WEALTEC

Dolphin-1D Gel Analysis Software

Installation and Operation Manual

Version 2.4

Item# 01040

Index

A. Introduction

A-1. Overview:

Dolphin-1D software is a tool for image capturing and analysis designed for life-science research laboratories. It is equipped with Wealtec Dolphin image system series. It is also capable of running image analysis independently.

A-2. Features:

- ✧ Easy image capturing
- ✧ Multiple file format supported: JPG, BMP, JPEG, DFN, TIFF, PCX, GIF, TGA image
- ✧ Fast data analysis (Within 1 minute)
- ✧ Traceable image enhancement function (Allows users to track previous actions)
- ✧ Reset analysis function
- ✧ Automatic data analysis
- ✧ Lane profile with lane image alignments
- ✧ Intelligent colony counting
- ✧ Comprehensive microtiter plate analysis
- ✧ Accurate spot density calculation
- ✧ Ability to identify smiling gel accurately
- ✧ Specialized X-axis band analysis function
- ✧ Image profile & 3-D display
- ✧ Support GLP/GMP

A-3. Applications:

- ✧ **Gel image analysis:** DNA agarose gel, sequencing gel, blotting membrane, Protein SDS-PAGE gels, X-Ray film and photo etc.
- ✧ **Colony counting:** Transformation or transfection efficiency assay, colony counting, plaque counting etc.
- ✧ **Microtiter plate assay:** Includes 48, 96, 384, 1536 wells micro-plate assay and various dot-blot and slot-blot formats.
- ✧ **Spot image analysis:** Suitable for irregular shape sample analysis, including 2-D gel sample and other special purpose assays.

B. Software & Driver Installation

Dolphin-1D software does not require any prerequisite hardware system to be installed in prior but it is recommended to use this software with Dolphin Image System. This software supports Dolphin-Doc/-Doc^{Plus}, Dolphin-Chemi/Chemi^{Plus} and Dolphin-Scan. For detail information on the hardware minimum requirement and installation, please refer to appropriate Dolphin Image system's hardware manual.

B-1. Minimum computer system requirement:

Pentium III-500 MHz, 128M RAM with English version Windows 2000/NT/XP system or above, USB (2.0) supported.

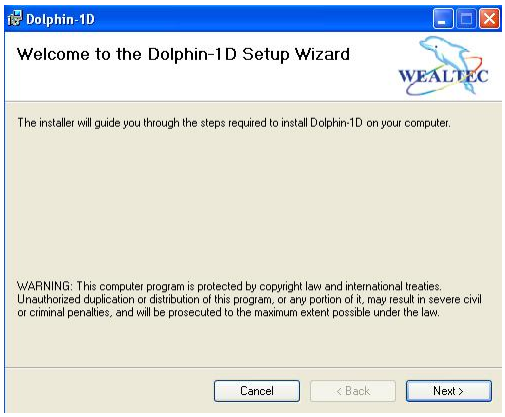
Printer: Digital thermal printer, laser printer or inkjet printer

B-2. Dolphin-1D software & driver installation:

1. Insert protection key to computer's USB port (USB key-pro).

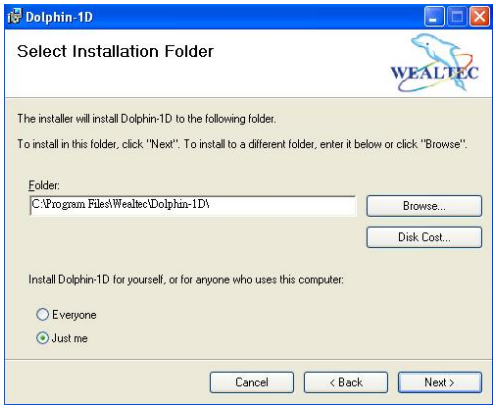
2. Log-in windows with English user account.
   Note: Dolphin-1D only recognizes English user account. The software would not be able to find the path if it is installed other than English user account. If the computer does not have any English user account it is recommended to generate a new user account with English user name before installing the software.

3. Insert software installation CD to the CD-driver. Click "Setup" to initiate Dolphin-1D setup wizard which will guide through the steps to install the software. Click "Next" to proceed.

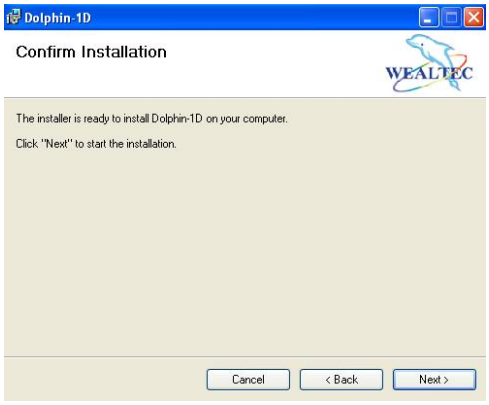


4. Choose the software installation folder by clicking “Browse” button and select the privacy option for single or multiple users. Click “Next” to proceed.

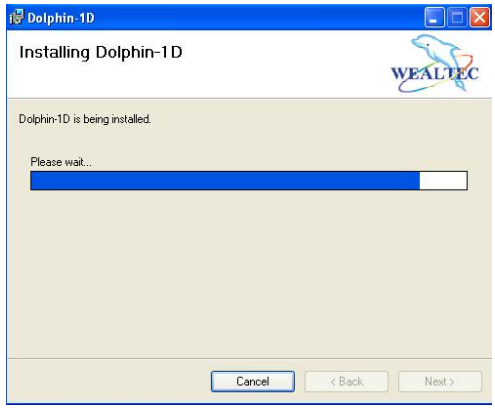
   Note: Default setting for folder “C:\Program Files\Wealtec\Dolphin-1D\” and single user privacy option “Just me” selected.



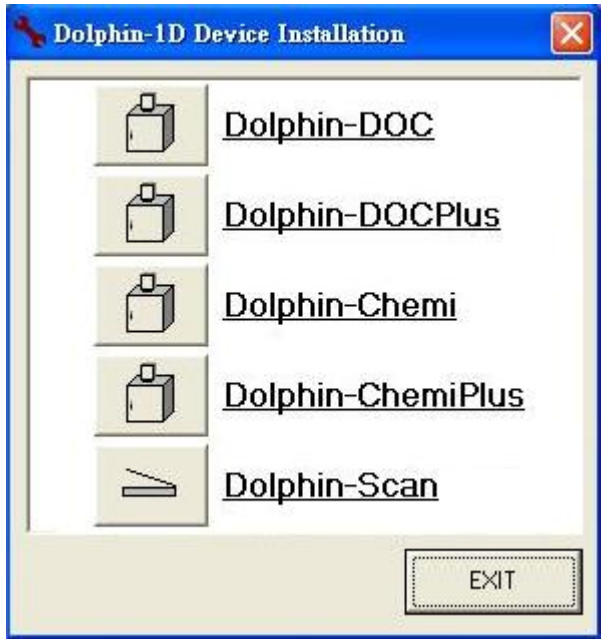
5. Click “Next” to reconfirm and start the installation.



6. Installation of the software on the progress.



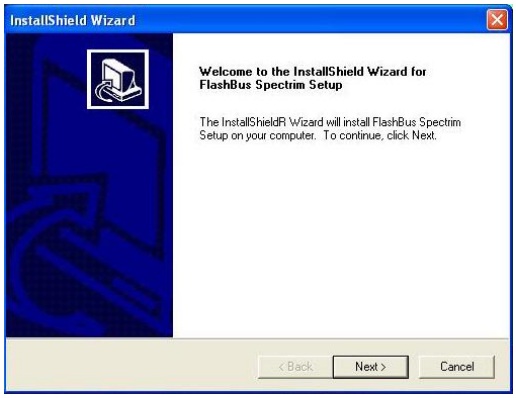
7. Select the purchased Dolphin image system model to install its hardware driver.



Note: To install other Dolphin image system hardware driver, click Windows Start menu and select Programs→Dolphin 1D→Device Installation.

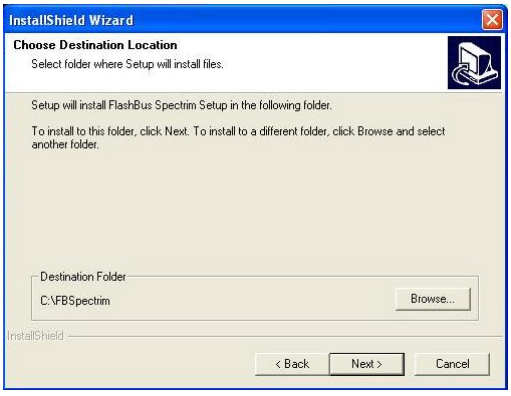
8. To install hardware driver follow the appropriate steps
    - Dolphin-Doc or Dolphin-Chemi continue to next step
    - Dolphin-Doc^{Plus} continue to step 15
    - Dolphin-Chemi^{Plus} skip to step 20
    - Dolphin-Scan skip to step 25

9. Setup wizard will guide through the steps. Click “Next” to proceed.



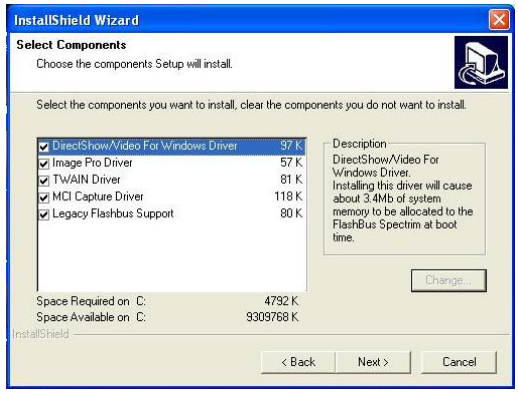
10. Choose the hardware driver installation folder by clicking “Browse” button. Click “Next” to proceed.

    Note: Default destination folder is “C:\FBSpectrim”.



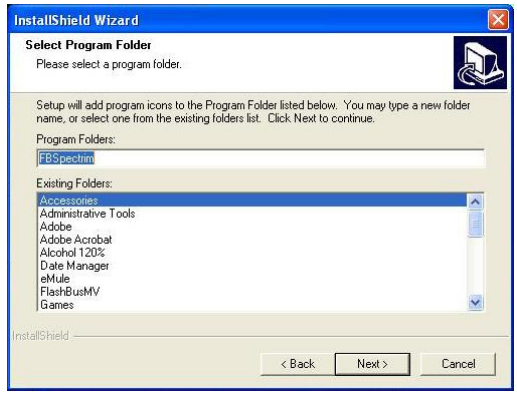
11. Select or unselect the components needed to be installed. Click “Next” to proceed.

    Note: All the components should be selected for default selection.

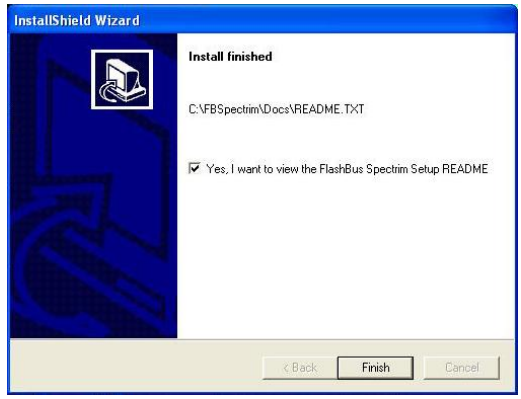


12. Setup will add/choose program icon in the program folder. Click “Next” to proceed with the default folder name or it can be reentered with different name to the existing list.

    Note: Default program folder name “FBSpectrim”.

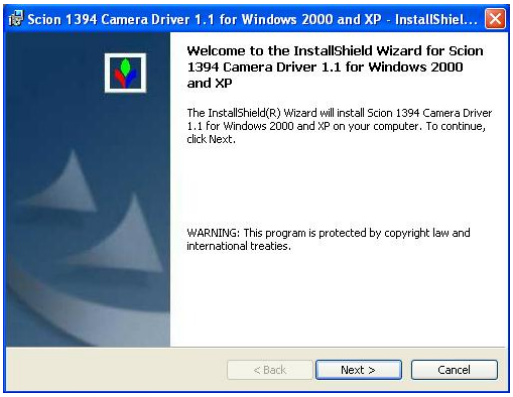


13. Once the installations completed successfully, for additional information select or deselect the option to view the “README” file. Click “Finish” to proceed.



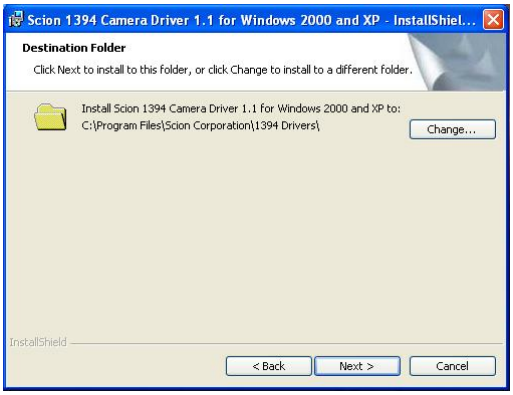
14. To install another systems driver, go to step 7 else skip to step 31.

15. Setup wizard will guide through the steps. Click “Next” to proceed.



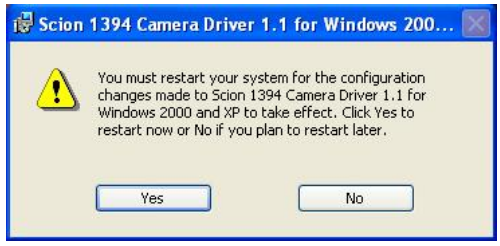
16. Choose the hardware driver installation folder by clicking “Change” button. Click “Next” to proceed.

    Note: Default destination folder is “C:\Program Files\Scion Corporation\1394 Drivers\”.



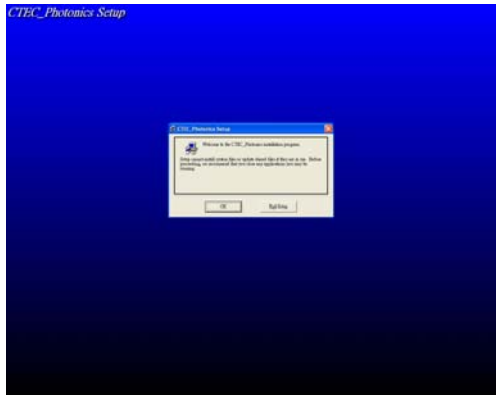
17. Once the installations completed successfully, click “Finish” to exit setup menu.

18. Click “Yes” to reboot the computer or click “No” to return to windows. (If computer is rebooted skip the following to step 34.



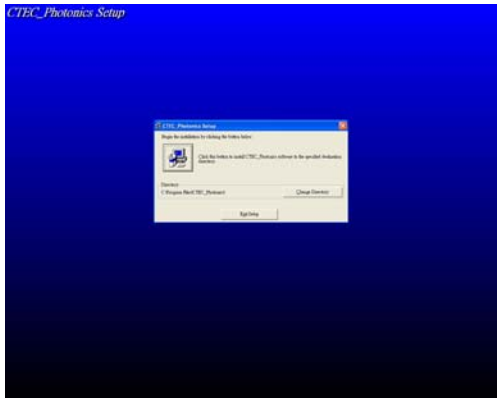
19. To install another systems driver, go to step 7 else skip to step 31.

20. CTEC_Photonics setup wizard will guide through the steps. Click “OK” to proceed.



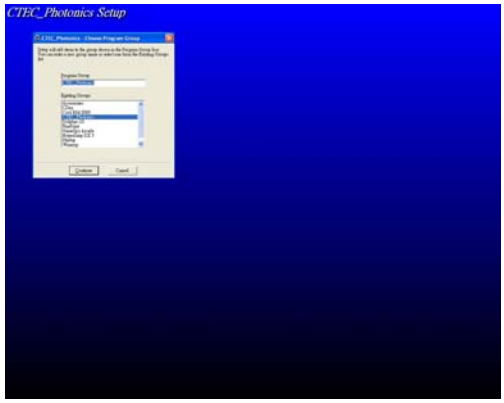
21. Choose the hardware driver installation folder by clicking “Change Directory” button. Click  to begin the installation.

Note: Default destination folder is “C:\Program Files\CTEC_Photonics\”.

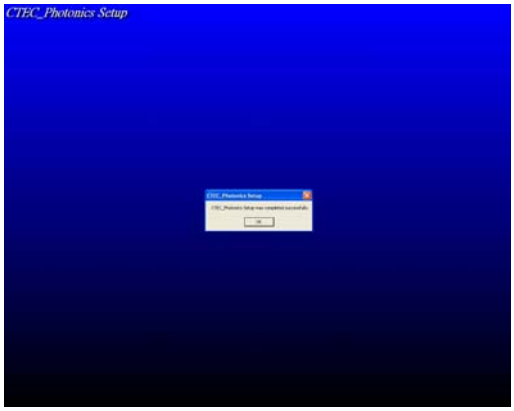


22. Setup will add program icon in the program folder. Click “Continue” to proceed with the default folder name or it can be reentered with different name to the existing list.

    Note: Default program folder name “CTEC_Photonics”.



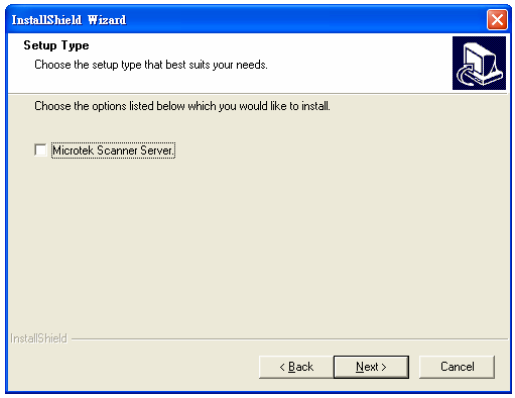
23. Once the installations completed successfully, click “OK” to exit setup menu.



24. To install another systems driver, go to step 7 else skip to step 31.

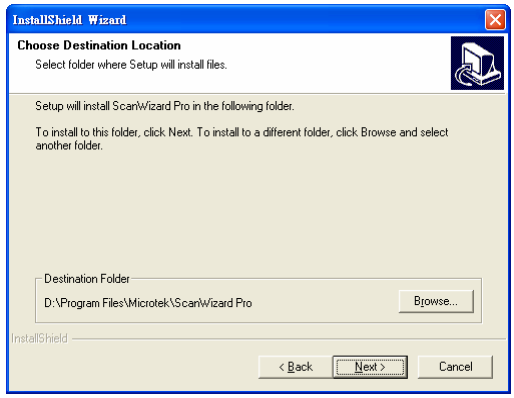
25. Setup wizard will guide through the steps. Select “I accept” and click “Next” to proceed.

26. Click “Next” to proceed.



27. Choose the hardware driver installation folder by clicking “Browse” button. Click “Next” to proceed.

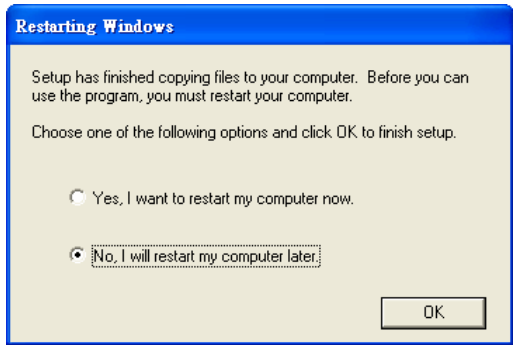
    Note: Default destination folder is “C:\Program Files\Microtek\ScanWizard Pro”.



28. Setup will add/choose program icon in the program folder. Click “Next” to proceed with the default folder name or it can be reentered with different name to the existing list.

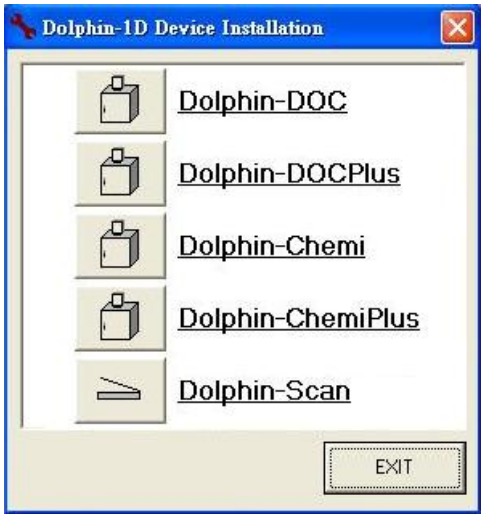
    Note: Default program folder name “Microtek ScanWizard Pro for Windows”.

29. Once the installations completed successfully select “No, I will restart my computer later” to reboot your system later. Click “OK” to proceed. (If computer is rebooted skip the following step to step 34)

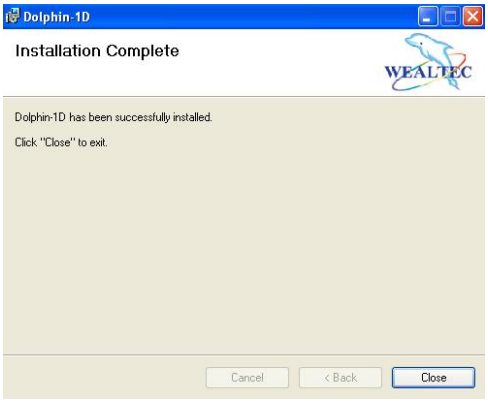


30. To install another systems driver, go to step 7 else skip to next step.

31. Click “Exit” to exit the hardware driver installation.



32. Dolphin-1D software setup completed successfully. Click “Close” to exit setup menu



33. Upon saving and closing all running programs, reboot the computer to complete the system setup.

34. To initiate software program double click on the shortcut button 

from windows desktop or go to “Start Menu” → “Program file” → “Dolphin-1D” → “Dolphin-1D”. Enter Dolphin-1D Serial Number printed on Key-pro or CD sleeve and click “Ok”.

Note: If key-pro is disconnected, a warning window will pop-up 

, click “OK” and ensure the key-pro connection before attempting to initiate the software.

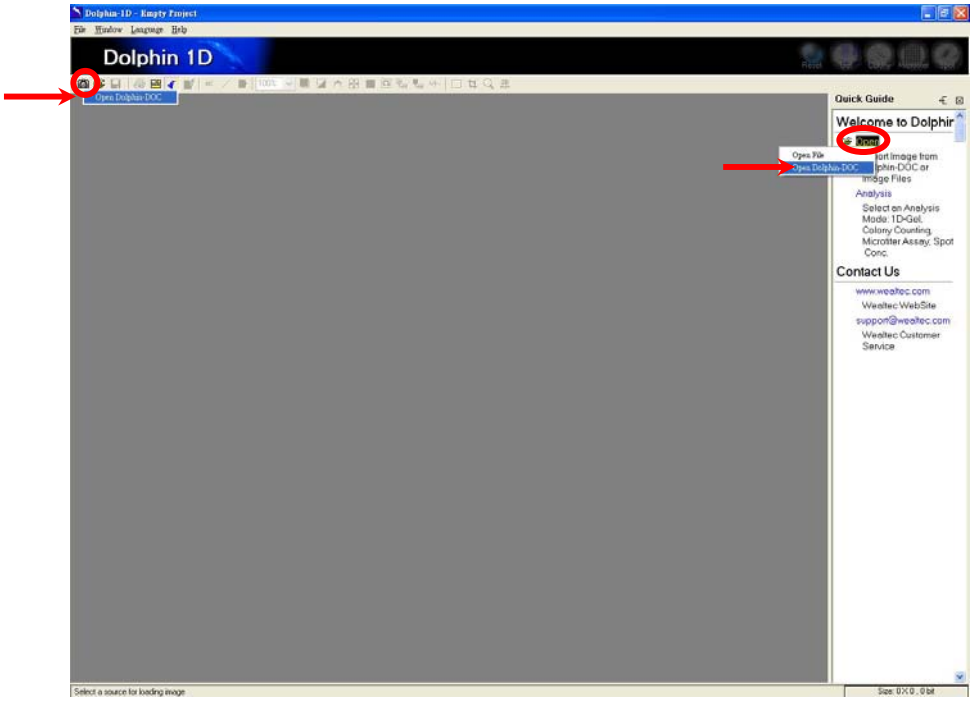
C. Image Capture

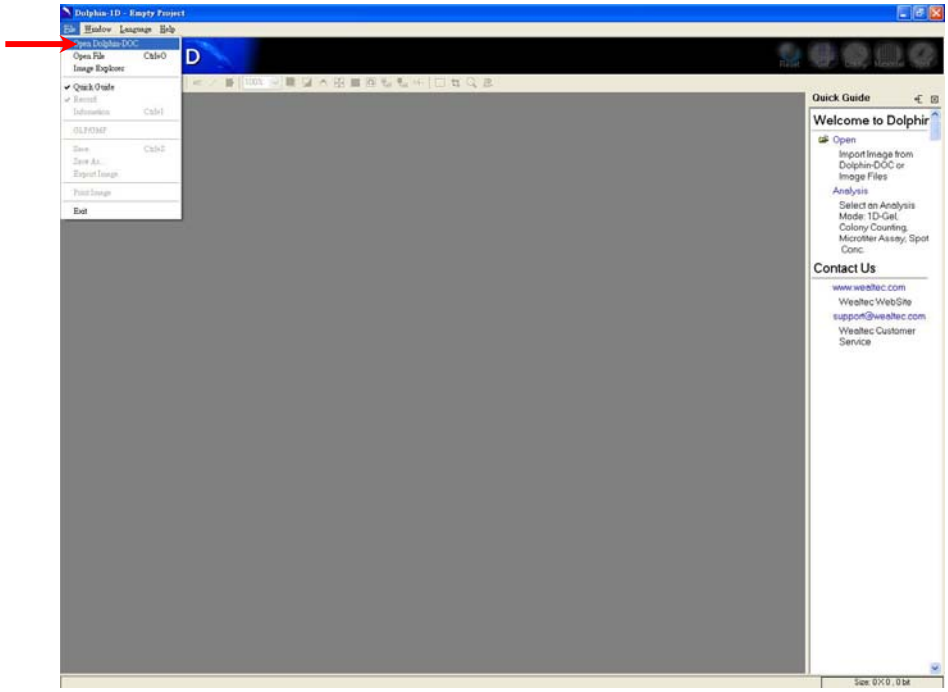
Dolphin-1D software supports Dolphin-Doc/-Doc^{Plus}, Dolphin-Chemi/Chemi^{Plus} and Dolphin-Scan Image system to capture image. Follow the procedures with appropriate Dolphin Image System.

Note: Dolphin-Doc is taken as a reference in the following examples. If you have purchased other than Dolphin-Doc image system and intended to use please select appropriate image system in every option selection of Dolphin-Doc in this manual. To scan image with Dolphin-Scan please refer to Dolphin-Scan operation manual for detail information.

C-1. Capture image with Dolphin Image System:

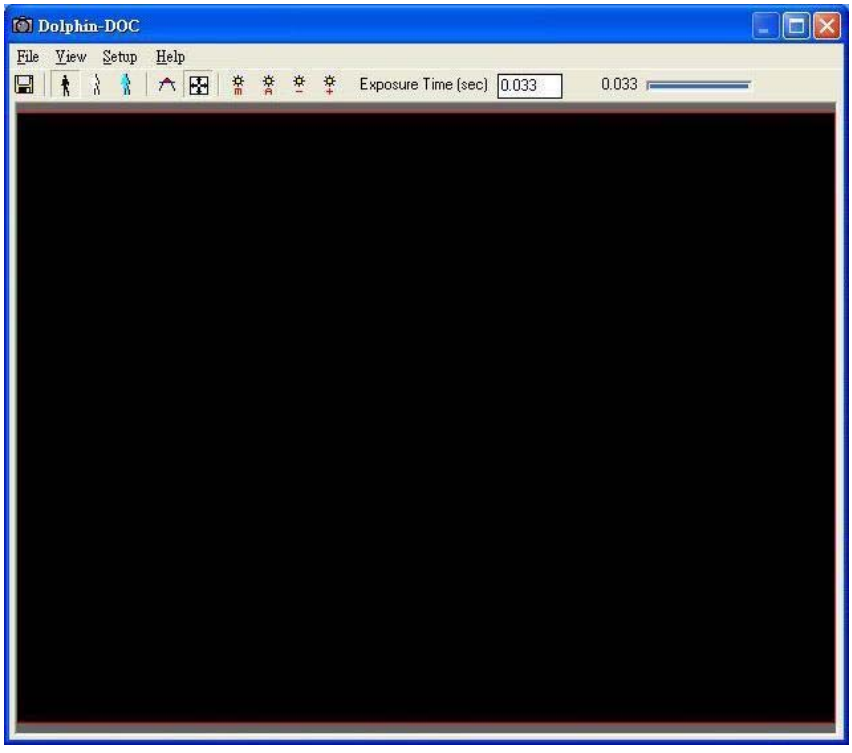
1. Click “Open” from quick guide or “New Image from Peripheral” icon then select and click “Open Dolphin-DOC”, or select and click “Open Dolphin-DOC” from file menu.
   Note: Dolphin-Doc is taken as a reference in the following examples. If you have purchased any other than Dolphin-Doc image system and intended to use please select appropriate image system in every option selection of Dolphin-Doc in this manual. To scan image with Dolphin-Scan please refer to Dolphin-Scan operation manual for detail information.



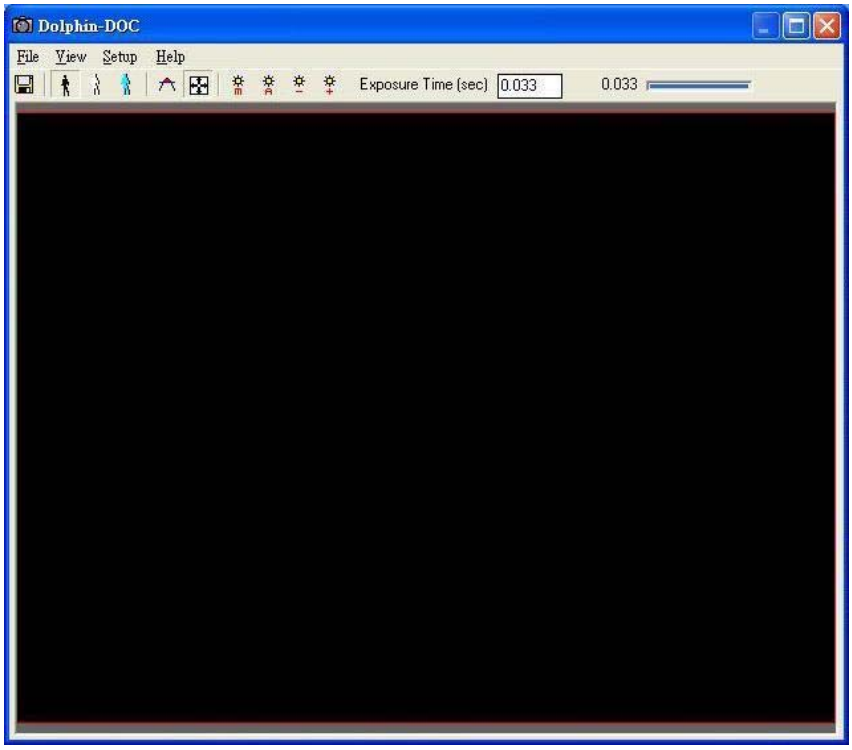


2. Image capture window will pop up.

Note: If none detected the windows will display no image.



C-2. Selection of capturing mode:



 Capture / Click “Capture” from file menu:

Allows user to capture the displayed targeted sample image and to exit the capturing window by returning to Dolphin-1D main menu windows to further analyze or process the captured sample image.

 Live mode / Click “Live” from view menu:

Allows user to view the sample image in live mode. Real time display signal transferred from image system.

 Preview mode / Click “Preview” from view menu:

Allows user to view the sample image in preview mode. Preview the capturing image continuously prior to the preset duration of the exposure time.

Note: Ensure to adjust the CCD if the lowest exposure time results in the brighter sample image.

 Freeze mode / Click “Freeze” from view menu:

Allows user to freeze the sample image.

 Saturation warning / Click “Saturation Warning” from setup menu:

Allows user to view the saturation warning.

 Full screen / Click “Full Screen” from setup menu:

Allows user to view the sample image in full screen.

 Manual exposure / Click “Manual Exposure” from view menu:

Allows user to have the manual exposure for viewing the sample image. Display the sample image prior to the preset duration of the exposure time.

 Automatic exposure / Click “Automatic Exposure” from view menu:

Allows user to have the automatic exposure for viewing the sample image. Display the sample image with automatic object detection.

 Decrease exposure time / Click “Increase” from setup menu by selecting “Exposure Time”:

Allows user to decrease the exposure time for manual viewing of the sample image.

 Increase exposure time / Click “Decrease” from setup menu by selecting “Exposure Time”:

Allows user to increase the exposure time for manual viewing of the sample image.

Note:

In preview mode, user may adjust the exposure time which will be displayed automatically as the preview takes place on the changes immediately. For adjustment click the exposure time decreasing or increasing from the icon exposure time or input the value directly into the “Exposure Time (sec)” box.

In freeze mode, users have to manually adjust the exposure time. User may adjust the exposure time by decreasing or increasing from the icon exposure time or input the value directly into the “Exposure Time (sec)” box. Then click the “Manual exposure icon” for the changes to take effect.

For Dolphin-Doc or Dolphin-Chemi ensure the settings of “Video Standard” from setup menu before capturing the image.

- select “NTSC” if local power source is 60Hz;
- select “PAL” if local power source is 50Hz.

C-3. Gel capturing procedure:

C-3-1. DNA/RNA EtBr Stained Gel or other **Dark Background** sample.

a). Open Dolphin Image System darkroom door.

b). Turn on the Epi-light source and place the gel on the UV transilluminator.

c). Start Dolphin-1D software.

d). Click “Open” in quick guide and select “Dolphin-Doc”. (Please refer to step “C-1. Capture Image with Dolphin Image System” for details)

Note: Dolphin-Doc is taken as a reference in the following examples. If you have purchased any other than Dolphin-Doc image system and intended to use please select appropriate image system in every option selection of Dolphin-Doc in this manual.

e). Click “  ” to monitor the adjustment of gel position, lens aperture, zooming and focus.

f). Close the darkroom door, switch the light source to “Trans” for UV transilluminator.

g). To capture the image, choose one of the option below

i). Click “  ” upon acquiring optimal image.

ii). Click “  ” and adjust the exposure time for image optimization or upon adjusting the exposure time, click “  ”. Then click “  ”.

iii). Click “  ” to get the auto-optimized image then click “  ”.

C-3-2. Protein SDS-PAGE Gels or other **Colormetric** samples.

a). Open Dolphin Image System darkroom door.

b). Turn on the Epi-light source and choose one of the option from below

i. Place the gel on the UV transilluminator.

ii. Place the gel on a white plate or optional UV/white light converter plate on top of UV transilluminator.

c). Start Dolphin-1D software.

d). Click “Open” in quick guide and select “Dolphin-Doc”. (Please refer to step “C-1. Capture Image with Dolphin Image System” for details)

e). **Note**: Dolphin-Doc is taken as a reference in the following examples. If you have purchased any other than Dolphin-Doc image system and intended to use please select appropriate image system in every option selection of Dolphin-Doc in this manual.

f). Click “  ” to monitor the adjustment of gel position, lens aperture, zooming and focus.

g). Close the darkroom door, choose one of the option from below

i. If gel were placed on the UV transilluminator as from step (b)-(i) then skip to step (g).

ii. If gel were placed on a white plate or optional UV/white light converter plate on top of UV transilluminator as from step (b)-(ii) then switch the light source from “Epi” to “Trans” for UV transilluminator.

h). To capture the image, choose one of the option below

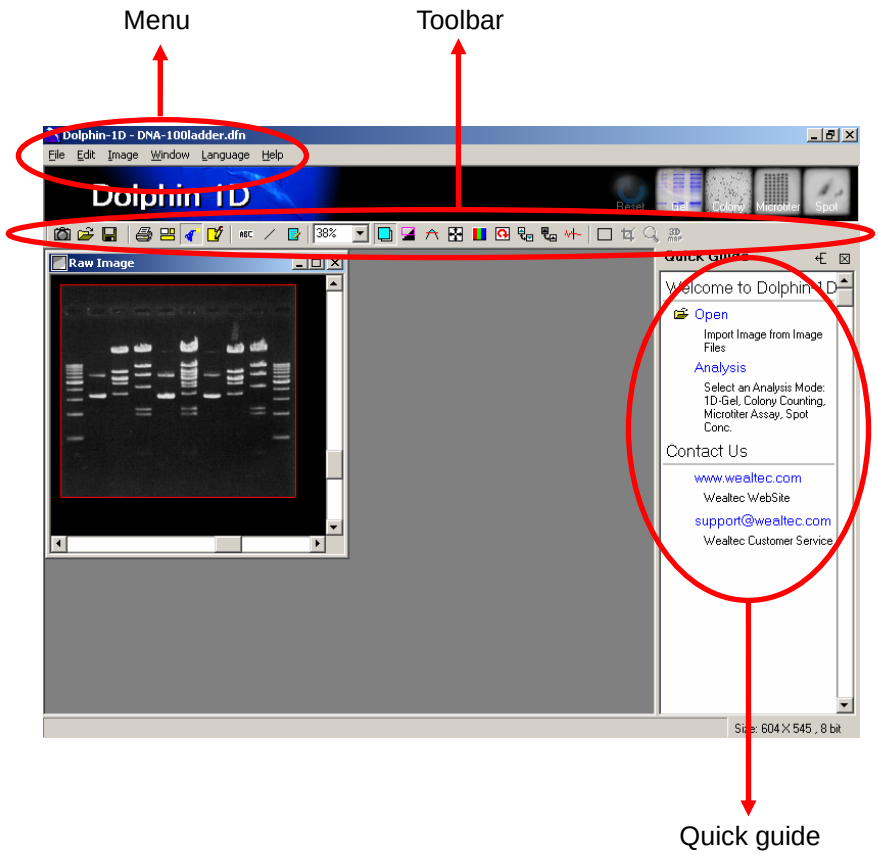
i. Click “  ” upon acquiring optimal image.

ii. Click “  ” and adjust the exposure time for image optimization or upon adjusting the exposure time, click “  ”. Then click “  ”.

iii. Click “  ” to get the auto-optimized image then click “  ”.

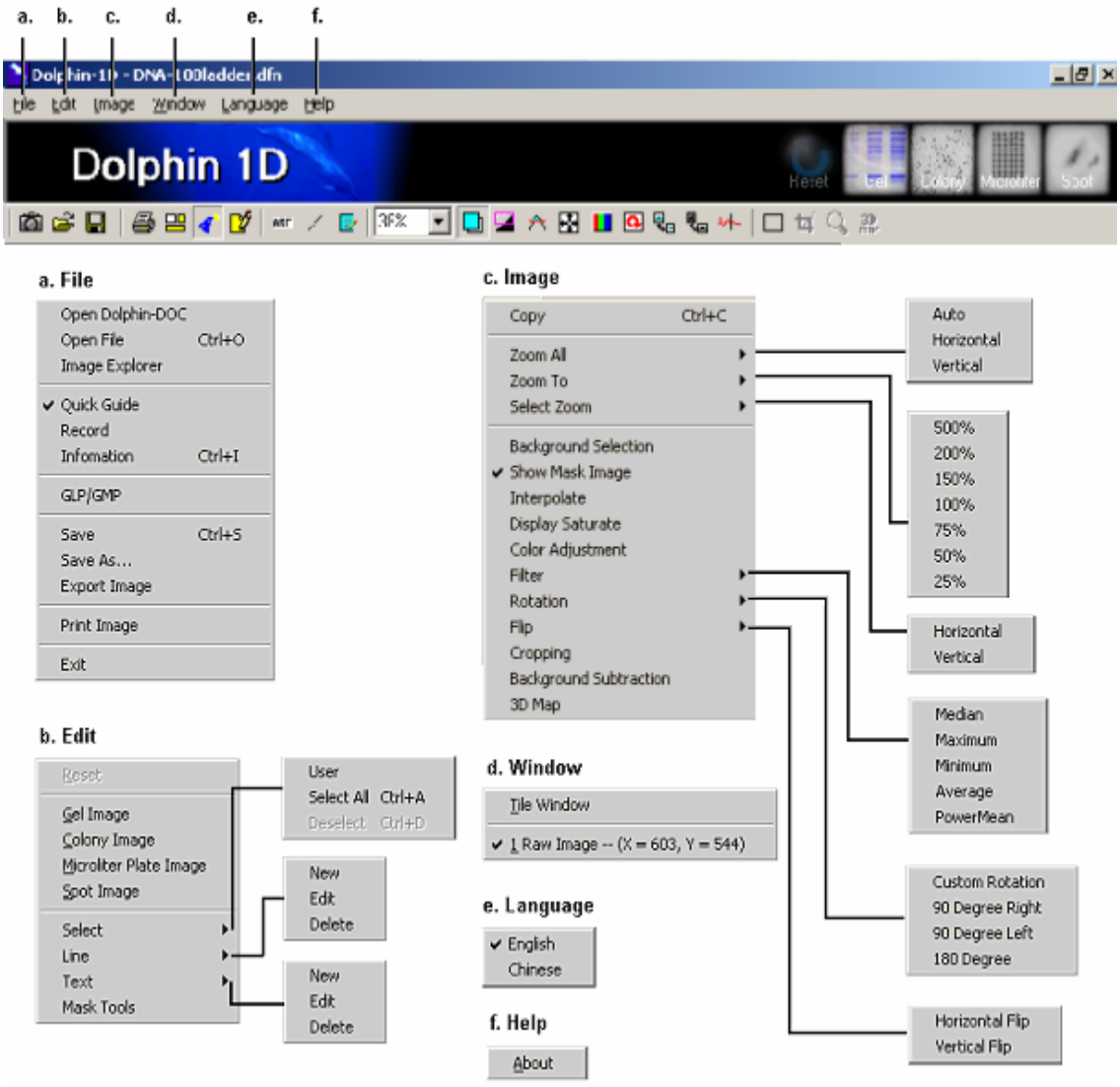
D. Image Enhancement

Images can be captured from peripheral or loaded from disk upon starting up Dolphin-1D software. A window will pop up with toolbar, provide tools to assist processing further the image analysis.

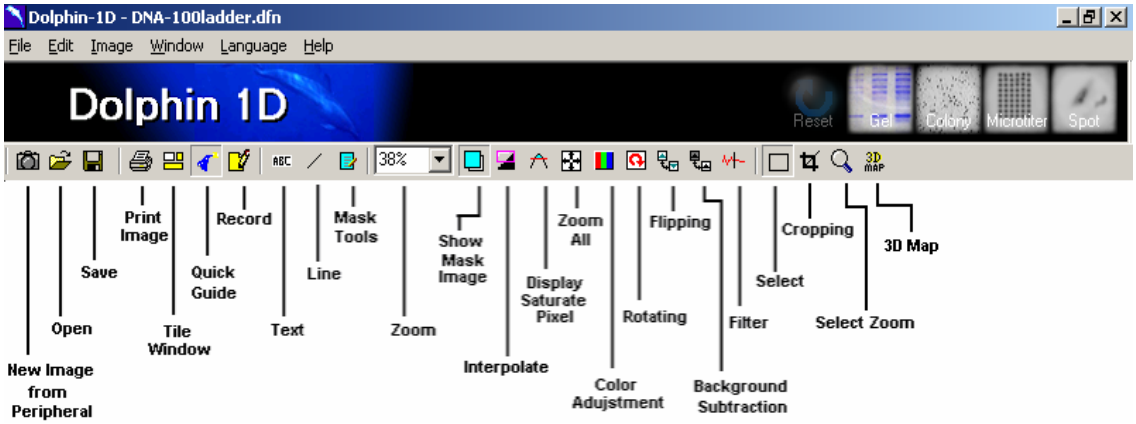


D-1. Operation interface introduction:

Menu introduction:



Tool bar introduction:



New image from peripheral tool:

Allows user to acquire an image from Dolphin Image System.

Open image tool:

Allows user to open an image from hard disk, USB disk, CD-ROM etc.

Save tool:

Allows user to save the file.

Print image tool:

Click to print the image.

Tile window tool:

Allows user to arrange multiple windows on same screen. User will be able to work on multiple windows simultaneously, switching between the windows is not needed.

Quick guide tool:

Open a user-friendly tool window containing all the essential tools based on the type of analysis. The quick guide tool window will be displayed on the right of user's working window.

Record tool:

Keep tracks the 7 manipulations during the image analysis. User can switch back to previous actions by double clicking on the "record" icon followed by double clicking in the "History Record" pop-up window. Record tool only tracks the previous actions where the original image data has been modified.

Text tool:

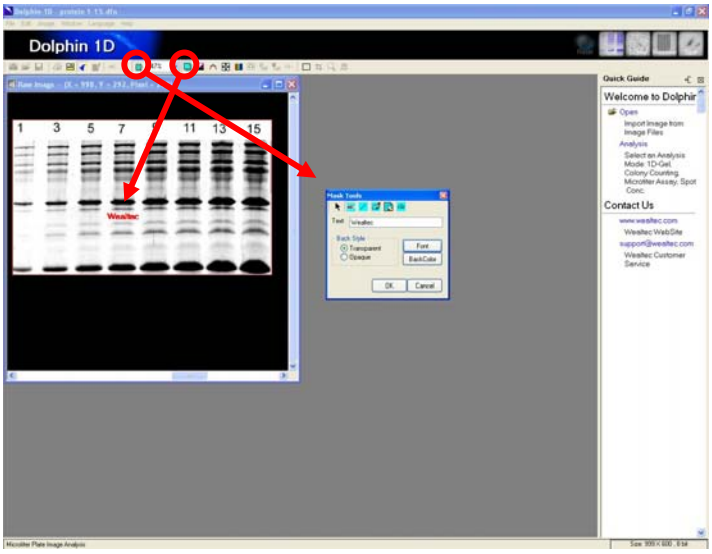
Allows user to add text on the image for annotation.

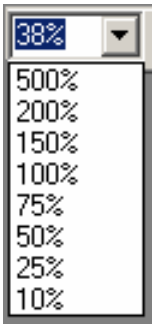
Line tool:

Allows user to add line or arrows on image for annotation.

Mask tool

Allows user to add text, line on a mask with rubber and clean tool to edit. Assume a text “Wealtec” is labeled. While writing the text it will appear on the image and upon clicking “OK” button the “Show mask image tool” button will be selected automatically indicating showing the mask.



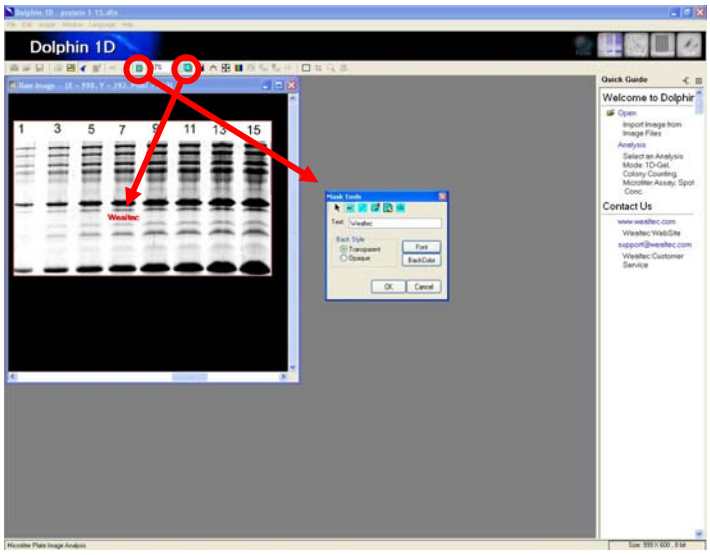


Zoom tool:

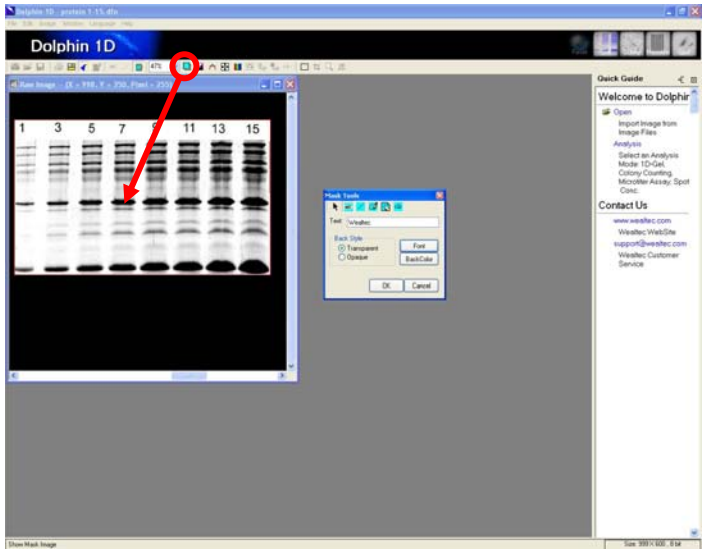
Allows user to select the view of the desired zooming size.

Show mask image tool:

Show or hide the edited text or lines mask on the image. Selecting or deselecting this tool allows user to see or hide the edited labeling text or lines on the Image.

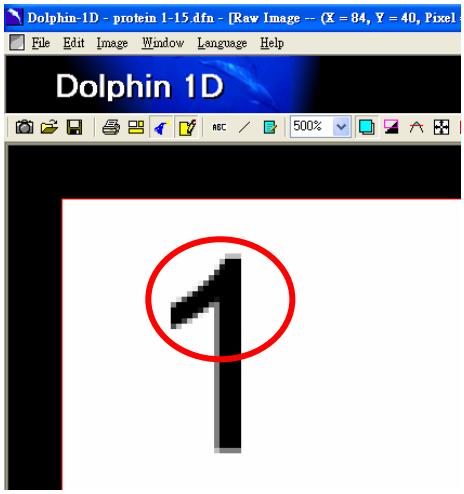


Deselecting this tool allows the edited labeling text or lines to be hidden on the Image.

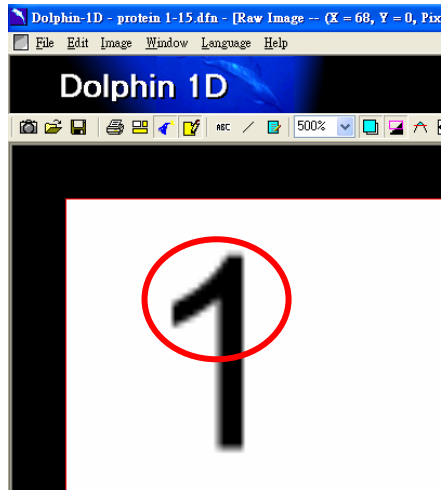


Interpolate tool:

Smoothen the border of the image. This tool only changes the image outlook on the screen and will not change the image data.



a) Before interpolation



b) After interpolation

Display saturate pixel tool:

The saturated pixels will be displayed as a warning to advice user of potential inaccurate results.

Zoom all tool:

Magnify the whole image to fit the screen. User can choose to magnify the image horizontally or vertically.

Color adjustment tool:

Allows user to adjust the brightness, contrast, histogram and color of the image and the background. Clicking on the tool will pop up a dialog box. Choose from various parameters to adjust the color and sharpness of user's image.

Rotating tool:

Allows user to rotate, reorient or adjust the angle of the image. Click on rotation icon and choose from custom rotation, 90 Degree right, 90 Degree left or 180 Degree. By choosing "Custom Rotation" tool, a new dialog box will pop up where user can either enter the value of rotation or click on "grid" to rotate manually. It is disabled under GLP/GMP mode.

Flipping tool:

Allows user to turn the image by 180 degrees horizontally (flip horizontal tool) or by 180 degrees vertically (flip vertical tool). It is disabled under GLP/GMP mode.

Background subtraction tool:

Allows user to define a region on the image as a background and subtracts the defined background intensity from the entire image. This tool is especially useful in the case where the

background intensity is evenly distributed. It is disabled under GLP/GMP mode.

 **Filter tool:**
Allows user to obtain the optimized image by filtering the noise. It is disabled under GLP/GMP mode.

 **Select tool:**
Allows user to define a region on the image for selected zooming and cropping. Click on select tool and drag the box to the region of interest.

 **Cropping tool:**
Allows user to cut and preserve the selected region on the image. The unselected portion of the image is deleted. It is disabled under GLP/GMP mode.
(**Note**: In order to enable or use this tool select the region first with “Select” tool)

 **Select zoom tool:**
Magnify the selected image region. Click on Zoom tool and choose horizontally or vertically to magnify the selected region of the image.
(**Note**: In order to enable or use this tool select the region first with “Select” tool)

3D Map tool:
This shows the 3D profile of the selected image region.
(**Note**: In order to enable or use this tool select the region first with “Select” tool)

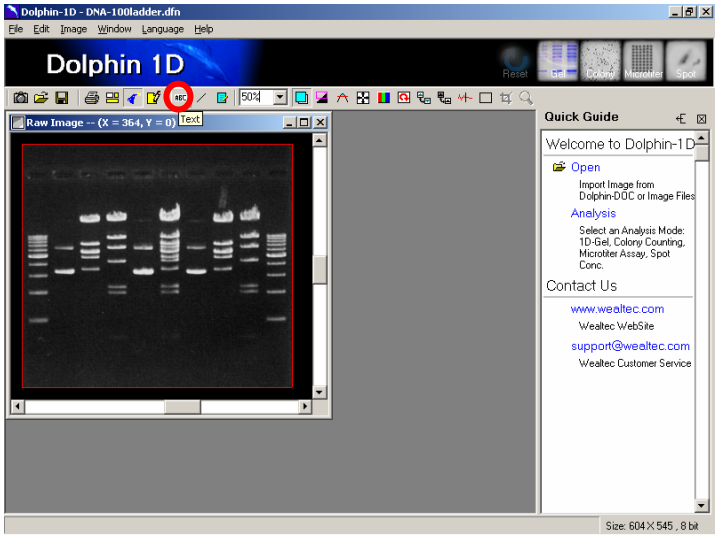
D-2. Image annotation:

Three options available to make annotation in Dolphin-1D: Text tool, line tool, and mask tool. The text made by text tool is movable and editable. It is like a sticker on the image, and allows the same size in different zooming. The line made by line tool is movable. The direction and length of line is editable. The mask tool is like drawing on the transparent drawing paper on the image. The text and line made by mask tool is fixed on the relative position of image. It is not movable and editable, but can be removed or erased with eraser.

D-2-1. Text tool:

Note: The size of text tag will not change when you enlarge or shrink the view size of the image. The text tag can be moved, edited and deleted. It is also can be printed out along on the image.

1. Click “ABC” icon on tool bar



2. Use mouse pointer or cursor and click on the image. A text dialog box will pop up and Text Tag will appear on the image. Type the image title or the lane and band information in the Text Tag box.

   Note: Adjust the position of text on the image by clicking and dragging the text with the mouse pointer or cursor to desired position.

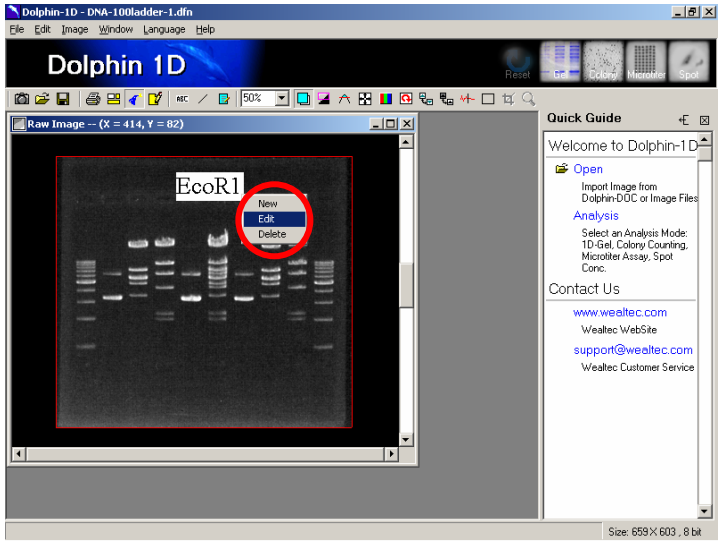
3. Choose the background style of the text as “Opaque” to highlight the text on the image or “Transparent” for the text to simply appear transparently on the image.

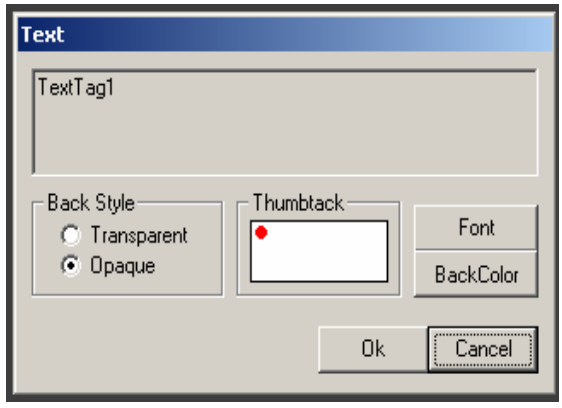
4. To highlight the text, choose the background color by clicking on “BackColor” from Text dialog box.

5. Click on “Font” icon to adjust the font type, style, size, color and effects.

   Note: The thumbtack fixes a reference point for the text on the image. The text remains tagged at the same position on the image and font size remains the same, even if the image is enlarged or reduced in size.

6. To edit the text, double click on the text on the image or right click and choose “Edit” or “Delete” to delete the text.

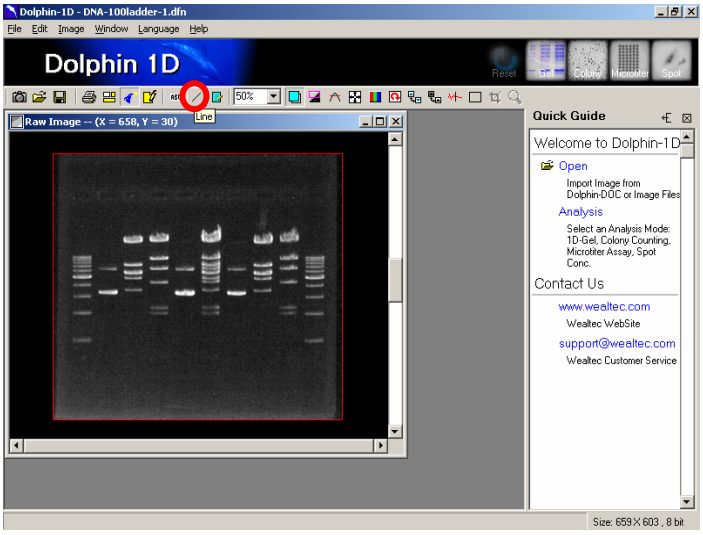




D-2-2. Line tool:

Note: The size of text tag will not change when you enlarge or shrink the view size of the image. The text tag can be moved, edited and deleted. It is also can be printed out along on the image.

1. Click “line” icon on the tool bar



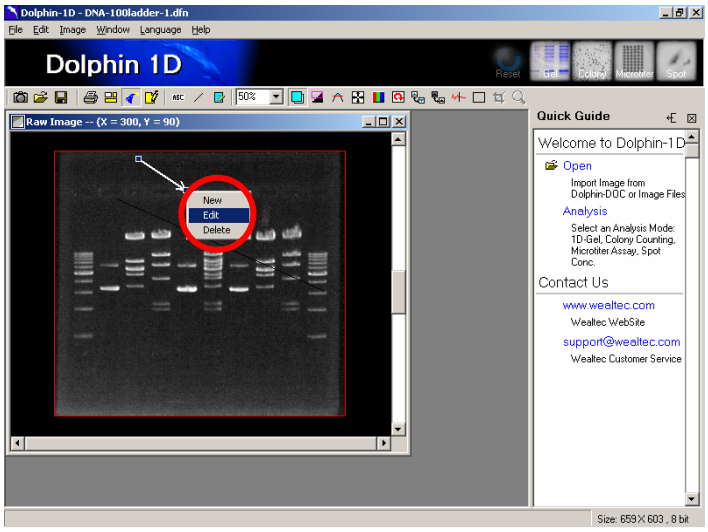
2. Drag the pointer on the image and draw a line. A line dialog box will appear as below.

3. Select the line style and the width from “Line Style” and “Line Width” pull down menu.
   Note: Adjust the position and angle of the line on the image by clicking on it and dragging the two end point of the line (square boxes at either end of the line) to desired position.

4. In order to use line, select “Don’t Use” option on “Line Arrow” dialog box. To use an arrow, choose the type of the arrow from “Line Arrow” pull down menu.

5. Choose the line color from “Color” button in the line dialog box.

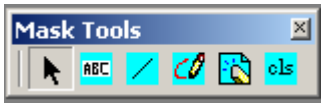
6. To edit the line, double click on the line on the image or right click and choose “Edit” or “Delete” to delete the line.



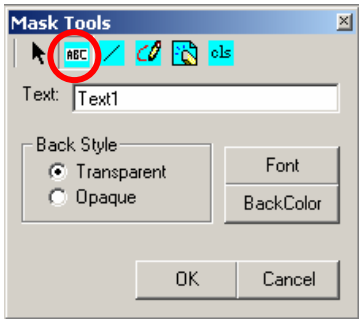
D-2-3. Adding mask:

Mask Tools are the functional tools for text label, line label, pen signature, eraser and clear-all mask labels on the image. The size of text tag and line drawing on the image can be altered to the viewing side of image. They can not be moved and edited but can be removed by erasing with eraser. This option also allows the user to show or not to show mask while viewing or printing the image.

1. Adding text on mask:
   a.) Click  “mask” icon on tool bar, mask tools window will pop up.



   b.) Click  “ABC” icon on mask tool window.
   c.) Use mouse pointer or cursor and click on the image. A text dialog box will pop up and Text Tag will appear on the image. Type the image title or the lane and band information in the Text Tag box and click ”OK” to enter the input.



Note: Adjust the position of text on the image by clicking and dragging the text with the mouse pointer or cursor to desired position before clicking “OK”.

d.) Choose the background style of the text as “Opaque” to highlight the text on the image or “Transparent” for the text to simply appear transparently on the image.

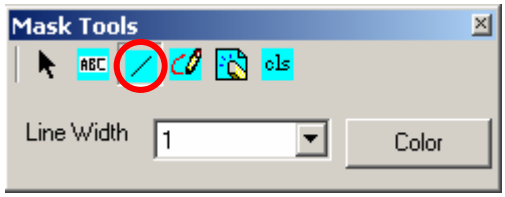
e.) To highlight the text, choose the background color by clicking on “BackColor” from Text dialog box.

f.) Click on “Font” icon to alter the font type, style, size, color and effects.

2. Adding line on mask:

a.) Click  “mask” icon on tool bar, mask tools window will pop up.

b.) Click  “line” icon on mask tool window and a line dialog box will pop up.



c.) Select the line width from “Line Width” pull down menu.

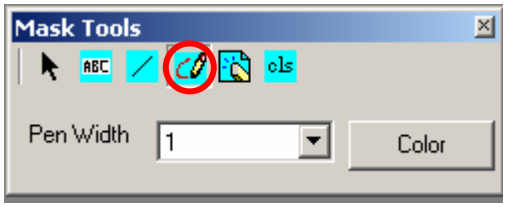
d.) Choose the line color from “Color” button.

e.) Drag the mouse pointer or the cursor on the image to draw a line.

3. Drawing on mask:

a.) Click  “mask” icon on tool bar, mask tools window will pop up.

b.) Click  “pen” icon on mask tool window and a pen dialog box will pop up.



c.) Select the pen width from “Pen Width” pull down menu.

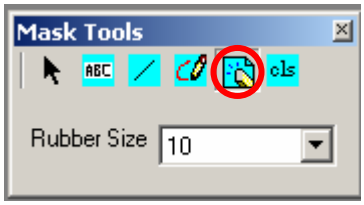
d.) Choose the pen color from “Color” button.

e.) Drag the mouse pointer or the cursor on the image to draw the irregular line.

4. Erase image (text, line, drawing) on mask

a.) Click  “mask” icon on tool bar, mask tools window will pop up.

b.) Click  “eraser” icon on mask tool window and an eraser dialog box will pop up.



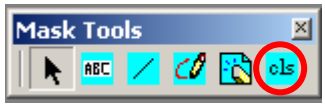
c.) Select the eraser size from “Rubber Size” pull down menu.

d.) Drag the mouse pointer or cursor on the image to erase the image on the mask.

5. Clear mask image

a.) Click  “mask” icon on tool bar, mask tools window will pop up.

b.) Click  “cls” icon on mask tool window and a dialog window will pop up.



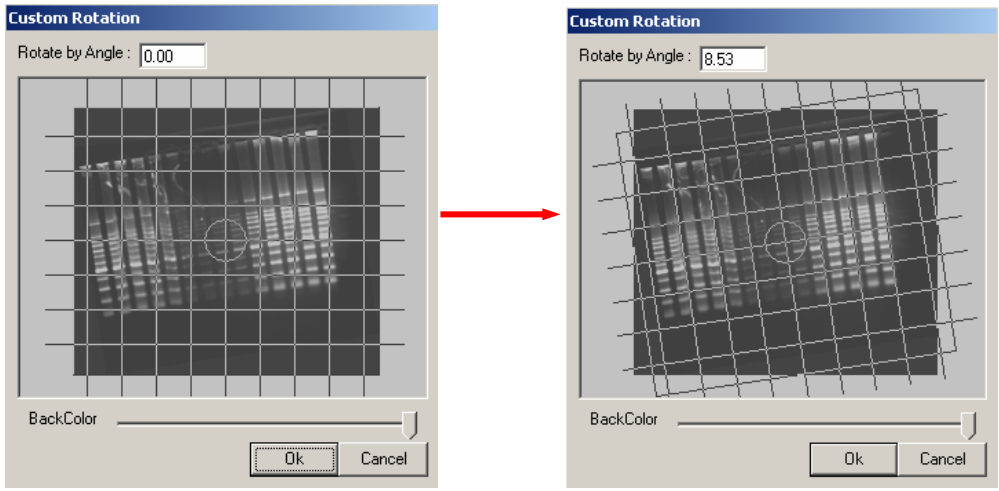
c.) Click “Yes” to clear mask image or click “No” to leave the dialog window.

D-3. Image modification:

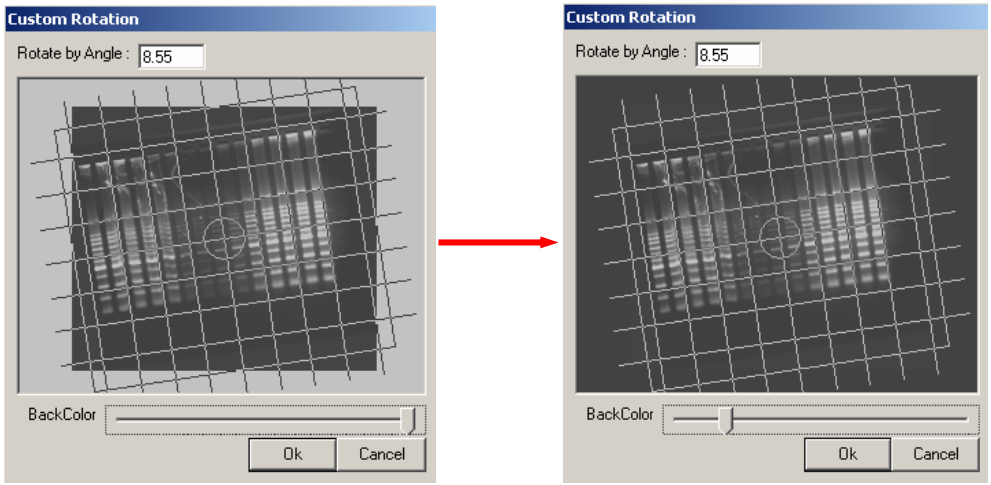
Previous actions or history record can be viewed by clicking  "Record" on tool bar followed by double clicking on "History Record" pop-up window. Image data will be permanently changed upon saving the file. The functions in this section are disabled under GLP/GMP mode.

D-3-1. Rotating

1. Click  "Rotating" icon on tool bar.
2. Select "90 Degree Right", "90 Degree Left", or "180 Degree" to rotate as required, or select "Custom Rotation" for any other desired rotate angle.
   a.) Adjust angle of image with input angle value or rotate the grill.



   b.) Drag the slider bar to adjust the background color.

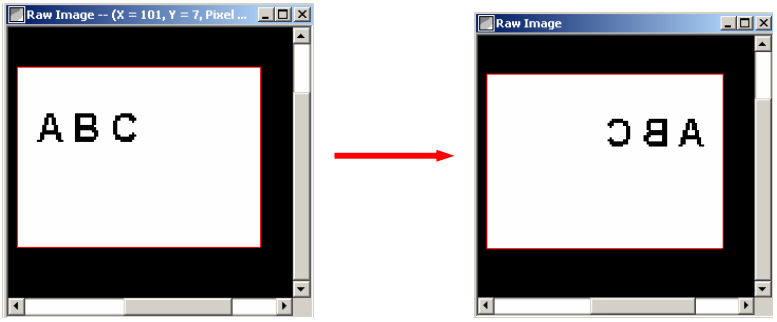


   c.) Click "Ok" to rotate the image.

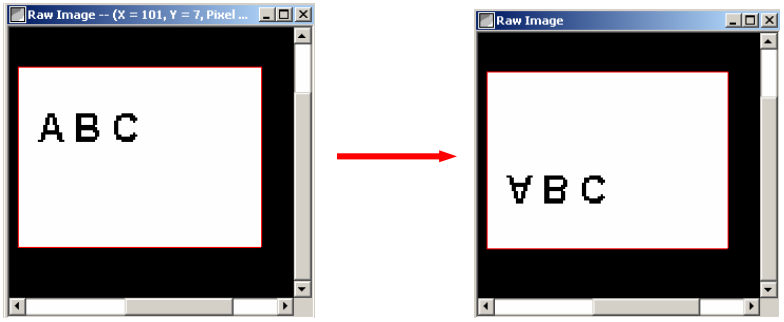
D-3-2. Flipping

1. Click  “Flipping” icon on tool bar.
2. Select “Horizontal Flip” or “Vertical Flip” to flip the image.

a.) Horizontal flip

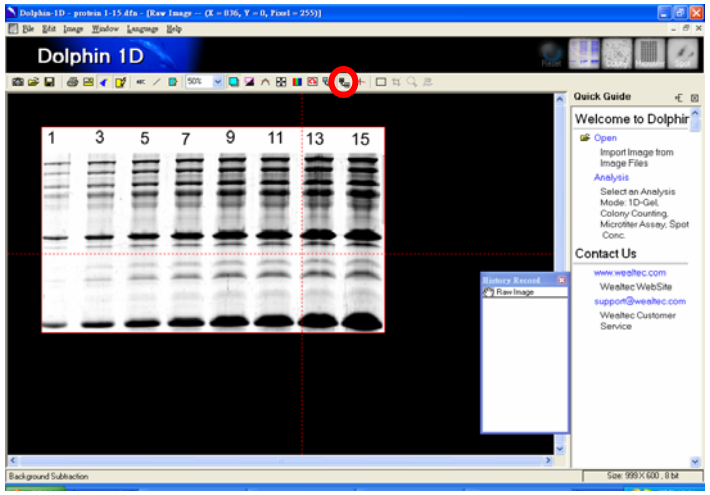


b.) Vertical flip

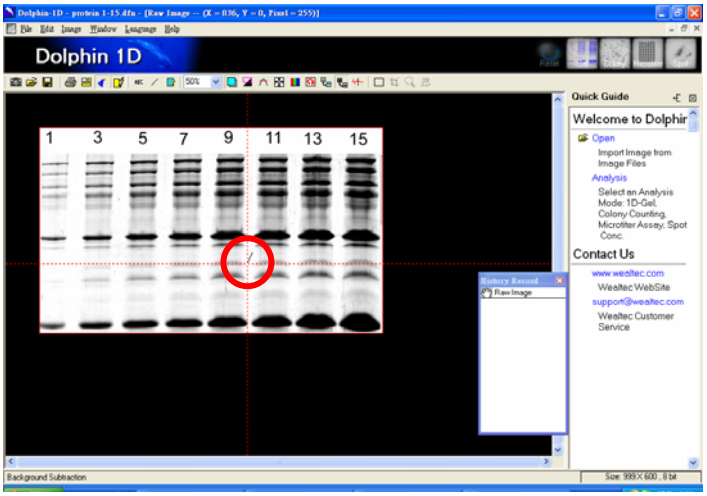


D-3-3. Background subtraction:

1. Click  “Background Subtraction” icon on tool bar.



2. Move cursor to draw a line on the image by click holding the left mouse on the image.

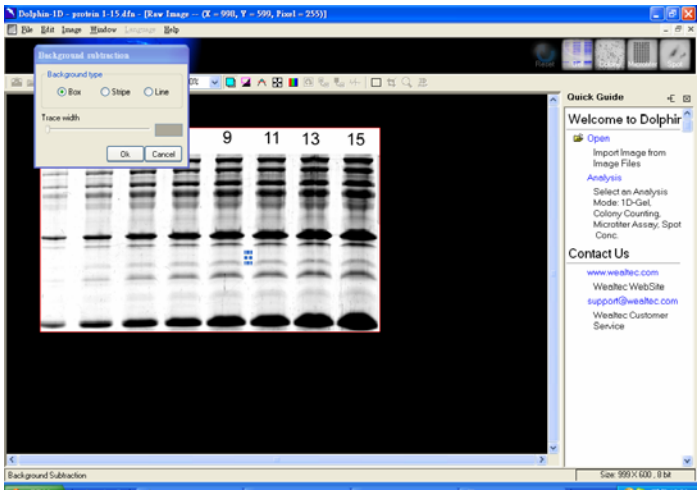


3. “Background subtraction” window will pop up. Select gel’s background type and trace width by selecting “Box”, “Stripe” or “Line”. Then click “Ok” to proceed.

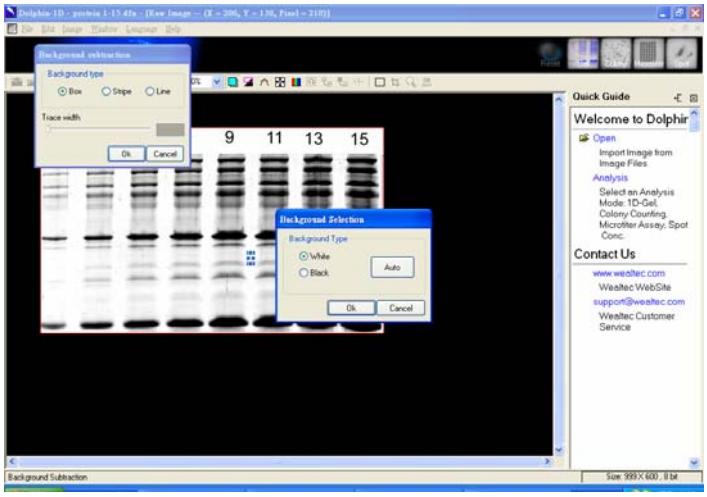
   a. Box: This function is applied to evenly distribute background intensity. It subtracts the selected area’s background intensity from the whole image.

   b. Stripe: This function is used for an uneven background from left to the right. Mark the background area from left to the right and drag the slider bar to adjust “Trace width”.

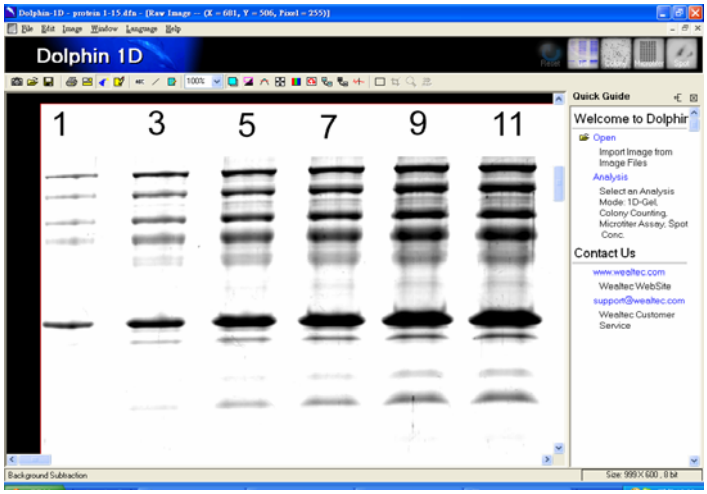
   c. Line: This function is applied for an uneven background from top to the bottom. Mark the background area from the top to the bottom and drag the slider bar to adjust “Trace width”.



4. Auto-background selection window will pop up. Select the background type and click “Ok” to proceed.



5. The resulting background subtracted image.



D-3-4. Filter:

1. Click  “Filter” icon on tool bar.
2. Select “Median”, “Maximum”, “Minimum”, “Average” or “PowerMean” to remove noise from the image. The filter size is 3 x 3 pixels.
   a.) Median: It replaces the pixel with the median pixel in 3 x 3 filter.
   b.) Maximum: It replaces the pixel with the maximum pixel in 3 x 3 filter. This filter is suitable for reducing only black noise and will enlarge white noise. In other words, it will reduce “pepper noise” (specks darker than the background), but will aggravate “salt noise” (specks lighter than the background).
   c.) Minimum: It replaces the pixel with the minimum pixel in 3 x 3 filter. This filter is suitable for reducing only black noise and will enlarge white noise. In other words, it will reduce “pepper noise” (specks darker than the background), but will aggravate “salt noise” (specks lighter than the background).
   d.) Average: It replaces the pixel with the averaged value in 3 x 3 filter.
   e.) Power Mean: It replaces the pixel with the value that processed by power mean in 3 x 3 filter.

D-3-5. Cropping:

1. Click  “Select” icon on tool bar to define the desired region on the image.
2. Click  “Cropping” icon on tool bar to delete unselected portion.

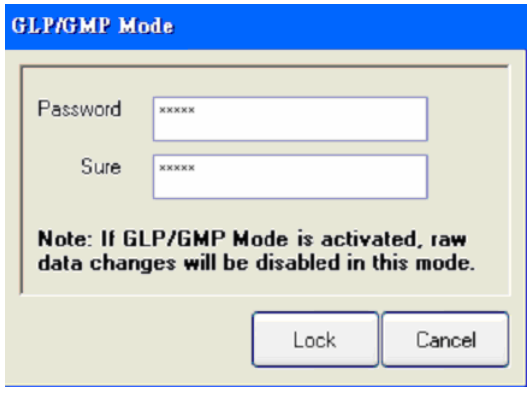
D-4. GLP/GMP mode:

When GLP/GMP function is activated, the image will be locked and cannot be modified. The modification function such as Rotating, Flipping, Background Subtraction and Filtering are disabled under GLP/GMP mode.

D-4-1. Activate GLP/GMP mode:

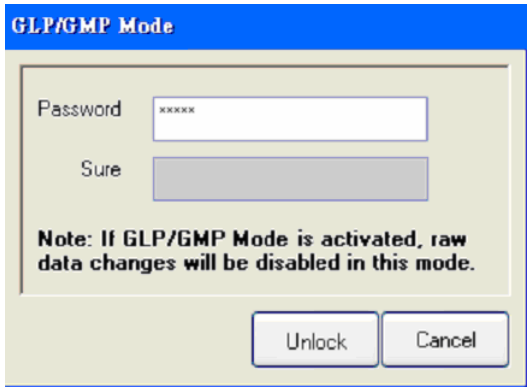
1. Open “GLP/GMP” dialog box by clicking “File” from menu and select “GLP/GMP”.
2. Input password and reenter again to confirm. Click “Lock” to activate GLP/GMP mode.

NOTE: Password is individually pre-settable **ONLY by operator**. Therefore, please remember the password for deactivation of the GLP/GMP mode. **Without password, neither operator nor Wealtec can deactivate GLP/GMP mode for raw data changes.**



D-4-2. Deactivate GLP/GMP mode:

1. Open “GLP/GMP” dialog box by clicking “File” from menu and select “GLP/GMP”.
2. Input password and click “Unlock” to deactivate GLP/GMP mode.



E. 3D Map

Upon starting Dolphin-1D software, images can be captured from peripheral or loaded from the disk. The tool bar will be displayed on top of the working window, provide tools to assist in processing further the image analysis.

E-1. Enabling 3D map tool

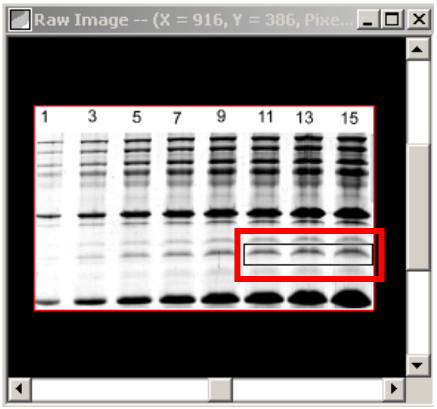
To enable the “3D MAP” icon click “Select” icon, or select and click “Select” from edit menu to choose the selection option “User” or “Select All Ctrl+A” or “Deselect Ctrl+D”.

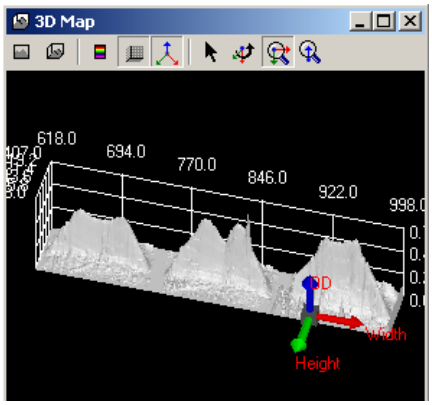
Click  “Select” tool on tool bar and move cursor on image to select desired image area.

Click 

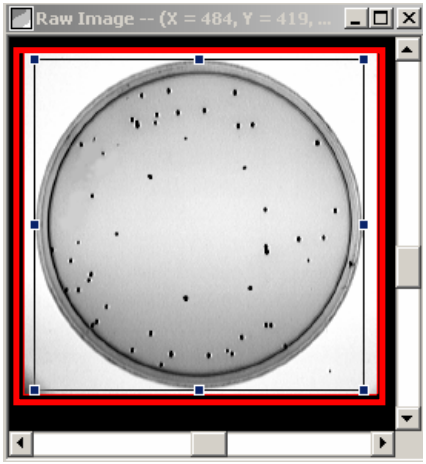
“3D Map” tool and select the image background color. The 3D Map window will pop up.

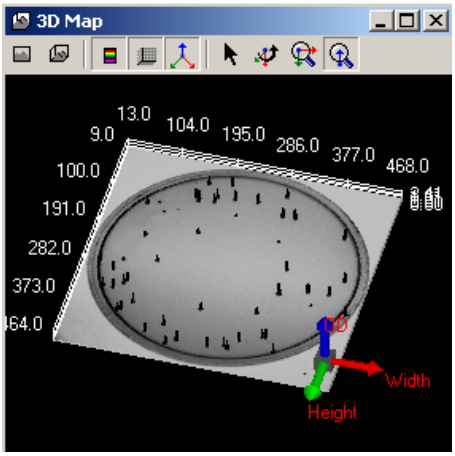
Given below is an example of 3D MAP of the selected region for gel image.



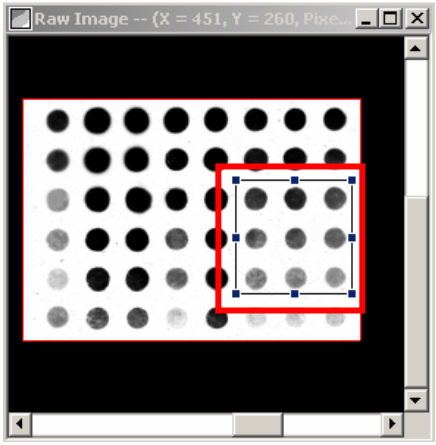


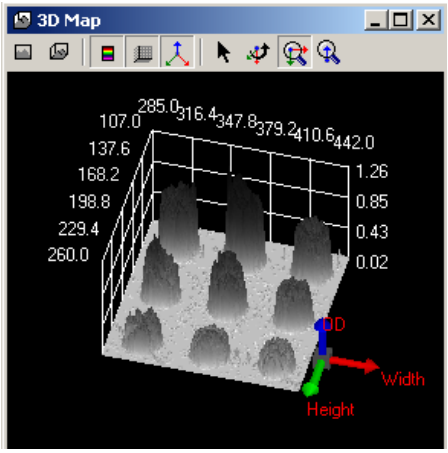
Given below is an example of 3D MAP of the selected region for colony image.



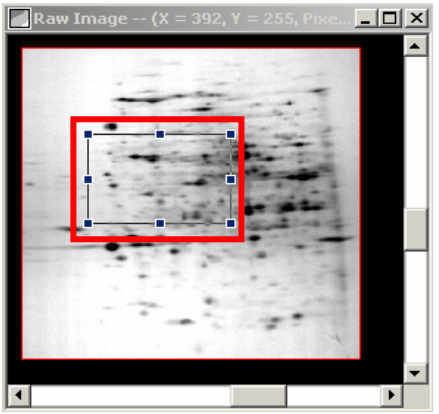


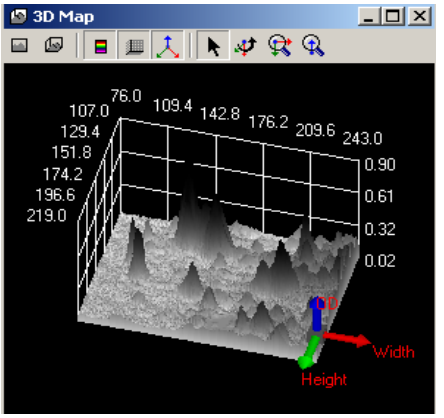
Given below is an example of 3D MAP of the selected region for microtiter plate image.





Given below is an example of 3D MAP of the selected region for spot image.





E-2. 3D Map tools

View front tool

Allows user to convert the image from 3D Map to 2D Map.

View custom tool

Allows user to return back the image to default 3D Map image.

Use color table tool

Allows user to display the 3D Map in ranging colors or in single color.

Show frame tool

Allows user to display coordinate frame on the image.

Show small coordinate tool

Allows user to display 3D coordination axis of the image at the right bottom of the window.

Move tool

Allows user to move the 3D Map image on the window using cursor.

Rotate tool

Allows user to rotate the 3D Map image using left mouse button. In general while using any other tools to rotate the 3D image right mouse button can be used.

Map zoom tool

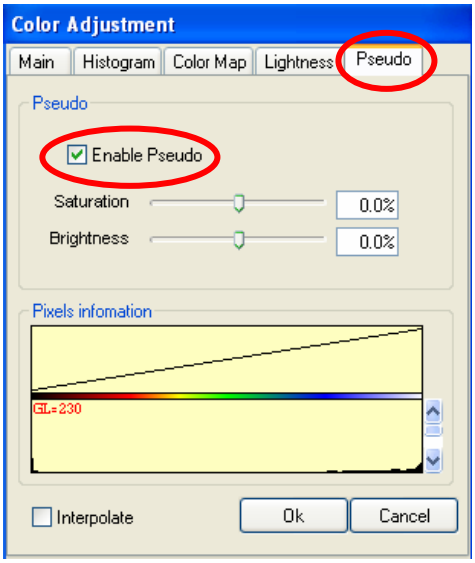
Allows user to enlarge or shrink the 3D Map image. Clicking and holding the left mouse button and moving the cursor to the right will enlarge the 3D Map image and moving the cursor to the left will shrink the 3D Map image.

Level zoom tool

Allows user to enlarge or shrink the single dimension of the OD axis. Clicking and holding the left mouse button and moving the cursor to the right will enlarge the OD axis of the 3D Map image and moving the cursor to the left will shrink the OD axis of the 3D Map image.

E-3. Color 3D map image

1. Click “Color Adjustment” tool on tool bar. Select “Pseudo” page and check “Enable Pseudo”.

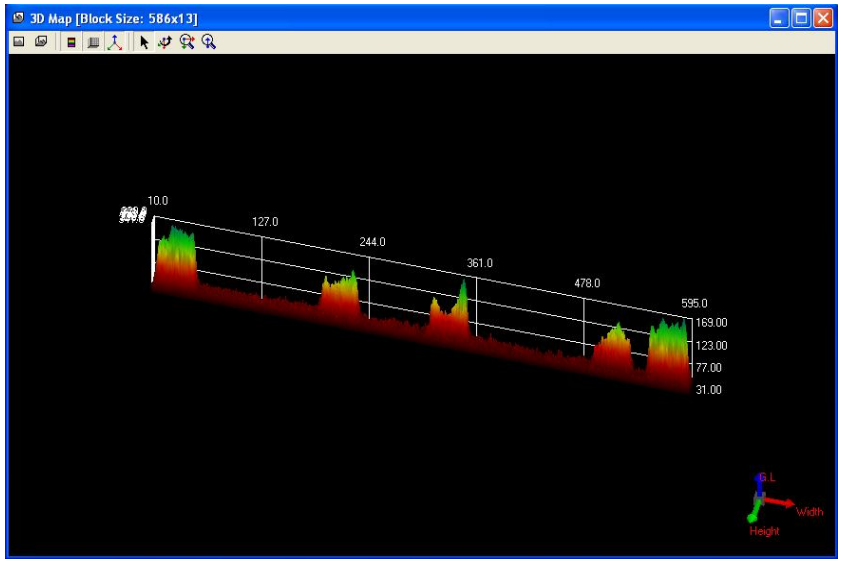


2. Click “Use Color Table” in 3D Map window to get color mode.

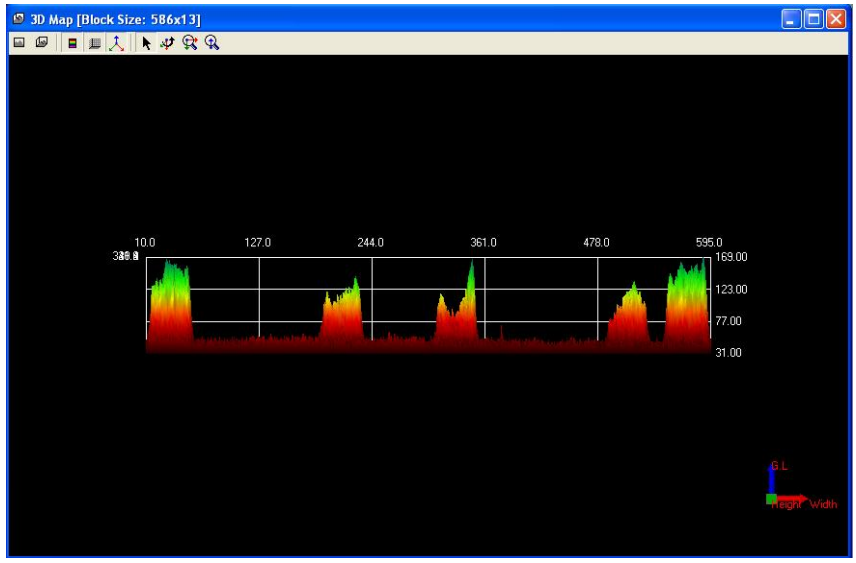
E-4. 3D map of single band profile

1. Click “Select” tool on tool bar and move cursor on image to select desired single band area.

2. Click  “3D Map” tool and the 3D Map window pops up. Click  “Use Color Table” to display 3D Map in color mode.



3. To view the single band profile in 2D select 2D mode by clicking  “View front”.



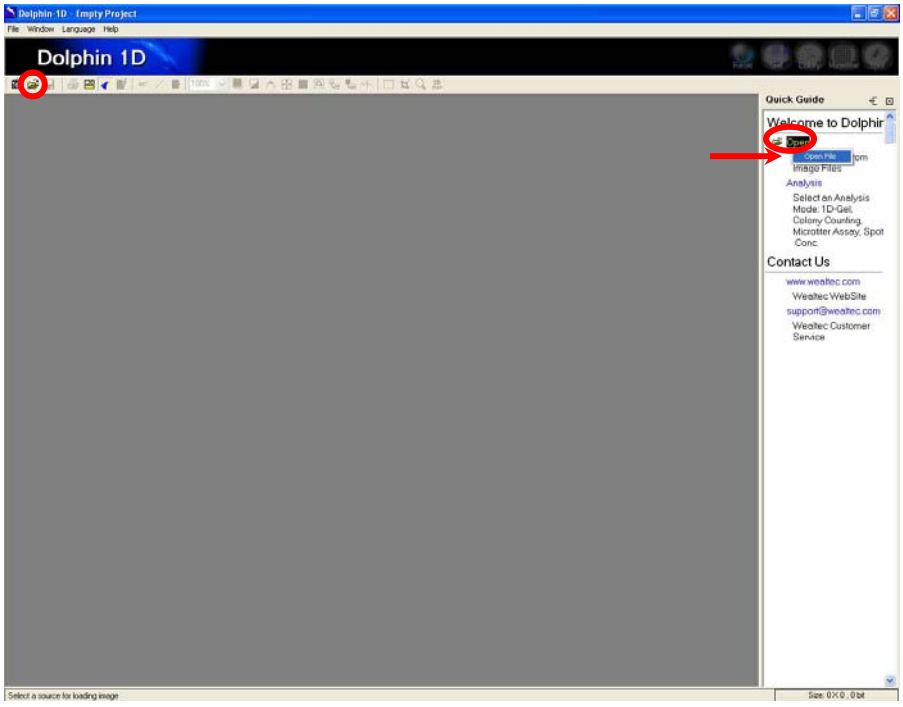
F. Gel Image Analysis

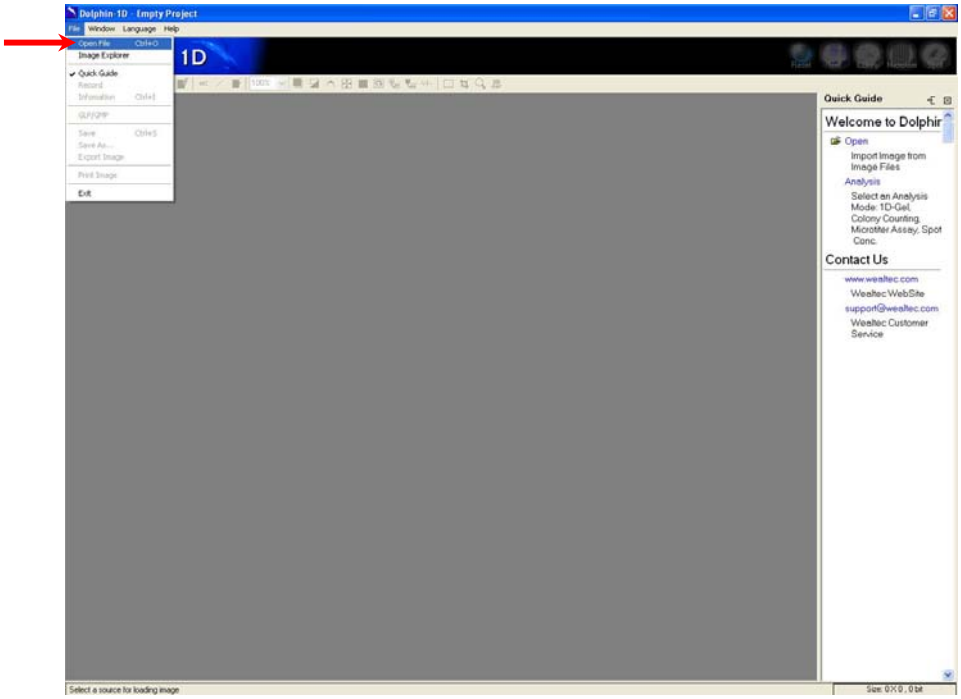
This chapter describes gel analysis tool of Dolphin-1D software. This tool allows user to analyze the gels, blots and X-ray films. DNA and protein gel image is taken as a reference in the following examples for tool description.

F-1. Capture / Import image:

1. To capture images from Dolphin Image System (eg. Dolphin-Doc) click “Open” from quick guide or “New Image from Peripheral” icon then select and click “Open Dolphin-DOC”, or select and click “Open Dolphin-DOC” from file menu. (Please refer to Chapter 3 for details).
   Note: Dolphin-Doc is taken as a reference in the following examples. If you have purchased other than Dolphin-Doc image system and intended to use please select appropriate image system in every option selection of Dolphin-Doc in this manual.

2. For stored images in the disk click “Open” from quick guide and select “Open File” or click “Open” icon, or select “Open File” from file menu then select the image file and click “Ok”.



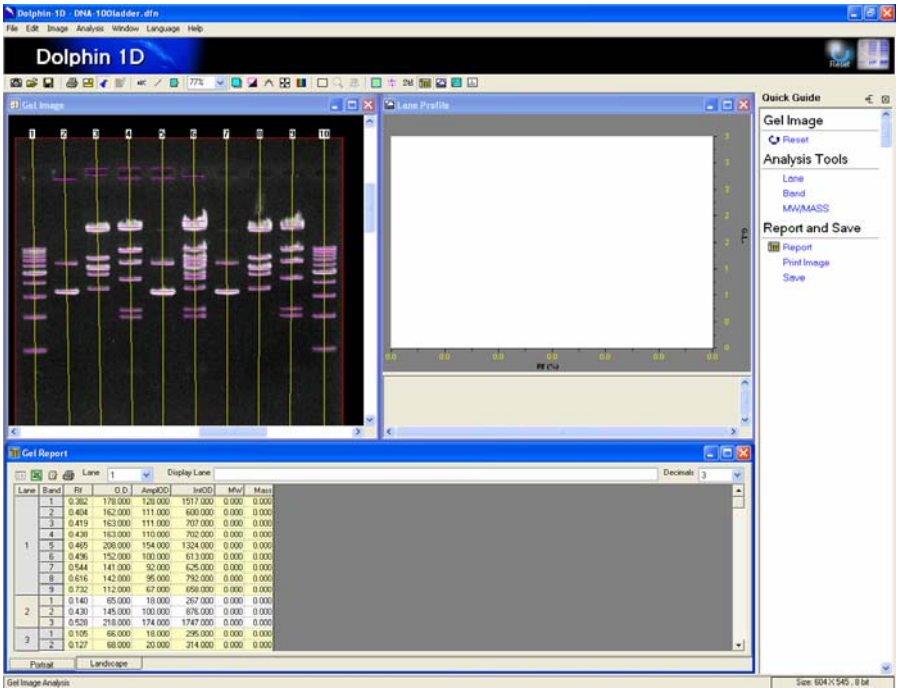


F-2. Gel image function:

1. Click “Analysis” from quick guide and select “Gel Image” or click “Gel” icon, or select “Gel Image” from edit menu to open gel analysis function.

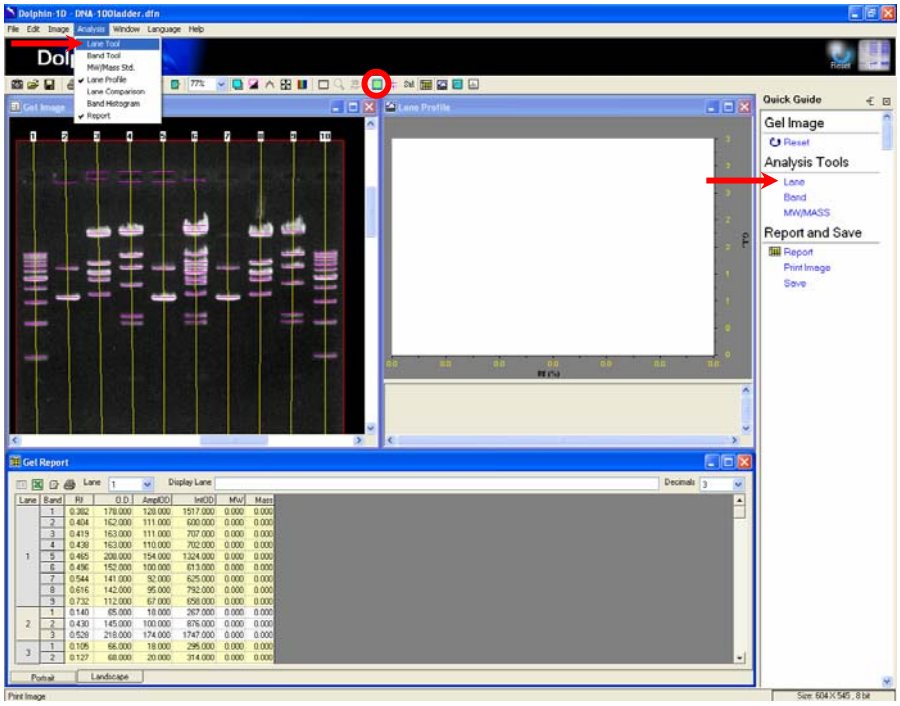
2. Select the appropriate background and click “Ok” button to proceed.

3. The program will define automatically the gel image, lane profile and gel report.

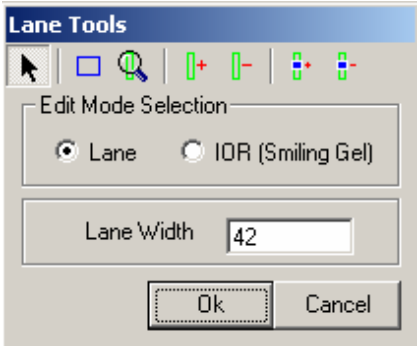


F.3. Lane analysis:

Click “Lane” from quick guide or “Lane Tool” icon, or select and click “Lane Tool” from analysis menu for lane identifying tool.



F-3-1. Lane tools:



Arrow tool:

Allows user to select the lane of the interest and adjust the lane width and lane angle. The lane frame can also be adjusted to define the region of interest

Define region / Region of interest (ROI) tool:

Allows user to draw a lane frame to define an area of interest on the image. Only one region of interest can be defined at a time.

Lane finder tool:

Allows user to detect lane(s) automatically by Dolphin-1D software within the defined region of interest

Add lane tool:

Allows user to add lane manually within the defined region of interest.

Delete lane tool:

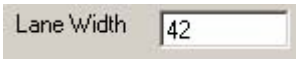
Allows user to delete a lane manually within the defined region of interest.

Add node tool:

Allows user to add nodes at various positions along the lane. These nodal points can be used to adjust the lane borders to fit the curved or skewed lane. In "IOR (Smiling Gel)" mode, these nodal points can be used to define the analysis area of smiling gel.

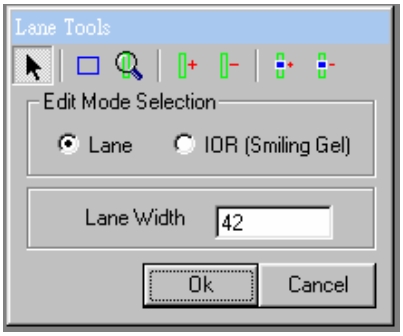
Delete node tool:

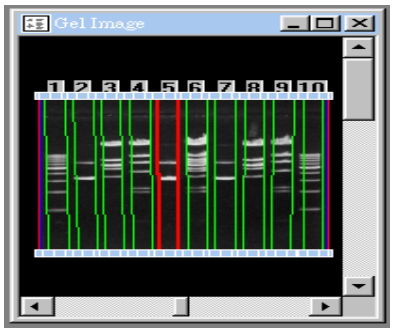
Allows user to delete the unwanted nodes.



Lane width:

Allows user to adjust the lane width by typing the desired number in the lane width dialog box on the lane tools menu. The minimum value that can be assigned for the lane width is 2.





Note: The lane width value applies to all the lanes that are defined in the image. Individual lanes cannot be assigned with different lane width values.

F-3-2. Defining lanes:

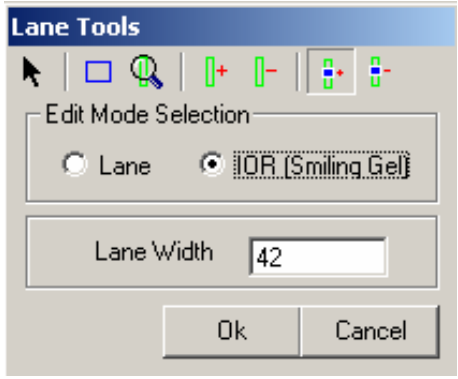
a). Blue border and individual lanes denote the lane frame by green columns. Clicking on the lane of the interest, will highlight them by a red column.

b). User can adjust the lane frame represented by an anchor point at each corner of the image by holding and dragging the anchor point with the mouse pointer. All the individual lanes attached to lane frame will also move accordingly.
Note: User can select the “ROI” tool to draw the new area of interest on the image referred to as lane frame. User then can use the “Lane Finder” tool or “Add Lane” tool to define lanes in the region of interest.

c). Three anchor points at the upper and lower border mark each lane. Holding and dragging the middle anchor point allows adjusting the position and angle of each lane.

d). To adjust for the skew of the gel and lanes, select “Add Node” from the “Lane Tools” dialog box and click on the lane at the skewed region. Then use the “Arrow Pointer” tool at the upper left corner of “Lane Tools” dialog box to drag and adjust the lane to fit the skewed region.

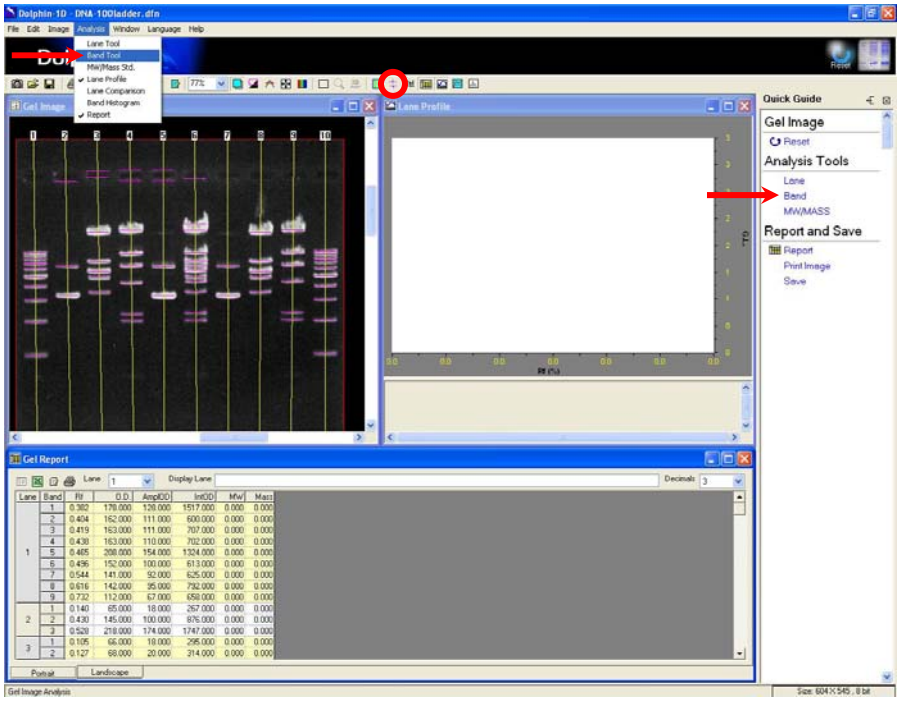
e). To adjust the smiling gel, select “IOR (Smiling Gel)” mode from “Edit Mode Selection” in “Lane Tools” dialog box. Select “Add Node” and click on the gel board at the skewed region. Use the “Arrow Pointer” tool at the upper left corner of “Lane Tools” dialog box to drag and adjust the gel board to fit the skewed region.



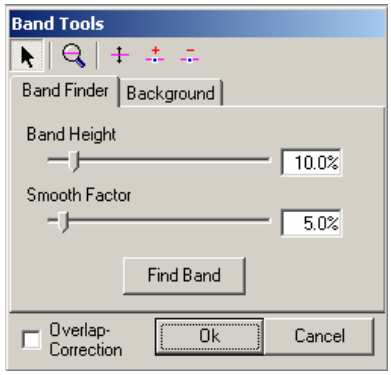
f). Click “Ok” upon finishing the lane definition.

F-4. Bands analysis:

Dolphin-1D software automatically identifies all the bands on the gel image. User may further edit the bands on the image by using the band tool menu. Click “Band” from quick guide or “Band Tool” icon, or select and click “Band Tool” from analysis menu for band identifying tool.



F-4-1. Band tools:



Arrow tool:

Click the arrow tool to select and analyze the band of the interest.

Band finder tool:

Allows user to detect bands automatically on the lane(s). Click on Band finder button and two options will be available. Choose the “Selected Lane” command to detect bands only in the selected lane or choose “All” command to detect bands in all the lanes within the region of interest.

Move band tool:

Click move band tool to adjust or relocate the band along the lane.

Add band tool:

Allows user to add band which is not detected by Dolphin-1D software.

Delete band tool:

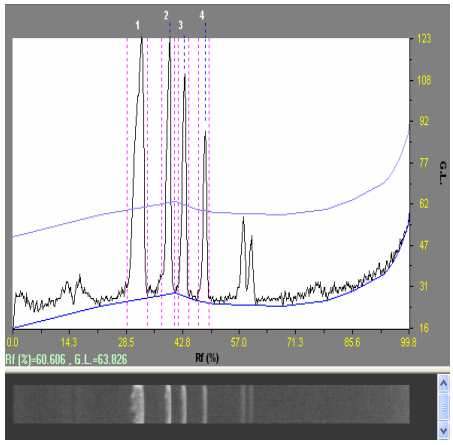
Click delete band tool to delete the bands that could be artifacts.

F-4-2. Band height and smooth factor:

Dolphin-1D software automatically detects all the bands on your image. Band height and smooth factor function allows user to define the sensitivity of the band detection.

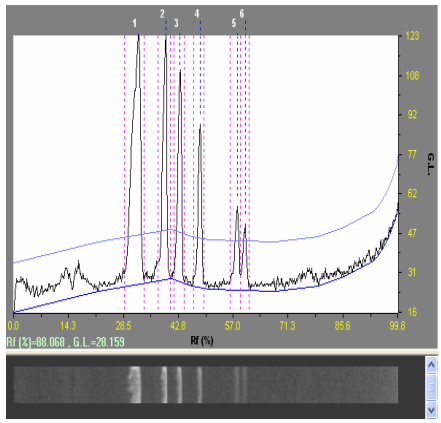
Band Height: Band Height:

Increasing the band height would reduce the sensitivity of detection. This is particularly useful when the bands are strong and well defined. Decreasing the band height increases the sensitivity of detection. This is particularly useful when the bands are fading. Band height represents the detectable peak height of the band in lane profile window. As shown in the figure



the upper line across the peaks. Fading bands represented by two small peaks are under the

detectable range. The line passing under the peaks represents the background noise. Decreasing the band height value increases the sensitivity of the detection. As shown in the figure below the upper line is passing across the small peaks. Now the fading bands are also detected by Dolphin-1D software.



Smooth Factor **Smooth Factor:**

Smooth factor's function is a "noise filter for band profile" and the value of smooth factor is a "parameter for filter's sensitive". Existing default value is sufficient for normal operation, but the adjustable option is kept for special requirements.

F-4-3. Overlap correction:

Overlap correction is applying the Gauss-Mode operation mode to calculate the adjacent bands.

F-4-4. Defining bands:

a). Choose the “Arrow Pointer” tool from the band tools menu and select a lane on the image. The bands in each lane are sequentially numbered from top to bottom. Further additions of bands in the same lane at any position are given subsequent numbers.

b). Move the sliding bar corresponding to the band height function and adjust the sensitivity of band detection. Choose the band height parameter that best detects all the bands on the image.

c). Click on “Add Band” button to add bands that are not detected by band finder after adjusting the band height parameter.

d). Click on “Delete Band” button to delete bands that you determine as artifacts.

e). Choose the “Move Band” tool to adjust the position of band marker.

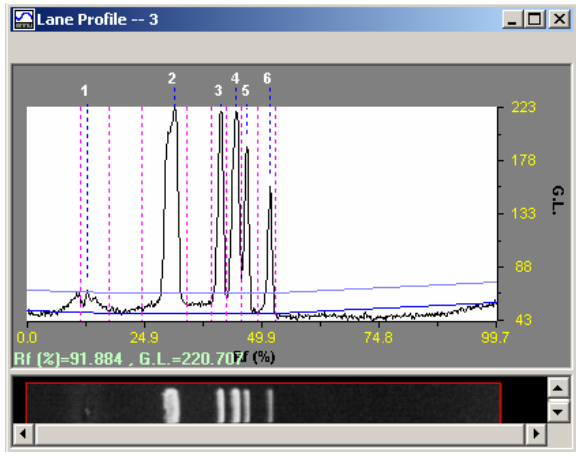
Each band is marked with a line passing through the band and a square box located at the center of the line. To adjust the band marker position, select the “Move Band”

function tool and click on the square box located on the band. Then drag the box to adjust the position of band marker.

Note: Band marker indicates the mobility of the band.

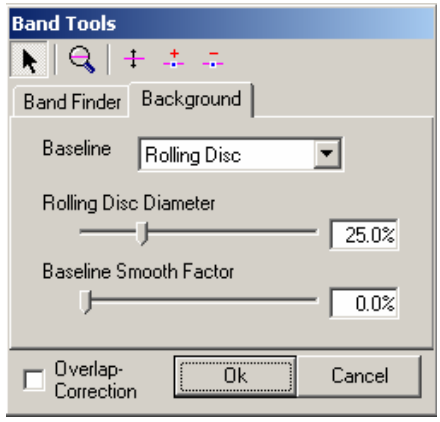
To predict the molecular weights of the bands more accurately, user can position the band marker to correspond exactly to band profile peak. Select the lane in which user wants to make band marker adjustments. Then click on  "Lane Profile" icon on the toolbar. A lane profile window will pop up displaying the profile of each band in the lane.

Three lines mark each band profile. One line on either side of profile, mark the base of peak and the center -line marks the profile peak. Select the "Move Band" tool from the band tools menu and drag the band marker till it corresponds to center or tip of the profile peak.



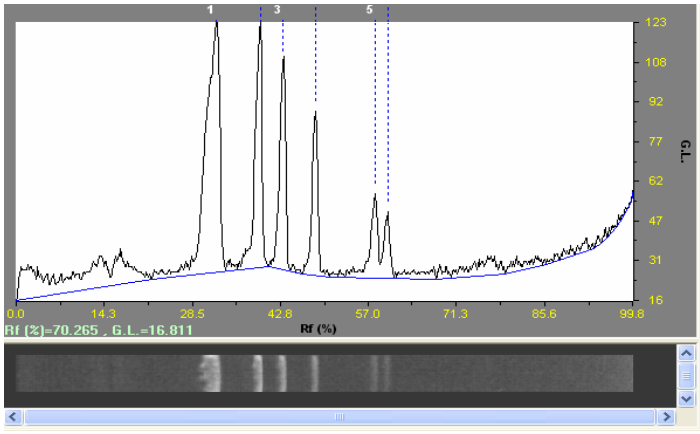
F-4-5. Baseline settings:

Dolphin-1D software allows user to edit different background parameters to best subtract the background noise from the image. Click the background page in the "Band Tools" dialog box.



F-4-6. Background baseline:

The background baseline is represented by a blue line running at the base of peaks in the lane profile window. Allows user to choose different baseline settings from the baseline dialog box:



a.) Rolling Disc: Rolling disc function chooses the optimal background baseline for the image automatically.

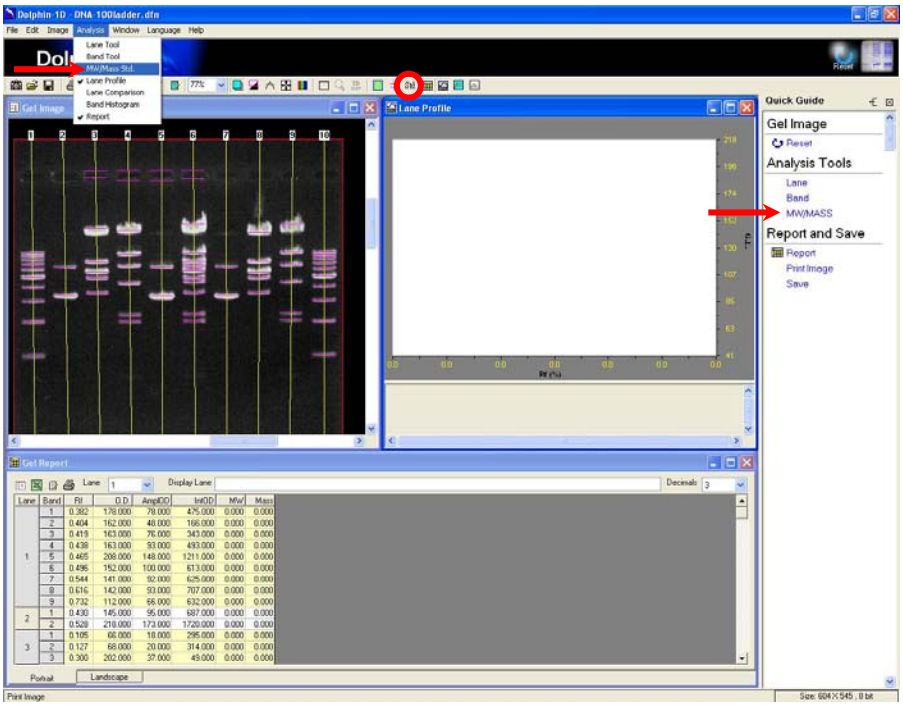
b.) Min: The minimum function chooses the lowest peak baseline as the background.

c.) Zero: The zero function doesn't set any baseline for the background.

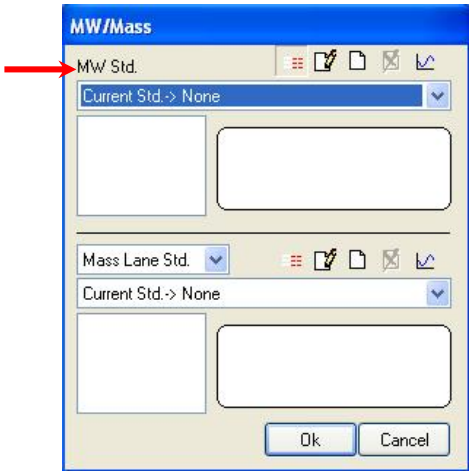
Note: If the user made any changes on the default background settings, ensure to check the "Overlap-Correction" as the Gauss-Modeling dialog box will pop up and if it is checked then click "Auto Fit" in Gauss-Modeling dialog box for the changes to take effect.

F-5. MW / Mass analysis:

After the lanes, bands and the optimal background parameter for the image have been defined, user can use the MW/Mass tools to analyze the image. Click "MW/MASS" from quick guide or "MW/MASS Std." icon, or select and click "MW/MASS Std." from analysis menu for molecular weight and mass calculation tool.



F-5-1. MW tools:

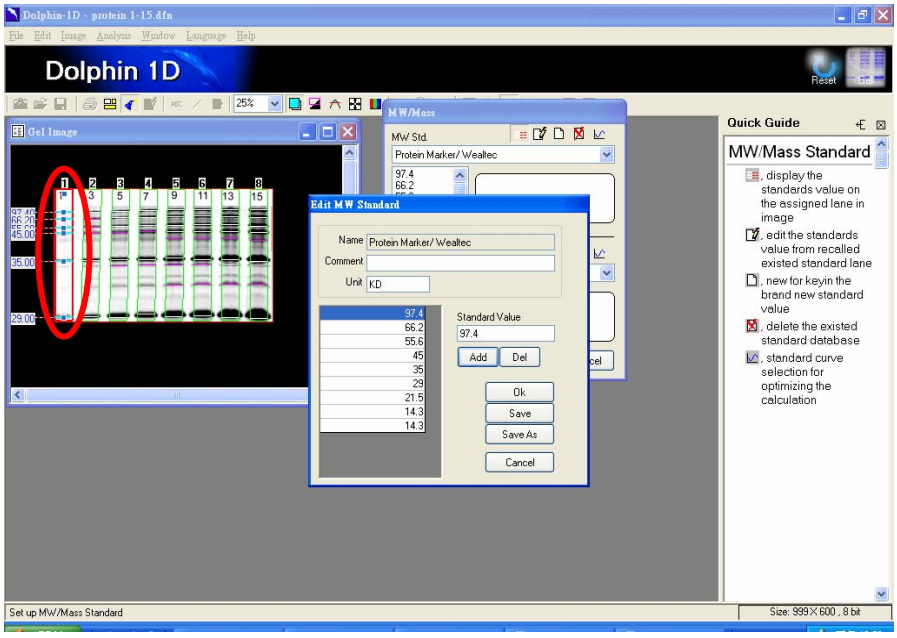


Display value on image tool:

Allows user to display the molecular weight standards data of bands on the image. Choose a molecular weight standard from the MW Std. pull down menu and click on a lane or multiple lanes on the image. The software automatically assigns the molecular weight standards to the bands in the lane and displays them on image.

Edit tool:

Click edit tool to edit any current saved molecular weight standard data. Select or deselect the standard lane on the image by clicking mouse on the lane. More than one standard lane can be selected. By pointing the cursor on the blue node, clicking the mouse on the band allows user to select or deselect the standard band as the rest of the bands will renew the ranking of standards.



New tool:

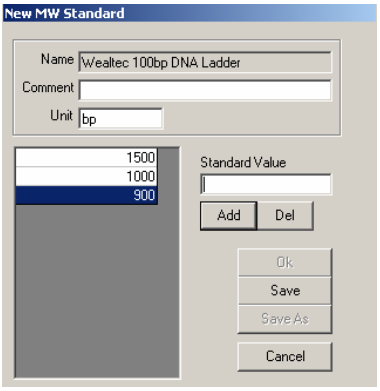
Allows user to create and add new molecular weight standard data if the loaded standard on the image does not exist from the standard list. Click “New” tool for MW Std. in the dialog box.

i. Input new standard name and click “OK”.

ii. Input standard's value and click "Add" to add the value to the left list.

iii. To delete wrong value, select from the left list and click "Del".

iv. Click "Save" and "Ok" to go back to "MW/MASS" window



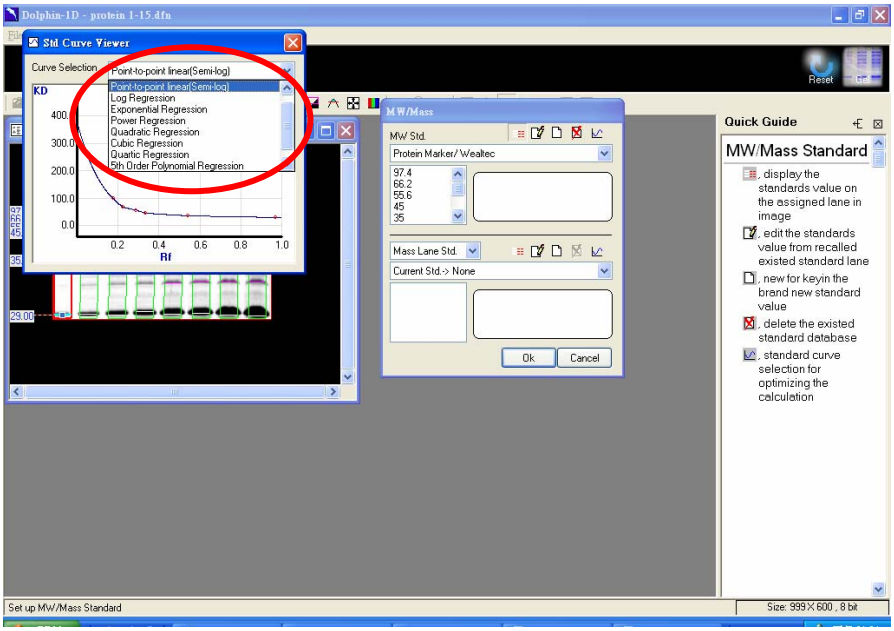
Note: Name: Give a "name" to a molecular weight standard.
Comment: Specific comment or note for this molecular weight standard.
Unit: Unit of the standard value, ex. DNA use "bp", protein use "KDa" and etc.
Add/Del: Add or delete a standard value into or from new molecular weight standard list.

Delete tool:

Click to delete molecular weight standard from the list.

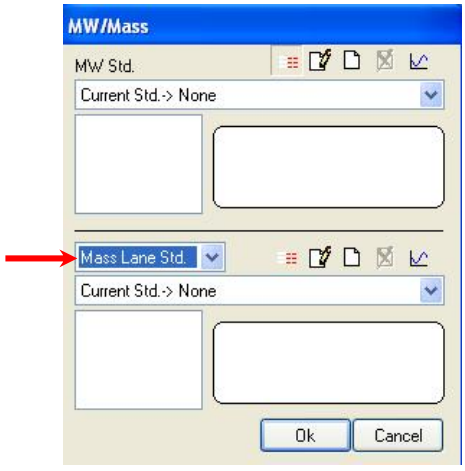
Standard curve tool:

The Standard curve tool is applied to select the best curve fit for the standards curve on the image. Select the molecular weight standards lane on the image then click on the standard curve button. Choose the best curve fit for specified standards from curve pull down menu.



F-5-2. Mass tools:

F-5-2-1. Mass lane standard



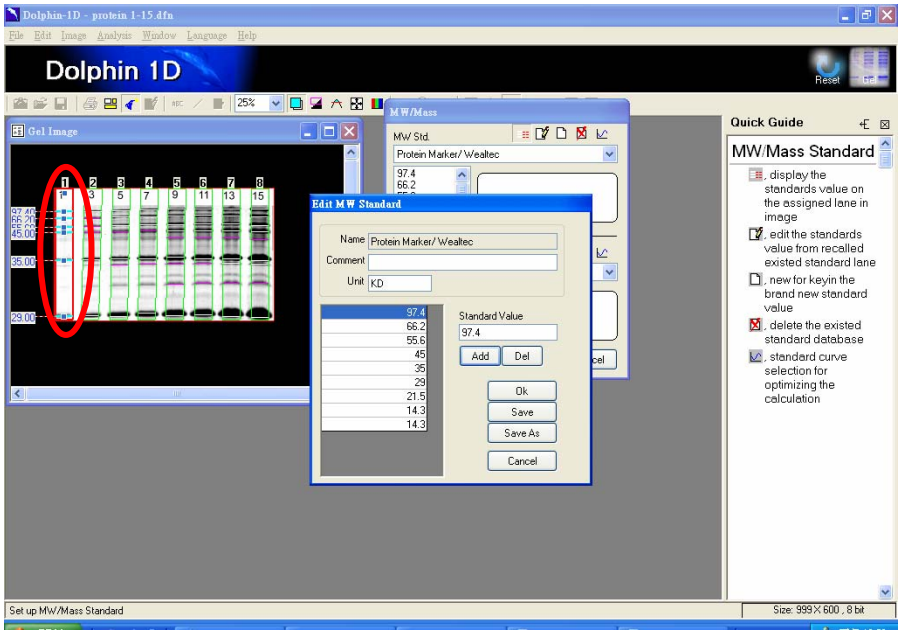
 **Display value on image tool:**

Click to display the mass standards data of bands on the image.

 **Edit tool:**

Click edit tool to edit any current saved molecular weight standard data. Select or deselect the standard lane on the image by clicking mouse on the lane. More than one standard lane can be selected. By pointing the cursor on the blue node, clicking the mouse on the band allows user to

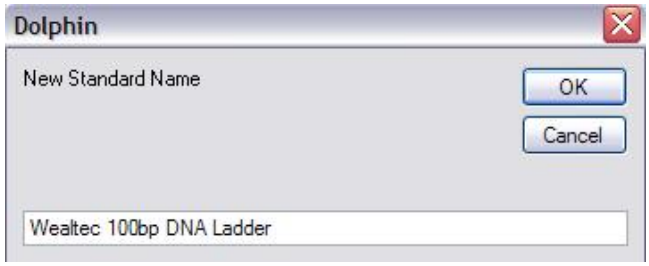
select or deselect the standard band as the rest of the bands will renew the ranking of standards.



New tool:

Allows user to create and add new mass standard data if the loaded standard on the image does not exist from the standard list. Click “New” tool for Mass Lane Std in the dialog box.

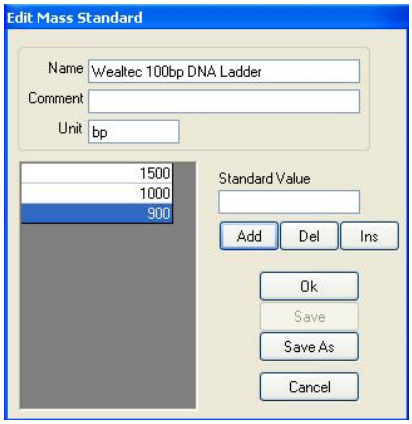
i. Input new standard name and click “OK”.



ii. Input standard’s value and click “Add” to add the value to the left list.

iii. To delete wrong value, select from the left list and click “Del”.

iv. Click “Save” and “Ok” to go back to “MW/MASS” window.



Note: Name: Give a “name” to a mass standard.

Comment: Specific comment or note for this mass standard.

Unit: Unit of the standard value, ex. DNA use “bp”, protein use “KDa” and etc.

Add/Del: Add or delete a standard value into or from new mass standard list.

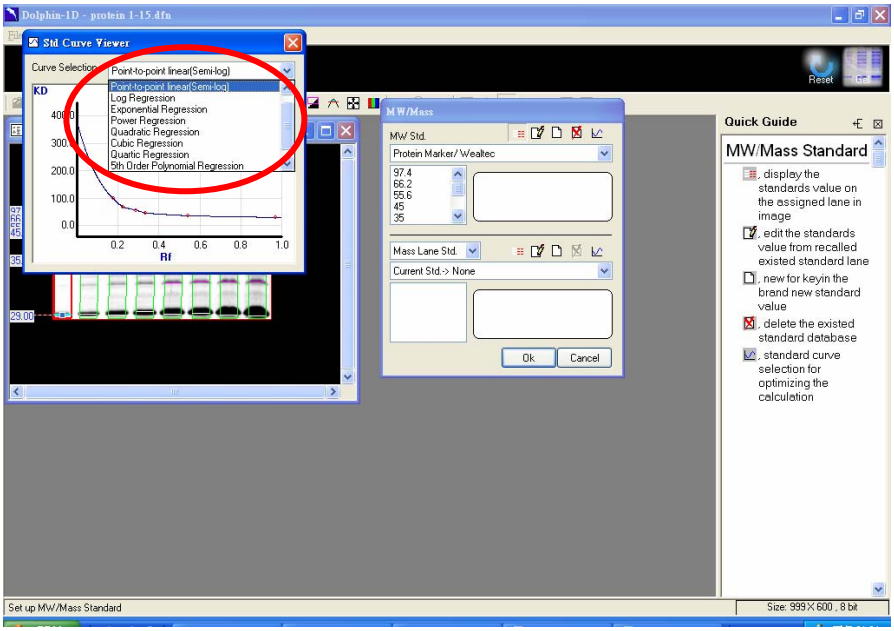
Ins: Insert a new standard value into the new mass standard list.

Delete tool:

Click to delete mass standard from the list.

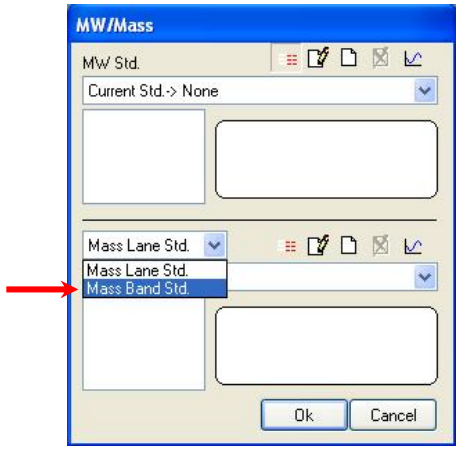
Standard curve tool:

Allows user to select the best curve fit for the mass standards on the image. Select the mass standards lane on the image and then click on the standard curve button. Choose the best curve fit for specified standards from curve selection pull down menu.



F-5-2-2. Mass band standard

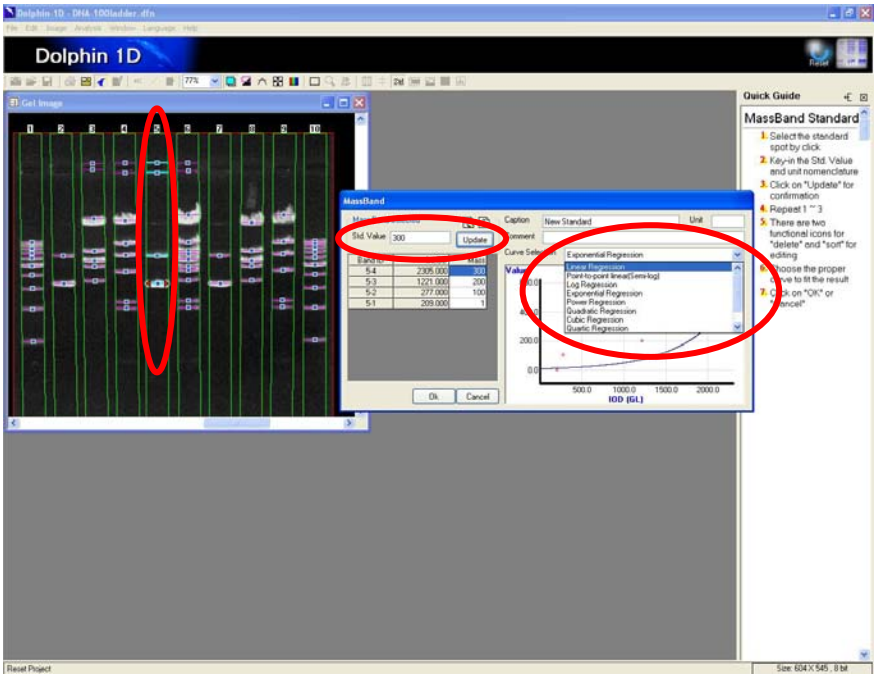
Select and click the “Mass Band Std.” from mass standard pull down menu



i. Select by clicking the Mass bands standard on the image, input and update the mass value individually in the Mass Band window. Use left click mouse to select and right click mouse to deselect the Mass bands.

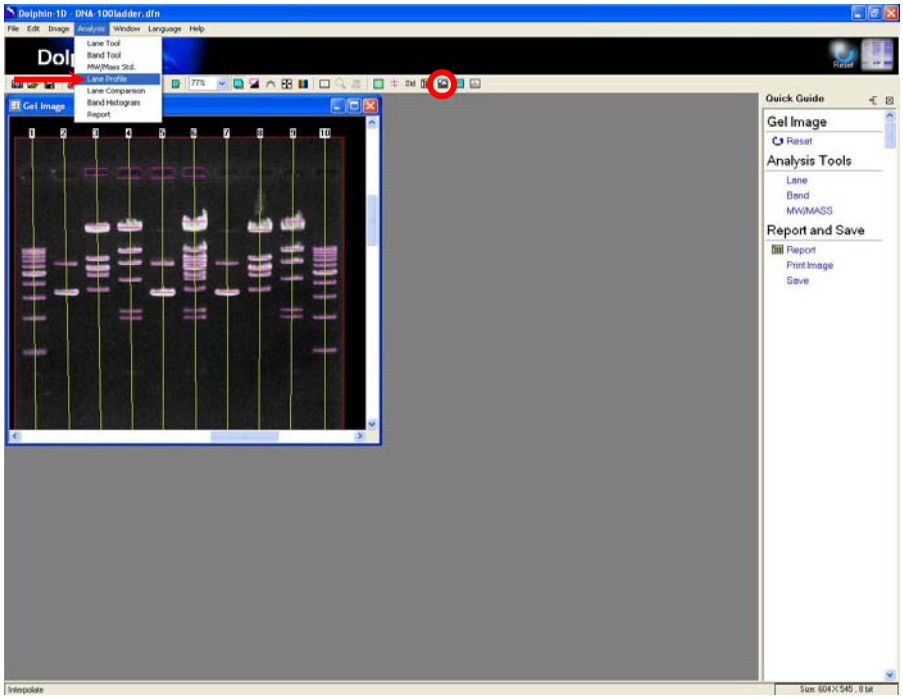
ii. Input the caption, unit and comments and choose the best curve fit for specified standards from curve selection pull down menu in Mass Band window.

iii. Click “Ok” to go back to “MW/MASS” window.

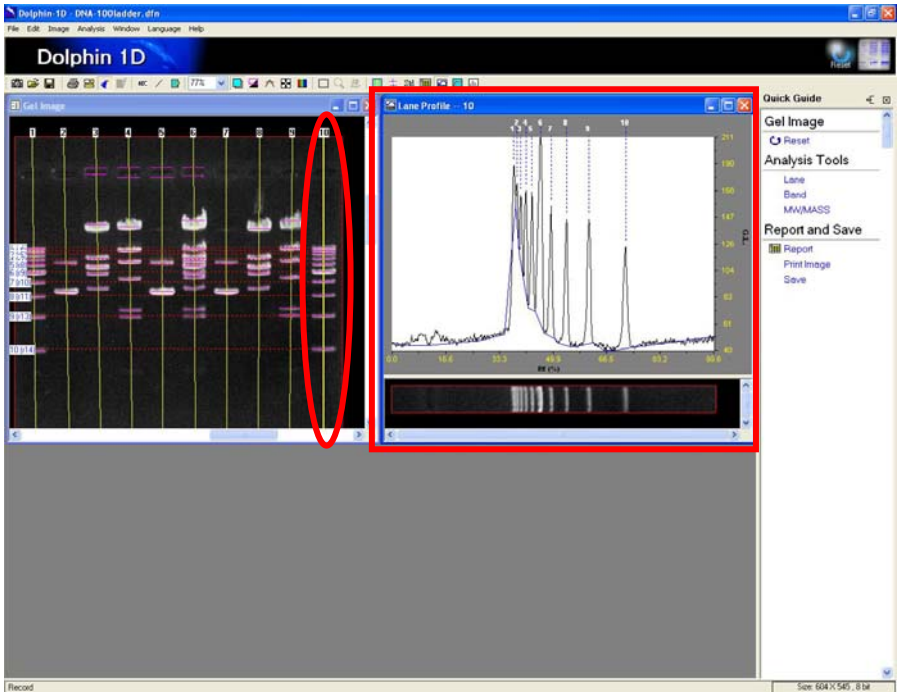


F-6. Lane profile

Click “Lane Profile” icon, or select and click “Lane Profile” from analysis menu to view the selected lane profile. For protein analysis lane profile displays OD (Optical Density) versus Lane and for DNA analysis it displays G.L (Gray Level) versus Lane.



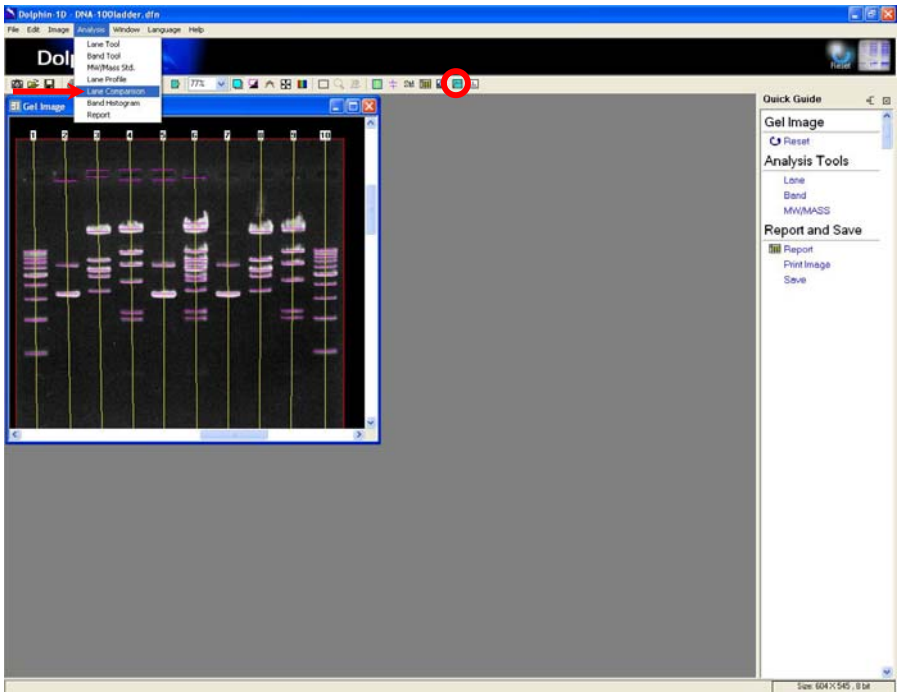
Given below is an example of DNA analysis image for selected lane profile.



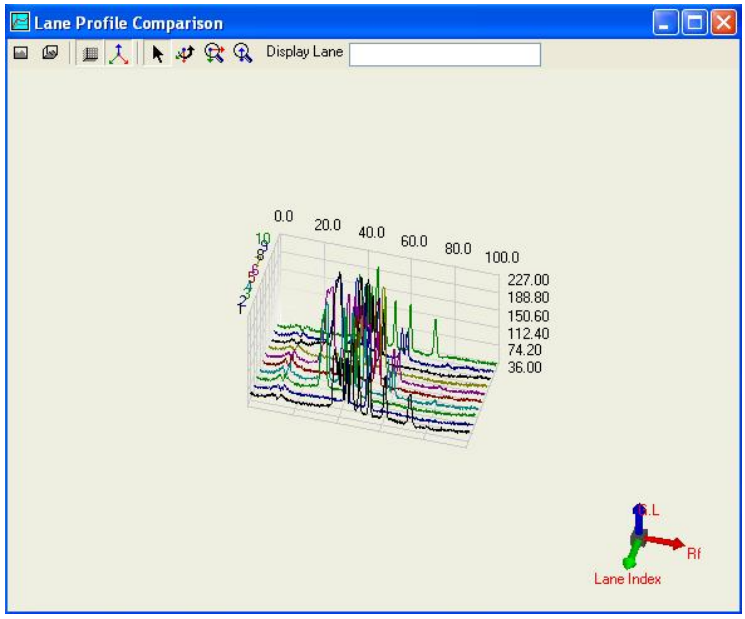
Given below is an example of protein analysis image for selected lane profile.

F-7. Lane comparison

Click “Lane Profile Comparison” icon, or select and click “Lane Comparison” from analysis menu to view all the lane profile of the image in 3D.



In default mode the Lane Profile Comparison window will display all the lanes from the image in 3D.



 **View front tool**

Click this tool to convert the image from 3D Map to 2D Map.

 **View custom tool**

Click this tool to return back the image to default 3D Map image.

 **Show frame tool**

Select this tool to display coordinate frame on the image.

 **Show small coordinate tool**

Select this tool to display 3D coordination axis of the image at the right bottom of the window.

 **Move tool**

Select this tool in order to move the 3D Map image on the window using cursor.

 **Rotate tool**

Select this tool to rotate the 3D Map image using left mouse click. In general while using any other tools to rotate the 3D image right mouse click can be used.

 **Map zoom tool**

Select this tool to enlarge or shrink the 3D Map image. Click holding the left mouse and moving cursor to the right will enlarge the 3D Map image and moving the cursor to the left will shrink the 3D Map image.

 **Level zoom tool**

Select this tool to enlarge or shrink the single dimension of the OD axis. Click holding the left mouse and moving cursor to the right will enlarge the OD axis of the 3D Map image and moving the cursor to the left will shrink the OD axis of the 3D Map image.

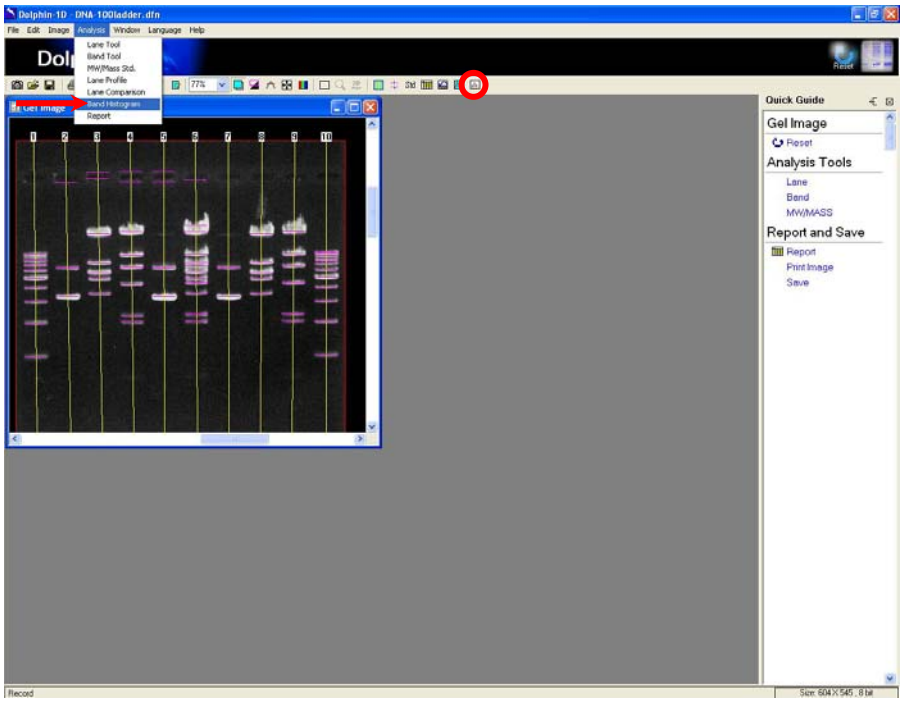
Display lane:

Choose a particular lane or few lanes of interest to be displayed by typing the lane number(s) in the display lane dialog box.

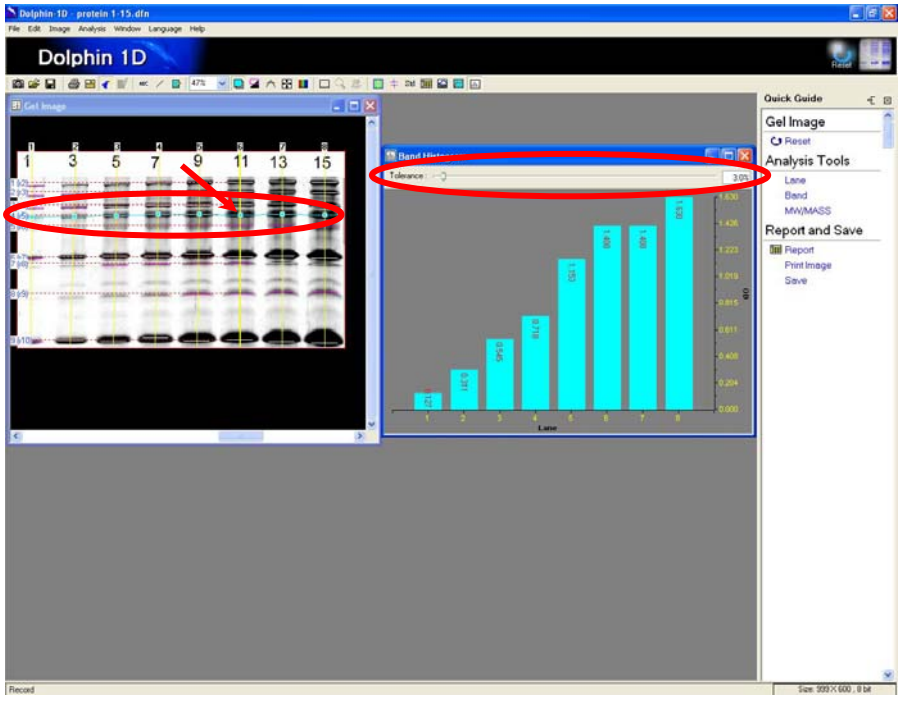
Note: For multiple lane numbers, separate each lane number by a comma.

F-8. Band histogram

Click “Band Histogram” icon, or select and click “Band Histogram” from analysis menu to view the band profile histogram.

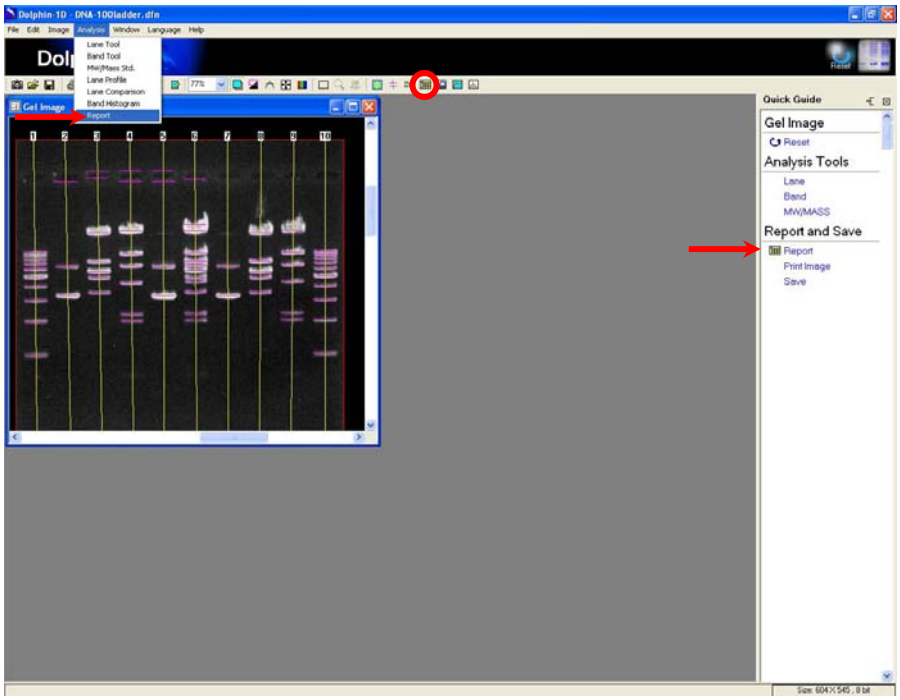


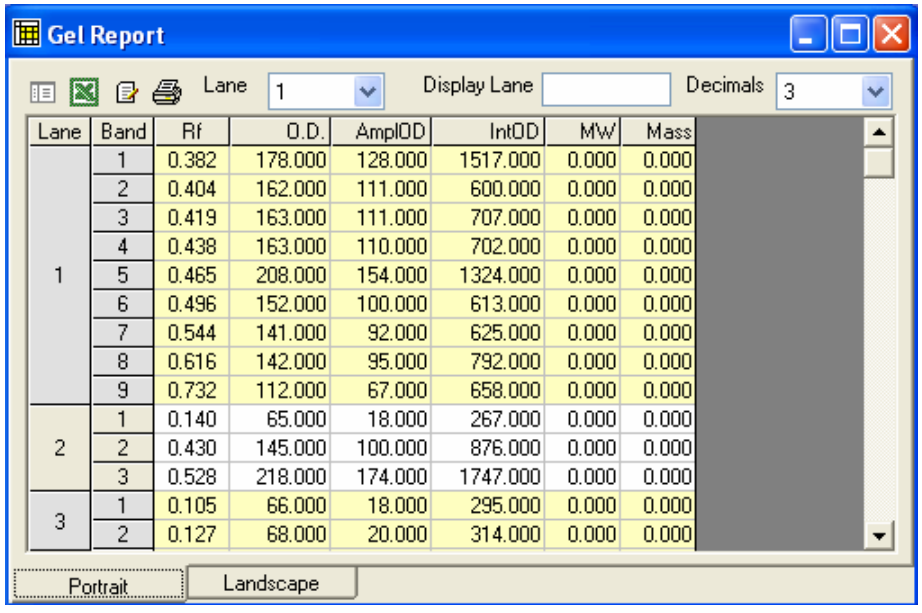
Click on any desired band profile or lanes to view the representation of band profile histogram. “Tolerance” in band histogram is the percentage of Relative Fragment Position (Rf.) Value to reference band (Recommended: 0.2% to 10%). For protein analysis band histogram displays OD (Optical Density) versus Lane and for DNA analysis it displays G.L (Gray Level) versus Lane.



F-9. Report:

Click “ Report” from quick guide or “Report” icon, or select and click “Report” from analysis menu to view the all the band information.





Lane	Band	Rf	O.D.	AmplOD	IntOD	MW	Mass
1	1	0.382	178.000	128.000	1517.000	0.000	0.000
	2	0.404	162.000	111.000	600.000	0.000	0.000
	3	0.419	163.000	111.000	707.000	0.000	0.000
	4	0.438	163.000	110.000	702.000	0.000	0.000
	5	0.465	208.000	154.000	1324.000	0.000	0.000
	6	0.496	152.000	100.000	613.000	0.000	0.000
	7	0.544	141.000	92.000	625.000	0.000	0.000
	8	0.616	142.000	95.000	792.000	0.000	0.000
	9	0.732	112.000	67.000	658.000	0.000	0.000
2	1	0.140	65.000	18.000	267.000	0.000	0.000
	2	0.430	145.000	100.000	876.000	0.000	0.000
	3	0.528	218.000	174.000	1747.000	0.000	0.000
3	1	0.105	66.000	18.000	295.000	0.000	0.000
	2	0.127	68.000	20.000	314.000	0.000	0.000

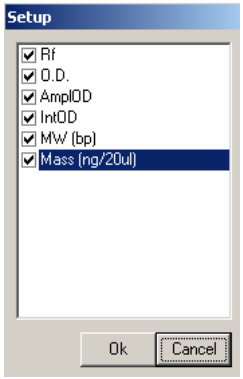
The default setting for the report window displays eight columns with lane and band information in the first two columns respectively. The next six columns describe the Rf, OD, Int.OD, Ampl.OD, MW and Mass of bands respectively.

- Rf: Relative Fragment position. It calculates the distance from start point (0.0) of the lane to the end of the lane which is located at the end of the gel. By adjusting the value from lane tool the standard point can be adjusted.
- OD: Optical Density. The value is set from the 256 partitions from black to white.
- Int. OD = Band area OD Integration value
- Ampl. OD = OD – background OD
- MW: Band Molecular Weight
- Mass: Band Molecular Mass

Note: The band information out of the standard curve range is displayed as N/A (not available) to minimize miscalculations.

Setup tool:

To change the band information display, click on “Setup” icon at the upper left corner of the report window. Then select and check the items to be displayed by the report window in the setup dialog box.



Save to excel tool:

Allows user to export the report to excel.

Save report tool:

Allows saving of the report as excel file format (.xls) or text file format (.txt). Click on the icon and a file-saving window will pop up. Input the file name, select the file format then click “Save” to save the file.

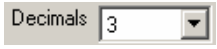
Print report tool:

Allows user to print the report. Click on the icon and a print report window will pop up. Select and input the printing format and the parameter. Then proceed to print the report by clicking “Print”.

Display lane:

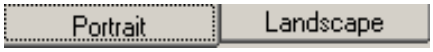
Allows user to choose a particular lane or few lanes of interest to be displayed by typing the lane number(s) in the display lane dialog box.

Note: For typing multiple lane numbers, separate each lane number by a comma.

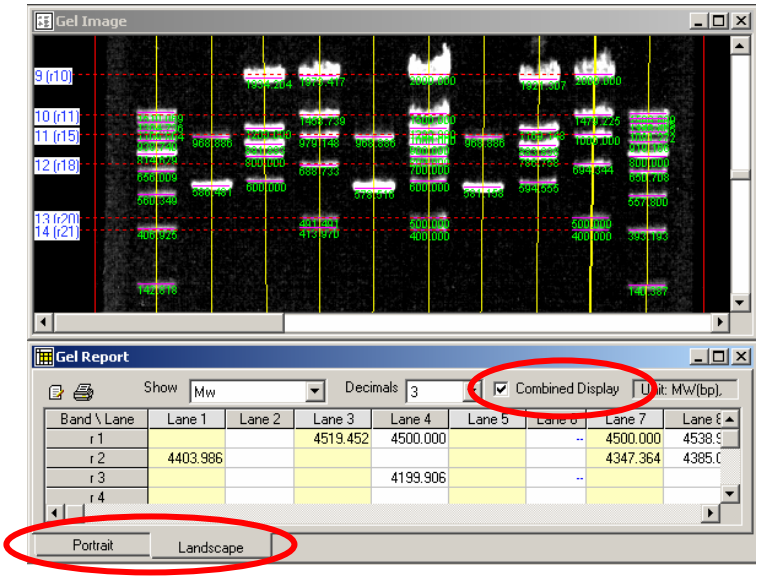


Decimals:

Allows user to choose the number of decimals for the results to be displayed from the “Decimals” pull down menu. The default number of decimals is 3 and the maximum number that can be chosen is 5.



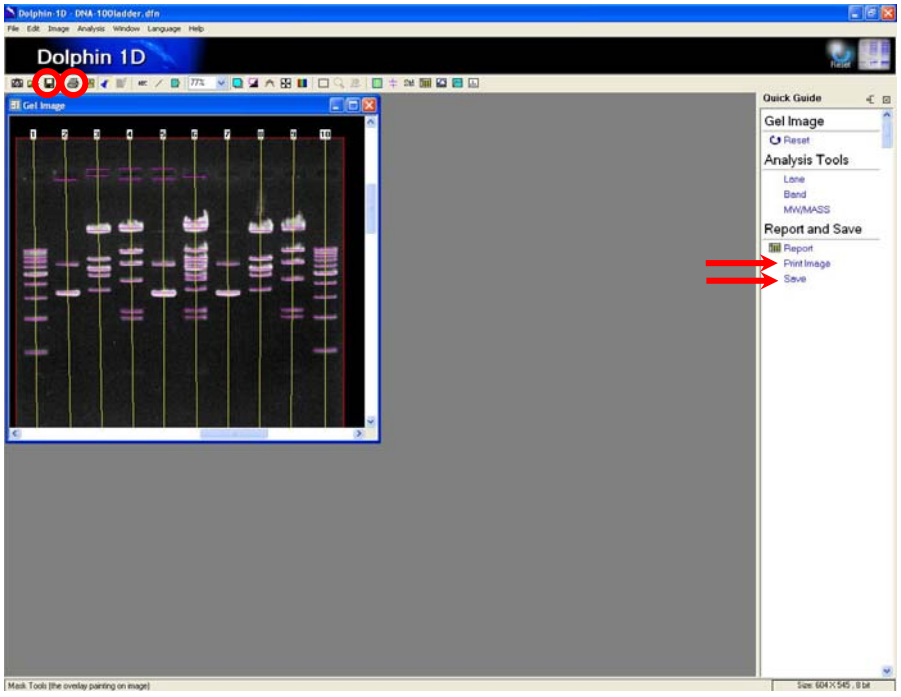
Report window display:



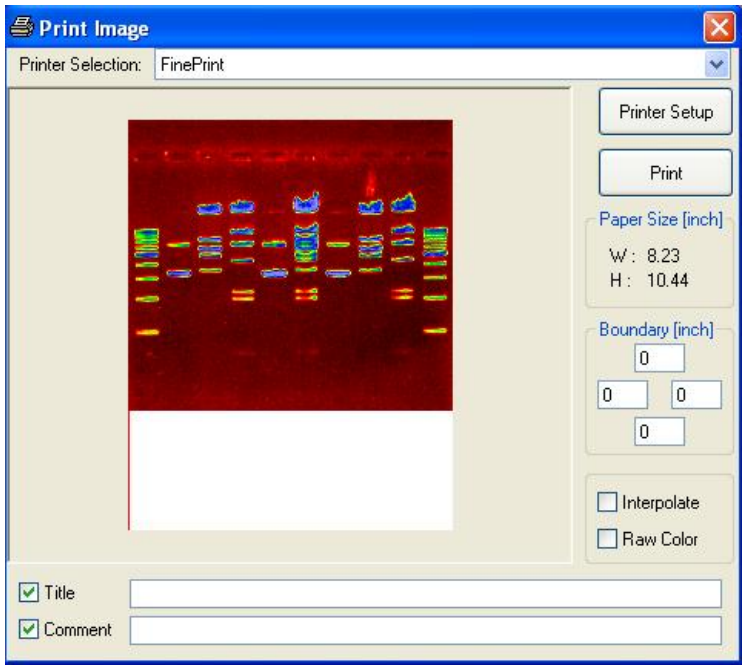
User may choose the results window to be displayed in “Portrait” or “Landscape” format. The default setup is portrait format. In portrait format, all the resulting analysis will be displayed and arranged in six different columns. For the landscape format, choose the result parameter to be displayed from the pop-up menu. To show the Mw or Mass value on the gel image, check “Combined Display” on right upper side of landscape format window.

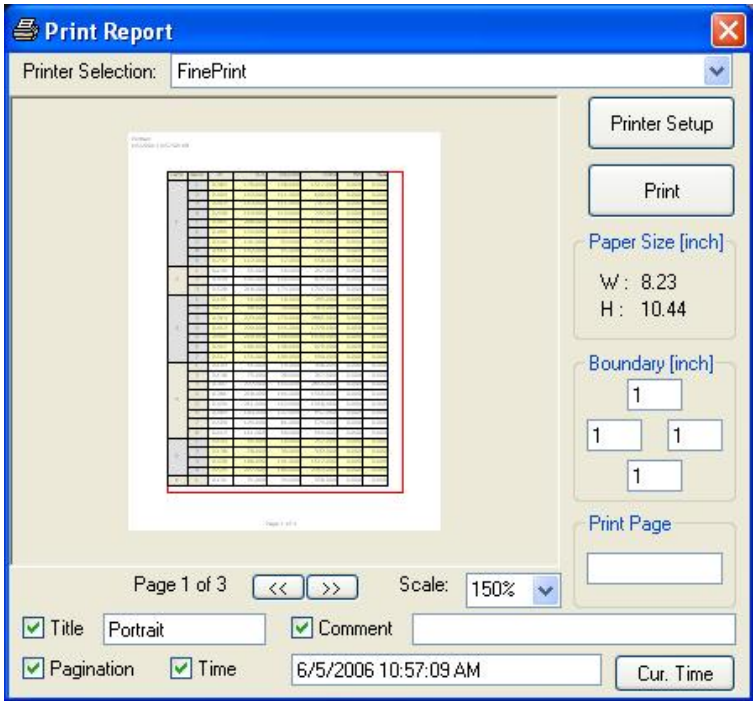
F-10. Print and save:

Click “Print Image” from quick guide or “Print Image” icon, or select and click “Print Image” from file menu to print the image. Click “Save” from quick guide or “Save” icon, or select and click “Save” or “Save As…” from file menu to save the image.

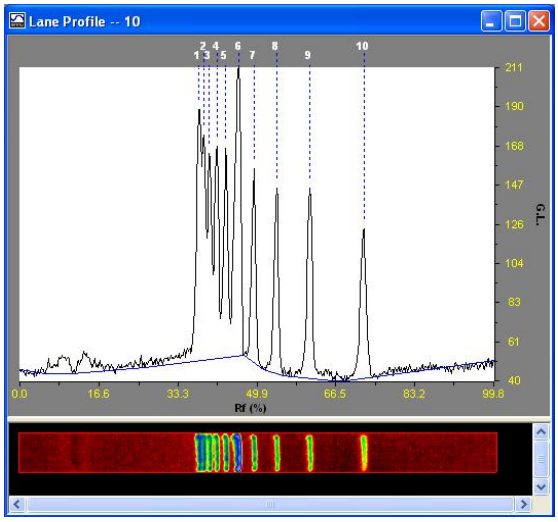


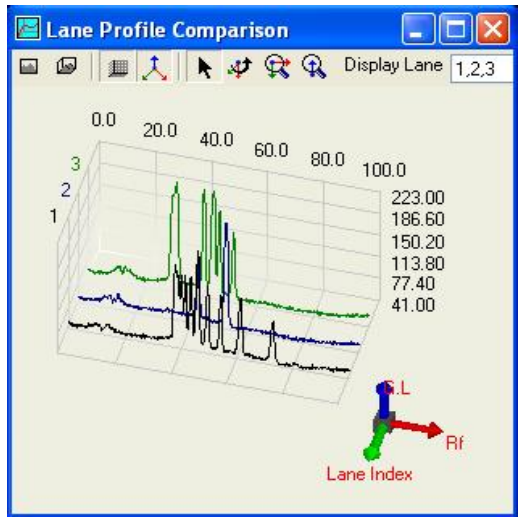
To print image or report, upon clicking the icon a “Print Image” or “Print Report” window will pop up. Input and select the printing parameter then click “Print”.

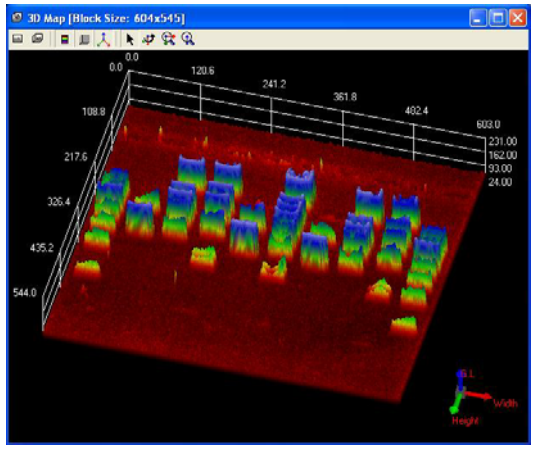




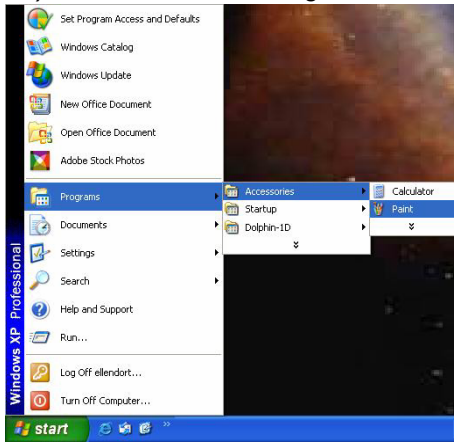
Printing or saving the following images: Lane Profile, Lane Profile Comparison or 3D Map can be done by closing the quick guide and maximizing the images, then







press “Print Screen” on keyboard and paste the image into the Microsoft Paint Software. (Start→ Programs→Accessories→Paint). Print or save the image with Paint Software.



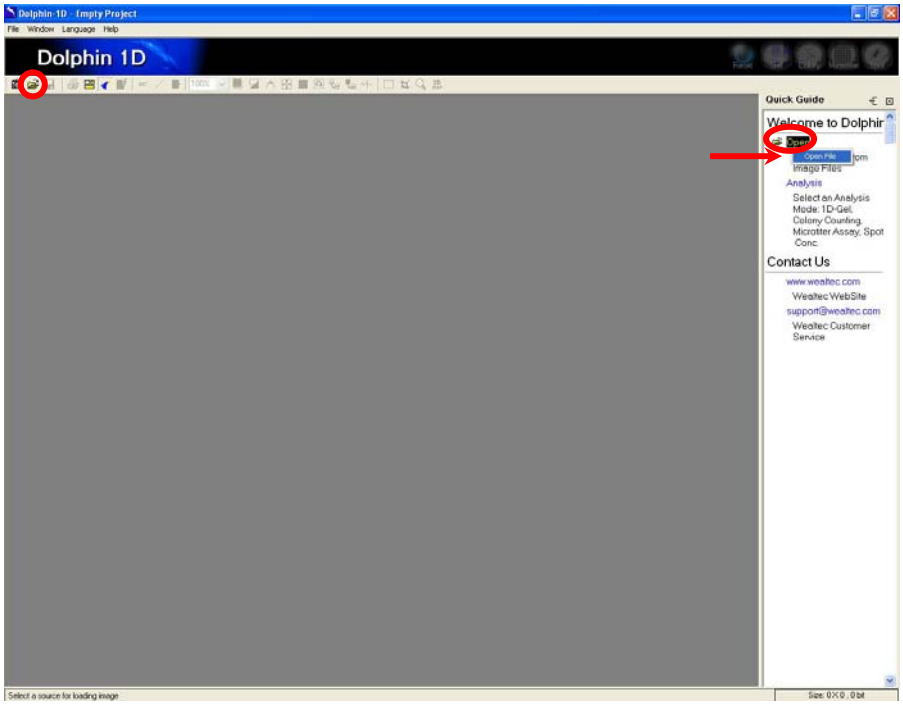
G. Colony Counting

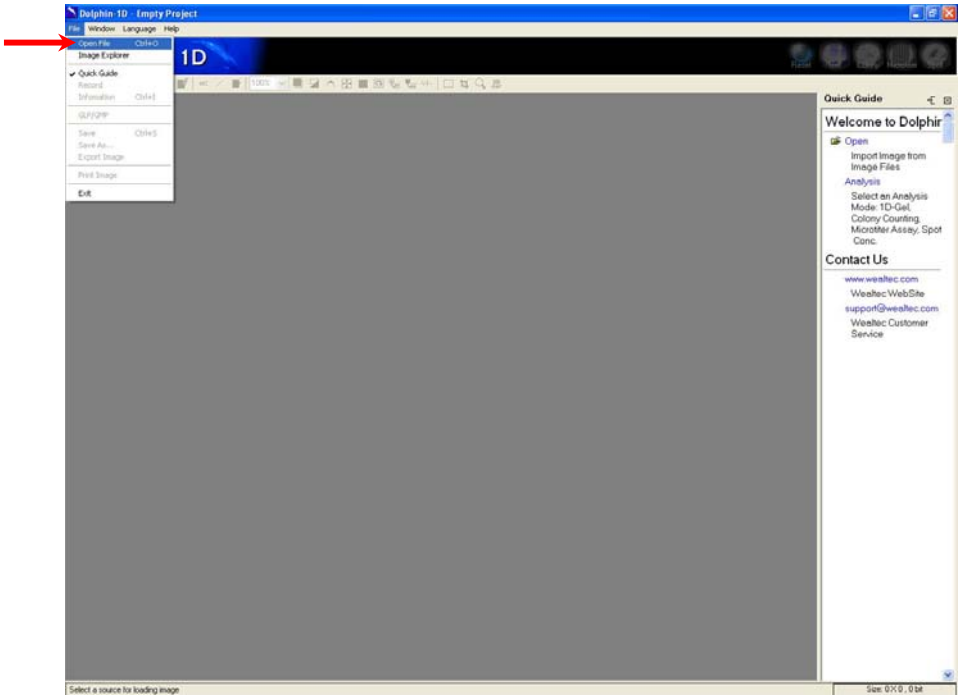
This chapter describes colony counting tool of Dolphin-1D software. This tool allows user to count the colonies in the culture plate. Culture plate image is taken as a reference in the following examples for tool description.

G-1. Capture / Import image:

1. To capture images from Dolphin image system (eg. Dolphin-Doc) click “Open” from quick guide or “New Image from Peripheral” icon then select and click “Open Dolphin-DOC”, or select and click “Open Dolphin-DOC” from file menu. (Please refer to Chapter 3 for details).
   Note: Dolphin-Doc is taken as a reference in the following examples. If you have purchased other than Dolphin-Doc image system and intended to use please select appropriate image system in every option selection of Dolphin-Doc in this manual.

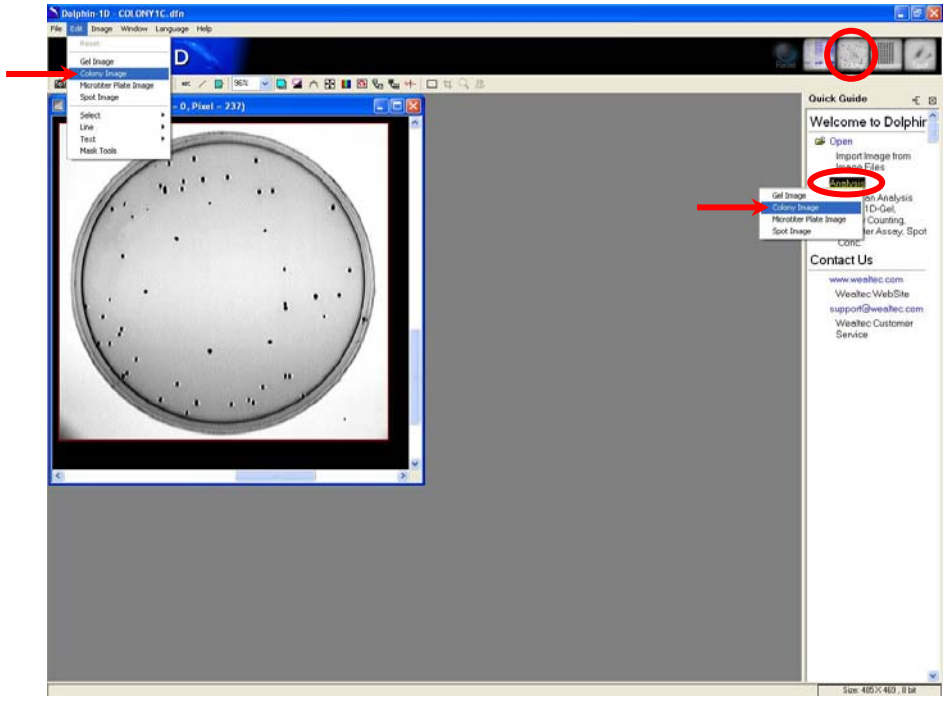
2. For stored images in the disk click “Open” from quick guide and select “Open File” or click “Open” icon, or select “Open File” from file menu then select the image file and click “Ok”.



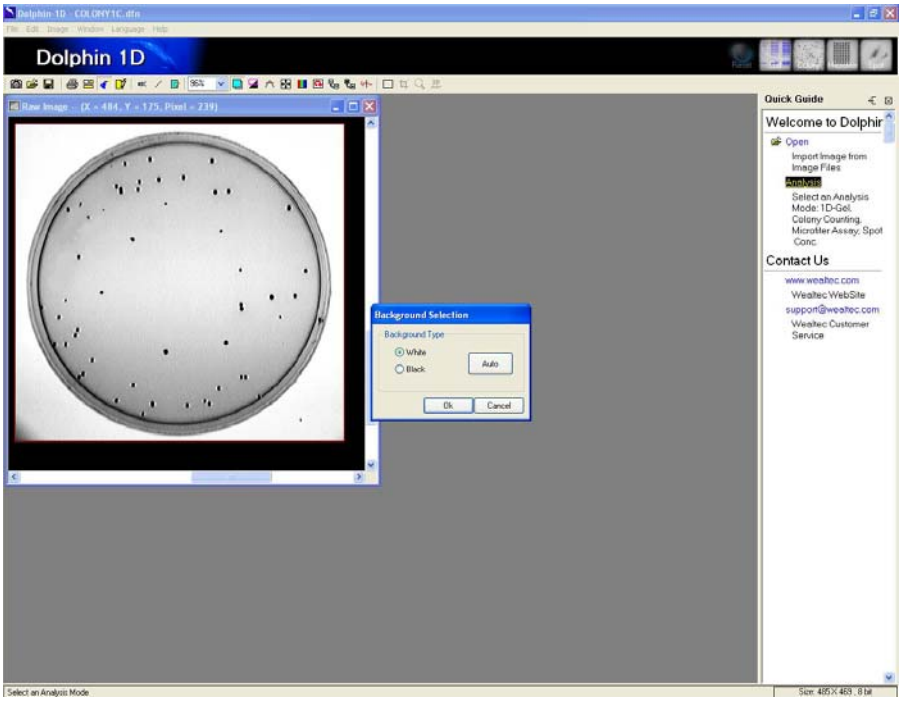


G-2. Colony image function:

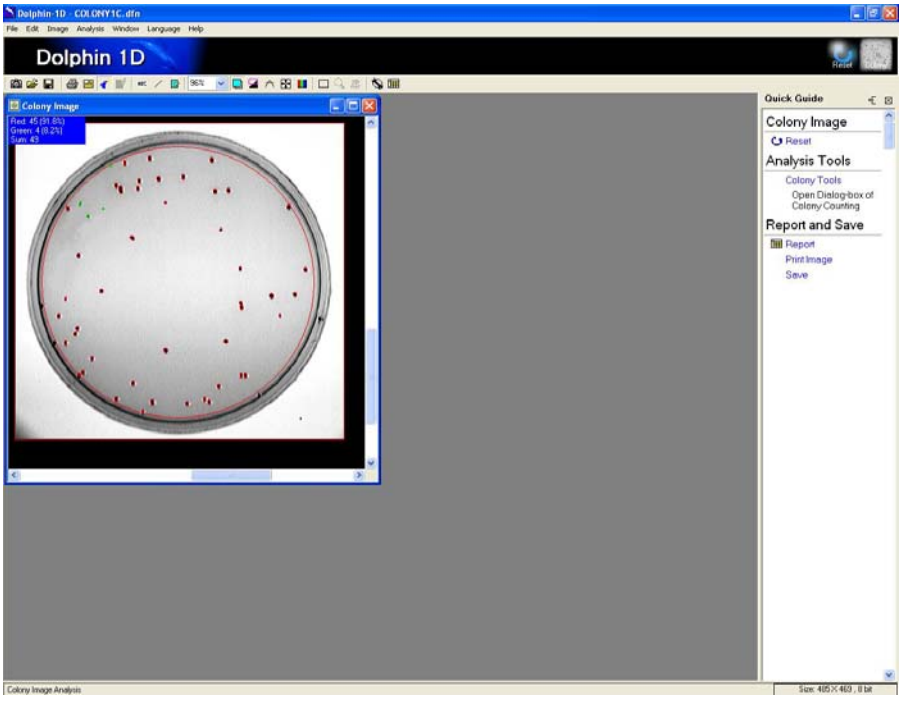
1. Click “Analysis” from quick guide and select “Colony Image” or click “Colony” icon, or select “Colony Image” from edit menu to colony image analysis function.



2. Select the appropriate background and click “Ok” button to proceed.

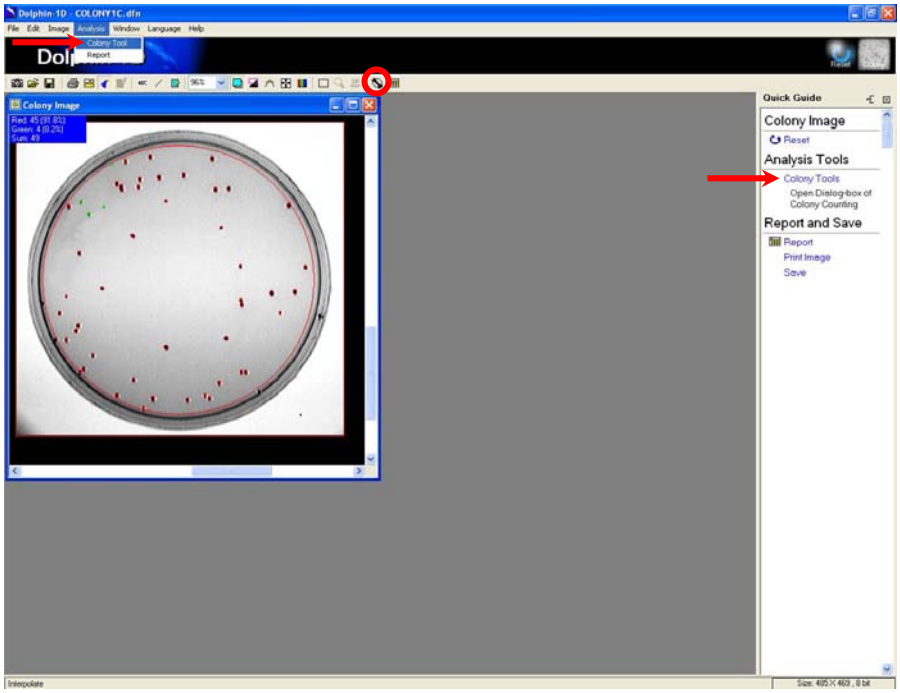


3. The program will automatically select the region of interest (Border of the plate) and selects all the colonies from the image.

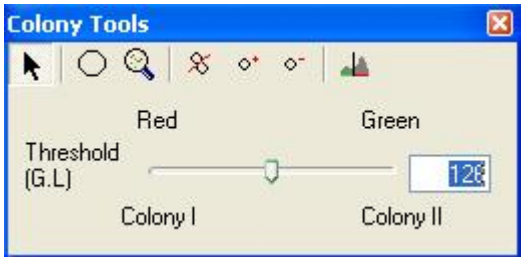


G-3. Colony definition:

Click “Colony Tools” from quick guide or “Colony Tools” icon, or select and click “Colony Tool” from analysis menu for colony tools dialog box.



G-3-1. Colony tools:



Arrow tool:

Allows user to define and adjust the size and position of the region of interest (ROI).

Region of interest (ROI) tool:

Allows user to define the area of interest on the image. Only one region of interest allowed to be defined at a time.

Colony detection tool:

Allows user to detect colony(s) automatically by Dolphin-ID software within the defined region of interest.

Split colony tool:

Allows user to split colony from one to two.

Add colony tool:

Allows user to add colony if at all any fading colony too weak to be detected by Dolphin-1D software.

Delete colony tool:

Allows user to delete any colony that could be artifacts.

Grab GL tool:

Allows user to define the colony type according to specified colony's gray level.

G-3-2. Colony detection:

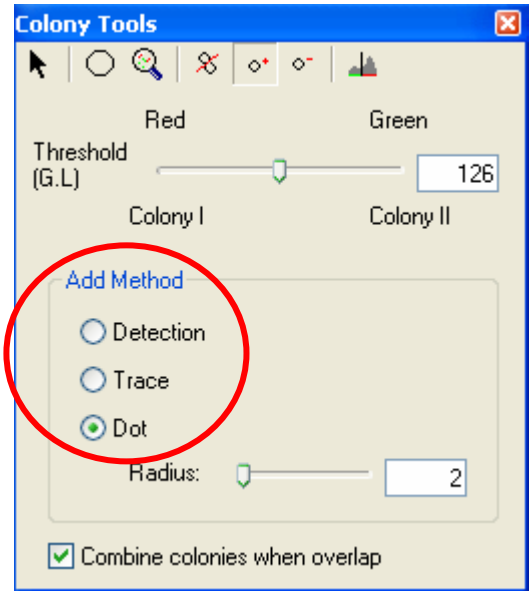
a.) To redefine ROI, click "ROI" tool from colony tools menu and draw a radius line across the plate in the image. A red circle will pop up as per drawn radius. Position the circle on the interested area and select "Colony Detection" tool. The colony detection sensitivity can be adjusted with the sliding bar in colony detection dialog box. Upon adjusting click "Start" for the detection to take effect.

Note: In order to adjust the ROI (region of interest), select arrow tool and click on the red circle of "ROI". Four squares boxes will appear on the red circle. Click and drag any one of the boxes with mouse pointer and adjust the circle area to fit the region of interest. Click and drag on the line of the circle to adjust its position on the plate.

b.) To differentiate accordingly between colony as per to the threshold (Gray level) the adjustment in sliding bar, will divide and indicate them into two group of colors.

Note: In order to define a single type of colony groups, Grab GL (Grab Grey Level) tool can be used. Click “Grab GL” tool from colony tools menu and click on any single desired colony. The similar and whichever higher types of colonies with the selected colony will be indicated with the same color (green) and the rest will be indicated with different color (red) indicating lower types of colonies.

c.) Click  “Add Colony” tool to add the colonies that are not detected by software.



There are three ways of adding colony: Detection, Trace and Dot.

i. Select “Detection”, on the image click and drag or select on the expected area where the colony needed to be added automatically. Point the cursor on the selected colony and clicking once will unselect the selection of the colony.

ii. Select “Trace” and point the cursor on the edge of any potential colony. Click left mouse to indicate the edge of the colony in blue, to alter the blue line to the colony move the cursor pointer and click left mouse of the pointer to the colony edge. Once satisfied to confirm and add the colony, right click the mouse pointer on the colony line so as the color will convert from blue to either red or green according to the threshold.

iii. Select “Dot” and the radius for the dot from the sliding bar and click on any desired area the image to add a colony.

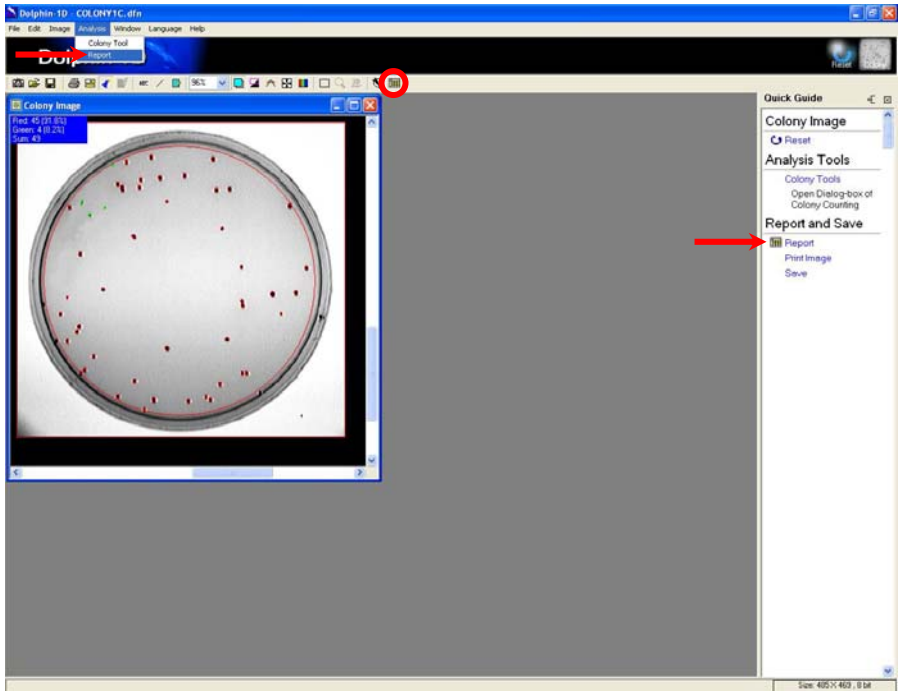
d.) Click  "Delete Colony" tool, point the cursor at the centre of the artificial colony and click mouse pointer will delete the colony.

e.) For fused colonies or closely spaced colonies, select  "Split Colony" tool from colony tools menu. As a splitting line click and draw a line on the desired splitting portion. The gap will appear on the drawn line as the colony will be separated into two.

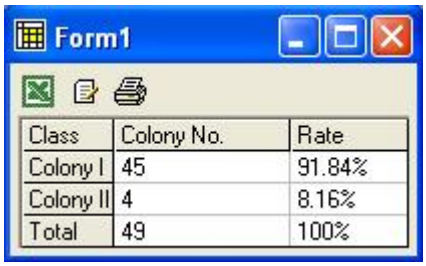
Note: Enlarge the image during splitting to ensure that the colonies have been successfully spitted. Alternatively, open the "Report" window and observe the increase in colony count number.

G-4. Report:

1. Click "  Report" from quick guide or "Report" icon, or select and click "Report" from analysis menu to display the report.



2. Report window will pop up, displays the colony numbers for each type, their percentage and the total number of colonies.



Save to excel tool:

Allows user to export the report to excel.

Save report tool:

Allows user to save the report as excel file format (.xls) or text file format (.txt). Click on the icon and a file-saving window will pop up. Input the file name, select the file format then click “Save” to save the file.

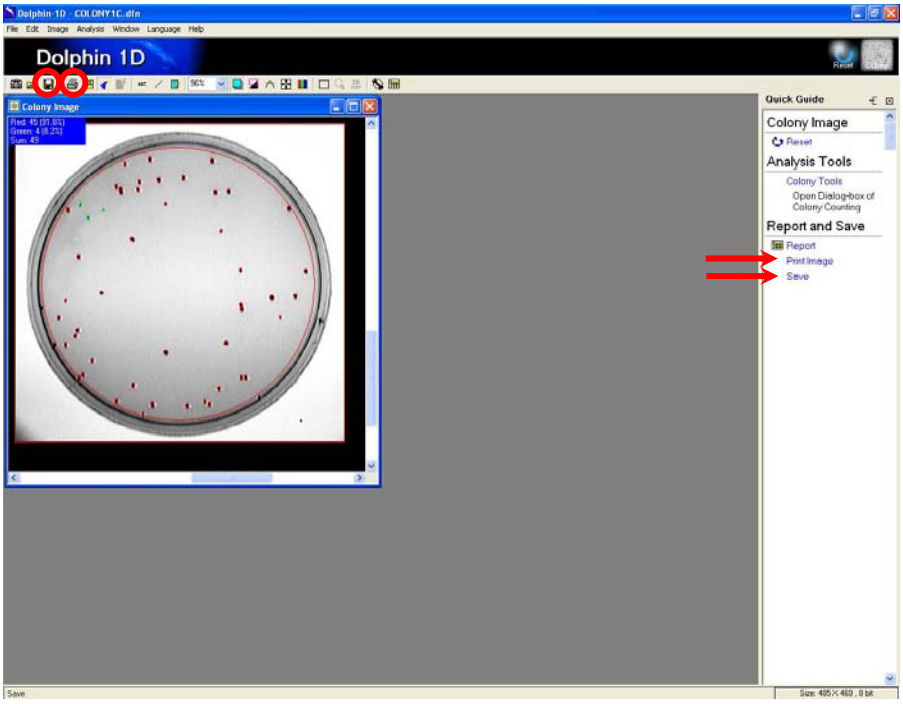
Print report tool:

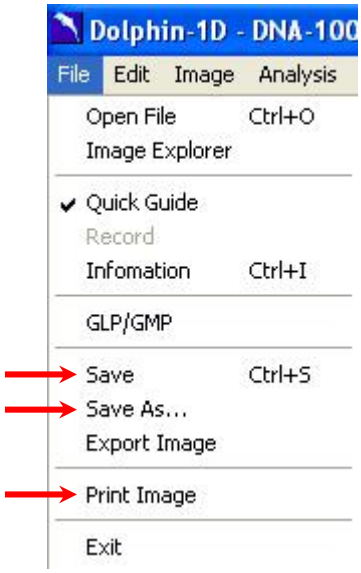
Allows user to print the report. Click on the icon and a print report window will pop up. Select and input the printing format and the parameter. Then proceed to print the report by clicking “Print”.

3. User may choose to export the report to excel by clicking ”Save to Excel” or to save the report as excel or text file format by clicking “Save Report” icon in the report window. In the case of “Save Report” a file-saving window will pop up, input the file name, select the file format and save the file by clicking “Save”.

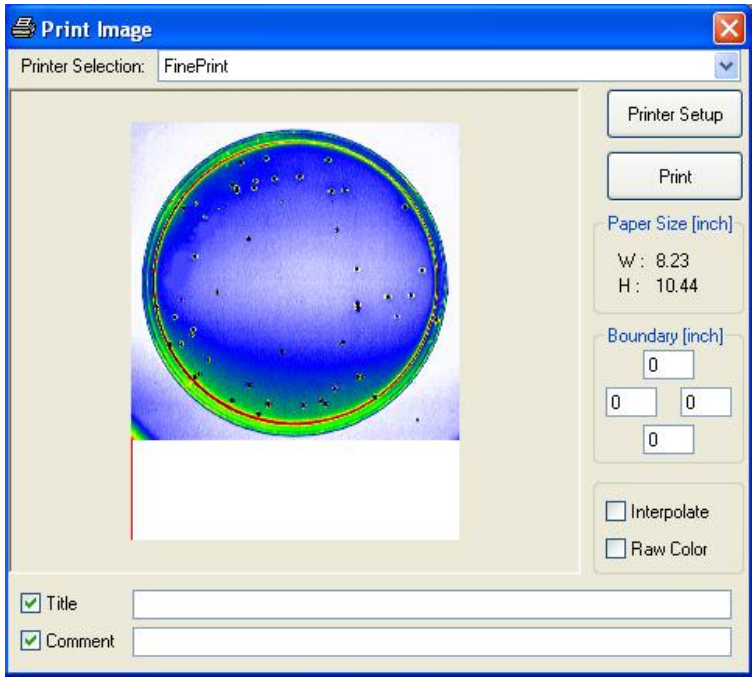
G-5. Print and save:

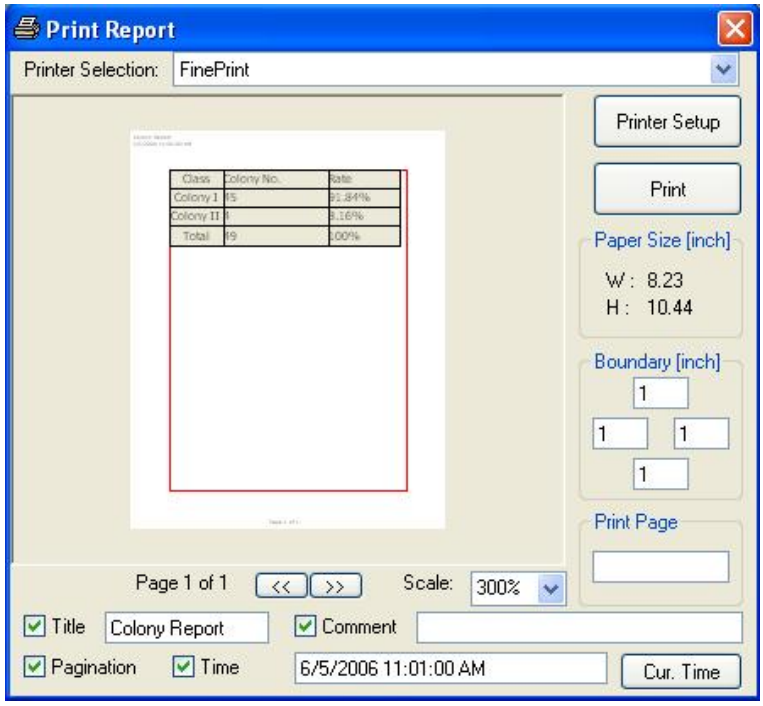
Click “Print Image” from quick guide or “Print Image” icon, or select and click “Print Image” from file menu to print the image. Click “Save” from quick guide or “Save” icon, or select and click “Save” or “Save As…” from file menu to save the image.



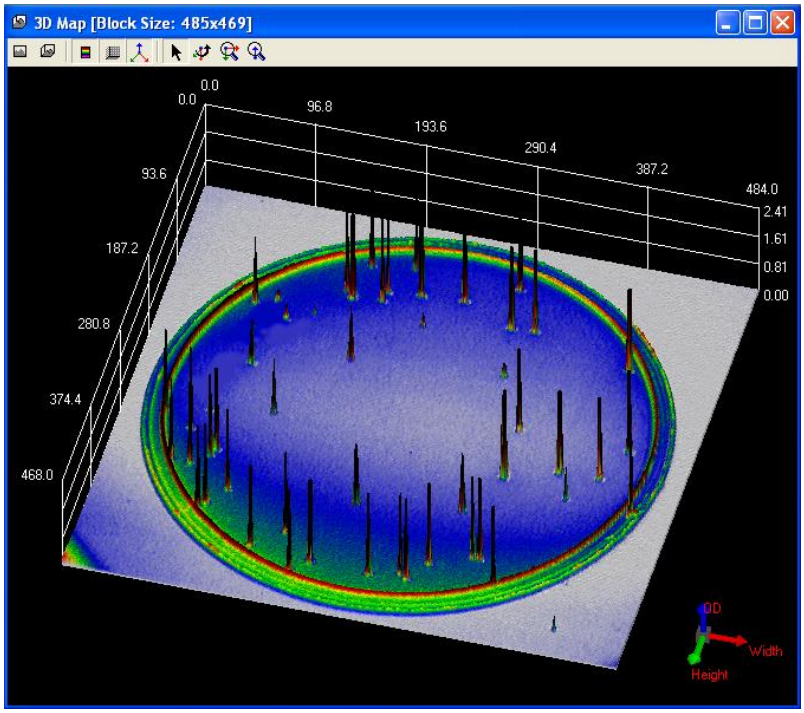


To print image or report, upon clicking the icon a “Print Image” or “Print Report” window will pop up. Input and select the printing parameter then click “Print”.

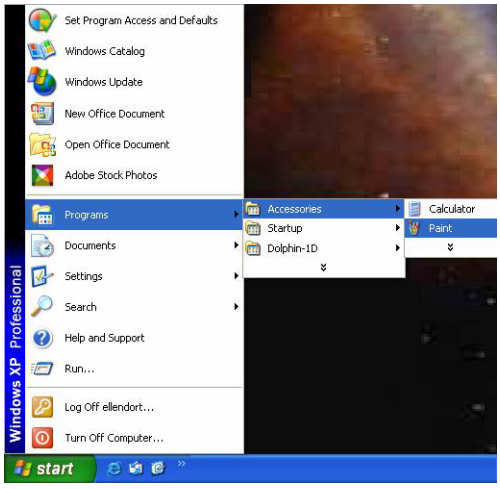




Printing or saving the following images: 3D Map image can be done by closing the quick guide and maximizing the images, then press “Print Screen” on keyboard and



paste the image into the Microsoft Paint Software. (Start→Programs→Accessories→Paint). Print or save the image with Paint Software.



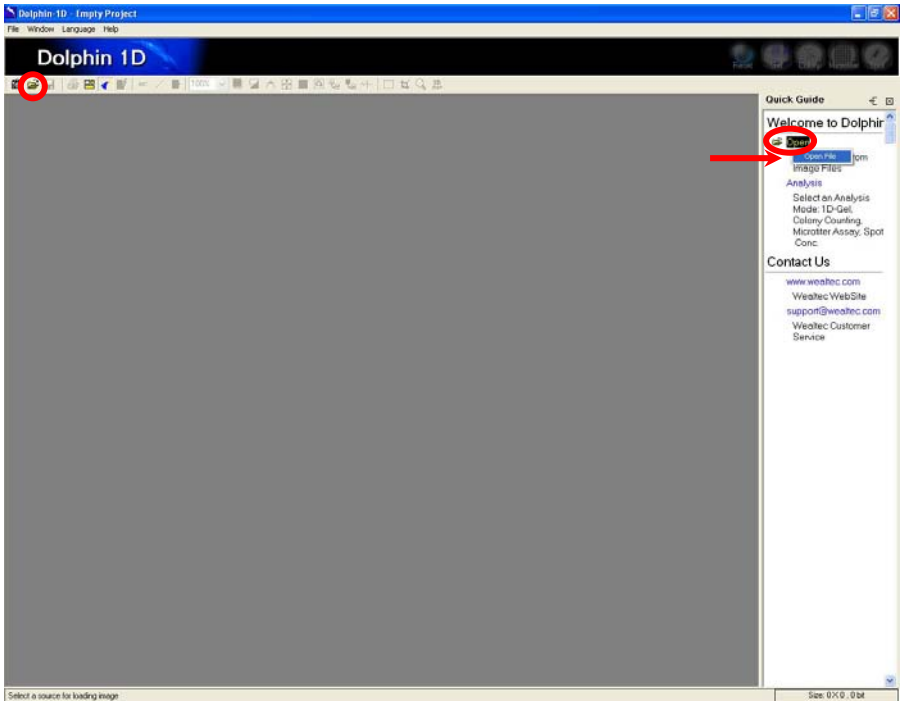
H. Microtiter Plate Assay

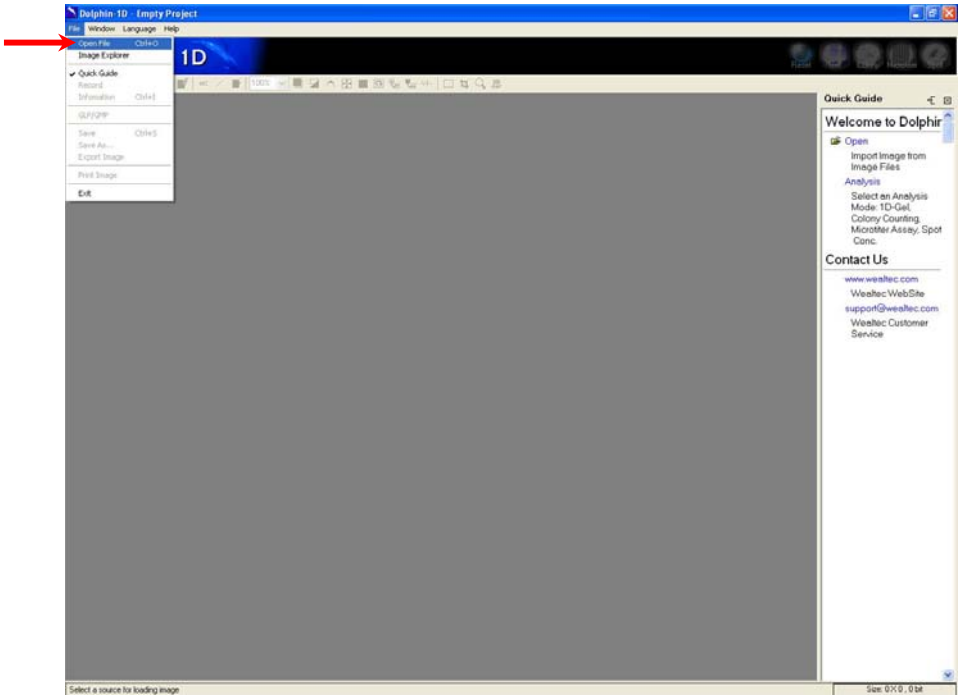
This chapter describes microtiter plate assay tool of Dolphin-1D software. This tool allows user to measure the mass of microtiter plate assay. Microtiter plate image is taken as a reference in the following examples for tool description.

H-1. Capture / Import image:

1. To capture images from Dolphin image system (eg. Dolphin-Doc) click “Open” from quick guide or “New Image from Peripheral” icon then select and click “Open Dolphin-DOC”, or select and click “Open Dolphin-DOC” from file menu. (Please refer to Chapter 3 for details).
   Note: Dolphin-Doc is taken as a reference in the following examples. If you have purchased other than Dolphin-Doc image system and intended to use please select appropriate image system in every option selection of Dolphin-Doc in this manual.

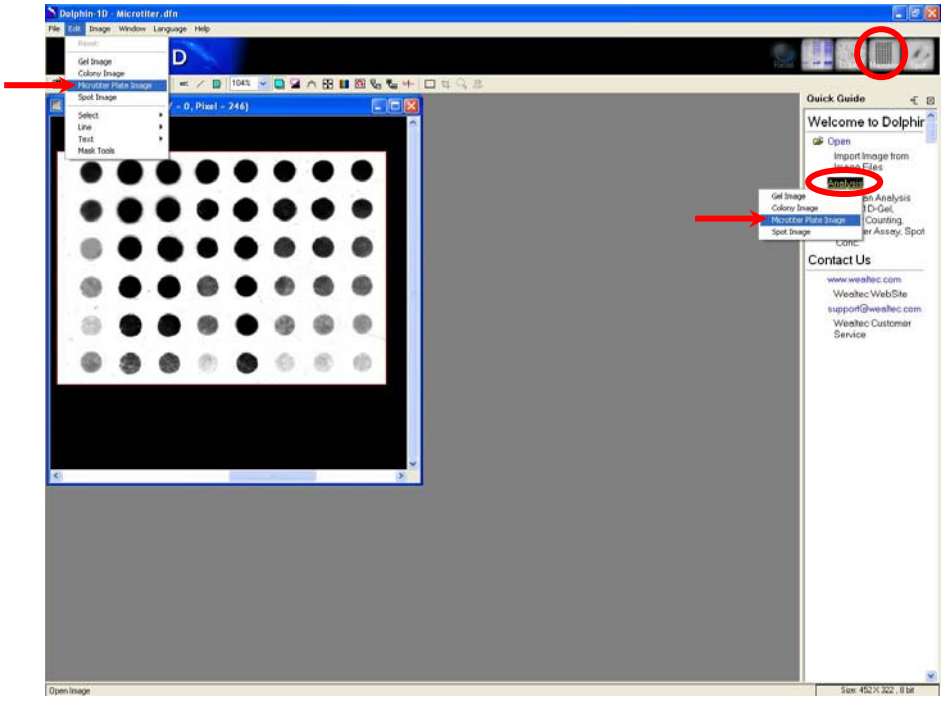
2. For stored images in the disk click “Open” from quick guide and select “Open File” or click “Open” icon, or select “Open File” from file menu then select the image file and click “Ok”.



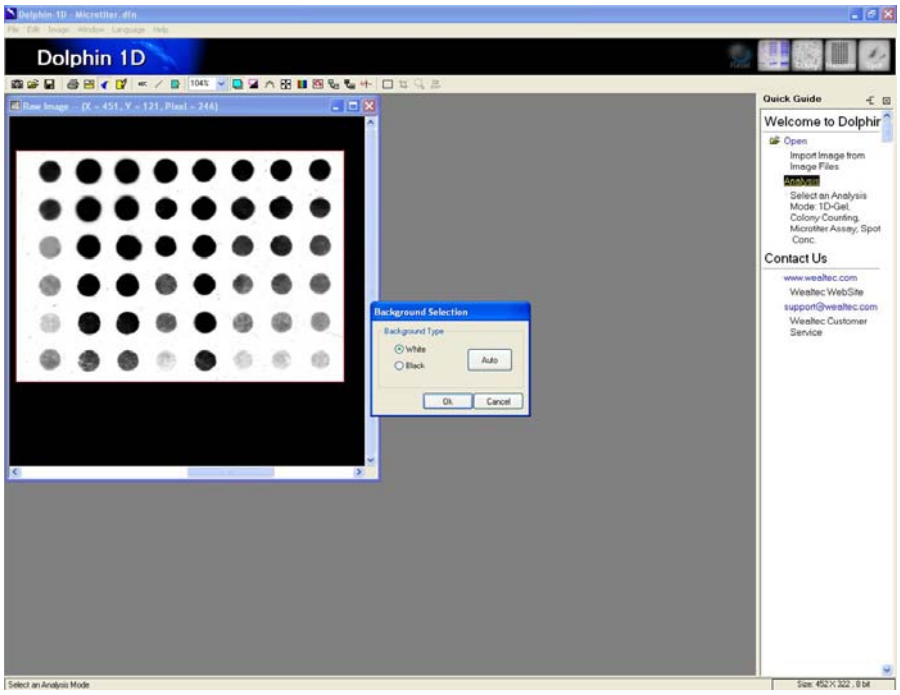


H-2. Microtiter plate assay function:

1. Click “Analysis” from quick guide and select “Microtiter Plate Image” or click “Microtiter” icon, or select “Microtiter Plate Image” from edit menu to open microtiter plate assay function.

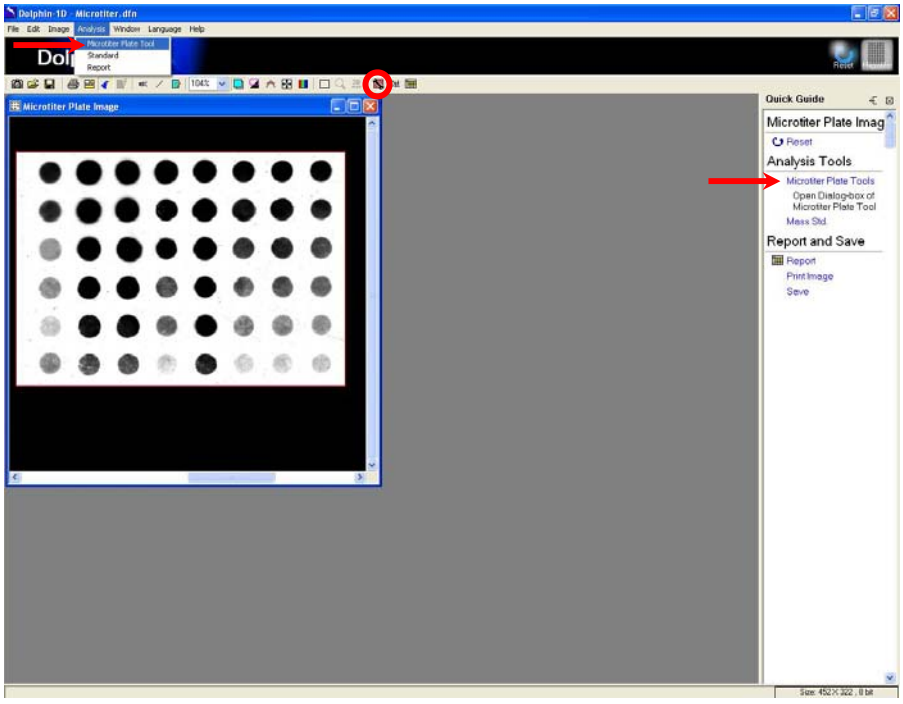


2. Select the appropriate background and click “Ok” button to proceed.

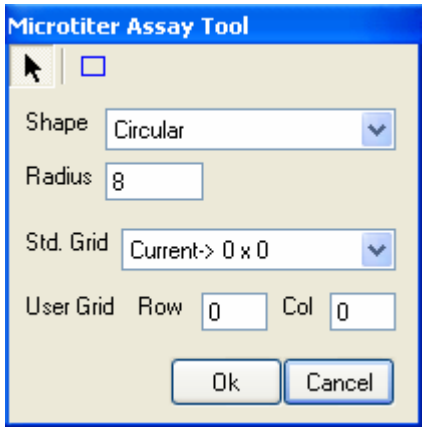


H-3. Microtiter plate assay definition:

Click “Microtiter Plate Tools” from quick guide or “Spot Tools” icon, or select and click “Microtiter Plate Tools” from analysis menu for microtiter assay tool window.



H-3-1. Microtiter assay tools:



Arrow tool:

Allows user to adjust the size and the position of the wells.

Define Region tool:

Allows user to define the interested region or area on the image. Only one region of interest can be defined at a time.

H-3-2. Defining microtiter plate:

a.) Select the  "Define Region" tool and draw region of interest on the image.

b.) Choose circular for dot-well image or rectangular for slot-well image from the "Shape" pull down menu.

c.) For the size of the circular shape, input the radius value in the "Radius" dialog box or click on any circle in the image and drag any one of the square boxes on the circle to adjust the circle radius.

Note: Click and drag any circle by grabbing the region other than the square boxes to adjust their position of the circle in the image.

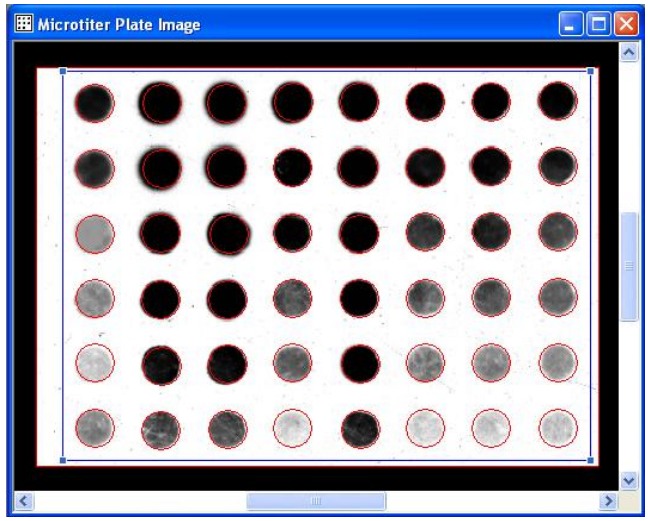
d.) For the size of the rectangular shape, input the width and height value in the "Width" and "Height" dialog box or click on any rectangle on image and drag any one of the square boxes on the rectangle to adjust the width and height of the rectangular size.

Note: Click and drag any rectangle by grabbing the region other than the square boxes to adjust their position in the image.

e.) Choose the plate type from the "Std.Grid" pull down menu.

Note: To analyze only few spots on the image, please choose number of rows and columns by entering the input in the "User Grid" row and column dialog box.

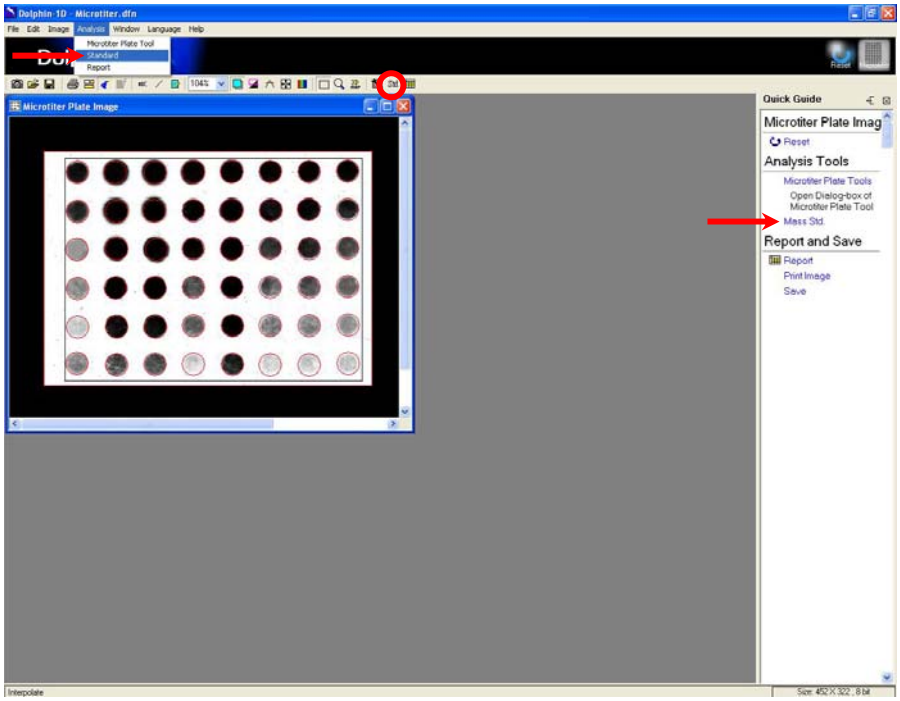
f.) Select  arrow tool to adjust circles to fit the wells. Click and drag four square boxes on blue frame of the selected region of interest to fit all the circles to all the wells from each corner. Then click and drag the circles or rectangles, place them exactly on the well or spots of the interest region or click and drag the four boxes on the red line of the circle to adjust their radius and rectangular to adjust their width and height.



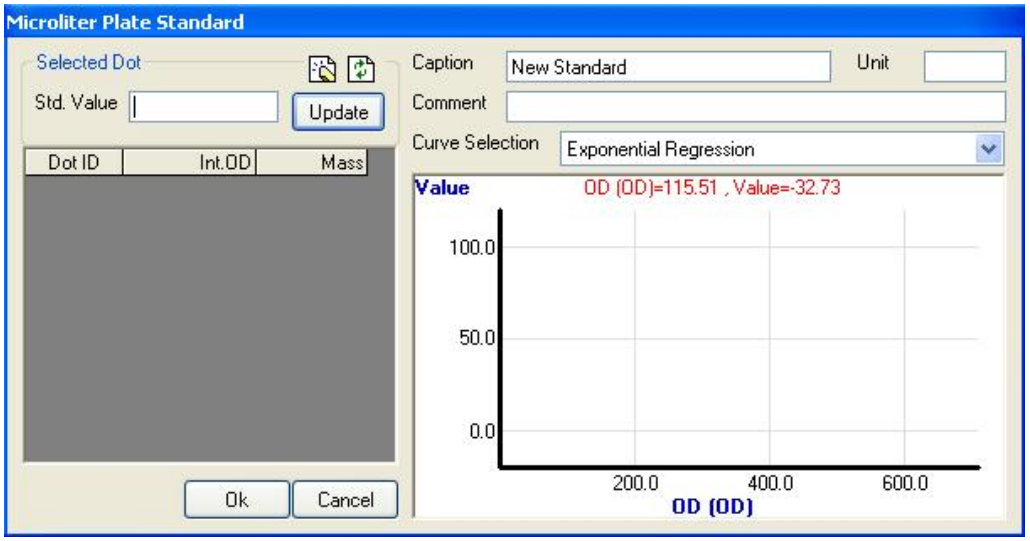
g.) Click "Ok" to complete the Microtiter plate assay definition.

H-4. Mass standard:

Click “Mass Std.” from quick guide or “Mass Std.” icon, or select and click “Standard” from analysis menu for microtiter plate standard window.



H-4-1. Microtiter plate standard window:



Delete tool:

Allows user to delete the Mass standard.

Sort tool:

Allows user to sort the standards by MicroID, IntOD(>), IntOD(<), Mass(>) or Mass(<).

H-4-2. Setting mass standard

a.) Click on known mass standard spots on the image and input their values in the “Std. Value” dialog box. Click “Update” button to add the standard value to the list.

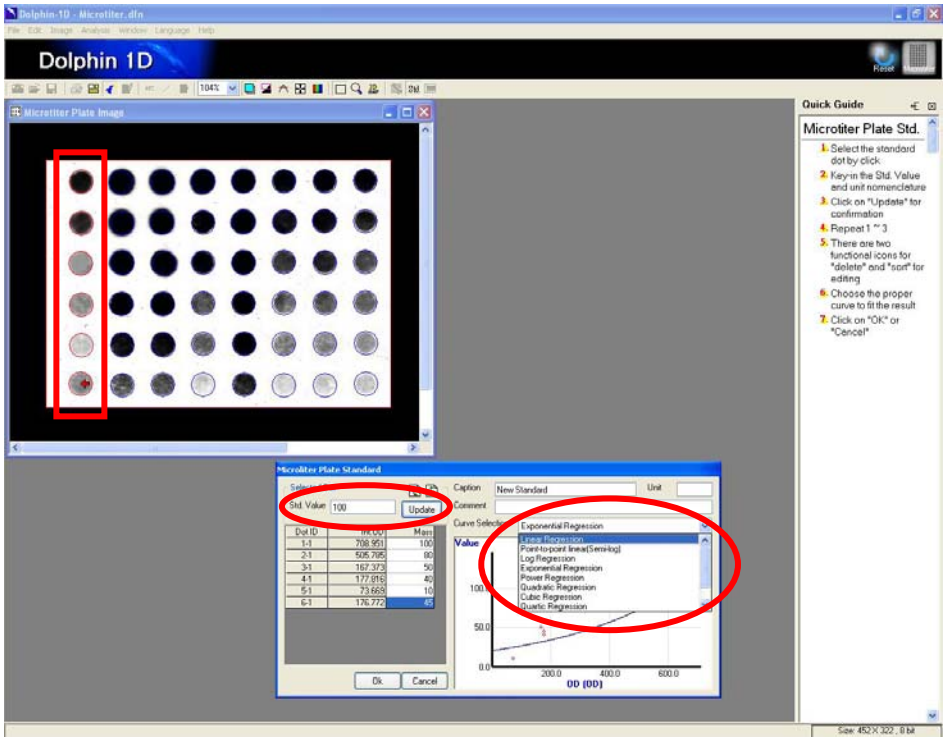
Note: User may edit the mass standard value by clicking on the “Std. Value” in the mass column and re-entering the new value. User may also choose to delete the mass standard by using the “Delete” icon in the dialog box.

b.) Select the sorting of the mass standards accordingly to either “MicroID”, ascending or descending “IntOD” or “Mass” values by clicking “sort” icon in mass standard window.

c.) Input the caption, unit and comments of the standards in the dialog box.

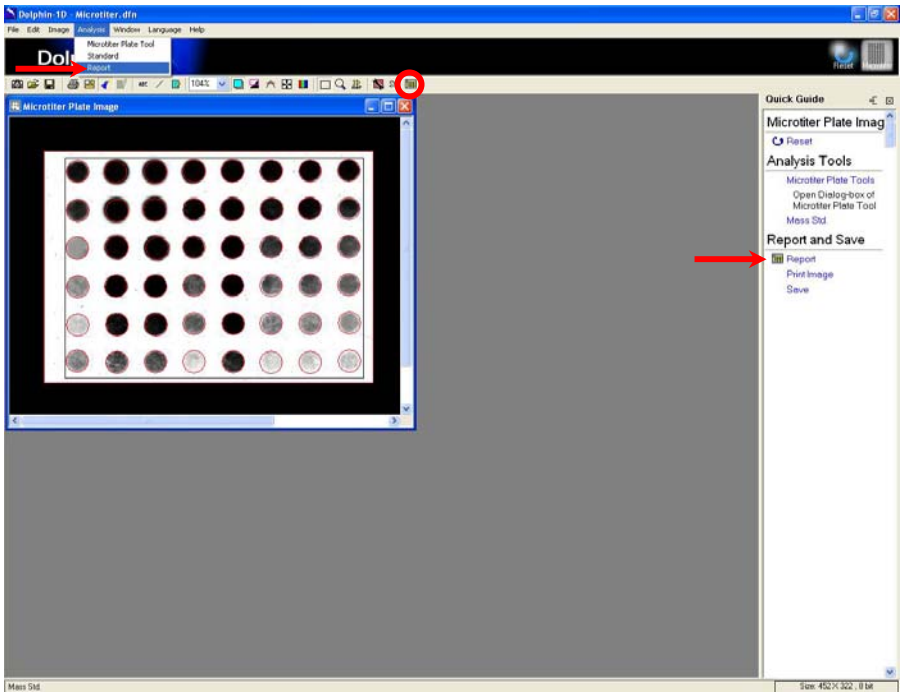
d.) Choose the best curve fit the standards from the curve selection pull down menu.

e.) Click “Ok” to complete mass standard settings.

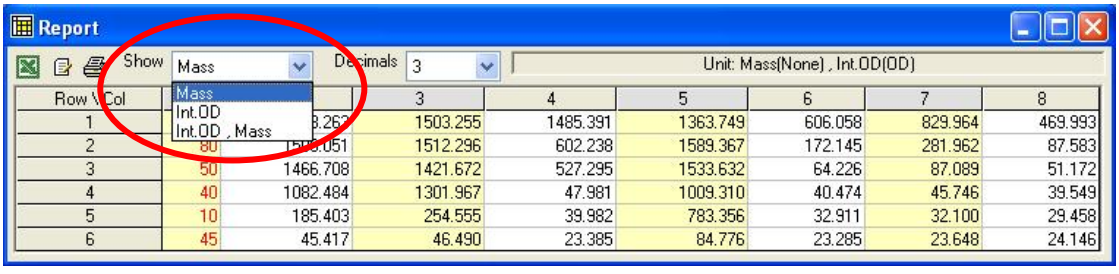


H-5. Report:

1. Click “ Report” from quick guide or “Report” icon, or select and click “Report” from analysis menu to display the report.



2. Report window will pop up. User may choose to display the reports in “Mass”, “Int.OD” or “Int.OD ,Mass” by selecting from “Show” pull down menu.



Row \ Col	2	3	4	5	6	7	8
1	[illegible]	1503.255	1485.391	1363.749	606.058	829.964	469.993
2	80	1512.296	602.238	1589.367	172.145	281.962	87.583
3	50	1466.708	1421.672	527.295	1533.632	64.226	87.089	51.172
4	40	1082.484	1301.967	47.981	1009.310	40.474	45.746	39.549
5	10	185.403	254.555	39.982	783.356	32.911	32.100	29.458
6	45	45.417	46.490	23.385	84.776	23.285	23.648	24.146

Save to excel tool:

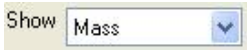
Allows user to export the report to excel.

Save report tool:

Allows user to save the report as excel file format (.xls) or text file format (.txt). Click on the icon and a file-saving window will pop up. Input the file name, select the file format then click “Save” to save the file.

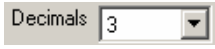
Print report tool:

Allows user to print the report. Click on the icon and a print report window will pop up. Select and input the printing format and the parameter. Then proceed to print the report by clicking “Print”.



Show tool:

Allows user to choose the report display in the table from “Show” pull down menu. The default setting will display “Mass”. Other option which is available from pull down menu is “Int.OD” or “Int.OD, Mass”.



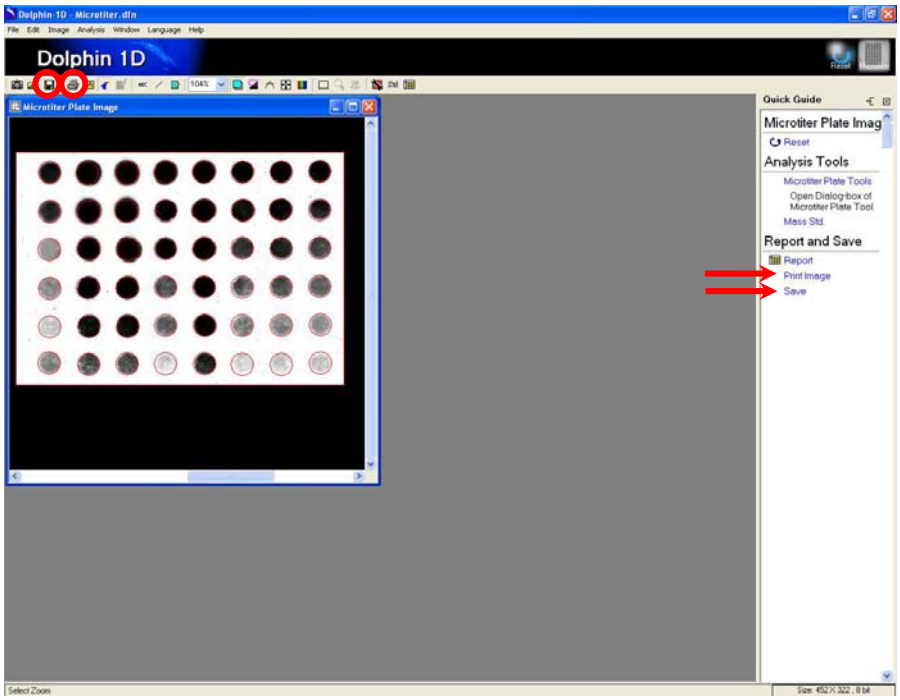
Decimals tool:

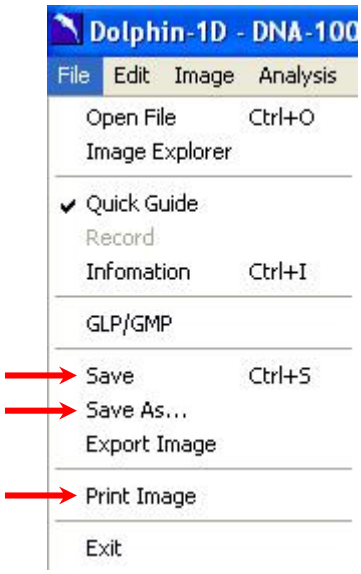
Allows user to choose the number of decimals for the results to be displayed from the “Decimals” pull down menu. The default number of decimals is 3 and the maximum number that can be chosen is 5.

3. User may choose to import the report to excel by clicking ”Save to Excel” or to save the report as excel or text file format by clicking “Save Report” icon in the report window. In the case of “Save Report” a file-saving window will pop up, input the file name, select the file format and save the file by clicking “Save”.

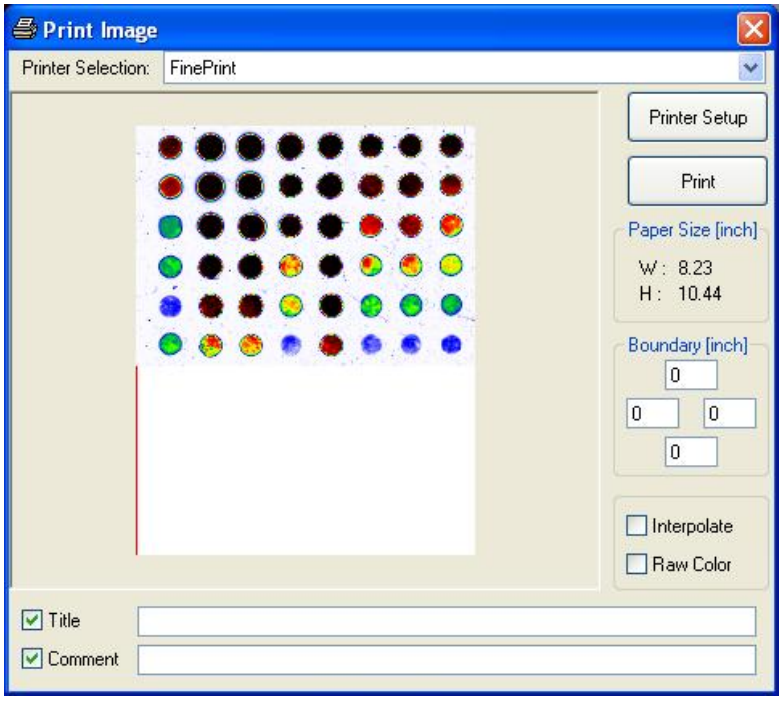
H-6. Print and save:

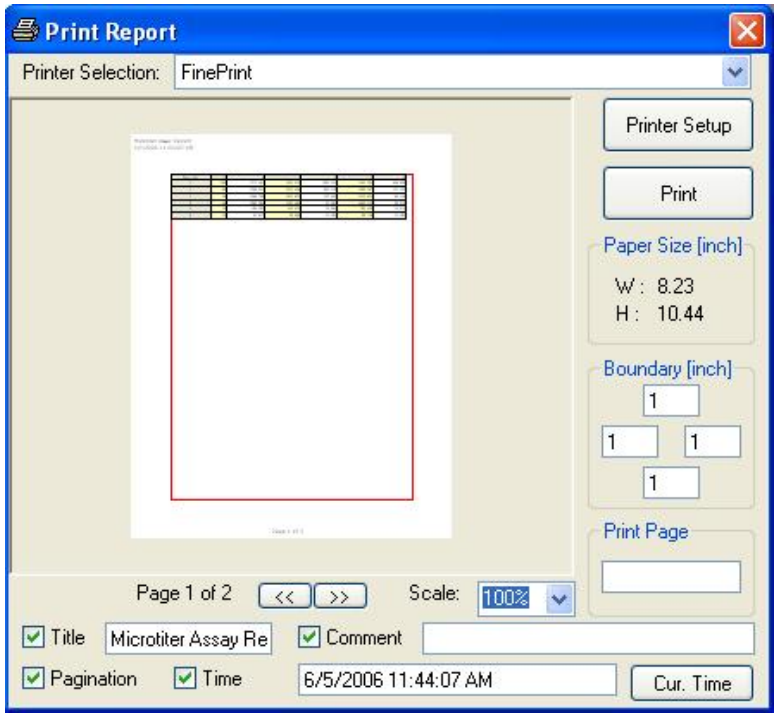
Click “Print Image” from quick guide or “Print Image” icon, or select and click “Print Image” from file menu to print the image. Click “Save” from quick guide or “Save” icon, or select and click “Save” or “Save As…” from file menu to save the image.



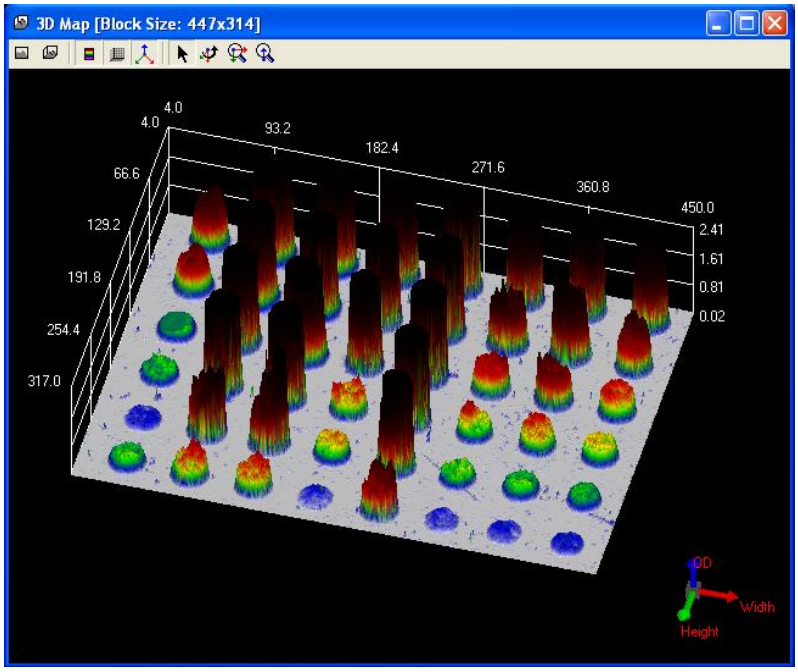


To print image or report, upon clicking the icon a “Print Image” or “Print Report” window will pop up. Input and select the printing parameter then click “Print”.

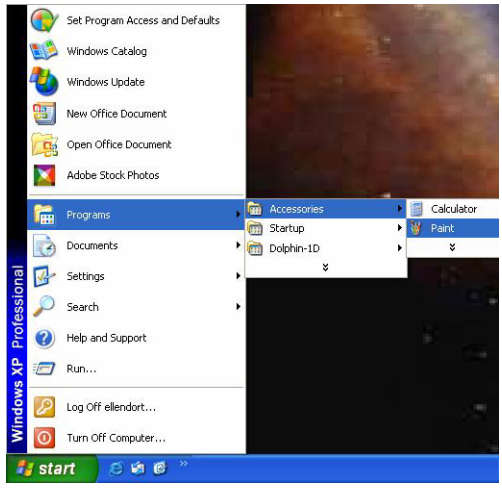




Printing or saving the following images: 3D Map image can be done by closing the quick guide and maximizing the images, then press “Print Screen” on keyboard and



paste the image into the Microsoft Paint Software. (Start→Programs→Accessories→Paint). Print or save the image with Paint Software.



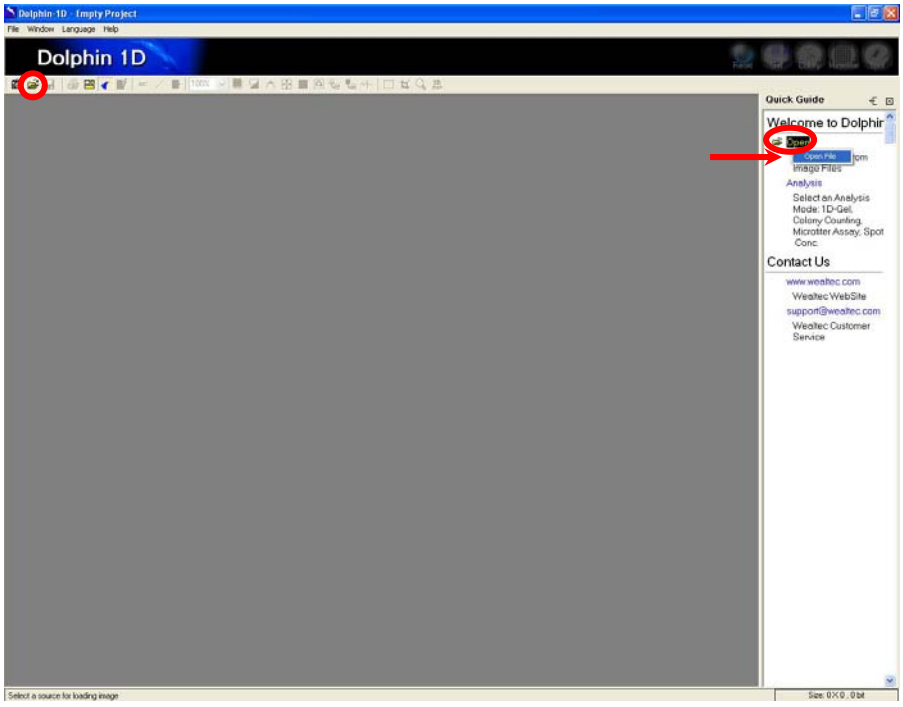
I. Spot Image Analysis

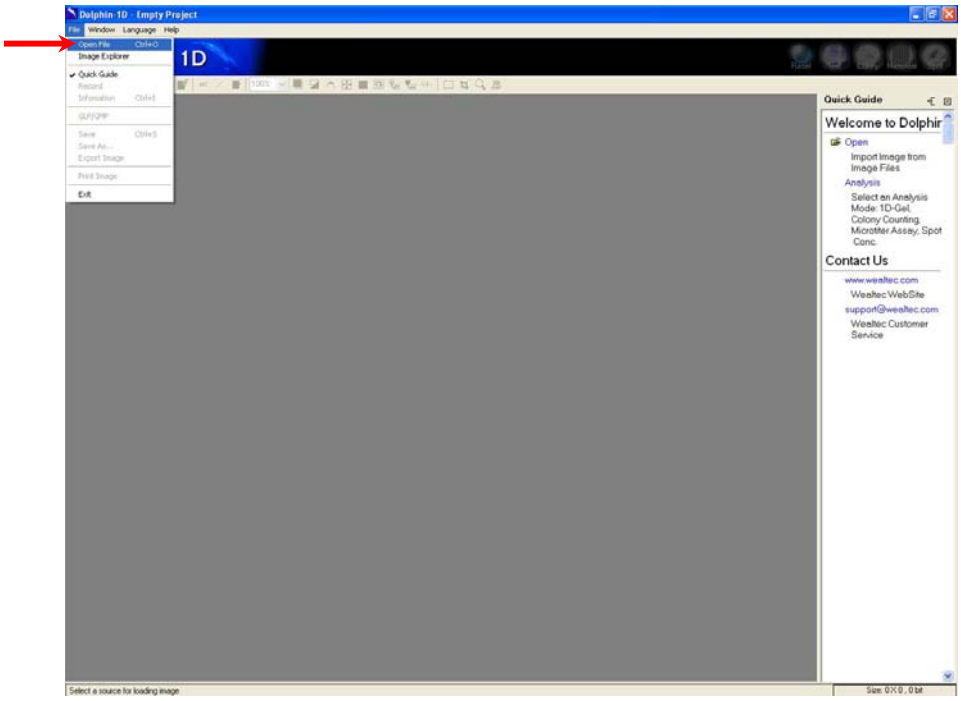
This chapter describes spot image analysis tool of Dolphin-1D software. This tool allows user to analyze the 2D gel image. 2D gel image is taken as a reference in the following examples for tool description.

I-1. Capture / Import image:

1. To capture images from Dolphin image system (eg. Dolphin-Doc) click “Open” from quick guide or “New Image from Peripheral” icon then select and click “Open Dolphin-DOC”, or select and click “Open Dolphin-DOC” from file menu. (Please refer to Chapter 3 for details). **Note**: Dolphin-Doc is taken as a reference in the following examples. If you have purchased other than Dolphin-Doc image system and intended to use please select appropriate image system in every option selection of Dolphin-Doc in this manual.

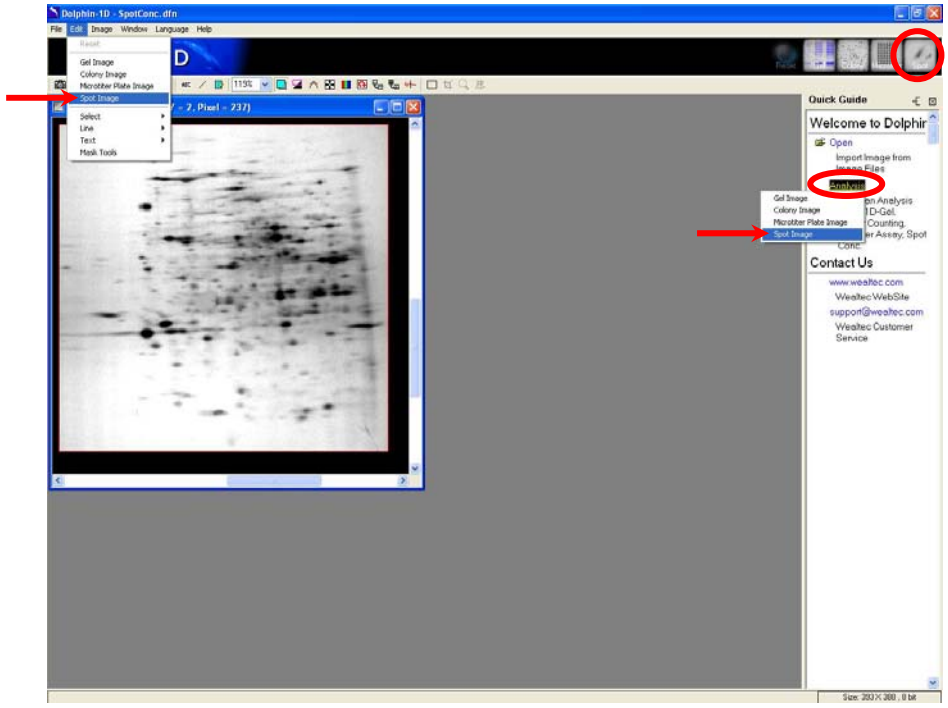
2. For stored images in the disk click “Open” from quick guide and select “Open File” or click “Open” icon, or select “Open File” from file menu then select the image file and click “Ok”.



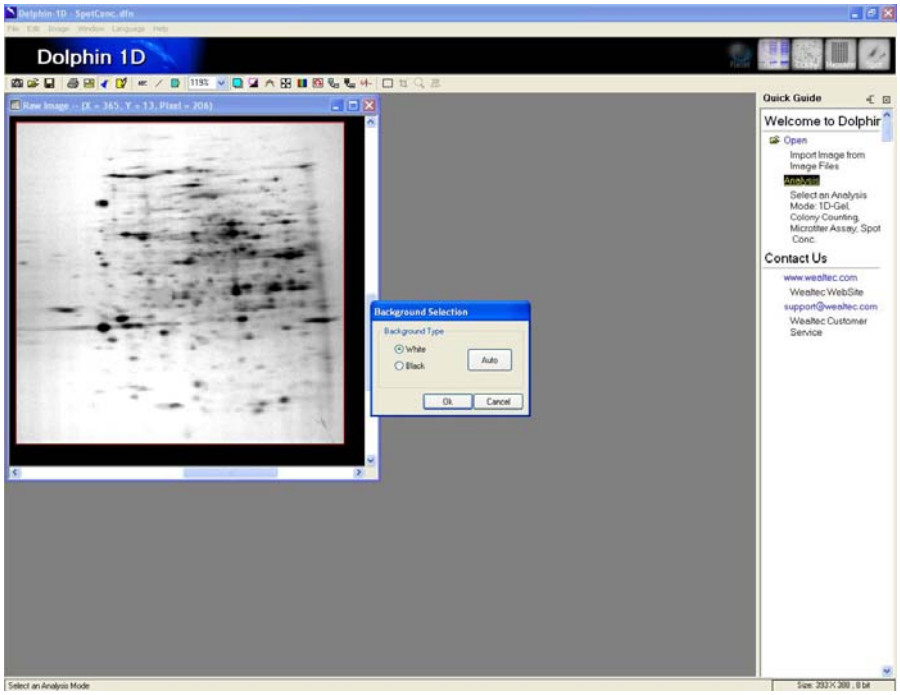


I-2. Spot image analysis function:

1. Click “Analysis” from quick guide and select “Spot Image” or click “Spot” icon, or select “Spot Image” from edit menu to open spot image analysis function.

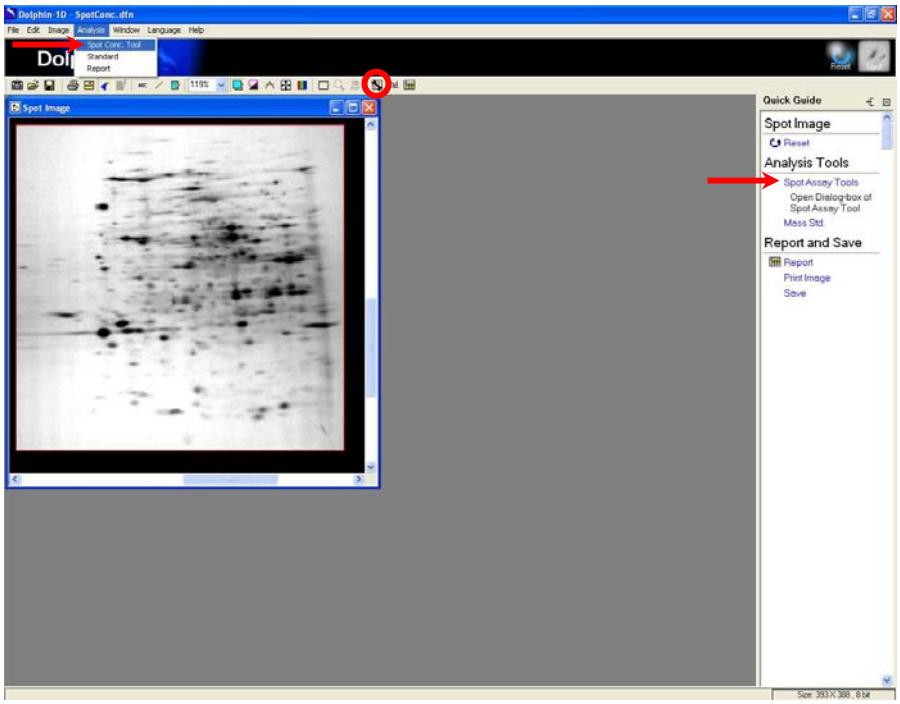


2. Select the appropriate background and click “Ok” button to proceed.



I-3. Spot image analysis definition:

Click “Spot Assay Tools” from quick guide or “Spot Tools” icon, or select and click “Spot Conc. Tool” from analysis menu for spot assay tool window.



I-3-1. Spot tools:

Arrow tool:

While using any spot region selection tools, by pointing and clicking the cursor on any unselected area in 2D image will automatically select this arrow tool. By pointing the cursor and right mouse click on any selected region or area will delete the spot selection.

Spot trace tool:

Allows user to select and define the spot region or area automatically simply by clicking on the desired spot border. Point the cursor on the desired spot border and left mouse click will define a spot region in blue line. To confirm the selected spot region or area, right click the mouse pointer and the blue line will convert to red line labeled with spot number.

Draw spot tool:

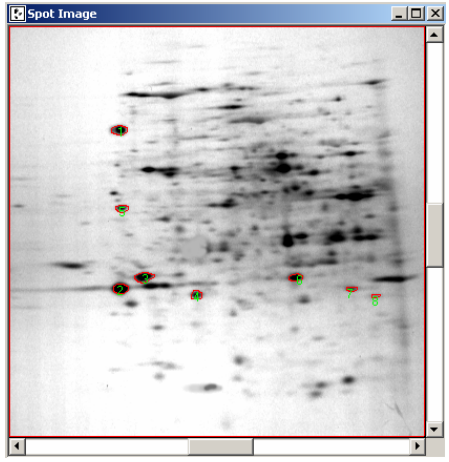
Allows user to draw and select the region or area of each spot. Click and hold the left mouse and draw the spot region. Drawn spot line will be in blue. To confirm the selected spot region or area, right click the mouse pointer and the blue line will convert to red line labeled with spot number.

Delete spot tool:

Allows user to delete any selected spot.

I-3-2. Define spot:

a.) Select the “Spot Trace” tool from the spot tool menu and click on the border of the spot. The selected area of each spot will be defined with blue border. Right click the mouse pointer on the spot to confirm the spot selection. After selection, the border color convert from blue to red and the spot will be labeled with a number. Similarly, select the other spots of interest on the image.



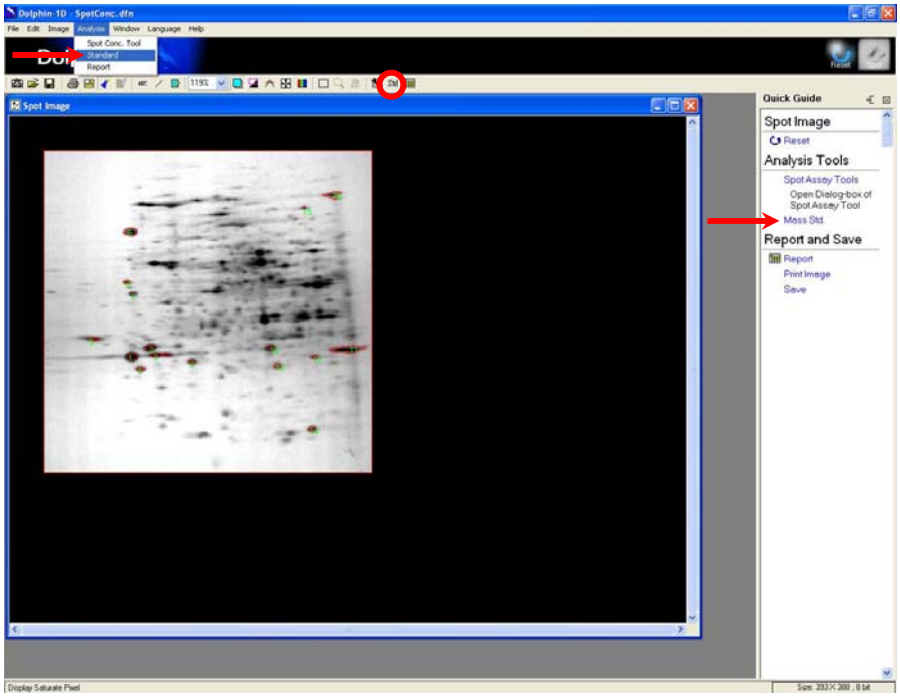
b.) User may also manually draw the selection area of each spot by selecting the “Draw Spot” tool from the spot tool menu. Click and hold the mouse pointer and drag the line around the desired region of the spot. After drawing each selected spot area, right click the mouse pointer on the selected spot to confirm the spot. Upon confirmation the blue line will convert to red line with the spot label.

c.) If any spot marking is not satisfactory, select the “Delete Spot” tool from the spot tools menu and click on spot to remove the defined spot.

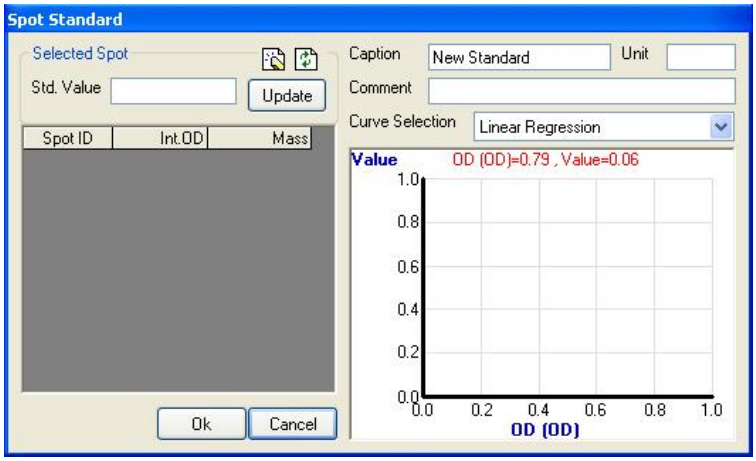
d.) Click “Ok” to finish spot definition.

I-4. Spot standard:

Click “Mass Std.” from quick guide or “Mass Std.” icon, or select and click “Standard” from analysis menu for spot standard window.



I-4-1. Spot standard window:



Delete tool:

Allows user to delete the Mass standard.

Sort tool:

Allows user to sort the standards by MicroID, IntOD(>), IntOD(<), Mass(>) or Mass(<).

I-4-2. Setting mass standard

a.) Click on known mass standard spots on the image and input their values in the “Std. Value” dialog box. Click “Update” button to add the standard value to the list.

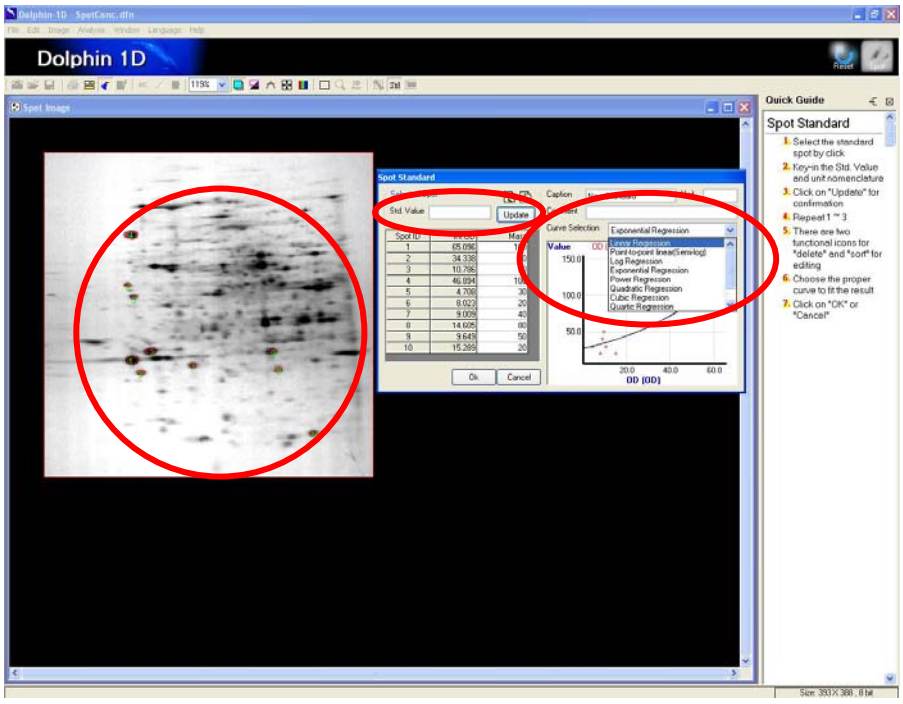
Note: User may edit the mass standard value by clicking on the “Std. Value” in the mass column and re-entering the new value. User may also choose to delete the mass standard by using the “Delete” icon in the dialog box.

b.) Select the sorting of the mass standards accordingly to either “MicroID”, ascending or descending “IntOD” or “Mass” values by clicking “sort” icon in mass standard window.

c.) In put the caption, unit and comments of the standards in the dialog box.

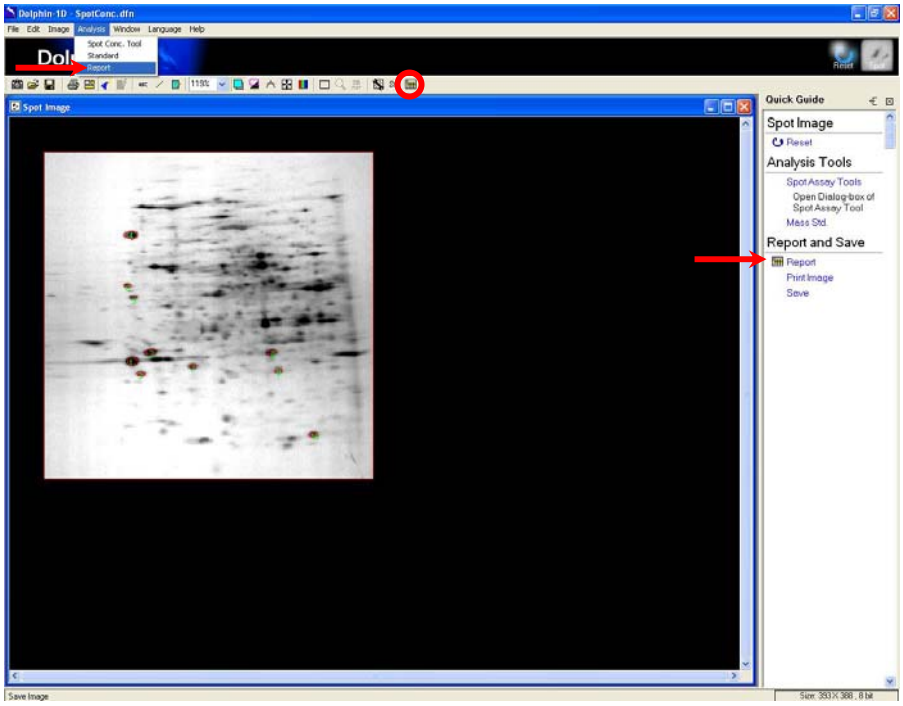
d.) Choose the best curve fit for the standards from the curve selection pull down menu.

e.) Click “Ok” to complete mass standard settings.

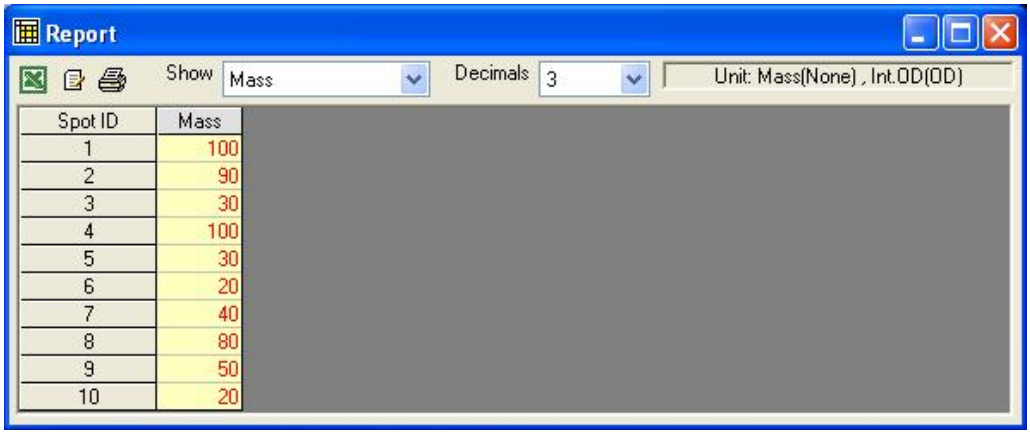


I-5. Report:

1. Click “ Report” from quick guide or “Report” icon, or select and click “Report” from analysis menu to display the report.



2. Report window will pop up. User may choose to display the reports in “Mass”, “Int.OD” or “Int.OD ,Mass” by selecting from “Show” pull down menu.



Save to excel tool:

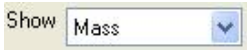
Allows user to export the report to excel.

Save report tool:

Allows user to save the report as excel file format (.xls) or text file format (.txt). Click on the icon and a file-saving window will pop up. Input the file name, select the file format then click “Save” to save the file.

Print report tool:

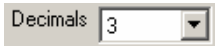
Allows user to print the report. Click on the icon and a print report window will pop up. Select and input the printing format and the parameter. Then proceed to print the report by clicking “Print”.



Show tool:

Allows user to choose the report display in the table from “Show” pull down menu. The default setting will display “Mass”. Other options which is available from pull down menu is “Int.OD”, “Int.OD, Mass”, “Area” or “Int.OD, Mass, Area”.

Note: “Area” is the selected region or area of each spot.



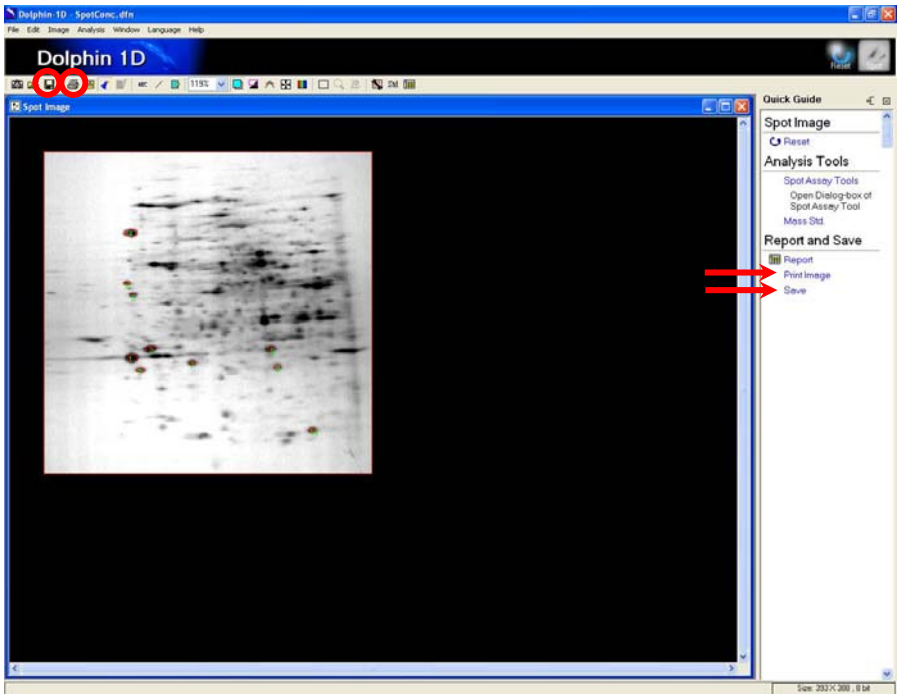
Decimals tool:

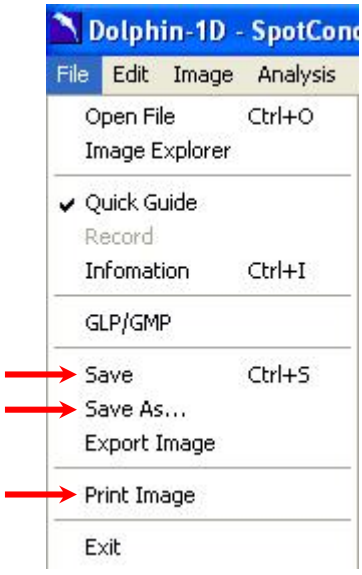
Allows user to choose the number of decimals for the results to be displayed from the “Decimals” pull down menu. The default number of decimals is 3 and the maximum number that can be chosen is 5.

3. User may choose to import the report to excel by clicking ”Save to Excel” or to save the report as excel or text file format by clicking “Save Report” icon in the report window. In the case of “Save Report” a file-saving window will pop up, input the file name, select the file format and save the file by clicking “Save”.

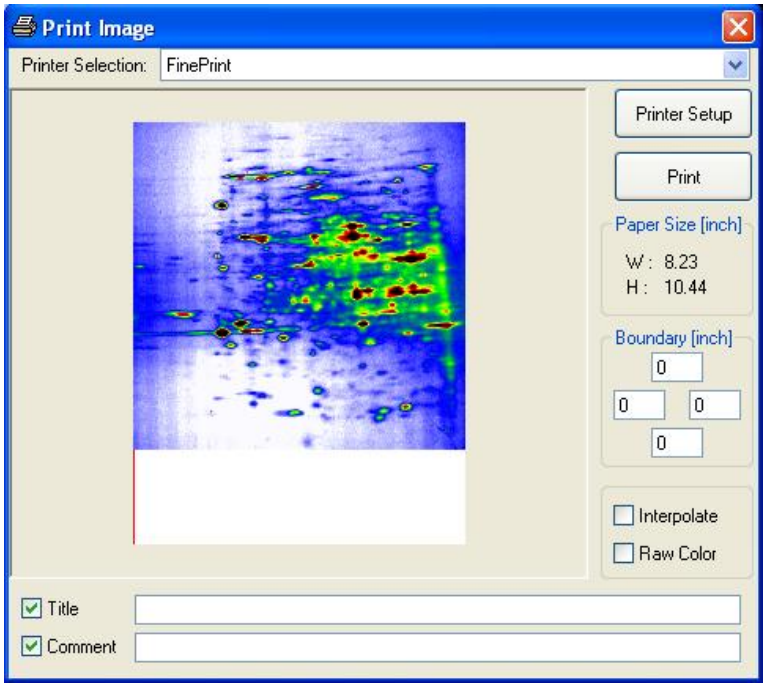
I-6. Print and save:

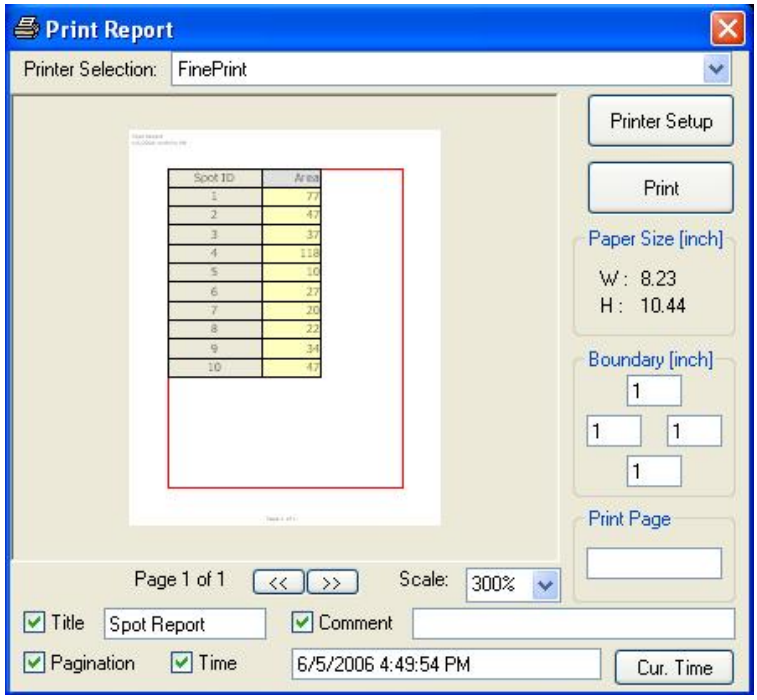
Click “Print Image” from quick guide or “Print Image” icon, or select and click “Print Image” from file menu to print the image. Click “Save” from quick guide or “Save” icon, or select and click “Save” or “Save As…” from file menu to save the image.



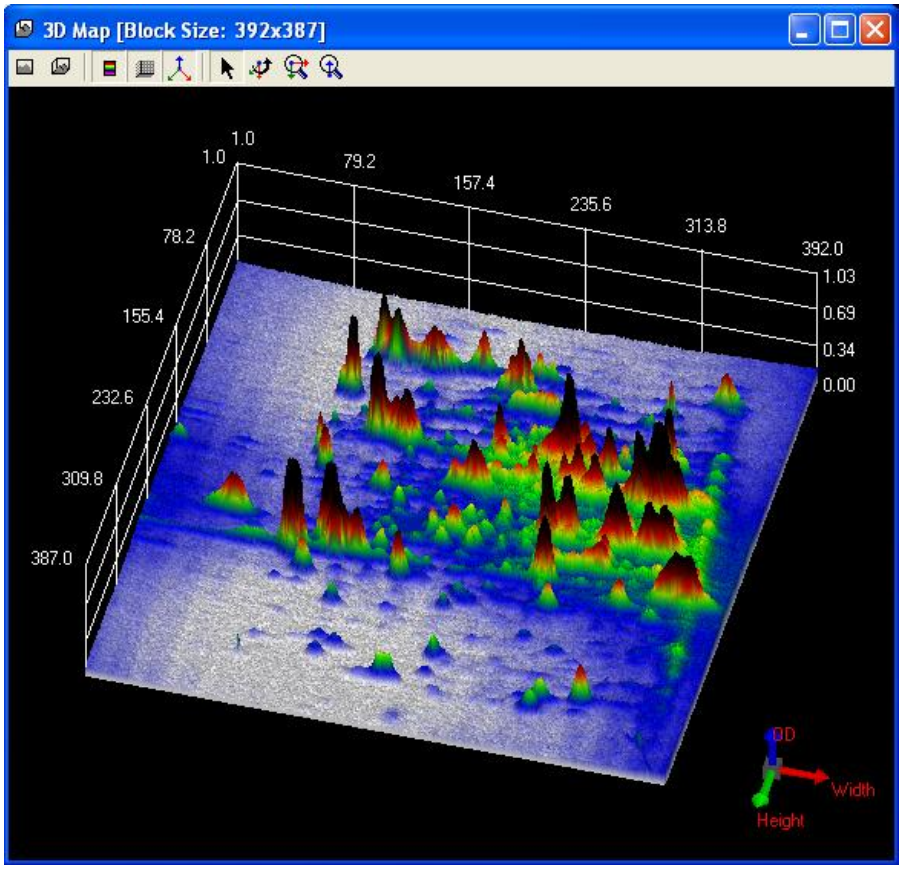


To print image or report, upon clicking the icon a “Print Image” or “Print Report” window will pop up. Input and select the printing parameter then click “Print”.

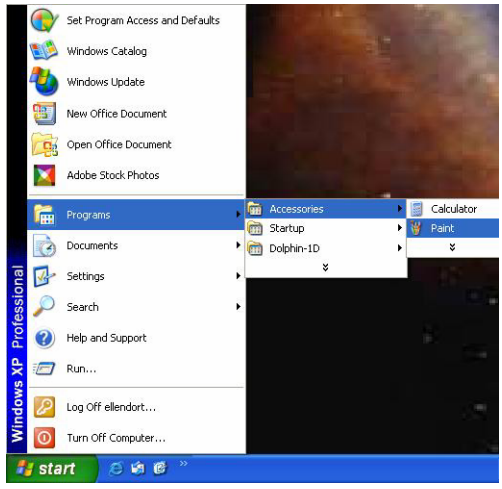




Printing or saving the following images: 3D Map image can be done by closing the quick guide and maximizing the images, then press “Print Screen” on keyboard and



paste the image into the Microsoft Paint Software. (Start→Programs→Accessories→Paint). Print or save the image with Paint Software.



01040 **Wealtec Corp.**

1885 Meadowvale Way Sparks, NV 89431 Tel: +1-775-351-2066 Fax:+1-775-351-2077

http://www.wealtec.com E-mail: support@wealtec.com