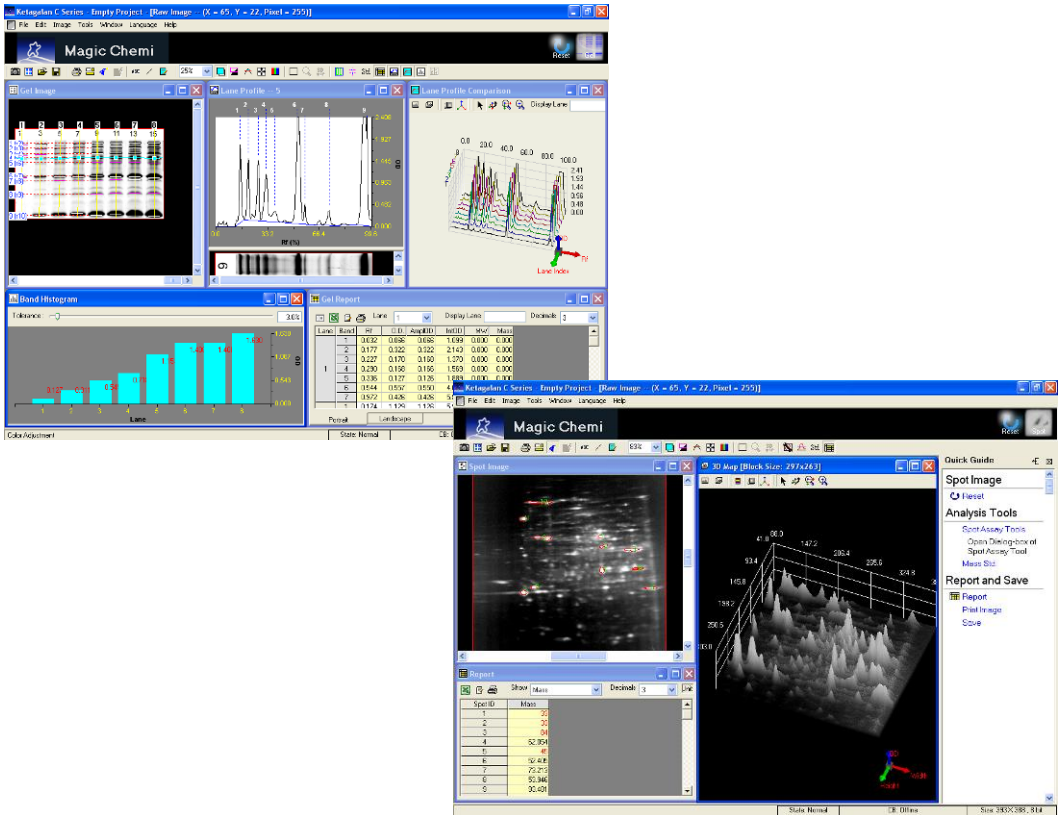
Magic Chemi Analysis Software



Installation and Operation Manual

Version 2.0

Item# 01270

Index

A. Introduction

A-1. Overview:

Magic Chemi with functional enhancement specifically on chemiluminescence image capturing. Software functions include with auto/manual exposure function in capture mode, with gradient increasing exposure time in batch of capturing, and with signal amplify function in image processing. Signal processing through the darkroom calibration, images profiling and blending, pixels binning, and camera shading correction gives the captured images display with the most intensified and clear result. Pictures are analyzed with reliable densitometry analysis which provides most detail information for users.

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
- ✧ Accurate spot density calculation
- ✧ Ability to identify smiling gel accurately
- ✧ Specialized X-axis band analysis function
- ✧ Image profile & 3-D display
- ✧ Support GLP/GMP
- ✧ Image blending function
- ✧ Enhanced capturing methods specific for Chemiluminescence detecting
- ✧ Signal accumulating to enhance the intensity of results

A-3. Applications:

- ✧ **Gel image analysis:** DNA agarose gel, sequencing gel, blotting membrane, Protein SDS-PAGE gels, X-Ray film and photo etc.
- ✧ **Spot image analysis:** Suitable for irregular shape sample analysis, including 2-D gel sample and other special purpose assays.

B. Software & Driver Installation

Magic Chemi software does not require any prerequisite hardware system to be installed in prior but it is recommended to use this software specific with KETA C series imaging system. For more detail information on the hardware minimum requirement and installation, please refer to appropriate KETA C series imaging system's hardware manual.

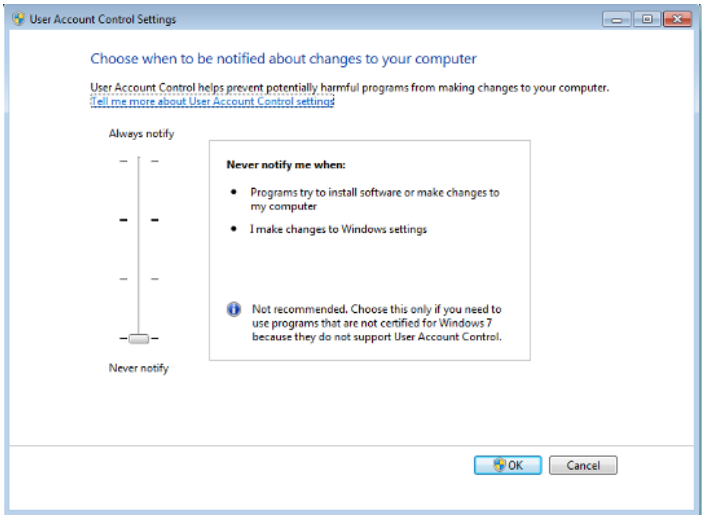
B-1. Minimum computer system requirement:

CPU Pentium IV 2.6 GHz and 1G RAM with English version Windows XP/VISTA/7 system or above, and USB (2.0) supported.

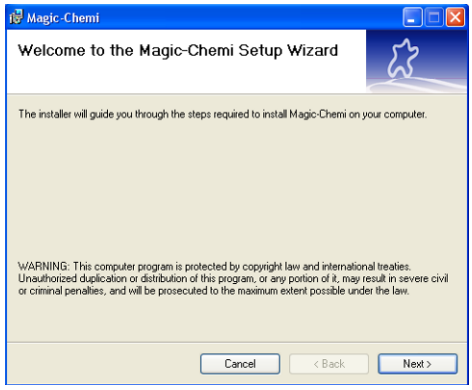
An optional digital thermal printer or inject printer is applicable the system. It is controllable using PC through Magic 1D software.
Recommended model: Sony UP-D897 Digital Graphic Printer.

B-2. Magic Chemi software & driver installation:

1. Before start with the Magic Chemi software in the **Windows 7 OS system**, change the "User Account Control Settings" to have setting as below or go to "Control Panel" →"User Account" →"Change User Account Control setting" →"Never Notify" →"OK" to set.

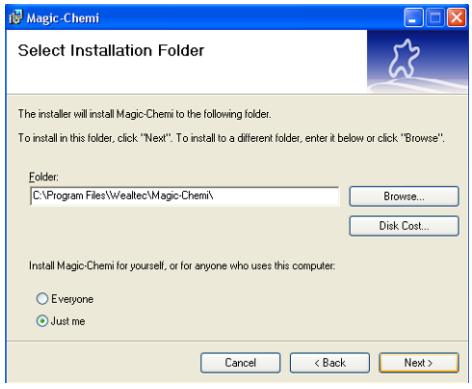


2. Insert software installation CD to the CD-driver. Click “Setup” to initiate Magic Chemi setup wizard which will guide through the steps to install the software. Click “Next” to proceed.

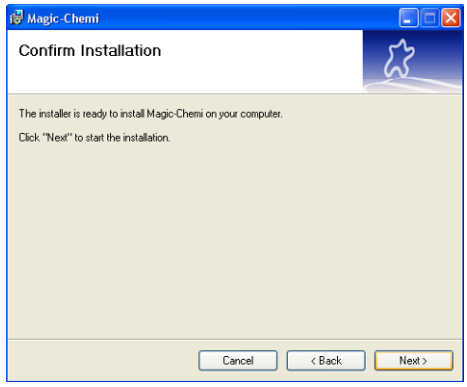


3. Choose the software installation folder by clicking “Browse” button and select the privacy option for single or multiple users. Click “Next” to proceed.

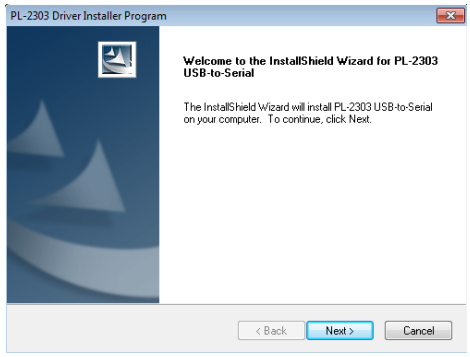
   Note: Default setting for folder “C:\Program Files\Wealtec\Magic Chemi\” and single user privacy option “Just me” selected.



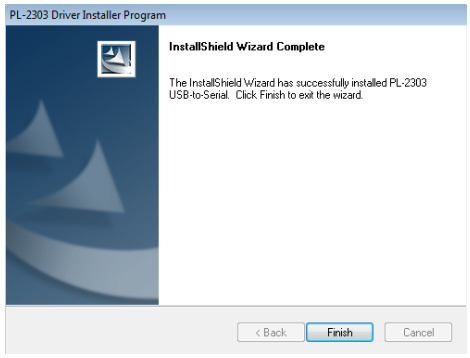
4. Click “Next” to reconfirm and start the installation.



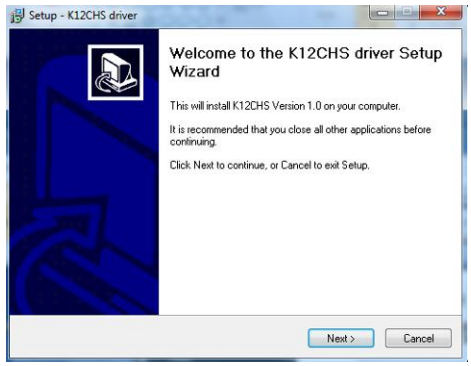
5. When the following window pumps out, click on “Next” to install the Control board driver.



6. Once the installations completed successfully, check on the “Finish” to proceed.

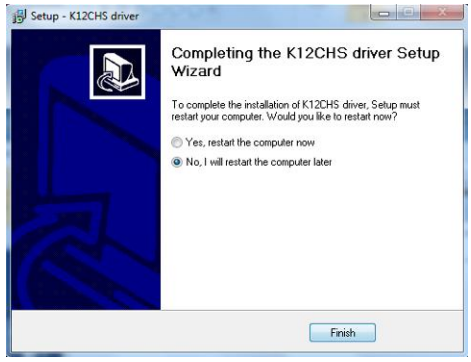


7. After install the driver of the control board, it will pump out with the camera installation window. Click on “Next” to proceed.

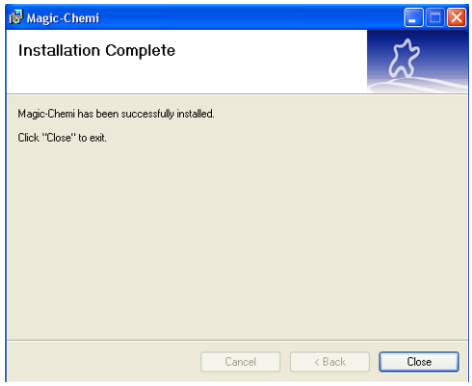


8. Click on “Install” when the Windows Security window pumps out.

9. When finish with the camera driver setup, check on “No, I will restart the computer later” and click on “Finish”.



10. Magic Chemi software setup completed successfully. Click “Close” to exit setup menu



11. Upon saving and closing all running programs, reboot the computer to complete the system setup.
12. Insert protection key to computer's USB port (USB key-pro).
13. A hardware installation window will pop up. Click "Continue Anyway" to proceed.

14. To initiate software program double click on the shortcut button from windows desktop or go to "Start Menu" → "Program file" → "Magic Chemi" → "Magic Chemi". Enter Magic Chemi 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 "Yes" and ensure the key-pro connection before attempting to initiate the software.

C. Image Capture

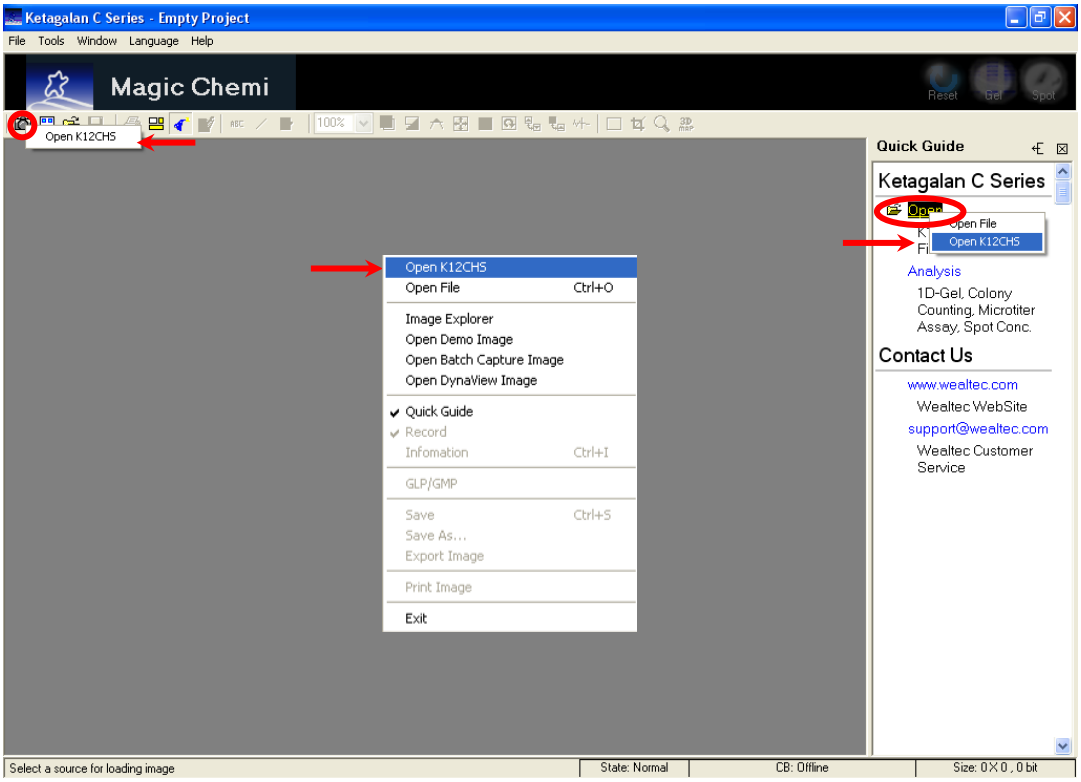
Magic Chemi software supports KETA C series Imaging system to capture image. Follow the procedures with appropriate KETA Imaging System.

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

C-1. Capture image with KETA imaging system:

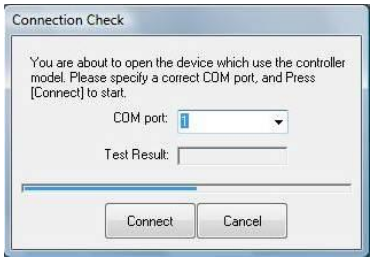
1. Click “Open” from quick guide or “New Image from Peripheral” icon then select and click “Open K12CHS”, or select and click “K12CHS” from file menu.

   Note: KETA CL is taken as a reference in the following examples.

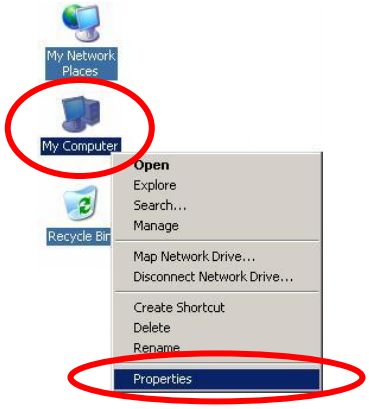


2. Image capture window.

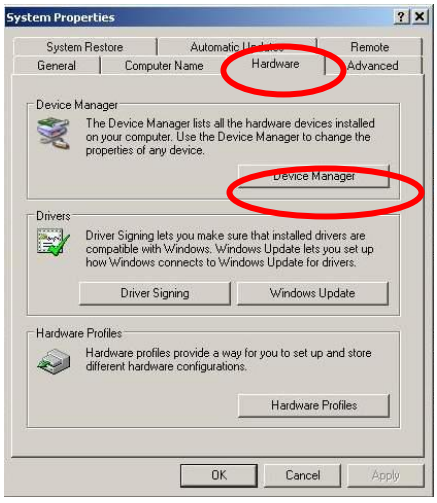
   Select appropriate COM port and click connect.



Note: To identify your USB COM port, point your mouse cursor on the “My Computer”. Right click then select “Properties” and left click your mouse.

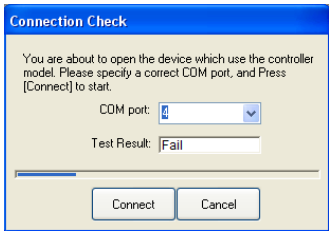


Select “Hardware” and click on “Device Manager”.

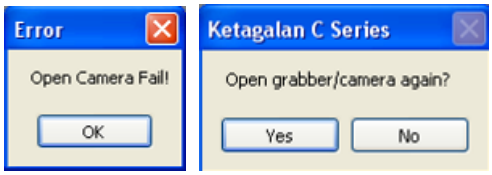


Expand the ”Ports (COM & LPT)”. All the available USB COM port will be listed. Your COM port selection should be one of the listed COM port. Ensure your USB cable is connected appropriately to the desired COM port. Please refer to KETA Imaging System operation manual for detail information on the connection of the USB cable for the appropriate connection.

Note: If none detected the windows will present as fail.

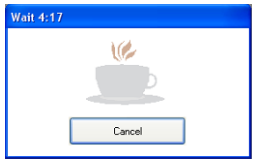


3. If the camera cannot been found, the following windows will come out and ask for open the camera again.



4. Force cooling (For systems equipped with cooled-CCD)

After the image system is connected with computer, the force cooling waiting windows may pumps out as followed. Wait for five minutes to have the CCD cooled down.



5. Darkroom calibration:

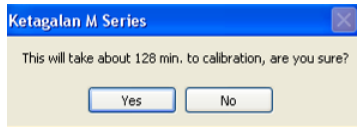
For the first time connecting computer with the camera, after the force cooling timer is finished, the system will start with the darkroom calibration automatically as followed. Users can also recalibrate the system after using for a period of time.

Notice: If image system had upgraded to “AS-100” auto-stage, make sure to lower down the stage to more than 1 cm higher from the bottom prior to calibration.

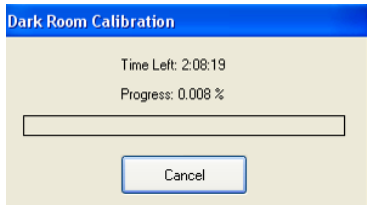
i. Before start with the calibration, make sure the “Power Scheme” setting of this computer is adjusted to have both “Turn off hard drive” and “System standby” setting over than 3 hours and click “YES” to process. Or click on “No” to cancel to calibration.

ii. Also adjust the Zoom, Iris, and Focus to have maximum setting.

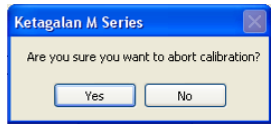
iii. The total calibration time will be over than 128 minutes. Click “Yes” to proceed.



iv. The window followed will pump out to show progressing rate of calibration.

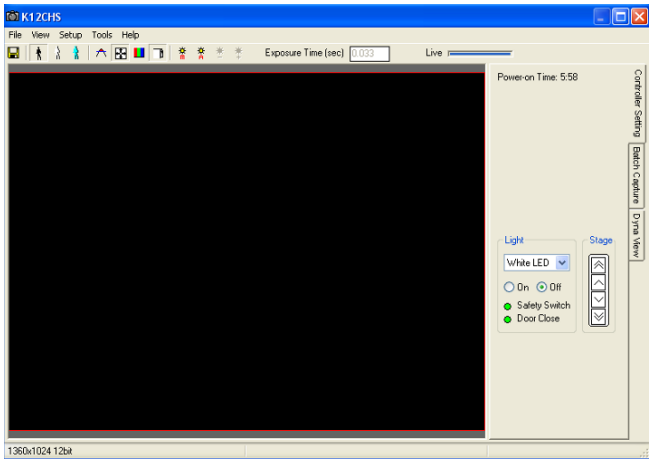


v. Any clicking in the software window during the calibration will cause the pause of the calibration and pump out with the window followed. Click on “No” to continue the calibration and “Yes” to abort.



6. Once the darkroom calibration is finished, the capturing window as in section C-2 will pump out.

C-2. Selection of capturing mode:



C-2-1. General control panel:

 Capture / Click “Capture” from file menu:

Allow user to capture the displayed targeted sample image and to exit the capturing window by returning to Magic Chemi main menu windows to further analyze or process the captured sample image.

 Live mode / Click “Live” from view menu:

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

 Preview mode / Click “Preview” from view menu:

Allow 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:

Allow user to freeze the sample image.

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

Allow user to view the saturation warning.

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

Allow user to view the sample image in full screen.

 Video adjustments / Click “Video adjustments” from setup menu:

Allow user to adjust the gain and black level value during the image capturing. While capturing the image, adjustment of the value will end up with different image in the result.

 Tools panel/ Click “Tools panel” from setup menu:

Allow user to view the control panel of motorized lens, auto-stage, light source, filter ID, and batch capture.

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

Allow 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:

Allow 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”:

Allow 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”:

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

Note:

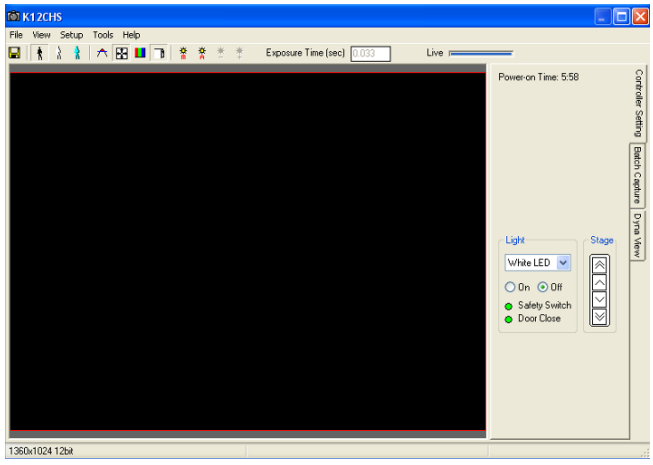
In preview mode, user may adjust the exposure time which will be displayed automatically as the preview takes place on the changes immediately. For adjustment click the exposure time decreasing or increasing from the icon exposure time or input the value directly into the “Exposure Time (sec)” box. Due to the difference of the power source frequency from area to area, setting of exposure time lower than 0.5 second in the preview mode will cause the slightly difference of image display.

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.

C-2-2. Capturing Mode

1. ***Controller Setting***



Stage – Sample tray stage adjustment:

Allow user to adjust the sample stage vertically.

Light – EPI light:

Light source can be switched “On” or “Off” by click on the circles.

Light indicator – Safety switch and door:

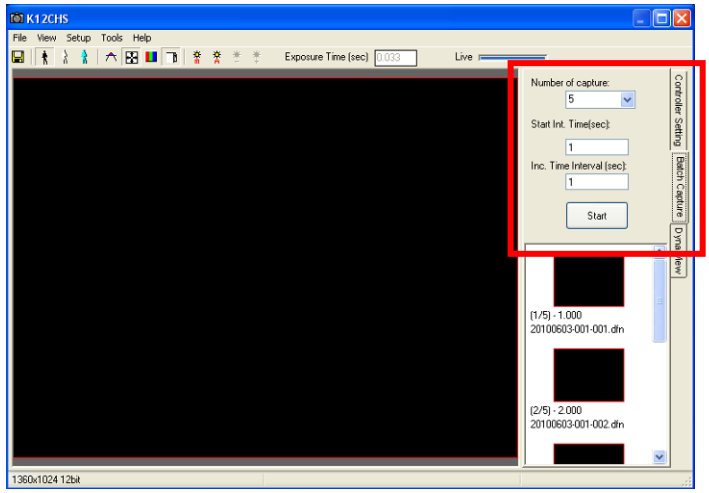
“Red” light indicator represent the door is open or the safety switch is off. “Green” light indicator represent the door is closed or the safety switch is on.

(Please refer to appropriate KETA imaging system operation manual for detail information on the safety switch).

2. ***Batch Capture***

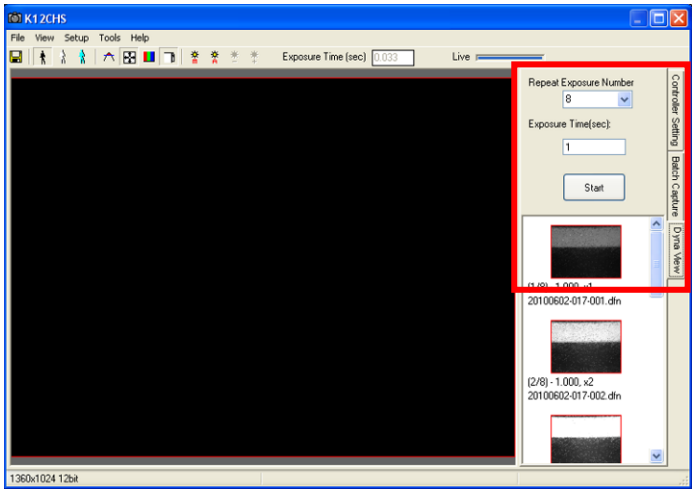
Allow user to preset the parameters for automatic capture. User will be able to select the best-desired image from the captured set of the images for different integration time. In prior the user will be required to set the parameter by selecting the “Number of capture”, “Start Int. Time

(sec)" and "Increment Time Interval (sec)". Upon setting up all the parameters clicking of "Start" button will automatically capture the desired number of the images with the desired starting integration time and interval. The limitation of the "Number of capture" is up to 99 in one batch. Images that captured by "Batch Capture" will be saved automatically to the preferred document. (Refer to section D-6 for detail)



3. Dyna View

Allow user to accumulate the multi capture signal with same exposure time within the automatic capturing process. Prior to capture the image, "Repeat exposure number" and "Exposure Time (sec)" will be needed to set by key in the numbers. Upon setting up all the parameters clicking of "Start" button will automatically capture the desired number of the images with the desired starting integration time and interval. The "Repeat Exposure Number" can be set from 1 to 99. Images that captured by "Dyna View" will be saved automatically to the preferred document. (Refer to section D-6 for detail)



C-3. Chemiluminescence image capturing procedure:

a). Open KETA Imaging System darkroom door.

b). Power on the main power switch and place the fluorescence ruler or calibration chart on top of the 2-stage or auto-stage sample tray.

Note: For all image systems that are available for detecting chemiluminescence, it takes five minutes for the CCD to cool down. Please power on the system five minutes prior to the operation.

c). Start up Magic Chemi software after five minutes.

d). Click “Open” in quick guide and select “K12CHS”. (Please refer to step “C-1. Capture Image with KETA imaging system” for details)

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

e). Select on the “Controller Setting” mode.

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

g). Open KETA imaging system darkroom door and replace the ruler or calibration chart with sample membrane.

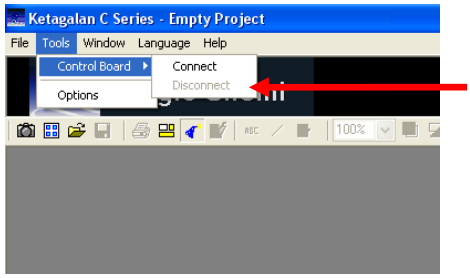
h). Adjust the sample position, lens aperture, zooming and focus again.

i). Close the cabient door and make sure to turn off all the light source.

j). Select on the “Batch capture” or “Dyna View” mode, and key-in the parameter that is needed. Click on the “Start” to start capture of the images. All the images that captured will be auto-saved in the preset document. (Refer to section D-6 for detail)

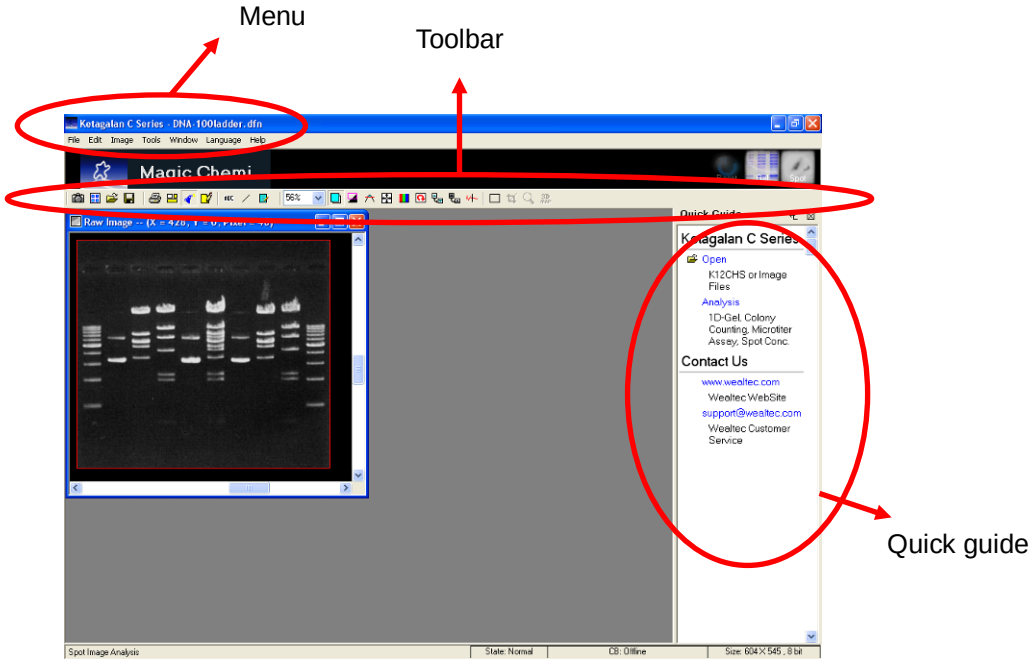
k). Or users can capture the image they want by choosing on the preview image and click on “  ” to save.

l). It is highly recommended to disconnect the KETA imaging system with computer from the “Tools” in the menu if the camera is not going to use within 30 minutes.



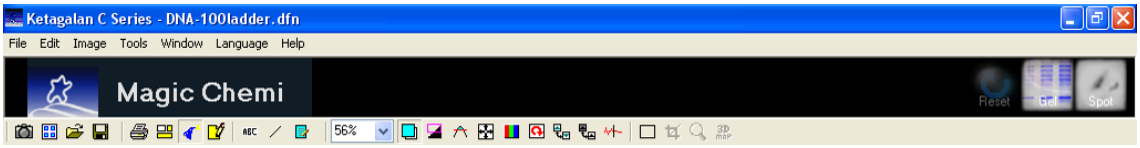
D. Image Enhancement

Images can be captured from peripheral or loaded from disk upon starting up Magic Chemi software. A window will pop up with tool bar provides tools to assist processing further the image analysis.

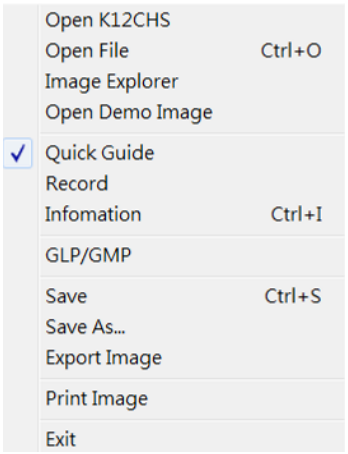


D-1. Operation interface introduction:

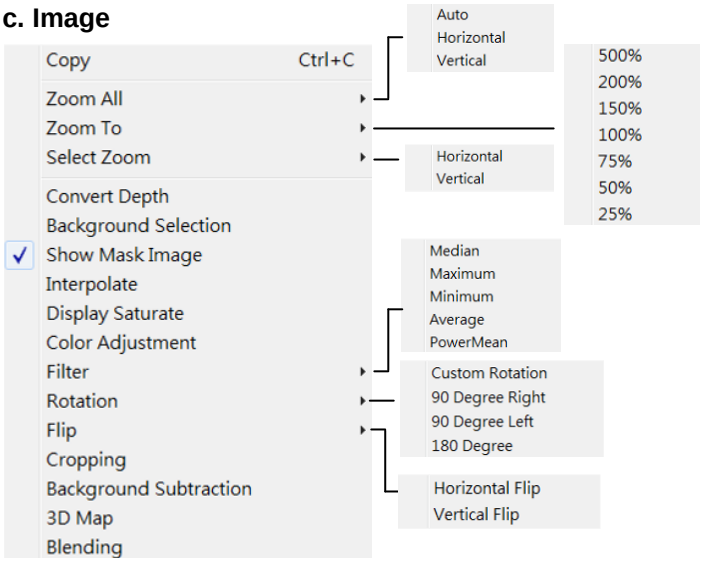
Menu introduction:



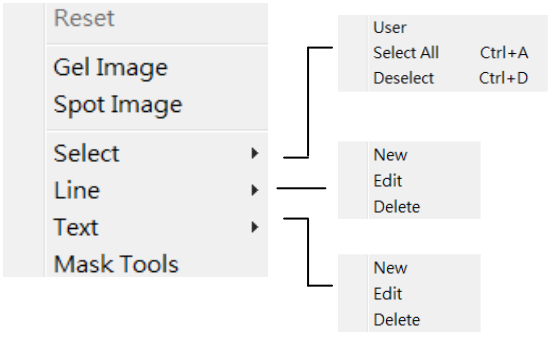
a. File



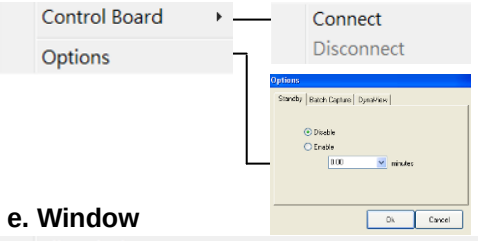
c. Image



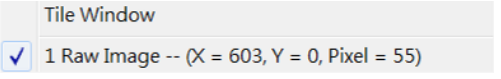
b. Edit



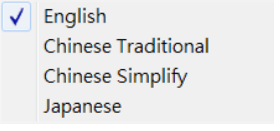
d. Tool



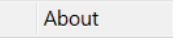
e. Window



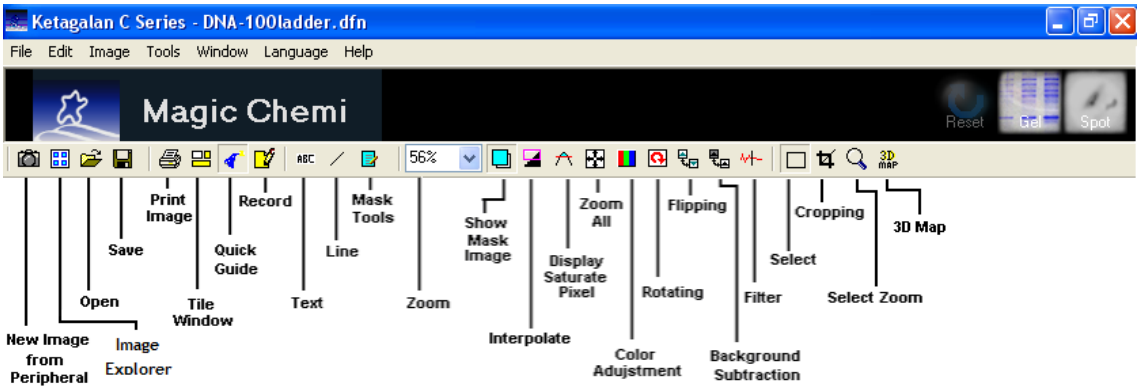
f. Language



g. Help



Tool bar introduction:

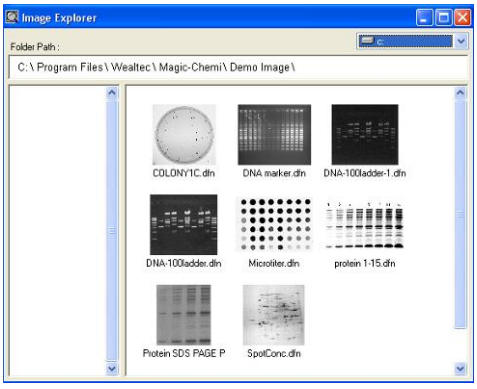


New image from peripheral tool:

Allow user to acquire an image from KETA Imaging System.

Image explorer:

Allow user to preview the image which captured from the Magic Chemi or other image systems as in followed window. Double click on the file to open the file in Magic Chemi software.



Open image tool:

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

Save tool:

Allow user to save the file.

Print image tool:

Click to print the image.

Tile window tool:

Allow 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:

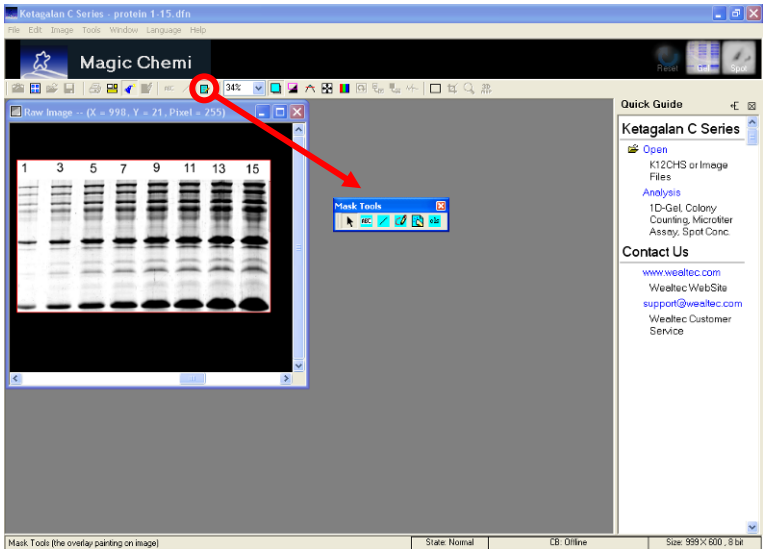
Allow user to add text on the image for annotation.

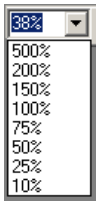
Line tool:

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

Mask tool

Allow 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.



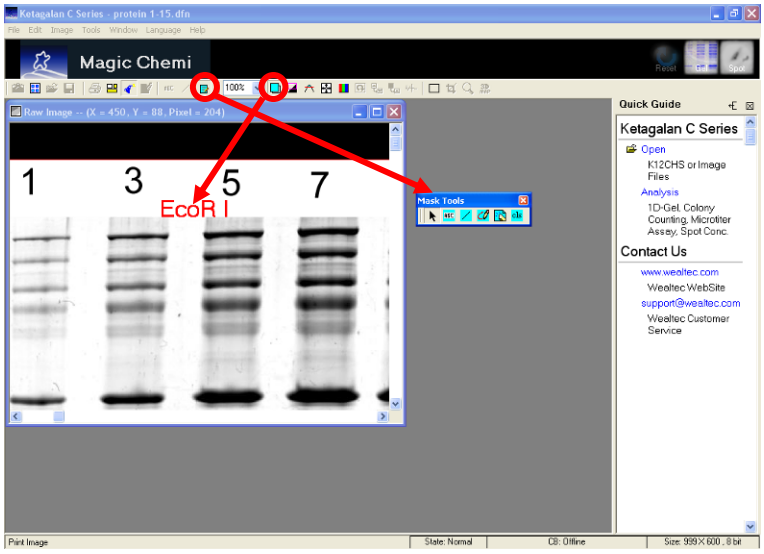


Zoom tool:

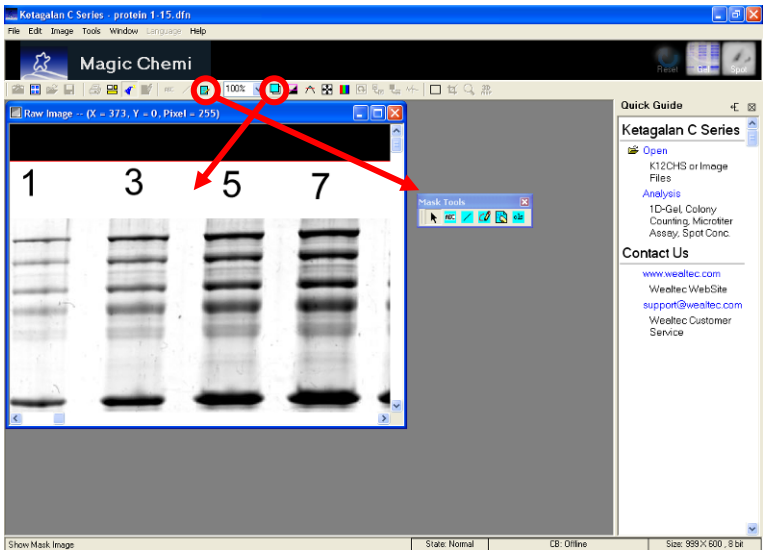
Allow user to select the view of the desired zooming size.

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.

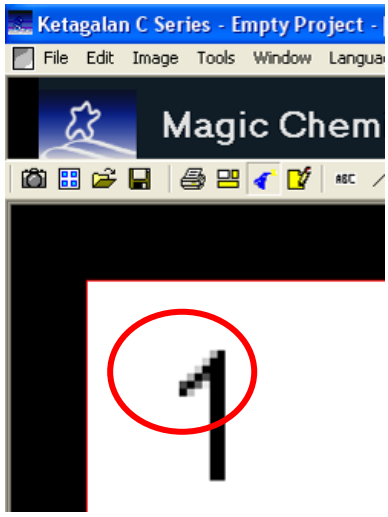


Deselecting this tool allows the edited labeling text or lines to be hidden on the Image.

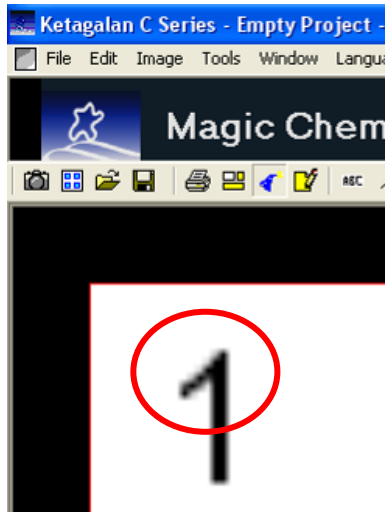


Interpolate tool:

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:

Allow 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:

Allow 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:

Allow 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:**

Allow 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:**

Allow user to obtain the optimized image by filtering the noise. It is disabled under GLP/GMP mode.

 **Select tool:**

Allow 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:**

Allow 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)

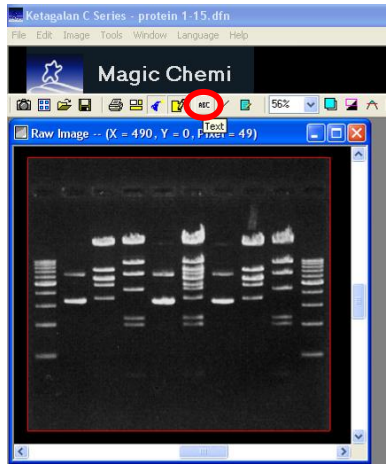
D-2. Image annotation:

Three options available to make annotation in Magic Chemi: 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.

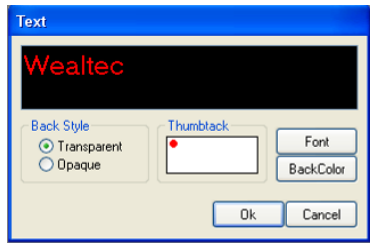
1. Click “ABC” icon on tool bar



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.

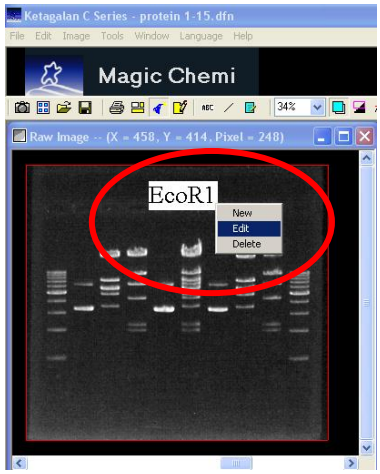


4. To highlight the text, choose the background color by clicking on “BackColor” from Text dialog box.
5. Click on “Font” icon to adjust the font type, style, size, color and effects.

   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.

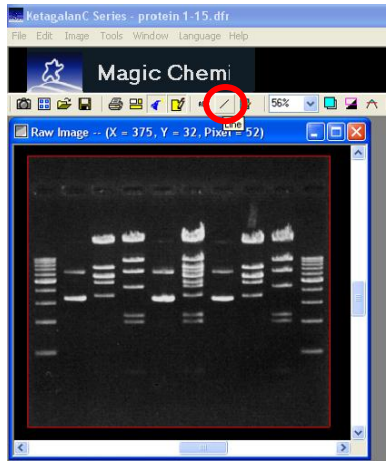
6. To edit the text, double click on the text on the image or right click and choose “Edit” or “Delete” to delete the text.



D-2-2. Line tool:

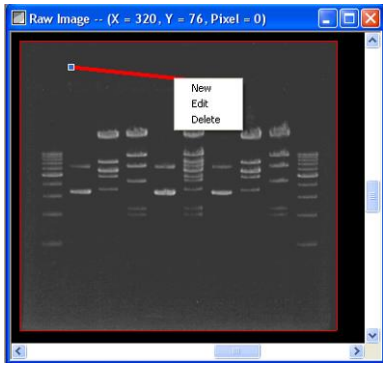
Note: The size of text tag will not change when you enlarge or shrink the view size of the image. The text tag can be moved, edited and deleted. It is also can be printed out along on the image.

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.

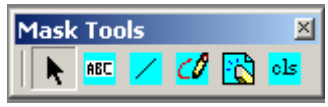
3. Select the line style and the width from “Line Style” and “Line Width” pull-down menu.
   Note: Adjust the position and angle of the line on the image by clicking on it and dragging the two end point of the line (square boxes at either end of the line) to desired position.
4. In order to use line,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

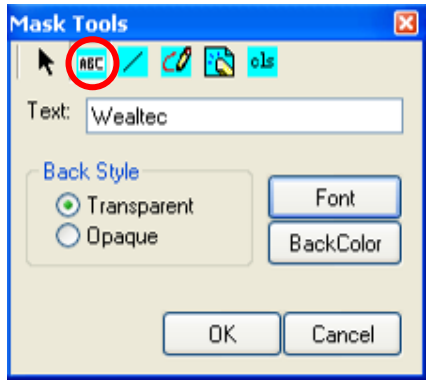
Mask Tools are the functional tools for text label, line label, pen signature, eraser, and clear-all mask labels on the image. The size of text tag and line drawing on the image can be altered to the viewing side of image. They cannot be moved and edited but can be removed by erasing with eraser. This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

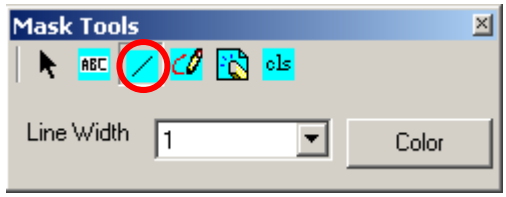
e.) To highlight the text, choose the background color by clicking on "BackColor" from Text dialog box.

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.

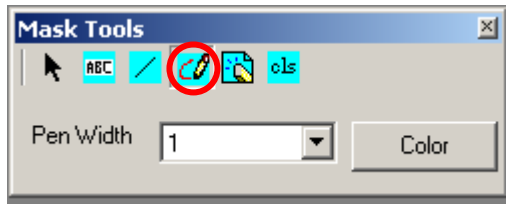
d.) Choose the line color from "Color" button.

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.

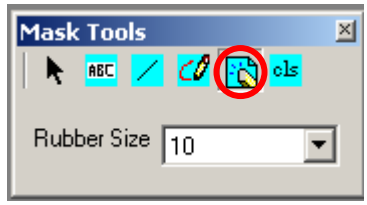
d.) Choose the pen color from “Color” button.

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.



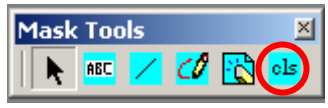
c.) Select the eraser size from “Rubber Size” pull down menu.

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

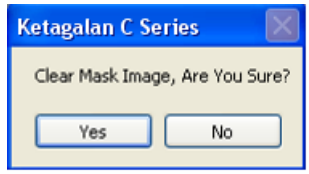
5. Clear mask image

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.

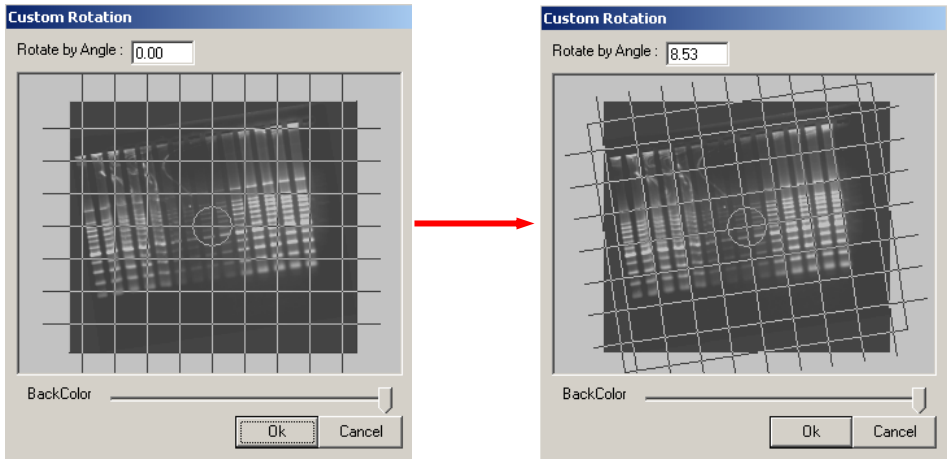


D-3. Image modification:

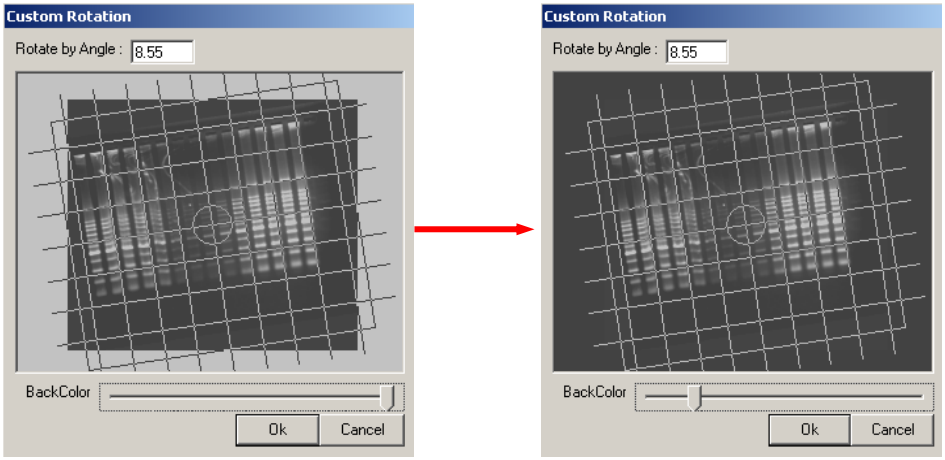
Previous actions or history record can be viewed by clicking “Record” on tool bar followed by double clicking on “History Record” pop-up window. Image data will be permanently changed upon saving the file. The functions in this section are disabled under GLP/GMP mode.

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.

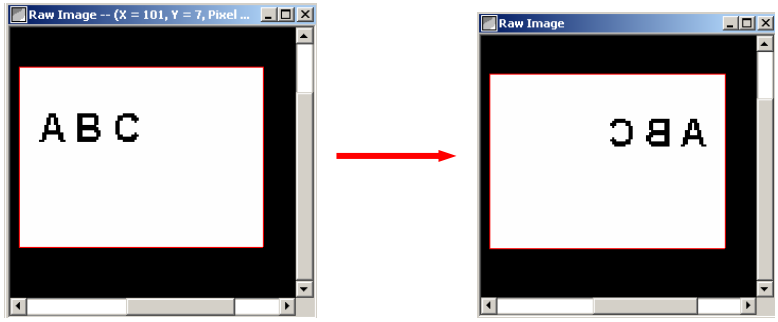


c.) Click “Ok” to rotate the image.

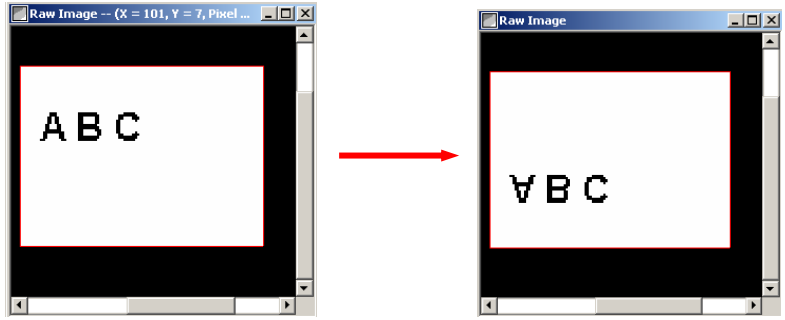
D-3-2. Flipping

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

a.) Horizontal flip

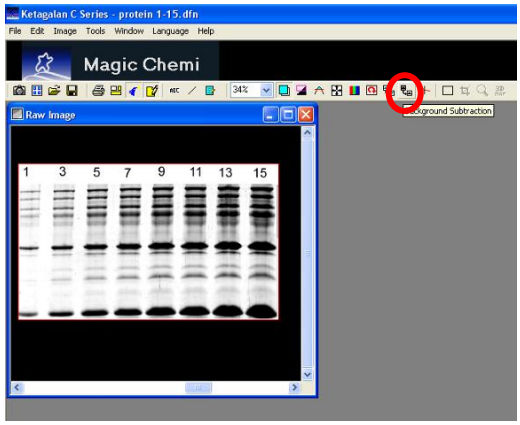


b.) Vertical flip

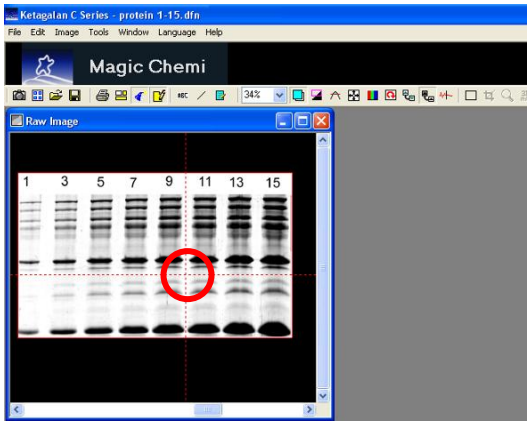


D-3-3. Background subtraction:

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

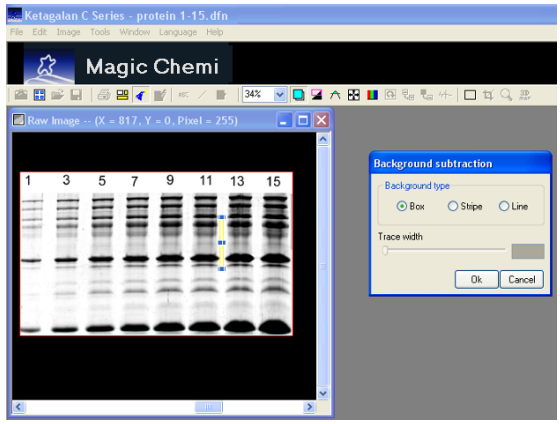


2. Move cursor to draw a line on the image by click holding the left mouse on the image.

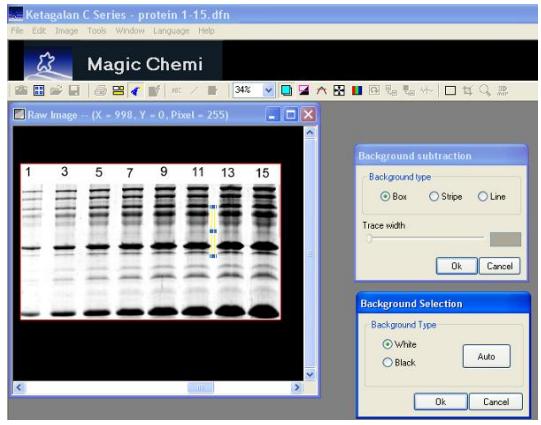


3. “Background subtraction” window will pop up. Select gel’s background type and trace width by selecting “Box”, “Stripe” or “Line”. Then click “Ok” to proceed.

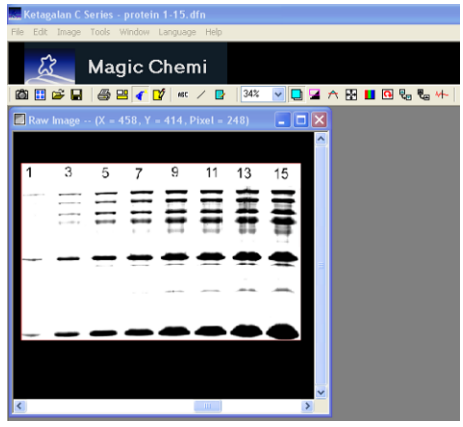
   a. Box: This function is applied to evenly distribute background intensity.
      It subtracts the selected area’s background intensity from the whole image.
   b. Stripe: This function is used for an uneven background from left to the right. Mark the background area from left to the right and drag the 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 noises from the image.

   a.) Median: This filter preserves more of the edges and contour of the main object in the image while getting rid of even more of the very sharp peripheral noise. It is particularly useful to reduce speckle, salt and pepper noise. Reduces noise in the active image by replacing each pixel with the median of the neighboring pixel values.

   b.) Maximum: This filter makes the lighter pixels larger and shrinks the darker ones. This filter does grayscale dilation by replacing each pixel in the image with the largest pixel value in that pixel’s neighborhood.

   c.) Minimum: This filter makes the lighter pixels smaller and the darker ones larger. This filter does grayscale erosion by replacing each pixel in the image with the smallest pixel value in that pixel’s neighborhood.

   d.) Average: This filter will smooth out sharp transitions (High frequencies), so it can get rid of sharp noise, but will also get rid of sharp aspects in the image that you may want to keep. This filter can be used for smoothing of noise in images. It also blurs edges, displaces boundaries and reduces contrast.

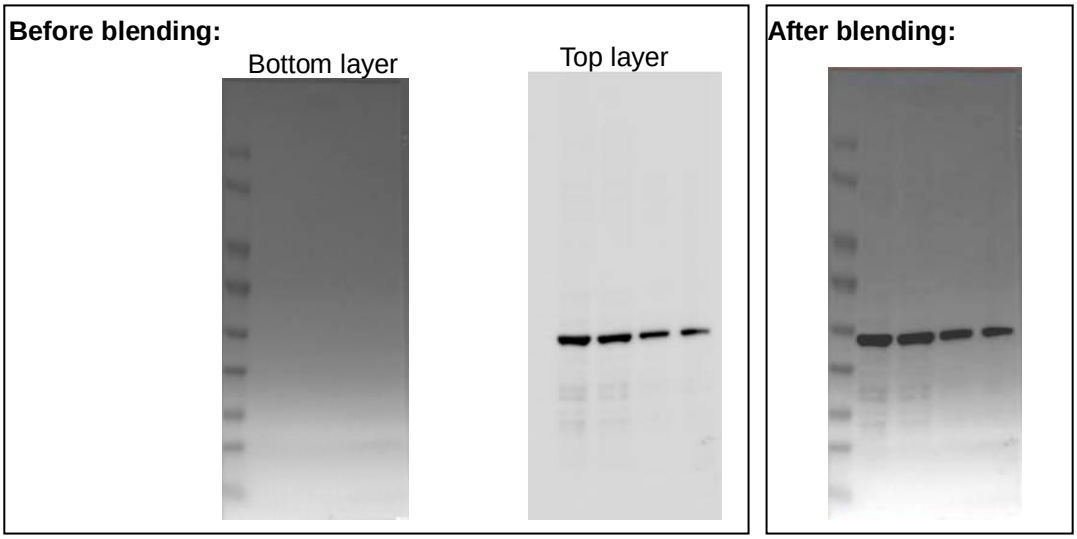
   e.) Power Mean: This filter is useful for suppressing salt and Gaussian noise within an image (It worsens the effect of pepper noise). It replaces the value of the pixel being processed with the power mean of the pixel values within the filtering window.

D-3-5. Cropping:

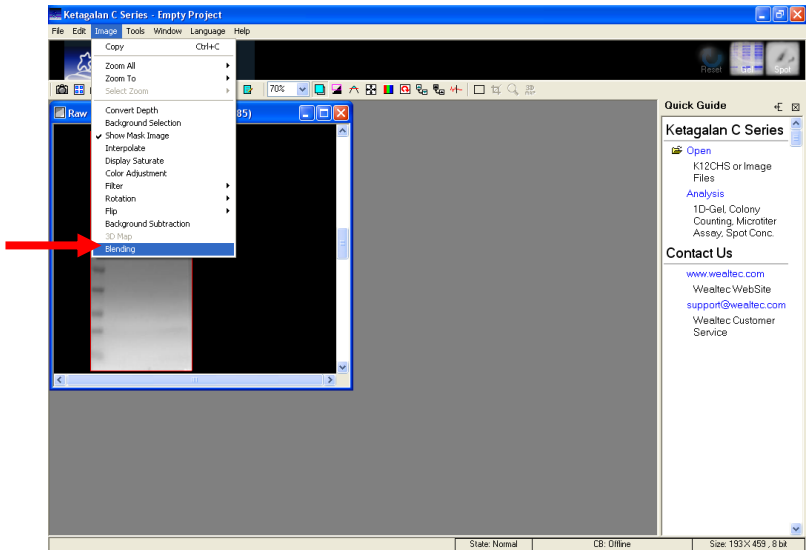
1. Click  “Select” icon on tool bar to define the desired region on the image.
2. Click  “Cropping” icon on tool bar to delete unselected portion.

D-3-6. Image Blending:

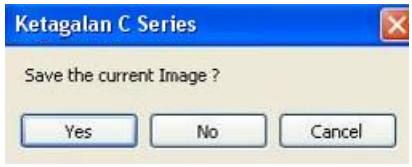
After capture the pictures with the image system, images can be integrated together by using the blending function. To have precise comparison with two different exposure time images, please make sure the image size and the gray layer depth of both images are the same. Given below is the example of performing blending function.



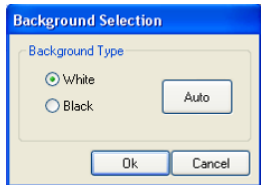
1. Capture the image from the image system or open the file that is going to be integrated.
2. Click on the “Blending” from the image menu.



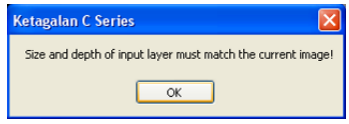
If the firstly opened image is not stored yet, the notification window will pop up and ask for storing it before processing the blending function.



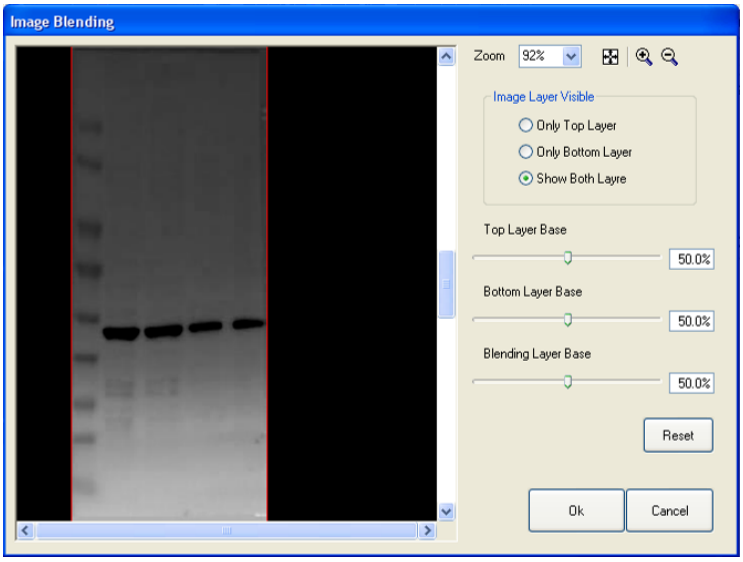
3. Select the appropriate background and click "**Ok**" button to proceed.



4. Select the image that is going to be integrated with the currently opened image. The selected image will be lapped over on the opened image to be the top layer of the blending image.
   Notice: Images that are going to blend together should have the same size or there will pops out a warning window.



5. Select the proper color from "**Image import options**" window and click "**OK"** to generate a blending image.



6. Above Image is a preview of the blending image. Tool functions on the right control panel are as listed below,

"**Zoom**": Click to select the proper enlarge rate of the image.

"  ": Click to adjust of the magnification by "Auto", "Horizontal", or "Vertical".

"  ": Click to zoom in or zoom out of the image.

"**Image Layer Visible**": Check to change the display on the preview image with "Only Top Layer", "Only Bottom Layer", or "Show Both Layers".

"**Top/ Bottom/ Blending Layer base**": Drag the slider bar on each option to adjust the exposure of the layers. And click on the "Reset" button to reset the tuning.

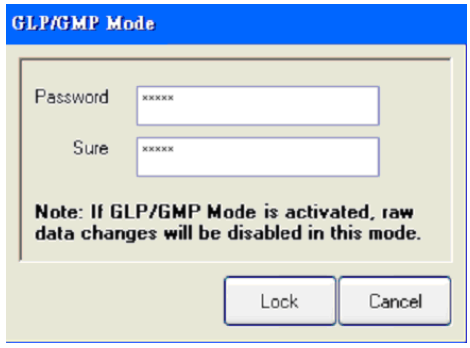
7. Click on the "**Ok**" bottom to finish the blending setting and get the integrated image. Or click on the "**Cancel**" to exit the blending function.

D-4. GLP/GMP Mode

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

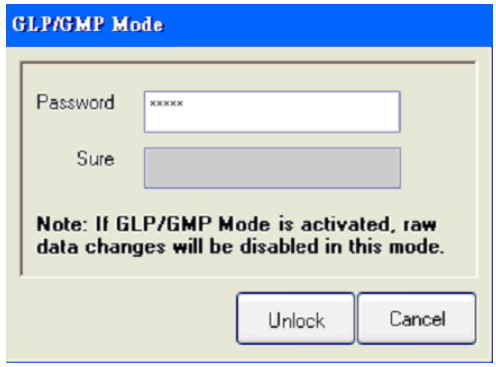
1. Open “GLP/GMP” dialog box by clicking “File” from menu and select “GLP/GMP”.
2. Input password and reenter again to confirm. Click “Lock” to activate GLP/GMP mode.

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.**



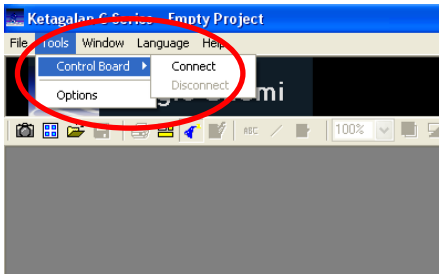
D-4-2. Deactivate GLP/GMP mode:

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.

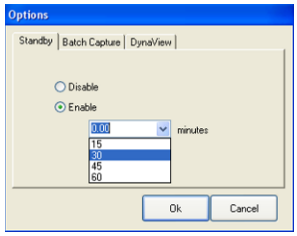


D-5. Standby mode setting

In order to prolong the life time of KETA series CCD camera, it is highly recommended to enable the “Standby” mode. Click on the “Tool” from the control panel and choose the option as followed.



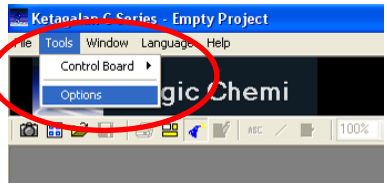
Check on the “Enable” and select the timer setting to turn on the standby mode of the CCD camera after idling for few minutes.



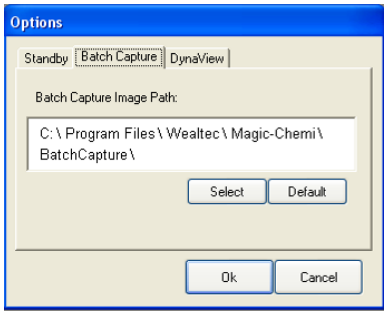
D-6. Auto-Save setting

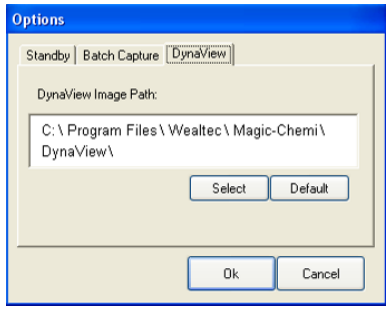
While capturing the image under “Batch capture” and “Dyna View” modes, the files will be auto-stored in the specific folder with the file name format as “yyyy-mm-dd-001-001”. User may change the folder by selecting the direction as followed.

1. Click on the “Tool” on the control panel and select on the “Option”.

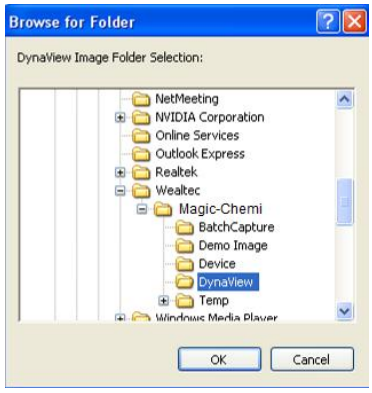


2. Select “Batch Capture” or “ Dyna View” and click on “Select” to browse the auto-saving folder. Or click on the “Default” to go back the default setting.





3. Change the auto-saving folder by selecting the folder as followed and click on “Ok”.



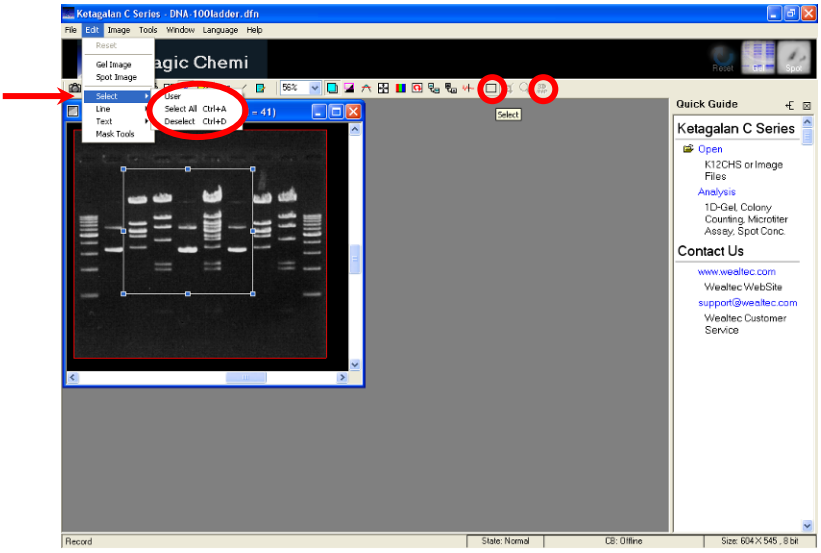
4. Click on “Ok” to close the setting window or “Cancel” to close the window without change the setting.

E. 3D Map

Upon starting Magic Chemi 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”.

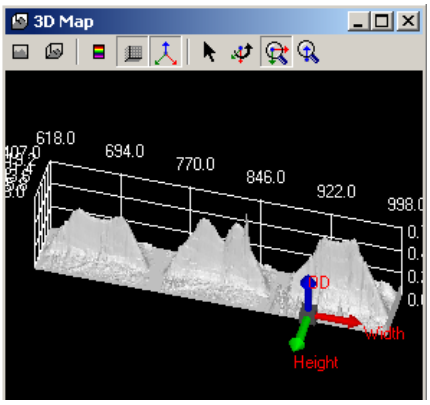


Click  “Select” tool on tool bar and move cursor on image to select desired image area.

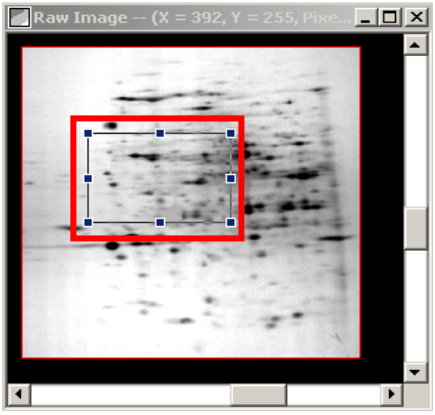
Click 

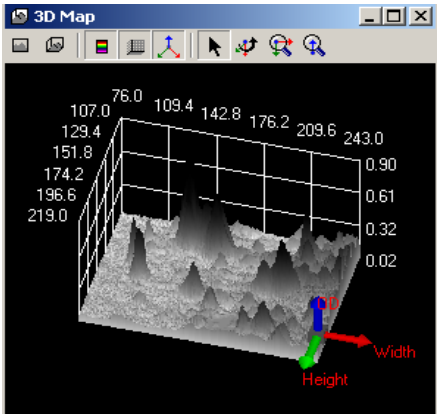
“3D Map” tool and select the image background color. The 3D Map window will pop up.

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 spot image.





E-2. 3D Map tools

View front tool

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

View custom tool

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

Use color table tool

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

Show frame tool

Allow user to display coordinate frame on the image.

Show small coordinate tool

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

Move tool

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

Rotate tool

Allow 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

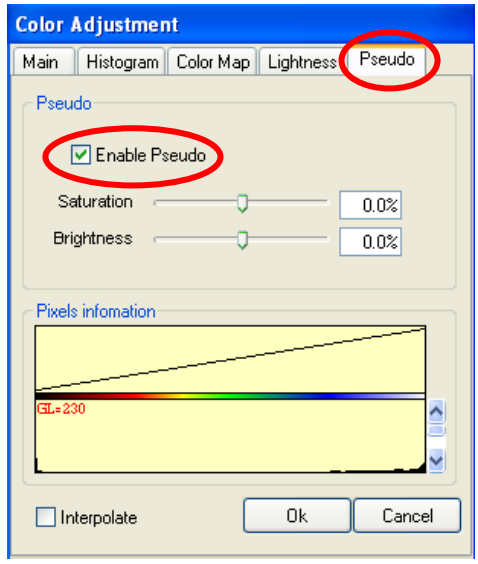
Allow user to enlarge or shrink the 3D Map image. Clicking and holding the left mouse button and moving the cursor to the right will enlarge the 3D Map image and moving the cursor to the left will shrink the 3D Map image.

Level zoom tool

Allow 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

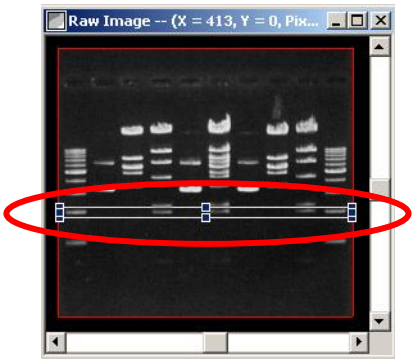
1. Click “Color Adjustment” tool on tool bar. Select “Pseudo” page and check “Enable Pseudo”.



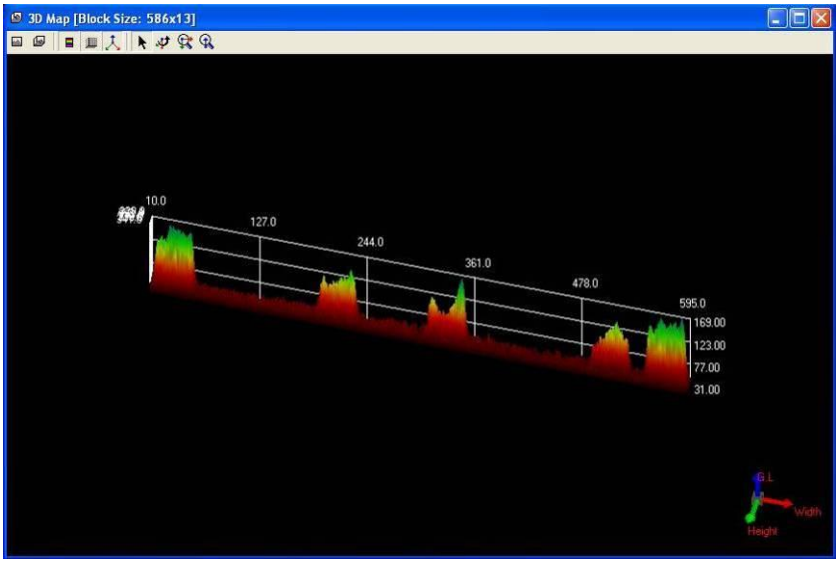
2. Click  “Use Color Table” in 3D Map window to get color mode.

E-4. 3D map of single band profile

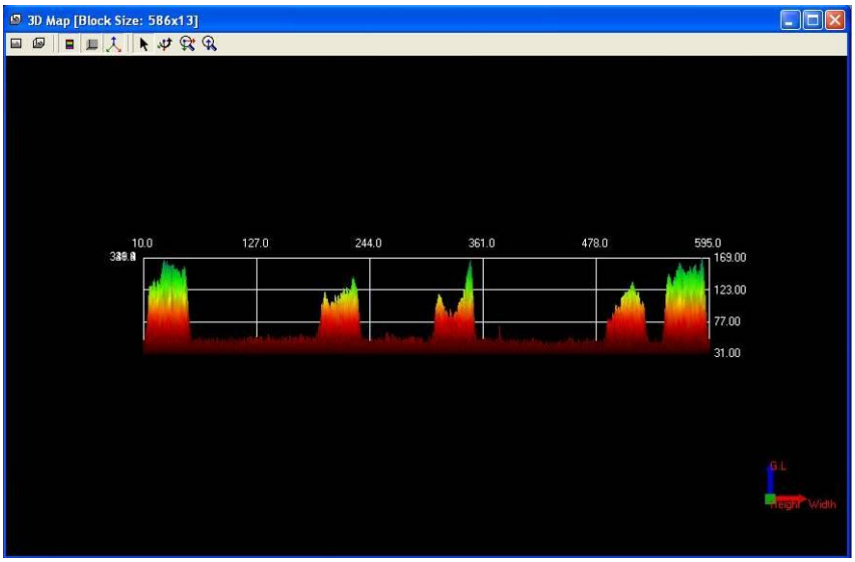
1. Click  “Select” tool on tool bar and move cursor on image to select desired single band area.



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”.


3D Map [Block Size: 586x13]
10.0
127.0
244.0
361.0
478.0
595.0
169.00
123.00
77.00
31.00
Height
Width

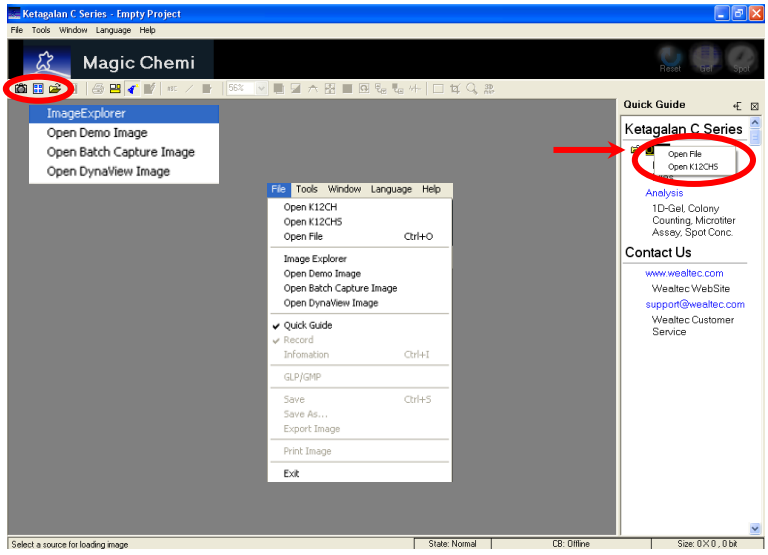
F. Gel Image Analysis

This chapter describes gel analysis tool of Magic Chemi 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:

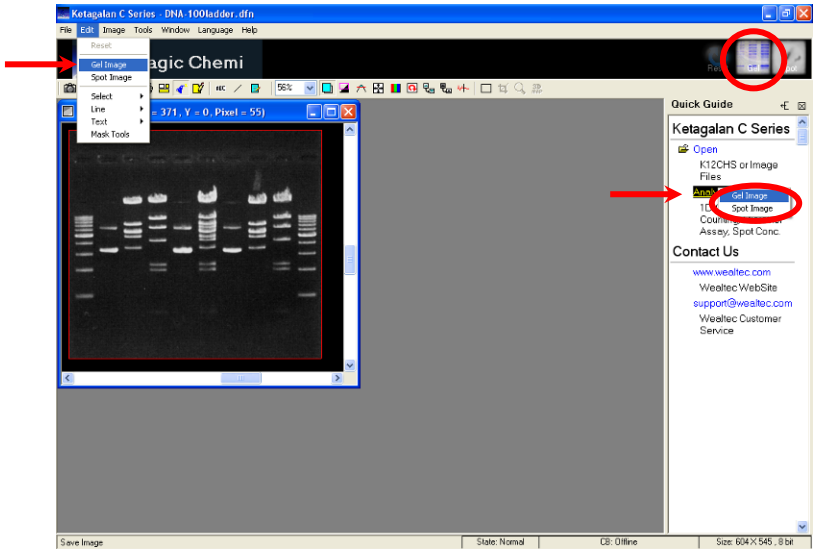
1. To capture images from KETA imaging system (eg. KETA CL) click “Open” from quick guide or “New Image from Peripheral” icon then select and click “Open K12CHS”, or select and click “Open K12CHS” from file menu. (Please refer to Chapter 3 for details).
   Note: KETA CL is taken as a reference in the following examples. If you have purchased other than KETA CL imaging system and intended to use please select appropriate image system in every option selection of KETA CL in this manual.

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

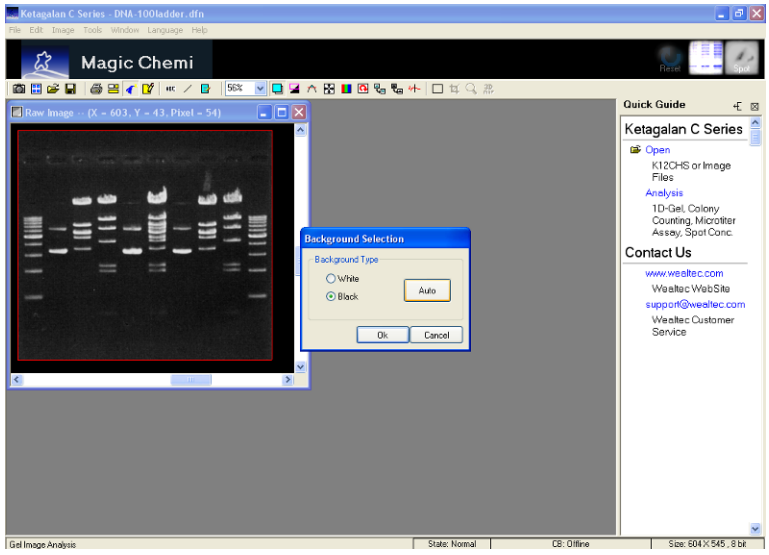


F-2. Gel image function:

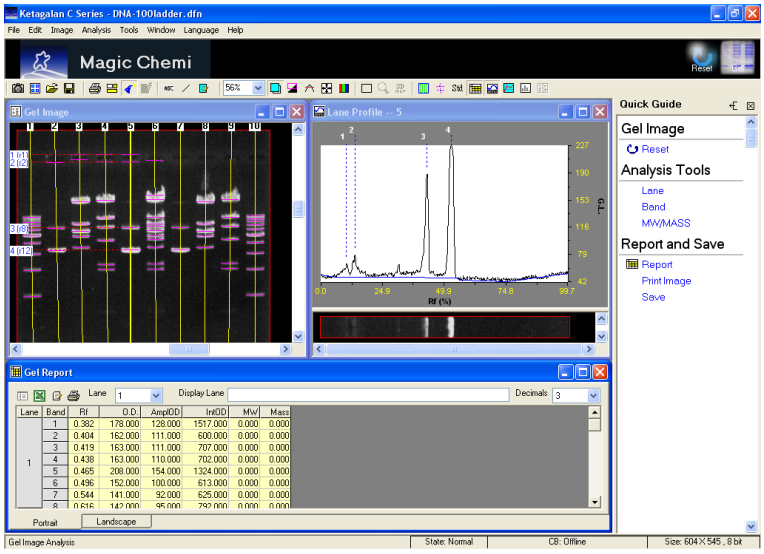
1. Click “Edit” from quick guide and select “Gel Image” or click “Gel” icon, or select “Gel Image” from edit menu to open gel analysis function.



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

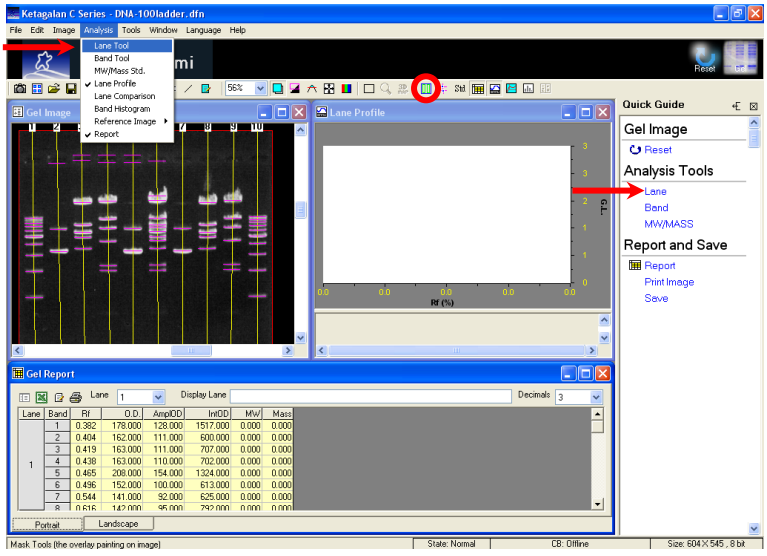


3. The program will define automatically the gel image, lane profile and gel report.

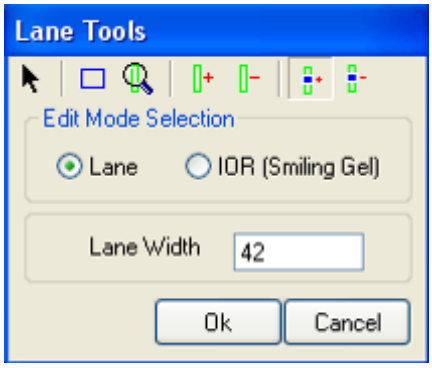


F-3. Lane analysis:

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:

Allow 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:

Allow 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:

Allow user to detect lane(s) automatically by Magic Chemi software within the defined region of interest

Add lane tool:

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

Delete lane tool:

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

Add node tool:

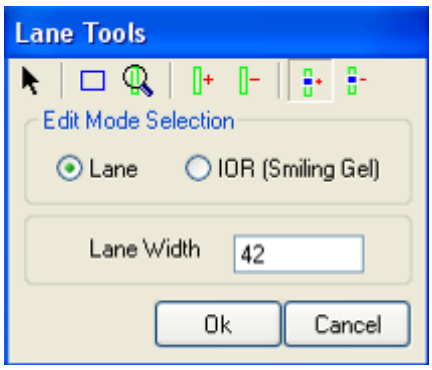
Allow user to add nodes at various positions along the lane. These nodal points can be used to adjust the lane borders to fit the curved or skewed lane. In "IOR (Smiling Gel)" mode, these nodal points can be used to define the analysis area of smiling gel.

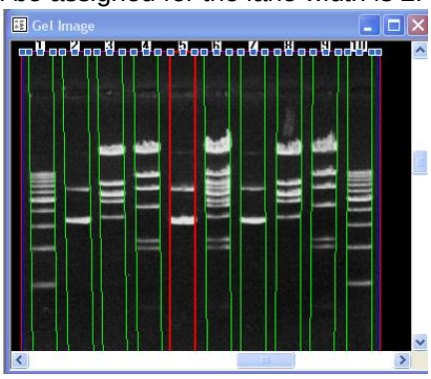
Delete node tool:

Allow user to delete the unwanted nodes.

Lane width:

Allow 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:

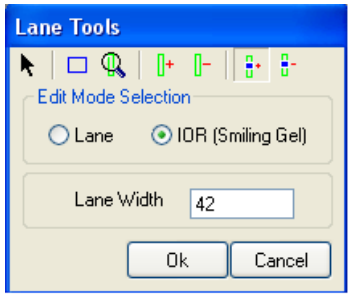
a). Blue border and individual lanes denote the lane frame by green columns. Clicking on the lane of the interest, will highlight them by a red column.

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.

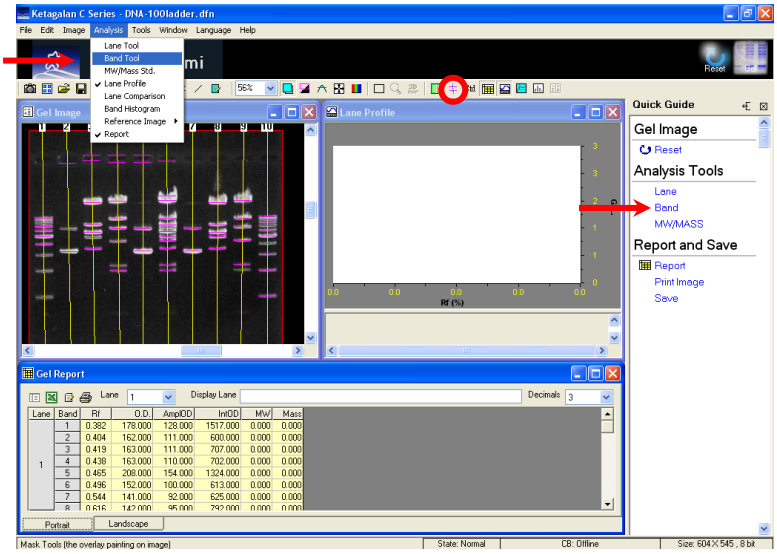
e). To adjust the smiling gel, select “IOR (Smiling Gel)” mode from “Edit Mode Selection” in “Lane Tools” dialog box. Select “Add Node” and click on the gel board at the skewed region. Use the “Arrow Pointer” tool at the upper left corner of “Lane Tools” dialog box to drag and adjust the gel board to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



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

F-4. Bands analysis:

Magic Chemi 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:

Allow 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:

Allow user to add band which is not detected by Magic Chemi software.

Delete band tool:

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

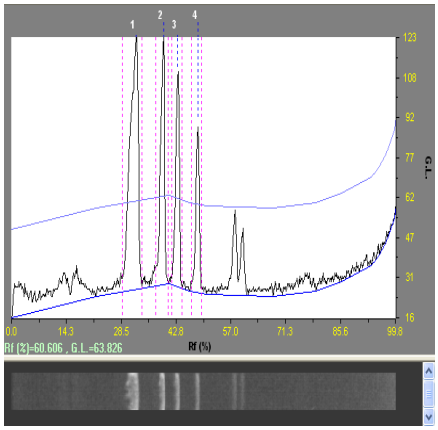
F-4-2. Band height and smooth factor:

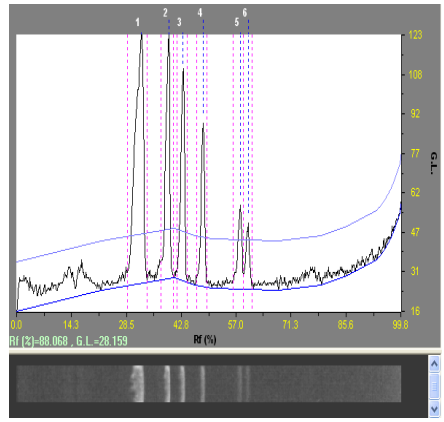
Magic Chemi software automatically detects all the bands on your image. Band height and smooth factor function allows user to define the sensitivity of the band detection.

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 Magic Chemi software.





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.

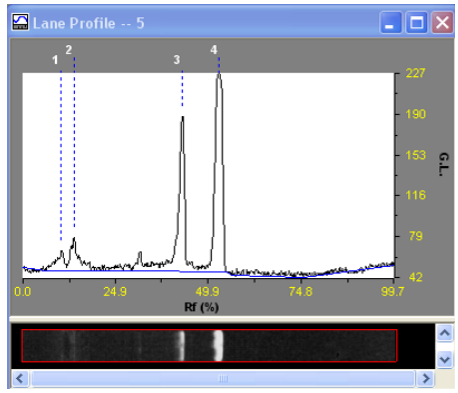
e). Choose the “Move Band” tool to adjust the position of band marker.

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.

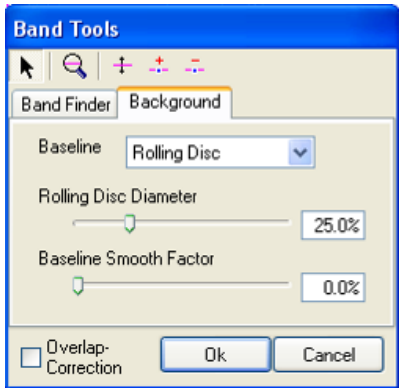
To predict the molecular weights of the bands more accurately, user can position the band marker to correspond exactly to band profile peak. Select the lane in which user wants to make band marker adjustments. Then click on  “Lane Profile” icon on the toolbar. A lane profile window will pop up displaying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



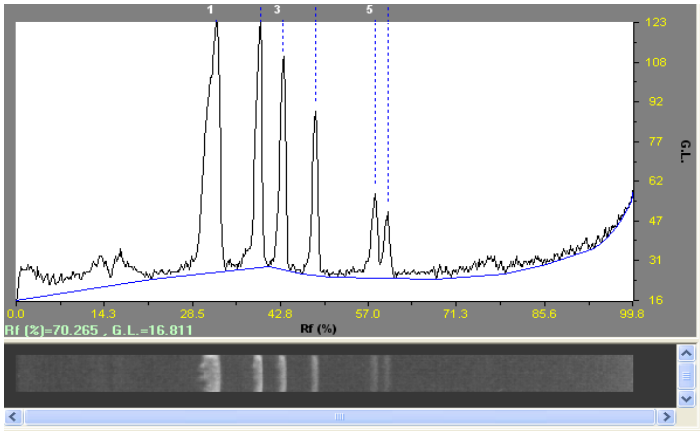
F-4-5. Baseline settings:

Magic Chemi 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.

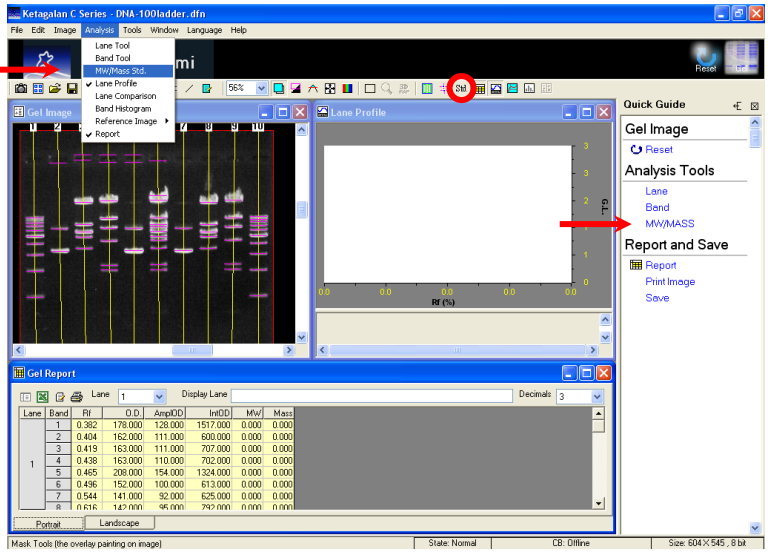
b.) Min: The minimum function chooses the lowest peak baseline as the background.

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

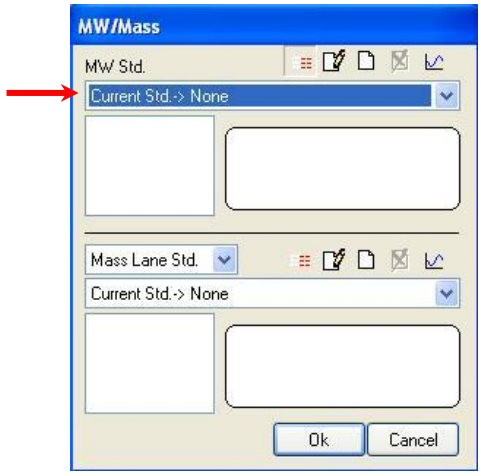
Note: If the user made any changes on the default background settings, ensure to check the "Overlap-Correction" as the Gauss-Modeling dialog box will pop up and if it is checked then click "Auto Fit" in Gauss-Modeling dialog box for the changes to take effect.

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:

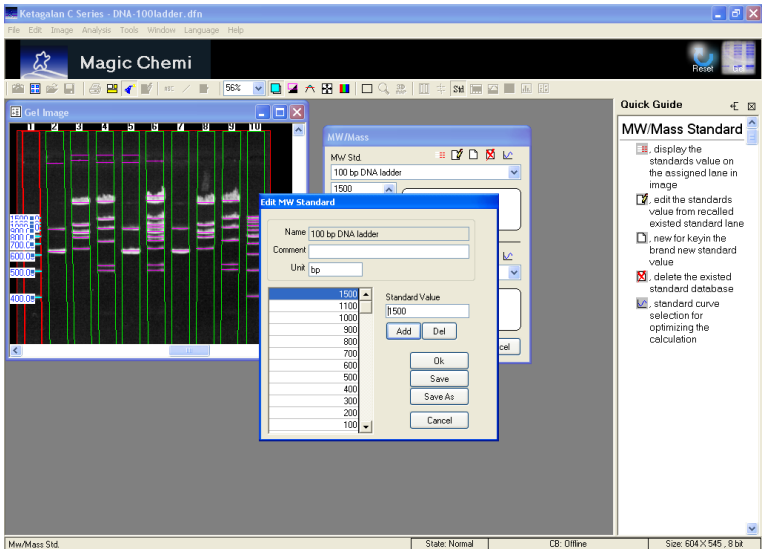


Display value on image tool:

Allow 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:

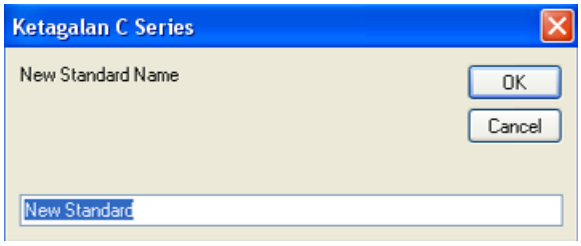
Click edit tool to edit any current saved molecular weight standard data. Select or deselect the standard lane on the image by clicking mouse on the lane. More than one standard lane can be selected. By pointing the cursor on the blue node, clicking the mouse on the band allows user to select or deselect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

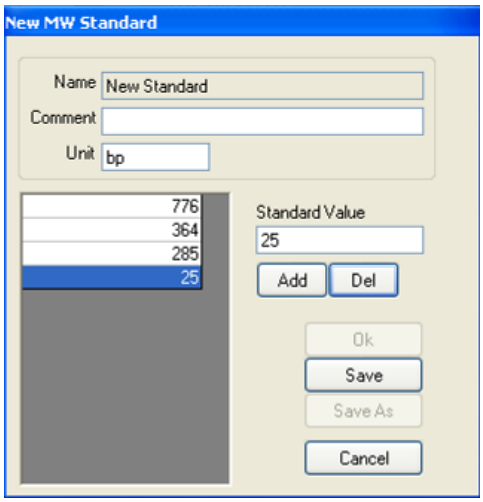
i. Input new standard name and click “OK”.



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.

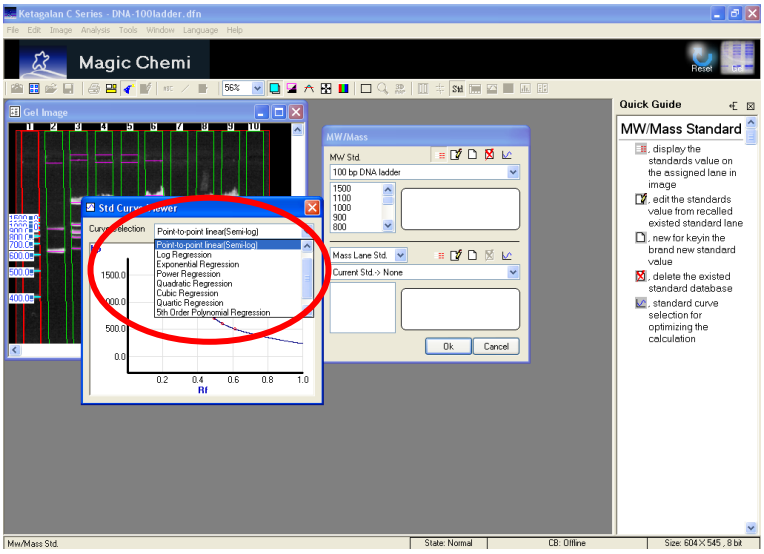
Add/Del: Add or delete a standard value into or from new molecular weight standard list.

Delete tool:

Click to delete molecular weight standard from the list.

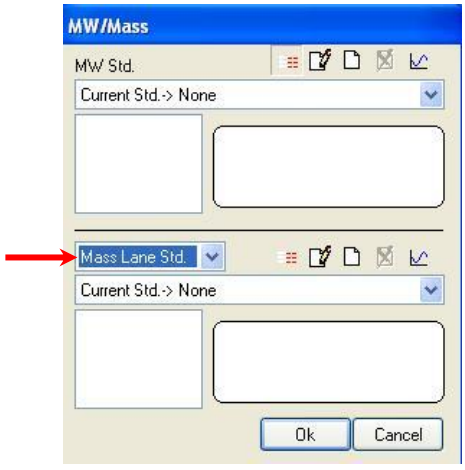
Standard curve tool:

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



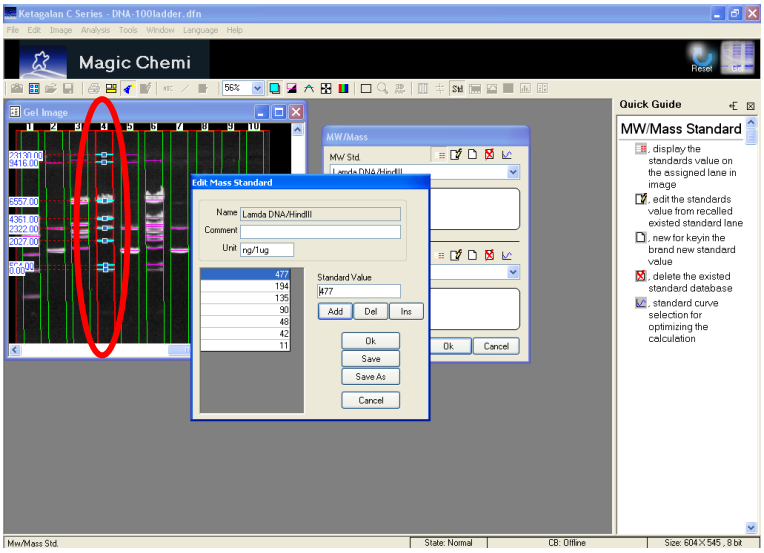
Display value on image tool:

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

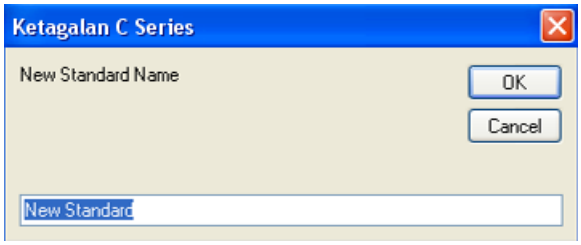
select or deselect the standard band, as the rest of the bands will renew the ranking of standards.



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.

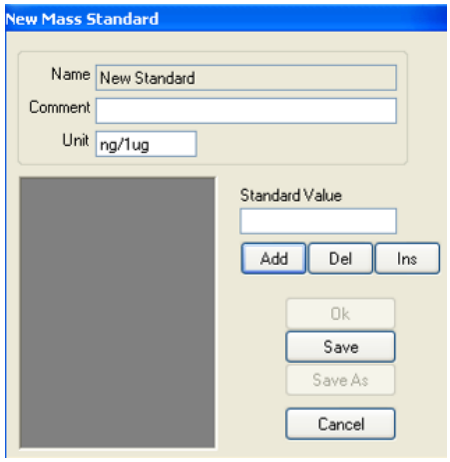
i. Input new standard name and click “OK”.



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.

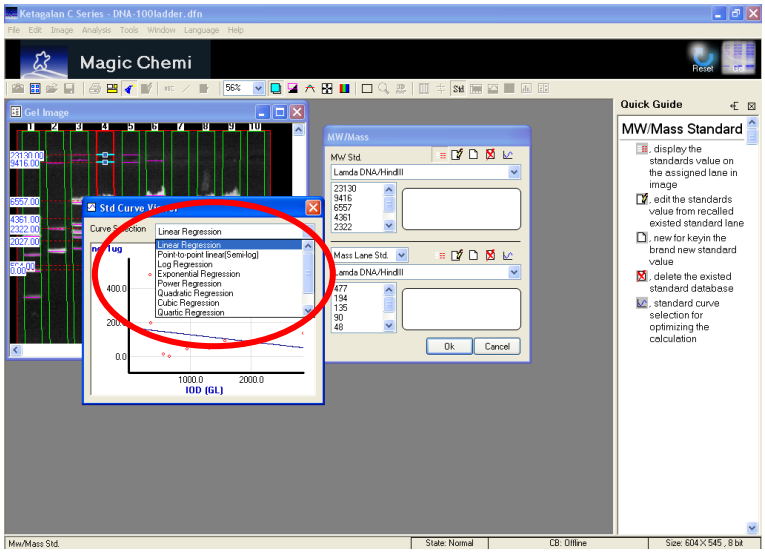
Ins: Insert a new standard value into the new mass standard list.

Delete tool:

Click to delete mass standard from the list.

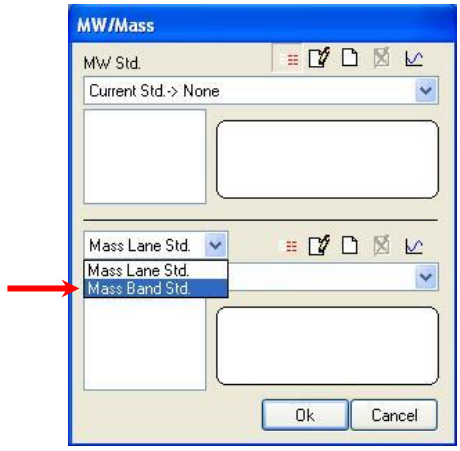
Standard curve tool:

Allow 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



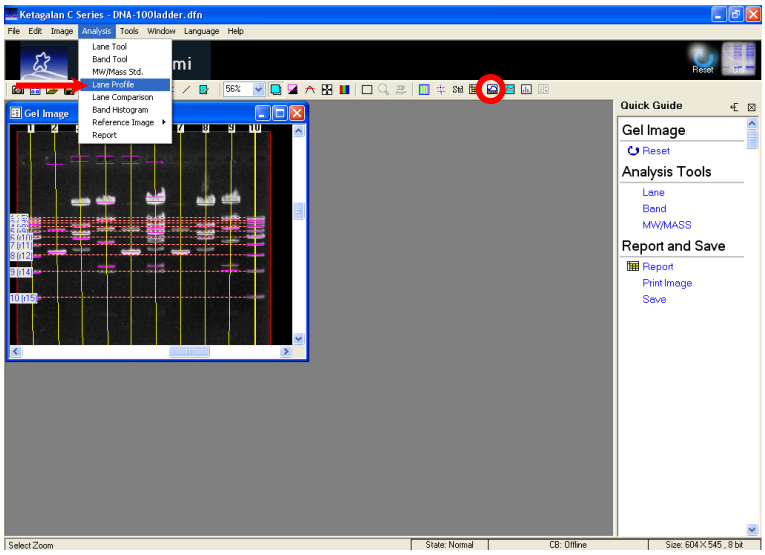
i. Select by clicking the Mass bands standard on the image input and update the mass value individually in the Mass Band window. Use left click mouse to select and right click mouse to deselect the Mass bands.

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.

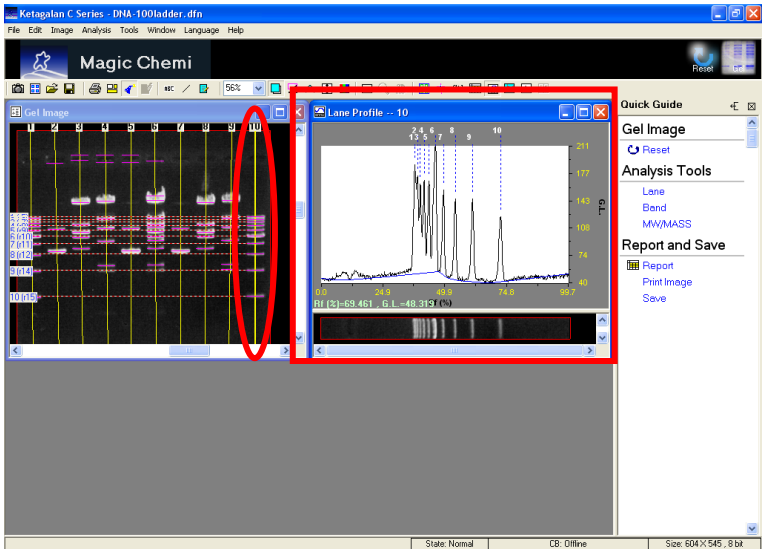
iii. Click “Ok” to go back to “MW/MASS” window.

F-6. Lane profile

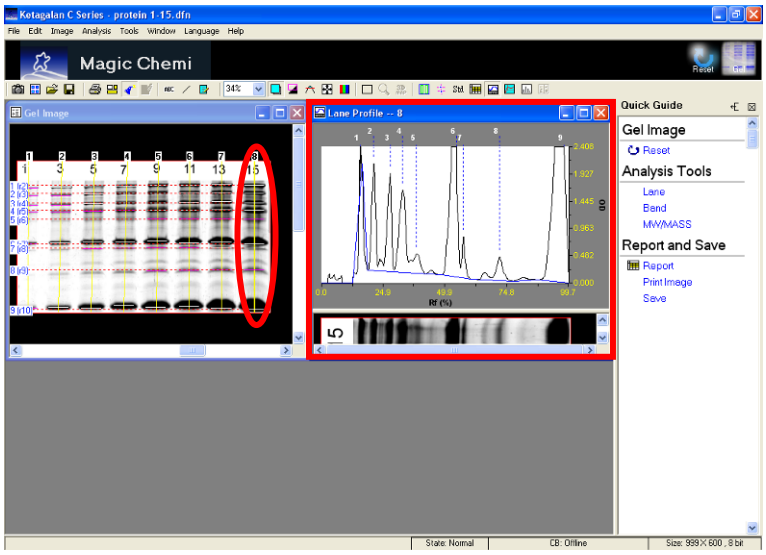
Click “Lane Profile” icon, or select and click “Lane Profile” from analysis menu to view the selected lane profile. For protein analysis lane profile displays OD (Optical Density) versus Lane and for DNA analysis it displays G.L (Gray Level) versus Lane.



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

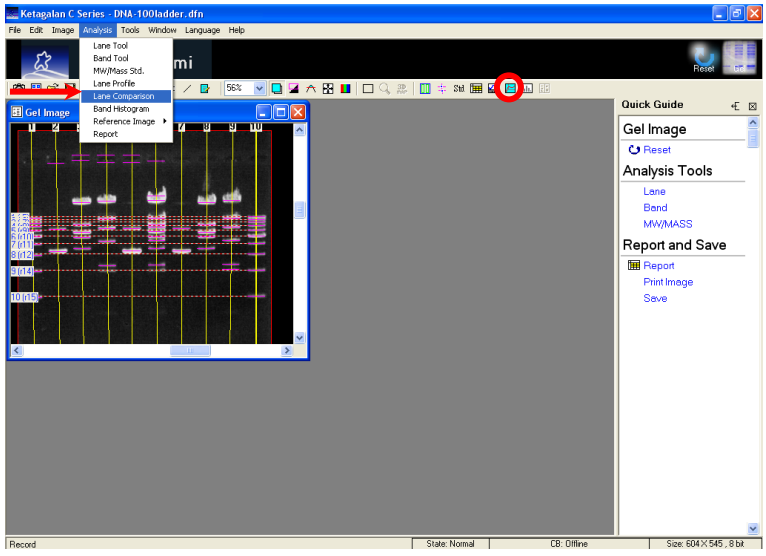


Given below is an example of protein analysis image for selected lane profile.

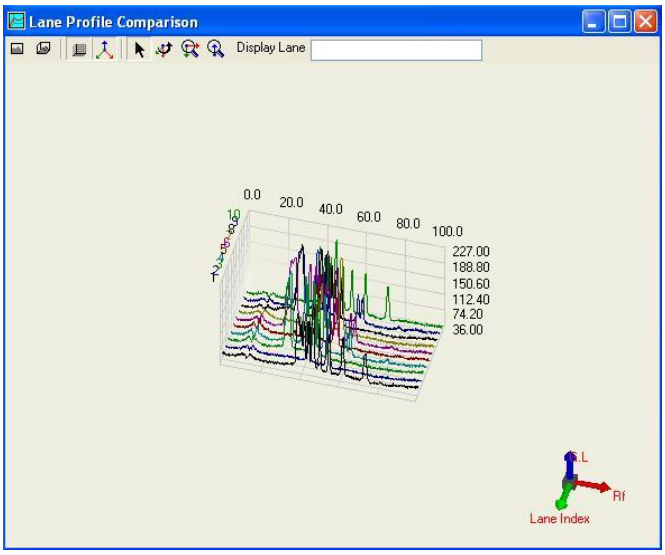


F-7. Lane comparison

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.

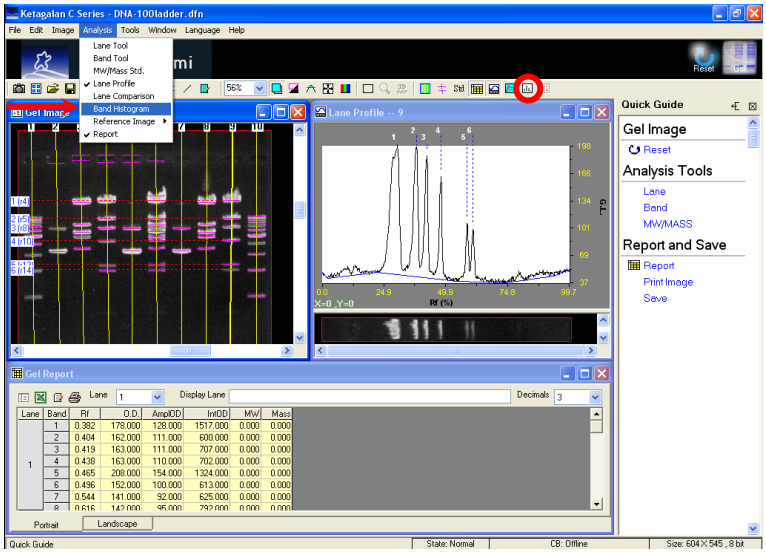
Display lane:

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

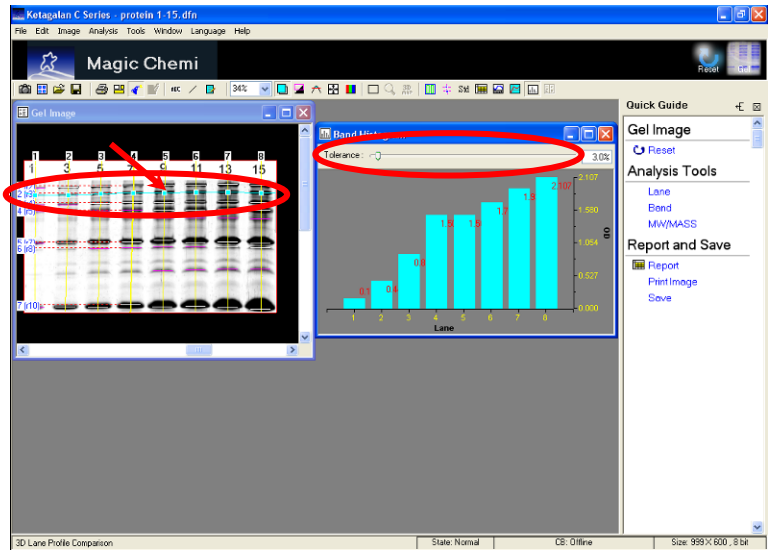
Note: For multiple lane numbers, separate each lane number by a comma.

F-8. Band histogram

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

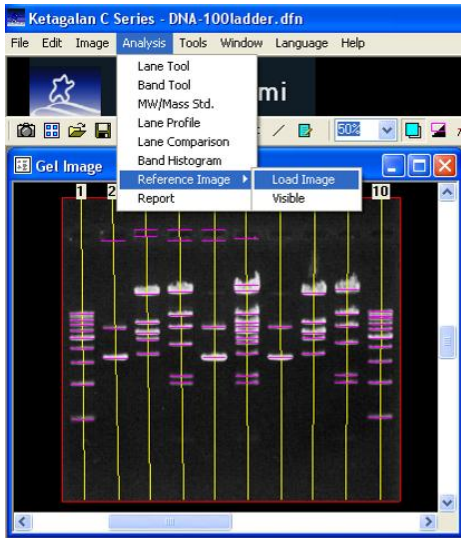


Click on any desired band profile or lanes to view the representation of band profile histogram. “Tolerance” in band histogram is the percentage of Relative Fragment Position (Rf.) Value to reference band (Recommended: 0.2% to 10%). For protein analysis band histogram displays OD (Optical Density) versus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

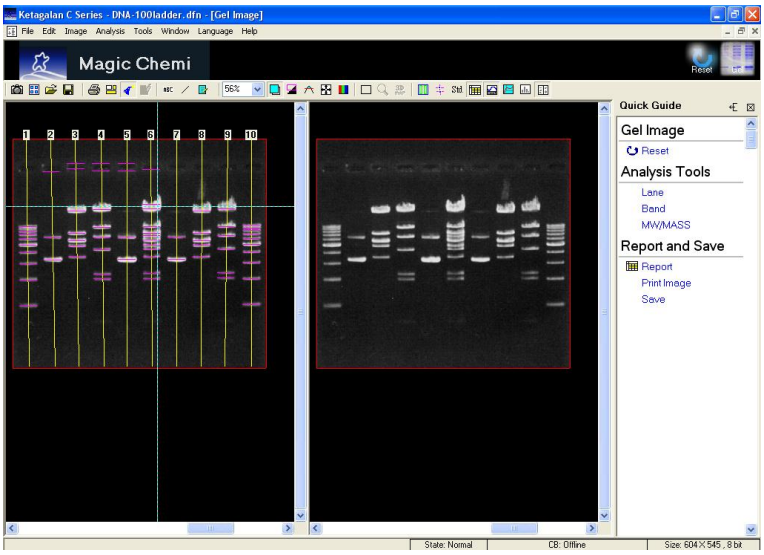


F-9. Reference Image

During processing the “Lane Tool” or “Band Tool”, users can apply with reference image in order to assist to define the location of the sample. Click on the “Analysis” from the menu and choose of “Reference Image” and “Load Image”.

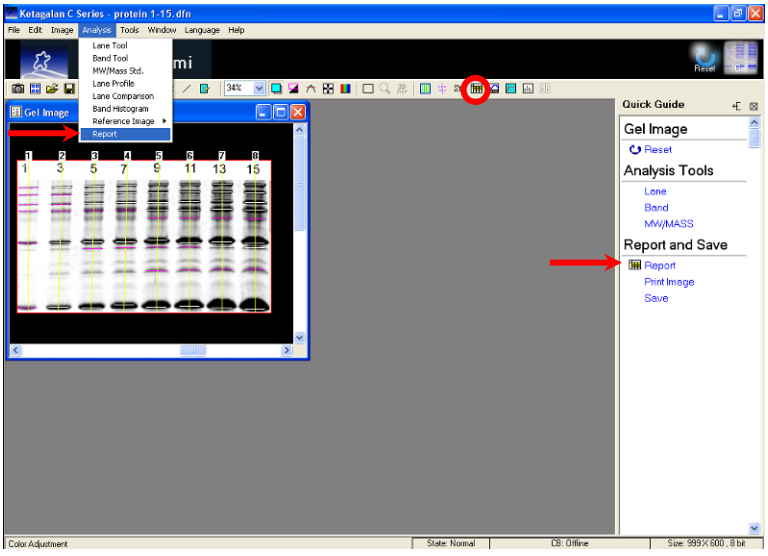


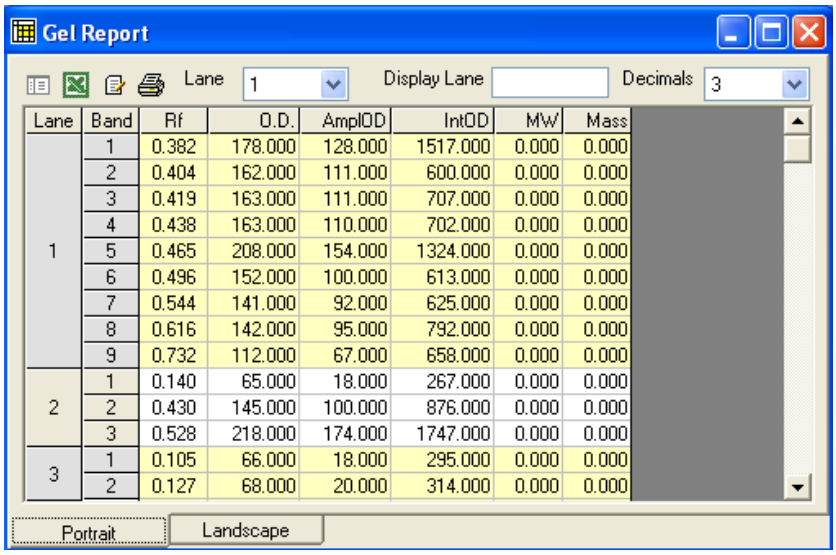
As load with the reference image, adjusting of lane analysis or band analysis will be more precisely. Close the reference image by uncheck the “Visible” above.



F-10. 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

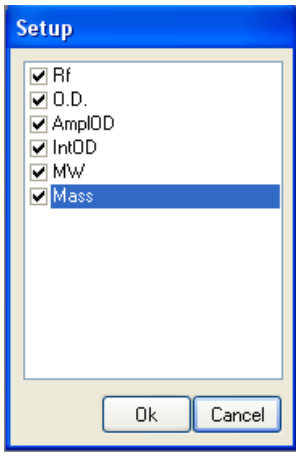
The default setting for the report window displays eight columns with lane and band information in the first two columns respectively. The next six columns describe the Rf, OD, Int.OD, Ampl.OD, MW and Mass of bands respectively.

- Rf: Relative Fragment position. It calculates the distance from start point (0.0) of the lane to the end of the lane that 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 4096 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:**

Allow user to export the report to excel.

 **Save report tool:**

Allow 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.

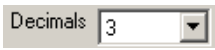
 **Print report tool:**

Allow 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:

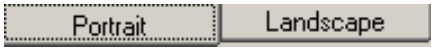
Allow user to choose a particular lane or few lanes of interest to be displayed by typing the lane number(s) in the display lane dialog box.

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

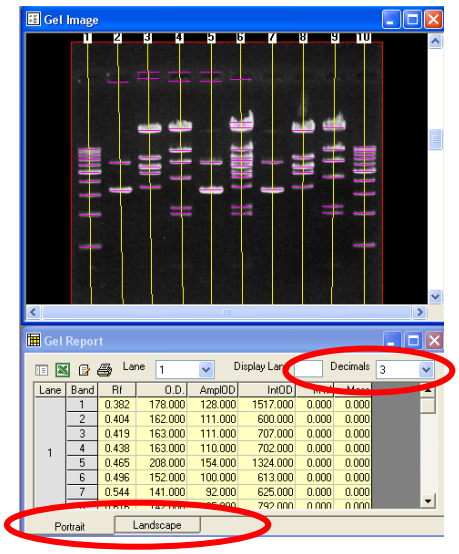


Decimals:

Allow 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.



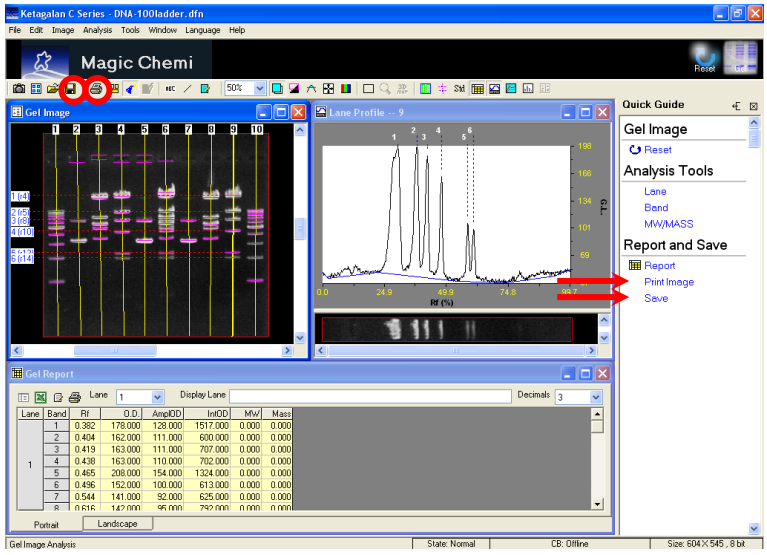
Report window display:

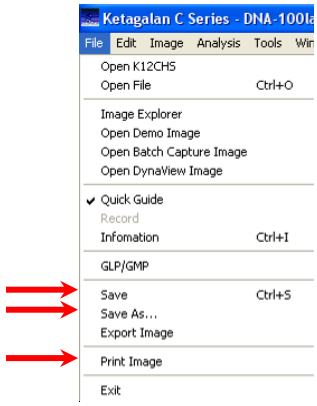


User may choose the results window to be displayed in “Portrait” or “Landscape” format. The default setup is portrait format. In portrait format, all the resulting analysis will be displayed and arranged in six different columns. For the landscape format, choose the result parameter to be displayed from 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.

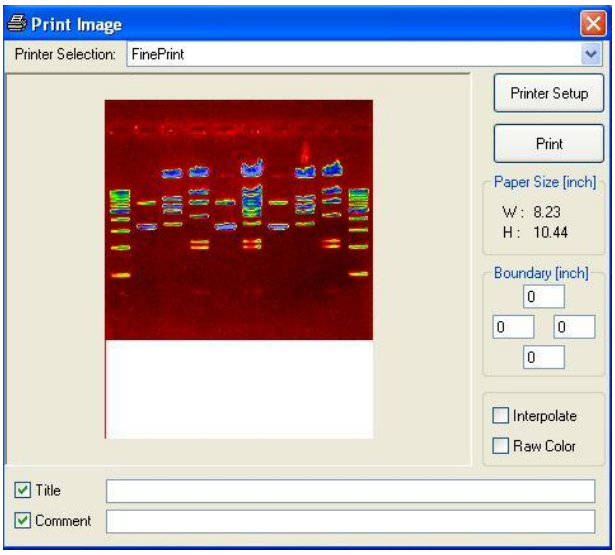
F-11. Print and save:

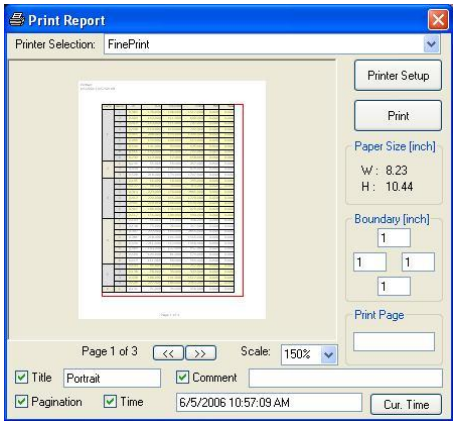
Click “Print Image” from quick guide or “Print Image” icon, or select and click “Print Image” from file menu to print the image. Click “Save” from quick guide or “Save” icon, or select and click “Save” or “Save As…” from file menu to save the image.



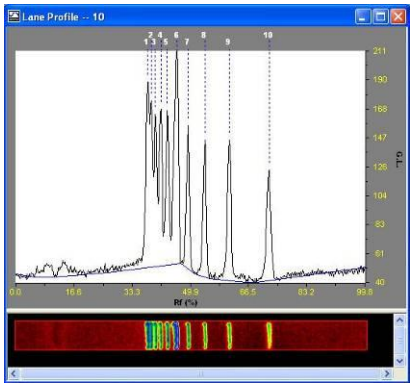


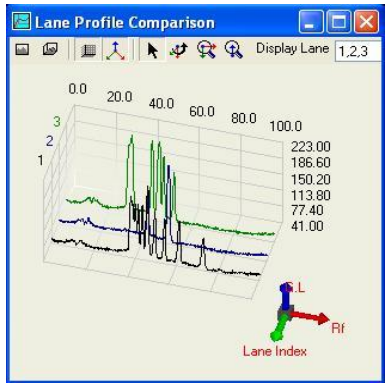
To print image or report, upon clicking the icon a “Print Image” or “Print Report” window will pop up. Input and select the printing parameter then click “Print”.

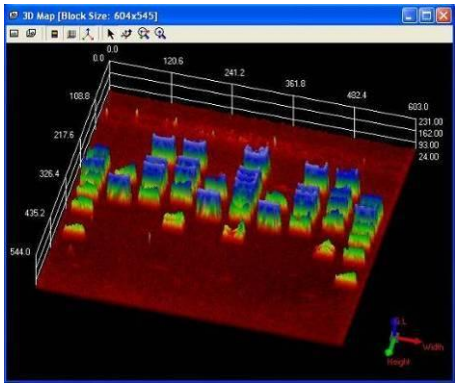




Printing or saving the following images: Lane Profile, Lane Profile Comparison or 3D Map can be done by closing the quick guide and maximizing the images, then press “Print Screen” on keyboard and paste the image into the Microsoft Paint Software. (Start→Programs→Accessories →Paint). Print or save the image with Paint Software.


Lane Profile -- 10
Rf (%)


Lane Profile Comparison
Display Lane 1,2,3
0.0
20.0
40.0
60.0
80.0
100.0
223.00
186.60
150.20
113.80
77.40
41.00
Lane Index
Rf


3D Map [Block Size: 604x545]
0.0
120.6
241.2
361.8
482.4
603.0
108.8
217.6
326.4
435.2
544.0
231.00
162.00
93.00
24.00

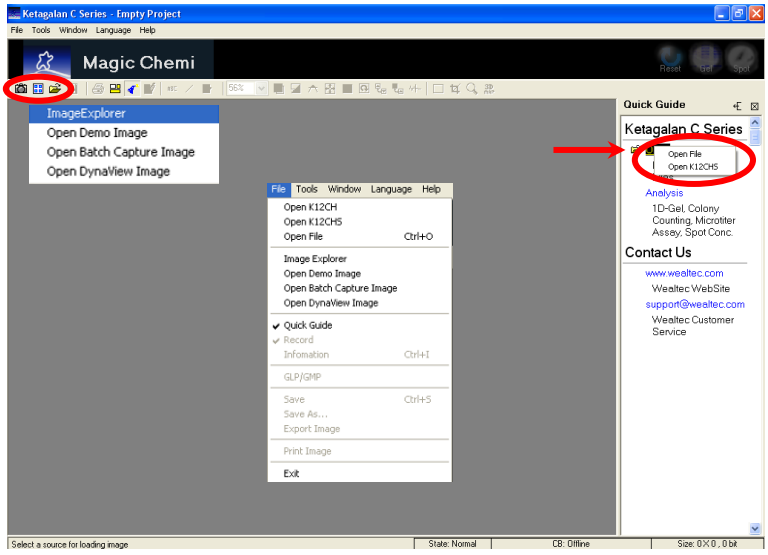
G. Spot Image Analysis

This chapter describes spot image analysis tool of Magic Chemi 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.

G-1. Capture / Import image:

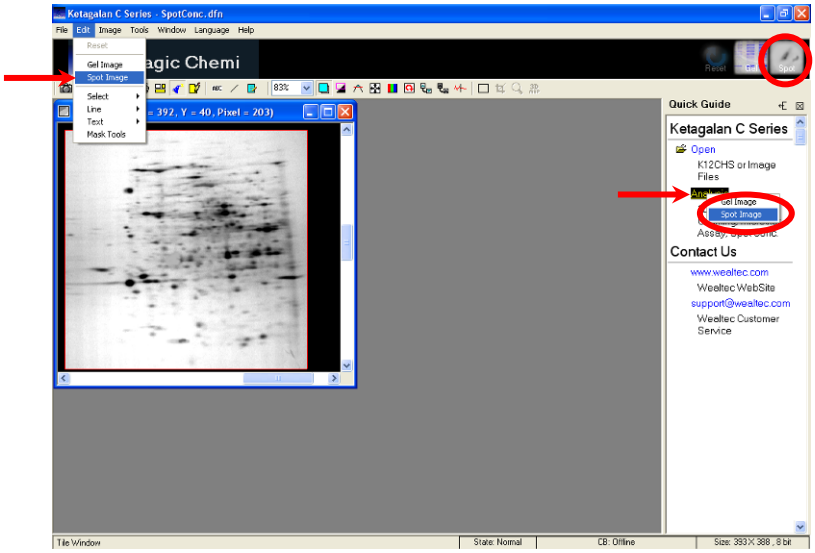
1. To capture images from KETA Imaging System (eg. KETA G) click “Open” from quick guide or “New Image from Peripheral” icon then select and click “Open K12R”, or select and click “Open K12R” from file menu. (Please refer to Chapter 3 for details). **Note**: KETA G is taken as a reference in the following examples. If you have purchased other than KETA G imaging system and intended to use please select appropriate imaging system in every option selection of KETA G 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”.

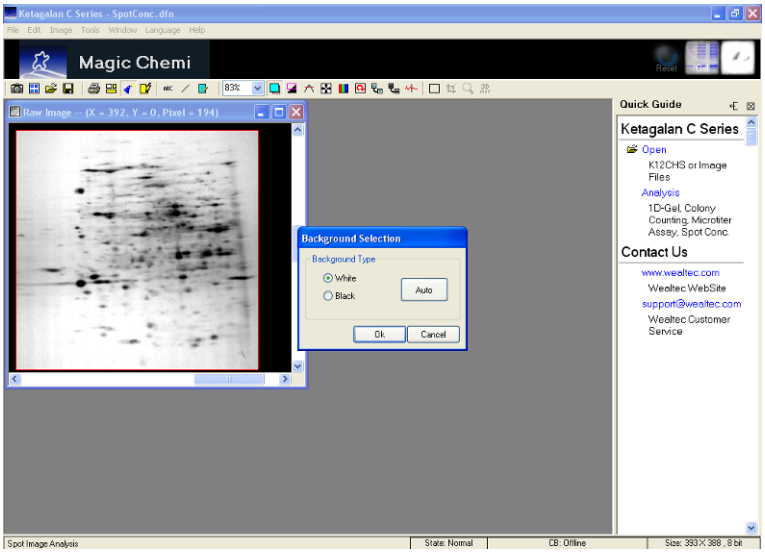


G-2. Spot image analysis function:

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

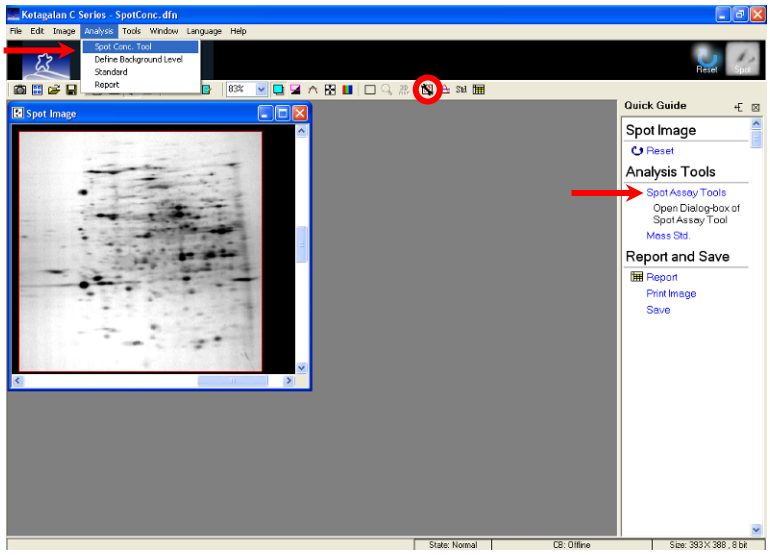


2. Select the appropriate background and click “Ok” button to proceed.

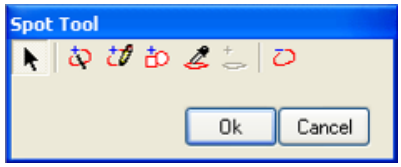


G-3. Spot image analysis definition:

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.



G-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.

Add Spot trace tool:

Allow 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.

Add Spot by Draw tool:

Allow 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.

 Add spot by Shape tool:

Allow user to define with desire shapes including circular and rectangle shapes. Left click to define the spots and right click to abort.

 Add Spot by Copy/Paste:

Allow user to select the defined spot and copy with the same shape to paste on the relative un-defined spot. Click on “  ” and select the previous defined spot to have the same selection shape. Left click on the undefined spot to define the spot and right click to abort.

 Delete spot tool:

Allow user to delete any selected spot.

G-3-2. Define spot:

a.) Select the “  ” 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 “  ” 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.

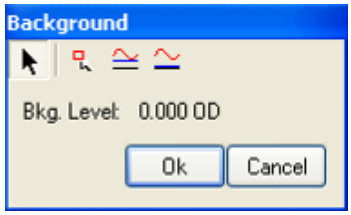
c.) Define spots with the fixed shape, click on the “  ” and setting the size parameter to have same size circular and rectangle shapes. Left click to define the spots and right click to abort.

d.) To define spot with same shapes, click on the “ ” to select defined reference spot and then left click on other spots that are going to define.

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

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

G-3-3. Define background level:



After define of the spots, users may need to define the background level to have precise analysis data. Click on each icon to define the background level with different categories and click on “Ok” to confirm.

User Define:

User can define the background area by dragging on the image. Software will calculate the define area to have average data to define as the background level.

Min:

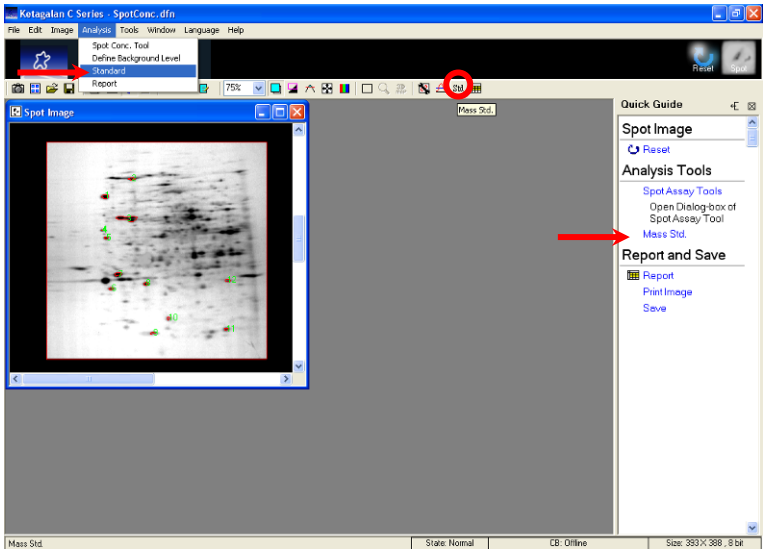
Define all the pixel intensity to have minimum value as background level.

Zero:

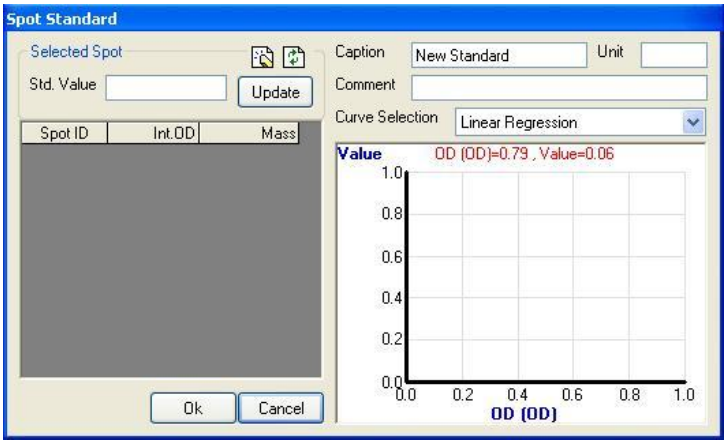
Define the background level as zero.

G-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.



G-4-1. Spot standard window:



Delete tool:

Allow user to delete the Mass standard.

Sort tool:

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

G-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.

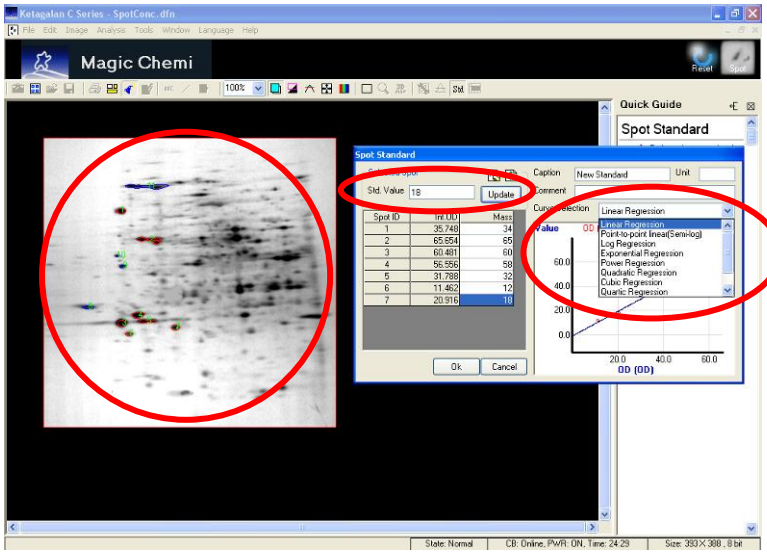
Note: User may edit the mass standard value by clicking on the "Std. Value" in the mass column and re-entering the new value. User may also choose to delete the mass standard by using the "Delete" icon in the dialog box.

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.

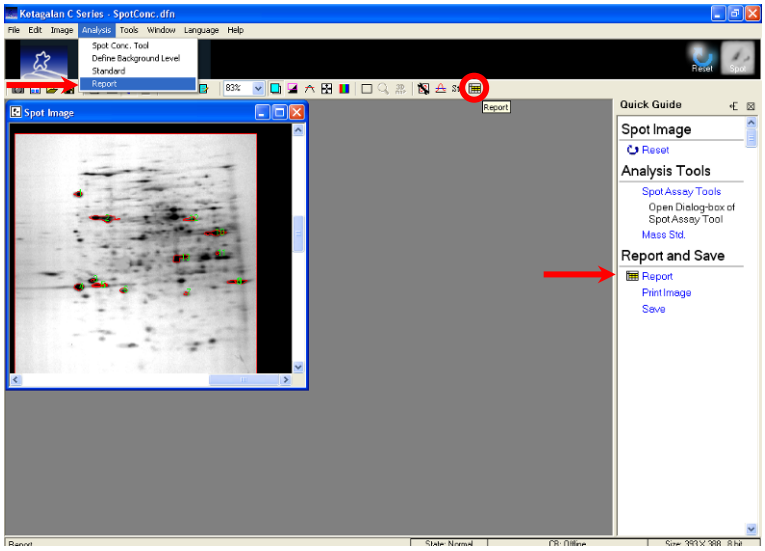
d.) Choose the best curve fit for the standards from the curve selection pull down menu.

e.) Click "Ok" to complete mass standard settings.

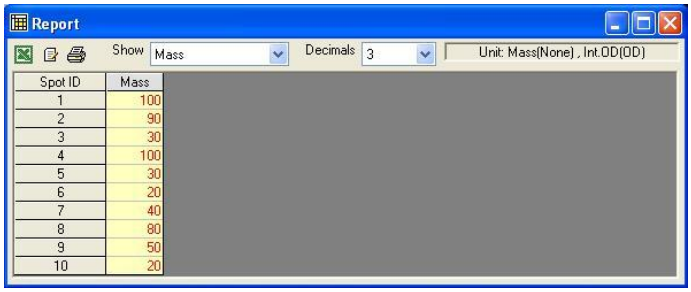


G-5. Report:

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:

Allow user to export the report to excel.

Save report tool:

Allow 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.

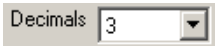
Print report tool:

Allow 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:

Allow 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.



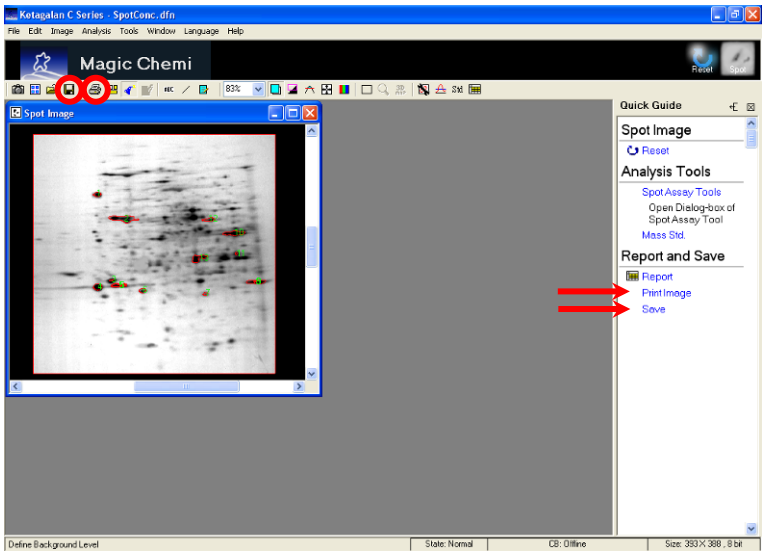
Decimals tool:

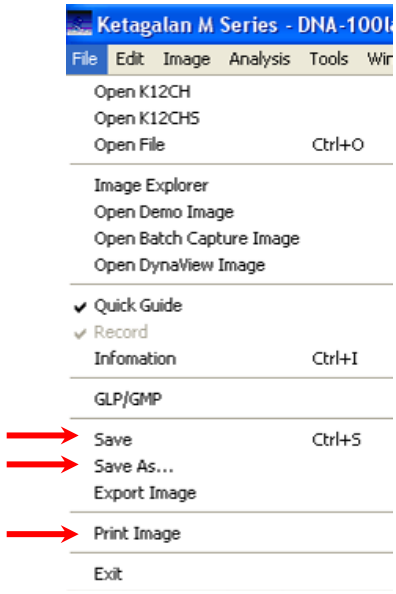
Allow user to choose the number of decimals for the results to be displayed from the “Decimals” pull down menu. The default number of decimals is 3 and the maximum number that can be chosen is 5.

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”.

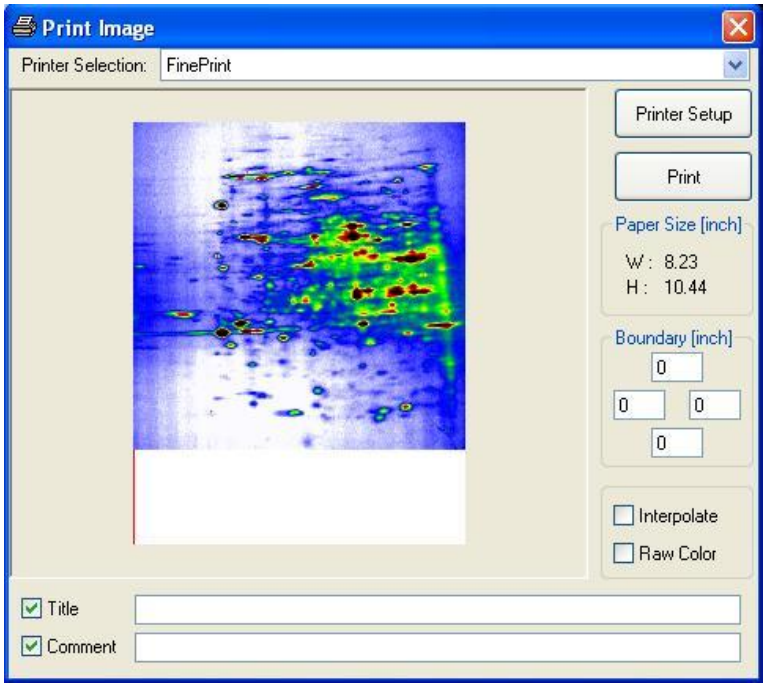
G-6. Print and save:

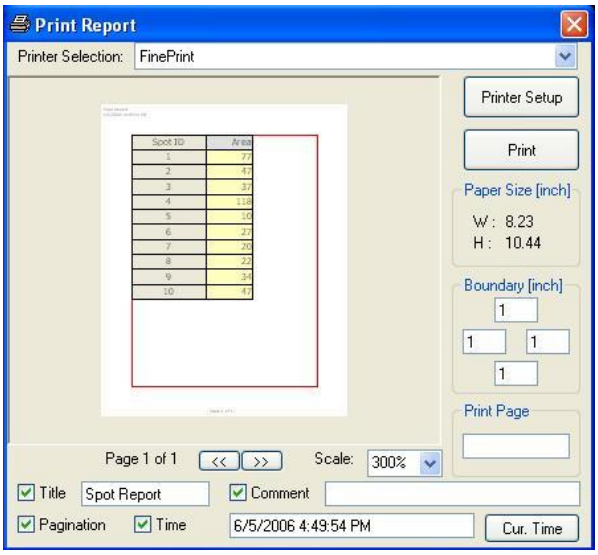
Click “Print Image” from quick guide or “Print Image” icon, or select and click “Print Image” from file menu to print the image. Click “Save” from quick guide or “Save” icon, or select and click “Save” or “Save As…” from file menu to save the image.



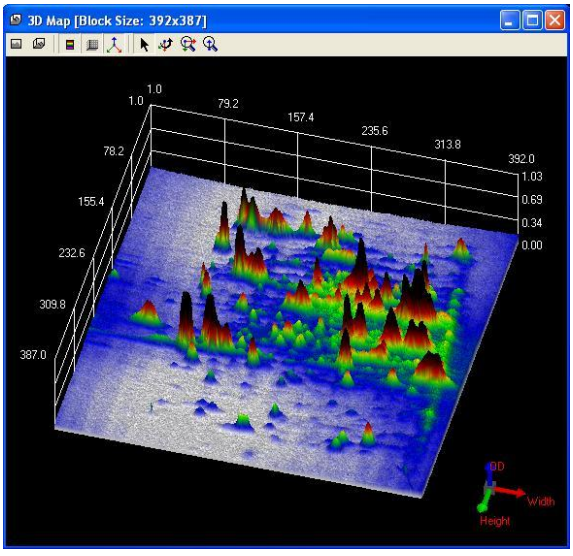


To print image or report, upon clicking the icon a “Print Image” or “Print Report” window will pop up. Input and select the printing parameter then click “Print”.





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.



01270 Printed in Taiwan

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