

# **Data Management Software CS-S10w Professional**

**Ver.1.3**

**Instruction Manual**



**KONICA MINOLTA**

## **Formal designations of application software used in this manual**

(Designation in this manual) (Formal designation)

Windows, Windows 2000	Microsoft <sup>®</sup> Windows <sup>®</sup> 2000 Professional Operating System
Windows, Windows XP	Microsoft <sup>®</sup> Windows <sup>®</sup> XP Professional Operating System
Windows, Windows Vista	Microsoft <sup>®</sup> Windows <sup>®</sup> Vista Business Operating System

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## Introduction

The CS-S10w software is color data software designed to connect the CS-200 or other Chroma meters or the CS-1000 Series Spectroradiometer to a PC (personal computer) to enable the measurement and graphic display of measurement data, as well as other operations. The name “CS-1000” in this manual refers to every models of the CS-1000 Series.



### 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)
- Protection key (USB port type or parallel port type)
- Installation Guide
- Instruction Manual (this manual)

## 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 2000, Windows XP or Windows Vista 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 SENSING authorized service facility.

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# CHAPTER 1

# OVERVIEW

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System  
Requirements

Major  
Functions

Operation  
Flow

Window  
Configuration

# 1.1 System Requirements

## 1.1.1 System Requirements

<b>OS</b>	Windows 2000 Professional Service Pack 4 Windows XP Professional Service Pack 2, x64 Edition Windows Vista Business 32-bit (x86), 64-bit (x64) (English, French, German, Spanish, Italian, Japanese, Traditional Chinese, Simplified Chinese, and Hangul versions)
<b>Computer</b>	PC equipped with a processor equivalent to Pentium III 600MHz or better
<b>Memory</b>	128 MB (256 MB recommended)
<b>Hard disk drive</b>	60 MB of available hard disk space At least 250 MB of available disk space is required on the system drive (drive where the OS is installed).
<b>Display</b>	Display hardware capable of displaying 1024 x 768 pixels / 16-bit color or better
<b>Optical disc drive</b>	CD-ROM drive
<b>USB or parallel port</b>	Required for protection key
<b>USB port</b>	Required for CS-200
<b>Serial port</b>	Required for CS-100A or CS-1000
<b>Browser</b>	Internet Explorer Ver. 5.01 or later

## 1.1.2 Compatible Instruments

<b>Instrument</b>	CS-200, CS-100A and CS-1000A/S/T
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## 1.1.3 Language

<b>Display language</b>	English, Japanese (Select one during installation.)
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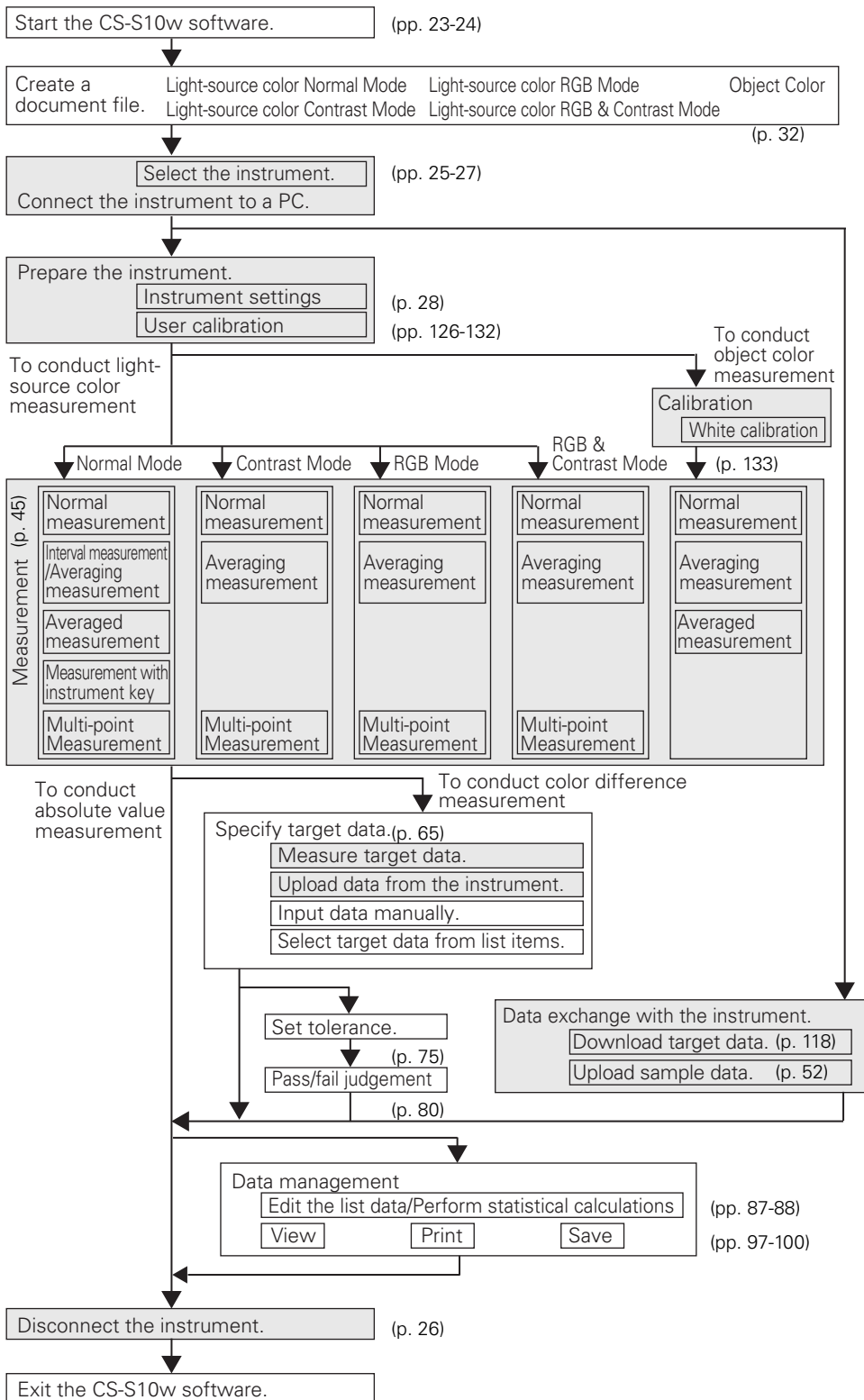
## 1.2 Major Functions

<b>Color space mode</b>	<p><b>(Light-source color mode)</b>  <math>L_{\nu xy}</math>, <math>L_{\nu u'v'}</math>, <math>L_{\nu T\Delta uv}</math>, XYZ, <math>L^*a^*b^*</math>, JND, Dominant Wavelength, Excitation Purity, Contrast, Square ratio</p> <p><b>(Object color mode)</b>  <math>L^*a^*b^*</math>, <math>L^*C^*h</math>, XYZ, <math>Y_{xy}</math>, Hunter Lab, <math>L^*u'v'</math>, <math>L^*u^*v^*</math>, Dominant Wavelength, Excitation Purity</p> <p><b>Notes concerning displayed values:</b>  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.</p> <p>Each colorimetric value of the data measured with a spectroradiometer or obtained by manual input of spectral data is calculated from spectral data. Each colorimetric value of the data measured with a chromameter or obtained by manual input of colorimetric data is calculated from XYZ data. As a result, the colorimetric value of the average value obtained by the manual averaging measurement or by the averaging of list data may differ from the average of colorimetric values displayed in the list.</p>
<b>Observer</b>	2 degree , 10 degree
<b>Illuminants</b> <b>(Object color mode)</b>	A, B, C, D50, D55, D65, D75, D95, E, F2, F6, F7, F8, F10, F11, F12 Up to three illuminants can be displayed simultaneously.
<b>Measurement flow</b>	Light-source Color-Normal Mode, Light-source Color-Contrast Mode, Light-source Color-RGB Mode, Light-source Color-RGB & Contrast Mode, and Object Color (Varies depending on the selected document type) Multi-Point measurement
<b>Graph</b>	xy-chromaticity diagram, $u'v'$ -chromaticity diagram, spectral graph, $L^*a^*b^*$ absolute value, trend chart and histogram, line graph
<b>Image display</b>	Measurement data can be linked with images (in JPEG or BMP format).
<b>Instrument control functions</b>	Measurement/Calibration Averaging measurement: 2 to 1000 measurements Interval measurement: 2 to 1000 measurements/0 to 12 hours interval (in increments of 10 seconds) Measurement with instrument key (only CS-200) Downloading of configuration data to the instrument Uploading of data stored in instrument memory User Calibration
<b>Target</b>	Two or more pieces of target data can be registered. Target data can be downloaded to the instrument.
<b>Data list</b>	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).  
Uploading/saving of template file(s) in original format  
(with file extensions “.mtp” (CM-S100w) and “.ctp” (CS-S10w)).  
Saving of data in text format.  
Copying of lists in clipboard.



# 1.3 Operation Flow



Operation Flow

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

# 1.4 Window Configuration

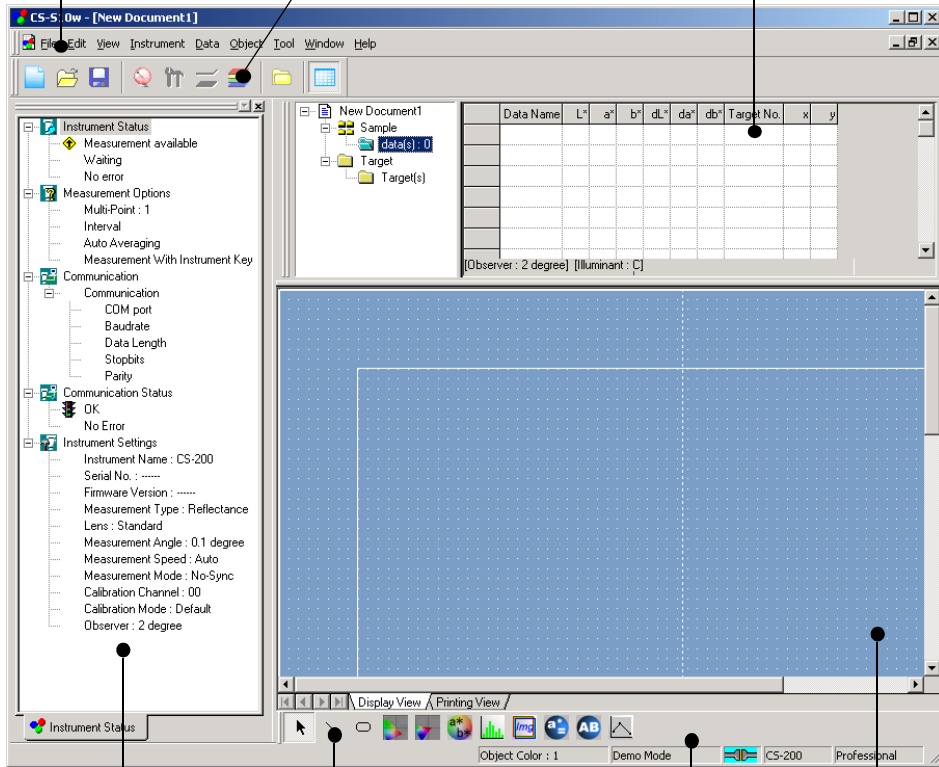
## 1.4.1 Operation Window

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

**Menu bar (p. 9)**  
Shows functions categorized among menus.

**Standard toolbar (p. 11)**  
Displays icons corresponding to frequently used functions.

**List window (p. 15)**  
Displays sample data.



**Status window (p. 18)**  
Displays the detailed status of the instrument.

**Tool icon bar (p. 17)**  
Displays icons representing graphic objects. You can select graphic objects from this bar and place them in the canvas window.

**Status bar (p. 19)**  
Displays the details or status of each function of the CS-S10w.








**Canvas window (p. 16)**  
Graphic objects are pasted in this window.

Window Configuration




## 1.4.2 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

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 Save As		..... 100
Save Selection As Text		.....88
Template		
Load Template		..... 102
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Page Setup		.....97
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 Exit	Shift+X	







### Edit

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Bring Forward		..... 186
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### View




<input checked="" type="checkbox"/> Standard Toolbar	..... 8, 11
<input checked="" type="checkbox"/> Status Bar	..... 8, 19
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The commands under the *Instrument* menu are available only when the instrument is connected to the computer.

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Delete Folder	
<hr/>	
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<hr/>	
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Input Spectral Target.....	66
Input Colorimetric Target.....	69
<hr/>	
Edit Spectral Data .....	136
Observer and Illuminant.....	33
<hr/>	
List Items .....	36
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<hr/>	
 Next Data .....	96
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<hr/>	
Data Property .....	54

**Object**

Select .....	93
<hr/>	
Line .....	184
Rectangle .....	185
xy u'v' .....	141
L*a*b* .....	155
Spectral Graph .....	147
Trend/Histogram .....	162
Image .....	170
Data Label .....	173
String Label .....	176
Line Graph .....	177
Property	

**Tool**

Change Target .....	74
Move to Target	
Average .....	89
Sort .....	88
<hr/>	
View Settings .....	83,84,92,107
<hr/>	
<input checked="" type="checkbox"/> Edit Mode .....	92
Option .....	110

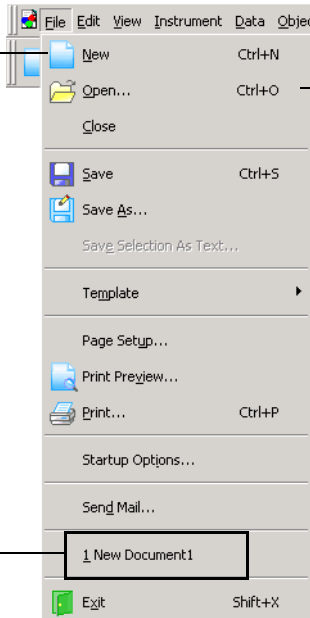
**Window**

Cascade .....	106
Tile .....	106
<hr/>	
<input checked="" type="checkbox"/> Documents currently open	

**Help**

About CS-S10w .....	24
---------------------	----

In the standard toolbar, this icon represents the command. See page 11 for details.

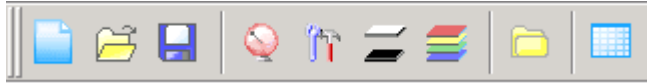


Shortcut keys for this command. See page 14 for details.

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

## 1.4.3 Standard Toolbar

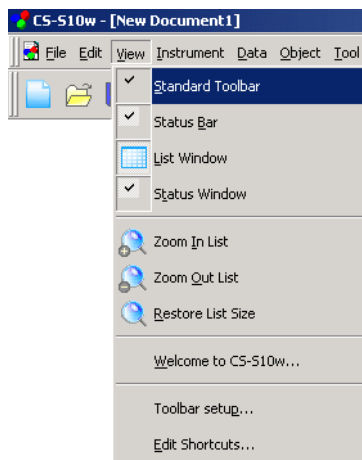
The standard toolbar contains buttons corresponding to frequently used functions. To invoke the command, simply click the button with the mouse.



- 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

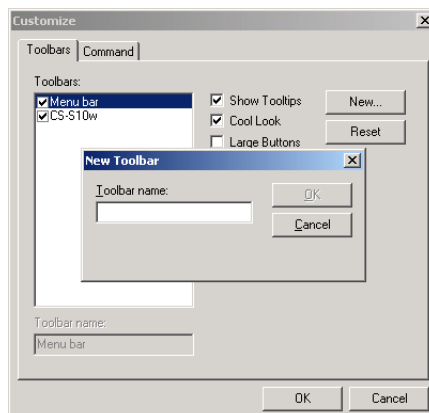
Click *View - Standard Toolbar* in the menu bar to show/hide the standard toolbar.



### Customizing the standard toolbar

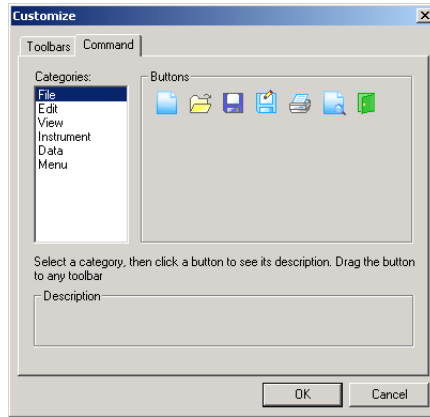
To customize your toolbar with a desired combination of icons, select *View - Toolbar setup* from the menu bar.

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



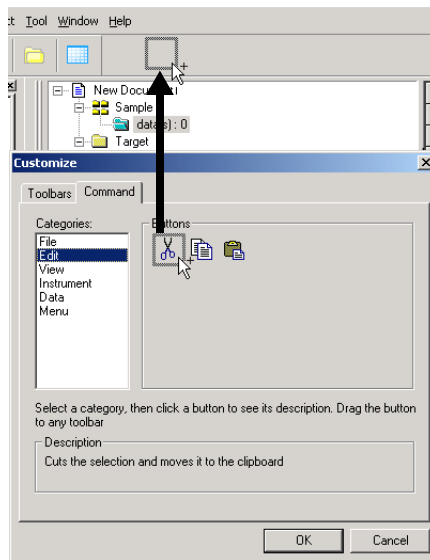
3. Select the Command tab and select the category of icon you want to add to the new toolbar from the list displayed below Categories.

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

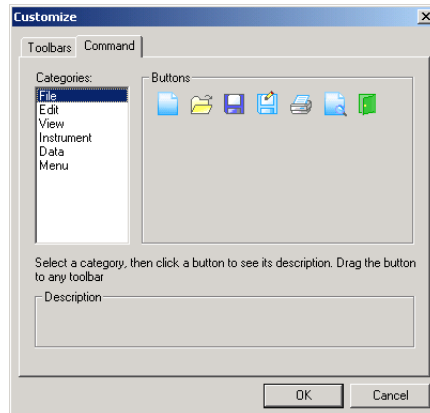
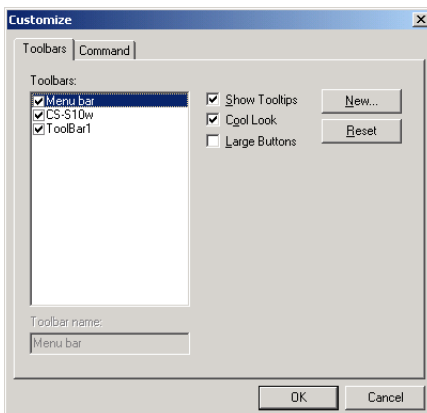


4. Drag-and-drop the button icon to the new toolbar.

The button appears in the toolbar.



### ■ Settings in the Customize dialog box



## Toolbars tab

### CS-S10w

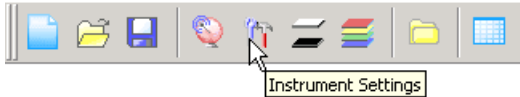
This is the standard toolbar. When this item is checked, the standard toolbar appears. Uncheck this item to hide the toolbar.

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.



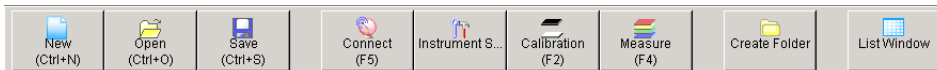
Cool look display



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

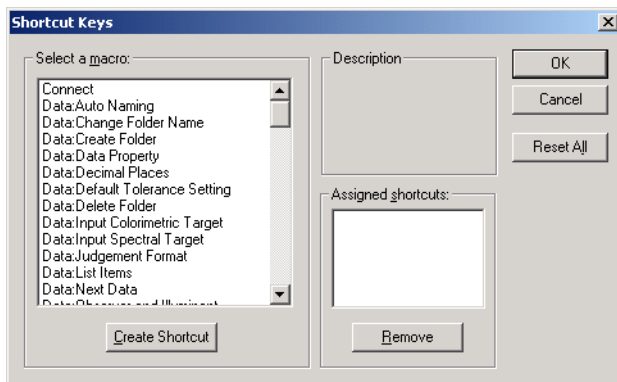
Select this tab to add or remove the buttons appearing in the toolbar.

## 1.4.4 Shortcut Keys

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

### Editing shortcut keys

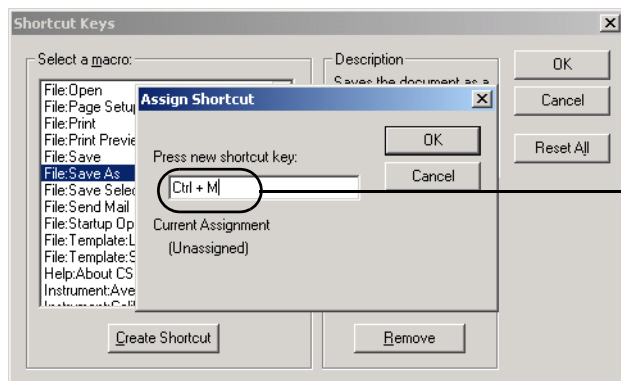
You can customize the shortcut keys by selecting *View - Edit Shortcuts* from the menu bar.



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.



Example:  
When the Ctrl and M  
keys are pressed

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 9 and 10.

### Remove

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

## 1.4.5 List Window

The list window lists the sample data.

Each document file has its own list window. When the canvas window is closed, the list window also closes.

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 103. The figure below shows an example of data displayed by row list.

	Data Name	L*	a*	b*	dL*	da*	db*	Target No.	x
1	1 (01/02/2005 11:57:19)	116,23	-8,30	8,54	.....	.....	.....	.....	0,3136
2	Mean2 (01/02/2005 11:57:26)	116,23	-8,30	8,54	.....	.....	.....	.....	0,3136
3	3 (01/02/2005 11:58:03)	116,18	-8,38	9,91	.....	.....	.....	.....	0,3156

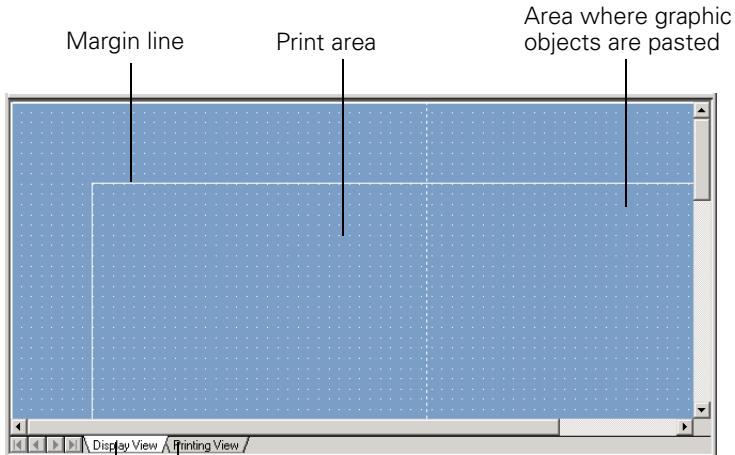
Observer : 2 degree [Illuminant : C]

## 1.4.6 Canvas Window

The canvas window is the window in which graphic objects are pasted.

Two views of the canvas window are available for each document file: Display View and Printing View.

In edit mode, graphic objects can be placed differently in each window as desired.

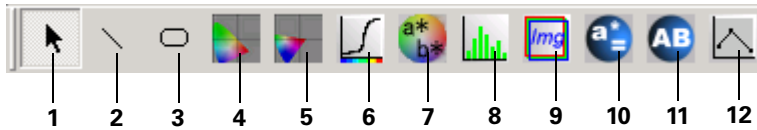


View selection tabs

Used to switch the canvas window between the display and printing views.

## 1.4.7 Tool Icon Bar

You can select graphic objects from this bar and place them in the canvas window. This bar appears in the window when the CS-S10w software is in edit mode.

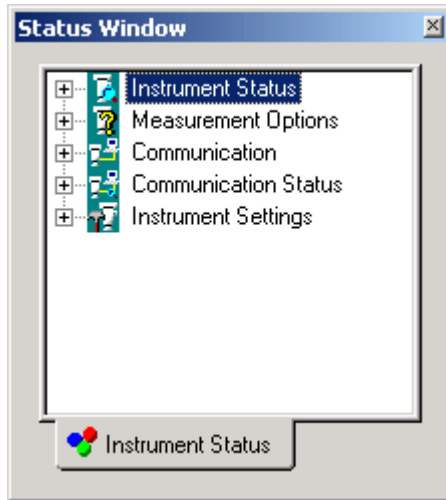


- 1) Selection tool
- 2) Line object
- 3) Rectangle object
- 4) xy-chromaticity diagram object
- 5) u'v'-chromaticity diagram object
- 6) Spectral Graph object
- 7) Absolute Graph (L\*a\*b\*) object
- 8) Trend chart/Histogram object
- 9) Image object
- 10) Data Label object
- 11) String Label object
- 12) Line Graph object

For details of the graphic objects, see “Graphic Object Properties” on page 139.

## 1.4.8 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

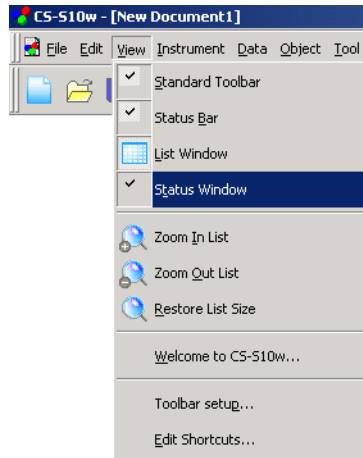
- └ 🟢 OK/ ⚡ Communicating/ 🔴 Not connected/ Error

### Instrument Settings

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

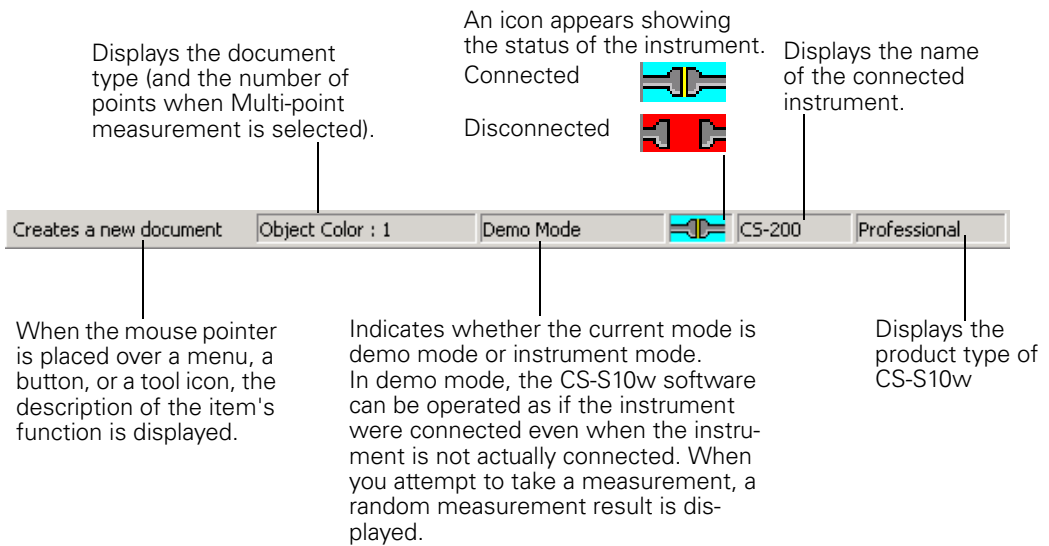
## ■ Showing/hiding the status window

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



## 1.4.9 Status Bar

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





# CHAPTER 2

## OPERATION GUIDE

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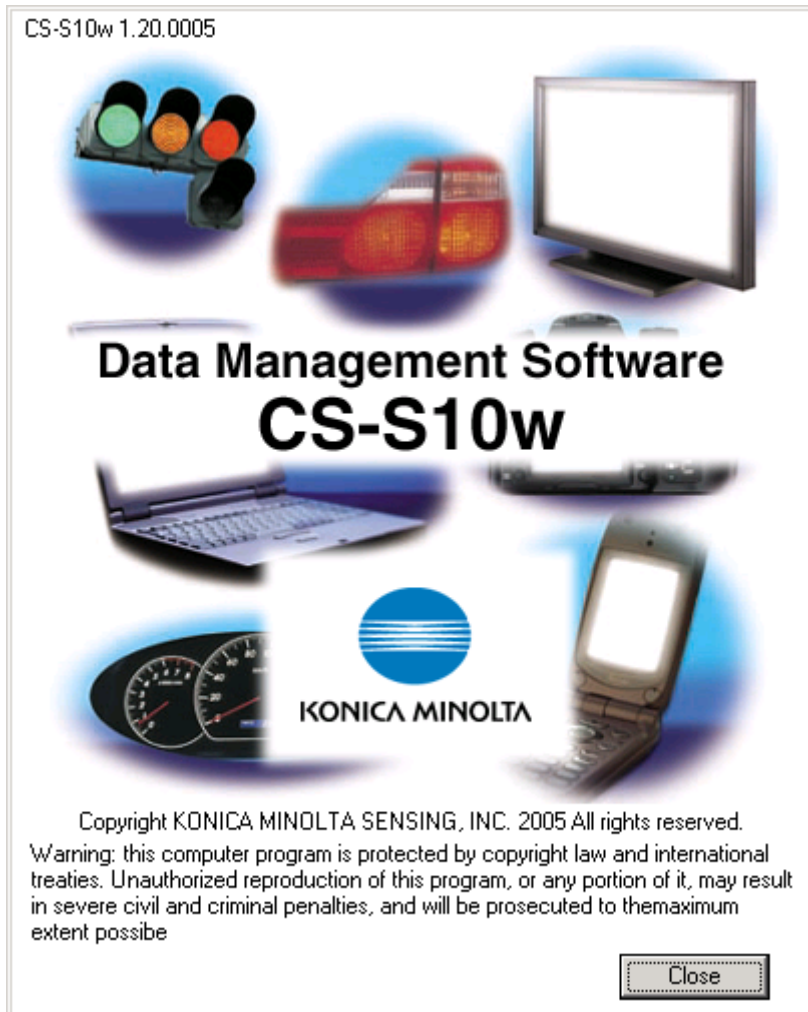


## 2.1 Starting the CS-S10w software

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

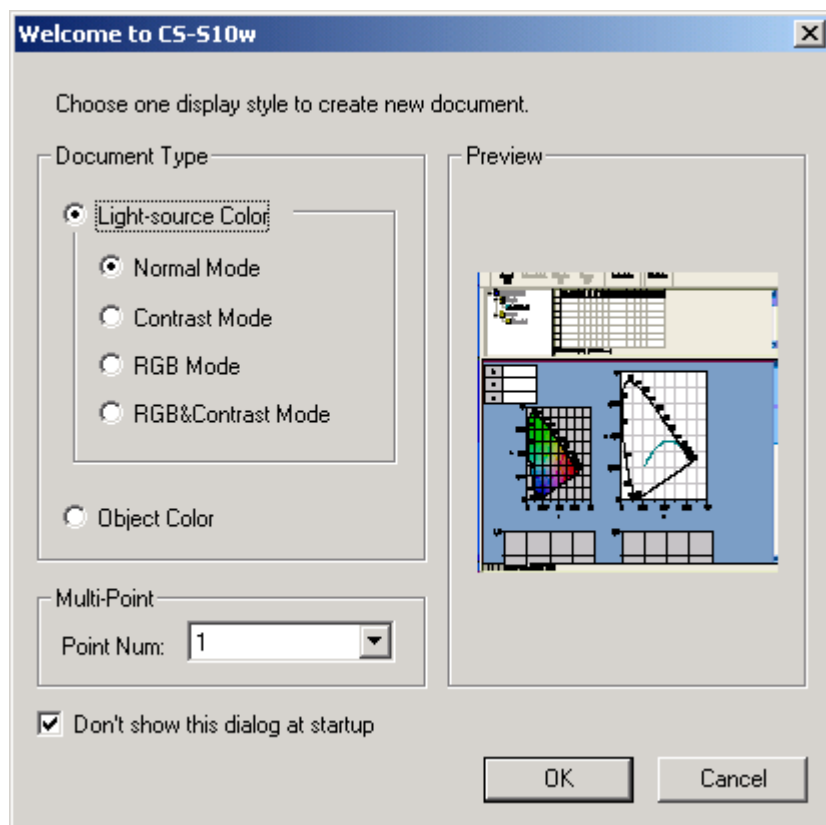


### ■ Version information

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, Light-source Color - Contrast Mode, Light-source Color - RGB Mode, Light-source Color - RGB&Contrast Mode, Object Color**

Select whether to perform light-source color measurement or object color measurement. For light-source color measurement, normal mode, contrast mode, RGB mode or RGB & contrast mode, can be used. The measurement flow, listed items and data management method vary depending on the mode. For details, refer to page 45.

Clicking one of the radio buttons displays the preview screen on the right.

#### Point Num

When the document type is set to light-source color mode, you can select the number of points used for Multi-Point measurement. For details of Multi-Point measurement, refer to page 63.

#### Don't show this dialog at startup

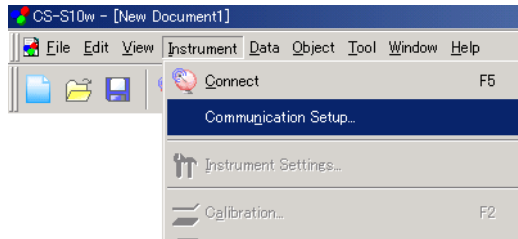
Leave this box unchecked to view the Welcome to CS-S10w dialog box the next time you start the CS-S10w software. You can view this dialog box at any time by selecting *View - Welcome to CS-S10w* from the menu bar.

Clicking the OK button closes the dialog box.

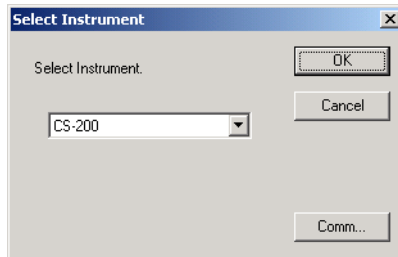
## 2.1.2 Selecting the Instrument to be connected

This procedure is available only when the instrument is connected.

1. Select *Instrument - Communication Setup* from the menu bar.



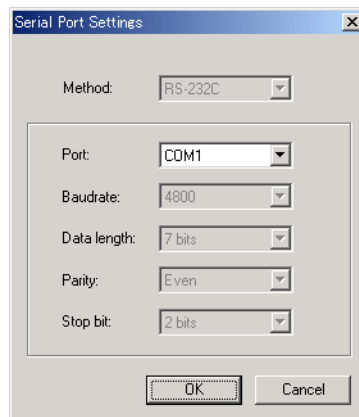
The Select Instrument dialog box appears.



2. Select the model of the instrument.
3. When CS-100A or CS-1000 is selected, click the Comm button.

The Serial Port Settings dialog box appears.

When CS-200 is selected in step 2, communication is established through the USB connection, so the serial port setting is unnecessary. Go to step 5.



4. Specify the parameters and click the OK button.

Select a COM port that is not currently used by another system or application. Selecting a COM port that is used by another system or application may result in malfunction.

To specify the parameters, refer to the instruction manual of your instrument so that the parameters agree with the settings of the instrument.

5. Click the OK button.

## 2.1.3 Establishing Connection with the Instrument

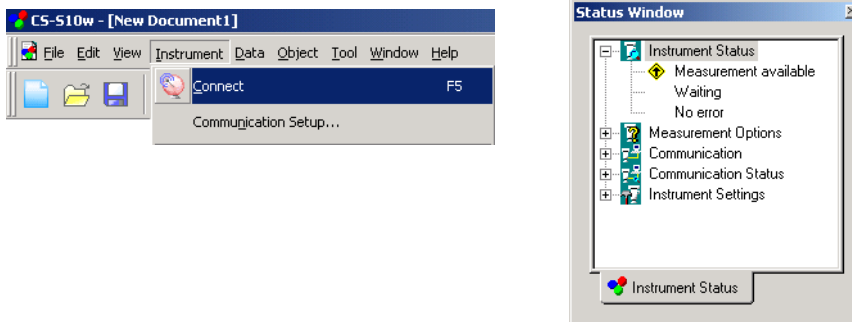
This procedure is available only when the instrument is connected.

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.

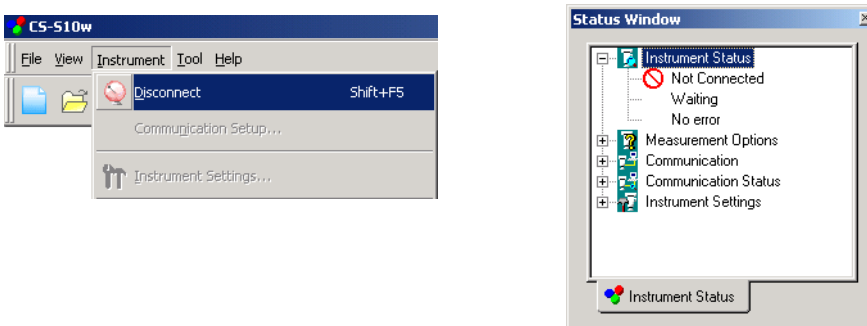
The CS-S10w software connects to the instrument and the status of the instrument is displayed in the status window. Once the connection is established, *Disconnect* appears in the *Instrument* menu instead of *Connect*.



### 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 or RS-232C cable is securely connected and that the instrument is turned on, and then select **Connect** again. If the connected instrument is the CS-100A or CS-1000, also check that the communication settings specified in the Serial Port Settings dialog box agree with those specified with the instrument.

## 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 or RS-232C cable is securely connected and that the instrument is turned on before selecting *Connect* again.

## When the instrument operates on batteries

---

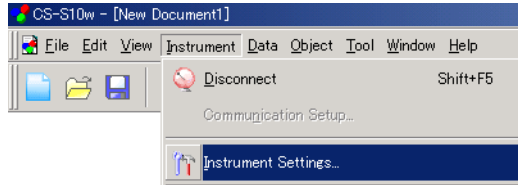
If you attempt communication with the instrument and the power supply voltage applied to the instrument is low, the CS-S10w may suspend the operation when waiting for the response from the instrument. In such a case, turn off the instrument. When a dialog box appears with a message “No response from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

## 2.1.4 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.

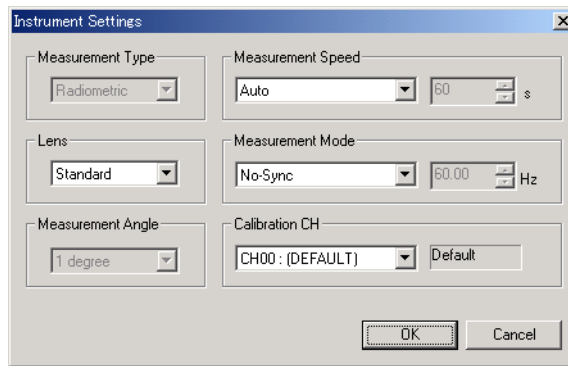


2. Specify the settings of the instrument.

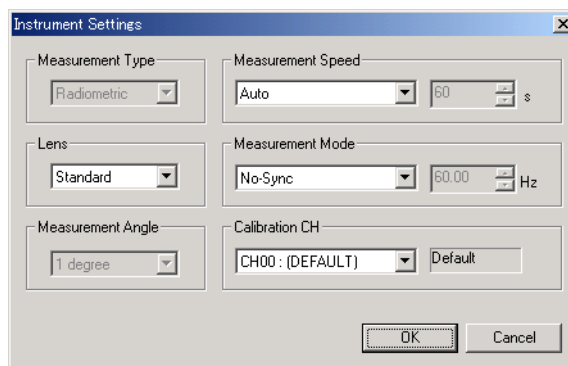
Only those items that can be specified for the instrument are displayed.

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 (When the CS-200 is connected)



#### Measurement Type

Radiometric is displayed when the document type is set to the light-source color measurement. [Selection disabled.]

When the document type is set to the object color measurement, 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 120.

**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**

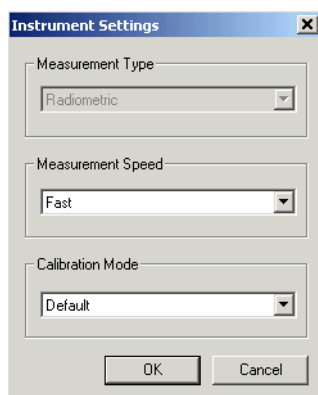
Select either Internal or No-Sync. When selecting Internal, set the Hz value in the box on the right between 40.00 and 200.00 in units of 0.01 Hz.

**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.

## ■ Instrument Settings dialog box (When the CS-100A is connected)



### Measurement Type

When the document type is set to the light-source color measurement, Radiometric is displayed.  
[Selection disabled]

When the document type is set to the object color measurement, select either Reflectance or Transmittance.

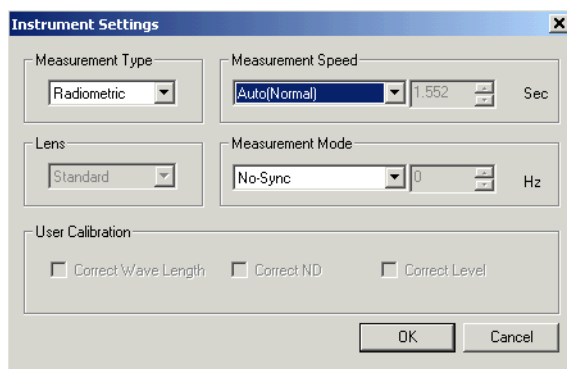
### Measurement Speed

Select either Fast or Slow.

### Calibration Mode

Select either Default or User.

## ■ Instrument Setting dialog box (When the CS-1000 is connected)



### Measurement Type

When the document type is set to the light-source color measurement, Radiometric is displayed.  
[Selection disabled]

When the document type is set to the object color measurement, select either Reflectance or Transmittance.

### Lens

Standard or Macro is displayed according to the status of the instrument.  
[Selection disabled]



**Measurement Speed**

Select the setting from Auto (Normal), Auto (Fast) or Manual. When selecting Manual, specify the number of seconds in the box on the right between 0.040 and 60.000 seconds in increments of 0.001 seconds.

**Measurement Mode**

Select the setting from Internal, External or No-Sync. When selecting Internal, specify the number of Hertz in the box on the right between 20.00 and 250.00 Hz in increments of 0.01 Hz.

**User Calibration**

When any coefficient is applied to the instrument, the corresponding check box is checked. For the setting, refer to page 113.

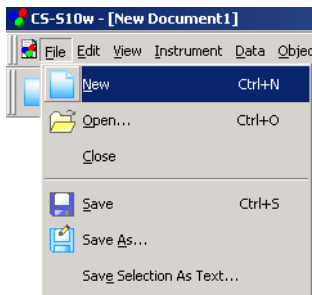
## 2.2 Creating a New Data File

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 and canvas window for the selected document type is displayed.



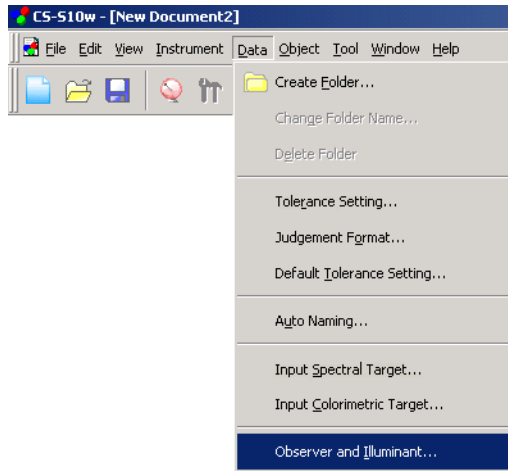
## 2.3 Preparing for Measurement

### 2.3.1 Setting the Observer and Illuminant

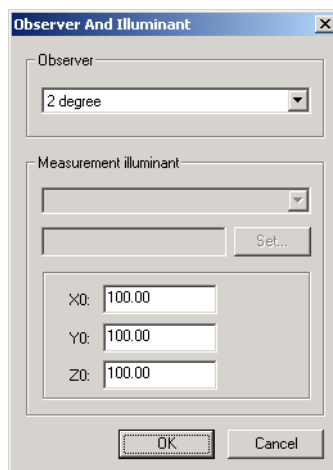
The observer and illuminant are important for calculating colorimetric data. The observer and illuminant must be identical to allow for comparison of colorimetric data from several samples. It is recommended that the observer and illuminant be specified beforehand. They should not be changed unnecessarily.

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

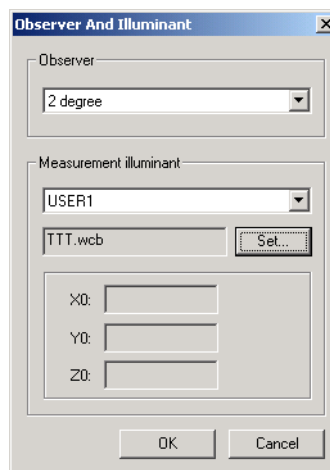
The Observer And Illuminant dialog box appears.



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 can be specified for each document file. This setting does 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

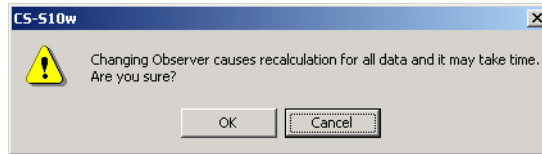
Select one from the following:

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

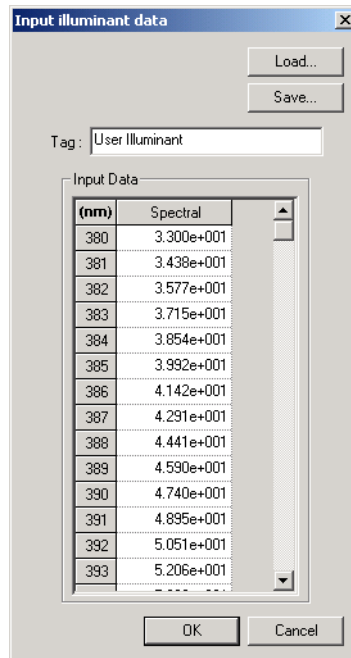
When selecting one of User 1 to 3, specify the user illuminant data file to be used. When the Set button is clicked, the Input illuminant data dialog is displayed.

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”.

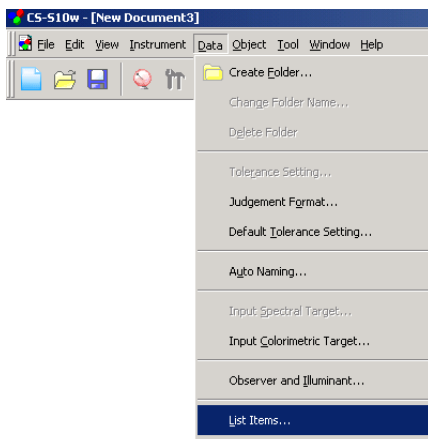
**Input Data**

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.

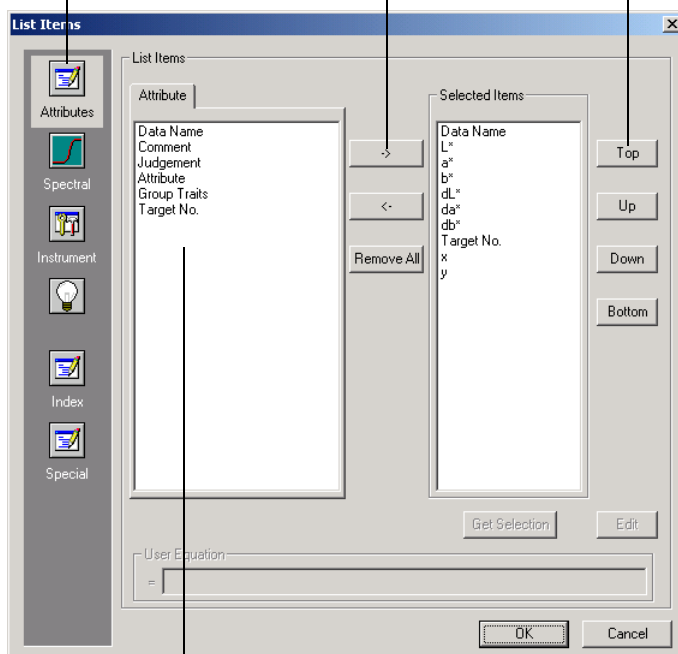


2. Specify the details of the items shown in the list window.

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.

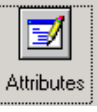


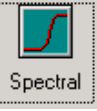
The list items included in the group indicated by the icon on the left are displayed.


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
<b>Attributes</b> 	<b>Data Name</b>	Name of data
	<b>Comment</b>	Comment
	<b>Judgement</b>	Pass / Fail (Available only for sample data)
	<b>Attribute</b>	Demonstration colorimetric data / Measured colorimetric data / Manually input colorimetric data / Uploaded colorimetric data / Averaged colorimetric data / Demonstration spectral data / Measured spectral data / Manually input spectral data / Uploaded spectral data / Averaged spectral data
	<b>Group Traits</b>	White / Black / Red / Green / Blue
	<b>Target No.</b>	No. assigned to linked target
	<b>Judgment (Opt1)</b>	OK / NG (Only for the measurement data list)
	<b>Judgment (Opt2)</b>	OK / NG (Only for the measurement data list)
	<b>Judgment (Opt3)</b>	OK / NG (Only for the measurement data list)
	<b>Judgment (Opt4)</b>	OK / NG (Only for the measurement data list)
	<b>Judgment (Opt5)</b>	OK / NG (Only for the measurement data list)


		Content displayed in list window
<b>Spectral value</b> 		*1 380 to 780 nm (1 nm-increment)

		Content displayed in list window
 Instrument	<b>Instrument Name</b>	CS-200 / CS-100A / CS-1000
	<b>Variation</b>	XXXX-XXX (when the CS-200 is connected) Model 1 / Model 2 (when the CS-1000 is connected)
	<b>Serial No.</b>	Serial No. of instrument
	<b>Firmware Version</b>	ROM version of instrument
	<b>Timestamp</b>	Day and time of measurement
	<b>Measurement Type</b>	Reflectance / Transmittance / Radiometric
	<b>Lens</b>	Standard / Close up 1 (No. 107) / Close up 2 (No. 122) / User 1 / User 2 / User 3 (when the CS-200 is connected) Standard / Macro / Small measuring diameter / Small measuring angle (when the CS-1000 is connected)
	<b>Measurement Angle</b>	1° / 0.2° / 0.1° (Only when the CS-200 is connected)
	<b>Measurement Speed</b>	Auto / LTD. AUTO / S-Fast / Fast / Slow / S-Slow / Manual (when the CS-200 is connected) Fast / Slow (when the CS-100A is connected) Auto (Normal) / Auto (Fast) / Manual (when the CS-1000 is connected) 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.)
	<b>Measurement Mode</b>	Internal / No-Sync (when the CS-200 is connected) Internal / External / No-Sync (when the CS-1000 is connected) 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.
	<b>Calibration Channel</b>	00 to 20 (Only when the CS-200 is connected)
	<b>Calibration Mode</b>	Konica Minolta Standard / One-point calibration / User (when the CS-200 is connected) Konica Minolta Standard / User (when the CS-100A is connected) Wavelength / ND / Level / Wavelength + ND / Wavelength + Level / ND + Level / Wavelength + ND + Level (when the CS-1000 is connected)
	<b>Observer</b>	2 degree, 10 degree
	<b>Illuminant</b>	A/B/C/D <sub>50</sub> /D <sub>55</sub> /D <sub>65</sub> /D <sub>75</sub> /D <sub>95</sub> /E/F <sub>2</sub> /F <sub>6</sub> /F <sub>7</sub> /F <sub>8</sub> /F <sub>10</sub> /F <sub>11</sub> /F <sub>12</sub>
	<b>Integral Time</b>	Integral time
<b>Meas.ID</b>	Measurement ID	
<b>Warning</b>	Over (brightness) / Over (chromaticity) / Over (brightness + chromaticity) / Under (brightness) / Under (chromaticity) / Under (brightness + chromaticity) / Insufficient exposure	



	When the light-source color mode is selected			
	Absolute Data	Color Difference	Equation	Others
	X	$\Delta X$	JND	Dominant Wavelength
	Y	$\Delta Y$		Excitation Purity
	Z	$\Delta Z$		T
*2	Lv	*2 $\Delta Lv$		$\Delta uv$
		*2 $\Delta Lv$ (%)		Le
	x	$\Delta x$		Contrast
	y	$\Delta y$		Square ratio
	u'	$\Delta u'$		
	v'	$\Delta v'$		
	L*	$\Delta L^*$		
	a*	$\Delta a^*$		
	b*	$\Delta b^*$		
	When the object color mode is selected			
	Absolute Data	Color Difference	Equation	Others
	X	$\Delta X$	$\Delta E^*ab$	Dominant Wavelength
	Y	$\Delta Y$		Excitation Purity
	Z	$\Delta Z$		
	x	$\Delta x$		
	y	$\Delta y$		
	u'	$\Delta u'$		
	v'	$\Delta v'$		
	L*	$\Delta L^*$		
	a*	$\Delta a^*$		
	b*	$\Delta b^*$		
	C*	$\Delta C^*$		
	h	$\Delta H^*$		
	u*	$\Delta u^*$		
	v*	$\Delta v^*$		
	L (Hunter)	$\Delta L$ (Hunter)		
	a (Hunter)	$\Delta a$ (Hunter)		
	b (Hunter)	$\Delta b$ (Hunter)		

 Index	When the light-source color mode is selected	<b>Index</b> Ra R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15	<b>Index Difference</b>
	When the object color mode is selected	<b>Index</b>	<b>Index Difference</b>

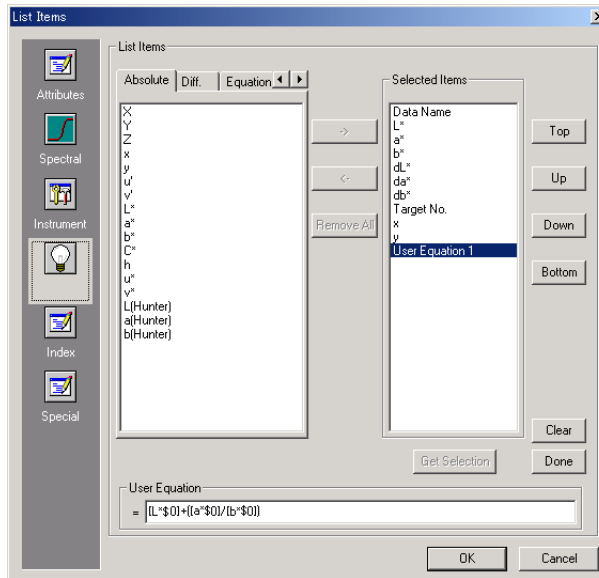
 Special	<b>Others</b> *3 User Equation 1 *3 User Equation 2 *3 User Equation 3
---	---

The items  $x$ ,  $y$ ,  $u'$ ,  $v'$ ,  $\Delta x$ ,  $\Delta y$ ,  $\Delta u'$  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 42 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 10°,  $L_v$  is as follows:
  - For a tristimulus value, displayed as “-----”.
  - For spectral data, calculated from the  $Y$  value for 2° observer.
- \*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.

Group attribute	String
None	\$0
White	\$WT
Black	\$BK
Red	\$RD
Green	\$GR
Blue	\$BL

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

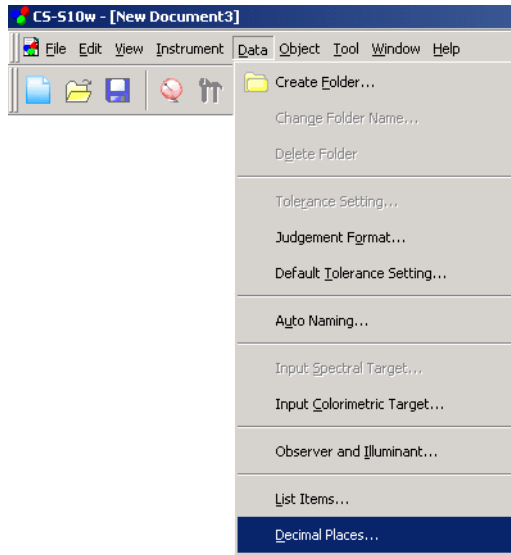
If the user equation is not correct, a message saying “Error!” or “Cycle!” is displayed. In this event, check that the user equation is correct and try again.

## 2.3.3 Setting the Number of Decimal Places for List Items

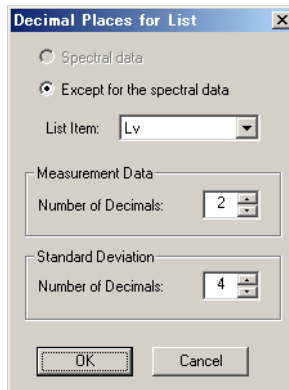
For list items that are represented by numbers, the number of decimal places can be specified individually.

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.

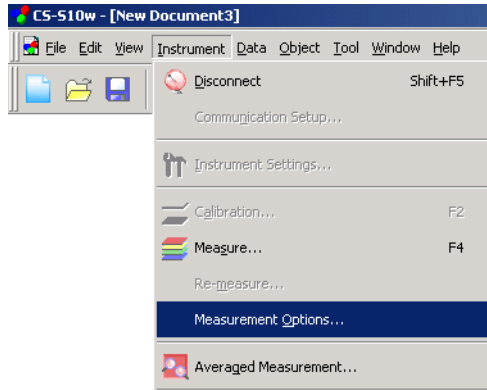
#### Standard Deviation

**Number of Decimals:** Numerical values between 0 and 8 can be entered or selected.

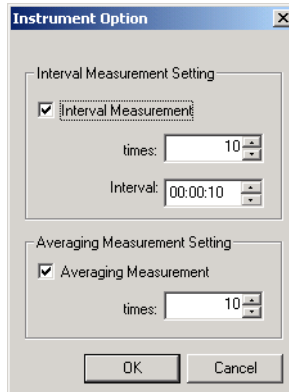
## 2.3.4 Setting the Measurement Options

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

The Measurement Mode 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 47.

##### 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

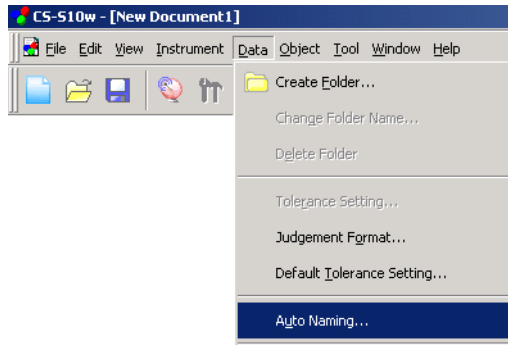
When this option is checked, averaging measurement is performed. For details of averaging measurement, refer to page 47.

##### times

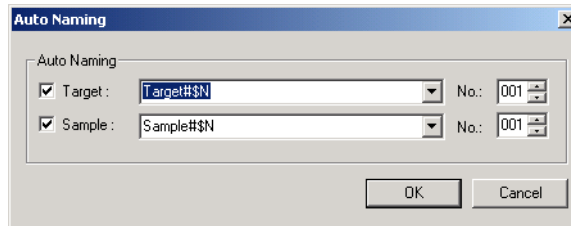
No. of measurements can be entered or selected between 2 and 1000.

## 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 by the string indicating the corresponding data.

String	Corresponding data
<b>\$N</b>	Automatically created number (serial number) assigned to a sample. (The first number in the series can be specified between 0 and 999.)
<b>\$D</b>	Day of measurement
<b>\$M</b>	Month of measurement
<b>\$Y</b>	Year of measurement
<b>\$h</b>	Hour of measurement
<b>\$m</b>	Minute of measurement
<b>\$s</b>	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. The manual averaging measurement is the function available only for normal mode light-source color measurement and object color measurement.

### **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.

In addition to the normal mode, light-source color measurement offers various modes in order to combine a series of measurements to obtain a single piece of sample data. The measurement flow, listed items and data management method vary depending on the mode.

The mode can be specified by selecting the document type in the Welcome to CS-S10w dialog box.

### **Contrast Mode:**

This mode measures two points of white and black and obtains a single piece of sample data from the two pieces of data. This mode is used to calculate the contrast of the data for white based on the data for black. (page 57)

### **RGB Mode:**

This mode measures three points of red, green and blue and then obtains a single piece of sample data from the three pieces of data. This mode is used to calculate the area on the chromaticity diagram from the data for red, green and blue. (page 59)

### **RGB & Contrast Mode:**

This mode measures five points of white, black, red, green and blue and then obtains a single piece of sample data from the five pieces of data. This mode is used to calculate the contrast of the data for white, red, green and blue respectively based on the data for black. It also calculates the area on the chromaticity diagram from the data for red, green and blue. (page 61)

The light-source color measurement offers another option for Multi-Point measurement. It can be specified by selecting a number of points in the Welcome to CS-S10w dialog box.

Multi-point measurement is the measurement flow to obtain sample data as many as the number of points by sequentially measuring several points on the target. Color variations (Non-Uniformity) can be calculated from the obtained sample data. (page 63)

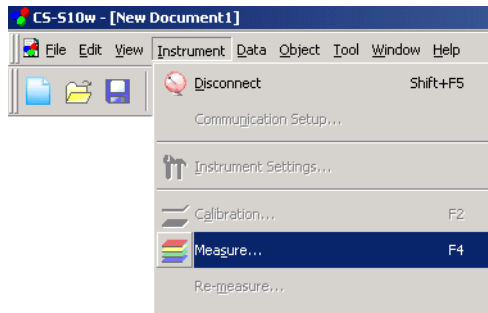
## 2.4.1 Performing Normal Measurement

This procedure is available only when the instrument is connected.

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

The Name dialog box appears.

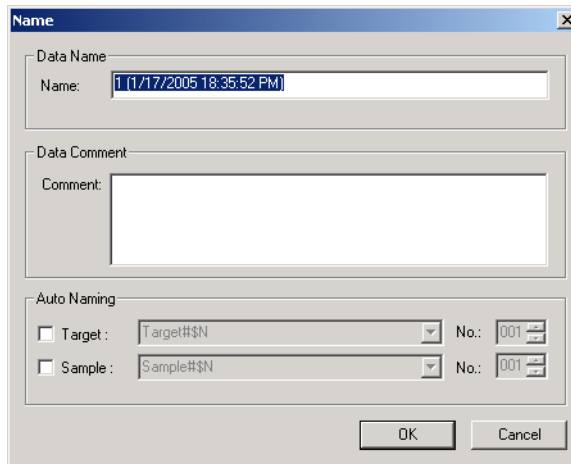
If Auto-Naming is activated, the Name dialog box does not appear. Skip this process and go to step 3. To assign a comment to each piece of sample data, select *Data - Data Property* from the menu bar after the measurement and type the comment in the displayed dialog box. (See page 54.)



2. Enter a name for the data.

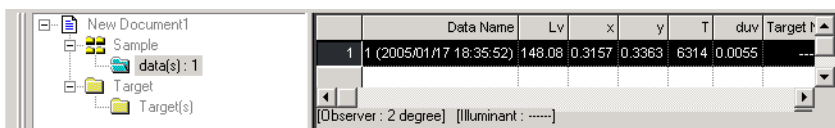
You can assign a name and comment to each piece of sample data.

Up to 64 and 256 alphanumeric characters can be used for each name and each comment, respectively. (See page 54.)



3. Click the OK button.

Data is added to the list window.



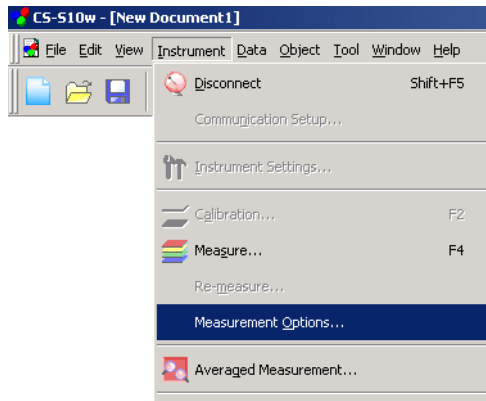


## 2.4.2 Performing Interval Measurement/Averaging Measurement

This procedure is available only when the instrument is connected.

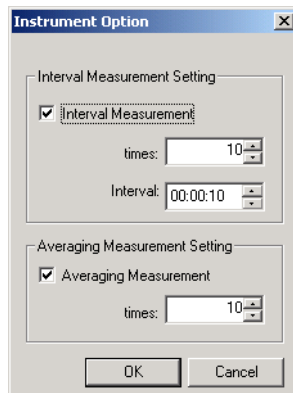
1. Select *Instrument - Measurement Options* from the menu bar.

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.

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.

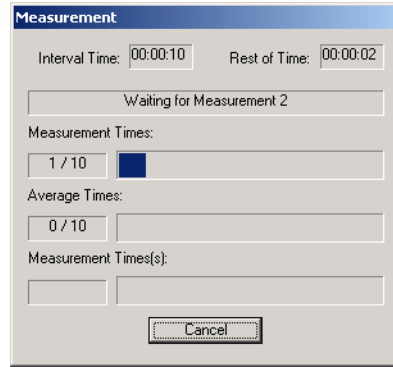
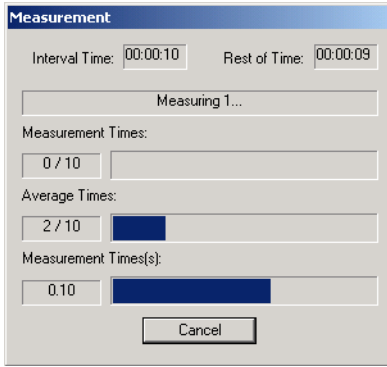
### ■ Instrument Option dialog box

Refer to the “Instrument Option dialog box” on page 43.

2. Click the OK button.

3. Start the measurement described on page 46.

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.



Measurement

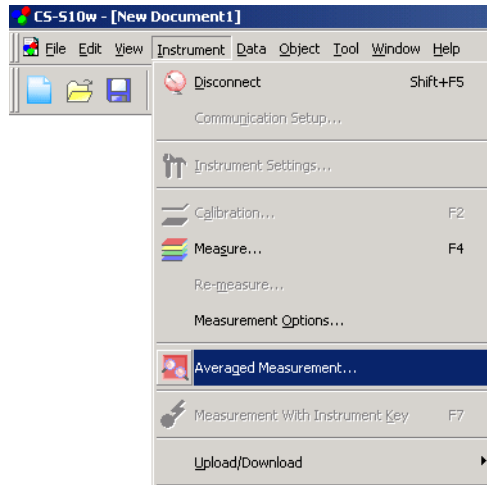
## 2.4.3 Performing Averaged Measurement

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

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

The Target Averaged Measurement dialog box appears.

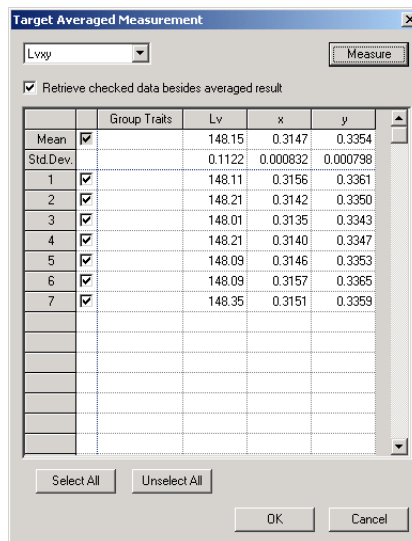
You cannot select Averaged Measurement when the interval measurement setting or Multi-Point measurement setting has been specified.



2. Click the Measure button repeatedly to perform measurement the desired number of times.

The sample data is displayed in the dialog box.

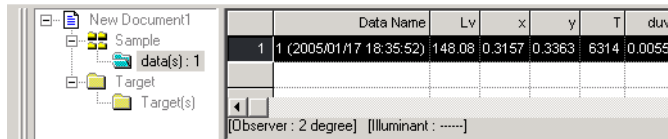
The average and standard deviation are calculated and displayed for each measurement. The data with check marks are used for the calculation of the average. Uncheck any data that you do not want to include in the average calculation, such as abnormal values.



**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 85 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**

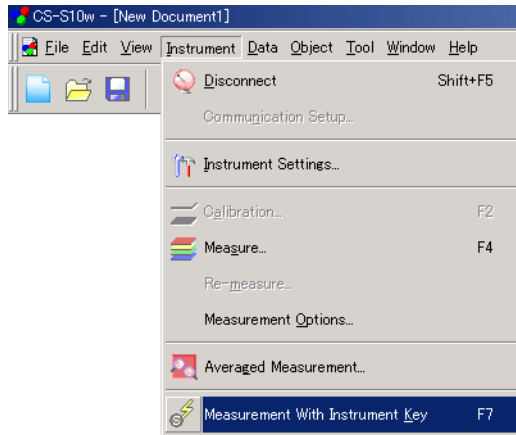
All the sample data will be unchecked.

## 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.

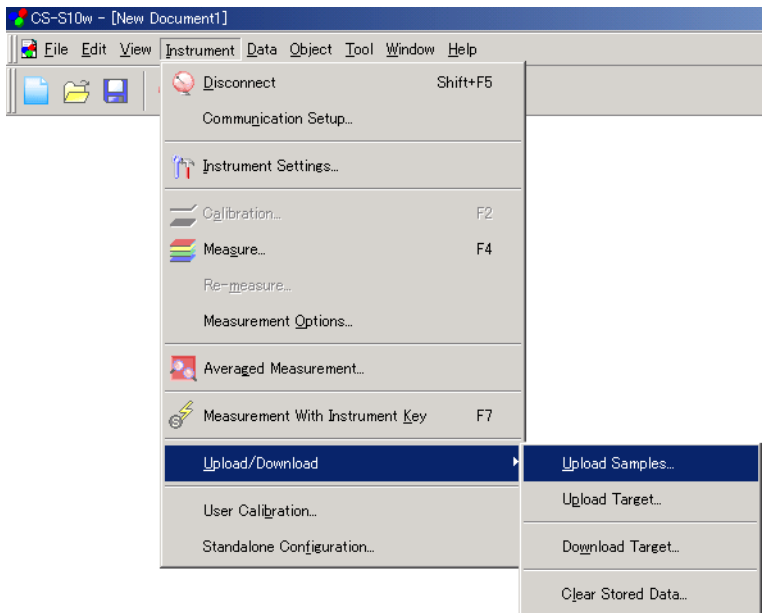


## 2.4.5 Uploading Sample Data from the Instrument

This procedure is available only when instruments other than the CS-100A are connected to the computer.

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.

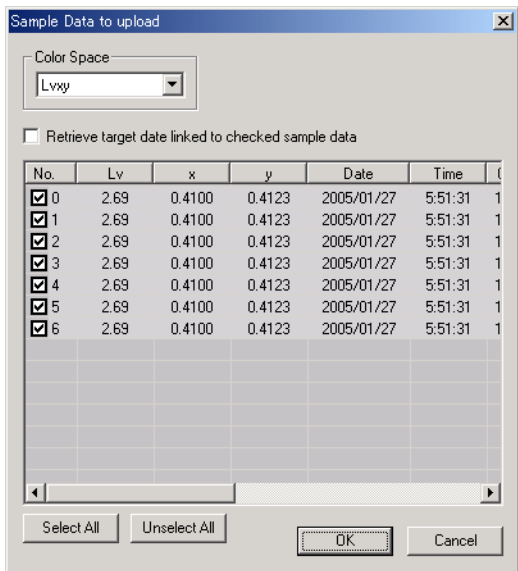
1. Select *Instrument - Upload/Download - Upload Samples* from the menu bar.



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.



Sample display when the CS-200 is connected

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.

#### Retrieve target data linked to checked sample data (displayed only when the CS-200 is connected)

When this check box is selected, the sample data is uploaded together with the linkage to the target data in the instrument. This linkage cannot be applied if the observer setting for the target data is different from that of the sample data.

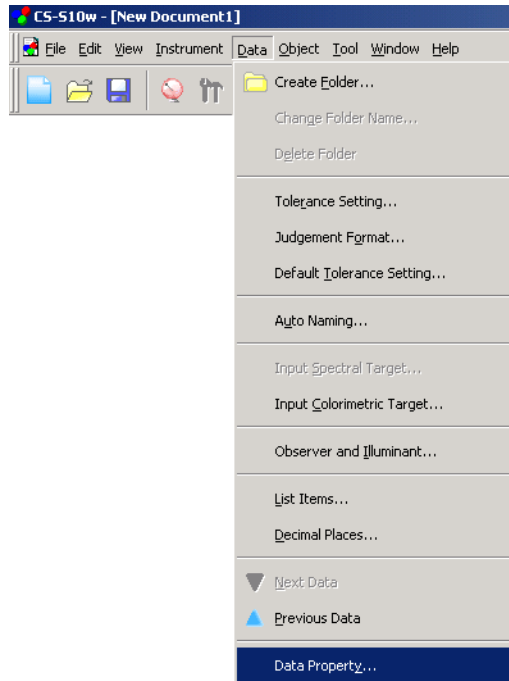
No.	Lv	x	y	Date	Time	1
<input checked="" type="checkbox"/> 0	2.69	0.4100	0.4123	2005/01/27	5:51:31	1
<input checked="" type="checkbox"/> 1	2.69	0.4100	0.4123	2005/01/27	5:51:31	1
<input checked="" type="checkbox"/> 2	2.69	0.4100	0.4123	2005/01/27	5:51:31	1
<input checked="" type="checkbox"/> 3	2.69	0.4100	0.4123	2005/01/27	5:51:31	1
<input checked="" type="checkbox"/> 4	2.69	0.4100	0.4123	2005/01/27	5:51:31	1
<input checked="" type="checkbox"/> 5	2.69	0.4100	0.4123	2005/01/27	5:51:31	1
<input checked="" type="checkbox"/> 6	2.69	0.4100	0.4123	2005/01/27	5:51:31	1

Sample display when the CS-200 is connected

## 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 87. 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.

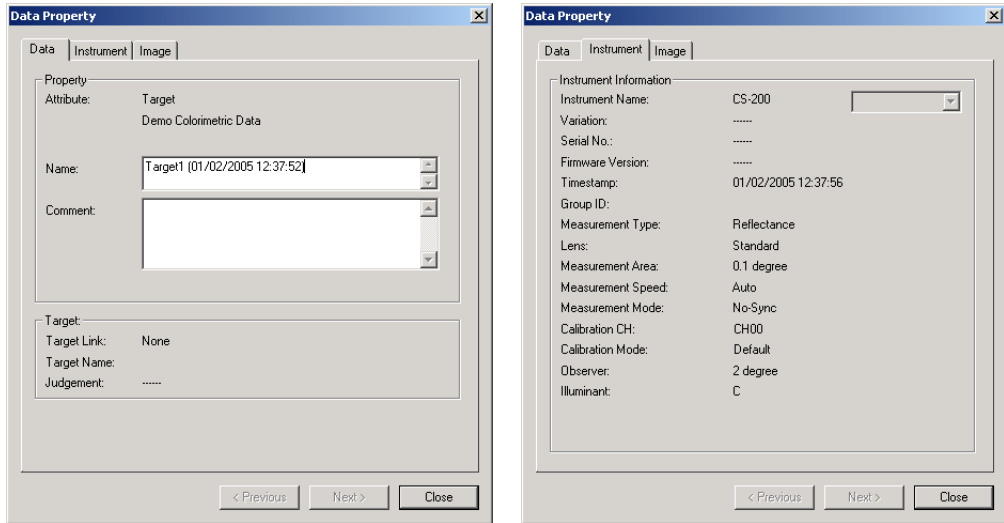


In addition to using the menu bar, you can select Data Property by right-clicking the data in the list window and selecting the command from the displayed context menu. When two or more pieces of data have been selected in the list window, you can navigate among the selected pieces of data one by one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

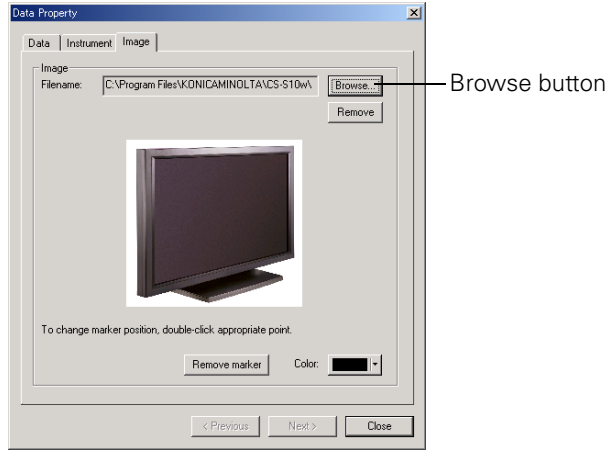
### Image tab

- Image file
- Image position marker
- Marker color

## 2.4.7 Linking an Image to Data

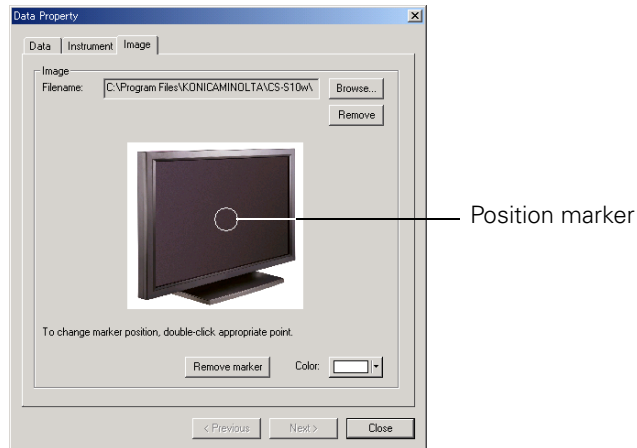
1. Click the Browse button in the Image tab of the Data Property dialog box. In the dialog box for selecting a file to be opened, select the image file directly.

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 109.

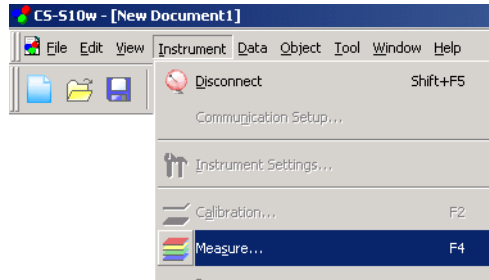
## 2.4.8 Performing Measurement in Light-source Color - Contrast Mode

This procedure is available only when the instrument is connected.

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

The Name dialog box appears.

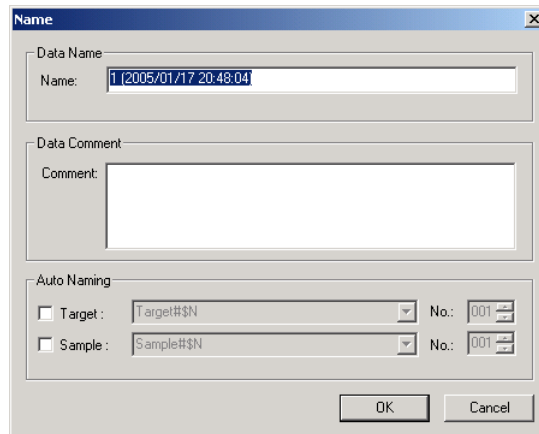
If Auto Naming is activated, the Name dialog box does not appear. Skip this process and go to step 3. To assign a comment to each piece of sample data, select *Data - Data Property* from the menu bar after the measurement and type the comment in the displayed dialog box. (See page 54.)



2. Enter a name for the data.

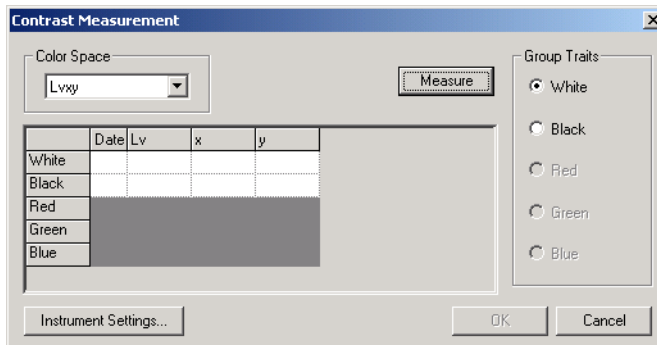
You can assign a name and comment to each piece of sample data.

Up to 64 and 256 alphanumeric characters can be used for each name and each comment, respectively. (See page 54.)



3. Click the OK button.

The Contrast Measurement dialog box appears.



**4.** Click the Measure button.

The Measure dialog box appears, and the data is added into the White row in the data list.

**5.** Select Black from Group Traits and click the Measure button.

The Measure dialog box appears, and the data is added into the Black row in the data list.

**6.** Click the OK button.

The Contrast Measurement dialog box closes, and the data is added to the list window.

Data Name	Group Traits	Lv	x	y	T	duv	Contrast	Target No.	dLv
1 1 (2005/02/15 14:33:52)	White	-----	0.3978	0.3970	-----	-----	14.26	-----	-----
	Black	-----	0.3223	0.2893	-----	-----	1.00	-----	-----

## ■ Contrast Measurement dialog box

### Instrument Settings

When this button is clicked, the Instrument Settings dialog box appears, allowing you to set the measurement conditions.

Refer to page 28 for details of the Instrument Settings dialog box.

As in the case of Light-source Color - Normal Mode measurement, the averaging measurement (page 47) and the Multi-Point measurement (page 63) can be used together with the Light-source Color - Contrast Mode measurement.

When the Light-source Color - Contrast Mode is selected, you can perform measurement for each group trait again at a later time. For details of the re-measurement, refer to page 90.

To change the Light-source Color - Contrast Mode to other modes, select *View - Welcome to CS-S10w* from the menu bar, change the mode, and create a new data file. Alternatively, you can open a data file which was created in the desired mode.

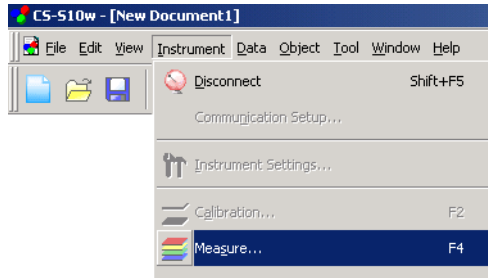
## 2.4.9 Performing Measurement in Light-source Color - RGB Mode

This procedure is available only when the instrument is connected.

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

The Name dialog box appears.

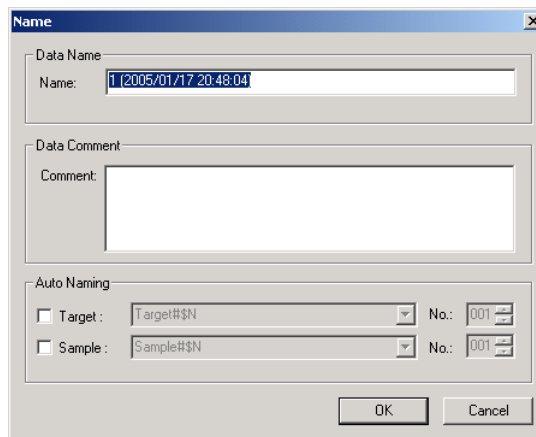
If Auto Naming is activated, the Name dialog box does not appear. Skip this process and go to step 3. To assign a comment to each piece of sample data, select *Data - Data Property* from the menu bar after the measurement and type the comment in the displayed dialog box. (See page 54.)



2. Enter a name for the data.

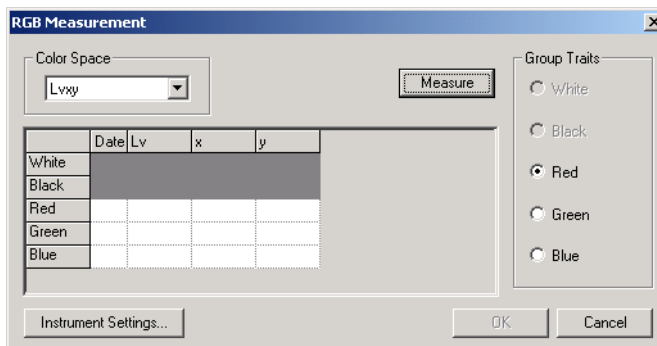
You can assign a name and comment to each piece of sample data.

Up to 64 and 256 alphanumeric characters can be used for each name and each comment, respectively. (See page 54.)



3. Click the OK button.

The RGB Measurement dialog box appears.



4. Click the Measure button.

The Measure dialog box appears, and the data is added into the Red row in the data list.

5. Select Green from Group Traits and click the Measure button.

The Measure dialog box appears, and the data is added into the Green row in the data list.

6. Select Blue from Group Traits and click the Measure button.

The Measure dialog box appears, and the data is added into the Blue row in the data list.

7. Click the OK button.

The RGB Measurement dialog box closes, and the data is added to the list window.

Data Name	Group Traits	Lv	x	y	T	duv	Square ratio	Target No.	dLv	dx	dy	Jk
1	Red	-----	0.5536	0.4162	-----	-----	-----	-----	-----	-----	-----	-----
2005/02/1 5 14:38:53	Green	-----	0.3902	0.5107	-----	-----	-----	-----	-----	-----	-----	-----
	Blue	-----	0.3496	0.3910	-----	-----	-----	-----	-----	-----	-----	-----

Measurement

■ RGB Measurement dialog box

**Instrument Settings**

When this button is clicked, the Instrument Settings dialog box appears, allowing you to set the measurement conditions.

Refer to page 28 for details of the Instrument Settings dialog box.

As in the case of Light-source Color - Normal Mode measurement (page 47) and the Multi-Point measurement (page 63) can be used together with the Light-source Color - RGB Mode measurement.

When the Light-source Color - RGB Mode is selected, you can perform measurement for each group trait again at a later time. For details of the re-measurement, refer to page 90.

To change the Light-source Color - RGB Mode to other modes, select *View - Welcome to CS-S10w* from the menu bar, change the mode, and create a new data file. Alternatively, you can open a data file which was created in the desired mode.

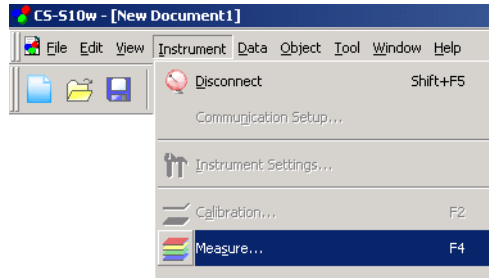
## 2.4.10 Performing Measurement in Light-source Color - RGB & Contrast Mode

This procedure is available only when the instrument is connected.

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

The Name dialog box appears.

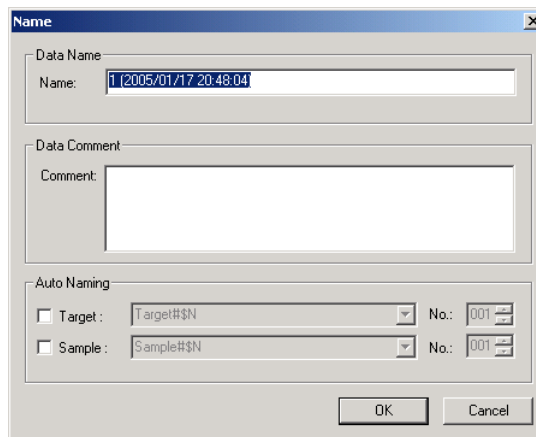
If Auto Naming is activated, the Name dialog box does not appear. Skip this process and go to step 3. To assign a comment to each piece of sample data, select *Data - Data Property* from the menu bar after the measurement and type the comment in the displayed dialog box. (See page 54.)



2. Enter a name for the data.

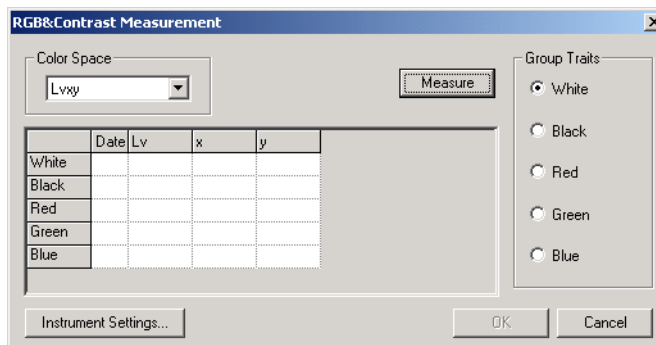
You can assign a name and comment to each piece of sample data.

Up to 64 and 256 alphanumeric characters can be used for each name and each comment, respectively. (See page 54.)



3. Click the OK button.

The RGB&Contrast Measurement dialog box appears.



4. Click the Measure button.  
The Measure dialog box appears, and the data is added into the White row in the data list.
5. Select Black from Group Traits and click the Measure button.  
The Measure dialog box appears, and the data is added into the Black row in the data list.
6. Select Red from Group Traits and click the Measure button.  
The Measure dialog box appears, and the data is added into the Red row in the data list.
7. Select Green from Group Traits and click the Measure button.  
The Measure dialog box appears, and the data is added into the Green row in the data list.
8. Select Blue from Group Traits and click the Measure button.  
The Measure dialog box appears, and the data is added into the Blue row in the data list.
9. Click the OK button.  
The RGB&Contrast Measurement dialog box closes, and the data is added to the list window.

Data Name	Group Traits	Lv	x	y	T	duv	Contrast	Square ratio	Target No.	dLv	dx
1 2 (2005/02/15 11:06:49)	White	-----	0.3971	0.4019	-----	-----	5.54	-----	-----	-----	-----
	Black	-----	0.3882	0.3569	-----	-----	1.00	-----	-----	-----	-----
	Red	-----	0.5745	0.4255	-----	-----	4.36	-----	-----	-----	-----
	Green	-----	0.4048	0.4487	-----	-----	7.98	-----	-----	-----	-----
	Blue	-----	0.3847	0.3826	-----	-----	7.88	-----	-----	-----	-----

## ■ RGB & Contrast Measurement dialog box

### Instrument Settings

When this button is clicked, the Instrument Settings dialog box appears, allowing you to set the measurement conditions.

Refer to page 28 for details of the Instrument Settings dialog box.

As in the case of Light-source Color - Normal Mode measurement, the averaging measurement (page 47) and the Multi-Point measurement (page 63) can be used together with the Light-source Color - RGB & Contrast Mode measurement.

When the Light-source Color - RGB & Contrast Mode is selected, you can perform measurement for each group trait again at a later time. For details of the re-measurement, refer to page 90.

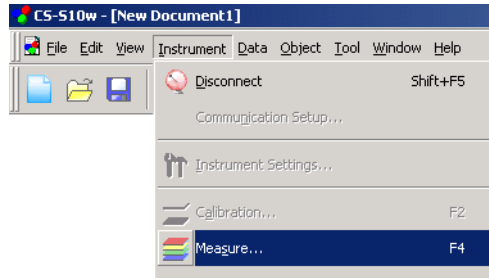
To change the Light-source Color - RGB & Contrast Mode to other modes, select *View - Welcome to CS-S10w* from the menu bar, change the mode, and create a new data file. Alternatively, you can open a data file which was created in the desired mode.



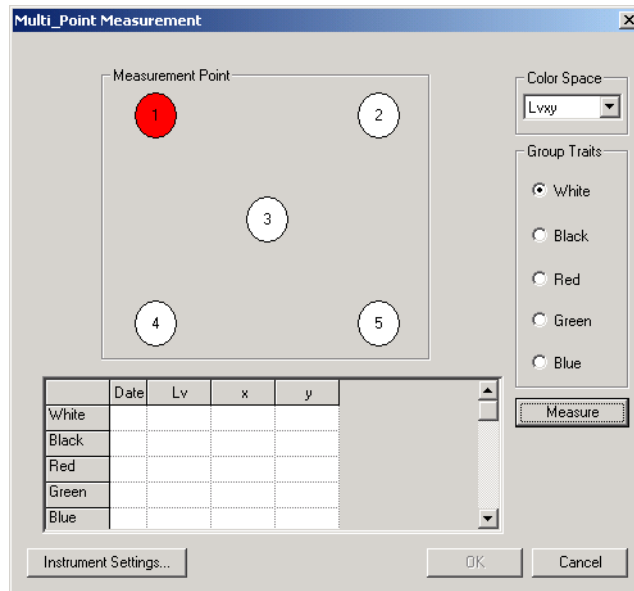
## 2.4.11 Performing Multi-Point Measurement

This procedure is available only when the instrument is connected.

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



The Multi-Point Measurement dialog box appears.



2. Click the Measure button.

The Measure dialog box appears, and then the color of Measurement Point 1 changes to green for Light-source Color - Normal Mode measurement or to yellow for other modes. The color of Measurement Point 2 changes to red.

3. Repeat step 2 for the number of necessary points.

All measurement points other than Measurement Point 1 change to green for the Light-source Color - Normal Mode measurement or to yellow for other modes. The data is added into the White row in the data list modes.

4. For measurement modes other than the Light-source Color - Normal Mode measurement, select the next setting from the Group Traits and repeat steps 2 and 3 for all group traits.

The data is added into the corresponding row in the data list.

For all group traits, the color of the measurement point for which measurement has been performed changes to green.

## 5. Click the OK button.

The Multi-Point Measurement dialog box closes, and as many pieces of data as the number of points are added to the list window.

In Multi-Point measurement, data names are generated automatically in a format of “(Folder name)\_P(Point No.)”.

	Data Name	Lv	x	y	T	duv	Target No.	dLv	dx	dy	Judgement	X	Y	Z
1	data(s)_P01	-----	0.3961	0.3961	-----	-----	-----	-----	-----	-----	-----	0.49	0.49	0.26
2	data(s)_P02	-----	0.4070	0.4151	-----	-----	-----	-----	-----	-----	-----	0.50	0.51	0.22
3	data(s)_P03	-----	0.4018	0.4034	-----	-----	-----	-----	-----	-----	-----	0.49	0.49	0.24
4	data(s)_P04	-----	0.4010	0.3994	-----	-----	-----	-----	-----	-----	-----	0.49	0.49	0.25
5	data(s)_P05	-----	0.3917	0.3933	-----	-----	-----	-----	-----	-----	-----	0.49	0.49	0.27

[Observer : 10 degree] [Illuminant : -----]

## ■ Multi-Point Measurement dialog box

### Measurement Point

The colors of the measurement points have the following meanings:

#### Red

Active measurement point

#### White

This point is not measured yet.

#### Yellow

Measurement has finished for one or more group traits.

#### Green

Measurement has finished for all group traits.

### Instrument Settings

When this button is clicked, the Instrument Settings dialog box appears, allowing you to set the measurement conditions.

Refer to page 28 for details of the Instrument Settings dialog box.

To change the Multi-Point measurement to other modes, select *View - Welcome to CS-S10w* from the menu bar, change the mode, and create a new data file. Alternatively, you can open a data file which was created in the desired mode.

## 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:

When the Multi-Point measurement is selected, the registration is available only by manual data input.

- **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.

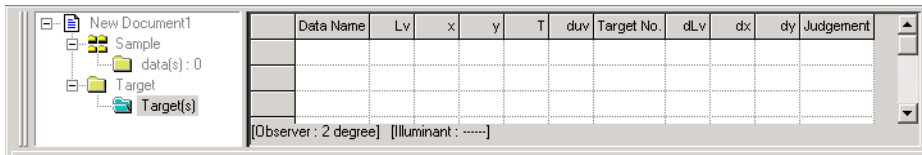
- **Copying target data from the existing data**

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.

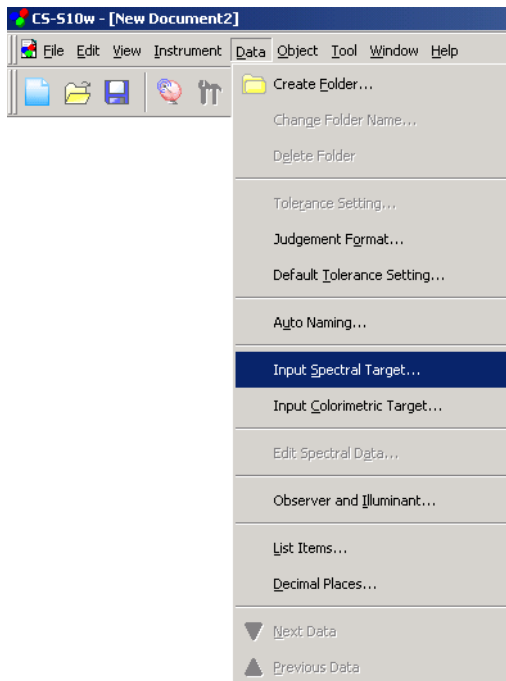
For the measurement method, refer to page 45.

## 2.5.1-b Registering Target by Manual Data Input

### Entering Spectral Data

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

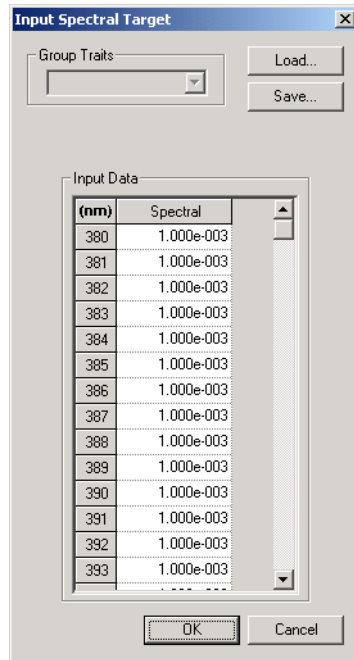
The Input Spectral Target dialog box appears.



2. Enter the spectral data.

When the type of document file is set to the Light-source Color - Contrast Mode measurement, select White or Black for Group Traits. When the type is set to the Light-source Color - RGB Mode measurement, select Red, Green or Blue for Group Traits. When the type is set to the Light-source Color - RGB & Contrast Mode measurement, select White, Black, Red, Green or Blue for Group Traits. Then, enter the spectral data for each color.

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



**3.** Click the OK button.

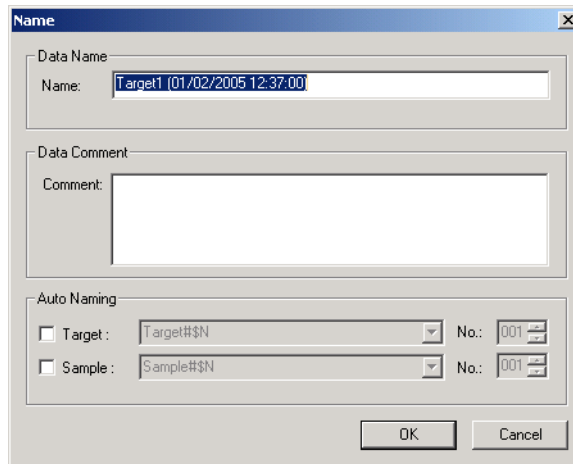
The Name dialog box appears.

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 54.)

**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 54.)

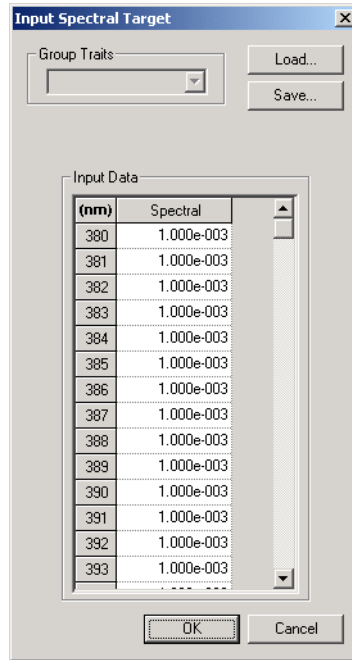


5. The data is added to the list window.

	Data Name	L*	a*	b*	dL*	da*	db*	Target No.	x	y
1	Target1 (01/02/2005 12:37:00)	91.68	3.02	10.08	.....	.....	.....	.....	0.3333	0.3333
2	Target2 (01/02/2005 12:37:52)	116.23	-8.27	9.50	.....	.....	.....	.....	0.3151	0.3357

[Observer : 2 degree] [Illuminant : C]

■ 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.

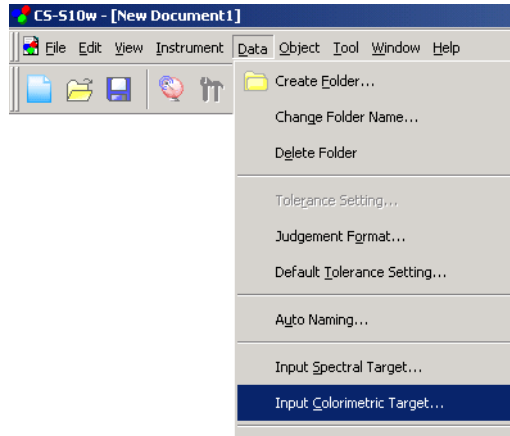
**Input data**

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

## Entering Colorimetric Data

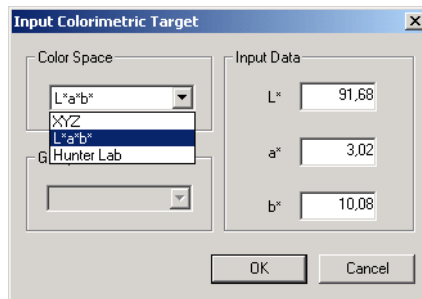
1. Select *Data - Input Colorimetric Target* from the menu bar.

The Input Colorimetric Target dialog box appears.



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

When the type of document file is set to the Light-source Color - Contrast Mode measurement, select White or Black for Group Traits. When the type is set to the Light-source Color - RGB Mode measurement, select Red, Green or Blue for Group Traits. When the type is set to the Light-source Color - RGB & Contrast Mode measurement, select White, Black, Red, Green or Blue for Group Traits. Then, enter the colorimetric data for each color.



3. Click the OK button.

The Name dialog box appears.

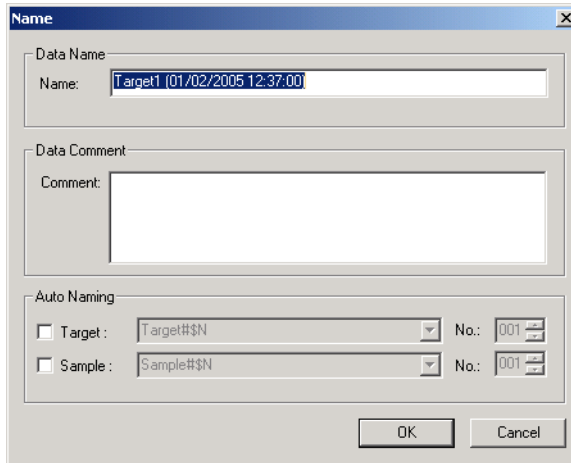
If auto-naming is activated, the Name dialog box does not appear. Skip this process and go to step 5. To assign a comment, select *Data - Data Property* from the menu bar after registration and type the comment in the displayed dialog box. (See page 54.)

4. Enter the name of the data.

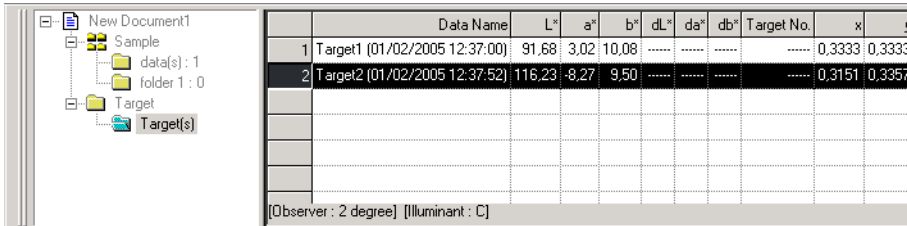
You can assign a name and comment for each piece of data.

Up to 64 and 256 alphanumeric characters can be used for a name and a comment, respectively.

(See page 54.)

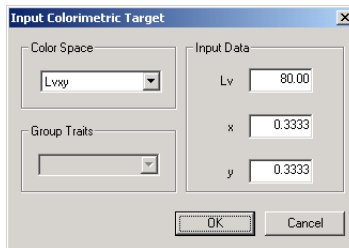


5. The data is added to the list window.



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, Lvxy and Lvu'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.

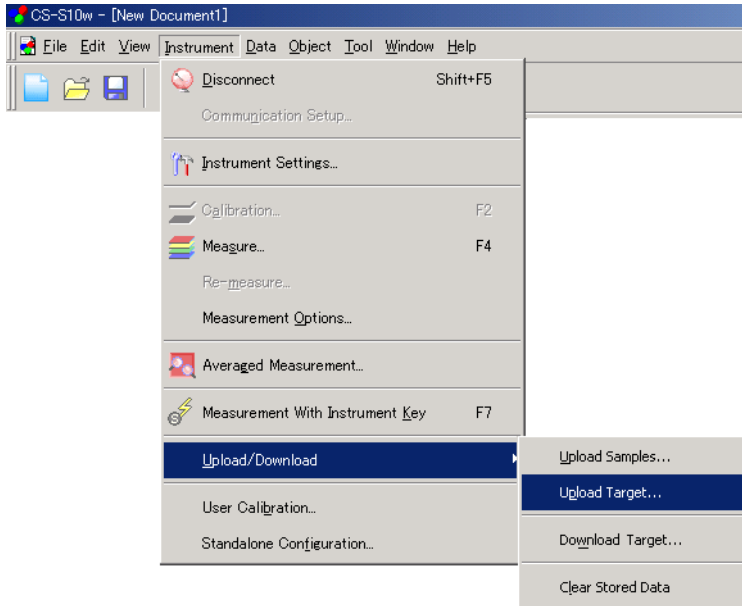


## 2.5.1-c Uploading Target Data from the Instrument

This procedure is available only when instruments other than the CS-100A are 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.

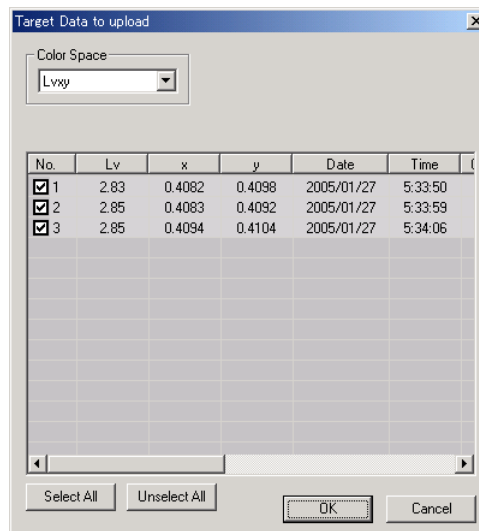
1. Select *Instrument - Upload/Download - Upload Target* from the menu bar.



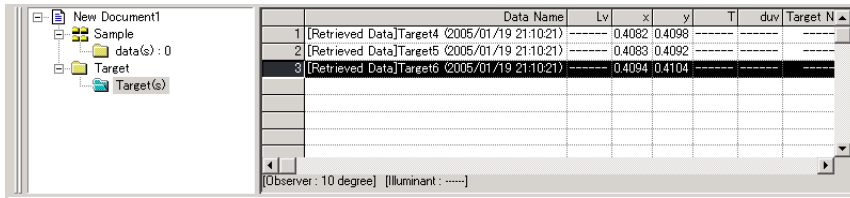
2. Uploading starts.

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

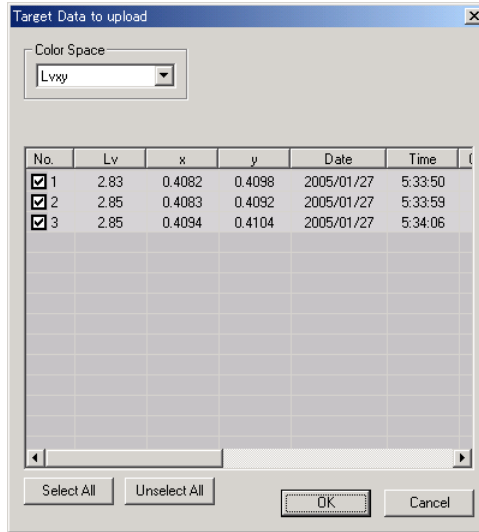
Note that the data cannot be displayed when the observer setting is different from the value currently specified with the CS-S10w software.



3. Click the OK button to begin uploading.



■ Target Data to upload dialog box



Specifying Target Data/Tolerance

**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 87.

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

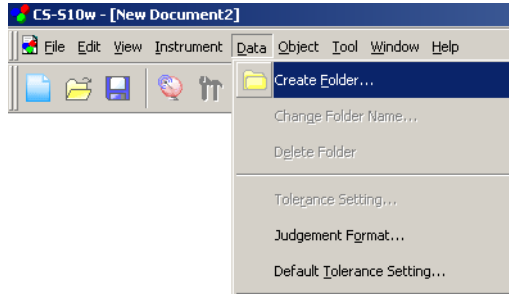
## 2.5.2 Specifying the Target Data

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

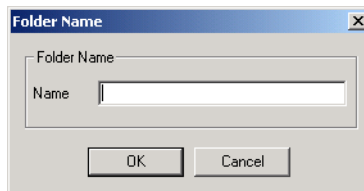
1. Select *Data - Create Folder* from the menu bar.

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.

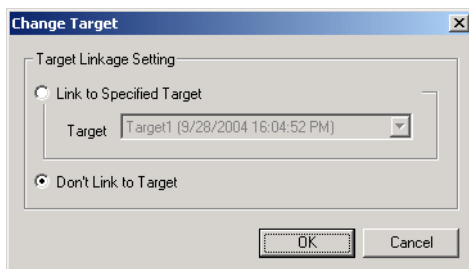
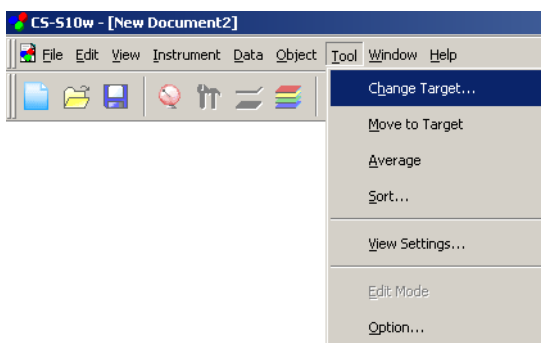
The data(s) folder under Sample is provided by default. You cannot link a target to the folder, and cannot delete or rename the folder.

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.

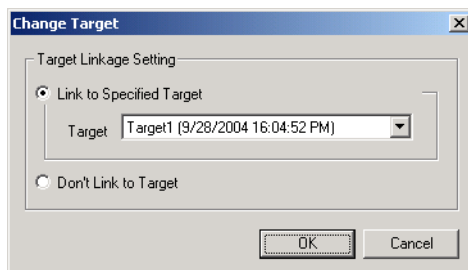
The Change Target dialog box appears.



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.

The screenshot shows the software interface with a list window displaying target data. The data is as follows:

	Data Name	Lv	x	y	T	dL/v	Target No.	dL/v	dx	dy	Judgement
Target	Target1 (2005/01/24 21:08:27)	80.00	0.3333	0.3333	5448	-0.0044	-----	-----	-----	-----	-----
1	3 (2005/01/24 21:13:56)	148.26	0.3147	0.3362	6373	0.0054	1	68.26	-0.0187	0.0019	-----

Observer : 2 degree | Illuminant : -----

## 2.5.3 Setting the Tolerance

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

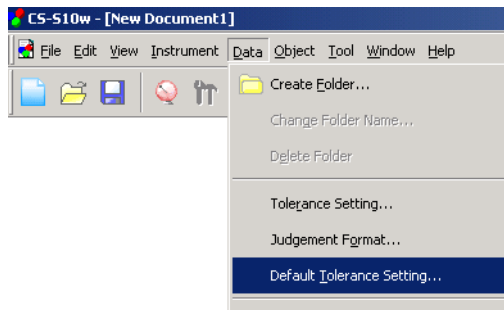
### 2.5.3-a Setting the Initial Tolerance

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.

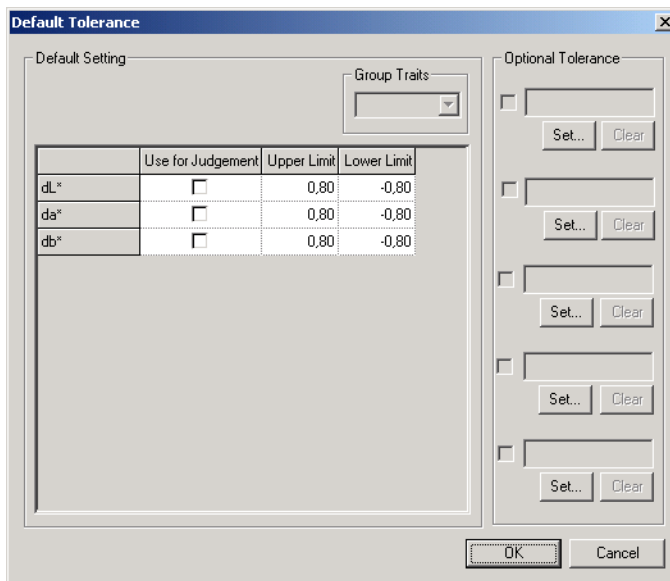
The colorimetric data items to be displayed (list items) are the items specified with the procedure in “Setting the List Items” (page 36).



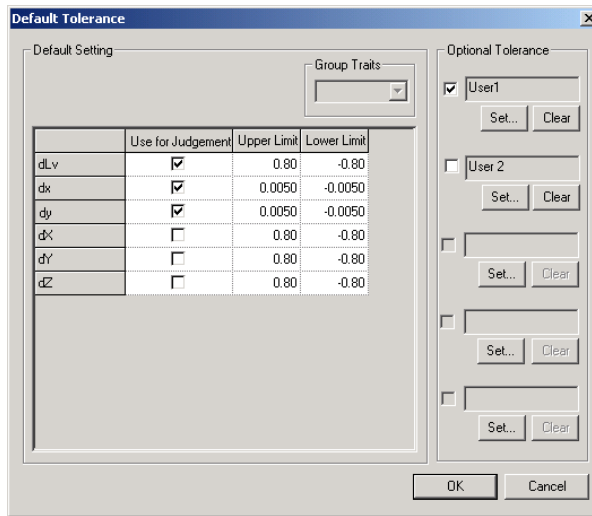
2. Specify the parameters of the tolerance.

When the type of document file is set to the Light-source Color - Contrast Mode measurement, select White or Black for Group Traits. When the type is set to the Light-source Color - RGB Mode measurement, select Red, Green or Blue for Group Traits. When the type is set to the Light-source Color - RGB & Contrast Mode measurement, select White, Black, Red, Green or Blue for Group Traits. Then, enter the tolerance data for each color.

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 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.

### Optional Tolerance

Polygonal tolerance data can be specified with a desired name. Polygonal tolerance data is the data of the tolerance range inside a polygon formed with chromaticity points that are specified on the chromaticity diagram. When the check box to the left of the name is checked, judgement will be performed with the user-defined tolerance data. When the check box is not checked, judgement will not be performed.

Setting is available regardless of the selection of the check box.

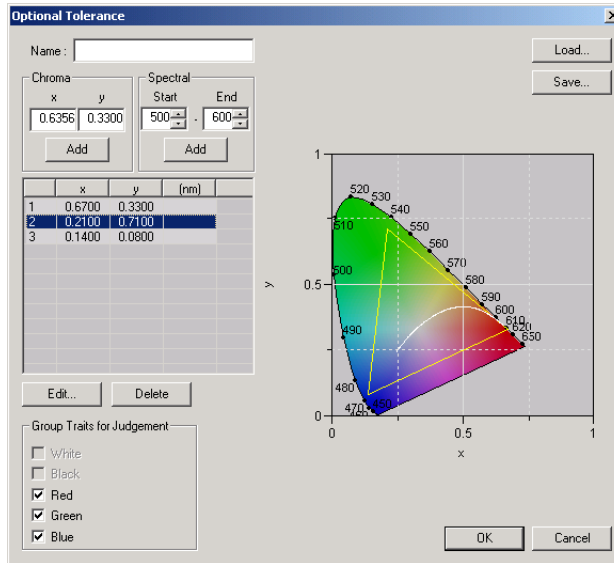
#### Set

When this button is clicked, the Optional Tolerance dialog box appears. You can set the polygonal tolerance data here.

#### Clear

When this button is clicked, the current user-defined tolerance data is cleared.

## ■ Optional Tolerance dialog box



### Name

Up to 64 alphanumeric characters can be entered. If no name is specified, the user-defined tolerance data setting cannot be completed.

### Chroma

Enter a chromaticity point to add. A numerical value between 0.0001 and 1.0 can be entered or selected.

#### Add

When this button is clicked, the chromaticity point is added to the data list.

### Spectral

Specify data to add as a spectral locus. A wavelength between 380 and 780 can be entered or selected.

#### Add

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

### Delete

When the registered data in the data list is selected and this button is clicked, the data is deleted.

### Edit

When one of the items of registered data in the data list is selected and this button is clicked, the Edit dialog box appears to allow you to edit the data.

### Group Traits for Judgement

The group trait of the selected check box is judged with the user-defined tolerance data. The selectable group traits vary depending on the type of document file.

### Load

If any tolerance data has been saved, the file (extension: .otr) can be loaded and the setting displayed on the screen.

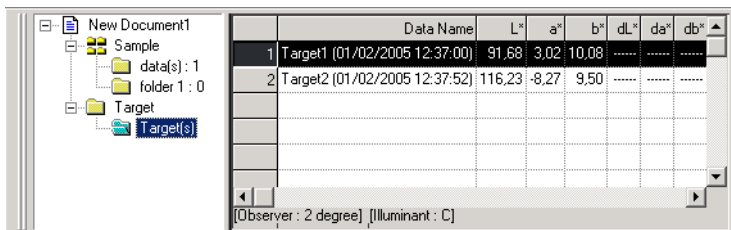
### Save

When this button is clicked, the setting is saved in a file (extension: .otr).

### 2.5.3-b Setting the Tolerance for Each Target

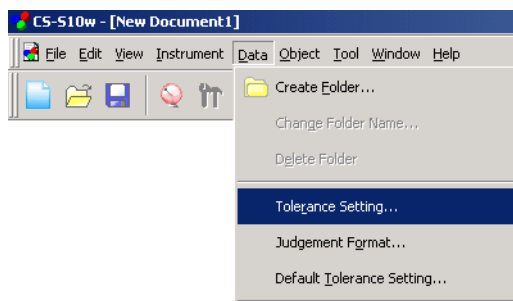
The tolerance specified with the default tolerance setting during the target registration can be changed for each target data.

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



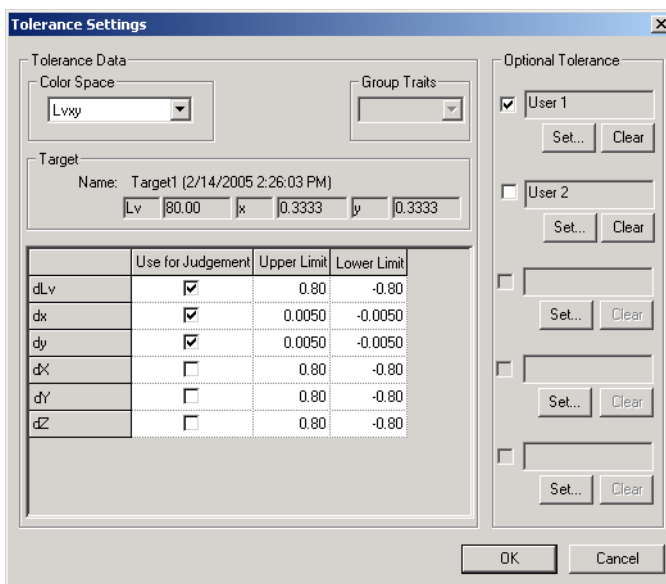
2. Select *Data - Tolerance Setting* from the menu bar.

The Tolerance Settings dialog box appears.



3. Specify the necessary parameters of the tolerance.

When the type of document file is set to the Light-source Color - Contrast Mode measurement, select White or Black for Group Traits. When the type is set to the Light-source Color - RGB Mode measurement, select Red, Green or Blue for Group Traits. When the type is set to the Light-source Color - RGB & Contrast Mode measurement, select White, Black, Red, Green or Blue for Group Traits. Then, enter the tolerance data for each color.



Specifying Target Data/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.

### Optional Tolerance

Polygonal tolerance data can be specified with a desired name. Polygonal tolerance data is the data of the tolerance range inside a polygon formed with chromaticity points that are specified on the chromaticity diagram. When the check box to the left of the name is checked, judgement will be performed with the user-defined tolerance data. When the check box is not checked, judgement will not be performed.

Setting is available regardless of the selection of the check box.

### Set

When this button is clicked, the Optional Tolerance dialog box appears. You can set the polygonal tolerance data here.

Refer to page 77 for details of the Optional Tolerance dialog box.

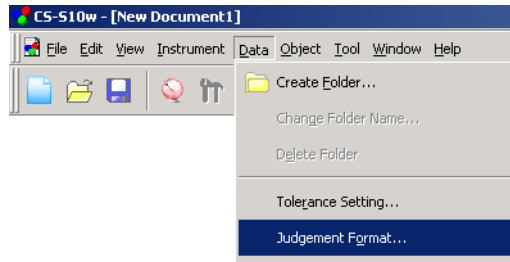
### Clear

When this button is clicked, the current user-defined tolerance data is cleared.

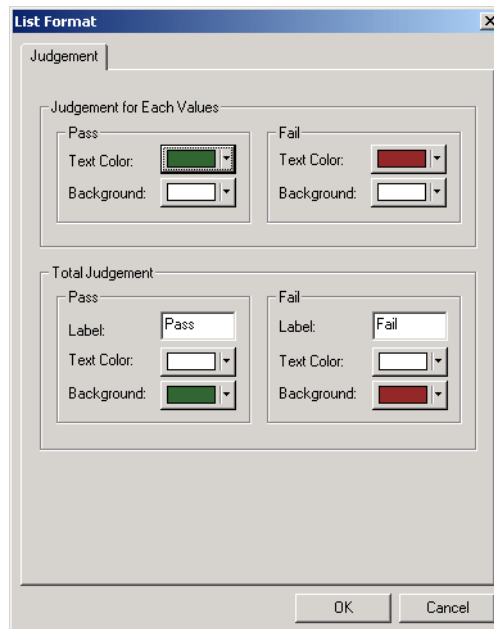
## 2.5.3-c Specifying the Judgement Format in the List Window

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.

These settings are also applied to the pass/fail judgement color in the trend chart of the object.

**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.

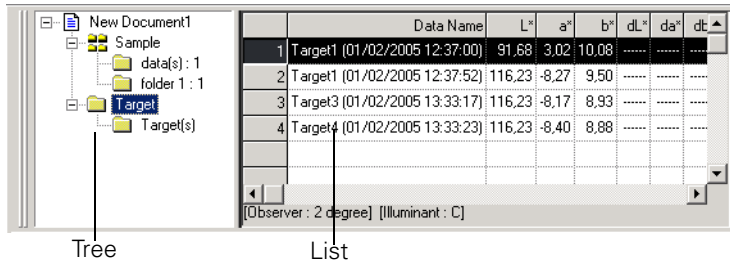
**Text Color:** Specifies the color of the string displayed in the list window when the result is judged as failed.

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

These settings are also applied to the pass/fail judgement color in the xy-chromaticity diagram, u'v'-chromaticity diagram and L\*a\*b\* graph of the object.

## 2.6 List Window Operation

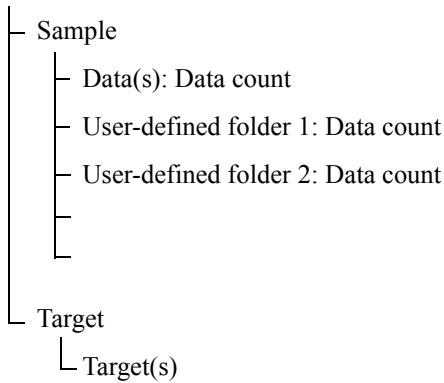
The list window lists sample data. You can show or hide the list window by selecting *View - List Window* from the menu bar.



### 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 73.

## 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 36.

The items  $x$ ,  $y$ ,  $u'$ ,  $v'$ ,  $\Delta x$ ,  $\Delta y$ ,  $\Delta u'$  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 42 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.

When the type of document file is set to the Light-source Color - Contrast Mode measurement, a piece of data is displayed over the two rows of White and Black. When the type is set to the Light-source Color - RGB Mode measurement, a piece of data is displayed over the three rows of Red, Green and Blue. When the type is set to the Light-source Color - RGB & Contrast Mode measurement, a piece of data is displayed over the five rows of White, Black, Red, Green and Blue.

The content of the list window and the function of the graphic objects in the canvas 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	duv	Targ
1 Target1 (2/14/2005 2:52:14 PM)	80.00	0.3333	0.3333	5448	-0.0044	
2 Target2 (2/14/2005 2:52:23 PM)	80.00	0.3333	0.3333	5448	-0.0044	

Display example for the Light-source Color - Normal Mode measurement

Data Name	Group Traits	Lv	x	y	T	duv	Contrast	Sv
1 Target1 (2/14/2005 2:55:33 PM)	White	80.00	0.3333	0.3333	5448	-0.0044	1.00	
	Black	80.00	0.3333	0.3333	5448	-0.0044	1.00	
	Red	80.00	0.3333	0.3333	5448	-0.0044	1.00	
	Green	80.00	0.3333	0.3333	5448	-0.0044	1.00	
	Blue	80.00	0.3333	0.3333	5448	-0.0044	1.00	

Display example for the Light-source Color - RGB & Contrast Mode measurement

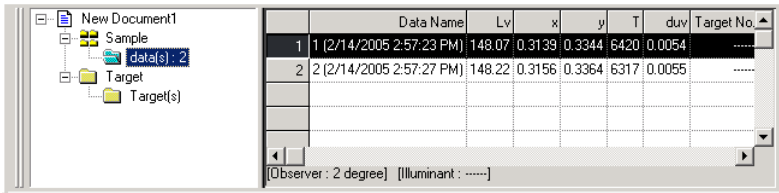
### Functions of graphic objects

<b>Chromaticity diagram, Absolute value graph</b>	The selected data (the last piece of data in the list when two or more pieces of data are selected) is displayed.*
<b>Spectral Graph</b>	The selected data (the first piece of data in the list when two or more pieces of data are selected) is displayed (without difference indication).*
<b>Trend chart/histogram</b>	All data in the list is displayed.*
<b>Image</b>	The image of the selected data (the first piece of data in the list when two or more pieces of data are selected) is displayed.
<b>Data object with target display attribute</b>	The numerical value of the selected data (the first piece of data in the list when two or more pieces of data are selected) is displayed.*
<b>Data object with sample display attribute</b>	Not displayed.

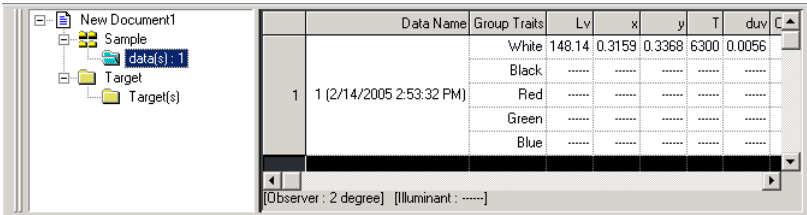
\* When the type of document file is set to the Light-source Color - Contrast Mode, Light-source Color - RGB Mode, or Light-source Color - RGB & Contrast Mode, only the data from the group traits that are selected in the group setting (see page 187) is displayed.

■ **Sample - data(s)**

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



Display example for the Light-source Color - Normal Mode measurement



Display example for the Light-source Color - RGB & Contrast Mode measurement

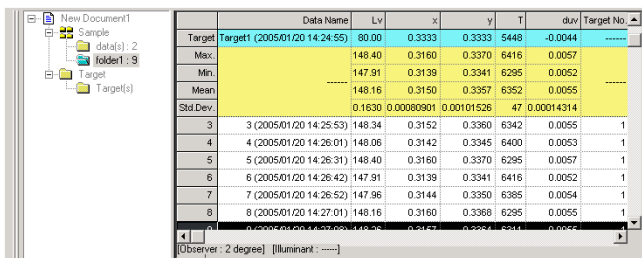
**Functions of graphic objects**

<b>Chromaticity diagram, Absolute value graph</b>	The distribution of all data in the list is displayed.*
<b>Spectral Graph</b>	The selected data is displayed (without difference indication).*
<b>Trend chart/histogram</b>	All data in the list is displayed.*
<b>Image</b>	The image of the selected data (the first piece of data in the list when two or more pieces of data are selected) is displayed.
<b>Data object with target display attribute</b>	Not displayed.
<b>Data object with sample display attribute</b>	The numerical value of the selected data (the first piece of data in the list when two or more pieces of data are selected) is displayed.*

\* When the type of document file is set to the Light-source Color - Contrast Mode, Light-source Color - RGB Mode, or Light-source Color - RGB & Contrast Mode, only the data from the group traits that are selected in the group setting (see page 187) is displayed.

■ **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 73.



Linked target data  
Statistical value

Display example for the Light-source Color - Normal Mode measurement

Data Name	Group	Traits	L*	x	y	T	duv	Contrast	Square ratio	Target No.	dL*
Target1 (2005/02/15 10:58:33)	White		0.4367	0.4383				18.79			
	Black		0.5333	0.4667				1.00			
	Red		0.5584	0.4280				29.07			
	Green		0.4060	0.5324				35.21			
	Blue		0.3503	0.3890				37.50			
Max.	White		0.4029	0.3973				1.28	84.21		-0.0338
Min.			0.4029	0.3973				1.28	84.21		-0.0338
Mean			0.4029	0.3973				1.28	84.21		-0.0338
Std.Dev.											
Max.	Black		0.5319	0.4033				1.00	84.21		-0.0016
Min.			0.5319	0.4033				1.00	84.21		-0.0016
Mean			0.5319	0.4033				1.00	84.21		-0.0016
Std.Dev.											
Max.	Red		0.5554	0.4270				1.01	84.21		-0.0025
Min.			0.5554	0.4270				1.01	84.21		-0.0025
Mean			0.5554	0.4270				1.01	84.21		-0.0025
Std.Dev.											
Max.	Green		0.3899	0.5111				1.07	84.21		-0.0162
Min.			0.3899	0.5111				1.07	84.21		-0.0162
Mean			0.3899	0.5111				1.07	84.21		-0.0162
Std.Dev.											
Max.	Blue		0.3555	0.3872				1.30	84.21		0.0052
Min.			0.3555	0.3872				1.30	84.21		0.0052
Mean			0.3555	0.3872				1.30	84.21		0.0052
Std.Dev.											

Linked target data

Statistical value

Display example for the Light-source Color - RGB & Contrast Mode measurement

Data Name	L*	x	y	T	duv	Target No.	dL*
Target2 (2005/02/15 13:39:49)	0.4094	0.4094					
Max.	0.4134	0.4106					0.0003
Min.	0.4038	0.4034					-0.0005
Mean	0.4083	0.4081					-0.0001
Std.Dev.	0.00352657	0.00291437					0.00052656
Non-Uniformity		2.31	1.76				244.5
1	01_P01	0.4069	0.4092			2	-0.0002
2	01_P02	0.4134	0.4100			2	0.0003
3	01_P03	0.4097	0.4034			2	0.0000
4	01_P04	0.4038	0.4106			2	-0.0005
5	01_P05	0.4080	0.4072			2	-0.0001

Linked target data

Statistical value

Display example for the Light-source Color - Normal Mode, Multi-Point measurement (No. of points: 5)

**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. When Multi-Point measurement is also specified, the row of Non-Uniformity (color variations) is displayed.

The averaging calculation performed here averages the colorimetric data of each piece of data that was calculated individually according to its spectral data or XYZ data. On the other hand, the averaged measurement (described on page 49) and the averaging of list data (on page 89) first average spectral data or 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.

List Window  
Operation

**Functions of graphic objects**

<b>Chromaticity diagram, Absolute value graph</b>	The distribution of all data in the list is displayed.*
<b>Spectral Graph</b>	The target data and selected data are displayed (without difference indication).*
<b>Trend chart/histogram</b>	All data in the list is displayed (reference line display). *
<b>Image</b>	The image of the selected data (the first piece of data in the list when two or more pieces of data are selected) is displayed.
<b>Data object with target display attribute</b>	The target data is displayed.
<b>Data object with sample display attribute</b>	The numerical value of the selected data (the first data in the list when two or more pieces of data are selected) is displayed.*

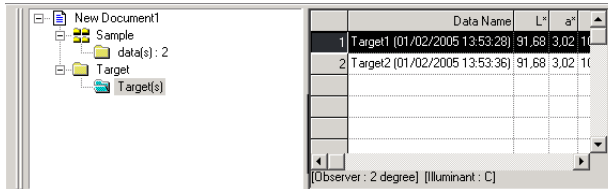
\* When the type of document file is set to the Light-source Color - Contrast Mode, Light-source Color - RGB Mode, or Light-source Color - RGB & Contrast Mode, only the data from the group traits that are selected in the group setting (see page 187) is displayed.



## 2.6.3 Editing the List Data

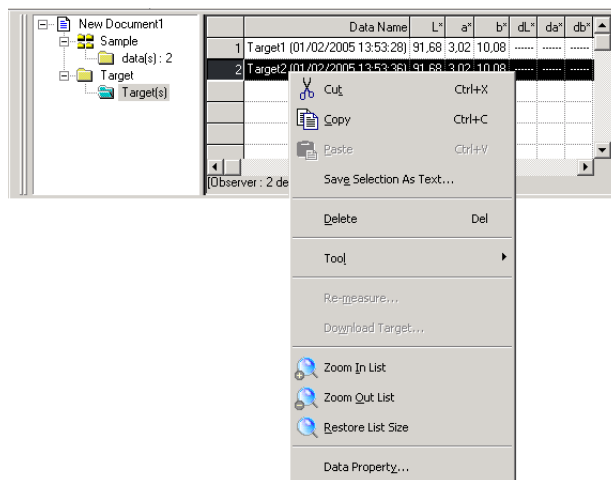
### ■ Selecting the list data

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.



### ■ 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 folder 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

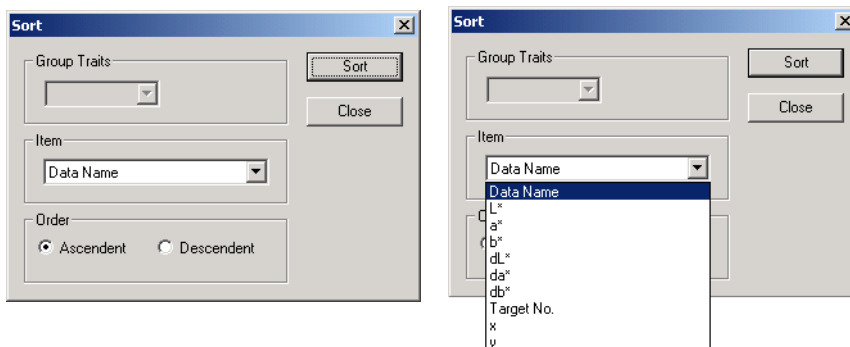
Right-click the selected (highlighted) data and select *Delete* from the displayed context menu. Or, select the data and select *Edit - Delete* from the menu bar. If more than one piece of data is selected, all the selected data will be deleted simultaneously. When target data is deleted, the sample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

When Multi-Point measurement is specified, the data cannot be deleted.

## ■ 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  $\Delta L_v$  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.

When the type of document file is set to the Light-source Color - Contrast Mode measurement, the Light-source Color - RGB Mode measurement or Light-source Color - RGB & Contrast Mode measurement, the data specified at Group Traits can be sorted.



When Multi-Point measurement is specified, the data cannot be sorted.

## ■ 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 111.

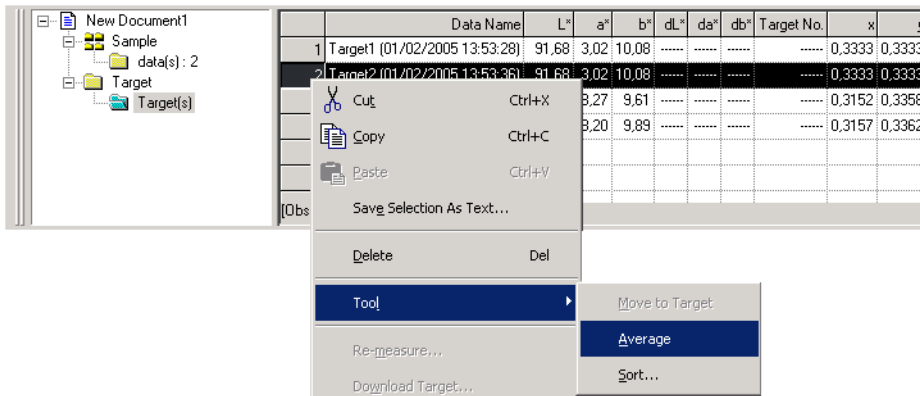
## 2.6.4 Adding Averaged Data

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

When Multi-Point measurement is specified, the list data cannot be averaged.

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.

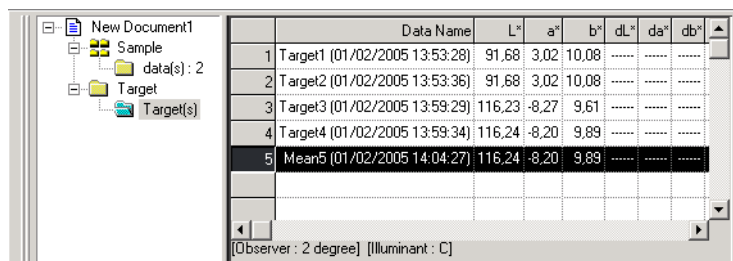
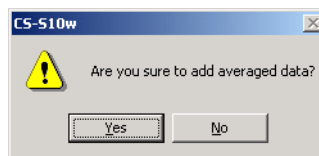
A dialog box with the following message appears: “Are you sure to add averaged data?”



2. Click the Yes button.

The averaged data is added to the list.

The averaging calculation performed here first averages spectral data or 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 85 averages the colorimetric data of each piece of data that was calculated individually according to its spectral data or XYZ data. Consequently, the results of these two types of calculations may differ.



## 2.6.5 Re-measuring the list data

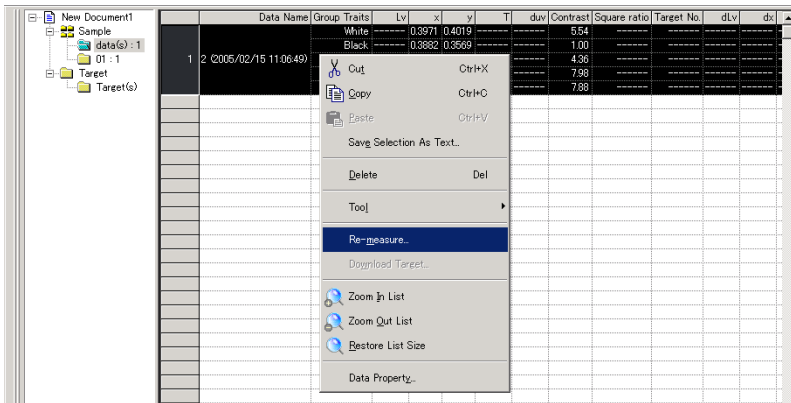
When the type of document file is set to the Light-source Color - Contrast Mode measurement, the Light-source Color - RGB Mode measurement or the the Light-source Color - RGB & Contrast Mode measurement, you can select any data from the list data, measure it again, and replace the old data with the new data.

1. When one of the items of list data is selected and highlighted, right-click the mouse to show the pop-up menu and select *Re-measure*.

Or, select *Instrument - Re-measure* from the menu bar.

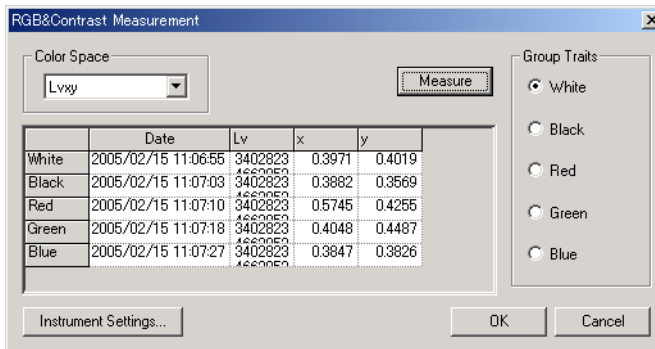
Or, when Multi-Point measurement is specified, select *Instrument - Measure* from the menu bar.

When the type of document file is set to the Light-source Color - Contrast Mode measurement, the Contrast Measurement dialog box appears. When the type is set to the Light-source Color - RGB Mode measurement, the RGB Measurement dialog box appears. When the type is set to the Light-source Color - RGB & Contrast Mode measurement, the RGB & Contrast Measurement dialog box appears. When the Multi-Point measurement is selected, the Multi-Point Measurement dialog box appears.



2. Select the group trait or measurement point to re-measure and click the Measure button.

The Measure dialog box appears, and the data in the row of the selected group trait or measurement point is replaced with the new data.



Display sample for the Light-source Color - RGB & Contrast Mode measurement

3. Repeat step 2 for other group traits or measurement points that require re-measurement.

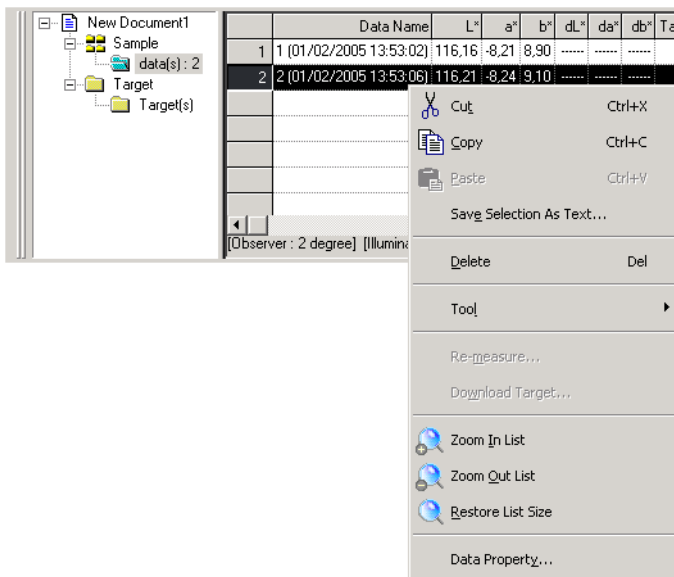
4. Click the OK button.

The dialog box closes, and the data selected in the list window is replaced with the new data.



## 2.6.6 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 106 for the procedure to change the default size.

## 2.7 Canvas Window Operation

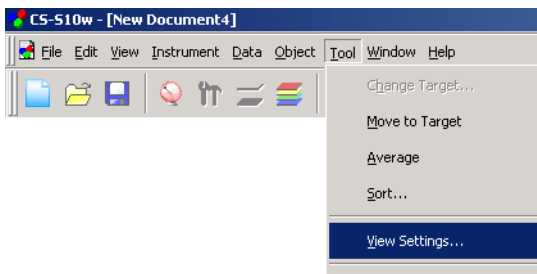
The canvas window displays data as graphs. The CS-S10w software provides various types of graphs that can be placed in the window as desired. The canvas window is available in two views: Display view and Printing view. Use display view to place graphic objects in order to check the measurement results on the PC display. Use printing view to place graphic objects in order to print out a test report. See page 139 for details of the graphic objects.

### 2.7.1 Editing the Canvas Window

Graphs, charts and their components are called graphic objects. To edit graphic objects, set the canvas window to edit mode.

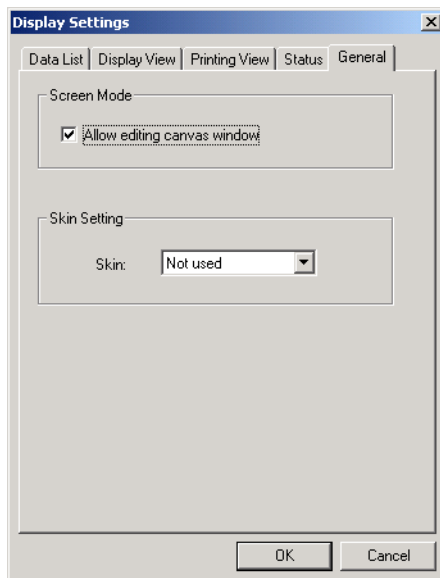
1. Select *Tool - View Settings* from the menu bar.

The Display Settings dialog box appears.



2. Select the General tab.
3. Check “Allow editing canvas window” and click the OK button.
4. Check *Tool - Edit Mode* in the menu bar.

The canvas window enters graphic object edit mode.

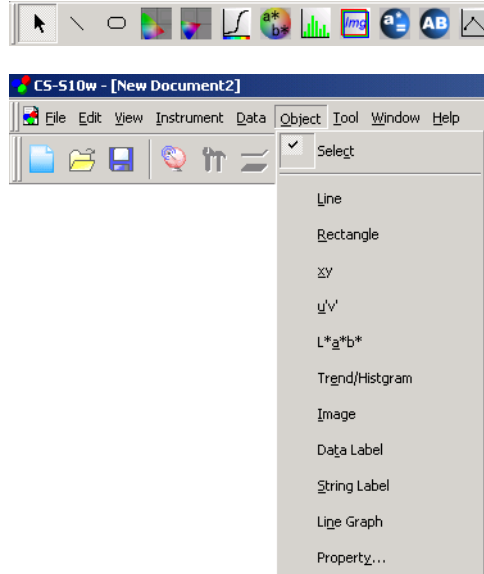


See pages 107 and 108 for the details of other setting items in the Display Settings dialog box.

## 2.7.2 Pasting a Graphic Object

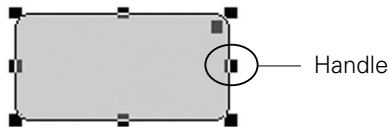
### 1. Select a graphic object.

Select a graphic object to paste into the tool bar or select it from the *Object* menu in the menu bar. When a graphic object is selected, the mouse pointer changes shape.



### 2. Paste the graphic object.

Drag the graphic object over the canvas window and paste it in the desired location. A frame with handles appears around the graphic object. Drag the appropriate handle to change the size of the object as desired.



## 2.7.3 Selecting a Graphic Object

When you click the inside of the frame of a graphic object that has been pasted in the canvas window, the graphic object is selected. You can select two or more objects by selecting them while holding down the Shift key.

When you drag the mouse pointer to enclose a graphic object, the object is also selected. (You can select an object by enclosing either all or part of it.) If you enclose two or more graphic objects, all the graphic objects involved are selected.

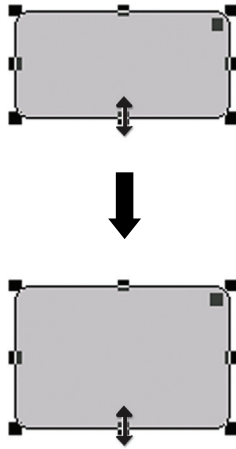
Even if several document files are opened, you cannot select graphic objects in more than one document file.

## 2.7.4 Deselecting a Graphic Object

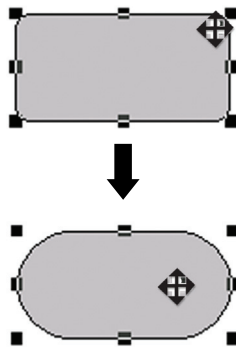
Click inside any area other than that of the pasted graphic objects or click the ESC key. When two or more graphic objects are selected, clicking an object while holding down the Shift key deselects only that object.

## 2.7.5 Changing the Size of a Graphic Object

Click and select a graphic object and move the mouse pointer over one of the handles on the frame. When the shape of the pointer changes into a double-headed arrow, drag the handle and change the size of the object.



With a rectangular object, dragging the handle at the upper right corner rounds the corners, converting the shape from a rectangle to an ellipse.



## 2.7.6 Moving a Graphic Object

Click and select a graphic object and move the mouse pointer to any point inside the frame. Drag the object to the desired location.





## 2.7.7 Copying a Graphic Object

Click and select a graphic object. Right-click the object and select *Copy* from the displayed context menu. You can also copy it by selecting *Edit - Copy* from the menu bar or by pressing the C key while holding down the Ctrl key. When you drag an object while holding down the Ctrl key, a copy of the object is dragged and pasted. When two or more objects are selected, all the selected objects are copied simultaneously.

## 2.7.8 Cutting out a Graphic Object

Click and select a graphic object. Right-click the object and select *Cut* from the displayed context menu. You can also cut the object by selecting *Edit - Cut* from the menu bar or by pressing the X key while holding down the Ctrl key. When two or more objects are selected, all the selected objects are cut simultaneously.

## 2.7.9 Pasting a Graphic Object

Right-click an object and select *Paste* from the displayed context menu. You can also paste it by selecting *Edit - Paste* from the menu bar or by pressing the V key while holding down the Ctrl key. When two or more document files are open, you can copy an object from one open document and paste it in the canvas window of another document file.

## 2.7.10 Deleting a Graphic Object

Click and select a graphic object. Select *Edit - Delete* from the menu bar or press the Delete key. When two or more objects are selected, all the selected objects are deleted simultaneously.

## 2.7.11 Run Mode of the Canvas Window

When *Tool - Edit Mode* in the menu bar is not checked, the canvas window is in run mode.

In run mode, you cannot change the size or position of graphic objects or paste a new graphic object. These operations are available only in edit mode. The following operations are available in run mode:

- When you double-click a graphic object, you can view the properties of that object.
- When you right-click a graphic object and select *Copy* from the displayed context menu (or select *Edit - Copy* from the menu bar), the object is copied to the clipboard in bitmap form. This data can be pasted into an a software program such as Microsoft Excel.

**Note:** You cannot paste a graphic object copied in run mode into the canvas window of the CS-S10w software. To copy and paste graphic objects into the canvas window, set the window to edit mode.

## 2.7.12 Window Operation when the List Window is Hidden

Select the data to display in the canvas window in the following procedure.

### Preparation

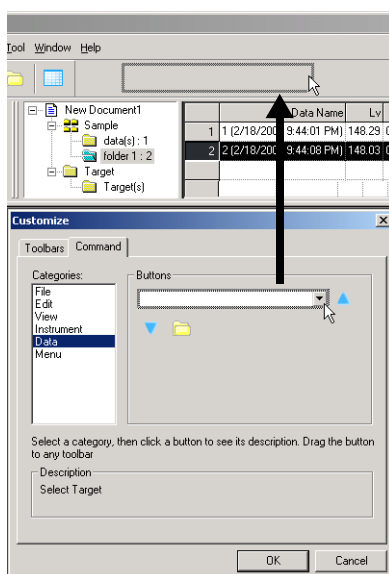
Before you can select the data, you must first add the necessary buttons to the toolbar.

1. Select *View - Toolbar setup* from the menu bar.

The Customize dialog appears.

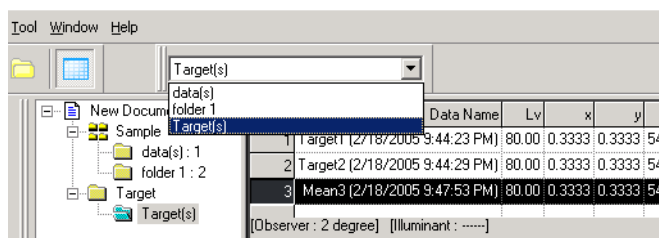
2. Select the Command tab and select Data from the list below Categories.
3. From the Buttons area, drag and drop the Select Target box, the Previous Data button ▲ and the Next Data button ▼ to the toolbar.

The buttons appear in the toolbar.



### Selecting data

1. In the Select Target box, select the data group you want to view.
2. Navigate through the data by clicking the ▲ or ▼ buttons in the toolbar or by selecting *Data - Next Data* or *Previous Data* from the menu bar.



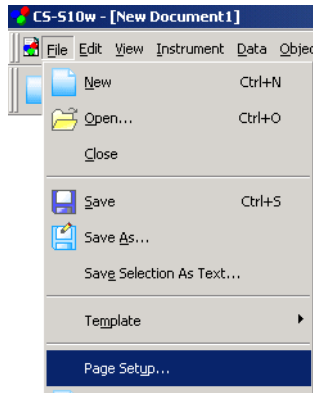
## 2.8 Printing

You can print the display view and printing view of the canvas window or the list in the list window.

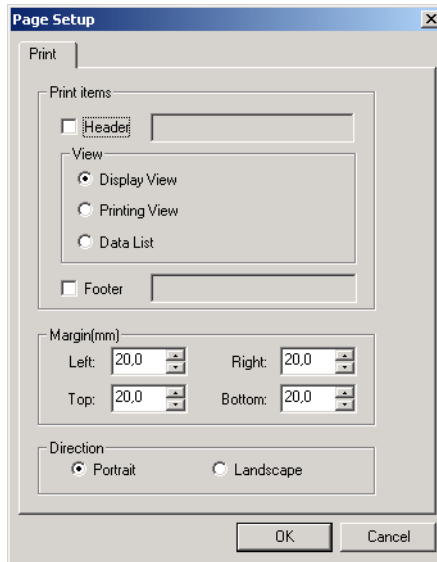
### 2.8.1 Page Setup

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.

#### Display View

Select this option when printing the canvas window in display view.

#### Printing View

Select this option when printing the canvas window in printing view.

#### 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
<b>\$D</b>	Day of measurement
<b>\$M</b>	Month of measurement
<b>\$Y</b>	Year of measurement
<b>\$h</b>	Hour of measurement
<b>\$m</b>	Minute of measurement
<b>\$s</b>	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). The margin setting determines the position of the margin line displayed in the canvas window (see page 16). Use the line as a guide when placing graphic objects.

### Direction

#### Portrait

Windows are printed in portrait orientation.

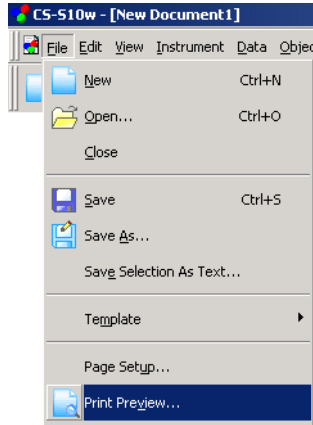
#### Landscape

Windows are printed in landscape orientation.

## 2.8.2 Print Preview

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

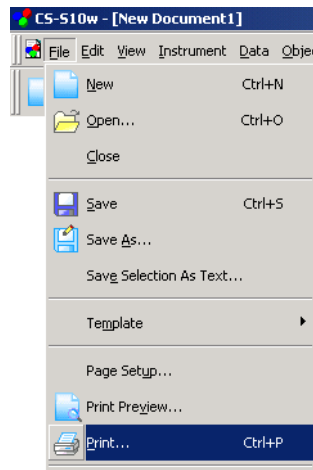
A preview window appears showing the actual appearance of the page to be printed as specified in the Page Setup dialog box.



## 2.8.3 Start Printing

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

The Print dialog box appears.



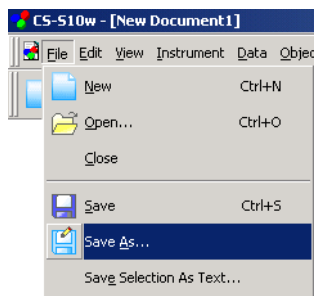
## 2.9 Saving Data

### 2.9.1 Saving a Data File

The content displayed in the list window or canvas 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
- Graphic objects pasted in the canvas window and their size and position information
- View setting parameters

A folder containing no data will not be saved.

## 2.10 Other Functions

### 2.10.1 Template File

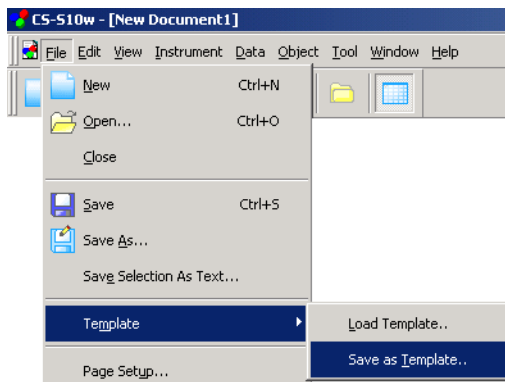
The CS-S10w software provides template files in its original file format (with the “.ctp” file extension). A template file contains the following data:

- Observer
- Initial tolerances
- Judgement display setting
- List items specified in the list window
- Graphic objects pasted in the canvas window as well as their size and position information
- Screen properties

Once you have saved the template files with the procedure described below, you can simply open the template file with the CS-S10w software and it will open consistently in the same view.

1. Select *File - Template - Save as Template* from the menu bar.

The Save As dialog box appears.



2. Select “Template” as the location to save to, type a filename in the Filename box and click the Save button.

The file is saved as a template file in the CS-S10w software's proprietary file format (with the “.ctp” file extension).

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

#### **Cont.ctp**

Specifies a document in Contrast Mode under Light-source Color which is selected in the Welcome to CS-S10w dialog.

#### **Normal.ctp**

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

#### **Ref.ctp**

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

#### **RGB.ctp**

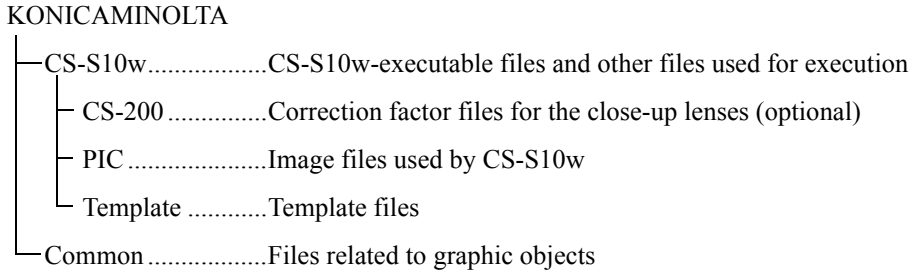
Specifies a document in RGB Mode under Light-source Color which is selected in the Welcome to CS-S10w dialog.

#### **RGBCont.ctp**

Specifies a document in RGB & Contrast Mode under Light-source Color which is selected in the Welcome to CS-S10w dialog.

**■ Directory structure of the CS-S10w software**

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

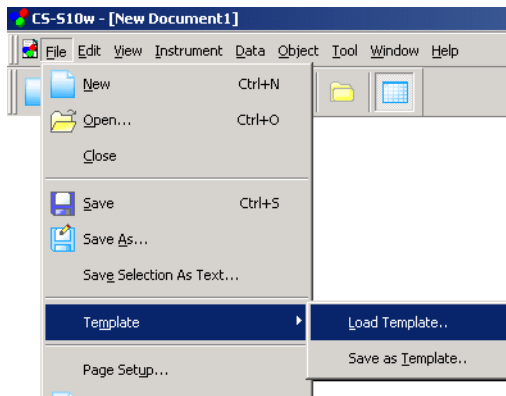


When you create a template, save it in the Template folder mentioned above.

**2.10.2 Reading a Template File**

You can change the type of document file by reading a template file previously created or included with the CS-S10w software.

1. Select *File - Template - Load Template* from the menu bar.  
The Open dialog appears.



2. Select a template file and click the Open button.

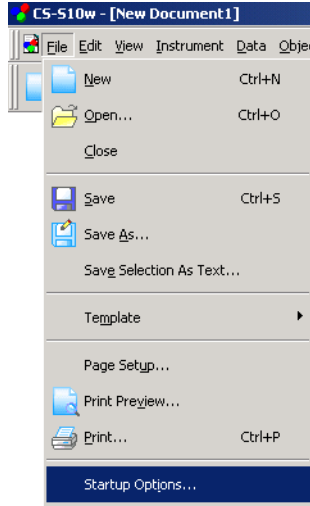


## 2.10.3 Setting Startup Options

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

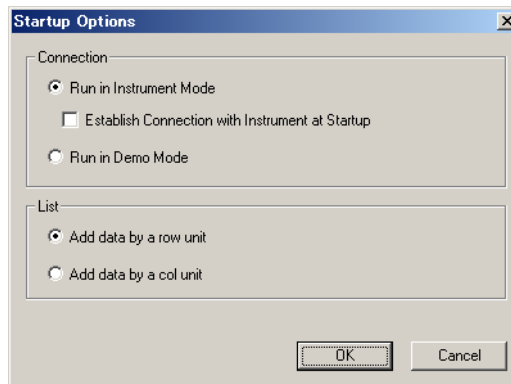
1. Select *File - Startup Options* from the menu bar.

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

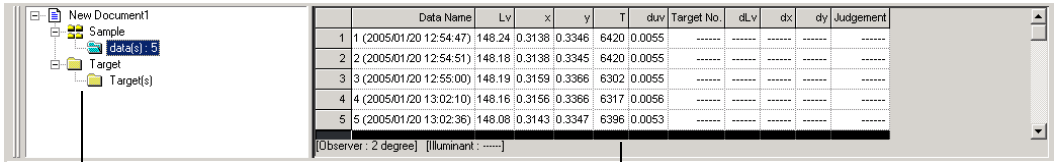
When this option is checked, the CS-S10w software starts in demo mode. In demo mode, the CS-S10w software can be operated as if the instrument were connected even when the instrument is not actually connected. When you attempt to take a measurement, a random measurement result is displayed.

**List**

**Add data by a row unit**

Each sample data is displayed in one row in the list window. Up to 5000 pieces of data can be stored in a document file.

This is the default setting.

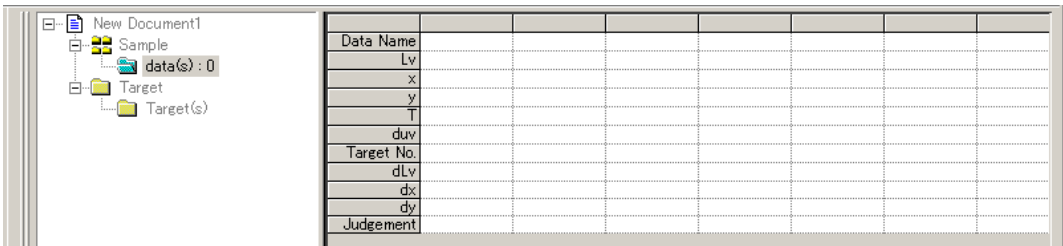


Tree

List

**Add data by a col unit**

Each sample data is displayed in one column in the list window. Up to 4000 pieces of data can be stored in a document file.

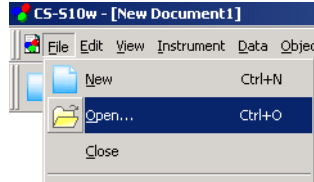


## 2.10.4 Opening a Data File

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

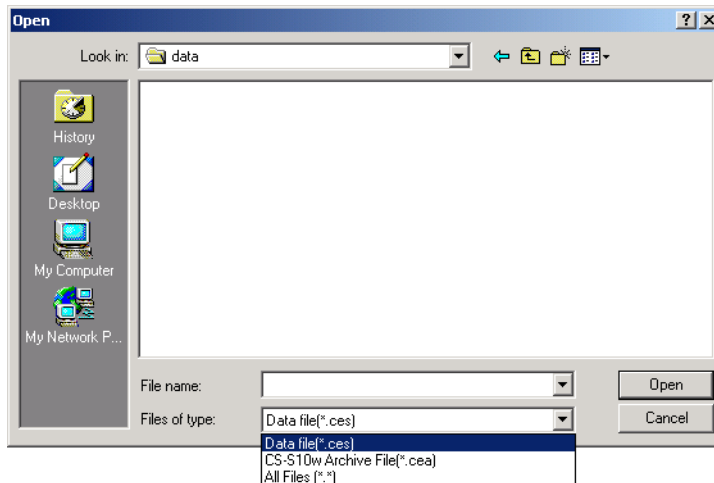
1. Select *File - Open* from the menu bar.

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.

As for DAT files, only the files saved as a sample data list or a target data list can be opened. Note that 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.

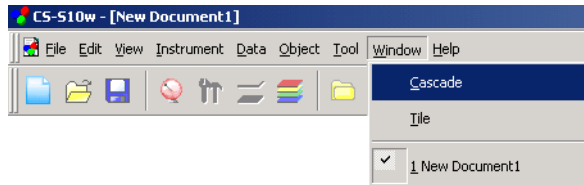
The CS-S10w can save as many as 5,000 pieces of data with a list style of Add data by a row unit, or 4,000 pieces of data with a list style of Add data by a col unit. Consequently, if a file created with the CS-S1w contains more pieces of data than these limits, it is divided into separate files that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

## 2.10.5 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).

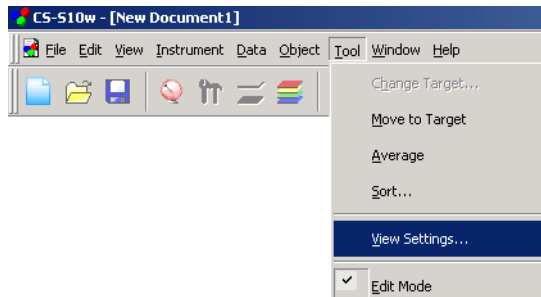


## 2.10.6 View Settings of Each Window

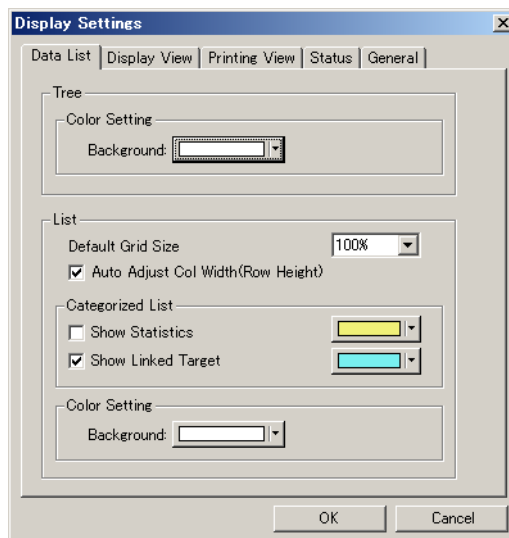
You can specify view setting details such as the background colors of the List Window, the Canvas Window (Display/Printing Views) and the Status Window.

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.

#### Liste

##### Default Grid Siz

Specify the normal size for the list display. This setting is used as the default size for Zoom In/Out display (See page 91).

### 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

#### Graphics Window

##### Color Setting

##### Background

You can specify the background color of the display view.

#### Grid

##### Show Grid

When this option is checked, a grid is displayed in the background of the window. You can specify the color of the grid from the box on the right. For the color setting method, see the following section.

### Status tab

#### Status Window

##### Color Setting

##### Background

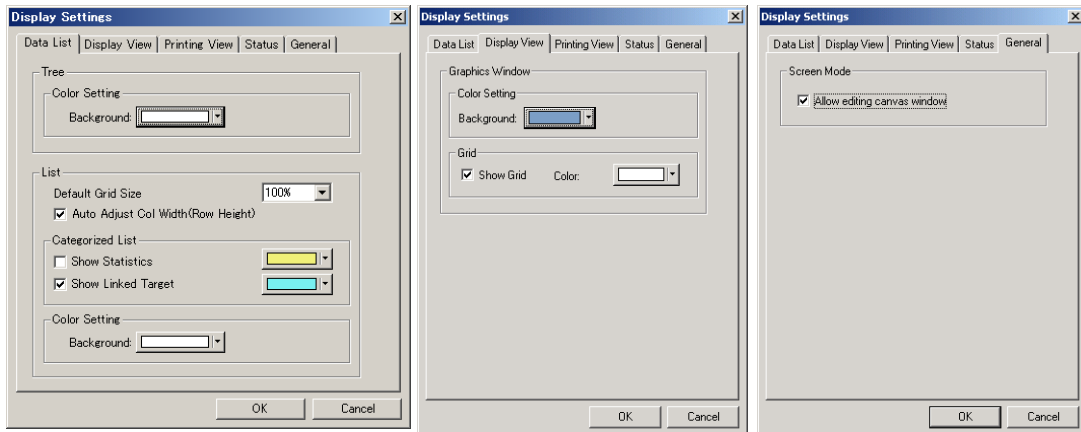
You can specify the background color of the status window.

## General tab


### Screen Mode

#### Allow editing canvas window

When this option is checked, the *Edit Mode* command under *Tool* in the menu bar can be selected. If this option is not checked, the edit mode and run mode cannot be switched.

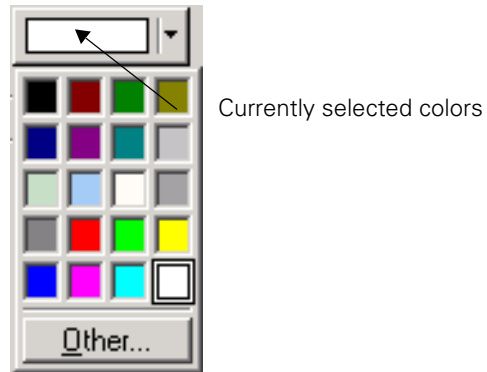


## 2.10.7 Color Setting

The color button appears, allowing you to select colors. 

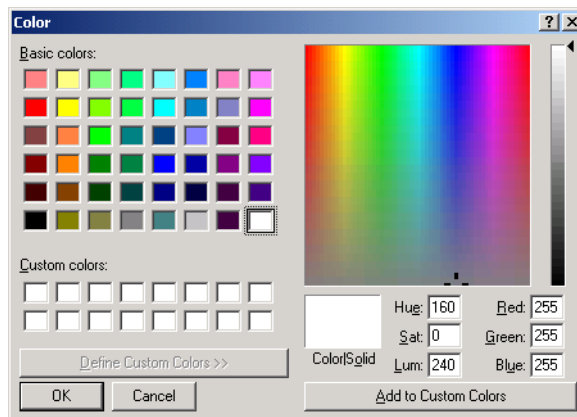
1. Click the color button.

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.

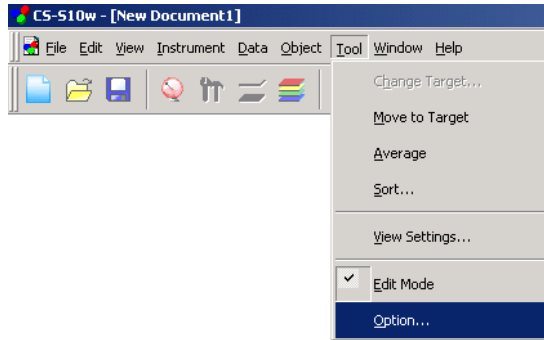
When the Other button is clicked, the Color dialog box appears.



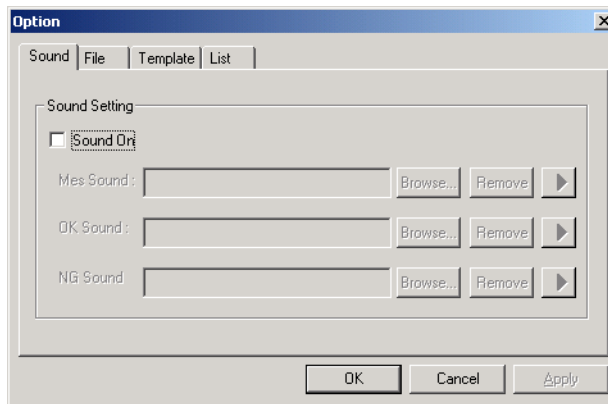
## 2.10.8 Setting Options

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

#### 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****Normal**

Specify the default file path that is displayed when *File - Template - Load Template* is selected from the menu bar in Light-source Color - Normal Mode.

**Contrast**

Specify the default file path that is displayed when *File - Template - Load Template* is selected from the menu bar in Light-source Color - Contrast Mode.

**RGB**

Specify the default file path that is displayed when *File - Template - Load Template* is selected from the menu bar in Light-source Color - RGB Mode.

**RGB & Contrast**

Specify the default file path that is displayed when *File - Template - Load Template* is selected from the menu bar in Light-source Color - RGB & Contrast Mode.

**Object Color**

Specify the default file path that is displayed when *File - Template - Load Template* is selected from the menu bar in Object Color measurement.

Configure the template file that will be used when each mode is selected.

**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  $\text{cd/m}^2$  or  $\text{ft-L}$ . The  $L_v$  value is calculated in the unit selected with this option.

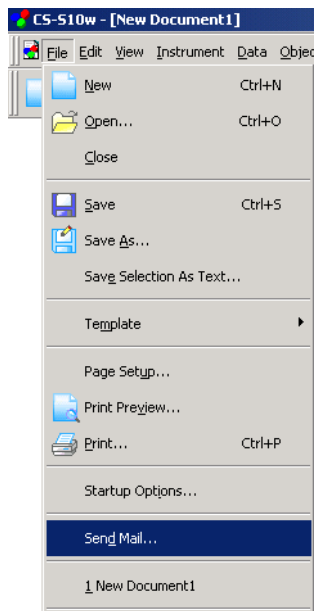
## 2.10.9 Sending Data Files by E-mail

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.

## 2.10.10 Setting User Calibration

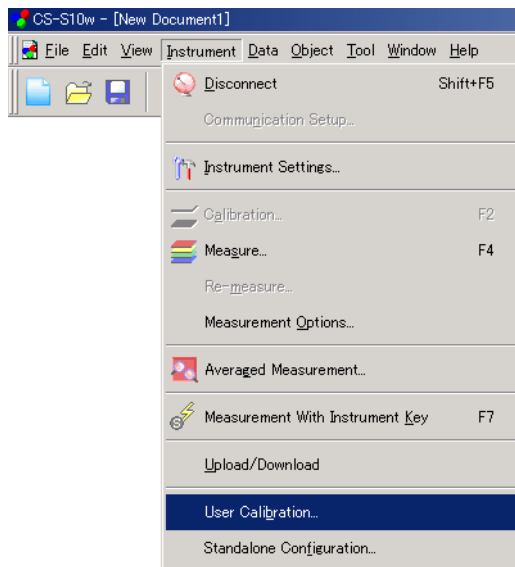
This procedure is available only when the instruments other than the CS-100A are connected to the computer.

### When the CS-200 is connected

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.

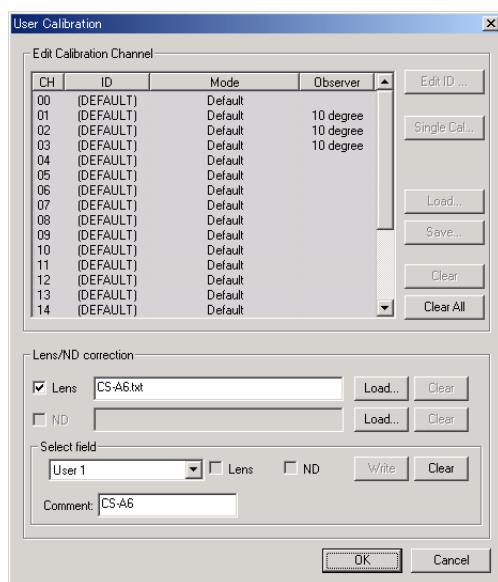
1. Select *Instrument - User Calibration* from the menu bar.

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 and the calibration value is loaded to the instrument.

## ■ User Calibration dialog box (When the CS-200 is connected)



### 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 126.

#### 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.

## When the CS-1000 is connected

Two types of user calibration are available for the CS-1000: wavelength calibration and level calibration.

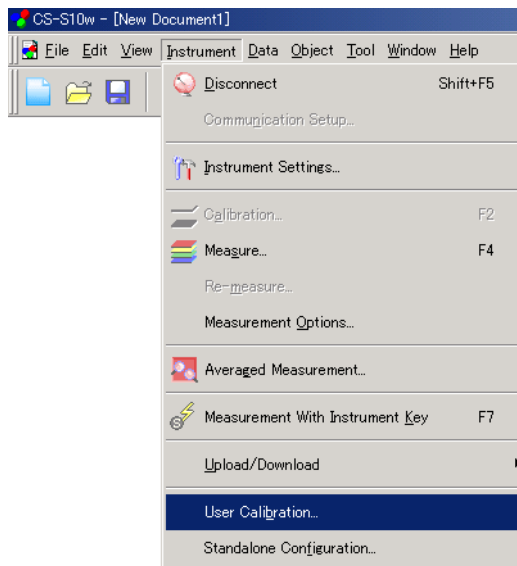
The wavelength calibration calibrates the wavelength of the data measured with the CS-1000. For instance, in the case of measurement of emission lines, you can shift the position of the wavelength axis so that the position of the measured peak or gravity wavelength matches your preset value.

The level calibration calibrates the spectral sensitivity. For instance, you can correct the spectral sensitivity so that the spectral waveform of the measured data matches the one you specified.

- Since the user-calibration function of the CS-S10w calibrates the measured data loaded from the CS-1000 to a personal computer, all the user-calibration calculations are carried out on the personal computer. No user-calibration calculation is carried out on the CS-1000. Thus, the user-calibration function cannot be operated with the CS-1000 alone.
- Once the user calibration is performed, the original measured data cannot be restored.
- The user calibration can be performed only when the document file type is in the light-source color mode.

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

The User Calibration dialog box appears.



2. To set the wavelength calibration, click the Load button for Wavelength. When the Open dialog box appears, select a calibration value file which you want to register from the calibration value files stored in the memory, and then click the Load button.
3. Select ON for Wavelength.
4. To set the level calibration, click the Load button for Level. When the Open dialog box appears, select a calibration value file which you want to register from the calibration value files stored in the memory and click the Load button.
5. Select ON for Level.
6. Click the OK button and the user calibration setting is applied.

## ■ User Calibration dialog box (When the CS-1000 is connected)

The screenshot shows the 'User Calibration' dialog box with the following fields and controls:

- Wavelength:** Radio buttons for OFF (selected) and ON. Text fields for Tag and Comment. Buttons: Load..., Save..., Calibrate..., Clear.
- ND:** Radio buttons for OFF (selected) and ON. Text field for Tag. Buttons: Load..., Clear.
- Level:** Radio buttons for OFF (selected) and ON. Text fields for Tag and Comment. Buttons: Load..., Save..., Calibrate..., Clear.
- Level Calibration Coefficient Property:** Text fields for Wavelength and Correct ND.

### Wavelength

#### ON/OFF

Select whether to enable or disable calibration. When no calibration value is set, OFF is selected. You cannot select ON.

#### Tag / Comment

The tag and/or comment attached to the calibration value is displayed. The tag shows the date and time of the calibration. It cannot be edited. The comment can be specified as desired within 32 characters.

#### Load

The calibration value file (extension: .wcf) is loaded from the specified path. The content of Tag/Comment is updated.

\* A file created with the CS-S1w can also be loaded.

#### Save

The calibration value file (extension: .wcf) is saved to the specified path.

#### Calibrate

The wavelength calibration is performed. This button is enabled when OFF is selected for all calibration types.

For details about performing the user calibration, refer to page 126. After calibration is performed, the content of Tag/Comment is updated.

#### Clear

The calibration data is reset to the default data.

**Level****ON/OFF**

Select whether to enable or disable calibration. When no calibration value is set, OFF is selected. You cannot select ON.

**Tag / Comment**

The tag and/or comment attached to the calibration value is displayed. The tag shows the date and time of the calibration. It cannot be edited. The comment can be specified as desired within 32 characters.

**Load**

The calibration value file (extension: .lcf) is loaded from the specified path. The content of Tag/Comment is updated.

**Save**

The calibration value file (extension: .lcf) is saved to the specified path.

**Calibrate**

The level calibration is performed. The calibration status (wavelength/ND) immediately before the calibration is checked, a calibration value appropriate for the status is applied, and then the calibration starts.

For details about performing the user calibration, refer to page 126. After calibration is performed, the content of Tag/Comment is updated.

**Clear**

The calibration data is reset to the default data.

**Level Calibration Coefficient Property**

When ON is selected and the level calibration is performed by using the wavelength calibration and/or ND correction, the information about the wavelength calibration and/or ND correction is displayed.

## 2.10.11 Downloading the Target Data to the Instrument

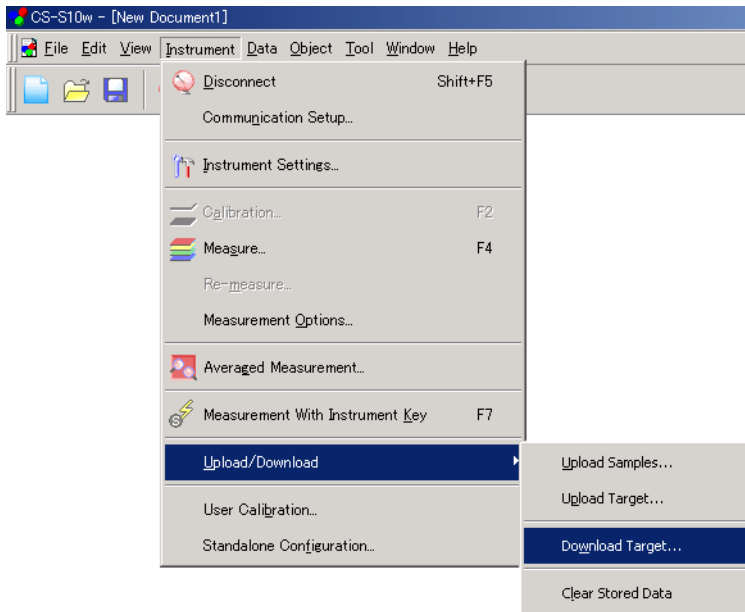
This procedure is available only when the instruments other than the CS-100A are connected to the computer.

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.

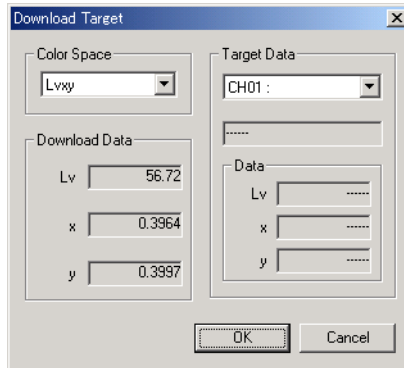
The Download Target dialog box appears. You can select multiple targets and download them in succession.



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 (When the CS-200 is connected)



### 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.

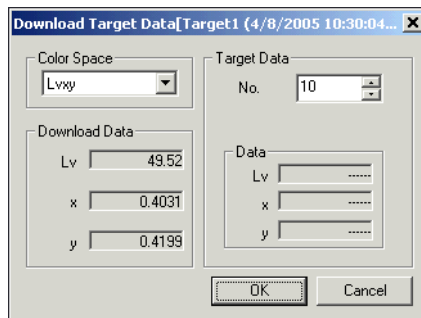
### Target Data

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.

## ■ Download Target dialog box (When the CS-1000 is connected)

All data is written into the instrument as tristimulus data.



### Color Space

Select one from  $L_vxy$ ,  $L_vu'v'$ , and XYZ.

### Download Data

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

### Target Data

In the Data No. combo box, select the number for writing data between 01 and 20.

The data registered for the selected number is displayed in Data under the combo box. If no data is registered for the number, “-----” is displayed.

## 2.10.12 Adding a Lens Type/ND Correction

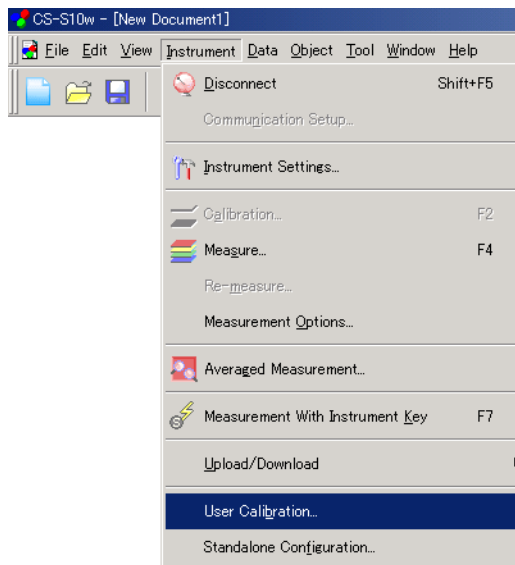
This procedure is available only when the instruments other than the CS-100A are connected to the computer.

To attach a lens such as a close-up lens and a ND filter, you need to correct the measurement value. When the CS-100 is connected, 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.

### When the CS-200 is connected

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 load the file for a correction factor that is already stored in the memory.
3. Specify the destination in the Select field area and click the Write button. The correction factor is loaded to the instrument.

### When the CS-1000 is connected

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

The User Calibration dialog box appears.

2. When the Load button for ND correction is clicked, the Open dialog box appears. Load a file for a correction factor that is already stored in the memory.
3. Select ON for ND correction.
4. Click the OK button and the ND correction setting is applied.

## ■ User Calibration dialog box (When the CS-200 is connected)

CH	ID	Mode	Observer
00	(DEFAULT)	Default	
01	(DEFAULT)	Default	10 degree
02	(DEFAULT)	Default	10 degree
03	(DEFAULT)	Default	10 degree
04	(DEFAULT)	Default	
05	(DEFAULT)	Default	
06	(DEFAULT)	Default	
07	(DEFAULT)	Default	
08	(DEFAULT)	Default	
09	(DEFAULT)	Default	
10	(DEFAULT)	Default	
11	(DEFAULT)	Default	
12	(DEFAULT)	Default	
13	(DEFAULT)	Default	
14	(DEFAULT)	Default	

### 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 102.)

#### 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.

## ■ User Calibration dialog box (When the CS-1000 is connected)

The screenshot shows the 'User Calibration' dialog box with the following fields and controls:

- Wavelength:** Radio buttons for OFF (selected) and ON. Text boxes for Tag and Comment. Buttons: Load..., Save..., Calibrate..., Clear.
- ND:** Radio buttons for OFF (selected) and ON. Text box for Tag. Buttons: Load..., Clear.
- Level:** Radio buttons for OFF (selected) and ON. Text boxes for Tag and Comment. Buttons: Load..., Save..., Calibrate..., Clear.
- Level Calibration Coefficient Property:** Text boxes for Wavelength and Correct ND.
- Bottom:** OK and Cancel buttons.

### ND

#### ON/OFF

Select whether to enable or disable the ND calibration. When no correction factor is set, OFF is selected. You cannot select ON.

#### Tag

The tag attached to the correction factor is displayed.

#### Load

The correction factor file (extension: .ncf) is loaded from the specified path. The content of Tag is updated.

#### Clear

The correction factor data is reset to the default data.

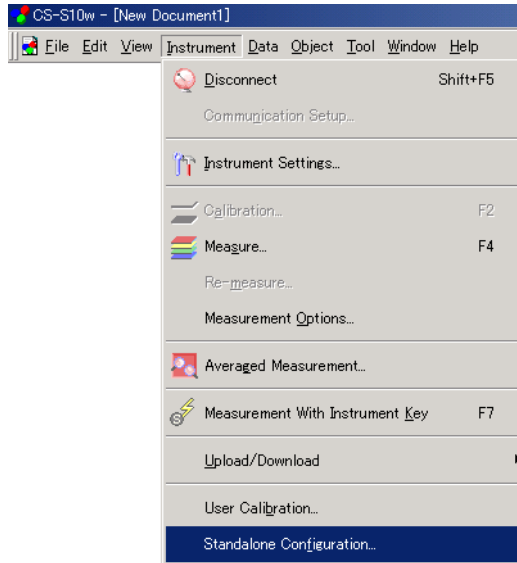
## 2.10.13 Downloading Configuration Data to the Instrument

This procedure is available only when the CS-200 instrument is connected.

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

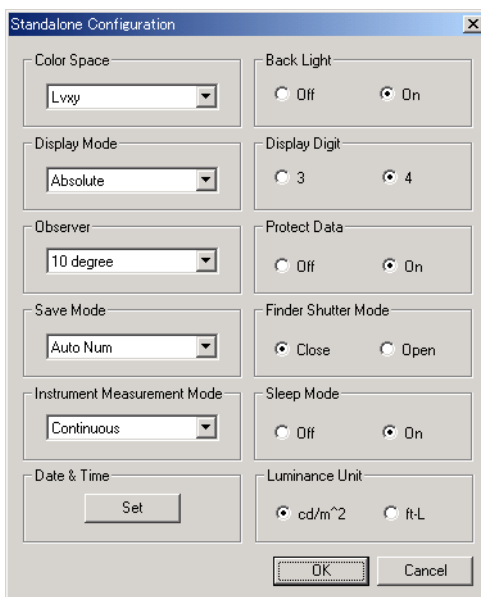
1. Select *Instrument - Standalone Configuration*.

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  $2^\circ$ .

### 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  $2^\circ$  or  $10^\circ$ . User1 and User2 will be added depending on the selection. When Color Space is set to  $L_vT\Delta uv$ ,  $2^\circ$  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  $\text{cd/m}^2$  or ft-L.

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

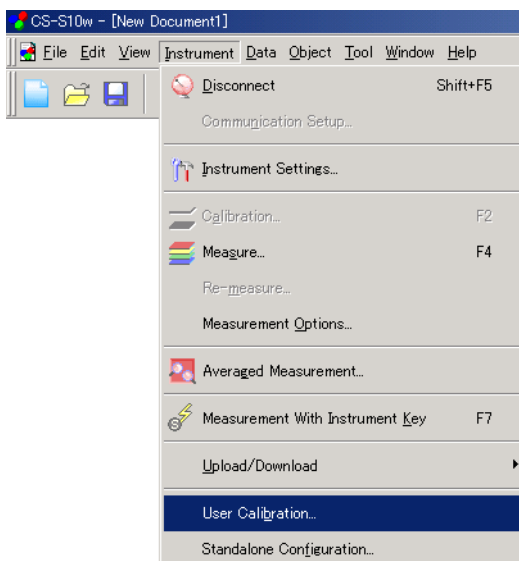
## 2.10.14 Performing User Calibration

This procedure is available only when the instruments other than the CS-100A are connected to the computer.

### When the CS-200 is connected

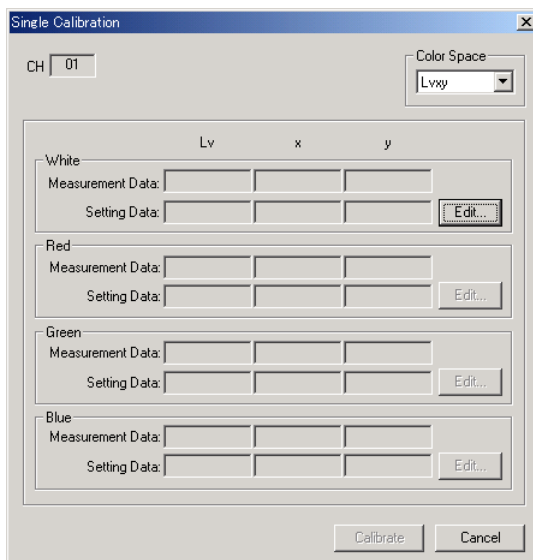
1. Select *Instrument - User Calibration* from the menu bar.

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 for White.

The Edit Calibrated Point dialog box appears.

The dialog box titled "Edit Calibrated Point" contains two main sections:

- Measurement Data:** Three input fields for  $L_v$ ,  $x$ , and  $y$ . A "Measure" button is positioned to the right of these fields.
- Setting Data:** Three input fields for  $L_v$ ,  $x$ , and  $y$ .

At the bottom of the dialog are "OK" and "Cancel" buttons.

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

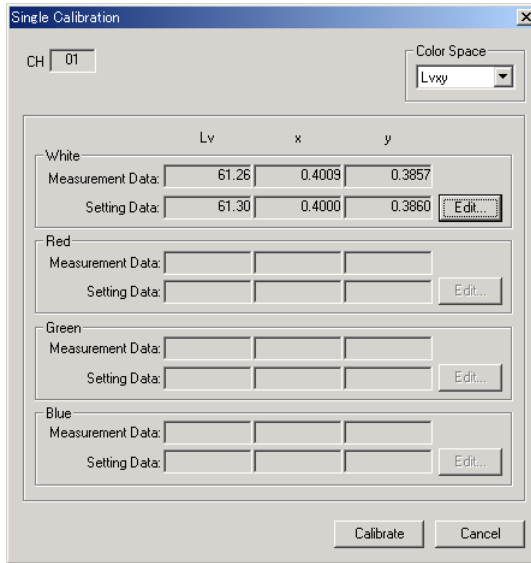
The dialog box titled "Edit Calibrated Point" now shows the following data:

- Measurement Data:**  $L_v$  = 61.26,  $x$  = 0.4009,  $y$  = 0.3857. The "Measure" button is visible.
- Setting Data:**  $L_v$  = 61.30,  $x$  = 0.4000,  $y$  = 0.3860.

"OK" and "Cancel" buttons are at the bottom.

- Click the OK button.

The Single Calibration dialog box appears again.



- Click the Calibrate button.

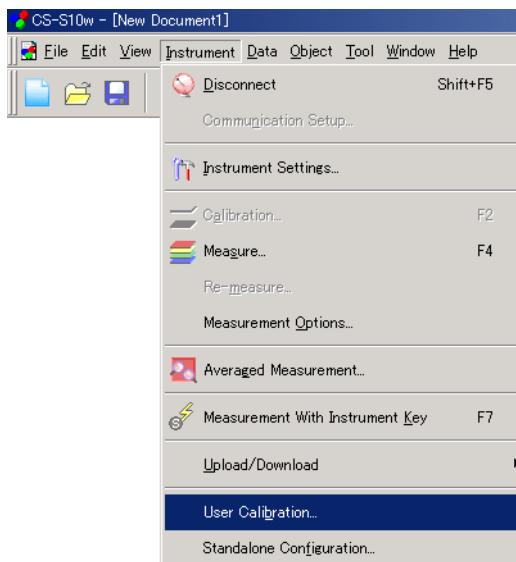
The calibration starts.

## When the CS-1000 is connected

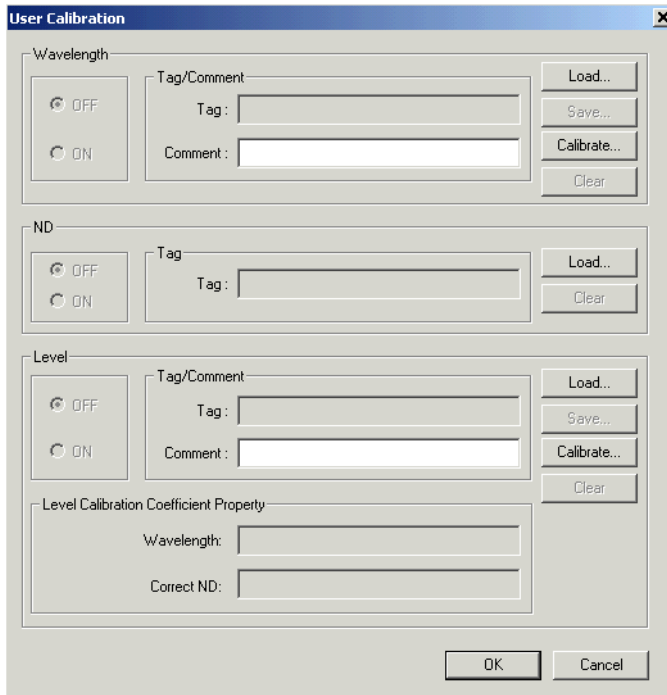
- The user calibration can be performed only when the document file type is in the light-source color mode.

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

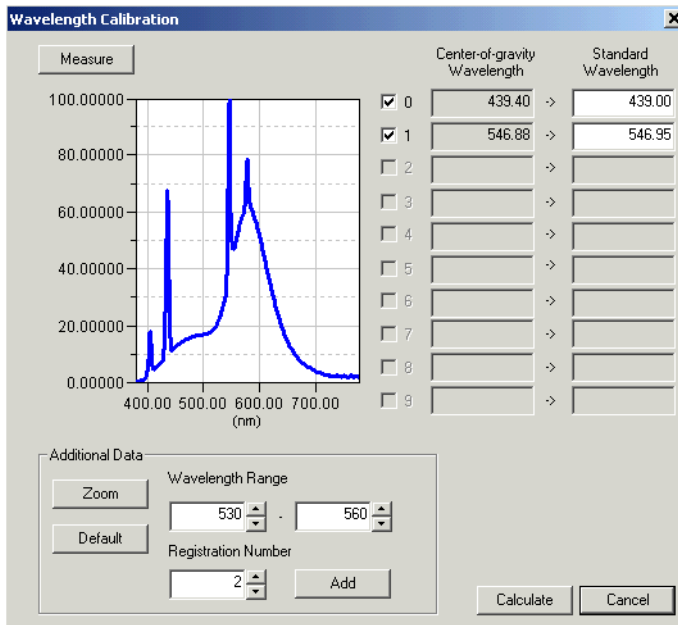
The User Calibration dialog box appears.



**2-1.** To perform the wavelength calibration, click the Calibrate button for Wavelength.



The Wavelength Calibration dialog box appears.



**2-2.** Click the Measure button.

Use the CS-1000 to measure the light source which is used for the wavelength calibration. The measurement is performed and the data is displayed in a graph as the subject of the wavelength calibration.

- 2-3. Specify the waveform range to calculate the gravity waveform in the Wavelength Range text box for Additional Data.
- 2-4. Specify the number to be registered in the Registration Number text box for Additional Data.
- 2-5. Click the Add button.

The gravity wavelength is calculated within the specified range, the appropriate registration number is checked in the table on the right, and data is added to Center-of-gravity Wavelength. The same value as in Center-of-gravity Wavelength is displayed in Standard Wavelength.

- 2-6. Correct the value displayed in Standard Wavelength to the value of the calibration waveform.
- 2-7. Repeat steps 2-3 through 2-6 to register as many target Center-of-gravity / Standard Wavelength as you need.

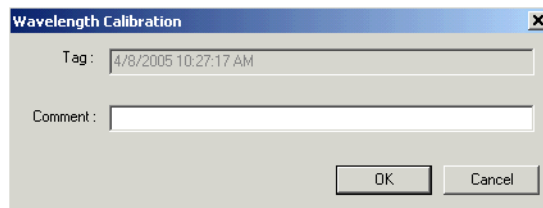
Up to 10 target Center-of-gravity / Standard Wavelength can be registered.

- 2-8. Select the check box(es) for the target Center-of-gravity / Standard Wavelength to specify the registration number(s) used for the factor calculation.

Up to 10 target gravity wavelengths can be specified.

- 2-9. Click the Calculate button.

The factor is calculated from the specified data.  
The Wavelength Calibration dialog box appears.



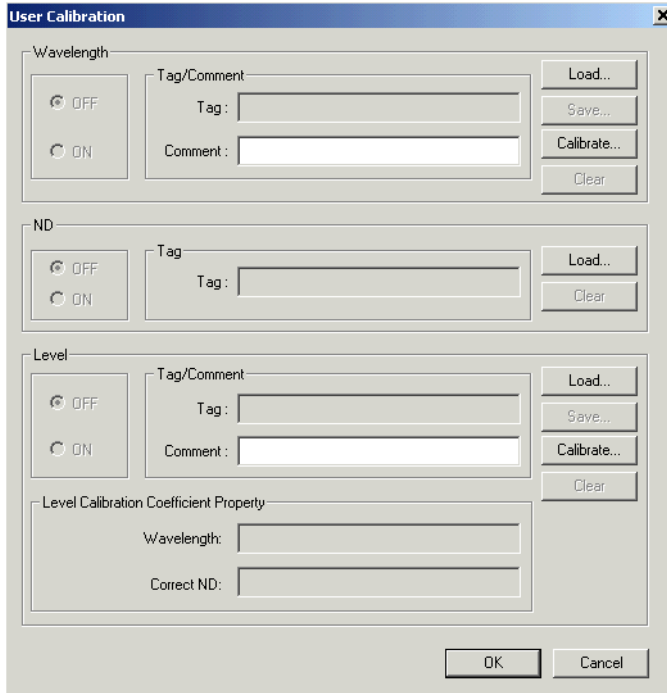
- 2-10. Enter a Comment.

The tag shows the date and time of the calibration. It cannot be edited. The comment can be specified as desired within 32 characters.

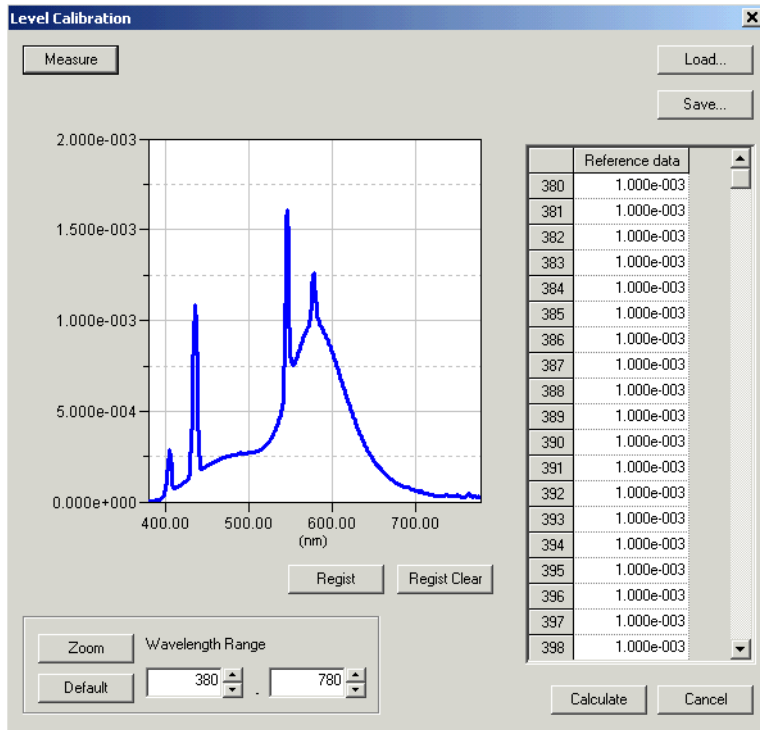
- 2-11. Click the OK button.

The content of Wavelength Calibration in the User Calibration dialog box is updated.

**3-1.** To perform the level calibration, click the Calibrate button for Level.



The Level Calibration dialog box appears.



**3-2.** Click the Measure button.

Use the CS-1000 to measure the light source which is used for the level calibration. The measurement is performed and the data for the level calibration is displayed in a graph.

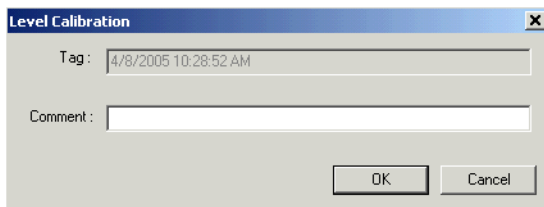
- 3-3.** Enter the data on which the calibration is based in the target data list on the right and click the Register button.

The registered target data is displayed in a graph.

By clicking the Load button, you can load the data which is already stored in the memory (file extension: .lrv) instead of entering data. You can also edit the loaded data. You can save the data by clicking the Save button (file extension: .lrv).

- 3-4.** Click the Calculate button.

The factor is calculated from the specified data.



- 3-5.** Enter a Comment.

The tag shows the date and time of the calibration. It cannot be edited. The comment can be specified as desired within 32 characters.

- 3-6.** Click the OK button.

The content of Level Calibration in the User Calibration dialog box is updated.

## 2.10.15 White Calibration for Object Color Measurement

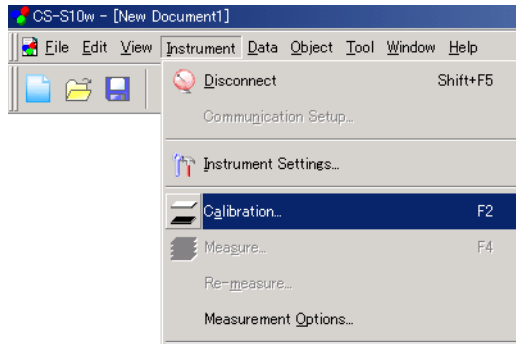
This procedure is available only when the instrument is connected to the computer.

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

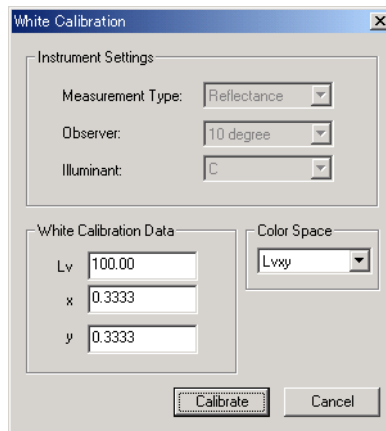
### When the CS-200 or CS-100A is connected

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

To measure transmitted object color, the calibration data is fixed (100.00 for XYZ respectively) and cannot be edited.

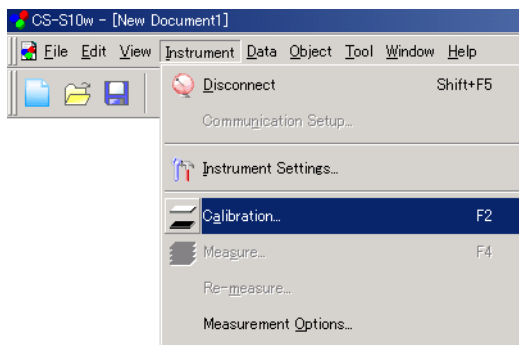
4. Click the Calibrate button to start the white calibration.

## When the CS-1000 is connected

- The white calibration for object color measurement can be performed when you are logged on the computer as a user with Administrator privileges.

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

For measurement of the reflected object color, the White Calibration dialog box appears. For measurement of the transmitted object color, the 100% Calibration dialog box appears.



### 2. To measure reflected object color, click the Change button for Standard Data File and specify the calibration data file.

Specify the calibration data file (extension: .wcb, data range: 0.0000 to 2.0000) supplied with the white calibration plate (optionally available).

A folder called "CS-1000" is created at the same level as the CS-S10w and the file is copied into the folder. The file name is displayed in the text box for Standard Data File.

You can use a desired white plate for the white calibration. In such a case, click the Load button for the Optional White Calibration Data, specify the calibration data file (extension: .wcb, data range: 0.0000 to 2.0000) and check the Use Optional White Calibration data check box.

In the spectral reflectance data file spectral reflectance must be specified for each wavelength in steps of 1 nm, starting with the shortest wavelength (380 nm) up to 780 nm. Thus, the file will contain a total of 401 spectral reflectance data.

Spectral reflectance data must be specified as follows, not in percentage. For instance, if reflectance is 35%, "0.35" must be specified.

#### Specify one reflectance for each line.

(e.g.)

0.1414	reflectance for 380 nm: 14.14%
0.1732	reflectance for 381 nm: 17.32%
0.2000	reflectance for 382 nm: 20.00%

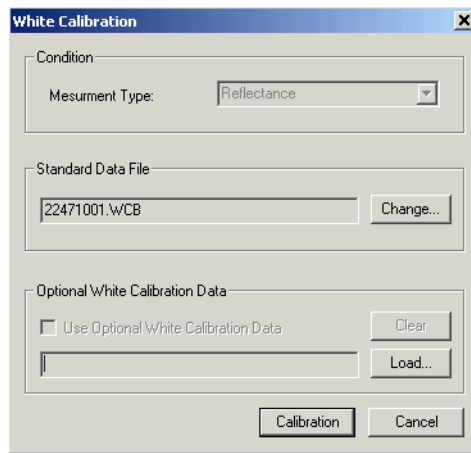
#### 401 data in total

0.2236	reflectance for 779 nm: 22.36%
0.3142	reflectance for 780 nm: 31.42%

To measure transmitted object color, the calibration data is fixed (1.0000 for all waveforms) and cannot be edited.



3. Click the Calibration button to start the white calibration.



The image shows a software dialog box titled "White Calibration". It is divided into three main sections:

- Condition:** A dropdown menu labeled "Mesurment Type:" is set to "Reflectance".
- Standard Data File:** A text field contains the file name "22471001.WCB", with a "Change..." button to its right.
- Optional White Calibration Data:** This section contains a checkbox labeled "Use Optional White Calibration Data" which is currently unchecked. To the right of the checkbox are two buttons: "Clear" and "Load...". Below the checkbox is an empty text field.

At the bottom of the dialog box, there are two buttons: "Calibration" and "Cancel".

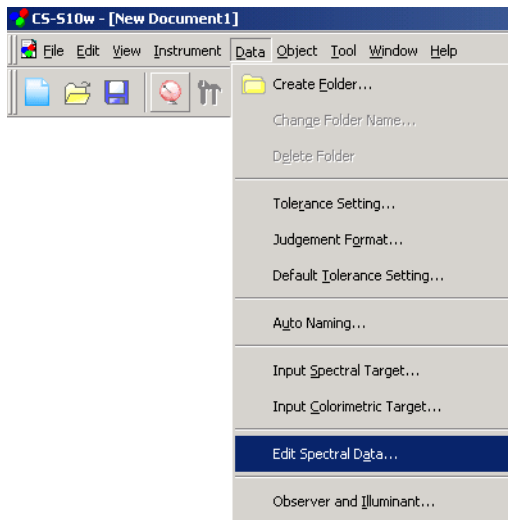
## 2.10.16 Calculating spectral data

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.

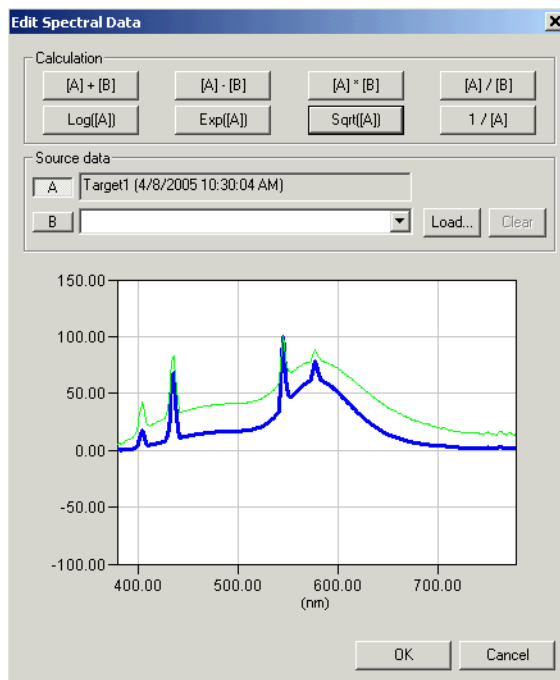
1. Select sample or target data from the list in the list window.
2. Select *Data - Edit Spectral Data* from the menu bar.

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”.

The file formats are as follows.

- Line 1:** Spectral radiance for 380 nm
- Line 2:** Spectral radiance for 381 nm
- Line 3:** Spectral radiance for 382 nm
  
- Line 400:** Spectral radiance for 779 nm
- Line 401:** Spectral radiance for 780 nm

### 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.



# CHAPTER 3

# GRAPHIC OBJECT PROPERTIES



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Image Object

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String Label Object

Line Graph Object

Line Object

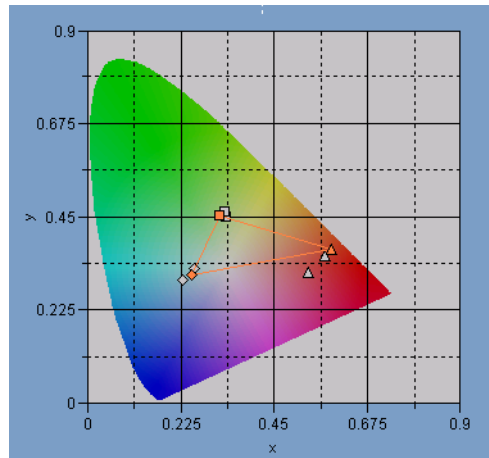
Rectangle Object

Operation of the Canvas Window in Edit Mode

## 3.1 xy Chromaticity Diagram and u'v' Chromaticity Diagram Object

### 3.1.1 Overview

The chromaticity diagram object is a graph to show the absolute values of either xy or u'v'. The values of x-y or u'-v' are plotted on the object.



### 3.1.2 Features

- Displays the absolute values of xy or u'v'
- Shows a horseshoe-shaped color display of the x-y space or u'-v' space
- The graph can be copied.
- The color of the graph can be specified (background color, axis color and label color).

### 3.1.3 Right-click Menu

Right-clicking a graphic object opens a context menu showing the menu items available. Table 1 shows the menu items displayed for the chromaticity diagram object.

xy Chromaticity Diagram and u'v' Chromaticity Diagram

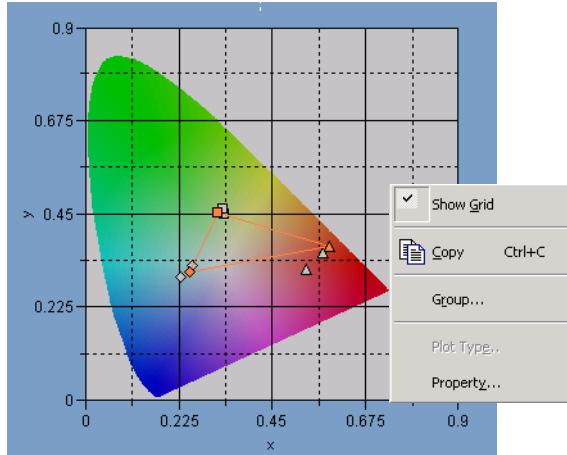


Fig. 1. Chromaticity diagram object

Title 1: Right-click menu of chromaticity diagram object

Menu Item	Function
Show Grid	Shows or hides the grid.
Copy	Copies the graphic object to the clipboard.
Group	Shows a dialog box for specifying the attributes of the data to be plotted.
Property	Shows the property dialog box for the graph.

Refer to page 187 for the group attribute setting procedure.

### 3.1.4 Property

Selecting Property from the right-click menu displays a dialog box for specifying the properties of the graph.

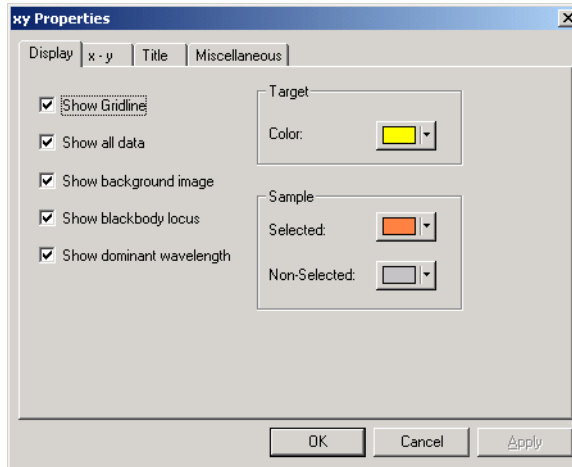
The following tabs are available for setting the properties.

- 1) Display
- 2) x-y or u'-v'
- 3) Title
- 4) Miscellaneous

The following sections describe the details of these tabs.



## 1) Display tab



### Show Gridline

Select whether to show or hide gridlines.

### Show all data

Select whether to show or hide all data of the list on the chromaticity diagram.

### Show background image

Select whether to show or hide the pseudocolor of the x-y or u'-v' space.

### Show blackbody locus

Select whether to show or hide the blackbody locus on the chromaticity diagram.

### Show dominant wavelength

Select whether to show or hide the dominant wavelength line and label on the chromaticity diagram.

### Target - Color

Specify the display color of the target data.

### Sample - Selected

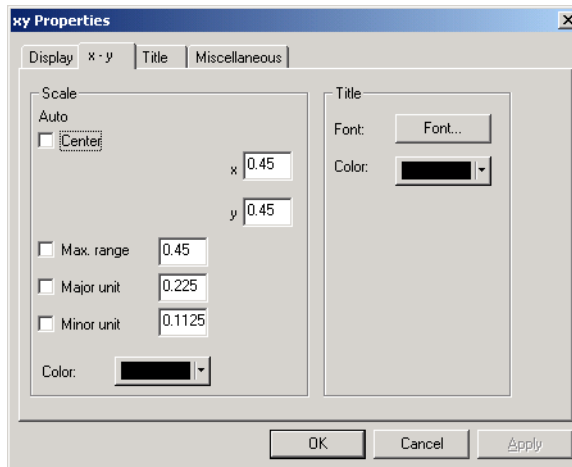
Specify the display color of the sample data that is selected.

### Sample - Non-Selected

Specify the display color of the sample data that is not selected.

See page 109 for the color setting procedure.

## 2) Chromaticity axis (x-y or u-'v') tab



### Scale - Auto [Center, Max. range, Major unit, Minor unit]

Specify whether to use the automatic setting of the scale for the chromaticity axis. When Auto is selected, these items are automatically determined according to the minimum and maximum values of the data.

### Scale - Center

Specify the coordinates of the center of the display area in the x-y or u'-v' space.

### Scale - Max. range

Specify the distance (maximum range) from the center to determine the display area.

### Scale - Value (Major unit, Minor unit)

Specify the major and minor intervals of the scales.

### Scale - Color

Specify the scale color of the chromaticity axis.

### Title - Font

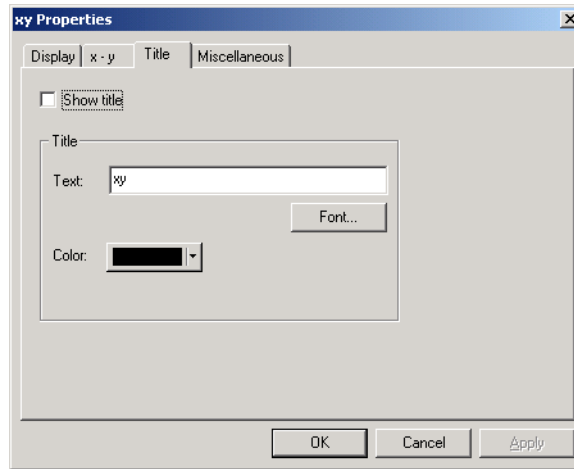
Specify the font to be used for the label appearing on the chromaticity axis. Be sure to also specify the type when specifying the font in the Font dialog box.

### Title - Color

Specify the label color of the chromaticity axis.

See page 109 for the color setting procedure.

### 3) Title tab



#### Show title

Select whether to show or hide the title of the chart.

#### Title - Text

Specify the text for the chart title.

#### Title - Font

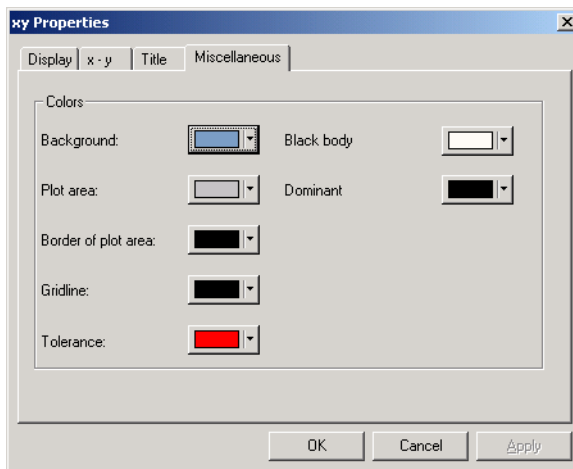
Specify the font to be used for the chart title. Be sure to also specify the type when specifying the font in the Font dialog box.

#### Title - Color

Specify the color of the chart title.

See page 109 for the color setting procedure.

#### 4) Miscellaneous tab



##### Colors - Background

Specify the background color of the graphic object.

##### Colors - Plot area

Specify the color to be used for the inside of the graph. The color can be changed only when “Show background image” in the “Display tab” on page 143 is not checked.

##### Colors - Border of plot area

Specify the border color of the graph.

##### Colors - Gridline

Specify the gridline color of the graph.

##### Colors - Tolerance

Specify the color of the tolerance data.

##### Colors - Black body

Specify the color of the black body.

##### Colors- Dominant

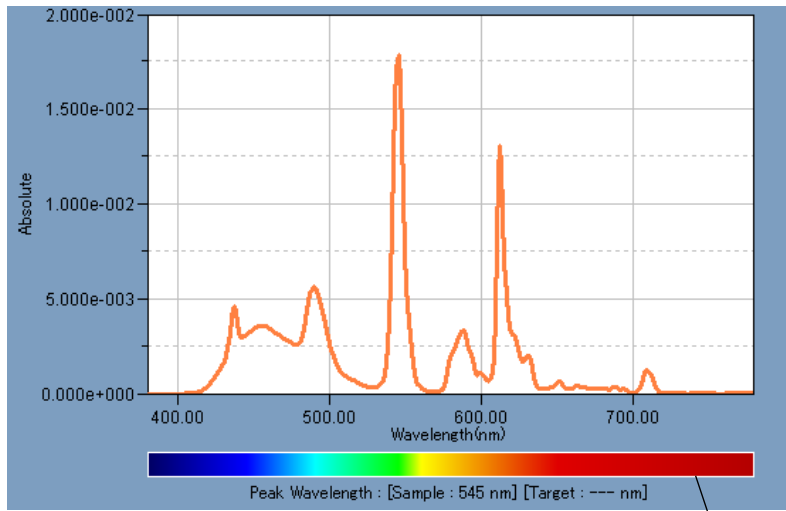
Specify the color of the dominant wavelength line and label.

See page 109 for the color setting procedure.

## 3.2 Spectral Graph Object

### 3.2.1 Overview

The spectral graph object is used to view spectral data. The horizontal axis of the graph represents the wavelength (nm) and the vertical axis represents the spectral radiance (the spectral reflectance when the object color mode is selected).



Wavelength color bar

### 3.2.2 Features

- Plots a line graph of spectral data (absolute spectral data, relative spectral data, spectral ratio).
- Indicates differences in spectral data of each wavelength.
- Displays a wavelength color bar.
- Graphs can be copied.
- Background, axis, and label colors are selectable.

### 3.2.3 Right-click Menu

Right-clicking a graphic object opens a context menu showing the available menu items. Table 2 shows the menu items available for the spectral graph object.

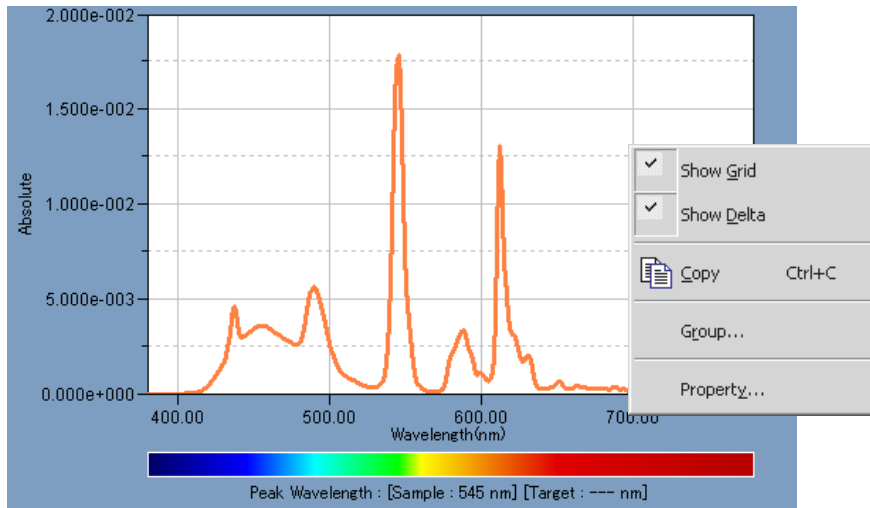


Fig. 2. Spectral graph object

Title 2: Right-click menu of spectral graphic object

Menu Item	Function
Show Grid	Shows or hides the grid.
Show Delta	Shows differences between target data and sample data at each wavelength.
Copy	Copies the graphic object to the clipboard.
Group	Shows a dialog box for specifying the attributes of the data to be plotted.
Property	Shows the property dialog box for the graph.

See page 187 for the group attribute setting procedure.

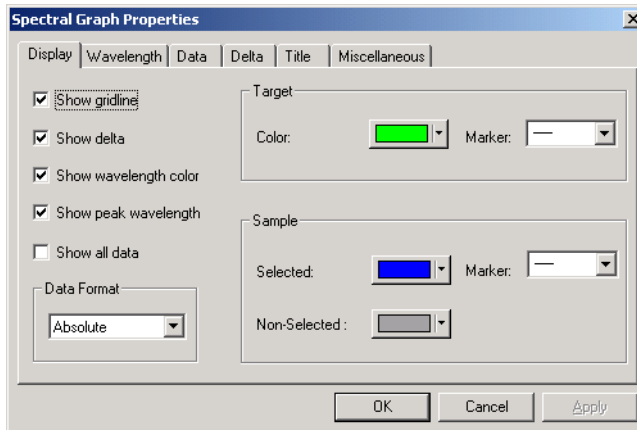
### 3.2.4 Setting Properties

Selecting Property from the right-click menu displays a dialog box for specifying the properties of the graph. The following six tabs are available for setting the properties of the spectral graph object.

- 1) Display
- 2) Wavelength
- 3) Data
- 4) Delta
- 5) Title
- 6) Miscellaneous

The following sections describe the details of these tabs.

## 1) Display tab



### Show gridline

Select whether to show or hide gridlines.

### Show delta

Select whether to show or hide the difference in reflectance between target data and sample data.

**Note:** When two or more pieces of sample data are selected, the results are overlapped on the graph.

### Show wavelength color

Select whether to display the wavelength color bar below the wavelength axis.

### Show peak wavelength

Select whether to show or hide the peak wavelength.

### Show all data

Select whether to show or hide all the data other than the selected data.

### Data Format

Select the data format to display.

Selectable item: Absolute, Relative, Ratio

### Target - Color

Specify the display color of the target data.

### Target - Marker

Specify -●-, -■-, X or --- as the line type to indicate the target data.

### Sample - Selected

Specify the display color of the sample data being selected in the list window.

### Sample - Non-Selected

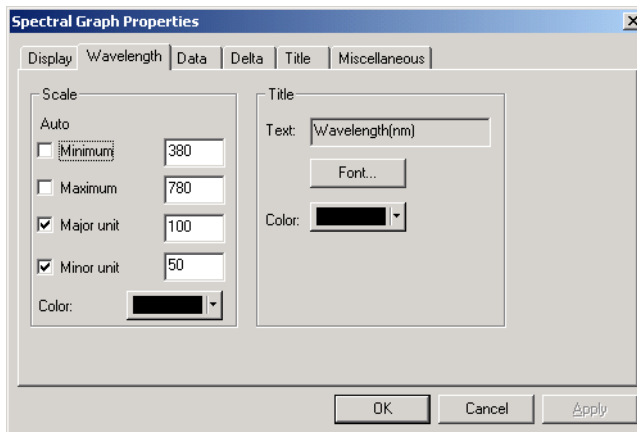
Specify the display color of the sample data that is not being selected in the list window.

### Sample - Marker

Specify -●-, -■-, X or --- as the line type to indicate the sample data.

See page 109 for the color setting procedure.

## 2) Wavelength tab



### Scale - Auto [Minimum, Maximum, Major unit, Minor unit]

Specify whether to use the automatic setting of the scale for the data axis (horizontal axis). When Auto is selected, these items are automatically determined according to the minimum and maximum values of the data.

### Scale - Value [Minimum, Maximum, Major unit, Minor unit]

Specify the minimum value, maximum value, major unit and minor unit of the scale for the data axis.

### Scale - Color

Specify the scale color of the data axis.

### Title - Text [Cannot be edited.]

This is the label text appearing on the wavelength axis.

### Title - Font

Specify the font to be used for the label appearing on the data axis. Be sure to also specify the language when specifying the font in the Font dialog box.

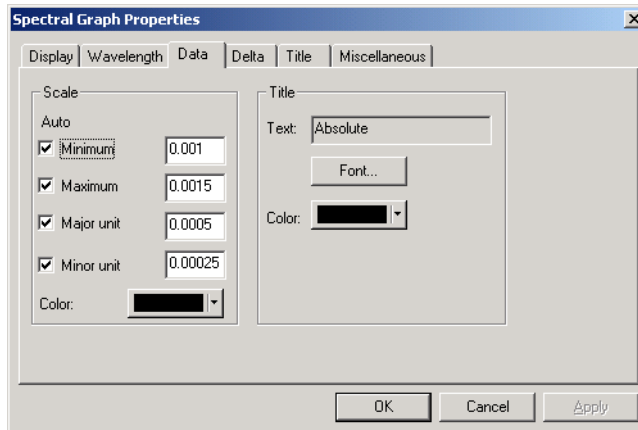
### Title - Color

Specify a label color for the data axis.

See page 109 for the color setting procedure.



### 3) Data tab



#### Scale - Auto [Minimum, Maximum, Major unit, Minor unit]

Specify whether to use the automatic setting of the scale for the reflectance axis (horizontal axis). When Auto is selected, these items are automatically determined according to the minimum and maximum values of the data.

#### Scale - Value [Minimum, Maximum, Major unit, Minor unit]

Specify the minimum value, maximum value, major unit and minor unit of the scale for the reflectance axis.

#### Scale - Color

Specify the scale color of the reflectance axis.

#### Title - Text [Cannot be edited.]

This is the label text appearing on the data axis.

#### Title - Font

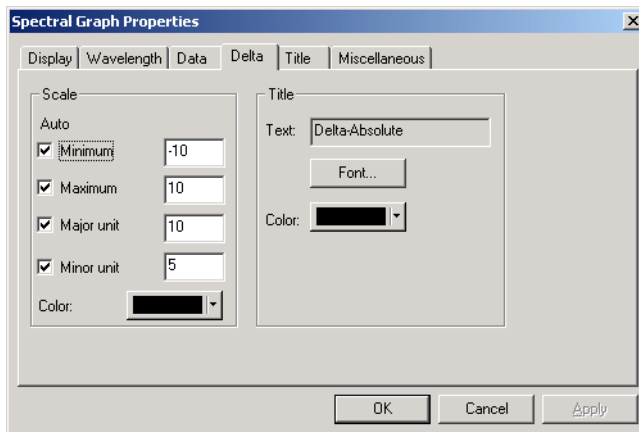
Specify the font to be used for the label appearing on the reflectance axis. Be sure to also specify the language when specifying the font in the Font dialog box.

#### Title - Color

Specify the label color for the reflectance axis.

See page 109 for the color setting procedure.

## 4) Delta tab



### Scale - Auto [Minimum, Maximum, Major unit, Minor unit]

Specify whether to use the automatic setting of the scale for the delta-reflectance axis (vertical axis on the right). When Auto is selected, these items are automatically determined according to the minimum and maximum values of the data.

### Scale - Value [Minimum, Maximum, Major unit, Minor unit]

Specify the minimum value, maximum value, major unit and minor unit of the scale for the delta-reflectance axis.

### Scale - Color

Specify the scale color of the delta-reflectance axis.

### Title - Text [Cannot be edited.]

This is the label text appearing on the delta data axis.

### Title - Font

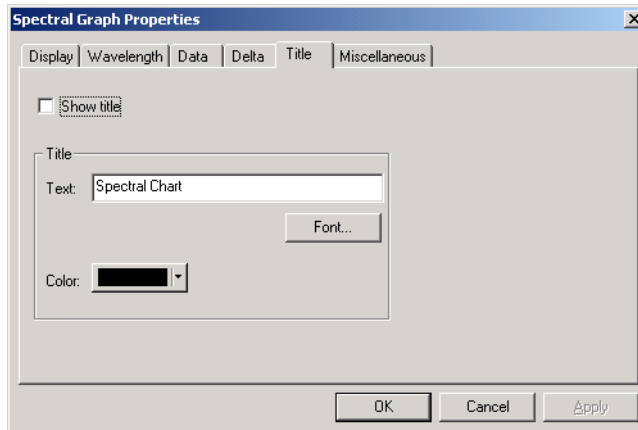
Specify the font to be used for the label appearing on the delta-reflectance axis. Be sure to also specify the language when specifying the font in the Font dialog box.

### Title - Color

Specify the label color for the delta-reflectance axis.

See page 109 for the color setting procedure.

## 5) Title tab



### Show title

Select whether to show or hide the title of the chart.

### Title - Text

Specify the text for the chart title.

### Title - Font

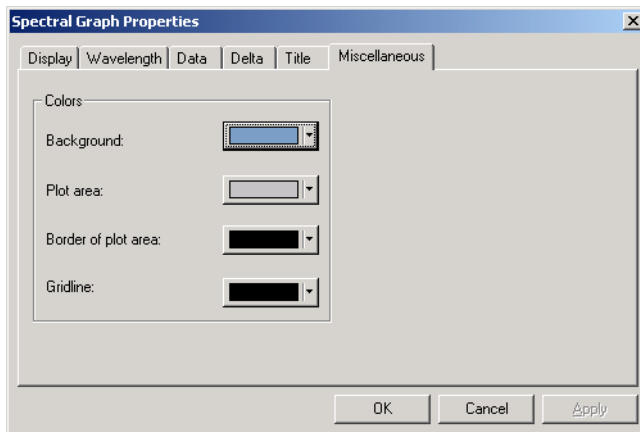
Specify the font to be used for the chart title. Be sure to also specify the language when specifying the font in the Font dialog box.

### Title - Color

Specify the color of the chart title.

See page 109 for the color setting procedure.

## 6) Miscellaneous



### Colors - Background

Specify the background color of the graphic object.

### Colors - Plot area

Specify the color to be used for the inside of the graph.

### Colors - Border of plot area

Specify the border color of the graph.

### Colors - Gridline

Specify the gridline color of the graph.

See page 109 for the color setting procedure.

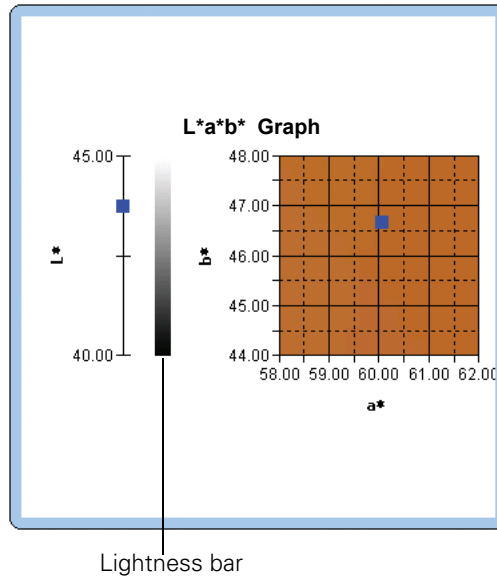
## 3.3 L\*a\*b\* Graph Object



### 3.3.1 Overview

The L\*a\*b\* graph object is used to view the absolute values under the L\*a\*b\* color system. The L\* value is plotted on the left side of the object, and the a\*-b\* value is plotted on the right side.

Depending on the plot type selected, you can hide the L\* value by selecting an appropriate plot type.



### 3.3.2 Features

- Plots an absolute graph for the L\*a\*b\* color system.
- Shows the lightness bar.
- Shows the pseudo color of the a\*-b\* color space.
- Graphs can be copied.
- Background, axis, and label colors are selectable.

### 3.3.3 Right-click Menu

Right-clicking a graphic object opens a context menu showing the available menu items. Table 3 shows the menu items displayed for the L\*a\*b\* graph object.

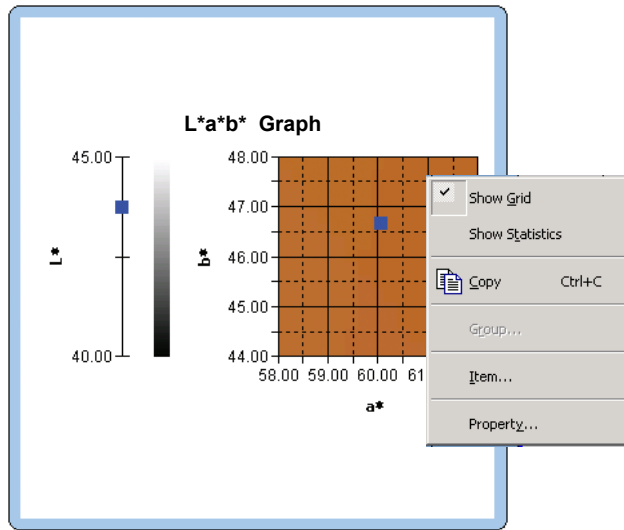


Fig. 3. L\*a\*b\* graph object

Title 3: Right-click menu of L\*a\*b\* graph object

Menu Item	Function
Show Grid	Shows or hides the grid.
Copy	Copies the graphic object to the clipboard.
Group	Shows a dialog box for specifying the attributes of the data to be plotted.
Plot Type	Shows a dialog box for specifying a space to be drawn. Select one from “L*, a*-b*”, “a*-b*”, “a*-L*” or “b*-L*”.
Property	Shows the property dialog box for the graph.

See page 187 for the group attribute setting procedure.

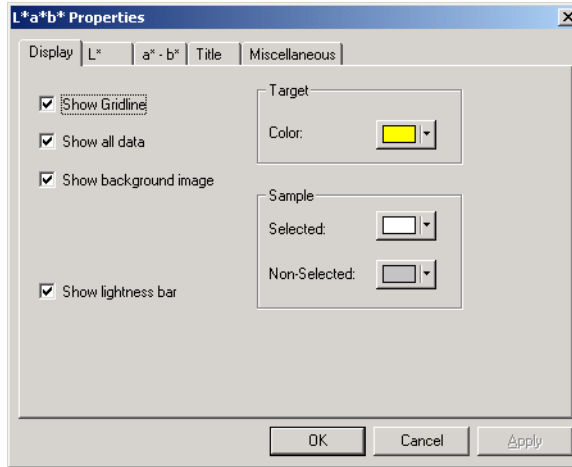
### 3.3.4 Setting Properties

Selecting Property from the right-click menu displays a dialog box for specifying the properties of the graph. The following five tabs are available for setting the properties of the L\*a\*b\* graph object.

- 1) Display
- 2) L\*
- 3) a\*-b\*, a\*-L\* or b\*-L\*
- 4) Title
- 5) Miscellaneous

The following sections describe the details of these tabs.

## 1) Display tab



### Show Gridline

Select whether to show or hide gridlines.

### Show all data

Select whether to show or hide all data of the list on the graph.

### Show background image

Select whether to show or hide the pseudocolor of the a\*-b\* color space.

### Show lightness bar

Select whether to display the lightness bar for the L\* axis.

### Target - Color

Specify the display color of the target data.

### Sample - Selected

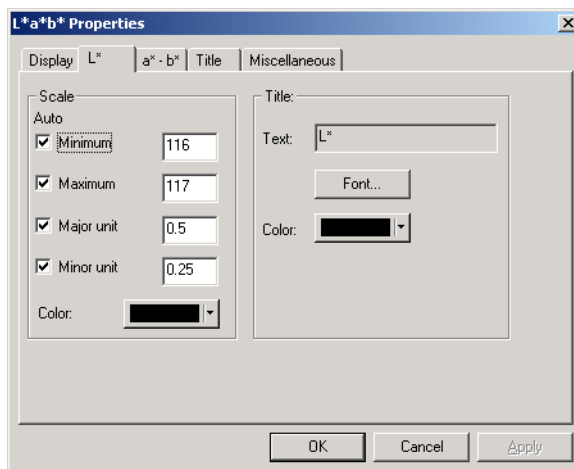
Specify the display color of the sample data that is selected.

### Sample - Non-Selected

Specify the display color of the sample data that is not selected.

See page 109 for the color setting procedure.

## 2) Lightness axis (L\*) tab



### Scale - Auto [Minimum, Maximum, Major unit, Minor unit]

Specify whether to use the automatic setting of the scale for the lightness axis. When Auto is selected, these items are automatically determined according to the minimum and maximum values of the data.

### Scale - Value [Minimum, Maximum, Major unit, Minor unit]

Specify the minimum value, maximum value, major unit and minor unit of the scale for the lightness axis.

### Scale - Color

Specify the scale color of the lightness axis.

### Title - Text [Cannot be edited.]

This is the label text appearing on the lightness axis.

### Title - Font

Specify the font to be used for the label appearing on the lightness axis. Be sure to also specify the type when specifying the font in the Font dialog box.

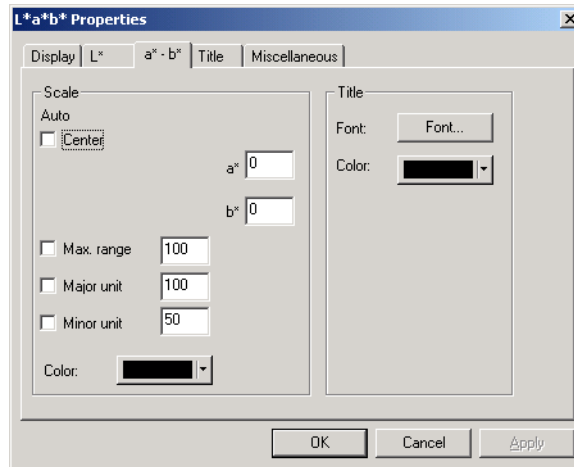
### Title - Color

Specify the label color of the lightness axis.

See page 109 for the color setting procedure.



### 3) Chromaticity axis (a\*-b\*) tab



#### Scale - Auto [Center, Max. range, Major unit, Minor unit]

Specify whether to use the automatic setting of the scale. When Auto is selected, these items are automatically determined according to the minimum and maximum values of the data.

#### Scale - Center

Specify the coordinates of the center of the display area in the color space.

#### Scale - Max. range

Specify the distance (maximum range) from the center in order to limit the display area.

#### Scale - Value [Major unit, Minor unit]

Specify the major and minor units of the scale.

#### Scale - Color

Specify the scale color.

#### Title - Font

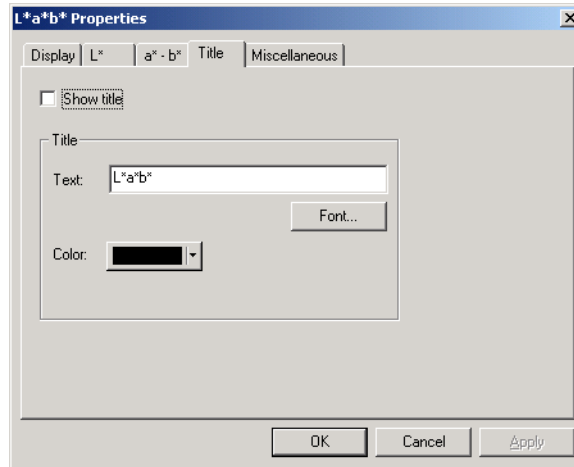
Specify the font to be used for the label text. Be sure to also specify the type when specifying the font in the Font dialog box.

#### Title - Color

Specify the label color.

See page 109 for the color setting procedure.

## 4) Title tab



### Show title

Select whether to show or hide the title of the graph.

### Title - Text

Specify the text for the graph title.

### Title - Font

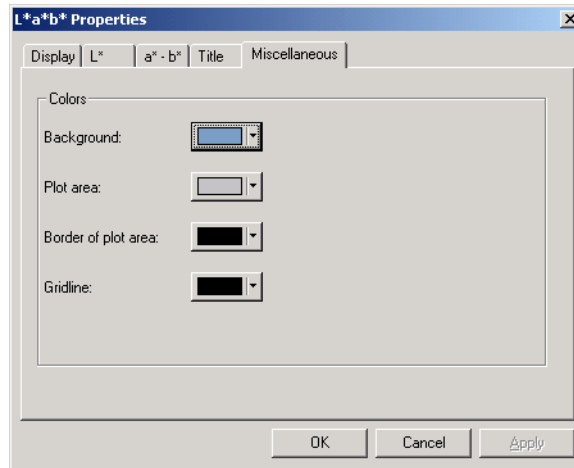
Specify the font to be used for the graph title. Be sure to also specify the type when specifying the font in the Font dialog box.

### Title - Color

Specify the color of the graph title.

See page 109 for the color setting procedure.

## 5) Miscellaneous tab



### Colors - Background

Specify the background color of the graphic object.

### Colors - Plot area

Specify the color to be used for the inside of the graph. The color can be changed only when "Show background image" in the "Display" tab on page 157 is not checked.

### Colors - Border of plot area

Specify the border color of the graph.

### Colors - Gridline

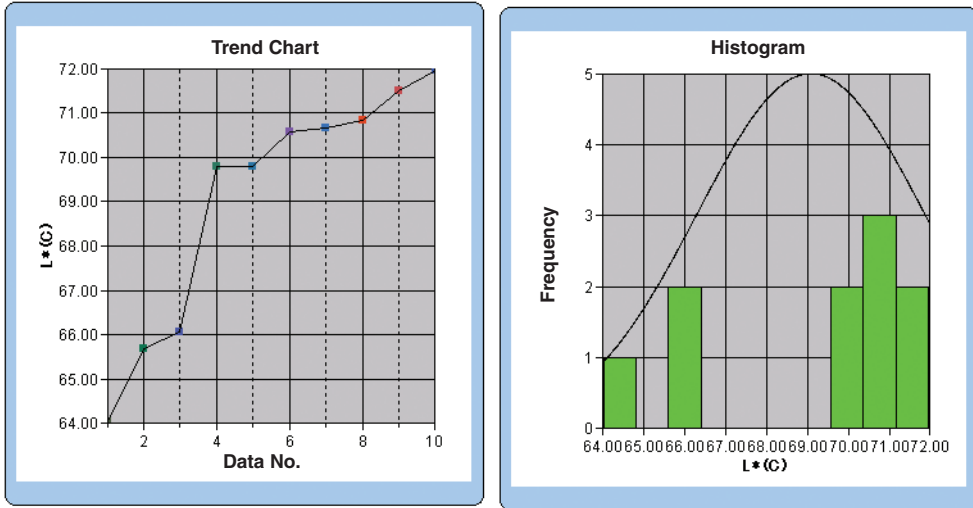
Specify the gridline color of the graph.

See page 109 for the color setting procedure.

# 3.4 Trend Chart/Histogram Object

## 3.4.1 Overview

This object is used to view the trend of the specific color value and color difference value. The data of the trend chart can also be displayed as a histogram or normal distribution.



Trend Chart/  
Histogram  
Object

## 3.4.2 Features

- Plots a trend chart.
- Draws a histogram.
- Draws the normal distribution.
- Shows statistics (average, standard deviation, maximum value and minimum value).

### 3.4.3 Right-click Menu

Right-clicking a graphic object opens a context menu showing the available menu items. Table 4 shows the menu items displayed for the trend chart/histogram object.

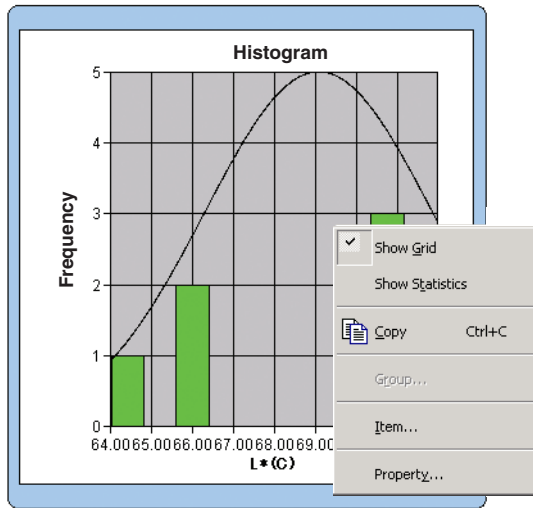


Fig. 4. Trend chart/histogram object

Table 4. Right-click menu of the trend chart/histogram object

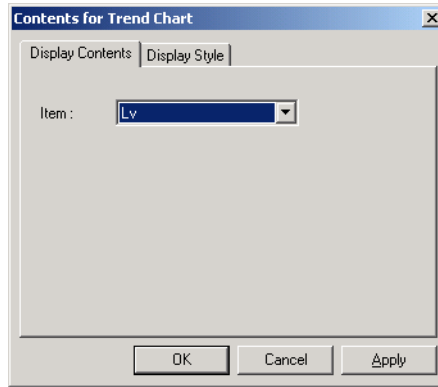
Menu Item	Function
<b>Show Grid</b>	Shows or hides the grid.
<b>Show Statistics</b>	Shows or hides the statistics.
<b>Copy</b>	Copies the graphic object to the clipboard.
<b>Group</b>	Shows a dialog box for specifying the attributes of the data to be plotted.
<b>Item</b>	Shows a dialog box for specifying the target data used for judgement and the display style.
<b>Property</b>	Shows the property dialog box.

See page 187 for the group attribute setting procedure.

### 3.4.4 Setting Items

Selecting Items from the right-click menu displays a dialog box for specifying the target value to be used for judgement for the trend chart/histogram and the display style.

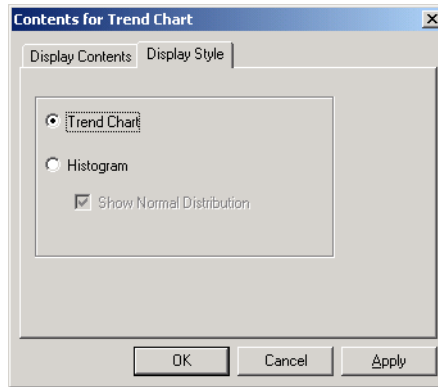
#### 1) Display Contents tab



##### Item:

Select the colorimetric data used for judgement.

#### 2) Display Style tab



##### Display Style

Select either Trend Chart or Histogram.

When Histogram is selected, you can specify whether to display normal distribution.

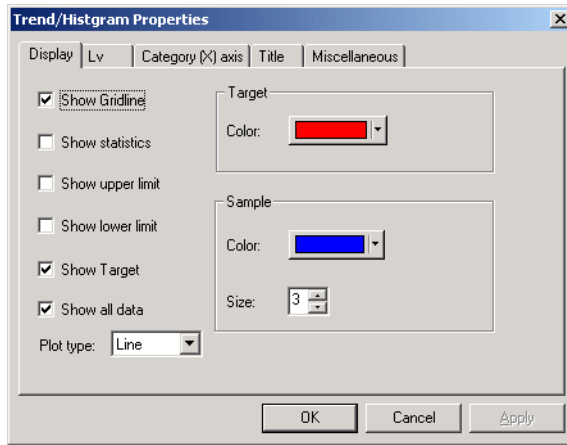
### 3.4.5 Setting Properties

The following five tabs are available for setting the properties of the trend chart/histogram object.

- 1) Display
- 2) Judgement data axis (Example:  $\Delta E$ )
- 3) Category axis
- 4) Title
- 5) Miscellaneous

The following sections describe the details of these tabs.

## 1) Display tab



### Show Gridline

Select whether to show or hide gridlines.

### Show statistics

Select whether to show or hide statistics (average, standard deviation, maximum value, minimum value).

### Show upper limit

Select whether to show or hide the upper limit in the trend chart.

### Show lower limit

Select whether to show or hide the lower limit in the trend chart.

### Show Target

Select whether to show or hide the target data in the trend chart.

### Show all data

Select whether or not to show all data when using a line graph in the trend chart. When not selected, some data including currently selected measurement data are displayed.

### Plot type

Specify a data plot method to be used in the trend chart such as a bar graph or line graph.

### Target - Color

Specify a color to indicate the target data.

### Sample - Color

Specify the display color of the sample data currently selected in the trend chart.

### Sample - Size

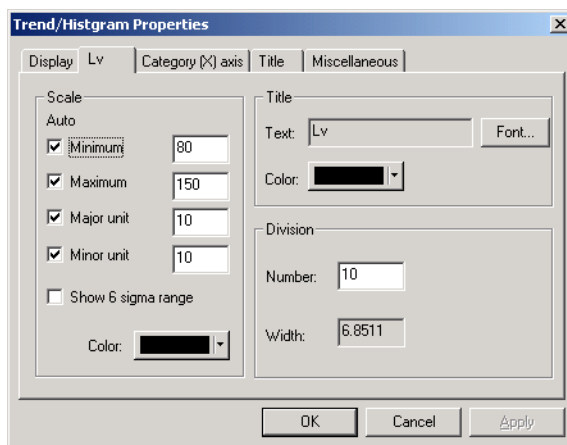
Specify the size (0 to 5) of the marker for plotting the sample data in the trend chart. (When 0 is selected, the marker is not displayed.)

- When the selected list items are absolute values (e.g. Lv, x, y, L\*, a\*, b\*), the upper and lower limits are not displayed in the trend chart. Even if the option is checked, it is ignored.
- When the selected list items are color difference values (e.g.  $\Delta Lv$ ,  $\Delta x$ ,  $\Delta y$ ,  $\Delta L^*$ ,  $\Delta a^*$ ,  $\Delta b^*$ ), the target data is always 0. Consequently, even when the option is checked, the target data will not be displayed in the trend chart.

See page 109 for the color setting procedure.

## 2) Judgement data axis tab

Specify the properties of the colorimetric data axis selected in the Display Contents tab in the Item properties. The selected colorimetric data is shown as the name of the tab.



### Scale - Auto [Minimum, Maximum, Major unit, Minor unit]

Specify whether to use the automatic setting of the scale for the colorimetric data axis (vertical axis) selected in the Display Contents tab in the Item properties. When Auto is selected, these items are automatically determined according to the minimum and maximum values of the data.

### Scale - Value [Minimum, Maximum, Major unit, Minor unit]

Specify the minimum value, maximum value, major unit and minor unit of the scale for the colorimetric data axis selected in the Display Contents tab in the Item properties.

### Scale - Show 6 sigma range

Enable display of the range between  $-3\sigma$  to  $+3\sigma$ .

\* “ $\sigma$ ” represents the standard deviation.

### Scale - Color

Specify the scale color of the judgement data axis.

### Title - Text [Cannot be edited.]

The colorimetric data selected in the Display Contents tab in the Item properties is displayed.

### Title - Font

Specify the font to be used for the label appearing on the colorimetric data axis selected in the Display Contents tab in the Item properties. Be sure to also specify the type when specifying the font in the Font dialog box.

### Title - Color

Specify the label color of the colorimetric data axis selected in the Display Contents tab in the Item properties.

### Division - Number

Specify the number of divisions between the minimum and maximum values used for data sampling in the histogram.

### Division - Width [Cannot be edited.]

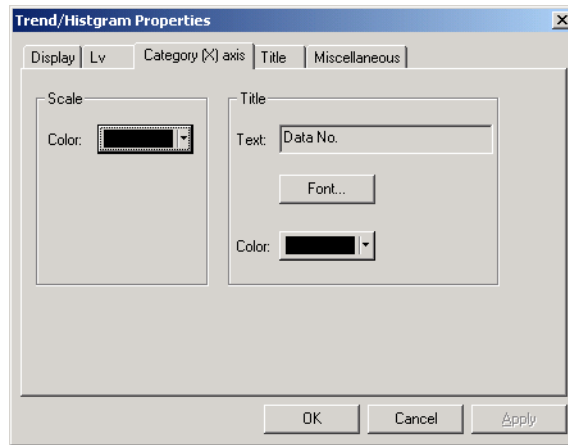
The width of a division used for data sampling in the histogram is displayed.

See page 109 for the color setting procedure.



### 3) Category tab

Specify the properties of the data No. and axes to display a trend chart, and specify the properties of the frequency axis to display a histogram.



#### Scale - Color

Specify the scale color.

#### Title - Text [Cannot be edited.]

The label text is displayed.

#### Title - Font

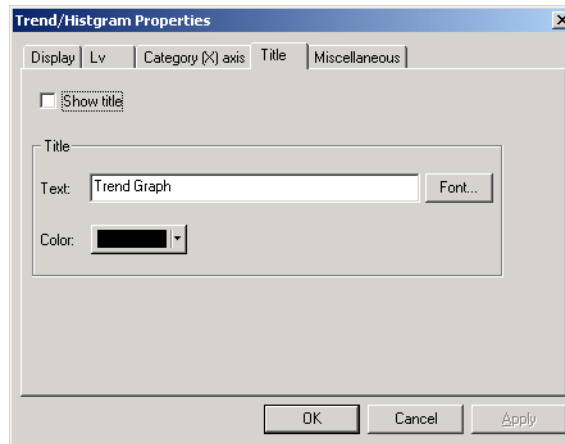
Specify the font to be used for the label text. Be sure to also specify the type when specifying the font in the Font dialog box.

#### Title - Color

Specify the label color.

See page 109 for the color setting procedure.

## 4) Title tab



### Show title

Select whether to show or hide the title of the chart.

### Title - Text

Specify the text for the chart title.

### Title - Font

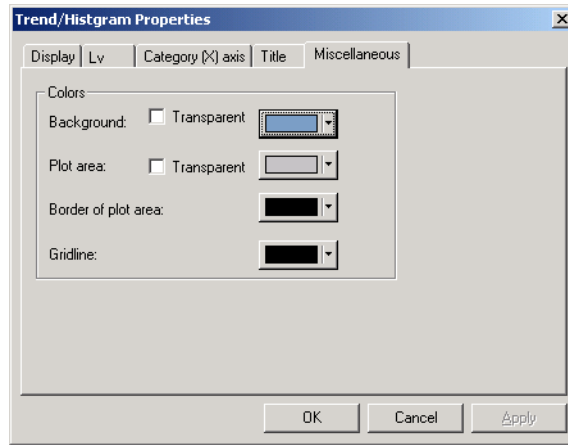
Specify the font to be used for the chart title. Be sure to also specify the type when specifying the font in the Font dialog box.

### Title - Color

Specify the color of the chart title.

See page 109 for the color setting procedure.

## 5) Miscellaneous tab



### Colors - Background

Specify the background color of the graphic object.

### Colors - Background - Transparent

Specify the background to the transparent display.

### Colors - Plot area

Specify the color to be used for the inside of the chart.

### Colors - Plot area - Transparent

Specify the graph area to the transparent display.

### Colors - Border of plot area

Specify the border color of the chart.

### Colors - Gridline

Specify the gridline color of the chart.

See page 109 for the color setting procedure.

## 3.5 Image Object

### 3.5.1 Overview

The image object is used to view an image file in JPEG or BMP format. The measurement spot can be marked on the image object. (See Fig. 5.)

### 3.5.2 Features

- Displays a specified image (JPEG or BMP format).
- Shows a marker at a measurement spot.
- Graphs can be copied.

### 3.5.3 Right-click Menu

Right-clicking a graphic object opens a context menu as shown in Fig. 5. Table 5 shows the menu items displayed for the image object.



Fig. 5. Image object

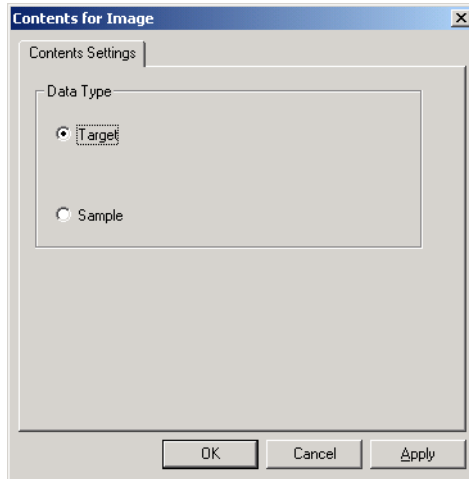
Table 5. Right-click menu of image object

Menu Item	Function
<b>Copy</b>	Copies the graphic object to the clipboard.
<b>Item</b>	Shows a dialog box for specifying the data to be displayed.
<b>Property</b>	Shows the property dialog box.

## 3.5.4 Setting Items

Selecting Items from the right-click menu displays a dialog box for specifying the type of the data to be displayed.

### 1) Content Settings tab



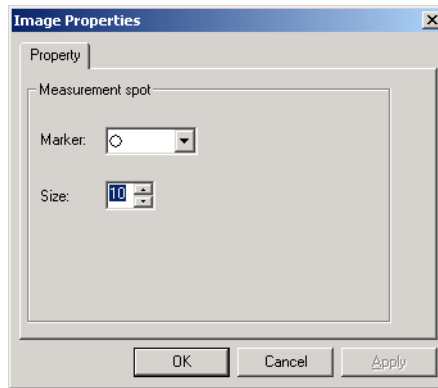
#### Data Type

Select whether to display the target data or sample data.

## 3.5.5 Setting Properties

Selecting Property from the right-click menu displays a dialog box for specifying the properties. The following tab is available for setting the properties of the image object.

### 1) Property tab



#### Measurement spot - Marker

Specify  $\times$ ,  $\circ$  or  $\oplus$  as the marker type.

#### Measurement spot - Size

Specify the size of the marker.

## 3.6 Data Label Object

### 3.6.1 Overview

The data label object is used to show colorimetric data or judgement items such as “Pass/Fail.” When Lv is selected as the data to be shown, for example, the object is displayed as shown in Fig. 6.

### 3.6.2 Features

- Displays colorimetric data.
- Displays judgement items (such as “Pass/Fail”).

### 3.6.3 Right-click Menu

Right-clicking a data label object opens a context menu as shown in Fig. 6. Table 6 shows the menu items displayed for the data label object.

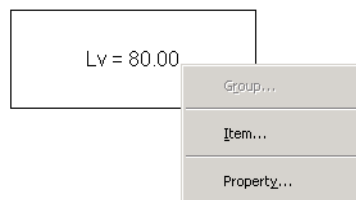


Fig. 6. Data label object

Table 6. Right-click menu of data label object

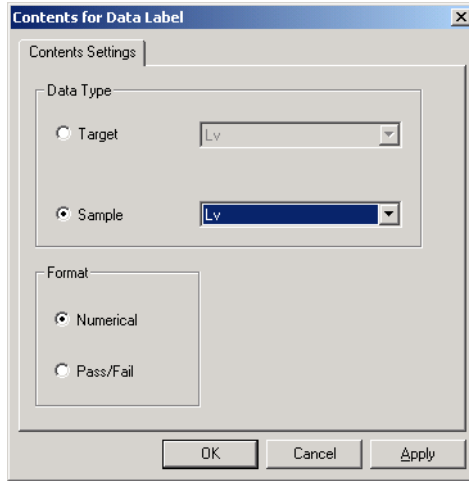
Menu Item	Function
<b>Group</b>	Shows a dialog box for specifying the attributes of the data to be plotted.
<b>Item</b>	Shows a dialog box for specifying the data to be displayed.
<b>Property</b>	Shows the property dialog box.

See page 187 for the group attribute setting procedure.

## 3.6.4 Setting Items

Selecting Items from the right-click menu displays a dialog box for specifying the type and format of the data to be displayed.

### 1) Contents Settings tab



#### Data Type

Select whether to display the target data or sample data and choose the contents of the selected data.

#### Format

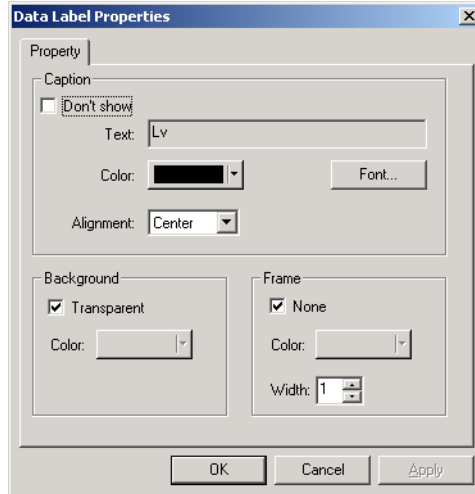
Select the format of the display items when sample data is selected for Data Type.  
Selectable item: Numeric value, assessment (result of the pass/fail judgement).



## 3.6.5 Setting Properties

Selecting Property from the right-click menu displays a dialog box for specifying the properties. The following tab is available for setting the properties of the data label object.

### 1) Property tab



#### Caption - Don't show

Select whether to show or hide the caption text.

#### Caption - Text [Cannot be edited.]

The text describing the data is displayed.

#### Caption - Color

Specify the color of the text.

#### Caption - Font

Specify the font to be used for the text. Be sure to also specify the type when specifying the font in the Font dialog box.

#### Caption - Alignment

Specify Left, Center, or Right for the alignment of the text within the label.

#### Background - Transparent

Specify whether to fill in the background. When pseudo color is selected as the data to be displayed, selecting fill the background fills the background of the label with the pseudo color.

#### Background - Color

Specify the background color of the label.

When pseudo color is selected as the data to be displayed, the background is filled with the pseudo color. Even if the background color is changed here, the setting will return to the pseudo color.

#### Frame - None

Select whether to draw a frame around the label.

#### Frame - Color

Specify a color for the frame around the label.

#### Frame - Width

Specify the width of the frame around the label.

See page 109 for the color setting procedure.

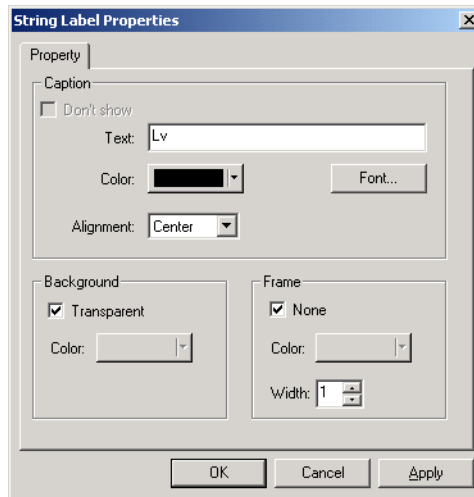
## 3.7 String Label Object

The string (text) label object is used to show the name of the data to be displayed.

### 3.7.1 Setting Properties

Selecting Property from the right-click menu displays a dialog box for specifying the properties. The following tab is available for setting the properties of the string label object.

#### 1) Property tab



#### Caption - Text

Type the name of the data to be displayed.

#### Caption - Color

Specify the color of the text.

#### Caption - Font

Specify the font to be used for the text. Be sure to also specify the type when specifying the font in the Font dialog box.

#### Caption - Alignment

Specify Left, Center or Right for the alignment of the text within the label.

#### Background - Transparent

Specify whether to fill in the background.

#### Background - Color

Specify the background color of the label.

#### Frame - None

Select whether to draw a frame around the label.

#### Frame - Color

Specify a color for the frame around the label.

#### Frame - Width

Specify the width of the frame around the label.

See page 109 for the color setting procedure.

## 3.8 Line Graph Object

### 3.8.1 Overview

The line graph object is used to judge data between different attributes. The group attributes are plotted on the horizontal axis, and the colorimetric data is plotted on the vertical axis.

When the type of document file is set to the Light-source Color - RGB Mode measurement, the data for red, green and blue are displayed with a line.

### 3.8.2 Features

- Shows data with two or more attributes
- Shows the tolerance of each attribute

### 3.8.3 Right-click Menu

Right-clicking a graphic object opens a context menu showing the available menu items as shown in Fig. 8.

Table 8 shows the menu items displayed for the line graph object.

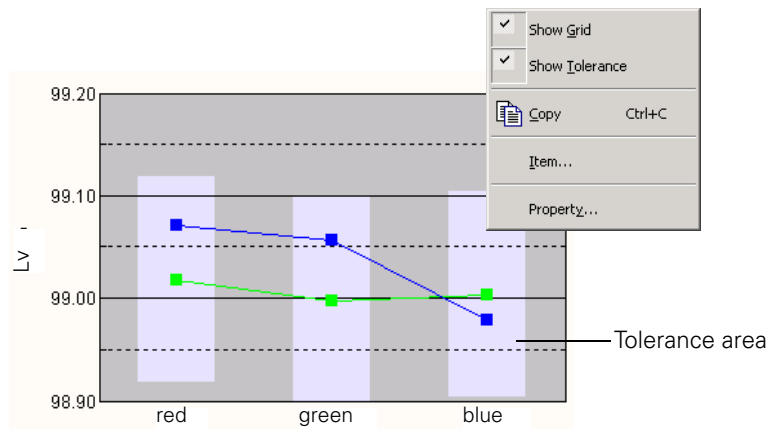


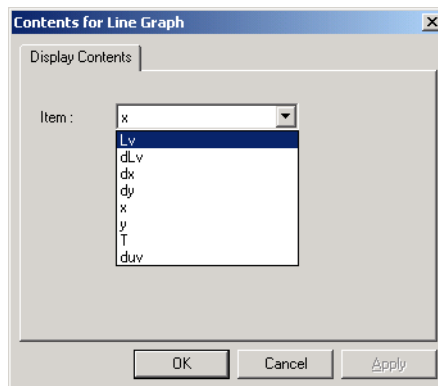
Fig. 8. Line graph object

Table 8: Right-click menu of line graph object

Menu Item	Function
<b>Show Grid</b>	Shows or hides the grid.
<b>Show Tolerance</b>	Shows or hides the tolerances
<b>Copy</b>	Copies the graphic object to the clipboard
<b>Item</b>	Shows a dialog box for specifying a data item to be judged.
<b>Property</b>	Shows the property dialog box

### 3.8.4 Setting Items

When Item is selected from the right-click menu, a dialog box appears for specifying the type of data to be displayed.



#### Item

Select colorimetric data to be judged.

Available item: The colorimetric data selected in the list items

### 3.8.5 Setting Properties

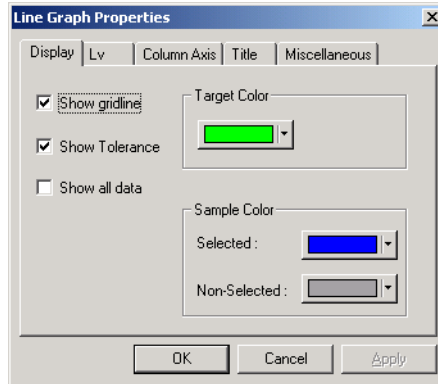
Selecting Property from the right-click menu displays a dialog box for specifying the properties of the graph.

The following five tabs are available for setting the properties of the line graph object.

- 1) Display
- 2) Judgement data axis (Example: Lv)
- 3) Column Axis
- 4) Title
- 5) Miscellaneous

The following sections describe the details of these tabs.

## 1) Display tab



### Show gridline

Select whether to show or hide gridlines.

### Show Tolerance

Select whether to show or hide tolerances.

### Show all data

Select whether to show or hide all of the data.

### Target Color

Specify the color to indicate target data.

### Sample Color - Selected

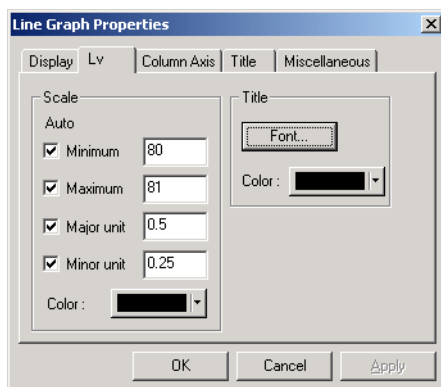
Specify the color of the sample data currently selected.

### Sample Color - Non- Selected

Specify the color of the sample data that is not currently selected.

## 2) Judgement data axis (Example: $\Delta Lv$ ) tab

Specify the properties of the colorimetric data axis selected with Item.  
The selected colorimetric data is shown as the name of the tab.



### Scale - Auto [Minimum, Maximum, Major unit, Minor unit]

Specify whether to use the automatic setting of the scale for the colorimetric data axis (vertical axis) selected in the Display Contents tab in the Item properties. When Auto is selected, these items are automatically determined according to the minimum and maximum values of the data.

### Scale - Value [Minimum, Maximum, Major unit, Minor unit]

Specify the minimum value, maximum value, major unit and minor unit of the scale for the colorimetric data axis selected in the Display Contents tab in the Item properties.

### Scale - Color

Specify the scale color of the judgement data axis.

### Title - Font

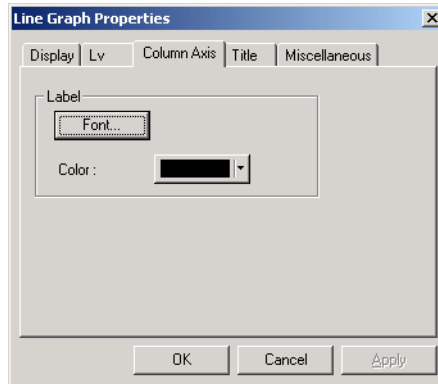
Specify the font to be used for the label appearing on the colorimetric data axis selected in the Display Contents tab in the Item properties. Be sure to also specify the type when specifying the font in the Font dialog box.

### Title - Color

Specify the label color of the colorimetric data axis selected in the Display Contents tab in the Item properties.

See page 109 for the color setting procedure.

### 3) Column Axis (attribute) tab



#### Label - Font

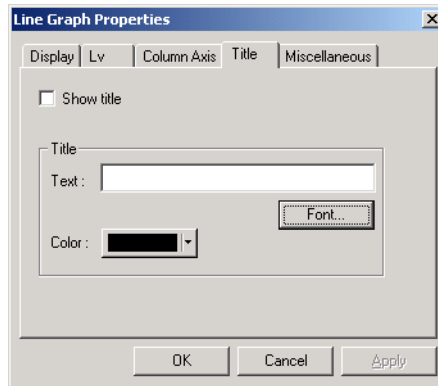
Specify the font to be used for the label text. Be sure to also specify the type when specifying the font in the Font dialog box.

#### Label - Color

Specify the label color.

See page 109 for the color setting procedure.

## 4) Title tab



### Show title

Select whether to show or hide the title of the chart.

### Title - Text

Specify the text for the chart title.

### Title - Font

Specify the font to be used for the chart title. Be sure to also specify the type when specifying the font in the Font dialog box.

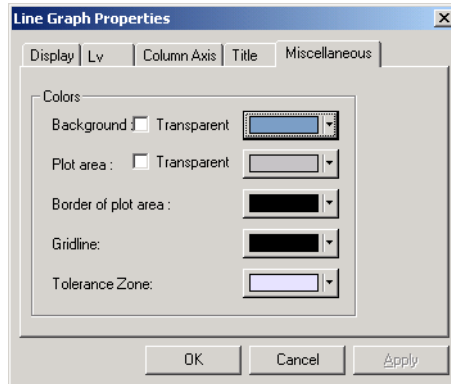
### Title - Color

Specify the color of the chart title.

See page 109 for the color setting procedure.



## 5) Miscellaneous



### Colors - Background

Specify the background color of the graphic object.

### Colors - Background - Transparent

Specify the background to the transparent display.

### Colors - Plot area

Specify the color to be used for the inside of the chart.

### Colors - Plot area - Transparent

Specify the graph area to the transparent display.

### Colors - Border of plot area

Specify the border color of the chart.

### Colors - Gridline

Specify the gridline color of the chart.

### Color - Tolerance

Specify the color of the tolerance area.

See page 109 for the color setting procedure.

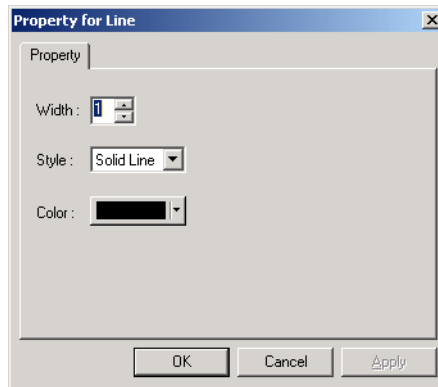
## 3.9 Line Object

The line object is used to draw lines.

### 3.9.1 Setting Properties

Selecting Property from the right-click menu displays a dialog box for specifying the properties. The following tab is available for setting the properties of the line object.

#### 1) Property tab



#### Width

Specify the width of the line.

#### Style

Select Solid Line, Dashed Line or Dotted Line as the line style.

#### Color

Specify the color of the line.

See page 109 for the color setting procedure.

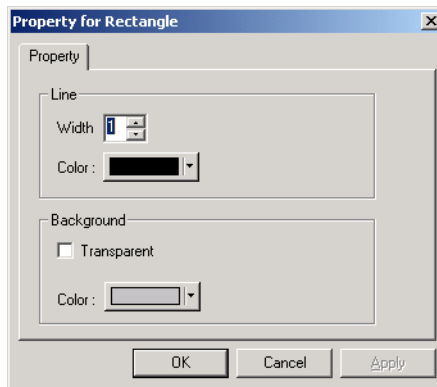
## 3.10 Rectangle Object

The rectangle object is used to draw rectangles.

### 3.10.1 Setting Properties

Selecting Property from the right-click menu displays a dialog box for specifying the properties. The following tab is available for setting the properties of the rectangle object.

#### 1) Property tab



#### **Line - Width**

Specify the width of the frame.

#### **Line - Color**

Specify the color of the frame.

#### **Background - Transparent**

Specify whether to fill in the background.

#### **Background - Color**

Specify the background color.

See page 109 for the color setting procedure.

## 3.11 Operation of the Canvas Window in Edit Mode

### 3.11.1 Right-click Menu

Table 10 lists the right-click menu displayed for each graphic object to edit screens (to place graphic objects) in the canvas window.

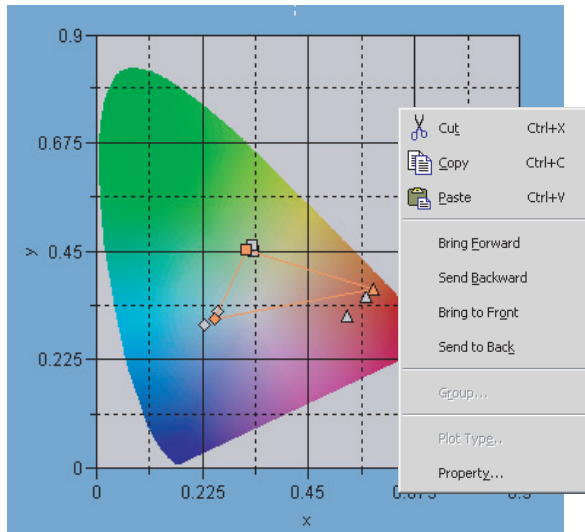


Table 10. Right-click menu used for editing graphic objects

Menu Item	Function
<b>Cut*</b>	Cuts the graphic object.
<b>Copy*</b>	Copies the graphic object.
<b>Paste*</b>	Pastes the graphic object.
<b>Bring Forward*</b>	Brings the graphic object forward.
<b>Send Backward*</b>	Sends the graphic object backward.
<b>Bring to Front*</b>	Brings the graphic object to the front.
<b>Send to Back*</b>	Sends the graphic object to the back.
<b>Group</b>	Shows a dialog box for specifying the group.
<b>Plot Type</b>	Shows the plot type dialog box. (Only for the $L^*a^*b^*$ graph).
<b>Property</b>	Shows the property dialog box.

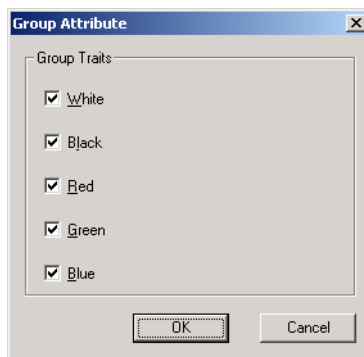
The menu items marked with an asterisk can be selected from *Edit* in the menu bar.

### 3.11.2 Group Setting

When the type of document file is set to the Light-source Color - Contrast Mode measurement, the Light-source Color - RGB Mode measurement or the Light-source Color - RGB & Contrast Mode measurement, you need to specify the group traits of the data to be displayed.

#### For the xy chromaticity diagram object, u'v' chromaticity diagram object or L\*a\*b\* graph object

You can display desired data on one graph object by selecting from: white and black for the Light-source Color - Contrast Mode measurement; red, green or blue for the Light-source Color - RGB Mode measurement; or white, black, red, green or blue for the Light-source Color - RGB & Contrast Mode measurement.



#### Group Traits - White

Select whether to show or hide the data for white.  
The shape of the plot point when displayed: ●

#### Group Traits - Black

Select whether to show or hide the data for black.  
The shape of the plot point when displayed: ×

#### Group Traits - Red

Select whether to show or hide the data for red.  
The shape of the plot point when displayed: ▲

#### Group Traits - Green

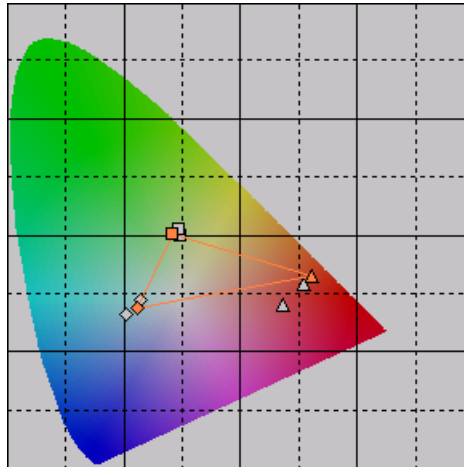
Select whether to show or hide the data for green.  
The shape of the plot point when displayed: ■

#### Group Traits - Blue

Select whether to show or hide the data for blue.  
The shape of the plot point when displayed: ◆

If all of the following three conditions are satisfied, a triangle connecting the data for red, green and blue is displayed on the chromaticity diagram (or a\*-b\* space).

- All the group traits of red, green and blue are checked.
- All the group traits of red, green and blue have data.
- The data is selected.

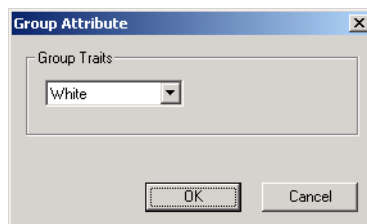


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### For the trend chart/histogram object or numeric label object

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You can display one of the items of data for white, black, red, green, and blue. Select a group trait to display.



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