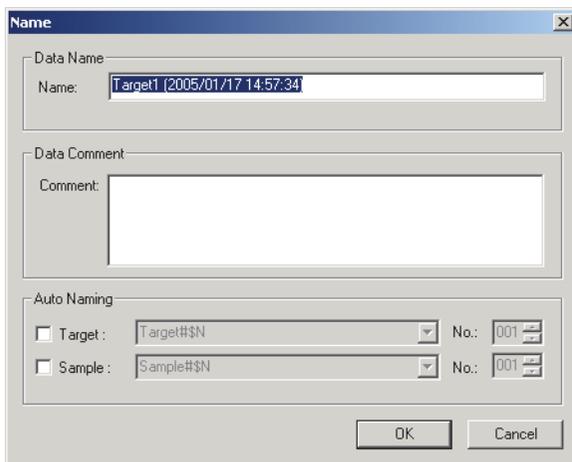
The Name dialog box appears.

If Auto Naming is activated, the Name dialog box does not appear. Skip this process and go to step 5. To assign a comment, select *Data - Data Property* from the menu bar after registration and type the comment in the displayed dialog box. (See page 44.)

4. Enter the name of the data.

You can assign a name and comment for each piece of data.

Up to 64 and 256 alphanumeric characters can be used for a name and a comment, respectively. (See page 44.)

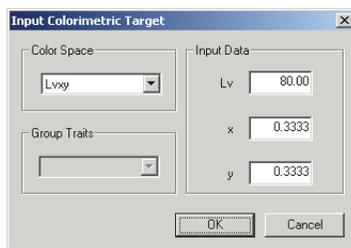


5. The data is added to the list window.



Specifying Target Data/Tolerance

■ Input Colorimetric Target dialog box



Color Space

Specify the color space used for manual input. The available color spaces are XYZ, L_vxy and $L_vu'v'$ for the light-source color mode, and XYZ, $L^*a^*b^*$ and Lab (Hunter) for the object color mode.

Input Data

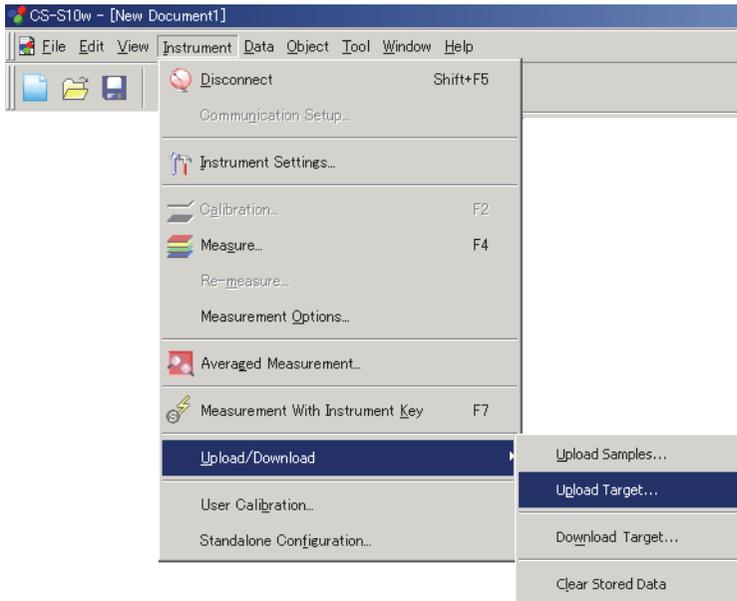
Enter the colorimetric data you selected.

2.5.1-c Uploading Target Data from the Instrument

This procedure is available only when the instrument is connected.

The target data stored in the memory of the instrument can be uploaded to the CS-S10w software. This procedure is enabled only when Normal Mode under Light-source Color is selected.

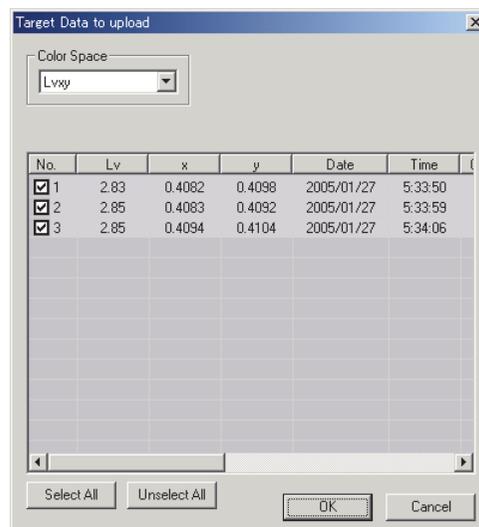
1. Select *Instrument - Upload/Download - Upload Target* from the menu bar.



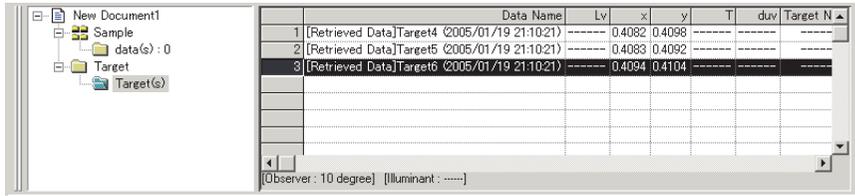
2. Uploading starts.

The Target Data to upload dialog box appears. Data with a check mark will be uploaded. Uncheck the unneeded data.

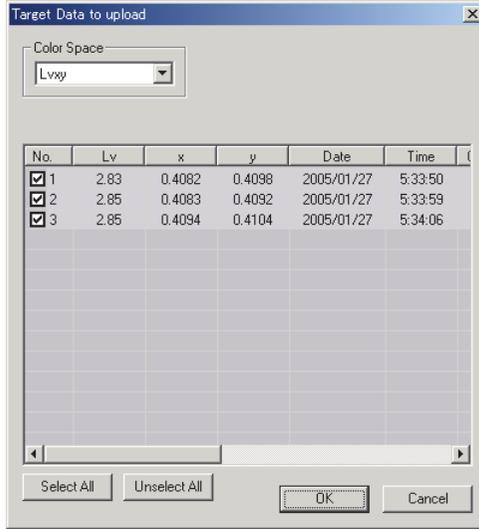
Note that the data cannot be displayed when the observer setting is different from the value currently specified with the CS-S10w software.



3. Click the OK button to begin uploading.



■ Target Data to upload dialog box



Select All

All sample data check boxes are selected.

Clear All

All sample data check boxes are cleared.

2.5.1-d Copying Target from the Existing Data

For data copy and paste procedures, see page 64.

You can copy sample or target data in the same or different document file and use it as target data.

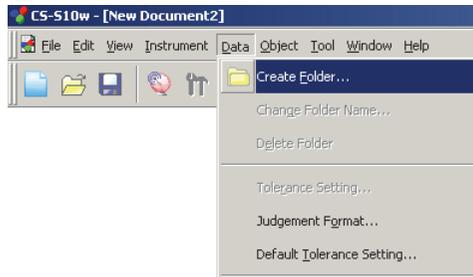
2.5.2 Specifying the Target Data

Specify the target data used for color difference measurement from the target data stored in the document file. When only absolute values are measured, it is not necessary to specify target data.

2.5.2-a Creating a Folder containing a Target

1. Select *Data - Create Folder* from the menu bar.

The Folder Name dialog box appears.



2. Type in the desired folder name.

You cannot use an existing folder name. Up to 64 characters can be used for a folder name.



3. Click the OK button.

The folder is added to the list window.

The folder can be deleted or renamed.

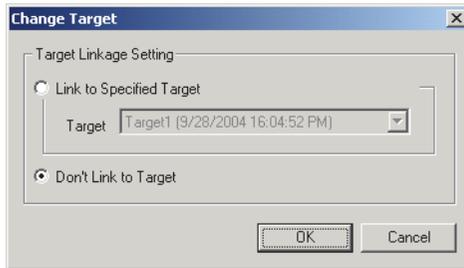
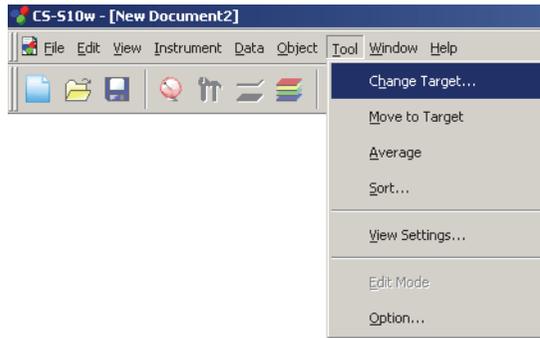
The data(s) folder under Sample is provided by default. You cannot link a target to the folder, and cannot delete or rename the folder.

4. Save data in the created folder.

While the folder is selected, perform measurement. Or, move sample data from the document file to the folder.

5. Select *Tool - Change Target* from the menu bar.

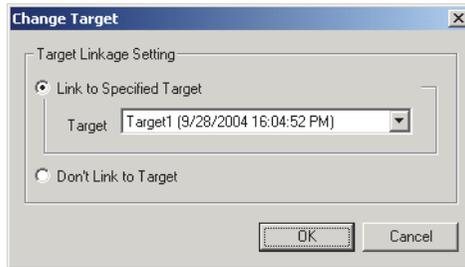
The Change Target dialog box appears.



6. Select *Link to Specified Target* and specify the target.

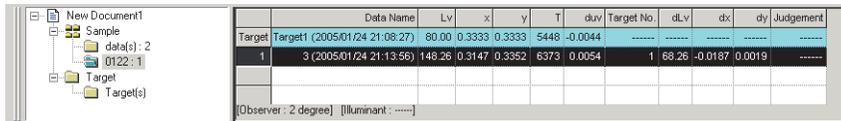
The target data options for the Target(s) folder under Target are listed in a combo box. Select one from here.

If you do not specify the target (to perform absolute measurement), leave *Don't Link to Target* selected.



7. Click the OK button.

The target data is displayed in the list window.



2.5.3 Setting the Tolerance

To perform judgement based on color difference measurement, it is necessary to set the tolerance.

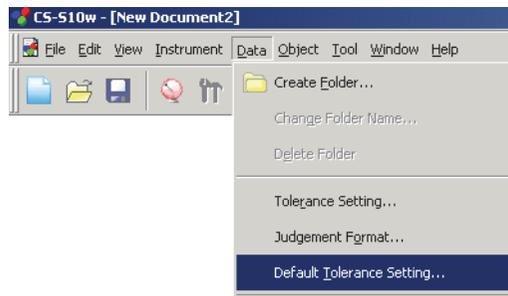
2.5.3-a Setting the Initial Tolerance

The default tolerance is the value which is automatically set when the target is registered during measurement or other operations. To always perform judgment with the same tolerance, you can specify the tolerance in advance to save performing the tolerance setting operation every time targets are changed.

1. Select *Data - Default Tolerance Setting* from the menu bar.

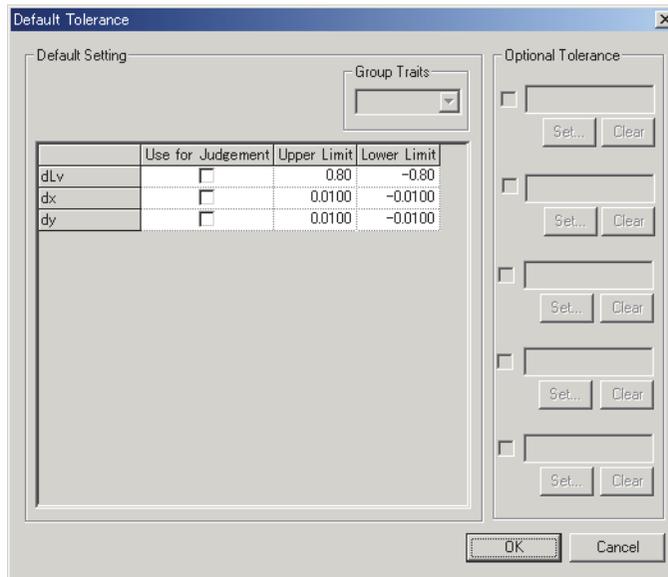
The Default Tolerance dialog box appears.

The colorimetric data items to be displayed (list items) are the items specified with the procedure in “Setting the List Items” (page 27).



2. Specify the parameters of the tolerance.

The specified tolerance is applied to newly added target data.

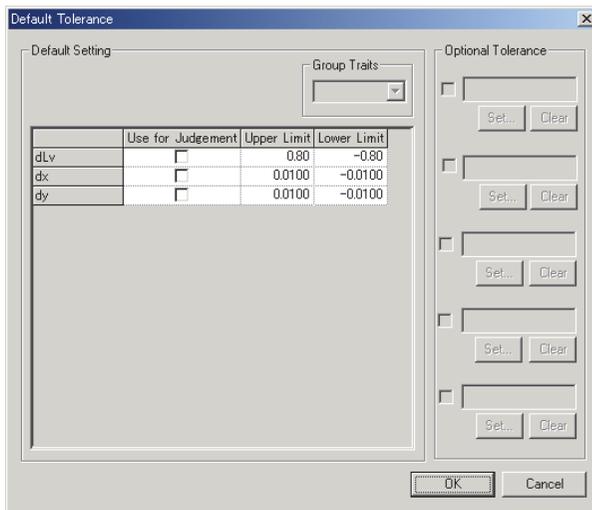


Default Tolerance dialog box

When the check box in the Use for Judgement column is checked, the data is judged with the upper/lower tolerance values. Data boxes left unchecked are not judged.

Numerical values can be edited regardless of the status of the check mark.

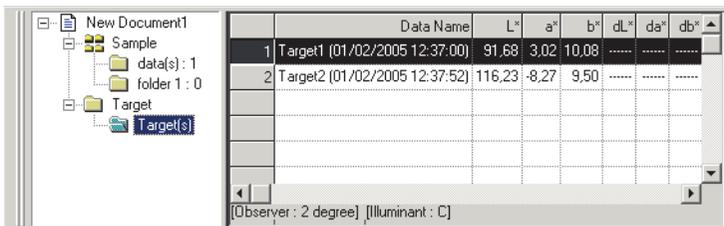
The tolerance can be specified for each of colorimetric data items (list items) displayed in the list window.



2.5.3-b Setting the Tolerance for Each Target

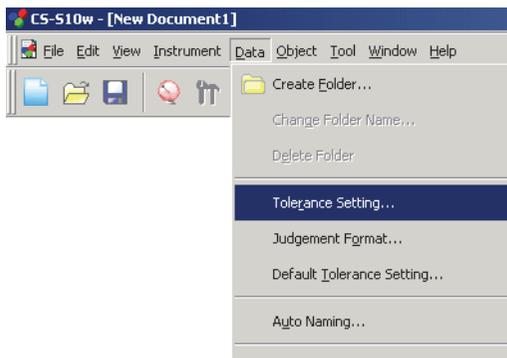
The tolerance specified with the default tolerance setting during the target registration can be changed for each target data.

1. From the tree in the list window, select a folder under *Target - Target(s)* and then select the target data from the list.

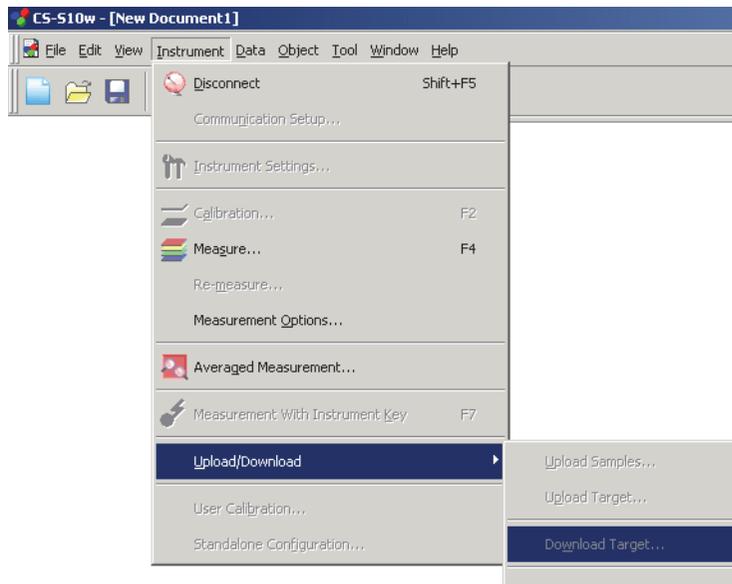


2. Select *Data - Tolerance Setting* from the menu bar.

The Tolerance Settings dialog box appears.



3. Specify the necessary parameters of the tolerance.



■ Tolerance Settings dialog box

Target

The target data to specify tolerance data is displayed.

When the check box in the Use for Judgement column is checked, the item will be judged with the upper and lower limit values. When the check box is not checked, the item will not be judged.

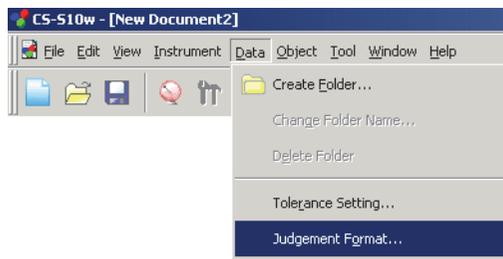
The numerical values can be edited regardless of the selection of the check box.

The tolerance data can be set for the colorimetric data items shown in the list window (listed items) individually.

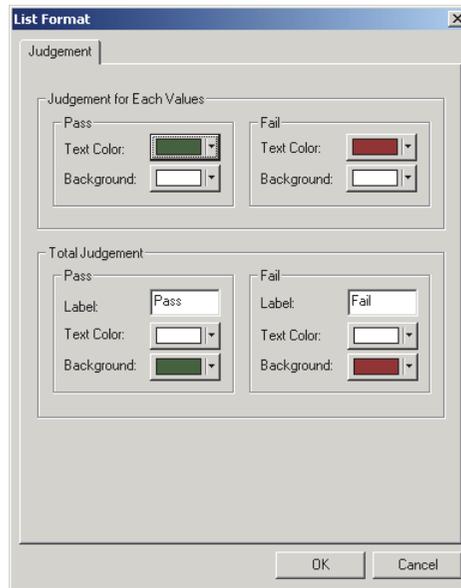
2.5.3-c Specifying the Judgement Format in the List Window

1. Select *Data - Judgement Format* from the menu bar.

The List Format dialog box appears.



2. Specify the parameters of the judgement format.



■ List Format dialog box

Judgement tab

Judgement for Each Values

The following settings are applied to the individual list items to be judged.

Pass

Text Color: Specify the color of the numerical value in the list window when the value is judged as passed.

Background: Specify the background color of the numerical value in the list window when the value is judged as passed.

Fail

Text Color: Specifies the color of the numerical value in the list window when the value is judged as failed.

Background: Specifies the background color of the numerical value in the list window when the value is judged as failed.

Total Judgement

The following settings are applied to the judgement result following judgement of all the target items in the list window.

Pass

Label: Specifies the wording to be displayed when the result is judged as passed.

Text Color: Specifies the color of the string displayed in the list window when the result is judged as passed.

Background: Specifies the background color of the string displayed in the list window when the result is judged as passed.

Fail

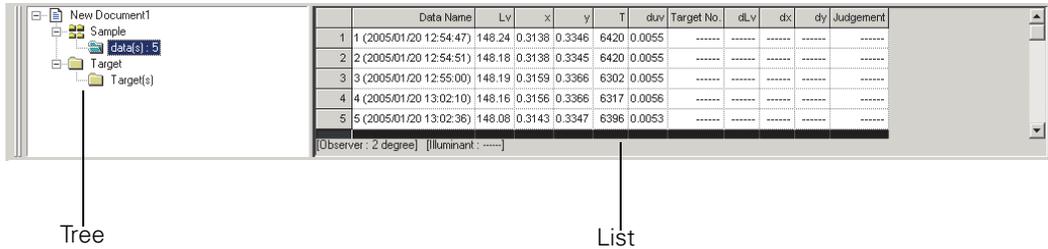
Label: Specifies the wording to be displayed when the result is judged as failed.

Text Color: Specifies the color of the string displayed in the list window when the result is judged as failed.

Background: Specifies the background color of the string displayed in the list window when the result is judged as failed.

2.6 List Window Operation

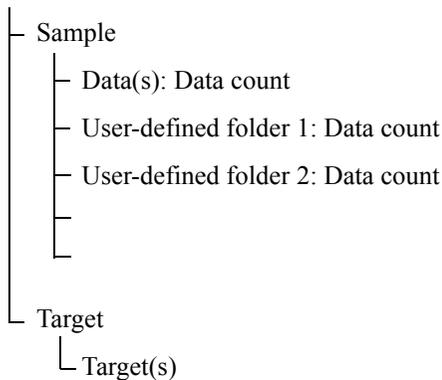
The list window lists sample data. You can show or hide the list window by selecting *View - List Window* from the menu bar.



2.6.1 Tree display

The tree displays the following items.

Document filename



“Sample - data(s)” and “Target - Target(s)” are folders defined by default when a document file is created. “Sample - User-defined folder 1, 2,...” is a folder which can be created by users. To create a folder, refer to page 55.

2.6.2 List

The list command lists the data included in the folder selected in the tree. Each item is displayed according to the list items specified on page 27.

The items x , y , u' , v' , Δx , Δy , $\Delta u'$ and $\Delta v'$ are expressed to four decimal places. Other colorimetric data is expressed to two decimal places.

The number of decimal places can be changed. See page 32 for details.

The CS-S10w software enhances calculation accuracy by performing internal calculations with numbers more precise 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.

The content of the list window vary depending on the folder selected, as follows:

■ Target - Target(s)

All target data existing in the document file is listed.

	Data Name	Lv	x	y	T	dLuv	Target No.	dLv	dx	dy	Judgement
1	Target1 (2005/01/20 13:06:09)	80.00	0.3333	0.3333	5448	-0.0044	-----	-----	-----	-----	-----
2	Target2 (2005/01/20 13:06:15)	80.00	0.3333	0.3333	5448	-0.0044	-----	-----	-----	-----	-----
3	Target3 (2005/01/20 13:06:21)	80.00	0.3333	0.3333	5448	-0.0044	-----	-----	-----	-----	-----
4	Target4 (2005/01/20 13:06:33)	80.00	0.3333	0.3333	5448	-0.0044	-----	-----	-----	-----	-----
5	Target5 (2005/01/20 13:06:48)	80.00	0.3333	0.3333	5448	-0.0044	-----	-----	-----	-----	-----

[Observer : 2 degree] [Illuminant : -----]

■ Sample - data(s)

Of all sample data existing in the document file, the data contained in this folder is listed.

	Data Name	Lv	x	y	T	dLuv	Target No.	dLv	dx	dy	Judgement
1	1 (2005/01/20 12:54:47)	148.24	0.3138	0.3346	6420	0.0055	-----	-----	-----	-----	-----
2	2 (2005/01/20 12:54:51)	148.18	0.3138	0.3345	6420	0.0055	-----	-----	-----	-----	-----
3	3 (2005/01/20 12:55:00)	148.19	0.3159	0.3366	6302	0.0055	-----	-----	-----	-----	-----
4	4 (2005/01/20 13:02:10)	148.16	0.3156	0.3366	6317	0.0056	-----	-----	-----	-----	-----
5	5 (2005/01/20 13:02:36)	148.08	0.3143	0.3347	6396	0.0053	-----	-----	-----	-----	-----

[Observer : 2 degree] [Illuminant : -----]

■ Sample - User-defined folder

Of all sample data existing in the document file, the data contained in this folder is listed. You can associate one target data with this folder. To specify a target data, refer to page 55.

	Data Name	Lv	x	y	T	dLuv	Target No.	dLv	dx	dy	Judgement
Target	Target1 (2005/01/20 14:24:55)	80.00	0.3333	0.3333	5448	-0.0044	-----	-----	-----	-----	-----
Max.		148.40	0.3160	0.3370	6416	0.0057					
Min.		147.91	0.3139	0.3341	6295	0.0052					
Mean		148.16	0.3150	0.3357	6352	0.0055					
Std.Dev.		0.1630	0.00080901	0.00101526	47	0.00014314					
3	3 (2005/01/20 14:25:53)	148.34	0.3152	0.3360	6342	0.0055	1				
4	4 (2005/01/20 14:26:01)	148.06	0.3142	0.3345	6400	0.0053	1				
5	5 (2005/01/20 14:26:31)	148.40	0.3160	0.3370	6295	0.0057	1				
6	6 (2005/01/20 14:26:42)	147.91	0.3139	0.3341	6416	0.0052	1				
7	7 (2005/01/20 14:26:52)	147.96	0.3144	0.3350	6385	0.0054	1				
8	8 (2005/01/20 14:27:01)	148.16	0.3160	0.3368	6295	0.0055	1				

[Observer : 2 degree] [Illuminant : -----]

Linked target data
Statistical value

Linked target data

The linked target data is displayed when List - Categorized List - Show Linked Target is checked in the Data List tab of the Display Settings dialog box. To show this dialog box, select *Tool - View Settings* from the menu bar. The lines of the linked target data cannot be scrolled.

Statistical value

The statistical values of the sample data linked with the target data are displayed.

The statistics are displayed when List - Categorized List - Show Statistics is checked in the Data List tab of the Display Settings dialog box. To show this dialog box, select *Tool - View Settings* from the menu bar. The lines of the statistics cannot be scrolled.

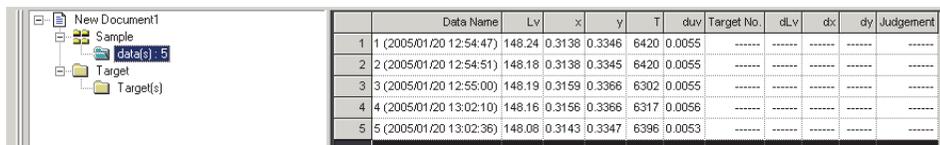
The averaging calculation performed here averages the colorimetric data of each piece of data that was calculated individually according to its XYZ data.

On the other hand, the averaged measurement (described on page 39) and the averaging of list data (on page 66) first average XYZ data to obtain data that is then used in the calculation of colorimetric data. For this reason, the results of these two types of calculations may differ.

2.6.3 Editing the List Data

■ Selecting the list data

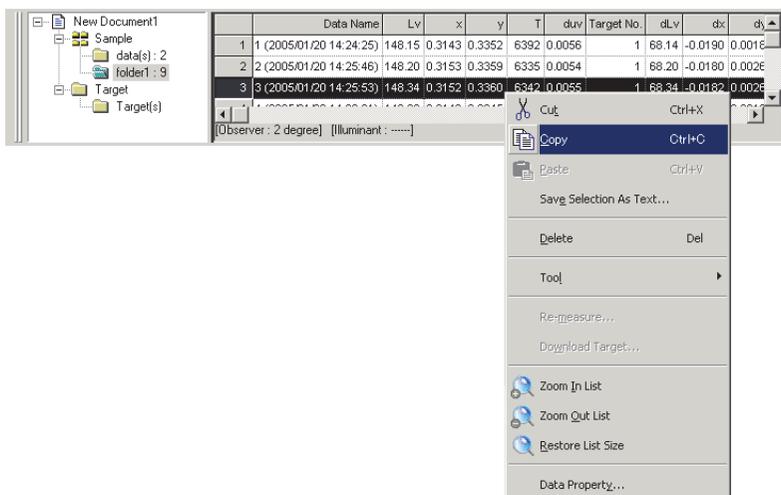
When the mouse pointer is positioned over the leftmost column (number column) in the list, the shape of the pointer changes into an arrow. Click the list data with this arrow to select the data. To select two or more pieces of data, click the first piece of data and specify the range by clicking the last piece of data while holding down the Shift key, or click the desired pieces of data one by one while holding down the Ctrl key. You can also select a range by dragging the mouse. To select noncontiguous pieces of data, hold down both the Shift and Ctrl keys. Data in different folders cannot be selected. Clicking the cell in the upper left corner selects all cells.



	Data Name	Lv	x	y	T	dlv	Target No.	dLv	dx	dy	Judgement
1	(2005/01/20 12:54:47)	148.24	0.3138	0.3346	6420	0.0055	-----	-----	-----	-----	-----
2	(2005/01/20 12:54:51)	148.18	0.3138	0.3345	6420	0.0055	-----	-----	-----	-----	-----
3	(2005/01/20 12:55:00)	148.19	0.3159	0.3366	6302	0.0055	-----	-----	-----	-----	-----
4	(2005/01/20 13:02:10)	148.16	0.3156	0.3366	6317	0.0056	-----	-----	-----	-----	-----
5	(2005/01/20 13:02:36)	148.08	0.3143	0.3347	6396	0.0053	-----	-----	-----	-----	-----

■ Copying the list data

In the list of data displayed by selecting Target - Target(s) or Sample - data(s), right-click the selected (highlighted) data and select *Copy* from the displayed context menu. Or, select the data and then select *Edit - Copy* from the menu bar. The copied data can be pasted into spreadsheet software such as Excel.



■ Cutting the list data

In the list of data displayed by selecting Target - Target(s) or Sample - data(s), right-click the selected (highlighted) data and select *Cut* from the displayed context menu. Or, select the data and then click *Edit - Cut* from the menu bar.

The cut data is shown in a dotted line on the list. If the data is pasted to somewhere, the previously cut data is deleted from the list.

The cut data can be pasted into spreadsheet software such as Excel.

■ Pasting the list data

Click in the location where you want to paste the data. Right-click on this location and select *Paste* from the displayed context menu. Or, select *Edit - Paste* from the menu bar. You can paste data only if you have copied data beforehand. Data cannot be pasted into the same document file from which the data was copied.

■ Simultaneous cut-and-paste/copy-and-paste of the list data

The list data can also be copied or moved by drag-and-drop operation. To drag data, select the data and move the mouse pointer to the boundary of the selected data. When the shape of the pointer changes into a square, drag the data and drop it at the desired point to move the data. If you drag-and-drop data while holding down the Ctrl key, the data is copied and pasted. However, the data displayed in Sample cannot be copied and pasted (replicated). It can only be cut and pasted (moved).

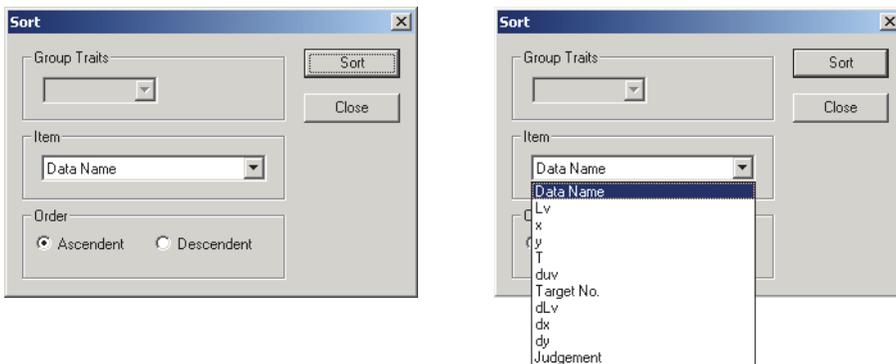
If you move sample data from a folder you created into a folder containing different target data, the linkage between the sample data and the target data changes.

■ Deleting the list data

Right-click the selected (highlighted) data and select *Delete* from the displayed context menu. Or, select the data and select *Edit - Delete* from the menu bar. If more than one piece of data is selected, all the selected data will be deleted simultaneously. When target data is deleted, the sample data linked to the target data loses its attribute and becomes absolute data.

■ Sorting the list data

The list data can be sorted according to a list item. For example, data can be arranged in ascending order according to the ΔL_v value. Right-click inside the list and select *Tool - Sort* from the displayed context menu. Or, select *Tool - Sort* from the menu bar. The data to be sorted is the list data in the list. When *Sort* is selected, the Sort dialog box appears.



■ Saving the list data in text format

Right-click the selected (highlighted) data and select *Save Selection as Text* from the displayed context menu. Or, select the data and select *File - Save Selection As Text* from the menu bar. The data is saved as a tab-delimited text in a text file with the extension “.txt” or as a file using a delimiter specified in the Control Panel (extension: .csv).

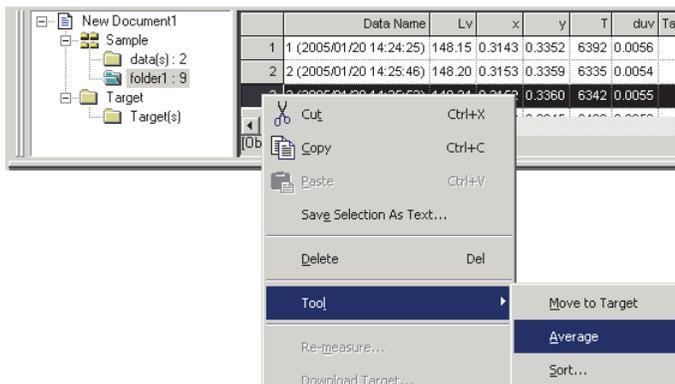
The spectral data can be saved as text even when it is not selected in the list items. For details, refer to page 80.

2.6.4 Adding Averaged Data

You can select the desired data from the list data, obtain the average and add the result as new data.

1. Right-click the selected (highlighted) list data and select *Tool - Average* from the displayed context menu. Or, select at least one piece of list data and select *Tool - Average* from the menu bar.

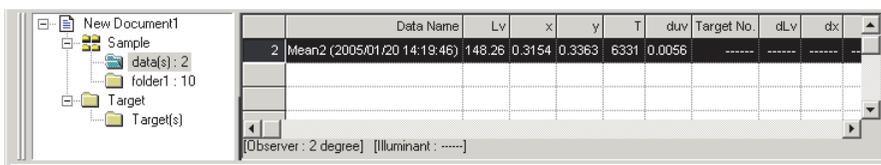
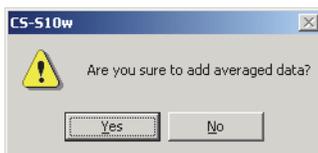
A dialog box with the following message appears: “Are you sure to add averaged data?”



2. Click the Yes button.

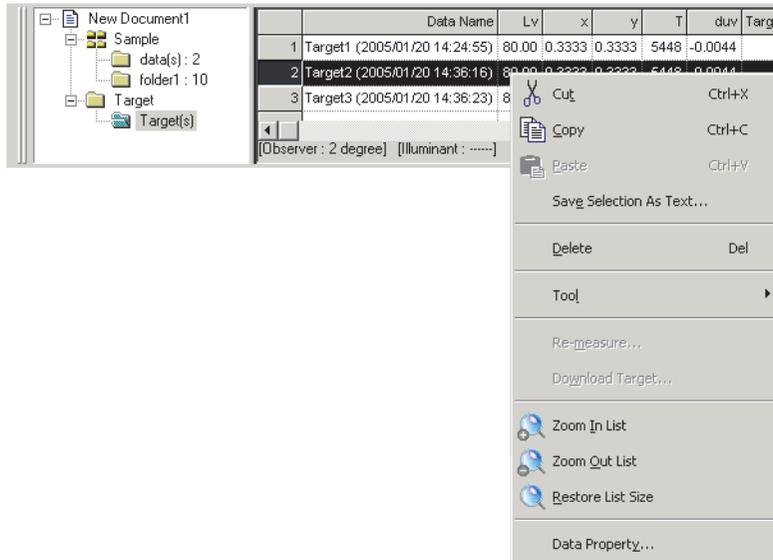
The averaged data is added to the list.

The averaging calculation performed here first averages XYZ data to obtain data that is then used in the calculation of colorimetric data. On the other hand, the averaging calculation that uses the statistical values described on page 63 averages the colorimetric data of each piece of data that was calculated individually according to its XYZ data. Consequently, the results of these two types of calculations may differ.



2.6.5 Enlarging/Reducing the List Size

Right-click inside the list to display the context menu or select *View* in the menu bar. Select an appropriate command.



■ Enlarging the list size

1. Select *Zoom In List*.

The size of the list is enlarged.

■ Reducing the list size

1. Select *Zoom Out List*.

The size of the list is reduced.

■ Restoring the list size

1. Select *Restore List Size*.

The size of the list is reset to the default size.

The default size can be changed. Refer to page 76 for the procedure to change the default size.

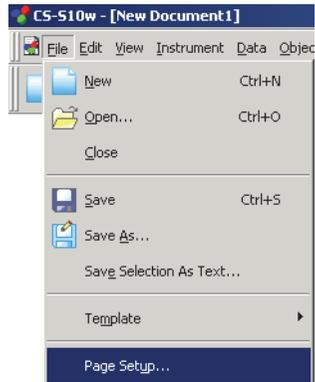
2.7 Printing

You can print the list in the list window.

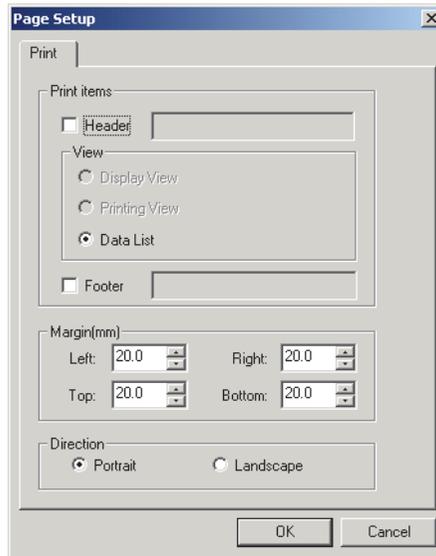
2.7.1 Page Setup

1. Select *File - Page Setup* from the menu bar.

The Page Setup dialog box appears.



2. Specify the necessary settings in the Print tab.



■ Page Setup dialog box

Print items

Header

Specify whether to include a header in the printed document. To print a header, enter the string to be printed as a header.

Data List

Select this option when printing the list in the list window.

Footer

Specify whether to include a footer in the printed document. To print a footer, enter the string to be printed as a footer.

You can specify whether the text to be printed as a header or footer is determined automatically during printing.

The characters in the table below are recognized as special symbols and are replaced with corresponding character strings.

String	Corresponding data
\$D	Day of measurement
\$M	Month of measurement
\$Y	Year of measurement
\$h	Hour of measurement
\$m	Minute of measurement
\$s	Second of measurement

Enter a combination of these characters in the text box. Up to 60 alphanumeric characters can be used.

Margin

When printing the list window, specify the Top/Bottom and Right/Left margins. The Right/Left margins can be specified within the range of 0 to 50 (mm), and the Top/Bottom margins can be specified within the range of 5 to 50 (mm).

Direction

Portrait

Windows are printed in portrait orientation.

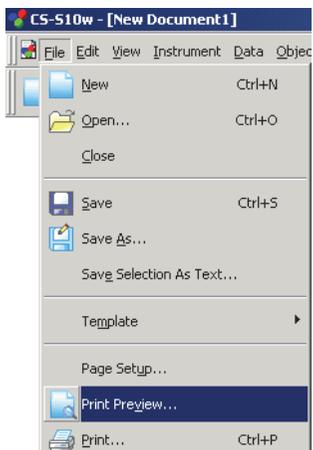
Landscape

Windows are printed in landscape orientation.

2.7.2 Print Preview

1. Select *File - Print Preview* from the menu bar.

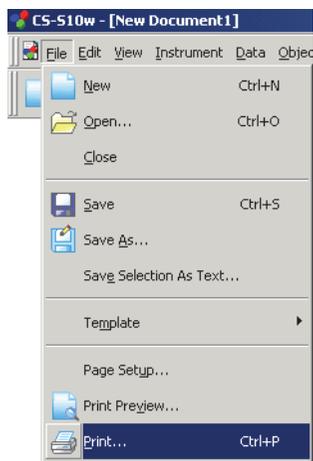
A preview window appears showing the actual appearance of the page to be printed as specified in the Page Setup dialog box.



2.7.3 Start Printing

1. Select *File - Print* from the menu bar.

The Print dialog box appears.



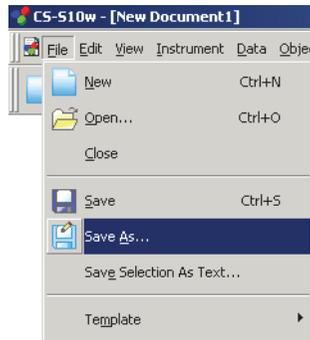
2.8 Saving Data

2.8.1 Saving a Data File

The content displayed in the list window is saved as a document file.

1. Select *File - Save As* from the menu bar.

The Save As dialog box appears.



2. Specify the filename and other items and save the data.

The data is saved as a data file in the original file format of the CS-S10w software (with the “.ces” file extension).

The data file contains the following data:

- Sample data
- Target data
- Folder
- Observer
- Initial tolerances
- Judgement display setting
- List items specified in the list window
- View setting parameters

A folder containing no data will not be saved.

2.9 Other Functions

2.9.1 Template File

The CS-S10w software provides template files in its original file format (with the “.ctp” file extension). A template file contains the following data:

- Observer
- Initial tolerances
- Judgement display setting
- List items specified in the list window
- Screen properties

The CS-S10w provides the following pre-defined template files, which specify the type of document:

Normal.ctp

Specifies a document in Normal mode under Light-source Color which is selected in the Welcome to CS-S10w dialog box.

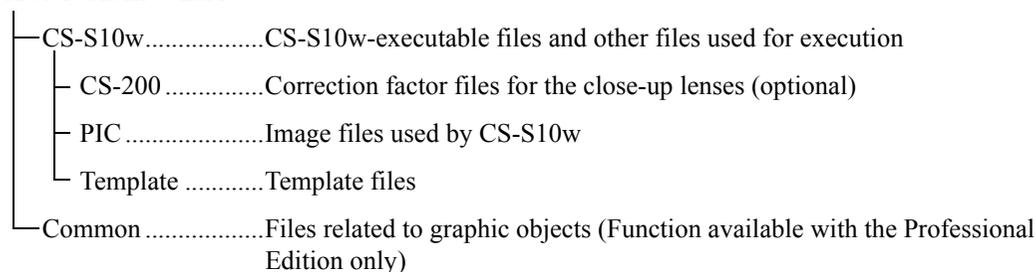
Ref.ctp

Specifies a document in Object Color mode which is selected in the Welcome to CS-S10w dialog box.

■ Directory structure of the CS-S10w software

The CS-S10w software is installed in a folder having the following directory structure.

KONICAMINOLTA

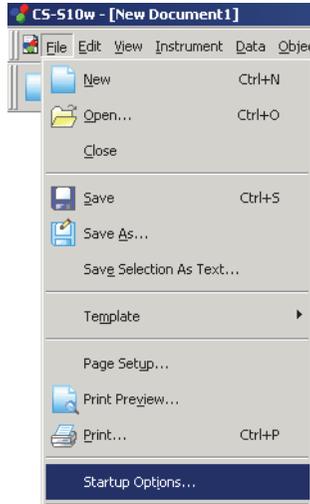


2.9.2 Setting Startup Options

You can specify whether to connect the instrument when the CS-S10w software is started.

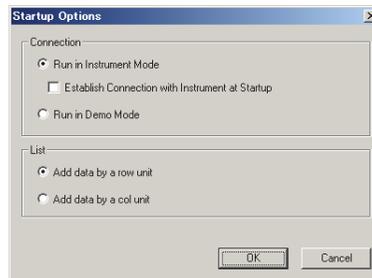
1. Select *File - Startup Options* from the menu bar.

The Startup Options dialog box appears.



2. Specify the start options.

Your selection will take effect at the next startup.



■ Startup Options dialog box

Connection

Run in Instrument Mode

When this option is checked, CS-S10w starts in the instrument mode, which is used to connect and operate an instrument.

Establish Connection with Instrument at Startup

When this option is checked, the connection to the instrument which was connected at the last operation is automatically established at startup.

Run in Demo Mode

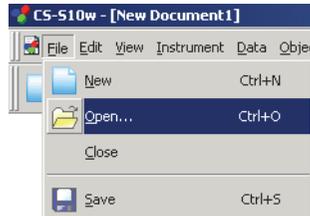
When this option is checked, the CS-S10w software starts in demo mode. In demo mode, the CS-S10w software can be operated as if the instrument were connected even when the instrument is not actually connected. When you attempt to take a measurement, a random measurement result is displayed.

2.9.3 Opening a Data File

You can open the document files (data files) created with the CS-S10w software.

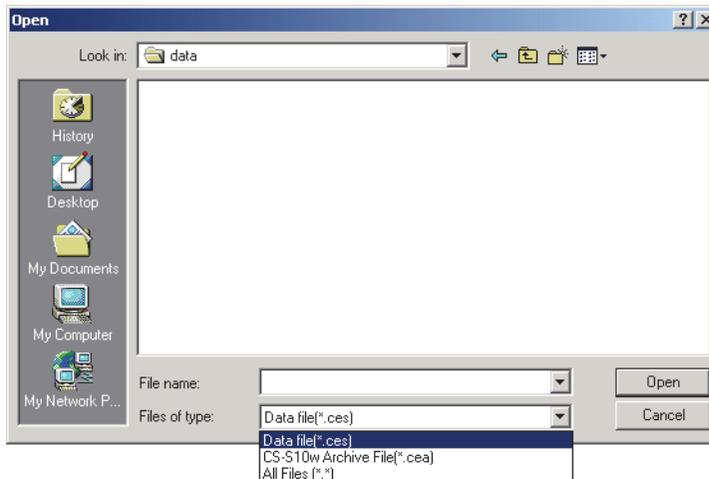
1. Select *File - Open* from the menu bar.

The Open dialog box appears.



2. Select the type of file to be opened.

The file names of the specified file type are displayed.



3. Select the desired file and click the Open button.

If a file that was created with a list style of Add data by a row unit containing more than 4,000 pieces of data, is opened with a list style of Add data by a col unit, data exceeding 4,000 pieces will be lost.

When the data file created with CS-S1w is opened

When you select a data file created with the CS-S1w (extension: LMB, LMT, OMB, OMT, LKB, LKT, OKB, OKT or DAT) and click the Open button, the file is converted into a data file in the CS-S10w format (extension: .ces). The converted ".ces" file is created in the same folder as the original file and is opened. If a file with the same name already exists, the name of the new file is prefixed with a tilde (~). The number of tildes increases as long as there is a file with the same name.

When a DAT file is selected, the system cannot identify whether the file contains a list of target data or that of measurement data. Consequently, the file is converted as a list of measurement data.

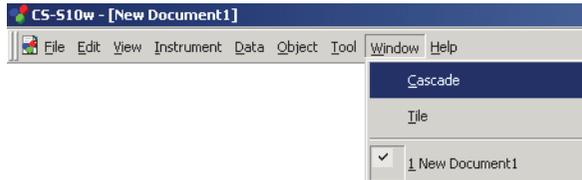
The CS-S10w can save as many as 5,000 pieces of data with a list style of Add data by a row unit, or 4,000 pieces of data with a list style of Add data by a col unit. Consequently, if a file created with the CS-S1w contains more pieces of data than these limits, it is divided into separate files that contain data equal to or less than these limits.

2.9.4 Arranging Windows with/without Overlapping

When two or more data files are opened, you can select whether the windows are to be displayed in an overlapping or tiled arrangement.

1. Select *Window - Cascade* or *Tile* from the menu bar.

The windows are displayed in either an overlapping arrangement (Cascade) or a side-by-side arrangement (Tile).

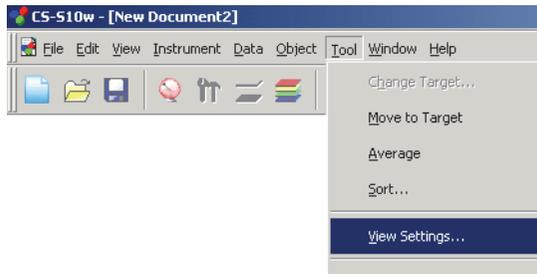


2.9.5 View Settings of Each Window

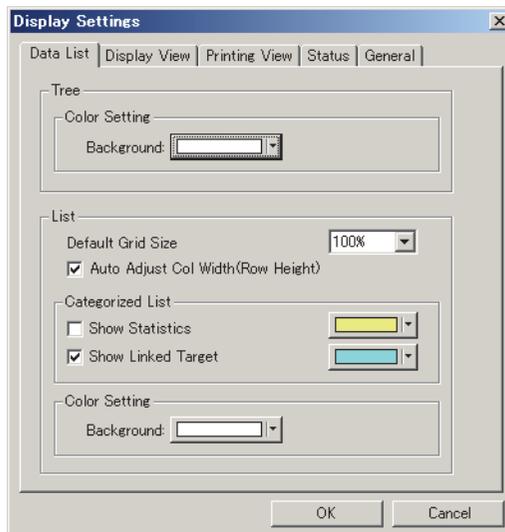
You can specify view setting details such as the background colors of the List Window and the Status Window.

1. Select *Tool - View Settings* from the menu bar.

The Display Settings dialog box appears.



2. Specify the view setting details for each window.



■ Display Settings dialog box

Data List tab

Tree

Color Setting

Background

Specify a background color for the tree.

List

Default Grid Size

Specify the normal size for the list display. This setting is used as the default size for Zoom In/Out display (p. 67).

Auto Adjust Col Width (Row Height)

Check this option to automatically adjust the column width or row height of the first data of the list according to the number of displayed digits.

For the Data Name, Comment, and Timestamp columns or rows, the column width or row height is automatically adjusted even when this option is not checked.

Categorized List

Show Statistics

Check this option to display statistics in the list for a folder when Sample - data(s) is selected. The color of the statistics line can be selected from the box at right.

Show Linked Target

Check this option to display the linked target data in the list for a folder when Sample - data(s) is selected. The color of the linked target line can be selected from the box at right.

Color Setting

Background

Specify a background color for the list.

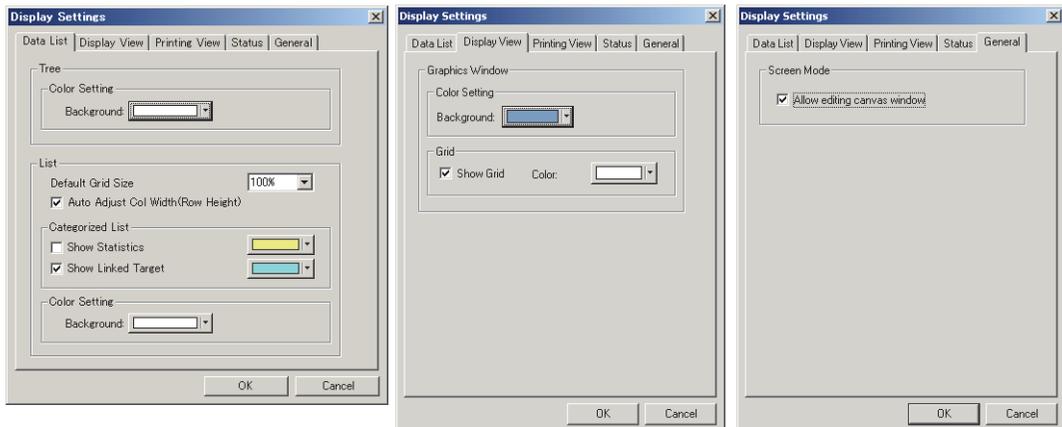
Display View tab, Printing View tab, General tab (Function available with the Professional Edition only)

Status tab

Status Window - Color Setting

Background

You can specify the background color of the status window.

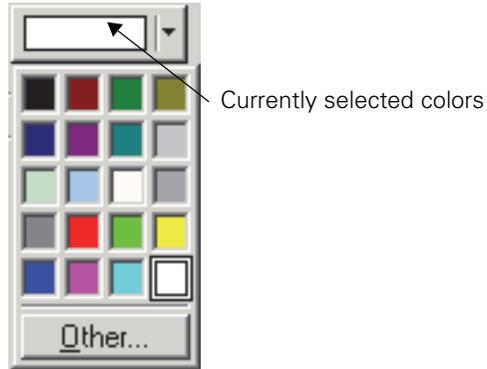


2.9.6 Color Setting

The color button appears, allowing you to select colors. 

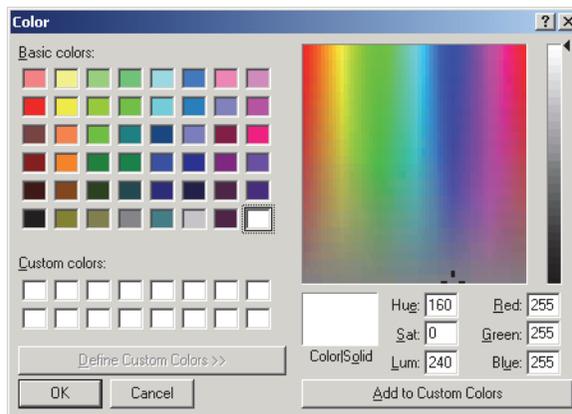
1. Click the color button.

To select a color other than those shown in the palette, click the Other button.



2. Select a color from the palette or create a desired color.

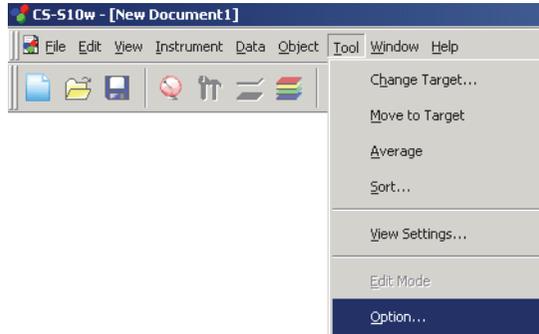
When the Other button is clicked, the Color dialog box appears.



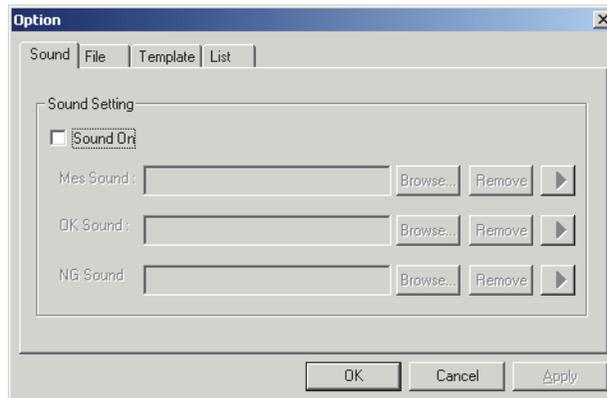
2.9.7 Setting Options

1. Select *Tool - Option* from the menu bar.

The Option dialog box appears.



2. Specify the sound, file-related functions, and list extension functions as necessary.



■ Option dialog box

Sound tab

Provides sound in WAV format during measurement.

You can select a sound to be played in response to a particular result during judgement operation.

File tab

File Path Setting

Load

Specify the default file path that is displayed when *File - Open* is selected from the menu bar.

Template

The file path pointing to the template file can be modified.

Auto Save Setting

Auto Save On

When this option is checked, data files are backed up automatically. The back up file names are prefixed with “~” (tilde).

Template tab

Template Path Setting

Auto Save Setting

Each template file can be modified.

(Contrast, RGB, and RGB&Contrast are only available with the Professional Edition.)

List tab

List Expansionary Setting

Add Header to Top of Copy Text

When the data in the list is selected and copied while this option is checked, the characters at the beginning are also copied.

Replace rows with cols at the time of “Save Selection As Text”

When this option is checked and the selected data is saved as text data, the data in the rows of the list items are replaced with those in the columns.

Save spectral data at the time of “Save Selection As Text”

When this option is checked and the selected data is saved as text data, only spectral data is saved. The saving occurs even when there is no spectral data in the list item.

Row Select On

When this option is checked, clicking any point in the list selects the line including the point.

Luminance units

Set the unit of luminance to either cd/m^2 or ft-L. The L_v value is calculated in the unit selected with this option.

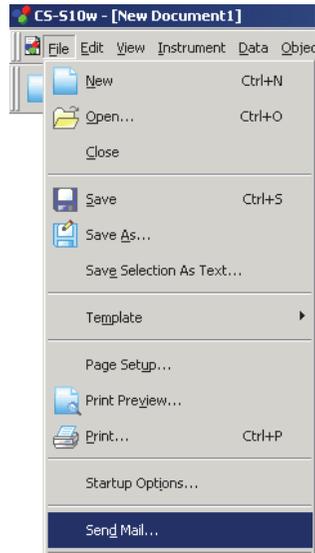
2.9.8 Sending Data Files by E-mail

A data file can be sent by e-mail as an attachment.

1. Select *File - Send Mail* from the menu bar.

With some e-mail software programs, a parameter setting dialog box may appear. Specify each parameter accordingly.

The window for sending E-mail appears.



2. Type the destination address and subject and send the mail.

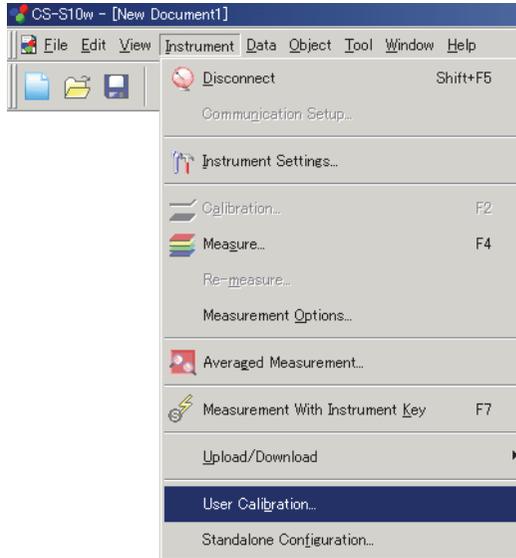
2.9.9 Setting User Calibration

This procedure is available only when the instrument is connected to the computer.

By setting a calibration value for the instrument, you can register your own correction factor in a calibration channel. By selecting the calibration channel before measurement, you can obtain sample data which has been corrected using the registered correction factor.

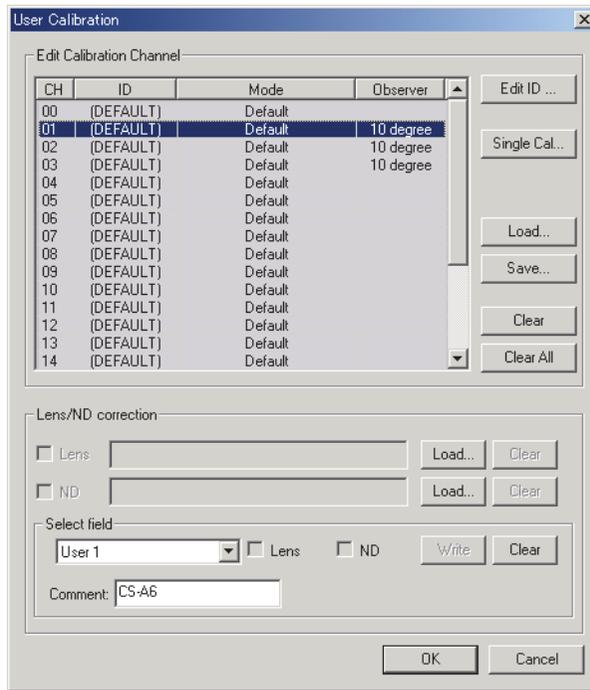
1. Select *Instrument - User Calibration* from the menu bar.

The User Calibration dialog box appears.



2. From the data list, select a calibration channel for which you want to set a correction factor.
3. Click the Load button to open the dialog box. Specify a file containing previously saved calibration values and click the Open button.
4. Click the OK button to start downloading data for calibration channel selected in step 2 to the instrument.

■ User Calibration dialog box



Edit Calibration Channel

Edit ID

Edit the ID name for the selected calibration channel. You can select calibration channels between CH01 and CH20, and can use up to 9 characters.

Single Cal

Perform the user calibration for the selected calibration channel. You can select this option for the calibration channels between CH01 and CH20 if the observer setting is the same as that of the instrument or if it is undefined.

For the procedure to perform the user calibration, refer to page 91.

Load

The specified file is read and the calibration value, ID name and target are written to the selected calibration channel.

Save

The backup of the calibration value, ID name and target for the selected calibration channel is stored in the specified file.

Clear

The information about the selected calibration channel is reset to the default setting. You can select this option for the calibration channels between CH01 and CH20.

Clear All

The information about all calibration channels is reset to the default setting.

2.9.10 Downloading the Target Data to the Instrument

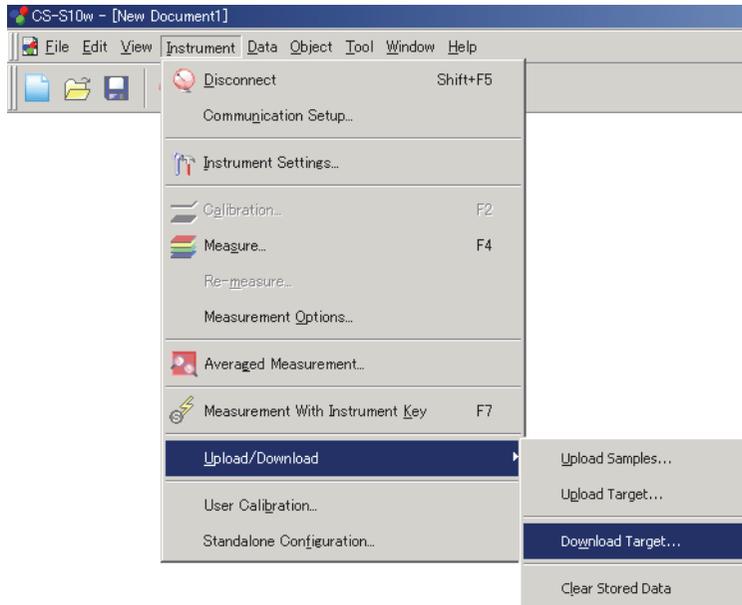
This procedure is available only when the instrument is connected.

This procedure is enabled only when Normal Mode under Light-source Color is selected.

1. In the list window, open a folder by selecting Target - Target(s), select the target data to download and select *Instrument - Upload/Download - Download Target* from the menu bar.

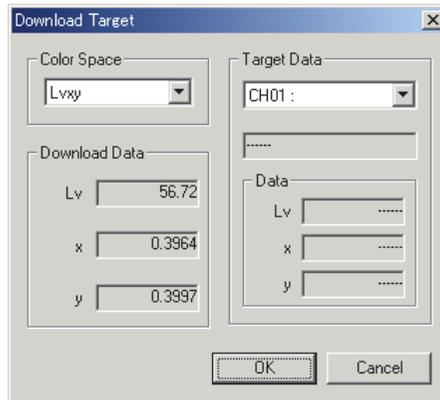
Or, right-click the target data and select *Download Target* from the displayed context menu.

The Download Target dialog box appears. You can select multiple targets and download them in succession.



2. Specify the details of the target data downloaded to the instrument.
3. Click the OK button to start downloading data to the instrument.

■ Download Target dialog box



Color Space

Select the setting from L_vxy , $L_vu'v'$, and XYZ.

Download Data

The data to be written is displayed in the color space mode selected in Color Space.

Target Data

The combo box shows calibration channels in the form of “CH number : ID name”. Select a calibration channel between CH01 and CH20. Target color is written to the selected calibration channel. The text box under the combo box displays the save date. The Data fields show the data registered with the selected calibration channel in the selected color space mode. When there is no data, “-----” is displayed.

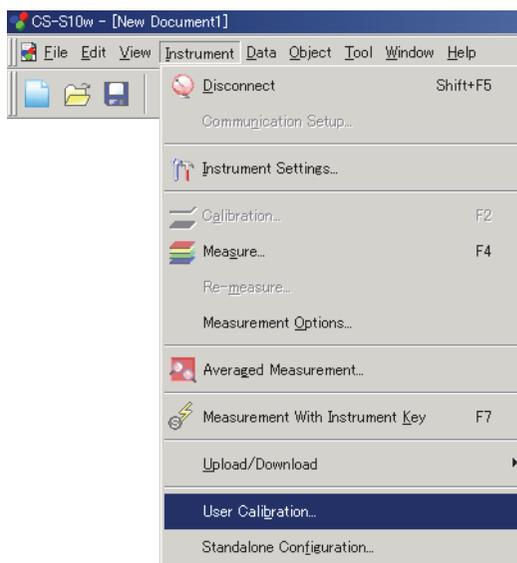
2.9.11 Adding a Lens Type

This procedure is available only when the instrument is connected to the computer.

To attach a lens such as a close-up lens, you need to correct the measurement value. For the optional accessory close-up lenses No. 107 and No. 122, their correction factors are pre-registered with the instrument as “No. 107” and “No. 122”. Other than these, you can add lens types as “User 1”, “User 2” and “User 3”. Follow the procedure below and register the correction factor to use for your desired lens, such as the optionally-available ND filter CS-A6 (1/10) or CS-A7 (1/100), or a combination of the close-up lens and ND filter.

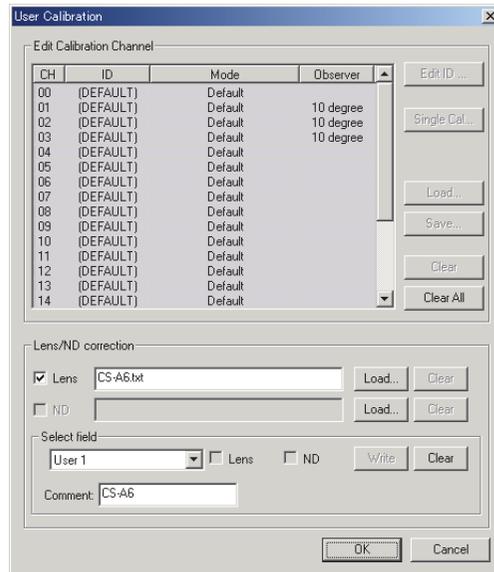
1. Select *Instrument - User Calibration* from the menu bar.

The User Calibration dialog box appears.



2. Click the Load button on the right of the Lens check box in the Lens/ND correction area, and read the file containing the correction factor.
3. Specify the destination in the Select field area and click the Write button. The correction factor is loaded to the instrument.

■ User Calibration dialog box



Lens/ND correction

Lens/ND

These check boxes can be edited only after you specify a file by using the Load button. Check an appropriate box to select whether to use the value as a correction factor.

Load

Click this button to load the correction factor file.

A correction factor for a lens should be a text file of data of 40 sensors, and a correction factor for the ND filter should be a text file of 401 pieces of data.

The correction factor files for the optional close-up lenses No. 107 and No. 122 are stored in the CS-S10w with names “107.lcf” and “122.lcf”. (Refer to page 73.)

Clear

This button is effective when any file is referenced. Clicking this button clears the specified file.

Select field

Select one from User 1, User 2 and User 3.

Comment

Up to 18 characters can be used.

Lens/ND

The corresponding check box is checked to indicate whether the correction factor for a lens or an ND filter is used.

Write

When this button is clicked, the correction factor is loaded to the instrument.

Clear

This button becomes effective after a correction factor is registered for the lens type specified in the combo box. When this button is clicked, the correction factor loaded in the instrument is cleared.

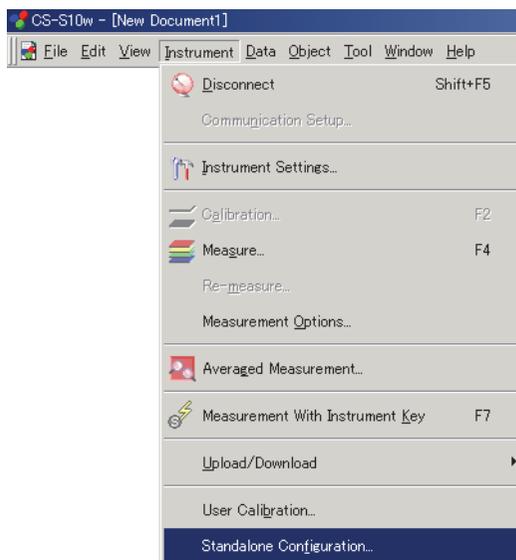
2.9.12 Downloading Configuration Data to the Instrument

This procedure is available only when the instrument is connected.

You can use the CS-S10w software to configure the instrument for standalone operation (when not connected to the computer).

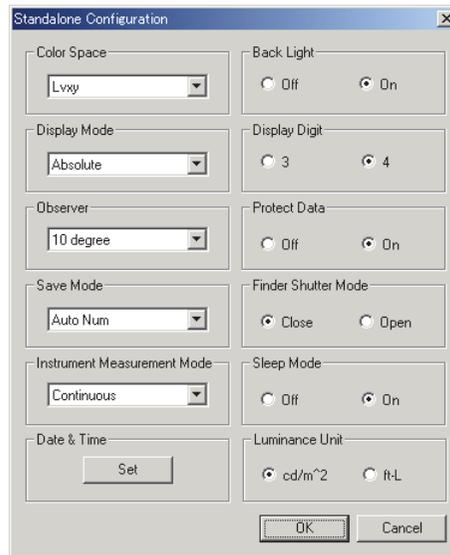
1. Select *Instrument - Standalone Configuration*.

The Standalone Configuration dialog box appears.



2. Specify or enter an appropriate value for each item.
3. Click the OK button to start downloading data to the instrument.

■ Standalone Configuration dialog box



Color Space

Select the Color Space from L_vxy , $L_vu'v'$, $L_vT\Delta uv$, XYZ or Dominant Wavelength. If Display Mode is set to Ratio, XYZ is displayed and cannot be edited. $L_vT\Delta uv$ can be selected only when the observer is set to 2° .

Display Mode

Select the setting from Absolute, Difference and Ratio. Ratio can be selected only when Color Space is set to XYZ.

Observer

Select either 2° or 10° . User1 and User2 will be added depending on the selection. When Color Space is set to $L_vT\Delta uv$, 2° is displayed and cannot be edited.

Save Mode

Select the setting from Auto Num, Manu Num and Auto Save.

Instrument Measurement Mode

Select either One shot or Continuous.

Date & Time

Clicking the Set button displays a confirmation message. Clicking the OK button sets the date and time settings of the instrument to those of the system.

Back Light

Select either On or Off.

Display Digit

Select either three or four digits.

Protect Data

Select either On or Off.

Finder Shutter Mode

Select either Open or Close for the action of the finder's shutter during measurement.

Sleep Mode

Select either On or Off to set whether to activate the sleep mode when there is no operation for a specified time.

Luminance Unit

Select either cd/m^2 or ft-L.

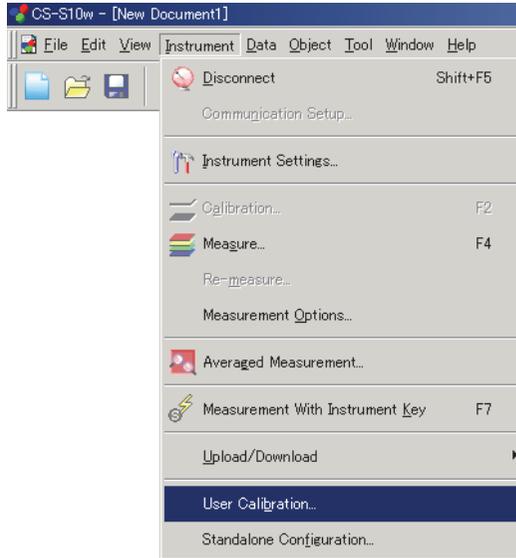
For details of each item, refer to the instruction manual of the instrument.

2.9.13 Performing User Calibration

This procedure is available only when the instrument is connected to the computer.

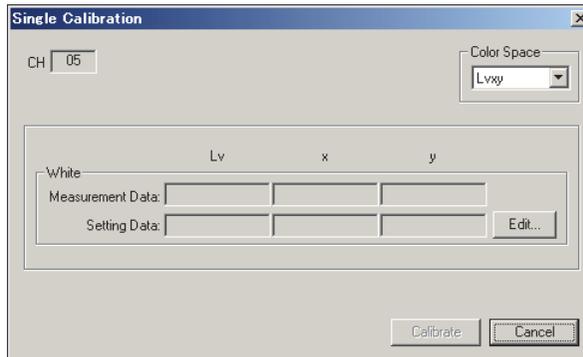
1. Select *Instrument - User Calibration* from the menu bar.

The User Calibration dialog box appears.



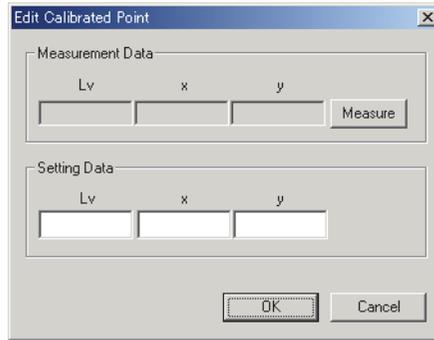
2. From the data list, select a calibration channel for which you want to perform user calibration.
3. Click the Single Cal button.

The Single Calibration dialog box appears.



4. Click the Edit button.

The Edit Calibrated Point dialog box appears.

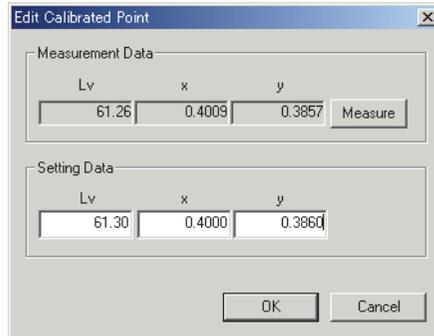


5. Click the Measure button.

The measurement is performed and the data for the calibrated point is displayed in the Measurement Data field.

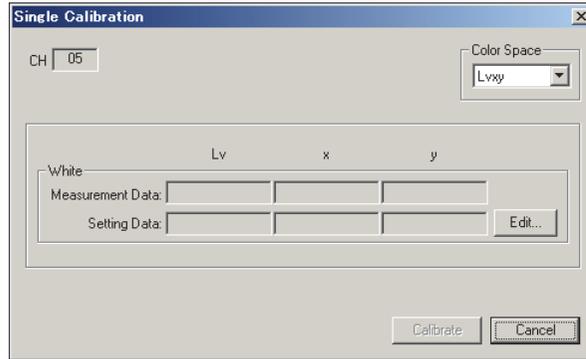
6. Enter the reference data in the Setting Data fields.

The available input range is as follows:
 X, Y, Z, and L_v : 0.01 to 99999000000.00
 x, y, u' and v': 0.0001 to 1.0000



7. Click the OK button.

The Single Calibration dialog box appears again.



8. Click the Calibrate button.

The calibration starts.

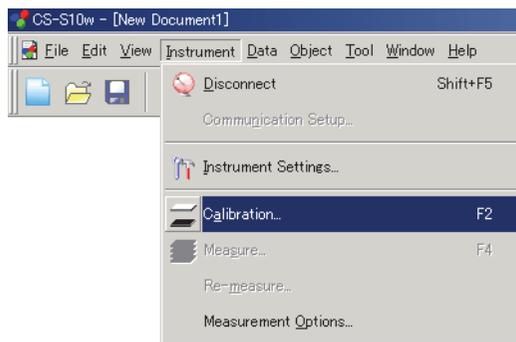
2.9.14 White Calibration for Object Color Measurement

This procedure is available only when the instrument is connected to the computer.

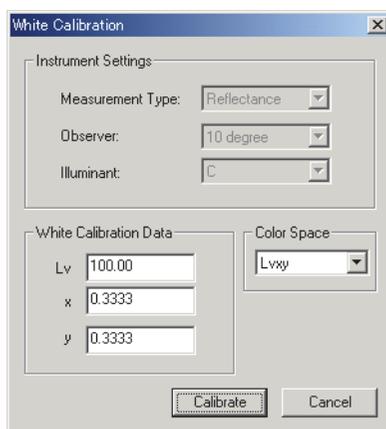
To perform object color measurement, you need to first perform white calibration.

1. Select *Instrument - Calibration* from the menu bar.

The White Calibration dialog box appears.



2. Select Color Space from Lvxy, Lvu'v' and XYZ.



3. To measure reflected object color, enter calibration data.

The available input range is as follows:

X, Y, Z, and Lv: 0.01 to 200.00

x, y, u' and v': 0.0001 to 1.0000

4. Click the Calibrate button to start the white calibration.

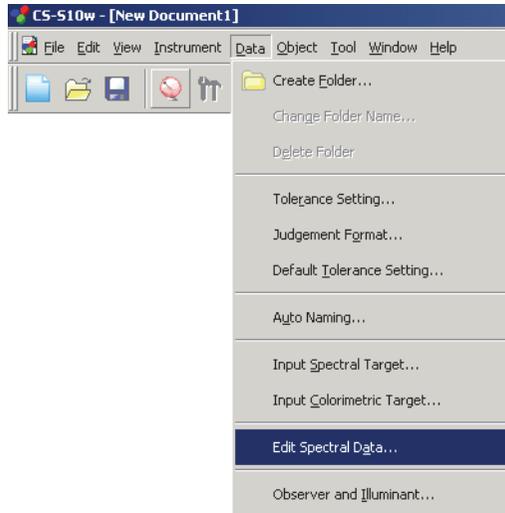
2.9.15 Calculating spectral data

Various calculations can be performed on spectral data for each wavelength. The calculated spectral data is added to the list window as one piece of data.

These calculations are applicable for spectral data only.

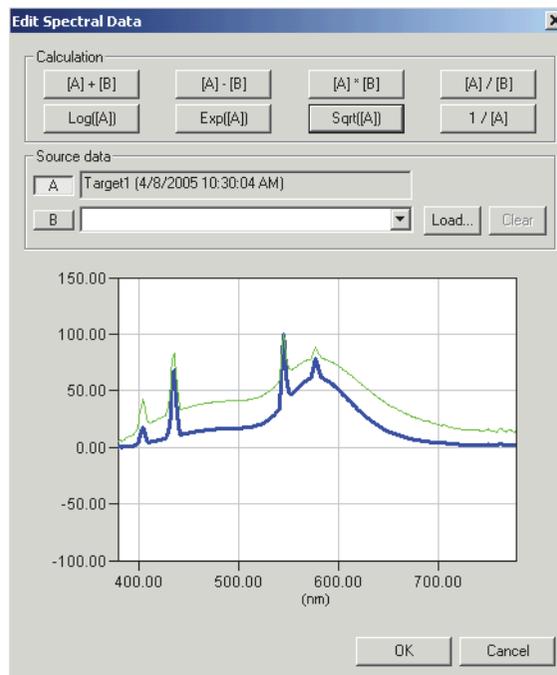
1. Select sample or target data from the list in the list window.
2. Select *Data - Edit Spectral Data* from the menu bar.

The Edit Spectral Data dialog box appears.



3. Calculate the spectral data.

The Edit Spectral Data dialog box appears.



■ Edit Spectral Data dialog box (When the CS-1000 is connected)**Source data****A**

The selected data is displayed. The calculation will be based on this data. [Cannot be edited]

B

Specify the data used for the calculation. You can select it from any data stored in the document file, load a data file by clicking the Load button, or type a numeric value.

Load

Click this button to load a file with an extension of “.lrv”.

Calculation

The following eight types of operations are available. When one of the buttons is clicked, the corresponding operation result is displayed on the graph.

Arithmetical operations: Arithmetical operation can be performed on the two pieces of spectral data for each wavelength. Use these buttons to obtain a result such as the spectral reflectance of an object from the spectral data of the light source illuminating the object and of the reflection from the object.

[A]+[B]

[A]-[B]

[A]*[B]

[A]/ [B]

Functional operations: Functional operation is performed on all spectral data for each wavelength. Use these buttons to obtain a result such as the spectral characteristics of concentration from the spectral reflectance data.

LOG([A])

Obtains a logarithm of the data with base 10 for each wavelength.

EXP([A])

Obtains an exponent of the data with base 10 for each wavelength.

SQRT([A])

Obtains a square root of the data for each wavelength.

1/[A]

Obtains a reciprocal of the data for each wavelength.

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