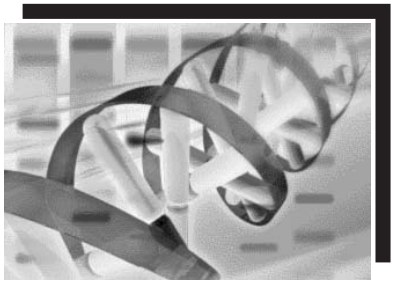
FUJIFILM

Science Lab 2002

General-Purpose
Analysis Software



Multi Gauge

-Ver2.0-

Operation Manual

for Windows

2002. Oct. Edition3.0
Science Lab 2002.Edition1.0

Notes to users

Thank you for purchasing FUJI FILM Multi Gauge Ver. 2.0. Please read the following important information carefully before using this software.

《 Before you use Multi Gauge 》

By starting to use this software, the customer consents to the following license agreement and Fuji Photo Film Co., Ltd. allows the customer to use this software Multi Gauge.
Fuji Photo Film Co., Ltd. has the copyright of this software. Accordingly, in the scope described here, this software is licensed to the customer by Fuji Photo Film Co., Ltd. rather than sold. While the customer has the property rights to the recording media, the Fuji Photo Film Co., Ltd. still has the property rights to the Multi Gauge software recorded on the media.

License terms:

1) **Multi Gauge can be used in a single unit that has a single CPU or multiple CPUs. Therefore, in a computer networking environment, Multi Gauge is necessary to each of the terminals that use it.**
2) **For backup and program execution purposes, Multi Gauge may be duplicated on different media.**

Restrictions:

1) **The customer may not duplicate, modify, or transfer Multi Gauge for purposes out of the license.**
2) **The customer may not convert Multi Gauge to a readable form by decompiling or disassembling.**
3) **The customer may not lend or distribute Multi Gauge in whole or in part for profitable purposes.**
4) **The customer may not create secondary work for Multi Gauge by modifying in whole or in part, or by combining to other software.**

About this manual:

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2) **This manual is subject to change without prior notice.**
3) **This manual has been developed very carefully. Please let us know if you find any ambiguities, errors, or omissions.**

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Part A

Before Beginning Operations

1.About Multi Gauge Ver. 2.0

1. Multi Gauge Ver. 2.0 (also called this software) can analyze image data given by unique image readers that Fuji Photo Film Co., Ltd. has developed as well as data in the TIFF or BMP format.

2. Sample images used in this manual have been chosen so that they meet the description of the corresponding functions. When you read this manual, replace them with appropriate images that you actually use.

3. For how to capture images, see the manual that comes with each reader.

4. The functions of this software have been tested in the following system.
Any other configurations may not be guaranteed to run this software correctly.

1.Standard hardware configuration (environment for operation test)

● PC:
DELL OptiPlex GX110-800S
(CPU: Pentium III-450 MHz, Built-in HDD: ATA33-ready EIDE drive)
(A keyboard and cable as well as a mouse and cable, which come with the PC.)
* The following main memory sizes are needed depending on kinds of images to be analyzed. Sizes in parentheses show the maximum. Use the maximum size if you analyze multiple kinds of images.

Image reader and maximum memory size	Main memory size
BAS-1000 (2MB), BAS-1500 (16MB) BAS-2000 (64MB), BAS-3000 (12MB)	320MB
BAS-2500 (64MB), BAS-1800 (40MB) FLA-2000 (64MB), FLA-8000 (136MB:Fluorescent measurement)	320MB
FLA-5000 (562MB)	768MB
BAS-5000 (160MB)	320MB
LAS-1000 (2.5MB)	320MB

● Peripherals:
○ Monitor: DELL D1025TH
(A 17-inch Trinitron monitor and cable, which comes with the PC)
○ SCSI board: Adaptec AVA-2930LP
○ MO drive: DELL optional accessory and built-in ATAPI
○ LBP: Canon LBP-350 (additional 16-MB memory)

2.Standard software configuration (already checked for proper operation)

● Operating system:

Japanese and English Windows® 98SE (which comes with the PC)
Japanese and English Windows® NT4.0/Service Pack 5
Japanese and English Windows® 2000/Service Pack 2
Japanese and English Windows® XP

3.Optional high-quality image output accessories

○ PG3000(48MB), PG3500(48MB), PG4000(120MB), PG4000II(120MB), PSD400
(With an Amphenol (Centronics) 50-pin terminator)
* For Pictrography, only one can be connected.

○ SCSI cable:
(The PC to Pictrography)
Sanwa Supply KB-SPC1
Centronics half-pitched 50-pin (MO side), Centronics 50-pin (Pictrography side),
1 meter long.

4.Compatibility with data derived from our other software

The compatibility between this software and our other software, Science Lab (Image Gauge, L Process), is described below.

○ Image data (img and inf files) is compatible.
For image data given by Science Lab for Macintosh, you need to convert it to the Fuji Exchange format (img and inf files) through the software.

○ Supplementary data for images, such as regions, annotations, and measurement data, are incompatible with each other.

5.Memory size necessary to use this software

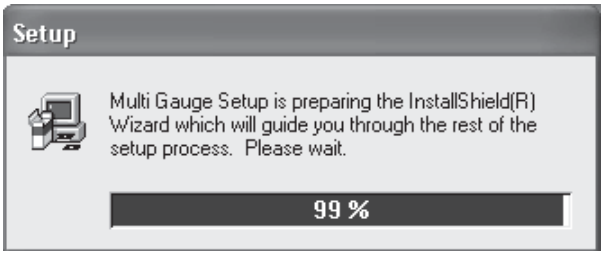
This software can analyze multiple images at the same time. In this case, the necessary memory size varies depending on the number of images to be analyzed simultaneously, but it can be guesstimated at the total size of all images plus 50 MB.
Note that an insufficient memory size or small space on the HD may cause the processing speed to decrease or this software to fail to work.

This manual is provided for readers who have experience using Windows® and are familiar with the basic operations and displays.

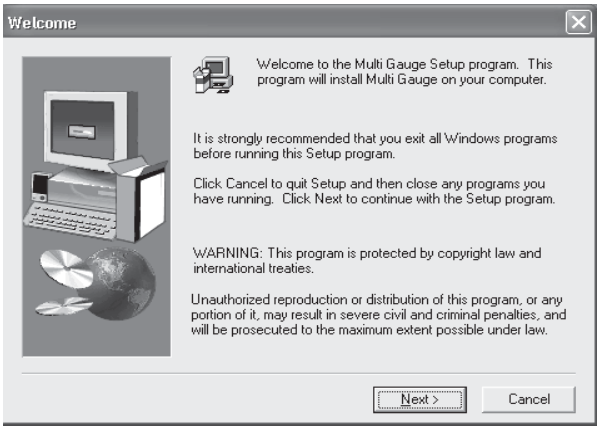
2.How to install and uninstall

2.1How to install

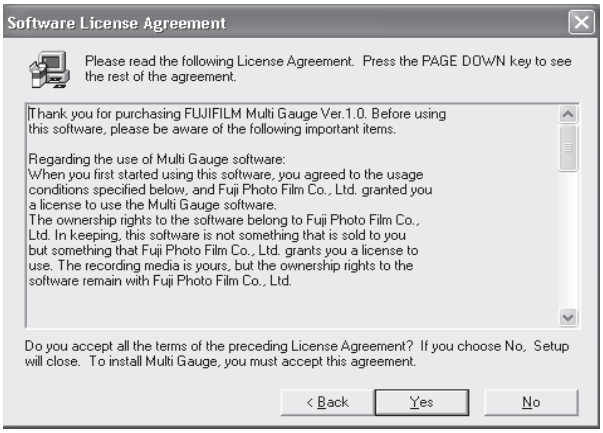
1. Activate Setup.exe, which you should locate on the CD-ROM supplied. Or select Control Panel and the Add or Remove Programs icon in turn, and then execute the installer.



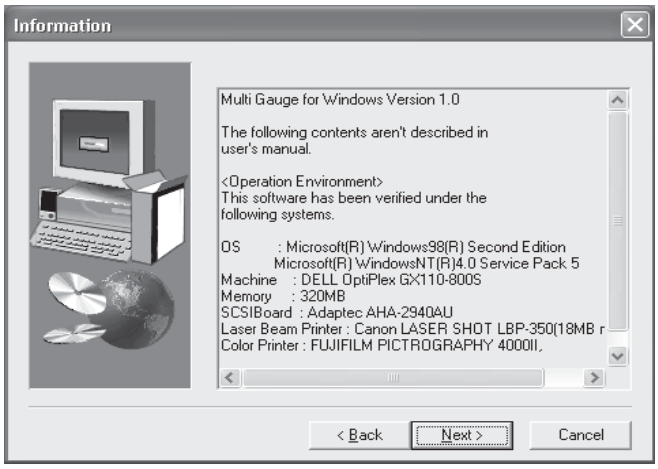
2. Read the messages and warnings in the Welcome dialog box shown below, then click on the Next > button to go to the Software License Agreement dialog box.



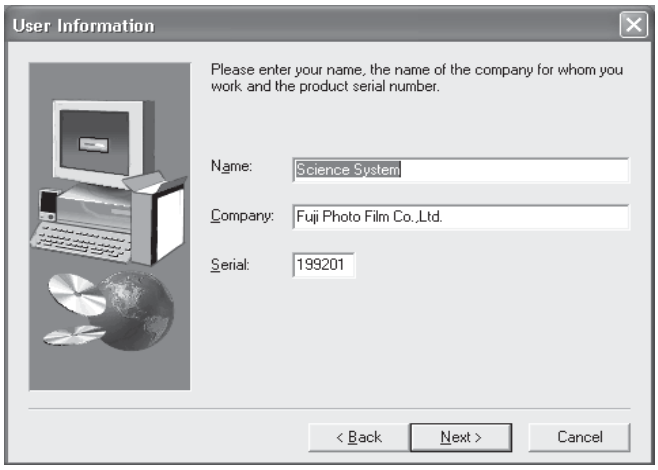
3. Read the license agreement in the Software License Agreement dialog box shown below, then click on the Yes button, if you consent to it, to move to the Information dialog box.



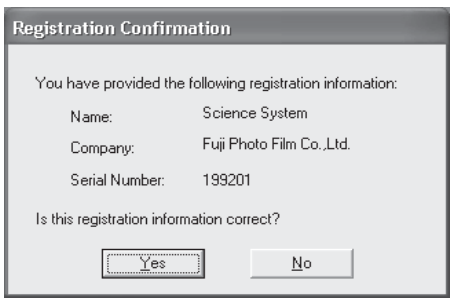
4 Click on the Next > button in the Information dialog box shown below to go to the User Information dialog box.



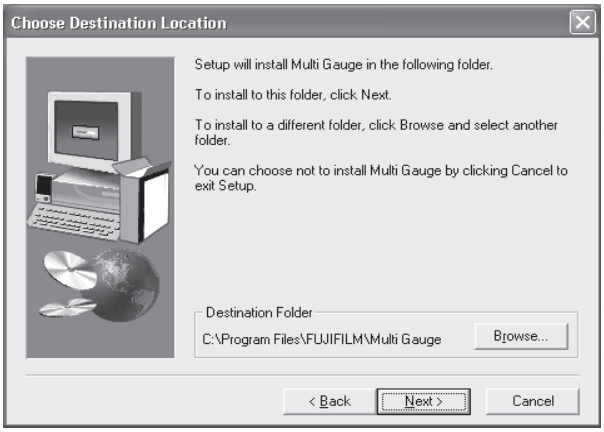
5 Input your name, company name, and the serial number which is shown on the rear of the CD-ROM case in the User Information dialog box shown below, then click on the Next > button to go to the Registration Confirmation dialog box.



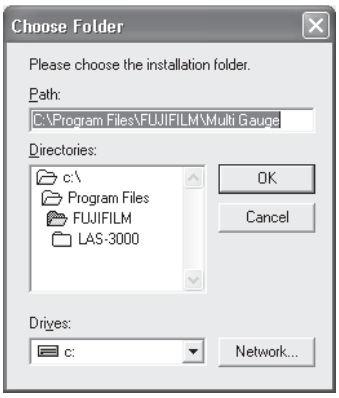
6 Check the information displayed in the Registration Confirmation dialog box for correctness, then click on the Yes button to advance to the Choose Destination Location dialog box.



7 Click on the Browse... button in the Choose Destination Location dialog box shown below to open the Choose Folder dialog box.

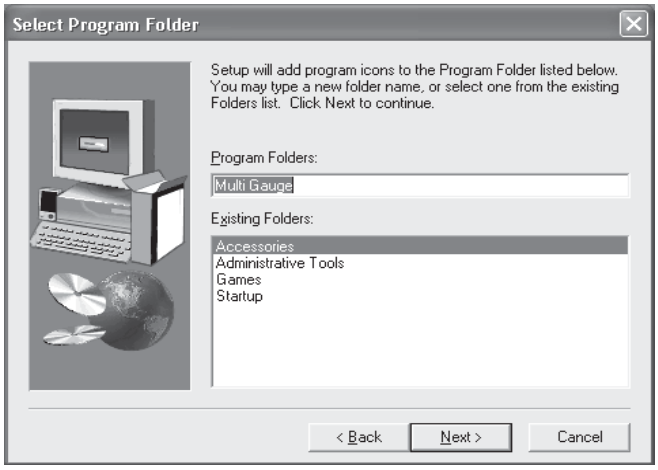


8 Select a desired directory, where this MultiGauge software will be installed, in the Choose Folder dialog box shown below, then click on the OK button to return to the Choose Destination Location dialog box.

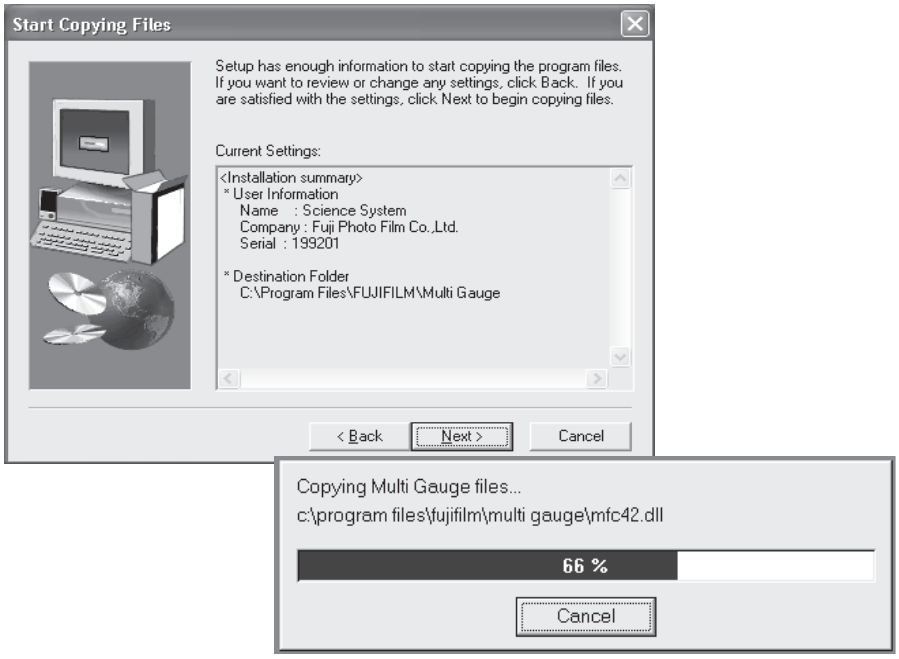


9 Click on the Next > button in the Choose Destination Location dialog box shown below to go to the Select Program Folder dialog box.

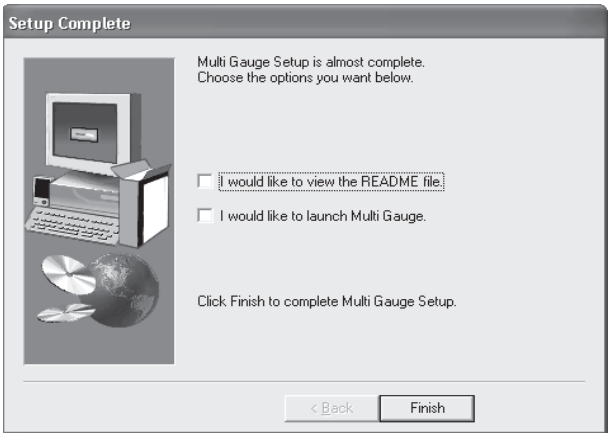
10 Input a program folder name, which will be added to the start-up menu, in the Select Program Folder dialog box shown below, then click on the Next > button to go to the Start Copying Files dialog box.



11 Check the user name and the directory where this software will be installed for correctness in the Start Copying Files dialog box shown below, then click on the Next > button. (Now, the installation starts.)

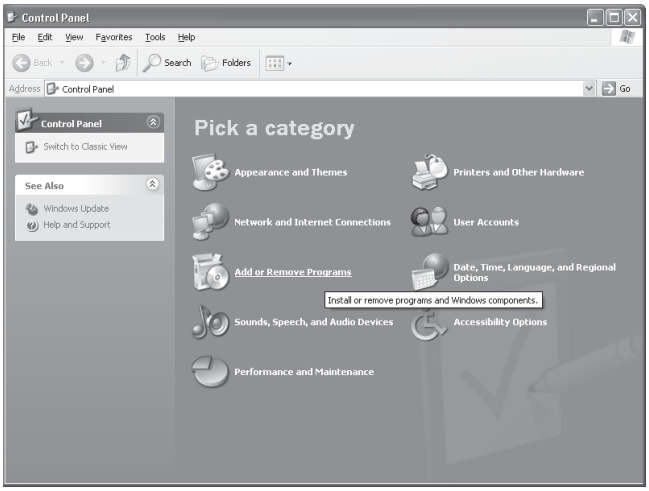


12 After the installation is complete, the Setup Complete dialog box appears as follows. Select desired options and click on the Finish button to end the installation.

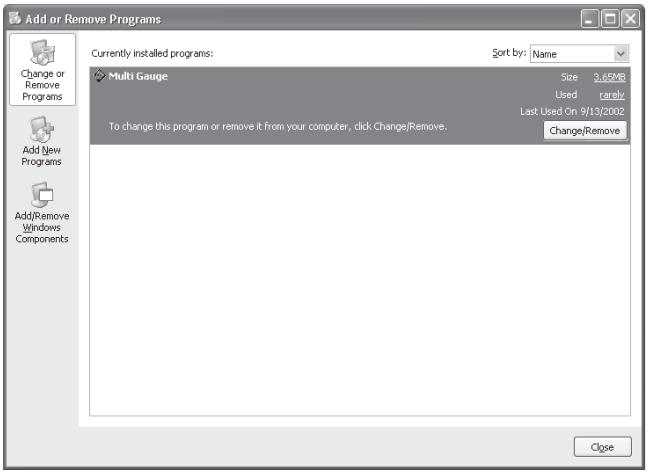


2.2How to uninstall

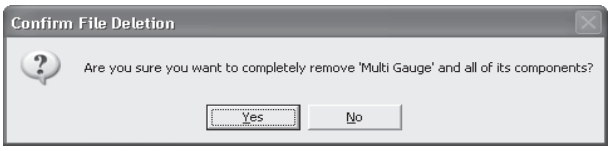
1 Open Control Panel and double-click on the Add or Remove Programs icon.



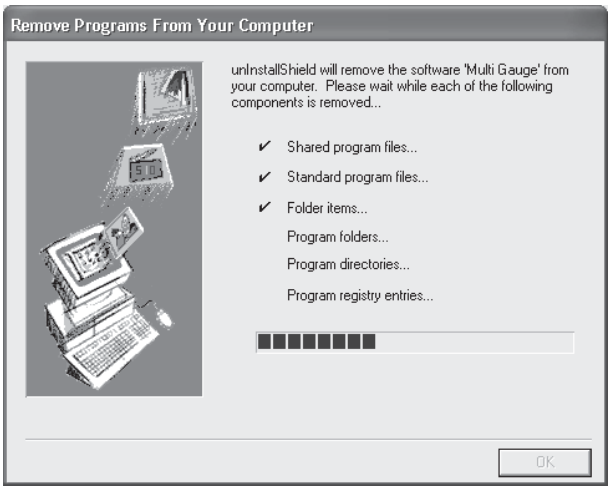
2 Select MultiGauge in the dialog box shown below, then click on the Change/Remove button.



3 The confirmation dialog box appears. If you wish to proceed, click on the Yes button. (Now, the uninstallation starts.)



4 The following progress dialog box appears and after the uninstallation is complete, the OK button becomes active. Click on this button to finish the uninstallation.



Part B

Operation Outline

2002. Oct. Ver.3.0

1.Starting up and Exitting the Software

Starting up

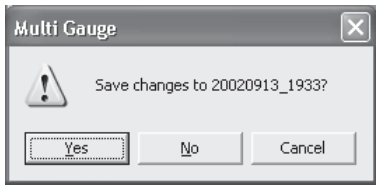
1. Double-click on the Multi Gauge icon

, use the short cut, or select the menu option added to the start-up menu.

Exitting

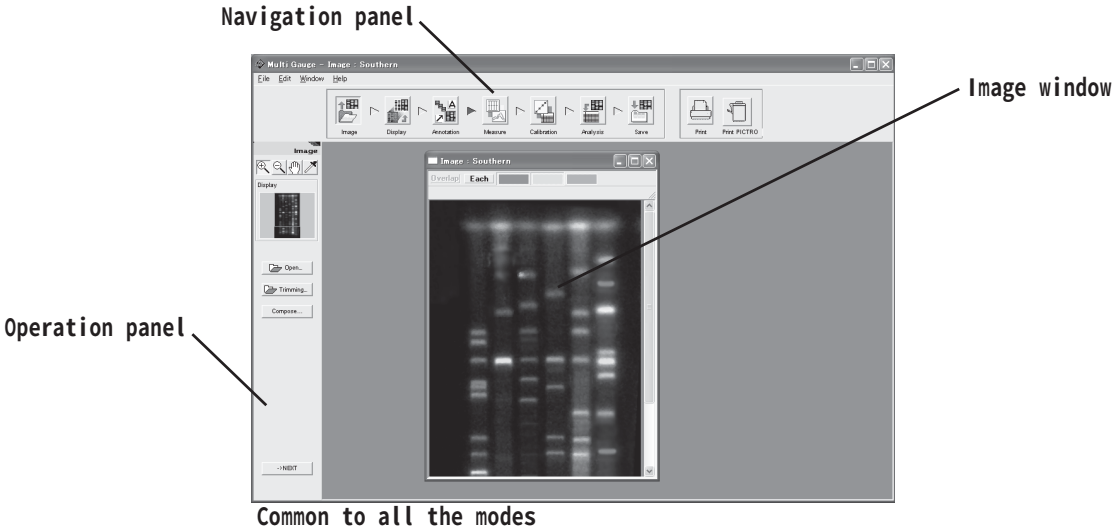
1. Select the Exit command from the File menu.

2. If you quit MultiGauge while images are displayed, the following dialog box appears.

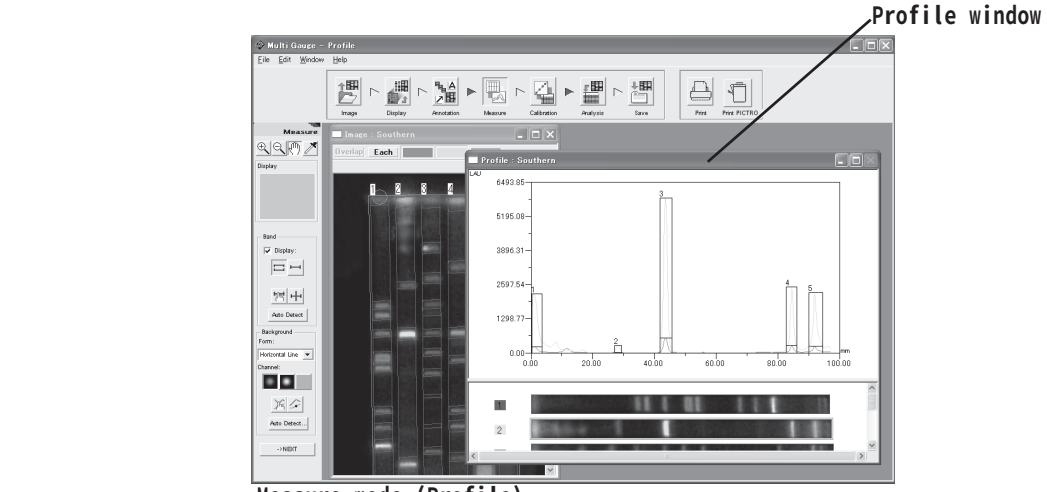


3. Determine whether or not to save them.

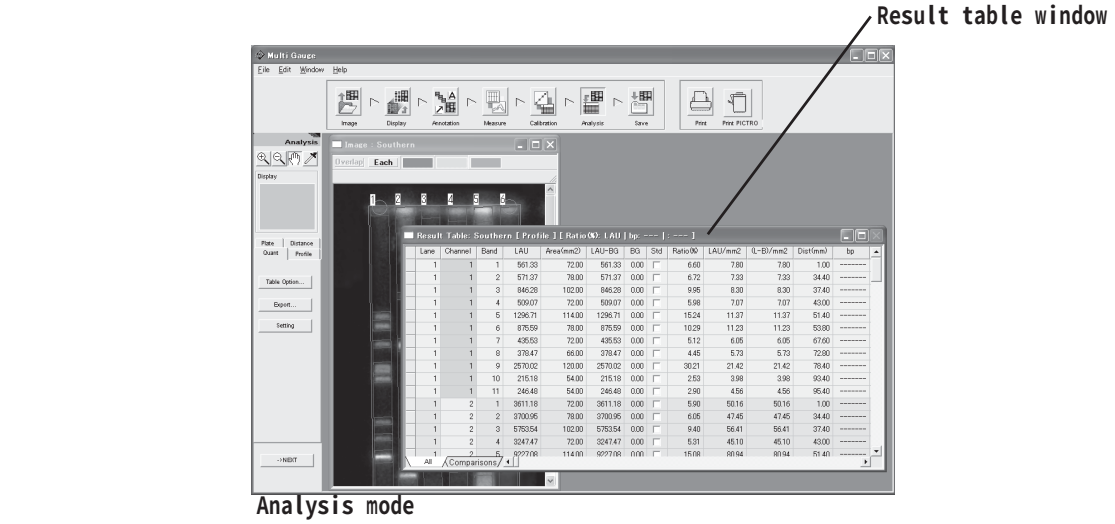
2.Name of each part on the window



Common to all the modes



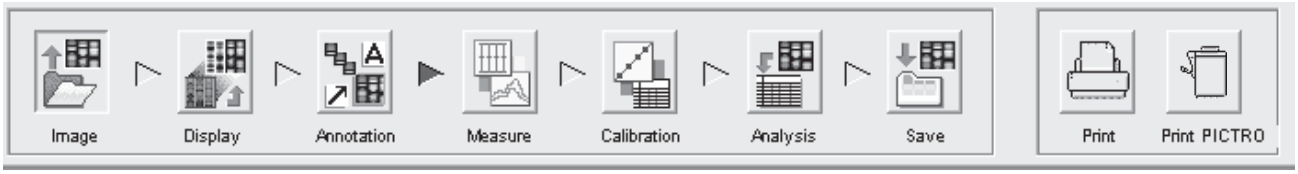
Measure mode (Profile)



Analysis mode

3.Operation flow with navigation

How to use MultiGauge with navigation is described below.



* Basically, when you want to change the operation mode, select (click on) any mode button (icon) freely.
For instance, MultiGauge can change from the Display mode to the Save mode.
However, there are some restrictions. If you enter the Measure mode from the Display mode and set no measurement region, you cannot go to the Analysis mode. Moreover, clicking on the Next > button in the lower left position on the window allows the operation mode to change in turn.

❶ Image mode

Allows you to open and trim an image.

* When you need to analyze multiple images, open them in this mode firstly, and proceed to the next mode.

❷ Display mode

Allows you to adjust the contrast of images opened and to make a crosstalk correction.

❸ Annotation mode

Allows you to put comments and arrows on the image.

❹ Measure mode

Allows you to set measurement regions, such as lanes, bands, and titer plates.

❺ Calibration mode

Allows you to draw the calibration lines of concentration and molecular weight.

❻ Analysis mode

Allows you to display measuring results and to analyze data.

❼ Save mode

Allows you to save images and analyzing results.

❽ Print

Allows you to print out images and analyzing results. For this purpose, printers (LBP), the printer drivers of which are installed, can be used.

❾ Print PICTRO

Allows you to print out images and analyzing results through Pictrography (3000, 3500, 4000, or PSD).

Part C

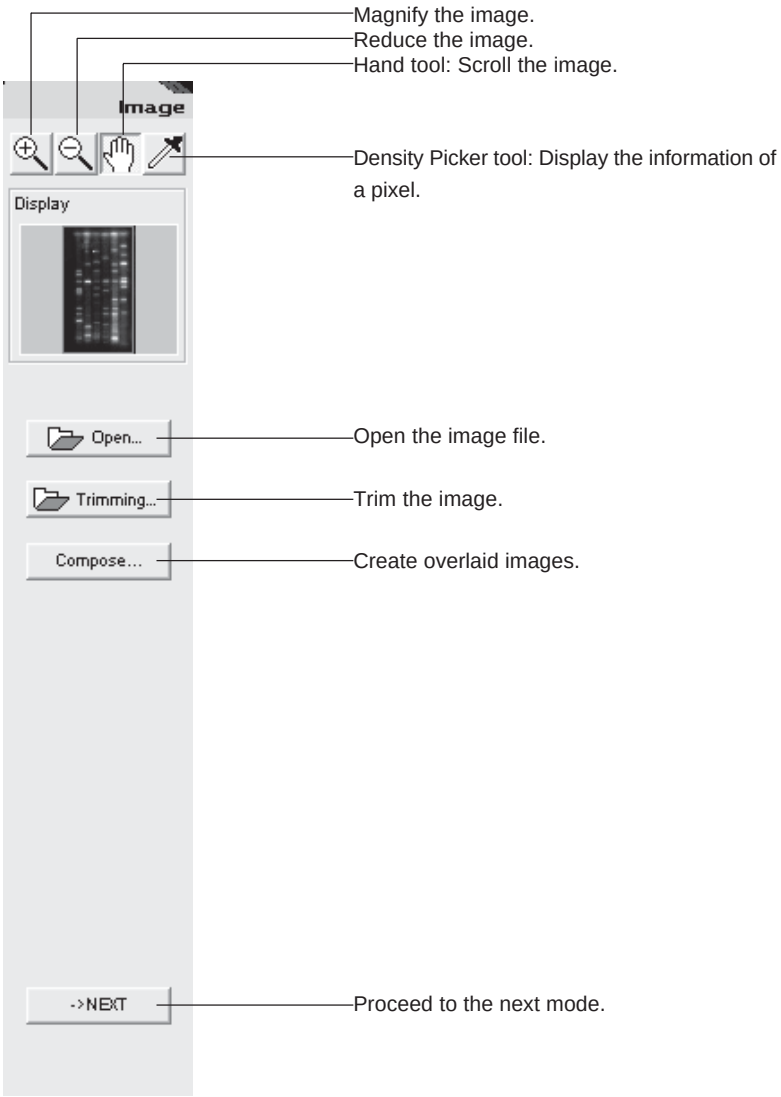
Operation Details

Step 1 Displaying an image "Image mode"

First of all, select the Image mode and open an image you want to analyze.
The following three ways can be used to open the image.

1. Open the image directly.
2. Trim the image, then open the trimmed image.
3. Combine images, then open the overlaid image.

The Image mode provides the following operation panel.

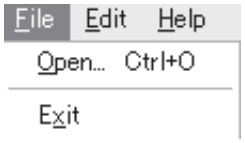


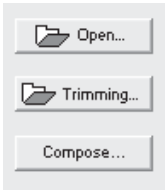
1. Opening an image file

1. Opening an image file ..... Open...

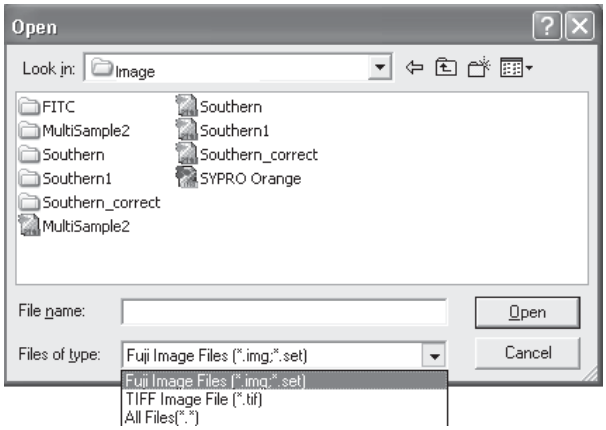
You can directly open the file you want to analyze.

1. Select the Open command from the File menu or click on the Open... button on the operation panel.





2. Move to the directory where the desired file is saved, and then select the file format.

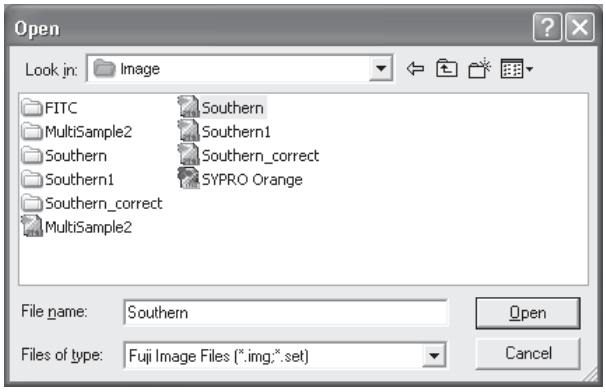


Tips

FUJI original files are those which are created by the following image readers:

FIJI FILM BAS series: BAS-1000, 1500, 1800, 1800II, 2000, 2500, 3000, and 5000.
FLA series: FLA-2000, 3000, 3000G, 5000, and 8000.
LAS series: LAS-1000, 1000C, 1000plus, 1000mini, and 3000.
If any Macintosh computer is used as the host of the image readers above, the Macintosh-specific files (individual image file icons) cannot be directly analyzed by this software. Be sure to convert them to the inf/img format.
Opening a set file created by FLA-5000 or FLA-8000 presents overlaid images.

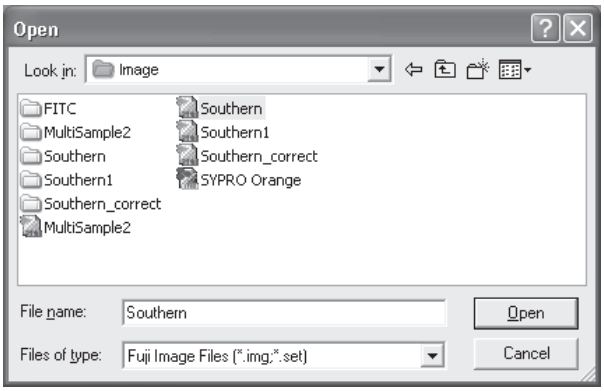
3. Select the file name and click the Open button.



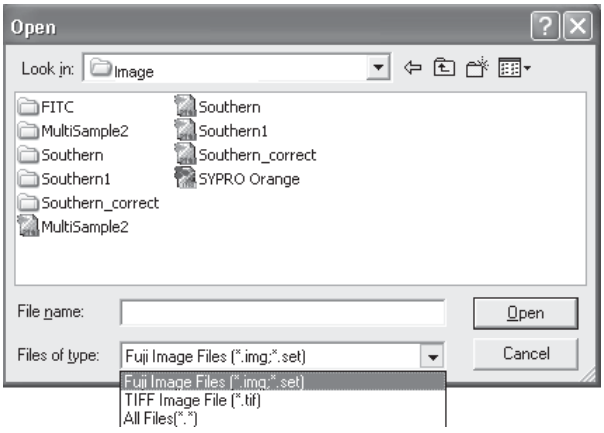
2. Trimming an image ..... Trimming...

You can trim part of the image you want to analyze and open the trimmed image.

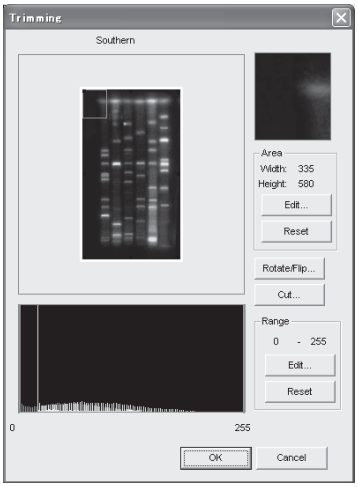
1. Click the Trimming... button on the operation panel.



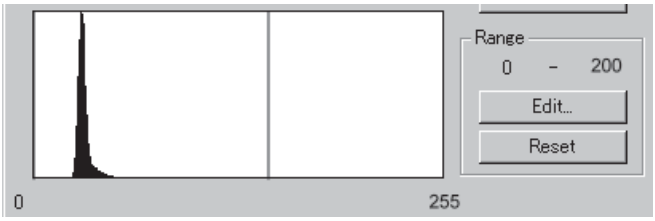
2. Move to the directory where the desired file is saved, and then select the file format.



3. Select the file name and click the Open button.
=>The Trimming dialog box is displayed.



4 Drag the adjustor in the Range Scope box to adjust the contrast.

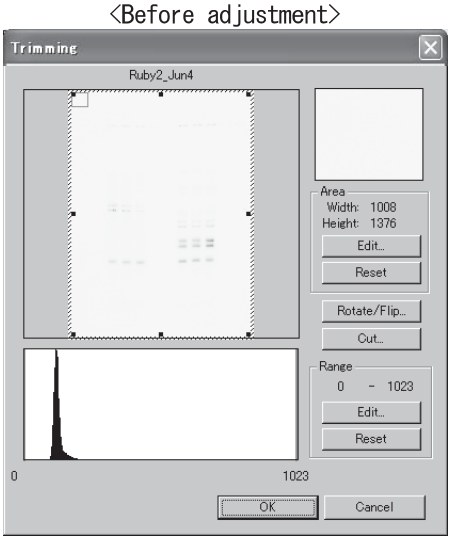


Tips

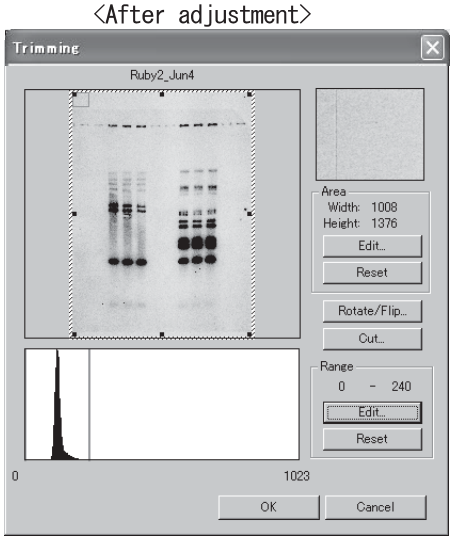
About Range Scope

This function enables you to select the range in which image data is distributed to enhance the contrast, resulting in the clearer image. For example, detecting very low-intensity light biases the image data on the left side. If it is converted in a full range of 16 bits, the contrast of the image is very low. However, narrowing the range can make high contrasted image.

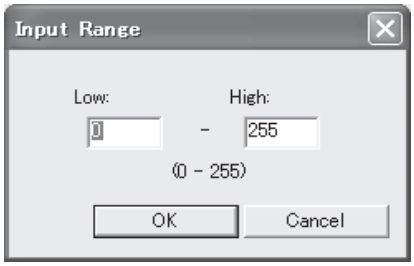
<Before adjustment>



<After adjustment>

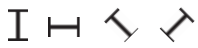


Clicking the Edit... button displays the following dialog box, which allows you to input numerical values directly.

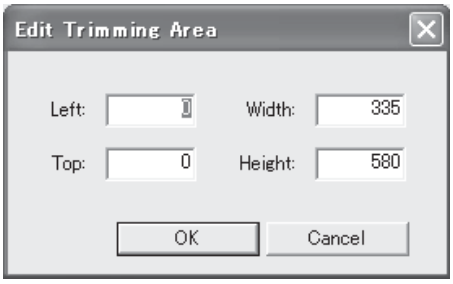


Clicking the Reset button returns your adjustment to the original situation.

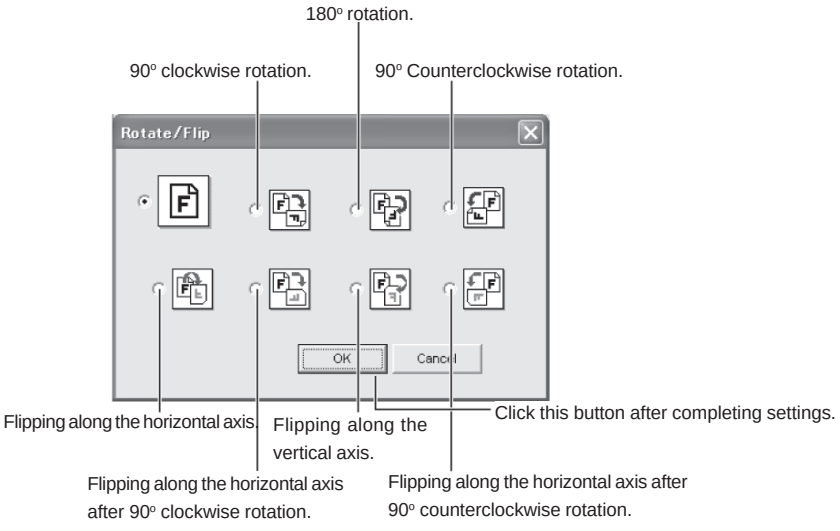
5 To trim the image, adjust the trimming box in the following way. The part enclosed in the red frame on the image window is enlarged and displayed on the Area window.

Shape of Pointer	Purpose	Operation Method
	Resize	Move the mouse pointer onto the frame or corner of the trimming box, and after the pointer form changes to any of the pointers shown in the left far column, drag it.
	Move	Place the mouse pointer into the trimming box, and after the pointer form changes to , drag it.

Clicking the Edit... button displays the following dialog box, which allows you to input numerical values directly for the width/height (pixels) of the trimming box and the Contrast range of Range Scope (to be described later).



6 Click the Rotate/Flip... button in the Trimming dialog box to rotate/flip the image.
=>The Trimming Option dialog box appears.
Go to Step **8** if neither rotation nor flip are necessary.



7 Select a desired option, then click the OK button.
=>The set conditions are performed and displayed in the Trimming dialog box.

8 Click the OK button or the Cut... button in the Trimming dialog box.

When you click the OK button,
Only the image you want to analyze will be displayed.

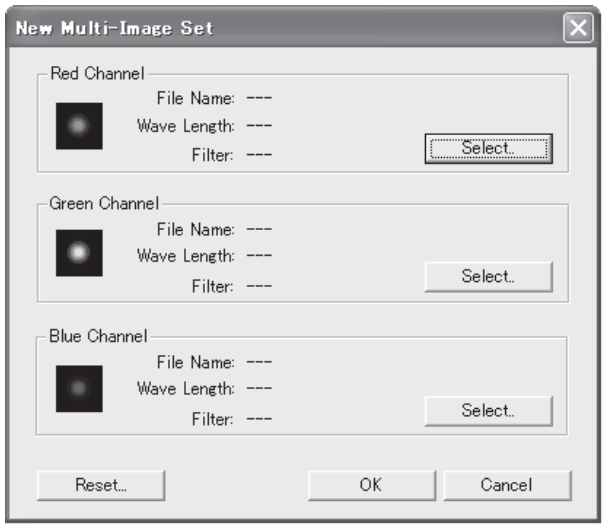
When you click the Cut... button,
The image will be displayed with the Trimming dialog box remaining as it is.
You can continue trimming.

3. Creating overlaid images ..... Compose...

You can overlay images detected on a wavelength basis and open the overlaid images.

1. Click the Compose... button on the operation panel.

2. Click the Select.. button of a channel you want to set and select the firse image file to be overlaid.



3. In the same fashion, click the Select.. button of a channel you want to set and select the second image file.

Note :Up to three images can be composed and the overlaid images are displayed in red, green and blue pseudo colors respectively.

4. Click the OK button.
=>The overlaid images will be displayed.

4. Handling the image window

You can magnify and reduce the image being displayed and also switch the view of images.

Magnify and reduce the image being displayed (on the control panel)

The magnifying glass tools allow you to magnify and reduce the image being displayed respectively.

Magnifying

Select the tool (click this icon).

After the mouse cursor changes to , move it to the center of a place you want to magnify and click.

Reducing

Select the tool (click this icon).

After the mouse cursor changes to , move it to the center of a place you want to reduce and click.

Scrolling the image being displayed (on the control panel)

When only part of the image is displayed in the image window, the hand tool enables you to scroll the image.

Select the tool (click this icon).

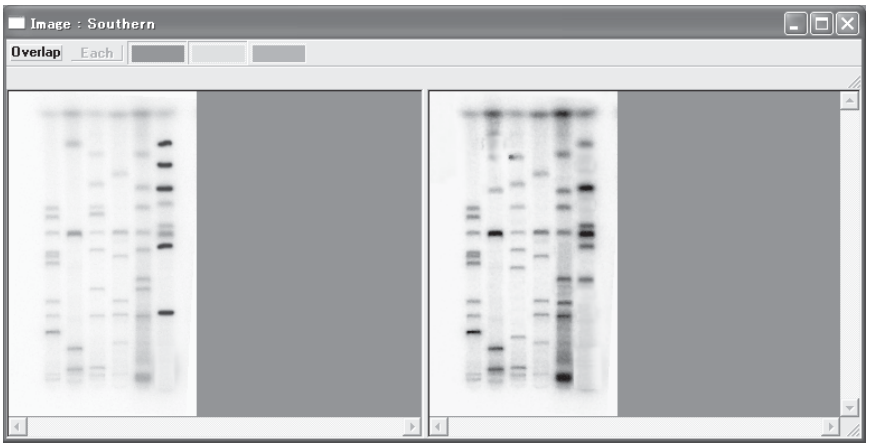
After the mouse cursor changes to , move it in the image window and drag the cursor.
The displayed image is scrolled with the cursor.
Or, move the cursor in the Display window and drag the red edge frame.

Switching the view of overlaid images

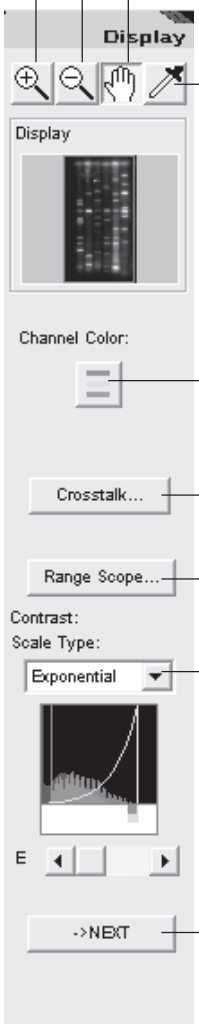
Use the **Overlap** or **Each** button in the upper part of the image window to switch between overlaid images and individual images.

Overlap

Each



Next, adjust the contrast of the opened image in the Display mode.
The Display mode provides the following operation panel.



Magnify the image.
Reduce the image.
Hand tool: Scroll the image.
Density Picker tool: Display the information of a pixel.
Color icon: Change the display color.
The appearance of this icon varies depending on a single, individual, or overlaid image(s).
Correct the crosstalk.
Enhance the contrast.
Adjust the contrast.
Proceed to the next mode.

1. Changing the display color

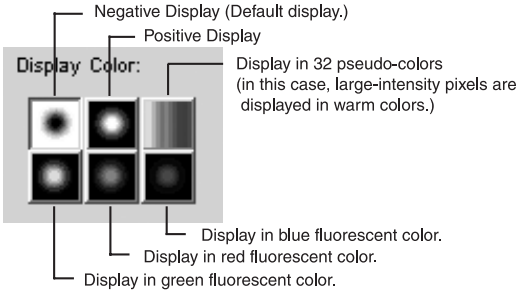
1. Changing the display color····· Display color

This option allows you to change the color of an image you want to display.

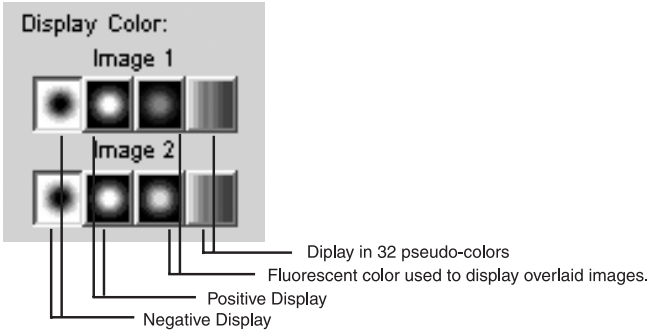
1. Click the image window you want to change.
   =>The window chosen becomes active.

2. Click the desired color icon on the operation panel. For overlaid images, click on the icon.
   =>The image display color changes.

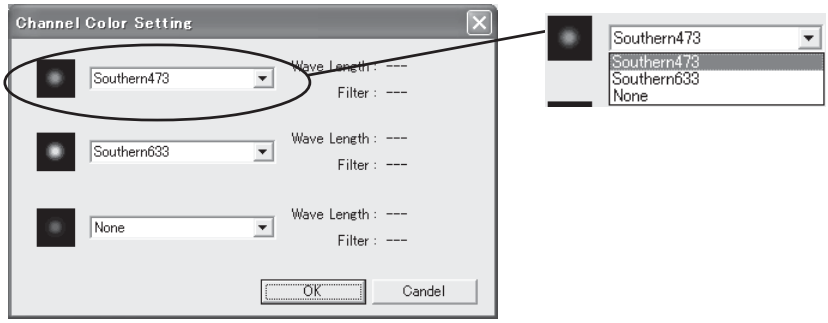
Single image (when an img/inf file or a tiff file is chosen)



Individual images (when a set file is opened or when images are opened by Compose function and the Each button is pressed)



Overlaid images (when a set file is opened or when images are opened by Compose function). Select a file name to which you want to assign each color, then click the OK button.

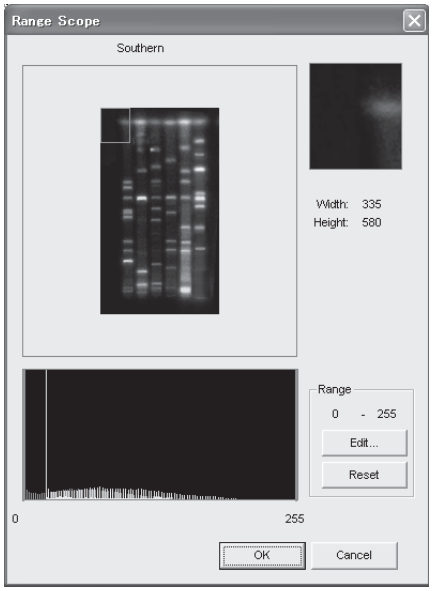


2. Enhancing the contrast ..... Range Scope

This function allows you to select a range in which image data is distributed to enhance the contrast, resulting in the clearer image.

1. Click the image window you want to change.
   =>The window chosen becomes active.

2. Click the [Range Scope...] button on the operation panel.
   =>The Range Scope dialog box is displayed.

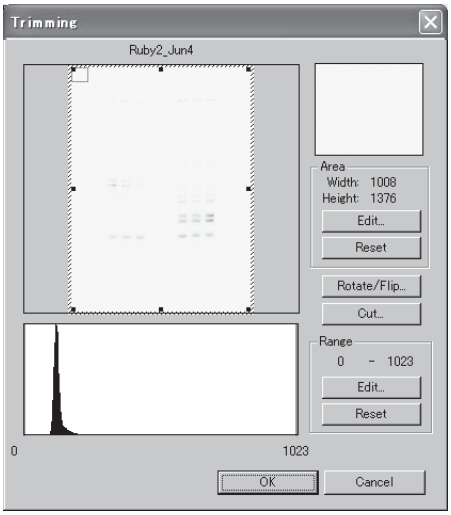


Tips

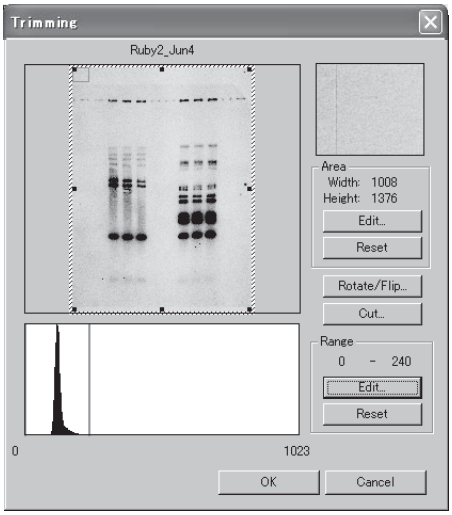
About Range Scope

The function enables you to select the range in which image data is distributed to enhance the contrast, resulting in the clearer image. For example, detecting very low-intensity light biases the image data on the left side. If it is converted in a full range of 16 bits, the contrast of the image is very low. However, narrowing the range can make high contrasted image.

<Before adjustment>

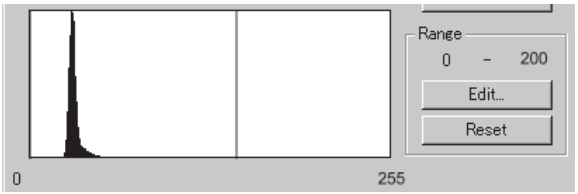


<After adjustment>

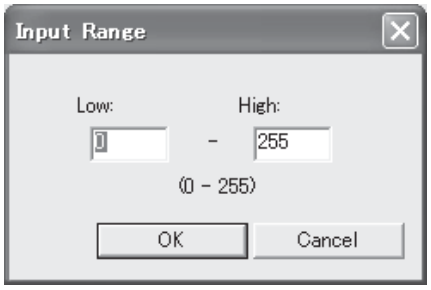


2. Enhancing the contrast

3. Drag the adjuster on the Range Scope box to set the desired range.



Clicking the Edit... button displays the following dialog box, which allows you to input numerical values directly.



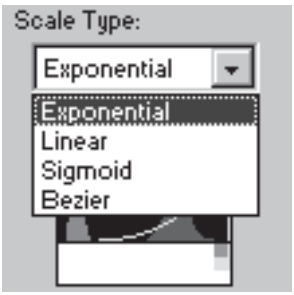
4. Click on the OK button.

3. Adjusting the contrast·····Contrast

This option allows you to use the tone curve and adjust the contrast of the image.

1. Click the image window you want to change.
   =>The window chosen becomes active.

2. Select the desired tone curve from the Scale Type pull-down menu on the operation panel.

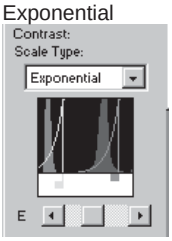


Exponential..... Adjusts the contrast based on an exponential tone curve.
Linear.....Adjusts the contrast based on a linear tone curve.
Sigmoid.....Adjusts the contrast based on a Sigmoid tone curve.
Bezier.....Adjusts the contrast based on a Bezier tone curve.

Tips

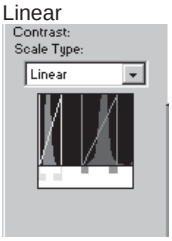
According to which one of the tone curves you select, the appearance of images changes much.

Exponential



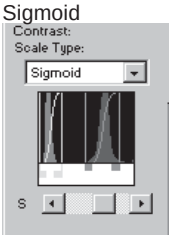
Adjusting the contrast with an Exponential curve is available.
This is useful for creating an image with the low background.
Dragging the adjuster reflects the image contrast in real time.
As the E slide bar is approaching the right end, the slope of the curve is increasing and the background becomes lower.
* In the case of overlaid images, you can adjust the contrast on individual images basis.

Linear



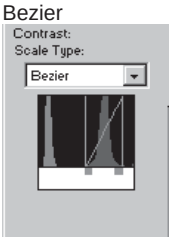
Adjusting the contrast with a Linear tone curve is available.
This is useful for images with gradations.
Dragging the adjuster reflects the image contrast in real time.
* In the case of overlaid images, you can adjust the contrast on individual images basis.

Sigmoid



Adjusting the contrast with a Sigmoid tone curve is availavle.
This is useful for creating a film-like image.
Dragging the adjuster reflects the image contrast in real time. As the S slide bar approaches the right end, the slope of the curve increases.
* In the case of overlaid images, you can adjust the contrast on individual images basis.

Bezier



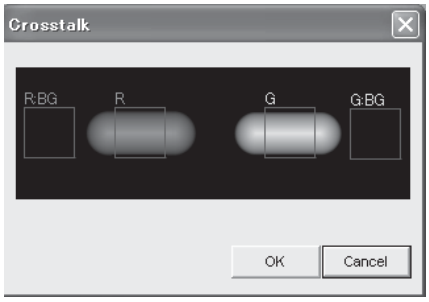
Adjusting the contrast with a Bezier tone curve is available.
Moving the mouse cursor onto any point of the Bezier curve and dragging it can change the shape of the curve, which causes the contrast of an image to change freely. Dragging the adjuster reflects the image contrast in real time.

4. Crosstalk correction

4. Crosstalk correction ..... Crosstalk

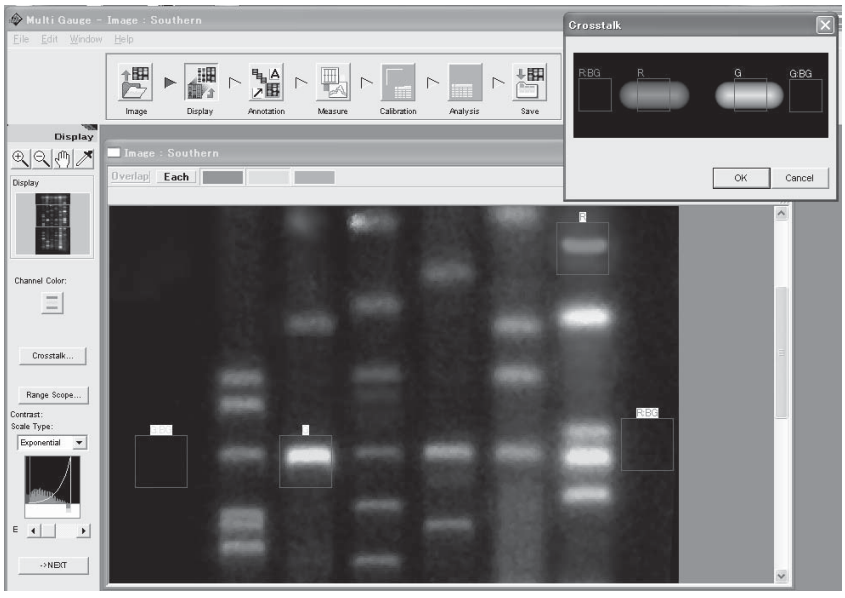
This option allows you to correct the effect of fluorescent overlap between colors and convert the image to the quantitative one. It is available only for overlaid images.

1. Click the Crosstalk... button on the operation panel.
   =>The Crosstalk Confirmation dialog box is displayed.



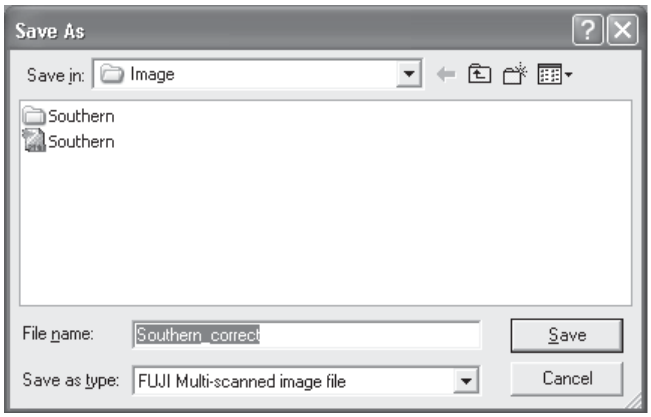
2. Click the window including overlaid images to make it active.

3. Drag the mouse to create control specification frame and background specification frame on the overlaid images.



4. Click the Crosstalk Confirmation dialog box to make it active.

5 Click the OK button on the Crosstalk Confirmation dialog box.
=>A dialog for saving the corrected file is displayed.



6 Input a file name, then click the Save button.
=>The crosstalk correction is executed.

Tips

About crosstalk

When the image of gels or membranes marked with multiple fluorescent pigments is captured, the pigments may not be distinguished due to a fluorescent overlap, that is the image of one pigment component is affected by other pigment components. This phenomenon is called crosstalk.

5. Handling the image window

You can magnify and reduce the image being displayed and also switch the view of images.

Magnify and reduce the image being displayed (on the control panel)

The magnifying glass tools allow you to magnify and reduce the image being displayed respectively.

Magnifying

Select the tool (click this icon).

After the mouse cursor changes to , move it to the center of a place you want to magnify and click.

Reducing

Select the tool (click this icon).

After the mouse cursor changes to , move it to the center of a place you want to reduce and click.

Scrolling the image being displayed (on the control panel)

When only part of the image is displayed in the image window, the hand tool enables you to scroll the image.

Select the tool (click this icon).

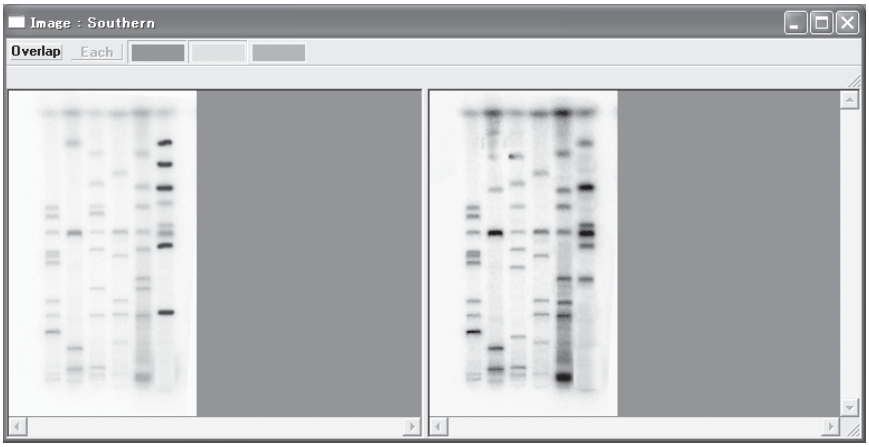
After the mouse cursor changes to , move it in the image window and drag the cursor.
The displayed image is scrolled with the cursor.
Or, move the cursor in the Display window and drag the red edge frame.

Switching the view of overlaid images

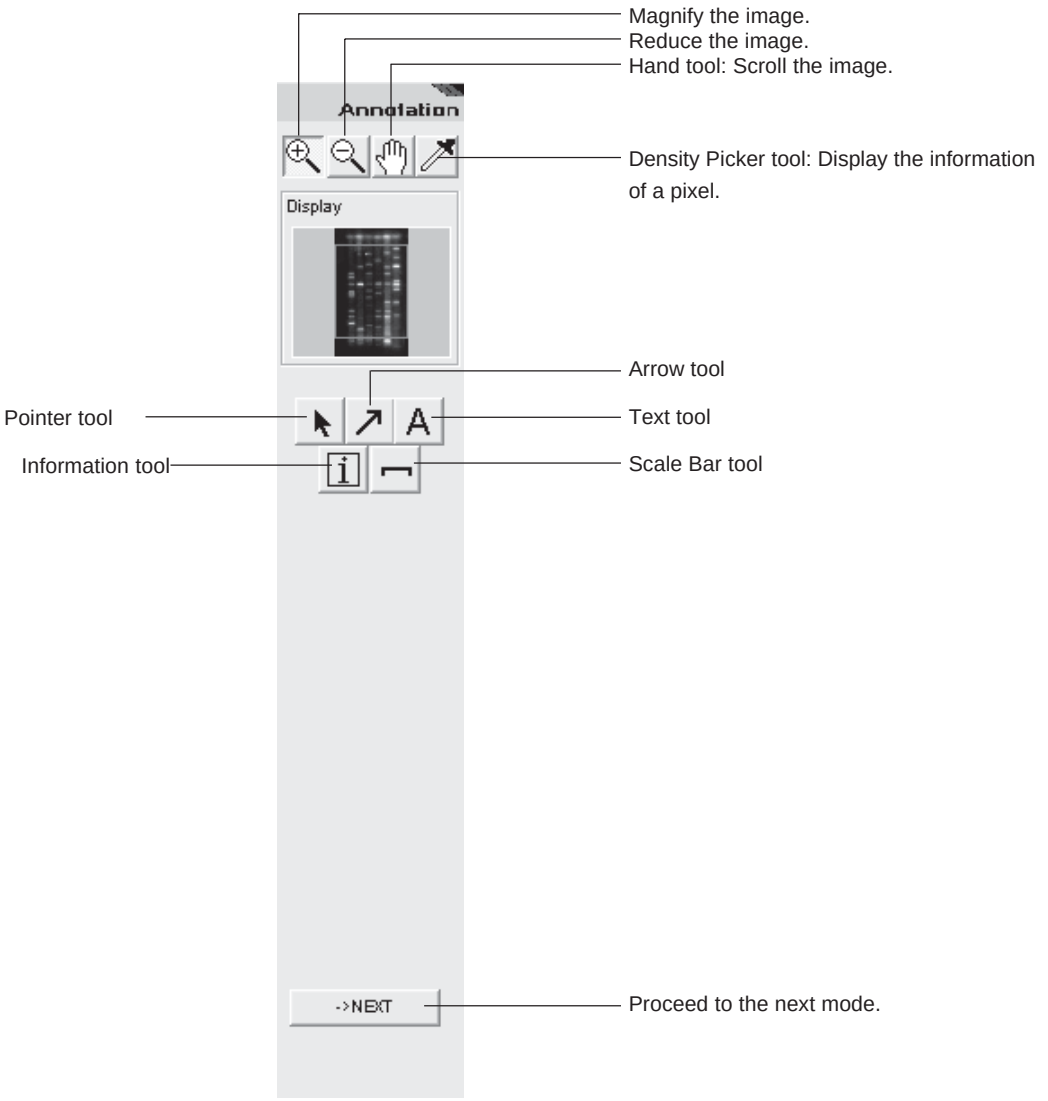
Use the **Overlap** or **Each** button in the upper part of the image window to switch between overlaid images and individual images.

Overlap

Each



The Annotation mode allows you to add arrows, comments, and file information on the image. It provides the following operation panel.



1. Drawing arrows

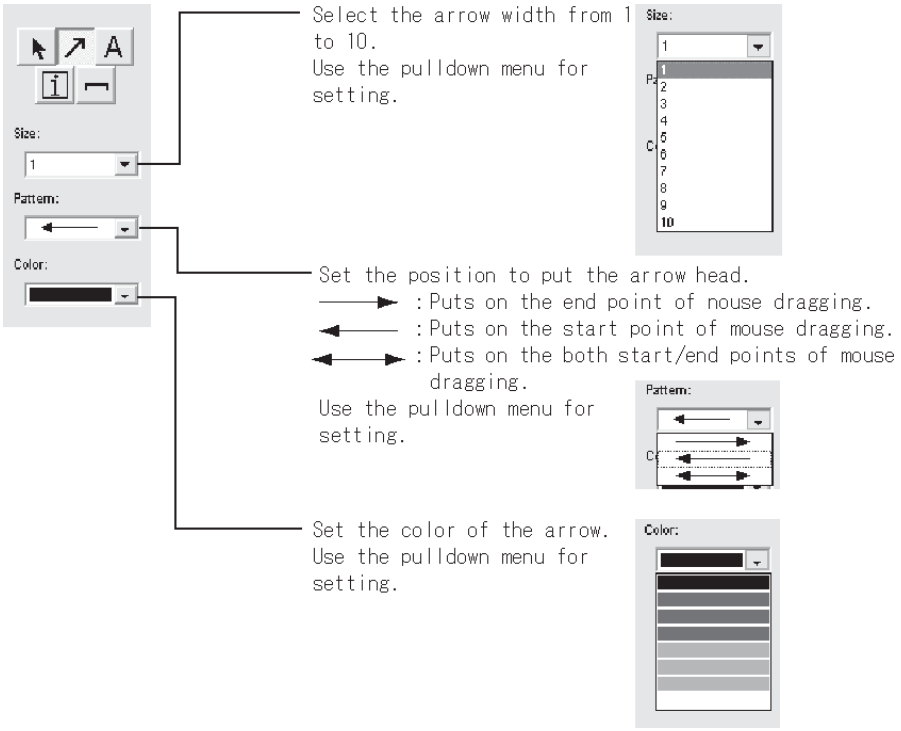
1. Drawing arrows

You can put arrows on an image.

1. Click the image window on which you want to put an arrow.
   =>The window chosen becomes active.

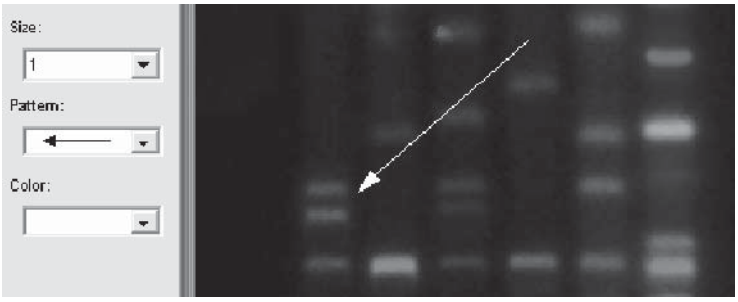
2. Click the Arrow tool on the operation panel.

3. Set the attributes of the arrow.



4. First, determine the start point of the arrow on the image and press the mouse button. Next, determine the length and direction of the arrow and drag the mouse cursor. Finally, release the mouse button at the end point.

   Ex.: Size: 1, Pattern: , and Color:



2. Moving, Changing attributes, or deleting the arrow

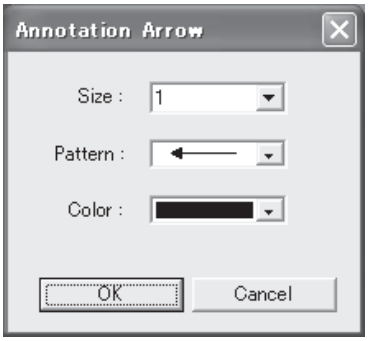
You can move or delete the arrow already added, or can change the attributes of it.

How to move

1. Click the image window on which an arrow you want to move.
   =>The window chosen becomes active.
2. Click on the pointer tool on the operation panel.
3. Place the mouse cursor onto the arrow and press the mouse button.
   =>The arrow is highlighted (enveloped in a red color frame).
4. Move the mouse cursor into the red color frame, and after checking that the cursor form changes to , drag it to a desired position.

How to change the attributes

1. Click the image window to change any attribute of the arrow.
   =>The window chosen becomes active.
2. Click the selection tool on the operation panel.
3. Move the mouse cursor onto the arrow and double-click.
   =>The Annotation Arrow dialog box is displayed.



4. Change any attributes and click the button.

How to delete

1. Click the image window on which an arrow you want to delete.
   =>The window chosen becomes active.
2. Click the pointer tool on the operation panel.
3. Move the mouse cursor onto the arrow and press the mouse button.
   =>The arrow is highlighted (enveloped in a red color frame).
4. Press the Delete key on the keyboard.

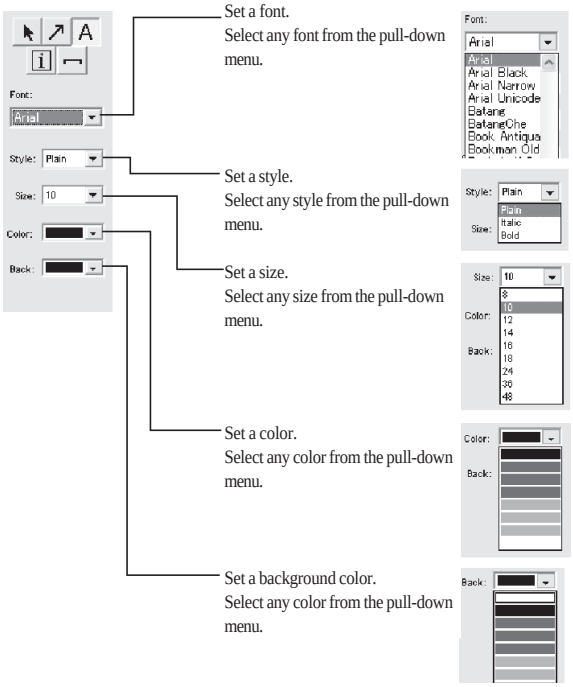
3. Writing comments

You can put comments on an image.

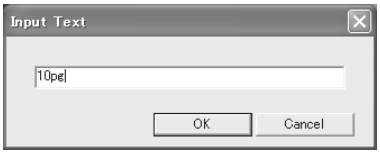
1. Click the image window on which you want to put a comment.
   =>The window chosen becomes active.

2. Click the text tool [A] on the operation panel.

3. Set the attributes of the comment.



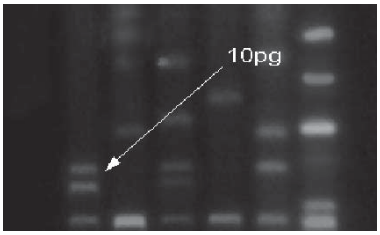
4. Move the mouse cursor into the window and click on a point where the comment is to be put.
   =>The Input Text dialog box is displayed.



5. Input the comment and click the [OK] button.
   =>The comment is displayed on the image.

   Ex.: Font: Courier New, Style: Bold, Size: 10, Color: [ ] ,

   and Back: [ ]



4. Moving, Changing attributes, or deleting the comment

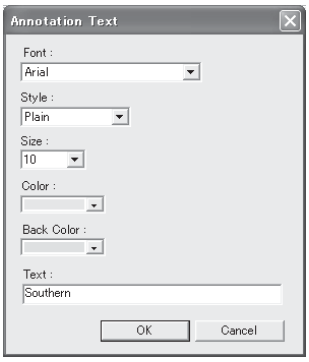
You can move or delete the comment already added, or can change the attributes of it.

How to move

1. Click the image window on which a comment you want to move.
   =>The window chosen becomes active.
2. Click the pointer tool on the operation panel.
3. Move the mouse cursor onto the comment and press the mouse button.
   =>The comment is highlighted (enveloped in a red color frame).
4. Move the mouse cursor into the red color frame, and after checking that the cursor form changes to , drag it to a desired position.

How to change the attributes

1. Click the image window to change any attribute of the comment.
   =>The window chosen becomes active.
2. Click the selection tool on the operation panel.
3. Move the mouse cursor onto the comment and double-click.
   =>The Annotation Text dialog box is displayed.



4. Change any attributes and click the button.

How to delete

1. Click the image window on which a comment you want to delete.
   =>The window chosen becomes active.
2. Click the pointer tool on the operation panel.
3. Move the mouse cursor onto the comment and press the mouse button.
   =>The comment is highlighted (enveloped in a red color frame).
4. Press the Delete key on the keyboard.

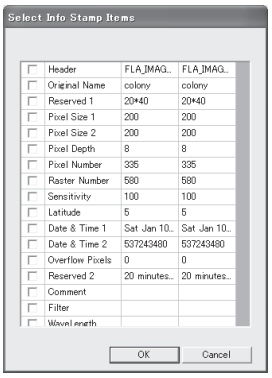
5. Pasting an information file

5. Pasting an information file

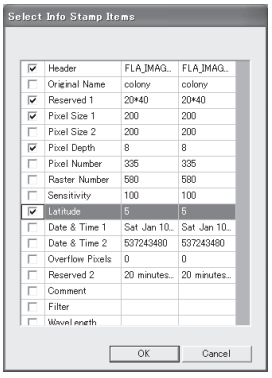
You can paste image information, such as reading conditions, on the image.

1. Click the information tool [i] on the operation panel.

2. Click the desired point on the image where the information file is pasted.
   =>The Select Info Stamp Items dialog box is displayed.



3. Check any items you want to paste.



4. Click the [OK] button.
   =>The information is displayed image.

6. Moving, Changing attributes, or deleting the information file

You can move or delete an information file already pasted, or can change the contents being displayed.

How to move

1. Click the selection tool on the operation panel, then move the mouse cursor onto an information stamp pasted and press the mouse button.
   =>The information is highlighted (enveloped in a red color frame).

2. Move the mouse cursor into the red color frame.
   =>The cursor form changes to the hand tool .

3. Drag the information to the desired position and release the mouse button.

How to Change the attributes

1. Click the pointer tool on the operation panel, then move the mouse cursor onto an information stamp pasted and double-click.
   =>The Annotation Info Stamp dialog box is displayed.

2. Change any attributes and click the

button.

How to delete

1. Click the pointer tool on the operation panel, then move the mouse cursor onto an information stamp pasted and press the mouse button.
   =>The information is highlighted (enveloped in a red color frame).

2. Press the Delete key on the keyboard.
   =>The information file is deleted.

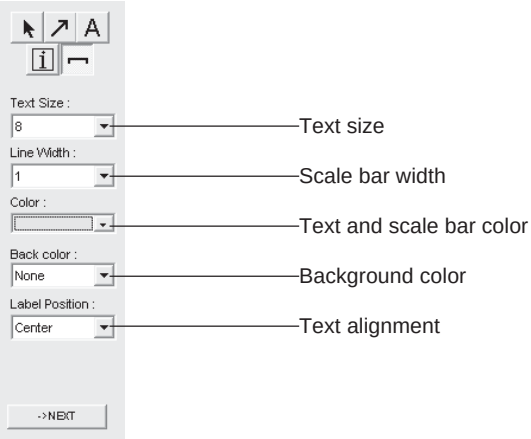
7. Pasting a scale bar

7. Pasting a scale bar

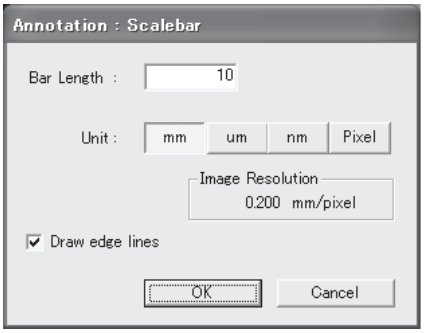
You can paste a scale bar on the image.

1. Click the scale bar tool on the operation panel.

2. Set the attributes of a scale bar by selecting each option on the operation panel.

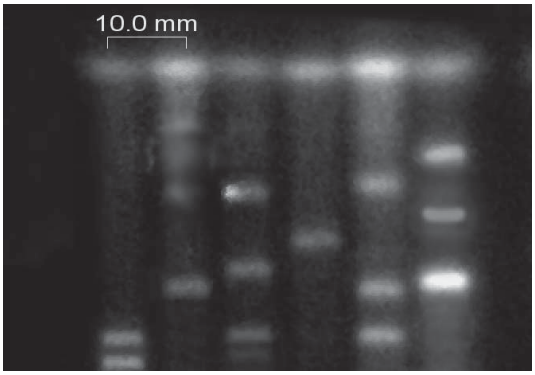


3. Click the desired point on the image where the scale bar is pasted.
=>The Annotation Scalebar dialog box is displayed.



4. Enter a length and select a unit. If you want to give edges to the scale, check the Draw edge lines check box.

5. Click the OK button.
=>The scale bar is displayed on the image.



8. Moving, Changing attributes, or deleting the scale bar

You can move or delete the scale bar already pasted, or can change the attributes of it.

How to move

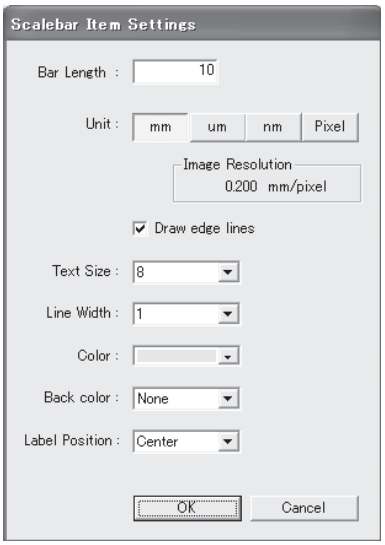
1. Click the pointer tool on the operation panel, then move the mouse cursor onto the scale bar pasted and press the mouse button.
   =>The scale bar is highlighted (enveloped in a red color frame).

2. Move the mouse cursor into the red color frame.
   =>The cursor form changes to the hand tool .

3. Drag the scale bar to a desired position and release the mouse button.

How to change the attributes

1. Click the selection tool on the operation panel, then move the mouse cursor onto an scale pasted and double-click the mouse button.
   =>The Scalebar Item Settings dialog box is displayed.



2. Change any attributes and click the OK button.

How to delete

1. Click the pointer tool on the operation panel, then move the mouse cursor onto an scale bar pasted and press the mouse button.
   =>The scale bar is highlighted (enveloped in a red color frame).

2. Press the Delete key on the keyboard.
   =>The scale bar is deleted.

The Measure mode allows you to quantify the image.
The following three options are available to set the quantifying region.

1.Quant

This option allows you to set the region so that it fits the shape of a sample. Specifying the background region gives a quantitative value from which the background is subtracted.

2.Profile

This option allows you to create the profile region in the migrating direction. For the background, any of Horizontal Line, Polygonal Line, and Spline can be speci fied.

3.Plate

This option allows you to easily set the region of a titer plate. For the background, a blank well can be specified.

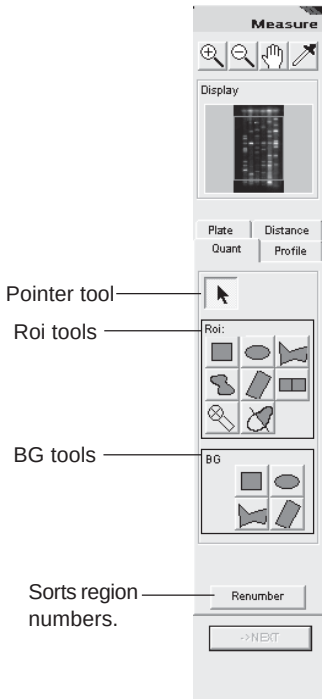
In this mode, you can also measure distances and angles.

1.Distance

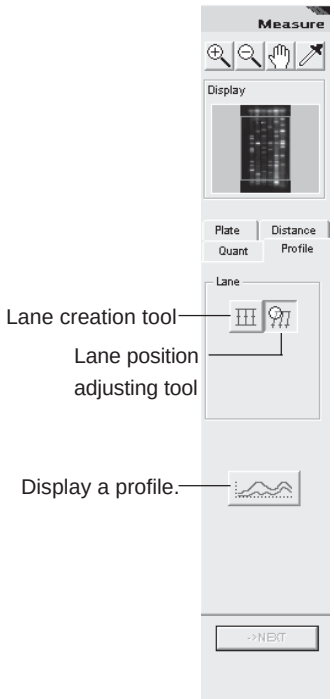
This option allows you to measure the diameter of a circle, the distance between points specified, and angles.

The Measure mode provides this operation panel. Select a desired tab to make the corresponding measurement.

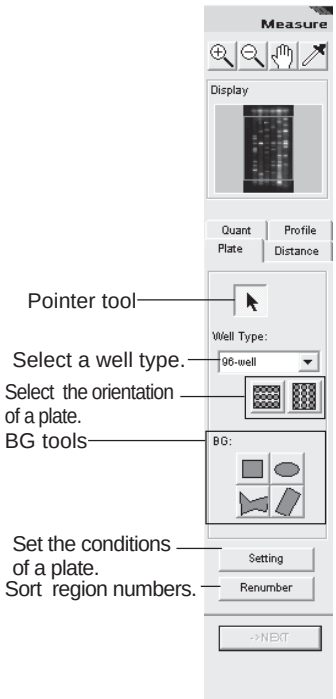
< Quant >



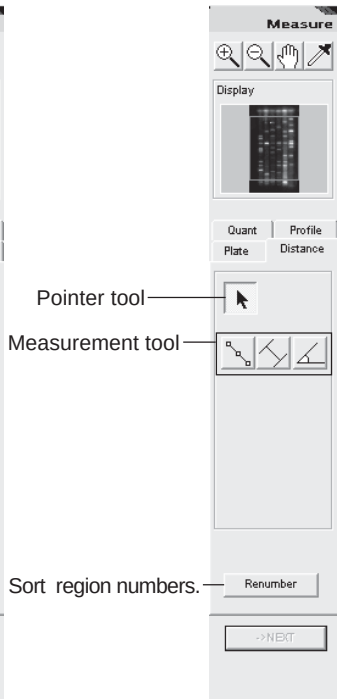
< Profile >



< Plate >



< Distance >



1. Quantitative analysis with a quantifying region

1. Quantitative analysis with a quantifying region..... "Quant"

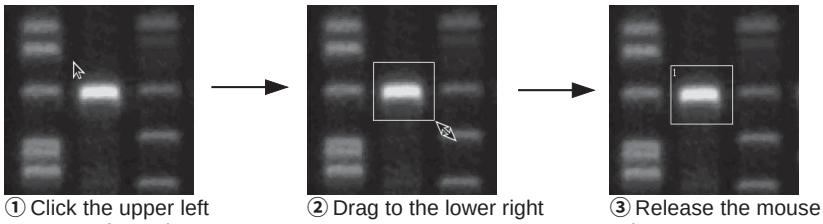
1-1. Creating a quantifying region

The Quant option allows you to set a region having an arbitrary shape.

1. Click the Quant tab on the operation panel.
2. Click any of the Roi tools that meets the shape you want to create.

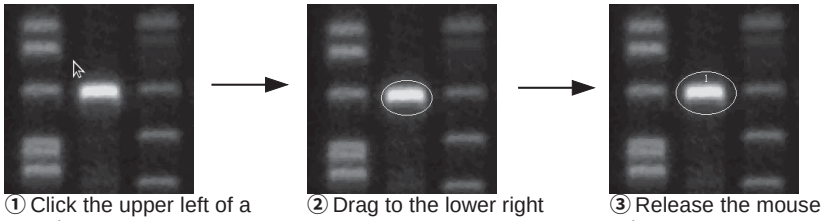
3. Click the desired image window to make it active.
4. Create a region on the image.

Rectangle tool



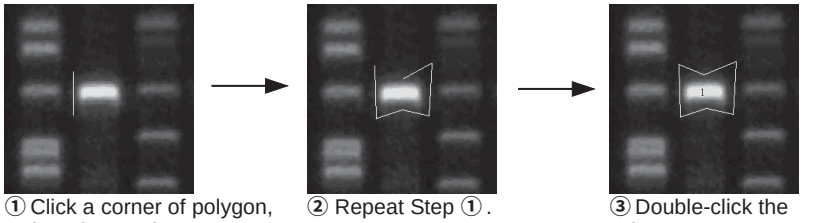
① Click the upper left corner of a region you want to create.
② Drag to the lower right corner.
③ Release the mouse button.

Oval tool



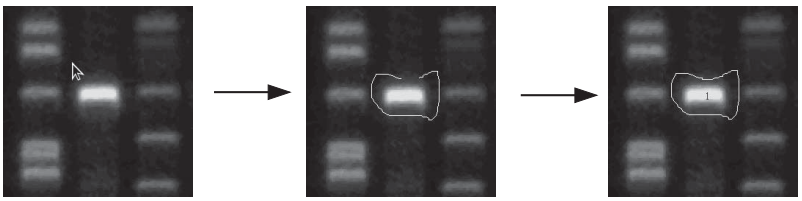
① Click the upper left of a region you want to create.
② Drag to the lower right corner.
③ Release the mouse button.

Polygon tool



① Click a corner of polygon, then drag to the next corner.
② Repeat Step ① .
③ Double-click the last corner.

Freehand tool

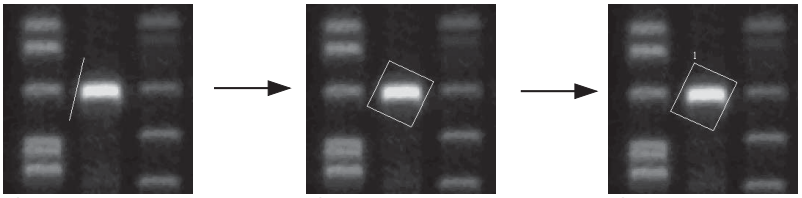


① Click the first point.

② Drag the cursor to draw an desired region.

③ Release the mouse button.

Slanted rectangle tool

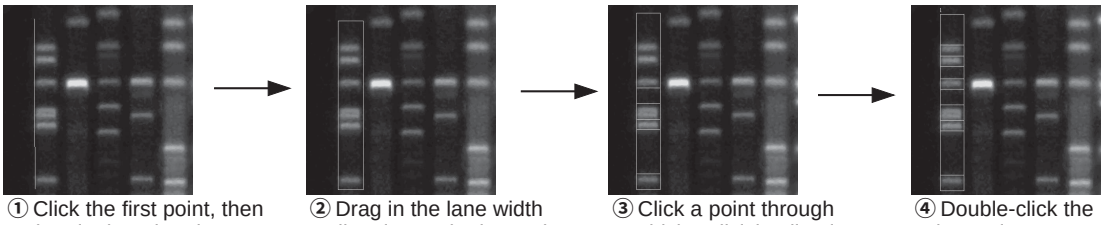


① Click the first point, then drag in the direction of one side and release the mouse button.

② Drag in the direction of the other side.

③ Click the last point.

Ladder tool



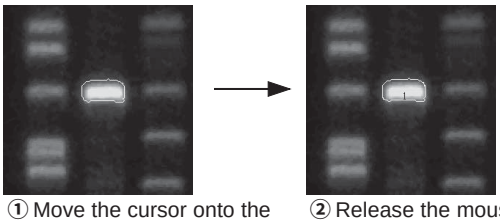
① Click the first point, then drag in the migrating direction and release the mouse button.

② Drag in the lane width direction and release the mouse button.

③ Click a point through which a division line is drawn and repeat it.

④ Double-click the last point.

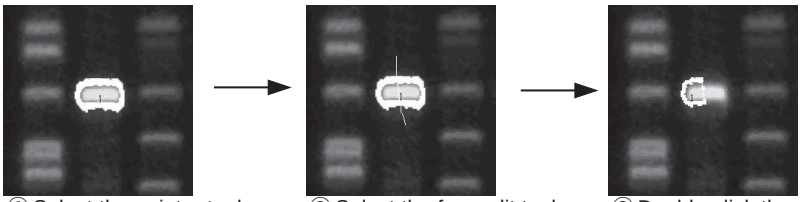
Magic Wands tool



① Move the cursor onto the outline of an region, then click and drag.

② Release the mouse button.

Free edit tool



① Select the pointer tool, then click on an area you want to split.

② Select the free edit tool, then drag the cursor to draw a division line.

③ Double-click the area you want to keep.

Part C

Operation Details

1-2. Modifying, moving, or deleting the quantifying region

The Quant option allows you to modify, move, or delete the quantifying region.

1. Click the Quant tab on the operation panel.

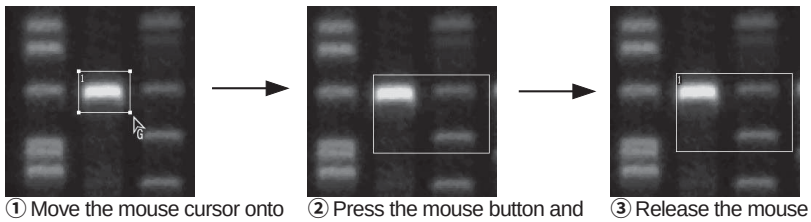
Modifying the quantifying region

2. Click the pointer tool on the operation panel.

3. Click the quantifying region you want to change.
   =>The region chosen is turned red.
   The modifying way depends on a Roi tool with which the region was created.

Magnify or reduce

Rectangle tool

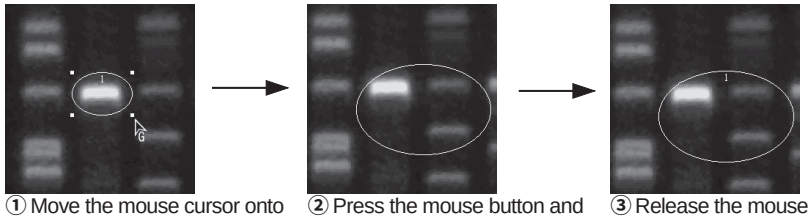


① Move the mouse cursor onto any point you want to change.
→ The cursor form changes to .

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

Oval tool

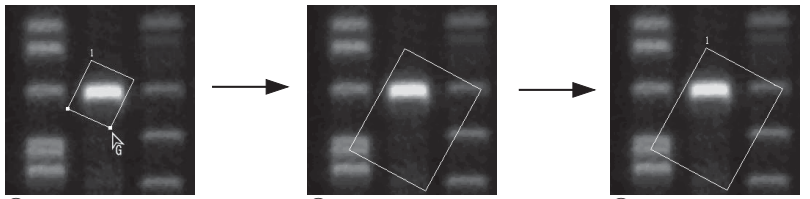


① Move the mouse cursor onto any point you want to change.
→ The cursor form changes to .

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

Slauted rectangle tool

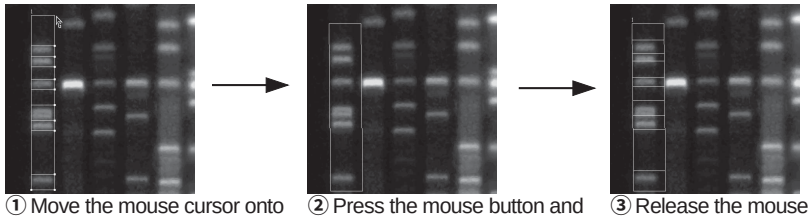


① Move the mouse cursor onto the lower right point to be changed.
→ The cursor form changes to .

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

Ladder tool



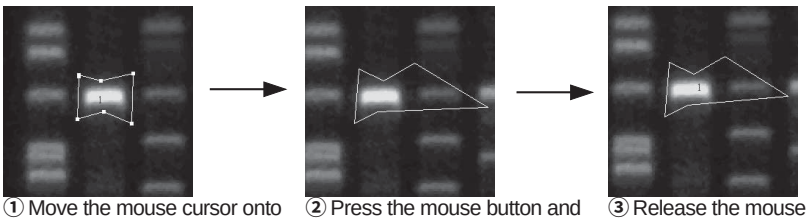
① Move the mouse cursor onto the upper right point to be changed.
→ The cursor form changes to .

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

Shape change

Polygon tool

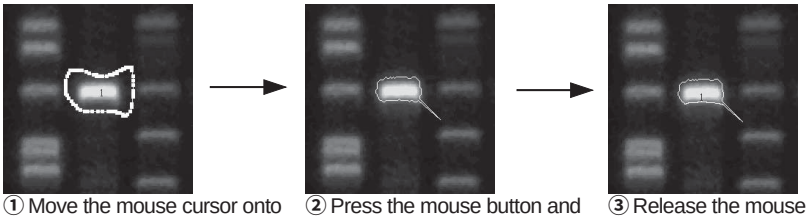


① Move the mouse cursor onto any point you want to change.
→ The cursor form changes to G.

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

Freehand tool

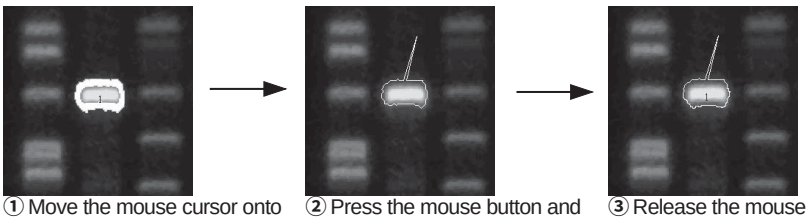


① Move the mouse cursor onto any point you want to change.
→ The cursor form changes to G.

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

Magic Wands tool



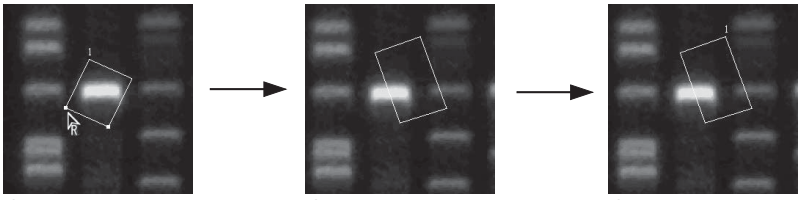
① Move the mouse cursor onto any point you want to change.
→ The cursor form changes to G.

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

Rotation

Slanted rectangle tool

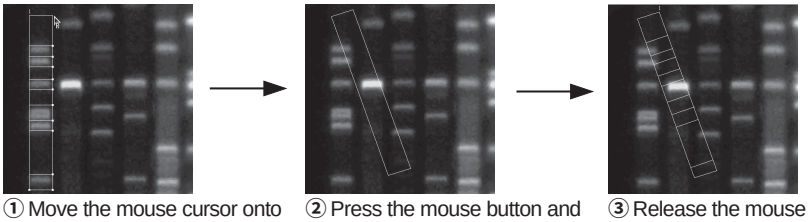


① Move the mouse cursor onto the lower left point to be changed.
→ The cursor form changes to R.

② Press the mouse button and drag rotationally.

③ Release the mouse button.

Ladder tool



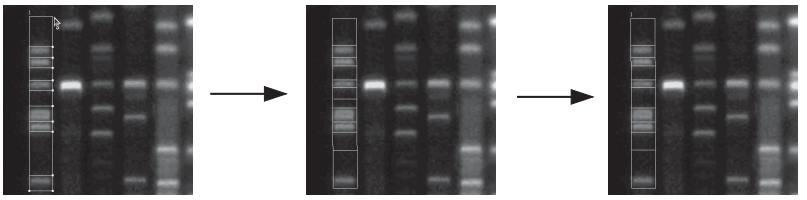
① Move the mouse cursor onto the lower left point to be changed.
→ The cursor form changes to R.

② Press the mouse button and drag rotationally.

③ Release the mouse button.

Modify Division lines of a ladder region

How to move division lines

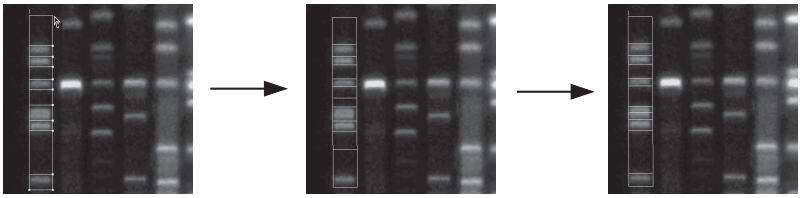


① Move the mouse cursor onto any division line you want to change.
→ The cursor form changes to S.

② Press the mouse button and drag the line in parallel.

③ Release the mouse button.

How to add division lines

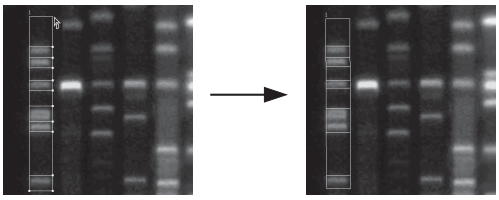


① Hold the Ctrl key down and move the cursor onto a desired point of the region's outline.
→ The cursor form changes to C.

② Press the mouse button and drag the cursor with the Ctrl key held down to draw the horizontal line.

③ Release the mouse button.

How to delete division lines



① Hold the Shift key down and move the cursor onto a division line you want to delete.
→ The cursor form changes to D.

② Press the mouse button with the Shift key held down.

Moving the quantifying region

1. Click the Quant tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click the region you want to move.
   =>The region chosen is turned red.
4. Move the mouse cursor in the region, drag to the desired position and release the mouse button.

Deleting the quantifying region

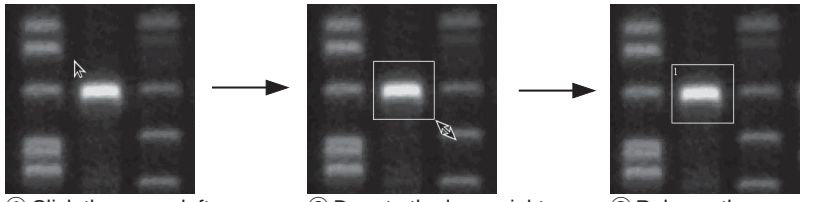
1. Click the Quant tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click the region you want to delete.
   =>The region chosen is turned red.
4. Press the Delete key on the keyboard.
   =>The region is deleted.

1-3. Creating a background region

The Quant option allows you to set a background region on the image.

1. Click the Quant tab on the operation panel.
2. Select a background shape you want to create from the BG tools on the operation panel.
3. Click the desired image window to make it active.
4. Create a region on the image.
   =>The resulting background region is displayed in purple.

BG rectangle tool

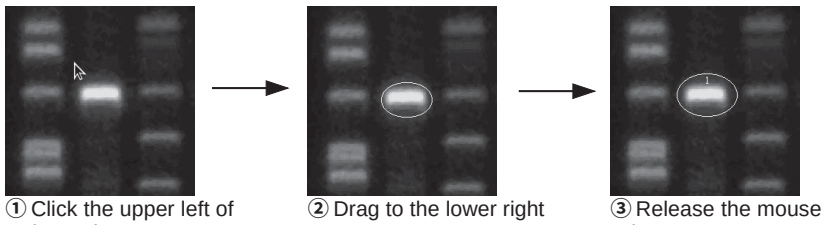


① Click the upper left corner of the region you want to create.

② Drag to the lower right corner.

③ Release the mouse button.

BG oval tool

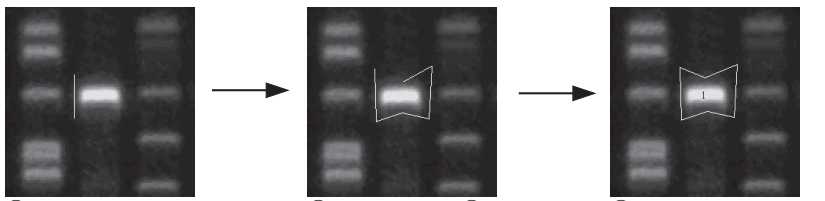


① Click the upper left of the region you want to create.

② Drag to the lower right corner.

③ Release the mouse button.

BG polygon tool

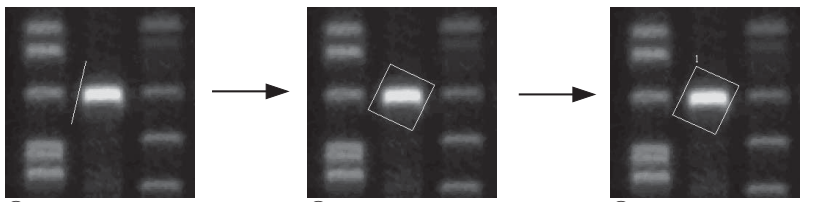


① Click a corner of polygon, then drag to the next corner.

② Repeat Step ①.

③ Double-click the last corner.

BG slanted rectangle tool



① Click the first point, then drag in the direction of one side and release the mouse button.

② Drag in the direction of the other side.

③ Click the last point.

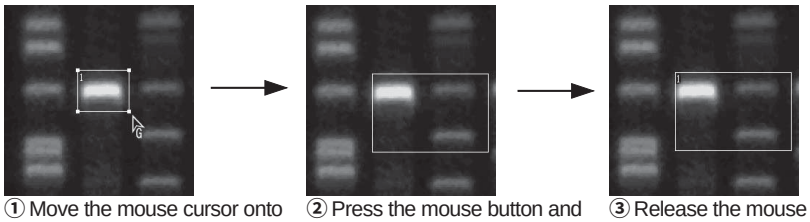
1-4. Modifying, moving, or deleting the background region

The Quant option allows you to modify, move, or delete a background region.

1. Click the Quant tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click the background region you want to change.
   =>The region chosen is turned red.
   The modifying way depends on a BG tool with which the region was created.

Magnify or reduce

BG rectangle tool

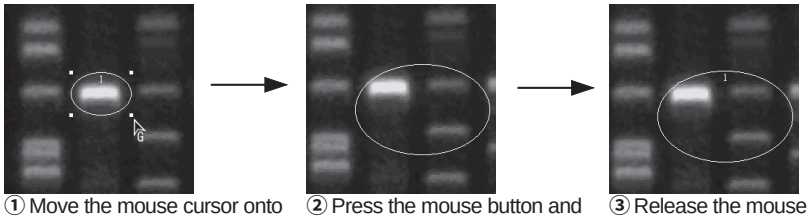


① Move the mouse cursor onto any point you want to change.
→ The cursor form changes to G.

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

BG oval tool

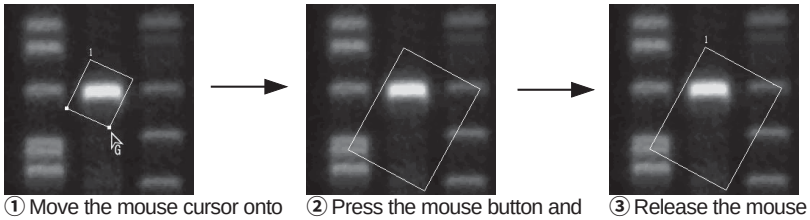


① Move the mouse cursor onto any point you want to change.
→ The cursor form changes to G.

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

BG slanted rectangle tool



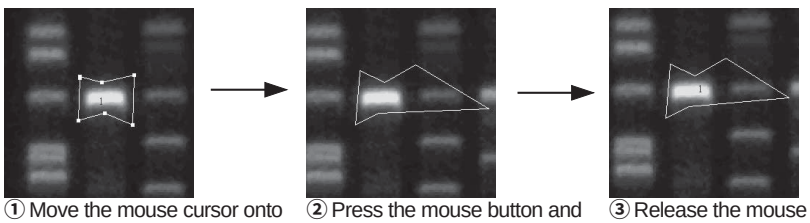
① Move the mouse cursor onto the lower right point to be changed.
→ The cursor form changes to G.

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

Shape change

BG polygon tool

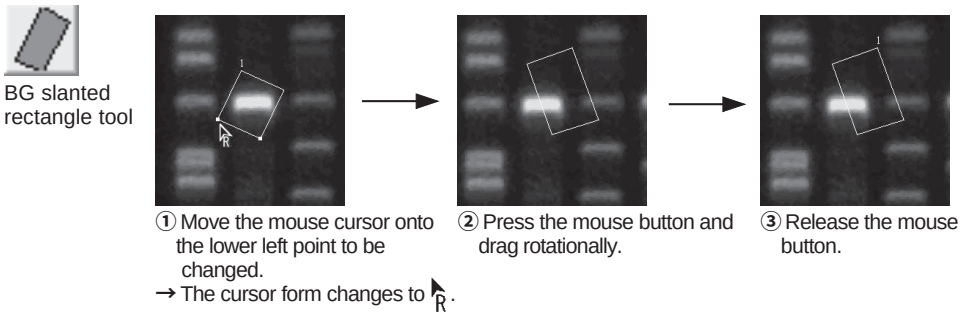


① Move the mouse cursor onto any point you want to change.
→ The cursor form changes to G.

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

Rotation



Moving the background region

1. Click the Quant tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click a region you want to move.
   =>The region chosen is turned red.
4. Click the region, drag to a desired position, and release the mouse button.

Deleting the background region

1. Click the Quant tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click a region you want to delete.
   =>The region chosen is turned red.
4. Press the Delete key on the keyboard.
   =>The background region is deleted.

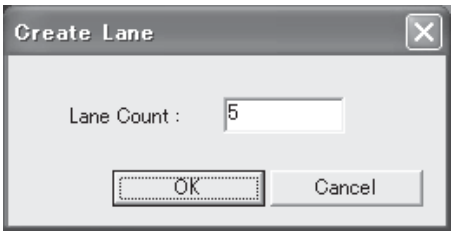
2. Quantitative analysis with a profile

2. Quantitative analysis with a profile..... "Profile"

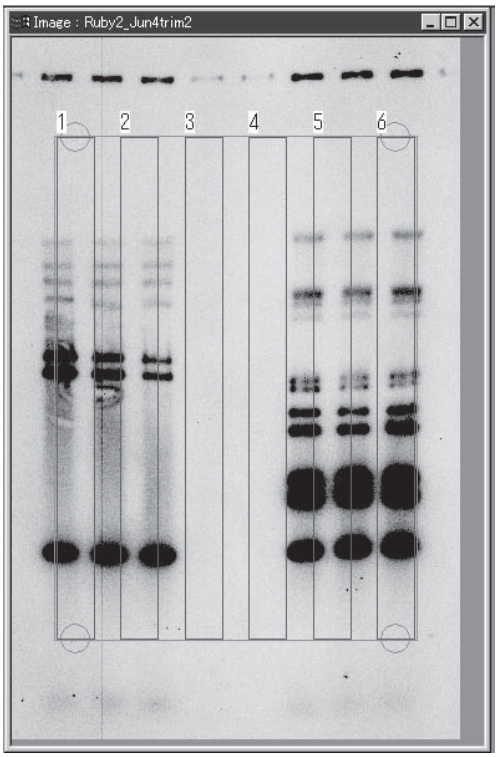
2-1. Creating a profile region

The Profile option allows you to set a profile region in the migrating direction.

1. Click the Profile tab on the operation panel.
2. Click the lane tool on the operation panel.
3. Input the number of lanes within an image to be analyzed in the Lane Count box.



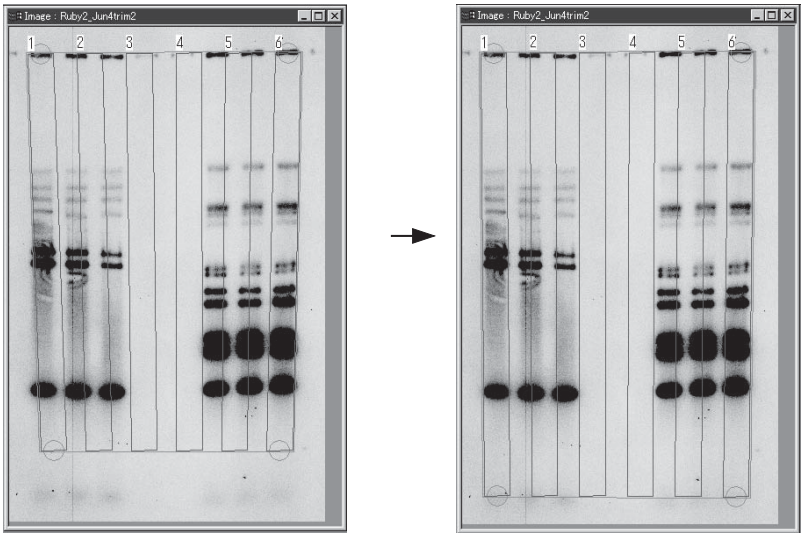
4. Click the OK button.
=>Lanes of an arbitrary size is displayed on the image.



Note :At this time, the lane position adjusting tool is automatically chosen in the Lane field.

5 Adjust the resulting profile region to the image.

1.Drag the handles (circles) at the four corners of the lane set respectively to the corners of the image pattern.

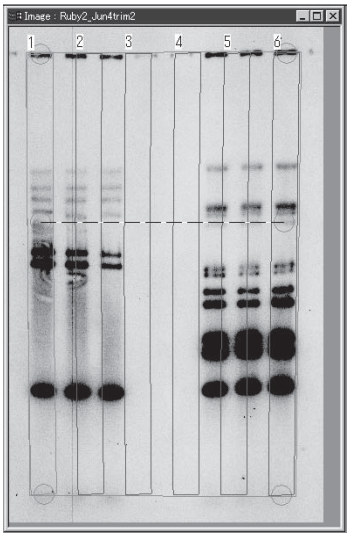


When the image is curved

(How to modify all the lanes)

(1) Move the mouse cursor into the lane at the left or right far end (Lane 1 or Lane 6 of the accompanying sample figure) and double-click the mouse button.

=> The curve handles (circles) appear in the lanes at both ends.



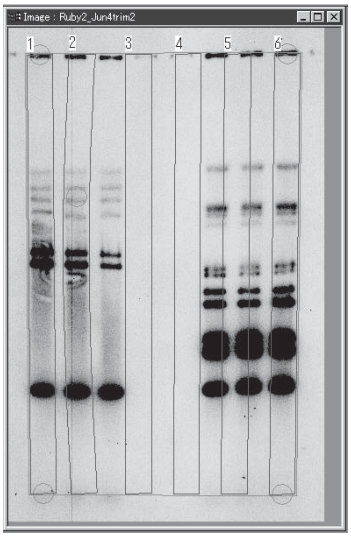
(2) Fit the lane set to the curve of the real image by dragging each of the curve handles in the vertical and horizontal directions.

Note :To delete the curve handles, press the Delete key on the keyboard with the handles chosen (red circles).

(How to modify the specific lane)

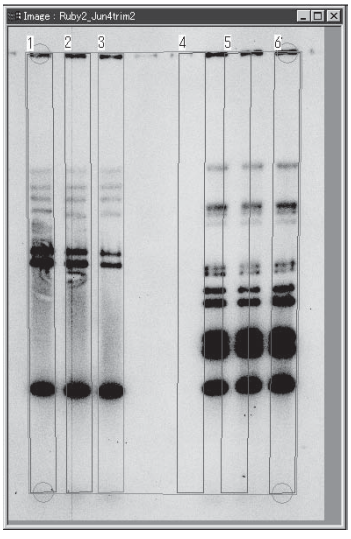
(1) Move the mouse cursor into the lane you want to curve and double-click the mouse button.
=>The curve handle (circle) is displayed in the lane chosen.

(2) Fit the lane to the curve of the real image by dragging the curve handle in the vertical and horizontal directions.



Note :This software may not allow you to curve each of the lanes at both ends independently.

2.Adjust the distance between lanes
Move the mouse cursor into the lane you want to move and drag it.
=>Only the lane chosen moves.



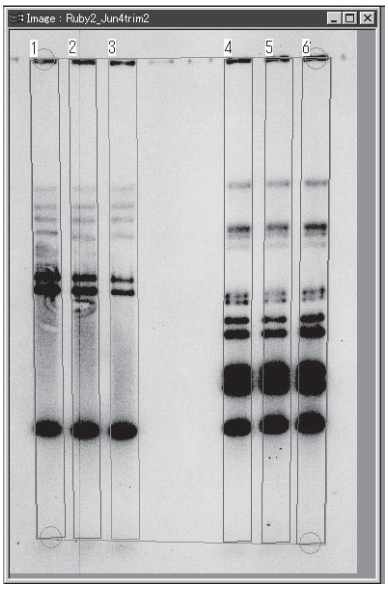
Note :This method cannot apply to the lanes at both ends. Move them by dragging the handles (circles) of the lane set at the four corners.

3.Adjust the lane width.

(1) Click the lane.
=> The lane chosen is tuned red.

(2) Move the mouse cursor onto the right or left line of the lane.
=>The cursor form changes to ⟷.

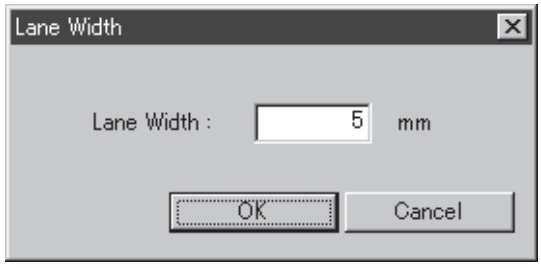
(3) Drag the mouse cursor to adjust the lane width.



Note : This method applies to all the lanes displayed.

Tips

With the cursor form being ⟷, double-clicking the mouse button allows you to input a numerical value for the lane width. This function is useful when the migrating width is known.

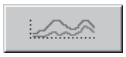


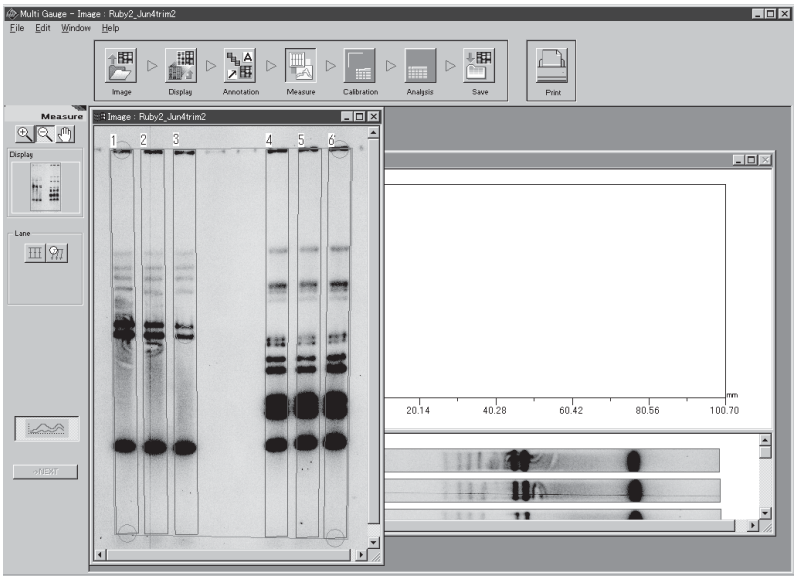
Note : To recreate the profile region, click the 田 button to start over.

2-2. Displaying a profile

The Profile option allows you to display the profile in the lanes already specified.

1. Click the Profile tab on the operation panel.

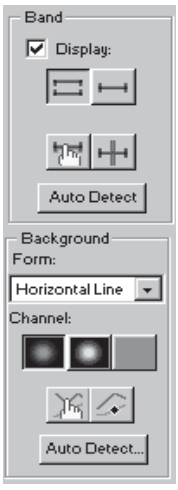
2. Click the  button on the operation panel.
=>The Profile window is displayed.



3. Click the Profile window to make it active.
=>The operation panel changes as follows.

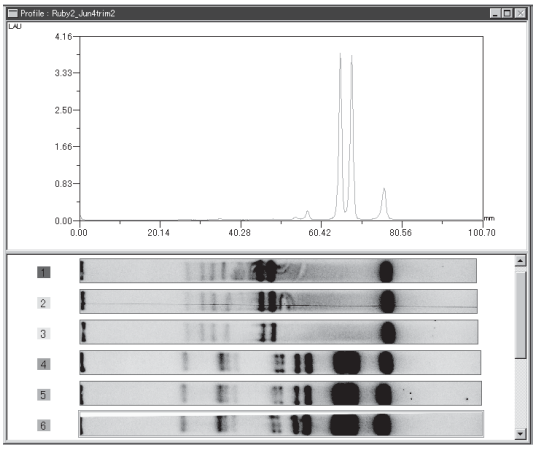
(Single image)

(Individual or overlaid images)

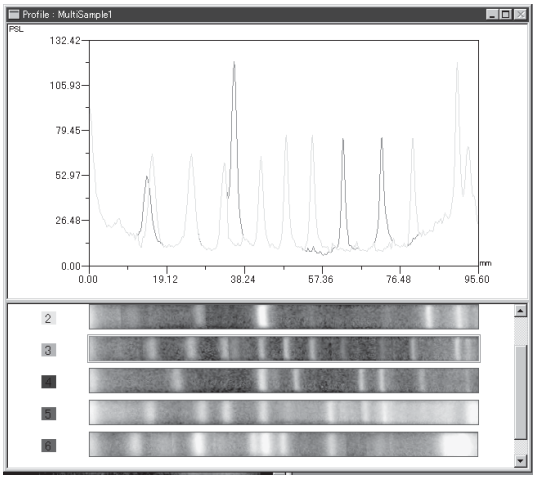


4 Click any of the lanes displayed on the lower pare of the Profile window.
=>The profile of the lane chosen is displayed on the upper pane.

(Single image)

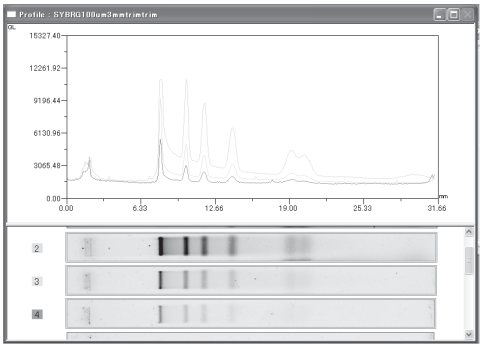


(Individual or overlaid images)



Tips

Holding the Shift or Ctr key down and clicking allows you to select multiple lanes and to display the profiles simultaneously.
For individual or overlaid images, the profiles of each channel (images used for composition) are overlaid and displayed in different colors.



Part C Operation Details

2-3. Setting bands

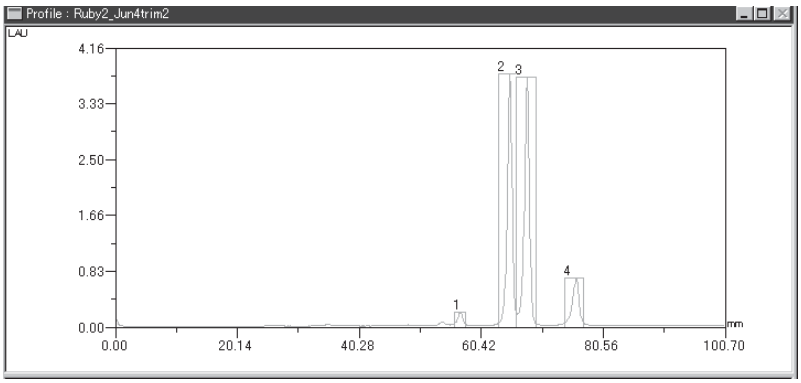
The Profile option allows you to set bands for quantification.
Two setting methods are available: automatic recognition and manual setting.

(Automatic recognition)

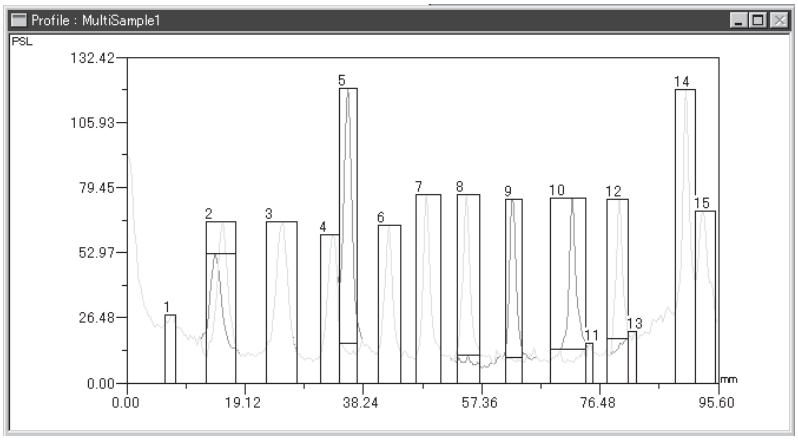
1. Click the Profile tab on the operation panel.

2. Click the Auto Detect button in the Band field of the operation panel.
The bands of all image lanes displayed in the lower part of the window are recognized automatically and displayed on the profiles.

(Single image)



(Individual or overlaid images)

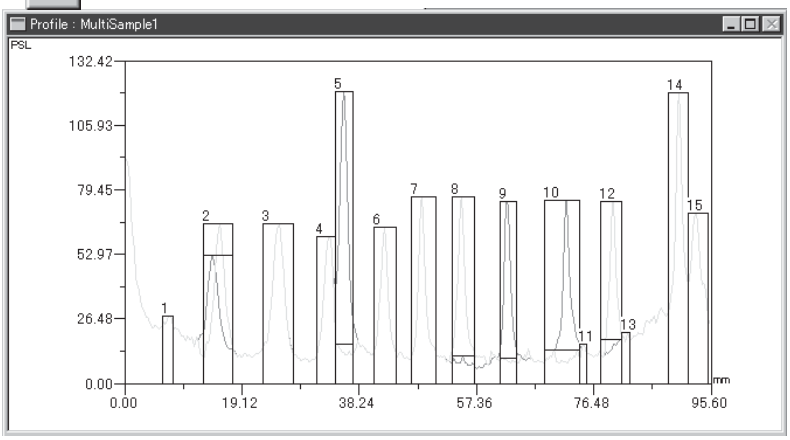


Note : The automatic recognition takes place for all the lanes.

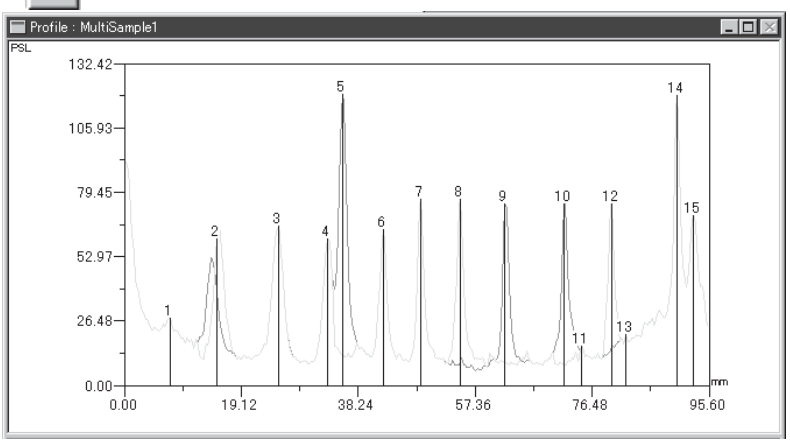
Tips

The view of bands recognized can toggle between the regional and positional types. Check the Display option in the Band field of the operation panel, then click either of the corresponding two buttons.

…Regional type (displays band widths detected.)



…Positional type (displays peaks detected.)



Deselecting the Display option, the band view is not displayed. This function is useful for re-checking the profile shape.

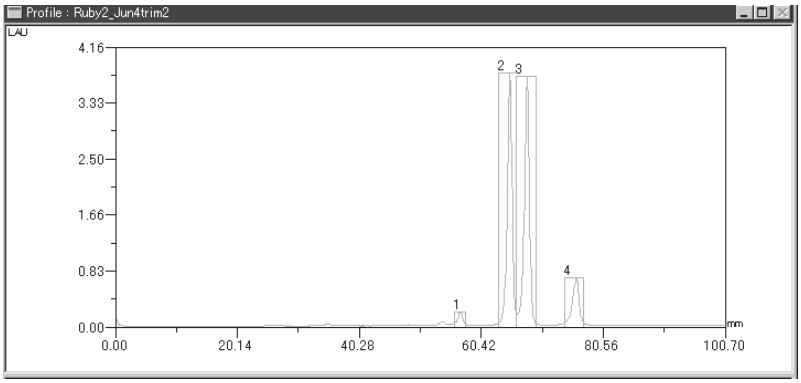
(Manual setting)

1. Check the Display option in the Band field of the operation panel.
2. Select either of the view types and .

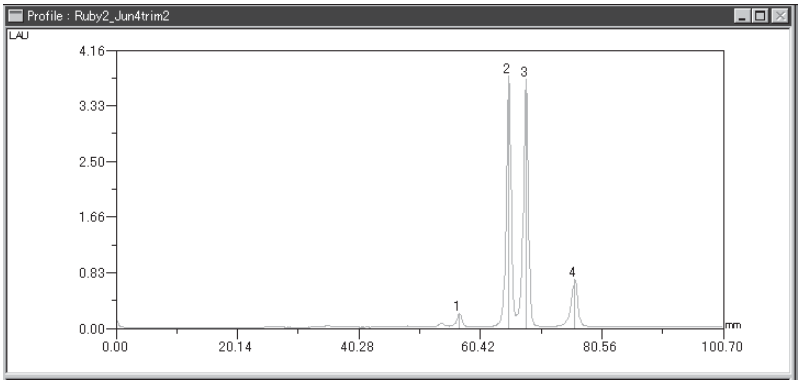
   Note : Even after the setup is complete, clicking on either button can change the band view.

3. Click button in the Band field of the operation panel.
4. Click the lane of a profile for which bands are specified to display the profile.
5. Move the mouse cursor close to the band peak on the profile graph.
6. Set a band.

   Regional type : Start dragging the mouse cursor from the left end of the band you want to set and release the mouse button at the right end.



   Positional type : Click the mouse button near the band peak.



2-4. Modifying or deleting the band

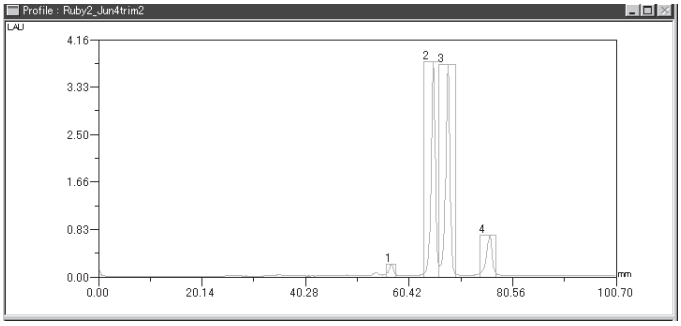
The Profile option allows you to modify or delete the band already specified.

Modifying a band

(When the band view is regional type)

You can change the band width.

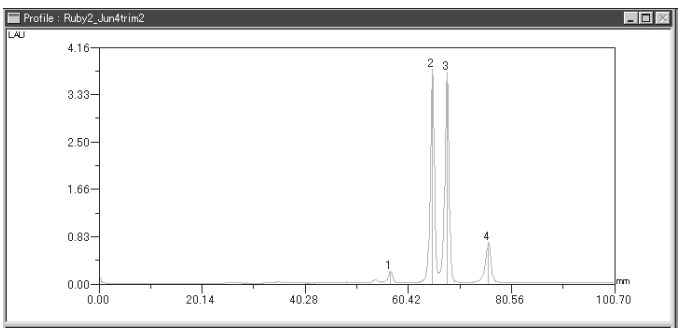
1. Click the Profile tab on the operation panel.
2. Click the button in the Band field of the operation panel.
3. Place the mouse cursor onto the left most or right most line of the band.
   =>The cursor form changes to ↔.
4. Drag the mouse cursor to change the band width.



(When the band view is positional type)

You can change position of the peak position indication line.

1. Click the Profile tab on the operation panel.
2. Click the button in the Band field of the operation panel.
3. Place the mouse cursor onto the peak position indication line already specified.
   =>The cursor form changes to the character B.
4. Drag the mouse cursor to change the position of the peak position indication line.



Deleting the band

1. Click the Profile tab on the operation panel.
2. Click the button in the Band field of the operation panel.
3. Click anyplace in the band or the vicinity of the peak position indication line.
   =>The band or line chosen is turned red.
4. Press the Delete key on the keyboard.

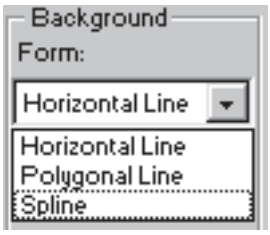
2-5. Setting a background

The Profile option allows you to set the background of the profile.
Two setting methods are available: automatic recognition and manual setting.
For a overlaid image, you can set backgrounds on individual images.

(Automatic recognition)

1. Click the Profile tab on the operation panel.

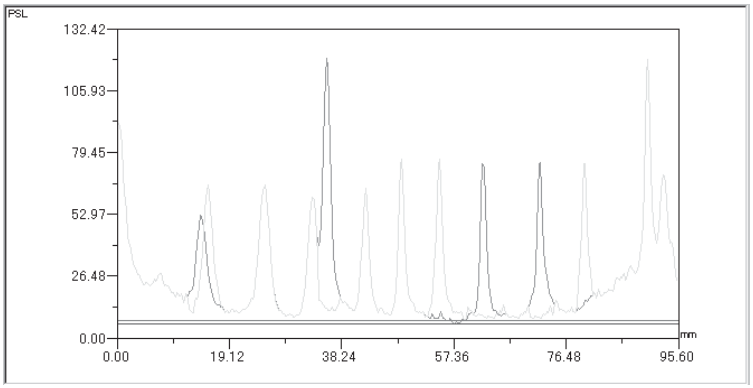
2. Select a background type from the Form pull-down menu in the Background field of the operation panel.



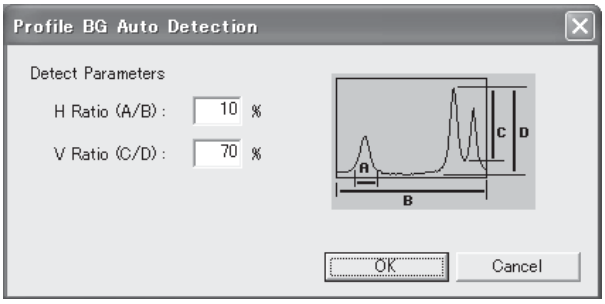
Horizontal Line ..... Horizontal Line
Polygonal Line ..... Polygonal Line (broken line)
Spline ..... Spline (curved line)

3. Click the Auto Detect button in the Background field of the operation panel.

=>If you select Horizontal Line, the backgrounds of all image lanes are recoguized automatically and displayed on the profile graph.



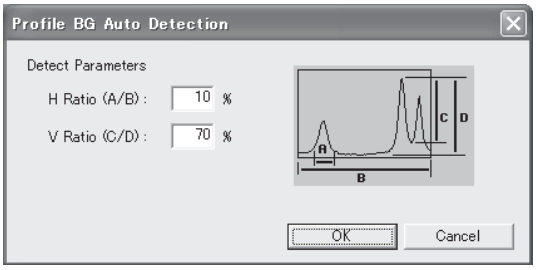
=>If you select either of Polygonal Line and Spline, the following dialog box is displayed.



4 If you select either of Polygonal Line and Spline, input values in percent for the automatic recognition parameters H.Ratio (A/B) and V.Ratio (C/D).

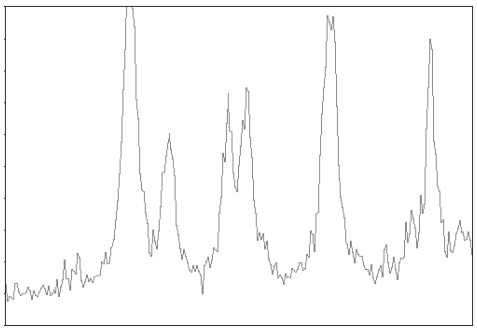
Tips

About the H.Ratio (A/B) and V.Ratio (C/D) parameters



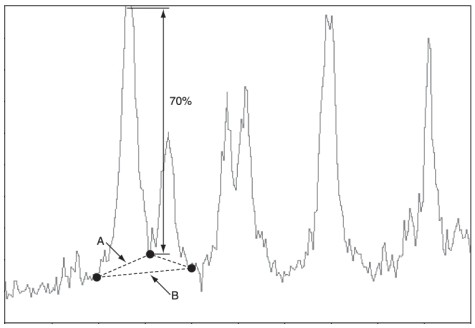
The H.Ratio (A/B) parameter specifies the extent to which a valley between peaks is detected. The smaller the value, the shallower the valley able to be detected, which allows the background to be specified with respect to smaller peaks. This parameter is specified as the ratio (percent) of the distance between valleys to the full length of a profile.

Ex.: Line A is drawn if the ratio of the distance between valleys to the full length of a profile is 10 percent or less, while Line B is drawn if larger.

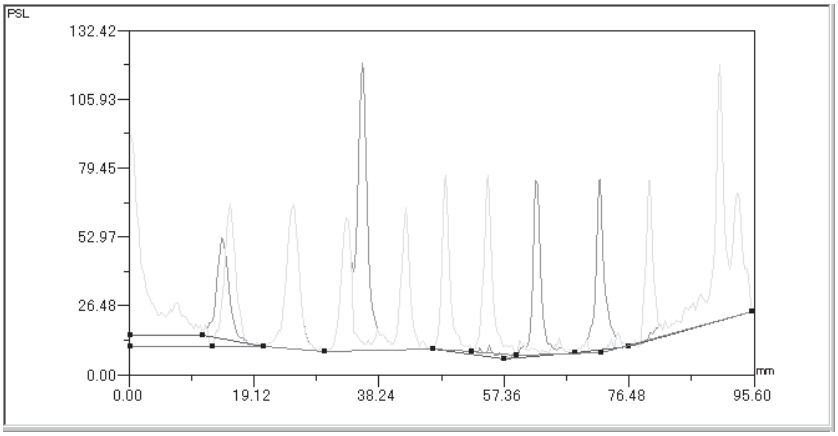


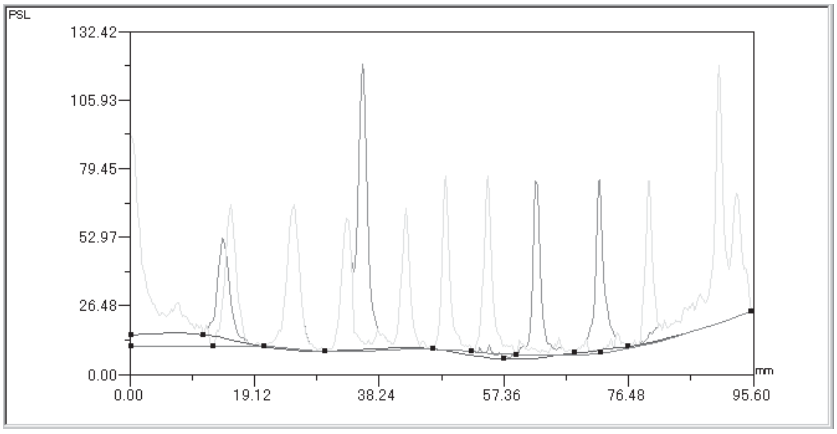
The V.Ratio (C/D) parameter specifies the extent to which valleys are detected with respect to the amplitude of peaks. The smaller the value, the lower the peaks, which allows valleys between them to be detected. This parameter is specified as the ratio of a profile height to the maximum amplitude (vertical) of a profile created.

Ex.: Line A is drawn if the ratio of a profile height to the maximum amplitude of a profile is 70 percent or less, while Line B is drawn if larger.



5 Click the OK button.
=>The background of all image lanes are recoguized automatically and displayed on the profile graph.

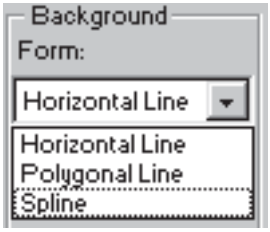




(Manual setting)

1. Click the Profile tab on the operation panel.

2. Select a background type from the Form pull-down menu in the Background field of the operation panel.



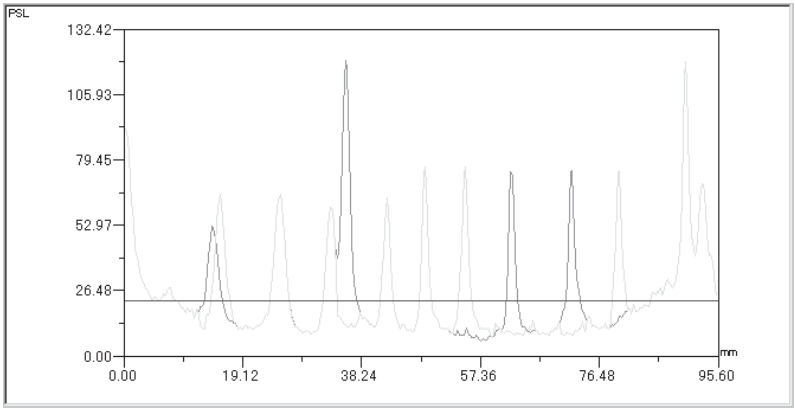
Horizontal Line ..... Horizontal Line
Polygonal Line ..... Polygonal Line (broken line)
Spline ..... Spline (curved line)

3. For overlaid images, click the icon of the channel for which the background is specified. (Click the color of the target channel icon.)
For a single image, go to Step 4 .

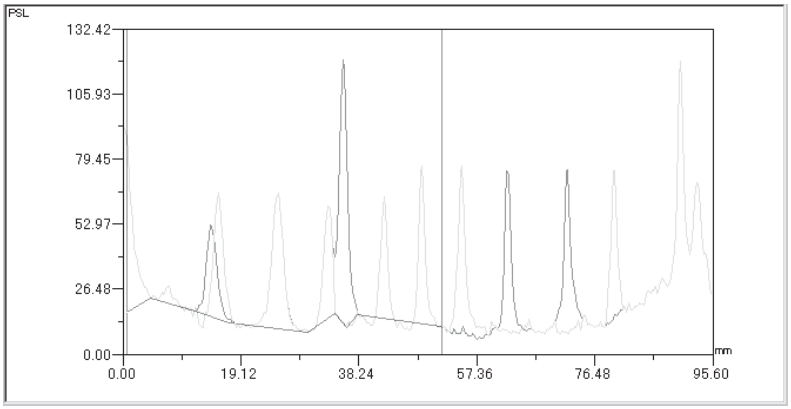
4. Click the background creation tool in the Background field of the operation panel.

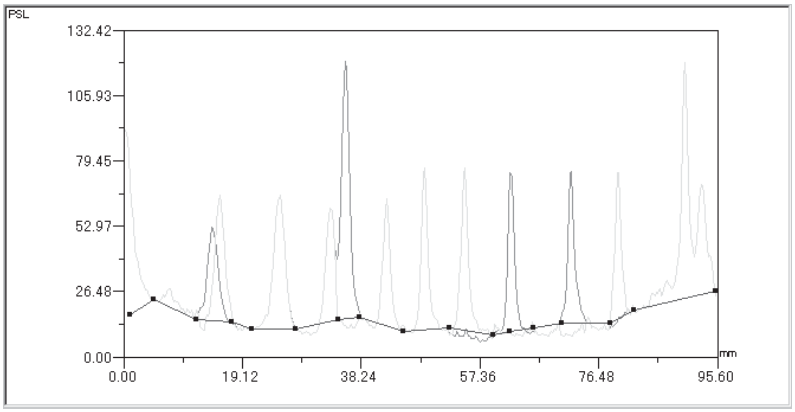
5. Create the background by clicking on the profile graph.
The creation method varies depending on the background type selected in the Form box.

Horizontal Line ..... Horizontal Line: Click anywhere on the profile graph to display a horizontal background line, then drag it to set vertical position.



Polygonal Line .....First, click a desired point on the left end of the profile graph. The start point is displayed. Next, click on points one after another toward the right end. Finally, double-click a desired point on the right end of the profile graph.





Spline ..... In the same manner as the Polygonal Line, set the background curve.

2-6. Modifying or deleting the background

The Profile option allows you to modify or delete the background already specified.

How to Modify

1. Click the Profile tab on the operation panel.
2. Click the button in the Background field of the operation panel.
3. Place the mouse cursor on the background line (for Horizontal Line) or the point of the background curve (for Polygonal Line/Spline).
   =>The cursor form changes to BG.
4. Drag the mouse cursor to change the background.
   Horizontal Line .....Place the mouse cursor onto the horizontal line, after the mouse cursor form changes to BG, drag it to adjust the vertical position.

   Polygonal Line/Spline.....Place the mouse cursor onto any point of the polygonal line/spline, after the cursor form changes to BG, drag it to adjust the point position.

How to delete

1. Click the Profile tab on the operation panel.
2. Click the button in the Background field of the operation panel.
3. Move the mouse cursor to the vicinity of the background you want to erase, and after the cursor form changes to GB, click the mouse button.
   =>The background is highlighted in red.
4. Press the Delete key on the keyboard.

3. Quantifying a titer plate

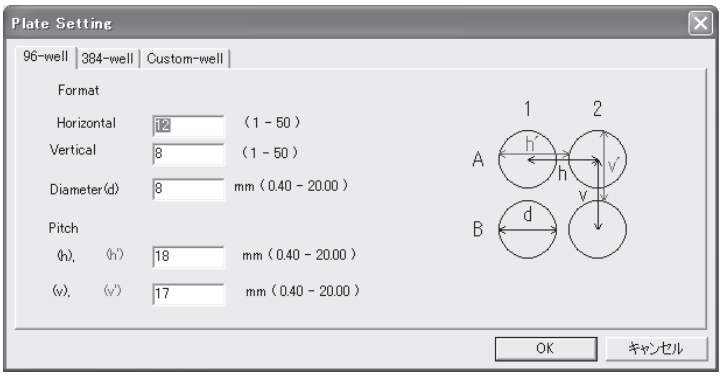
3. Quantifying a titer plate·····"Plate"

3-1. Setting the parameters of a template

The Plate option allows you to set the shape of a template you want to create.

1. Click the Plate tab on the operation panel.

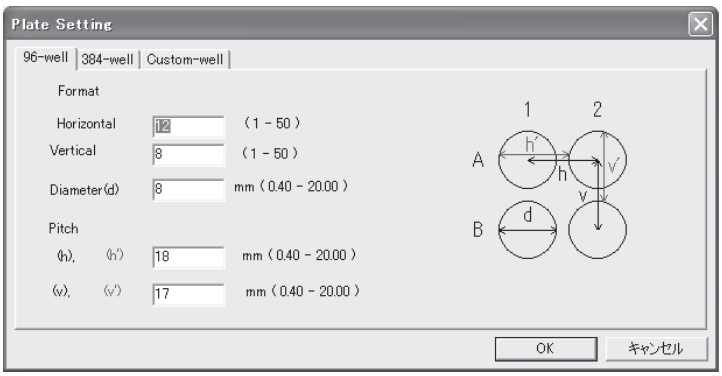
2. Click the Setting button on the operation panel.
   =>The Plate Setting dialog box is displayed.



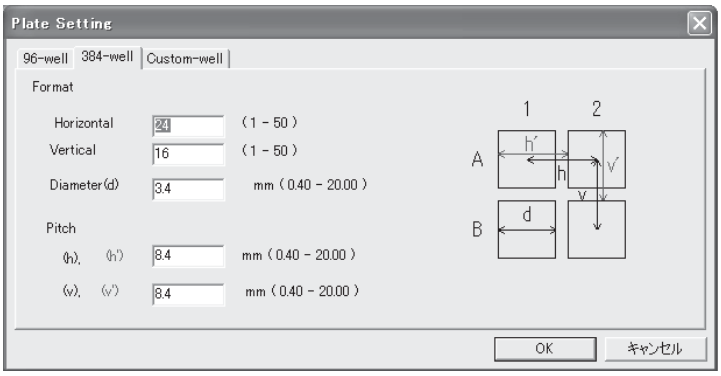
3. Click the tab corresponding to the shape of the template you want to create.
   96Well····· Uses a 96-holes titer plate.
   384Well····· Uses a 384-holes titer plate.
   Custom-Well····· Uses a custom-made plate.

4. Set the parameters for the plate chosen.

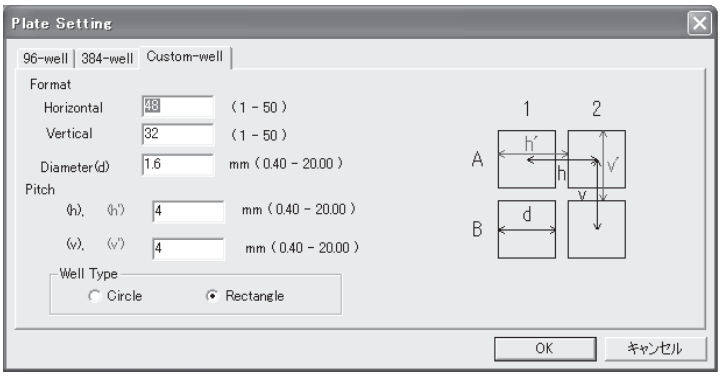
(96Well)



(384Well)



(Custom-Well)



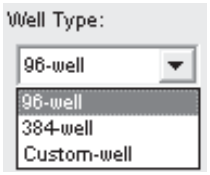
5 Click the OK button.

3-2. Creating a template

The Plate option allows you to create the template on the image.

1. Click the Plate tab on the operation panel.

2. Select a well type.



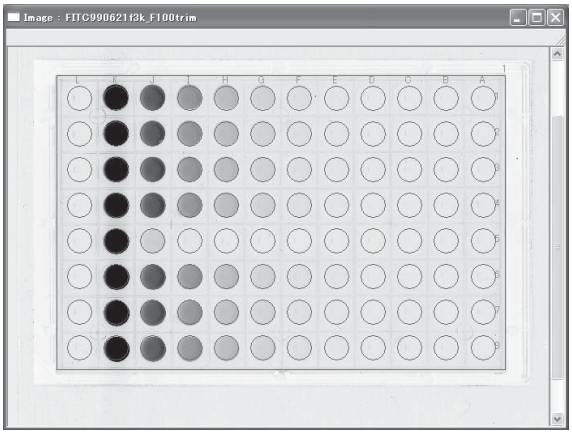
3. Select a plate orientation.

   The button·····Horizontal plate

   The button·····Vertical plate

4. Click the plate center on an image.
   =>The template is displayed in red.

5. Drag the template to adjust the position, then release the mouse button.

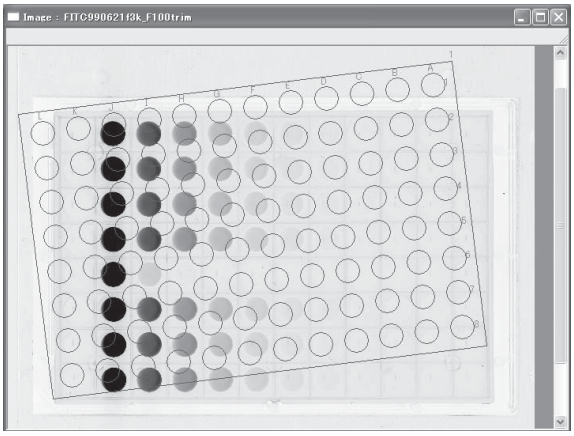


3-3. Modifying or deleting the template

The Plate option allows you to adjust position by rotation, or change the attributes, or move and delete the template already specified.

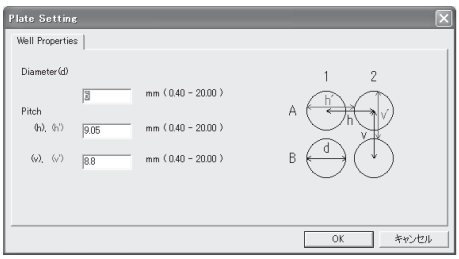
How to adjust position

1. Click the Plate tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click the template on the image.
   =>The template is turned red.
4. Place the mouse cursor onto the lower right point to be changed.
   =>The mouse cursor form changes to .
5. Press the mouse button at the point, drag rotationally, and release the mouse button.



How to change attribute

1. Click the Plate tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Double-click the template on the image.
   =>The Plate Setting dialog box is displayed.



4. Change any attributes, then click the OK button.

3. Quantifying a titer plate

How to move

1. Click the Plate tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click the template on the image.
   =>The template is turned red.
4. Click the template, drag to a move position, and release the mouse button.

How to delete

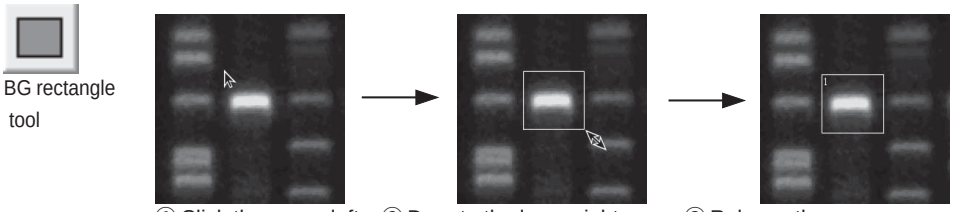
1. Click the Plate tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click thetemplate on the image.
   =>The template is turned red.
4. Press the Delete key on the keyboard.

3-4. Setting a background

The Plate option allows you to set a background on the image and on the well of the template.

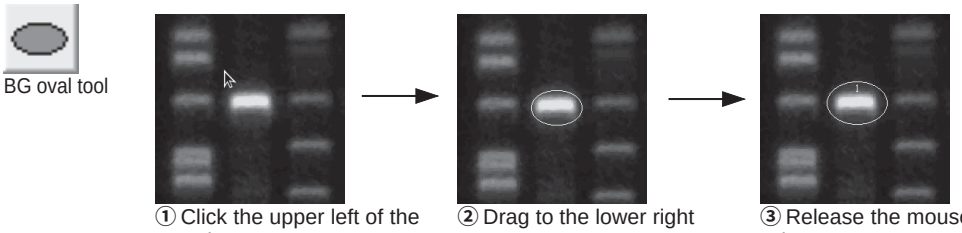
Setting a background on the image

1. Click the Quant tab on the operation panel.
2. Select the background shape you want to create from the BG tools on the operation panel.
3. Click the image window to make it active.
4. Create the backgound region on the image.
   =>The resulting background region is displayed in purple.



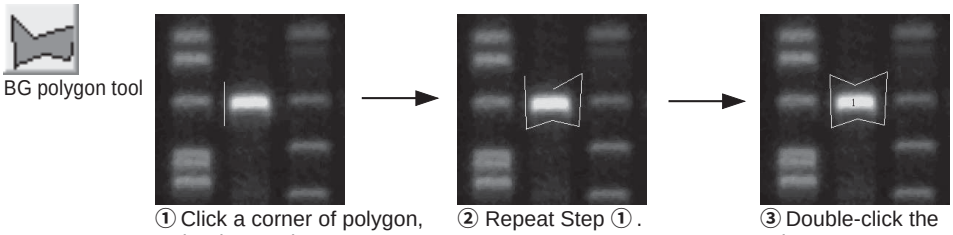
BG rectangle tool

① Click the upper left corner of the region you want to create.
② Drag to the lower right corner.
③ Release the mouse button.



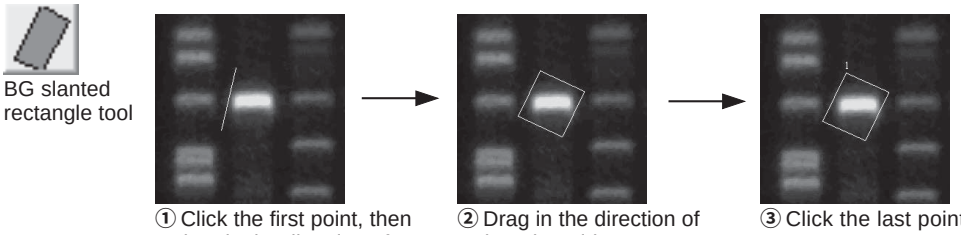
BG oval tool

① Click the upper left of the region you want to create.
② Drag to the lower right corner.
③ Release the mouse button.



BG polygon tool

① Click a corner of polygon, the drag to the next corner.
② Repeat Step ① .
③ Double-click the last corner



BG slanted rectangle tool

① Click the first point, then drag in the direction of one side and release the mouse button.
② Drag in the direction of the other side.
③ Click the last point.

Setting a well background

1. Click the Plate tab on the operation panel.

2. Move the mouse cursor onto the well you want to set as the background, then press the right mouse button.
   =>The Attribute menu is displayed for the well.

3. Select the BG command from the Attribute menu.
   =>The well is turned purple and set as the background.

3-5. Modifying, moving, or deleting the background

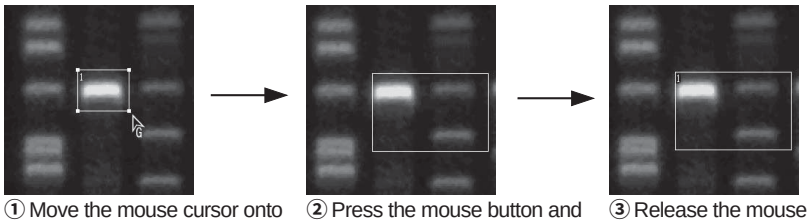
You can magnify/reduce, modify by rotation move, or delete the template already specified.

< Background set on the image >

1. Click the Quant tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click the background region you want to change.
   =>The region chosen is turned red.
   The modifying way depends on the BG tool with which the region was created.

Magnify or reduce

BG rectangle tool

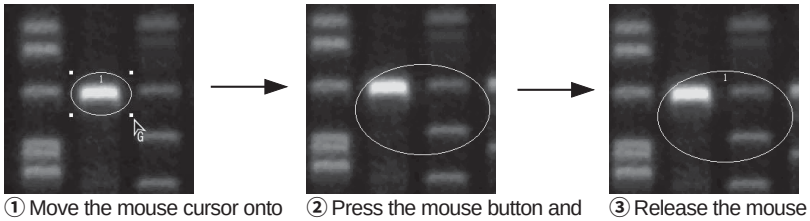


① Move the mouse cursor onto any point you want to change.
→ The cursor form changes to G.

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

BG oval tool

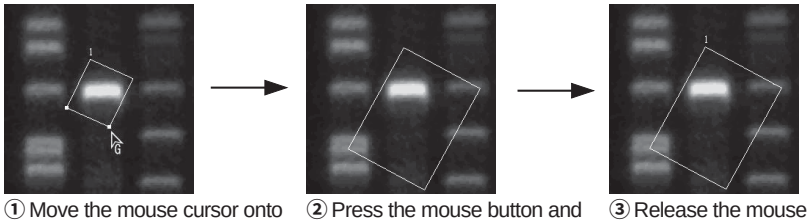


① Move the mouse cursor onto any point you want to change.
→ The cursor form changes to G.

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

BG slanted rectangle tool



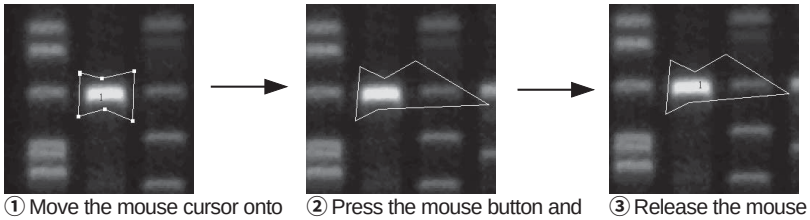
① Move the mouse cursor onto the lower right point to be changed.
→ The cursor form changes to G.

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

Shape change

BG polygon tool



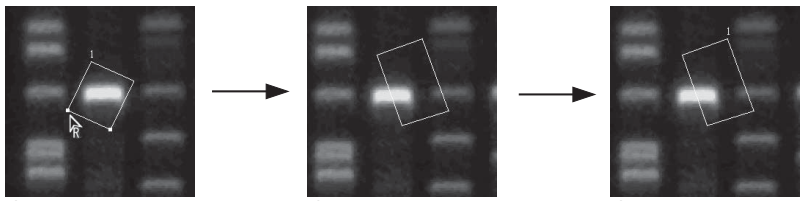
① Move the mouse cursor onto any point you want to change.
→ The cursor form changes to G.

② Press the mouse button and drag to a desired point.

③ Release the mouse button.

Rotation

BG slanted rectangle tool



① Move the mouse cursor onto the lower left point to be changed.
→ The cursor form changes to R.

② Press the mouse button and drag rotationally.

③ Release the mouse button.

How to move

1. Click the Quant tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click a region you want to move.
   =>The region chosen is turned red.
4. Click the region, drag to a desired position, and release the mouse button.

How to delete

1. Click the Quant tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click the region you want to delete.
   =>The region chosen is turned red.
4. Press the Delete key on the keyboard.
   =>The background region is deleted.

＜Background set on the well＞

1. Click the Plate tab on the operation panel.

2. Move the mouse cursor onto the well background you want to change, then press the right mouse button.
=>The Attribute menu is displayed for the well.

3. Select the Normal command from the Attribute menu.
=>The well is turned blue.

4. Measuring distances or angles

4. Measuring distances or angles ..... "Distance"

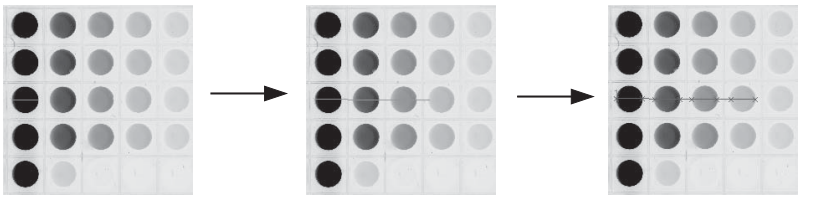
4-1. Creating measurement lines

The Distance option allows you to create lines on the image for measurement.

1. Click the Distance tab on the operation panel.
2. Click any of the measurement tools you want to use.

3. Click the desired image window to make it active.
4. Create the measurement line on the image.

Distance tool

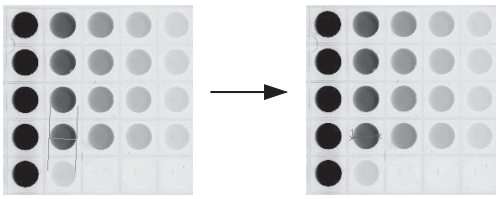


①Click the mouse button at the first point, then move the cursor in a measuring direction.

②Click the mouse button at the second point you want to measure, then move the cursor in a measuring direction. Repeat this operation.

③Double-click the mouse button at the last point.

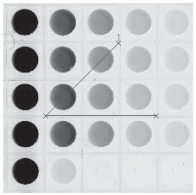
Interval tool



①Click the mouse button at the first point, then move the cursor in a measuring direction.

②Click the mouse button at the last point.

Angle tool



①Click three points so that a measured angle is formed.
=>The interior angle is measured.

4-2. Modifying, moving, or deleting the measurement line

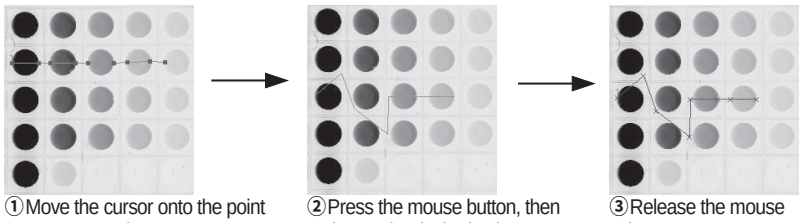
The Distance option allows you to modify, move, or delete the measurement line already drawn on the image.

1. Click the Distance tab on the operation panel.

Modifying

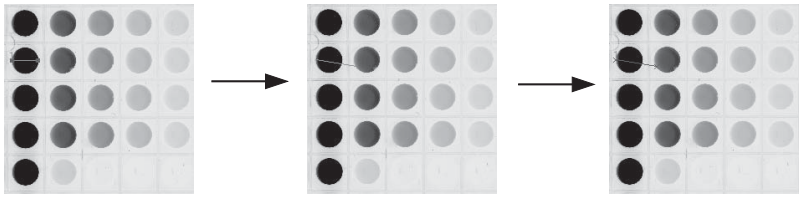
2. Click the pointer tool on the operation panel.
3. Click the measurement line you want to change.
   =>The line chosen is turned red.
4. Move the cursor onto a point to be changed. The mouse cursor form changes to .
   Click the point, drag to a desired point, and release the mouse button.

Distance tool



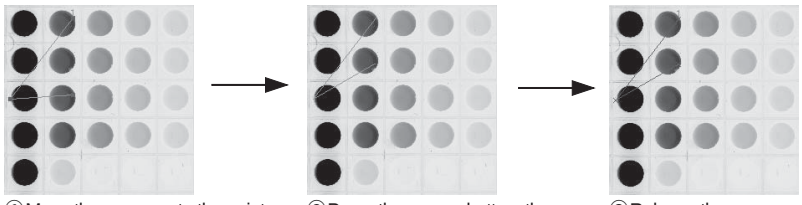
①Move the cursor onto the point you want to change. ②Press the mouse button, then drag to the desired point. ③Release the mouse button.

Interval tool



①Move the cursor onto the point you want to change. ②Press the mouse button, then drag to the desired point. ③Release the mouse button.

Angle tool



①Move the cursor onto the point you want to change. ②Press the mouse button, then drag to the desired point. ③Release the mouse button.

How to move

1. Click the Distance tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click the measurement line you want to move.
   =>The line is turned red.
4. Click the measurement line, drag to a desired point, and release the mouse button.

How to delete

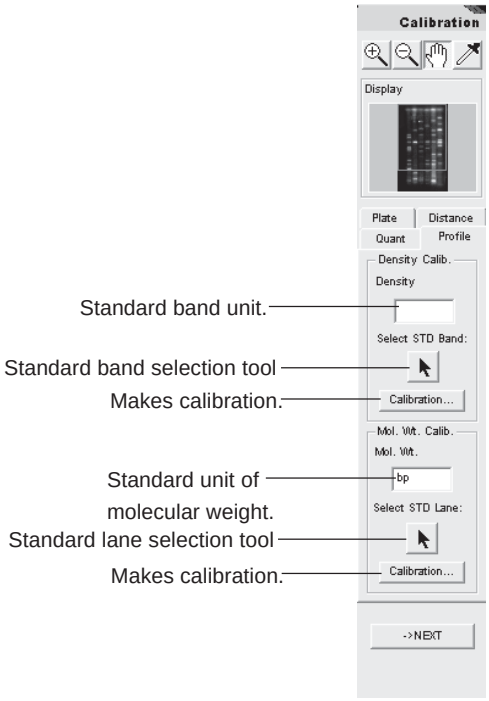
1. Click the Distance tab on the operation panel.
2. Click the pointer tool on the operation panel.
3. Click the measurement line you want to delete.
   =>The line is turned red.
4. Press the Delete key on the keyboard.

The Calibration mode allows you to set a calibration curve (calibration) for measuring molecular weight, isoelectric points, or band concentration. Parameters able to be specified vary depending on the quantifying modes.

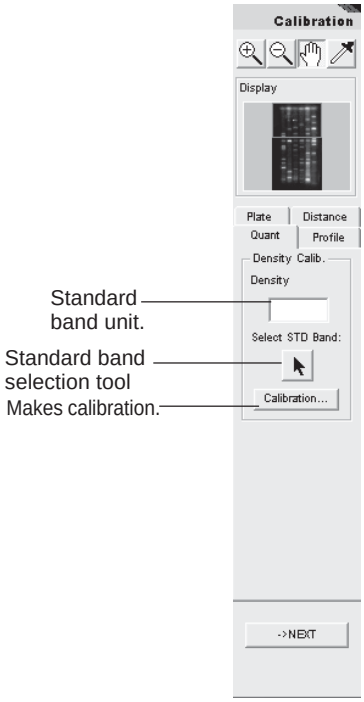
Quant・・・ Used for measuring band concentration.
profile・・・ Used for measuring band concentration, molecular weight, and isoelectric points.
Plate・・・ Used for measuring titerplate concentration.
Distance・・ No setup.

Calibration mode provides the following operation panel.

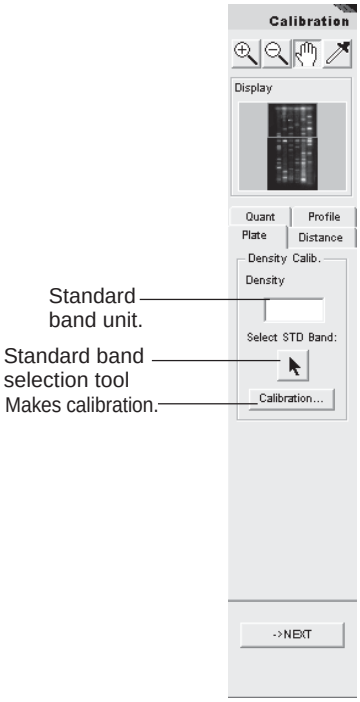
< Profile>



<Quant>



< Plate >



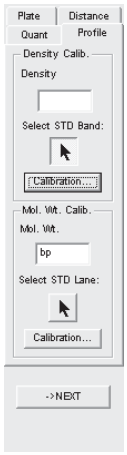
1. Molecular weight and isoelectric point calibration

1. Molecular weight and isoelectric point calibration

You can set the lane as standard.

1. Click the Profile tab, one of the quantifying modes.

2. Place the mouse cursor into the Mol. Wt. text box in the Mol. Wt. Calib. field, then input a unit.



3. Click the button under Select STD Lane in Mol. Wt. Calib. field.

4. Move the cursor onto the lane region of the image.

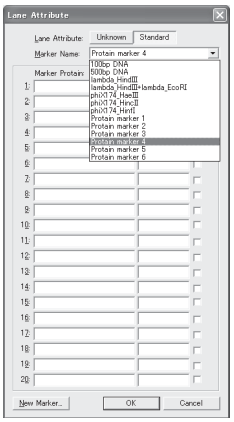
   =>The cursor form changes to .

5. Click the lane you want to set as standard.

   =>The Lane Attribute dialog box is displayed.

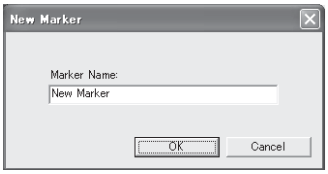
6. Click the Standard button.

7 Select a marker name.
=>The marker list is displayed.



Tips

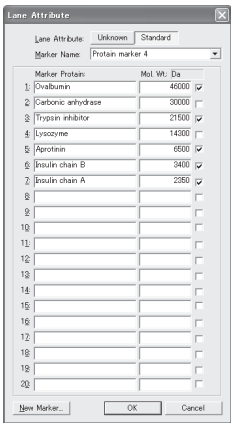
You can register a new marker. Input the marker name and molecular weight, then click the New Marker... button.
=> The New Marker dialog box is displayed.



Input a file name for the new marker, then click the [OK] button to register it.
The marker name registered is added to the list in the next analysis.

Tips

Bands checked in the Marker list are used for calibration. If any band is not used, you can deselect it.



2. Band concentration calibration

You can set the band, the concentration of which is known.

1. Click the Profile, Quant, or Plate tab for calibrating band concentration.

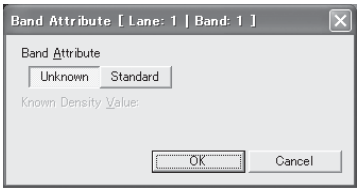
2. Place the mouse cursor into the Density text box in the Density Calib. field, then input a unit for quantitative values.

3. Click the button under Select STD Band in Density Calib. field.

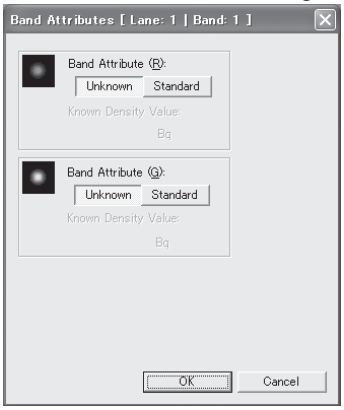
4. Move the cursor onto the quantifying region of an image.
=>The cursor form changes to the character B.

5. Click the quantifying band you want to set as standard.
=>The Band Attribute dialog box is displayed.

< Single image >



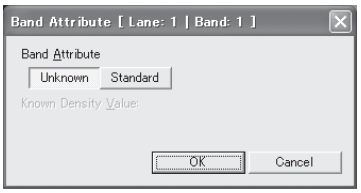
< Individual or overlaid images >



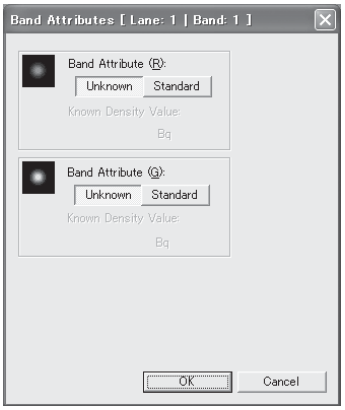
6 Click the Standard button.

7 Input a standard value in the Know Density Value box.

< Single image >



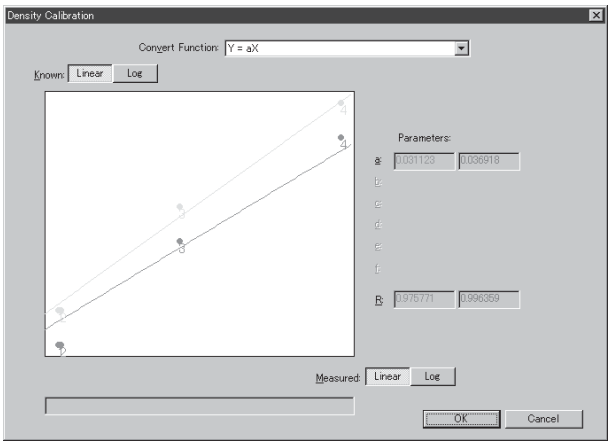
< Individual or overlaid images >



8 Click the [OK] button.

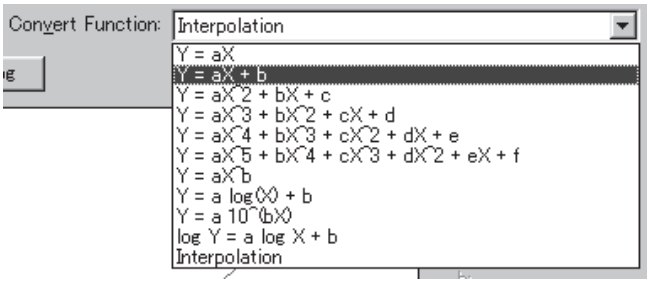
9 Repeat Step 5 to Step 7 for each band you want to set as standard.

10 Click the [Calibration] button in Density Calib. field.
=>The Density Calibration dialog box is displayed.

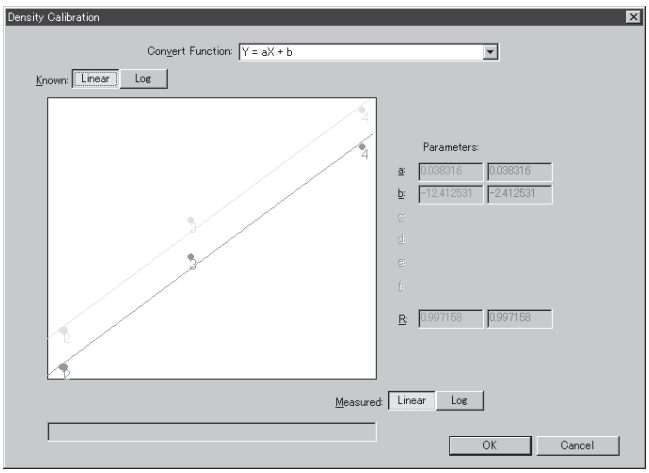


2. Band concentration calibration

11 Select the curve function.



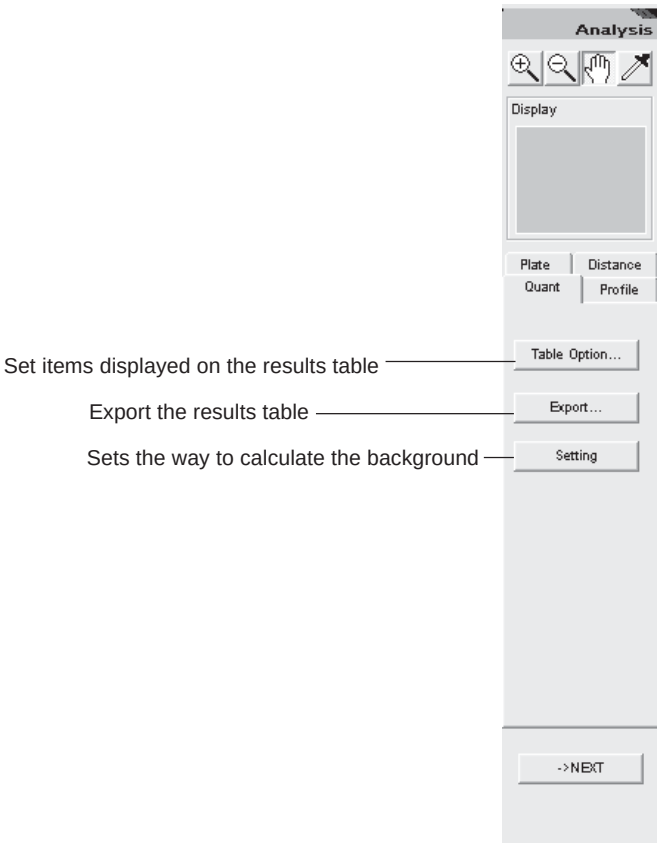
12 Select parameters for the vertical and horizontal axes of the calibration graph.



13 Click the [OK] button.

=>The bands specified as standard is displayed in yellow.

Click the Analysis icon on the navigation panel to enter the Analysis mode.
This mode allows you to analyze the quantitative results, which are given as the results table.
In the Analysis mode, image and results table windows are displayed.
The table format varies depending on the quantifying modes used.
To change the quantifying modes, click the desired tab.
The Analysis mode provides the following operation panel. The functions displayed in the operation panel are same regardless of the quantifying modes.



In addition to the results table that shows the quantitative results in order, optional tables suitable for each quantifying mode are available.

(Quant) All……Display the quantitative results in order.
Comparisons……Arrange the quantitative results so that the corresponding bands are adjacent to each other.

(Profile) All……Display the quantitative results in order.
Comparisons……Arranges the quantitative results so that the corresponding bands are adjacent to each other.

(Plate) All……Display the quantitative results in order.
Comparisons……Arranges the quantitative results so that the corresponding wells are adjacent to each other.
Plate……Display the quantitative results in the same arrangement as the microplate.

(Distance) Display the results in order.

1. Displaying the quantitative results..... "Quant"

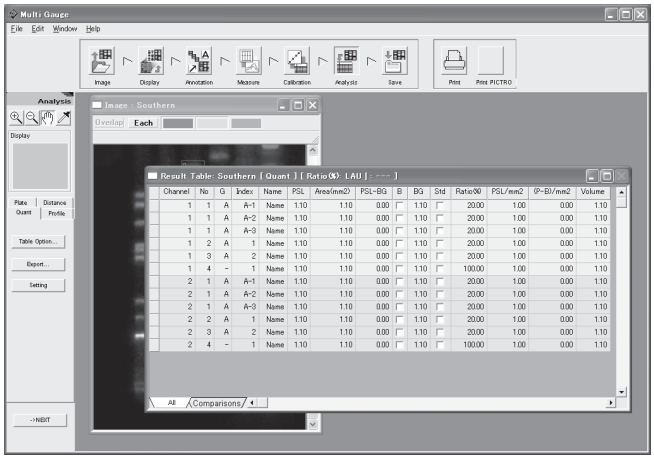
The Quant tab allows you to calculate quantitative values and display them in the results table.

1. Click the Quant tab on the operation panel.
   =>The results table and image windows are displayed.

2. Switch the results views as follows.

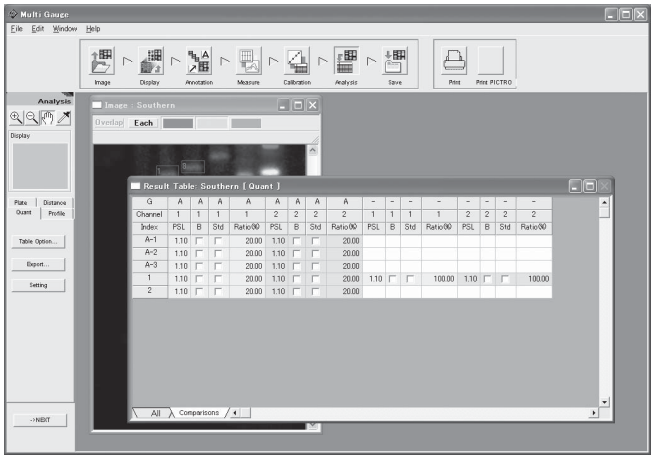
Listing view

Click the All tab on the results table window.
=>Measurement values are listed.



Comparison view

Click the Comparison tab on the results table window.
=>Measurement values are arranged side by side on the group basis, which makes it easy to compare the bands with each other.



2. Displaying the quantitative results····· "Profile"

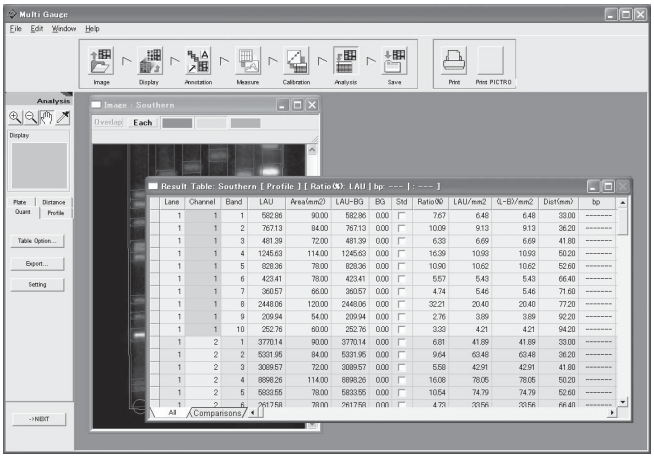
The Profile tab allows you to calculate quantitative values and display them in the results table.

1. Click the Profile tab on the operation panel.
   =>The results table and image windows are displayed.

2. Switch the results views as follows.

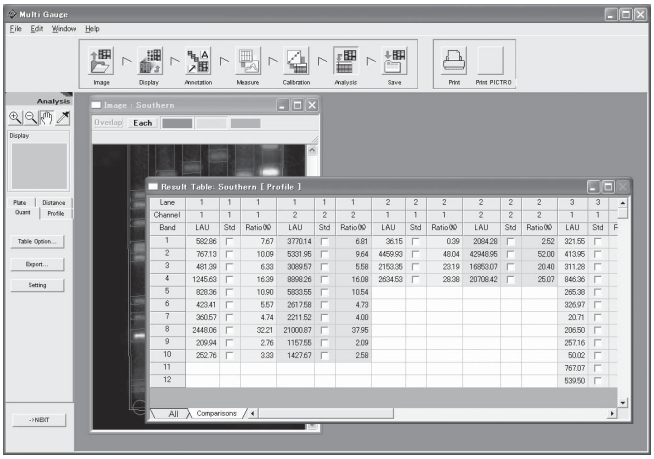
Listing view

Click the All tab on the results table window.
=>Measurement values are listed.



Comparison view

Click the Comparison tab on the results table window.
=>The measurement values of each lane are arranged side by side, which makes it easy to compare the bands with each other.



3. Displaying the quantitative results..... "Plate"

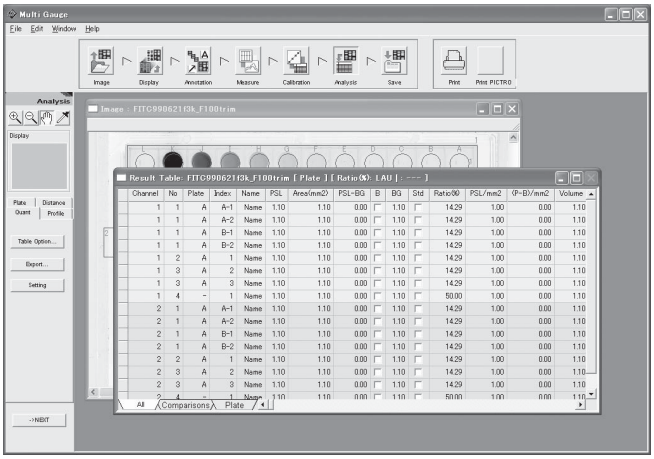
The Plate tab allows you to calculate quantitative values and display them in the results table.

1. Click the Plate tab on the operation panel.
   =>The results table and image windows are displayed.

2. Switch the results views as follows.

Listing view

Click the All tab on the results table window.
=>Measurement values are listed.



Comparison view

Click the Comparison tab on the results table window.
=>The measurement values of each well are arranged side by side, which makes it easy to compare the wells with each other.

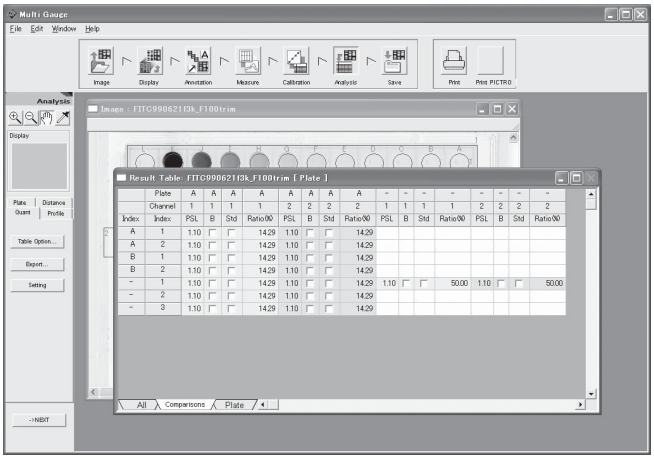
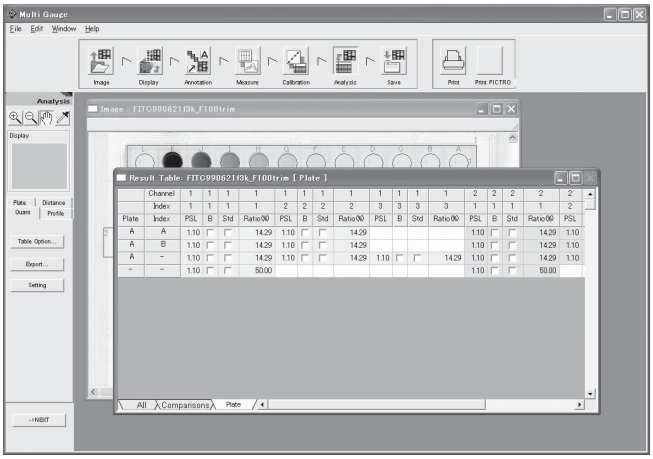


Plate view

Click the All tab on the results table window.

=>Measurement values are listed in the same arrangement as the plate, which makes it easy to correspond to the image.



4. Displaying the measurement results·····"Distance"

The Distance tab allows you to calculate quantitative distances and display them in the results table.

1. Click the Distance tab on the operation panel.
   =>The results table and image windows are displayed.

Results table

5. Selecting items displayed in the results table

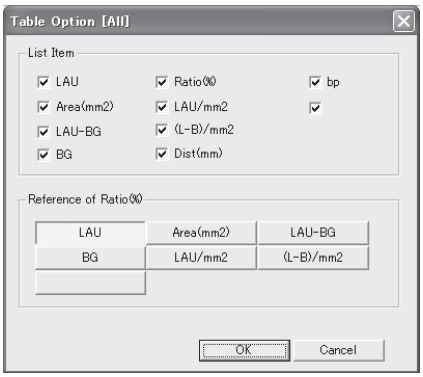
You can set items displayed in the results table and items for calculating the ratio.

Selecting items displayed in the results table

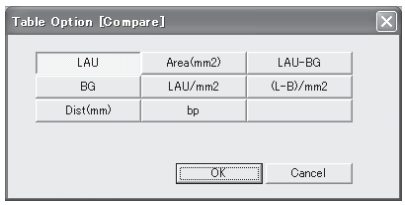
1. Click the results table window to make it active.

2. Click the Table Option... button on the operation panel.
   =>The Table Option dialog box is displayed.

(Listing view)



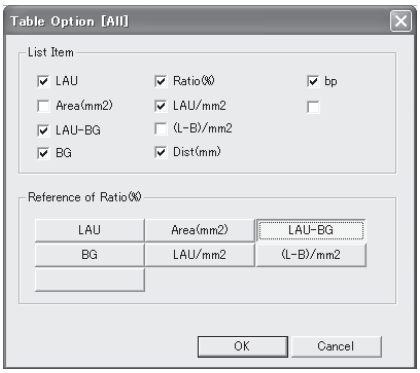
(Comparison or plate view)



3. Select items to be displayed in the results table

(Listing view)

Check desired items in the List Item field.



Items checked in the List Item field appear in the results table.

☐ → ☑

LAU ····· Region intensity. LAU stands for Linear Arbitrary Unit. The intensity unit depends on kinds of images.

Area(mm^2) ····· Regional area.

LAU-BG ····· "Region intensity" - "Background intensity"

BG ····· Background on the each region basis.

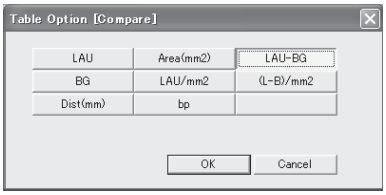
Ratio(%) ····· Ratio of the region to the sum of all regions in each lane (which is 100%)
See below reference of Ratio.
When the check box in the Std field is checked, the ratio of another region is calculated, assuming that the ratio of the checked region is 100%.

☐ → ☑

Reference of Ratio(%) ····· Allows you to select the reference for calculating the ratios.

(Comparison or plate view)

Click desired items.



4. Click the [OK] button.

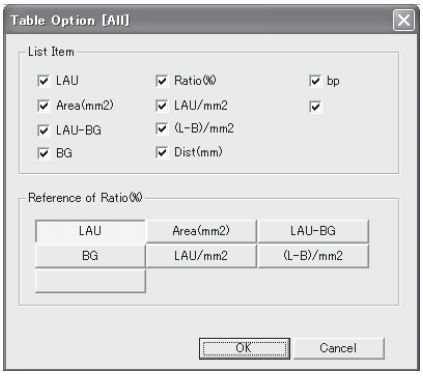
5. Selecting items that appear in a results table

Setting items for calculating the ratio

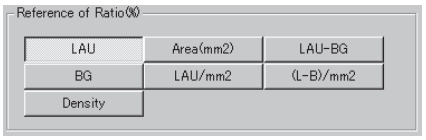
1. Click the results table window to make it active.

2. Click the All tab on the results table window.

3. Click the Table Option... button on the operation panel.
   =>The Table Option dialog box is displayed.



4. Select the value unit for calculating the ratios from the Reference of Ratio(%) field.



LAU/mm^2 ..... Region intensity per unit area.
(L-B)/mm^2 ..... ("Region intensity" - "Background intensity") per unit area.
Dist ..... Band migrating distance.
Da ..... Molecular weight derived from the calibration curve in the Calibration mode. The unit is one specified when the calibration curve was set. The lane used for creating the calibration curve is displayed in yellow in the results table.
Density ..... Quantitative value derived from the calibration curve in the Calibration mode. The unit is one specified when the calibration curve was set. The region used for creating the calibration curve is displayed in yellow in the results table.

5. Click the [OK] button.

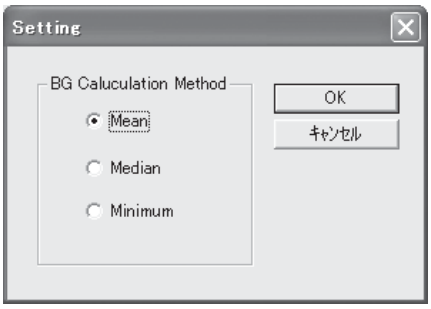
Note : This selection is enabled only when the listing view is chosen.

6. Selecting a way to calculate background

Set a calculation method of the background when multiple backgrounds are set.

1. Click the results table window to make it active.

2. Click the [Setting] button on the operation panel.
   =>The Table Option dialog box is displayed.



3. Select a calculation method

   Mean ..... Finds the mean value and uses the value as the background.
   Median ..... Applies the median of the backgrounds. When the number of backgrounds is even, the smaller of the two median values is applied.
   Minimum ..... Applies the minimum value of the backgrounds.

4. Click the [OK] button.

7. Exporting the results table

You can save the results table as a text file or export the data through the Copy & Paste technique.

Saving the whole results table as a text file

1. Click the results table window to make it active.
2. Click the

button on the operation panel.
3. Input a file name to save.

Exporting part of the results table

1. Click the results table window to make it active.
2. Drag and select part of the results table you want to export.
3. Select the Copy command from the Edit menu.
   =>The data chosen is copied in the clipboard.
   Paste it to desired one.

Click the Save icon on the navigation panel to enter the Save mode.
This mode allows you to save images and analyzing results.
The following saving modes are available.

Image

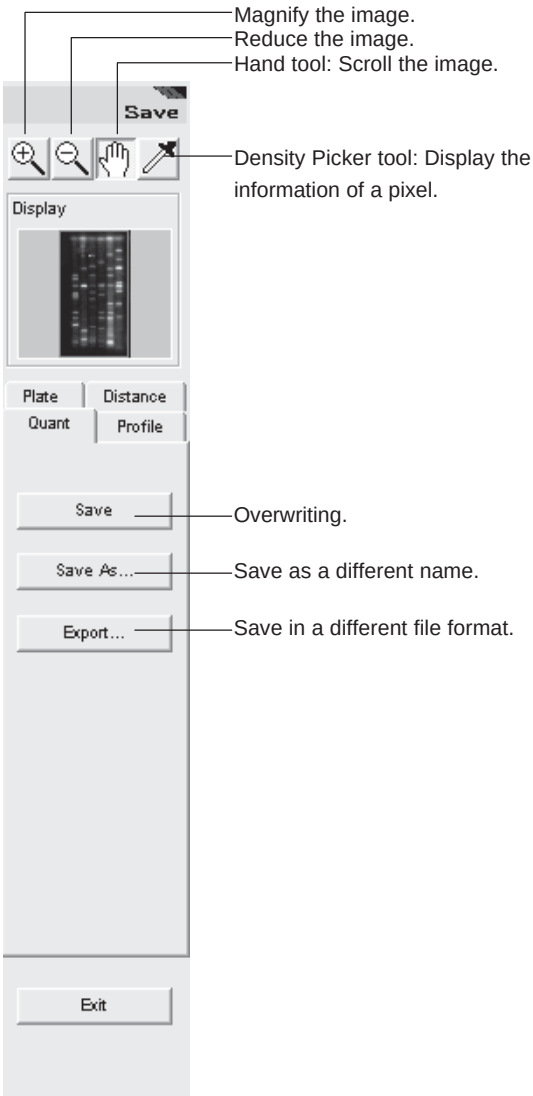
- Overwriting
- Saving as a different name
- Saving in a different file format

Results table

- Saving in the text file format

The Save mode provides the following operation panel.

<When the image window is active >



<When the results table window is active >

1. Saving images

Images can be saved.

1. Click the image window to make it active.

2. Click the desired saving button on the operation panel.

a) Overwriting

Click the Save button on the operation panel. The image is saved by overwritting.

b) Saving as a different name

Click the Save As... button on the operation panel. Input a name and save the image.

c) Saving in a different file format

Click the Export... button on the operation panel, select one from the following file types, change the file name if necessary, and save the image.

Original Image By Gray TIFF file (*.tif)..... Saves as a gray tiff file with the same number of pixels and bit image as the original.

Original Image By Color TIFF file (*.tif)..... Saves as an 8-bit color tiff file with the same number of pixels as the original.

Window Image By Color TIFF file (*.tif)..... Saves as an 8-bit color tiff file with the number of pixels displayed on the monitor.

BMP Image File (*.bmp)..... Saves as a color bmp file with the number of pixels displayed on the monitor.

* When a more than 8-bit image is saved as a color tiff file, the 8-bit color tiff is generated from a range (between the right and left adjustors) specified by Range Scope.

Tips

The Save and Save As buttons save the image with the analyzing results.

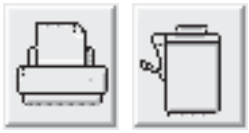
Note : The saving function is disabled for the Profile window.

2. Saving the results table

The results table can be saved in the text file format.

1. Click the results table window to make it active.

2. Click the Export... button on the operation panel.
   =>The results table is saved in the text file format.



The Print and Print PICTRO icons on the navigation panel allows you to print out images and results tables. The printing function is always enabled in any mode.

Windows able to be printed

The printing function is enabled only for image and results table windows. When images are overlaid image, only the overlaid image can be printed out.
The printing function is disabled for the Profile window.

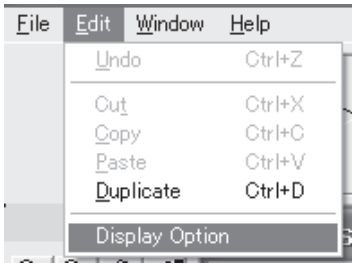
Printers usable

- Printer having the printer driver (LBP, etc.)
  =>Click the Print icon for printing.
- Pictrography (3000, 3500, 4000, and PSD)
  =>Click the Print PICTRO icon for printing.

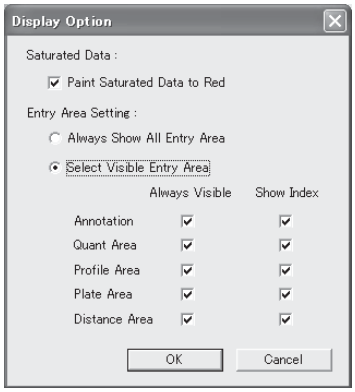
1. Printing out images

You can print out the image on the image window or the image on which quantifying regions, comments, arrows, and/or the information file are put.

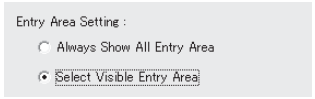
1. Select the Display Option command from the Edit menu.



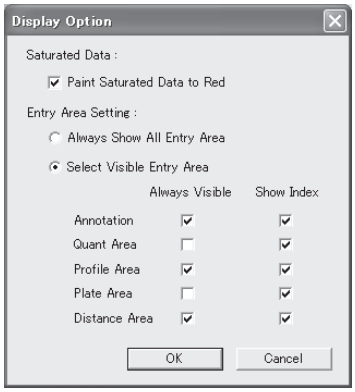
=>The Display Option dialog box is displayed.



2. Check the Select Visible Entry Area option in the Entry Area Setting field.



3. Select the Always Visible check box in a mode in which you created some items to be printed with the target image.



4. Click the [OK] button.

5. Click the desired image window to make it active.

6 Click the Print or Print PICTRO icon on the navigation panel.

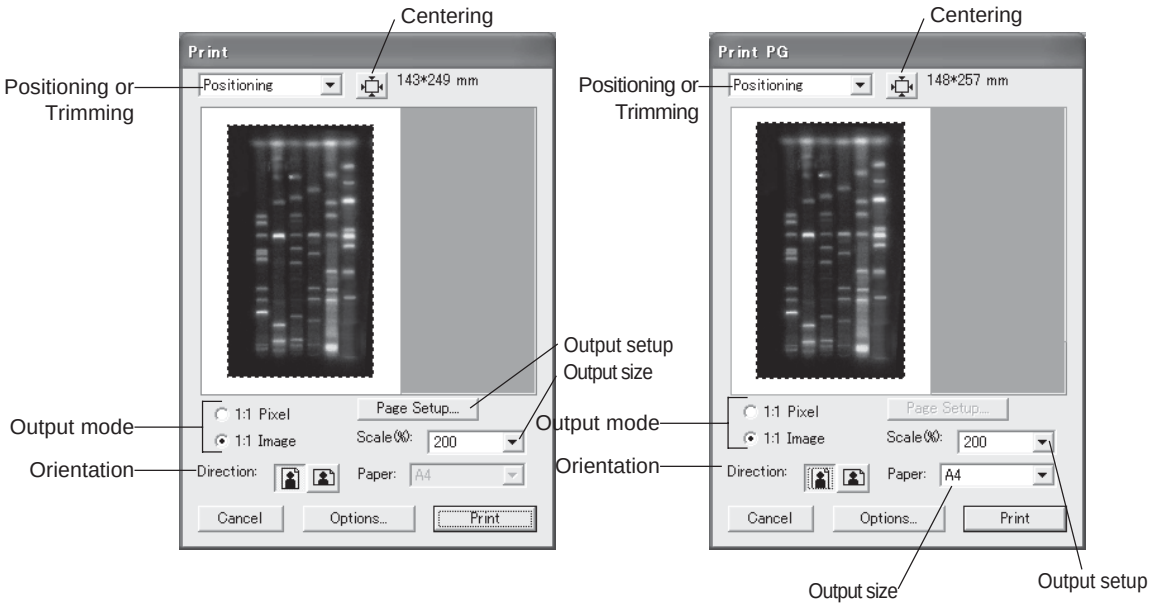
LBP

Click the Print icon.

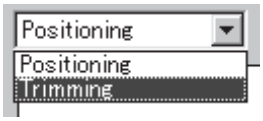
Pictrography(3000, 3500, 4000, PSD)

Click the Print PICTRO icon.

=>The Print or Print PG dialog box is displayed.

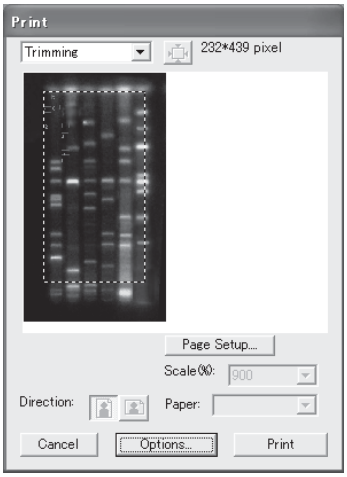


7 Select Trimming.



Part C Operation Details

8 Magnify or reduce the trimming frame on the image window to set the desired printing area.

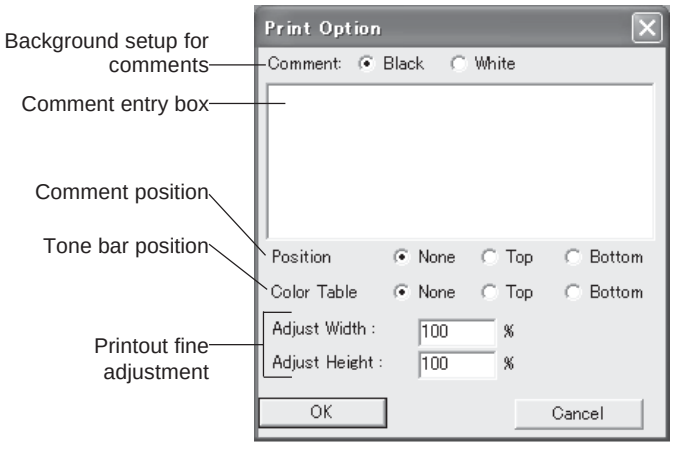


9 Select Positioning.

10 Click the Centering button.
=>The image is aligned with the center.

Tips

Clicking the Option button displays the Print Option dialog box, which allows you to add comments and a tone bar as well as to finely adjust the printout for higher recordability.



11 Specify an output mode, output size, orientation, and output setup or paper size, then click the Print button.

2. Printing out a results table

The results table can be printed out.

1. Click the desired result table window to make it active.

2. Click the Print or Print PICTRO icon on the navigation panel.

   LBP

   Click the Print icon.

   Pictrography(3000, 3500, 4000, PSD)

   Click the Print PICTRO icon.

   =>The Print Driver window is displayed. Note that this window depends on the printer connected.

3. Click the OK button.

Part D

Colony analysis

1. About colony analysis

This is the function to mark the colonies of cultured fungi with RI, pigment, or fluorescent substances, to capture the image through a scanner or CCD camera, and to detect and quantify the colonies. The colonies can be detected automatically and be added or modified manually.

2. Starting up/ Exitting the Software

Starting up

The colony analysis is independent software. Double-click the Colony icon to start the software by same manner as Malti Gauge.

Exitting

Select the Exit command from the File menu, and then determine whether or not to save a file before quitting the software.

3. Operation flow with navigation

The analysis goes step by step by clicking on the icons on the navigation panel.

Step 1 Image mode

Allows you to open and trim an image.

↓

Step 2 Display mode

Allows you to adjust the contrast of the image opened.

↓

Step 3 Measure mode

Allows you to set measurement regions.

↓

Step 4 Analysis mode

Allows you to detect, add, and modify colonies and display the measurement results. Analyze the data obtained.

↓

Step 5 Annotation mode

Allows you to put comments and arrows on the image.

↓

Step 6 Save mode

Allows you to save the image and analyzing results.

↓

Step 7 Print or Print PICTRO

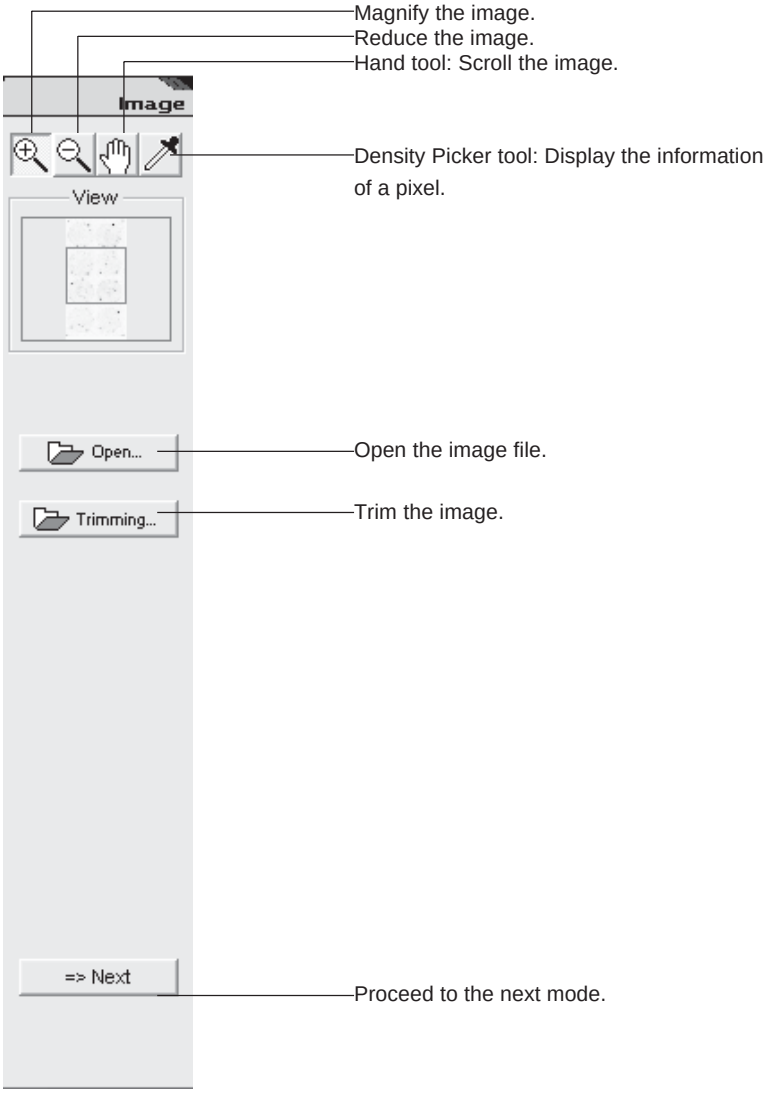
Allows you to print out the image and analyzing results.

Step 1 Displaying an image "Image mode"

First of all, open the image you want to analyze in the Image mode.
The following two ways are available to open the image.

1. Open the image directly.
2. Trim the image, then open the trimmed.

The Image mode provides the following operation panel.



1 Opening an image file ..... Open...

The Open command allows you to directly open the file you want to analyze.

For in-depth operations, see "1. Opening an image file ..... Open... " on page C-2 of "Part C. Operation Details."

2 Trimming an image ..... Trimming...

The Trim command allows you to trim part of the image you want to analyze and to open the trimmed image.

For in-depth operations, see "2. Trimming an image" file ..... Trimming... on page C-3 of "Part C. Operation Details."

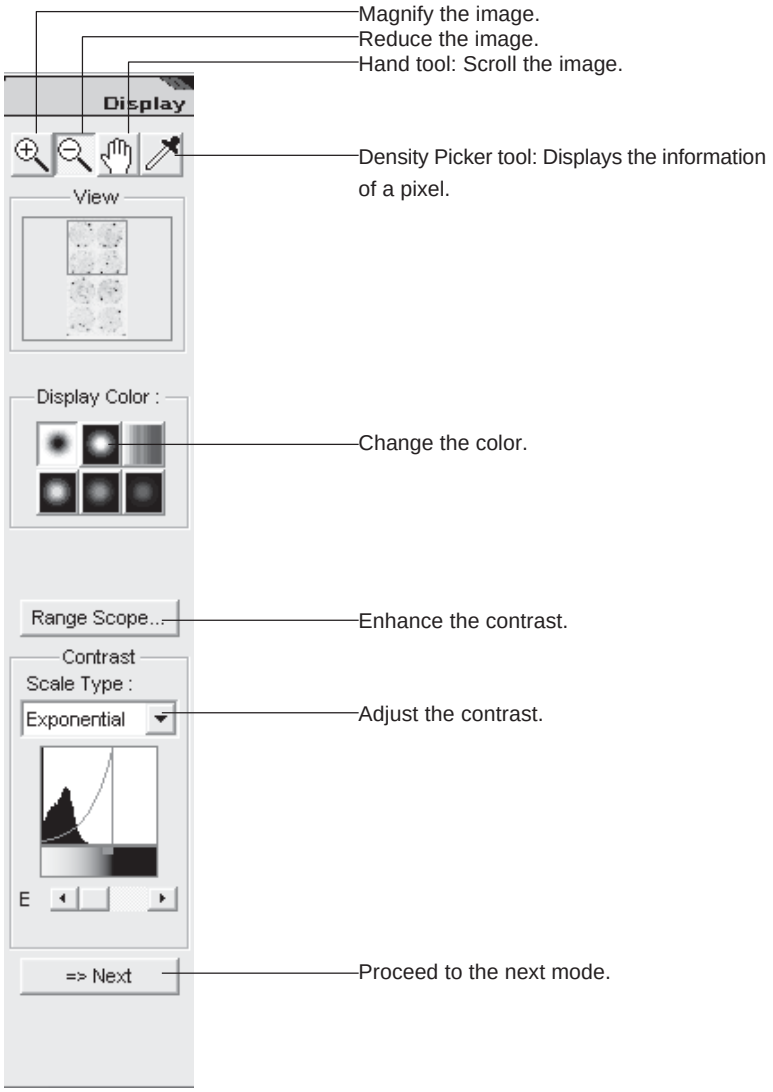
3 Handling the image window

You can not only magnify or reduce the image being displayed but also switch the image views.

For in-depth operations, see "4. Handling the image window" on page C-8 of "Part C. Operation Details."

Step 2 Changing the view of the image "Display mode"

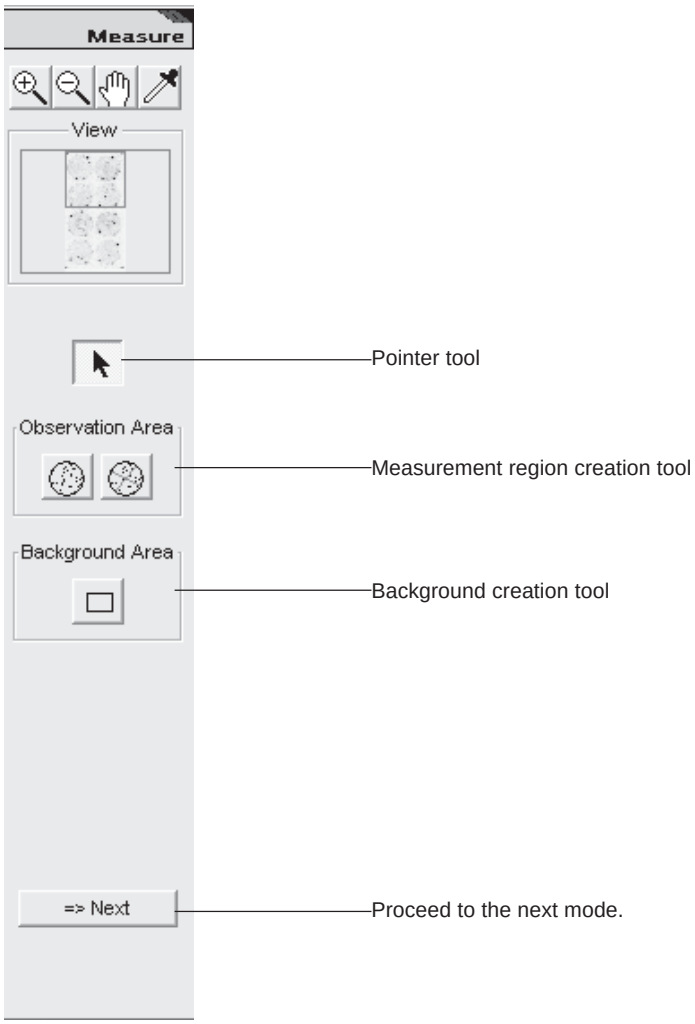
Next, adjust the contrast of the opened image in the Display mode.
Click on the Display icon on the navigation panel to enter the Display mode.
The Display mode provides the following operation panel.



For in-depth operations, see pages C-11 to C-20 of "Step 2: Changing the view of the image."

Step 3 Setting a measurement region "Measure mode"

Set a measurement region.
Click the Measure icon on the navigation panel to enter the Measure mode.
The Measure mode provides the following operation panel.

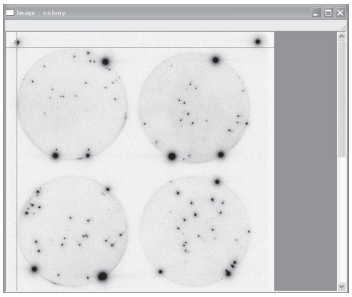


❶ Setting a measurement region

Set the region for the petri dish to be measured.

1. Click in the Observation Area field on the operation panel.

2. Move the mouse cursor in the upper left of the petri dish displayed, click the position where the vertical and horizontal auxiliary lines are tangent to the perimeter of the petri dish, and drag to the lower right.
   Align the resulting circle with the petri dish, then release the mouse button.



3. If the alignment is not good in Step 2, modify the resulting region.

Movement

Place the mouse cursor on the region created.
=>The cursor form changes to .
Press the mouse button, drag to the correct position, and release the mouse button.

Size change

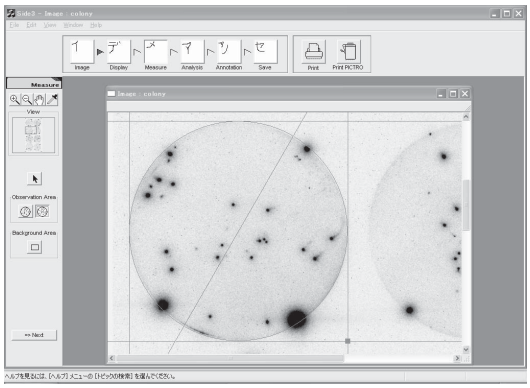
Move the mouse cursor onto the lower right dot ■ of the auxiliary lines of the region.
=>The cursor form changes to .
Press the mouse button, drag the dot to magnify or reduce the region, and release the mouse button.

❷ Splitting the measurement region

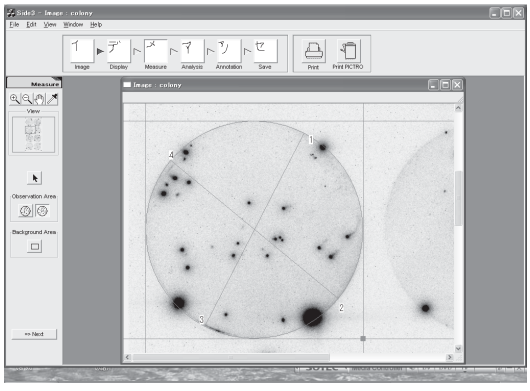
Split the petri dish region specified for measurement.

1. Click in the Observation Area field on the operation panel.

2. Move the mouse cursor on the measurement region specified.
   =>The auxiliary line is displayed, passing the center of the measurement region.



3. Move the auxiliary line, then click the position at which you want to split the region.
   =>Division lines and numbers are displayed.



4. Repeat Step 3 to create necessary divisions, and finally double-click the mouse button.

3 Setting a background

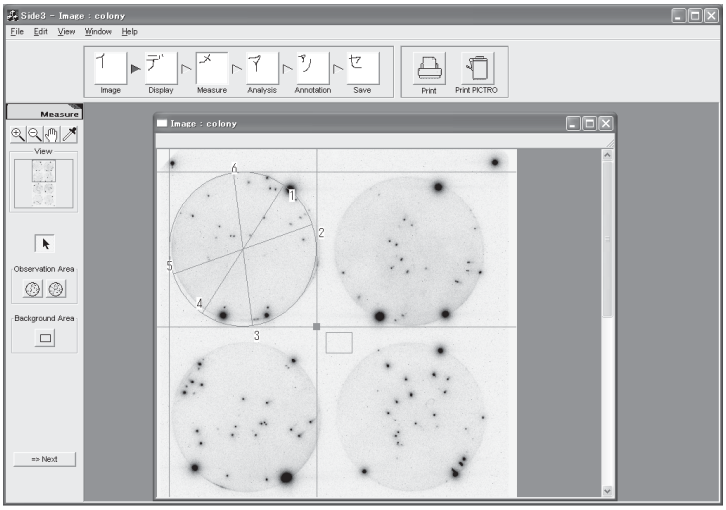
Create a background region.

1. Click in the Background Area field on the operation panel.

2. Move the mouse cursor onto the background region on the image.

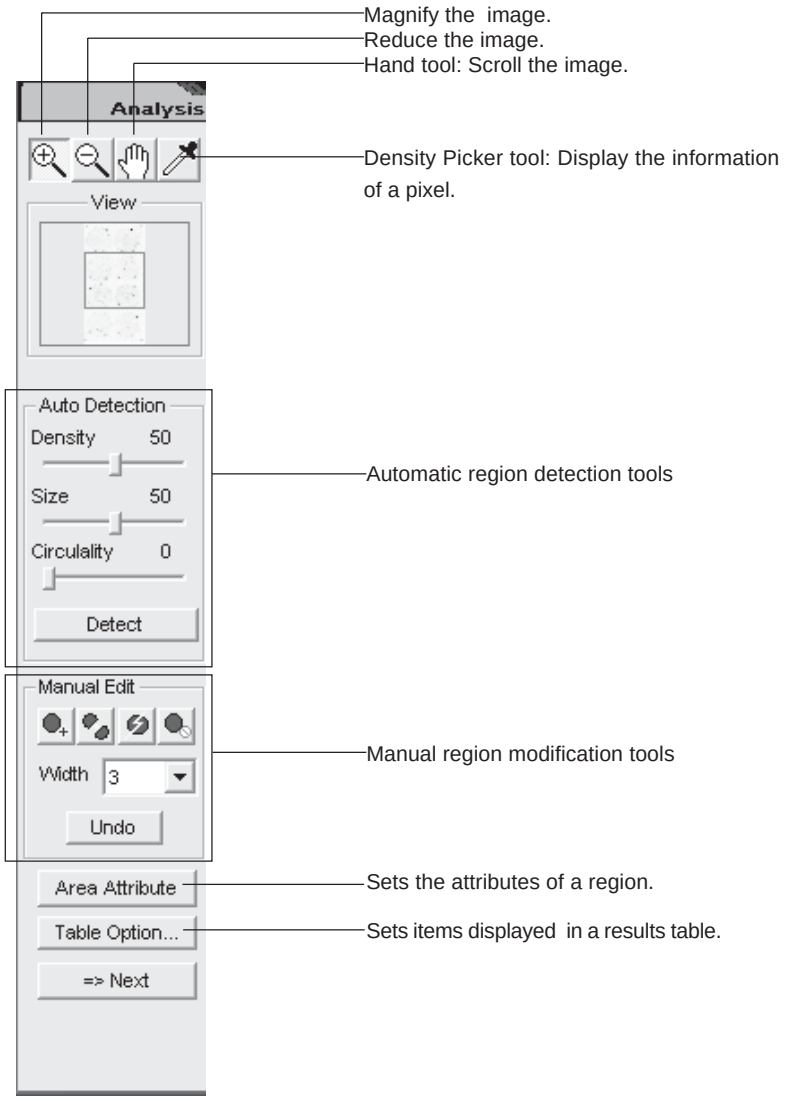
3. Click and drag.
   =>The region is displayed the starting point where the mouse button was pressed.

4. After determining the region, release the mouse button.
   =>The background region is displayed.



Step 4 Measuring the image "Analysis mode"

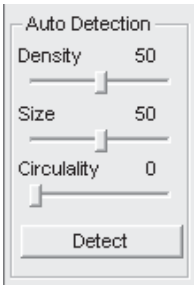
Detect, add, and modify colonies to display the measurement results, and analyze the data.
Click the Analysis icon on the navigation panel to enter the Analysis mode.
This mode provides the following operation panel.



❶ Automatic region detection

After the criteria for detecting regions are specified, automatic region detection is executed. Entering in the Analysis mode, automatic region detection is executed with the intial settings and the result is displayed.

1. Set the density, size, and circularity in the Auto Detection field on the operation panel. To change the values, place the cursor onto the desired slide bar and drag it.



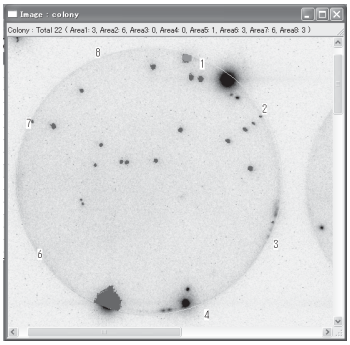
Density:..... Allows you to specify a colony density for detection. Only colonies denser than the specified are detected. The larger the value, the denser the colony able to be detected.

Size:..... Allows you to specify a colony size for detection . Only colonies larger than the specified are detected. The larger the value, the lager the colony able to be detected.

Circulality:..... Allows you to specify a colony circularity for detection. Only colonies that have the circularity rounder than the specified are detected. The larger the value, the rounder the colony able to be detected.

2. Click the Detect button.

=>Detected regions are displayed in blue.



=>The measurement results is displayed in the results table.

Result : colony

No.	Area	PSL	PSL/mm2	PSL-BG	(PSL-BG)/mm2	Area(mm2)	Position	Circulality	Condition
1	1	2625.96	308.21	2625.96	308.21	8.52	(77.60, 120.20)	116.83	
2	1	60.50	137.49	60.50	137.49	0.44	(74.80, 124.20)	92.77	
3	1	375.66	195.66	375.66	195.66	1.92	(62.80, 144.00)	111.21	
4	2	495.16	162.88	495.16	162.88	3.04	(87.60, 154.80)	169.39	
5	3	409.50	179.60	409.50	179.60	2.28	(61.40, 155.80)	205.20	
6	3	386.36	201.23	386.36	201.23	1.92	(59.20, 155.80)	119.39	
7	3	419.09	205.44	419.09	205.44	2.04	(76.40, 159.20)	113.90	
8	3	710.61	177.65	710.61	177.65	4.00	(81.20, 162.60)	158.57	
9	4	298.36	201.60	298.36	201.60	1.48	(56.20, 162.40)	95.47	
10	4	31285.14	512.87	31285.14	512.87	61.00	(73.80, 186.20)	153.71	
11	4	467.16	204.90	467.16	204.90	2.28	(62.40, 187.60)	117.06	
12	7	233.73	166.95	233.73	166.95	1.40	(40.00, 185.60)	100.93	
13	7	280.66	116.94	280.66	116.94	2.40	(36.40, 191.60)	1084.61	
14	8	197.88	190.27	197.88	190.27	1.04	(44.60, 157.40)	87.56	
15	8	338.97	169.49	338.97	169.49	2.00	(42.80, 162.40)	125.60	
16	8	10361.00	334.23	10361.00	334.23	31.00	(21.60, 181.00)	126.61	

❷ Adding, splitting, or deleting the region

You can add, split, or delete the region manually. The changes update the results table automatically.

Adding a region

1. Click the addition tool from the manual region modification tools.

2. Select the width in the Width box of the Manual Edit field.

Note : The width is the diameter of the region to be added. The larger the value, the larger the region.

3. Click the point where the region to be added on the image.
=>The resulting region is displayed and filled with blue.

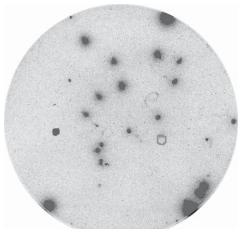
Adding a region by freehand

1. Click the freehand addition tool from the manual region modification tools.

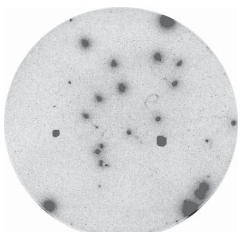
2. Select the width in the Width box of the Manual Edit field.

Note : The width is the thickness of the line to be drawn.

3. Press the mouse button at the desired point, then drag the cursor to create a color-filling region.



4. Release the mouse button at the last point.



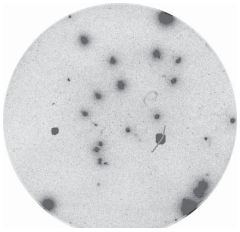
Splitting the region

1. Click the split tool from the manual region modification tools.

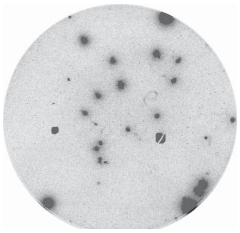
2. Select the width in the Width box of the Manual Edit field.

Note : The width is the thickness of the division line.

3. Press the mouse button at the starting point of the region you want to split, drag the mouse cursor to draw a line which splits the region, and release the mouse button.



=>The region is divided into two.



Deleting the region

1. Click the deletion tool from the manual region modification tools.

2. Click the region you want to delete.
=>The region is deleted.

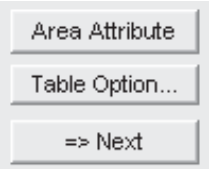
Tips

The Undo command resets the last action.

❸ Modifying the attributes of the region

You can set whether or not to measure the region and input comments.

1. Click the Area Attribute button on the operation panel.
   =>The Area Attribute button is held down.



2. Click the region, the attributes of which you want to change.
   =>The Area Attribute dialog box is displayed.

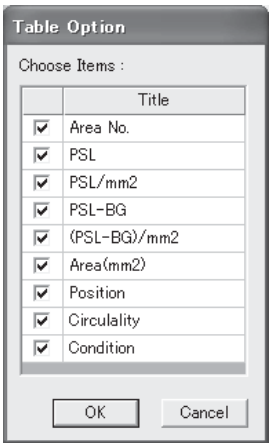
3. Select any condition and input comments, then click the OK button.

4 Setting items displayed the results table

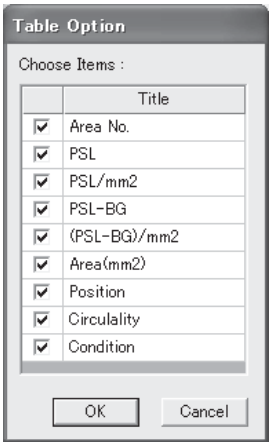
You can specify items displayed in the results table.

1. Click the results table window to make it active.

2. Click the Table Option... button on the operation panel.
   =>The Table Option dialog box is displayed.

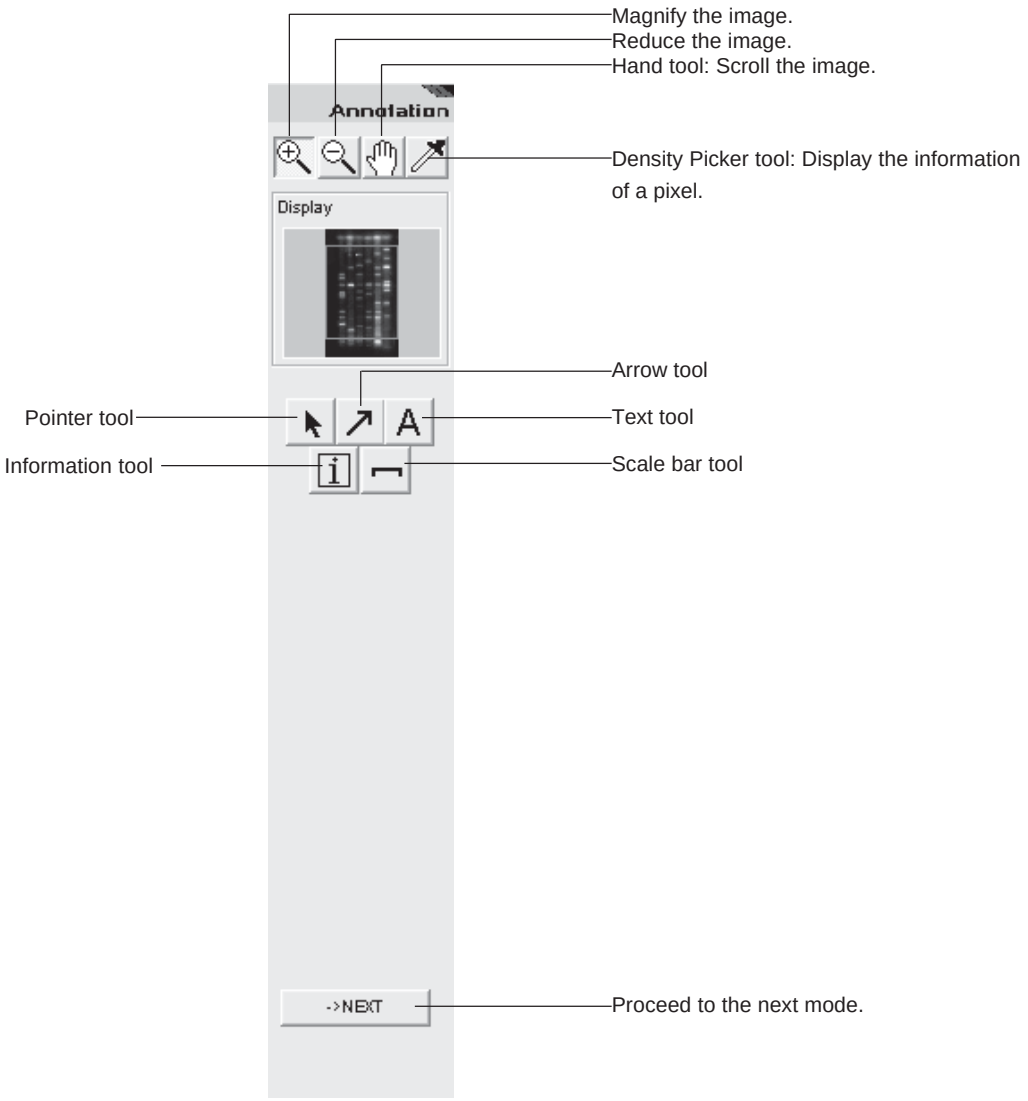


3. Check desired items, then click the OK button.
   =>The results table is updated.



Step 5 Writing comments on the image "Annotation mode"

The Annotation mode allows you to add arrows, comments, and file information on the image. This mode provides the following operation panel.



For in-depth operations, see pages C-21 to C-30 in "Step 3: Writing comments on an image."

Step 6 Saving the image and results "Save mode"

Click the Save icon on the navigation panel to enter the Save mode.
This mode allows you to save the image and analyzing results.
The following saving functions are available.

Image

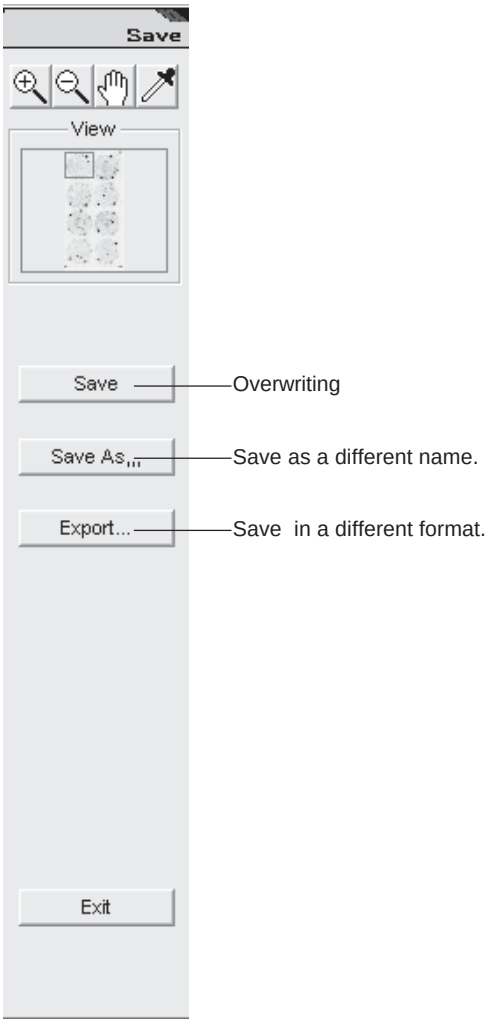
- Overwriting
- Saving as a different name
- Saving in a different file format

Results table

- Saving in the text file format

The Save mode provides the following operation panel.

<When the image window is active >



<When the results table window is active >

For in-depth operations, seepages C-91 to C94 in "Step 7: Saving images and results."

Step 7 Printing "Print" and "Print PICTRO"

Click the Print or Print PICTRO icon on the navigation panel to print out the image and result table. This printing function is always enabled in any mode.

Windows able to be printed

The printing function is enabled only for image and results table windows. When images are overlaid images, only the overlaid image can be printed out.
The printing function is disabled for the Profile window.

Printers usable

・Printer having the printer driver (LBP, etc.)
=>Click the Print icon for printing.
・Pictrography (3000, 3500, 4000, PSD)
=>Click the Print PICTRO icon for printing.

For in-depth operations, seepages C-95 to C-100 of "Step 8: Printing."