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Dentsply Sirona

CDR DICOM User Guide

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Sirona Dental, Inc.
30-30 47th Avenue, Suite 500
Long Island City, NY 11101
USA

(718) 937-5765
(718) 937-5962 (fax)

EC REP Sirona Dental Systems GmbH
Fabrikstr. 31
D-64625, Bensheim
Germany

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http://www.schickbysirona.com/items.php?itemid=13112

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Introduction and Installation

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1. Introduction and Installation

1.1. Your CDR DICOM User Guide

CDR DICOM for Windows software is intended for use by qualified personnel, either trained dental professionals or their assistants, to display, access, store and retrieve intraoral and extraoral X-ray and video images acquired by Sirona Dental imaging devices. CDR DICOM for Windows can be configured for either standalone or network use on Windows-based PC clients and servers in dental operatories or similar clinical settings.

CDR DICOM software complies with the DICOM standard, which is maintained by an international committee, to achieve compatibility and to improve workflow efficiency between imaging systems and other information systems in healthcare environments.

CDR DICOM software is designed and tested for use with Schick hardware devices, which comply with the applicable medical device safety standards and conform to the appropriate standards and directives in North America and in international markets where Sirona Dental products are sold

This User Guide has been updated to describe new features incorporated in CDR DICOM imaging software. If you're looking for information about installing CDR DICOM software, you will find it in this chapter.

1.2. Help Resources for CDR DICOM

An on-line support page specifically for CDR DICOM software issues is accessible from the Help menu in the CDR Exam window. For technical assistance, customers in North America can contact the Patterson Technology Center at 1-877-498-6505. Customers residing outside this area, please contact the authorized dealer for Sirona Dental' products in your country or region.

An on-line forum is available also for general questions and comments related to CDR DICOM. The forum is available here:

www.schickbysirona.com/bbs3/

1.3. System Requirements

System requirements for CDR DICOM can be found below. CDR DICOM software is installed in one of the following configurations: (a) Single workstation running CDR single user (CDR DICOM Standalone), or (b) Networks with multiple workstations running CDR multi-user (CDR DICOM Client / Server). We recommend the use of dedicated servers for image storage and retrieval — not image acquisition.

For optimum performance, we recommend the following specifications listed below. For the latest specifications, please check our website at www.schickbysirona.com.

1.3.1. Client or Standalone

- Windows 10 Pro or Windows 8.1 Pro (with CDR DICOM 5) and Windows 7 Pro x64

- Intel i7 or equivalent

- 8 GB RAM

- 4 GB graphics card

- 500 GB hard drive (practice-specific, depends on number of patients)

- Intel USB 2.0 or 3.0.

1.3.2. Server

- Windows Server 2008 R2 or Windows Server 2012 R2 or Windows 10 Pro

- TCP/IP networking protocols (for DICOM Servers)

- 16 GB RAM (recommended)

- 1 TB (recommended).

NOTE: To achieve maximum image transfer-to-display speed, we recommend quad-core processors, 8 GB RAM, Windows 10 operating system, and 4 GB graphics card. Recommended minimum display resolution is 1280x1024.

1.4. Installing CDR DICOM Software

Installing CDR DICOM 5 software will uninstall older versions automatically. For standalone installations, install <u>both</u> the Server and the Client.

1.4.1. Server

S<small>TEP</small> 1

A. Exit the CDR DICOM program if open.

B. Insert the CDR DICOM 5 disk into your DVD drive.

C. Click **Install CDR Server** when the start page is displayed. *(If the start page does not display, browse the disk for the Server folder and double-click the CDR DICOM Server Setup file.)*

D. Click **Install** to add the CDR Prerequisite Checker and, if prompted, Microsoft SQL Server files and other updates.

Depending on your system, the installation of several prerequisite programs may be required and these may take several minutes to install. It may be necessary to restart your desktop or laptop PC, if prompted.

For a successful installation of CDR, it is necessary for the prerequisites to install successfully as well, so allow the installation to continue until complete.

E. Restart your laptop or desktop PC, if prompted.
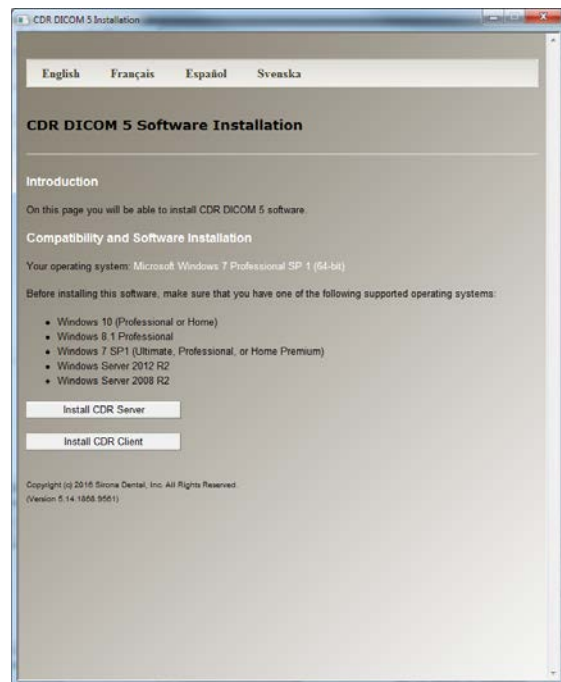
STEP 2

Click **Next** at the CDR DICOM Server Welcome screen.
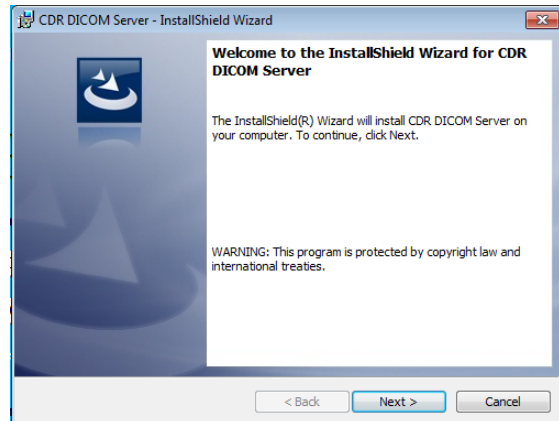
STEP 3

Click **Next** after agreeing to the software license agreement.
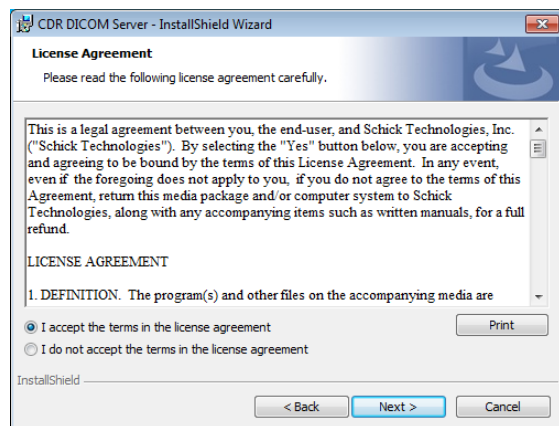
STEP 4

Click **Next** after entering customer information.
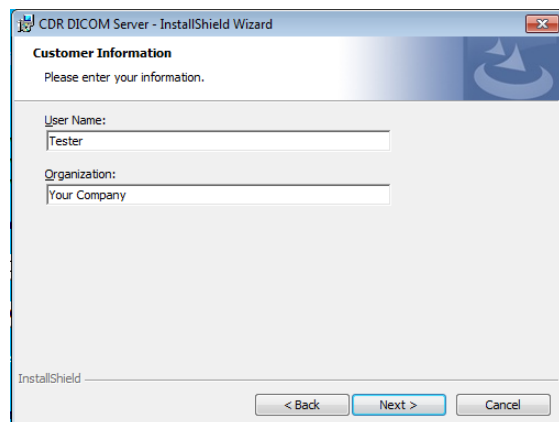
STEP 5

Click **Next** after choosing where your database server is located (for many users this will be (local)\CDRDICOM) and login preference.

.
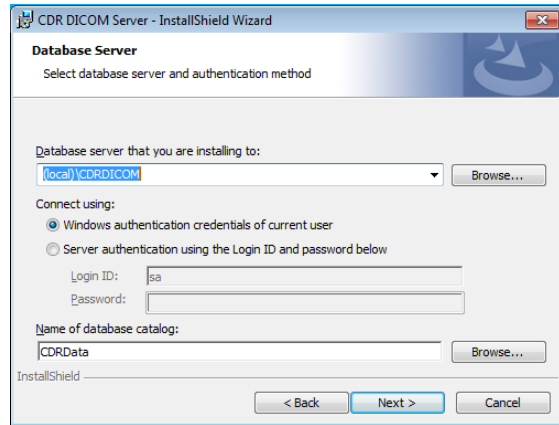
STEP 6

Click **Next** after choosing the folder where your images will be stored (typically, this is "C:\images", but if your images are stored at a different location, select it here).
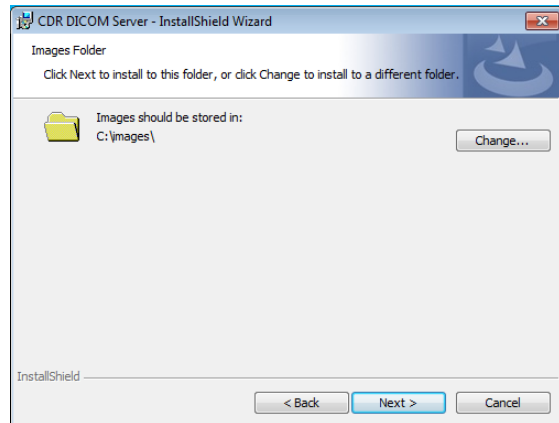
STEP 7

Click **Next** after choosing the type of setup (Complete).
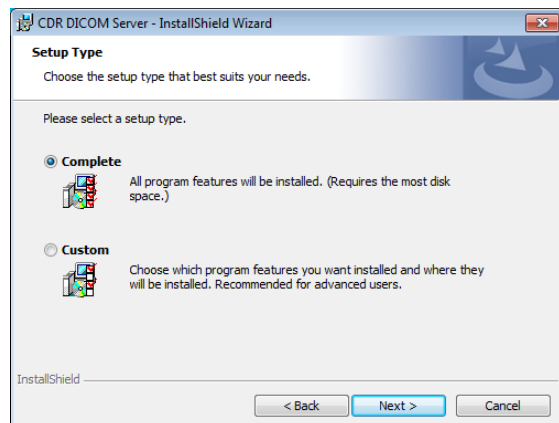
STEP 8

Click **Install**.
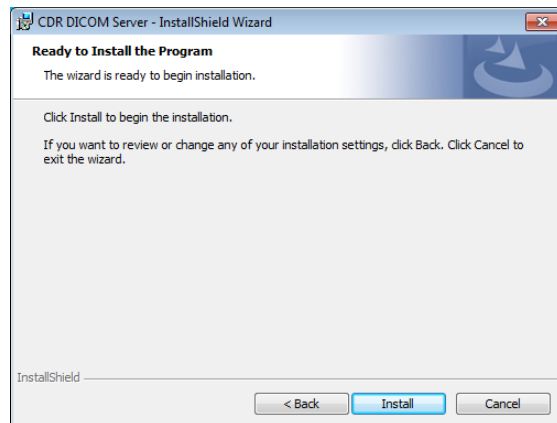
STEP 9

A. Click **Finish**.

B. Continue with the Client setup, described in the next section. If you are installing Client software at a different workstation, remove the CDR DICOM 5 disk and place it in the DVD drive of that system.
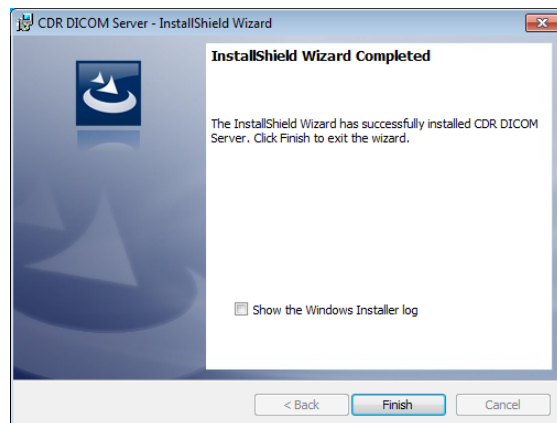
1.4.2. Client

A. Click **Install CDR Client** when the start page is displayed.

   (If the start page does not display, browse the disk for the Client folder and double-click the CDR DICOM Client Setup file.)

B. If prompted to install any updates, click Install.

C. Restart your laptop or desktop PC, if prompted.
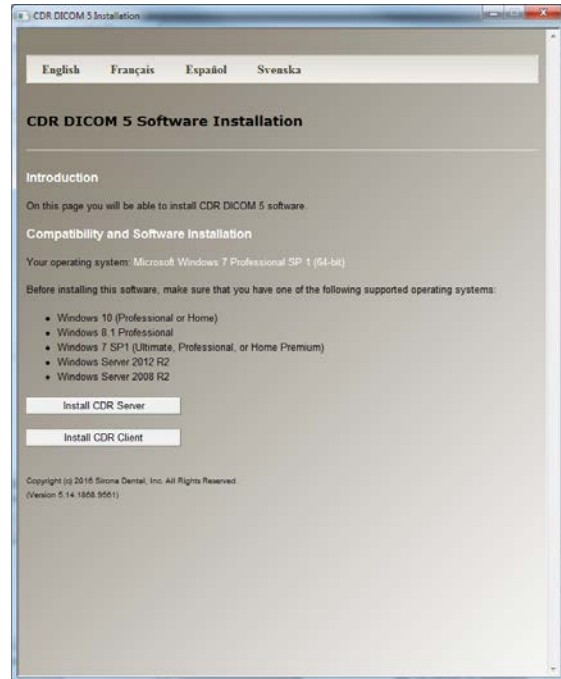
Click **Next** at the CDR DICOM Client Welcome screen.
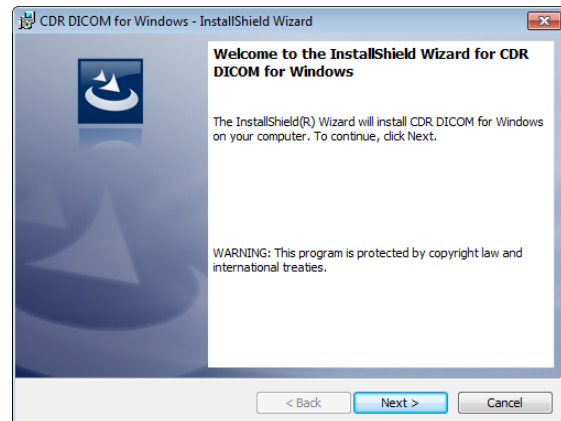
STEP 3
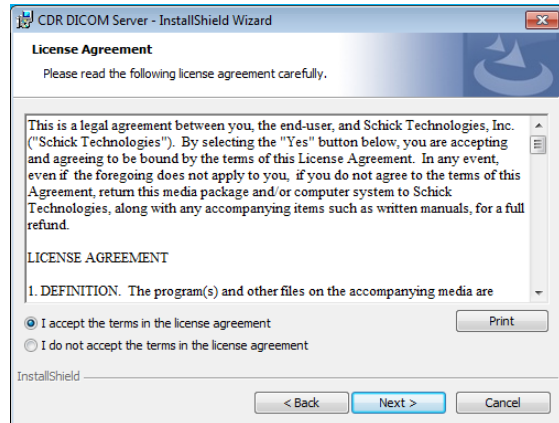
Click **Next** after agreeing to the software license agreement.

STEP 4

Click **Next** after entering customer information.
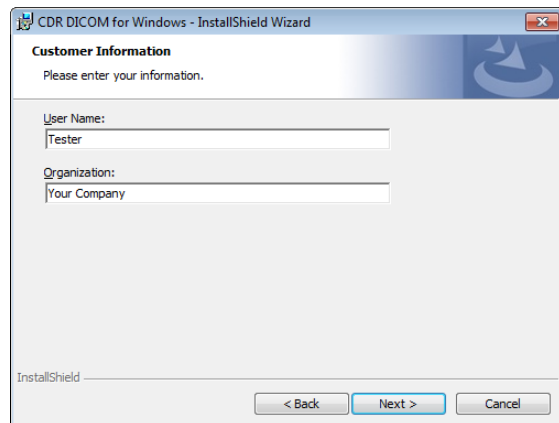
STEP 5

Click **Next** after choosing the type of setup (Complete).
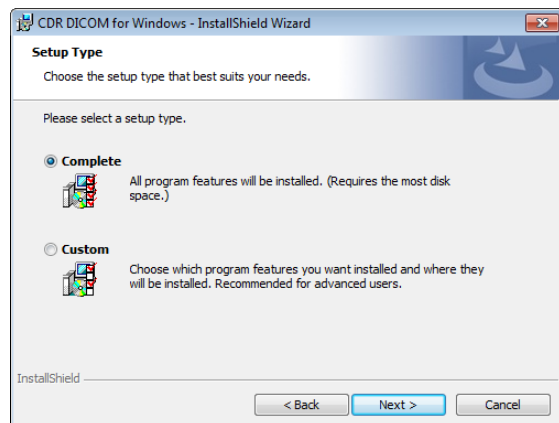
STEP 6

Click **Install**.
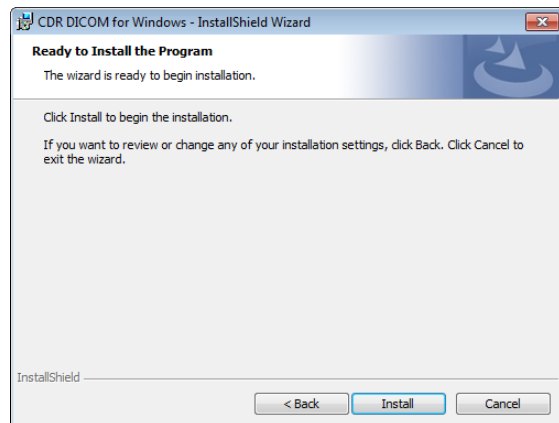
STEP 7

A. Click **Finish**.

B. Remove the CDR DICOM 5 disk.
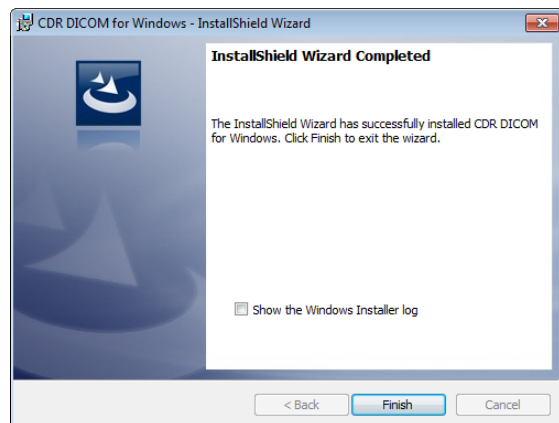
1.4.3. Start CDR DICOM and Configure Database

S<small>TEP</small> 1

A. Start CDR DICOM by double-clicking on the desktop shortcut. The Configure Database Connection dialog will display.

B. If you are connecting to an external server, (for example, your images are stored on a workstation different from the one you're at currently), click on the down arrow and select your server from the list.

C. Select the option, "Connect with my Windows login credentials."

D. Click the **Test Connection** button.

   • If the connection is good, click **OK**. Installation is complete.

   • If the connection fails, continue with the next step.
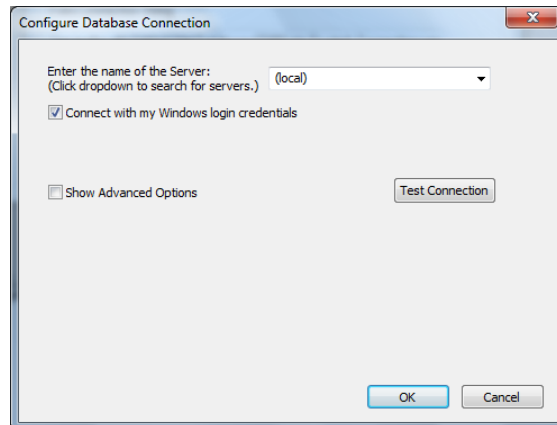
S<small>TEP</small> 2

A. De-select the option, "Connect with my Windows login credentials."

B.   Type in "cdr" (without quotes, all lower case) for the user name and the password.

C. Click the **Test Connection** button. When the connection is good, click **OK**.

> For information on changing the default passwords in CDR, please refer to Section 1.5 on page 12.
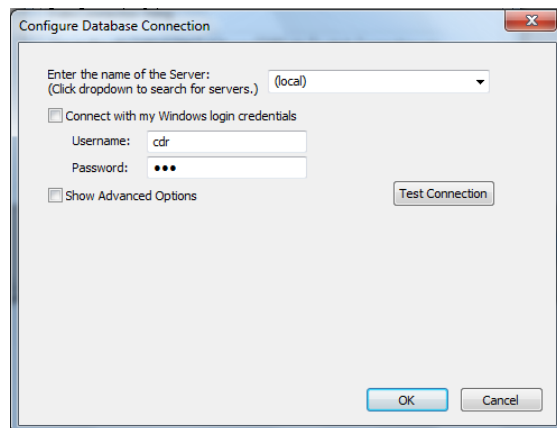
1.5. Changing Default Passwords

The following information can assist with changing the default passwords that were set up during the installation of CDR Dicom. You may wish to do this as an added security measure to protect the patient information stored within the SQL database used by CDR Dicom.

1.5.1. Credentials Used by CDR

The following default credentials in CDR are listed below:

- sa - This is the system administrator account and is required when installing SQL Server. It has administrative rights to the entire SQL instance.

- cdr - This is the user account created by CDR and is typically used by clients to connect to the server.

1.5.2. SQL Commands for Changing Passwords

We have developed two SQL commands, one for the sa account and the other for the cdr acccount, that can be used to change the default passwords.

To do this, start by opening a command prompt window on the server workstation where the SQL database is installed, typically where CDR Server is located. Type "cmd" *(without the quotes)* in the Windows Start menu to open a command prompt window.

For the sa account type the first command *(below)*, substituting newpassword1 with your own password and press Enter.

 sqlcmd -S .\CDRDICOM -U sa -P CDRDicom50 -Z newpassword1

For the cdr account type the second command *(below)*, substituting newpassword2 with your own password and press Enter.

 sqlcmd -S .\CDRDICOM -U cdr -P cdr –Z newpassword2

Remember to keep a record of the new passwords and to protect them.

1.5.3. Additional Information

Additional information about the default passwords used by CDR and recommendations on keeping patient data safe can be found at the following link:

https://www.schickbysirona.com/items.php?itemid=19189

1.6. Schick Sensors

1.6.1. Schick 33

Gain an unprecedented level of resolution and control over digital images with the new Schick 33. Featuring the industry's highest theoretical resolution and lowest learning curve, it will change the way you see your images — and your practice.

1.6.2. Schick Elite

Schick Elite combines truly outstanding image quality, an easy-to-use design and a robust, hard-wearing construction, to provide an intraoral radiography experience that is truly Elite.

1.7. Sensor Sheaths and Sensor Care

Schick Sensors by Dentsply Sirona are designed and tested to withstand years of daily use. To help ensure reliable service, refer to the "Sensor Care Guide" provided with your Sensor or download a copy of this document from our website at:

www.schickbysirona.com.

When used correctly, sheaths provide an effective barrier against exposure to bacteria and infection. Use Dentsply Sirona sheaths every time the Schick Sensors are used. **Never use the Sensor without a protective sheath. Never use a damaged sheath. Always dispose of the sheath after every patient.**

Protective sheaths are single-use devices and must not be reused under any circumstance. Reuse of single-use devices/instruments may cause them to become contaminated, compromise their intended function, and result in patient and user infection, injury and/or illness.

1.8. Sensor Positioning Systems

1.8.1. AimRight Adhesive Positioning System

Single-use, disposable holders are available for Schick Sensors, appropriate for Size 1 and Size 2 sensors, and are designed to fit comfortably in the positioning arms and rings you may already be using in your practice. Each new holder tab is color-coded for quick reference and specific to the intraoral area you wish to image.

Figure 1. AimRight Adhesive System

1.8.2. AimRight Autoclavable Positioning System

Like our adhesive-style holders, the autoclavable AimRight system is color-coded for easy, intuitive placement. Rounded edges and corners around the holders significantly increase comfort for your patients and the fact that the elements are disposable makes post-treatment clean-up faster and easier.

Figure 2. AimRight Autoclavable System

1.9. Program Group Icons

The following icons represent various program components that are installed with CDR DICOM software. Additional items may be added when new CDR software and drivers are installed.

Table 1. CDR DICOM Program Group

Icon	Description
	CDR DICOM for Windows – Program for network clients or standalone workstations
	CDR Server – Program for network servers
	CDR Data Administration Utility – Helps manage information in your CDR database
	CDR Settings Editor – CDR-specific settings previously stored in Windows registry
	CDR DICOM for Windows Help – Opens CDR HTML Help

1.10. Text Conventions in this Manual

Throughout this manual, some text conventions have been introduced to highlight certain actions (keyboard and mouse), screen locations (toolbar buttons and menu items) and other areas of usage or interest.

Table 2. Conventions in this Manual

Item	Usage	Example
Keystrokes	Describe keyboard keys	<ENTER>
Screen Text	Describes text found in dialog boxes	"Dentist data unavailable"
Menus and Buttons	Describe menu commands and toolbar button names	**New Exam**
File Names	Describe file names and locations	C:\Images

1.11. Other Products

Schick WiFi takes advantage of a unique modular design and cable replacement technology to provide a one-of-a-kind enhancement option to the industry leading *Schick Elite* sensor range.

With a focus on flexibility and functionality, Schick WiFi untethers the clinician from the operatory computer, providing safe and easy 360-degree access to the patient in the dental chair, while allowing fast and convenient transfer of the system between operatories.

Figure 3. Schick WiFi

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Chapter 2

Getting the Best X-ray Images

What you will read about in this Chapter —

- Getting the Best Images with your Sensor

- Sensor Calibration, Position, and Orientation

- Firmware Upgrades

2. Getting the Best X-ray Images

2.1. Exposure

CDR Sensors are very sensitive to X-rays; more sensitive than film to X-rays. This is one of CDR DICOM's important advantages over film since it allows for a reduction in radiation when using the system. For this same reason, however, small variations in exposure can produce visible differences in image quality because the Sensors are so sensitive.

In addition, the X-ray setting may need to be changed depending on Sensor placement and the distance between the X-ray source and the Sensor. With film, the X-ray source was left on a single setting. With the CDR system, small adjustments may be needed based on the Sensor's location in the patient's mouth.

Before taking the X-ray, properly aligning the Sensor is very important as is using the right holder or bite tab. Over a period of time, you will learn what the best setting is for your X-ray source. *After* taking the X-ray, use the **Pixel Value** command in the **Measure** menu to measure the pixels in the darkest areas of the image. The darkest pixels should have a value between 92 and 99%. If they are not dark enough, the image can be retaken at a higher exposure.

2.2. Placement

The distance between the X-ray source and the Sensor is extremely important. The intensity of X-rays decreases with the square of the distance. Therefore, if the Sensor is twice as far from the X-ray source, the amount of X-rays reaching the Sensor will be reduced by a factor of four.

This effect can be minimized by using a "long cone" tube or a longer collimator. A longer cone, for example, reduces the effect of distance. Although the increase in tube length means an increase in exposure duration, this is actually an advantage because a typical X-ray source offers few settings for short exposures. More choices are available if the exposure duration is longer.

2.3. Sensor Calibration

Each Sensor has its own calibration file, which helps to ensure consistently sharp and clear images. The calibration file for each Sensor must be installed and available to every workstation where the Sensor is used.

With our latest Sensor products, *Schick 33 and Schick Elite*, the calibration file is programmed onto the Sensor itself, so it will install automatically. When a new Sensor is connected, the Sensor's calibration file will install automatically the first time an exam is opened. If the calibration file does not download properly, disconnect the Sensor and re-connect it.

2.4. Sensor Positioning

The orientation of the Sensor is indicated on the computer screen by a small square of inverse pixels. When the image is zoomed, either by QuickZoom or by using one of the zoom settings in the Zoom window, these pixels can be seen in one corner of the image.

There are two ways to view the orientation of images on the screen: the default (normal orientation) and the alternate (flipped left/right orientation). Viewed normally, images in a standard full mouth series appear on the screen as if you were facing the patient. The patient's right appears on the left side of the screen; the patient's left, on the right side of the screen. When the alternate setting is selected (by clicking **Flip** from the **Series** menu bar), the images are re-arranged so that the patient's left is now on the left side of the screen. In **Table 3**, images are shown in *normal orientation*.

2.5. Sensor Orientation

The orientation of the Sensor is indicated on the computer display by a small square of inverse pixels. These pixels will be seen in one corner of the Zoom Window, Facing the flat part of the Sensor, with the cable extending the right, the inverse pixels are located on the bottom right as shown in the following figure.
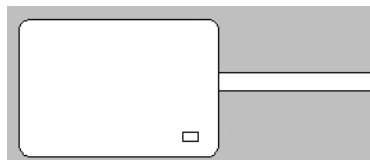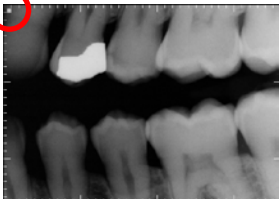
Table 3. CDR Sensor to Image Orientation

Sensor Location	Sensor Orientation	Inverse Pixels (Circled) and Image Orientation
Patient's left side		 *Normal Orientation (Left Bitewing)*
Patient's upper jaw		 *Normal Orientation (Anterior Periapical, Maxillary)*

2.6. Firmware Upgrades

USB modules supplied as part of the Schick system can be upgraded with new firmware to ensure that the latest updates are available. Diagnostic tools that test the imaging capability of the system from the Sensor to the workstation are also available.

When new firmware is available, we strongly recommend that you follow the directions supplied with it and install the latest version. There may be several reasons for new firmware, including enhancements in operation, new functionality, or support for hardware changes.
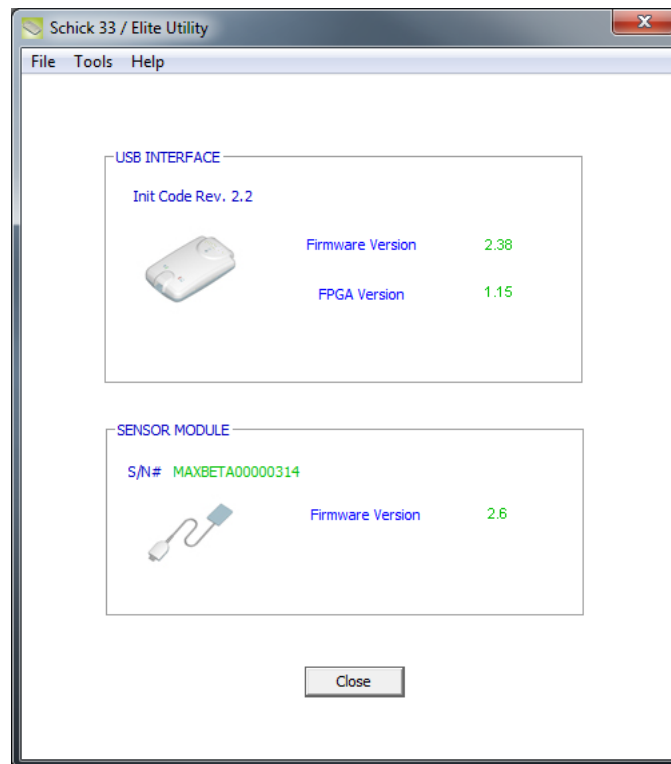
Figure 4. Sample of Schick 33/Elite Upgrade Utility

Chapter 3
Taking X-rays with CDR DICOM

What you will read about in this Chapter —

- Taking X-rays with the CDR System and Software

- Navigating the Exam Window

- Actions to Acquire Images

- Auto-Accept Options

- Exposure Quality

- High-Resolution Imaging

3. Taking X-rays with CDR DICOM

3.1. Acquiring X-ray Images

S<small>TEP</small> 1

Start CDR DICOM from the Windows **Start** button or by double-clicking the shortcut to CDR DICOM for Windows on your desktop.

S<small>TEP</small> 2

1. In the CDR Exam window, click **File** > **New**, or click the **New Exam** button.

2. In the Patient Information dialog box, enter the appropriate information and select the series.

3. Click **OK.**

S<small>TEP</small> 3

1. *If not already connected,* connect the USB cable to the Schick USB Interface module. Connect the other end of the USB cable to the laptop or desktop PC. Connect the Sensor to the Schick USB Interface module.

2. Check the X-ray exposure settings. The proper settings depend on several factors, among them, the X-ray source itself, the anatomy of the patient, and the location of the Sensor in the oral cavity

3. Place the Sensor in a positioning holder, and then place the sheath over the Sensor and holder. Place the Sensor in the patient's mouth with the flat side facing the X-ray source.

S<small>TEP</small> 4

> IMPORTANT! To avoid exposing the patient to unnecessary X-rays, ensure that the CDR exam window viewbox is flashing green (default color) in AutoTake mode, or that the message, "Waiting to take X-ray," is displayed before triggering the X-ray source.

AutoTake Mode —

The first empty view box is pre-selected and flashes green (default setting). Skip ahead to Step 6.

Manual Mode —

Select an empty view box matching the Sensor's location in the patient's mouth. When the frame is highlighted, click on it again.

STEP 5

The CDR system is now in image acquisition mode. A "Please Wait" message may appear momentarily.

STEP 6

AutoTake Mode —

Activate the X-ray source. "Reading Image from Sensor" appears on the screen momentarily.

Manual Mode —

Activate the X-ray source when "Waiting to take X-ray" appears.

STEP 7

AutoTake Mode —

When acquisition is complete, the image appears in the Zoom window.

Manual Mode —

If the "Auto Accept Image" box (**System** > **X-ray Settings**) is checked, the image appears immediately in the Zoom window. If the checkbox is clear, the Accept/Reject dialog box appears.

STEP 8

AutoTake Mode —

CDR advances to the next empty frame in the series automatically. To take another X-ray, repeat this procedure starting at Step 6.

Manual Mode —

Close the Zoom window. The Exam window is displayed again with the image. To take another X-ray, repeat this procedure starting at Step 4.

3.2. Selecting View Boxes and Taking X-rays

Images can be acquired in any order, but it is important to select a view box that matches the Sensor's position in the patient's mouth. Selecting a view box for acquisition outlines it with a red border. To navigate view boxes and acquire images in the CDR Exam Window, refer to the following table.
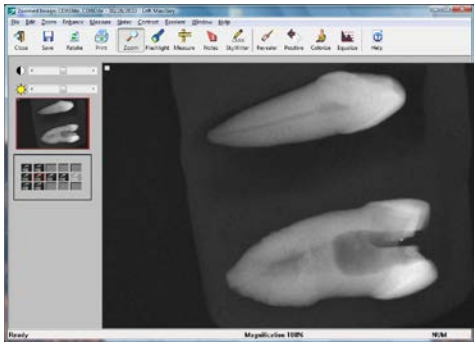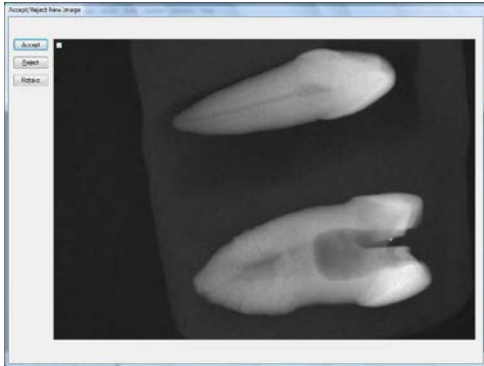
Table 4. Navigation and Acquisition in the CDR Exam Window

To Perform this . . .	Perform One of These Actions . . .		Then Do This . . .
Task	At Keyboard	With Mouse	In CDR
Select a View Box	Press [spacebar], [Page Up], or [Page Down]	Left-click on any view box	Acquire image (manual or AutoTake mode)
Take an X-ray image in Manual Mode	Press [Insert] or [Enter]	Double-click on view box	Activate X-ray source to take image when system is ready *(selected view box is flashing green)*
Take an X-ray image in AutoTake Mode	—	—	Activate X-ray source to take image (selected view box is flashing green)

3.3. Accepting, Retaking, and Rejecting X-rays

X-rays can be either accepted immediately upon acquisition or reviewed first in a separate Zoom window. (When AutoTake is active, images are acquired automatically.) The Auto Accept Image checkbox (**System > X-ray Settings**) controls which option is used. Each time an X-ray image is acquired, it will be displayed according to that setting.

Table 5. Accepting and Rejecting Images

Setting	Effect on Display after Taking X-ray
☑ Auto Accept Image (To access this setting, click System > X-ray Settings) When Auto Accept Image is checked, each time you acquire an image, CDR accepts it and displays it immediately.	
☐ Auto Accept Image (To access this setting, click System > X-ray Settings) When Auto Accept Image is unchecked, each time you acquire an image, you can review it first and then decide to either accept it or take another exposure. **Accept** button (or green foot pedal) accepts the image. **Reject** button (or amber foot pedal) discards the image. **Retake** button holds the image in the Accept/Retake window and sets the system to acquire a second image to compare with the first. Select either image (one of the two images must be accepted) and that image will be displayed in the Exam window.	

3.4. Exposure Quality

Exposure Quality is designed to convey, in a visual way, an assessment of images by highlighting a range where image exposure is considered optimal *(may be unavailable for most non-Schick 33 images).*

Figure 5. Exposure Quality

- At the top of the meter, the range shown in green means that the image has been exposed optimally for the technique factors that were used.

- The range in blue suggests that the image was underexposed and adjusting technique factors would improve image quality.

- The range in orange suggests just the opposite: that the image was overexposed and adjusting technique factors would reduce patient dose without reducing image quality.

If you prefer to have this indication hidden during an exam, it can be turned off manually or hidden permanently.

- To turn off Exposure Quality so it is hidden permanently from view, go to the System menu in the Exam window and select CDR Options. Select the Windows tab. Click to clear the Show Exposure Meter check box and click OK.

- To turn off Exposure Quality for the current image in the Zoom window, go to the Windows menu in the Zoom Window and uncheck Display Exposure Meter. Opening another image in the exam essentially creates a new Zoom window for that image and will display the meter again, which can be hidden manually or permanently, as described.

The Exposure Quality meter is available for 8-bit X-ray images acquired with Schick 33 Sensors, but will be unavailable for 8-bit images from other Schick Sensors.

For 8-bit, non-Schick 33 images, the meter will appear dimmed with the wording, "Not Available for this Image," appearing above it.

Figure 6. Exposure Quality (Unavailable)

The Exposure Quality meter can be enabled, however, when acquiring new images by changing CDR DICOM settings to 12-bit mode. To do this, click System > Xray Acquisition Control Properties, tick the Acquire 12 bit image checkbox, click Apply, and click OK, which will display the meter for new images, unless hidden intentionally.

Please note that acquiring images in 12-bit mode will affect the file size of those images and may increase the time to retrieve them from the image database.

3.5. Sharpen and High-Resolution Images

Sharpen is a tool for image enhancement developed specifically for Schick 33 images. Sharpen uses a combination of different functions to optimize Schick 33 images for detail and contrast. It is applied automatically to every image taken with Schick 33 Sensors.

To adjust image sharpness dynamically, a Sharpen slider and a Sharpen cursor are available. The slider can be shown or hidden. It can also be positioned at the Top or Bottom areas outside the image, or as an Overlay on the image.
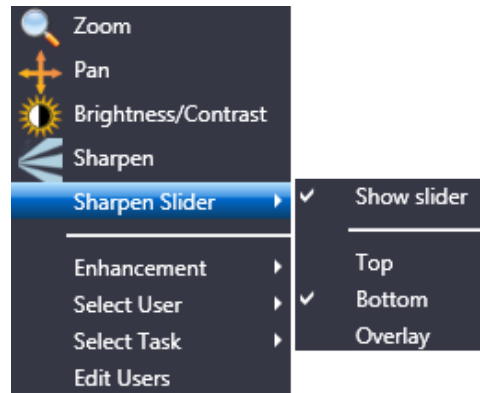
Figure 7. List of New and Updated Features for High-Resolution Images

3.5.1. Showing the Sharpen Slider

To show the Sharpen slider (if currently hidden), perform the following steps:

1. Move your cursor over a high-resolution image (taken with a Schick 33 Sensor).

2. Press the right-mouse button to open a short menu.

3. Select Sharpen Slider.

4. Click on Show Slider (this will *apply* the check mark and *display* the slider).

3.5.2. Hiding the Sharpen Slider

Although the Sharpen slider is shown by default when high-resolution images are displayed, it can also be hidden to maximize the image area inside the Zoom window. Please note that even with the slider hidden, image sharpness can be adjusted dynamically using the Sharpen cursor, by following the steps in the next paragraph.

1. Move your cursor over a high-resolution image (taken with a Schick 33 Sensor.

2. Press the right-mouse button to open a short menu.

3. Select Sharpen Slider.

4. Click on Show Slider (this will *remove* the check mark and *hide* the slider).

3.5.3. Positioning the Sharpen Slider

To position the Sharpen slider, perform the following steps:

1. Move your cursor over a high-resolution image (taken with a Schick 33 Sensor.

2. Press the right-mouse button to open a short menu.

3. Select Sharpen Slider.

4. Verify that the Show Slider item is checked. If checked, continue with the next step. If unchecked, click on this item and repeat steps 1 through 3.

5. Click on the position in the Zoom Window where the slider will be shown (Top, Bottom, or Overlay). For examples, see the following figures.

Figure 8. Sharpen Slider (Top Position)

Figure 9. Sharpen Slider (Bottom Position)

Figure 10. Sharpen Slider (Overlay Position)

3.5.4. Using the Sharpen Slider

The Sharpen slider is used to adjust image sharpness dynamically, as additional enhancement to the automatic sharpening that occurs when high-resolution images are displayed. A Sharpen percentage is shown on the slider and serves as an easy way to remember the specific Sharpen settings that are most useful to you.

User profiles, described in detail in Section 6.10.2 on page 117 can save Sharpness settings for various commonly-performed clinical tasks such as Endodontic, Periodontic, General Dentistry, and Restorative. For example, once you have set a particular Sharpness setting for a clinical task, the slider will move automatically to that position.

Please note that manual adjustments of image sharpness by using the Sharpen slider or the Sharpen cursor are not saved with the image.

3.5.5. Using the Sharpen Cursor

Adjusting the slider dynamically is one way of varying the effects of the Sharpen tool. It is also possible to use the Sharpen cursor to change the amount of sharpening. To adjust image sharpness dynamically by using the cursor, perform the following steps:

1. Move your cursor over a high-resolution image (taken with a Schick 33 Sensor.

2. Press the right-mouse button to open a short menu.

3. Select Sharpen.

4. Press the left-mouse button, which changes the Sharpen icon to a two-arrow cursor.

5. Keeping the mouse button depressed, move the cursor up to increase sharpness.

6. Keeping the mouse button depressed, move the cursor down to decrease sharpness.

7. Sharpen remains active until another tool (like Zoom, Pan, or Brightness / Contrast) is selected.

3.5.6. Using Sharpen with Other Image Enhancements

As Sharpen is applied automatically each time a Schick 33 image is displayed, the Sharpen enhancement cannot be saved with the image in the way that other image tools in the Zoom Window are (like Colorize, Equalize, etc.). For the same reason, Sharpen does not appear on the Change List (*Edit > List All Changes in the CDR Zoom Window*), nor are user adjustments in Sharpen retained when the Zoom Window is closed.

Please note that the image enhancements introduced with the Schick Elite product — Edge High, Edge Low, Smooth, and Edge Pro — have no effect on images acquired with Schick 33 Sensors and their effects are effectively ignored. *(They are still available, when enabled, for images taken with Schick Elite Sensors.)*

3.6. Diagnostic Tasks and User Profiles

Schick 33 sensors and supporting software enable the clinician to optimize image presentation to a level appropriate for the diagnostic task being performed. These settings are applied at display time and do not affect the original image data. Diagnostic Task selections can be changed for any image, from one task to another, and back at will.

The different task selections optimize the contrast and brightness of the displayed image to improve visibility of the anatomical structures important for that diagnostic task. Refer to the table below.

In addition to contrast optimization, the visibility of some anatomical structures benefit from additional image sharpening. Selecting any diagnostic task applies an initial level of sharpening to the image. A slider control is available to dynamically change the level of image sharpness in real time. Users also use the slider in conjunction with the "Save As Default" button to change the default sharpen level to their personal viewing preferences for each clinical task described here.

The table below shows the diagnostic task to select to improve visibility of relevant dental anatomy. Figure 12 and Figure 13 on pages 40 and 41, repectively, provide several sample images.

Table 6. Diagnostic Task Descriptions and Default Values

Diagnostic Task	Optimized Anatomy	Sharpen Default (User Changeable)
General Dentistry	Balanced for general tooth and bone display	75%
Endodontic	Root apices, pulp chamber, lamina dura, periodontal ligament, cementum	70%
Periodontic	Alveolar and crestal bone, calculus	50%
Restorative	Enamel, Dentin, DEJ, CEJ	85%
Hygiene	Balanced for general tooth and bone display but with a lighter tone to the image	55%

To create your own user profile, or to perform other profile actions, complete the steps in the following paragraphs.

3.6.1. How to Add a User Name

1. In the Zoom Window, right-click on an image acquired with a Schick 33 Sensor.

2. Click on the Edit Users menu item.

3. Click on the Add User button.

4. Click inside the New User name text box and type in a user name.

5. Click Close.

6. To verify, right-click on the image again and click on Select User. The new user name will appear in the menu.

3.6.2. How to Edit a User Name

1. In the Zoom window, right-click on an image acquired with a Schick 33 Sensor.

2. Click on the Edit Users menu item.

3. Locate the user name you wish to edit.

4. Double-click on the user name, which becomes an editable text box.

5. Type in a new name for this user.

6. Click Close.

7. To verify, right-click on the image again and click on Select User. The edited name will appear in the menu.

3.6.3. How to Delete a User Name

1. In the Zoom window, right-click on an image acquired with a Schick 33 Sensor.

2. Click on the Edit Users menu item.

3. Select the user name you wish to delete from the list.

4. Click on the Delete user button.

5. Click Close.

6. To verify, right-click on the image again and click on Select User. The edited name will appear in the menu.

3.6.4.   How to Edit a Task

1.   In the Zoom window, right-click on an image acquired with a Schick 33 Sensor.

2.   Click on the Select User menu item.

3.   Select a user name from the list.

> Note: The [default] name is not editable. To create your own custom profile, add a user name and then perform the following steps.

4.   Right-click on the image again and click on the Select Task.

5.   Choose one of the task categories from the list.

6.   Adjust the slider to a level of Sharpening that you feel is appropriate.

7.   Click on the Save as default button.

8.   When prompted, click Yes to save the new the Sharpen value as the default setting for this task category and this user.

9.   To check or compare the Sharpen settings with other user profiles or default values, click on Edit User, which opens the user profile dialog.

Figure 11. User Profile Menu Selections

(Shown expanded at right)

Sharpen: 75% Save as default

Sharpen: 70% Save as default

Figure 12. Diagnostic Tasks: General Dentistry (top) and Endodontic (bottom)

Figure 13. Diagnostic Tasks: Periodontic (top) and Restorative (bottom)

Figure 14. Diagnostic Task: Hygiene

3.7. Enhancement Modes

Dynamic image enhancement with Schick 33 Sensors represents a departure from the traditional method of image processing that is performed at the time of acquisition. Schick 33 Sensors perform only basic processing at acquisition and instead process the image at display time, providing customers with the flexibility to adjust various enhancements and mapping choices after the image is acquired.

This flexibility, which is always available to Schick 33 customers with CDR DICOM, EagleSoft, and Sidexis imaging software, include the ability to adjust the amount of sharpness in an image after it is acquired and to choose and customize brightness and contrast settings in diagnostic tasks. Additional enhancement is also possible.

Two modes are available: Mode A, which is the enhancement initally provided for Schick 33 Sensors, and Mode B, which offers a slightly different appearance, but may be attractive to customers who prefer a generally softer enhancement in their images.
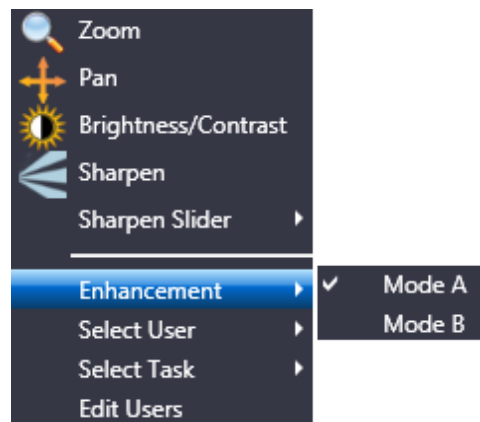
Figure 15. Enhancement Mode Selections

3.8. Schick 33 Image Enhancement

An alternate option in the way Schick 33 images are presented for display is available. This alternative, known as fixed enhancement, is intended primarily for third-party imaging customers that do not have access to the dynamic processing in CDR Dicom, EagleSoft and Sidexis and would not otherwise benefit from the enhancements available for Schick 33 high-resolution images.

Fixed enhancement is also an option to CDR Dicom, Eaglesoft, and Sidexis customers, although this choice will disable the benefits associated with dynamic processing, such as the availability of the Sharpen slider, Diagnostic tasks, and Enhancement modes after the image is presented for display.

In CDR Dicom, fixed enhancement is selected in the Image tab of the Xray Acquisition Control Properties page.
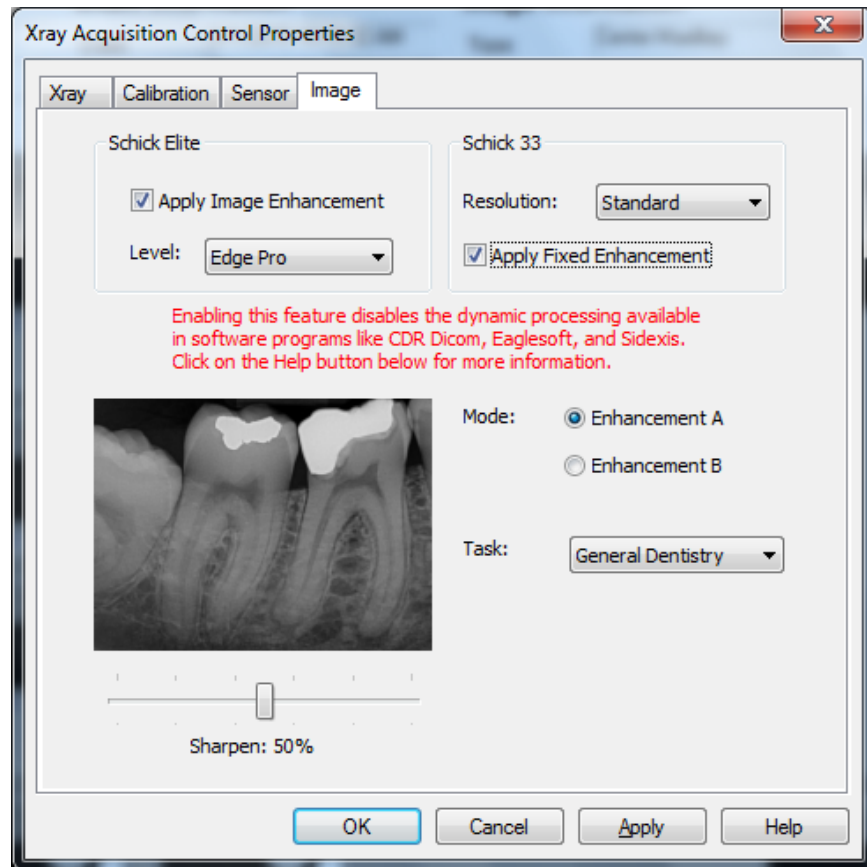
Figure 16. Selecting Fixed Enhancement in CDR Dicom

Referring to the previous image, additional information about the differences between fixed and dynamic enhancement may be found in the following tables.

Table 7. Selecting Fixed or Dynamic Enhancement in CDR Dicom

(See Figure 16 for reference)

Apply Fixed Enhancement	Results
☐ Not Selected	Applies dynamic processing in CDR Dicom, EagleSoft, and Sidexis software. Enables users to adjust the sharpness slider, to choose any diagnostic task, and to select a different enhancement mode AFTER the image is displayed. This box is unchecked by default.
☑ Selected*	Applies fixed processing in any imaging software compatible with Schick 33 sensors. Enables users to select a specific degree of sharpness, a particular diagnostic task, and either enhancement mode BEFORE the image is acquired. The effects of fixed processing cannot be changed after image display.

* Selecting this option by CDR DICOM, EagleSoft, and Sidexis customers will disable dynamic processing and the availability of the Sharpen slider, Diagnostic tasks, and Enhancement Modes after the image is presented for display.

3.8.1. Dynamic Enhancement

A description of dynamic enhancement may be found in Section 3.6 on page 37.

3.8.2. Fixed Enhancement

A description of the options available with fixed enhancement is described in the following table

Table 8. Mode and Diagnostic Task Selections in CDR Dicom

(See Figure 16 for reference)

Fixed Enhancement	Results
Sharpen Slider	Enables users to select a specific degree of sharpness, along a scale from 0 to 100%, BEFORE the image is acquired. The selected sharpness is applied in addition to the other choices made for fixed enhancement, such as Mode and Task
Sample Image Preview	Provides a preview of how an image might be affected by user-selected fixed enhancement choices (Mode, Task, and Sharpen).
Mode A	Provides the original image enhancement processing for Schick 33 sensors. It displays image features in vivid detail and supports a wide sharpening range.
Mode B	Provides a softer enhancement, especially around object edges, and supports a tighter sharpening range.
Task	Provides the same diagnostic tasks optimized for brightness and contrast described previously in this document.

NOTE: The subtle difference between Mode A and B may be difficult to see in the sample image preview.
It may be helpful to move the slider to 100% to note the differences more easily.

Chapter 4

Exam and Zoom Windows

What you will read about in this Chapter —

- Working with Exam and Zoom windows

- Magnifying Images in the Exam Window (QuickZoom)

- Menu Overview

4. Exam and Zoom Windows

4.1. Introduction

As you begin working with the CDR software, you will become familiar with two principal CDR windows, the Exam window and Zoom window, and a special display, QuickZoom®, which appears on the Exam window.

The Exam and Zoom windows have some common element:.

Menu Bar – A row near the top of the main and Zoom windows containing the names of drop-down menus.

Toolbar – A row of buttons located below the menu bar that access several commonly used CDR features. Each button includes an icon and a short text description. Options to turn off toolbar text, to use a smaller button toolbar, or to hide the toolbar entirely, are available also.

Image Area – The viewing area for view boxes (Exam window), for QuickZoom (Exam window), and for a single, zoomed image (Zoom window).

Status Bar – A row at the bottom of the main and Zoom windows containing CDR system status information, time of day, and additional help.

4.2. Exam Window

Whenever the CDR program is started, the Exam window appears first. Initially, only the menu bar, toolbar, and status bar are shown, but as patient exams are either opened or created, the Exam window fills with exam and image information.
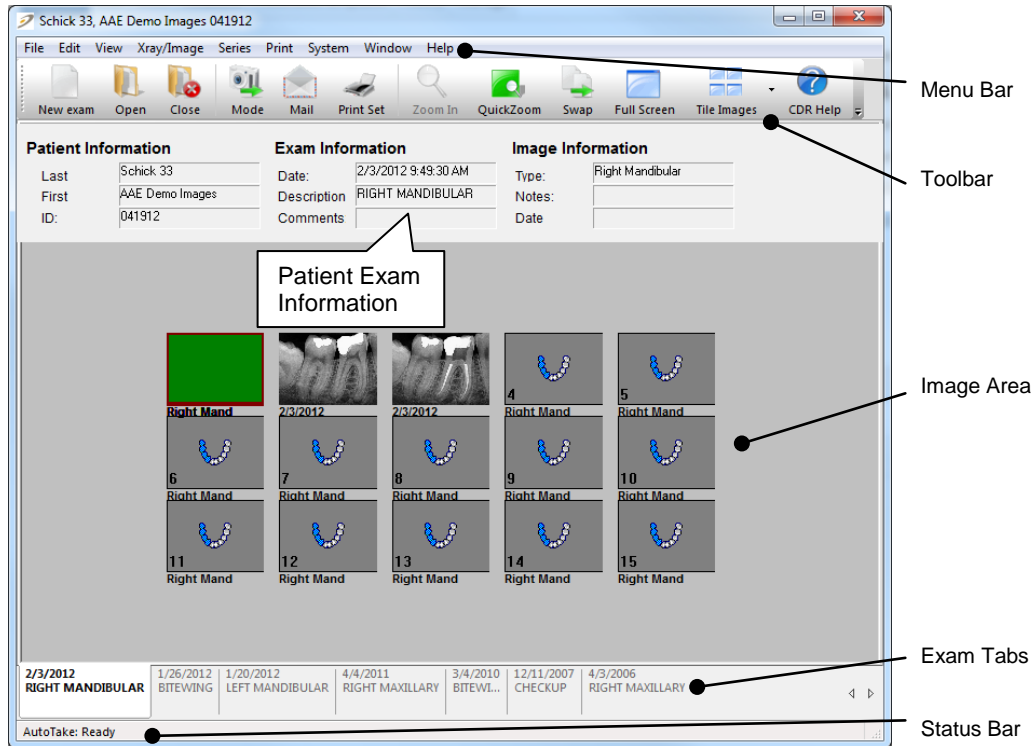
Figure 17. Exam Window

More Information about Exam Tabs

A tabbed row is visible along the bottom of the CDR Exam window. Each tab represents an exam for that patient, shown from the oldest exam at the right to the most current one on the left. If there are more exams than can fit along the row at the bottom of the screen, two arrow keys located at the lower right of the Exam window can be used to scroll through the tabs until the desired exam is displayed.

4.3. QuickZoom

QuickZoom is a CDR feature that "zooms" or magnifies the images in an exam, allowing each image to appear at its zoomed size. Using QuickZoom can be a valuable timesaver, eliminating the repetition of opening each image separately to view it in greater detail.

For more information on QuickZoom, including viewing options and different choices for activating this feature, refer to Section 5.4.7 on page 63.
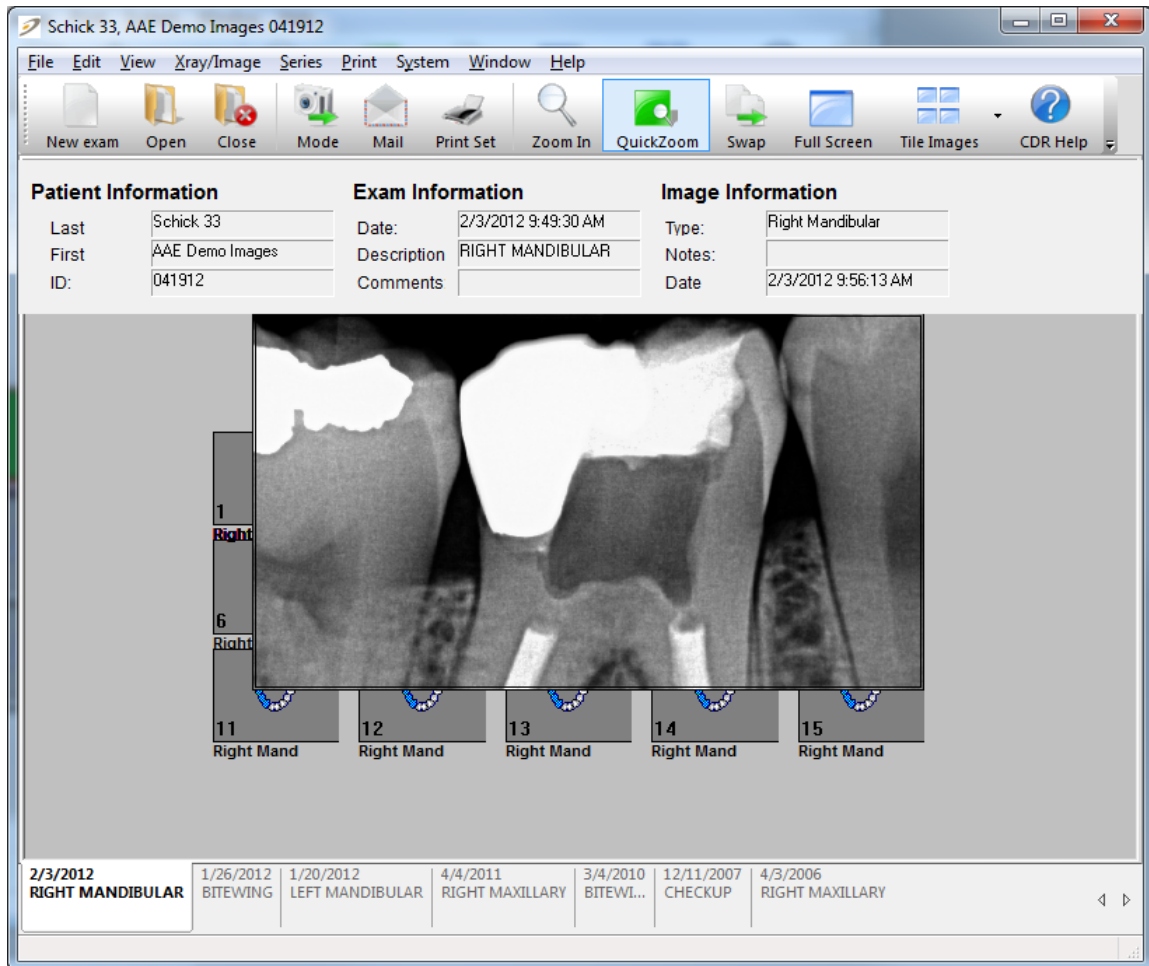
Figure 18. QuickZoom Display

4.4. Zoom Window

The Zoom window supplies the image enhancement tools in CDR. These tools employ graphic elements (for example, color, brightness, contrast, orientation, and magnification) and diagnostic aids (measurements, pixel values, and notes).
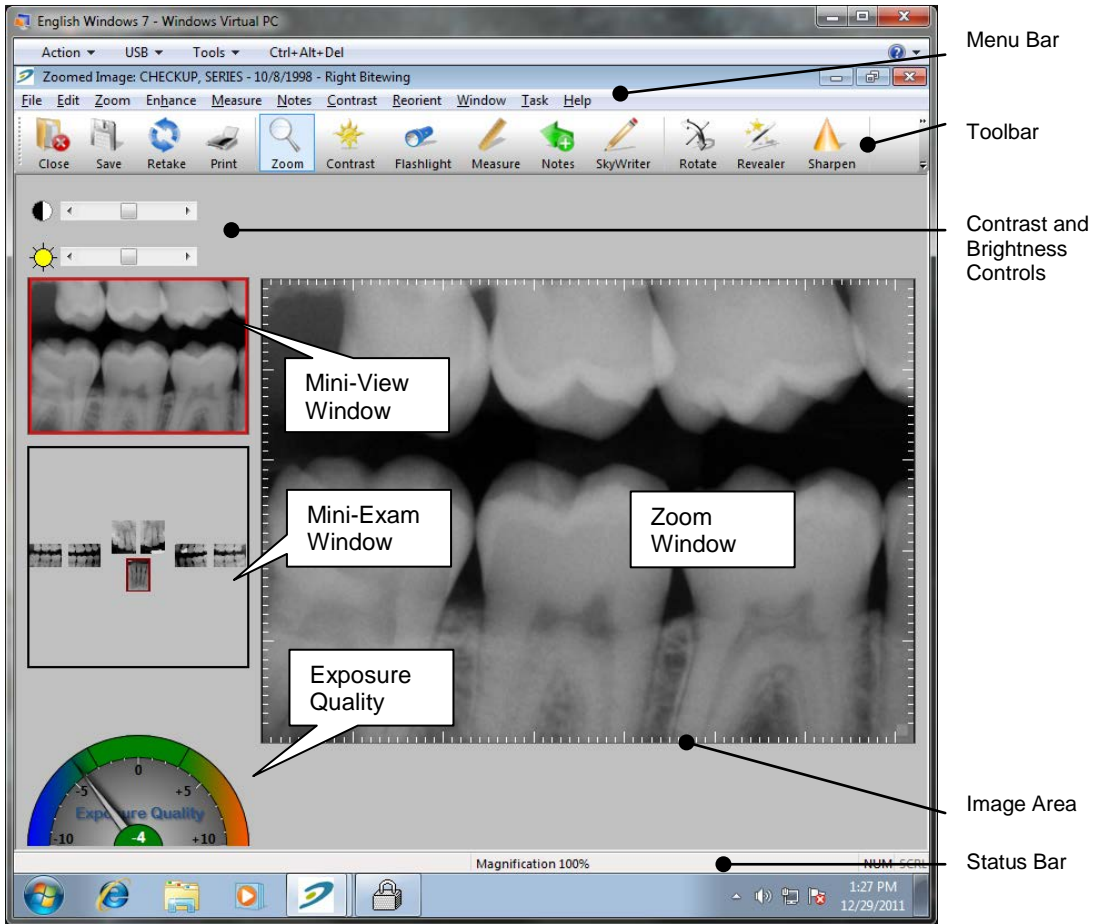
Figure 19. Zoom Window

4.4.1. Mini-Exam Window

The mini-exam window provides the capability to take X-rays and evaluate them from a single location inside CDR. **Figure 19** shows that the mini-exam window is really just that — a smaller version of the patient exam, displaying all of the images "mini-size."

The mini-exam window can be used to keep track of images already in the current exam and to select a view box for the next image. If AutoTake mode is on during X-ray acquisition, CDR will capture the image in the current view box and then automatically advance to the next frame in the series. If the mini-exam window is not active when you open an image in a Zoom window, click **Window** > **Display Exam**.

4.4.2. Mini-View Window

The mini-view window provides a thumbnail view of the current image in the Zoom window. It can be used primarily as a point of reference, particularly when using the image zoom and pan options.

When the zoom and pan options are in use, an outlined box appears in the mini-view window and dynamically resizes depending on zoom magnification. This enables you to navigate (pan) over the magnified image while having the mini-view window provide a "one-look" orientation of your relative position in the image.

4.5. Menus, Shortcuts, and Accelerator Keys

All CDR commands are provided in drop-down menus. To open a drop-down menu, simply click on the menu name on the menu bar. To open the menu using the keyboard, press and hold down the `<Alt>` key and type the letter that is underlined in the menu name (also known as the *accelerator key*). For instance, holding down the `<Alt>` key and pressing the "F" will open the "File" menu because the F in File is underlined.
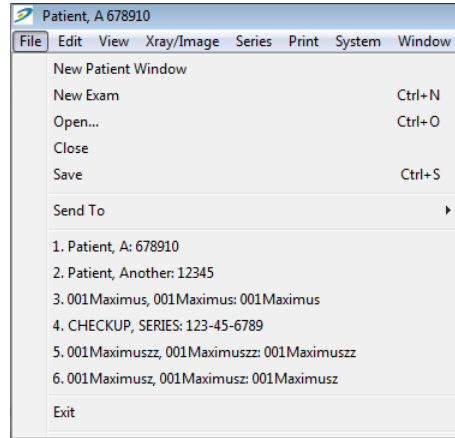
Figure 20. Sample Pull-down Menu

Some menu commands may appear as "dimmed" on the menu bar, meaning the selection is disabled. This is one of the ways CDR DICOM ensures that you make valid choices that can be performed by the program. Other commands may be dimmed because the command itself is not active or is not currently available.

Some commands can be activated by holding down the `<Ctrl>` key and by pressing the letter corresponding to the command. These are *shortcut keys* and are useful, timesaving aids. Shortcut keys can be found for the functions described in the next section and are listed also in **Table 9** and **Table 10**, near the end of this manual.

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Chapter 5

Exam Window Menus

What you will read about in this Chapter —

- Starting a New Exam

- Working with Images in the Exam Window

- Selecting and Editing a Series

- Printing

- Setting Dentist Information

- CDR Options

5. Exam Window Menus

5.1. File Menu

5.1.1. New Exam

Creates new patient exams.

(Accelerators: Alt + F, E) (Shortcut: Ctrl + N)

At the Patient Information dialog box, patient first and last names and ID information are mandatory. Letters as well as numbers can be used.

In CDR DICOM software, the first and last name and patient ID information are required elements for every exam. If previous exams exist for the patient, clicking the **List** button opens the Patient Query dialog box, where patient information can be retrieved. At the New Exam dialog box, select a series (or viewset) for the exam and enter any optional exam level information. Study ID, Accession Number, and comment fields are available for this purpose.
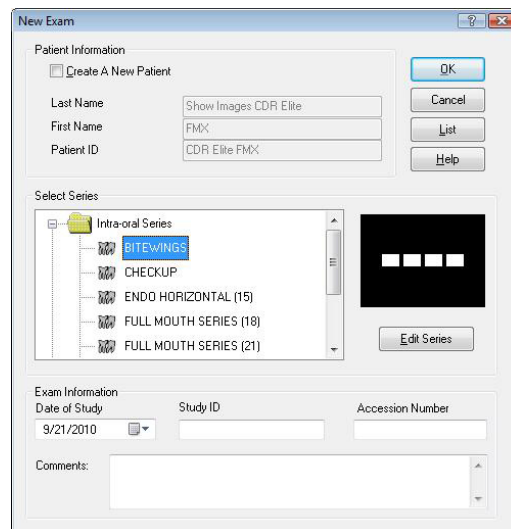
Figure 21. New Exam Dialog Box

5.1.2. Open

Opens patient exams.

(Accelerators: Alt + F, O) (Shortcut: Ctrl + O)

To view a list of all patients exams, click the Search button. Open the desired patient exam by highlighting it and then clicking OK or by double-clicking on the patient name. To search the patient database at the Study Level, check the Study Level Search box and click Search. *(Other study-level search fields are available on this dialog box also.)*

Sorting Patient Exams

Above the exam list in the Patient Query dialog box are headings (Last Name, First Name, Patient ID) that can be used for sorting. Clicking once on the heading sorts the items in that column alphabetically with any numbered entries listed first. Clicking the heading a second time reverses the sort.

Searching Patient Exams

Searches for patient names, ID numbers, study dates, accession numbers and exam comments can be performed using those items as keywords. It is also possible to use a wildcard character (*) to expedite searches when some of the characters in the keyword are known. CDR can be instructed to automatically supply wildcards by checking the "Add wildcard to Patient fields" box in the **System** > **CDR Options** > **Windows**
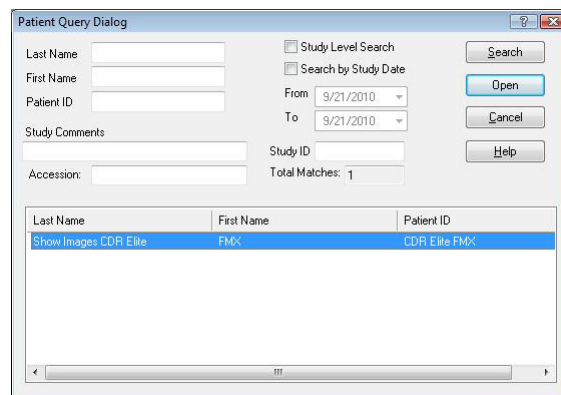
Figure 22. Open Exam Dialog Box

5.1.3. Close

Closes patient exams

(Accelerators: Alt + F, C) (Shortcut: Ctrl + W)

CDR images are saved automatically when they are displayed. CDR studies are updated automatically when the CDR application is closed. In the event a patient exam is closed unintentionally, all CDR images in that exam are saved and will appear when the exam is reopened.

5.1.4. Save

Saves exam changes

(Accelerators: Alt + F, S) (Shortcut: Ctrl + S)

When changes are made to the Exam window, CDR automatically saves them, so it is not necessary to click on **Save** to retain changes.

Once new images are acquired or imported, the Exam window can be closed safely without **Save** and with no loss of information. Other examples of changes that are saved automatically include changes to the position of the images and changes to the size or order of the view boxes.

5.1.5. Send To

Sends images in the current exam by e-mail messaging or by web viewer

(Accelerators: Alt + F, D, E (for E-mail Recipient), W (for Web Viewer)

Use of the e-mail feature requires a licensed version of CDR DICOM. No other software (zip utility or DICOM viewer) is needed to open and view DICOM exams sent via e-mail.

Use of the web viewer feature requires any version of the Internet Explorer browser — no other viewing software (neither CDR nor separate DICOM viewer) is needed.

Refer to **Chapter 7** for more information and steps on how to use these features.

5.2. Edit Menu

5.2.1. Copy / Paste

Copies and pastes images within CDR or from CDR into another application.

(Accelerators: Alt + E, C [for Copy], P [for Paste] (Shortcut: Ctrl + C [for Copy], P [for Paste]

To copy an image, highlight it first and select **Copy** from the **Edit** menu, or press the [Ctrl + C] keys, or right click on the highlighted image to display a short menu and click on **Copy**. When pasting a image, the frame must be empty before the image can be copied there.

Images can be copied and pasted within a single exam or from one exam to another. The Data Administration Utility can also be used to move images, but you are limited to repositioning images within the same viewset (same exam). Images can also be copied and pasted into other applications like Microsoft Word, for example.

5.2.2. Select All

Selects all the images in the current exam.

(Accelerators: Alt + E, A) (Shortcut: Ctrl + A)

There are two ways all of selecting all the images in an exam.

The first option is to click **Edit** > **Select All**.

The second option is to right-click anywhere in the view box area of the Exam Window and choose "Select All" from the menu.

5.2.3. Edit Exam Comments

Adds or edits comments for the current exam.

Exam comments provide an opportunity to add a general notation to an exam (also called a study). Practitioners who use exam comments tend to add or edit them at the conclusion of an exam as an easy way to record a general observation.

Exam comments can also be added at the start of a new exam in CDR DICOM or either added or edited in the CDR Data Administration Utility.

5.3. View Menu

5.3.1. Toolbar / Status Bar / Exam Info / Full Screen / Application Look

Shows or hides toolbar, status bar, or exam information as a personal preference or to adjust the displayed size of images in the Exam window.

(Accelerators: Alt + V, T [for Toolbar], S [for Status Bar], E [for Exam Info], F [for Full Screen]

Items under the View menu enable the Exam window to be customized, allowing you to adjust the displayed sizes of the images by hiding one or more areas of information.

To hide all the non-image areas on the exam at once, select the Full Screen option. (Exam tabs, if enabled, will also be hidden.) Full Screen maximizes images by scaling up the Exam window to fill the entire monitor display area.

To revert to a typical exam view, click on the **Close Full Screen** button or show the menu bar by moving your cursor to the very top edge of your monitor display.

Application Look provides a choice among several alternate "themes" that affect the overall appearance of CDR

5.4. Xray / Image Menu

5.4.1. Zoom In

Opens the selected image in a Zoom window.

(Accelerators: Alt + X, Z)

By opening a Zoom window, you are able to view an image at greater detail and also access CDR DICOM's enhancement, measurement, and annotation options.

Zoom In is the quickest way to open an image in a Zoom window, although you may find that clicking twice on the image in the Exam window works just as well. Zoom In gets you to the image enhancement stage quickly, which is the primary benefit of this item.

If you only wish to view the image in greater detail, using the QuickZoom option may offer a better alternative than Zoom In. QuickZoom also simplifies image-by-image viewing at the exam level and eliminates the extra time of opening and navigating between several images, each in its own Zoom window. For more information on QuickZoom, refer to that option.

5.4.2. Acquisition Mode

Displays the acquisition modes that may be available to the current workstation.

(Accelerators: Alt + X, A, X [for X-ray]), V [for Video], P [for Panoramic], S [for Scanner], C [for Cephalometric])

By listing the capture modes under a menu, CDR enables users to select alternate acquisition processes (and devices) quickly and easily. Because view boxes will accommodate images from any imaging source (X-ray, camera, or scanner), several types of images can be added to the same exam.

When an acquisition mode is listed in the menu, it means that the device drivers needed to acquire images in this mode are available. No assumptions are made about the connection, availability, or operation of the hardware necessary to acquire in that mode.

To provide more flexibility and recoverability, CDR DICOM's list of acquisition modes are also reported in the **Systems** > **CDR Options**. For more information on reviewing, changing, or restoring configuration settings for CDR DICOM's acquisition modes, refer to the **CDR Options** item description in the **System** menu.

5.4.3. Swap

Switches the view box location of two images in the same exam.

(Accelerators: Alt + X, S)

Highlight images by pressing down and holding the `<SHIFT>` key, selecting one image and then the other. Go to the **Xray/Image** menu and select **Swap**. The images appear immediately in their new positions.

5.4.4. Detach

Separates images from the viewset in which they were originally acquired.

(Accelerators: Alt + X, D)

Detaching an image retains it as part of the patient study, but the image itself is not displayed in the series. This allows greater versatility in the way viewsets are managed, permitting you to retain both active and inactive viewsets and both attached and detached images.

By detaching and attaching images, you're able to refine exams so they include appropriate images in an appropriate series. For example, you may want to choose among several images in an exam and select the ones that serve as the best examples. Using the Data Administration Utility, you can ensure the most appropriate viewset is active and then drag-and-drop images (from the upper right pane) into the viewset (at the lower right pane). Images that you want to hide from display, but want to retain, can be detached from their current viewset. Once an image is detached, it can be deleted or reattached to its original, or new, viewset.

5.4.5. Import

Imports images from other applications.

(Accelerators: Alt + X, I)

To import an image, select an empty view box. Select **Import** from the **X-ray / Image** menu. When the dialog box is displayed, select the file to import and click **Open**.

CDR DICOM imports 8-bit and 12-bit black and white (grayscale) images and 24-bit color images in a variety of formats, including TIFF, Targa, Paintbrush, Windows Bitmap, Leadtools, and JPEG format. When images are imported (I) into CDR DICOM or exported (E) from CDR DICOM, a watermark is added to the image.

5.4.6. Export

Exports images to other applications.

(Accelerators: Alt + X, E)

Select **Export** from the **X-ray / Image** menu. When the dialog box is displayed, select the location where you want to save the file and select the file format. Enter a name for the file and click Save.

Selecting a graphics format depends generally on the how the image will be used: Windows Bitmap (.BMP) — standard format; LeadPQ1 (.CMP) — minimal loss in image quality but lower compression (5:1) than JPEG; JPEG (JPG) — higher compression rate (17:1) than PQ1, but some loss in image quality; Paintbrush (PCX) — Paintbrush bitmap format; TIFF/TIFF RLE (TIF) — bitmap format for grayscale images, and optional RLE lossless compression.

5.4.7. QuickZoom

"Zooms" or magnifies all the images in an exam

(Accelerators: Alt + X, Q)

QuickZoom can be activated several different ways, by clicking on the **QuickZoom** button on the toolbar, by selecting **QuickZoom** from the **Xray/Image** menu, or by using the mouse and right-clicking on the view box and selecting **QuickZoom** from the context menu.

Performing any of these actions prepares the viewing window, switches CDR DICOM to QuickZoom mode, and opens the QuickZoom window. Once opened, you do not need to press and hold the mouse button to keep the QuickZoom window active.

When QuickZoom is active, a magnifying glass cursor displays to with view the images at their magnified sizes. Moving the cursor across each view box displays that image in its zoom setting.

To change a QuickZoom setting, left click again to close the QuickZoom window, then right click for options (Size, Zoom, Shape).

Right-click to close the QuickZoom window, and right-click to open it again. To exit QuickZoom, right-click and select "Off."

To preset QuickZoom viewing options, click **System** > **CDR Options** > **QuickZoom Settings** (General tab).

5.4.8. AutoTake

Takes X-rays automatically, eliminating the extra step of starting CDR DICOM's acquisition mode ("clicking on a view box") before each X-ray. When AutoTake is active, CDR provides a visual cue (flashing view box) to confirm the mode is active and ready to receive an X-ray image in that view box.

(Accelerators: Alt + X, T)

AutoTake can be set manually during a CDR session (**Toggle On / Off**), or it can be active each time you start CDR. To make AutoTake active for each session, click **System > CDR Options** and check the "Start when Application starts" box.

5.5. Series Menu

CDR DICOM includes several predefined series intended to cover the most common types of exams performed by dental professionals. These exam series (Full Mouth, Checkup, Bitewings, Vertical and Horizontal Endo) can be selected from the **New Exam** dialog box (for new exams) or from the **Series** menu by clicking on the **Select** item (for current exams).

X-ray images in a series can be flipped from one side of the Exam window to the other by clicking **Flip** from the **Series** menu. When X-rays are flipped, the patient's left is shown on the left side of the screen. This view differs from the default setting where X-rays on the patient's left side are displayed on the right side of the screen (as if you were looking directly at the patient). To enable Series Flip at the start of CDR, click **System** > **CDR Options (**General tab) and check the "Flip (Left to Right) Exam View" box.

Our predefined series may not always provide an exact match for the type of examination you need to perform. In these cases, edit the series to fit the exam.

5.5.1. Edit

Edits the series for the current CDR DICOM exam.

(Accelerators: Alt + S, E) (Shortcut: Ctrl + E)

To change a series, use the Edit Series button in the New Exam dialog box (if you are creating a new exam), or use the Edit menu item in the Series menu.

To edit a series when creating a new exam:

1.   Start a new patient exam (**File** > **New Exam**)

2.   Enter patient information in the New Exam dialog box

3.   Use the scroll bar to review the series available. Click on a series to select it

4.   Click **Edit Series** to customize the series. Click **OK** when finished

5.   To use the edited series, click **OK** to close the New Exam dialog box

To edit a series for a currently open exam:

1. Click on the **Series** menu and select **Edit** to customize that series for the current exam.

2. Click **OK** when finished.

> Please Note: You cannot edit a series after images have been taken except by detaching the images, changing the series, and then restoring them in the CDR Administration Utility.

5.5.2. Select

Select a new series for current and / or new exams.

(Accelerators: Alt + S, S)

To modify a default series template:

1. Click on the **Series** menu and choose **Select.**

2. In the Series Template dialog box, the series shown in *gray* is the default series (which may or may not be the <u>current</u> series). A default series is the first series listed for that acquisition mode in the New Exam dialog box.

3. Select the default series and modify it using the Edit and / or Order buttons.

4. Clicking **OK** at the Edit and Order dialog boxes edits the default series, even if you choose not to **Use** those changes in the current series by clicking the **Close** button.

To modify any series template:

1. Click on the **Series** menu and choose **Select.**

2. In the Series Template dialog box, any series shown in *white* is a non-default series. (It may or may not be the <u>current</u> series.)

3. Select the series and modify it using the Edit and / or Order buttons.

4. Clicking **OK** at the Edit and Order dialog boxes edits the default series, even if you choose not to **Use** those changes in the current series by clicking the **Close** button.
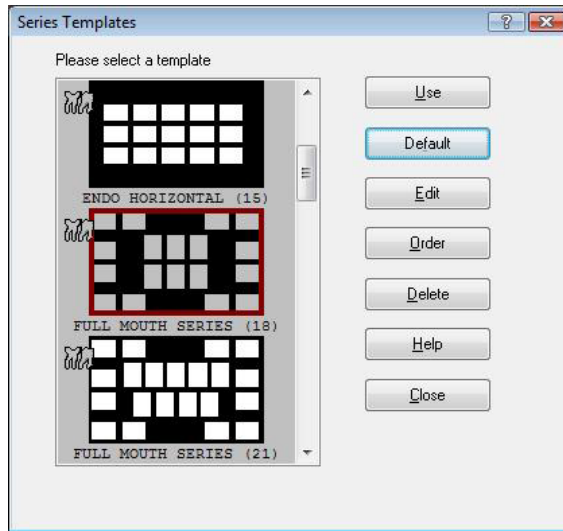
(Gray series template – default:

pre-selected series in New Exam dialog box)
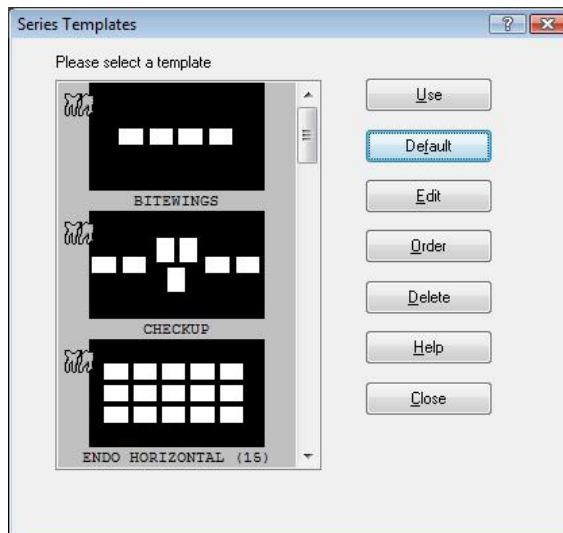
(White series templates –

all other series available in CDR DICOM)

5.5.3. Order

Sets the sequence of view boxes; in other words, the order in which X-rays are taken.

(Accelerators: Alt + S, O)

The view box order can be set at anytime -- either before you start taking X-rays (when the exam is empty), or during the exam (after you have taken any number of images). Since every series in CDR DICOM uses a default sequence to start, you can always choose to follow that sequence and not modify the order at all.

If you decide to change the order of view boxes, selecting the **Order** option from the **Series** menu will display a dialog box showing each view box and its number in the sequence. Just click on a view box to change the number.

As a reminder while resetting the sequence, view boxes will be outlined in red so you know you've changed the order for that particular box. You can choose to change the view boxes one at a time, or use the reset buttons on the dialog box to change all the view boxes at once.
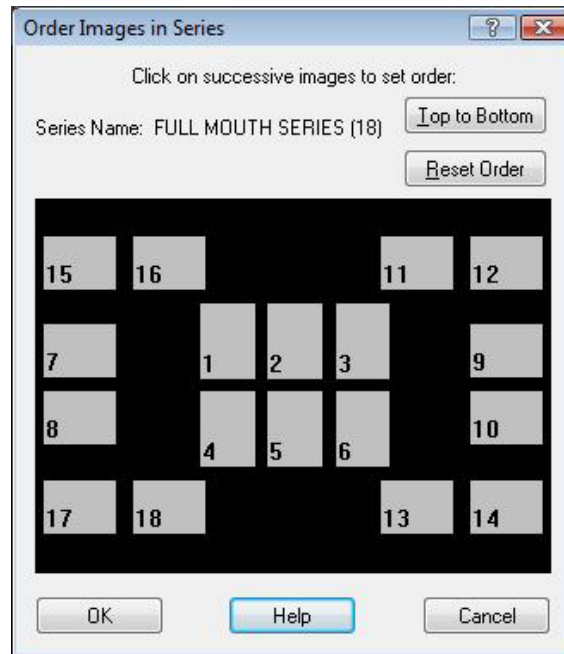

Figure 23. Order Dialog Box

5.5.4. Flip

Changes the arrangement of view boxes by creating a "mirror" view of the exam -- view boxes on one side of the Exam window are moved to the opposite side.

(Accelerators: Alt + S, F)

There are two ways to view the orientation of images on the screen: the default (normal orientation) and the alternate (flipped left / right orientation).

When viewed in the default orientation, images in a standard full mouth series appear on the screen as if you were facing the patient. The patient's right appears on the left side of the screen; the patient's left, on the right side of the screen.

Using the "flip" option, the images are re-positioned so that the patient's left is now on the left side of the screen and the patient's right is on the right side of the screen.

Figure 24. Series (Normal View) and Series Flip

5.5.5. Reload

Sends a new query to the database to "refresh" the contents of the current exam.

(Accelerators: Alt + S, R)

Reload can be used at anytime during the current CDR DICOM session, but is most useful in the following examples.

Example 1: In an office equipped with several operatories, certain resources may be shared among several workstations. In this setup, it is possible that the same exam could be open in one or more of these workstations at the same time. If this is the case and the exam is modified at one workstation, **Reload** enables all the other workstations to view updates in that exam.

Example 2: New images are being added at an X-ray station, while another user (perhaps a dentist at a viewing workstation with the same

exam open) wishes to see those images as well. By clicking on **Reload**, the dentist's local version of CDR DICOM queries the server, searches for any changes in the current exam, and reads them into the exam.

Reloading is more efficient than closing and reopening an exam, which would be the alternate approach for reading new changes in an exam since the last time it was opened.

5.5.6. New Intra-oral Series (Standard and Grid)
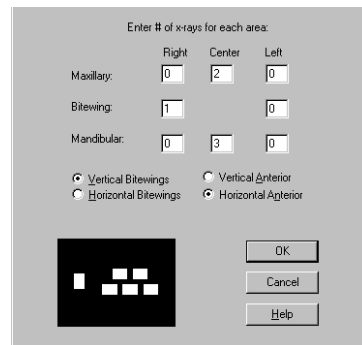
Creates new standard or grid series for intra-oral X-rays.

(Accelerators: Alt + S, I)

A **standard series** can be customized for the most flexibility in setting up view boxes by image type (bitewing, mandibular, maxillary), position (right, left, center), and orientation (vertical or horizontal).

A **grid series**, which is common to endodontic dentistry, can be customized so that all the images in a particular area are oriented in the same direction. For example, if you choose Right Bitewing as the type for horizontal view boxes, all Right Bitewings in this exam will be oriented horizontally. The same is true of verticals.

When several images of a specific region in the mouth are required, creating a grid series provides an efficient way to ensure exact coverage by selecting view boxes that are all oriented either vertically or horizontally.

When a new series is created, it can be used with any new patient. A new series can also replace the current series in an open exam.

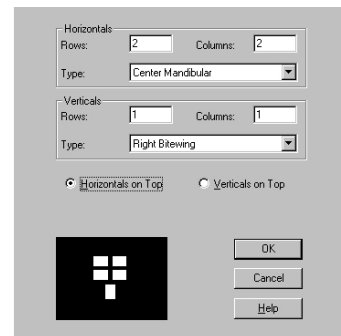| Standard Series Setup	Grid Series Setup

5.5.7. New Video Series

Creates new series for intra-oral video images.

(Accelerators: Alt + S, V)

CDR DICOM can capture video in an intra-oral X-ray series, but using **video series** for video images helps you organize your different types of CDR DICOM exams.

For example, when you create a video series, CDR DICOM makes it easy to find that series the next time you want to use it. When starting a new exam for a patient, scroll down the list of available series and select an appropriate video series.

Video Series Dialog Box

5.5.8. New Panoramic Series

Creates new series for panoramic images.

(Accelerators: Alt + S, P)

Although CDR DICOM can capture panoramic images in an intra-oral X-ray series, using a **panoramic series** for panoramic images helps you organize your different types of CDR DICOM exams.

For example, when you create a panoramic series, CDR DICOM makes it easy to find that series the next time you want to use it. When starting a new exam for a patient, scroll down the list of available series and select an appropriate panoramic series.
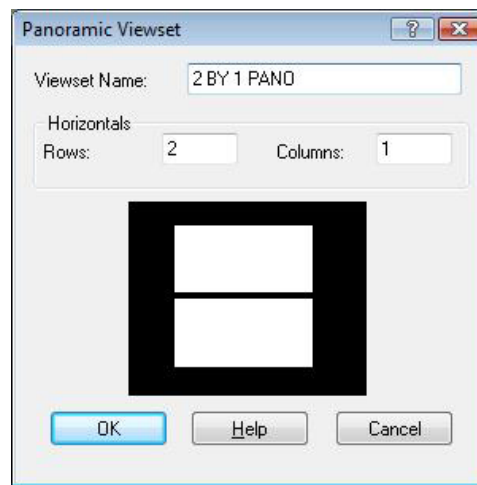
5.5.9. New Cephalometric Series

Creates new series for cephalometric images.

(Accelerators: Alt + S, C)

As with other series described previously, a **cephalometric series** helps you to organize the different types of imaging exams in CDR and to use them quickly and easily.

As with all acquisition modes in CDR DICOM, the imaging hardware must be connected and the imaging software (CDR DICOM, for example) must be ready to capture an image. Creating a new series supplies the "layout" or "look" of an exam, but the required resources for imaging still need to be present to acquire an image in that series.

Panoramic Series Dialog Box
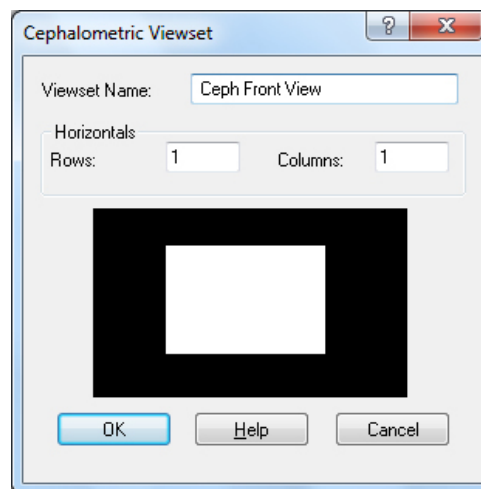
Cephalometric Series Dialog Box

5.6. Print Menu

5.6.1. Print Set

Prints all the images in a patient exam.

(Accelerators: Alt + P, P) (Shortcut: Ctrl + P)

To print all the images in an exam, select the **Print Set** option from the **Print** menu, or click on the **Print Set** button, or press the <Ctrl + P> keys. You also have the option of including patient, dentist, and exam information on the printed copy.

Exams are printed in landscape orientation, show only view boxes with images (empty view boxes are disregarded), and include exam comments (if any were added).

Occasionally, you may need to print images from several different exams. In this situation, copy and paste the images into a single exam and then select the **Print Set** option. This will print each image and the date it was acquired. Click the Print Dates checkbox on the Print Dialog Box to include/suppress exam dates in the printed copy. Not including exam dates will enable images to print about 20% larger.

5.6.2. Print One

Prints the last saved version of the current image.

(Accelerators: Alt + P, O)

To print the last saved version of an image, highlight the image in the Exam window, and then select the **Print One** option from the **Print** menu. You also have the option of including patient, dentist, exam, and image information on the printed copy. When printing with this option, the image can be shown at 100% or scaled to fit the printed page.

To print the current image, including any enhancement effects, *even if you have not saved them yet with the image*, select **Print** from the **File** menu of the Zoom window. In addition, line measurements, numbered flags, global notes, text annotations (SkyWriter) or local enhancement (Flashlight) will also be printed with the image. You can also choose to include patient and dentist information by adding a checkmark to the appropriate box on the Print dialog box.

5.6.3. Add Report

Creates a Microsoft Word report or new template.

(Accelerators: Alt + P, A)

Creating a New Report

1. Open an exam in CDR DICOM. Choose the images you want to include in the report by selecting one image at a time. The order in which the images are selected determines where the images appear in the report

2. Click on the **Print** menu, **Reports**, and then on the particular report style you want to use. Word creates a report based on the template style, and the patient's name, X-ray images, and dates are all automatically copied into the report

3. At Word's **File** menu, click **Print** to print the reportSince your report was based on a template, Word will prompt you to save changes to the **report**. **(The template remains unchanged.)**

4. Word will open the Save dialog box so you can choose to save the report just as you would any document created in Word

Creating a New Template

1. Start CDR DICOM. At the Print menu, click **Add Report** > **New Word Template Report.**

2. Word opens a blank template (BLANK.DOT).

3. Start entering the text portion of your template. Use the special toolbar provided with BLANK.DOT to add First Name, Last Name, and Exam Date to the appropriate places in text. Use the **Insert Image** button on the special toolbar to select the image order and orientation.

4. When you click on the **Insert Image** button, the dialog box is displayed. The *Image #* box refers to the order (starting with number 1) in which images are selected in CDR DICOM. Select the *Orientation* of the image box by clicking either the vertical or horizontal checkbox. Select whether you want the *Exam Date* to appear below the image.

5. When finished, click on **File** > **Save As** and then enter a name for the template. To create a report based on the new template, click **Print > Reports** and then browse for the template.

5.6.4. Organize Report

If you've decided to create new templates for CDR DICOM, you may find organizing them helpful. You can include these templates in their own folder or add them individually. How you group them under the Reports folder determines how they appear when you open the **Print** > **Reports** menu to display the templates.

(Accelerators: Alt + P, G)

Organizing Templates

1. In CDR DICOM, click on the **Print** > **Organize Reports.**

2. CDR DICOM opens a Explorer window showing the default location of the Reports folder and any subfolders listed below it. Please note that you can only organize the templates stored in this location.

3. To add a new folder, click on the Explorer's **File** > **New Folder**. When the new folder appears, type in a name for it.

4. To move a template into a folder, click on the file, and then, with the left mouse button pressed down, drag and drop it to the folder you want. Release the button.

5. To verify your changes, click on the **Print** > **Reports.**

5.6.5. Reports

Lists the templates available in the CDR DICOM Reports folder.

The default location of the Reports folder is defined during the CDR DICOM software setup process, but you can also verify the location by checking the Directories tab in the **System** > **CDR Options** menu.

5.7. System Menu

5.7.1. Sensor Info

Provides information on the currently connected Sensor.

(Accelerators: Alt + Y, I)

Sensor Info includes the currently connected Sensor serial number, the size of the Sensor, and the date of the Sensor's calibration file. If no Sensor is connected, "Unknown" is displayed for each of these items. If for CDR DICOM cannot find the calibration file for the current Sensor, the calibration file date will be listed as "Unknown."

Checking the Sensor information is important during troubleshooting. If images cannot be acquired, verify that the calibration file for the currently connected Sensor is installed on your system. If the correct calibration file is installed (the date of the calibration file is listed on the Sensor Information dialog box), but you continue to experience problems with taking X-rays, additional troubleshooting is indicated.

One of the first places to look for the cause of the problem is the computer-to-Sensor connection. If the cables between Sensor, Remote Module, and computer are secure, but CDR DICOM does not detect the Sensor, the problem may be along the path between the Sensor and the computer. Additional troubleshooting would be needed to localize the cause of the error, but this simple check may eliminate some obvious factors.

When several Sensors are used on the same workstation, their serial number, calibration files, and calibration file paths can be found in **System** > **X-ray Settings** (Calibration tab).
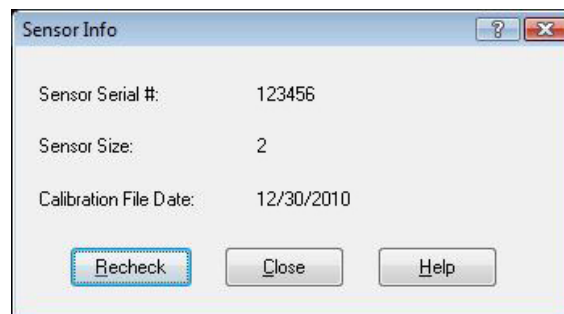
Figure 25. Sensor Dialog Box

5.7.2. Setup Dentist Info

Adds dentist information to reports and mailed exams.

(Accelerators: Alt + Y, D)

Dentist information can be included with CDR DICOM reports and as part of the text supplied with CDR DICOM Mail messages. It can also be hidden during report printing or deleted before images are mailed. In dental practices where several associates are resident, this option is an easy time-saver, eliminating the need to re-enter dentist information.

Unlimited sets of dentist information may be stored in CDR DICOM, although only one set may be selected at any time.

Inside the Dentist Information dialog box, you have the option to edit, add, copy and delete information. Information to be deleted should be double-checked since there are no prompts prior to deletion
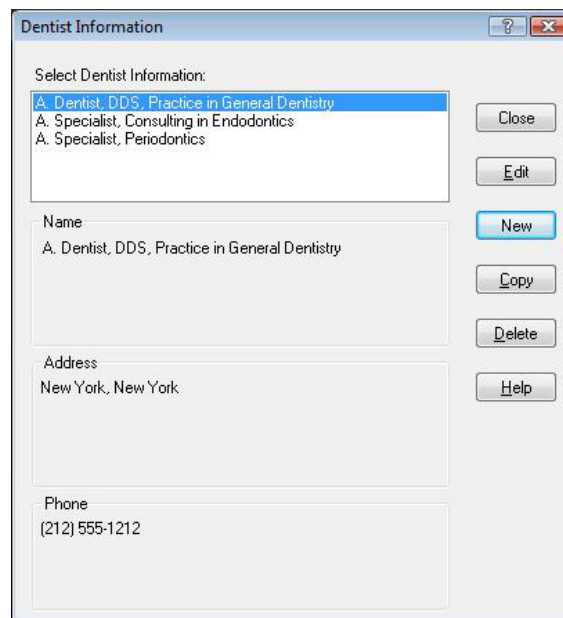
Figure 26. Dentist Information Dialog Box

5.7.3. Define Note Shortcuts

Instantly recall and apply relevant information when evaluating images. Shortcuts can be used in a variety of ways – to mark a condition that is encountered often in the practice or a recommendation that is used frequently.

(Accelerators: Alt + Y, N)

The **Define Note Short-Cuts** dialog box (**System** > **Define Shortcuts**) is the starting point for setting up the shortcuts and reviewing or changing them. When the dialog box appears, it lists all the currently defined shortcuts (if any).

- Clicking Edit displays the note text.

- Clicking New displays a blank text box.

- Clicking Delete removes the note text. Although there is no prompt prior to deletion, CDR will ask whether you wish to save changes at the end of the note editing session. Clicking **Cancel** discards any changes or deletions made during that session
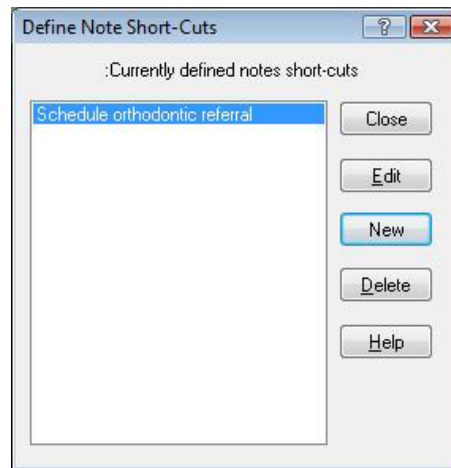
Figure 27. Note Shortcut Dialog Boxes

5.7.4. CDR Options

Contains the settings for the acquisition, display, printing, and storage of X-ray and video images in CDR DICOM. A complete description of options is provided in the CDR DICOM help file.

(Accelerators: Alt + Y, O)

By selecting CDR Options, a dialog box with several tabs is displayed. Each tab covers a different aspect of CDR DICOM, and related settings are enclosed in groups that contain checkboxes or lists.

Information about currently connected hardware (intraoral sensor or intraoral camera, panoramic or cephalometric X-ray machine, or TWAIN device, like a scanner), and configurable settings for the acquisition mode, can be found by selecting one of the modes listed below and clicking on either Hardware Info or Properties.

- X-ray – Intraoral X-ray modality (IO)

- Video – External Camera modality (XC)

- Panoramic – Panorex modality (PX)

- Scanner – Other Type modality (OT)

- Cephalometric – Ceph modality (DX)
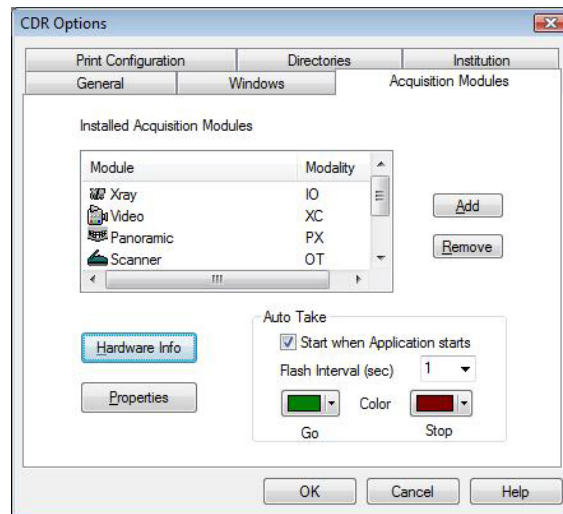
Figure 28. CDR Options Dialog Box

5.8. Window Menu

5.8.1. Tile / Stack Images

Tiling and stacking display selected images in a non-overlapping arrangement.

(Accelerators: Alt + W, T [for Tile], S [for Stack])

When you open two or more images, it is possible to tile them so you can see all of the images at once on your display. You can also control the tiling arrangement. To use the tiling feature, select two or more images from the current exam and select a tiling option from the Windows menu or from the Tile icon down arrow on the toolbar.

There are three tiling options: Tile Vertical, Tile Horizontal, and Tile Multiple. If you choose Tile Vertical, the images will appear one below another. In Tile Horizontal, the images are displayed side-by-side. The Tile Multiple option orders the images automatically to optimize their viewing.

NOTE: If you intend to tile images, open each image from the Exam window: do not use the thumbnail exam on the Zoom window. Using the mini-exam window "recycles" images in the same Zoom window. Tiling requires at least two images, each in its own Zoom window.

How can you tell how many images are open at one time? One way is to check your Windows taskbar, found usually at the bottom of your Windows desktop. Each time an image is opened in CDR DICOM, a button is placed on the taskbar.

When images are tiled, they are resized to fit inside the Exam window. As the number of tiled images increases, the size of each image – how large it appears in the Zoom window – decreases. This is important to remember since opening too many images at the same time will make them difficult to see even with the tile feature active. Selecting **Hide Extras** from the **Window** menu of each Zoom window provides some extra space for each image.

When images are stacked, it easy to page through them at full size. Stacking image is similar to having them in a book with one image on top of another. To move from one stacked X-ray to the next, use the <Page Up> and <Page Down> keys. Stacking X-rays works best when it is necessary to work with several images, full size, at the same time. All buttons and menu features are available for stacked X-rays.
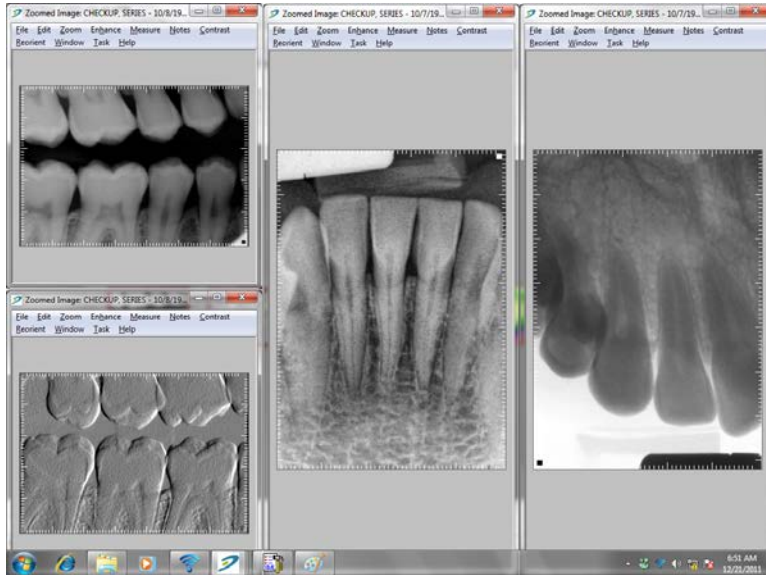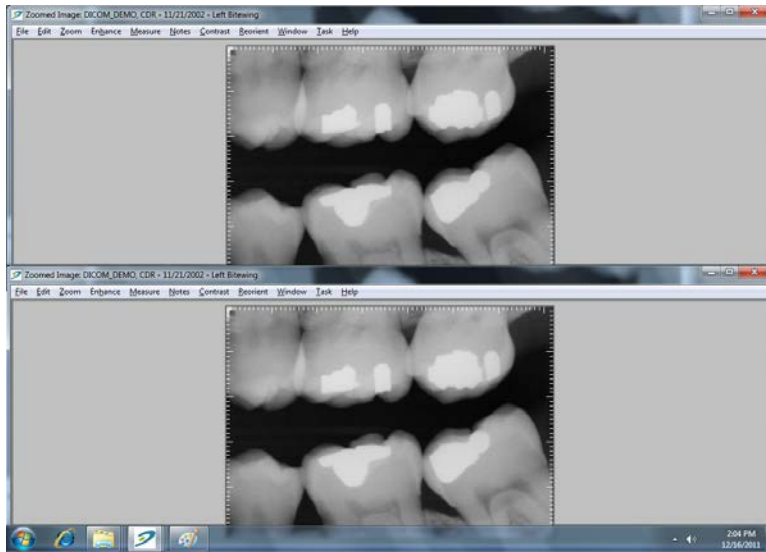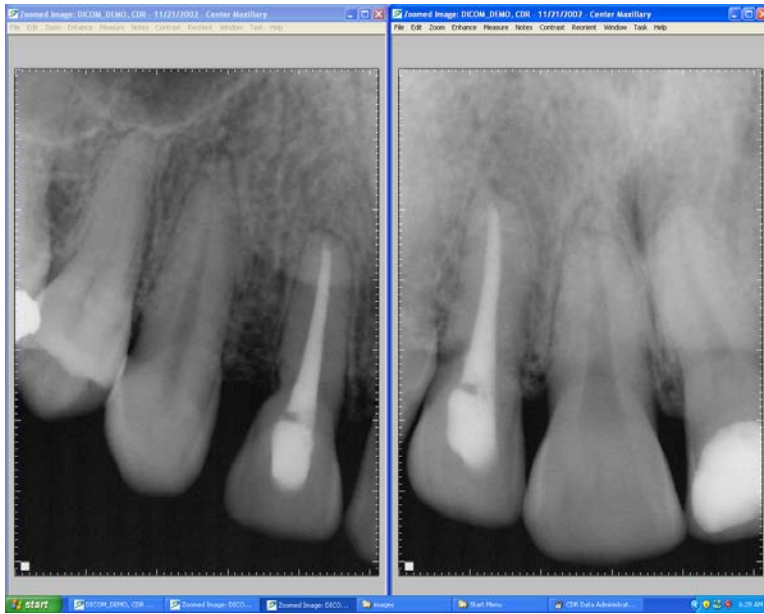
Figure 29. Tiling Options (Vertical and Multi-Tile)

Figure 30. Tiling Options (Horizontal)

5.9. Help Menu

5.9.1. Contents

This menu item opens the help files for CDR DICOM software. Help files are designed to provide quick access to information about the various features and options in CDR DICOM software.

Pressing the <F1> key or the Help toolbar button launches the help file (selecting the Contents item from the Help menu does the same). In addition, many dialog boxes and property pages in CDR DICOM are associated with specific topics in the help file and can provide appropriate information by pressing the <F1> key or the Help button on the dialog boxes themselves.

5.9.2. CDR DICOM on the Web

This menu item links directly to a specific support area on the Schick by Sirona website for CDR DICOM. This area contains a range of topics, including updates, that may be of interest to customers. Links to documentation and other resources can be found here also.

5.9.3. About CDR DICOM

This menu item displays version information about your CDR DICOM software. Version data would be typically requested by service personnel in the event you required assistance with CDR DICOM software, so it is important to know where to find this information.

The "Help About CDR DICOM" window also contains the name and company information you entered during the installation process and product type and key information.

Chapter 6
Zoom Window Menus

What You'll Read About in this Chapter —

- Saving and Retaking Images

- Enhancing Images

- Measuring Images

- Evaluating Exposures

- Adding Notes

- User Profiles and Tasks

6. Zoom Window Menus

6.1. File Menu

6.1.1. Save Image

Saves the current image and any changes that were made to it during the current CDR DICOM session.

(Accelerators: Alt + F, S)(Shortcut: Ctrl + S)

6.1.2. Retake

Takes a second X-ray to compare with the current one.

(Accelerators: Alt + F, R)

Select **Retake** from the **File** menu or click on the **Retake** toolbar button. After you take the second X-ray, CDR DICOM displays both images, side-by-side, for comparison. After reviewing the X-rays, accept one image, which will appear in the Exam window.
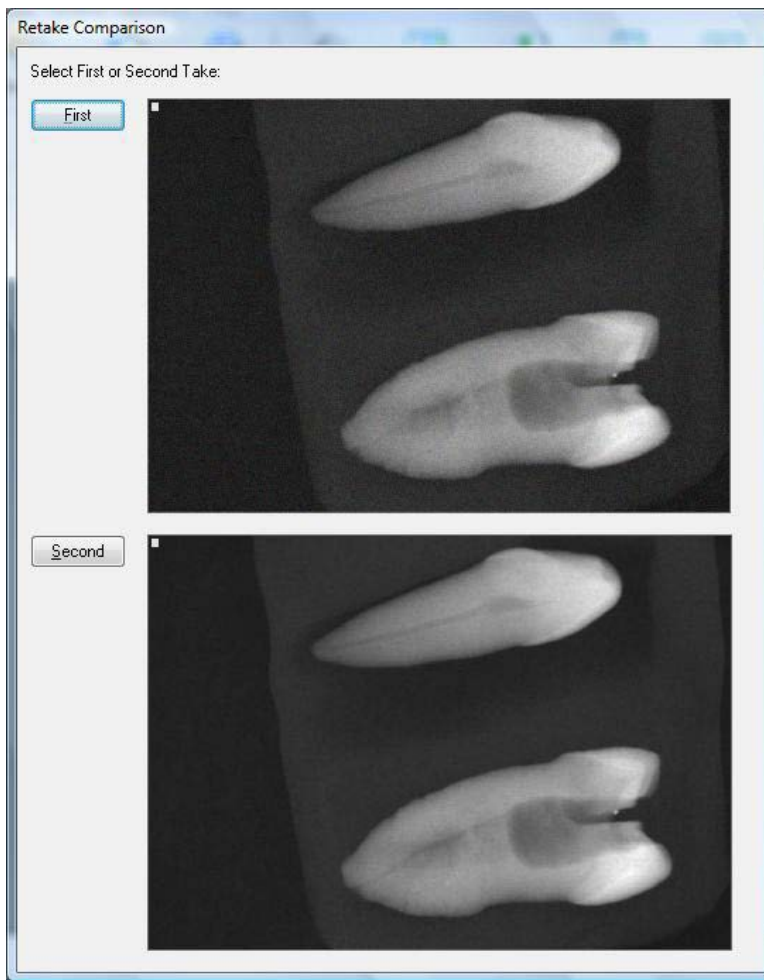
Figure 31. Retake Comparison Display

6.1.3. Print

Prints the current image in the Zoom window.

(Accelerators: Alt + F, P) (Shortcut: Ctrl + P)

The printed image will reflect the enhancements and options applied in the Zoom window (contrast, colorize, etc.). These changes will appear on the image in the printed report even if the changes themselves were not saved yet. You also have the option of including patient, dentist, exam, and image information on the printed copy.

6.1.4. Close Window

Closes the Zoom window.

(Accelerators: Alt + F, C) (Shortcut: Ctrl + Q)

Select **Close Window** from the **File** menu or click on the **Exit** toolbar button. If the image was enhanced in any way, you are prompted to save those changes or discard them.

6.2. Edit Menu

6.2.1. Undo / Redo / List All Changes.

Keeps track of all changes to an image (**List all changes**), and can be used to remove them (**Undo**) and re-apply them (**Redo**).

(Accelerators: Alt + E, U [for Undo], R [for Redo], L [for List All Changes])

Changes are undone one at a time and every enhancement change that was applied to an image can be removed and re-applied. The date and the time the changes were made are also listed in the dialog box
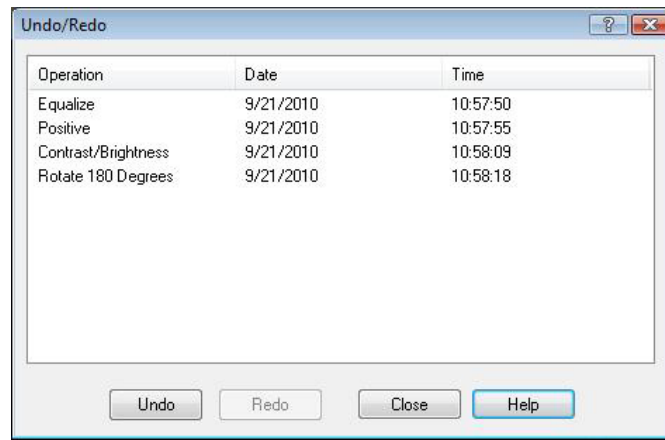
Figure 32. Undo/Redo Menu and Dialog Box

6.3. Zoom Menu

6.3.1. ZoomMode / Zoom In 2x / Zoom Out 2x / Zoom Full

Magnifies the entire image, using either pre-set or user-defined settings.

(Accelerators: Alt + Z, Z [for Zoom Mode], I [for Zoom In 2x], O [for Zoom Out 2x], F [for Zoom Full]) (Shortcuts: Ctrl + Z [for Zoom In 2x], O [for Zoom Out 2x], F [for Zoom Full])

The Zoom tool supports pre-defined settings to magnify an image to 500% or to return it to original size, using just double-mouse clicks when Zoom mode is selected. Zoom is the default mode in the image window, so these actions can be performed immediately.

To use pre-defined Zoom settings, perform the following steps:

1. Move your cursor over any area of the image in the CDR Zoom Window you wish to magnify.

2. Using the left-mouse button, double-click to magnify the image to 500%.

3. Double-click again to return the image to 100%.

Adjusting the zoom levels manually, from 20% to 3000%, is also available. To magnify the image manually, perform the following steps:

1. Move your cursor over an image in the CDR Zoom Window.

2. Press the right-mouse button to open a short menu.

3. Select Zoom.

4. Press down and hold the left-mouse button, which changes the Zoom icon to a two-arrow cursor.

5. Keeping the mouse button depressed, move the cursor in an upward direction to increase the zoom level.

6. Keeping the mouse button depressed, move the cursor in a downward direction to decrease the zoom level.

Zoom remains active until another tool (like Pan or Brightness / Contrast) is selected.

6.3.2. Pan Mode

Provides navigation inside the image at any zoom setting.

(Accelerators: Alt + Z, P)

The Pan tool is used with Zoom, enabling inspection of adjoining areas of a magnified image at the same magnification.

To pan around the image, perform the following steps:

1.   Move your cursor over an image in the CDR Zoom Window.

2.   Press the right-mouse button to open a short menu.

3.   Select Pan.

4.   Press down and hold the left-mouse button, which changes the Pan icon to a four-arrow cursor.

5.   Keeping the mouse button depressed, move the cursor either up/down or left/right to pan around the image.

Pan remains active until another tool (like Zoom or Brightness / Contrast) is selected.

6.3.3. SkyWriter

Provides a freehand drawing tool to annotate an X-ray.

(Accelerators: Alt + Z, S)

You have the option of selecting line width and color and can even change the color of the annotations once you've added them to the image. You can draw using any color in the Windows palette, which will apply to all annotations on that image. After they are applied, annotations can also be hidden (by turning them off) or removed completely (by erasing them).

Like other enhancement changes, annotations can be saved with the image and viewed again when the image is retrieved. When you print the image, annotations will also appear on the printed page unless you choose to hide or erase them.

SkyWriter can also be used with other Zoom window enhancements to provide a customized and printable record of the image. For example, draw a circle around a particular area of interest on an image, and then add notes to provide additional text. (If annotations are hidden momentarily, just click on the **SkyWriter** toolbar button to display them again.) Turn on Flashlight to further enhance the region and adjust the contrast and brightness settings, if needed. Print the image and each of these changes appear combined and visible on the printed copy.

To preset SkyWriter options, click **System** > **CDR Options** > **Zoom Window Settings** (General tab).
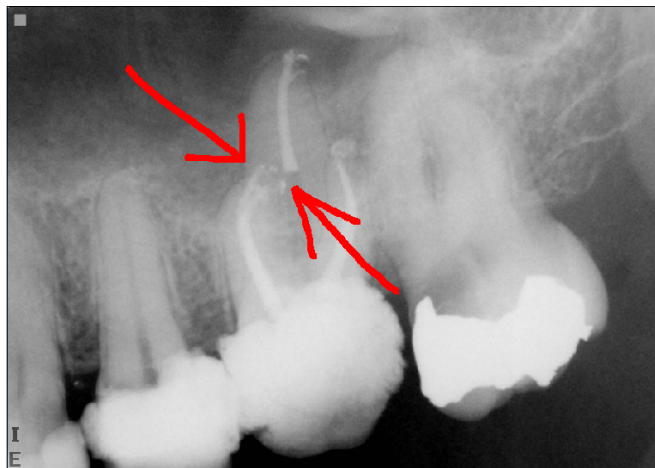
Figure 33. Using SkyWriter

6.4. Enhance Menu

6.4.1. Revealer

Displays X-rays at a greater level of detail than Maximize Contrast and maintains that clarity with minimal noise and artifacting. *(Revealer is most effective on images taken with CDR Sensors and unenhanced images taken with Schick Elite Sensors.)*

(Accelerators: Alt + Z, S) (Shortcut: Ctrl + R)

Unlike other image contrast tools that sacrifice mid-tone values in an image, Revealer takes the large volume of data in an X-ray and enhances it pixel-by-pixel. By processing each pixel individually, Revealer is able to capture more visual information and display it so that subtle differences in the image can be discerned more easily. The enhancement process begins automatically when you click on the **Revealer** button or select **Revealer** from the **Enhance** menu.
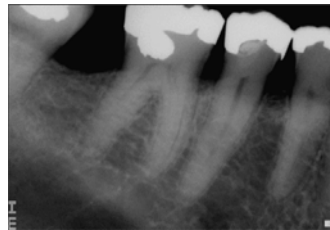
Before Revealer   After Revealer

Figure 34. Using Revealer

6.4.2. Colorize

Applies a color layer by mapping 8-bit grayscale pixel values to a 24-bit color range.

(Accelerators: Alt + H, C) (Shortcut: Ctrl + C)

Because some differences can be easier to distinguish in color, colorizing provides another means to identify potential dental problems during exams. Click on the **Colorize** button or select **Colorize** from the **Enhance** menu. Then use the contrast and brightness sliders to modify the color.
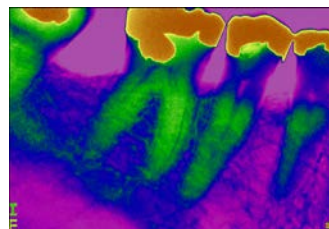
Before Colorize   After Colorize

Figure 35. Using Colorize

6.4.3. Positive

Inverts the gray shades of the image – negative images appear as positive, and positive images as negative.

(Accelerators: Alt + H, P)

Click on the **Positive** button or select **Positive** from the **Enhance** menu. Clicking the button toggles the feature on and off, as does selecting and deselecting the menu item.
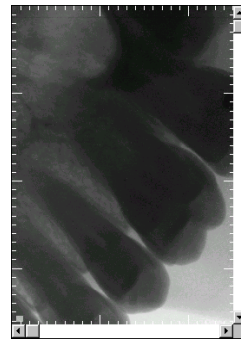
Negative   Positive

Figure 36. Using Positive

6.4.4. Sharpen

Applies an edge filter to the entire image.

For Schick 33 images, a Sharpen slider is available to optimize Schick 33 images for detail and contrast.

(Accelerators: Alt + H, S)

Select **Sharpen** from the **Enhance** menu. To increase sharpness, choose the enhancement again.
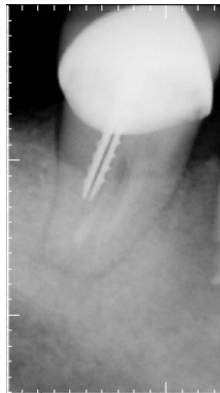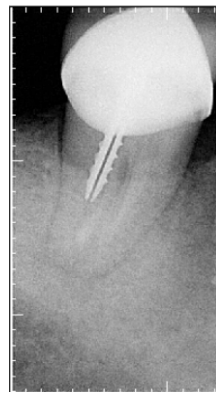
Before Sharpening   After Sharpening

Figure 37. Using Sharpen

6.4.5. Spot Remover

Removes fixed pattern noise from an image.

(Accelerators: Alt + H, R)

First, click **Positive** from the toolbar to change the negative image to a positive. (If the image is already positive, begin with the next instruction.) Second, select **Spot Remover** from the **Enhance** menu to remove the noise (spots) from the image. Then, click on Positive to revert the image to its negative. If the spots were caused by fixed pattern noise, they should have been removed.

To make sure the calibration file is installed, go to the **System** menu and select **Sensor Info**. Check the Sensor serial number and the Calibration File date. If the Calibration File Date reads "Unknown" it means that the file is missing or is not in the location CDR DICOM expects to find it. To correct the problem, re-connect the Sensor, restart CDR DICOM, and check Sensor info again

NOTE A: Missing Calibration File. (Lines can also be horizontal, have different lengths, and appear more than once on an image.)

NOTE B: Fixed Pattern Noise. (White pixels on negative image.)
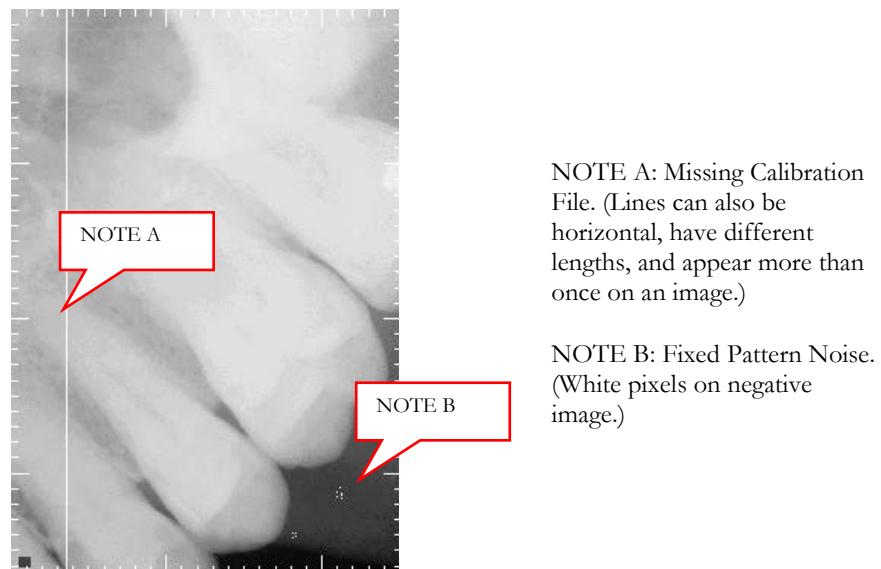
Figure 38. Using Spot Remover

6.4.6. Equalize

Stretches the contrast of an image, and can be used to enhance some light X-rays to produce darker, more discernible images.

(Accelerators: Alt + H, E)

Locate the darkest area of an image and measure some of the pixels using the **Pixel Value** tool in the **Measure** menu The values should be between 92 and 98% (black). If they are not, using the Equalize feature can help to improve the image.

To apply Equalize, click on the **Equalize** button or select **Equalize** from the **Enhance** menu. When used appropriately, this feature can be a valuable tool for exposures where the darkest pixels are not all black.

NOTE: If all images are underexposed, increase the settings on the X-ray source so that the darkest areas of an image are nearly all black. Equalize should not be used to routinely compensate for underexposed images since they may become "pixilated" or "noisy" after applying this feature, As with film, exposures in different areas of the mouth may require different X-ray settings

6.4.7. Emboss

Applies a relief filter to an X-ray, giving it a three-dimensional appearance.

(Accelerators: Alt + H, B)

Select **Emboss** from the **Enhance** menu. The emboss filter traces the edges in an image and distinguishes between foreground and background layers. Emboss raises the foreground layer, giving the image its three-dimensional look. Emboss can be applied more than once to an image, but in most cases applying it once or twice is sufficient.
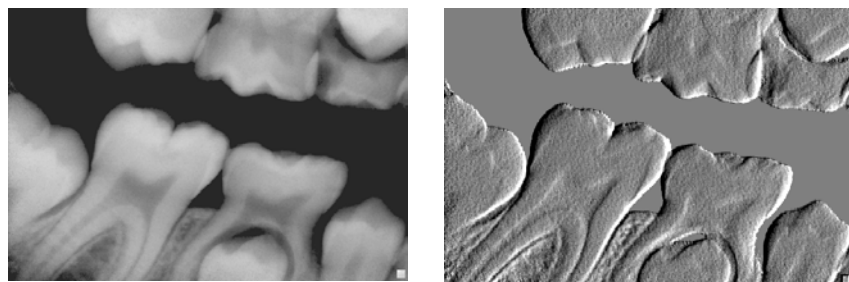
Before Embossing

After Embossing

Figure 39. Using Emboss

6.4.8. Highlight

Emphasizes areas on the image that share the same pixel values. It is a valuable tool for determining the outline of particular areas in the image and for detecting potential problem areas.

(Accelerators: Alt + H, H)

Select **Highlight** from the **Enhance** menu. The Highlight scroll bar appears and the cursor changes to a paint bucket as you move it over the image.

Click on a pixel in the area of the image you want to highlight. A color palette appears from which one color can be selected.

After selecting the color, All pixels with that value will appear on the image in that color. These steps can be repeated any number of times, each color standing for a particular item or area of interest
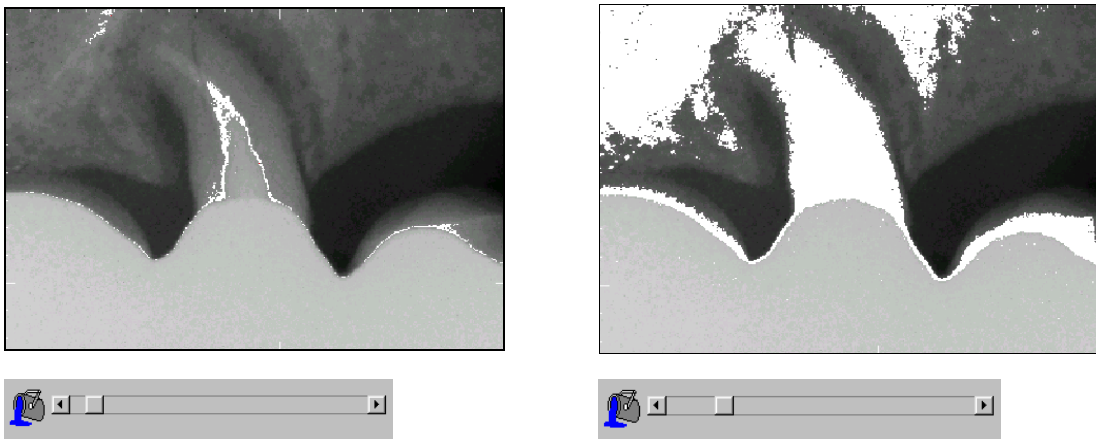
Figure 40. Using Highlight

6.5. Measure Menu

6.5.1. Pixel Value

Displays pixel grayscale values on the status bar.

(Accelerators: Alt + M, P)

Select **Pixel Value** from the **Measure** menu and then navigate anywhere on the image. The pixel value at that point appears on the status bar.

Pixel values are measures of density, so if the density of the area being X-rayed is relatively high (bone for example), pixel values will be in the low-to-medium grayscale range. When X-rays travel through areas of low density (air for example) pixel values are much higher.

Knowing pixel values can help determine whether the exposure is dark enough for evaluation purposes. Darkest pixels should fall within the 92 to 99% range. If they fall below this threshold, retaking the image at a slightly higher exposure can improve the image quality and make it easier to distinguish contrasting areas.

Figure 41. Measuring Pixel Values

6.5.2. Distance

Straight Line

Measures the distance between two user-defined points and displays it on the status bar. To preset line color, text color, and text display options when using the Distance feature, click **System** > **CDR Options** > **Zoom Window Settings** (General tab).

(Accelerators: Alt + D, L)

On the **Measure** menu, select **Distance** and then **Straight Line**. Press and hold down the left mouse button to set a starting point and then continue to hold the button down until you reach the length you want to measure. When you release the button, the length of the line from point-to-point is displayed on the image and in the status bar. When you begin measuring a new line, the previous line disappears.

Use this option as a quick way to determine single line distances and when you require more precise measurements than those supplied by the grid pattern. Distances measured with the Straight Line option are rounded to the nearest tenth of a millimeter; in comparison, the Grid is a 1-millimeter pattern. Selecting **File** > **Print** from the Zoom window prints the image with the line measurement included
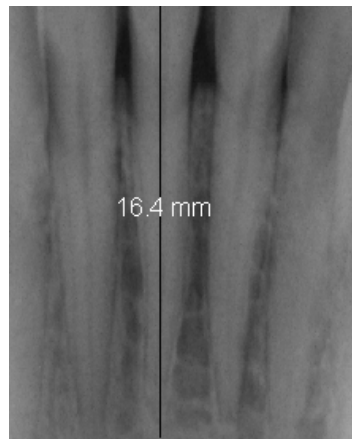
Figure 42. Measuring Straight Line Distances

Calibrate / Reset Calibration.

Sets or resets distance information in an image.

(Accelerators: Alt + M, D, C [for Calibrate], R [for Reset Calibration])

The Calibrate feature corrects distortion problems created by poor Sensor position, X-ray source misalignment, or other factor. To correct this problem, place an item of known length (such as an endodontic file) in the area being X-rayed. This item will provide a benchmark measurement once the image is acquired. Then, take an X-ray. *(For this discussion, we refer to an endodontic file as the item of known length.)*

On the **Measure** menu, select **Distance** and then **Calibrate**. Click the left mouse button to set a starting point parallel to the endodontic file and hold the button down until you reach the end of the file. When you release the button, the Distance Calibration dialog box appears. Enter the known length of the endodontic file in the text box.

Saving the image will save the new calibrated value, eliminating the need to recalibrate the image. When the image is re-opened, the saved value will be used as the baseline for all other measurements, including those for crowns, roots, and the distance for implants.

To clear the current settings for distance measurements select **Reset Calibration** from the **Measure** menu. Selecting **File** > **Print** from the Zoom window prints the image with the line measurement included
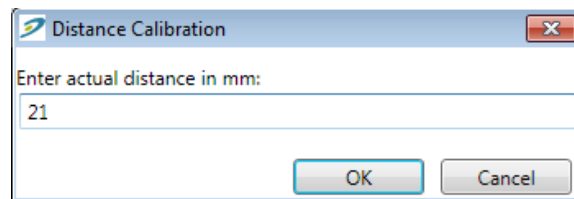
Figure 43. Distance Calibration Dialog Box

Multiple Lines and Angles

Measure the distance between multiple lines and the angle between two straight lines. (Although they are separate features, Multiple Lines and Angles are grouped together for this discussion.)

(Accelerators: Alt + M, D, M [for Multiple Lines], A [for Angles])

On the **Measure** menu, select **Multiple Lines** or **Angles**. Click the left mouse button the to set a starting point on the image. Move the cursor in any direction to draw the next line, and left click again to end that line. Continue that line or stop measuring by clicking the right mouse button.

The Multiple Line option is used primarily to measure lines with curved features *(for example, files and roots)*. When **Measure** > **Multiple Lines** is selected, at least two measurements are provided on the image and in the Multiple Line Measure dialog box. One is the distance of the last line and the other is the total of all line distances. Selecting **File** > **Print** from the Zoom window prints the image with the line measurement included. Angles can also be reported in the dialog box when the checkbox for that item is set.

When **Measure** > **Angles** is selected, the angle between the last two lines drawn, up to 180°, is displayed on the dialog box.
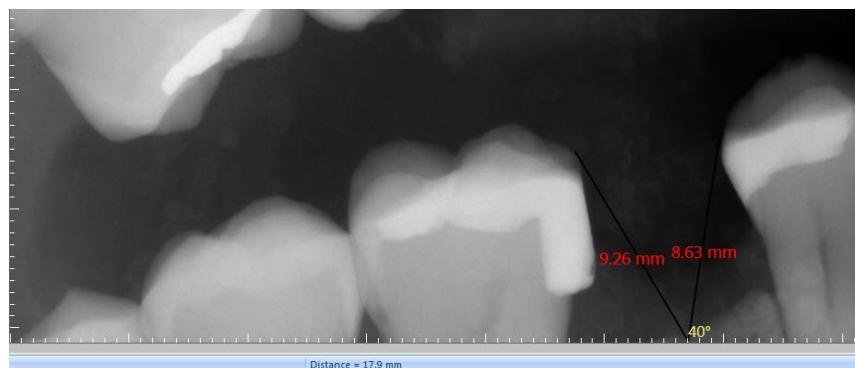
Figure 44. Measuring Multiple Line Distances and Angles

6.5.3. Grid

Places a grid overlay over the image.

(Accelerators: Alt + M, G) (Shortcut: Ctrl + G)

Select **Grid** from the **Measure** menu or click on the **Grid** toolbar button. The grid pattern, divided into 1 mm by 1 mm squares, appears over the image. To remove the pattern, click the **Grid** button again or select Grid from the **Measure** menu again. Grid is updated automatically when images are calibrated.

The grid can be used to get a quick, one-step view of distances on the image. When the dimensions of a small area are needed, using the grid overlay provides an accurate frame for that information. Selecting **File > Print** from the Zoom window prints the image with the grid pattern included.
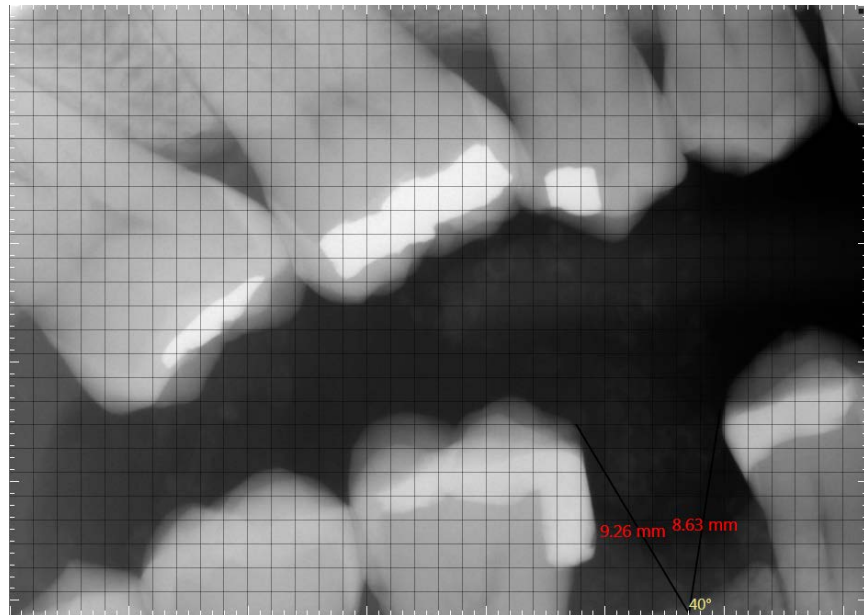
Figure 45. Measuring Distances by Grid Pattern

6.5.4. Density Profile

Display the grayscale value of every pixel along a vertical, horizontal, or user-defined line.

(Accelerators: Alt + M, H, H [for Horizontal], V [for Vertical]), L [for Line])

Select **Density Profile** from the **Measure** menu and select the style. For vertical and horizontal styles, click on any pixel in the image and CDR DICOM creates a density profile measuring every pixel along that line. For line profiles, click once in the image to mark the starting point for the line, then hold the button down and drag the line to a certain length. When the button is released, the profile is displayed.

Density profiles are useful for finding areas of pixels having similar grayscale percentages. This can be used to help determine the spread of areas affected by pathology and for finding other areas on the image with similar indications.

Like the other line measurement tools in CDR DICOM, the current image with the density profile included can be printed by clicking **File > Print** from the Zoom window.
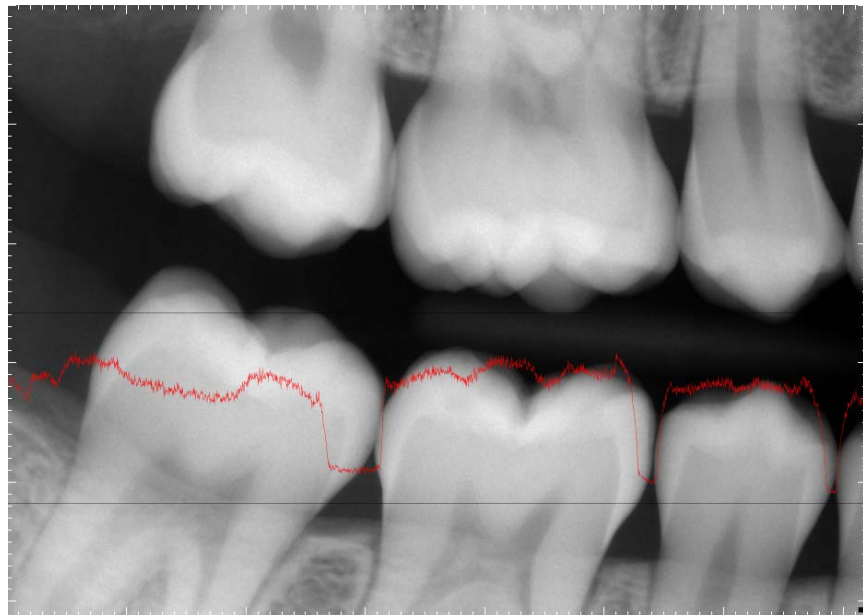
Figure 46. Horizontal Density Profile

6.6. Notes Menu

6.6.1. Adding Notes

Adds numbered flag notes to an image.

(Accelerators: Alt + N, I)

Flagged notes can be added whenever an image is open in the Zoom window. Select **Insert** from the **Notes** menu, which changes the cursor to an arrowhead. Clicking on the image displays the Insert New Note dialog box.

Inside the Insert New Note dialog box, the wording for the note can be added in any of the following ways:

- Note buttons (Caries, Abscess, Root Canal, and Filling)

- Note shortcuts

- Text you enter yourself.

Once the text of the note has been decided, clicking **OK** closes the dialog box, assigns (or increments) the number of the note, and saves the text. After they have been added to an image, flag notes will printed with the image and the note text will appear below the image area.
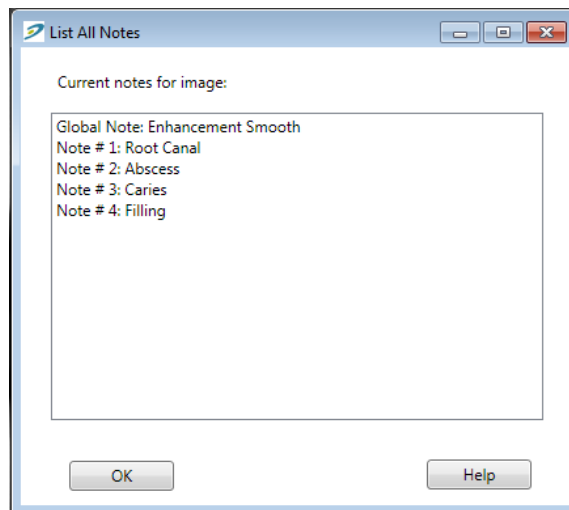
Figure 47. Insert Note Dialog Box

6.6.2. Hiding / Editing / Deleting Notes

Hides, edits, or deletes numbered flag notes on an image.

(Accelerators: Alt + N, H [for Hide], E [for Edit]), D [for Delete])

To momentarily hide flag notes that have been placed on an image, select **Hide Flags** from the **Notes** menu. To display them again, repeat the action.

To edit or delete specific notes, select **Edit** or **Delete** from the **Notes** menu. Position the cursor over the note flag and click the left mouse button. A dialog box appears (either **Edit** or **Delete**) with the wording of the note. The note can then be deleted or edited. *(The following samples are provided only for illustration and should not be used for diagnostic purposes.)*
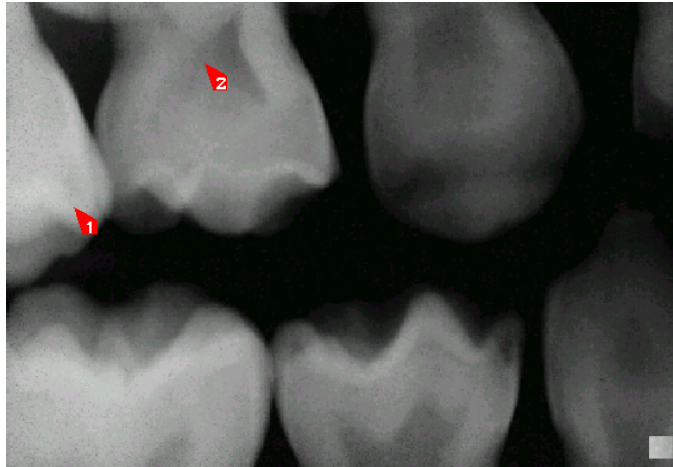
Image inside zoom window with two flagged notes
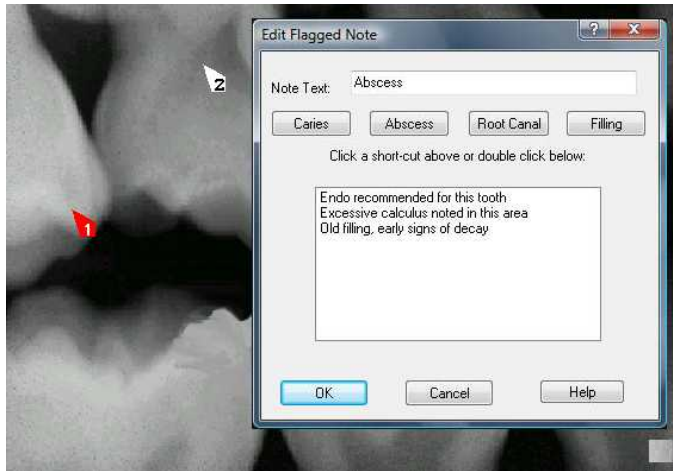
Flagged note #2 selected and ready to be edited
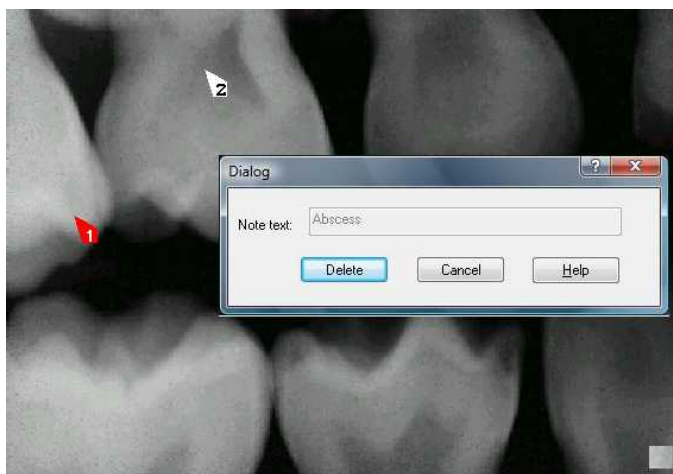
Flagged note #2 selected and ready to be deleted

Figure 48. Editing and Deleting Notes

6.6.3. Global Notes

Provide an easy way of getting information about an image without having to open it in the Zoom window.

(Accelerators: Alt + N, G)

To edit or delete specific notes, select **Global** from the **Notes** menu. When the dialog box appears, enter any note information you wish to add about the image.

In the Sample area (**Figure 49**), several notes have been added to an image. A global note is shown as it appears when the patient exam is opened in the Exam window. The global note is also shown in the List All Notes dialog box. In addition to the global note, a default note "Abscess" was used (Note #1) and two note shortcuts (Note #2 and Note #3) were also added.

Global notes appear under "Image Information" on the Exam window. After a global note is added to an image, the text will appear below the image when it is printed.

Global Note in Exam Window

Global Note in Zoom Window

Figure 49. Location of Global Notes

6.7. Contrast Menu

6.7.1. Increase / Decrease / Maximize Contrast

Changes image contrast.

(Accelerators: Alt + C, I [for Increase Contrast], D [for Decrease Contrast]),M [for Maximize Contrast]) (Shortcuts: Ctrl + I [for Increase Contrast], D [for Decrease Contrast])

Image contrast can be adjusted in two different ways:

- By moving the Contrast slider to the left (where the image approaches 100% gray) or to the right (where the image approaches 50% white, 50% black)

- By right-clicking on the image, selecting the Brightness/Contrast option, and moving the icon to the left or the right (with the same result as above).

To adjust image contrast using the second option, perform the following steps:

1.   Move your cursor over an image in the CDR Zoom Window.

2.   Press the right-mouse button to open a short menu.

3.   Select Brightness / Contrast.

4.   Press down and hold the left-mouse button, which changes the Brightness / Contrast icon to a two-arrow cursor.

5.   Keeping the mouse button depressed, move the cursor to the right to increase contrast. Moving the cursor to the left decreases contrast.

Brightness / Contrast remain active until another tool (like Pan or Zoom) is selected.

As image contrast is increased, there are fewer mid-range (gray) pixels and much clearer distinctions between black and white areas. As image contrast decreases, this distinction decreases. When image contrast is at a minimum, the image will appear entirely gray, as higher- and lower-range pixel values are mapped into the middle (half-black and half-white) range.

For maximum contrast, click the **Maximum Contrast** menu item.

To restore the contrast of an image to its original setting, click **Normal** from the **Contrast** menu. If you are adjusting Brightness and Contrast using the icon, double-click on the image to achieve the same result.

Contrast / Brightness sliders   Contrast / Brightness icon

6.7.2. Darken / Lighten / Normal Brightness

Changes image brightness.

(Accelerators: Alt + A, I [for Darken], L [for Lighten]),N [for Normal])
(Shortcuts: Ctrl + A [for Darken], L [for Lighten], N [for Normal])

Image brightness can be adjusted in two different ways:

- By moving the slider to the left (where the image approaches 100% black) or to the right (where the image approaches 100% white). When image brightness is maximized, all pixels are 100% white. When image brightness is minimized, all pixels are 100% black.

- By right-clicking on the image, selecting the Brightness/Contrast option, and moving the icon up or down (with the same result as above).

To adjust image brightness using the second option, perform the following steps:

1. Move your cursor over an image in the CDR Zoom Window.

2. Press the right-mouse button to open a short menu.

3. Select Brightness / Contrast.

4. Press down and hold the left-mouse button, which changes the Brightness / Contrast icon to a two-arrow cursor.

5. Keeping the mouse button depressed, move the cursor up to increase brightness. Moving the cursor down decreases brightness.

Brightness / Contrast remain active until another tool (like Pan or Zoom) is selected.

To restore the brightness of an image to its original setting, click **Normal** from the **Contrast** menu. If you are adjusting Brightness and Contrast using the icon, double-click on the image to achieve the same result.

6.7.3. Flashlight

Enhances or "illuminates" a specific area of an image.

(Accelerators: Alt + C, F) (Shortcut: Ctrl + B)

Clicking the **Flashlight** toolbar button turns on the feature with the large beam size as the default. Once the beam appears, right clicking on the image displays a menu so other beam sizes and enhancements can be selected.

The following enhancements are available with Flashlight: Maximize Contrast, Positive, Magnify, Emboss, and Colorize.

These enhancements can be selected by a simple two-step process:

1.   Select Flashlight from the Contrast menu or click on the Flashlight icon in the toolbar.

2.   Right-click on the image and select one of the enhancement options from the menu.

Some enhancements can be applied to the entire image without affecting the area inside the Flashlight beam. Colorize and Positive, for example, work this way. To see this, click on either toolbar icon while the Flashlight beam is on.

When Flashlight is on, the beam can be suspended in its current location by selecting Suspend from the menu bar or popup menu. When the beam is suspended, moving the mouse will not affect beam location.
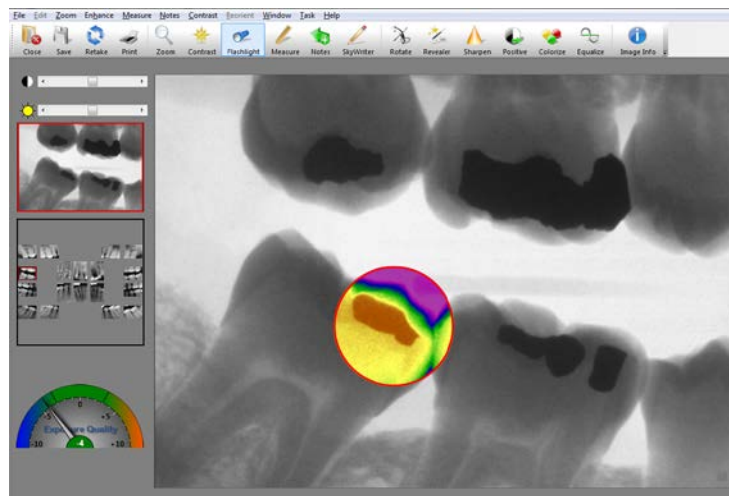
Figure 50. Using Flashlight

6.8. Reorient Menu

6.8.1. Flip / Rotate 180 Degrees / Normal

Changes image orientation.

(Accelerators: Alt + R, L [for Flip Left / Right], U [for Up / Down], R [for Rotate 180 Degrees], 9 {for 90 Degrees}, N [for Normal])

There are three **Reorient** settings: rotating the image 90 or 180 degrees, flipping the image up and down, and flipping the image left to right. A fourth setting, **Normal**, returns the image to its original orientation.

In some cases this feature is used when images are acquired in the wrong view box. Normally, CDR DICOM auto-rotates the image to its correct orientation based on the view, and this is usually sufficient. In other cases additional reorientation may be needed.

| Normal | Flip Up/Down | Rotate 180° | Flip Left/Right |
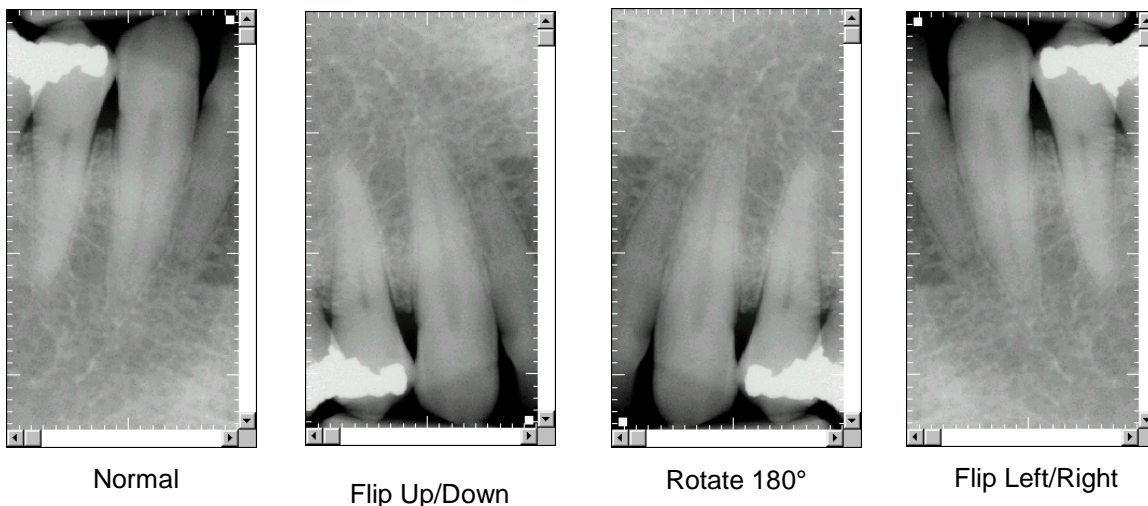
Figure 51. Using Reorient

6.9. Window Menu

6.9.1. Display Toolbar / Mini View / Status / Tick Marks / Exam / Hide Extras

Shows or hides enhancement controls and image windows

(Accelerators: Alt + W, D [for Toolbar], M [for Mini View]), S [for Status] E [for Exam],) H [for Hide Extras]

These options can be toggled on or off to allow the current image to occupy more of the area inside the Zoom window. These options are turned on by default, but can be hidden if desired by unchecking the appropriate item in the menu. Although self-explanatory, these options are described below:

- Display Toolbar – Displays the toolbar above the image.

- Display Mini View: – Displays a thumbnail of the current image. It can be used also with the Magnify and Pan tools to navigate around the image.

- Displays Status – Displays the status bar below the image.

- Display Tick Marks – Displays the tick marks located along the edge of the image window.

- Displays Exam Window – Displays a smaller representation of the current exam.

- Hide Extras – Hides the options listed above from display.

6.9.2. Tile Multiple / Tile Horizontal / Tile Vertical / Stack Images

Tiling and stacking display selected images in a non-overlapping arrangement.

Refer to Section 5.8 on page 81 for details about these options.

6.10. Task Menu

6.10.1. Task Settings

Task settings (*Endodontic, Periodontic, General Dentistry, Restorative, and Hygiene*) relate to the use of the Sharpen slider, which is available to optimize Schick 33 images for detail and contrast. **These settings are not available with other Schick Sensors.**

Schick 33 sensors and supporting software enable the clinician to optimize image presentation to a level appropriate for the diagnostic task being performed. These settings are applied at display time and do not affect the original image data. Diagnostic Task selections can be changed for any image, from one task to another, and back at will.

The different task selections optimize the contrast and brightness of the displayed image to improve visibility of the anatomical structures important for that diagnostic task. Refer to the table below.

In addition to contrast optimization, the visibility of some anatomical structures benefit from additional image sharpening. Selecting any diagnostic task applies an initial level of sharpening to the image. A slider control is available to dynamically change the level of image sharpness in real time. Users also use the slider in conjunction with the "Save As Default" button to change the default sharpen level to their personal viewing preferences for each of the clinical tasks described here.

The table below shows the diagnostic task to select to improve visibility of relevant dental anatomy.

Diagnostic Task	Optimized Anatomy	Default Sharpen Level (User Changeable)
General Dentistry	Balanced for general tooth and bone display	75%
Endodontic	Root apices, pulp chamber, lamina dura, periodontal ligament, cementum	70%
Periodontic	Alveolar and crestal bone, calculus	50%
Restorative	Enamel, Dentin, DEJ, CEJ	85%
Hygiene	Balanced for general tooth and bone display but with a lighter tone to the image	55%

Selecting a task applies a preset amount of image sharpening to the current image. Since Sharpen slider values can be adjusted to suit your personal preferences, you can focus faster on image details, using a Sharpen setting that you find to be the most appropriate.

Task settings are designed to work with user profiles to customize Sharpen settings for the clinical tasks you perform most frequently. For more information about user profiles, please refer to the next paragraph.

6.10.2. User Profiles

User profiles make it possible to customize Sharpen slider settings so you can pre-select the appropriate amount of image sharpening for commonly-performed clinical tasks, such as Endodontic, Periodontic, General Dentistry, Restorative, and Hygiene.

To create your own user profile, or to perform other profile actions, complete the steps in the following paragraphs.

6.10.2.1.   How to Add a User Name

1.   In the Zoom Window, right-click on an image acquired with a Schick 33 Sensor.

2.   Click on the Edit Users menu item.

3.   Click on the Add User button.

4.   Click inside the New User name text box and type in a user name.

5.   Click Close.

6.   To verify, right-click on the image again and click on Select User. The new user name will appear in the menu.

6.10.2.2.　How to Edit a User Name

1. In the Zoom window, right-click on an image acquired with a Schick 33 Sensor.

2. Click on the Edit Users menu item.

3. Locate the user name you wish to edit.

4. Double-click on the user name, which becomes an editable text box.

5. Type in a new name for this user.

6. Click Close.

7. To verify, right-click on the image again and click on Select User. The edited name will appear in the menu.

6.10.2.3.　How to Delete a User Name

1. In the Zoom window, right-click on an image acquired with a Schick 33 Sensor.

2. Click on the Edit Users menu item.

3. Select the user name you wish to delete from the list.

4. Click on the Delete user button.

5. Click Close.

6. To verify, right-click on the image again and click on Select User. The edited name will appear in the menu.

6.10.2.4.   How to Edit a Task

1.   In the Zoom window, right-click on an image acquired with a Schick 33 Sensor.

2.   Click on the Select User menu item.

3.   Select a user name from the list.

Note: The [default] name is not editable. To create your own custom profile, add a user name and then perform the following steps.

4.   Right-click on the image again and click on the Select Task.

5.   Choose one of the task categories from the list.

6.   Adjust the slider to a level of Sharpening that you feel is appropriate.

7.   Click on the Save as default button.

8.   When prompted, click Yes to save the new the Sharpen value as the default setting for this task category and this user.

9.   To check or compare the Sharpen settings with other user profiles or default values, click on Edit User, which opens the user profile dialog.

Figure 52. User Profile Menu Selections (shown expanded at right)

6.11. Help Menu

6.11.1. Contents

This menu item opens the help files for CDR DICOM software. Help files are designed to provide quick access to information about the various features and options in CDR DICOM software.

Pressing the <F1> key or the Help toolbar button launches the help file (selecting the Contents item from the Help menu does the same). In addition, many dialog boxes and property pages in CDR DICOM are associated with specific topics in the help file and can provide appropriate information by pressing the <F1> key or the Help button on the dialog boxes themselves.

6.11.2. Help on Zoom

This menu item opens a help file topic showing the location of principal features in the Zoom Window and a short description of each.

6.11.3. Image Information

This menu item displays information about the current image in the Zoom Window, including the type of Sensor that was used, its serial number, when the image was taken, and other Senor- or image-specific details. For a list of DICOM tags and values regarding the image, click on the Show All Tags button located in the Image Information window.

Chapter 7
Sharing Images

What You'll Read About in this Chapter —

- Sharing Images

- Printing Images

- Reports

7. Sharing Images

7.1. Introduction

This feature allows CDR DICOM users to exchange X-ray and video images electronically over a networked system or the Internet.

New options for image sharing are available:

- E-mail images individually or by series in the popular JPEG format.

- Save a CDRZIP file to a location that you specify so it can be attached and sent by e-mail.

- Save JPEG images to another location.

- Create an exam "postcard" including selected images or the entire exam for patients or other professionals.

7.2. Sending JPEGs by E-Mail

S TEP 1

Open an exam in CDR DICOM that contains the image(s) you wish to send or save.
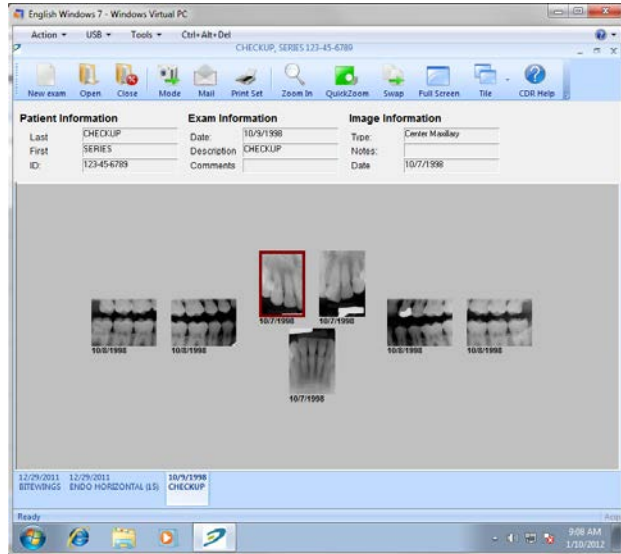
S TEP 2

A. Select the image(s). If there are several, use the <SHIFT> key to add them. To select all the images, press <CTRL> and <A>.

B. Click the **Mail** button on the toolbar.
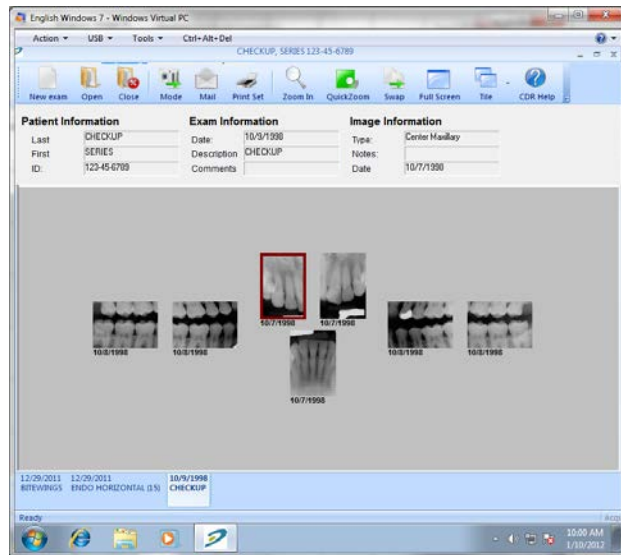
STEP 3

A. Select "JPEG" when the Send Mail dialog opens.

B. Select "Email."

C. Click "Send Email."
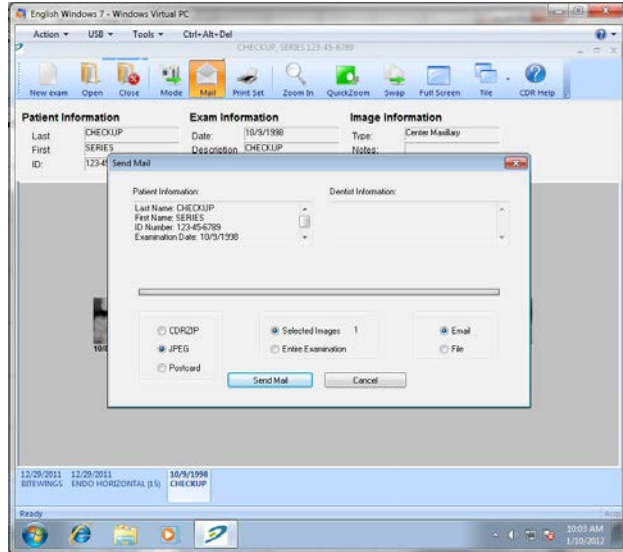
STEP 4

Your mail program opens with JPEG(s) attached.
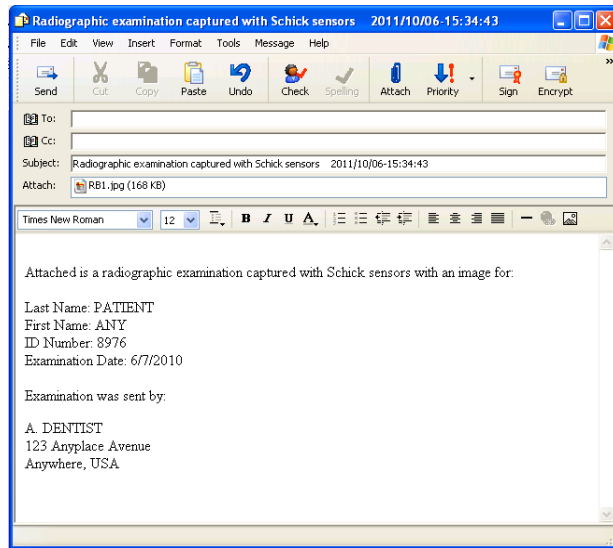
7.3. Saving a CDRZIP File

STEP 1

Open an exam in CDR DICOM that contains the image(s) you wish to send or save.
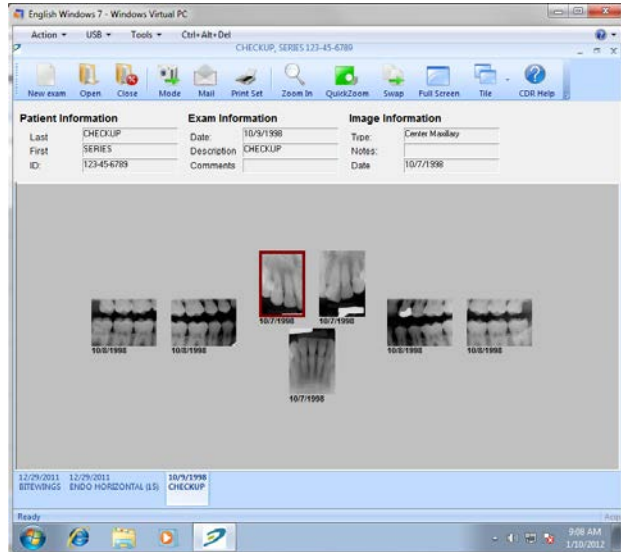
STEP 2

A. Select the image(s). If there are several, use the <SHIFT> key to add them. To select all the images, press <CTRL> and <A>.

B. Click the **Mail** button on the toolbar.
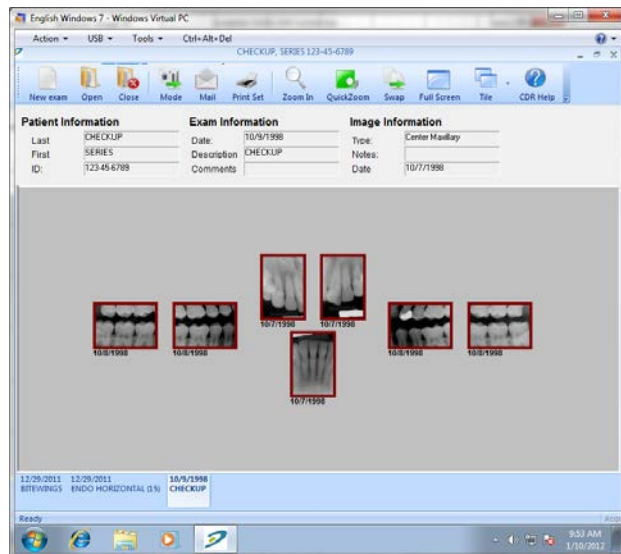
STEP 3

A. Select "CDRZIP" when the Send Mail dialog opens.

B. Select "File."

C. Click "Generate Attachment."
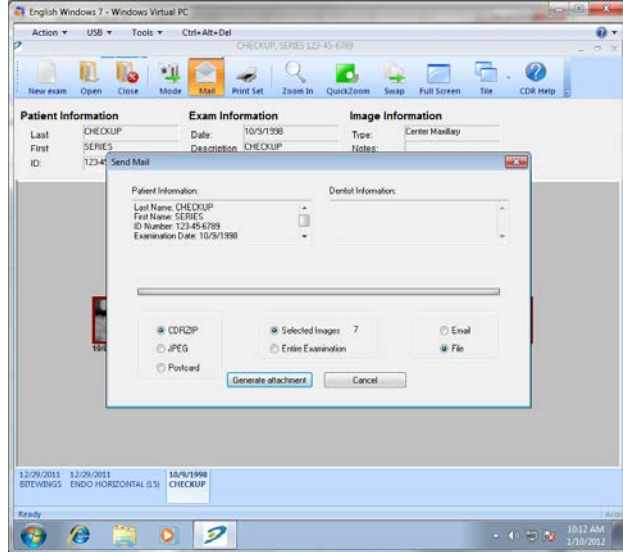
STEP 4

A. When prompted, browse to a location on your system and click Save. The CDRZIP file will be saved in this location.

B. Start your mail program and attach the CDRZIP file as you would any file attachment.
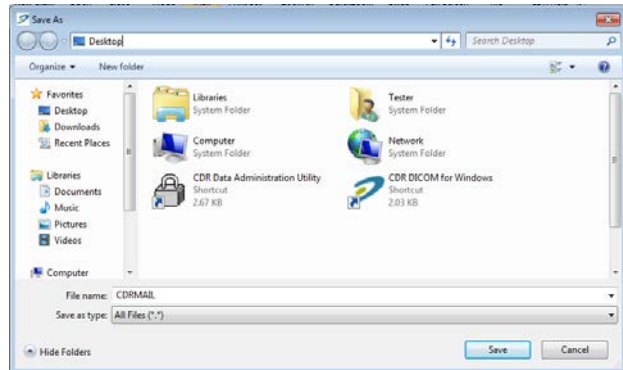
7.4. Saving JPEGs to Another Location

STEP 1

Open an exam in CDR DICOM that contains the image(s) you wish to send or save.
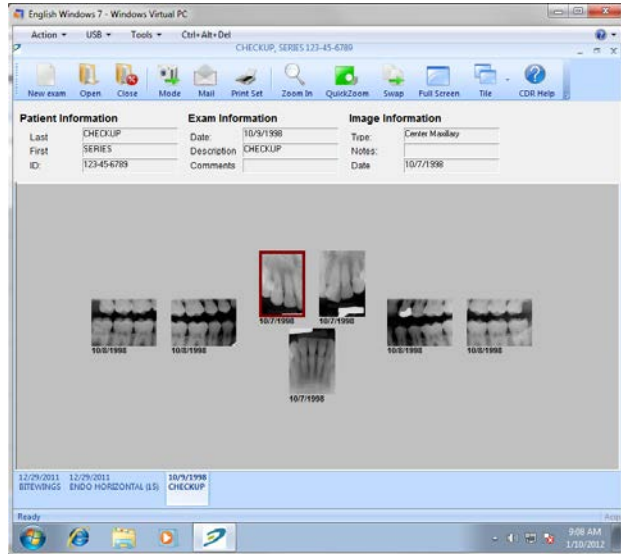
STEP 2

A. Select the image(s). If there are several, use the <SHIFT> key to add them. To select all the images, press <CTRL> and <A>.

B. Click the **Mail** button on the toolbar.
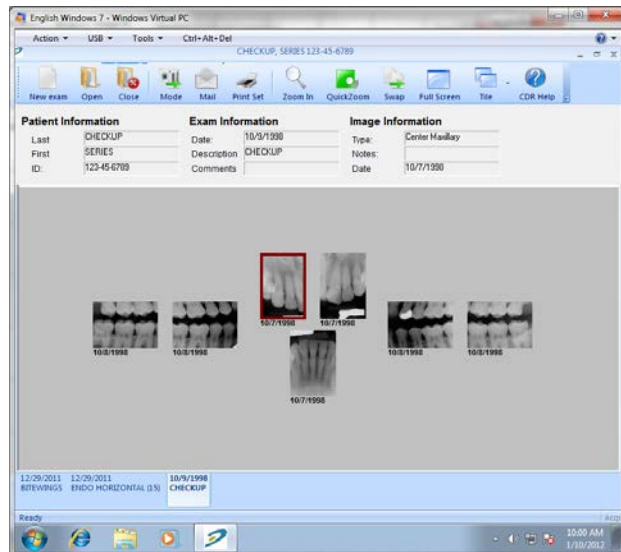
STEP 3

A. Select "JPEG" when the Send Mail dialog opens.

B. Select "File."

C. Click "Generate Attachment."
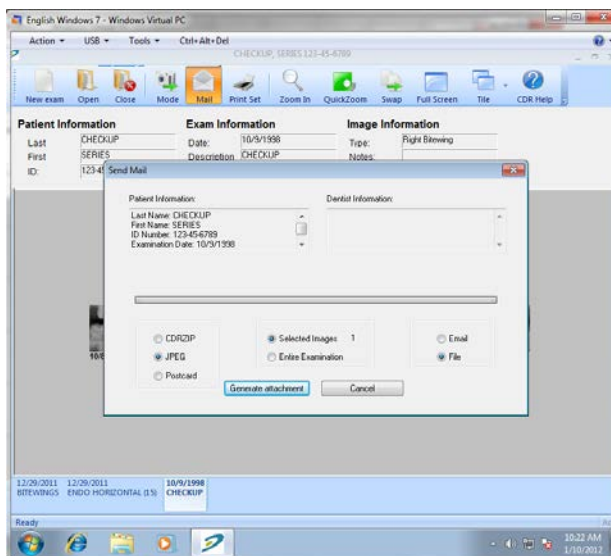
STEP 4

A. When prompted, browse to a location on your system and click Save.

B. The image(s) are saved in one folder. The image(s) can be browsed, copied to CD, uploaded to file, or printed.
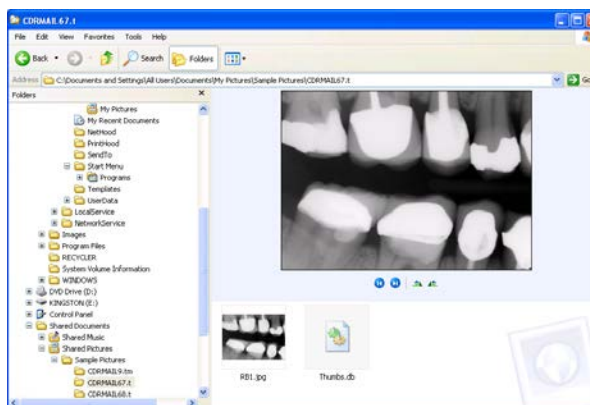
7.5. Sending Postcards by E-Mail

Open an exam in CDR DICOM that contains the image(s) you wish to send or save.

> NOTE: If you would like a specific color for the postcard's background, click System > CDR Options. Select the Windows tab. In the "Postcard Background" box, choose a color. Click OK to save your choice and return to the exam.
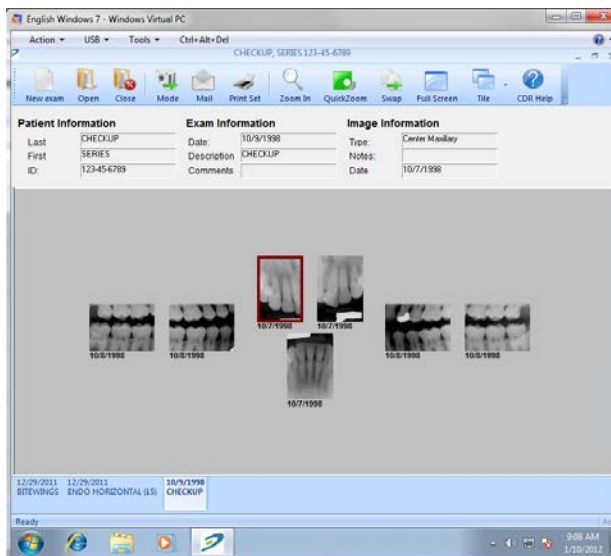
A. Select the image(s). If there are several, use the <SHIFT> key to add them. To select all the images, press <CTRL> and <A>.

B. Click the **Mail** button on the toolbar.
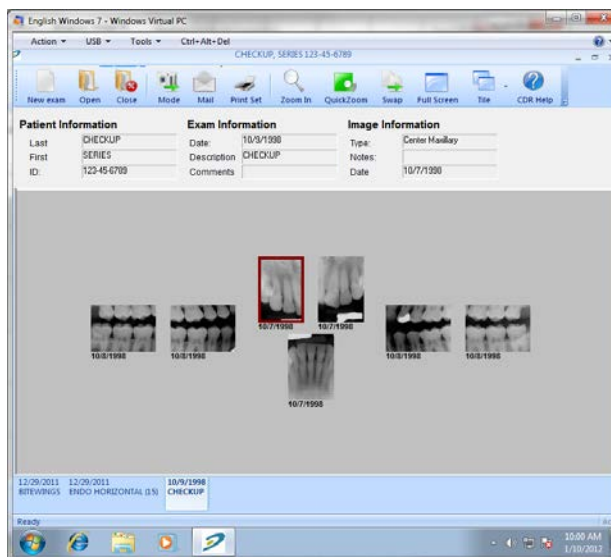
STEP 3

A. Select "Postcard" when the Send Mail dialog opens.

B. Select "Email."

C. Click "Send Email."
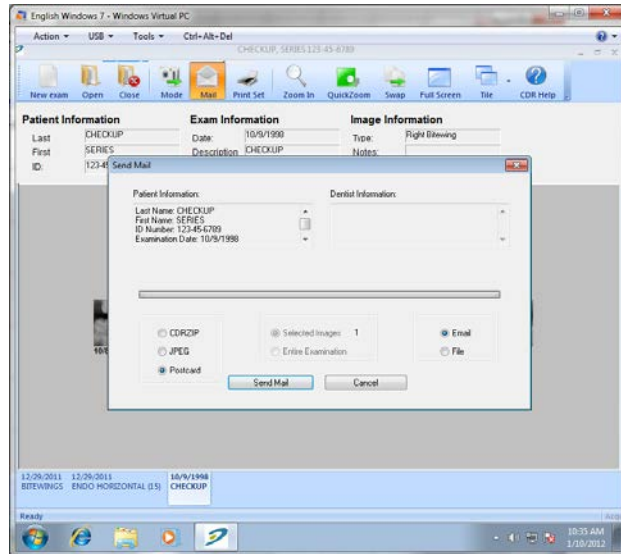
STEP 4

Your mail program opens with the exam Postcard attached.
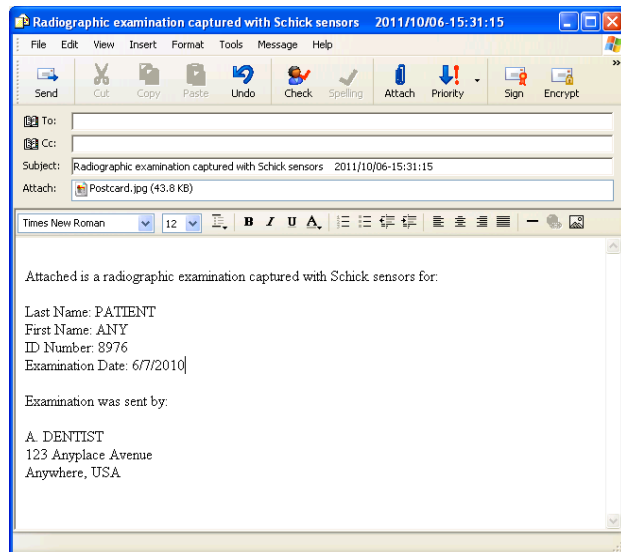
7.6. Web Viewing

STEP 1

A. Open a patient exam from either the File menu or by clicking on the **Open** button on the toolbar

B. When the patient exam is displayed, click on **File** > **Send to > Web Viewer.**
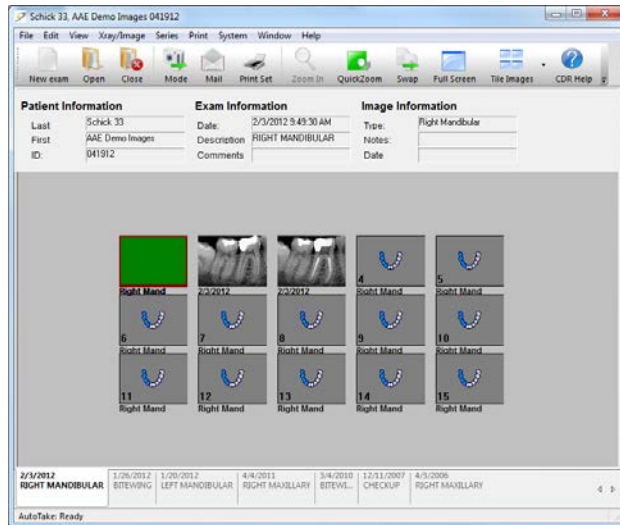
STEP 2

A. All of the images in the exam are exported, in JPEG format, to a single HTML page

B. When prompted, enter a name and location to save the file.
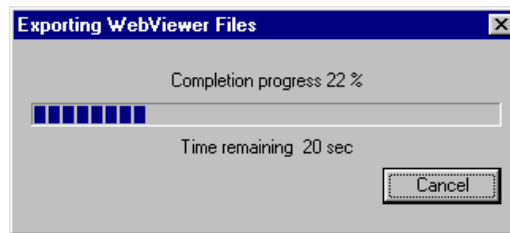
STEP 3

A. Internet Explorer will start automatically and display the exam and images in an HTML page

B. The HTML page can be easily saved to portable media. Other users can also view this file, provided they have Internet Explorer. Neither CDR DICOM nor another DICOM viewer is needed.
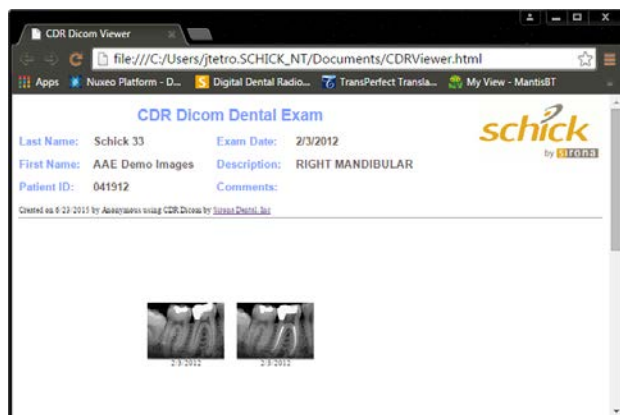
7.7. Printing Images

CDR DICOM provides several different printing options.

- Print the current image in the Zoom window. The effects of CDR DICOM's enhancement tools (for example, Contrast, Colorize, etc.) will appear when printed, even if those effects have not been saved with the image yet.

- Print the last saved version of the image.

- Print an entire exam.

After images are printed they can be used in a number of ways.

- Stored with other information in a patient's physical file

- Shared with other consulting dental care professionals

- Provided to dental insurers when needed

- Shared with the patient.

7.8. Reports

Word Style Template Reports can be created and printed using CDR DICOM software. Reports can be generated *after* a patient exam is opened. Once the exam is open, you choose between a default report style, which includes standard wording appropriate to the type of exam, or a new report style, where the text is entered directly by you.

Chapter 8

Data Administration Utility

What You'll Read About in this Chapter —

- Importing DICOM Studies and Images

- Exporting Patients, DICOM Studies, and Images

- Detaching, Deleting, and Purging Images

- Attaching and Undeleting Images

- Database Searches, Editing, and Validation

8. Data Administration Utility

8.1. Displaying Exam and Patient Information

When you launch the CDR Data Administration Utility (either from its desktop shortcut or from the CDR DICOM for Windows group in the Start menu), the utility's tri-pane screen will appear blank initially.

To view patient, study, and image information in your CDR image database, click Tools > Search and click OK. The default search is by patient, but if you're looking for images or studies primarily, select one of these items instead from the menu.
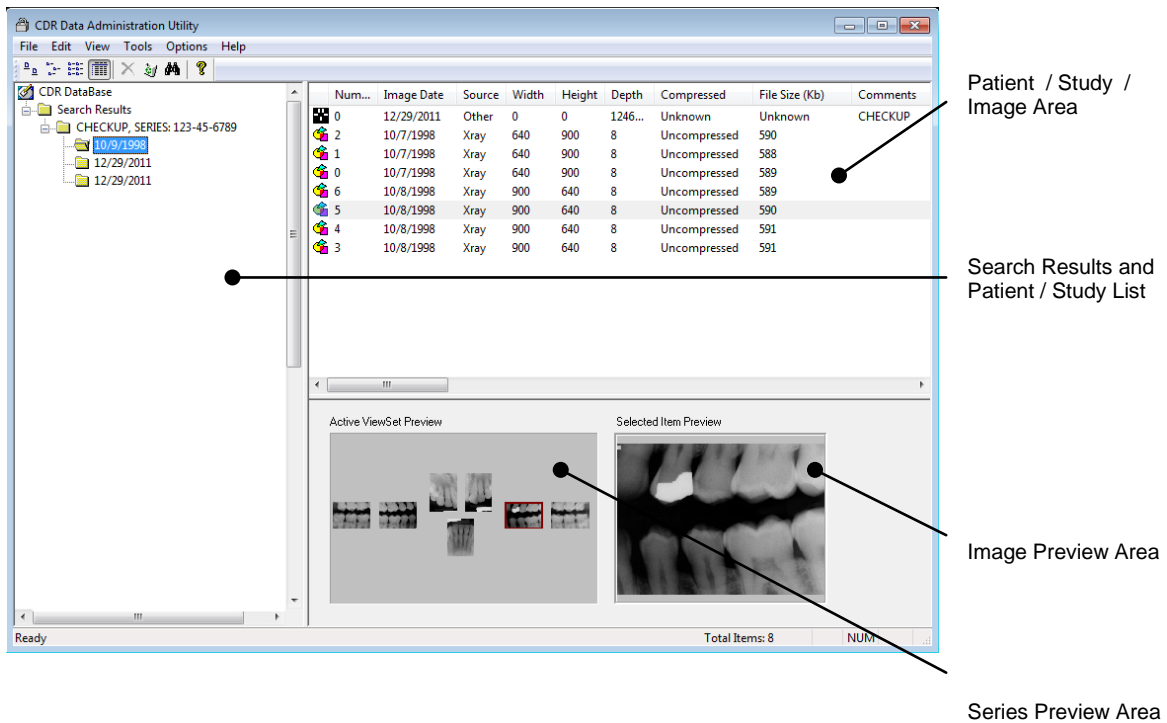
Figure 53. Data Administration Window

8.2. File Menu

8.2.1. Import DICOM Studies / Images

Imports DICOM studies and images to the current database from another drive location.

(Accelerators: Alt + F, M)

The import source can be any valid DICOM file or archive, located on an accessible volume path or on physical media. CDR DICOM will read into the current database all of the records contained within a "DICOMDIR" file set. Each record contains Patient / Study / Series / Image information and populates the tables in the connected database appropriately.
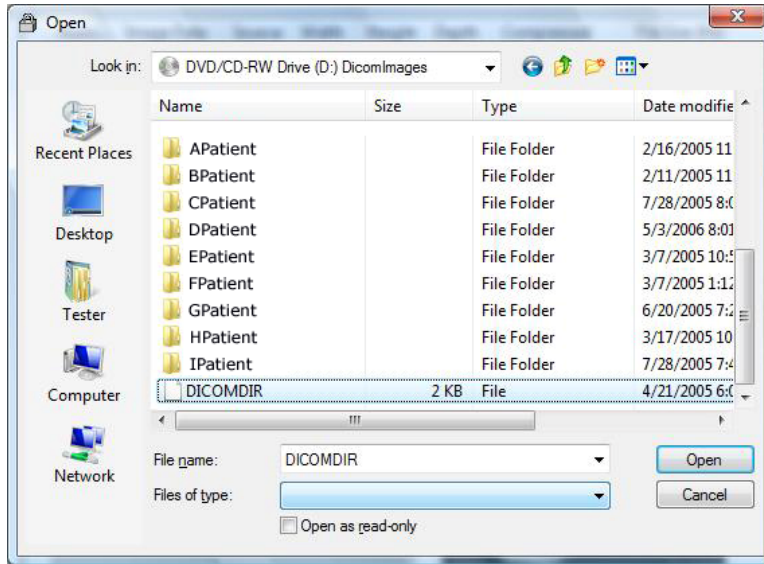
Figure 54. Selecting Studies
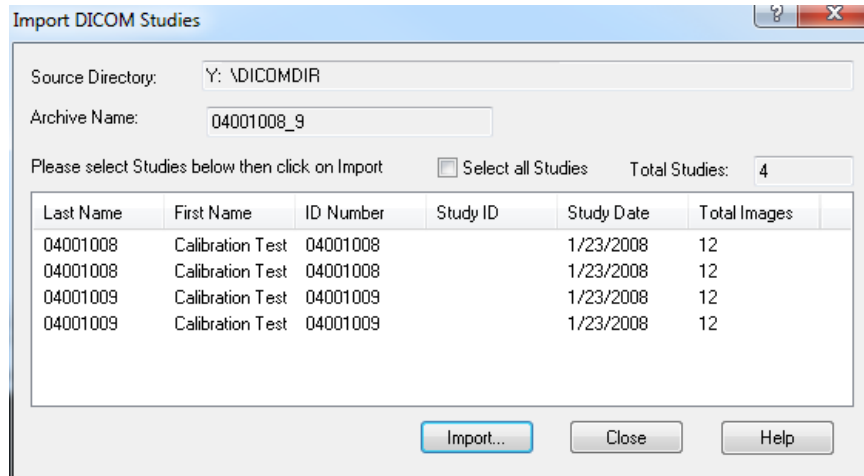
Figure 55. Import Studies Dialog Box

8.2.2. Export Patients / DICOM Studies / Images

Exports patient information, DICOM studies, and images to another drive location.

(Accelerators: Alt + F, X)

You have the option of creating a new storage archive for these items at their destination, or simply use a folder location that exists already.

Items can be selected individually, or as a group (by selecting items with the <SHIFT> key depressed), or as all the studies and images for a selected patient (by selecting **Edit > Select All** or by using the shortcut keys <CTRL><A>.
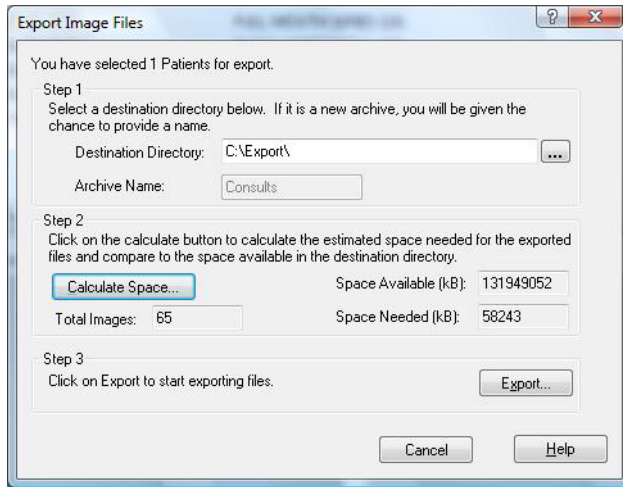
Exporting Patients
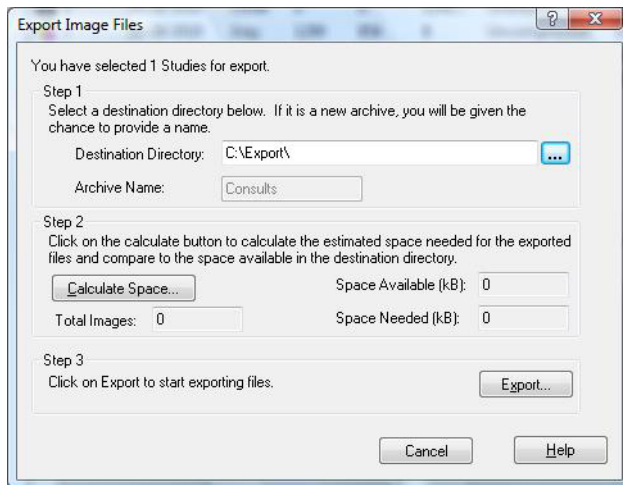
Exporting Studies
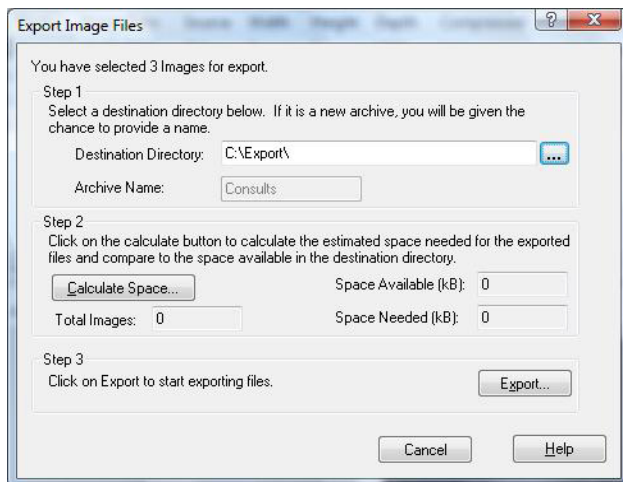
Exporting Images

Figure 56. Export Dialog Boxes

8.2.3. Setup DICOM CD-ROM

Registers DICOM exams from CD-ROM or other DICOM-compatible media with the current database.

(Accelerators: Alt + F, C)

To read DICOM exams from CD-ROM (or other DICOM media), browse the image folder on the disk and then click the **Setup** button. It is important to note that this operation will only read exams that have already been converted to DICOM.

Registering DICOM exams with the current database involves updating the database with the volume information so CDR knows where the exams are located.
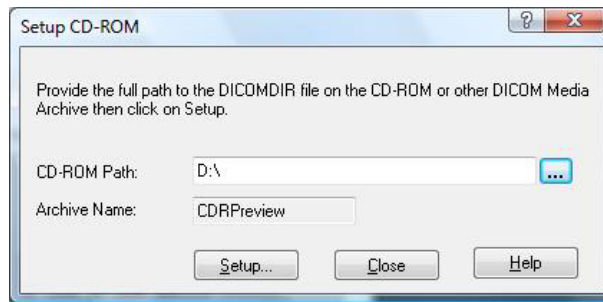
Figure 57. Setup DICOM CD-ROM

8.2.4. DICOM Compress

Decreases the storage size of X-ray images, using either lossless or lossy compression.

(Accelerators: Alt + F, P)

Compressing X-ray images offers several benefits, including: increased efficiency in the use of space allocated for storing images, increased image retrieval and display time because the file sizes are smaller, and for the same reason – increased portability.

The following compression formats are supported:

- Low compression (High Quality), which uses JPEG2000 Lossless, and saves images with a 2:1 reduction in file size. There is no comparable format in previous versions of CDR.

- Medium compression (Medium Quality), which uses JPEG2000 Near Lossless, and saves images with a 5:1 reduction in file size. This compression is comparable to Lead PQ1 in previous versions of CDR.

- High compression (Low Quality), which uses JPEG Lossy, and saves images with a 20:1 reduction in file size. This compression is comparable to JPEG in previous versions of CDR.

For images acquired with *Schick 33 Sensors*, all compression settings will default automatically to High Quality. Customers should note that Schick 33 images, with compression, will require a longer time to load and display than uncompressed Schick 33 images.
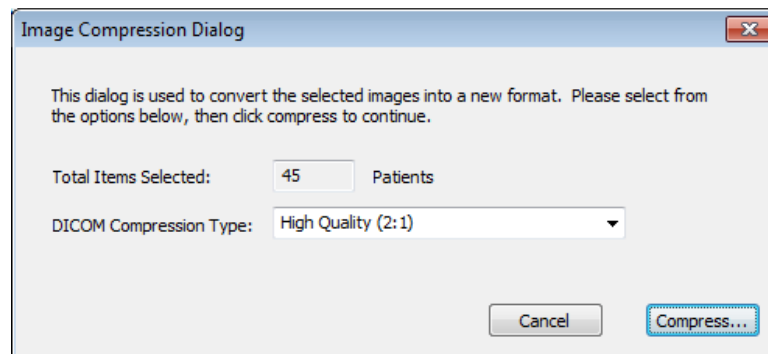
Figure 58. Image Compression

8.2.5. Print All Patients

Obtains a printed list of patients.

Before you can print a list of patients, you will need to perform a search. To open the Search dialog box, click on **Tools** > **Search**. Since the patient list will be based on search results, you may wish to narrow those results by selecting options in the Search dialog box. Click OK when ready.

After the patient list is displayed, click **File** > **Print All Patients**.

8.2.6. Send to Remote Server

Provides a single dialog to store patient records at a remote location.

(Accelerators: Alt + F, S)

The benefit provided by this feature will likely be more relevant to multi-office practices that back up patient records to a central server or share patient patient records between several locations. In a multiple office operation, practices may use more than one server for patient records — a local server that their office workstations connect to, and a remote server for archiving and storage. You have the option of sending all the studies for a particular patient, or just the studies and images you want.
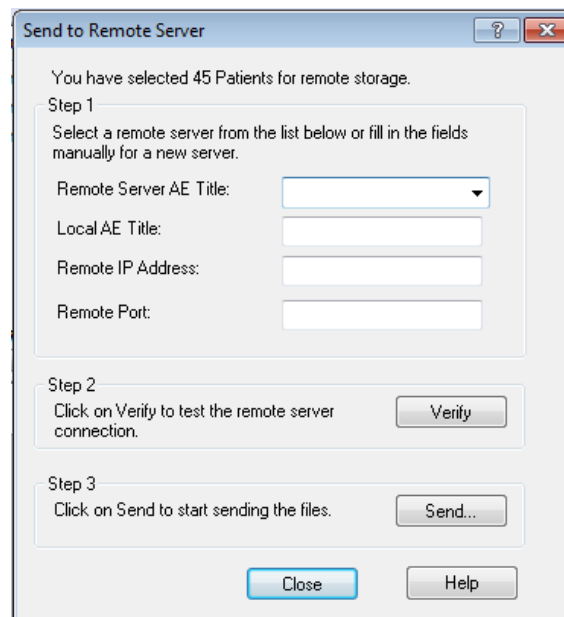
Figure 59. Sending Patient Exams to Remote Server

To send all the studies for a particular patient:

1. Open the All Patients folder in the Data Administration utility.

2. Select the patient(s) whose files you wish to send.

3. Click **File > Send to Remote Server**. In the dialog box, select a registered remote server from the drop down menu or fill in the text boxes to add a new server.

4. Click **Verify** to confirm the connection to the remote server is available.

5. Click **Send** if the remote server is ready.

To send the studies for a specified patient:

1. Open the All Patients folder and double click on the patient's name in the upper right pane.

2. Click **File > Send to Remote Server**. In the dialog box, select a registered remote server from the drop down menu or fill in the text boxes to add a new server.

3. Click **Verify** to confirm the connection to the remote server is available.

4. Click **Send** if the remote server is ready.

To send the images for a selected study:

1. Open the All Patients folder, double click on the patient's name in the upper right pane, and then double click on the study whose images you want to send.

2. Click **File > Send to Remote Server**. In the dialog box, select a registered remote server from the drop down menu or fill in the text boxes to add a new server.

3. Click **Verify** to confirm the connection to the remote server is available.

4. Click **Send** if the remote server is ready.

8.3. Edit Menu

8.3.1. Detach Image

Separates images from the viewset (or series) in which they were originally acquired.

(Accelerators: Alt + E, E)

When you choose to detach an image, it is retained as part of the patient study, but it is not displayed in the series. Detaching offers greater versatility in the way viewsets are managed, enabling you to keep active and inactive viewsets, and attached and detached images.

By detaching and attaching images, you're able to refine exams so they include appropriate images in an appropriate series. Frequently, relevant images are spread across several exams, making comparisons sometimes difficult. Using the Administration Utility, you can ensure the most appropriate viewset is active and then drag-and-drop images (from the upper right pane) into the viewset (at the lower right pane).

Images that you wish to hide from display, but want to retain, can be detached from their current viewset. Once an image is detached, it can be deleted or reattached to its original, or new, viewset. In the sample shown below, the image is viewbox #2 has been detched from the viewset.
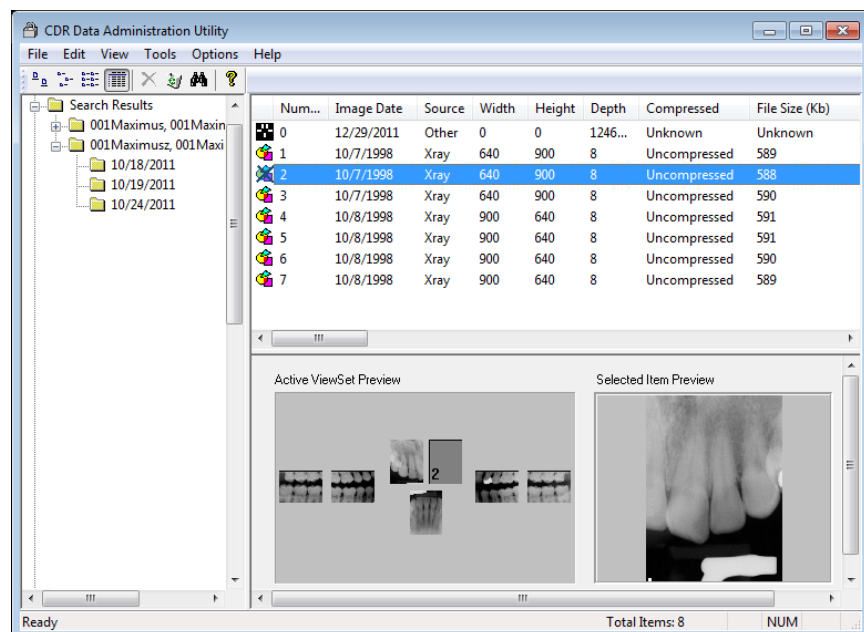
Figure 60. Detaching Image from Viewset

8.3.2. Delete

Deletes studies from a selected drive and moves them to the CDR Recycle Bin.

(Accelerators: Alt + E, D)

Deletion of patient studies and images in CDR DICOM is managed within the Data Administration Utility, using a multi-tiered strategy to ensure your data is protected from accidental deletion.

When a patient is deleted, all of the studies, viewsets, and images for that patient are deleted (moved to CDR Recycle Bin).

When a study is deleted, all of the viewsets and images for that study are deleted (moved to CDR Recycle Bin).

When an active viewset is deleted, all of the images are unassigned. The images can be reassigned to another viewset or deleted (moved to CDR Recycle Bin). When an image is deleted, it is unassigned and can either be reassigned to another viewset or deleted (moved to CDR Recycle Bin).
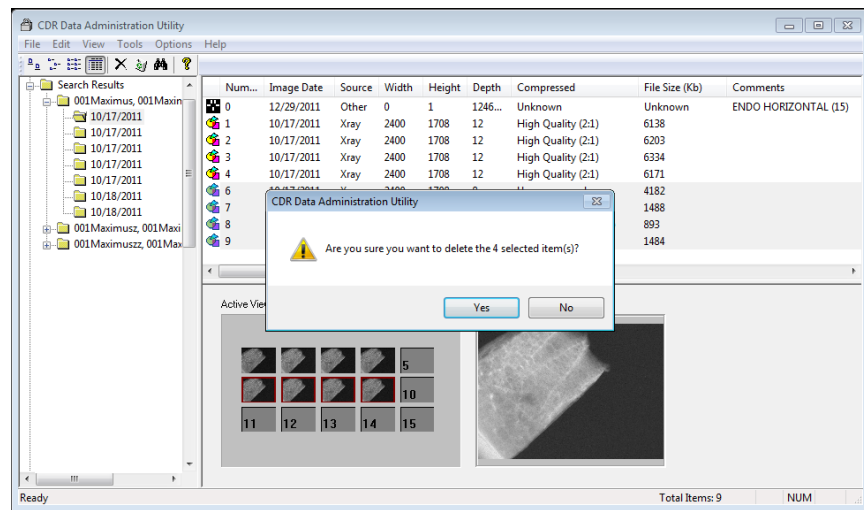
Figure 61. Deleting Images

The steps to delete either studies or images are similar, as described below:

1. Start the CDR Data Administration Utility.

2. Navigate the patient list as follows: Select a Patient folder (left pane) to display the list of studies (upper right pane), or Select a Study folder (left pane) to display the list of viewsets and exams (upper right pane).

3. Select a patient, study, series, or image to delete. (Patient(s) can only be deleted using the upper right pane, when the All Patient folder is opened.) If you choose to delete a patient, all the studies, series, and images associated with that patient will be deleted as well. The same is true for studies, where all the viewsets and images associated with that study will be deleted.

4. Click **Edit > Delete**, which will move the affected items to the CDR Recycle Bin (below the patient folder list in the left pane).

5. To remove the items completely, purge them from the CDR Recycle Bin.

8.3.3. Undelete

Recovers deleted studies and images.

(Accelerators: Alt + E, U)

Using the Administration Utility, it is possible to recover deleted studies and images. When items are deleted in the Data Administration Utility, they are first moved to the CDR Recycle Bin. (The CDR Recycle Bin is located on the left pane, after the expandable list of Patient folders.)

To restore studies and images from the CDR Recycle Bin, open the bin and select which items you wish to restore, or click on **Edit > Select All** for all of them. Then, click **Undelete** from the Edit menu.

When a patient is undeleted, all of the studies, viewsets, and images for that patient are also undeleted (restored from CDR Recycle Bin). When a study is undeleted, all of the viewsets and images for that study are also undeleted (restored from CDR Recycle Bin). When an active viewset is undeleted (restored from CDR Recycle Bin), all of the images are reassigned to that viewset. When an image is undeleted (restored from CDR Recycle Bin), it is reassigned to the currently active viewset.

If the items have been purged from the CDR Recycle Bin, they may still be retrievable from the Windows Recycle Bin, located on your Windows desktop. Retrieving items from this location requires a few extra steps, however. For a step-by-step procedure to restore purged items, refer to the "Purge" menu item.
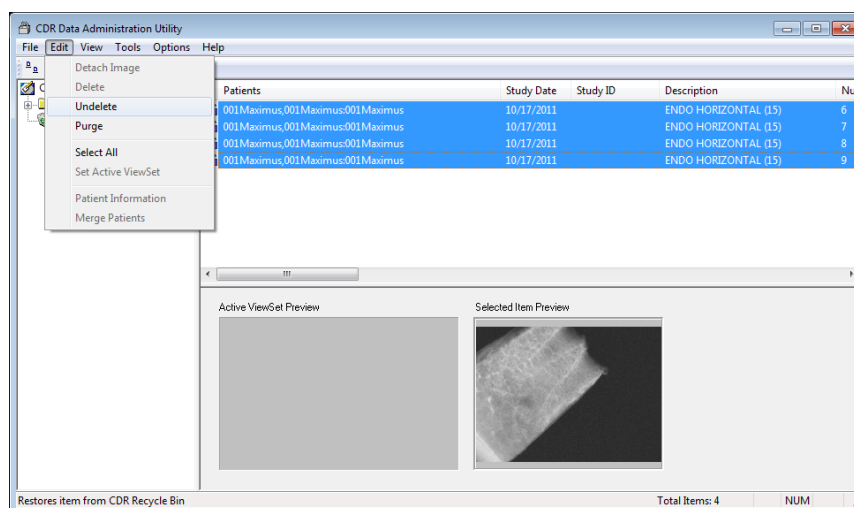
Figure 62. Undeleting Images

8.3.4. Purge

Moves deleted studies / images from the CDR Recycle Bin to the Windows Recycle Bin.

(Accelerators: Alt + E, P)

When studies and images are purged, their database records are removed as well. This helps ensure that image files and database records remain correctly mapped.
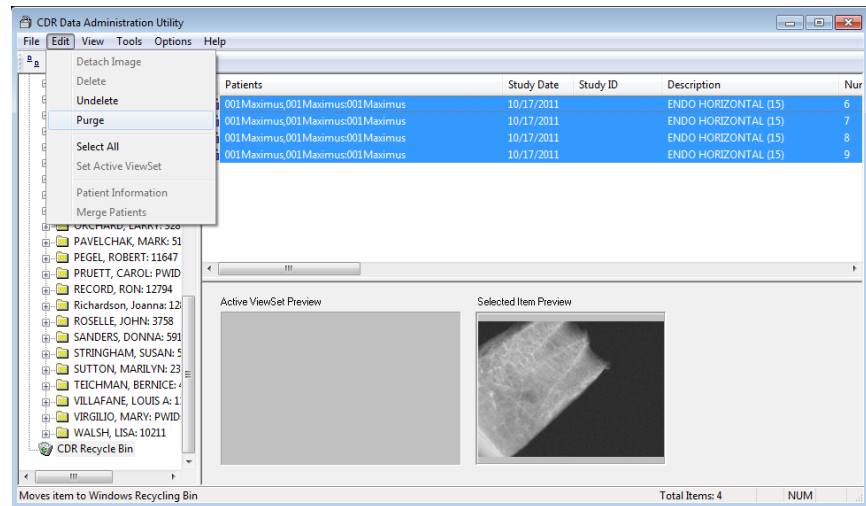
Figure 63. Purging Images

To restore purged items in the Windows Recycle Bin, perform the following steps.

1. Open the Windows Recycle Bin (usually found on your Windows desktop).

2. Select the items you want to restore. In the Windows Recycle Bin, exams and images items might not be grouped together, so select all the items you want to restore.

3. Click Restore.

4. Open the CDR Administration Utility and click Validate from the Tools menu. Validate will create records in your database for the deleted items.

5. Proceed through the Validate (Database Integrity) wizard. One of the screens in the Validate wizard will report images that do not have corresponding database records. On this screen you should find images you want to recover.

6. Click Add Records and continue with the wizard. Click Finish on the last screen.

8.3.5. Set Active Viewset

Changes the inactive viewset is changed to active status for studies with multiple viewsets.

(Accelerators: Alt + E, V)

The currently active viewset is indicated by a dark icon. The alternate viewset is indicated by a gray icon. When swapping viewsets, consider the number of view boxes in each viewset, as suggested by the following example.

Study A has two viewsets. The currently active viewset has seven images in seven view boxes; the alternate (currently inactive viewset) has five view boxes. If you choose to change the status of the viewsets, making the inactive one active, there would not be enough view boxes in the five-box-viewset to accommodate all the images.

As a result, two of the images would be detached, meaning they would be retained in the study, but they would not be displayed in the current viewset. To eliminate this problem when working with multiple viewsets, make sure the alternate viewset (the one you wish to make active) has a sufficient number of view boxes for the number of images in the current viewset (the one to become inactive).
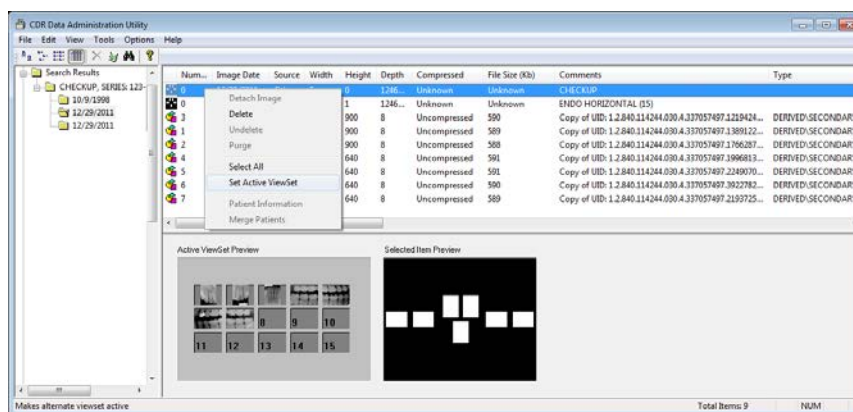
Figure 64. Active and Inactive Viewsets

8.3.6. Patient / Study Information

Allows changes to be made to patients and studies.

(Accelerators: Alt + E, V)

Patient and study information constitute critical data in CDR DICOM. Notwithstanding their importance, it is sometimes necessary to revise this information to maintain database records that can track accurately with actual patient and study data. Editing patient information in the Data Administration area provides an accessible tool to update and / or clarify patient information in your database.

Changes in patient information cascade automatically through all of the studies and images for that patient. Changes in study information occur similarly, updating all the images in that changed study.
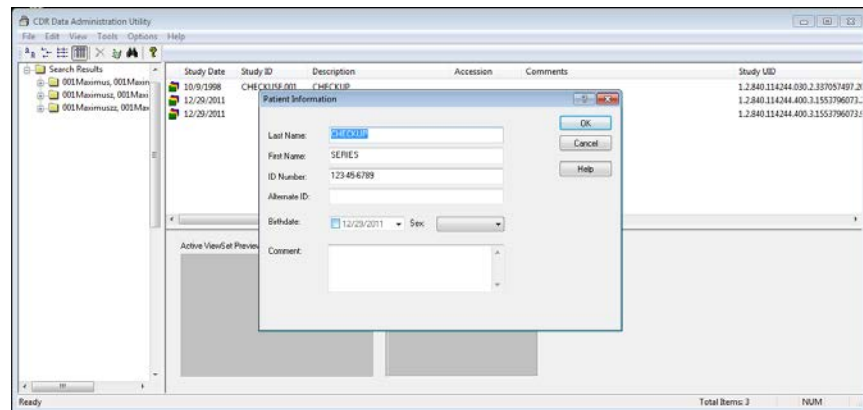
Figure 65. Patient Information

8.3.7. Merge Patients

Combines the studies from one patient record with another.

(Accelerators: Alt + E, M)

In keeping your patient database up-to-date, you may find it convenient to combine studies. Combining previous studies with newer ones when a patient has married and taken a new last name is one example when using the merge study feature can be helpful. You also have the option of merging all the studies for a particular patient, or just the studies you want.
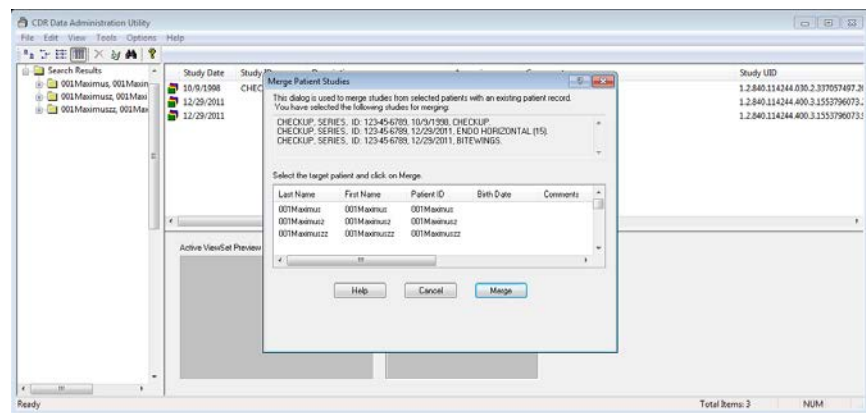
Figure 66. Merging Patients

To merge all of the studies for a specified patient:

1. Open the All Patients folder in the Data Administration utility.

2. Select the patient's name in the upper right pane. (By selecting the patient, you choose where you want the studies to be moved from.)

3. Click **Edit > Merge Patients**. In the dialog box, select the target patient (where you want the studies to be moved to).

4. Click **Merge** to move the studies to the target location.

To merge some of the studies for a specified patient:

1. Open the All Patients folder in the Data Administration utility.

2. Double click on the patient's name in the upper right pane. (By exposing the studies for the selected patient, you are able to choose which studies you wish to move from that patient.)

3. Click **Edit > Merge Patients**. In the dialog box, select the target patient (where you want the studies to be moved to).

4. Click **Merge** to move the studies to the target location.

8.4. Tools Menu

8.4.1. Validation Wizard

Checks the data integrity of patient and image information stored in the database.

(Accelerators: Alt + T, V)

To expedite validation, the Database Integrity Wizard performs the following tasks:

- Identifies the location of stored images

- Identifies image files without corresponding database records

- Identifies database records without corresponding image files

- Adds database records for missing image files.

Although there may be more than one path or location on your system where images are stored, only one path can be validated at a time. While validating the selected path, the wizard may identify images that are not associated with a corresponding record in the database. In this case, you have the option of deleting these images or adding records automatically to accommodate the images.

The wizard will also identify missing database records, which can be added to the database or deleted.
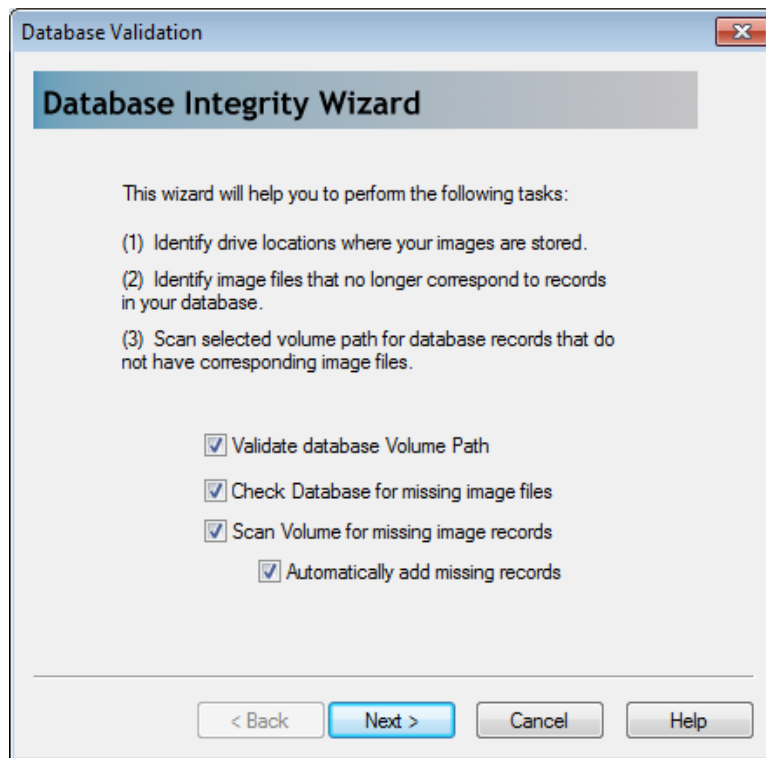
Figure 67. Validation Wizard

8.4.2. Search

Performs customized patient-level and study-level searches.

(Accelerators: Alt + T, S)

The Search dialog box provides, essentially, three different avenues for retrieving information in your database: by patient, study, or image, using the specific fields found in the dialog box.

To do this, select either **Patients**, **Studies**, or **Images** from the drop-down list and add as much, or as little, additional information in the appropriate fileds to filter the results. Clicking OK retrieves the information corresponding to the search parameters you entered.

Figure 68. Searching Patients and Studies

8.4.3. Refresh Database

Sends a query to the current database for the latest patient and image information.

(Accelerators: Alt + T, R)

In CDR DICOM, clients and servers function as separate applications. CDR servers receive requests for image storage and respond to query and retrieval requests from one or more CDR clients. Although CDR clients and servers interact with each other during patient, study, and image information exchanges, updates by one CDR client may not be immediately visible to another client, even though they are connected to the same server.

Clicking **Tools** > **Refresh Database** enables the client to retrieve the latest information from the server's database. If the information you are trying to retrieve has been added by another CDR client, remember that patient studies are updated on the server at the end of CDR DICOM sessions. To ensure that the information added by a specific client is saved to the server's database, close the CDR DICOM session running on that workstation.

8.4.4. Show Volumes

(Accelerators: Alt + T, V)

Volume information is maintained in your CDR DICOM database to identify paths where images are stored on your system. Should it become necessary to make changes to volume information --whether to add, modify, or delete an image archive -- such changes can be made using the Volume editing tool.

It is important to note that changing the volume paths can affect the ability of CDR DICOM to locate and retrieve images. For this reason, we recommend that you do not make changes to the Volumes unless assisted or directed by qualified support personnel.

8.4.5. Delete Empty Folders

Automatically removes empty folders from the database.

(Accelerators: Alt + T, D)

8.5. Options Menu

8.5.1. Options

Selecting this option adds a column in the Patient / Study / Image area that displays the total number of studies for each study, or the total number of images for each viewset.
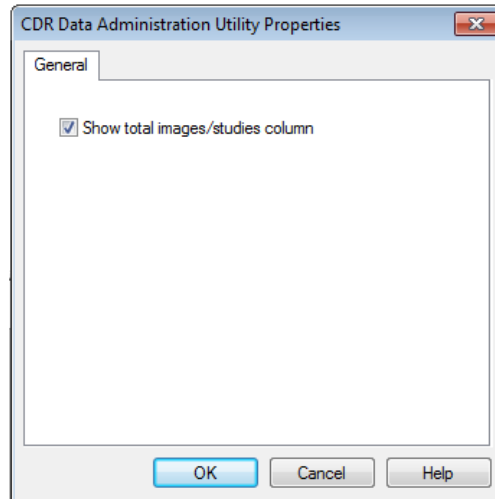
Figure 69. Data Administration Option

8.5.2. Database

This dialog can also be found in the CDR DICOM program and can be used to test the connection to the patient database, to report the current path to the images folder where X-rays are stored, and to configure the database.
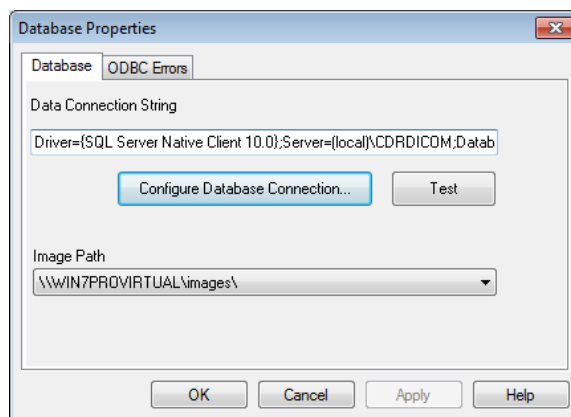
Figure 70. Database Properties

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Chapter 9

Shortcuts and Toolbar Buttons

What You'll Read About in this Chapter —

- Toolbars

- Tool Tips and Menu Item Tips

- Status Bar Messages

- Shortcut Keys

9. Shortcuts and Toolbar Buttons

9.1. Toolbars

9.1.1. Standard Toolbars

The CDR DICOM windows make generous use of toolbar buttons to expedite the selection of features and to streamline exam setup and editing tasks. Using toolbar buttons is optional because every feature started by a toolbar button can also be started from a menu. In addition, there are no functional differences between starting a CDR feature from a toolbar button or a drop-down menu. They work exactly the same way.

The Exam window toolbar, shown below, consists of buttons for the most commonly used features in that window. The toolbar (like the status bar and exam info area) can be hidden from view and restored when needed by selecting those items from the **View** menu.

Figure 71. Exam Window Toolbar

The Zoom window toolbar, shown below, consists of buttons for the most commonly used features in that window. The toolbar (like the mini windows and status bar) can be hidden from view and restored when needed by selecting those items from the **Window** menu.

Figure 72. Zoom Window Toolbar

9.1.2. Customizable Toolbars

Toolbars can be customized to include just the icons that you use frequently to simplify the Exam and Zoom windows.

To add or remove toolbar buttons, perform the following steps:

1. In either the CDR Exam or Zoom window, click on the small down arrow after the last toolbar button.

2. Select **Add or Remove Buttons**.

3. Select **Standard**.

4. Clear the checkboxes of the toolbar buttons you wish to remove.

5. If you wish to add any toolbar buttons that were removed previously, select those checkboxes.

6. Close and restart CDR DICOM.
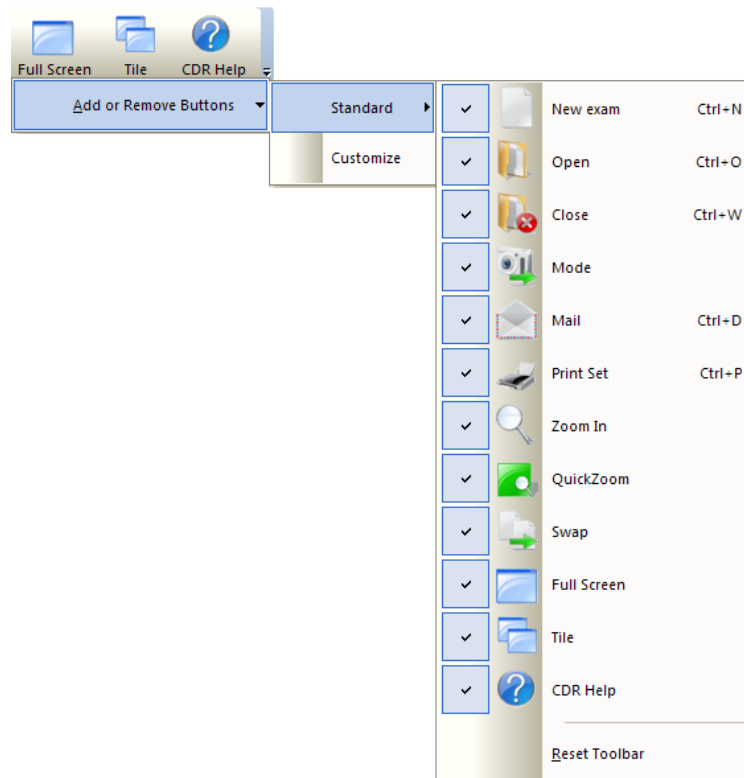
Figure 73. Standard Toolbar Menu

To customize the toolbar buttons, perform the following steps:

1. In either the CDR Exam or Zoom window, click to the right of the last toolbar button.

2. Select **Customize**

3. Click on one of the tabs to do the following

   - To drag-and-drop a new button to the toolbar, click on the Commands tab and scroll through the Categories window until the desired button is located. Click and hold the button in the Commands window and drag it onto the toolbar. Release the button to complete the action.

   - To add a new toolbar, click on the Toolbars tab and click on the New button. When prompted, type in a toolbar name and click OK. Drag the new toolbar (initially empty) into the toolbar area and click on the small down arrow to add the buttons you wish. To rename, delete or show / hide button text labels, these actions can also be performed here.

   - To assign or change accelerators (shortcut keys) for any menu or action in CDR, click on the Keyboard tab and scroll through the Category window until the desired command is located. Different shortcut keys can be used in the Exam (CDR Dicom) and Zoom windows, so be sure to select the appropriate one from the drop-down menu. Click inside the New Shortcut Key text box and enter, using your keyboard, the combination of keys (typically Ctrl+another key) you wish to associate with the command. If the combination you entered is unassigned, click the Assign button. Removing shortcut keys can also be performed here.

   - To add menu shadows or animations, click on the appropriate item in the Menu tab.

   - To show toolbar screen tips (with or without shortcut keys), or large-sized buttons, click on the appropriate item in the Options tab.
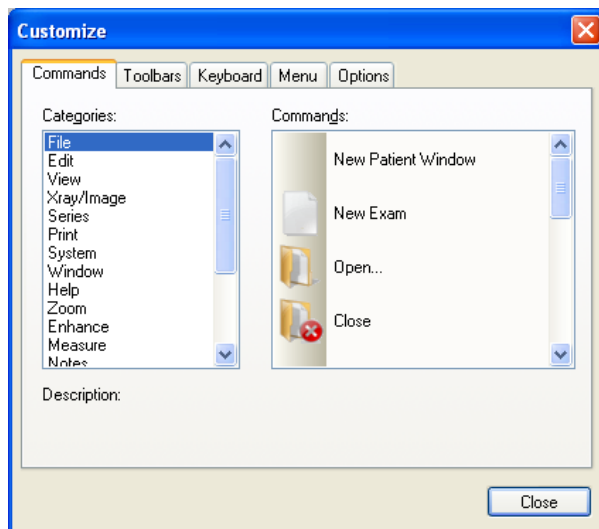
Figure 74. Customize Toolbar Menu

9.2. ToolTips, Menu Item Tips, and Status Messages

9.2.1. ToolTips

ToolTips provide short descriptions of toolbar buttons in the exam and Zoom windows. Whenever the cursor moves over a button, CDR DICOM displays a short description of its function.

ToolTips can be especially useful when the small button toolbar is active. When this style of toolbar is used, the names of the buttons are hidden to minimize the area used by the toolbar and to maximize the size of the screen for viewing images. Even if the small buttons seem unfamiliar, ToolTips can be used to identify each button just by moving the cursor over it.

9.2.2. Menu Item Tips

Selections in CDR DICOM's drop down menus are described in the status bar located below the exam and Zoom windows. By scrolling through each menu item, a short description of the selection appears in the status bar.

9.2.3. Status Messages

Status messages provide information on the currently selected acquisition mode, the readiness of the CDR DICOM system to acquire images, and other helpful reminders.
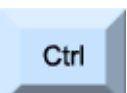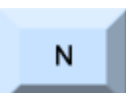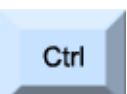
9.3. Shortcuts

Table 9. Exam Window Shortcut Keys

Menu Name	Command Name	Shortcut Key		
FILE	New Exam	Ctrl	+	N
	Open Exam	Ctrl	+	O
	Save Exam	Ctrl	+	S
	Close Exam	Ctrl	+	W
	Send CDR Mail	Ctrl	+	D
	Exit CDR DICOM	Ctrl	+	Q
EDIT	Copy X-ray	Ctrl	+	C
	Paste X-ray	Ctrl	+	V
	Select All	Ctrl	+	A
SERIES	Edit Series	Ctrl	+	E
PRINT	Print Full Set	Ctrl	+	P

Table 10. Zoom Window Shortcut Keys

Menu Name	Command Name	Shortcut Key		
FILE	Save X-ray	Ctrl	+	S
	Print	Ctrl	+	P
	Close Window	Ctrl	+	Q
ZOOM	Zoom In 2x	Ctrl	+	Z
	Zoom Out 2x	Ctrl	+	O
	Zoom Full	Ctrl	+	F
	Zoom Window	Ctrl	+	W
ENHANCE	Revealer	Ctrl	+	R
	Colorize Image	Ctrl	+	C
MEASURE	Grid	Ctrl	+	G
CONTRAST	Increase Contrast	Ctrl	+	I
	Decrease Contrast	Ctrl	+	D

Menu Name	Command Name	Shortcut Key		
	Lighten Image	Ctrl	+	L
	Darken Image	Ctrl	+	A
	Normal	Ctrl	+	N
	Flashlight	Ctrl	+	B

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