

MEASUREMENT UTILITY SOFTWARE FD-S2w

(OS X / macOS / Windows)

Ver. 1.41

En INSTRUCTION MANUAL

 **Before using this instrument, please read this manual.**



KONICA MINOLTA

| Formal designations of application software used in this manual

(Designation in this manual)	(Formal designation)
Windows, Windows 7	Microsoft® Windows® 7 Professional Operating System
Windows, Windows 8.1	Microsoft® Windows® 8.1 Pro Operating System
Windows, Windows 10	Microsoft® Windows® 10 Pro Operating System
OS X	Apple® OS X® 10.9 to 10.11
macOS	Apple® macOS™ 10.12

| Trademarks

- “Microsoft”, “Windows”, “Windows 7”, “Windows 8.1”, and “Windows 10” are registered trademarks of Microsoft Corporation in the U.S.A. and other countries.
- Apple, Mac, Mac OS, OS X, and macOS are registered trademarks of Apple Inc. in the U.S.A. and other countries.
- “Intel” and “Pentium” are registered trademarks of Intel Corporation in the U.S.A. and other countries.
- Other company names and product names mentioned in this manual are the registered trademarks or trademarks of their respective companies.

| Notes on this manual

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

| About this manual

- The screen capture shots in this manual are examples and may be slightly different from actual screen images. OS X screens are shown in most cases. Menu items, button names, etc. and their respective functions are the same under Windows even if their position on the screen is slightly different.

| Introduction

Measurement Utility Software FD-S2w is color data software designed to connect to the Auto Scan Spectrophotometer FD-9 to control the instrument and enable scans of color charts, creation of chart definition data files, and various other operations.

| Package Contents

- Installation CD-ROM of Measurement Utility Software FD-S2w (Qty: 1)

The Instruction Manual is installed in PDF form during the software installation.

To read the manual:

OS X or macOS: Right-click on the FD-S2w application, select “Show package contents”, and go to Contents → Document → Manual.

Windows: Go to Start Menu → All programs → KONICA MINOLTA → FD-S2w → Manual.

Versions of the Instruction Manual in other languages are also installed.

You will need Adobe Reader® from Adobe Corporation or another PDF viewing software to view the instruction manual. The latest Adobe Reader® can be downloaded for free from the Adobe website.

| Software License Agreement

The terms of the license agreement of Measurement Utility Software FD-S2w 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

- Measurement Utility Software FD-S2w is designed to be used with the Windows 7, Windows 8.1, or Windows 10, OS X 10.9 to 10.11, or macOS 10.12 operating system. Note that no operating system is included with this software. One of these operating systems must be installed on the computer before this software can be installed.
- When inserting the CD-ROM into the CD-ROM drive, note the correct orientation of the disc and 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.
- Remove the CD-ROM from the CD-ROM drive while the computer is turned on.

| Notes on Storage

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

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

Contents

Major Functions	1
Operation Flow	2
General Chart Measurements	2
Density Balance/ Color Density Control Measurements	3
Main Window Configuration	4
Menu Bar	5
File(F) menu	5
View(V) menu	5
Setting(S) menu	5
Instrument (I) menu	6
Tool(T) menu	6
Help(H) menu	6
Toolbar	7
Showing/Hiding Toolbar	7
Docking/Undocking Toolbar	7
Status bar	8
Showing/Hiding Status Bar	8
Chart Canvas	9
Chart Layout tab	9
Measured Point tab	10
Chart Canvas status bar	11
View section	11
Measurement section	11
Windows	12
Data List window	13
Chart Definition Data Section	14
Freeform Chart Section	17
Data List area buttons	18
Measurement Settings window	19
Measurement Data window	20
Spectral Graph window	21
Operations Common to All windows	22
Showing/Hiding a Window	22
Docking/Stacking/Floating a Window	22
Resizing Windows	22
Starting the software	23
When using Windows:	23
When using OS X or macOS:	23
Splash Screen	23
Connecting with the FD-9	24
Selecting from Device List	24
Connecting via USB	25
Connecting via LAN	26
Connecting Using LAN IP Address	26

Connecting Using Network Name (Windows only).....	27
Setting Network Settings	28
Measurements.....	29
Measurement Setup	29
Settings Dialog: Measurement Option tab	29
Settings Dialog: Environment tab.....	32
Adding/changing data group	34
Chart conditions	35
Paper size	35
Relative positions of chart and paper	35
Conditions for general patch areas (groups of patches) and patches.....	37
Conditions for solid charts.....	37
Chart conditions for freeform chart measurements.....	37
Taking Chart Definition Data Measurements	38
Manual selection of chart definition data	38
Automatic selection of chart definition data having QR codes	40
Taking Freeform Chart Measurements.....	42
Taking FD-9 Job Measurements using FD-9 LCD and controls.....	44
Editing Measurement Points	45
Edit Patch Area dialog	45
Deleting measurement points	46
Adding measurement points directly	47
Adding measurement points using Clipping Chart.....	49
Saving the edited measurement points as a new chart	49
Controls	50
Exporting measurement data.....	52
Creating/Editing Chart Definition Data.....	53
Registering a freeform chart as chart definition data.....	53
Creating entirely new chart definition data.....	53
Editing existing chart definition data.....	53
Create Chart dialog.....	54
Layout area	54
Page buttons.....	57
Patch Area buttons.....	57
Patch Color / Patch Area x	57
Chart display area	58
User Illuminant	60
Setting user illuminant data stored in a CL-500A or an FD-7	60
Importing user illuminant data from a file	62
Exporting user illuminant data to a file	62
Diagnose Instrument	63
Setting Standard Values	63
Setting standard values by tile measurement	63

Setting standard values by reading from file	65
Exporting Standard Values	65
Setting Tolerances.....	66
Diagnosis Measurement	67
Exporting Diagnosis Measurement Results.....	68
Density Balance/Color Density Control	69
Taking Measurements with FD-9 only	69
Taking Measurements with FD-9 Mounted on Optional Auto Sheet Feeder.....	71
Taking Measurements with FD-series Portable Instruments.....	73
If measurement will be performed by scanning:.....	75
If measurement will be performed by measuring each patch individually:.....	76
Saving Measured Chart Data Manually	77
Save Measurement Data dialog	78
Sending measurement results after measurement.....	78
Adding/Deleting a Folder	79
Adding/Deleting a Printer.....	80
Density balance/Color density control window configuration	81
Menu Bar (Density balance / Color density control window).....	82
File(F) menu	82
View(V) menu.....	82
Setting(S) menu	82
Instrument (I) menu	82
Status bar (Density balance / Color density control window).....	83
Showing/Hiding Status Bar	83
Chart Canvas (Density balance / Color density control window)	84
Chart Layout tab	84
Measured Point tab	85
Chart Canvas status bar.....	86
Chart List Window (Density balance / Color density control window)	87
Chart definition data	87
Measurements	88
Measurement Settings Window (Density balance / Color density control window)	89
Measurement Data Window (Density balance / Color density control window).....	90
Operations Common to All Windows (Density balance / Color density control window).....	91
Showing/Hiding a Window	91
Docking/Stacking/Floating a Window	91
Resizing Windows	91
Periodic Calibration dialog	92
Error Messages	93
System Requirements	95
System Requirements	95
Compatible Instruments	95
Language	95

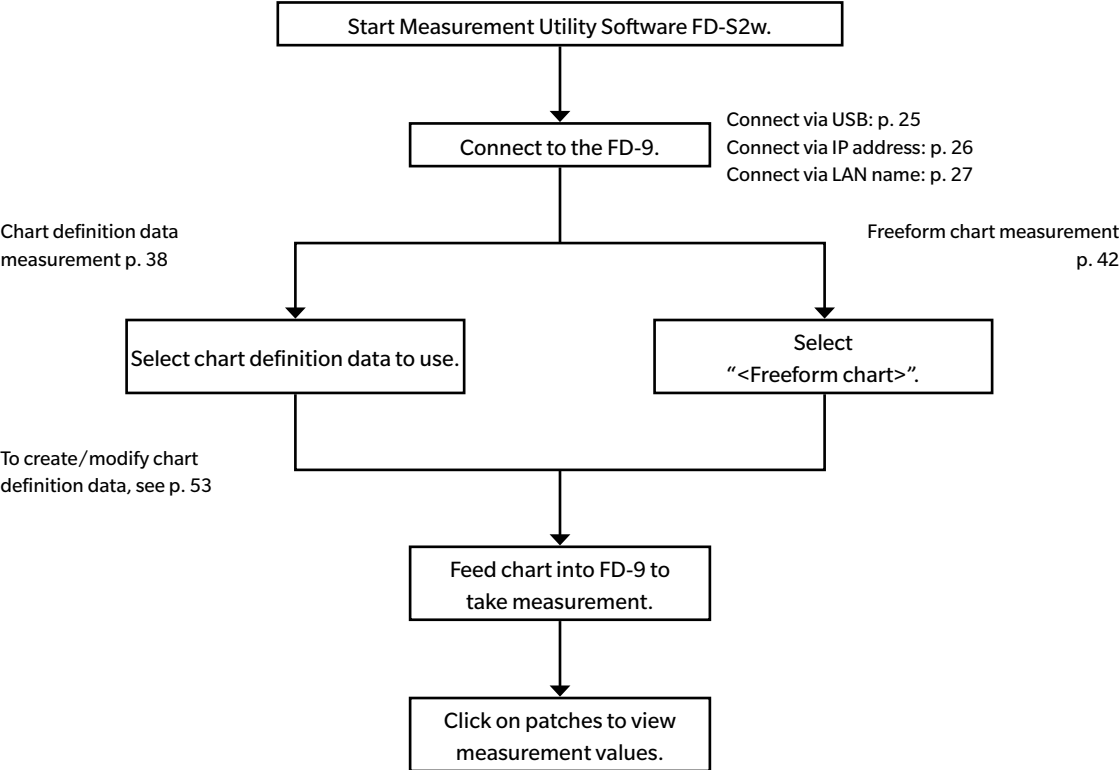
Major Functions

Measurement of color charts for testing printing quality

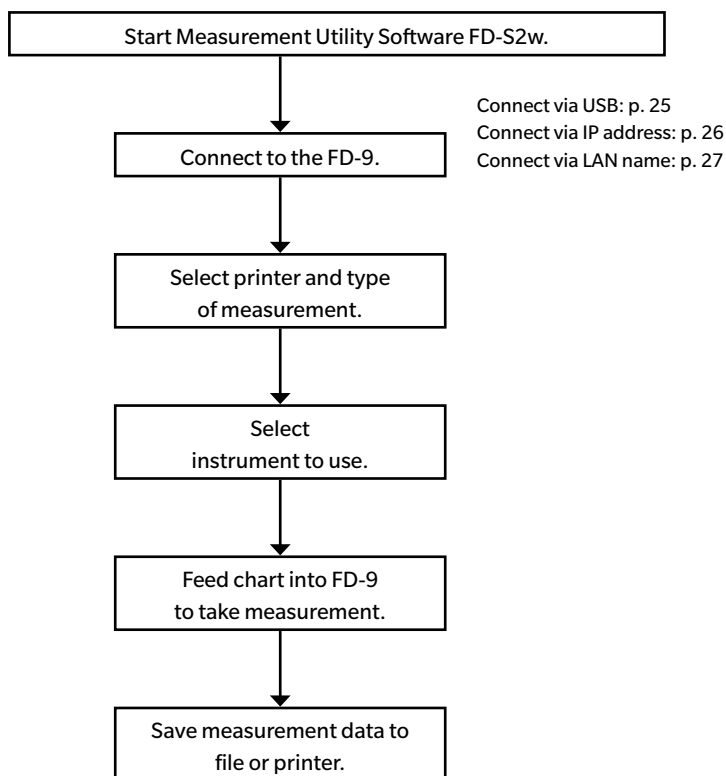
Measurement of color density control and density balance for adjusting KONICA MINOLTA printers

Operation Flow

| General Chart Measurements



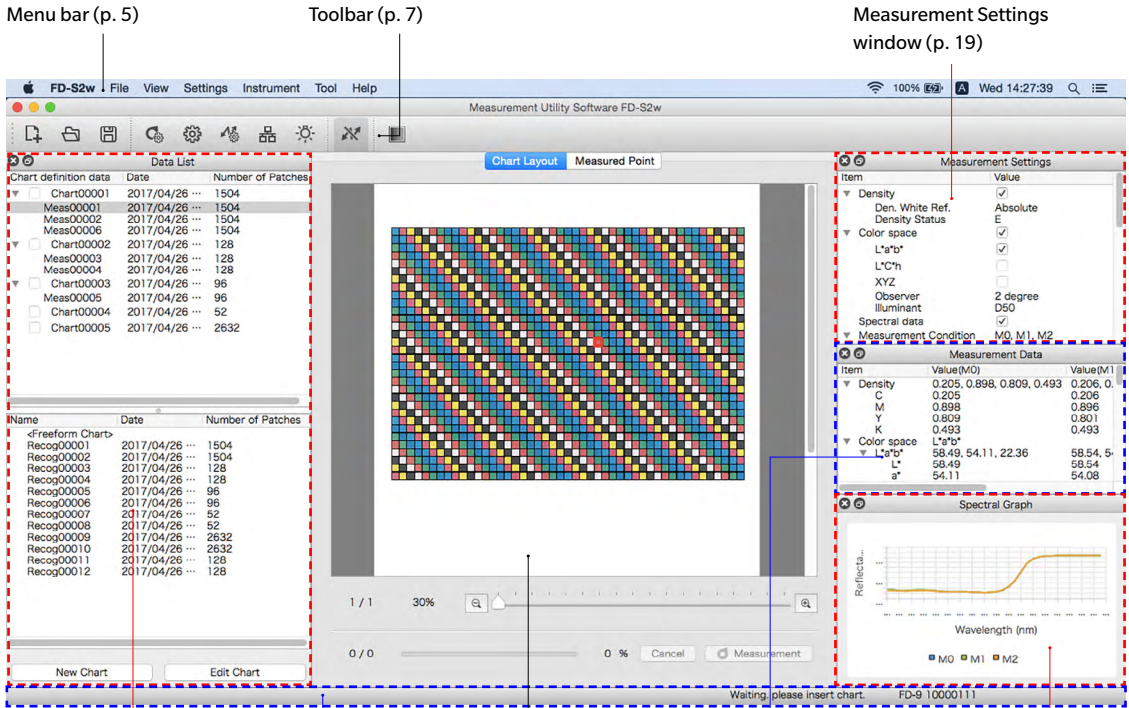
| Density Balance/ Color Density Control Measurements



See p. 69 for details on each step.

Main Window Configuration

OS X or macOS



Data List window
(p. 13)

Window status (p.
8)

Chart canvas (p.
9)

Measurement Data
window (p. 20)

Spectral Graph window
(p. 21)

The FD-S2w main window consists of the menu bar, toolbar, chart canvas, status bar, and 4 windows: Data List window, Measurement Settings window, Measurement Data window, and Spectral Graph window.

- The toolbar and the 4 windows can be docked to the screen as shown, or can be undocked as floating windows. See p. 22
- The toolbar, status bar, and any of the 4 windows can be shown or hidden.

| Menu Bar

File(F) menu

New Chart File:	Opens the Create Chart dialog. See p. 54.
Open Chart File:	Opens the Open Chart dialog to select a chart definition data file.
Export Data:	If a measurement in the chart definition data section of the Data List is selected, the Save Measurement Data dialog will open. If a measurement in the freeform chart measurement section of the Data List is selected, the Save Measurement Data dialog will open.
Exit:	Exits from the application.

View(V) menu

Toolbar:	Displays/hides Toolbar.
Status bar:	Displays/hides Status Bar.
Data List Window:	Displays/hides Data List window.
Measurement Settings Window:	Displays/hides Measurement Settings window.
Measurement Data Window:	Displays/hides Measurement Data window.
Spectral Graph Window:	Displays/hides Spectral Graph window.

Setting(S) menu

Measurement Option:	Opens the Settings dialog with the Measurement Option tab selected. See p. 29.
Environment:	Opens the Settings dialog with the Environment tab selected. See p. 32.
Instrument Connection:	Opens the Instrument Connection Settings dialog. p. 24.
Network:	Opens the Network Settings dialog. p. 26. <ul style="list-style-type: none">• Disabled when no FD-9 is connected or when an FD-9 is currently connected via LAN.
User Illuminant:	Opens the User Illuminant Setting dialog. See p. 60.

Instrument (I) menu

Connect/Disconnect:	When no instrument is connected, the menu item will be Connect . Clicking Connect connects to the FD-9 according to the settings made in the Instrument Connection dialog. When an instrument is connected, the menu item will be Disconnect . Clicking Disconnect disconnects the connected FD-9.
Restart measurement:	Restarts a stopped measurement. <ul style="list-style-type: none">• Enabled only when FD-9 is connected and a measurement is interrupted.
Stop measurement:	Stops the measurement currently being performed. <ul style="list-style-type: none">• Enabled only when FD-9 is connected.

Tool(T) menu

Diagnose Instrument:	Opens the Diagnose Instrument screen. See p. 63.
Density balance/Color density control:	Starts the procedure for performing density balance/color density control measurement. See p. 69.

Help(H) menu

Manual:	Opens this instruction manual.
About:	Displays this software's version information.

| Toolbar

The toolbar contains buttons for frequently used functions.



Place the mouse pointer over a button to see a brief description of the button function in the status bar.

- (1) Click and drag here to dock/undock the toolbar.
- (2) Opens the Create Chart dialog. See p. 54.
- (3) Opens the Open dialog to select a chart definition data file.
- (4) Opens the Save dialog to save measurement data.
- (5) Opens the Measurement Options tab of Settings dialog. See p. 29.
- (6) Opens the Environment tab of Settings dialog. See p. 32.
- (7) Opens the Instrument Connection Settings dialog. See p. 24.
- (8) Opens the Network Settings dialog. See p. 28.
 - Disabled when no FD-9 is connected or when FD-9 is currently connected via LAN.
- (9) Opens the User Illuminant Setting dialog. See p. 60.
- (10) Connects/disconnects FD-9.

Pressed appearance:	FD-9 is connected. Clicking on button will disconnect FD-9.
Unpressed appearance:	FD-9 is not connected. Clicking on button will connect to FD-9 according to settings in Connect Settings dialog.
- (11) Starts the procedure for performing density balance/color density control measurement. See p. 69.

Showing/Hiding Toolbar

Select *View - Toolbar* to show/hide the toolbar.

Docking/Undocking Toolbar

The toolbar is dockable. Clicking and dragging the left end (top end when toolbar is docked vertically) of the toolbar will enable the toolbar to be moved to the desired new position. The toolbar can be docked horizontally at the top or bottom of the software window, vertically on the left or right side of the software window, or can be undocked and used as a floating toolbar.

| Status bar

The status bar consists of several sections which show various kinds of information.

The information shown in the sections are in the following order from the left side of the screen.

- Description of menu item or toolbar button under cursor
- FD-9 status information
- Connected FD-9 information: Instrument name and serial number (Shown only when FD-9 is connected.)
- Connected portable spectrodensitometer: Instrument name and serial number (Shown only when portable spectrodensitometer is connected.)

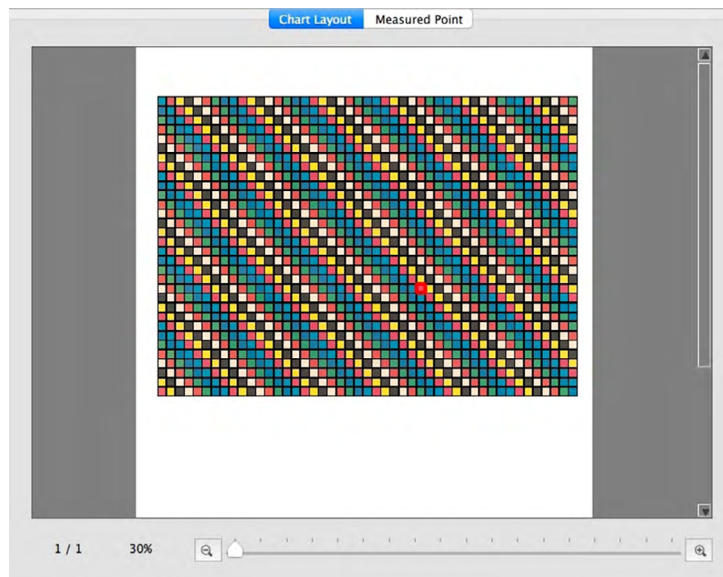
Showing/Hiding Status Bar

Select *View - Status Bar* to show/hide the status bar.

| Chart Canvas

The Chart Canvas consists of two tabs showing images of chart definition data charts or scanned charts.

Chart Layout tab



The Chart Layout tab shows a color image of the patches on the selected chart or selected measurement.

Chart definition data:

When a chart definition data name is selected in the Data List window, the patches will show the patch color defined in the chart definition data.

Measurement under chart definition data name:

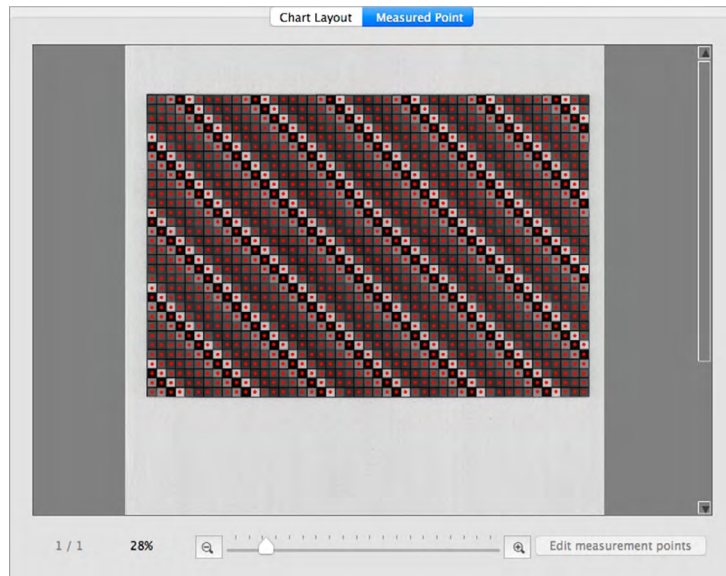
When a measurement is taken with a chart definition data name or a measurement name under a chart definition data name selected in the Data List window, during measurement each patch will be divided diagonally with the upper left half showing the defined patch color and the lower right half showing the measured color. When a measurement name under a chart definition data name is selected after measurement has been completed, the patches will show only the measured color.

Freeform chart measurement:

When a measurement name in the Freeform chart section of the Data List window is selected, the patches will show the measured color.

- To show the measurement data for a patch in a measured chart, select the patch in the Chart Layout tab. The measurement data for that patch will appear in the Measurement Data window. The measurement data items shown will be those items selected in the Measurement Settings window.

Measured Point tab



The Measured Point tab shows a black-and-white image of the measured chart sheet and the location of measurement points on that image.

Chart definition data:

When a chart definition data name is selected in the Data List window, no image will be shown in the Measured Point tab.

Measurement under chart definition data name:

When a measurement name under a chart definition data name is selected in the Data List window, the scanned image of the chart sheet will be shown together with the measurement points which were actually measured.

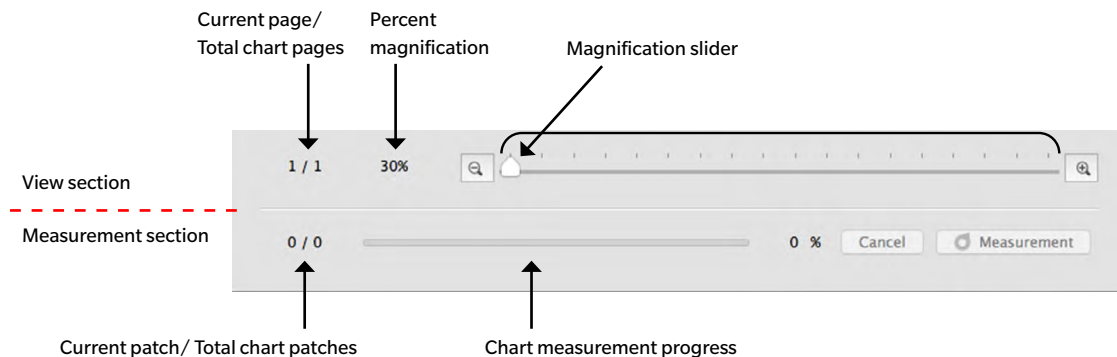
Freeform chart measurement:

When a measurement name in the Freeform chart section of the Data List window is selected, the scanned image of the chart sheet will be shown together with the measurement points determined by patch recognition.

See p. 45 for information on editing measurement points.

Chart Canvas status bar

The Chart Canvas status bar is shown below



View section

Current page / Total chart pages

Shows the current page and the total number of pages in the chart.

For multi-page charts, clicking on ▼ opens a dropdown list for selecting the desired chart page.


Percent Magnification

Shows the current chart magnification percentage. Clicking on ▼ opens a dropdown list for selecting the desired magnification from several predefined steps or "Fit in window".



Zoom out. Reduces magnification by 1% each time it is clicked.

Magnification slider

Slide the slider  to gradually adjust magnification or click on the bar to move the slider directly to that point to adjust magnification quickly.



Zoom in. Increases magnification by 1% each time it is clicked.

Edit measurement points (Shown only in Measured Point tab)

Opens the Edit Patch Area dialog. See p. 45.

Measurement section

Current patch / Total chart patches

During measurement, shows the current patch being measured and the total number of patches on the current chart page.

Chart measurement progress

Shows the measurement progress for the current chart page.

Cancel

Cancels a measurement in progress.

Measurement

Continues a measurement paused after patch recognition.

| Windows

FD-S2w includes 4 dockable windows:

Data List Window	Lists chart definition data and measurements.
Measurement Settings Window	Enables selection of settings for calculating measurement data.
Measurement Data Window	Shows data for the selected color patch calculated for each measurement setting.
Spectral Graph Window	Shows the spectral graph for the selected color patch.

Data List window

The Data List window is divided into two sections:

- Chart definition data section:** This section displays a list of chart definitions and their associated measurements. Each chart definition is expanded to show its measurements. The columns are Chart definition data, Date, and Number of Patches.
- Freeform chart section:** This section displays a list of freeform charts and their associated measurements. The columns are Name, Date, and Number of Patches.

Buttons at the bottom of the window are "New Chart" and "Edit Chart".

Chart definition data	Date	Number of Patches
<input type="checkbox"/> Chart00001	2017/04/26 ...	1504
Meas00001	2017/04/26 ...	1504
Meas00002	2017/04/26 ...	1504
Meas00006	2017/04/26 ...	1504
<input type="checkbox"/> Chart00002	2017/04/26 ...	128
Meas00003	2017/04/26 ...	128
Meas00004	2017/04/26 ...	128
<input type="checkbox"/> Chart00003	2017/04/26 ...	96
Meas00005	2017/04/26 ...	96
<input type="checkbox"/> Chart00004	2017/04/26 ...	52
<input type="checkbox"/> Chart00005	2017/04/26 ...	2632

Name	Date	Number of Patches
<Freeform Chart>		
Recogn00001	2017/04/26 ...	1504
Recogn00002	2017/04/26 ...	1504
Recogn00003	2017/04/26 ...	128
Recogn00004	2017/04/26 ...	128
Recogn00005	2017/04/26 ...	96
Recogn00006	2017/04/26 ...	96
Recogn00007	2017/04/26 ...	52
Recogn00008	2017/04/26 ...	52
Recogn00009	2017/04/26 ...	2632
Recogn00010	2017/04/26 ...	2632
Recogn00011	2017/04/26 ...	128
Recogn00012	2017/04/26 ...	128

The Data List window is divided into two sections: The Chart Definition Data section shows the available chart definition data and measurements taken against each chart definition data, and the Freeform Chart section shows measurements taken without chart definition data.

The items to be displayed in addition to chart definition data name or measurement name in the Data List window can be selected in the Environment tab of the Settings dialog. See p. 32 for details.

Chart Definition Data Section

The Chart Definition Data section shows a list of chart definition data and measurements taken against each chart definition data.

Chart definition data	Date	Number
<input type="checkbox"/> Chart00001	2017/04/26 ...	1504
<input type="checkbox"/> Meas00001	2017/04/26 ...	1504
<input type="checkbox"/> Meas00002	2017/04/26 ...	1504
<input type="checkbox"/> Meas00006	2017/04/26 ...	1504
<input type="checkbox"/> Chart00002	2017/04/26 ...	128
<input type="checkbox"/> Meas00003	2017/04/26 ...	128
<input type="checkbox"/> Meas00004	2017/04/26 ...	128
<input type="checkbox"/> Chart00003	2017/04/26 ...	96
<input type="checkbox"/> Meas00005	2017/04/26 ...	96
<input type="checkbox"/> Chart00004	2017/04/26 ...	52
<input type="checkbox"/> Chart00005	2017/04/26 ...	2632

FD-9 job measurement checkboxes

Chart definition data

Measurements taken against respective chart definition data

Chart definition data

Measurements taken against respective chart definition data

Chart definition data

Chart definition data

Chart definition data are data in which the sizes, positions, and colors of color patches for the chart have been defined. For information on creating chart definition data, see p. 53.

When a chart definition data name is selected:

- The Chart Layout tab will show a color image of the selected chart. Clicking on a patch in the color image in the Chart Layout tab will not show any measurement data in the Measurement Data window or spectral graph in the Spectral Graph window.
- The Measured Point tab will not show any image.
- Taking a measurement will result in the measurement being taken against the selected chart definition data, and the measurement will appear under the selected chart definition data name when completed.
- Clicking on the ▼ (OS X or macOS) or ▲ (Windows) next to a chart definition data name will collapse the list of measurements taken against the chart definition data.
- Clicking on the ► (OS X or macOS) or ▷ (Windows) next to a chart definition data name will expand the list of measurements taken against the chart definition data.

FD-9 job measurement checkboxes

When an FD-9 job measurement checkbox is checked (enabled), the corresponding chart definition data name will be shown in the FD-9 Connection & Joblist screen and can be selected on the FD-9 to take measurements against that chart definition data.

Right-click menu

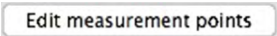
The menu that appears when right-clicking on a chart definition data name offers the following functions:

Edit Name	Enables the chart definition data name to be edited. <ul style="list-style-type: none"> The chart definition data name can also be edited by double-clicking on the name.
Save	Opens Save dialog to save the chart definition data (as *.xml file)
Edit Chart	Opens the Create Chart dialog for editing the chart definition data. See p. 53.
Save Tiff image data	Opens Save dialog to save image of chart definition data (as *.tiff file)
Delete	Deletes selected chart definition data.
Measurement Area	Opens a pullout for setting the measurement area for the chart definition data. Settings available: Auto, 1×1, 2×2, 3×3, 4×4 <ul style="list-style-type: none"> For settings other than 1×1, FD-9 uses multiple overlapping measurements of the same patch with slight shifts in position within the patch to create a virtual measurement area equal to the set value. Because multiple measurements are taken for each patch, measurement time will become longer for such settings.

Measurements under chart definition data name

The measurements taken against chart definition data are shown under the respective chart definition data name. They can be seen when ▼ (OS X or macOS) or ▲ (Windows) next to a chart definition data name is clicked to expand the list of measurements taken against the chart definition data.

When a measurement under a chart definition data name is selected:

- The Chart Layout tab will show a color image of the measured chart. Clicking on a patch in the color image in the Chart Layout tab will show the measurement data for the patch in the Measurement Data window and the spectral graph for the patch in the Spectral Graph window.
- The Measured Point tab will show the scanned image of the chart sheet, with the measurement points superimposed on the scanned image. Measurement points can be edited by clicking  (see p. 45).
- Taking a measurement will result in the measurement being taken against the same chart definition data used for the selected measurement, and the new measurement will appear under the same chart definition data name when completed.

Right-click menu

The menu that appears when right-clicking on a measurement under a chart definition data name offers the following functions:

Edit Name	Enables the measured chart name to be edited. <ul style="list-style-type: none"> The chart name can also be edited by double-clicking on the name.
Save	Opens Save dialog to export the measurement data.

The standard file name when saving is formed from chart name and measurement number, for Freeform measurements only the measurement number is used. The preselected file format is "cgats txt File (*.txt)".

Example Chart measurement:

Chart00042_00116.txt

Example Freeform measurement:

00116.txt

Depending on the setting for the export method (see pages 32, 33), a file with all selected measurement conditions or a separate measurement file for each measurement condition is saved. Separate files with different measurement conditions are automatically marked accordingly at the end of the file name:

Chart00042_00116_M0.txt

Chart00042_00116_M1.txt

Chart00042_00116_M2.txt

...

Formats available

csv File (*.csv)	Comma-separated values output in the order of patch position
txt File (*.txt)	Tab-separated values output in the order of patch position
cgats xml File (*.xml)	xml format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch position
cgats txt File (*.txt)	Tab-separated values format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch position
CxF3 xml File (*.xml)	xml format as defined by CxF3 (Color Exchange Format version 3) output in the order of patch position
csv File [Output ID Order] (*.csv)	Comma-separated values output in the order of patch IDs
txt File [Output ID Order] (*.txt)	Tab-separated values output in the order of patch IDs
cgats xml File [Output ID Order] (*.xml)	xml format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch IDs
cgats txt File [Output ID Order] (*.txt)	Tab-separated values format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in order of the patch IDs
CxF3 xml File [Output ID Order] (*.xml)	xml format as defined by CxF3 (Color Exchange Format version 3) output in the order of patch IDs

Delete

Deletes selected measurement data.

Freeform Chart Section

The freeform chart section shows a list of measurements taken without chart definition data.

Name	Date	Number of F
<Freeform Chart>		
Recog00001	2015/10/...	1504
Recog00002	2015/10/...	105

When a measurement is selected:

- The Chart Layout tab will show a color image of the measured chart. Clicking on a patch in the color image in the Chart Layout tab will show the measurement data for the patch in the Measurement Data window and the spectral graph for the patch in the Spectral Graph window.
- The Measured Point tab will show the scanned image of the chart sheet, with the measurement points superimposed on the scanned image. Measurement points can be edited by clicking

(see p. 45).

Right-click menu

The menu that appears when right-clicking on a measurement offers the following functions:

Edit Name	Enables the measured chart name to be edited. <ul style="list-style-type: none"> The chart name can also be edited by double-clicking on the chart name.
Save	Opens Save dialog to export the measurement data.

The standard file name when saving is formed from chart name and measurement number, for Freeform measurements only the measurement number is used. The preselected file format is "cgats txt File (*.txt)".

Example Chart measurement:

Example Freeform measurement:

Depending on the setting for the export method (see pages 32, 33), a file with all selected measurement conditions or a separate measurement file for each measurement condition is saved. Separate files with different measurement conditions are automatically marked accordingly at the end of the file name:

Chart00042_00116_M0.txt, Chart00042_00116_M1.txt, Chart00042_00116_M2.txt, ...

Formats available

csv File (*.csv)	Comma-separated values output in the order of patch position
txt File (*.txt)	Tab-separated values output in the order of patch position
cgats xml File (*.xml)	xml format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch position
cgats txt File (*.txt)	Tab-separated values format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch position
CxF3 xml File (*.xml)	xml format as defined by CxF3 (Color Exchange Format version 3) output in the order of patch position
csv File [Output ID Order] (*.csv)	Comma-separated values output in the order of patch IDs
txt File [Output ID Order] (*.txt)	Tab-separated values output in the order of patch IDs
cgats xml File [Output ID Order] (*.xml)	xml format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch IDs
cgats txt File [Output ID Order] (*.txt)	Tab-separated values format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in order of the patch IDs
CxF3 xml File [Output ID Order] (*.xml)	xml format as defined by CxF3 (Color Exchange Format version 3) output in the order of patch IDs

Register chart Registers the freeform measured chart as a chart definition data.

Delete Deletes selected freeform measured chart.

Data List area buttons

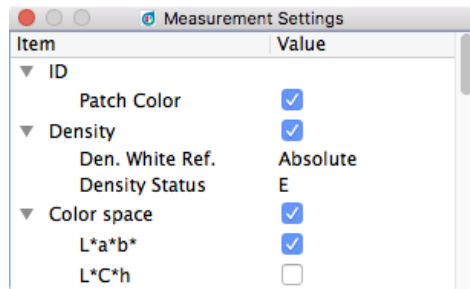
Opens the dialog for creating a new chart. See p. 53.

Opens the dialog for editing the chart. See p. 53.

- Enabled only when a chart definition data name is selected.

Measurement Settings window

The Measurement Settings window determines what measurement data will be shown in the Measurement Data window and written to the file(s) when saving.



- Clicking on the ▼ (OS X or macOS) or ▲ (Windows) next to a group name will collapse the list of settings under that group.
 - Clicking on the ► (OS X or macOS) or ▷ (Windows) next to a group name will expand the list of settings under that group.
 - For measurement items with a checkbox, to display data for the measurement item in the Measurement Data window, check the checkbox next to the name of the group containing the measurement item, and then check the checkbox next to the item itself. If an item is checked but the name of the group that contains it is not checked, the measurement data for that item will not be shown in the Measurement Data window.
 - For measurement items with a dropdown list, to display data for the measurement item in the Measurement Data window, check the checkbox next to the name of the group containing the measurement item, and then select the setting to use from the dropdown list. If the name of the group that contains an item is not checked, the measurement data for that item will not be shown in the Measurement Data window.
- When *Den. White Ref.* is set to *Paper*, the chart definition data must include a white patch with the color defined as (C, M, Y, K) = (0, 0, 0, 0) or (R, G, B) = (255, 255, 255) as a reference patch.
 - *Measurement Condition* specifies the illumination conditions used to obtain the spectral reflectance data. *Illuminant* specifies the illuminant used to calculate color space data. When *Illuminant* is set to a specific illuminant, color space data will be calculated using the illuminant values for the specified illuminant and the spectral reflectance data obtained using the illumination conditions specified in *Measurement Condition*. When *Illuminant* is set to *Auto*, the illuminant used to calculate color space data will be selected automatically as listed below according to the illumination conditions specified in *Measurement Conditions*.

<i>Measurement Condition</i>	Illuminant used for calculating color space data
M0, M1, M2	D50
Other <i>Measurement Condition</i>	Same as <i>Measurement Condition</i> illumination
 - Under ID you can switch the display and storage of patch definitions (RGB, CMYK, Multi Color) on and off. This can be very useful for Freeform measurements. The field ID, on the other hand, is always written to the measurement files.

Measurement Data window

The Measurement Data window shows the data calculated for each measurement item and measurement condition selected in the Measurement Settings window for the color patch currently selected in the Chart Layout tab for a measured chart selected in the Data List window.

- No data will be shown if a chart definition data name is selected in the Data List window, even if a patch is selected on the image for the chart definition data.
- If a chart contains several patches with the same patch definition, the densities of these patches show both the measured value of the active patch and the average (ϕ) of all patches with this definition.

Item	Value(M0)	Value(M1)	Value(M2)
▼ ID	19		
Patch Color	100.00, 0.00, 0.00, 0.00		
▼ Density	1.323, 0.473, 0.221, 0.777	1.322, 0.470, 0.213, 0.775	1.323, 0.473, 0.221, 0.777
C	1.323 (ϕ 1.346)	1.322 (ϕ 1.346)	1.323
M	0.473 (ϕ 0.478)	0.470 (ϕ 0.475)	0.473
Y	0.221 (ϕ 0.223)	0.213 (ϕ 0.215)	0.221
K	0.777 (ϕ 0.786)	0.775 (ϕ 0.783)	0.777
▼ Color space	L*a*b*, L*C*h		
▼ L*a*b*	53.50, -27.52, -53.93	53.67, -27.14, -54.67	53.50, -27.52, -53.93
L*	53.50	53.67	53.50
a*	-27.52	-27.14	-27.52
b*	-53.93	-54.67	-53.93
▼ L*C*h	53.50, 60.55, 242.97	53.67, 61.03, 243.60	53.50, 60.55, 242.97

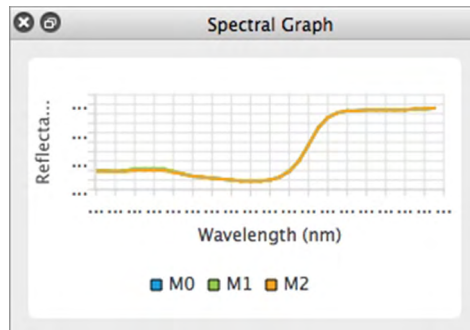
The measurement data items shown will be the items selected in the Measurement Settings window.

- Clicking on the ▼ (OS X or macOS) or ▲ (Windows) next to a measurement group name or subgroup name will collapse the list of measurement data under that measurement group or subgroup.
- Clicking on the ► (OS X or macOS) or ▷ (Windows) next to a measurement group name or subgroup name will expand the list of measurement data under that measurement group or subgroup.

Spectral Graph window

The Spectral Graph window shows the spectral graph for each measurement condition selected in the Measurement Settings window for the color patch currently selected in the Chart Layout tab for a measured chart selected in the Data List window.

- No graph will be shown if a chart definition data name is selected in the Data List window, even if a patch is selected on the image for the chart definition data.



Operations Common to All windows

Showing/Hiding a Window


Select the window name in the *View* menu to show or hide the window. When a check is in front of the window name in the menu, the window will be shown; if no check is shown, the window will be hidden. Clicking on the window name toggles the status of the window.

Windows can also be hidden (closed) by clicking the X in the window title bar.

Docking/Stacking/Floating a Window

Windows can be docked at the top, bottom, left, or right side of the FD-S2w chart canvas area by clicking on the title bar of the window and dragging it to the desired location. As the window nears the new location, a blue area will open up into which the dragged window can be dropped. A floating window can also be docked by double-clicking on the title bar of the window, which will cause it to return to its most recent docked position.

Windows can be stacked as tabs in the same area by clicking on the title bar of the window, dragging it onto a docked window, and dropping it onto the docked window when the docked window is blue. Switching between stacked windows can then be done by clicking on the window tab at the bottom of the area.

Windows can be floated by clicking on the title bar of the docked window, dragging it away from the docked window and dropping the window on the canvas area. Windows can also be floated by double-clicking on the title bar of a docked window or by clicking the restore button () in the title bar.

Resizing Windows

Windows can be resized by clicking on the border of the window and dragging it to the desired size. Resizing docked windows will also resize other windows in the same docked area.

Starting the software

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

| When using Windows:

To start Measurement Utility Software FD-S2w, click *KONICA MINOLTA* in the *Start* menu, click the *FD-S2w* folder, and then click the *FD-S2w* icon inside that folder.

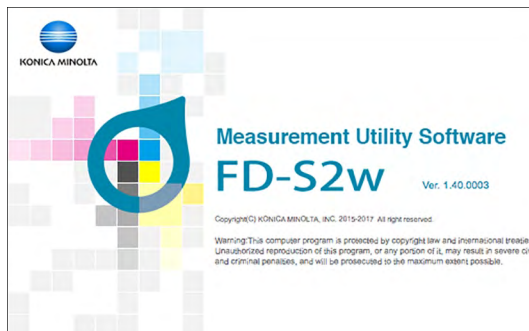
If an *FD-S2w* shortcut has been registered on the desktop, *FD-S2w* can also be started by double-clicking on that icon.

| When using OS X or macOS:

To start Measurement Utility Software *FD-S2w*, double-click on the *FD-S2w* icon.

| Splash Screen

When the software starts, the following splash screen will appear showing version and copyright information.



The information in the splash screen can also be displayed by selecting *Help - About* in the menu bar.

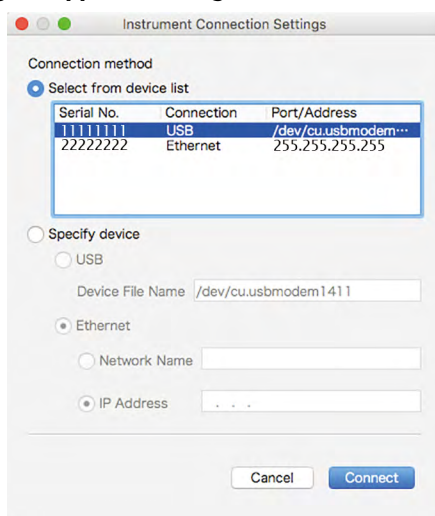
Connecting with the FD-9

The FD-9 can be connected directly to the computer via USB, or via LAN.

- If the software was used before, it will attempt to automatically reconnect to the FD-9 which was used last during startup. If the FD-9 with the serial number of the FD-9 which was used last is not available, the error message “Failed to connect to FD-9.” will be shown and the Instrument Connection Settings dialog will appear.
- When using FD-S2w, it is recommended that the computer’s “Sleep” function be disabled. If the automatic “Sleep” function is enabled, the computer may enter “Sleep” in the middle of a measurement, immediately stopping the measurement without canceling it. If this occurs, the chart should be ejected manually and the software reconnected to the FD-9. The “Sleep” function can be disabled in the Power Options setting (Windows) or Energy Saver preference pane (OS X or macOS).
- If it has been more than approximately 1 year since the FD-9 was first connected to a computer running FD-S2w after being calibrated by an authorized Konica Minolta service facility, the Periodic Calibration dialog will appear. See p. 92.

Selecting from Device List

- 1 With the FD-9 switched on, select *Settings(S) - Instrument Connection* in the menu bar. The Instrument Connection Settings dialog will appear, showing a list of available FD-9 instruments.**

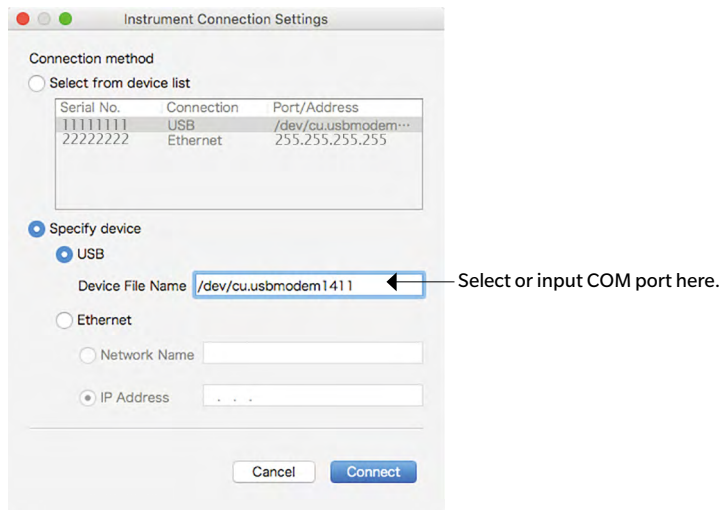


- 2 Select the desired FD-9 from the device list and click [Connect]. The software will attempt to connect to the FD-9, and if connection is successful, the dialog will close automatically.**

- If connection is not successful, the error message “Failed to connect to FD-9.” will appear. Check that the FD-9 corresponding to the FD-9 selected in the device list is switched on and that it is not showing any error message.

Connecting via USB

- 1** With the FD-9 and computer connected via USB and the FD-9 switched on, select **Settings(S) - Instrument Connection** in the menu bar. The Instrument Connection Settings dialog will appear.
- 2** Click on **Specify device**. The **USB** and **Ethernet** items will be enabled.
- 3** If **USB** is not selected, click on **USB** to select it and then click on the down arrow to select the **COM port** to which the instrument is connected from the pull-down list.
 - If the pull-down list does not include the required COM port, type in the required COM port (for example, "COM20") directly.



- 4** Click [**Connect**]. The software will attempt to connect to the FD-9, and if connection is successful, the dialog will close automatically.
 - If connection is not successful, the error message "Failed to connect to FD-9." will appear. Check that the FD-9 is switched on and that the COM port to which the FD-9 is connected has been properly set.
 - If connection problems occur when connecting via USB when using OS X 10.11, connect via LAN (p. 26) instead.

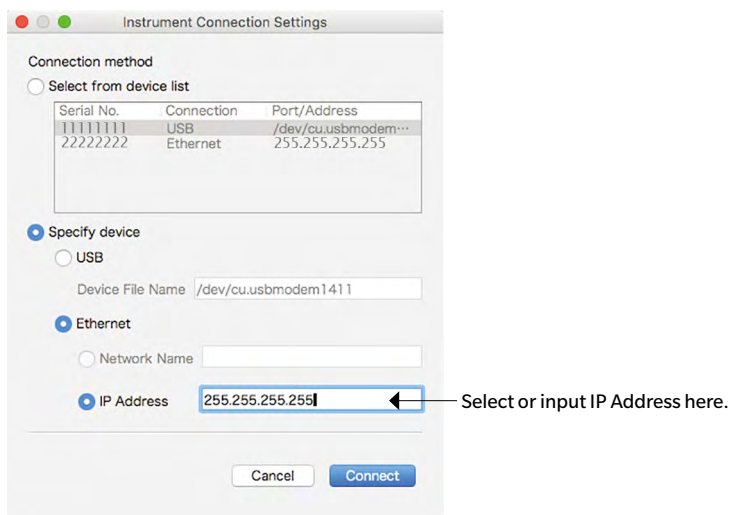
Connecting via LAN

Connecting to the FD-9 via LAN can be performed using the LAN IP address or the network name set on the FD-9.

- The LAN IP address, subnet mask, and default gateway can be set directly on the instrument or by using the Network Settings dialog of FD-S2w. The network name can be set only by using the Network Settings dialog of FD-S2w.
- To make network settings using the Network Settings dialog, see p. 28.
- Connection using a network name cannot be performed under OS X or macOS.

Connecting Using LAN IP Address

- 1 With the FD-9 connected to the LAN and the FD-9 switched on, select *Settings(S) - Instrument Connection* in the menu bar. The Instrument Connection Settings dialog will appear.**
- 2 Click on *Specify device*. The *USB* and *Ethernet* items will be enabled.**
- 3 Click *Ethernet* to select it, click on *IP Address* to select it, and then click on the down arrow to select the IP address of the instrument from the pull-down list.**
 - If the pull-down list does not include the required IP address, type in the required IP address directly.



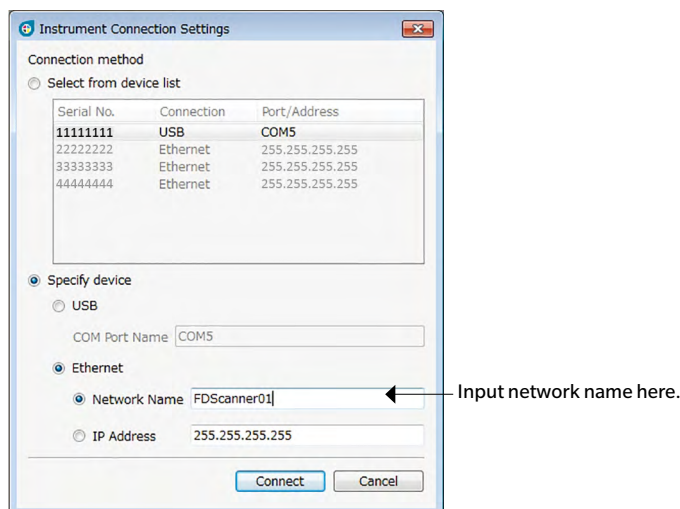
- 4 Click [*Connect*]. The software will attempt to connect to the FD-9, and if connection is successful, the dialog will close automatically.**
 - If connection is not successful, the error message "Failed to connect to FD-9." will appear. Check that the FD-9 is switched on and that the IP address of the FD-9 has been properly set.

Connecting Using Network Name (Windows only)

If a network name has been assigned to the FD-9, connection can be performed using that network name.

- Connection using a network name cannot be performed under OS X or macOS.
- Assigning of the network name can be performed using the Network Settings dialog. See p. 28.

- 1 With the FD-9 connected to the LAN and the FD-9 switched on, select *Settings(S) - Instrument Connection* in the menu bar. The Instrument Connection Settings dialog will appear.**
- 2 Click on *Specify device*. The *USB* and *Ethernet* items will be enabled.**
- 3 Click *Ethernet* to select it, click on *Network Name* to select it, and then input the network name of the instrument.**



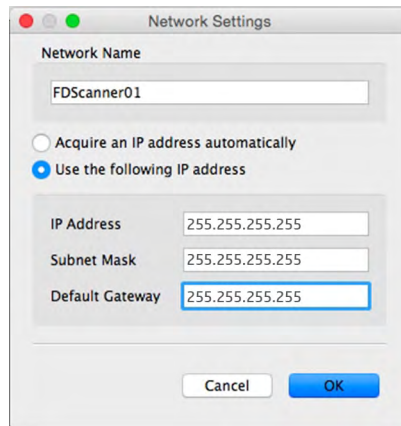
- 4 Click [*Connect*]. The software will attempt to connect to the FD-9, and if connection is successful, the dialog will close automatically.**

- If connection is not successful, the error message "Failed to connect to FD-9." will appear. Check that the FD-9 is switched on and that the network name of the FD-9 has been properly set.

Setting Network Settings

Network settings (network name, IP address, subnet mask, default gateway, whether or not to use DHCP) can be set from the Network Settings dialog.

- 1 Connect to the FD-9 via USB. (See p. 25.) Network settings can be performed only when connected to the FD-9 via USB.**
- 2 Select *Settings(S) : Network* in the menu bar. The Network Settings dialog will appear.**



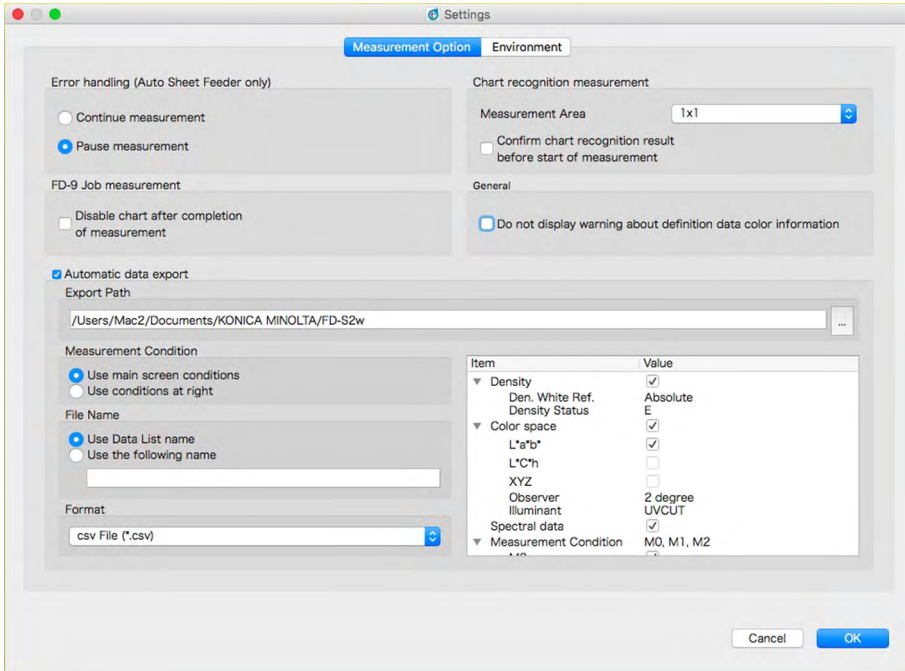
- 3 Make the desired settings.**
 - If “*Acquire an IP address automatically*”(use DHCP) is selected, the IP Address, Subnet Mask, and Default Gateway text boxes will be disabled.
- 4 Click [OK]. The Network Settings dialog will close.**
- 5 Switch off the FD-9 for a few seconds and then switch it back on.**
 - The new settings will not take effect until the FD-9 has been restarted.

Measurements

| Measurement Setup

Settings Dialog: Measurement Option tab

The Measurement Option tab of the Settings dialog can be opened by selecting *Settings (S) - Measurement Option* from the menu bar or by clicking the Measurement tab when the Settings dialog is open and the Environment tab is shown.



Error handling (Auto Sheet Feeder only)

Determines action taken when an error occurs during the scan. (Default: Pause measurement)

Continue measurement:

Even if an error occurs, feeding or scanning is continued without an error message.

Pause measurement:

When an error occurs, feeding or scanning of chart is paused and a popup error message is shown.

FD-9 Job measurement

Disable chart after completion of measurement (Default: Disabled)

After scanning to a selected chart definition data has been completed, the checkmark is removed from the selected chart definition data name.

Chart recognition measurement

Measurement Area:

Selects the measurement area size to be used for measurements. (Default: 1x1)

Available settings: Auto, 1x1, 2x2, 3x3, 4x4

- For settings other than 1x1, FD-9 uses multiple overlapping measurements of the same patch with slight shifts in position within the patch to create a virtual measurement area equal to the set value. Because multiple measurements are taken for each patch, measurement time will become longer for such settings.

Confirm chart recognition result before start of measurement (Default: Disabled)

Pauses the measurement after the pre-scan to enable measurement points to be examined and modified.

General

Do not display warning about chart definition data color information (Default: Disabled)

No warning message will be displayed even if the patch layout, patch color/density, etc. of the chart being measured does not match that of the selected chart definition data.

Automatic data export

Determines whether or not the numerical measurement data will be automatically saved to a file after each measurement (Default: Disabled)

If **Automatic data export** is enabled, the following items will be available:

Export path

Sets the location where the automatically exported measurement data will be saved. (Maximum length: 200 characters)

[...]: Opens a dialog for browsing to the desired save path.

Measurement Condition

Determines which measurement conditions to use to calculate numerical data to be saved to a file after each measurement. (Default: Use main screen conditions)

Use main screen conditions: The conditions in the Measurement Settings window will be used.

Use conditions at right: The conditions selected in the right side of the dialog will be used.

File Name

Determines the file name format to be used for automatically exporting measurement data. (Default: Use Data List name)

Use Data List name: The file name is formed from chart name and measurement number, with Freeform measurements only the measurement number is used.

The preselected file format is "cgats txt File (*.txt)"

File name format:

ChartName_MeasurementNumber_MeasurementCondition.FileExtension

Example Chart measurement: Chart00042_00116_M0.txt

Example Freeform measurement: 00116_M0.txt

Use the following name: The name input into the textbox is used for the beginning of the file name.

File name format:

TextboxText+SequenceNumber_MeasurementCondition.FileExtension

Example: TestMeas0001_M0.txt

Text box (Enabled only when Use the following name is selected):

For inputting text to be used as the first part of the file name. Maximum length: 32 characters

Format

Determines the format in which to automatically export measurement data. (Default: csv File (*.csv))

Formats available:

csv File (*.csv)	Comma-separated values output in the order of patch position
txt File (*.txt)	Tab-separated values output in the order of patch position
cgats xml File (*.xml)	xml format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch position
cgats txt File (*.txt)	Tab-separated values format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch position
CxF3 xml File (*.xml)	xml format as defined by CxF3 (Color Exchange Format version 3) output in the order of patch position
csv File [Output ID Order] (*.csv)	Comma-separated values output in the order of patch IDs
txt File [Output ID Order] (*.txt)	Tab-separated values output in the order of patch IDs
cgats xml File [Output ID Order] (*.xml)	xml format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch IDs
cgats txt File [Output ID Order] (*.txt)	Tab-separated values format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in order of the patch IDs
CxF3 xml File [Output ID Order] (*.xml)	xml format as defined by CxF3 (Color Exchange Format version 3) output in the order of patch IDs

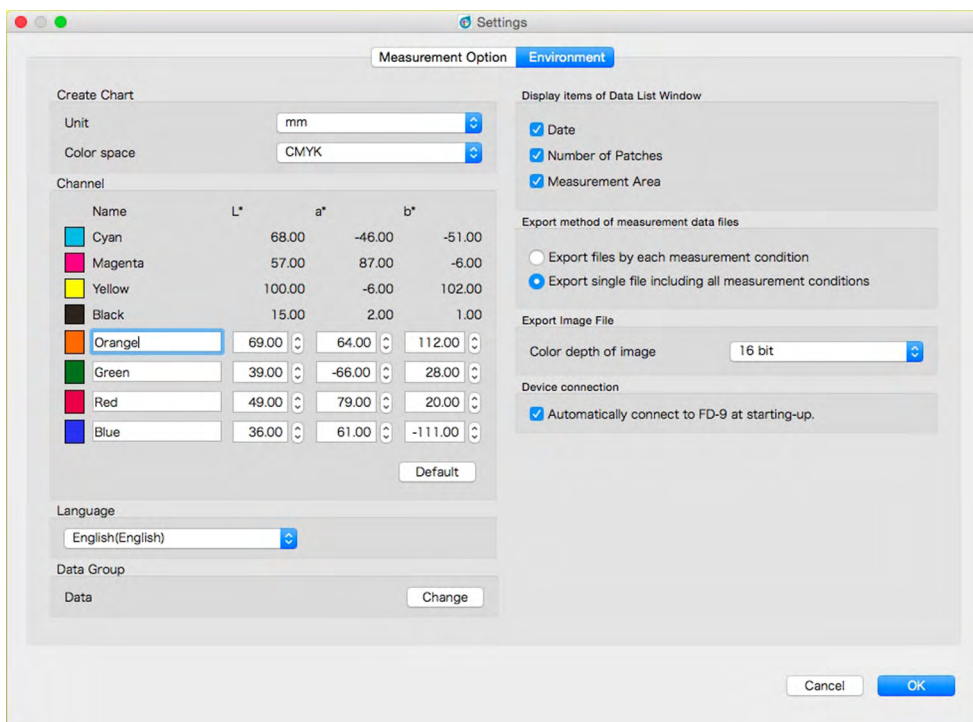
Measurement settings area: When *Use conditions at right* is selected, sets the measurement conditions for calculating the measurement data to be automatically exported.

[OK] Saves settings and closes dialog.

[Cancel] Closes dialog without saving any changes.

Settings Dialog: Environment tab

The Environment tab of the Settings dialog can be opened by selecting *Settings (S) - Environment* from the menu bar or by clicking the Environment tab when the Settings dialog is open and the Measurement Options tab is shown.



- The settings in the Create Chart section and Channel section apply only to subsequently created charts. Previously created charts will be shown using the *Unit* and *Color space* settings that were set at the time the chart was created.

Create Chart

Unit: Sets units to use. (Default: *mm*)
Available settings: mm, inch

Color space: Sets the color system to be used when creating charts. (Default: *RGB*)
Available settings: RGB, CMYK, 5-Color, 6-Color, 7-Color, 8-Color

Channel Defines the L*a*b* color values for channels 5 and higher when 5-Color, 6-Color, 7-Color, or 8-Color is selected as the Color Space.

- Changes to colors for channels 5 and higher will apply if charts previously created using those channels are edited and saved again.

Language Sets the language to be used the next time FD-S2w is started.
Available settings: English (English), 日本語 (Japanese), 中文 (簡体字)(Simplified Chinese), Deutsch (German), Français (French), Español (Spanish)

- Changes to the setting do not take effect until FD-S2w is restarted.

Data Group

FD-S2w automatically saves measured data to data folders under Chart\ and Density\ folders at the following location:

OS X or macOS: /Users/(user name)/Library/Application Support/KONICA MINOLTA/FD-S2w/

Windows: C:\Users\(user name)\AppData\Local\KONICA MINOLTA\FD-S2w\

The group name shown here is the name used for the user data folders under the Chart\ and Density\ folders.

Different user data folders can be used for different users if desired.

Maximum measurements per data folder: 3,000

See p. 34 for adding/changing data group.

Display items of Data List Window

Enables/disables display of items in addition to chart name or measurement name in the Data List window.

Items available: Date (of measurement), Number of Patches, Measurement Area

Export method of measurement data files

Selects how measurement data is exported to files.

Export files by each measurement condition: Individual files containing the measurement data for each enabled measurement condition will be created when a measurement is exported. The number of files created for a single measurement depends on the number of measurement conditions enabled.

Export single file including all measurement conditions: A single file containing the measurement data for all enabled measurement conditions will be created when a measurement is exported. Only one file will be created, regardless of the number of measurement conditions enabled.

Export Image File

Color depth of image: Sets the color depth when exporting TIFF files

Available settings: 8 bit, 16 bit

Device connection

Automatically connect to FD-9 at starting-up

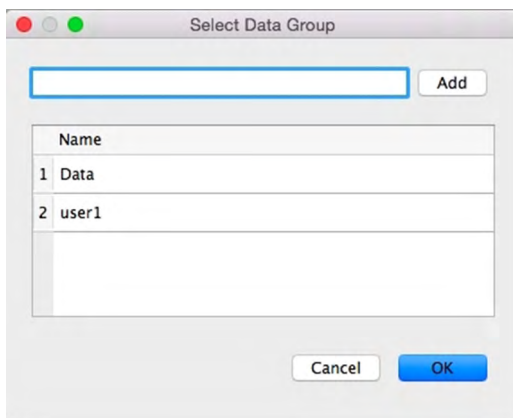
When checked, FD-S2w will automatically attempt to connect to the FD-9 when starting up.

[OK] Saves settings and closes dialog.

[Cancel] Closes dialog without saving any changes.

Adding/changing data group

- 1 Click [*Change*]. The Select Data Group dialog will appear, showing a list of currently set data groups.



- 2 To add a data group, input the desired group name in the text box and click [*Add*]. The new data group name will be added to the data group list.
- 3 To change the data group, select the desired data group from the list of available groups and click [*OK*]. The Select Data Group dialog will close and the new data group name will be shown in Data Group in the Environment tab. When the Environment tab is closed, measurements saved in the selected data group will be shown in the Data List window of the main FD-S2w screen or the Chart List window of the Density balance / Color density control window.

[*OK*] Saves settings and closes dialog.

[*Cancel*] Closes dialog without saving any changes.

| Chart conditions

- Even if paper conditions and chart layout conditions meet the conditions below, some charts may not be measurable.

Paper size

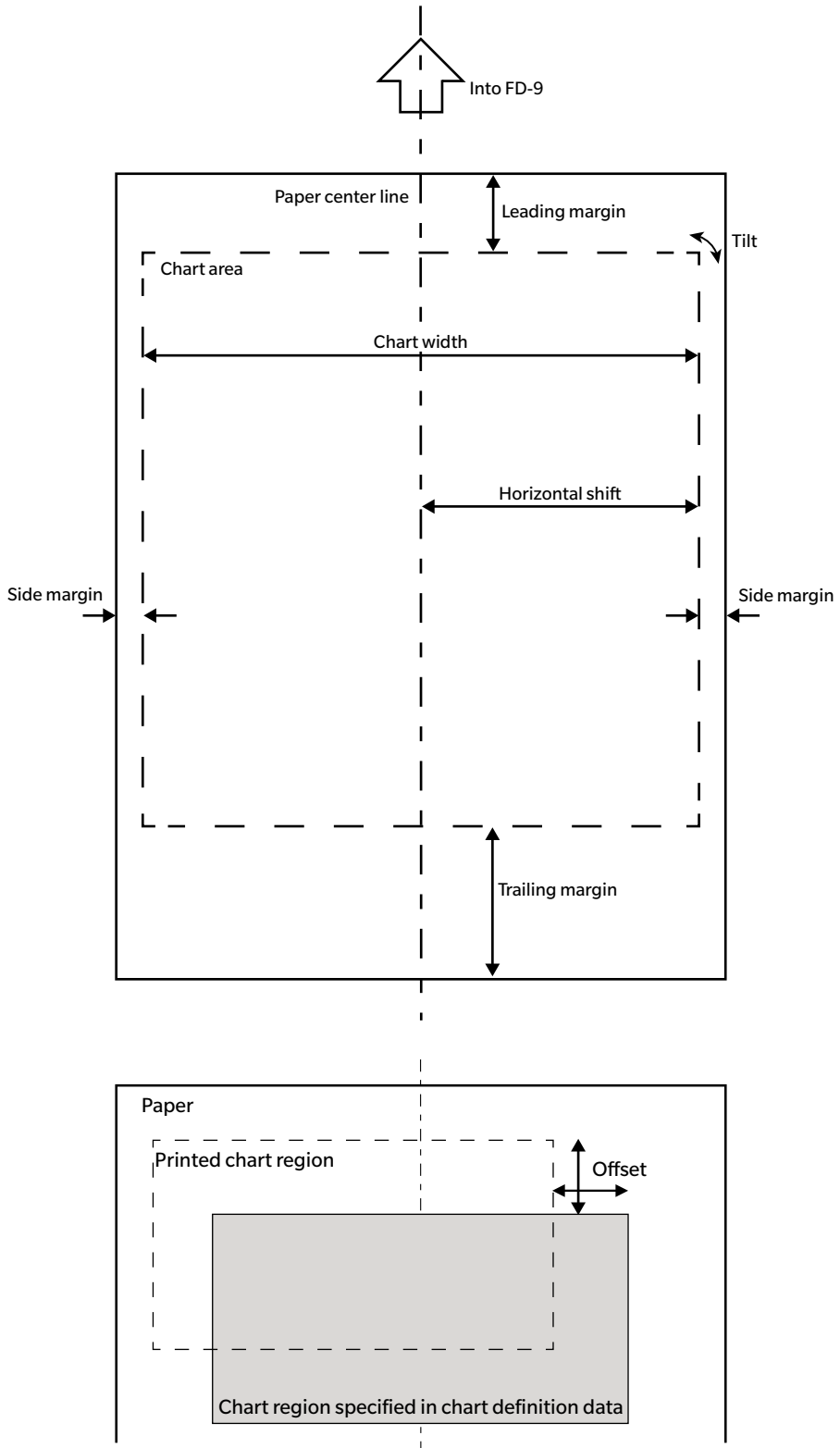
	When feeding test charts using FD-9 alone	When using optional Auto Sheet Feeder FD-A09
Paper width	45 to 330 mm	90 to 320 mm
Paper length	170 to 1500 mm	170 to 450 mm
Paper thickness	0.05 to 0.45 mm	0.08 to 0.25 mm ^{*1}

- *1 When using optional Auto Sheet Feeder FD-A09, the maximum recommended number of loaded sheets is:
 Normal paper (80 g/m²): 100 sheets
 Heavy paper (130 g/m²): 70 sheets

Relative positions of chart and paper

The layout of the chart on the paper must conform to the following layout. (See figures on next page.)

Minimum leading margin	23 mm
Minimum trailing margin	33 mm
Minimum side margins	4 mm
Distance from paper center line to left/right edge of chart region	Within 150 mm
Maximum chart region width	300 mm
Maximum chart region length	1444 mm
Printing tilt (relative to paper edge)	±2° (maximum)
Offset (printing position relative to chart definition data)	±21 mm (maximum)



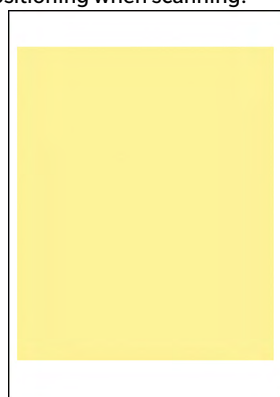
Conditions for general patch areas (groups of patches) and patches

White space between patch areas	8 mm or more
Maximum number of patch areas per page	50
Patch size (height or width)	Minimum: 6 mm; Maximum: 30 mm
Patch tilt	Within $\pm 2^\circ$ (relative to paper feed direction)
Maximum number of patches per page	12932 (Reference: A4-size paper: 1394 A3-size paper: 2928)

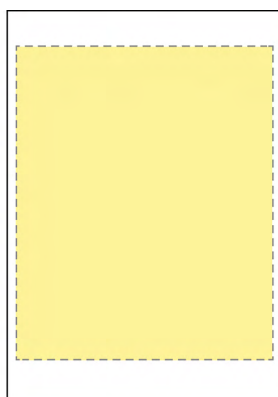
- Patch areas should contain patches of the same size arranged at constant lengthwise and crosswise intervals.
- The area around a patch area should be white. Patch areas must not be surrounded by high-density colors.
- There must be no text or other characters or marks within 2 mm of the patch area border.
- For a strip chart, there should be no characters in areas in line with the extension of the longitudinal direction of the chart.
- Patches should be squares or rectangles. Circles, ovals, or irregular shapes may not be recognized as patches.
- Density difference between adjacent patches or between a patch and adjacent gap should be at least 40/256 tone.
- The width of the gap between patches should be less than 17% of the patch width.

Conditions for solid charts

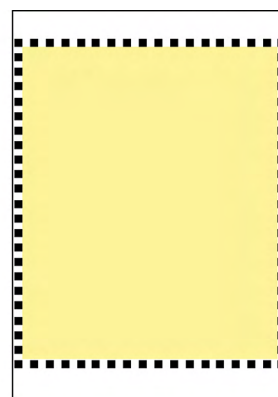
When measuring a solid chart (a chart consisting of a single large solid color area covering most of the page), the perimeter of the solid color area should be defined by either of the following two methods in order to ensure proper positioning when scanning.



(Original chart)



Method 1: Outline the perimeter with a dashed line in a contrasting color.



Method 2: Place numerous patches of contrasting color around the perimeter.

Chart conditions for freeform chart measurements

For freeform chart measurements, the FD-9 attempts to determine the position and size of patch areas and the patches within each patch area without any pre-defined position or size data. However, under certain conditions it may not be possible for the FD-9 to properly recognize patch areas and patches. In such cases, it is recommended that chart definition data be created with the layout of the chart to be measured, and that measurements be taken using that chart definition data.

Taking Chart Definition Data Measurements

Chart definition data include data on the color of each patch as well as the patch position and size. If the chart definition data is equipped with a QR code, the QR code will include information on the chart name, number of chart pages, and the number of color patches including the number of rows and columns, and can be used for automatically selecting the chart definition data to use for measurement.

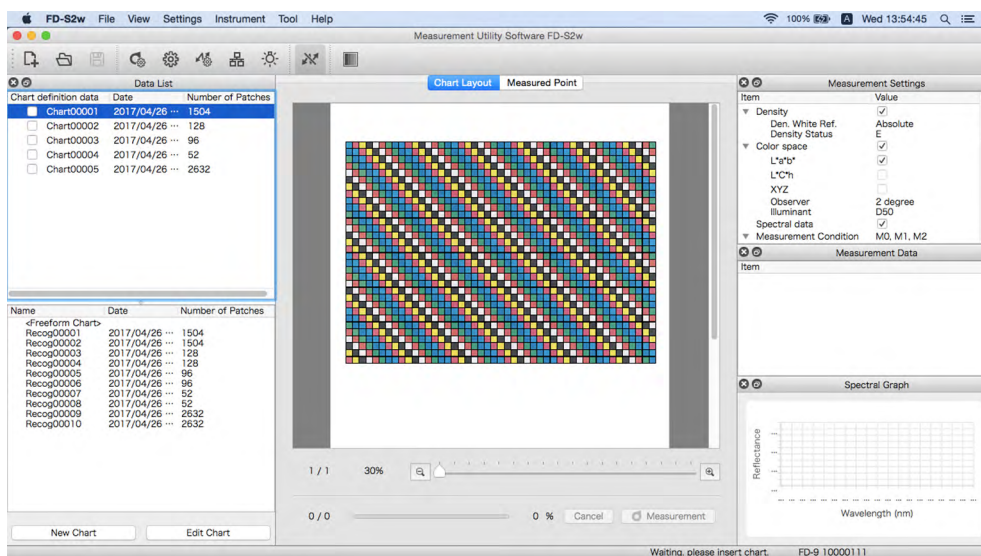
- To create chart definition data, see p. 53.

Manual selection of chart definition data

To take a chart definition data measurement by manually selecting the chart definition data:

- For taking measurements of chart definition data charts equipped with QR codes, see p. 40.

1 Select the desired chart in the chart definition data list. A color image of the chart definition data chart will appear in the Chart canvas.



2 Insert the chart to measure into the FD-9.

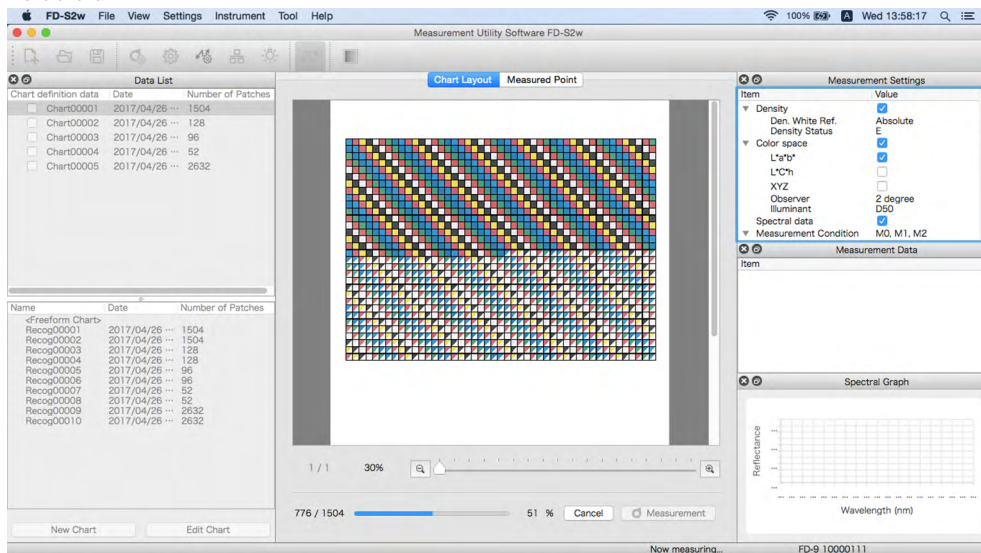
- When measuring multi-page charts, insert the first page of the chart.
- When using the optional Auto Sheet Feeder, place the chart or charts to measure in the paper supply tray and then press the [OK] button on the FD-9. If the selected chart is a multi-page chart, be sure to place the charts in the paper supply tray in the proper page order.

3 The FD-9 will pre-scan the chart to measure.

- If the patch sizes and positions determined by the pre-scan of the chart to measure do not match the patch positions of the chart definition data, the warning message "The detected patch positions are different from chart definition data." will appear. (This message may also appear even if the chart is actually correct due to white areas in the chart not being recognized as patch areas.) Click [OK] to continue measurement if desired.

4 The FD-9 will start patch measurements. The Chart Layout tab will show the color image of the chart definition data chart with the defined color of each patch in the upper left half of the patch. As the measurement of each patch is completed, the lower right half of the patch will change to the measured color. The progress of measuring the chart will be shown in the status bar.

- To cancel a measurement, click [Cancel]. The measurement will be canceled, and after a few seconds the FD-9 will eject the chart.



- When measuring multi-page charts by manually feeding each page, insert the next page of the chart and the FD-9 will repeat steps 3 and 4. Be sure to insert the chart pages in the proper order.
- When measuring multi-page charts using the optional Auto Sheet Feeder, steps 3 and 4 will be repeated automatically until all pages have been measured.
- If the computer's "sleep" function activates in the middle of a measurement, the measurement will be interrupted without being canceled. If this occurs, it may be necessary to manually eject or remove the chart and reconnect to the instrument. The "Sleep" function can be disabled in the Power Options setting (Windows) or Energy Saver preference pane (OS X or macOS).

5 When measurement of the chart is complete, the measurement will appear below the selected chart definition data name with a sequential number, and the data will be automatically stored.

- Selecting the measurement in the Data List window will cause the image in the Chart Layout tab of the Chart canvas to change to an image of the measured chart, with the color of each patch showing only the measured color instead of the diagonally split patch showing defined color/measured color.
- When using the optional Auto Sheet Feeder, the Auto Sheet Feeder will feed in the next chart in the stack of charts in the paper supply tray and repeat steps 3 through 5 until all charts have been read. If an error occurs, measurement will be paused or continued according to the "Error handling (Auto Sheet Feeder only)" setting in the Measurement Option tab of the Settings dialog.

Automatic selection of chart definition data having QR codes

When QR codes have been added to chart definition data and are included on the test chart, the FD-9 and FD-S2w can automatically determine which chart definition data should be selected when measuring a chart.

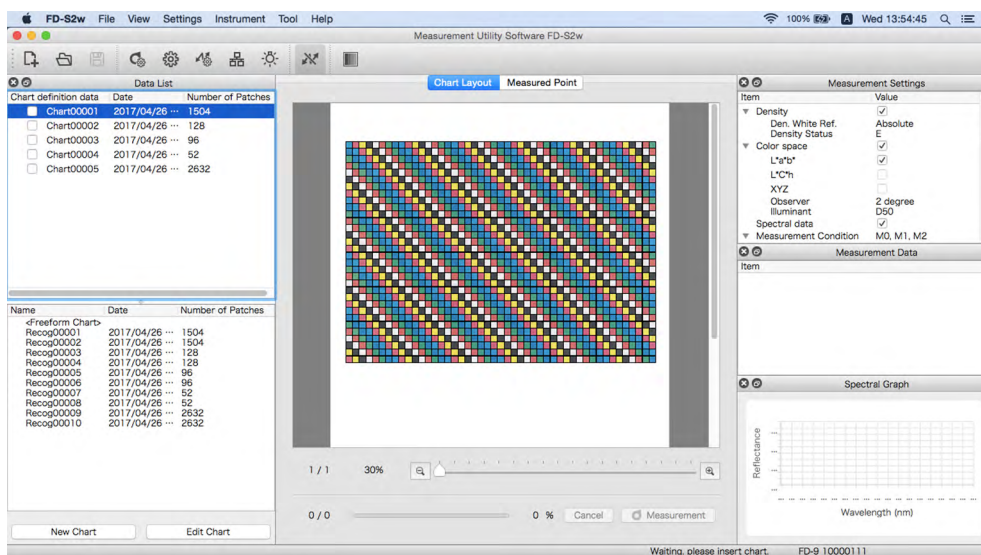
To take a chart definition data measurement of charts having QR codes:

- For taking measurements of chart definition data charts by manually selecting the chart definition data to use, see p. 38.

1 Insert the chart to measure into the FD-9.

- When measuring multi-page charts having QR codes, the pages for a single multi-page chart can be inserted in any order. The QR code will tell FD-S2w the number of the page within the multi-page chart.
- When using the optional Auto Sheet Feeder, place the chart or charts to measure in the paper supply tray and then press the [OK] button on the FD-9. If the selected chart is a multi-page chart, the charts can be placed in any order in the paper supply tray, although the pages for each multi-page chart should be kept together.

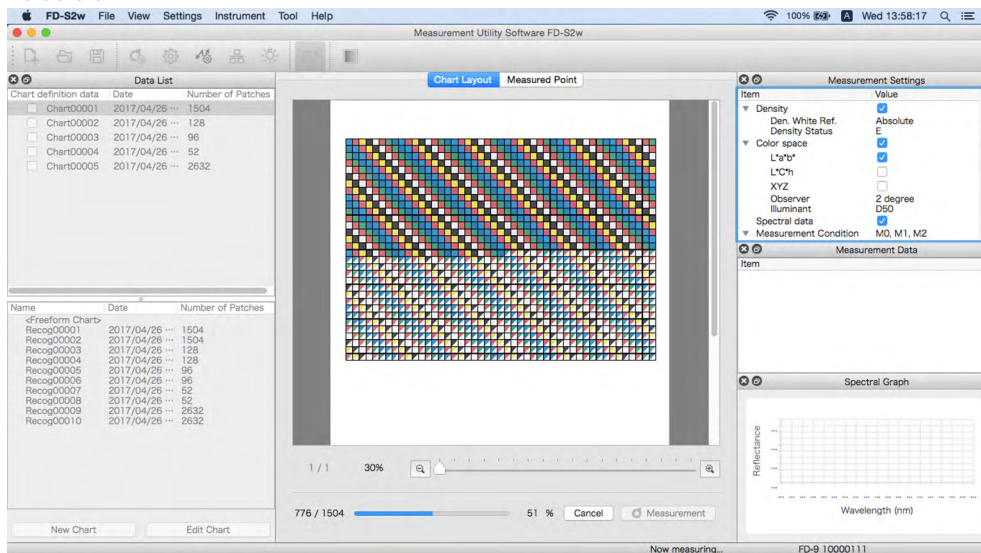
2 The FD-9 will pre-scan the chart to measure, and select the chart definition data specified by the chart's QR code. The chart definition data chart image (the first page of the chart for multi-page charts) will be shown in the chart canvas.



- If the chart definition data for the chart definition data name specified by the QR code does not exist in the chart definition data list, the chart will be measured as if there was no QR code. If a chart definition data name or a measurement under a chart definition data name is currently selected, the chart will be measured as if that chart definition data was selected (see p. 38); if "<Freeform chart." is selected, the chart will be measured as a freeform chart (see p. 42).

3 The FD-9 will start patch measurements. The Chart Layout tab will show the color image of the chart definition data chart with the defined color of each patch in the upper left half of the patch. As the measurement of each patch is completed, the lower right half of the patch will change to the measured color. The progress of measuring the chart will be shown in the status bar.

- To cancel a measurement, click [Cancel]. The measurement will be canceled, and after a few seconds the FD-9 will eject the chart.



- When measuring multi-page charts by manually feeding each page, insert another page of the same chart and the FD-9 will repeat steps 2 through 4. The pages of a single multi-page chart can be inserted in any order, but inserting a page from a different chart before completing all pages of a multi-page chart will cause the new page to be measured as a separate chart.
- When measuring multi-page charts using the optional Auto Sheet Feeder, steps 3 and 4 will be repeated automatically until all pages have been measured.
- If the computer's "sleep" function activates in the middle of a measurement, the measurement will be interrupted without being canceled. If this occurs, it may be necessary to manually eject or remove the chart and reconnect to the instrument. The "Sleep" function can be disabled in the Power Options setting (Windows) or Energy Saver preference pane (OS X or macOS).

4 When measurement of the chart is complete, the measurement will appear below the selected chart definition data name with a sequential number, and the data will be automatically stored.

- Selecting the measurement in the Data List window will cause the image in the Chart Layout tab of the Chart canvas to change to an image of the measured chart, with the color of each patch showing only the measured color instead of the diagonally split patch showing defined color/measured color.
- When using the optional Auto Sheet Feeder, the Auto Sheet Feeder will feed in the next chart in the stack of charts in the paper supply tray and repeat steps 3 through 5 until all charts have been read. If an error occurs, measurement will be paused or continued according to the "Error handling (Auto Sheet Feeder only)" setting in the Measurement Option tab of the Settings dialog.

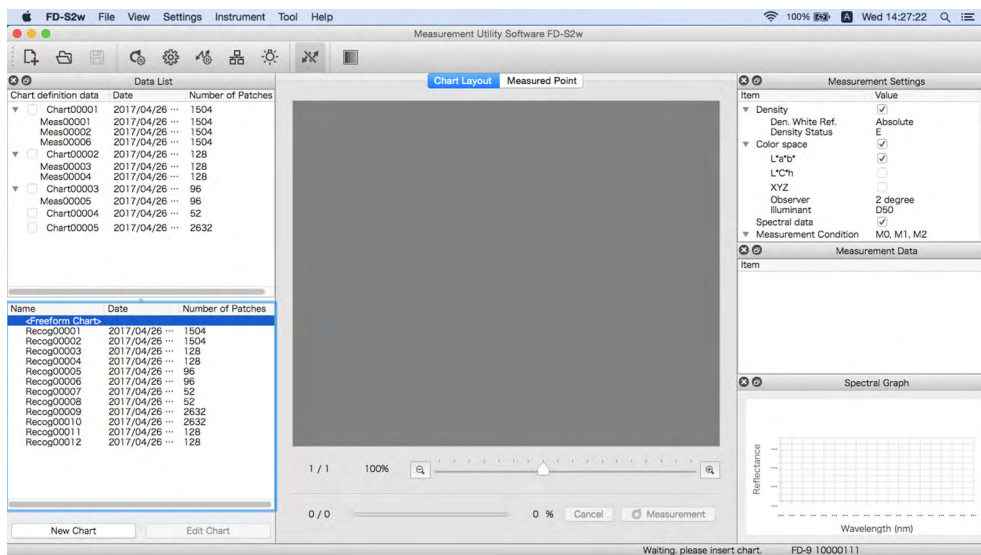
Taking Freeform Chart Measurements

A freeform chart measurement is a measurement taken without any chart definition data.

- Refer to “Chart conditions for freeform chart measurements” on p. 37 for information on patch area and patch conditions for freeform chart measurements.

To take a freeform chart measurement:

1 Select “<Freeform chart>” in the freeform chart list. The chart canvas area will become blank.



2 Insert the chart to measure into the FD-9.

- When using the optional Auto Sheet Feeder, place the chart or charts to measure in the paper supply tray and then press the [OK] button on the FD-9.

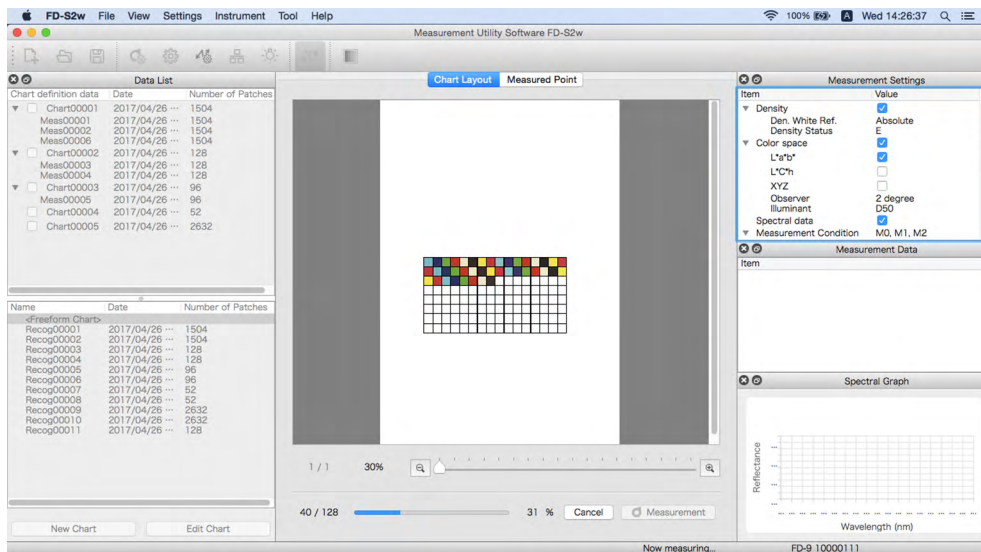
3 The FD-9 will pre-scan the chart to measure to determine patch positions and measurement points.

- If the chart is equipped with a QR code corresponding to a chart definition data, the corresponding chart definition data will be automatically selected and used for measurements even if “<Freeform chart>” is selected in step 1.

4 If *Confirm chart recognition result before start of measurement* is enabled in the Measurements Options tab of the Settings dialog, measurement will be paused after the pre-scan so that the recognized patches and measurement points can be checked in the Measured Point tab. (To edit measurement points, see p. 45.) To continue measurements, press Measurement .

5 The FD-9 will start patch measurements. As the measurement of each patch is completed, the measured color of the patch will be shown. The progress of measuring the chart will be shown in the status bar.

- To cancel a measurement, click [Cancel]. The measurement will be canceled, and after a few seconds the FD-9 will eject the chart.



- If the computer's "sleep" function activates in the middle of a measurement, the measurement will be interrupted without being canceled. If this occurs, it may be necessary to manually eject or remove the chart and reconnect to the instrument. The "Sleep" function can be disabled in the Power Options setting (Windows) or Energy Saver preference pane (OS X or macOS).

6 When measurement is complete, the measurement will appear in the freeform chart list with a sequential number, and the data will be automatically stored.

- When using the optional Auto Sheet Feeder, the Auto Sheet Feeder will feed in the next chart in the stack of charts in the paper supply tray and repeat steps 3 through 5 until all charts have been read. If an error occurs, measurement will be paused or continued according to the "Error handling (Auto Sheet Feeder only)" setting in the Measurement Option tab of the Settings dialog.

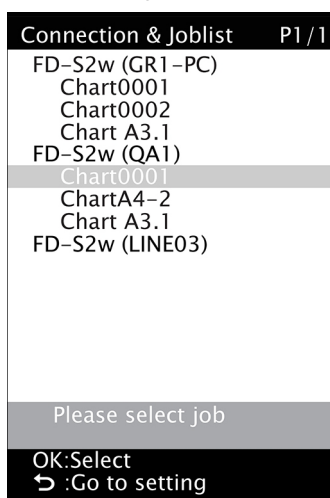
| Taking FD-9 Job Measurements using FD-9 LCD and controls

When using FD-S2w with the FD-9, the destination computer to send measurement data to can be selected from the FD-9. If chart definition data are enabled for FD-9 Job measurements in the Chart Definition Data section of the Data List window, the chart definition data to measure against can also be selected.

- To enable a chart definition data for FD-9 Job measurements, click on the checkbox next to the chart definition data name in the Chart Definition Data list area so that the checkbox is checked.
- When the FD-9 is connected via USB, only a single destination computer will be available. When the FD-9 is connected via LAN, the destination computer can be selected from among several computers connected to the FD-9.

To select the destination computer or chart definition data on the FD-9:

- 1 On the FD-9, when the main screen (showing “Please insert chart”) is shown in the LCD, press [OK]. The FD-9 LCD will change to the Connection & Joblist screen as shown below.**



- 2 Press ▼ or ▲ on the FD-9 to select the desired computer or chart definition data to use as the destination for the measurement.**
- 3 Press OK. The FD-9 LCD will change back to the main screen.**
- 4 When a test chart is fed into the FD-9 to take a measurement after making the selection:**
 - If a chart definition data name was selected, when the chart is fed into the FD-9 the measurement will be taken against the selected chart definition data on the selected computer.
 - If a chart definition data name was selected and “Disable chart after completion of measurement” in FD-9 Job measurement of the Measurement Options tab in the settings dialog is checked, remote selection of the chart definition data will be disabled after measurement of the chart has been successfully completed.
 - If a computer was selected, when the chart is fed into the FD-9 the measurement will be taken as a freeform chart measurement on the selected computer.
- 5 When measurement is completed, the data will be shown at the computer for the selected chart or computer.**

Editing Measurement Points

The measurement points on a scanned chart can be edited in the Edit Patch Area dialog, and the edited results registered as a new chart.

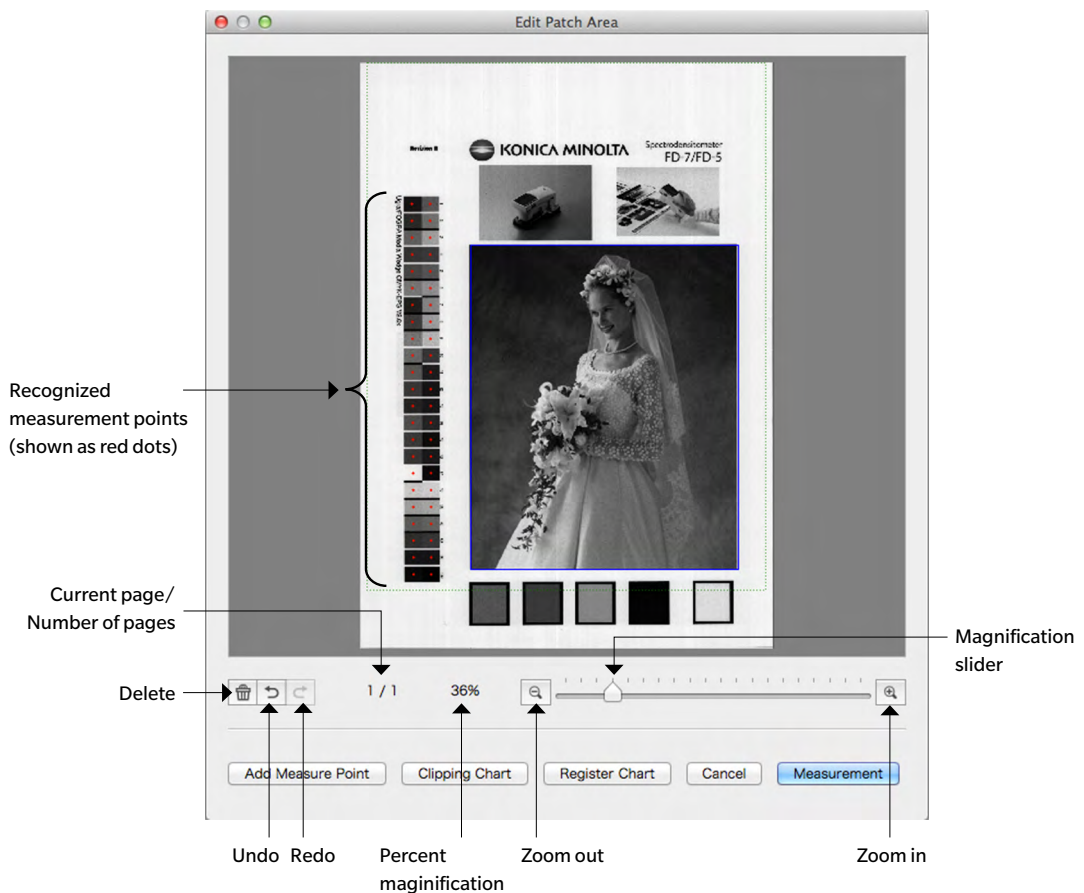
For freeform chart measurements, editing of measurement points can be performed either after the pre-scan and before patch measurements, or after patch measurement of the chart has been completed.

For chart definition data chart measurements, editing of measurement points on the scanned and measured chart can be performed only after patch measurement of the chart has been completed.

- To edit the chart definition data instead of a measured chart, see p. 53.

Edit Patch Area dialog

To open the Edit Patch Area dialog, click **Edit measurement points** in the Measured Point tab of the chart canvas. The Edit Patch Area dialog will appear.



Deleting measurement points

1 Select the point to be deleted by one of the following methods:

Single point:

To select a single point, click on it. The color will change from red to yellow.

Multiple adjacent points:

To select multiple adjacent points, click and drag to create a blue frame that encloses the points to be selected (the color of points within the blue frame will change from red to yellow).



Multiple non-adjacent points:

To select multiple non-adjacent points, click on the first point and then hold Ctrl (Windows) / Cmd (macOS) pressed while clicking on the additional points (the color of each selected point will change from red to yellow when it is selected).

Canceling selection:

To cancel selection of points, click on an area other than the selected measurement point or points. The measurement point color will change back to red.

2 After the measurement points to be deleted have been selected, click (Delete). The selected measurement points will be deleted.



- To undo deletions, click  (Undo). One deletion will be undone each time the button is pressed, starting with the most recent deletion.
- To redo an undone deletion, click  (Redo) button. One undone deletion will be redone each time the button is pressed, starting with the most recent.

Adding measurement points directly

- 1 Click and drag on the scanned chart image to create a blue frame that encloses the area where you want to add measurement points, and then let go of the mouse button.
- 2 Click **Add Measure Point**. The Add Measure Point dialog will appear. The initially specified number of rows and columns is the number of rows and columns that can be created within the blue frame using the minimum patch size.
- 3 Set the desired number of rows and columns, and click OK. The Modify Chart Dialog will appear, with a red grid having the specified number of rows and columns in the area enclosed by the blue frame in step 1.



- If the specified number of rows and/or columns cannot fit within the area specified by the blue frame even at the minimum patch size, the area covered by the red grid will be expanded to the smallest area that can fit the specified number of rows/columns at the minimum patch size.
- If the specified number of rows and/or columns is too low to cover the area specified by the blue frame at the maximum patch size, the area covered by the red grid will be reduced to the largest area that can fit the specified number of rows/columns at the maximum patch size.
- The size of the area covered by the red grid can be changed by clicking and dragging the lower right corner of the grid. However, the size of the grid cannot be adjusted to smaller than the minimum patch size x the number of rows/columns or to larger than the maximum patch size x the number of rows/columns.

- The position of the red grid can be moved by clicking anywhere within the grid and dragging the grid to the desired position.
- **Layout section:** The Patch Area settings can also be changed directly in the Layout section of the dialog. (It is not possible to change Paper Layout settings.) To change the position of the left top corner of the red grid, click on the X and Y values and input the desired position directly or use the ▲ and ▼ buttons next to the value. To change the number of patches, click on the Row and Column values, and input the desired number directly or use the ▲ and ▼ buttons next to the value. (The Number of patches always equals Row value x Column value, and cannot be changed.) To change the patch size, click on the Width and Height values in the Patch Size section and input the desired number directly or use the ▲ and ▼ buttons next to the value. If necessary, the overall size of the grid area will change. To change the patch gap (the distance from one edge of a patch to the same edge of the adjacent patch), click on the Width and Height values in the Patch Gap section and input the desired number directly or use the ▲ and ▼ buttons next to the value. If necessary, the overall size of the grid area will change.
- The magnification of the chart image can be changed by Clicking on ▼ and selecting the desired magnification from the pull-down list that appears, Clicking on  (zoom out) or  (zoom in) buttons to set the desired magnification, or Moving the magnification slider to set the desired magnification.

4 After the size, position, and layout of the red grid and the number of rows and columns in it have been set as desired, click [OK] to confirm the settings and close the Modify Chart dialog, and return to the Edit Patch Area dialog. Measurement points will be added at the center of each block of the red grid.

- To close the Modify Chart dialog and return to the Edit Patch Area dialog without confirming the settings and adding measurement points, click [Cancel].

Adding measurement points using Clipping Chart

- Adding measurement points using Clipping Chart is possible only when taking a freeform chart measurement with *Confirm chart recognition result before start of measurement* enabled (checked) in the Measurement Options tab of the Settings dialog.

1 Click and drag on the scanned chart image to create a blue frame that encloses the area where you want to add a measurement point, and then let go of the mouse button.

2 Click . Automatic re-recognition of the enclosed area will be attempted.

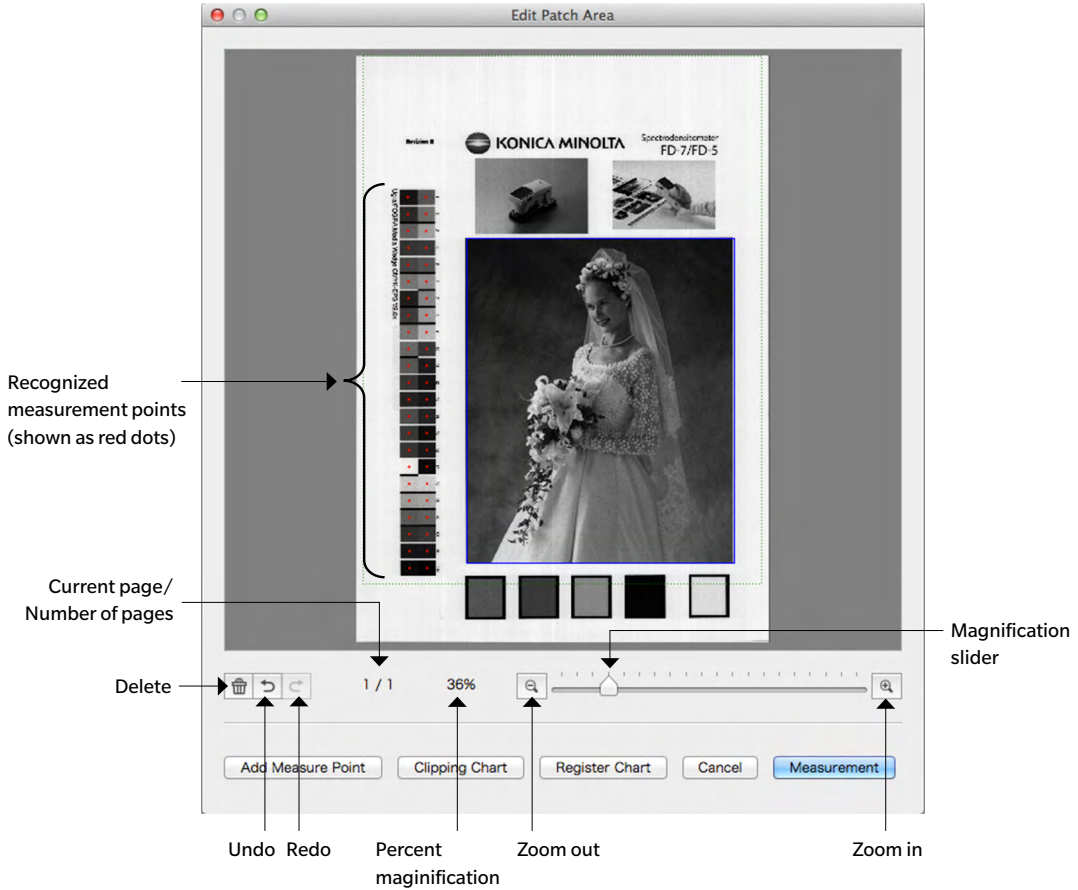
- If the selected area contains mainly a single color and is small, it will be recognized as a single patch and a single measurement point will be created. If the selected area is large, several measurement points may be created.
- If the selected area contains several regions of different colors and the regions are of sufficient size, automatic re-recognition will recognize the several regions as patches and a measurement point for each patch will be created.
- If the selected area is a region with mottled colors, automatic re-recognition may not be able to recognize any patches within the area and it will be impossible to create a measurement point.




Saving the edited measurement points as a new chart

After the measurement points have been edited as desired, click . The chart will be added to the Chart Definition Data section of the Data List window as a new chart definition data.


- To exit the dialog without saving the changes, click .


Controls




-  **Delete:** Deletes the selected measurement point or points.
-  **Undo:** Undoes the most recent deletion.
-  **Redo:** Redoes the most recent undone deletion.

Percent magnification: Shows current magnification. Clicking on ▼ opens a dropdown list for selecting the desired magnification from several predefined steps or "Fit in window".

 **Zoom out:** Reduces the magnification of the chart area.

Magnification slider: Slide the slider  to gradually adjust magnification or click on the bar to move the slider directly to that point to adjust magnification quickly.

 **Zoom in:** Increases the magnification of the chart area

Add Measure Point Adds measurement points to the area selected by clicking and dragging on the chart. The number of rows and columns of measurement points to add can be set.

Clipping Chart (Enabled only when editing during freeform chart measurement after pre-scan) Causes re-recognition of area enclosed by blue frame created by clicking and dragging to be attempted. New measurement points will be added if re-recognition is successful.

Register Chart

Saves the edited chart to the Chart Definition Data section of the Data List window as a new chart definition data.

- If editing measurement points was performed during freeform chart measurement after pre-scan and before color measurement, measurement will continue.

Cancel

Cancels changes and closes the dialog.

Measurement

If this dialog was shown between pre-scan and color measurement, this dialog will be closed and measurement will continue.

Exporting measurement data

FD-S2w automatically saves the pre-scan image, measurement points, and measurement data of each measurement at the time of measurement.

Measurement data can also be exported to a file using the procedure below.

1 Select File - Export Data from the menu bar. The Save dialog will open.

2 Browse to the location in which to save the exported data and input the desired file name.

The standard file name is formed from chart name and measurement number, with Freeform measurements only the measurement number is used. The preselected file format is "cgats txt file (*.txt)".

Depending on the setting for the export method (see pages 32, 33), a file with all selected measurement conditions or a separate measurement file for each measurement condition is saved. Separate files with different measurement conditions are automatically marked accordingly at the end of the file name:

Chart00042_00116_M0.txt

Chart00042_00116_M1.txt

Chart00042_00116_M2.txt

...

3 Select the file type to be used.

Available file types:

csv File (*.csv)	Comma-separated values output in the order of patch position
txt File (*.txt)	Tab-separated values output in the order of patch position
cgats xml File (*.xml)	xml format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch position
cgats txt File (*.txt)	Tab-separated values format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch position
CxF3 xml File (*.xml)	xml format as defined by CxF3 (Color Exchange Format version 3) output in the order of patch position
csv File [Output ID Order] (*.csv)	Comma-separated values output in the order of patch IDs
txt File [Output ID Order] (*.txt)	Tab-separated values output in the order of patch IDs
cgats xml File [Output ID Order] (*.xml)	xml format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in the order of patch IDs
cgats txt File [Output ID Order] (*.txt)	Tab-separated values format as defined by CGATS (Committee for Graphic Arts Technologies Standards) output in order of the patch IDs
CxF3 xml File [Output ID Order] (*.xml)	xml format as defined by CxF3 (Color Exchange Format version 3) output in the order of patch IDs

4 Click OK. The measurement data will be exported to the selected location, with one file for each measurement condition selected in the Measurement Settings window.

Creating/Editing Chart Definition Data

A chart definition data chart consists of one or more chart pages, each page having one or more patch areas, and each patch having a defined color. QR codes can also be added to chart definition data charts for automatic identification of chart definition data.

Chart definition data can be created by registering a scanned freeform chart as a chart definition data, by creating entirely new chart definition data, or by editing existing chart definition data.

| Registering a freeform chart as chart definition data

- 1** Select the freeform chart to register in the Freeform Chart section of the Data List window.
- 2** Right-click on the chart and select *Register Chart* from the right-click menu. The chart will be copied to the Chart Definition Data section of the Data List window and automatically given the name "Chartxxxx" where "xxxx" is the next sequential number for chart definition data names.

| Creating entirely new chart definition data

- Before creating a new chart definition data, check that the Unit and Color Space are set as desired in the Environment tab of the Settings dialog.

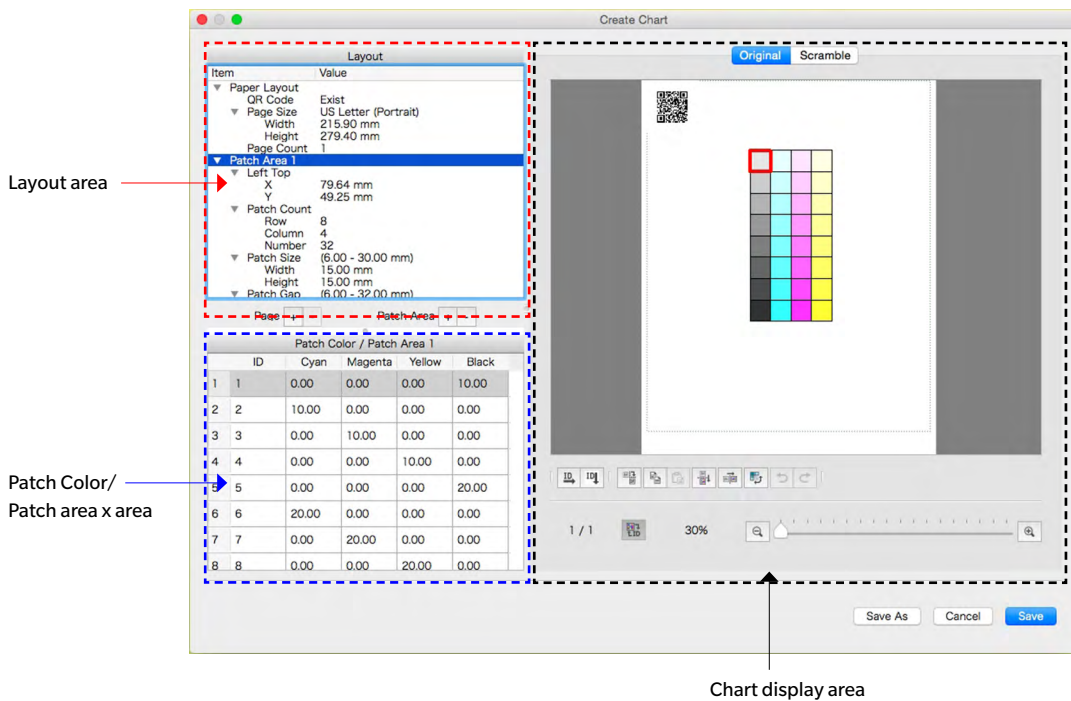
- 1** Click at the bottom of the Data List window.
or
Select *File - New Chart File* from the menu bar.
- 2** The Create Chart dialog will appear. See p. 54 for Create Chart dialog operations to create or edit chart definition data.

| Editing existing chart definition data

To edit existing chart definition data in the Chart Definition Data section:

- 1** Select the chart definition data to edit in the Chart Definition Data section.
- 2** Click at the bottom of the Data List window.
or
Right-click on the chart definition data name in the Chart Definition Data section and select *Edit Chart* from the right-click menu.
- 3** The Create Chart dialog will appear. See p. 54 for Create Chart dialog operations to create or edit chart definition data.

| Create Chart dialog



Layout area

- Clicking on the ▼ (OS X or macOS) or ▲ (Windows) next to a section or subsection title will collapse the section or subsection.
- Clicking on the ► (OS X or macOS) or ▷ (Windows) next to a section or subsection title will expand the section or subsection.

Note on measurement units:

For newly created charts, measurement units for Width and Height in each section will be according to the Unit setting in Create Chart of the Environment tab of the Setting dialog.

For charts registered from freeform charts or for previously created charts, the units will be the units set at the time the chart was scanned or created.

Paper Layout:

- QR Code** QR codes are 2-dimensional bar codes. In FD-S2w, the codes contain information on the chart definition data name, number of pages, the number of patch areas on each page, and the number of rows/columns/patches for each patch area.
Click on the current QR Code setting and select the desired setting from the pull-down list that appears.
- Exist:** A QR code will be present on the chart.
When *Exist* is first selected, a QR code spaceholder will be added to the chart. This placeholder can be moved to the desired position on the chart.
If the QR code overlaps a color patch area or is outside the scannable area indicated by the green dotted-line frame, an error message will appear.
The QR code spaceholder will be replaced by a QR code containing the chart definition data information when the edited chart is saved.
- None:** No QR code will be present on the chart.
- Page Size** Click on the current page size and select the desired page size from the pull-down list that appears.
- Selectable sizes: US Letter (Portrait) (*Default*)
US Letter (Landscape)
Tabloid
Legal
A4 (Portrait)
A4 (Landscape)
A3
A3+ (Portrait)
Custom*
- When “Custom” is selected as the paper size, the size can be input directly by clicking on the values for Width and Height and inputting the desired values
- Width, Height** If Page Size is set to “Custom”, the values for Width and Height can be changed by clicking on the value and editing it directly, or by using the ▲ and ▼ buttons next to the value.
- If Page Size is set to any setting other than “Custom”, the values for Width and Height are shown for display purposes only and cannot be changed.
- Page Count** Page Count is shown in the Layout section for display purposes only and cannot be changed directly here.
- To add or remove pages from the chart, click the or buttons next to Page below the Layout area. Clicking will add a page to the end of the chart; Clicking will remove the currently selected page from the chart.
 - To select pages within a multipage chart, click the page number below the chart area.

Patch Area xx

The settings here determine position and layout of the specified patch area on the currently displayed chart page.

- To add or remove patch areas from a chart, click the + or - buttons next to Patch Area below the Layout area. Clicking + will add a patch area to the chart; Clicking - will remove the patch area selected in the Layout area from the chart.

- Left Top** The X and Y distances from the left and top edges of the chart page to the upper left corner of the patch area can be set directly by clicking on the value and editing it directly, or by using the ▲ and ▼ buttons next to the value.
- Minimum values: X: 4.00mm (0.157 inch); Y: 0.00
- Patch areas can also be moved directly by clicking and dragging the patch area in the chart display area.
- Patch Count:** The number of rows, number of columns, and total number of patches in the patch area can be set by clicking on the value and editing it directly, or by using the ▲ and ▼ buttons next to the value.
- Row: The number of rows in the patch area.
- Column: The number of columns in the patch area.
- Number: The total number of patches.
- If the number of patches is set to less than Row x Column, the patches will be arranged starting with the top left corner and filling each row in succession until the number of patches has been reached. For example, if Row: 3 and Column: 5 are set, and Number is set to 12, the first row will be 5 patches, the second row will be 5 patches, and the third row will only have the leftmost 2 patches.
 - It is not possible to set Number to a value higher than Row x Column.
 - Number does not change automatically with the Row and Column values, and must be set to the desired number of patches.
- Patch Size:** The width and height of patches within the patch area can be set by clicking on the value and editing it directly, or by using the ▲ and ▼ buttons next to the value.
- Minimum value: 6.00 mm (0.236 inch); Maximum value: 30.00 mm (1.181 inch)
- Width: Width of patch
- Height: Height of patch
- All patches within the selected patch area will be set to the same size.
 - It is also possible to set patch size by clicking on the patch in the lower right corner of the patch area, moving the cursor over the lower right corner of the frame of that patch so that the cursor changes to a double-headed arrow, and then clicking and dragging the patch frame. All patches will be set to the same size.
- Patch Gap:** The distance from the edge of one patch to the same edge of the adjacent patch can be set by clicking on the value and editing it directly, or by using the ▲ and ▼ buttons next to the value.
- Width: The distance from the left edge of one patch to the left edge of the adjacent patch.
- Height: The distance from the top edge of one patch to the top edge of the patch directly beneath it.
- The patch gap is the same for all patches.
 - If the patch gap is set to values smaller than the Patch Size width and/or height, the patches will abut one another horizontally and/or vertically.
 - For charts created by registering a freeform scanned chart, setting the patch gap to a larger value than the patch size will cause the patches in the scanned patch area to be separated and spread out.

Page buttons

- + Adds a page to the end of the chart.
- Deletes the current page from the chart.
 - If the chart consists of only a single page, it cannot be deleted.

Patch Area buttons

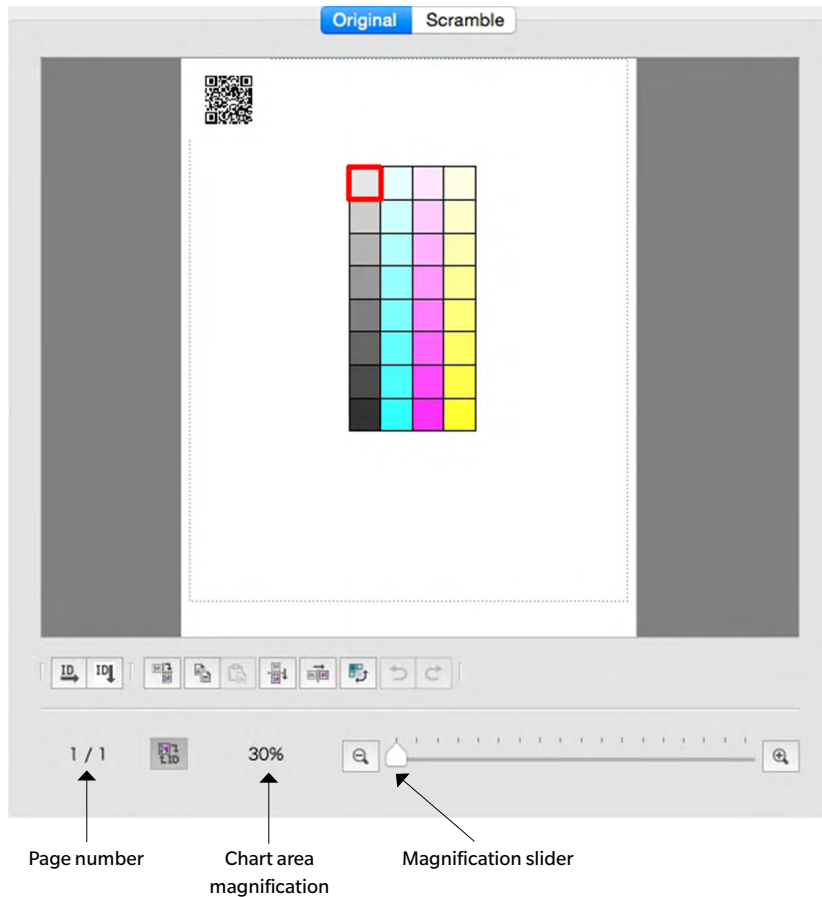
- + Adds a patch area to the chart.
- Deletes the currently selected patch area from the chart.

Patch Color / Patch Area x

Shows a list of the patches in the Patch Area selected in the Layout area and their respective IDs and color values. For a newly created chart, the color settings depend on the Color Space setting in Create Chart in the Environment tab of the Setting dialog.

- For a chart previously created directly, the Color Space setting at the time the chart was created will be used.
- For a chart which was registered from a scanned freeform chart, the Color Space will depend on the Color Space setting in Create Chart in the Environment tab of the Setting dialog.
- The values for each color can be set by clicking on the value and editing it directly, or by using the ▲ and ▼ buttons next to the value. As each value is set, the color of the corresponding patch in the chart display area will change immediately.
- The ID for each patch can also be set by clicking on the value and editing it directly, or by using the ▲ and ▼ buttons next to the value.

Chart display area













Page number

Chart area
magnification

Magnification slider

- Original tab: Shows patches in the original order in which they were arranged on the chart.
 Scramble tab: Arranges the patches within each patch area in random order.
 Green dotted-line frame: Indicates area scannable by FD-9.

-  (Assign IDs Hor.) Resets patch IDs starting with 1 from the upper left corner and incrementing across rows.
 - If there are multiple patch areas on the chart, patch IDs will be reset starting with the patch area closest to the upper left corner of the chart page.
-  (Assign IDs Vert.) Resets patch IDs starting with 1 from the upper left corner and incrementing down columns.
 - If there are multiple patch areas on the chart, patch IDs will be reset starting with the patch area closest to the upper left corner of the chart page.
 - Patch IDs can also be set directly. If a patch ID is set to the same ID as another patch, “ID overlaps” will be shown in the lower part of the dialog.
-  (Rotate) Rotates chart clockwise 90°.
-  (Copy patch): Copies selected patch color.
-  (Paste patch): Pastes copied patch color in selected patch. (ID stays the same as before paste.)

-  (Flip vertically) Flips patches in patch areas vertically while maintaining chart layout.
-  (Flip horizontally) Flips patches in patch areas horizontally while maintaining chart layout.
-  (Exchange R/C) Exchanges (transposes) the rows and columns in each patch area and changes chart layout between Portrait and Landscape.
-  (Undo): Undoes patch color paste.
-  (Redo): Redoes an undone patch color paste.



Page number: Shows the page number of the chart page currently shown. To select another page for multipage charts, click here and select the desired page from the dropdown list.

 Toggles between displaying patch ID or patch color in the chart display area when clicked.

Chart area magnification:

The magnification of the chart area can be changed by:

Clicking next to percentage and selecting the desired magnification from the dropdown list containing several predefined steps or “Fit in window”.

Clicking  (zoom out) to decrease magnification or  (zoom in) to increase magnification
or

Clicking on the slider  and dragging it to the desired magnification.

- [Save] Overwrites the existing chart definition data in the Chart Definition Data list. (Not shown when editing existing chart definition data that already have measurements associated with them.)
- [Save As] Saves the chart definition data to the Chart Definition Data list as a new chart definition data.
- [Cancel] Cancels any changes that were made and closes the dialog.

User Illuminant

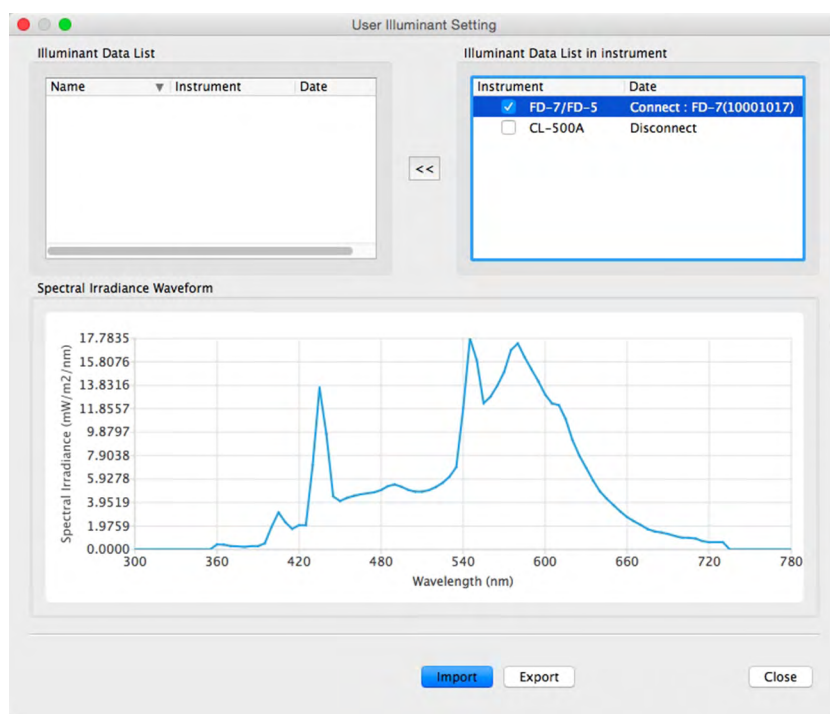
In addition to calculating measurement data under the standard measurement conditions M0, M1, M2, etc. and standard illuminants such as C, D65, etc., FD-S2w can also calculate data based on user-set illuminants. This enables measurement values to be calculated based on the illuminant conditions under which the printed material will be viewed.

- User illuminant data can be imported from the KONICA MINOLTA Illuminance Spectrophotometer CL-500A or the Spectrodensitometer FD-7.
- User illuminant data can also be imported from a file or exported to a file.

Setting user illuminant data stored in a CL-500A or an FD-7

1 Select **Settings - User Illuminant** from the menu bar. The **User Illuminant Setting** dialog will appear, showing the currently set user illuminants (if any).

- Clicking on a currently set user illuminant will cause the spectral irradiance waveform of that illuminant to be shown.



2 In the **Instrument Illuminant Data List**, select an instrument by clicking on the checkbox next to it. The illuminant measurement(s) stored in the selected instrument will be read. The instrument serial number and the measurement date/time of each illuminant measurement in the instrument will be shown in the **Instrument Illuminant Data List**.

- The FD-7 can store only a single user illuminant. When FD-7 is selected, the spectral irradiance waveform of the illuminant will appear as soon as the measurement has been read from the instrument.
- The CL-500A can store several illuminant data. No spectral irradiance waveform will be shown until one of the measurements is selected.

- 3 Select the desired measurement and click << to copy the data to the Illuminant List. When a measurement is selected, the spectral irradiance waveform for the selected measurement will be shown.**
- Selection of multiple measurements in the Instrument Illuminant Data List is not possible. To upload multiple measurements, repeat this step for each desired measurement.
 - Up to 5 user illuminants can be set in FD-S2w. When 5 user illuminants have been set in the Illuminant List, << will be disabled.
 - To change the name of the user illuminant in FD-S2w, right-click on the user illuminant and select *Edit Name*. The name of the selected illuminant will be shown in a text box. Change the name as desired (up to a maximum of 16 characters). Clicking outside the text box will end editing of the name.
- 4 After the desired illuminants have been copied to the Illuminant List and their names set as desired, click [Close] to close the dialog. When the dialog is closed, the selected user illuminants will be set on FD-S2w and will appear in the Measurement Condition section of the Measurement Settings window.**

| Importing user illuminant data from a file

User illuminant data stored in a *.uid file (created using FD-S1w) or *.uid2 file can be imported to FD-S2w.

- 1 Select *Settings - User Illuminant* from the menu bar. The User Illuminant Setting dialog will appear, showing the currently set user illuminants (if any).**
- 2 Click [*Import*]. The Open dialog will appear.**
- 3 Browse to the folder containing the file to be imported.**
- 4 Select the file and click [*Open*]. The illuminant data in the file will be imported and will be added to the Illuminant List.**
- 5 The name of the imported file will be used as the name of the imported illuminant. If a user illuminant with the same name exists, a message box asking whether to overwrite the existing data will appear. Click [*Yes*] to overwrite the data or click [*No*] to not overwrite the data.**
 - To change the name of the user illuminant in FD-S2w, right-click on the user illuminant and select *Edit Name*. The name of the selected illuminant will be shown in a text box. Change the name as desired (up to a maximum of 16 characters). Clicking outside the text box will end editing of the name.
- 6 After the desired illuminants have been imported to the Illuminant List and their names set as desired, click [*Close*] to close the dialog. When the dialog is closed, the selected user illuminants will be set on FD-S2w and will appear in the Measurement Condition section of the Measurement Settings window.**

| Exporting user illuminant data to a file

User illuminant data set in FD-S2w can be exported to a *.uid file or *.uid2 file.

- 1 Select *Settings - User Illuminant* from the menu bar. The User Illuminant Setting dialog will appear, showing the currently set user illuminants (if any).**
- 2 Select the illuminant to export in the Illuminant List.**
 - It is not possible to select multiple illuminants.
- 3 Click [*Export*]. The Save dialog will appear.**
- 4 Browse to the folder in which to save the exported file.**
- 5 Input the desired file name.**
- 6 Select the desired file type.**
 - *.uid: The exported file can be read and used by FD-S1w or FD-S2w.
 - *.uid2: The exported file can be read and used only by FD-S2w.
- 7 Click [*Save*]. The file will be saved.**
 - Repeat steps 2 through 6 to export other illuminants if desired.
- 8 Click [*Close*] to close the User Illuminant Setting dialog.**

Diagnose Instrument

The Diagnose instrument function uses optional color tiles to check the measurement performance of the FD-9. Typically, the function is used as follows:

- ① Set the standard values immediately after receiving the instrument or after KONICA MINOLTA calibration service has been used. See below.
- ② Set the tolerance values. (See p. 66.)
- ③ Periodically take diagnosis measurements. (See p. 67.)

Since the Diagnose instrument function enables you to check the change trend in instrument performance since receiving the instrument or since using the KONICA MINOLTA calibration service, the periodically measured values can serve as judgement criteria in determining when to use the KONICA MINOLTA calibration service.

- For best results, all measurements (measurement of standard values and periodic measurements) should be performed under the same temperature conditions to avoid the effects of thermochromism.

Setting Standard Values

Standard values for the tiles can be set in the Standard Setting dialog. Values can be set by measurement of the tiles, or by importing standard data from a file.

Setting standard values by tile measurement

- If standard data have not been set when *Tools – Diagnosis instrument* is selected from the menu bar, the Standard Setting dialog will appear, with Tile Measurement selected and [Measurement] enabled. To set values by measuring the tiles, continue with step 3 below; to set values by importing from a file, see the next section.

1 In the Diagnose instrument dialog, click [Set Standard]. The Standard Setting dialog will appear.

- If standard values have already been set, the previously set standard values will be shown.

Stand...	WHITE	PALE GREY	MID GREY	DIFF. GREY	DEEP GREY	DEEP PINK	RED	ORAN.	YELLOW	GREEN	DIFF. GREEN	CYAN	DEEP BLUE	BLACK
L*														
a*														
b*														

2 Select Tile Measurement. [Measurement] will be enabled and [Import] will be disabled.

3 Click [Measurement]. A dialog requesting that Tile Strip No. 1 (Colors: White to Red) be inserted in the FD-9 will appear.

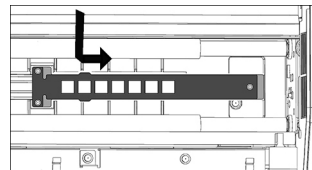
4 Open the cover of the FD-9.

5 Insert Tile Strip No. 1 as shown.

Align the tab at the right end of the tile strip with the slot at the right end of the white backing of the FD-9, and the crosspiece at the left end of the tile strip with the cutout in the FD-9 platen.

Press down slightly so that the white backing is depressed and slide the tile strip to the right as far as it will go.

- Be careful not to touch the tile surfaces.



6 Close the cover of the FD-9.

7 Click [Measurement]. “Now measuring ...” will be shown and the FD-9 will measure the tile strip.

8 When measurement of Tile Strip No. 1 is completed, a dialog requesting that Tile Strip No. 2 (Colors: Orange to Black) be inserted in the FD-9 will appear.

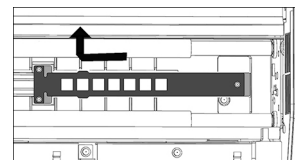
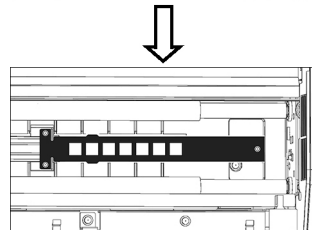
9 Open the cover of the FD-9.

10 Remove Tile Strip No. 1 as shown.

Press down slightly on the tile strip and slide it to the left as far as it will go so that the right end of the tile strip is removed from the FD-9 slot.

Release the tile strip. The white backing will push the tile strip up slightly. Carefully remove the tile strip.

- Be careful not to touch the tile surfaces.



11 Insert Tile Strip No. 2 as was done in step 5 above.

12 Close the cover of the FD-9.

13 Click [Measurement]. “Now measuring ...” will be shown and the FD-9 will measure the tile strip.

14 When measurement of Tile Strip No. 2 is completed, the measured standard values will be shown in the Standard Values table.

Standard Setting

File Import

Tile Measurement FD-9 10001030 2015/10/14 15:09 Measurement

Standard Value

Stand...	WHITE	PALE GREY	MID GREY	DIFF. GREY	DEEP GREY	DEEP PINK	RED	ORAN.	YELLOW	GREEN	DIFF. GREEN	CYAN	DEEP BLUE	BLACK
L*	95.34	82.59	56.71	56.27	27.49	41.02	37.84	63.79	84.27	50.85	52.20	49.43	12.23	7.97
a*	-0.39	-0.38	0.03	-3.48	0.09	29.81	54.84	46.17	0.55	-31.81	-31.09	-17.77	14.81	-0.95
b*	2.90	1.49	0.62	1.53	1.12	5.72	38.16	70.80	86.09	13.32	20.53	-33.58	-32.54	-2.49

Export Cancel OK

Setting standard values by reading from file

- If standard data have not been set when *Tools – Diagnosis instrument* is selected from the menu bar, the Standard Setting dialog will appear, with *Tile Measurement* selected. To set values by measuring the tiles, see the previous section; to set values by importing from a file, continue with step 2 below.

- 1 In the Diagnose instrument dialog, click [Set Standard]. The Standard Setting dialog will appear.**
- 2 Select File. [Import] will be enabled and [Measurement] will be disabled.**
- 3 Click [Import]. The Open dialog will appear.**
- 4 Browse to the location of the file containing the standard tile values and select the file.**
- 5 File format: cgats txt File (*.txt)**
- 6 Click [Open]. The file will be opened and the standard tile values in the file will be read and set in the Standard Values table.**

Exporting Standard Values

The standard values shown in the Standard Values table can be exported to a file.

- 1 In the Standard Setting dialog, click [Export]. The Export dialog will appear.**
- 2 Browse to the folder in which to save the results file**
- 3 Input the file name to save the results to.**
- 4 Click [Save]. The standard values will be saved to a file with the file name input in step 3.**
 - File format: cgats txt File (*.txt)

Setting Tolerances

The tolerance for each color-difference value (dL*, da*, db*, dE*ab, dE00) can be set. These tolerance values are used for judgement after test measurements. Judgement results are indicated for each test measurement value as well as for the overall diagnosis.

Difference values background: Green: Difference value is within tolerance.

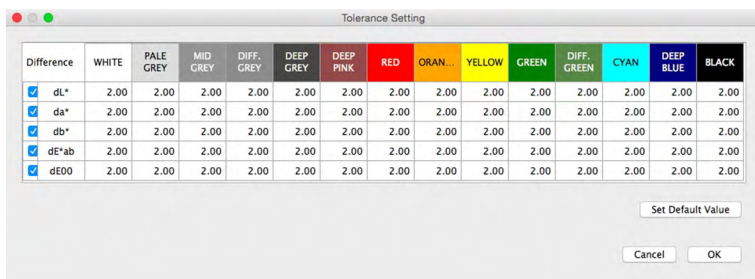
Red: Difference value is out of tolerance.

Judgement:

“OK” with green background: All difference values are within tolerance

“FAIL” with red background: One or more difference values are out of tolerance.

1 In the Diagnose instrument dialog, click [Set Tolerance]. The Tolerance Setting dialog will appear.



2 To use the difference value for judgement, make sure there is a check in the checkbox next to the value. If the checkbox is empty, click on the checkbox next to the value so that there is a check in the checkbox.

To not use the difference value for judgement, make sure that the checkbox next to the value is empty. If the checkbox is checked, click on the checkbox to remove the check.

3 Set each tolerance value as desired. Click or double-click on the current value and input the desired value.

- To set the default values for all tolerances, click on [Set Default Value].

4 After all values have been set as desired, click [OK] to save the setting and close the dialog.

- To close the dialog without saving the new settings, click [Cancel]

Diagnosis Measurement

- 1 **Select *Tools – Diagnose instrument* from the menu bar. The Diagnose instrument dialog will appear.**

Measurement conditions

Overall judgement

Serial No.	Date	Judgement	
1	10001030	2015/10/19 11:51	OK
2	10001030	2015/10/19 11:51	OK

Serial No. 10001030
Date 2015/10/19 11:51
Meas. Condition M1
Observer 2 degree
Illuminant D50

Judgement OK

Set Standard
Set Tolerance
Diagnose
Export result

Test	WHITE	PALE GREY	MID GREY	DIFF. GREY	DEEP GREY	DEEP PINK	RED	ORAN ..	YELLOW	GREEN
L*	95.43	82.47	56.57	56.37	27.51	40.78	37.69	63.96	84.22	50.87
a*	-0.47	-0.38	0.04	-3.59	0.09	30.23	54.47	46.04	0.60	-31.68
b*	2.85	1.50	0.53	1.66	1.16	5.88	37.79	70.53	85.77	13.13

Test measurement values

Standard	WHITE	PALE GREY	MID GREY	DIFF. GREY	DEEP GREY	DEEP PINK	RED	ORAN ..	YELLOW	GREEN
L*	95.44	82.48	56.57	56.37	27.50	40.77	37.74	64.00	84.24	50.90
a*	-0.49	-0.39	0.05	-3.61	0.09	30.30	54.55	45.98	0.51	-31.77
b*	2.87	1.51	0.53	1.66	1.17	5.89	37.83	70.62	85.82	13.17

Standard values

Difference	WHITE	PALE GREY	MID GREY	DIFF. GREY	DEEP GREY	DEEP PINK	RED	ORAN ..	YELLOW	GREEN
dL*	-0.01	-0.01	-0.00	0.00	0.01	0.01	-0.05	-0.04	-0.02	-0.03
da*	0.02	0.01	-0.01	0.02	-0.00	-0.07	-0.08	0.06	0.09	0.09
db*	-0.02	-0.01	-0.00	0.00	-0.01	-0.01	-0.04	-0.09	-0.05	-0.04
dE*ab	0.03	0.02	0.01	0.02	0.01	0.07	0.10	0.12	0.10	0.10
dE00	0.03	0.02	0.01	0.03	0.01	0.03	0.05	0.07	0.05	0.05

Difference values (between test measurement values and standard values)

Past test measurements

- If this is the first time the Diagnose instrument function is used and standard values have not yet been set, the Standard Setting dialog will appear instead of the Diagnose instrument dialog. See p. 63 for how to set standard values.

- 2 **Click [*Diagnose*]. A dialog requesting that Tile Strip No. 1 (Colors: White to Red) be inserted in the FD-9 will appear.**

- 3 **Open the cover of the FD-9.**

- 4 **Insert Tile Strip No. 1 as shown.**

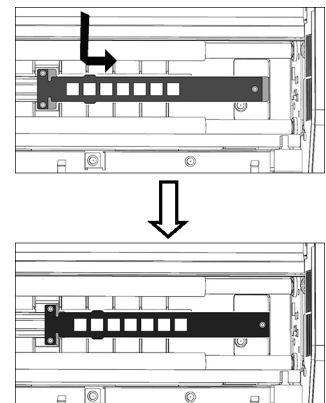
Align the tab at the right end of the tile strip with the slot at the right end of the white backing of the FD-9, and the crosspiece at the left end of the tile strip with the cutout in the FD-9 platen.

Press down slightly so that the white backing is depressed and slide the tile strip to the right as far as it will go.

- Be careful not to touch the tile surfaces.

- 5 **Close the cover of the FD-9.**

- 6 **Click [*Measurement*]. “Now measuring ...” will be shown and the FD-9 will measure the tile strip.**



7 When measurement of Tile Strip No. 1 is completed, a dialog requesting that Tile Strip No. 2 (Colors: Orange to Black) be inserted in the FD-9 will appear.

8 Open the cover of the FD-9.

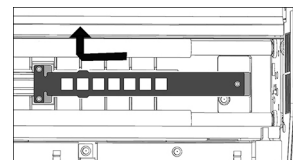
9 Remove Tile Strip No. 1 as shown.

Press down slightly on the tile strip and slide it to the left as far as it will go so that the right end of the tile strip is removed from the FD-9 slot.

Release the tile strip. The white backing will push the tile strip up slightly.

Carefully remove the tile strip.

- Be careful not to touch the tile surfaces.



10 Insert Tile Strip No. 2 as was done in step 4 above.

11 Close the cover of the FD-9.

12 Click [*Measurement*]. “Now measuring ...” will be shown and the FD-9 will measure the tile strip.

13 When measurement of Tile Strip No. 2 is completed, the measured test values will be shown in the Diagnosis dialog along with the difference value for each color and the overall judgement.

Judgement results will for individual difference values and overall judgement will be indicated as follows:

Difference values background:

Green: Difference value is within tolerance.

Red: Difference value is out of tolerance.

Judgement:

“OK” with green background: All difference values are within tolerance

“FAIL” with red background: One or more difference values are out of tolerance.

Exporting Diagnosis Measurement Results

The results of diagnosis measurements can be exported to a file.

1 Click [*Export results*] in the Diagnose instrument dialog. The Export results dialog will appear.

2 Browse to the folder in which to save the results file

3 Input the file name to save the results to.

4 Click [*Save*]. The diagnosis measurement results will be saved to a file with the file name input in step 3.

- File format: csv

Density Balance/Color Density Control

The Density Balance and Color Density Control functions of FD-S2w can be used for monitoring and adjusting the density balance and color density control of certain KONICA MINOLTA bizhub PRESS printers.

- The charts used for this function are predefined and stored in the printer.

Taking Measurements with FD-9 only

- If measurements will be taken with the FD-9 mounted on the optional Auto Sheet Feeder, see p. 71.

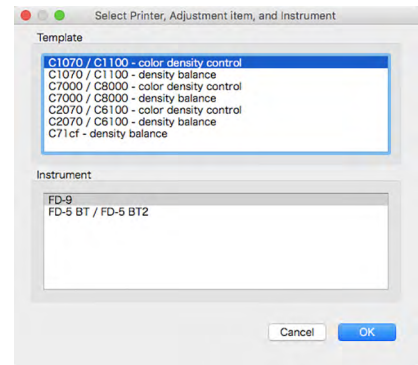
1 Select Tool – Density balance/Color density control from the menu bar. The Select Printer, Adjustment item, and Instrument dialog will appear.

2 Select the Template to be used from the list in the Template section according to the printer to be adjusted and the desired adjustment process.

Color density control: For controlling color density

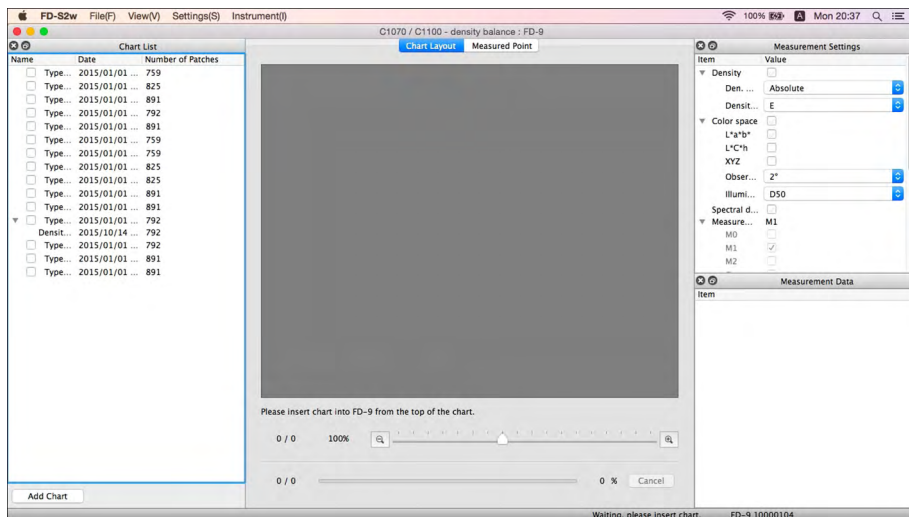
Density balance: For controlling density balance

- When a template is selected, the instrument(s) for which the template can be used will appear in the Instrument section. Only the instruments shown can be used for the selected template.



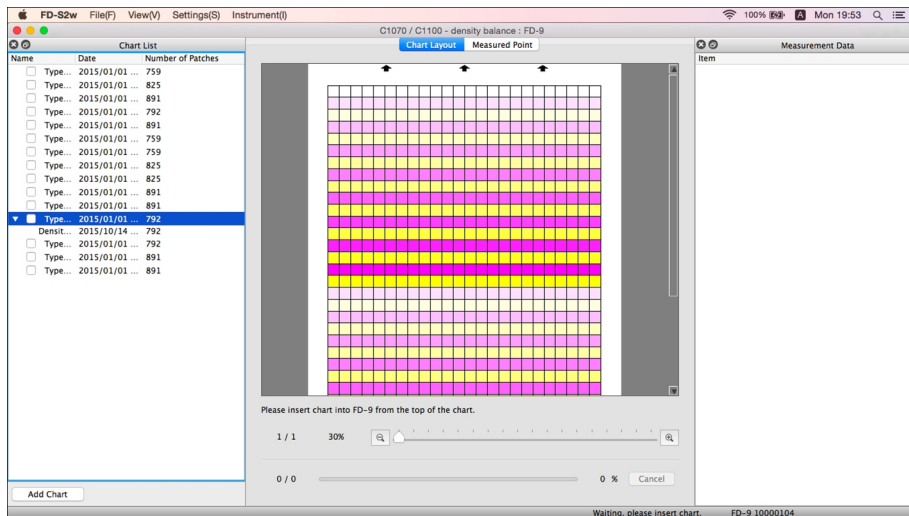
3 Select “FD-9” as the instrument.

4 Click [OK]. The density balance/color density control window for the adjustment process selected in step 2 will appear.



- If the chart to be measured is not equipped with a QR code, it is necessary to select the corresponding chart from the Chart List. An image of the chart will be shown in the Chart Layout tab.
- If the chart to be measured is equipped with a QR code, the corresponding chart will be automatically selected from the Chart List when the chart is read.
- For color density control, if the paper size specified by the chart QR code is not available, the error message “There is no

chart definition data matching QR code. Measurement will be performed using chart definition data with closest size." will appear. Click [OK] to continue measurement with the chart definition data selected by the software; click [Cancel] to cancel the measurement and eject the chart.



5 Insert the printed chart to measure into the FD-9.

- Be sure to insert the chart in the proper direction. The chart should be inserted with the black bar away from the FD-9.

6 The FD-9 will pre-scan the chart to measure.

- To see the measurement points superimposed on the pre-scan image, click the Measured Point tab. Measurement points will be shown as red points superimposed on the pre-scan image of the chart.
- If the patch sizes and positions determined by the pre-scan of the chart to measure do not match the patch positions of the chart definition data, the warning message "The number of Rows or Columns is different. Are you sure you want to continue measurement?" will appear. (This message may also appear even if the chart is actually correct due to white areas in the chart not being recognized as patch areas.) Click [OK] to continue measurement if desired.

7 The FD-9 will start patch measurements. The Chart Layout tab will show the color image of the selected chart with the defined color of each patch in the upper left half of the patch. As the measurement of each patch is completed, the lower right half of the patch will change to the measured color. The progress of measuring the chart will be shown in the status bar.

- To cancel measurements, click [Cancel]. The measurement will be canceled, and after a few seconds the FD-9 will eject the chart.

8 When measurement is complete, the Chart Layout tab will show the measured chart with the measured color of each patch, the measurement will appear below the selected chart definition data name with the date and time of measurement, and the data will be automatically stored.

- To show the measurement data for a patch in the chart, select the patch in the Chart Layout tab. The measurement data for that patch will appear in the Measurement Data window. The measurement data items shown will be those items selected in the Measurement Settings window.
- If "Send measurement result automatically after measurement" in "Auto saving of measurement data" is checked in the Save Measurement data dialog, the measurement results will be automatically sent to the specified printer after measurement.

9 Continue with "Saving Measured Chart Data Manually" (p. 77) if desired.

Taking Measurements with FD-9 Mounted on Optional Auto Sheet Feeder

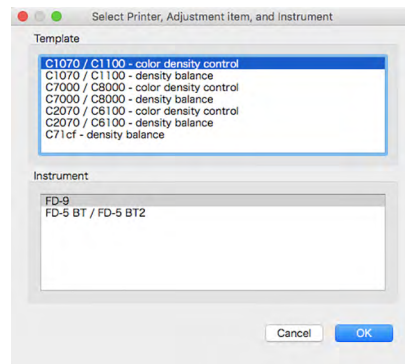
- If measurements will be taken with the FD-9 only, see p. 69.

- 1 Select Tool – Density balance/Color density control from the menu bar. The Select Printer, Adjustment item, and Instrument dialog will appear.**
- 2 Select the Template to be used from the list in the Template section according to the printer to be adjusted and the desired adjustment process.**

Color density control: For controlling color density

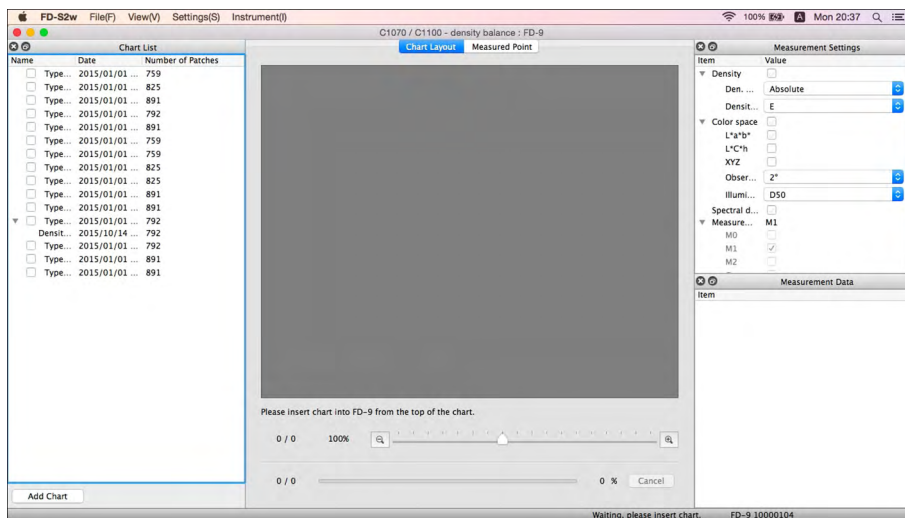
Density balance: For controlling density balance

- When a template is selected, the instrument(s) for which the template can be used will appear in the Instrument section. Only the instruments shown can be used for the selected template.



- 3 Select “FD-9” as the instrument.**

- 4 Click [OK]. The density balance/color density control window for the adjustment process selected in step 2 will appear.**



- If the charts to be measured are not equipped with QR codes, it is necessary to select the corresponding chart from the Chart List. An image of the chart will be shown in the Chart Layout tab. In this case, all printed charts loaded in the paper supply tray of the Auto Sheet Feeder should be charts corresponding to the selected chart.
- If the charts to be measured are equipped with QR codes, the corresponding chart to measure will be automatically selected from the Chart List when each chart is pre-scanned. In this case, it is possible to load printed charts corresponding to several different charts in the Chart List in the paper supply tray of the Auto Sheet Feeder tray and measure the several different printed charts in a single operation. As each chart is pre-scanned, the corresponding chart definition data in the Chart List will be automatically selected.
- For color density control, if the paper size specified by the chart QR code is not available, the error message “There is no chart definition data matching QR code. Measurement will be performed using chart definition data with closest size.”

will appear. Click [*OK*] to continue measurement with the chart definition data selected by the software; click [*Cancel*] to cancel the measurement and eject the chart.

- 5 Place the printed charts to measure into the paper supply tray of the Auto Sheet Feeder.**
 - Be sure the charts are all placed in the paper supply tray in the proper orientation, facing upwards with the black bar at the end away from the FD-9.
- 6 Press [*OK*] on the FD-9.**
- 7 The Auto Sheet Feeder will feed the top chart into the FD-9 and the FD-9 will pre-scan the chart.**
- 8 The FD-9 will start patch measurements. The Chart Layout tab will show the color image of the selected chart with the defined color of each patch in the upper left half of the patch. As the measurement of each patch is completed, the lower right half of the patch will change to the measured color. The progress of measuring the chart will be shown in the status bar.**
 - To cancel a measurement, click [*Cancel*]. The measurement will be canceled, and after a few seconds the FD-9 will eject the chart.
- 9 As measurement of each chart is completed, the Chart Layout tab will show the measured chart with the measured color of each patch, the measurement will appear below the selected chart definition data name with the date and time of measurement, and the data will be automatically stored.**
 - To show the measurement data for a patch in the chart, select the patch in the Chart Layout tab. The measurement data for that patch will appear in the Measurement Data window. The measurement data items shown will be those items selected in the Measurement Settings window.
 - If “Send measurement result automatically after measurement” in “Auto saving of measurement data” is checked in the Save Measurement data dialog, the measurement results will be automatically sent to the specified printer after measurement.
- 10 Steps 7 through 9 will be repeated until all charts in the paper supply tray of the Auto Sheet Feeder have been measured.**
- 11 Continue with “Saving Measured Chart Data Manually” (p. 77) if desired.**

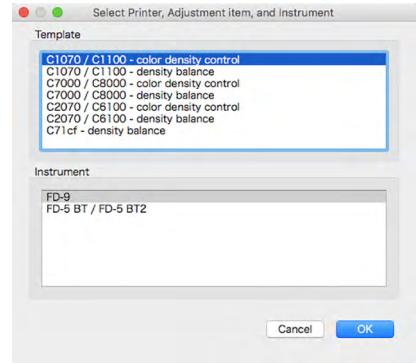
| Taking Measurements with FD-series Portable Instruments

- 1** Select *Tool – Density balance/Color density control* from the menu bar. The *Select Printer, Adjustment item, and Instrument* dialog will appear.
- 2** Select the *Template* to be used from the list in the *Template* section according to the printer to be adjusted and the desired adjustment process.

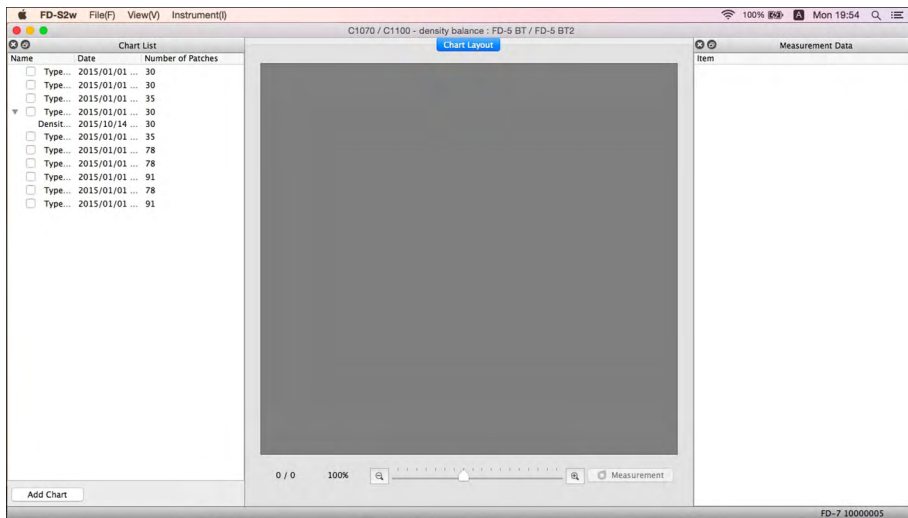
Color density control: For controlling color density

Density balance: For controlling density balance

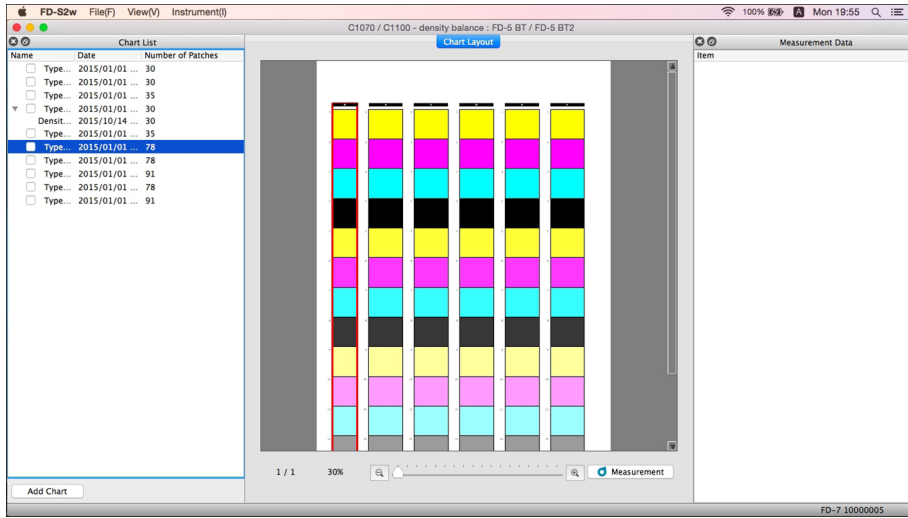
- When a template is selected, the instrument(s) for which the template can be used will appear in the *Instrument* section. Only the instruments shown can be used for the selected template.



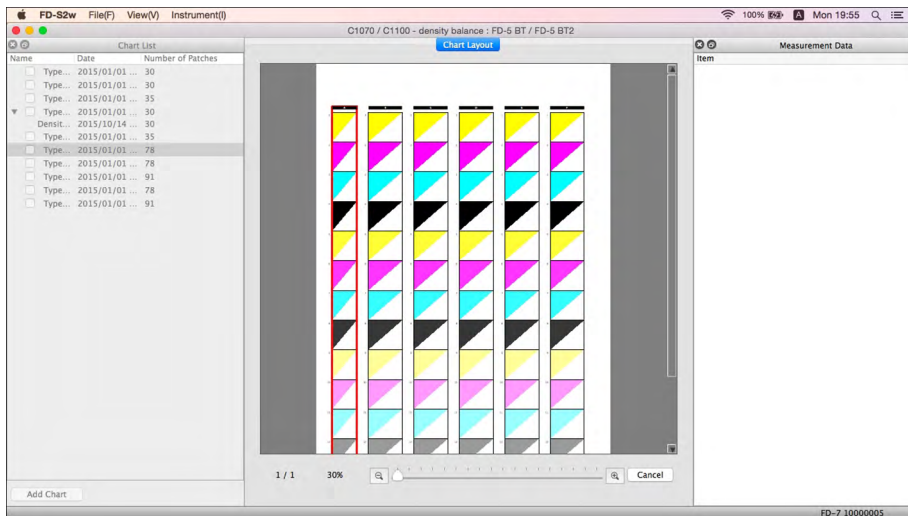
- 3** Select “*FD-5 BT / FD-5 BT2*” as the instrument.
- 4** Click [*OK*]. The density balance/color density control window for the adjustment process selected in step 2 will appear.



- 5 Select the chart to measure from the Chart List. An image of the chart patches to measure will be shown in the Chart Layout tab, with the patch column to measure outlined in red.



- 6 Click **Measurement**. The chart patches will change to show the defined color for the patch in the upper left half of the patch, with the lower right half being the paper color.



If measurement will be performed by scanning:

- For more information on scan measurements, refer to the instrument's instruction manual.
- 7** Position the instrument's accessory Ruler on the chart aligned with the column of patches to measure.
 - 8** Place the instrument's two feet in the Ruler's grooves and align the instrument's specimen measuring port with the opening in the Ruler.
 - 9** Press the instrument's measuring button. A beep will sound after about 1 second.
 - 10** While keeping the measuring button pressed, slowly slide the instrument along the ruler at a constant speed. It should take about 2 to 4 seconds to slide along the length of the Ruler's opening.
 - 11** After scanning of one patch column has been completed, the lower right half of each patch image in the column will show the measured color for that patch in the Chart Layout tab.
 - 12** Click at the top of the next patch column in the Chart Layout tab (the column will become outlined in red), and repeat steps 7 through 11 to measure that column. Repeat until all patch columns have been measured. The measurement will appear below the selected chart definition data name with the date and time of measurement, and the data will be automatically stored.
 - If "Send measurement result automatically after measurement" in "Auto saving of measurement data" is checked in the Save Measurement data dialog, the measurement results will be automatically sent to the specified printer after measurement.
 - 13** To show the measurement data for a patch in the chart, select the patch in the Chart Layout tab. The measurement data for that patch will appear in the Measurement Data window. The measurement data items shown will be those items selected in the Measurement Settings window.
 - 14** Continue with "Saving Measured Chart Data Manually" (p. 77) if desired.

If measurement will be performed by measuring each patch individually:

- For more information on measuring patches, refer to the instrument's instruction manual.
- 7 Click on a single patch in the patch column. The red outline will change to outline only the selected patch.**
 - 8 Align the instrument's Target Mask port with the center of the patch to measure.**
 - 9 Push the instrument down against the patch. A beep will sound after about 1 second, the measured color for the patch will be shown in the lower right half of the patch image in the Chart Layout tab, and the red outline will move to the next patch to be measured.**
 - 10 Repeat steps 8 and 9 until all patches have been measured. The measurement will appear below the selected chart definition data name with the date and time of measurement, and the data will be automatically stored.**
 - If "Send measurement result automatically after measurement" in "Auto saving of measurement data" is checked in the Save Measurement data dialog, the measurement results will be automatically sent to the specified printer after measurement.
 - 11 To show the measurement data for a patch in the chart, select the patch in the Chart Layout tab. The measurement data for that patch will appear in the Measurement Data window. The measurement data items shown will be those items selected in the Measurement Settings window.**
 - 12 Continue with "Saving Measured Chart Data Manually" (p. 77) if desired.**

| Saving Measured Chart Data Manually

The measured chart data can be saved to a folder or to a printer by following the steps below.

1 Right-click on the measurement to save and select Save from the right-click menu. The Save Measurement Data dialog will appear.

2 Select the location to save the data to:

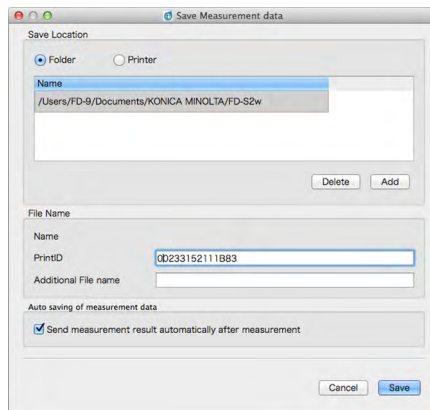
Folder: Data will be saved to a text file in the folder selected in the list window.

Printer: Data will be saved to the printer selected in the list window.

- The list window will show folders or printers available for selection. See p. 79 for adding or deleting folders or printers.

3 Input the file name to save the data to. The name input as PrintID will be used as the file name.

4 Click [Save] The data will be saved and the dialog will close.



| Save Measurement Data dialog

The Save Measurement Data dialog of the Density balance/Color density control window can be used to set locations (folders or printers) for saving measured chart data outside of the FD-S2w data location and to set whether or not measured data will be automatically sent to the set printer after each measurement.

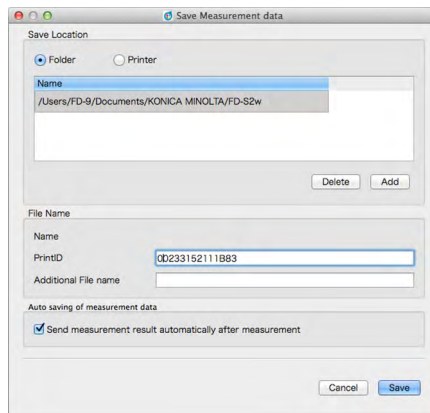
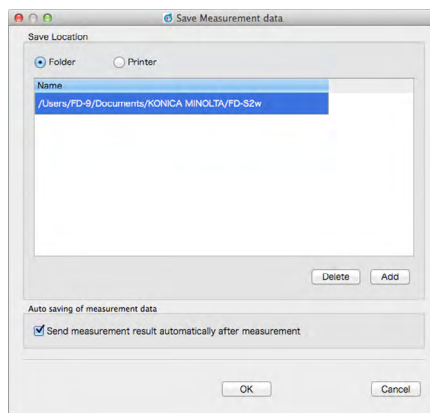
- Measurement results are always saved to the FD-S2w data location, regardless of the setting in the Save Measurement Data dialog.

In the Density balance/Color density control window, the Save Measurement Data dialog can be opened in either of the following ways:

Select *Settings – Measurement Data Save* from the menu bar. The Save Measurement Data dialog will appear as shown at right.

or

Right-click on a measurement in the Chart List and select *Save* from the right-click menu. The Save Measurement Data dialog will appear as shown at right, with the File Name group also shown.



Sending measurement results after measurement

- To enable automatically sending measurement results to the selected printer immediately after measurement, click the checkbox next to “Send measurement result automatically after measurement” so that there is a checkmark in the checkbox.
- To disable this function, click the checkbox again so that the checkbox is empty.

Adding/Deleting a Folder

To add a folder:

- 1 While Folder is selected as the Save Location, click [*Add*]. The Choose Folder dialog will appear.**
- 2 Browse to the folder to add to the list and click [*Select Folder*]. The folder will be added to the list and the dialog will close.**

To delete a folder:

- 1 While Folder is selected as the Save Location, select the folder to delete.**
- 2 Click [*Delete*]. The folder will be deleted from the list immediately.**

Adding/Deleting a Printer

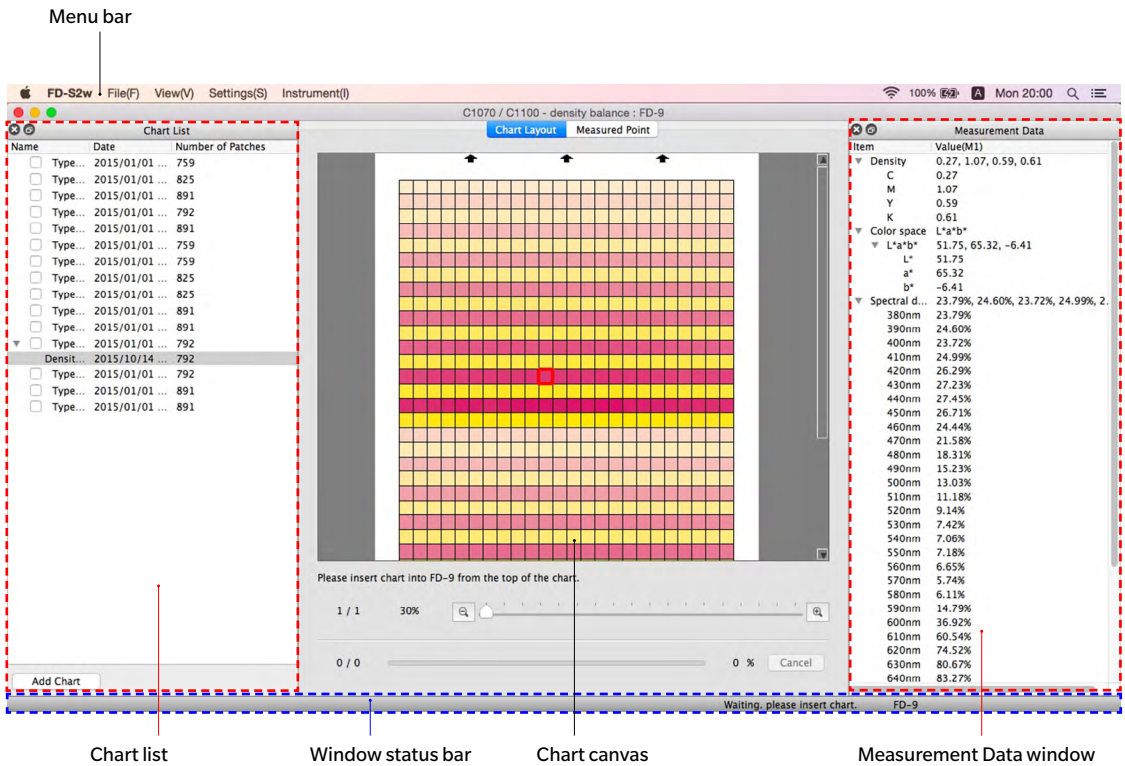
To add a printer:

- 1** While **Printer** is selected as the **Save Location**, click [*Add*]. The **Add Printer** dialog will appear.
- 2** Input the required information and click **OK**. The printer will be added to the list and the dialog will close.
 - Required information:
 - Printer name
 - Password
 - IP address
 - Port

To delete a printer:

- 1** While **Printer** is selected as the **Save Location**, select the printer to delete.
- 2** Click [*Delete*]. The printer will be deleted from the list immediately.

Density balance/Color density control window configuration



The measurement window for Density balance/Color density control is very similar to the main FD-S2w window. It consists of a menu bar, chart canvas, window status bar, and 3 windows: Chart List window, Measurement Settings window (hidden as a default), and Measurement Data window.

Menu Bar (Density balance / Color density control window)

File(F) menu

Close: Closes the Density balance/Color density control measurement window.

View(V) menu

Status Bar: Displays/hides Status Bar.

Chart List Window: Displays/hides Chart List window.

Measurement Settings Window: Displays/hides Measurement Settings window.

Measurement Data Window: Displays/hides Measurement Data window.

Setting(S) menu

Instrument Connection: Opens the Instrument Connection Settings dialog. See p. 24.

Measurement Data Save: Opens the Save Measurement Data dialog. See p. 78.

Instrument (I) menu

Connect/Disconnect: When no instrument is connected, the menu item will be **Connect**. Clicking **Connect** connects to the FD-9 according to the settings made in the Instrument Connection dialog. When an instrument is connected, the menu item will be **Disconnect**. Clicking **Disconnect** disconnects the connected FD-9.

Cancel: Stops the measurement currently being performed.

- Shown only when FD-9 is connected.

Status bar (Density balance / Color density control window)

The window status bar consists of several sections which show various kinds of information and two buttons to stop/restart measurement.

The sections and the information they show are in the following order from the left side of the screen.

- 1 Description of menu item or toolbar button under cursor**
- 2 FD-9 status information**
- 3 Connected FD-9 information: Instrument name and serial number**
 - Shown only when FD-9 is connected.
- 4 Connected portable spectrodensitometer: Instrument name**
 - Shown only when portable spectrodensitometer is connected.

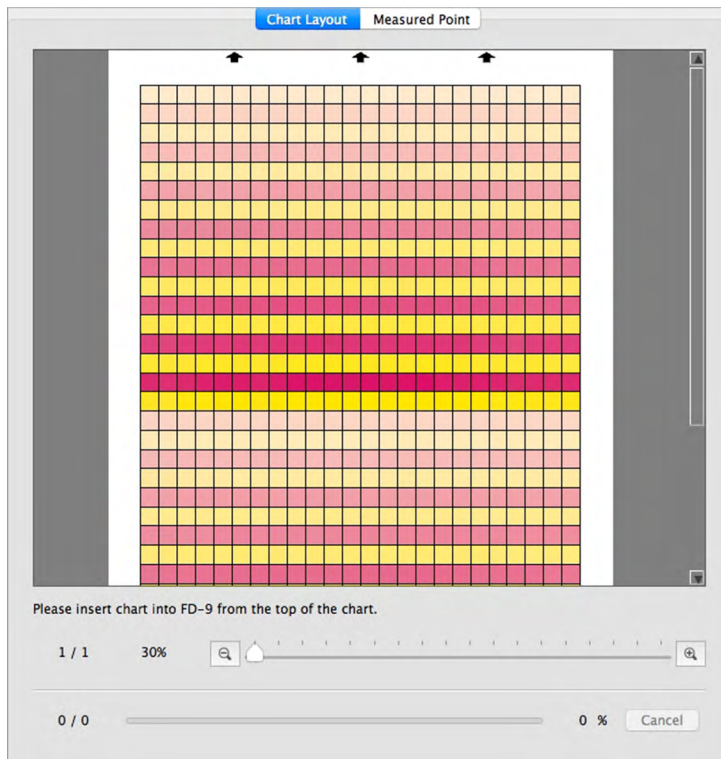
Showing/Hiding Status Bar

Select *Status Bar* in the *View* menu to show/hide the status bar.

Chart Canvas (Density balance / Color density control window)

The Chart Canvas consists of two tabs showing images of chart definition data charts or scanned charts.

Chart Layout tab

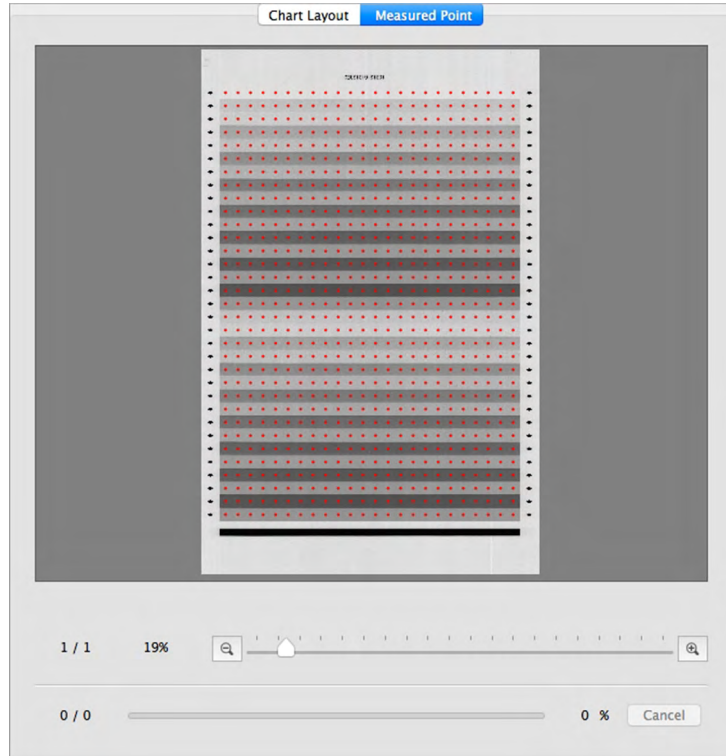


The Chart Layout tab shows a color image of the patches on the selected chart definition data or selected measurement.

Chart definition data: When a chart definition data is selected in the Chart List window, the patches will show the patch color defined in the chart definition data.

Measurement: During measurement each patch will be divided diagonally with the upper left half showing the defined patch color and the lower right half showing the measured color. When the measurement has been completed, the patches will show only the measured color.

Measured Point tab



The Measured Point tab shows a black-and-white image of the measured chart sheet and the location of measurement points on that image.

Chart:

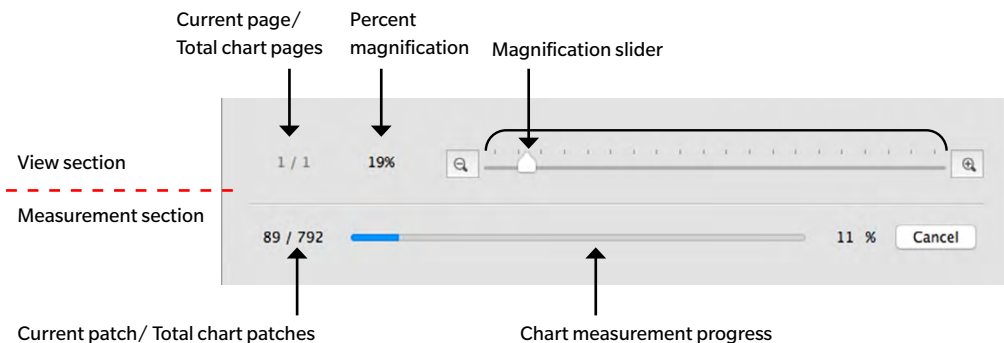
When a chart is selected in the Chart List window, no image will be shown in the Measured Point tab.

Measurement under chart:

When a measurement under a chart is selected in the Chart List window, the scanned image of the chart sheet will be shown together with the determined measurement points.

Chart Canvas status bar

The Chart Canvas status bar is shown below



View section

Current page / Total chart pages

Shows the current page and the total number of pages in the chart.

For multi-page charts, clicking on ▼ opens a dropdown list for selecting the desired chart page.

Percent magnification

Clicking on ▼ opens a dropdown list for selecting the desired magnification from several predefined steps or “Fit in window”.

Zoom out. Reduces magnification by 1% each time it is clicked.

Magnification slider

Slide the slider to gradually adjust magnification or click on the bar to move the slider directly to that point to adjust magnification quickly.

Zoom in. Increases magnification by 1% each time it is clicked.

Measurement section

Current patch / Total chart patches

During measurement, shows the current patch being measured and the total number of patches on the current chart page.

Chart measurement progress

Shows the measurement progress for the current chart page.

Cancels a measurement in progress.

- Not shown before measurement started when using a portable FD-series instrument.

Starts measurement sequence when using a portable FD-series instrument.

- Shown in place of only before measurement is started when using a portable FD-series instrument. Once measurement has started, it is replaced by .

Chart List Window (Density balance / Color density control window)

The Chart List window shows a list of the chart definition data for the adjustment selected when entering the Density balance / Color density control window.

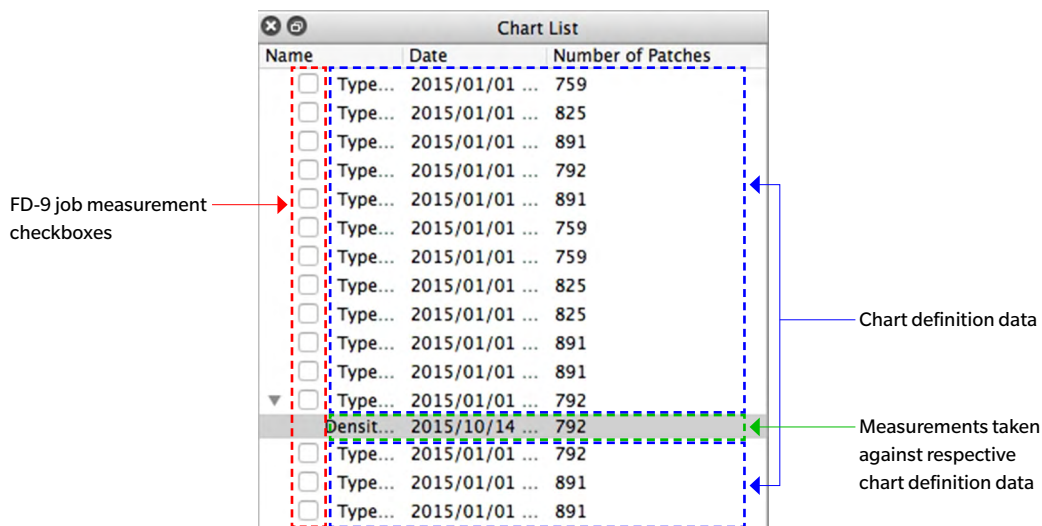


Chart definition data

Chart definition data are the definition data for charts which have been defined for the adjustment and instrument selected when entering the Density balance / Color density control window.

When a chart definition data is selected:

- The Chart Layout tab will show a color image of the selected chart definition data chart.
- Clicking on a patch in the color image in the Chart Layout tab will not show any measurement data.
- The Measured Point tab will not show any image.
- Taking a measurement will result in the measurement being taken against the selected chart definition data, and the measurement will appear under the selected chart definition data name when completed.
- Clicking on the ▼ (OS X or macOS) or ▲ (Windows) next to a chart definition data name will collapse the list of measurements taken against the chart definition data.
- Clicking on the ► (OS X or macOS) or ▷ (Windows) next to a chart definition data name will expand the list of measurements taken against the chart definition data.

FD-9 job measurement checkboxes

When an FD-9 job measurement checkbox is checked (enabled), the corresponding chart definition data name will be shown in the FD-9 Connection & Joblist screen and can be selected on the FD-9 to take measurements against that chart definition data.

Button

Add Chart

Opens a dialog for adding a chart definition data (from an *.xml or *.csv file) to the Chart List.

Right-click menu

The menu that appears when right-clicking on a chart definition data name offers the following functions:

- | | |
|-----------|--|
| Edit Name | Enables chart definition data name to be edited. <ul style="list-style-type: none"> • The chart definition data name can also be edited by double-clicking on the name. |
| Save | Opens Save dialog to save the chart definition data (as *.xml file) |
| Delete | Deletes selected chart definition data. |

Measurements

Measurements are shown underneath the name of the chart definition data against which they have been measured.

When a measurement is selected.

- The Chart Layout tab will show a color image of the selected measured chart.
- Clicking on a patch in the color image in the Chart Layout tab will cause the measurement data for that patch to be shown in the Measurement Data window.
- The Measured Point tab will show the scanned image of the chart sheet, with the measurement points superimposed on the scanned image.
- Taking a measurement will result in the measurement being taken against the same chart definition data used for the selected measurement, and the new measurement will appear under the chart definition data name when completed.

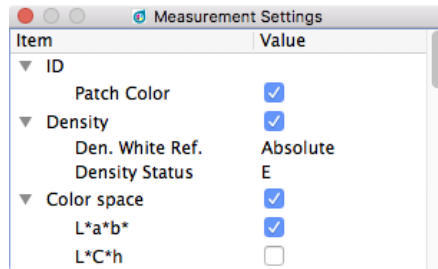
Right-click menu

The menu that appears when right-clicking on a measurement name offers the following functions:

Edit Name	Enables the measured chart name to be edited. <ul style="list-style-type: none">• The chart name can also be edited by double-clicking on the name.
Save	Opens Save dialog to save the measurement data. See Saving Measurement Data on p. 78.
Delete	Deletes selected measurement data.

Measurement Settings Window (Density balance / Color density control window)

The Measurement Settings window determines what measurement data will be shown in the Measurement Data window.



The Measurement Settings window is hidden by default. To show the Measurement Settings Window, select *View - Measurement Settings Window*.

- Clicking on the ▼ (OS X or macOS) or ▲ (Windows) next to a measurement group name will collapse the list of measurement data under that measurement group.
- Clicking on the ► (OS X or macOS) or ▷ (Windows) next to a measurement group name will expand the list of measurement data under that measurement group.
- For measurement items with a checkbox, to display data for the measurement item in the Measurement Data window, check the checkbox next to the name of the group containing the measurement item, and then check the checkbox next to the item itself. If an item is checked but the name of the group that contains it is not checked, the measurement data for that item will not be shown in the Measurement Data window.
- For measurement items with a dropdown list, to display data for the measurement item in the Measurement Data window, check the checkbox next to the name of the group containing the measurement item, and then select the setting to use from the dropdown list. If the name of the group that contains an item is not checked, the measurement data for that item will not be shown in the Measurement Data window.

Measurement Data Window (Density balance / Color density control window)

The Measurement Data window shows the measurement data for the color patch selected in the Chart Layout tab when a measurement is selected in the Chart List.

Item	Value(M1)
▼ ID	19
Patch Color	100.00, 0.00, 0.00, 0.00
▼ Density	1.325, 0.470, 0.214, 0.775
C	1.325 (ø 1.348)
M	0.470 (ø 0.475)
Y	0.214 (ø 0.217)
K	0.775 (ø 0.783)
▼ Color space	L*a*b*
▼ L*a*b*	53.64, -27.28, -54.60
L*	53.64
a*	-27.28
b*	-54.60
▼ Spectral data	
380nm	4.37%
390nm	8.00%
400nm	13.85%
410nm	24.44%
420nm	41.54%
430nm	55.53%
440nm	66.64%

- No measurement data will be shown if a chart definition data name is selected in the Chart List, even if a color patch is selected in the Chart Layout tab.
- If a chart contains several patches with the same patch definition, the densities of these patches show both the measured value of the active patch and the average (ø) of all patches with this definition.

The measurement data items shown will be the items selected in the Measurement Settings window.


- Clicking on the ▼ (OS X or macOS) or ▲ (Windows) next to a measurement group name or subgroup name will collapse the list of measurement data under that measurement group or subgroup.
- Clicking on the ► (OS X or macOS) or ▷ (Windows) next to a measurement group name or subgroup name will expand the list of measurement data under that measurement group or subgroup.

Operations Common to All Windows (Density balance / Color density control window)

Showing/Hiding a Window

- Select the window name in the View menu to show or hide the window. When a check is in front of the window name in the menu, the window will be shown; if no check is shown, the window will be hidden. Clicking on the window name toggles the status of the window.
- Windows can also be hidden (closed) by clicking the X in the window title bar.

Docking/Stacking/Floating a Window

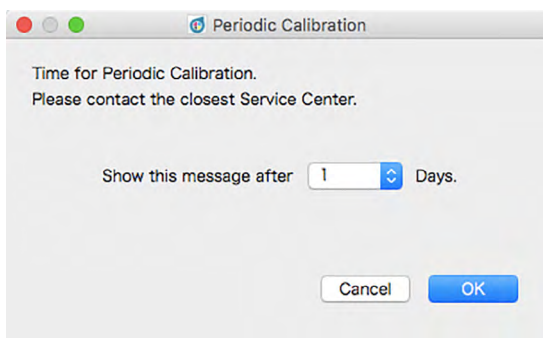
- Windows can be docked at the top, bottom, left, or right side of the Density balance / Color density control window chart canvas area by clicking on the title bar of the window and dragging it to the desired location. As the window nears the new location, a blue area will open up into which the dragged window can be dropped. A floating window can also be docked by double-clicking on the title bar of the window, which will cause it to return to its most recent docked position.
- Windows can be stacked as tabs in the same area by clicking on the title bar of the window, dragging it onto a docked window, and dropping it onto the docked window when the docked window is blue. Switching between stacked windows can then be done by clicking on the window tab at the bottom of the area.
- Windows can be floated by clicking on the title bar of the docked window, dragging it away from the docked window and dropping the window on the canvas area. Windows can also be floated by double-clicking on the title bar of a docked window or by clicking the restore icon () in the title bar.

Resizing Windows

- Windows can be resized by clicking on the border of the window and dragging it to the desired size.
- Resizing docked windows will also resize other windows in the same docked area.

Periodic Calibration dialog

In order to maintain the high accuracy of the FD-9 and obtain the best performance, it is recommended that the FD-9 be calibrated annually by a KONICA MINOLTA authorized service facility. As a reminder that period calibration should be performed, the Periodic Calibration dialog will appear approximately 1 year after the FD-9 is first connected to FD-S2w after having been calibrated by KONICA MINOLTA.



When this dialog appears, it can be set to reappear after a specific period (1, 3, 7, 30, 180, or 365 days) even if Konica Minolta service calibration has not been performed.

To set the time period before showing this dialog again:

- 1 Click on the ▼ next to the current setting for Days and select the desired number of days from the dropdown list that appears.**
- 2 Click [OK] to complete the setting and close the dialog.**
 - Clicking [Cancel] will close the dialog without setting a time period. The Periodic Calibration dialog will then appear again each time that connection with the FD-9 is performed.

When the FD-9 is calibrated by a KONICA MINOLTA authorized service facility, the time will be reset and the Periodic Calibration dialog will not be shown again until approximately one year after the calibrated FD-9 is first connected to FD-S2w again.

Error Messages

During the operation of this software, the following error messages may appear. If an error message appears, take the corresponding corrective action. If the problem persists after taking the corrective action, contact the nearest KONICA MINOLTA authorized service facility.

Error message	Symptom/Possible cause	Corrective action
Patch area size does not match selected chart definition data.	Chart area size does not match definition of selected chart definition data.	Check the selected chart definition data or the orientation, scaling, margins, or printing conditions* used for printing.
Patch color/density does not match selected chart definition data. Check measurement points. If they are correct, continue with measurement.	Patch color/density of chart does not match definition of selected chart definition data.	Check measurement points. If their positions are correct, the warning can be ignored and measurements performed. In addition, selecting "Do not display warning about definition data color information" in the Measurement Option tab of the Settings dialog will cause this message to not be displayed. (See "Settings Dialog: Measurement Option tab" on p. 29.)
	Chart printing density is greatly shifted.	
	Patch position could not be automatically recognized properly.	
Chart content does not match selected chart definition data.	Scanned chart content and chart definition data are different in ways other than those described for the above two error messages.	Check the selected chart definition data or the orientation, scaling, margins, or printing conditions* used for printing.
Temporary file could not be saved to disk.	Remaining free space on disk is insufficient.	Check remaining disk free space.
	Disk is write-protected.	Check whether disk is write-protected.
Chart image data could not be properly obtained.	Scan image could not be properly created.	Make sure that the computer satisfies the system requirements for FD-S2w, and then reboot the computer and try taking the measurement again. If the condition persists, contact the nearest KONICA MINOLTA authorized service facility.
Unexpected error during image processing for patch detection.	Image processing could not be performed for reasons other than that described for the above error message.	Make sure that the chart and selected chart definition data satisfy recommended chart conditions and check the printing conditions*, and then try taking the measurement again. If the condition persists, contact the nearest KONICA MINOLTA authorized service facility.
Computer memory is insufficient.	Computer memory is insufficient.	Make sure that the computer satisfies the system requirements for FD-S2w.
	Paper size is larger than maximum size in specifications, and cannot be measured.	Use a paper size that is within the specified paper size range.

Unexpected error	A problem has been detected in the measurement circuits, etc.	Switch the FD-9 off for several seconds and then switch it back on and try taking the measurement again. If the condition persists, contact the nearest KONICA MINOLTA authorized service facility.
There are too many patch areas.	The number of patch areas in the selected chart definition data exceeds 50.	Make sure that the chart and selected chart definition data satisfy recommended chart conditions and then try taking the measurement again.
There are too many patches.	The number of patches in the selected chart definition data exceeds 15000.	Make sure that the chart and selected chart definition data satisfy recommended chart conditions and then try taking the measurement again.
Chart is too long.	Chart paper length exceeds 1500 mm	Use a chart paper length that is within the specified length range and try taking the measurement again.
The number of patch areas or patches do not match those of the selected chart definition data. Check the measurement points and press [Measurement] to continue if desired.	The borders between patches could not be detected because the number of patch areas or patches do not match the selected chart definition data.	Check the measurement points, and if their positions are correct, the warning message can be ignored and measurement continued by pressing [Measurement]. If the measurement positions were not properly detected, make sure that the chart and selected chart definition data satisfy recommended chart conditions.
	Some detected patches are outside the measurement area range.	
The number of rows or columns in the patch area do not match the selected chart definition data. Check the measurement points and press [Measurement] to continue if desired.	The borders between patches could not be detected because the number of rows or columns in the patch area do not match the selected chart definition data.	Check the measurement points, and if their positions are correct, the warning message can be ignored and measurement continued by pressing [Measurement]. If the measurement positions were not properly detected, make sure that the chart and selected chart definition data satisfy recommended chart conditions.
	Some detected patches are outside the measurement area range.	
There is no chart definition data matching QR code. Measurement will be performed using chart definition data with closest size.	When performing measurements for color density control, the paper size specified by the QR code on the scanned chart does not match the paper size for any of the available chart definition data. The software will therefore use the chart definition data having a paper size closest to that of the paper size specified by the QR code.	Click [OK] to continue by using the chart definition data selected by the software. <ul style="list-style-type: none"> If you do not want to use the software-selected chart definition data, click [Cancel]. The measurement will be canceled and the chart ejected from the FD-9.

- “Printing conditions” means distortion, rubbing, stretching, scratching, tilt, etc. in printing.

System Requirements

| System Requirements

OS	Windows 7 Professional 64-bit Windows 8.1 Pro 64-bit Windows 10 Pro 64-bit OS X 10.9 to 10.11 macOS 10.12 (English, Japanese, Simplified Chinese, German, French, or Spanish version of the above OS) The computer must meet the system requirements specified by the applicable OS or the requirements listed below, whichever is higher.
CPU	1GHz or faster
Memory	At least 2GB
Hard disk drive	At least 8GB of available hard disk space is recommended.
Display	Display hardware capable of displaying 1024 x 768 pixels or better
Optical disc drive	CD-ROM drive (required for installation)
Interface	USB 2.0 (Hi-speed)* or Ethernet (100BaseTx) * When using OS X 10.11, communication errors may occur when using USB. In such case, connection via Ethernet is recommended.

| Compatible Instruments

Auto Scanning Spectrophotometer FD-9

| Language

Display language English, Japanese, Simplified Chinese, German, French, Spanish

< CAUTION >

KONICA MINOLTA WILL NOT BE LIABLE FOR ANY DAMAGES RESULTING FROM THE MISUSE, MISHANDLING, UNAUTHORIZED MODIFICATION, ETC. OF THIS PRODUCT, OR FOR ANY INDIRECT OR INCIDENTAL DAMAGES (INCLUDING BUT NOT LIMITED TO LOSS OF BUSINESS PROFITS, INTERRUPTION OF BUSINESS, ETC.) DUE TO THE USE OF OR INABILITY TO USE THIS PRODUCT.



KONICA MINOLTA