



## Instruction Manual

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# **E-Editor™ Software**

**For Configuring E-Gel® and E-PAGE™ Gel Images  
Microsoft Windows® Version**

**Version D**  
16 September 2003  
25-0490

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# Installation

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## Downloading and Installing E-Editor™

The E-Editor™ installer can be downloaded for free from the Invitrogen Web site:\*

1. Go to the E-Gel® product page at [www.invitrogen.com/egels](http://www.invitrogen.com/egels) or the E-PAGE™ product page at [www.invitrogen.com/epage](http://www.invitrogen.com/epage) and follow the links to the **E-Editor™ Software download** page.
2. Follow the instructions on the page to download the zipped Windows® installation file (**E-Editor™ setup.zip**) to your computer.
3. After downloading the file, double-click on it to unzip the application. If your computer does not include the WinZip® utility, you can download a version for free from [www.winzip.com](http://www.winzip.com).
4. In the WinZip® window, double-click on the **Setup E-Editor.exe** file to begin running the installer.
5. The installation program will guide you through the installation process. E-Editor™ will be installed in a folder in the Windows **Program Files** directory, and a button will be added to the Windows **Start menu**. The folder for the **Start menu** will appear open, and you can copy the shortcut icon for the application (shown below) to your desktop:



E-Editor

\*If your computer is not connected to the Internet, you can download the zip file to another computer and copy it to a removable disk for installation. If you do not have Internet access, contact Technical Service (see page 21) to obtain a copy of the file.

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## Computer Requirements

The following are the minimum system requirements for running E-Editor™ on the Microsoft® Windows® operating system:

Operating system: Windows® 2000, XP, NT, or 98  
Computer: Pentium II or higher  
Built-in memory: 128 MB or higher

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## Windows® Display Settings

To properly display reconfigured E-Gel® and E-PAGE™ images on your computer screen, set the Windows® display settings to **16-bit High Color** or higher. You can change this setting in the Windows **Display** control panel (see your Windows documentation for details).

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## Network Compatibility

E-Editor™ will not work over a computer network.

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# Introduction

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## Welcome to E-Editor™

E-Editor™ software for Windows® allows you to quickly reconfigure digital images of E-Gel® 96 and 48 gels and E-PAGE™ 96 gels for analysis and documentation. The staggered lanes in these gels can be difficult to compare and analyze using standard 1-D gel analysis programs such as Bio-Rad's Quantity One®, Phoretix 1D, or Kodak 1D Image Analysis software. E-Editor™ reconfigures the staggered wells into a side-by-side format for easy comparison and analysis.

You can reconfigure gels that have been scanned in the original gel cassette, or gels that have been removed from the cassette and stained or blotted.

After capturing a digital image of the gel or blot, open the image in E-Editor™ and follow the steps described in this manual to align and arrange the lanes in the image. Then save the reconfigured image for further analysis, print the image, or copy and paste selected lanes or the entire image into other applications for printing, saving, e-mailing, and/or publishing on the Web.

You can also relabel the lane images to match the well numbers in the original microtiter plate, for easy sample tracking. This is useful if you have loaded the gel using a multi-tip pipettor, and the numbers of the plate wells do not correspond to the numbers of the gel wells.

Finally, you can group the images of multiple gels loaded from a 384-well microtiter plate into a single image with a layout corresponding to that of the original plate.

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## Imaging Gels

Use a flatbed scanner or digital camera to capture a digital image of your E-Gel® or E-PAGE™ gel. When imaging, the gel should be properly aligned (i.e., not at an angle), and gel features should be clear and distinct in the image. We recommend an image resolution of **150 dpi** or higher.

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## Supported File Formats

E-Editor™ software supports the following standard image file formats:

- tiff
- bmp
- jpeg
- png

**Note:** If you will be analyzing the gel image using an analysis software program, be sure to save the image in a format supported by that program.

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## Compatible Image Analysis Software

Images edited by E-Editor™ can be analyzed using many different biological image analysis programs, including Bio-Rad's Quantity One, Phoretix 1D, Kodak 1D, UVP LabWorks™, and UVP GelWorks®. Consult your image analysis program documentation for appropriate file formats.

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# Getting Started

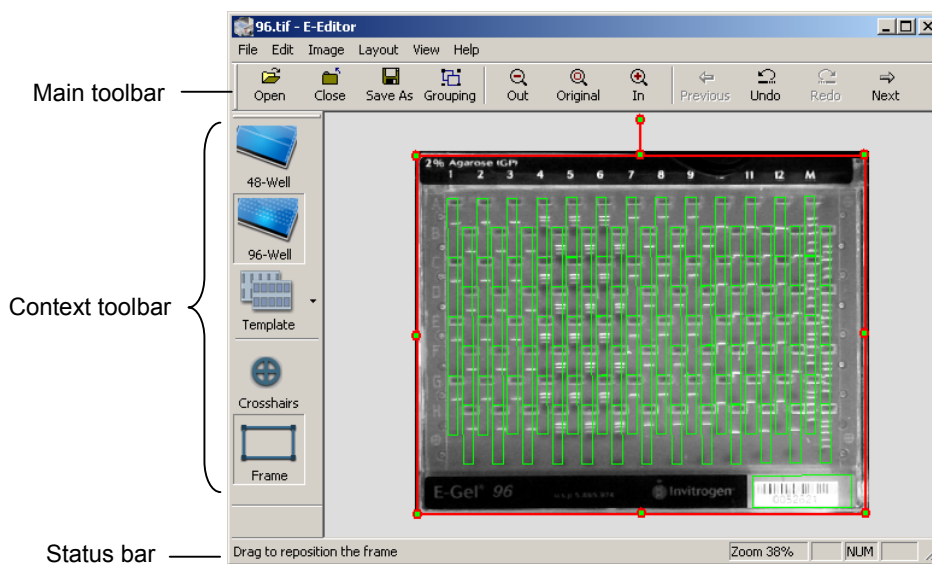
## Starting the Program

To begin running E-Editor™, select the program from the **Windows Start Menu > Programs** list, or double-click on the application shortcut on your desktop.

The graphical interface consists of a menu bar, main toolbar, context toolbar, a status bar, and an image window.

The **context toolbar** changes depending on which step you are in.

The **status bar** displays messages about the current command under the cursor.

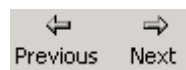


## Workflow Overview

E-Editor™ software is designed to guide you through the following series of steps:

1. **Align the Image** (page 7). In the first step, you select the gel type and position a lane frame or crosshairs on the image to facilitate alignment of the lane boxes in Step 2.
2. **Adjust the Lanes** (page 10). In this step, you align image boxes over the lanes on the gel.
3. **Copy, Print, and Analyze the Reconfigured Image** (page 14). In the final step, the reconfigured image will be displayed on the screen. You can save the reconfigured image for analysis, or copy and print the lanes in the image.

In each step, use the **Next button** on the main toolbar to proceed to the next step, and the **Previous button** to return to the previous step:



**Note**


The image will not be reconfigured until you complete Step 2 above. When you complete Step 2, you should save the reconfigured image under a different name or in a different location if you want to preserve the original image.

# Opening and Saving Images

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## Opening Images

To open an image in E-Editor:


- Click on the **Open button**  or select **Open** from the **File menu** (Ctrl+O), and select the image in the **Open dialog** (see figure below),
  - Drag an image file directly into the open application window, or
  - Select the image file name from the four most recently opened images listed at the bottom of the **File menu**.
- 




Note

- The E-Editor™ window can contain only one image at a time; if you open another image, it will replace the current image. You will be prompted to save any changes to the current image.
  - If you open an image that has already been reconfigured using E-Editor™, only the options for reconfigured images will be available (changing the configuration, printing, copying, etc.). (See **Reconfigured Image**, beginning on page 14.)
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## Saving Images

To save an image in E-Editor™, click on the **Save As button**  to open a dialog box in which you can specify the image file name and location. This command is also on the **File menu**.

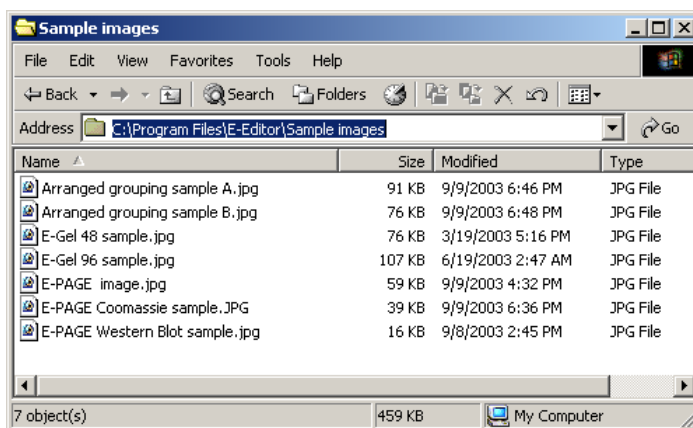
**Note:** E-Editor™ will automatically append an underscore character (“\_”) to the original image file name, to avoid overwriting the original file. To overwrite the original file, delete this character.

To close an image without saving, click on the **Close button** .

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## Sample Images

A folder with various sample images is installed with the software, in the same directory as the application (e.g., C:\Program Files\E-Editor\Sample Images).





# Adjusting the Image Display

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## Magnifying Images

When you open an image, it is initially sized to fit the screen.

With the image open, click on the **Zoom In** button on the main toolbar to magnify the image, **Zoom Out** to shrink it, or **Original** to return the image to its actual size:



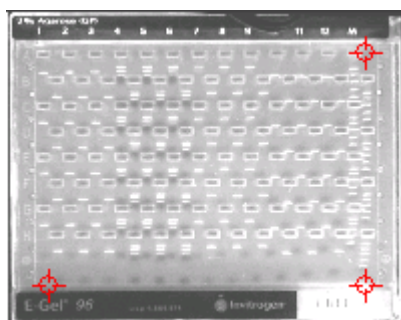
## Adjusting the Brightness

If the image display is too bright or too dark, you can adjust it using the **Brightness** controls.

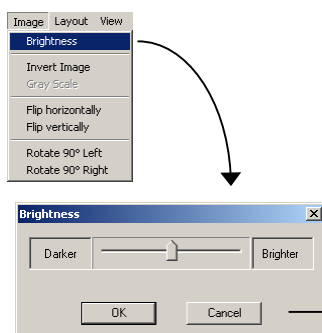
**Note:** This command will change the image data, which can affect downstream analysis.

1. Go to the **Image menu** and select **Brightness**.
2. In the **Brightness** dialog, drag the slider to make the image brighter or darker.
3. When you are satisfied with the image brightness, click on **OK**. The image display will appear adjusted.

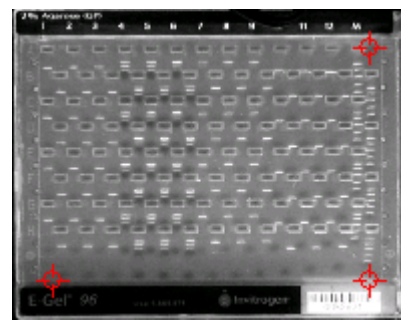
1. Image is too light



2. Open Brightness dialog, drag slider to darken image, and click OK



3. Image display is adjusted



## Inverting the Image

To invert the data the image (i.e., light areas will become dark, and dark will become light), select **Invert Image** from the **Image menu**. To undo the inversion, select the command again.

**Note:** This command will change the image data, which can affect downstream analysis.

## Changing to Gray Scale

To change any colors in the image to grayscale, select **Gray Scale** from the **Image menu**.

**Note:** This command will change the image data, which can affect downstream analysis.

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## Adjusting the Image Display, continued

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### Flipping and Rotating the Image

To flip and rotate the image, use the commands on the **Image menu**.

**Flip Horizontally** and **Flip Vertically** are reversible; select the commands again to undo the flip. Use **Rotate 90° Left** and **Rotate 90° Right** to rotate the image in 90° increments.

**Note:** These commands will not change the image data (e.g., size and intensity of bands). The new orientation will be saved when you save the image.

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### Undoing Display Settings

Use the **Undo button** (Ctrl+Z) and **Redo button** (Ctrl+Y) on the main toolbar to undo and redo individual display changes.

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# Aligning the Lane Frame or Crosshairs

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## Introduction

In this step, you select the gel type and position a lane frame or crosshairs on the image to facilitate alignment of the lane boxes in the next step.

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## Selecting the Gel Format

To begin, select the gel format by clicking on the **48-well** or **96-well** button on the context toolbar on the left side of the window. For E-PAGE™ 96 gels, select the 96-well buttons.



## When to Use the Lane Frame or the Crosshairs

**Crosshairs:** You can use the crosshairs for gels that are still in the gel cassette. Simply drag the crosshairs over the targets printed on the cassette and the software will automatically calculate the position of the lane boxes in the next step.

**Lane Frame:** Unlike the crosshairs, the lane frame does not require the printed targets on the gel cassette for positioning. You can use the lane frame for gels in the cassette as well as gels that have been removed from the cassette for post-run staining or blotting. Drag the corners of the lane frame to resize and reposition it over the lanes, or drag the handle at the top of the frame to rotate it for skewed gels.

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## Loading a Lane Box Template

If you have saved a lane box template from an image in which the lanes are in the same relative positions (see **Saving a Lane Box Template**, page 13), you can load this template on the current image and save yourself subsequent lane box positioning steps. This is useful if you are using the same imager on multiple gels, and the imager distorts the gels in the same way each time.

1. Click on the **Template button** on the toolbar, or select **Template** from the **Layout menu**.
2. Select from the drop-down list of available templates. If you are viewing the lane frame, the lane boxes will appear within the frame configured as they are in the template. If you are using crosshairs, the template will be loaded but will not appear overlaid on the image.
3. Align the lane frame or crosshairs as specified on the following pages.
4. When you click on **Next**, the template arrangement of lane boxes will appear sized and aligned over the image.

To unload a selected template, click on the **96-well button** or **48-well button**.

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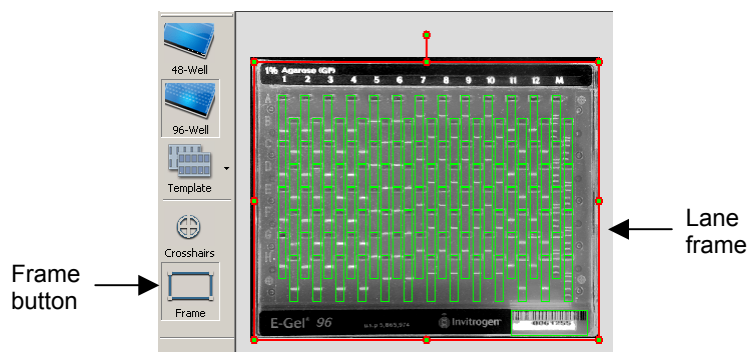
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## Aligning the Lane Frame or Crosshairs, continued

### Lane Frame

The lane frame is a graphical overlay in which the green lane boxes are attached to a red frame with positioning handles at its corners and sides. You can drag the corners and sides of the frame to align the lane boxes with the gel lanes, or drag the handle at the top to rotate the frame for skewed gels.

To display the lane frame, make sure that the appropriate gel format is selected (see previous page), and click on the **Frame** button in the context toolbar.

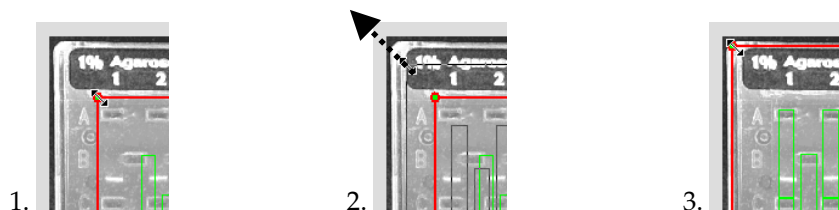


Resize, reposition, and rotate the frame as needed to align the lane boxes with the gel lanes:

- To **resize** the frame, position your cursor on a frame handle and drag (see figure below). You may want to magnify a section of the gel using the **Zoom** tools before resizing, to ensure proper alignment with the gel lanes.
- To **reposition** the entire frame, position your cursor at the center and drag.
- To **rotate** the frame, position your cursor on the top handle and drag.

Note that the top of each lane box should include the well for that lane. Be careful to exclude the slopes of neighboring wells from the lane boxes. Use the **Undo** button to undo any positioning changes you make.

Click on **Next** to complete the alignment.



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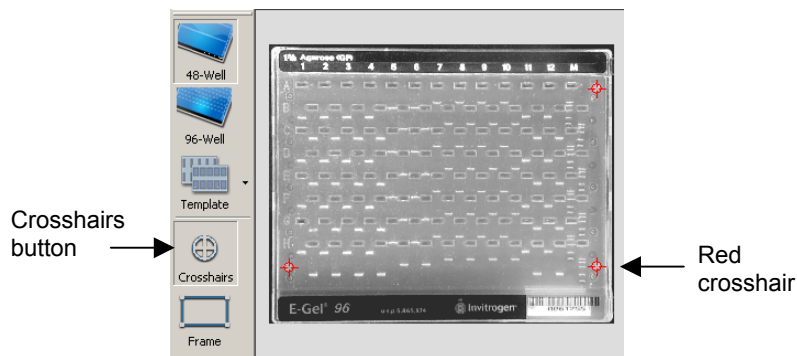
# Aligning the Lane Frame or Crosshairs, continued

## Crosshairs

Crosshairs are graphical overlays that can be positioned over the targets (⊕) imprinted on E-Gel® or E-PAGE™ cassettes. Position the crosshairs over the targets, and when you click on **Next** the lane boxes will automatically be aligned with the gel.

**Note:** For gels that have been removed from the cassette, use the lane frame to align the lane boxes.

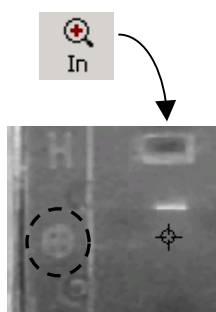
To display the red crosshairs, make sure that the appropriate gel format is selected (page 7), and click on the **Crosshairs** button in the context toolbar.



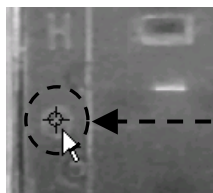
We recommend magnifying each target using the **Zoom** tools before positioning the crosshairs. To position the crosshairs:

1. Locate a target on the cassette.
2. Using your mouse:
  - **Drag** the nearest red crosshair directly over the target, or
  - **Double-click** on the center of the target to “jump” the crosshair into position
3. Repeat this procedure for the remaining two targets. Each red crosshair should be directly aligned over a target.
4. Click on **Next** to complete the alignment.

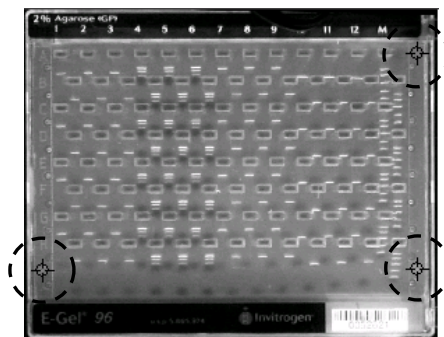
1. Magnify gel target



2. Drag, double-click, or use the arrow keys to move the crosshair



3. Repeat for all crosshairs



# Adjusting the Lane Boxes

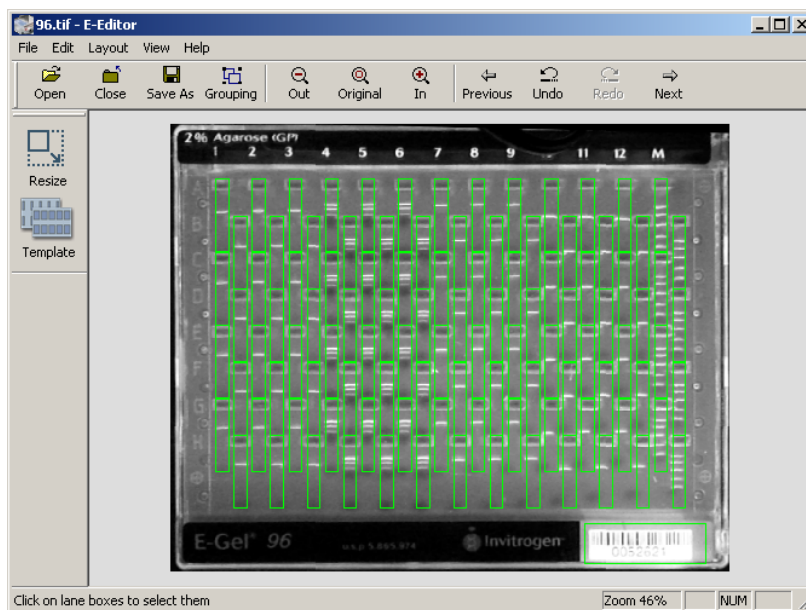
## Lane Boxes

When you complete the alignment step, the crosshairs or frame will disappear, and green lane boxes will appear on the image. A green box will also surround the bar code label on the gel cassette (see the figure below).

The lane boxes indicate how the lanes will be cropped and positioned in the final configuration. In this step, you can fine-tune the position of the boxes so that they surround the individual lanes in the gel without overlapping adjacent lanes.

Note that the top of each lane box should include the well for that lane.

If the image is skewed or the lane boxes are grossly out of position, click on the **Previous** button to return to the alignment step.



If you analyze your gels using a 1-D gel image analysis software program, be careful to exclude the slopes of neighboring wells from the lane boxes. The software could misinterpret adjacent wells as bands.

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# Adjusting the Lane Boxes, continued

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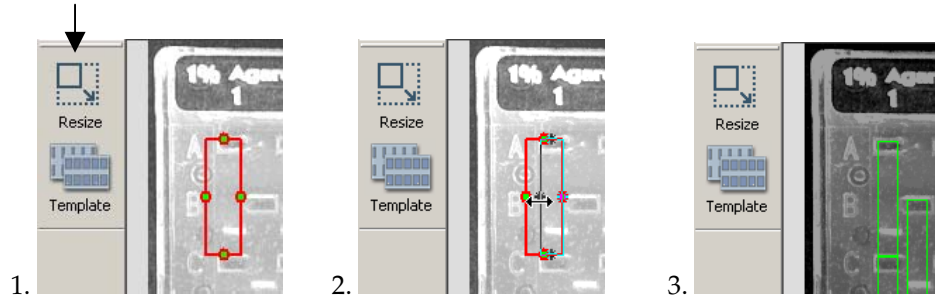
## Resizing Lane Boxes

Use the **Resize command** to resize the lane boxes. Note that this command affects all the lane boxes at once.

Before you begin, make sure that the green lane box in the upper left corner of the image is positioned approximately over the corresponding lane. Then, to resize the boxes:

1. Click on the **Resize button** on the context toolbar, or select the command from the right-click context menu or **Layout menu**. The green lane boxes will disappear, and be replaced by a single lane box in the upper left corner with a red frame and adjustment handles.
2. Drag the handles to resize the lane box so that it fits the lane.
3. Select **Resize** again. All the lane boxes in the image will be changed to the new size.

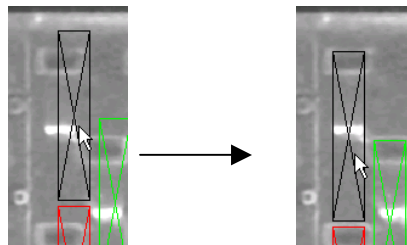
Resize button



## Repositioning a Single Lane Box

To manually adjust the horizontal and/or vertical position of a single lane box:

1. Select the lane box by clicking on it. It will appear marked with an X.
2. Using your cursor, drag the selected box to the new position.



To undo the change, click on **Undo**.

To deselect the lane box, click on it again.

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# Adjusting the Lane Boxes, continued

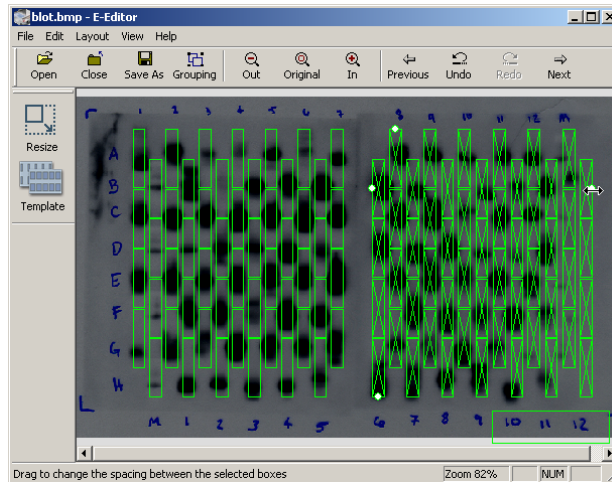
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## Repositioning Multiple Lane Boxes

To manually adjust the position of multiple lane boxes, or change the spacing between them:

1. Select the lane boxes by one of the following methods:
  - To select a group of boxes, click on them individually or drag a box around them.
  - To select a column of boxes, right-click on the column and select **Select Column** from the context menu.
  - To select a row of boxes, right-click on the row and select **Select Row** from the context menu.
  - To select all the boxes in the image, right-click on any lane in the image and select **Select All** from the context menu.

Selected lane boxes will appear marked with an X, and the group of boxes will have white handles at the edges.



2. To move the selected boxes to a new position, position your cursor over the boxes and drag.
3. To change the spacing between the selected boxes, drag the white handles at the edges of the selected boxes.

To undo the changes, click on **Undo**.

To deselect the boxes, click on a non-lane box area of the image.

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## Adjusting the Lane Boxes, continued

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### Undoing Lane Box Adjustments

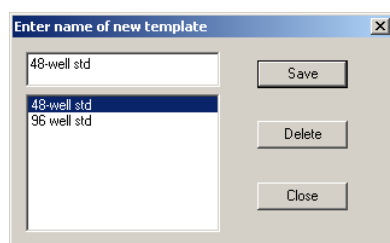
Use the **Undo button** (Ctrl+Z) and **Redo button** (Ctrl+Y) on the main toolbar to undo and redo lane box positioning and resizing changes.

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### Saving a Lane Box Template

After you have repositioned and resized the lane boxes for the current image, you can save the settings for use on similar gel images in which the lanes are in the same relative positions. This is useful if you are using the same imager on multiple gels, and the imager distorts the gels in the same way each time.

1. Click on the **Template button** on the toolbar, or select **Template** from the **Layout menu**.
2. In the **Template dialog**, enter a name for the template and click on **Save**.



You can then open a new gel image of the same basic size and shape and load the saved template to save yourself the step of positioning the lane boxes (see **Loading a Lane Box Template**, page 7).

To delete a saved template, select it from the list and click on **Delete**.

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### Completing the Adjustment

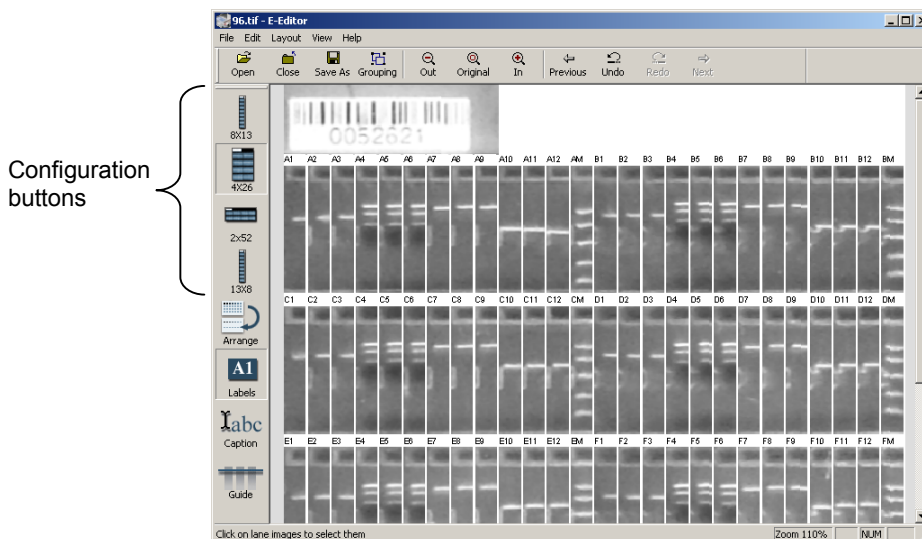
Confirm that the lane boxes completely surround the lanes in the gel without overlapping adjacent lanes. When you are satisfied with the position and size of the boxes, click on the **Next button** to complete the step.

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# Reconfigured Images

## Introduction

When you complete the lane box adjustment step, the gel image will appear reconfigured in the application window:

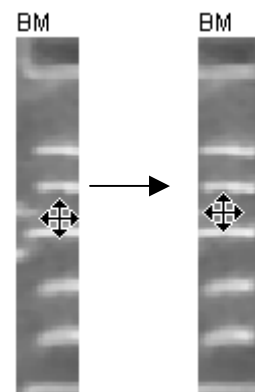


The lanes in each row will appear side-by-side for easy comparison. To change the configuration of the lanes, click on the desired configuration button to rearrange the rows and columns in the image.

## Repositioning Images within the Lane Boxes

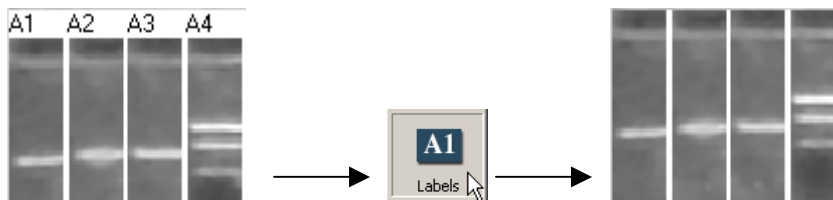
You can reposition the lane image within the lane box.

1. Position your cursor on the lane image.
2. Hold down the Shift button, and drag the image to a new position within the box.



## Hiding and Displaying Lane Labels

The labels marking each lane (A1, A2, A3, etc.) can be displayed or concealed for copying, printing, and publishing purposes. Click on the **Labels** button on the context toolbar to hide the labels, and click on it again to display the labels.



*Continued on next page*

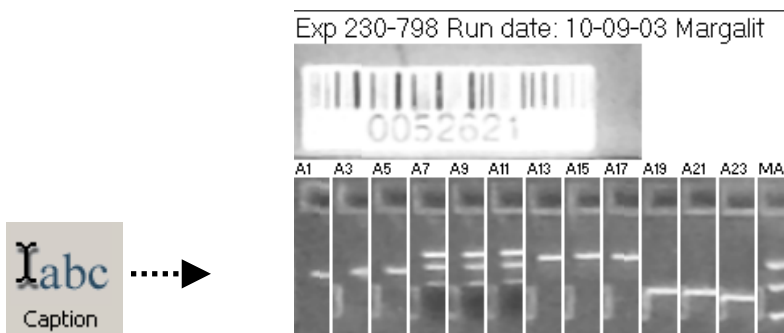
## Reconfigured Images, continued

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### Adding a Caption

To add a caption to the top of the gel image:

1. Click on **Add Caption** on the context toolbar.
2. In the pop-up box, enter the caption and click on **OK**.
3. The caption will be added to the top of the image.



### Comparing Bands Across the Gel

You can display a line that will allow you to easily compare a band across lanes in the image:

1. Click on the **Guide** button. The line will appear on the image.
2. Drag the line up or down to compare the bands across the image.

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*Continued on next page*

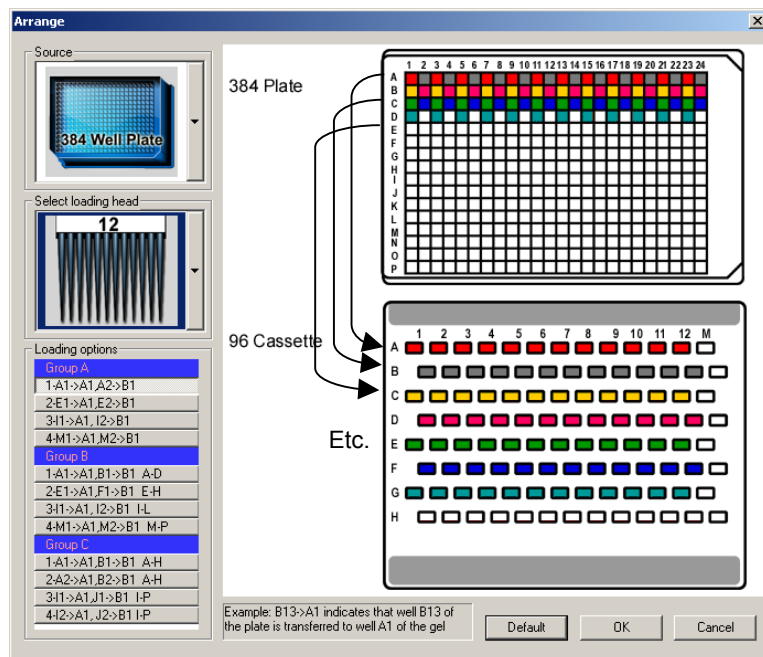
## Reconfigured Images, continued

### Arranging the Image to Match the Original Plate

Using E-Editor™ software, you can relabel the lane images to match the well numbers in the original microtiter plate. This is useful if you have loaded the gel using a multi-tip pipettor, and the numbers of the plate wells do not correspond to the numbers of the gel wells.

To label the images based on the microtiter plate layout, click on the **Arrange** button in the context toolbar.

The **Arrange** dialog will open.



Using the dialog, perform the following steps:

1. Select the microtiter plate layout by clicking on the **Source** button.
2. Select the size of the multi-tip loading head by clicking on the **Select Loading Head** button.
3. Under **Loading Options**, click on a button to select the appropriate loading pattern. The name of the button describes the loading pattern. When you select a button, the plate and gel diagrams in the dialog show the loading pattern, using flashing color-coded wells to indicate the transfer of samples from plate to gel.

For example, if you have selected a 384-well plate and an 8-tip loading head, the **3-A13>A1, A14>A2, 13-18** button indicates that well A13 of the plate was loaded into well A1 of the gel, and from the diagram you can see that well C13 went into B1, E13 went into C1, etc. Then the pattern repeats, with A14 going into A2, C14 into B2, etc.

4. Click on **OK** to close the dialog and relabel the images according to plate well number. To change the labels back to the gel well numbers, reopen the **Arrange** dialog and click on **Default**.

# Grouping Images

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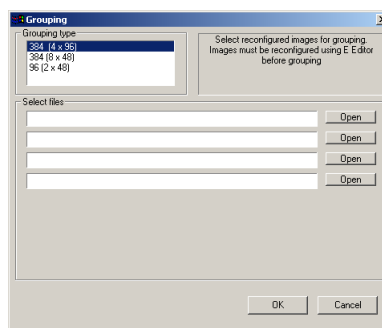
## Grouping Images

If you have loaded multiple gels from a single 96-well or 384-well microtiter plate, you can combine the reconfigured images of those gels into a single image to match the original plate layout.

**Important:** Before they can be grouped, the lanes in the different images must be correctly labeled using the **Arrange tool** (see page 16) to correspond to the original plate wells.

First, configure and arrange your 96-well or 48-well gel images using E-Editor™ and save them as separate files. Then, to group the separate files into a single larger image representing your original microtiter plate:

1. Click on the **Grouping button** or select the command from the **File menu**. The Grouping dialog will open.



2. In the dialog, select a layout from the **Grouping Type** list. Each layout name lists the plate size first, followed by the number of gels by the number of wells in the gel. For example, **384 (4 x 96)** indicates a 384-well plate that was loaded into 4 96-well gels.
  3. When you make your selection, a field will open for each gel to be loaded. Click on the **Open button** next to each field name to select the reconfigured gel.
  4. Click on **OK**. The gels will be loaded and displayed as a single image.
-

# Copying, Printing, and Analyzing

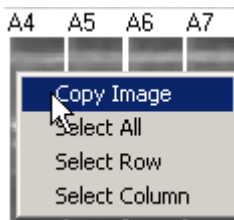
---

## Copying the Entire Image

You can copy the entire image to the Windows® clipboard and then paste it into a document or other file. (To copy individual lanes, see below.)

To copy the entire image:

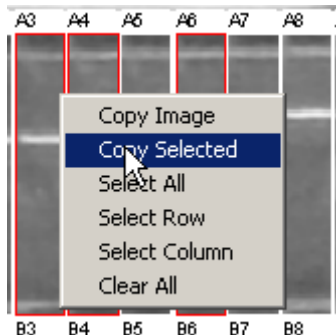
1. Select **Copy Image** from the **Edit** menu or right-click on the image and select the command from the context menu:



2. Open your word processing, spreadsheet, or other application and paste the image using the tools in that application.
- 

## Copying Individual Lanes

To select individual lanes in the image for copying, drag across the lanes or click on them one at a time. They will appear highlighted with a red border:



To deselect individual lanes, click on them again. To select all the lanes in the image, select **Select All** from the context menu. To clear all selections, select **Clear All**.

When you are satisfied with your selections:

1. Select **Copy Selected** from the right-click context menu, or use the **Ctrl+C** key command. Only the selected lanes will be copied to the Windows® clipboard.
  2. Paste the lanes into a word processing, spreadsheet, or other application for documentation and analysis. The lanes will be pasted as a block in alphanumerical order (regardless of the order of selection).
- 

*Continued on next page*

# Copying, Printing, and Analyzing, continued

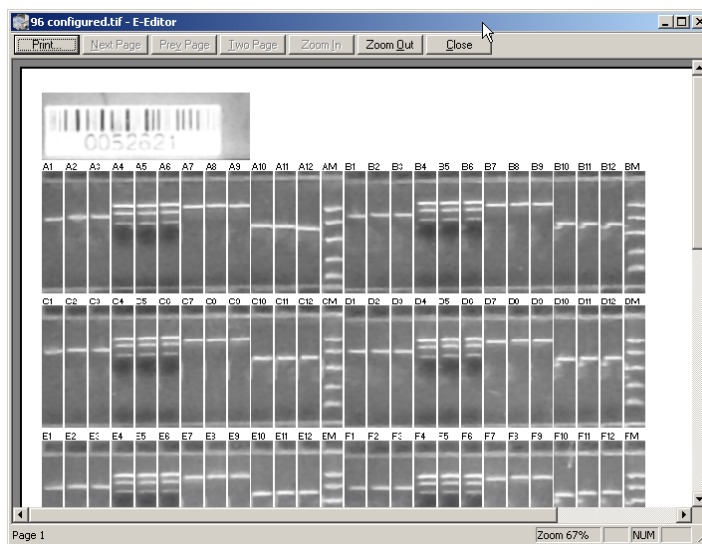
---

## Printing the Image

When you are ready to print, select **Print** from the **File** menu.

To change the printer settings, select **Print Setup** from the **File** menu.

To view the image as it will appear on the printout, select **Print Preview** from the **File** menu:



## Further Analysis

After you have reconfigured the image, use the **Save As** command to save it under a different name and open it in a 1-D gel analysis software program for further analysis.

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## Software License

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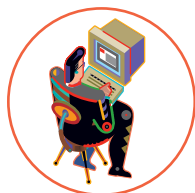
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# Technical Service

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Visit the Invitrogen Web Resource using your World Wide Web browser. At the site, you can:

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- View and download vector maps and sequences
- Download manuals in Adobe® Acrobat® (PDF) format
- Explore our catalog with full color graphics
- Obtain citations for Invitrogen products
- Request catalog and product literature

Once connected to the Internet, launch your Web browser (Internet Explorer 5.0 or newer or Netscape 4.0 or newer), then enter the following location (or URL):

<http://www.invitrogen.com>

...and the program will connect directly. Click on underlined text or outlined graphics to explore. Don't forget to put a bookmark at our site for easy reference!

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## Technical Service, Continued

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