Canon

Non-Mydriatic Retinal Camera

CR-DGi Image Viewer User's Manual

Version 1.00

Be sure to always read this user's manual before using this product.
Keep this manual in a safe, easily accessible place for future reference.

To the Customer

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Contents

1. Introduction 1
1.1 Overview 1
1.2 Operating Environment 1
1.3 Image Management of the CR-DGi Image Viewer 2
1.4 Installation 3
1.5 Uninstalling 3
1.6 Online Help 3

2. Preparation and Basic Operations 4
2.1 Preparation 4
2.2 Main Window 5
2.3 Connecting to the Digital Camera 7
2.4 Basic Operations 9
2.4.1 Capturing and Saving 9
2.4.2 Viewing 10
2.4.3 Printing 10

3. Screen Operations 11
3.1 Capture Mode and View Mode 11
3.2 Thumbnail Window 12
3.3 Main Window 14
3.4 Entering and Correcting Image Information 15
3.4.1 Entering Image Information 15
3.4.2 Correcting Image Information 16
3.5 Comparing Images (Pop-up Windows) 17
3.6 Adjusting Images 18
3.7 Printing 19
3.8 Deleting Images 19
3.9 Setup Dialog Box 20
3.10 Menus 22
3.11 List of Error Messages 23

4. Other Operations 24
4.1 Loading from a CF Card 24
4.2 Backup and External Storage of Image Files 25

Usage Precautions

Be sure to always observe the following precautions.

1. Never use general-purpose image retouching software to edit or overwrite the images files for the CR-DGi Image Viewer. The study information and image information written into the image file can be corrupted or become unreadable.
2. Do not use the preview screen in Windows XP to rotate an image file for the CR-DGi Image Viewer. If an image is rotated, the study information and image information written into the image file can be corrupted or become unreadable.
3. If the display is not set to full color, the colors may not be displayed properly. To set the display colors in Microsoft Windows, select **Display Properties**, go to **Settings**, and then check that the **Colors** is set to **True Color** (24 bit or 32 bit).
4. Use the CR-DGi Image Viewer in a system environment with the proper security protection. The CR-DGi Image Viewer itself does not have any security protection functions.
5. In CR-DGi Image Viewer, the study information and image information are saved to the image in clear text.
6. Be sure to always test beforehand to check that images are captured and saved properly.
7. The user of the CR-DGi Image Viewer needs to belong to the member of the Power Users group or the Administrators group.

IMPORTANT

Original images captured by the CR-DGi are reversed horizontally and vertically and do not have an aperture mask.
Be sure to always use the CR-DGi Image Viewer to rotate the image 180 degrees and add an aperture mask to the image.

1. Introduction

1.1 Overview

This software package is a viewer application specifically for the Canon Non-Mydriatic Retinal Camera CR-DGi (called "CR-DGi" below). Retinal images captured from the EOS digital camera installed on the CR-DGi are automatically loaded, and special CR-DGi image processing is performed to display the images. If necessary, the study information is recorded together with the image and saved to a folder created for each capture date.

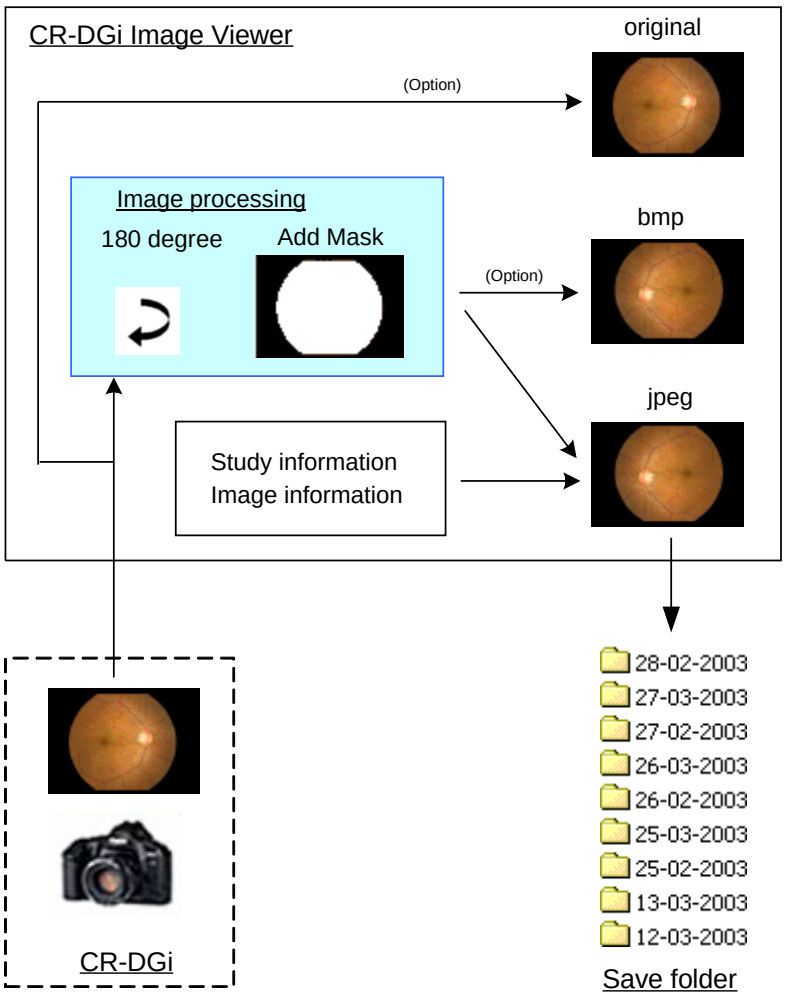
- Images captured using the CR-DGi are automatically received and displayed.
- Exif and RAW images can be captured.
- Any size image set by the EOS digital camera can be captured.
- Images can be saved in JPEG, BMP, and RAW formats.
- Study information is saved inside the JPEG file.
- Images can be magnified and reduced in size, and the brightness and contrast can be adjusted.
- Images can be printed with the study information.
- Images can be managed using dated folders.
- Images can be managed by the counter number for each date.
- Images can be compared.

1.2 Operating Environment

OS:	Windows 2000 Professional or Windows XP Professional
CPU:	Pentium III 600 MHz or faster (Pentium 4 1.6 GHz or faster is recommended)
RAM:	256 MB or more (512 MB recommended)
Hard disk:	10 GB or more recommended
Monitor:	1024 x 768 dots or higher resolution, 24bit color or higher
CD-ROM drive	Required for installation
Printer	Required if using the printing function
Digital camera	EOS-D60/10D
Retinal camera	CR-DGi

1.3 Image Management of the CR-DGi Image Viewer

Images recorded by the CR-DGi Image Viewer are rotated 180 degrees, combined with an aperture mask, and then displayed on the monitor. When an image is saved, image information and study information are added to the appended information of the JPEG image, and the image is saved to a folder with the capture date. Under the standard settings, only JPEG images are saved, but it is also possible to save uncompressed image formats such as BMP and original images captured by the retinal camera in formats set by the digital camera.



Format of saved files

▪ CXXXXXXX.jpg
This is the standard format for compressed image files that are saved. The file name is 'C' + a 7-digit number. This 7-digit number is the same regardless of the format. This image file contains the following information.

	Item	Description
1	Serial number	This is the same number in the file name and cannot be changed by the user.
2	Capture date and time	This cannot be changed by the user.
3	Counter number	This is a four-digit number that counts up whenever an image is captured, and each day starts at 0001.
4	Right/left eye	This is designated at the panel.
5	Image comments	Up to 64 bytes of text can be entered.
6	Note 1	This can be entered by the user from the panel. Up to 32 bytes of text can be entered.
7	Note 2	This can be entered by the user from the panel. Up to 32 bytes of text can be entered.
8	Note 3	This can be entered by the user from the panel. Up to 32 bytes of text can be entered.
9	Note 4	This can be entered by the user from the panel. Up to 32 bytes of text can be entered.

▪ BXXXXXXX.bmp
This is an uncompressed image file. This format can be viewed from this software. Study information and image information are not recorded in this file. The file name begins with 'B' + 7-digit number.

▪ RXXXXXXX.jpg /RXXXXXXX.crw
These are original images captured by the digital camera. The file format is identical to the format set by the digital camera. The file name begins with 'R' + 7-digit number.
Note: The original image does not undergo a 180-degree rotation or application of an aperture mask. The image cannot be displayed in the CR-DGi Image Viewer.

1.4 Installation

- Log on to Windows as the Administrator or as a user who is a member of the Administrators group.
- Install the RemoteCapture and ZoomBrowser software supplied with the EOS digital camera. Perform installation by following the instructions on the screen. This process also installs the drivers for the digital camera.
- Install the CR-DGi Image Viewer. Perform installation by following the instructions on the screen.

1.5 Uninstalling

- Log on to Windows as the Administrator or as a user who is a member of the Administrators group.
- Open **Add/Remove Programs** under the Control Panel.
- Select the CR-DGi Image Viewer, and then click the **Change/Remove** button to uninstall.

1.6 Online Help

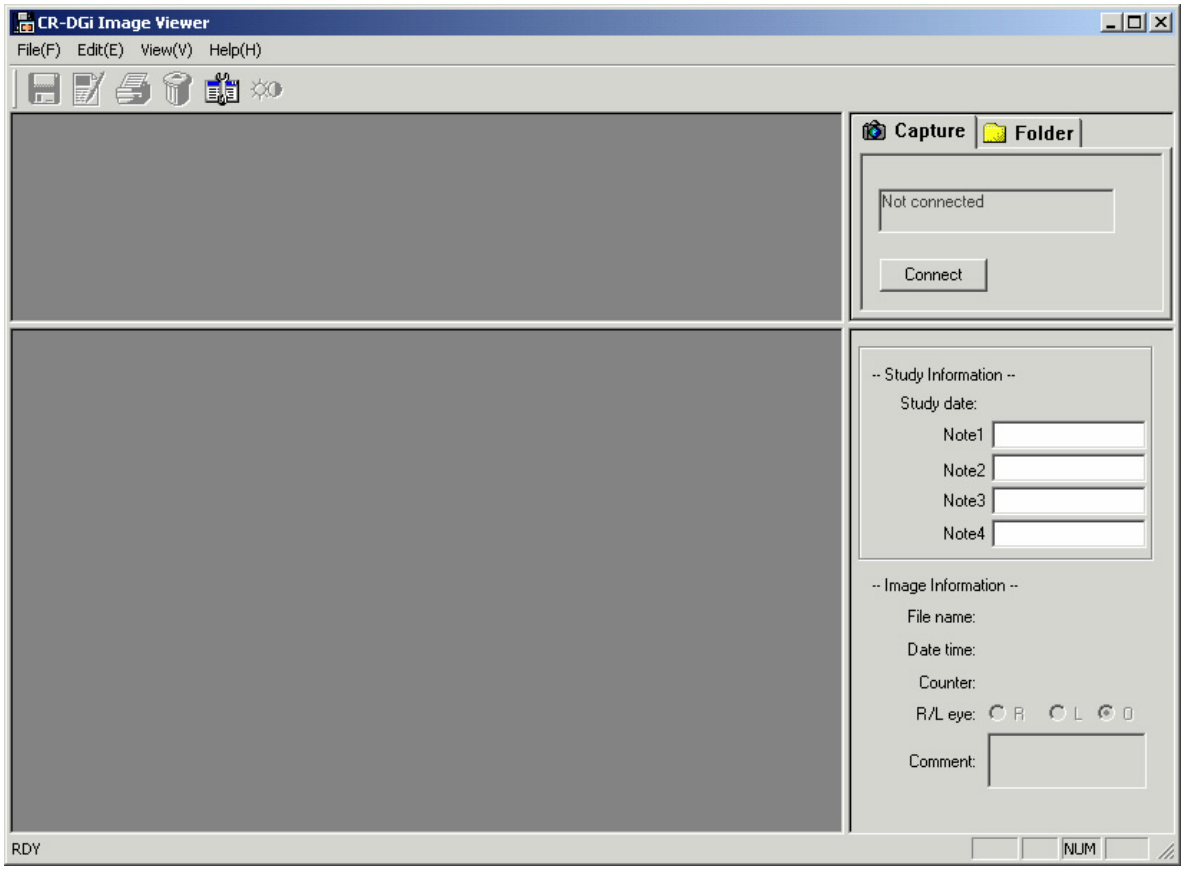
- Open **DGi Image Viewer Help** under the **Help** menu.

2. Preparation and Basic Operations

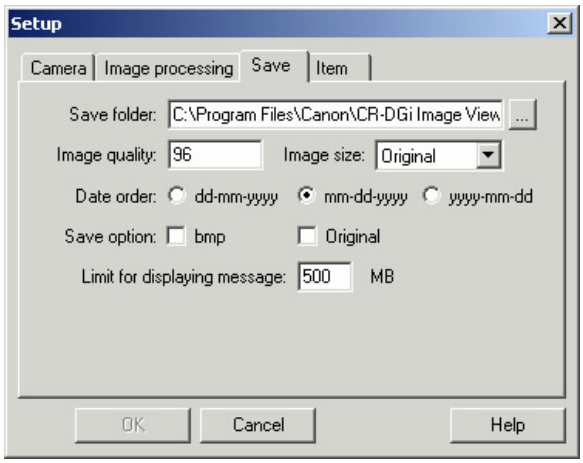
2.1 Preparation

Click the shortcut on the Desktop, or from the **Start** menu, select **Programs** > **Canon CR-DGi Image Viewer** > **CR-DGi Image Viewer V1.00** to start the software.

The main window of the software opens.

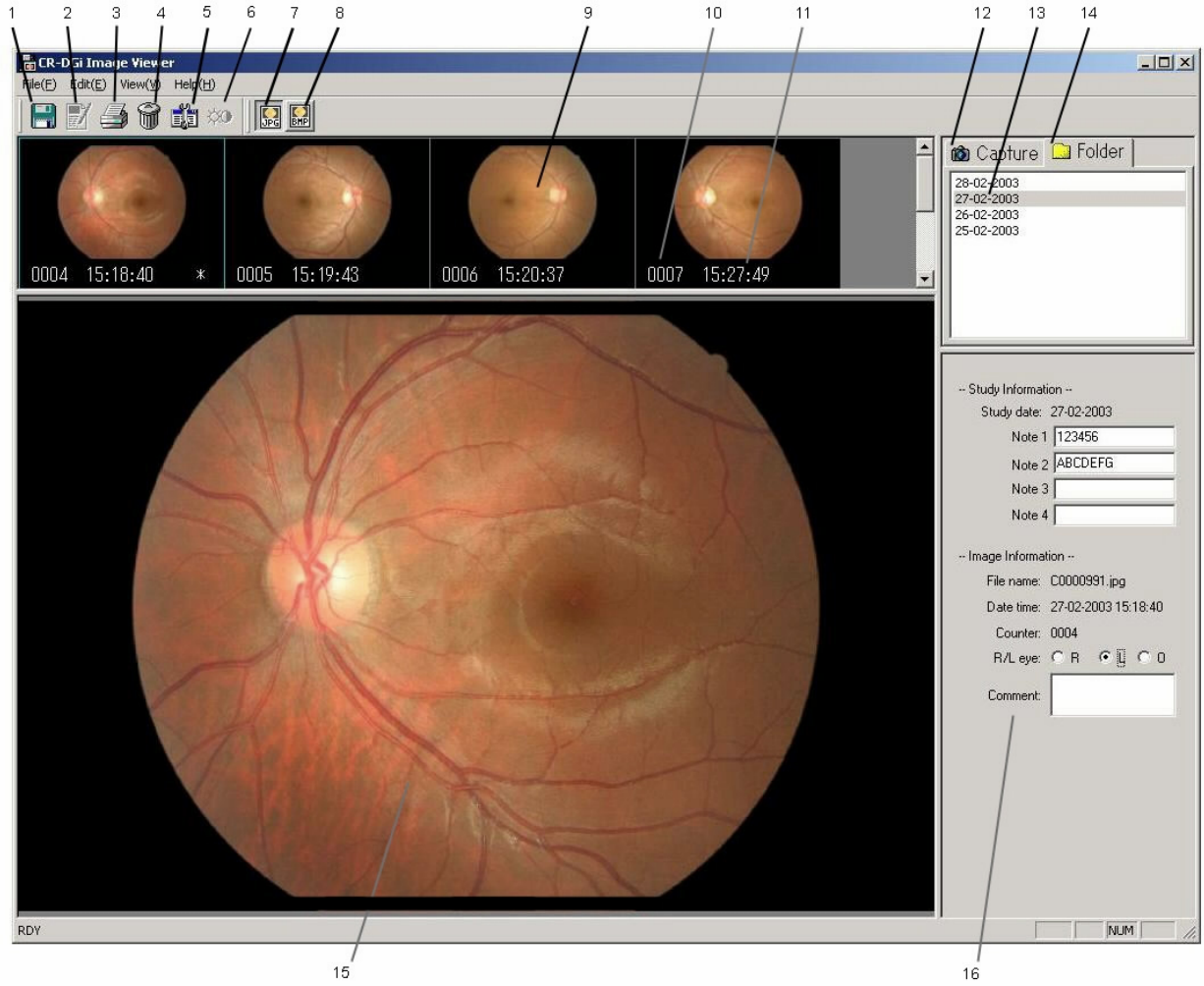


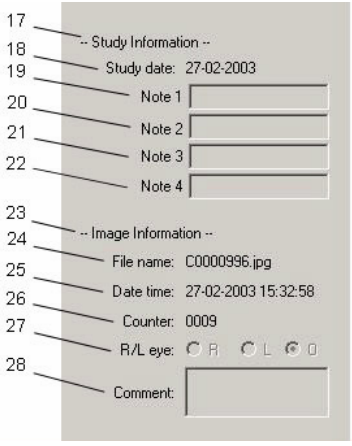
Click the **Setup** button. The **Setup** dialog box opens.
Select the **Save** tab.



Select **Date order**.
Insert a check mark for **bmp** if saving in an uncompressed image format.

2.2 Main Window





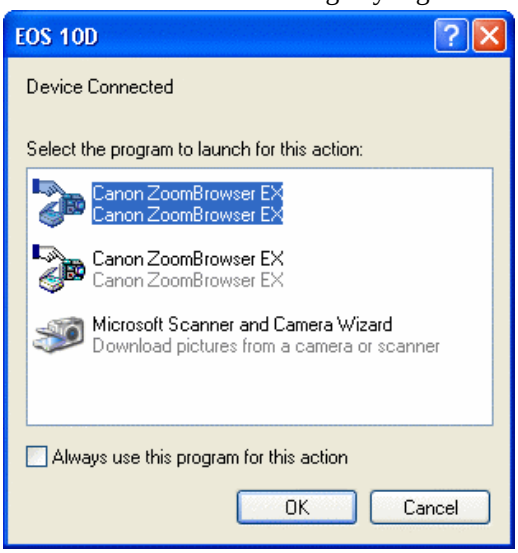
	Item	Description
1	Save button	This is used when saving the captured image or saving corrected image information.
2	Correct button	This is used to correct the study information for a saved image.
3	Print Preview button	This displays the Print Preview screen for the selected image.
4	Erase button	This deletes the selected image.
5	Setup button	This opens the **Setup** dialog box.
6	Adjust Image button	This is used to adjust the image brightness and contrast.
7	JPG button	This displays the JPEG image.
8	BMP button	This displays the BMP image.
9	Thumbnail image display area	This displays the thumbnails of images saved in the date folder, and it displays the images before they are saved during capture.
10	Counter number	This displays the counter number.
11	Capture time	This displays the time that the image was captured.
12	Capture tab	This switches to Capture mode. This is selected when capturing a retinal image. This displays the connection status for the Connect button and Release button.
13	Date folder	This is the folder for the date when the study was conducted.
14	Folder tab	This switches to View mode. This is selected to view the images saved in the date folders.
15	Main image display area	This displays the image selected in the Thumbnail Image Display Area.
16	Information display area	This displays the study and image information.
17	Study Information	This displays the study information.
18	Study Date	This displays the study date.
19	Note 1	This records and displays notes for the study.
20	Note 2	This records and displays notes for the study.
21	Note 3	This records and displays notes for the study.
22	Note 4	This records and displays notes for the study.
23	Image Information	This displays the information for each image.
24	File name	This displays the file name.
25	Date time	This displays the capture date and time.
26	Counter	This displays the counter number.
27	R/L eye	This records and indicates the right or left eye. The right eye is indicated by R, the left eye by L, and undermined by O. The setting O is used if no setting is made.
28	Comment	This records comments for the image.

2.3 Connecting to the Digital Camera

- Refer to the Retinal Camera Operation Manual for the attachment procedures for the retinal camera and digital camera. Load a CF card into the digital camera.
- Use the supplied interface cable to connect the camera and PC. If the cable is not long enough, do not use a USB hub. Instead, obtain an extension cable. The maximum allowable length of the USB cable is 5 m.
- Turn on the retinal camera. Do not switch the retinal camera to retinal image observation mode.
- The standard settings for the digital camera (EOS D series) are shown in the table below.

Setting Item	Standard Setting
Shooting mode	Manual (M)
Drive mode	Off
ISO speed	400
Shutter speed	1/60 sec
White balance	Flash
Auto power off	OFF
Quality (Recording size)	User selected
Quality (Compression ratio)	User selected

- Turn on the digital camera.
- The Event on Device window opens. Click the Cancel button without selecting any registered applications.



- Select the Capture tab of the CR-DGi Image Viewer, and then click the Connect button.
- The connection was made properly if the connection status changes from “Not connected” to “Connected”.

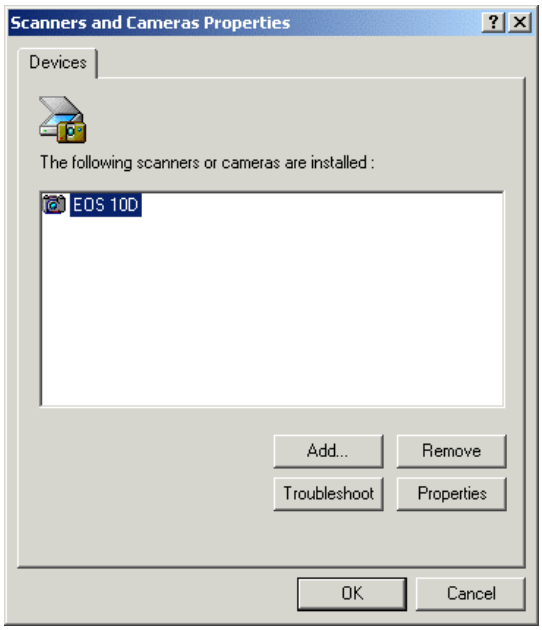
NOTE

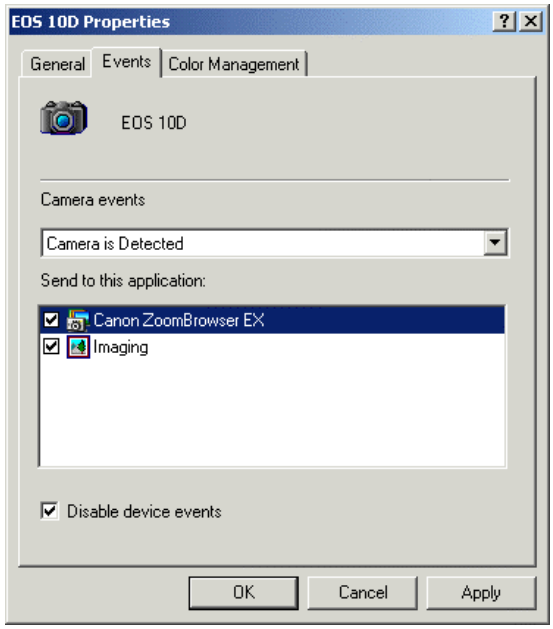
The connection cannot be made when pressing the Connect button if the retinal camera is in retinal image observation mode. Be sure to always click the Connect button from the eye front observation mode.
In Windows XP, the Canon ZoomBrowser may start without opening the event window for the device when the digital camera is turned on. In this case, exit the Canon ZoomBrowser.

NOTE To disable opening of the event window for the device:

Windows 2000

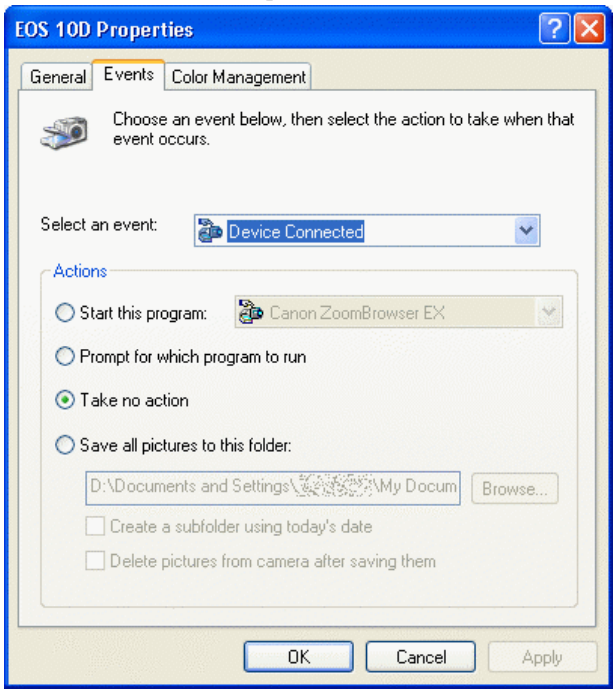
- Go to Start → Settings → Control Panel, and then open “Scanners and Cameras”.
- Check that “EOS xxx” is selected, and then click the Properties button.
- Open the Events tab in the EOS xxx Properties dialog box, insert a check mark for “Disable device events”, and then click the OK button.





Windows XP

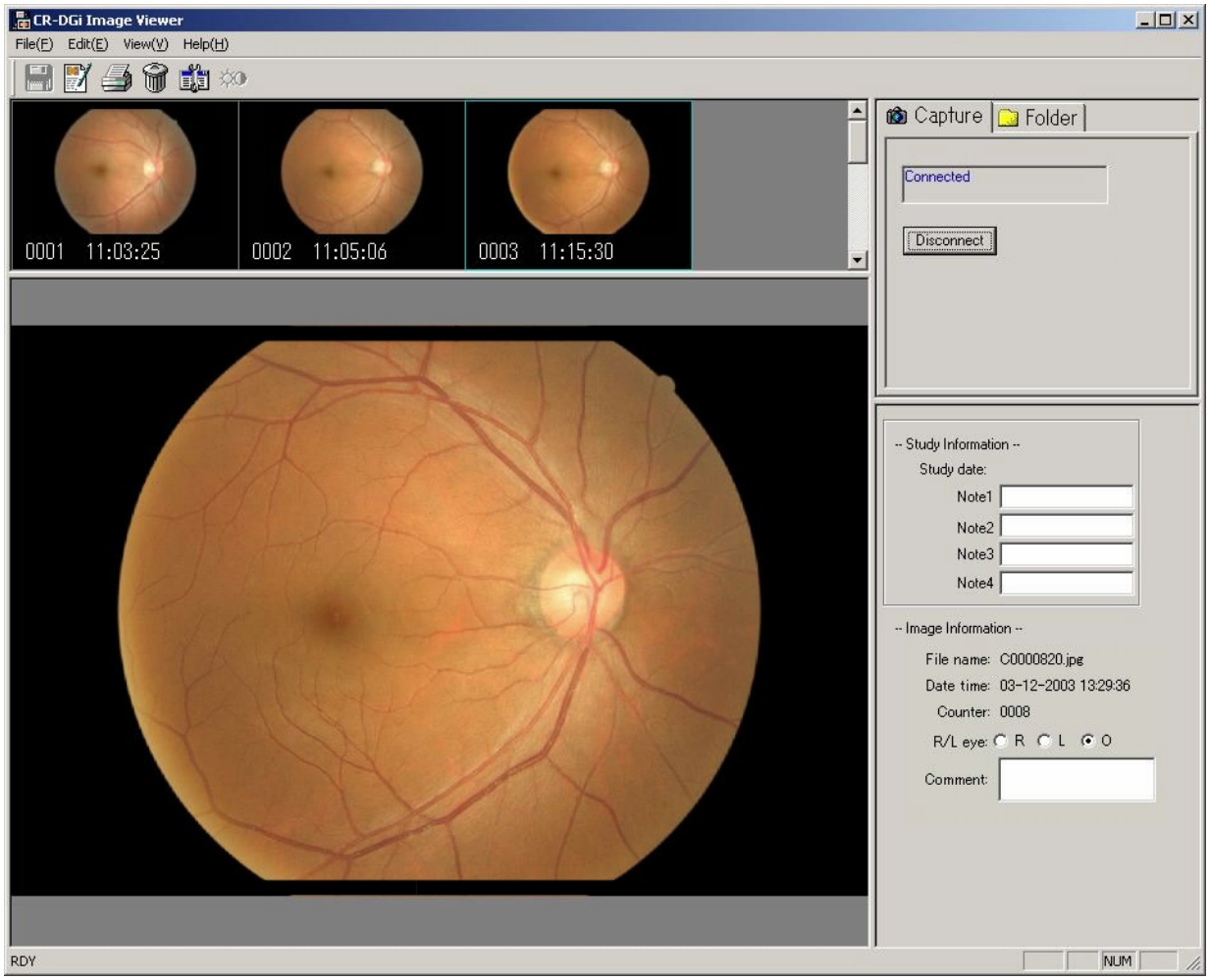
- Go to Start → My Computer, and then right-click “EOS xxx” to open the Properties dialog box.
- Open the Events tab in the EOS xxx Properties dialog box, select “Take no action” under the Actions section, and then click the OK button.
- If there are multiple selections for the “Select an event” option, set “Take no Action” for all selections.



2.4 Basic Operations

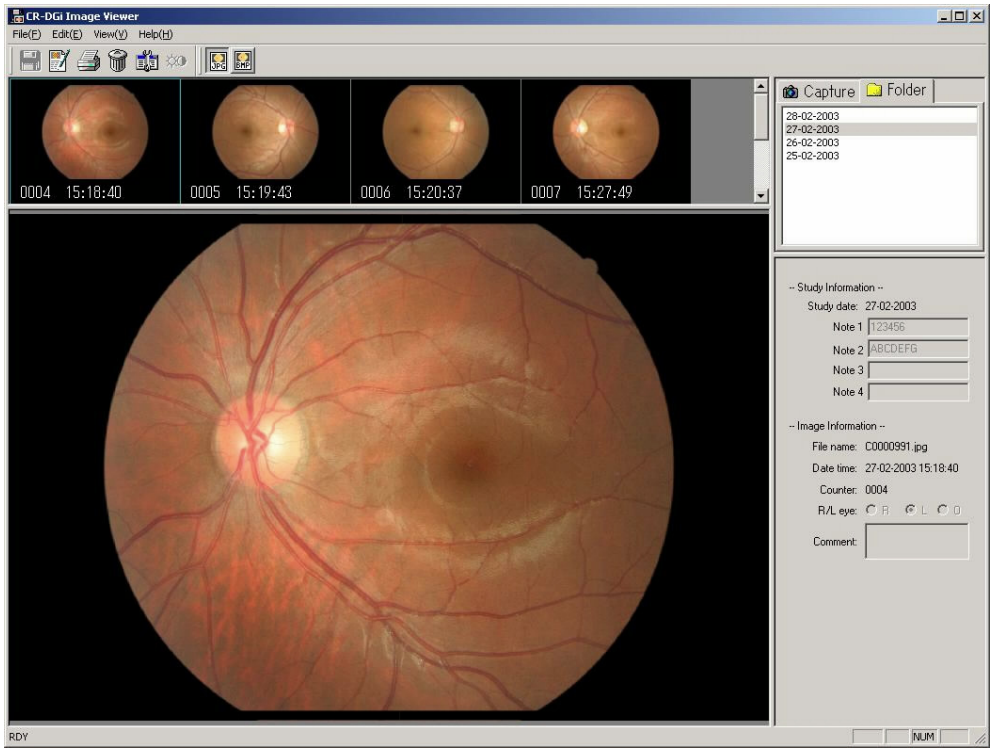
2.4.1 Capturing and Saving

To capture the retina, select the Capture tab. Check that the connection status is “Connected” before starting capture. When capture is started, the connection status changes to “Downloading…”, and the transfer of the captured image from the digital camera is started. When the transfer is complete, the captured image is displayed in the thumbnail display area and main image display area. Click the button to save. Once the image is saved, it no longer appears on the screen.



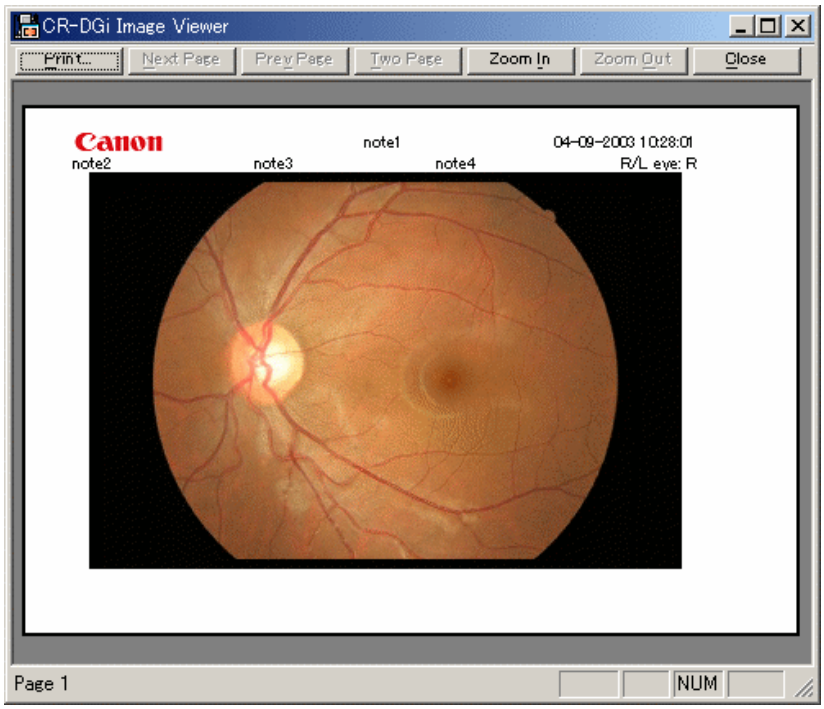
2.4.2 Viewing

Click the Folder tab. Select the folder with the capture date from the folder list. Thumbnails of images saved to the selected date folder are displayed in the order that the images were captured. Find the counter number of the image that you want to view, and then select the image to display it in the main image display area.



2.4.3 Printing

Images can be printed from either the Capture tab or Folder tab. Select the image to be printed, and then click the button. Printing is performed in single pages.

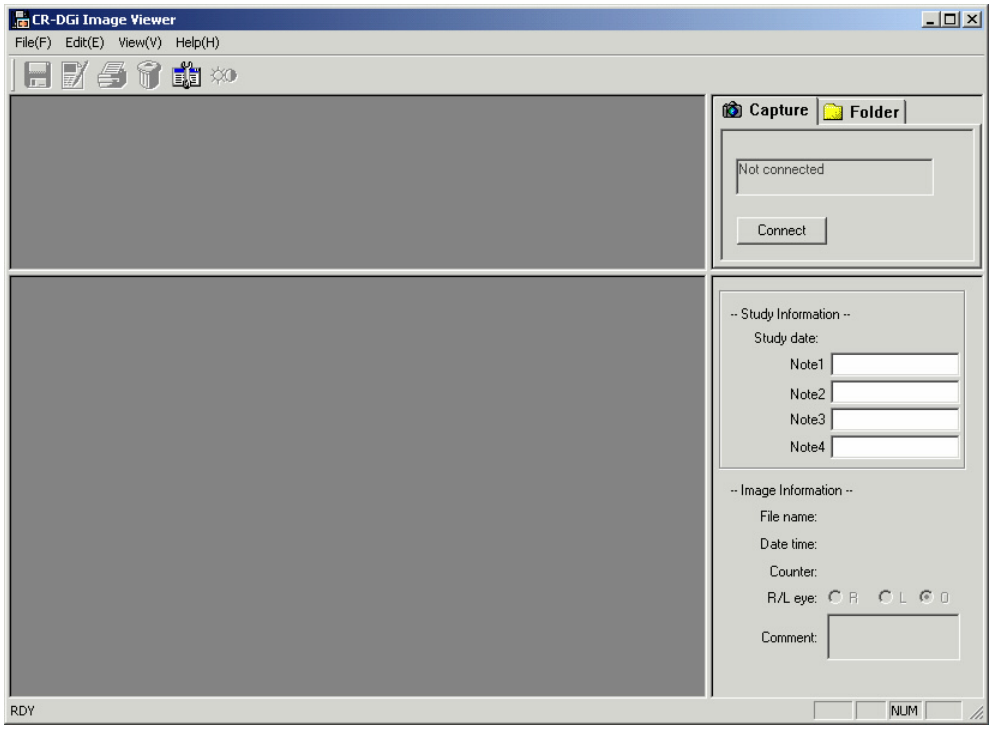


Clicking the Print button displays the **Print** dialog box. Select the printer to be used, set the printing paper, orientation, and other options in **Properties**, and then start printing.

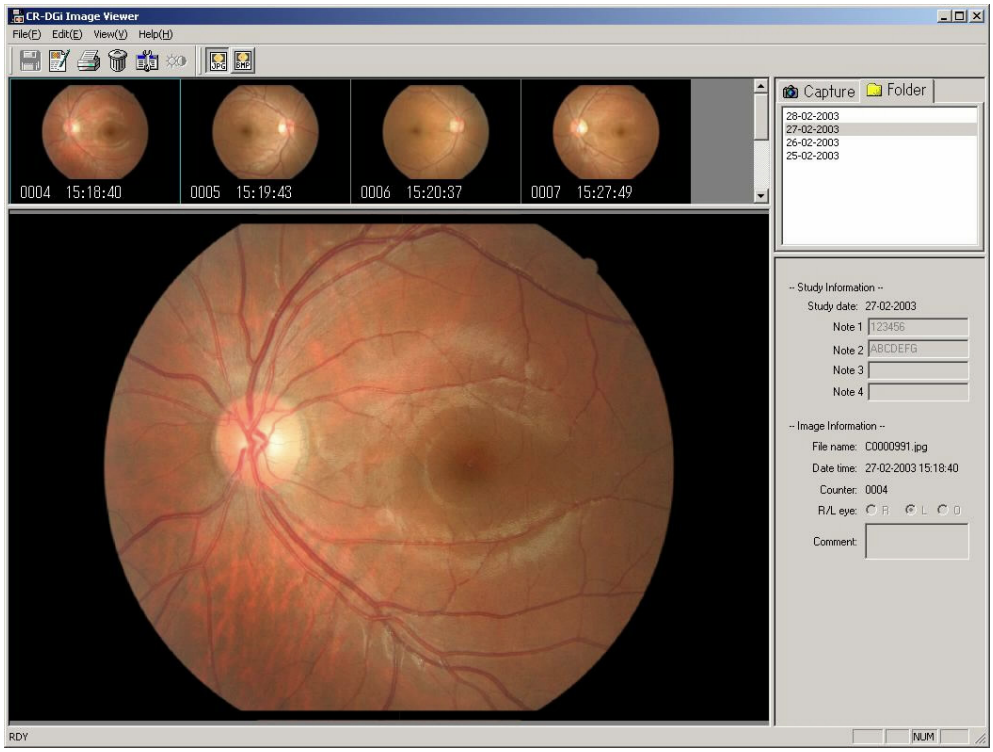
3. Screen Operations

3.1 Capture Mode and View Mode

- Capture mode is started when the Capture tab is selected. Select the Capture tab when capturing images.

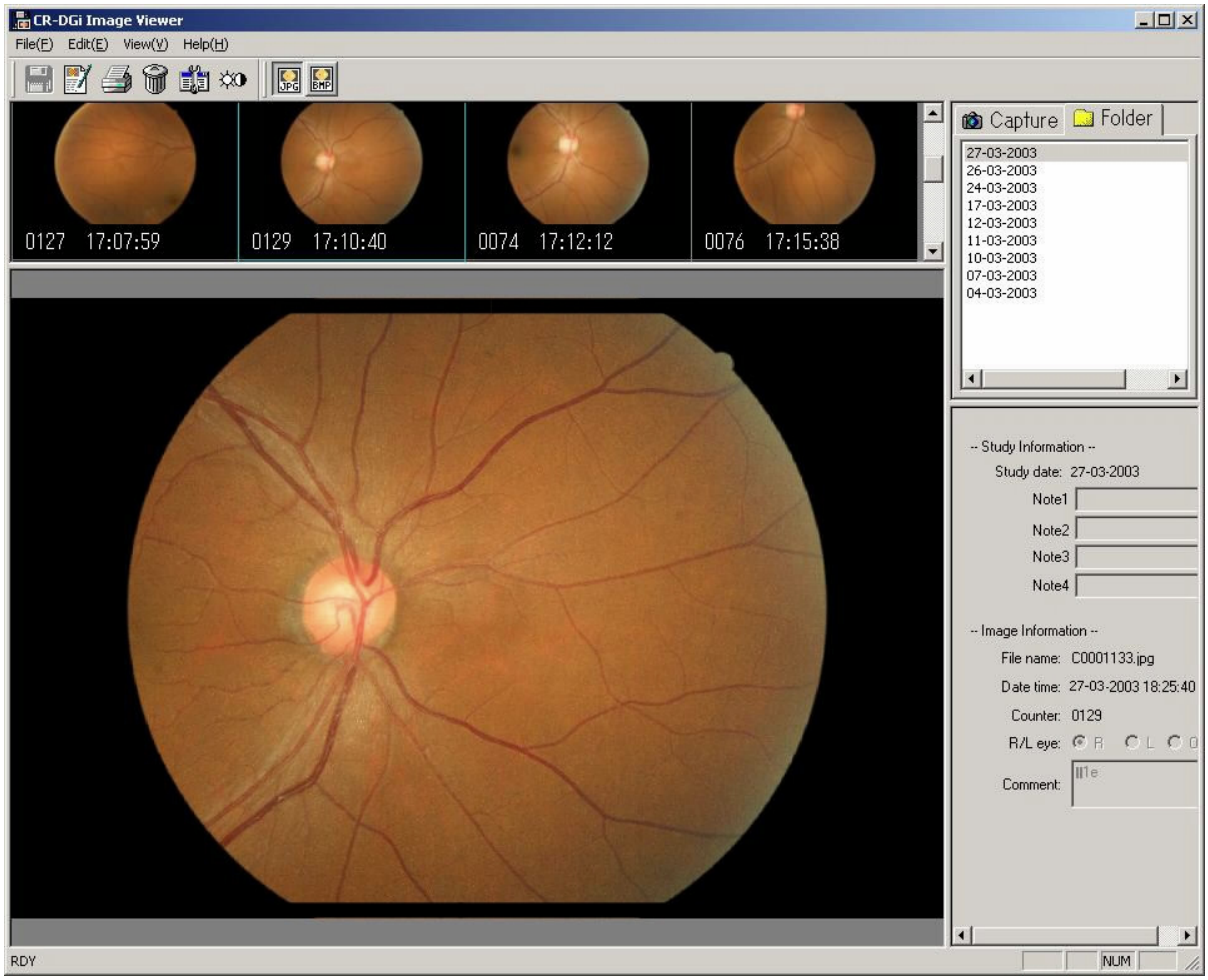


- Select the Folder tab to start View mode. This is used to display saved images.

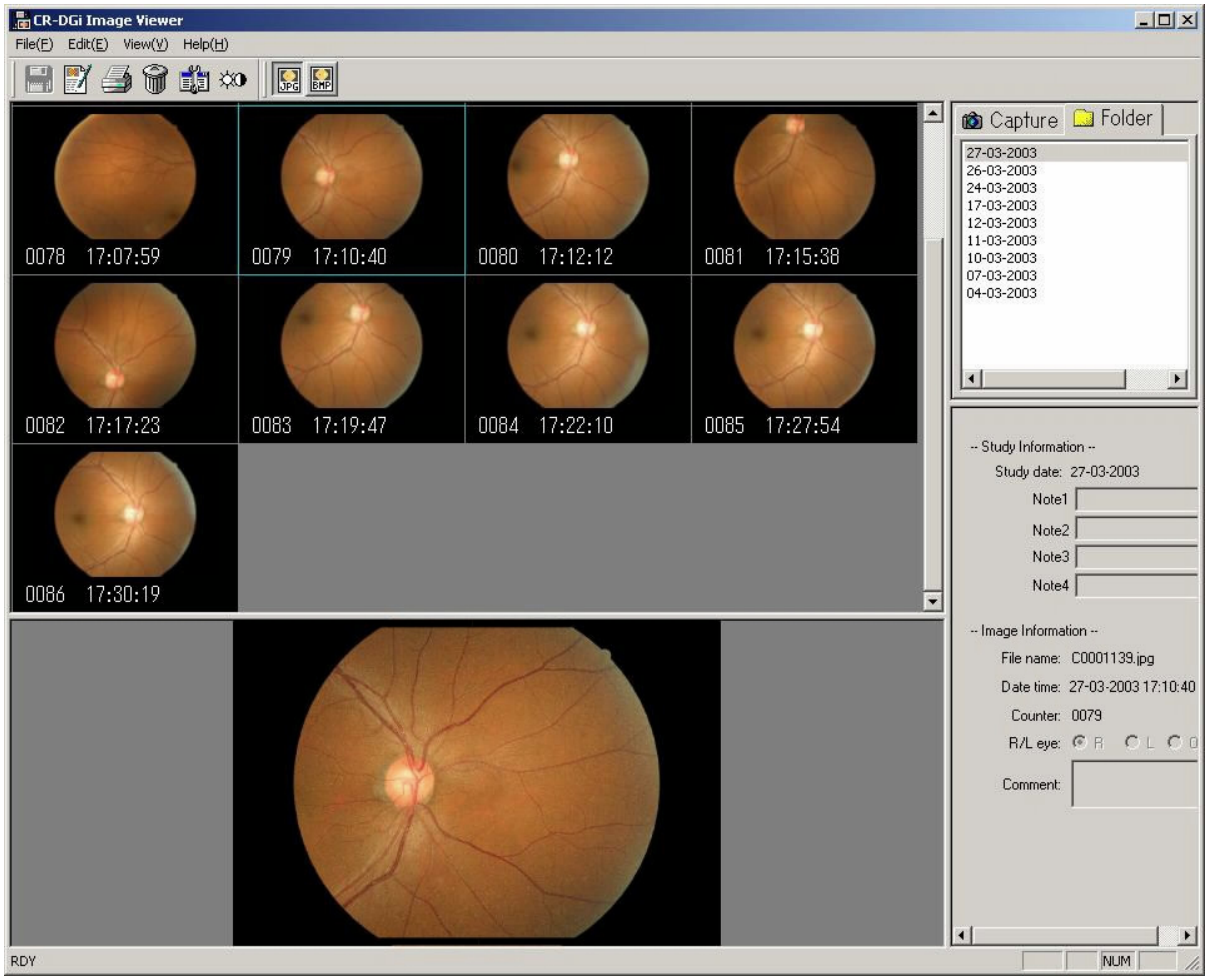


3.2 Thumbnail Window

- Thumbnails are displayed from left to right and top to bottom in the order that they were captured.
- Left-click the mouse to select an image. The selected thumbnail is indicated with a blue frame.
- The selected thumbnail image is displayed in the main image display area below the thumbnails.
- Press the right arrow key to move the selected image to the right. Press the left arrow key to go back. Pressing the down key moves selection to the thumbnails in the lower row. Pressing the up key moves the selection to the thumbnails in the upper row.
- Pressing the Home key moves the selection to the first image, and pressing the End key moves the selection to the last image.
- Double-clicking the thumbnail opens a pop-up window. More than one pop-up window can be opened.

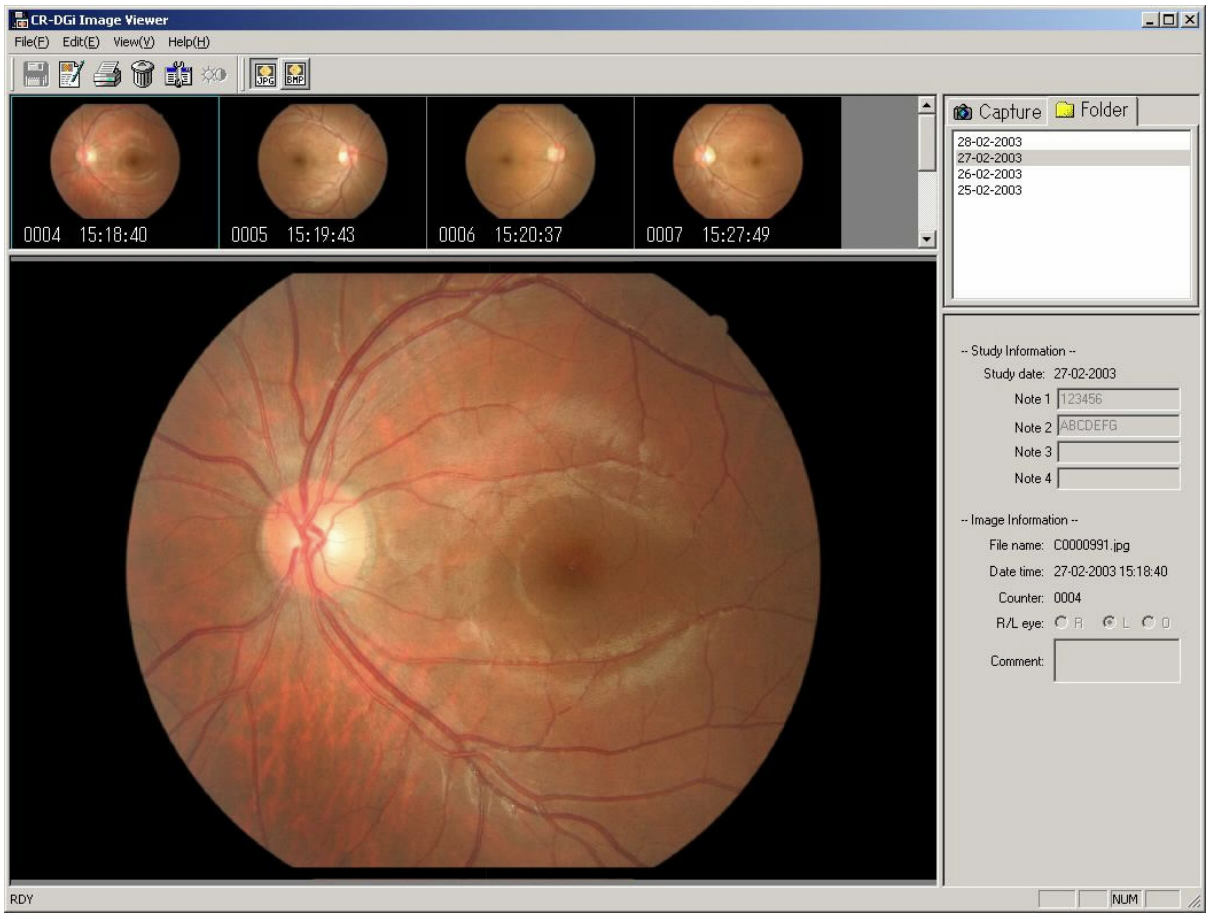


You can change the number of displayed thumbnails by moving the boundary up or down for the thumbnail image display area and main image display area. Enlarge the thumbnail display area when there are large numbers of thumbnails.



3.3 Main Window

- This displays the selected thumbnail.
- The size of the image in the main window is adjusted to the size of the display area. A larger image can be viewed if the display area is enlarged by adjusting the borders.
- Pressing the + key enlarges the image, and pressing the – key reduces the image.
- To view the image at its original size, select the Original size command from the View menu. To view the image so that it matches the main window, select the Fit image to window command under the View menu.
- Double-clicking the image opens a pop-up window at the displayed zoom percentage.



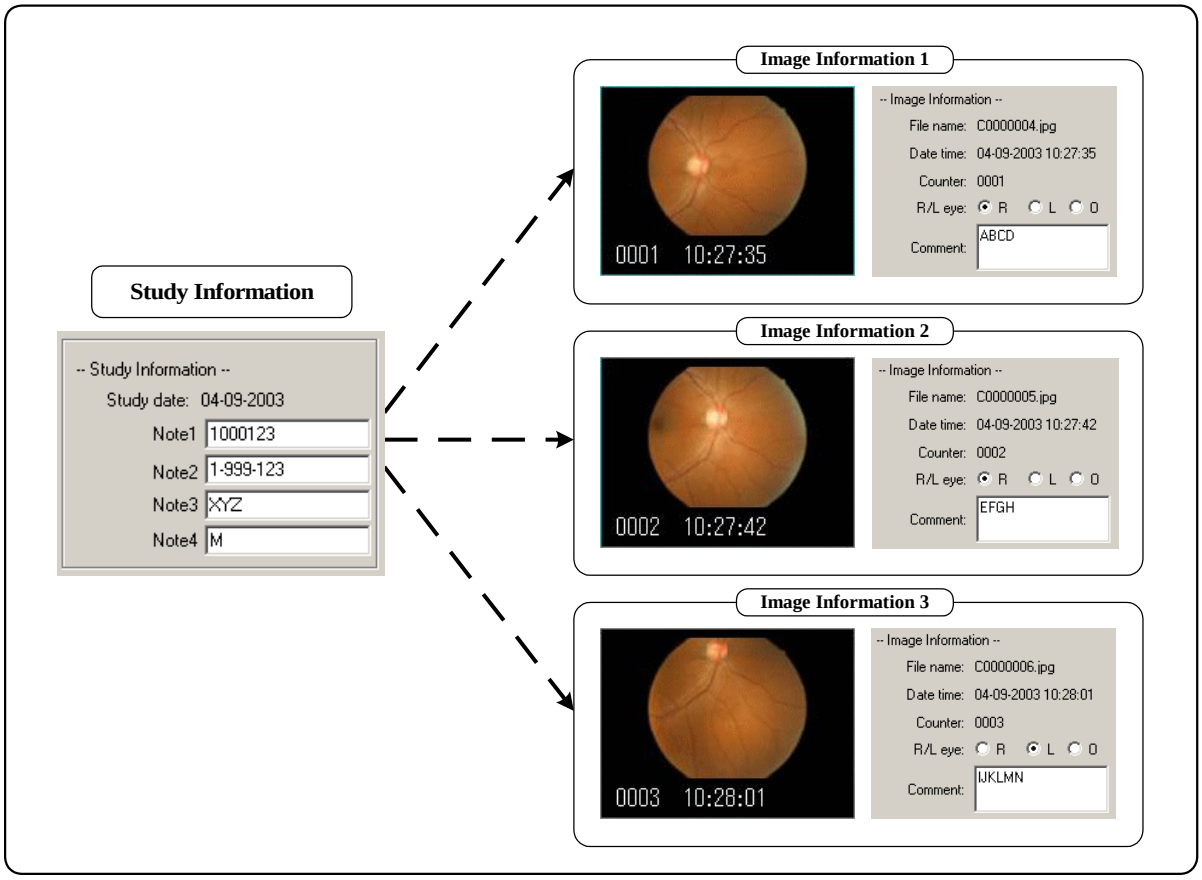
3.4 Entering and Correcting Image Information

3.4.1 Entering Image Information

By entering the Study Information in Capture mode, the same information can be entered for all images captured at a single study. Image-specific information is entered from the R/L eye and Comment fields of Image Information.

The example shows the recorded information when three images are captured in a single study, and the Study Information and Image Information are entered and saved.

Information Field		Image File		
File name		C0000004.jpg	C0000005.jpg	C0000006.jpg
Study Information	Note 1	1000123		
	Note 2	1-999-123		
	Note 3	XYZ		
	Note 4	M		
Image Information	Counter	0001	0002	0003
	R/L eye	R	R	L
	Comment	ABCD	EFGH	IJKLMN



NOTE

Up to 32 characters can be entered in Notes 1 to 4. Up to 64 characters can be entered in the Comment.

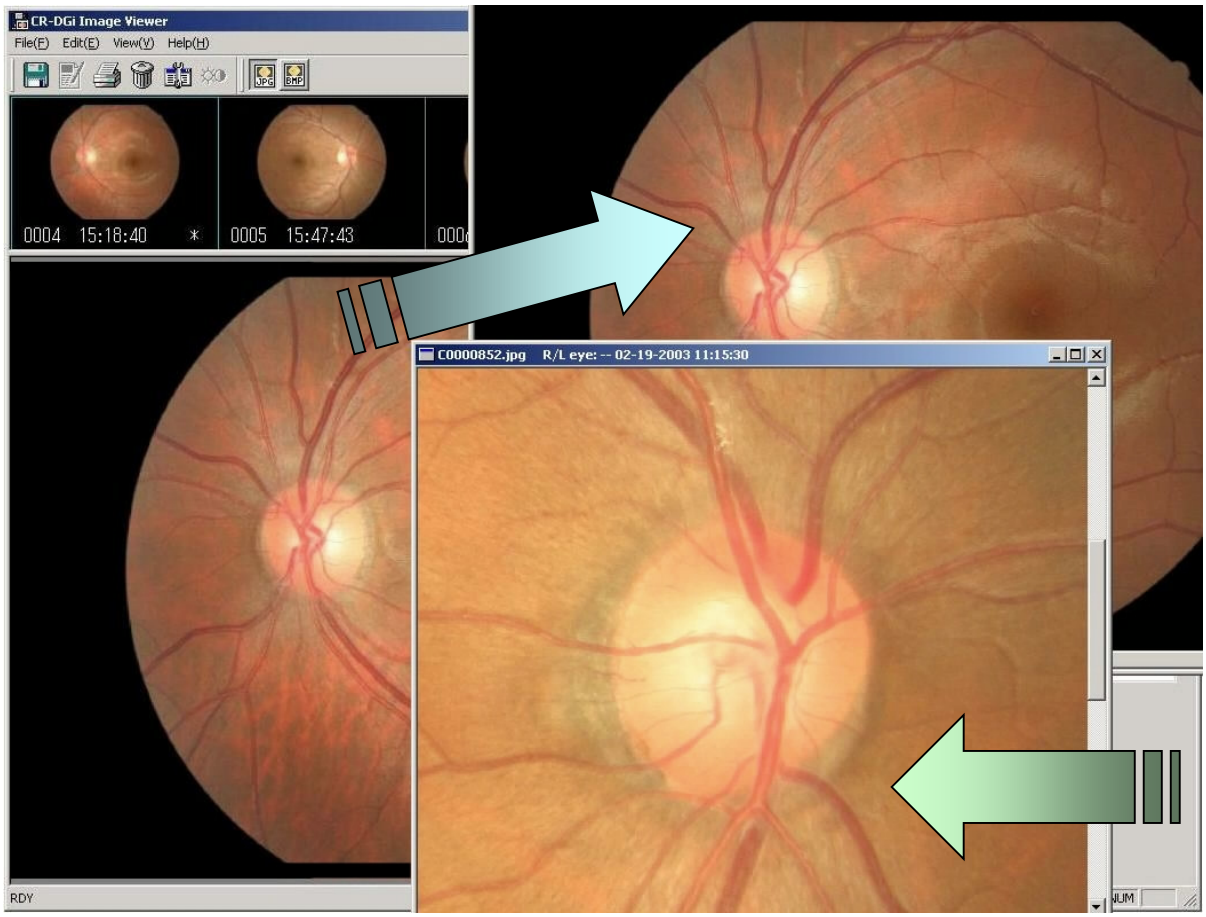
3.4.2 Correcting Image Information

Study information is corrected and added from View mode.

- Select the date folder, and then select the image to be corrected.
- Click the button. The fields for Study Information and Image Information in the Information screen can be entered.
- Correct or add the Study Information.
- Click the button. The fields for Study Information and Image Information in the Information screen are grayed out to indicate that corrections can no longer be performed.
- To cancel the corrections, either press the ESC key, or select **Undo** from the **Edit** menu.
- Corrections are cancelled if the date folder is moved while making the corrections.

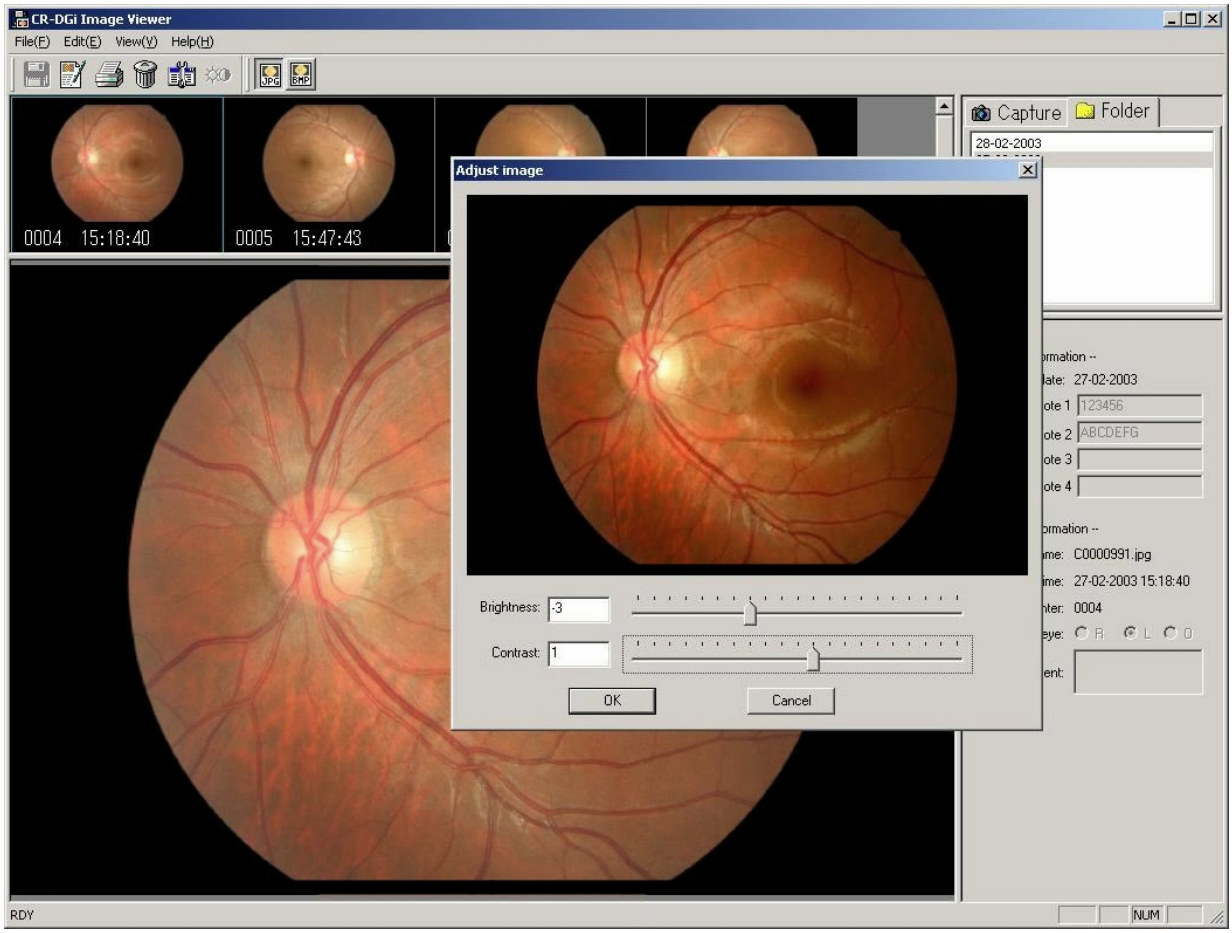
3.5 Comparing Images (Pop-up Windows)

Pop-up windows are used to compare images. Double-clicking the thumbnail window or main window opens a separate pop-up window. If comparing with a previous image, select another date folder, and then open a pop-up window for the image that you want to compare. When the zoom percentage of the main window is changed, the pop-up window is opened at that zoom percentage. The images in the pop-up windows cannot be printed or retouched. All pop-up windows are closed when exiting the DGi Image Viewer.



3.6 Adjusting Images

The contrast and brightness of images can be adjusted. When an image is selected in the main window, the Adjust Image button is enabled. Clicking this button opens the Adjust Image screen. Move the slide bar to adjust the brightness and contrast. The image can also be adjusted by directly entering the numerical value. The adjustable range is -10 to +10. Check the image, and then click the OK button to close the Adjust Image screen. Click the Cancel button to abort the image adjustment.



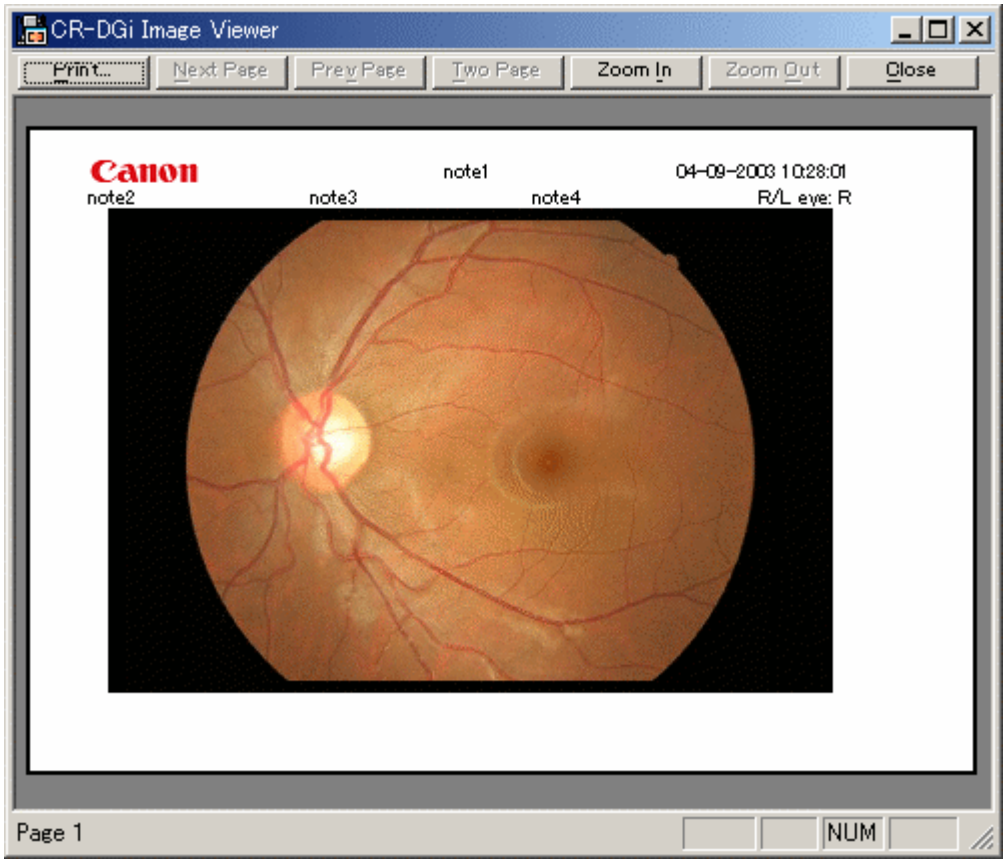
The adjusted image is displayed in the main window. The image is still unsaved when displayed in this way, and so the adjusted image will return to its original state if you switch to another image. To save the adjusted image, select the **Save retouched image** command from the **File** menu.
The original image is not overwritten when you adjust and save an image. All image information is maintained and saved as a new image. In the thumbnail window, the adjusted image can be identified by the same counter number.

NOTE
Images can be adjusted when the JPG button is selected.

3.7 Printing

The image selected in the main window can be printed. An adjusted image in the main window can also be printed. Images cannot be printed at the zoom setting.

Click the button in the tool bar to open the Print Preview window. Clicking the Print button opens the **Print** dialog box. Select the printer to be used, set the printing paper, orientation, and other options in the Properties, and then start printing. The available options in **Printer Properties** vary depending on the selected printer. For more information, refer to the manual of the printer that you are using.
The fields that can be printed are Note 1 to Note 4, R/L eye direction, and Capture date and Capture time. For some paper sizes, it may not be possible to print all the information.



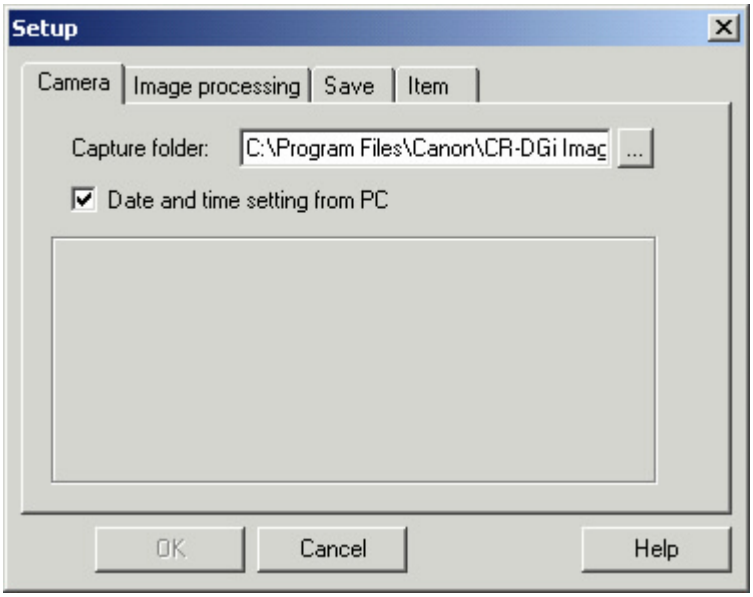
3.8 Deleting Images

Images can be deleted in Capture mode and View mode. Select the image, and then click the button. A dialog box is opened. Click OK to delete the image. To abort the delete operation, click the Cancel button. If the save folder is set to the hard drive of the PC, deleted images are moved to the Recycle Bin. To restore images that were accidentally deleted, open the Recycle Bin, and restore the file. For details about this procedure, refer to Windows Help file.

NOTE
Deleted images cannot be restored if the save folder is shared over a network. Be sure to make backups on a regular basis.

3.9 Setup Dialog Box

The Setup dialog box is used for making the settings for the save folder, selecting option for saving the image etc. Click the button to open the **Setup** dialog box.



Capture folder: This folder temporarily stores the digital camera images. The default setting is the Temp folder under the installation folder.

Date and time setting from PC: This resets the clock in the digital camera to match the PC clock.

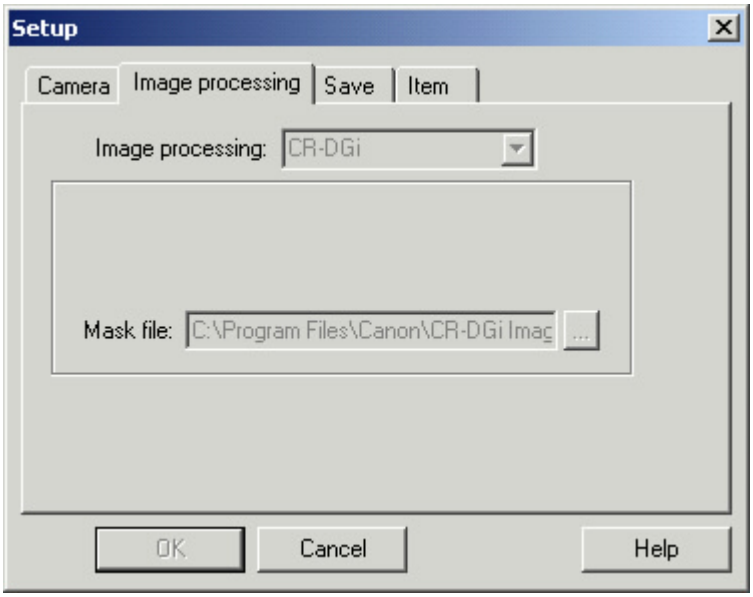
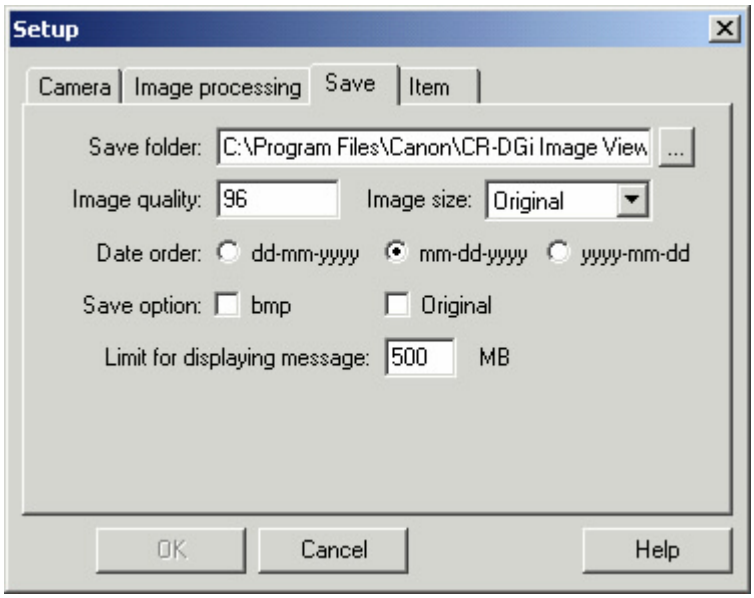


Image processing: CR-DGi is selected, and this setting cannot be changed.

Mask file: Mask file exclusive for the CR-DGi is selected, and this setting cannot be changed.



Save folder: This selects the save folder. Click the button at right end to select the save folder. In the default setting, a Save folder is created under the Installation folder.

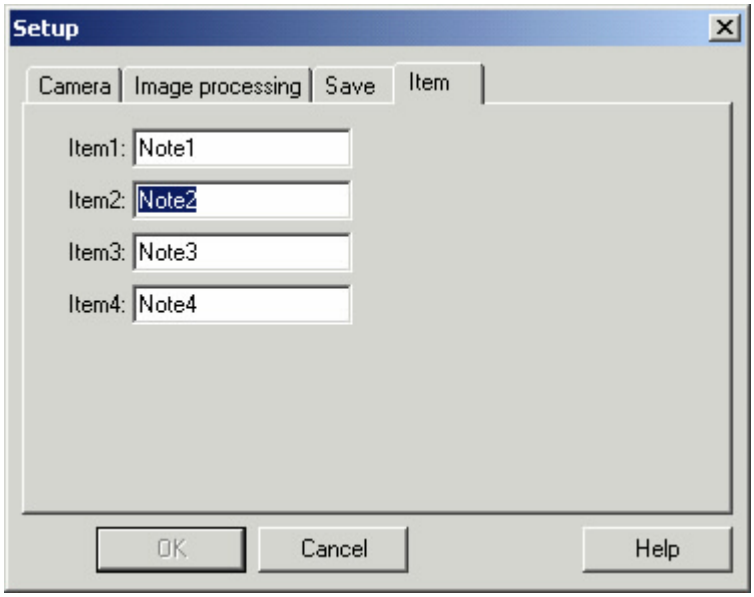
Image quality: This sets the image quality of JPEG files. The default setting is 96. The setting range is 80 to 100. Larger values provide in higher image quality, but also result in larger image sizes.

Image size: This selects the pixel size of JPEG files. The Original setting saves that image at the same size as the captured image. The 3072, 2160, and 1440 settings indicate the pixel width, and the aspect ratio of the image is not changed. The default setting is Original.

Date order: This sets the format of the date folder.

Save option: Although the image is saved as a JPEG file under the standard settings, when a checkmark is inserted in this option, the BMP file and the original file before image adjustment are saved at the same time. BMP files are saved as BXXXX.bmp, and original files are saved as RXXXX.crw(jpg). The "XXXX" portion is the same number as the JPEG file.

Limit for displaying message: A warning will be displayed when the storage capacity of the disk where Save folder is stored becomes lower than the value set here. The default setting is 500(MB).



Item1: This defines the "Note1" label in the Study Information. Up to 12 bytes of alphanumeric characters can be entered. In some system fonts, the character width is large, or some characters are not displayed. Therefore, be sure to check the displayed information at the Information screen.

Item2: This defines the "Note2" label in the Study Information.

Item3: This defines the "Note3" label in the Study Information.

Item4: This defines the "Note4" label in the Study Information.

3.10 Menus

File menu:

Save: This stores unsaved images.
Save retouched image: This saves retouched images. This does not overwrite the image. It is saved under a new file name.
Print: This opens the **Print** dialog box.
Print preview: This opens the Print Preview screen.
Print setup: This opens the Printer Setup screen.
Exit: This exits the application.

Edit menu:

Undo: This deletes the last revision made for the study information.
Adjust image: This opens the Adjust Image screen.
Edit image information: This corrects the study information.
Delete: This deletes the selected image.
Setup: This displays the **Setup** dialog box.

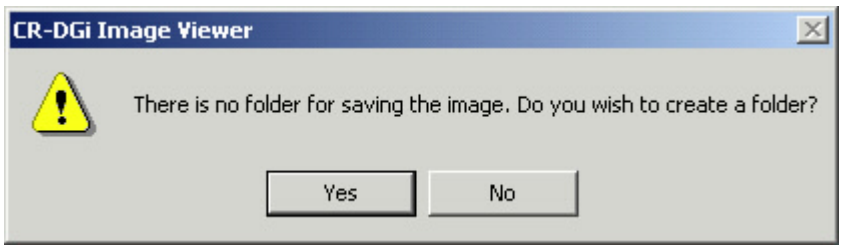
View menu:

Zoom in: This provides an enlarged view.
Zoom out: This provides a reduced view. The view cannot be reduced smaller than the size of the main window.
Fit image to window: This displays the main screen size to fit the main window.
Original size: This displays the image at the original image size.
JPEG: This displays a JPEG image.
BMP: This displays a BMP image.

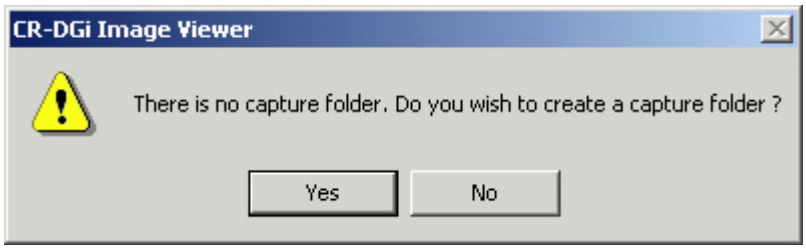
Help menu:

DGi Image Viewer help: This displays online help.
About DGi Image Viewer: This displays the version information.

3.11 List of Error Messages



This is displayed when the designated save folder does not exist. If you click the Yes button, a Save folder is created under the installation directory of the software.



This is displayed when the capture folder does not exist. If you click the Yes button, a Temp folder is created under the installation directory of the software.

This indicates that the available hard disk space where the Save folder was set is less than the specified amount. Immediately move the images to obtain more disk space.

This indicates that the available hard disk space where the Capture folder was set is less than the specified amount. Immediately move the images to obtain more disk space.

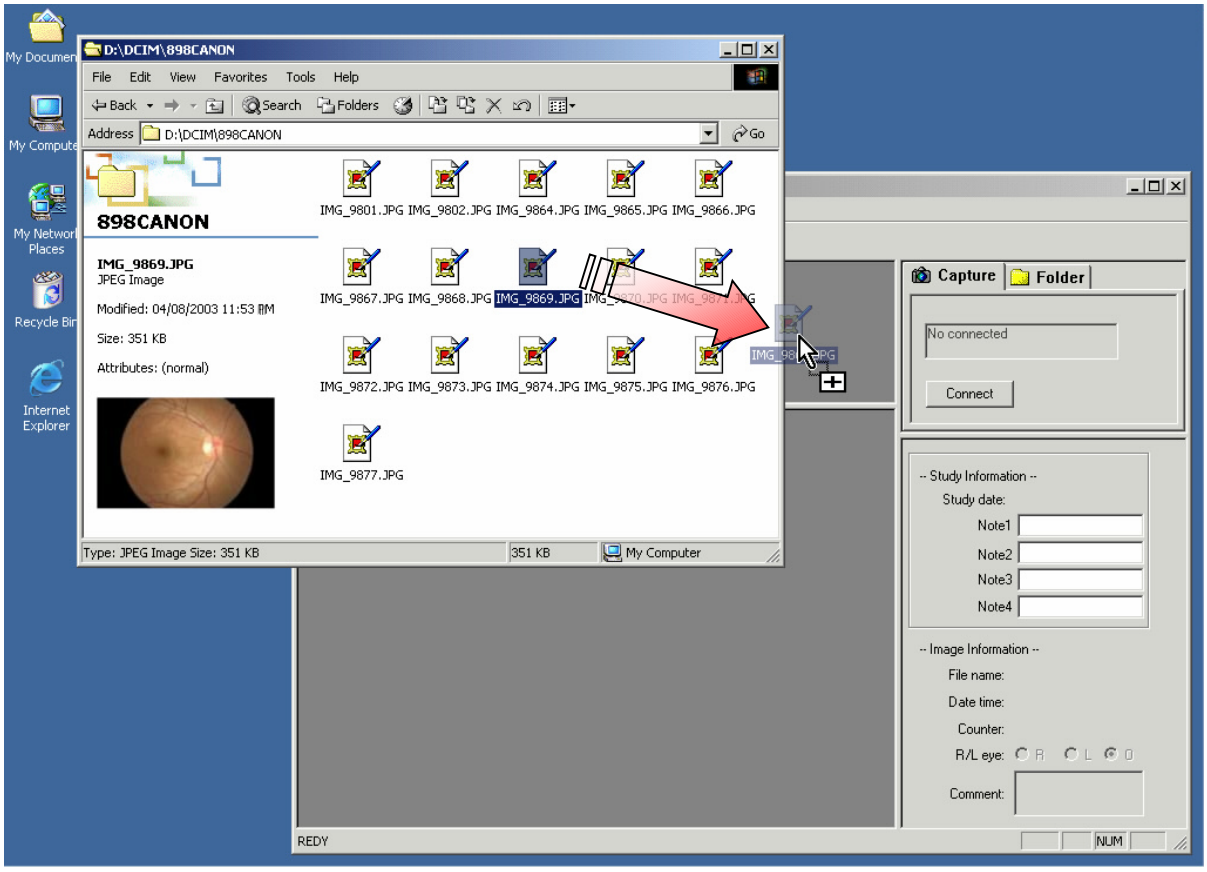
This is displayed when there is an unsaved image. This is displayed when you capture images and try to exit without saving or try to exit the software while correcting the Study Information. Clicking the Yes button saves the image.

4. Other Operations

4.1 Loading from a CF Card

Recorded images may be stored in the CF card loaded in the digital camera without being transferred to the PC if images are recorded without connecting the digital camera to the CR-DGi Image Viewer or if some type of error terminates the software while the image is being recorded. This section shows the procedure for later loading the retinal images saved to the CF card to the CR-DGi Image Viewer.

1. Set the main switch of the digital camera to OFF, and check that the access lamp is turned off. Open the CF card slot cover, and then press the Eject button to unload the CF card.
2. Insert the card into a CF card reader connected to the PC.
3. The PC recognizes the CF card as a removable disk.
4. Open Explorer, and display the list of images in the CF card.
5. Start the CR-DGi Image Viewer, select the Capture tab, and then switch to Capture mode.
6. From Explorer, drag each retinal image in the order that it was captured to the thumbnail window or main window of the CR-DGi Image Viewer. If you drag more than one image at a time, the images will not be ordered according to their capture time.
7. Enter the Study Information and Image Information if necessary.
8. Click the button to save. The images are put into the saved date folder.



NOTE

When ejecting the CF card from the CF card reader, open **My Computer**, and then right-click the icon for the CF card reader, and click **Eject** from the pop-up menu. Then, take the CF card out of the slot.

4.2 Backup and External Storage of Image Files

Back up the image folders under the save folder on a regular basis. Possible methods of backing up are shown below.

- Use Explorer to copy the folders to another hard disk.
- Copy the save folder to CD-R, DVD, or other removable media.
- Use the backup tools in Windows 2000/XP.
- Use a commercial backup utility.

When the amount of available space on the hard disk containing the save folder and capture folder becomes less than 500 MB, an alert is displayed when starting the software and when saving an image. In this case, you should immediately free space on your hard disk. Possible methods of freeing disk space are shown below.

- Move old date folders that are not viewed in Explorer to another hard disk.
- Copy old date folders that are not viewed to CD-R, DVD, or other removable media, and then delete from your hard disk.

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