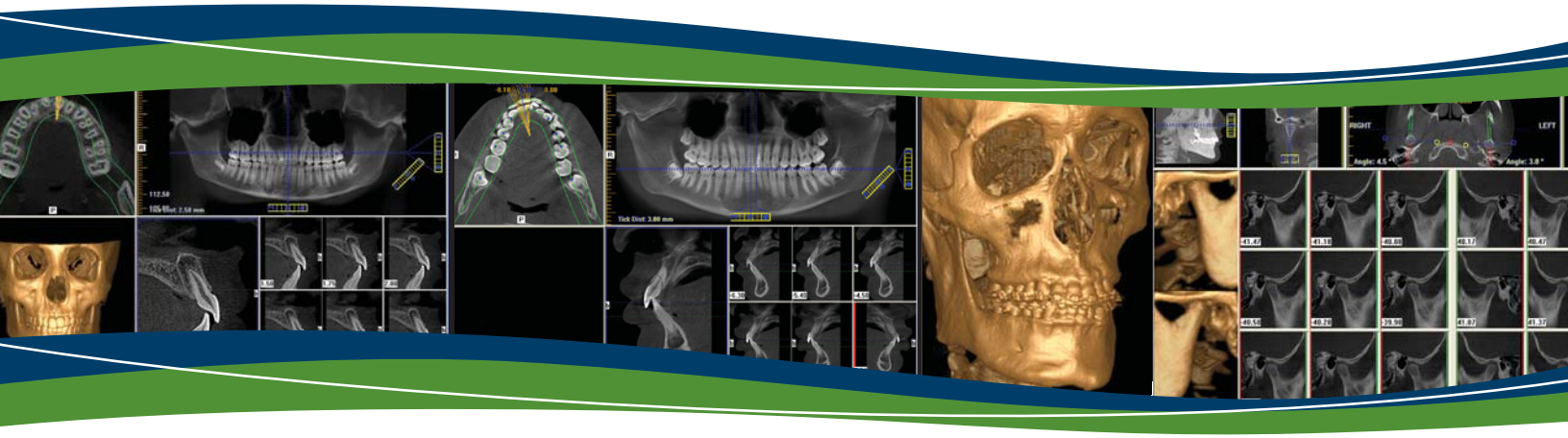
i-CAT®

17-19 Operators' Manual

Cone Beam Volumetric Tomography and Panoramic Dental Imaging System



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This Operators' Manual contains original instructions by Imaging Sciences International for the safe use of the i-CAT 17-19. Imaging Sciences International reserves the right to make changes to both this Operators' Manual and to the products it describes. Equipment specifications are subject to change without notice. Nothing contained within this manual is intended as any offer, warranty, promise or contractual condition, and must not be taken as such.

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What's New in this Release

Change Description	Link to Topic
User-selectable image processing feature, Quantum IQ, added to smooth noise in soft tissue areas of reconstructed scans.	***Quantum IQ***
Sure Smile compatibility enabled between VisionQ studies and Sure Smile software.	***Export Sure Smile Studies***
Dose Area Product feature (available by license) added to display the patient radiation dose measurement for each exposure.	***Dose Area Product Feature***
DICOM modules RSSM and RSQM are now able to send and receive datasets using LEI VR transfer syntax.	***RSSM Installation and Setup*** ***RSQM Installation and Setup***
Storage Commitment feature enhanced to enable selection of a separate connection for DICOM storage.	***RSSM Installation and Setup***
Additional patient study information and status has been added to the Study List.	***Study Information***
DICOM Export feature enhanced to enable export of a volume scan with rotation applied.	***Export DICOM*** ***Add Rotated Volume***

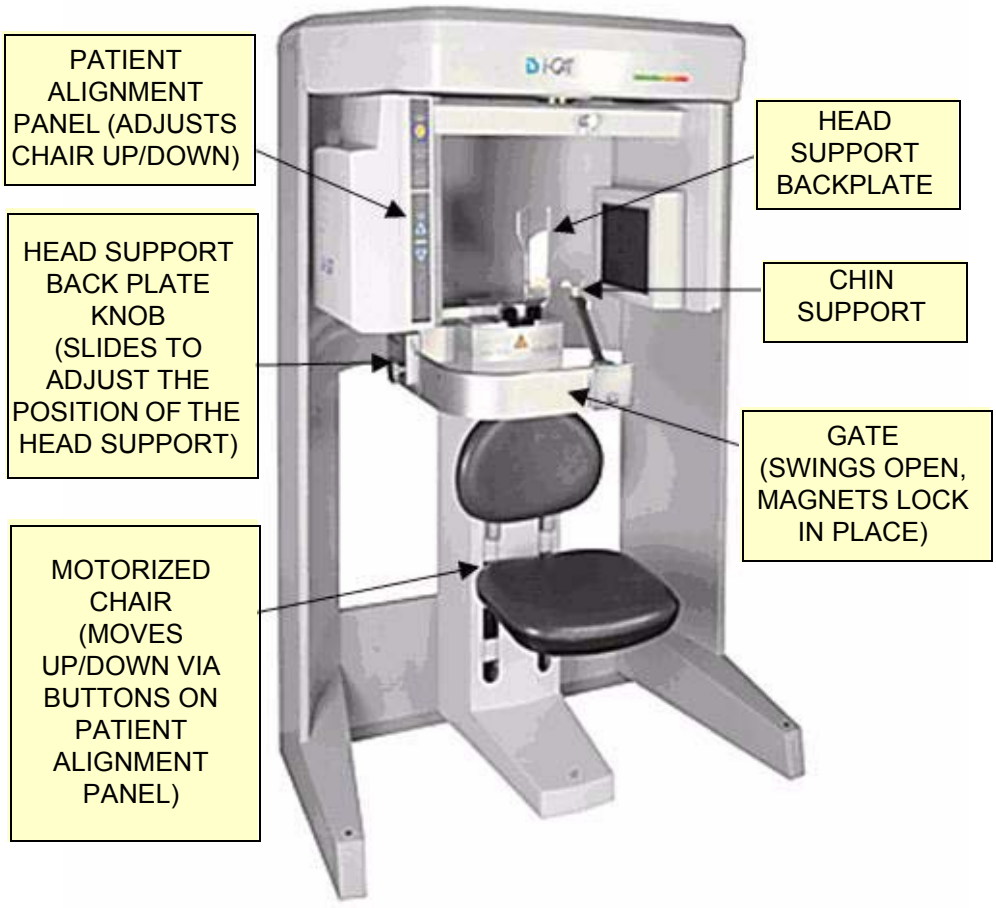
Change Description	Link to Topic
Import Study feature added to enable Vision patient studies to be imported into the system from a CD or network.	***Import Study***
Rescan feature added to enable a rescan of the entire study list database if corruption of the list is suspected.	***Rescan***
Auto Send feature added to enable reconstructed datasets to be sent automatically to a selected server.	***PACS***
New option added to the Tools Setup dialog for designating a Fast System.	***Fast System***
Dolphin 3D, TxStudio and InVivoDental applications can now be launched from the Tools menu. InVivoDental and TxStudio can also be launched for a selected study from the Study List.	***Start External Applications***
Preview scans are saved automatically as .jpg files.	***Preview, Dry Run, and Capture Scans***
iCATVision Standalone is supported on Windows 7 Professional or Ultimate (32-bit or 64-bit modes).	***Workstation Minimum Requirements***

Chapter 1 Introduction

System Description

The system is a Cone Beam Volumetric Tomography and Panoramic X-ray device used for dental head and neck applications. The system consists of a Scanner and Computer Workstation which is suitable for an in-office environment.

This scanning device is an open design that allows Patients to sit upright during a procedure. An electric powered seat is built into the device for proper Patient positioning.



17-19 i-CAT® Imaging System

The system consists of a Scanner and Computer Workstation. In order for the system to operate, both the Scanner and Computer Workstation must be turned ON.

The system captures data for 3D Skull Reconstruction for the following procedures:

- Implants
- TM Joints
- Reconstructed Panoramic
- Reconstructed Cephalometrics
- Airway / Sinus, etc.
- Nerve Canal
- PAN - Optional Conventional Digital Panoramic Feature

Cone Beam Volumetric Tomography is a medical imaging technique that uses X-rays to obtain cross-sectional images of the head or neck. Quality of the images depends on the level and amount of X-ray energy delivered to the tissue. Imaging displays both high-density tissue, such as bone, and soft tissue. When interpreted by a trained Physician, these images provide useful diagnostic information.

Intended Use of the Device

The Imaging Sciences International (ISI) Scanner constructs a three dimensional model from images taken during a rotational X-ray sequence. The scanner is intended to be used whenever a dentist, oral surgeon, or other physician needs 3D information of high contrast objects. The system is designed for imaging of TM joint studies, mandible and maxilla for implant planning, sinuses, and other areas of the maxillofacial complex.

CAUTION

U.S. Federal law restricts this device to sale by or on the order of a dentist or other licensed practitioner.

Major System Items

The system is comprised of the following major items:

- Scanner
- Computer Workstation
- Operator Control Box with 50 ft. (15.2m) Cable
- Patient Emergency Stop Box with 10 ft. (3m) Cable
- Interlock Jumper Cable, 8 inch (20cm)
- Interlock Cable 50 ft. (15.2m)
- Warning Light Cable 50 ft. (15.2m)
- Chair Connection Cable, 10 ft. (3m)
- Power Cable, 15 ft.(4.6m)
- CAT 5 Ethernet Cable, 50 ft. (15.2m)

About the Operators' Manual

This documentation describes the safe and effective operation of the system. The information is intended to provide trained Technologists and Physicians the necessary guidance to operate the system in a safe and effective manner.

Conventions Used in the User Manual

- Keyboard keys are represented in a **Bold** font.

  For example, "Press **Start**."
- Menu items and button names on the user interface display are represented in a **Bold** font.

  For example, "At the Print window, click the **Print** button."
- Keyboard entries are represented in **`bold Courier font`**.

  For example, "Type **`QA Test`** in the filename box."

Standard Limited Warranty

Imaging Sciences International (ISI) warrants the original purchaser that this hardware system will be free from defects for a period of one (1) year from the date of delivery. During the warranty period, ISI will correct any defects in material or workmanship, at no charge for materials. Any replacement parts shall be new or serviceable used parts and are warranted for the remainder of the original warranty or thirty (30) days, whichever is longer. The warranty period is not extended as a result of purchasing any additional parts from ISI. The original purchaser must promptly notify ISI in writing if there is a defect in material or workmanship. Written notice in all events must be received by ISI before expiration of the warranty period. This warranty is not transferable.

This One-Year Limited Warranty covers normal use. **ISI does not warrant or cover:**

- Damage caused by impact with other objects, dropping, falls, spilled liquids or immersion in liquids
- Damage caused by a disaster such as fire, flood, wind, earthquake, or lightning
- Damage caused by unauthorized attachments, alterations, modifications or foreign objects
- Damage caused by peripherals
- Damage caused by failure to provide a suitable environment
- Damage caused by the use of the hardware system for purposes other than those for which it was designed
- Damage from improper maintenance
- Damage from improper electrical connection or supply
- Damage caused by any other abuse, misuse, mishandling, or misapplication
- Damage to acquisition computer, software, or operating system caused by;
    - Unauthorized additions or changes
    - Viruses, spyware, or gaming software
    - Damage caused by Network or Operating Engineers
    - Damage from the use of this machine or computer for any other purpose

- Applications other than its intended use
- Damage caused by third party software
- Damage caused by unauthorized changes to the system software
- Damage caused by unauthorized upgrades, additions or deletions
- Damage caused by internet use, or any other unauthorized application.

Under no circumstances shall ISI be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict liability or any other legal theory. Such damages include, but are not limited to, loss of data, loss of profits, loss of revenue, loss of use of hardware system or any associated equipment, cost of capital, cost of substitute or replacement equipment, facilities or services, down time, purchaser's time, the claims of third party, including customers, and injury to property.

Disclaimer of Warranties
The warranty stated above is the only warranty applicable to this product, all other warranties, expressed or implied including all implied warranties of merchantability or fitness for a particular purpose, are hereby disclaimed. No oral or written information or advice given by ISI, its agents or employees shall create a warranty or in any way increase the scope of this warranty

Backup Recommendations

The owner/operator is responsible for performing data backup. It is recommended that the following data be backed up regularly:

- Imaging Sciences International folder (located in C:\Program Files)
- Patient data (typically LocalRoot or ImageRoot folder)
- For Networked systems, patient data on server (typically NetworkRoot folder)

Chapter 2 Safety Items

Important Safety Information

Imaging Sciences designs its products to meet stringent safety standards. However, to maintain the safety of Operators and Patients, you must operate the equipment correctly and properly and ensure the equipment is properly maintained.

It is essential to follow all safety instructions, warnings, and cautions specified in this manual to ensure the safety of Patients and Operators. In addition, read and observe all danger and safety labelling on the system.

Before attempting to use the equipment for any patient examination, read, understand, and know how to implement the ***Emergency Stops*** on the system.

Warnings, Cautions, and Notes

Before attempting to operate the equipment, it is recommended that you read this manual thoroughly including all cautions and warnings. This guide uses the following conventions to describe situations that are potential hazards to the Patient or Operator, potential loss of data, or potential damage to the equipment.

WARNING

Warnings are intended to alert the user that failure to follow the procedure could cause fatal or serious injury to the user, Patient, or any other person, or result in a misdiagnosis.

CAUTION

Cautions are intended to alert the user that failure to follow the procedure could cause damage to the equipment or cause loss of data.

ADVISORY: Advisories are used to defined information for the operator regarding advice towards use of the device or a process.

NOTE: Notes are used to highlight important or unusual points to be brought to the attention of the operator.

Safety Precautions

WARNING

The X-ray device may be dangerous to the Patient and Operator if you do not observe and follow operating instructions. Do not operate this system unless you have received training to perform a procedure.

WARNING

Do not remove covers or cables on system. High voltage is present in the system. To avoid personal injury from electrical shock, do not operate the system with any covers open or cables removed.

WARNING

Closing the Gate creates a pinch point. Keep hands and other body parts clear when closing Gate.

Electrical Hazards

Installation and system wiring must meet all requirements of local governing authorities. Please check your local authorities and local codes to determine best practices for a safe installation.

Do not place any liquid or food on any part of the consoles or other modules of the system.

Observe all fire regulations. Fire extinguishers should be provided for both electrical and non-electrical fires. All operators should be fully trained in the use of fire extinguishers and other fire-fighting equipment and in local fire procedures.

WARNING

In the event of an electrical fire, only use extinguishers that are labelled for that purpose. Using water or other liquids on an electrical fire can lead to fatal or other serious personal injury.

WARNING

In the event of an electrical fire, to reduce the risk of electrical shock, try to isolate the equipment from the electric source before attempting to extinguish the fire.

Explosion Hazard

Do not use the System in the presence of explosive gases or vapors, including anaesthetic gases. Use of this system in an environment for which it is not designed can lead to fire or explosion.

WARNING

This unit is not suitable for use in a flammable air mixture environment.

If hazardous substances are detected while the system is turned on, do not attempt to turn off the system. Evacuate the area and then remove the hazards before turning off the system.

Mechanical Hazards

WARNING

Do not operate the system with any covers open or removed. Operating the system with open or removed covers could expose mechanical operating systems that could cause serious or fatal personal injury to you or the Patient. Only qualified and authorized service personnel should remove covers from the system.

Carefully observe the patient during the scanning procedure to ensure that when the System Gantry moves, the patient does not collide with the Gantry or other equipment. Ensure that the patient does not grab or hold any part of the system or nearby equipment.

Collision System

The Gantry motor is programmed to operate at a rotational force of <= 15 lbf (66.7N). Interference or incidental contact with the Gantry during rotation, which results in an interruption in Gantry motion, will be detected and trigger a system stall event. This will result in a system fault condition which will cause the following system events to occur:

- Stepper Motor power is removed
- X-Ray operations cease
- System Fault Light illuminates
- X-Ray Audio and Visual indicators de-energize

Operator intervention is required to recover the system for normal use.

Laser Beam Hazards

WARNING

Laser beams can cause optical damage. Instruct the Patient to close eyes to avoid looking into the beam. The use of optical instruments such as eyeglasses with large diopter or mirrors, increase eye hazard with this product.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

The System Gantry has laser markers to assist you in planning scan procedures. If you are using the laser markers while a patient is in the chair, warn the patient that the laser beam could be harmful. Advise the patient that laser beams can cause optical damage. Instruct the patient not to stare at the laser beam and to avoid looking into the beam.

Radiation Safety

X-rays are dangerous to both operator and others in the vicinity unless established safe exposure procedures are strictly observed. Use the following safety measures to ensure safety to the Patient and Operator.

The useful and scattered beams can produce serious or fatal bodily injuries to Patients and persons in the surrounding area if used by an unskilled operator. Adequate precautions must always be taken to avoid or reduce exposure to the useful beam or to scattered radiation.

Operators are strongly urged to comply with the current recommendations of the International Commission on Radiological Protection and, in the United States, the US National Council for Radiological Protection.

Radiation Protection Measures

Use the following measures to protect yourself and the patient from unintended exposure to radiation. Anyone who is near the patient during test procedures must observe the following precautions:

- Maintain adequate distance from exposed radiation source.
- Keep exposure times to a minimum.
- Wear protective clothing (lead apron, etc.) to protect the anatomical areas.
- Wear a PEN dosimeter and/or film badge.
- If you are required in the exam room during a procedure, stay as far from the scanner as possible or behind a mobile protective wall.
- The physician is responsible for protecting the patient from unnecessary radiation.

System Safety Devices

Emergency Stops

This manual contains instructions for safe operation of this dental X-ray System. In the event of an emergency (any moving component collides with any parts of the equipment or items in the environment, or that could cause physical injury to the Patient), the Operator and/or Patient should utilize the **Emergency Stop buttons** to turn off the power to all moving parts in order for the Patient to be safely removed from the machine.

Warning System

The System is equipped with provisions for warning lights and/or audible alarms when X-ray power is energized.

An externally powered Warning System can be connected to the cable provided which is capable of 250 volts, 50/60 hertz, and 2.5 amps. When X-ray power is energized the warning system is also energized.

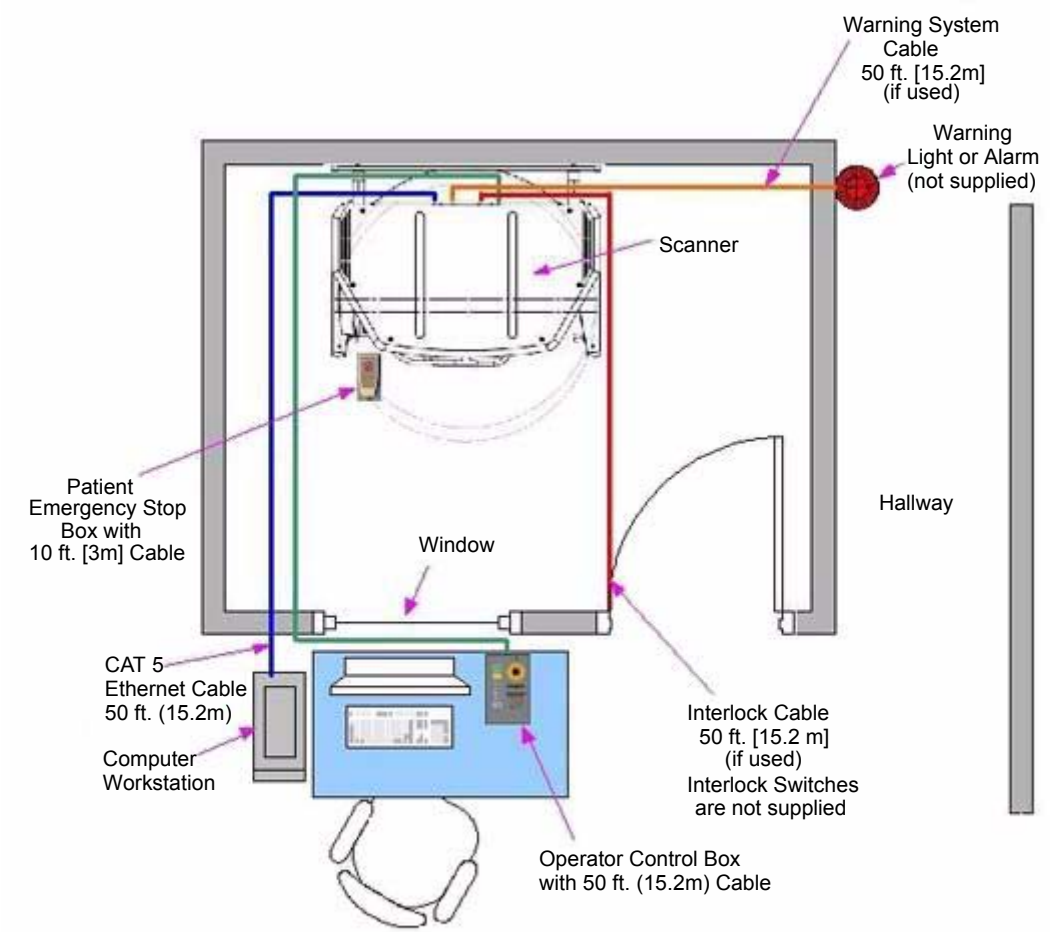
Interlock System

This System is equipped with provisions for an Interlock Circuit which, when opened, will turn off X-ray power. This is a low voltage circuit, 12 volts DC. To use the Interlock Circuit disconnect the factory installed Shorting Plug. Connect the supplied Interlock Cable to the scanner. Connect door switches (NO/COM terminals) and/or emergency stop switches (NC/COM terminals) in series between the other end of the Interlock Cable wires.

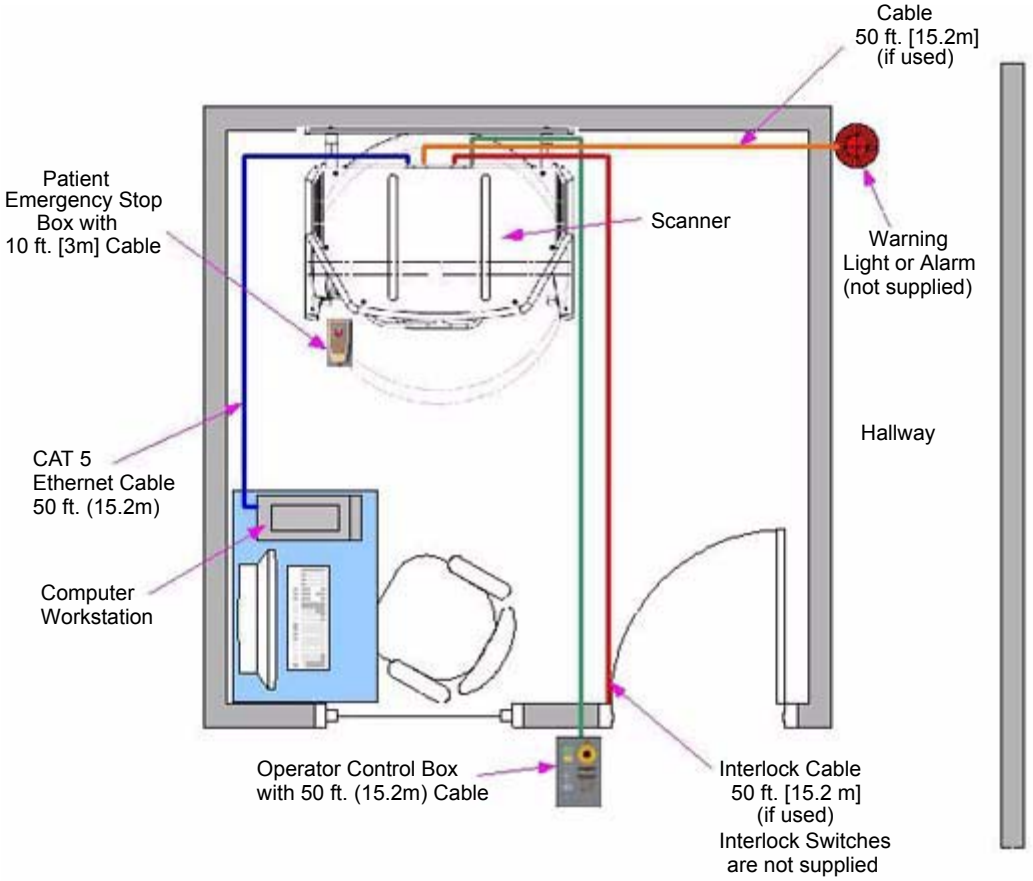
Multiple door switches and/or emergency stop switches can be connected as long as the devices are connected in series. The entire circuit must be a closed loop when all of the doors are closed and/or emergency stop switches are in their normally closed state. Whenever the door switch or switches are opened or emergency stop button(s) pressed the X-ray power will be turned off. X-ray power cannot be turned on when the interlock circuit is open.

Sample Site Plan

Below are two typical scanning room layouts that illustrate the system interconnect for the Warning System, Operator Control Box (Emergency Stop) and Interlock System which are all describe above. Room layouts must provide a means for audio and visual communication between the Operator and Patient. The Patient Emergency Stop Box, which can stop the operation of the X-ray device, must be within reach of the Patient when scanning occurs.

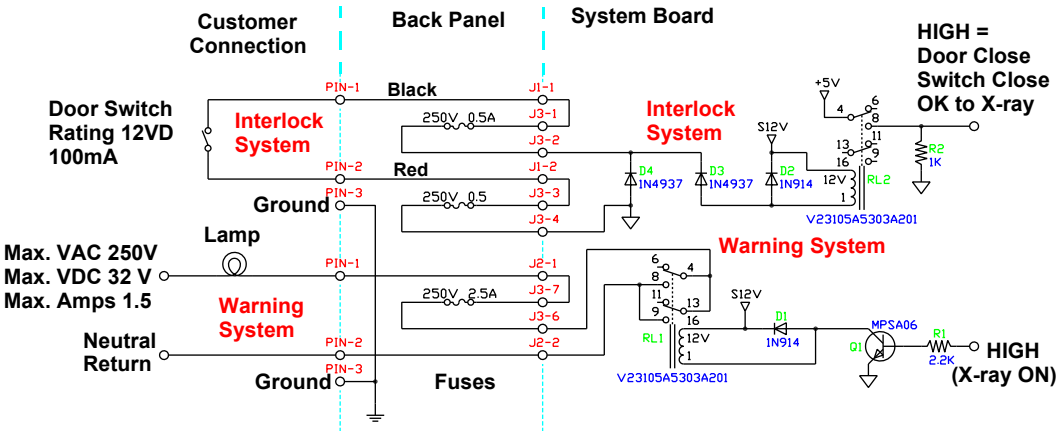


Room Size
6.5 x 8.5 feet [2 x 2.6 meters]



Room Size
8.5 x 8.5 feet [2.6 x 2.6 meters]

Interlock and Warning System Schematic



Cabling Requirements

System cabling connections must be installed away from walkways and doorways. It is recommended to run cabling along wall perimeters. If there is a chance of mechanical damage due to the cable location, then the use of conduit or other means of protection should be considered.

Emergency Removal of a Patient

If an emergency arises where it becomes necessary to interrupt a scan and/or remove a patient from the Patient Chair, use the following procedures.

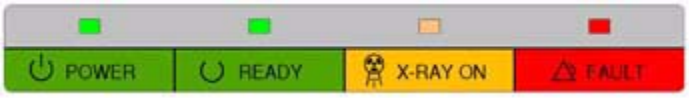
1. Press an Emergency Stop button.
2. When you have determined that you can safely remove the patient, grasp and pull the gate outward.
3. Make sure the patient's head will not touch the top of the Gantry and help the patient off the Patient Chair.

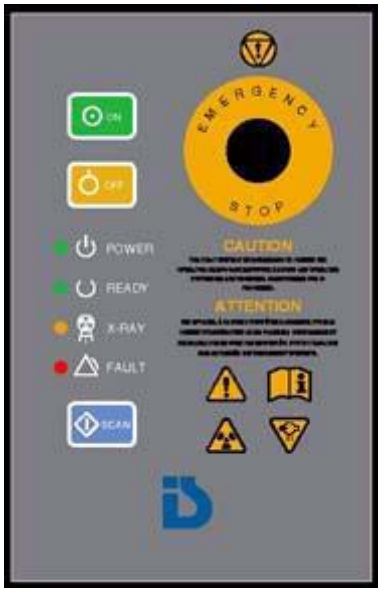
Error Messages

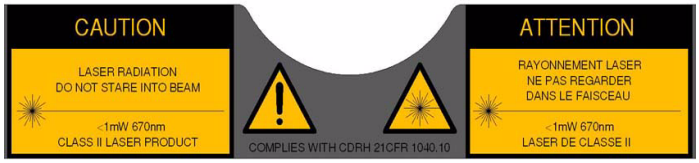
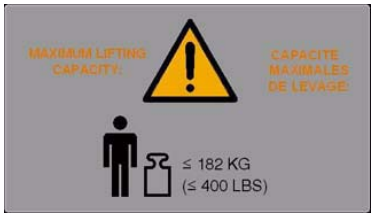
The system may display error message dialogs. If problems persist after performing the indicated action or actions in the message, call Technical Support.

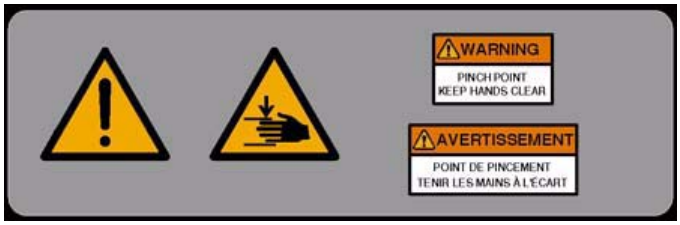
System Labels

The following labels are attached to the system.

Label Definition and Location	Symbol Definition
Patient Emergency Stop Panel Label Location: Can either be hung from the chair support mechanism or held in the Patient's hand. 	EMERGENCY STOP
Indicator Panel Label Location: Front Overhead 	POWER READY X-RAY ON FAULT
PANEL ONLY TO BE REMOVED BY ISI TRAINED SERVICE PERSONNEL Location: Beam Limiter Panel 	General Warning

CAUTION: THIS X-RAY UNIT MAY BE DANGEROUS TO PATIENT AND OPERATOR UNLESS SAFE EXPOSURE FACTORS AND OPERATING PROCEDURE ARE OBSERVED. UNAUTHORIZED USE IS PROHIBITED. Location: Control box 	 Turns Unit On  Turns Unit Off  Starts the Scan  Power  Ready  X-Ray On  Fault  Emergency Stop  General Warning  Warning Ionizing Radiation  Follow Operating Instructions for Use  X-Ray Radiation
CAUTION: LASER RADIATION **DO NOT STARE INTO BEAM** **<1mW 635nm CLASS II LASER PRODUCT** Location: X-Ray Source 	 General Warning  Laser

CAUTION: LASER RADIATION **DO NOT STARE INTO BEAM** **<1mW 670nm CLASS II LASER PRODUCT** Location: Gantry 	General Warning Laser
Patient Alignment Panel Location: X-Ray Source Assembly 	Laser Seat Height Adjustment
Chair Warning Label **MAXIMUM LIFTING CAPACITY** **≤ 182 KG (≤400 LBS)** Location: Chair Assembly 	General Warning Maximum Lifting Capacity

Chair Installation Label **WARNING PINCH POINT** **KEEP HANDS CLEAR** **Seat Weighs 6.8 KG (15 LBS)** Location: Seat Assembly  	 Pinch Point  Seat Weight
Gate Label **WARNING PINCH POINT** **KEEP HANDS CLEAR** Location: Chair Gate  	 General Warning  Pinch Point

Rear Overhead Label
Modes of Operation: Continuous & Intermittent

Location: Rear Overhead

General Warning

Warning Electrical Hazard

Type B (Body) applied part complies with IEC 60601-1

Non-Ionizing Radiation

Recycle

1520 Chair Cable

1518 Control Box Cable

1525 Interlock Cable

1527 Warning Cable

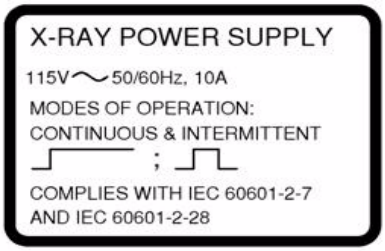
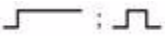
Network Cable to Work Station Computer Cable

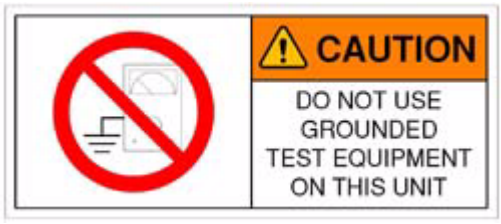
0 I Breaker Switch On/Off

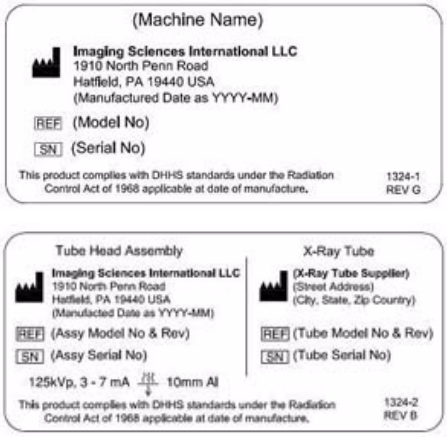
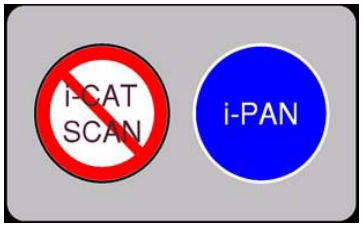
12VDC 20mA Output for Interlock

AC In

Continuous : Intermittent

Fuse Label Location: Rear Overhead 	 Interlock Fuse  X-Ray On Lamp Fuse  X-Ray Supply Fuse  Fuse
X-Ray Power Supply Label **MODES OF OPERATION:** **CONTINUOUS & INTERMITTENT** **COMPLIES WITH IEC 60601-2-7 AND IEC 60601-2-28** Location: X-Ray Power Supply 	 Continuous : Intermittent

Capacitor Warning Label **Capacitor Has >300VDC** **Wait 5 minutes for capacitor discharge before handling.** Location: X-Ray Power Supply  **Capacitor Caution Label** **DO NOT USE GROUNDED TEST EQUIPMENT ON THIS UNIT** Location: X-Ray Power Supply  	 General Warning
CE/ETL Label Location: Leg  	

Serial Label Locations: Tube Head Assembly, X-Ray Power Supply, X-Ray Controller, Beam Limiter, Rear Overhead, Leg  	 Manufactured By REF Model No. SN Serial No.
Do Not Use with i-CAT SCAN **Only Use with i-PAN SCAN** Location: i-Pan Head Positioner  	
Push to Release Label Location: i-Pan Head Positioner  	

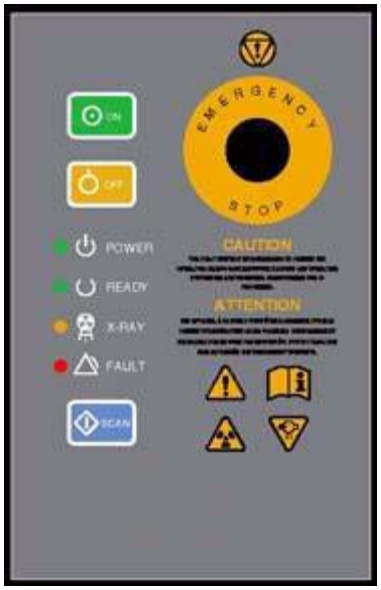
Chapter

3 System Controls and Indicators

Controls and Indicators are found on the following system units:

- Operator Control Box
- Patient Alignment Panel
- Patient Emergency Stop Control
- System Status Indicators

Operator Control Box



ON powers the Scanner and the POWER indicator lights to show that the device is ON.

OFF removes power from the device and the POWER indicators go OFF.

EMERGENCY STOP immediately halts all X-ray and scanning activities.

SCAN initiates Patient X-ray scanning. (This allows the Operator Control Box to be mounted in a location different from the Computer Workstation.) When scanning is occurring, the **X-RAY ON** indicator is lit.

FAULT indicator lights when a system error occurs (such as an X-ray exposure problem).

Patient Emergency Stop Control

PATIENT EMERGENCY STOP allows the Patient to halt all X-ray and scanning activities by pressing the button.

The Emergency Stop Control can either be hung from the head support mechanism or held in the Patient's hand as desired.

Patient Alignment Panel

WARNING

Laser beams can cause optical damage. Do not stare into the laser beam. Instruct the Patient to avoid looking into the beam. The use of optical instruments such as eyeglasses with large diopter or mirrors, increase eye hazard with this product.

ALIGNMENT LIGHT - pressing the button turns ON the laser alignment lights for two minutes, or until the button is toggled OFF.

PATIENT ALIGN allows the Operator to move the Patient seat up and down to facilitate Patient alignment with the Chin Rest.

System Status Indicators

The System Status Indicators are located on both the overhead unit and the Operator Control Box.

POWER indicator is lit when the scanner is ON.

READY indicator is lit when the software Acquire button is pressed to begin the scanning process.

X-RAY ON indicator is lit during the scanning process.

FAULT indicator lights when a system error occurs (such as an x-ray exposure problem).

Chapter

4 System Startup and Shutdown

System Startup

The System includes the Scanner and a Computer Workstation. The system is available for use immediately after System Startup, no device warmup is required. Both units must be ON to function properly. To start the system, do the following:

1. Power up the Scanner: press the ON button on the Main Control Box. The POWER indicator on the Main Control Box and Scanner should light.

2. **Power up Computer Workstation:** press the power button on the front of the Workstation. The computer boots and loads the operating system.

3. **Launch VisionQ Software:** double-click the **VisionQ** icon on Workstation desktop. The VisionQ software application is launched.

NOTE: Although the system is now ready to scan, the **Ready** indicator does not illuminate until the **Acquire** button is pressed to start a scan.

System Shutdown

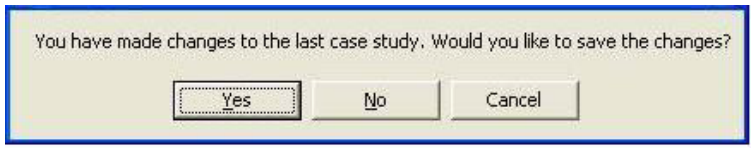
The Scanner and Computer Workstation are powered independently. Both units are powered OFF as described below.

NOTE: It is recommended that the VisionQ application be closed at the end of each business day.

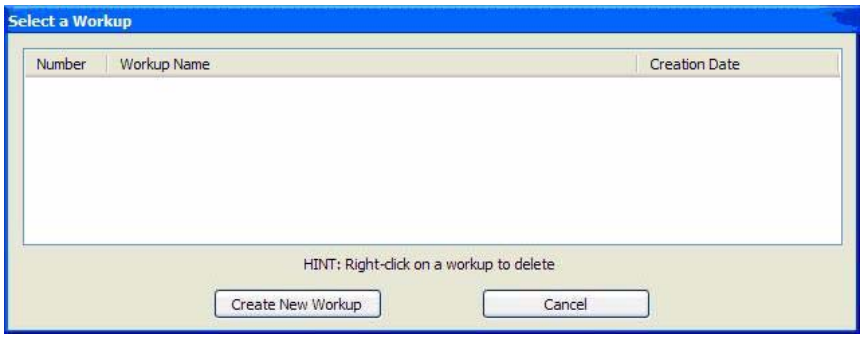
To shut down the system:

1. From the Main menu on the Computer Workstation, select **File > Exit**. VisionQ closes but the Windows desktop remains ON.

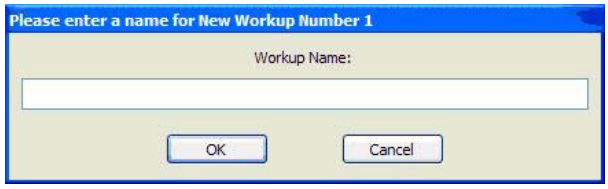
If changes were made to a case study, the following dialog box appears.



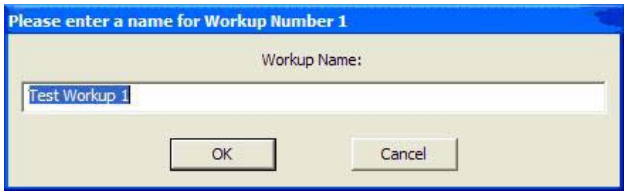
a. Click **Yes**. The dialog box closes.



b. Click **Create New Workup**.



c. Enter a name for new Workup in the *Workup Name:* field. Click **OK**
or
Overwrite an existing Workup by clicking an existing Workup Name.

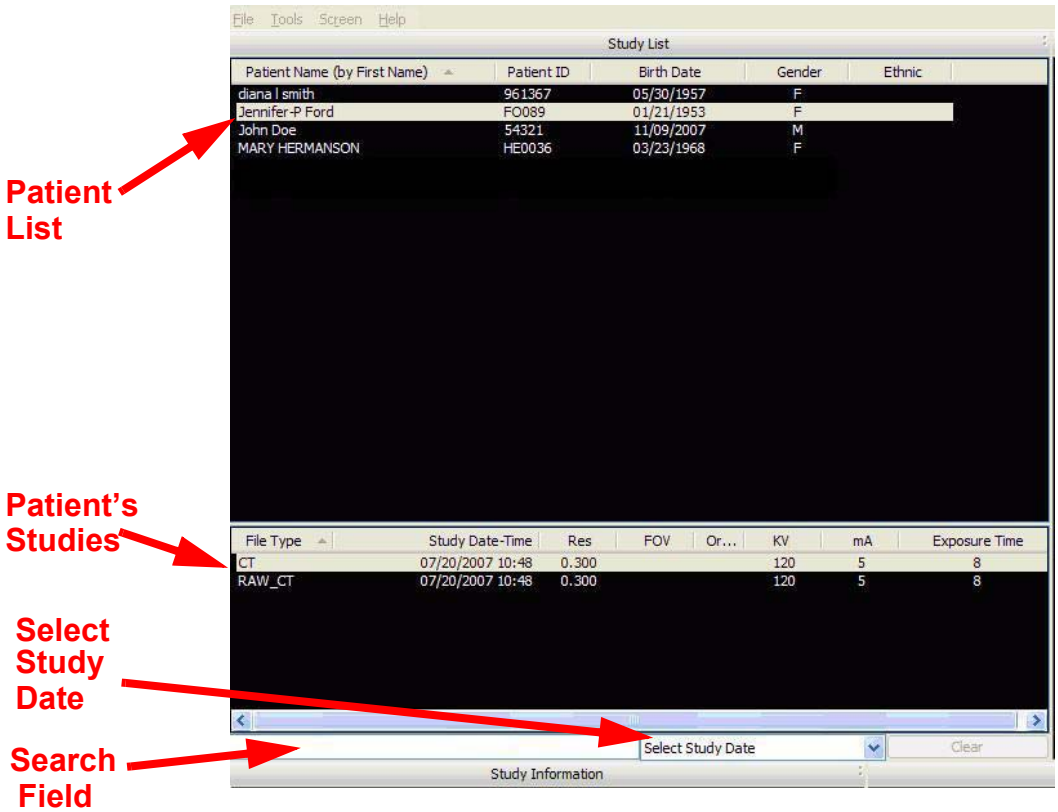


2. **Power OFF Scanner:** press the **OFF** button on the Main Control Box. The Scanner shuts down and the POWER indicators on the Main Control Box and Scanner go OFF.
3. **Power OFF Computer Workstation:** from the Windows desktop, select **Start > Shut Down** and then select **Shut Down** and press **OK**. The Computer shuts down and the POWER indicator on the Workstation goes OFF.

Chapter 5 Managing Patient Data

Patient Information

When Vision is launched, the Patient Information window is displayed. The Study List (shown below) lists all Patients that were entered into the database. The combination of Patient ID, Name, and Birthdate identify a unique patient, and all studies captured with this combination are listed under the same patient. Otherwise, a separate patient listing is created. When a Patient is selected (highlighted), that Patient's scanned images are listed in the window beneath the Study List.



The order in which patients are listed may be altered by clicking a header above the Study List. For example, clicking **Birth Date** changes the *Study List* to display numerically by birth dates, starting from month 01 down to 12. Clicking **Birth Date** again reverses the order, displaying the 12th month first. This works with all headers for both the Patient and Scan Lists. Clicking **Patient Name** not only toggles the alphabetical order but can alter the listing to display the order of patients by *First Name* or by *Last Name*.

The **Search Field** enables entry of a character string (letters and/or numbers) for which to search the Patient Name and Patient ID columns to quickly locate a Patient by name or ID.

The **Select Study Date** displays only the Patients that were scanned within the selected time period. The drop-down list has the following selections:

- Today
- Two days
- Three days
- One week
- Two weeks
- Three weeks
- Four weeks

Clicking the **Clear** button returns the *Study List* to display all patients.

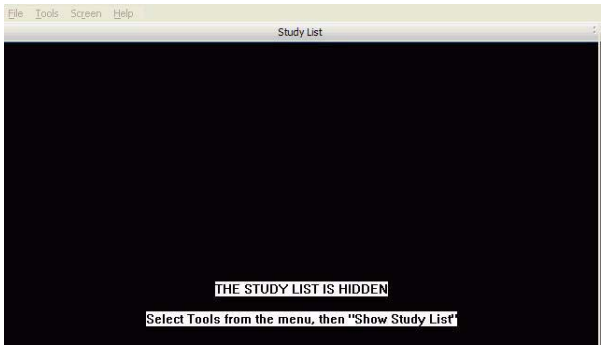
Study Information

The following study information is displayed for each selected patient study. Use the scroll bar across the bottom of the study information pane to view all fields as needed.

Field	Display	Description
File Type	CT	CT Image
	RAW_CT	Raw CT data
	DX	Digital X-ray (PAN image)
	OT	Raw PAN data
Study Date-Time	Creation Date/ Time	Study is ready to be viewed
	In Progress	Study is in the acquisition phase
	% Reconstructing	CT study is being reconstructed with the displayed % complete
	Transferring	Acquisition or reconstruction is completed and the data is being transferred to the server
Resolution (Res)	Numeric	Resolution of scan as selected from Resolution drop-down on Acquisition screen
Field of View (FOV)	Numeric	Height of scan as selected from Size of Reconstructed Volume on Acquisition screen
Orientation	Landscape	Standard scan
	Portrait	Extended diameter scan
KV	Numeric	Number of KiloVolts that X-ray tube is emitting
mA	Numeric	Number of milliAmps that X-ray tube is emitting
Exposure Time	Numeric	Exposure time in seconds
PACS	Sent	A study has been sent successfully to all selected PACS servers
	Sent Failed	The attempt to send a study failed to all selected PACS servers
	Partial Sent Failed	An attempt to send a study to several PACS servers has failed on at least one of the PACS servers
	Committed	The study is successfully committed to storage on the PACS server
	Commitment failed	An attempt to commit the study to storage on the PACS server has failed
Quantum IQ (QIQ)	Yes	Indicates that Quantum IQ imaging process is applied to the study
	Blank	Indicates that Quantum IQ imaging process is NOTapplied to the study
Rotated	Yes	Indicates that study has volume rotation applied
	Blank	Indicates that study does not have volume rotation applied

Hide/Display Study List

The *Study List* can be hidden by selecting **Tools > Hide Study List** from the Main menu. When hidden, the Study List appears as shown below.



To display the Study List, select **Tools > Show Study List** from the Main menu.

Delete Patient Scans

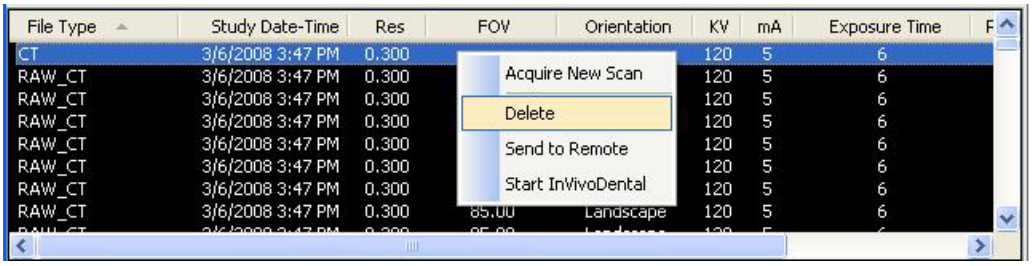
To delete a patient dataset, follow the procedure below. This procedure does NOT delete raw studies.

CAUTION

Do not use Windows Explorer to select and delete studies, Manually deleting a study using a method other than the one described below will require a potentially time-consuming rescan operation.

To delete a Patient dataset:

1. With a Patient selected in the Study List, right-click on the scan to be deleted and select **Delete.**

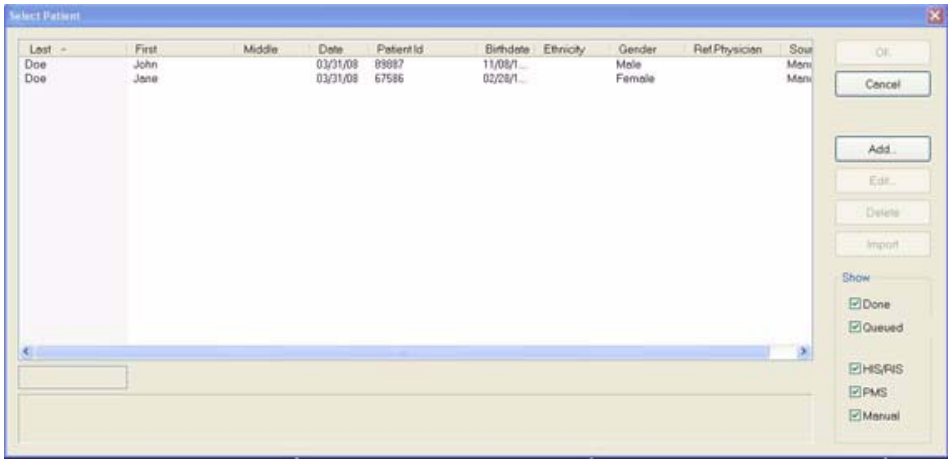


2. Click **Yes** to confirm deletion of Patient Dataset, including all scans and workups. A second confirmation dialog is displayed.
3. Click **Yes** to confirm deletion.

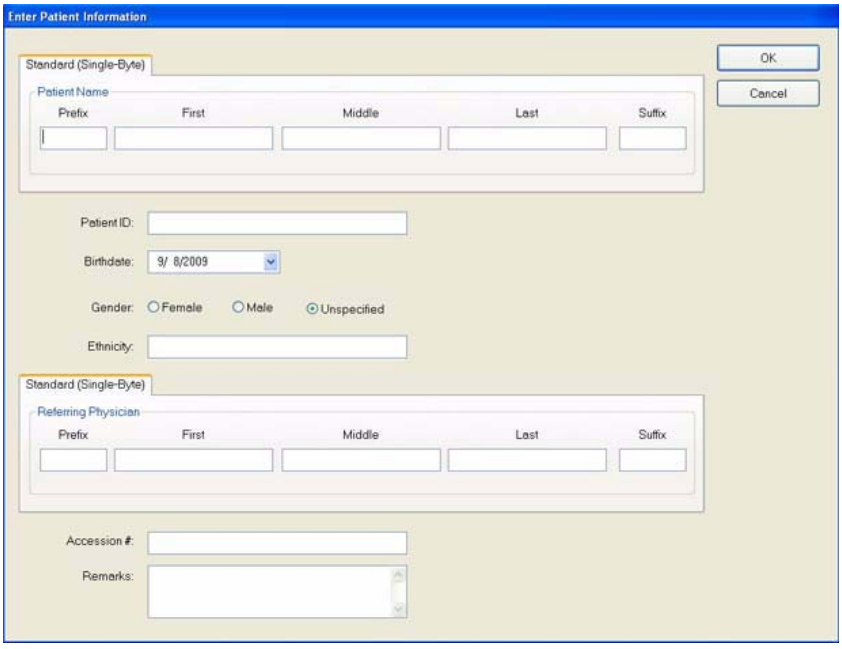
Add New Patient

To add a new Patient

1. From the Main menu, select **File > New Patient** or right click an existing image from Patient Study list and select **Acquire New Scan**.

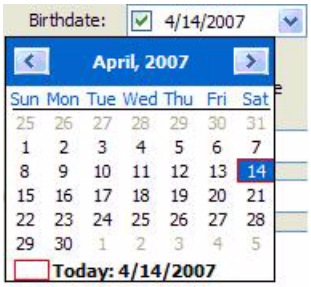


2. Click **Add . . .** button.



NOTE: The *Enter Patient Information* screen may have additional tabs for entering names in Standard (Single Byte), Ideographic, or Phonetic characters. For setup instructions, see ***DICOM Character Set for New Files***.

3. Enter Patient data in the corresponding fields as applicable.
   - A unique **Patient ID** must be added, such as a Patient file number or social security number.
   - Click the **Birthdate** drop-down to display the calendar tool.



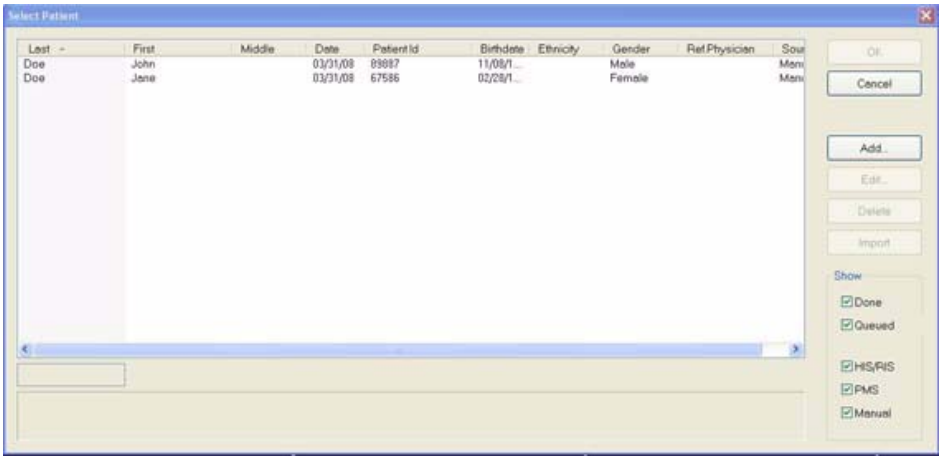
Although dates may be manually entered, it is recommended that the calendar tool be used in order to avoid data entry errors.

4. Click **OK** to add Patient data.
5. Click **Cancel** to close the dialog box or click **OK** to access the acquisition screen to start the patient scan.

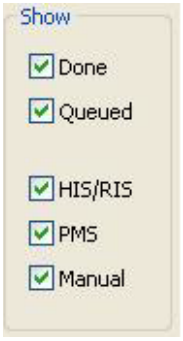
Edit Patient Details

To edit Patient details:

1. From the Main menu, select **File > New Patient**.



2. If desired, limit the number of Patients listed by using the check boxes in the Show area at the lower right side of the dialog box. Only Patients whose data matches the selected criteria are displayed.



   - **Done -** Patient Data entered and scanned
   - **Queued -** Patient Data entered but not scanned
   - **HIS/RIS -** (Hospital Info System/Radiology Info System) imported Patient Data
   - **PMS -** (Practice Management System) imported Patient Data
   - **Manual -** Patient Data entered manually
3. Click (highlight) the Patient to modify.
4. Click **Edit**.

NOTE: The *Enter Patient Information* screen may have additional tabs for entering names in Standard (Single Byte), Ideographic, or Phonetic characters. For setup instructions, see ***DICOM Character Set for New Files***.

5. Modify Patient data as desired.
6. Click **OK** to update Patient data.
7. Click **Cancel** to close the dialog box or click **OK** to access the acquisition screen to start the patient scan.

Access Patient Data

Access Patient Details to be Scanned:

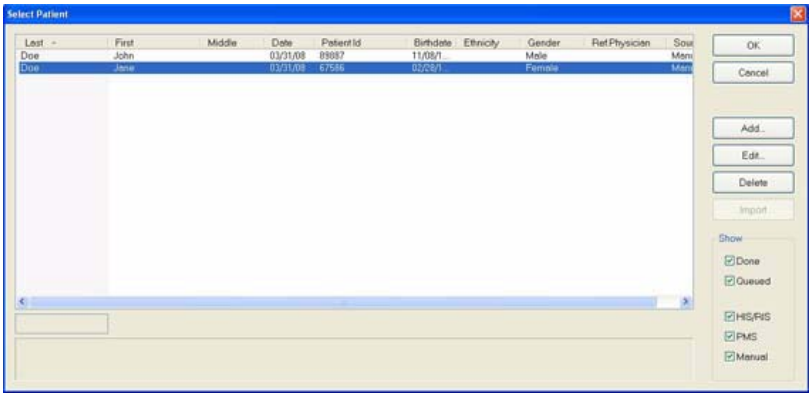
1. From the Main menu, select **File > New Patient**.
2. Highlight the Patient to be scanned and click **OK** or just double click the patient line.
3. The Acquisition screen is displayed for the selected patient.

Delete a Patient

To delete an existing Patient:

NOTE: Deleting a Patient does not delete any of the Patient's scan data.

1. From the Main menu, select **File > New Patient**.
2. Click (highlight) the Patient to delete and click **Delete**.



3. Click **Yes** to confirm deletion of Patient from database.
4. Click **Cancel** to close dialog box.

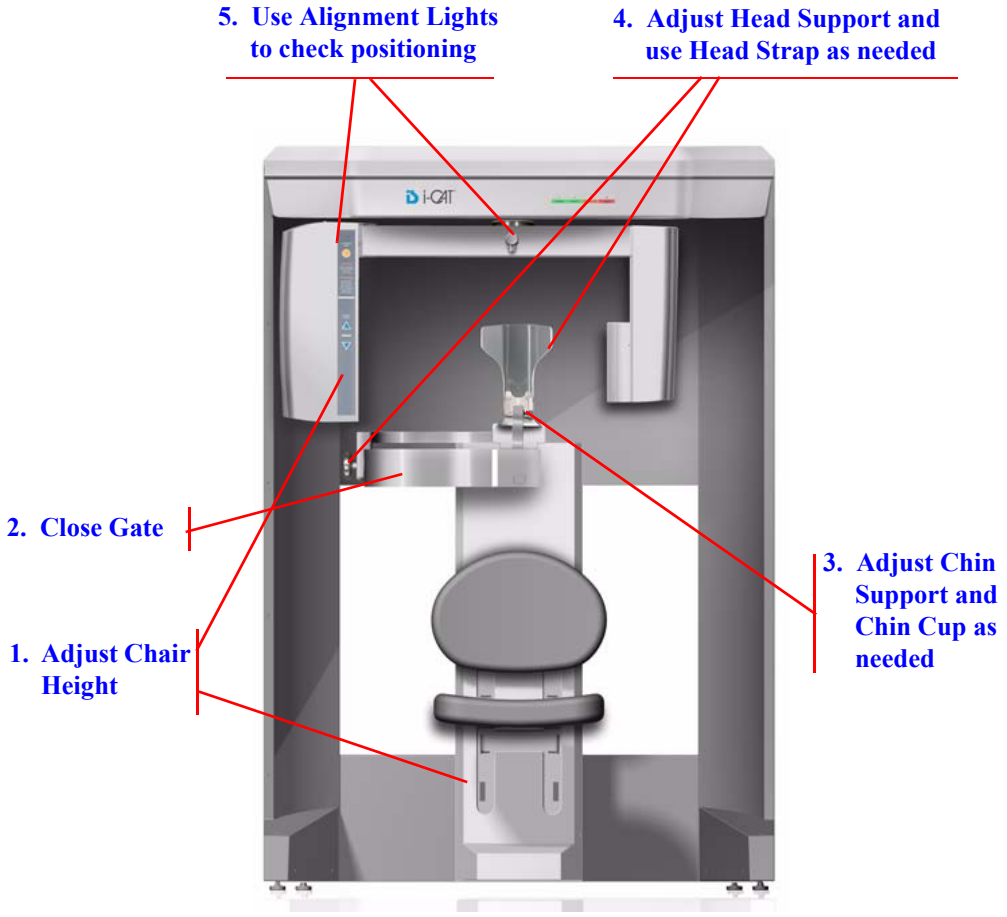
Chapter

6 Patient Positioning and Protocols

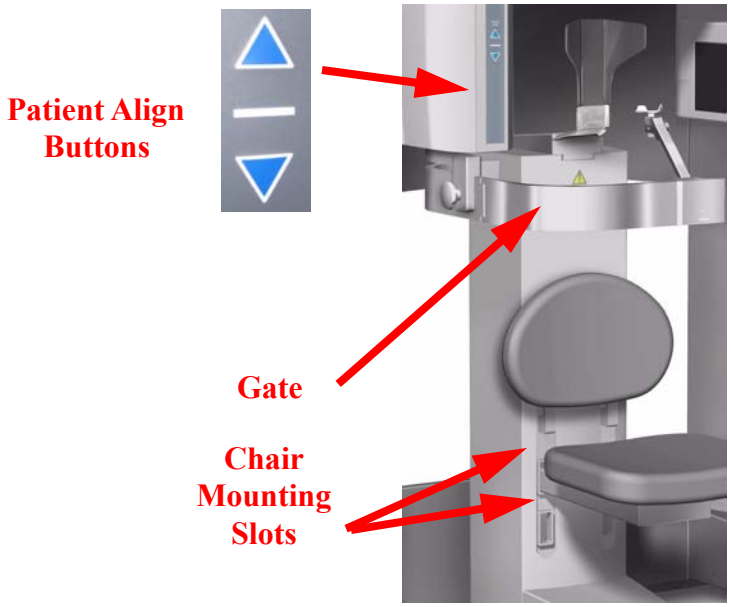
Patient Positioning

Positioning the patient properly and minimizing patient movement are the keys to optimal scan results. Several system features can be used to assist with patient positioning and are detailed in the following paragraphs.

The figure below shows the location of these features and the order in which they are generally used to position a patient.



Patient Chair



There are two sets of mounting slots for the chair. Use the following table as a guideline for initial placement of the chair:

Patient Height	Chair Position
4' 9" and Taller	Lower Slots
Under 4' 9"	Upper Slots

CAUTION

Ensure chair is fully seated in slots to prevent movement when chair is used.

The Chair height can be adjusted using the **PATIENT ALIGN** buttons on Patient Alignment Panel. These controls allow movement of the chair, up (▲) and down (▼), to facilitate Patient alignment with the Chin Support.

Other factors to consider when positioning the Patient in the chair are:

- Very tall patients (over 7') may be required to slide down in the chair to gain the proper alignment with the Sensor Panel.
- Shorter adults or children may require a footstool to stabilize the feet.
- Children may need a booster seat to gain proper alignment.

Gate

The gate swings open to allow Patient seating. The Patient should be seated facing forward with hands in lap.

WARNING

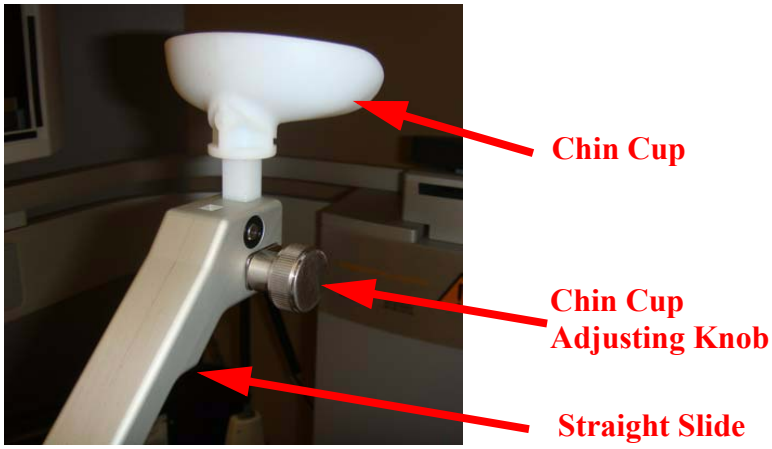
Closing the Gate creates a pinch point. Keep hands and other body parts clear when closing Gate.

Close Gate prior to scanning, making sure the magnet is secured in its locked position. If gate will not close:

- Move Head Support to the rearmost position
- Use Head Strap without the Chin Cup
- Keep Gate open and remove Chin Support.

Chin Support

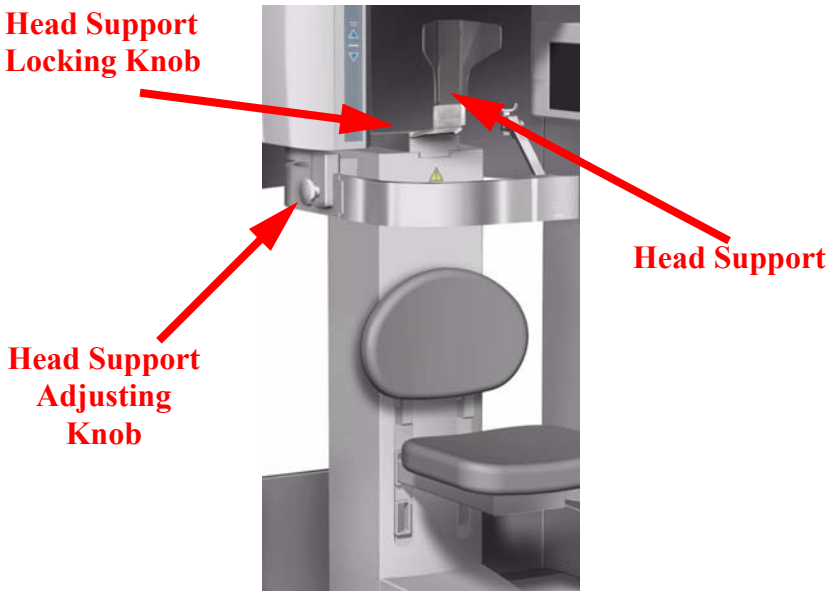
The Chin Support is comprised of several components to help facilitate correct positioning of the Patient. For most studies, the Chin Cup should be aligned with the bottom of the Sensor Panel.



To Adjust the Chin Support:

1. Insert the Straight Slide in the Slide Block.
2. Insert the Chin Cup and use the Adjusting Knob to raise or lower the Chin Cup as needed.

Head Support and Head Strap.



The Head Support slides forward or backward for head stabilization. The Patient's head should be supported firmly between the Chin Cup and Head Support. Grasp the Adjusting Knob and pull forward or push backward to move the Head Support into the proper position.

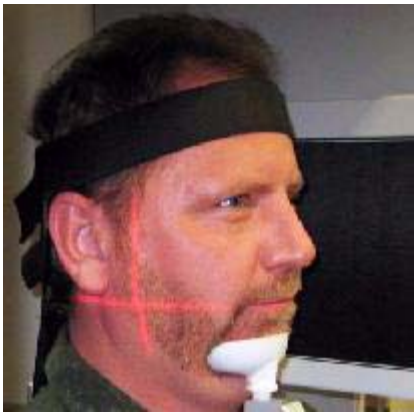
A Head Strap can also be used help stabilize the head. A Velcro Head Restraint kit comes with the system. For initial use of the Head Strap, the Velcro pads in the kit must be attached to the back of the Head Support.

To Install Velcro Pads:

1. Loosen the Locking Knob and remove the Head Support.
2. Attach pads and, if necessary, trim to fit.
3. Insert Head Support and tighten Locking Knob.

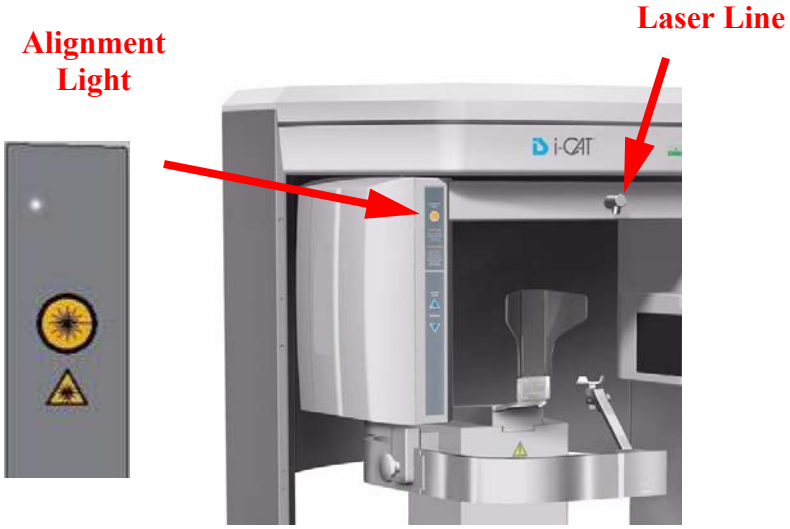
To Use the Head Strap:

1. Attach one end of the Head Strap to one side of the Head Support.
2. Wrap Head Strap around Patient's forehead and secure to other side of Head Support.



For scans that are specific to TMJ or orthodontics, only the head support and head strap should be used. It is recommended that the chin support not be used because it can affect the Condylar position in Fossa and interfere with soft tissue at the chin.

Alignment Light.



The Laser Line projects a vertical line down the center of the chair. Typically, this line should run down the center of the Patient's head and the chin support.

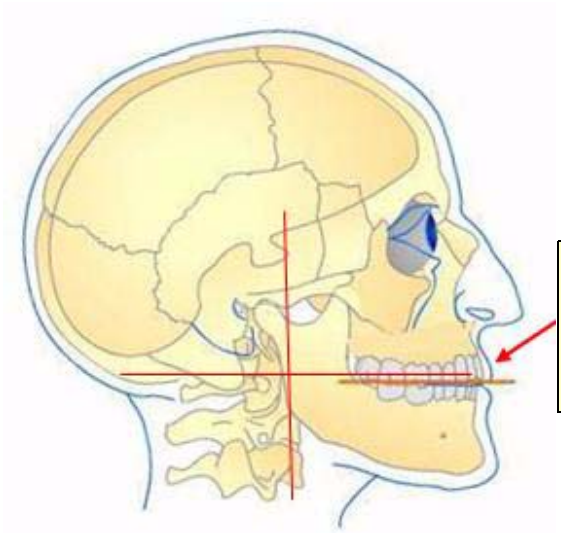
The Alignment Light on the Patient Alignment Panel projects a horizontal and vertical light to assist with patient positioning. In general, the Alignment Light should be positioned as follows:

- Horizontal light - Position at the Occlusal Plane between the lips (smile line).
- Vertical light - Position at 1.5 inches in front of condyles.

NOTE: Make sure that the turret has enough clearance as to NOT brush the Patient's shoulders as it rotates. This may cause movement. Perform a Dry Run, as described in the next chapter, if clearance is uncertain.

CAUTION

The horizontal Alignment Light may vary slightly depending on the Patient position according to the selected height of scan desired, refer to taking a Preview, in the next chapter, to ensure that the target area of interest is in the image.



Position of Alignment Lights:
Horizontal: Occlusal plane between the lips.
Vertical: 1.5 inches in front of condyle (chin support adjusted to acquisition position).

Instruct Patients Prior to Exam

It is important to inform patients of what to expect during a scan so that they are prepared and avoid movement during the scan.

Patients should be informed of the following:

- The turret rotates around the head during the scan.
- The exposure buzzer sounds for the duration of the rotation.
- The scan takes less than 10 seconds to complete.

Patients should be instructed to perform the following prior to or during the exam:

- Remove all metal objects from the shoulders up, including spectacles.
- Place hands in lap or hold on to the bottom of chair.
- Do not swallow during scan.
- Breath through nose during scan.
- Stay as still as possible until the turret has finished moving.
- Close eyes during scan.
- Keep teeth gently together and in same position

Previews and Dry Runs

NOTE: Preview scans and Dry Runs are described in detail in the *Acquisitioning* chapter.

It is recommended that a Preview scan be performed to verify Patient positioning. A Preview scan exposes the Patient to a fraction of a second of radiation, but provides an image that can be used to verify that the Patient is positioned to capture desired field of view (FOV) during acquisition.

A Dry Run is recommended for Patients who want a demonstration of the machine motion, and to check shoulder clearance. A Dry Run simply rotates the turret in the exact manner that is required for the selected protocol, but does not expose the Patient to any radiation.

Protocol Guidelines

NOTE: Refer to the *Acquisitioning* chapter for information specific to PAN scan positioning and acquisition.

In general, protocols should be selected based on the field of view (FOV) required for the study while minimizing radiation dose to the patient. Use the following guidelines to help determine which protocol to use for a study:

- The smaller the diameter and height of the scan, and the larger the voxel size (0.4, 0.3), the less dose to the Patient.
- A smaller voxel size (0.25, 0.2, 0.125) results in a longer scan time and larger dose to the Patient, but produces better resolution and detail.
- A smaller voxel size creates a larger data set so the reconstruction time is longer. Also, these protocols are more sensitive to Patient movement, so it is critical to restrict Patient movement during the scan.
- It is recommended to use either 0.4 or 0.3 voxel resolution when importing VisionQ data into 3rd party software.

Chapter 7 Acquisitioning (Scanning)

Volume Scans

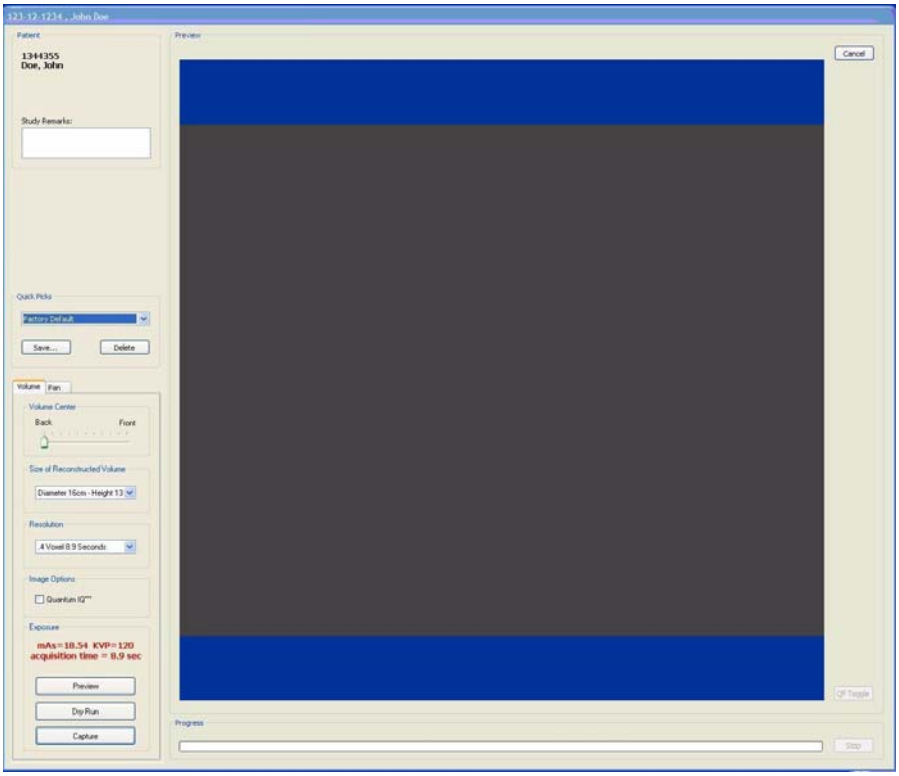
Once Patient data is entered and the Patient is properly positioned, acquisitioning can begin.

NOTE: Refer to the *Patient Positioning and Protocols* chapter for detailed information about patient positioning.

1. From the Main menu select **File > New Patient**.
2. In the *Select Patient* Pane, highlight patient and click **OK** or just double-click the patient to be scanned.

The Acquire window is displayed.

3. If desired, enter any remarks in the *Study Remarks* text field.



4. Select a **Size of Reconstructed Volume** from the drop-down list to indicate the Diameter position of the X-ray sensor.
   - **2 arches/anchor, 8.9 seconds, 0.3 Voxel -** recommended when data is exported to implant planning software systems such as Nobel or SimPlant.
     Please check with your service to determine the desired height of the scan. Please be aware that 3rd party software may have specific requirements for resolution settings that can be imported.
   - **Mandible or Maxilla… -** Protocols can be used if only 1 arch is required for an Implant case.
   - **High Resolution (0.125, 0.2, 0.25, 26.9 seconds) -** recommended protocols for specialized cases such as 3rd molars, root canal relationships, small root fractures, supernumerary or impacted teeth, periodontal condition and other anatomy requiring detailed visualization.
   - **Diameter 23 - Height 17 cm (0.4 or 0.3 Voxel)** (licensed option) **-** should be used for adult Patients where cephalometric data is required. The 600 frame Enhanced (17.8 seconds) setting provides a more detailed scan and is recommended for initial capture of a study. The 300 frame (8.9 seconds) setting provides a scan with less detail and may be sufficient for follow-up studies.
   - **Custom** - enables custom adjustment of collimator. Click and drag top and bottom handles to increase or decrease the FOV. Smallest FOV is 1 cm above and below the beam. For the 0.125 resolution setting, the height adjustment is limited and the handles will not move when the height limit is reached.

   - **Sure Smile Studies -** must be acquired at:
     Size: **Diameter 16 cm, Height 13 cm**
     Resolution: **0.25 voxel, 26.9 Seconds**
     Quantum IQ: **NOT selected**

     Studies then must be reconstructed at :
     Size: **Diameter 16 cm, Height 8 cm**
     Resolution: **0.2 voxel, 26.9 Seconds**
     Quantum IQ: **NOT selected**

     See ***Export Sure Smile Studies*** for more information on reconstructing and exporting Sure Smile studied.

5. Select a **Resolution** from the drop-down list box.

   In general, the lower the voxel size and the longer the scan time, the better the resolution and detail; however, a smaller voxel size and longer scan time creates a larger data set so the reconstruction time is longer. Also, these protocols are more sensitive to Patient movement, so it is critical to restrict Patient movement during the scan. Longer scan times also delivers a higher radiation dose.

   Standard scans should be taken at *Full 13cm, 8.9 seconds, 0.4 Voxel*. This captures the entire maxillofacial region from above the condyles down to below the lower jaw, at the most practical scan time (reducing chance of movement), at a reduced radiation dose, with a voxel size that maximizes detail without the dataset being too large.

   It is recommended to use a faster scan time (for example, 5 seconds.) for children, some elderly Patients (if movement is a significant issue), or if you require only a quick PAN or TMJ Scan, or a secondary/follow-up scan (e.g. Open Jaw TMJ views, TMJ views with appliance/splint, etc.). Since it is a faster scan time, the radiation dose is the lowest, and the opportunity for Patient movement is less.

6. If desired, select the **Quantum IQ** checkbox to apply this reconstruction type when the image is processed. See ***Quantum IQ*** for more information on Quantum IQ.

7. Once the settings are made, you may perform a **Preview**, **Dry Run**, and **Capture** scan.

Preview, Dry Run, and Capture Scans

After the acquisition is launched and the protocol is selected, a **Preview** of the Patient is recommended to verify Patient positioning.

WARNING

The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

Operation Guidelines:

- A site review should have been performed by a qualified physicist prior to system installation to ensure proper equipment layout for safe operation of the system.
- If any changes are made to the equipment layout or occupancy of adjacent areas, or if there is a significant increase in patient workload after the original review, re-evaluation should be performed by a qualified physicist.
- Refer to the *Radiation Environment Survey* chapter for specific scatter beam measurements for your system.

1. Click the **Preview** button under *Exposure*.
2. On the Volume Preview dialog, click **OK** to continue.
3. Press the **Scan** button on the Control Box when prompted to proceed with the Exposure.

   An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.

   If the Patient position appears to be correct, then proceed with the scan. To ensure good quality, the image should appear within a ¼ inch from the front border of the Preview screen.

   Otherwise, re-position the Patient.

   Access **Volume Center** to improve Front/Back positioning.

   The **Volume Center** slide bar moves the X-ray sensor panel (Front/Back) which adjusts the horizontal image positioning. Another Preview scan is recommended after repositioning the Patient.

   Preview scans for both CT and PAN studies are saved automatically as .jpg files to the study folder location for each patient. To access preview scans for a patient, right-click the Preview tab on the Acquisition screen. An output folder opens that contains all previews for the patient for that day. Saved previews show the patient's name, ID, magnification, and DAP value (when enabled). To access previews from older sessions or other patients, reconstruct the raw patient scan and right-click on

the Preview tab. See ***Viewing and Reconstructing Raw Patient Scans***.

4. **Dry Run** is used to give the Patient a demonstrate of the machine motion and also checks shoulder clearance without any radiation exposure. The Dry Run scan rotates the turret in the exact manner that is required for the selected protocol, but does not expose the Patient to any radiation. If desired, do a Dry Run by clicking the **Dry Run** button.

NOTE: It is critical that the Patient is instructed to hold still, swallow before the scan, take shallow breaths during the scan and may want to close his/her eyes so he/she won't be tempted to follow the turret with their eyes during the scan.

WARNING

The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

5. Click **Capture** to start the acquisition.
6. Ensure no one is in the immediate area, then click **OK**.
7. Press the **Scan** button on the Control Box when prompted to continue the scan process. An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.

The turret rotates around the Patient's head. The exposure buzzer sounds for the duration of that rotation, although the true exposure time is much less because the exposure pulses on and off.

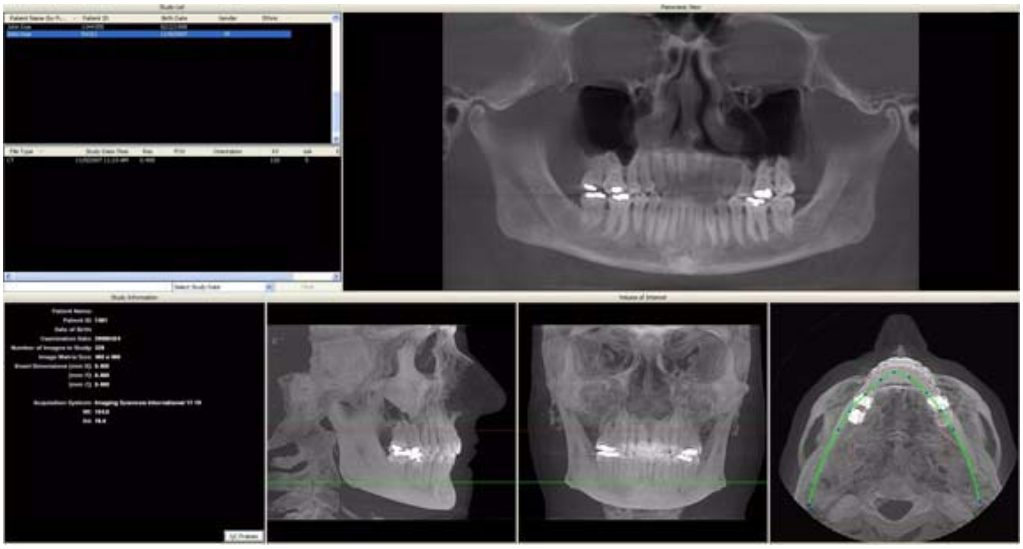
The progress of the scan is displayed on the *Progress* bar at the bottom of the Acquire window.

Once the acquisition is complete, the machine rewinds. **Wait until the machine rewinds before releasing the Patient from the machine**.

The software immediately begins reconstruction of the image data. The time required to reconstruct depends on the acquisition scan time and voxel size that was selected.

NOTE: If DAP is licensed on your system, see ***Dose Area Product Feature*** for more information.

8. The scan is ported to the Vision preview screen for anatomy reconstruction (shown below).

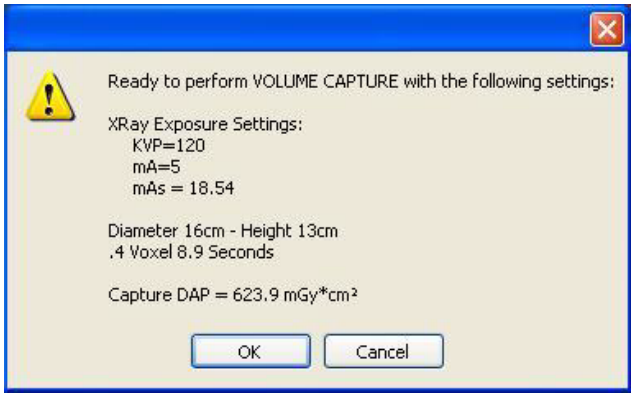


Dose Area Product Feature

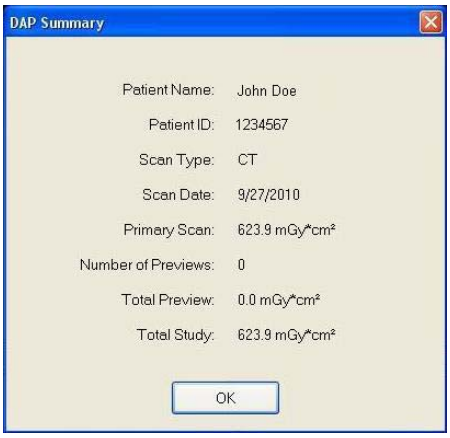
The Dose Area Product (DAP) feature requires a license for activation. Once activated, DAP displays the patient radiation dose measurement for each exposure. The radiation dose measurement is also archived with the patient data.

If the DAP feature is licensed on your system:

- The DAP value of the scan is listed on the dialog that is displayed after clicking the **Preview** or **Capture** buttons on the Acquisition screen, prior to scanning the patient for either a CT or PAN scan.



- The DAP Summary dialog displays after a scan is captured and reconstruction begins in VisionQ for both CT and PAN scans. This dialog shows the DAP value for the patient's full (Primary) scan, the number of Previews, and the Total Study DAP value of all Previews and the Primary scan combined.



- To view the DAP Summary after a CT or PAN scan is acquired, right-click on any dataset and select **Show DAP Summary**. If DAP information is not available for a scan, DAP Not Available is displayed.

- Each CT or PAN preview scan acquired has the DAP value embedded in the Preview scan display.

Quick Picks

Quick Picks are created and named by the Operator. A Quick Pick captures and saves to memory the following settings: Exposure, Volume Center, Size of Reconstructed Volume, and Resolution. For convenience, speed, and accuracy, the Operator may create Quick Picks of commonly used scan settings.

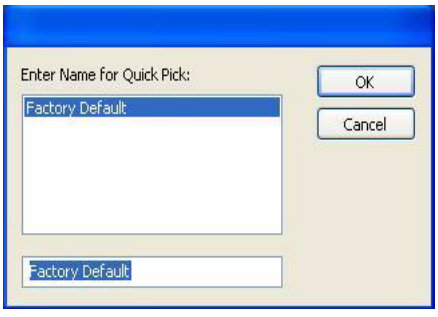
To add a Quick Pick:

1. Select scan settings:
   - Exposure (if available)
   - Volume Center
   - Size of Reconstructed Volume
   - Resolution
2. Click **Save…** button, below the Quick Picks list box.

   This saves the selected settings.

3. Enter a name for the new Quick Pick.
4. Click **OK**.

   The newly created Quick Pick is now available from the Quick Picks drop-down list box.



To delete a Quick Pick:

1. Select the Quick Pick to delete from the Quick Picks drop-down.
2. Click **Delete** button below the Quick Picks drop-down.
3. A confirmation box is displayed, click **Yes** to delete.

PAN Scans (Optional)

A PAN scan is a scan mode that creates a Panoramic exposure that is a two dimensional image. Patient positioning is critical for PAN scans.

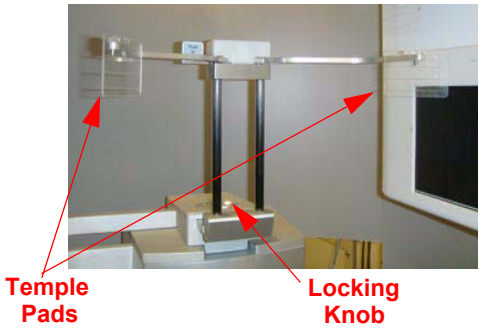
NOTE: Perform a PAN Phantom test, described in *Quality Assurance*, if image quality is degraded.

1. Place Chair in the upper slots so that chair back does not impede Patient's ability to sit with an Erect posture.

CAUTION

The head holder is to be used when obtaining PAN scans only. Do not use for Volume scans as there is a collision hazard with the head holder and the rotating panel.

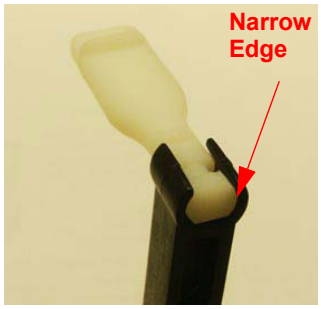
2. If head support is installed, loosen locking knob and remove head support.
3. Slide head holder into place and tighten locking knob.



NOTE: Cover temple pads with a plastic sheath before use, or sanitize with an alcohol wash after use.

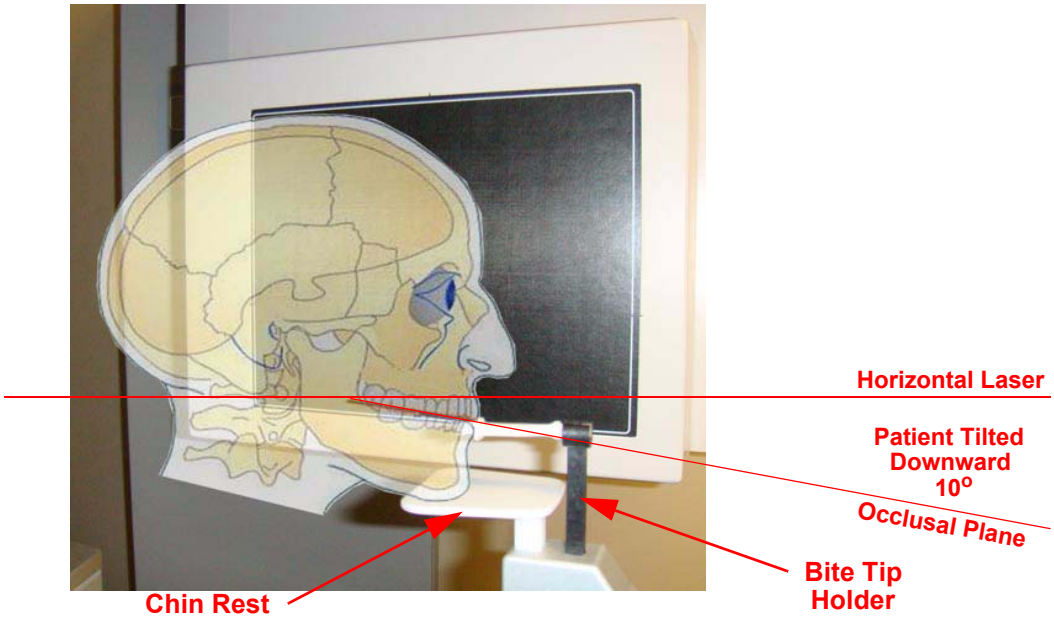
4. Prepare the Bite Tip by inserting the narrow edges of white Bite Tip down into Bite Tip Holder uprights. Then turn the Bite Tip a 1/4 turn to lock into place.

   The Patient will be biting on the grove of the white Bite Tip during the scan.



NOTE: If bite tips are planned to be reused, cover with a plastic sheath before use, or sanitize with an alcohol wash after use.

5. Insert the Chin Rest and Bite Tip Holder into the Positioning Block.
6. Seat the Patient in the chair with an Erect posture. The neck must be as straight as possible to avoid the spine getting in the view. Close the gate.
7. Adjust Patient height using the buttons on the Patient Alignment Panel so that the Patient's chin is on the Chin Rest, but Erect posture is maintained.
8. Tilt the patient's head downward so that the occlusal plane forms roughly a 10^{o} angle to the horizontal laser line.



NOTE: Patient positioning is critical for a quality image. Refer to the illustration above for a visual of tilting the Patient. Using the Sagittal Laser (front center laser), ensure that the Patient is centered and facing straight forward.

9. Instruct patient to bite in the groove of the bite tip and to close lips around the bite tip as if using a straw. Adjust height of bite tip holder as needed.

10. When patient is positioned, close head holder arms so temple pads fit to patient's temples. If necessary, loosen Head Support Knob and adjust head holder forward or backward as needed to fit head holder to patient. Tighten knob

11. From the Main menu select **File > New Patient**.
12. In the *Select Patient* Pane, highlight patient and click **OK** or just double-click the patient to be scanned.

    The Acquire window is displayed.
13. If desired, enter any remarks in the *Study Remarks* text field.
14. Click **Pan** tab. Select *Exposure* setting.
15. Before capturing the image, instruct Patient to swallow and hold, putting the tongue to the roof of the mouth and holding for the duration of the exposure.

WARNING

The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

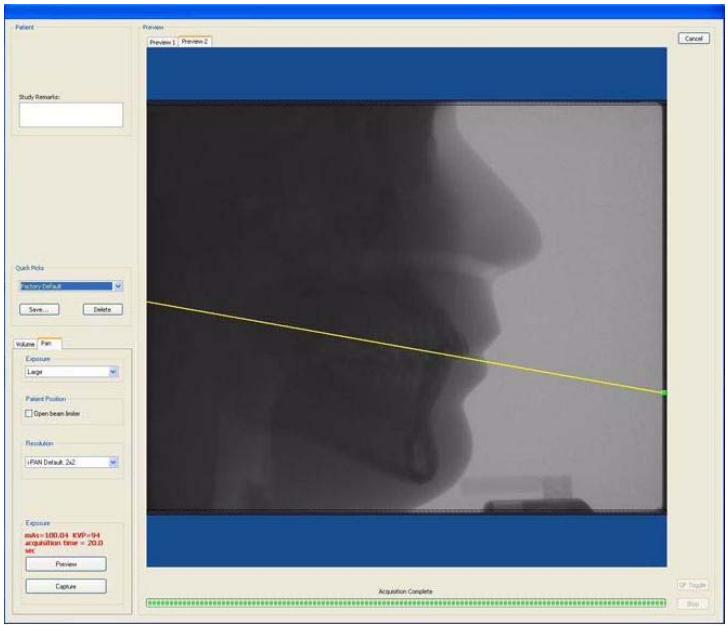
16. Click the **Preview** button under *Exposure*. The sensor panel moves to the front position. A dialog box is displayed with the scan parameters.
17. Click **OK** to continue.

18. When prompted, press the **Scan** button on the Control Box.

    An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.

19. Check the Preview to ensure the following:

    - Verify patient is positioned properly at a 10^{o} angle. Click and drag the green handle on the Occlusal (yellow) plane line to position it over the patient's Occlusal plane on the Preview image. The line should roughly align from the back of the smile line to the point where the patient is biting on the bite tip.
    - If alignment is not correct, use Patient Alignment Panel buttons to lower or raise the chair. To lower the degree of the angle, lower the chair. To raise the degree of the angle, raise the chair. You may need to adjust the head holder and bite tip holder appropriately. Perform another Preview scan to check positioning.



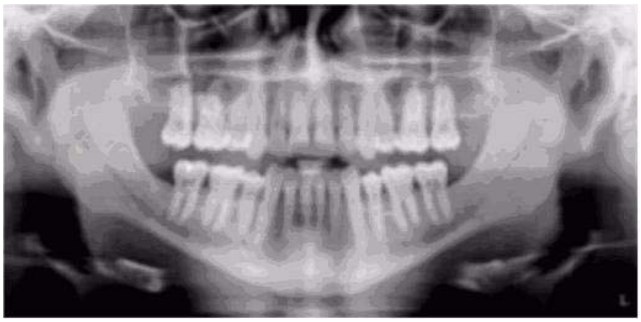
20. Instruct Patient to close lips around the bite tip as if using a straw, swallow and hold, and put the tongue to the roof of the mouth and hold for the duration of the exposure.

WARNING

The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

21. Click the **Capture** button to start the scan. The system moves approximately 1/4 rotation to the Home Position and then displays the scan parameters on a dialog.
22. Click **OK** to start the scan process.
23. Press the **Scan** button on the Control Box when prompted. An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.
24. The PAN scan runs for about 20 seconds, and the reconstructed image displays in less than one minute.

NOTE: If DAP is licensed on your system, see ***Dose Area Product Feature*** for more information.



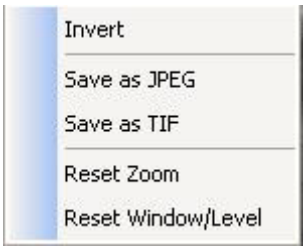
25. Adjust the Brightness/Contrast by dragging the cursor across the image (vertical/horizontal).
26. When a suitable PAN scan is acquired and the patient can be released from the Scanner, press the **Push to Release** lever on the head holder to open the arms. Do not manually force arms open. Open gate.
27. If you are done performing PAN scans, remove head holder and re-install the head support.

CAUTION

The head holder is to be used when obtaining PAN scans only. Do not use for Volume scans as there is a collision hazard with the head holder and the rotating panel.

To Save a PAN Scan as JPEG or TIF:

1. If PAN image is not displayed, click on file type **DX** in Study List.
2. Right-click on image to display popup menu, then click the desired option to save image as a JPEG or TIF.



To Use Window/Level and Zoom with PAN Scan:

- Window/level and zoom controls on PAN scans work the same way as on Volume scans. See *Reconstruction of Anatomy* chapter.
- Changes to window/level and zoom settings are retained unless they are reset or modified by the user.
- To reset setting, right-click on the image and select either Reset Zoom or Reset Window/Level option.

Chapter 8 Reconstruction of Anatomy

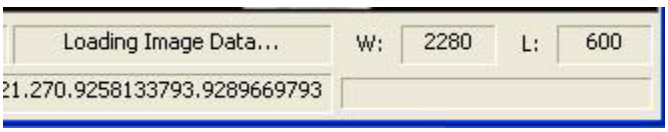
Preview Screen

Once Patient data is acquired or data for a Patient is loaded, the software immediately reconstructs the Patient anatomy images. (User modified Patient data, referred to as a *Workup*, can also be loaded to the preview screen. While data loading is occurring, a preview window appears in the center of the screen.

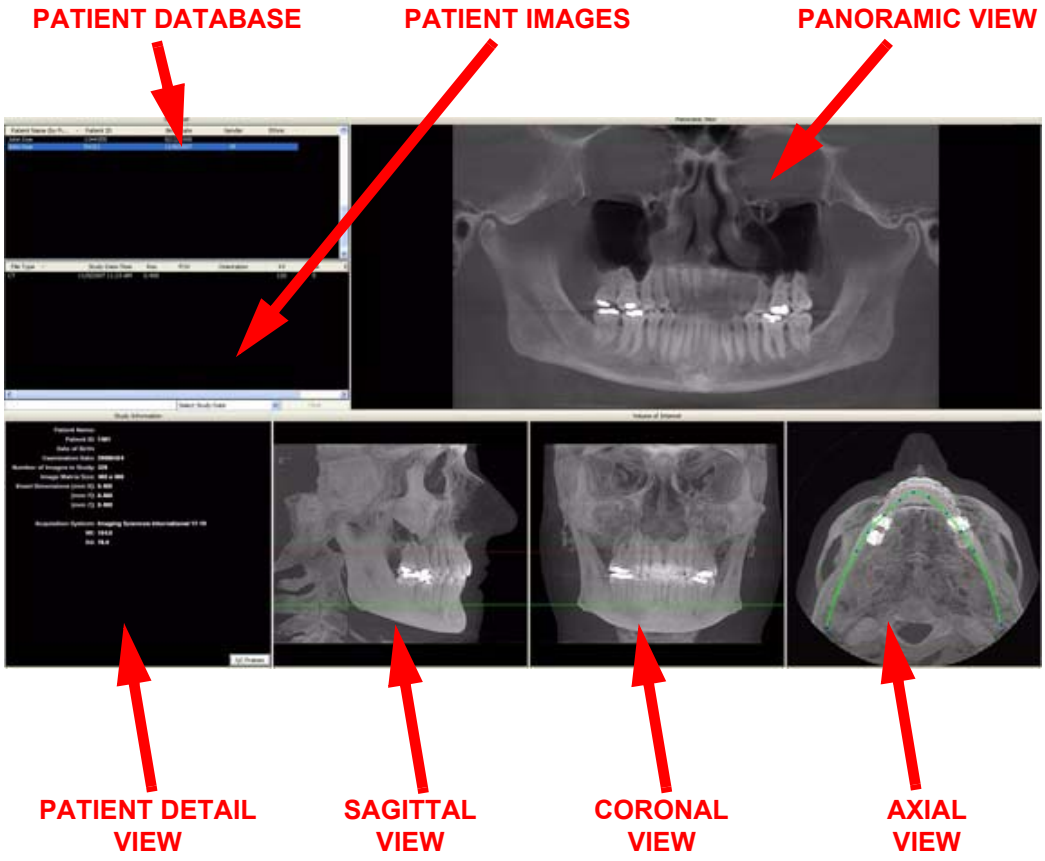
At the bottom right side of the reconstruction window, the status of the data loading is displayed.

CAUTION

DO NOT do anything in a Patient study until the status bar located at the bottom right of the window indicates that the Patient data is fully loaded. Wait until the status bar reads “Image Data in Memory” prior to performing any tasks. Otherwise, data loss may occur.



Once data is successfully reconstructed, the Preview screen appears as shown below, showing the Panoramic, Sagittal, Coronal, and Axial views of the skull through midline.



The Preview Screen is divided into seven views:

- Patients in Database
- Patient Images
- Patient Detail View
- Panoramic View
- Sagittal View
- Coronal View
- Axial View

Patients in Database lists all Patients and their data who are entered into the database.

Patient Images lists all images that pertain to the selected (highlighted) Patient from the *Patients in Database* list.

Patient Detail View shows detailed Patient data, including acquisition details for the currently selected Patient workup that is highlighted in the *Patients in Database* list.

Panoramic View shows a wide detail view of the selected points on the Axial View. Distance and Hounsfield Unit measurements can be taken on this view. Double-clicking the Panoramic View brings up the Implant Planning Screen.

Sagittal View displays the Maxilla and Mandible contour lines. Distance and Hounsfield Unit measurements can be taken on this view. Double-clicking on the Sagittal View brings up the Ceph Screen.

Coronal View also displays the Maxilla and Mandible contour lines. Distance and Hounsfield Unit measurements can be taken on this view. Double-clicking on the Coronal View brings up the MPR Screen.

Axial View controls the image displayed in the Panoramic View. Distance and Hounsfield Unit measurements are taken on this view. Double-clicking the Axial View brings up the TMJ Screen.

See the remainder of this chapter for details on taking measurements, modifying the displayed information, and changing filter settings etc.

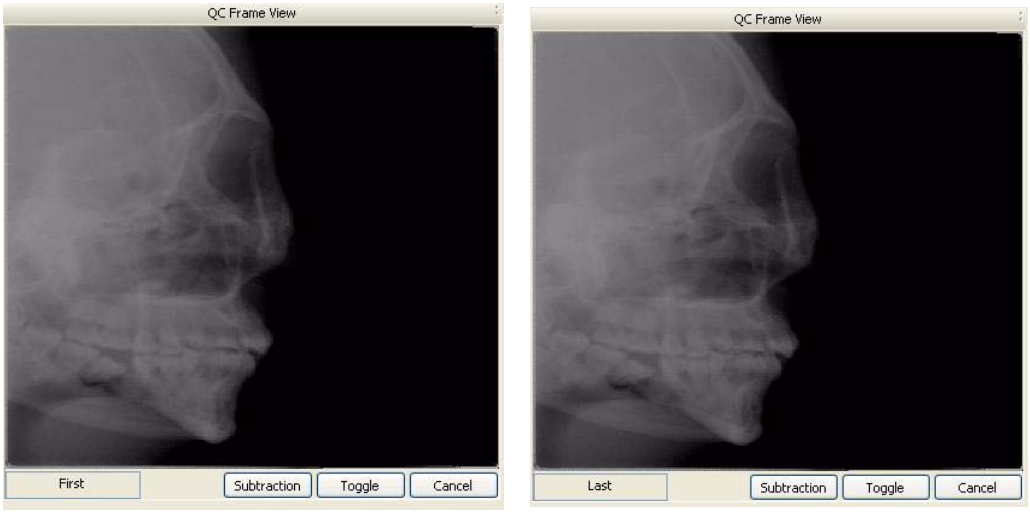
Using Quality Control Frames

QC frames can be used to help detect patient movement during a scan.

To use QC Frames:

1. With a study selected, click **QC Frames** on the Patient Detail view. The first image of the selected scan is displayed.

2. Click **Toggle** to display the last image of the scan. Toggle as needed to compare first and last frames. Frames should look identical if patient did not move.



3. Click **Subtraction**. Values for motion factor (Mf) and brightness density (Bd) are displayed.
   - The Mf and Bd values are intended to be used by Technical Support to help diagnose image quality issues.
   - In general, Mf values below 80 indicate no visible motion between the first and last scan. However, values above 80 do not mean a rescan is required. Use your professional judgement as to whether the scan is acceptable.
   - Bd values are not as important for motion assessment, but values below 50 are generally good.

4. Click **Cancel** to exit QC Frames.

Panoramic View (Tru-Pan Feature Set as Default)

When the Tru-Pan feature has been enabled on your system, studies are automatically computed and displayed in the Panoramic View. Tru-Pan uses a set of algorithms to automatically construct the Panoramic View and increase image quality. Tru-Pan uses the variable inner and outer jaw arch boundaries for image construction, with the primary goal being to eliminate the depression of the middle jaw portion of the image.

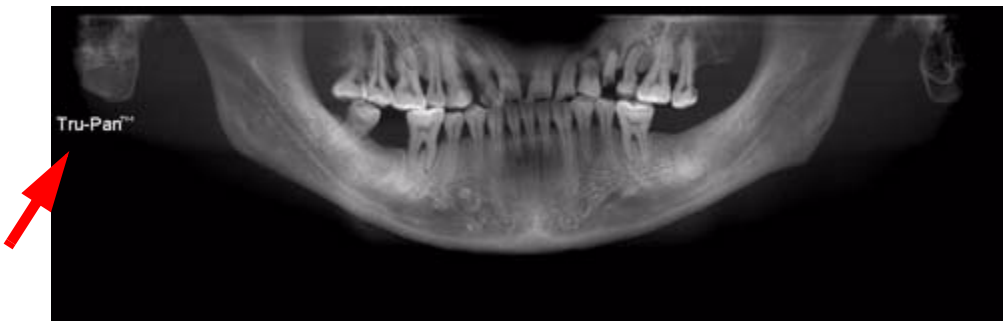
Images constructed using the Tru-Pan feature:

- Pronounce the front middle region of jaw dentition clearly.
- Show the sinus floor structures and the condyles clearer and show the major jaw structures more accurately. The jaw volume is rendered in more detail compared to other techniques.
- Eliminate the need to adjust the contourlines of the arch curve for the 3D panoramic image.

Using the Tru-Pan Feature

After selecting a study from the Study List, the Tru-Pan dialog is displayed while the image is rendering.

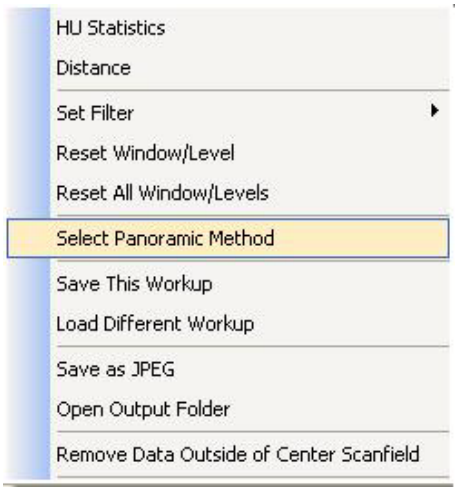
It may take up to 2 1/2 minutes for the Tru-Pan image to compute, depending on the resolution of the study. Tru-Pan images are displayed with a Tru-Pan tag on the Panoramic View.



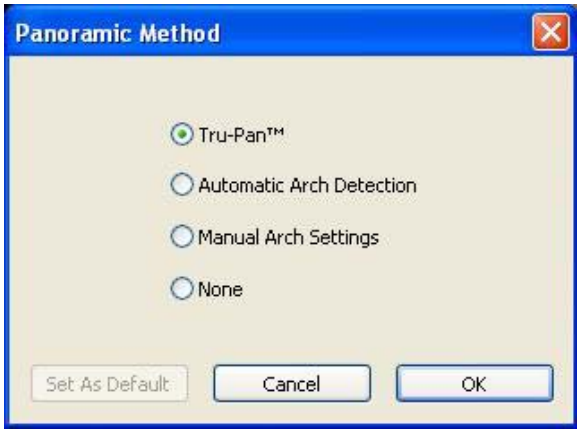
Changing the Panoramic Method

You can change the panoramic method used in one of two ways:

- Click **Cancel** on the Computing Tru-Pan dialog.
- Right-click on the panoramic image to display the pop-up menu and click **Select Panoramic Method**.



The Panoramic Method dialog is displayed. Click the radio button next to the desired method and click **OK**. The selected method is used to compute the Panoramic View.



NOTE: To set another method as the default, select the desired method, then click **Set as Default**. If you click **OK,** the currently selected study will be displayed using the new default method. If you click **Cancel,** the default will be applied on the next newly-selected study.

- Tru-Pan - Default selection when Tru-Pan feature is enabled.

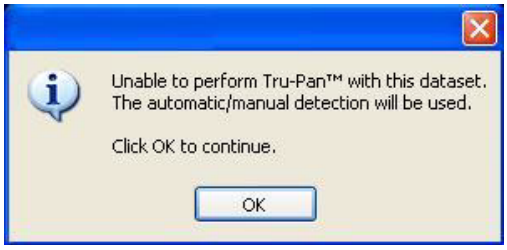
NOTE: The Automatic Arch Detection and Manual Arch Settings options are legacy methods for displaying images in the Panoramic View.

- Automatic Arch Detection - Automatically detects the Maxilla and Mandible contourlines so that you can manually adjust the Panoramic View. See ***Manually Adjusting the Panoramic View***.
- Manual Arch Settings - Displays the Contourline Setup dialog so you can select whether the Maxilla and/or Mandible contourlines are displayed for use to manually adjust the Panoramic View. See ***Manually Adjusting the Panoramic View***.

- None - no method is used to compute the Panoramic View and no image is displayed. This option is typically used when imaging for QA phantoms or anytime a Panoramic View is not needed.

Additional Information about Tru-Pan

If the Tru-Pan calculation is not able to complete for a dataset, the following dialog is displayed.



When you click OK, Tru-Pan will try to automatically detect the arches using the Automatic Arch Detection method. If that cannot be completed, the Manual Arch Setting method will be used.

Additionally, be aware of the following:

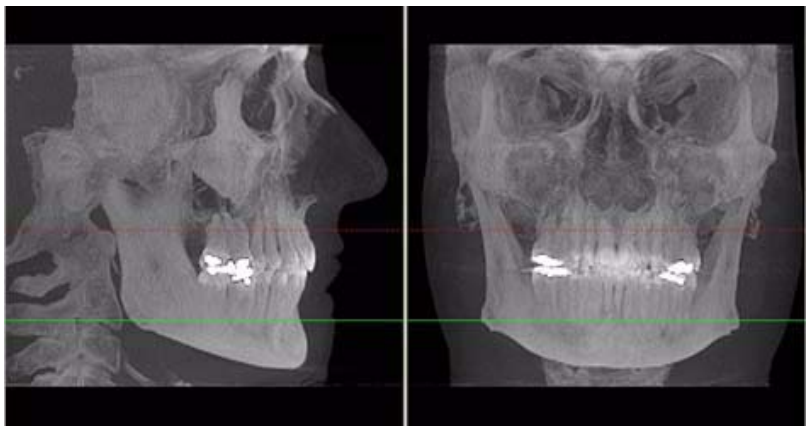
- The Tru-Pan image does not include the regions below the bottom of the bony jaw and far above the condyle heads and maxillary sinuses. The purpose is to represent the entire jaw only where dentists are interested. The inclusion height is from the bottom of the bony jaw to a level above the condyle heads.
- At this time, Tru-Pan does not support collimated heights less than 8 cm or diameters less than 16 cm. The Tru-Pan option is greyed out on the Panoramic Method dialog for these restricted protocols.

Manually Adjusting the Panoramic View

You may need to adjust the Panoramic View if the Tru-Pan feature is not enabled on your system, or if you select the Automatic Arch Detection or Manual Arch Settings options as the Panoramic Method.

Contourlines are used to mark the Maxilla and Mandible in the Sagittal and Coronal Views on the preview screen. Both contourlines are displayed automatically when Automatic Arch Detection is selected as the panoramic method. You can select the contourlines to be displayed when using the Manual Arch Settings method.

- **Maxilla** is a **red** line.
- **Mandible** is a **green** line.

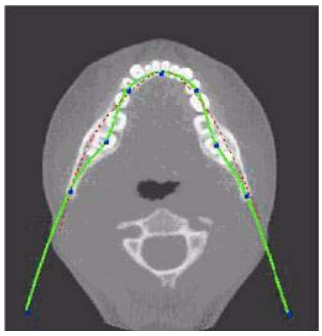


Both the Maxilla and Mandible contourlines can be repositioned with a click and drag to the desired location.

Clicking a contourline selects that line for use in adjusting the Panoramic View via the Axial View.

To adjust the Panoramic View:

1. Select whether the Maxilla or Mandible contourline is used as the Panoramic View adjustment reference by clicking on the desired contour line in the Sagittal or Coronal View. The selected contourline is shown as a solid line; the line which is not currently selected is shown as a dotted line. The displayed line in the Axial View matches the color of the selected contourline in the Sagittal and Coronal Views.
2. Center the anterior point at midline.
3. Move the next two points up closer to the anterior point on each side. Place them a few teeth away from anterior center.
4. Then move the next two points closer to the molars. See the example below.

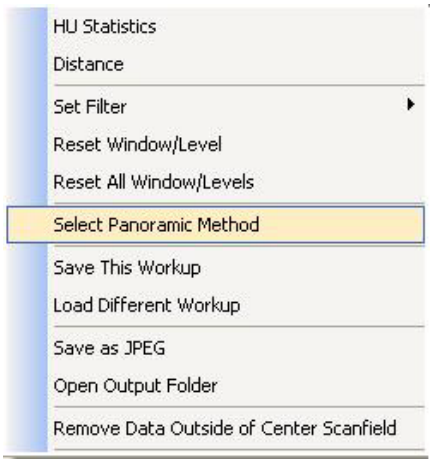


All changes are reflected in the Panoramic View.

Select Contourlines for Manual Arch Settings

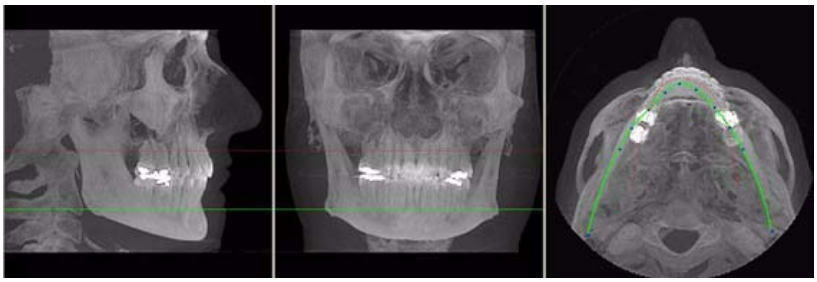
One or both contourlines can be added to the Sagittal and Coronal Views on the preview screen. To do this, do the following:

1. On an image view on the Preview screen, right-click and click **Select Panoramic Method**.
2. On the Panoramic Method dialog, select **Manual Arch Settings**. The Contourline Setup dialog is displayed.



3. Click check boxes to add desired contourlines.

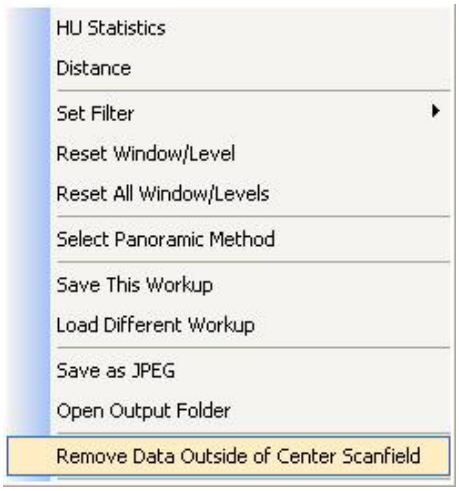
4. Click **OK**. The dialog box closes and the selected settings are used for the Sagittal, Coronal, and Axial views.



Removing Circumference Artifacts

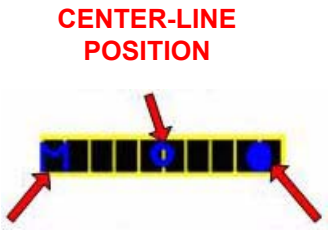
Circumference Artifacts are displayed in the Preview Screen as horizontal lines in the Coronal and Sagittal views and a white partial circle around the Axial View.

This artifact can be removed from the dataset by right clicking the Preview Screen and selecting **Remove Data Outside of Center Scanfield**. The data is recalculated without the artifact.



Adjusting MIP, Centerline and Image Type

The following slice control bar is found in various views and positions throughout the system software.



- **Center-Line Position -** click and drag the *Center-Line Position* tool moves the displayed centerline of the selected image. This changes the selected position of subordinate images.
- **MIP/Radiograph Toggle Control -** clicking the *MIP/ Radiograph Toggle Control* toggles the images displayed between MIP and Radiograph.
- **Slice Thickness Control -** click and drag the Slice Thickness Control right/left increases/decreases slice thickness and spacing (respectively).

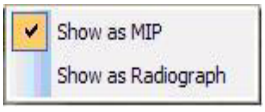
NOTE: The Slice Thickness of each view is at the Voxel size originally scanned. For example, if scanned at a 0.3 Voxel size, the slice thickness is 0.3. If scanned at a Voxel size of 0.4, the slice thickness is 0.4

Selecting MIP or Radiograph Display

The system software enables displaying images as MIP or Radiograph.

To select the type of image displayed:

1. Move cursor to the top right of any of the image views on the preview screen. The cursor becomes an **M**.
2. Click mouse while cursor is an **M** and the following popup window appears.



3. Click the menu item corresponding to the desired image type. (The currently selected image type is denoted with a checkmark.)

Adjusting Brightness and Contrast

All views include a window level Brightness/Contrast cursor tool. By default, this cursor is displayed. When cursor appears as shown, click and drag up/down and left/right to adjust brightness and contrast.

- **Brightness -** left and right.
- **Contrast -** up and down.

NOTE: If brightness and contrast are changed, they can be reset for the specific window/level, or for all window/levels that were affected, using the reset options on the pop up menu.

Pan Feature

Most views allow panning left, right, up, or down in order to view a desired portion of the displayed image.

To use the pan feature:

1. Move the cursor to the bottom left of the image where the pan function is to be used. The pan cursor tool appears.
2. Click and drag up/down and left/right to pan to the desired portion of the displayed image.

Rotation Feature

The Sagittal, Coronal and/or Axial views can be rotated.

To use rotate feature:

1. Hover the cursor over the lower right corner of the desired view. The cursor changes to the rotation tool.
2. Using the rotation tool, click and drag to rotate the selected image. A grid appears over the selected image to provide a reference for rotation.

NOTE: The Volume Rotation feature is disabled on studies that use the Tru-Pan feature. The cursor will have a cross through it.

Zoom Feature

Most views allow zooming in and out to view more or less detail for the displayed image.

To use the zoom feature:

1. Move the cursor to the bottom right of the image where the zoom function is to be used. The zoom cursor tool appears.
2. Click and drag up and down to zoom in and out, respectively.

Back Tool

When viewing one of the detail screens, the X cursor can be used to return to the preview screen.

To exit the detail screen and return to the preview screen:

1. Move cursor to the top left corner of the screen until the cursor becomes an **X**.
2. While the cursor is an **X**, click mouse to return to the preview screen.

   This can also be performed by clicking **Screen>Preview Screen** on menu bar.

Filter Settings

Filtering is provided for all image views. Images can be softened/ sharpened as desired by selecting one of five filter settings (**Normal**, **Sharpen Mild**, **Hard**, **Sharp** or **Very Sharp**).

Default filter values are selected for all screens as follows:

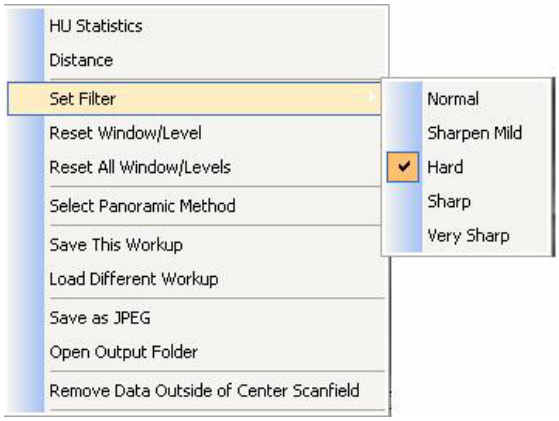
- Preview Screen: **Hard** on Panoramic and **Sharpen Mild** for all others.
- Implant Screen: **Sharpen Mild** on Axial Slice and Cross Sections **- Hard** on Panoramic Map.
- TMJ Screen: **Hard** for top row images and **Sharpen Mild** for Condyle Ceph Images.
- MPR Screen: **Sharpen Mild** all images.
- Ceph Screen: **Sharp** for Upper Left Right Lateral and **Hard** for all others.

These defaults can always be changed by using one of the methods described below.

Setting Filters for a Single Image

To change the filter setting for an individual image:

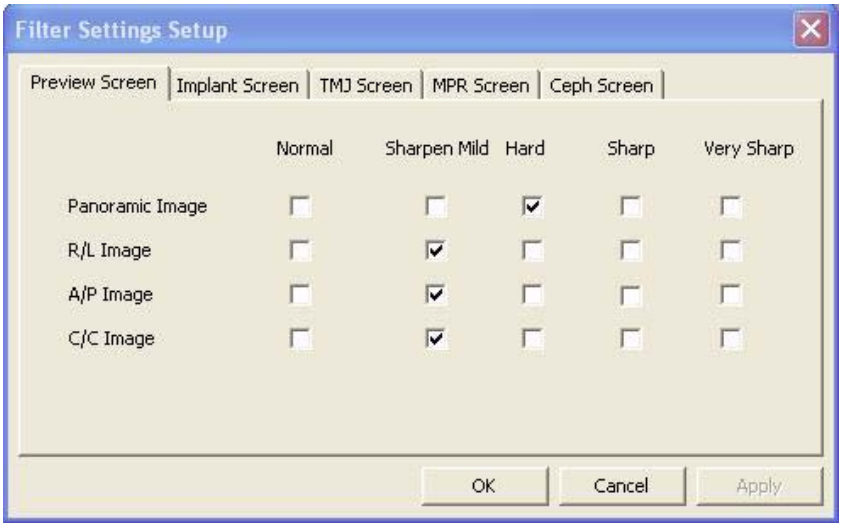
1. Right-click image and select **Set Filter >** and select filter setting. The selected filter setting is applied.



Setting Filters for One or More Image Types

To change the filter setting for one or more image types:

1. From the Main menu, select **Tools > Filter Settings > Set Filters**



2. Select a tab at the top of the dialog box which contains the screen to change the filter setting.
3. Select check boxes to change the filter settings.
4. Click **OK**. The dialog box closes and the selected filter settings are applied.

Resetting all Filters to the Default Values

To reset filters to the default values:

1. From the Main menu, select **Tools > Filter Settings > Reset To Default**.

2. Click **Yes**. The dialog box closes and all filter settings are set to the default.

Taking Measurements

Hounsfield Units

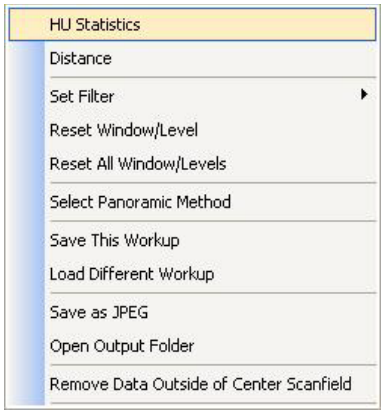
The system software allows making measurements in Hounsfield Units (Shape Region) for all image views. These measurements calculate and display the average (Mean) grayscale level of the area enclosed from -1000 to 3000 (where 0 equals the density of water). The Standard Deviation is also calculated, where the smaller the number, the closer each shade of gray is in density to the others in the enclosed area.

CAUTION

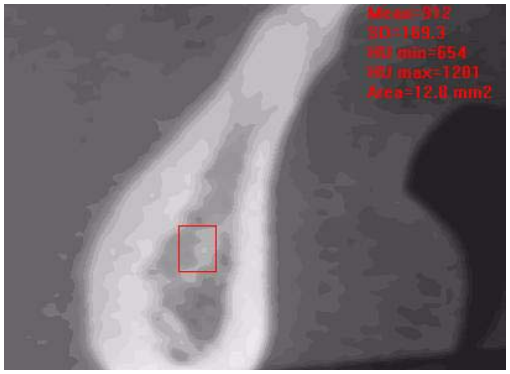
Do not use this feature with images acquired using the Landscape 8cm H x 8cm D protocol, as Hounsfield unit measurements may be inaccurate.

1. To make an HU measurement, right click image and select **HU Statistics**.

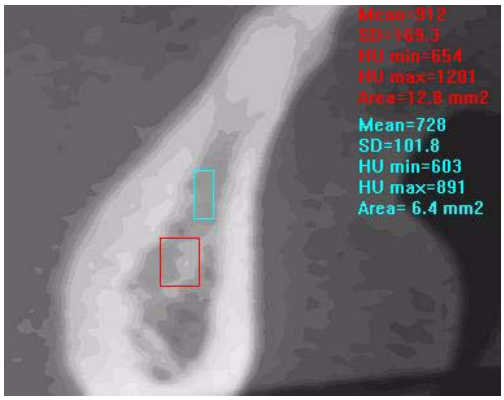
   The menu closes and the cursor changes to the **hu** measurement symbol.



2. Click, drag, and click to define an area. Measurement statistics appear in the upper right corner of the image.



3. Repeat steps 2 and 3 to take additional measurements. A maximum of four HU measurements can be taken at a time in a normal view and two in a cross section view. Additional measurements are displayed in varying colors so that they can be easily associated with the selected image area.



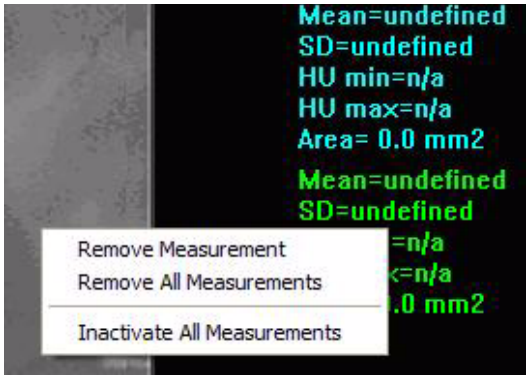
To switch off the hu cursor:

1. Right click the image. A popup window appears.
2. Click **HU Statistics** on the popup menu. The menu closes and the cursor reverts to the default cursor.

   Measurements can be selectively removed from a view as desired. All measurements can also be deactivated/reactivated for a view.

To remove a specific measurement:

1. Right-click the measurement that is to be removed.
2. Select **Remove Measurement** from the popup menu.



Remove All Measurements - removes all measurements from selected view.

Inactivate All Measurements - grays out all measurement indicators and removes the measurements from the selected view. When this is done, the *Reactivate All Measurements* becomes available.

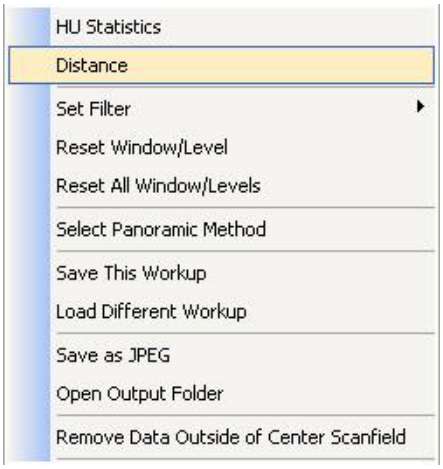
Reactivate All Measurements - restores all of the inactivated measurements to the selected view.

Distance

The system software allows making distance (linear) measurements for all image views.

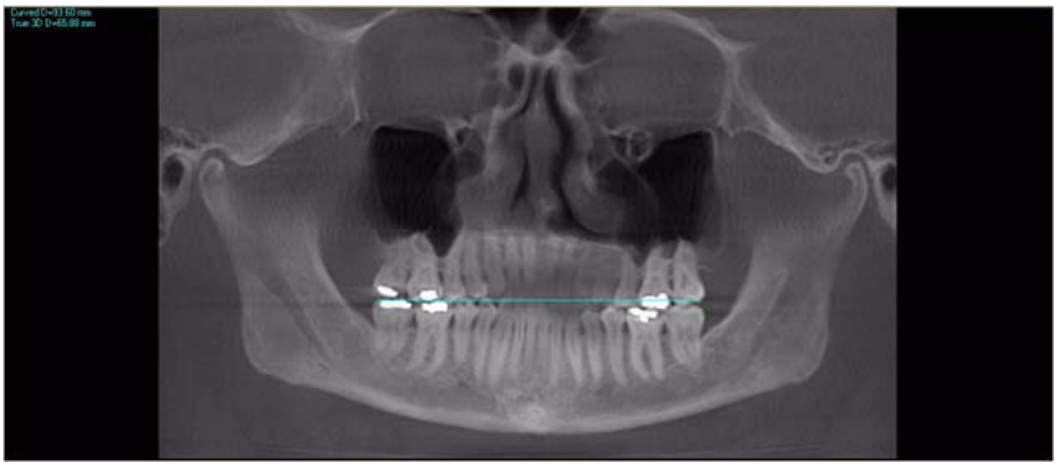
To make a linear (distance) measurement:

1. To make a measurement, right click image and select **Distance**.

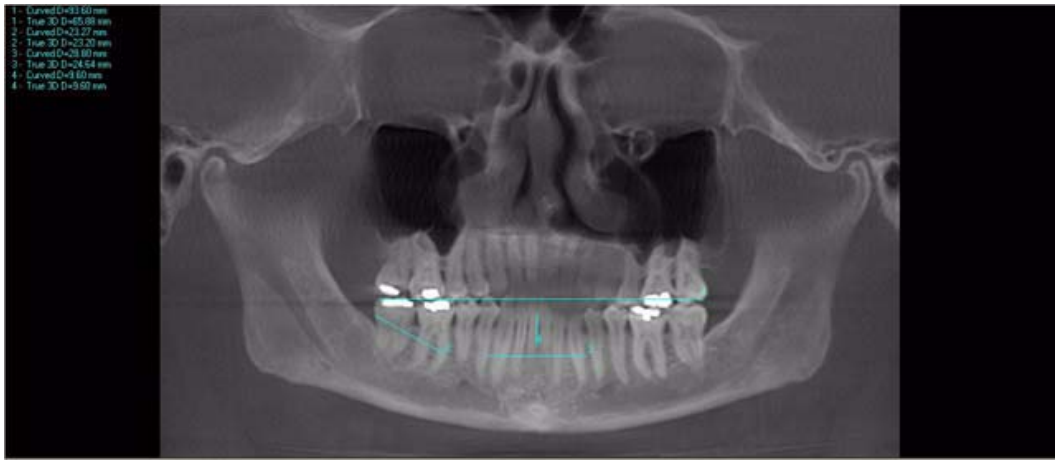


   The menu closes and the cursor changes to the distance measurement symbol.

2. Click, drag, and click to define the measurement. Measurement statistics appear in the upper left corner of the image.



3. Repeat steps 2 and 3 to take additional measurements. A maximum of nine distance measurements can be taken at a time in a normal view and four in a cross section view.



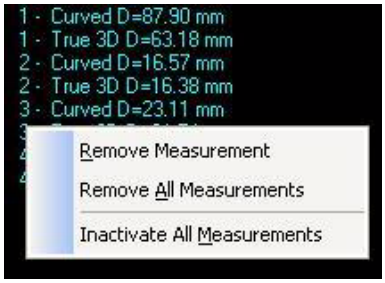
To switch off the distance cursor:

1. Right click the image and select **Distance**. The cursor reverts to the default cursor.

To remove a specific measurement:

Measurements can be selectively removed from a view as desired. All measurements can also be deactivated/reactivated for a view.

1. Right-click the measurement to be removed and select **Remove Measurement**.



Remove All Measurements - removes all measurements from selected view.

Inactivate All Measurements - grays out all measurement indicators and removes the measurements from the selected view. When this is done, the *Reactivate All Measurements* becomes available.

Reactivate All Measurements - restores all of the inactivated measurements to the selected view.

Rotating Views

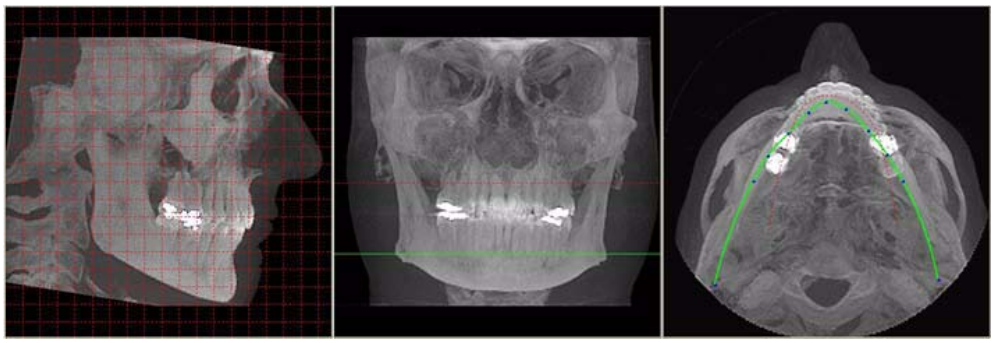
NOTE: The Volume Rotation feature is disabled on studies that are using the Tru-Pan feature.

The Sagittal, Coronal and/or Axial views can be rotated.

To rotate a view:

1. Hover the cursor over the lower right corner of the desired view. The cursor changes to the rotation tool.

2. Using the rotation tool, click and drag to rotate the selected image. A grid appears over the selected image to provide a reference for rotation.

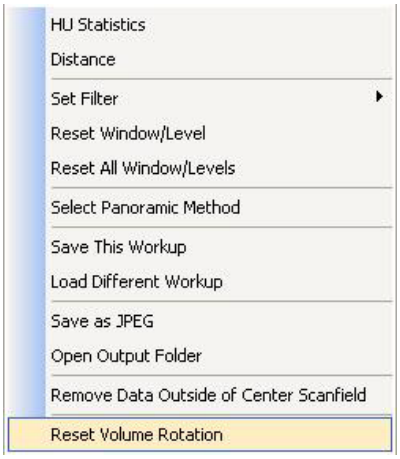


3. After the selected image is rotated, release the mouse. All views adjust to the new position and the grid is no longer present.

To return to the original rotation orientation:

4. Right click image and select **Reset Volume Rotation**.

The menu closes and the software recalculates the original rotation in all views.



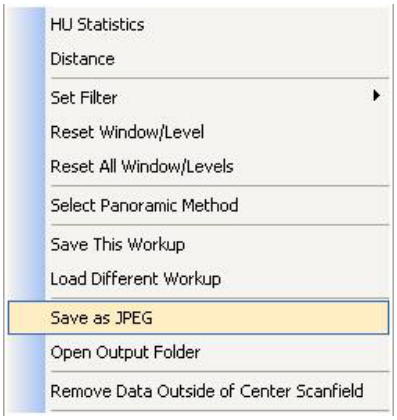
Saving Views as JPEG Image Files

Data in any view in Vision can be saved as a JPEG image file.

To save view as a JPEG Image File:

1. Right click image and select **Save as JPEG**.

   The file is named and saved into a customized directory based on the type of image currently selected, Patient name, and other details.



To open directory where image was saved:

2. Right click image and select **Open Output Folder**.

   Windows Explorer opens to the selected directory.

Saving and Loading Workups

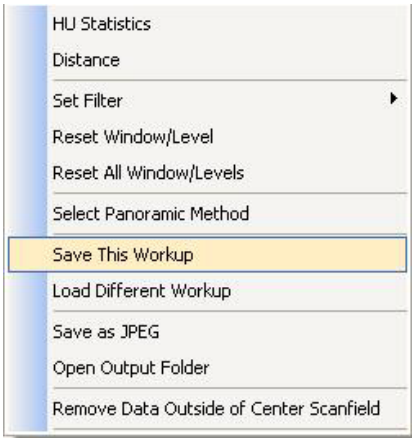
Modifications made to reconstructed Patient data (Case Studies), are named and saved as a *Workup*.

Workups allow the retrieval of various modifications, markups, measurements, etc. made to previously modified *Detail Screens*.

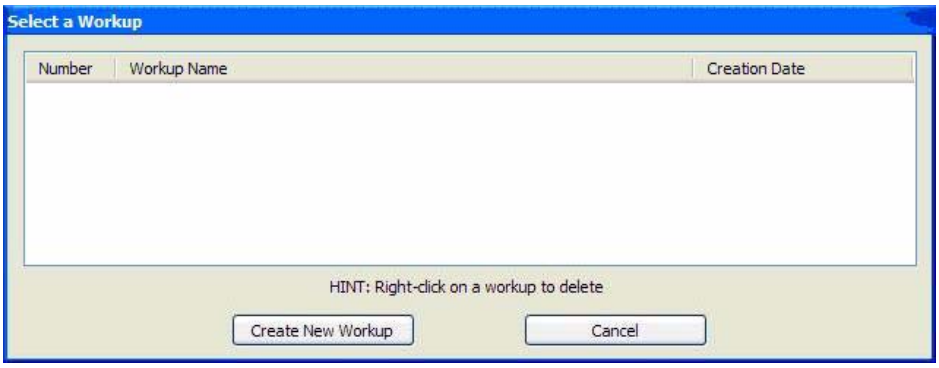
Save a Workup

To save the currently displayed data (Case Study) as a Workup:

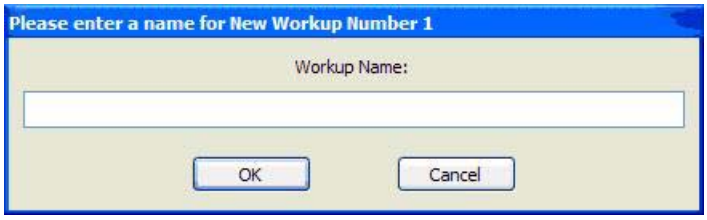
1. Right-click any image on the Preview screen and select **Save This Workup**.



2. Then do one of the following:



   a. Click **Create New Workup**.

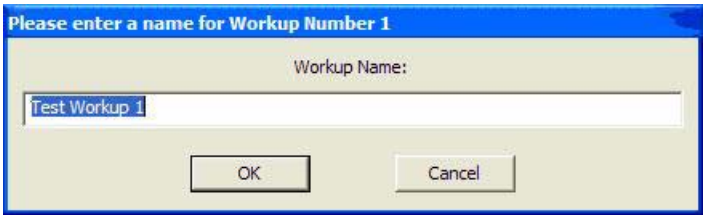


   b. Enter a name for the new workup in the *Workup Name:* field.

   c. Click **OK**. The dialog box closes and the new workup is displayed on the *Select a Workup* dialog box.

   - or -

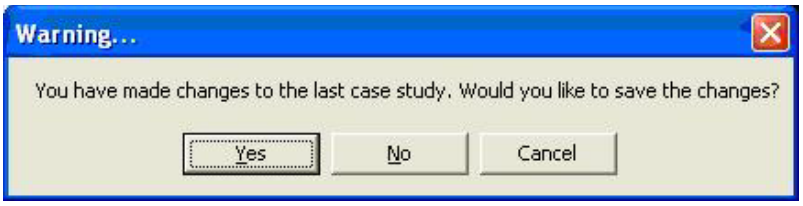
   a. Overwrite an existing workup by clicking an existing Workup Name.



   b. Click **OK**. The dialog box closes and the new workup is displayed on the Select a Workup dialog box.

3. Click **Cancel** to close the Select a Workup dialog box.

If a workup was made or changed and an attempt is made to close the Vision software or switch to a different Patient, the following dialog box appears.

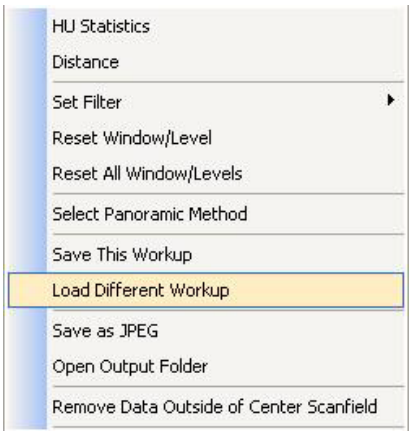


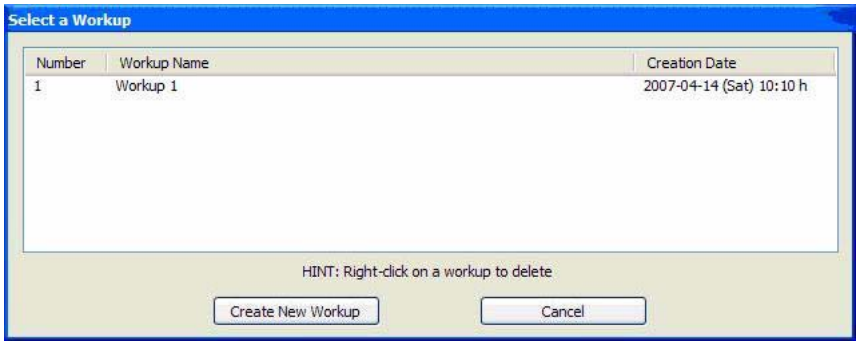
To save the changes made, click **Yes**. The Select a Workup dialog box appears. Continue the save procedure as described above.

Load an Existing Workup

To load an existing workup for a Patient with multiple workups:

1. Right-click any image on Preview screen and select **Load Different Workup**.



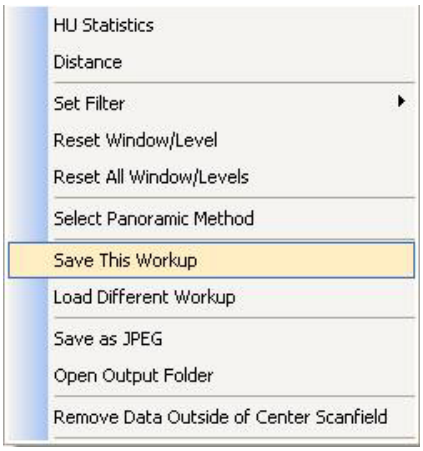


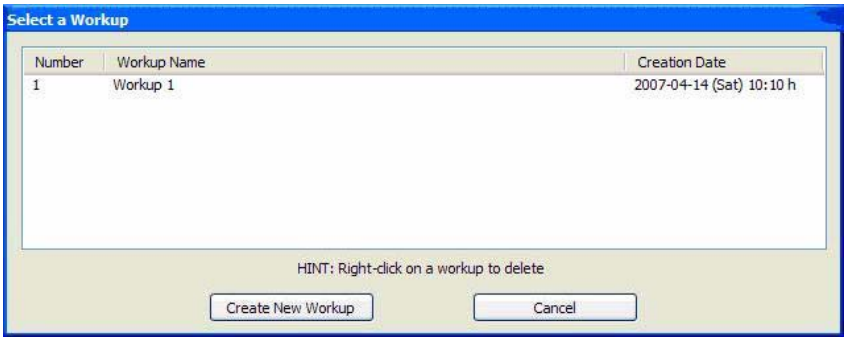
2. Double-click Workup Name. The dialog box closes and the existing workup is loaded.

Delete an Existing Workup

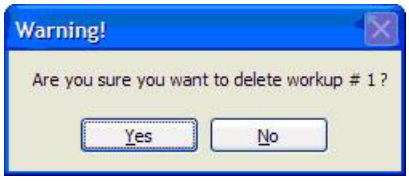
To delete an existing workup:

1. Right-click any image on Preview screen and select **Save This Workup**.





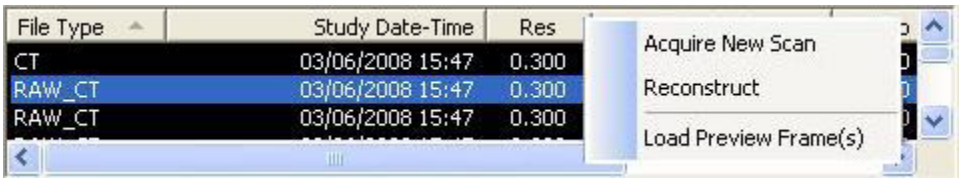
2. Right-click the Workup to delete.



3. Click **Yes**. The dialog box closes and the selected Workup is deleted.
4. Click **Cancel** to close.

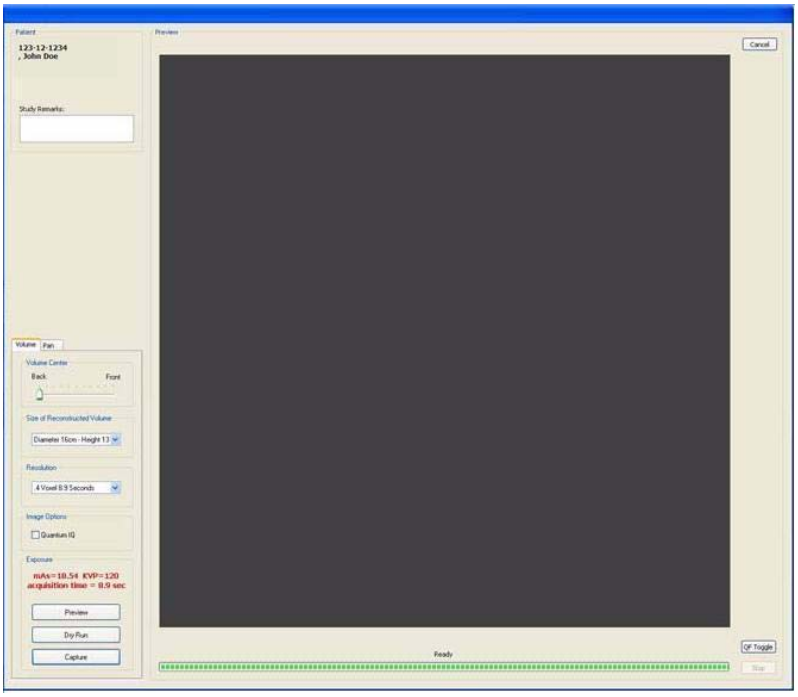
Viewing and Reconstructing Raw Patient Scans

Raw scan data that is displayed in the Patient Images section can be reconstructed using different volume and resolution parameters, and preview scans can be viewed and manipulated.



To Reconstruct Raw Images:

1. Right-click on Raw scan and select **Reconstruct**. Reconstruct screen is displayed

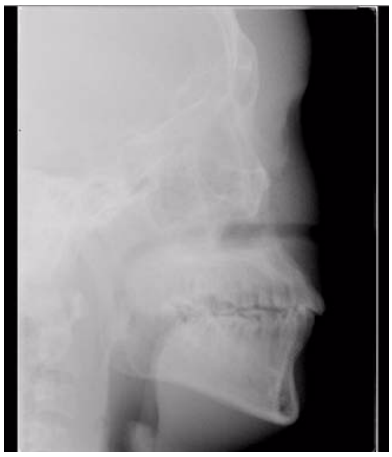


2. Select the Size of Reconstruction Volume from the drop-down menu. Sizes available for selection are limited based on the field of view captured in the original scan.
3. Select a Resolution from the drop-down menu. Resolutions available for selection are limited as follows:
   - Scans taken at 0.3 or.0.4 can be reconstructed at 0.3 or 0.4.
   - Scans taken at 0.2 or 0.25 can be reconstructed at 0.2 or 0.25.

4. If desired, select the **Quantum IQ** checkbox to apply this reconstruction type when the image is processed. See ***Quantum IQ*** for more information on Quantum IQ.
5. Click **Reconstruct**. The raw DICOM images are reconstructed as specified.

To Load Preview Frames:

1. Right-click on Raw scan and select **Load Preview Frame(s)**. Preview screen is displayed.

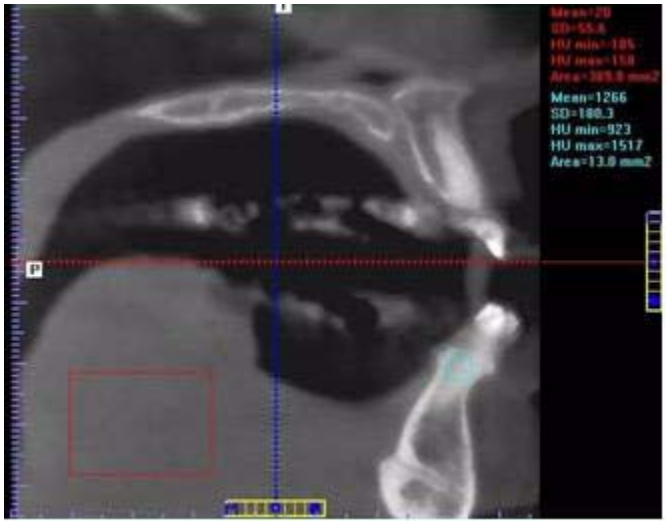


2. Image can be manipulated as follows using the features described earlier in this chapter:
   - Adjust brightness and contrast
   - Zoom
   - Pan
   - Scroll between first and last frame
3. Right-click on the image to:
   - **Invert** - Toggle between MIP and Radiograph.
   - **Save as JPEG** - Select a location on the computer to save the image as a JPEG file.

   - **Save as TIF** - Select a location on the computer to save the image as a TIF file.
   - To reset setting, select either **Reset Zoom** or **Reset Window/Level** option.
4. To return to the Preview screen, click **Screen > Preview Screen**.

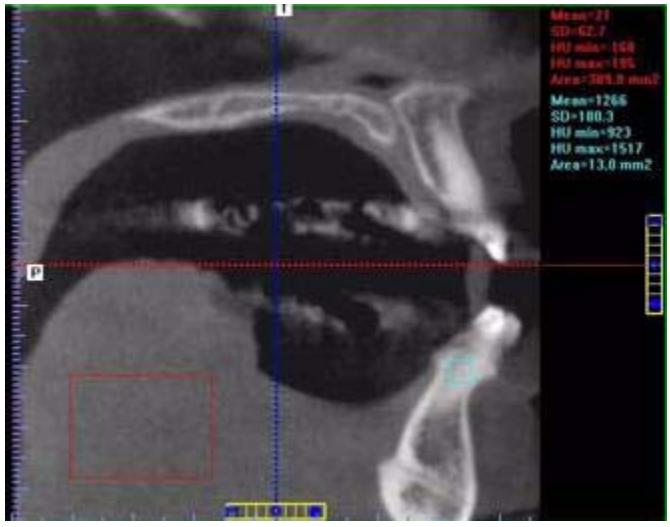
Quantum IQ

Quantum IQ is an image processing option that may be performed on an image volume when it is reconstructed. Quantum IQ smoothes out the noise in the soft tissue areas.



Quantum IQ applied
Soft tissue appears smooth

Standard Deviation (SD) values in soft tissue (red) decrease with Quantum IQ applied.
Bone (blue) remains the same.

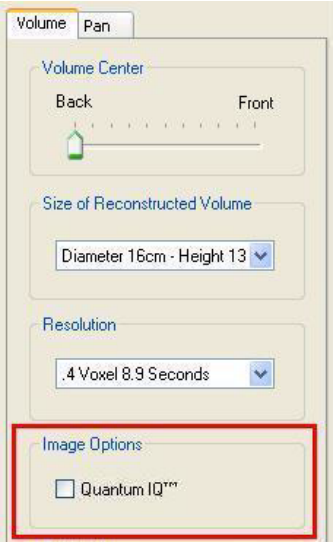


Quantum IQ not applied
Soft tissue contains more noise

WARNING

Quantum IQ will reconstruct raw data with emphasis on removing noise. This may lead to image data at the boundaries between hard and soft tissue to appear less defined. This tool cannot be a substitute for your professional expertise and judgment.

To apply, click the Quantum IQ checkbox to select it. The default setting is unchecked. When checked, Quantum IQ will be applied to all volume scans during reconstruction. The progress bar at the bottom of the Acquire window provides status as it is applied.



The Quantum IQ setting is retained for future acquisitions/reconstructions until a different setting is selected.

The QIQ column in the Study List indicates if a study has Quantum IQ applied.

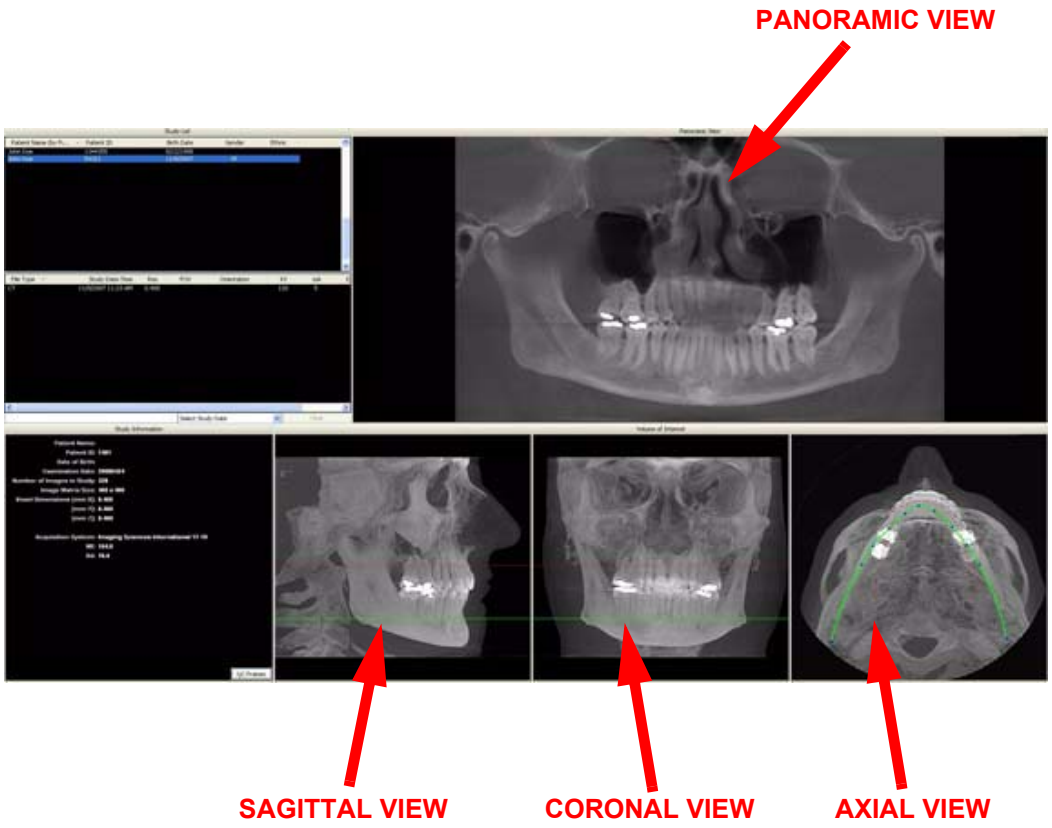
CAUTION

Quantum IQ should NOT be selected when acquiring or reconstructing scans that will be used with Sure Smile software or scans used for QA testing.

Chapter 9 Detail Screens

Preview Screen

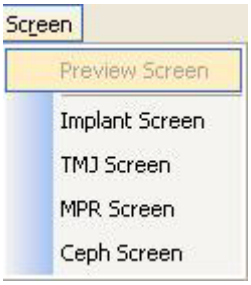
All Detail Screens are accessed by double-clicking a corresponding view on the Preview Screen. To correlate the mouse position on the Preview screen to the Sagittal, Coronal, and Axial views, hold down the **C** key on keyboard and move the mouse. A yellow mark shows the correlated positions on the other views.



- **Panoramic View -** double-click displays the Implant Planning Screen.
- **Sagittal View -** double-click displays the Ceph Screen.

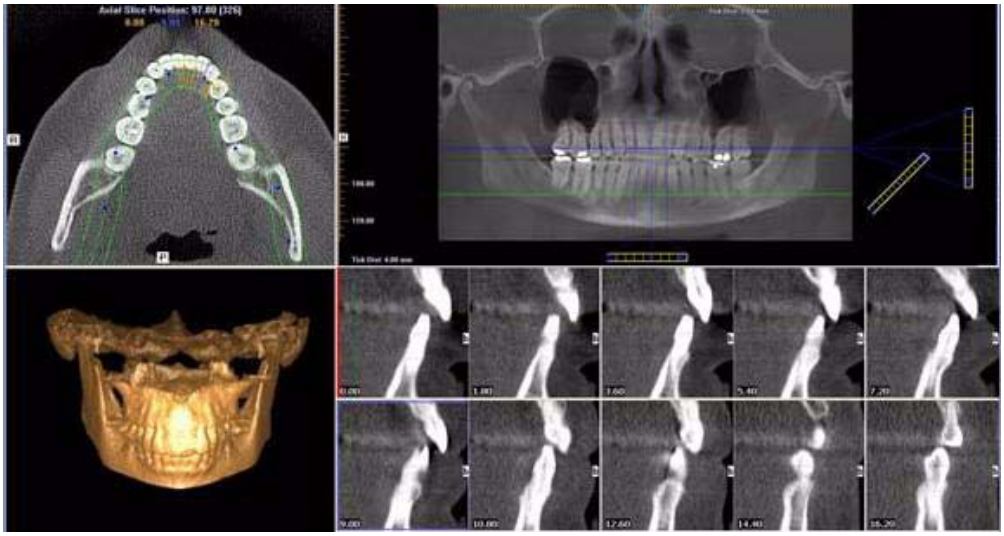
- **Coronal View -** double-click displays the MPR Screen.
- **Axial View -** double-click displays the TMJ Screen.

Detail screens can also be selected from the Screen menu accessed from the top menu bar. This enables movement from one detail screen to another without having to access the Preview screen.



Implant Planning Screen

Double-clicking the Panoramic View on the Preview Screen displays the Implant Planning Screen.



The Implant Planning Screen is divided into four viewing areas:

- **Axial Slice Position View (upper left)** used to adjust the panoramic map view (upper right). The mouse scroll wheel is active to scroll through the slices.
- **Panoramic Map View (upper right)** used to modify the position of the axial views (which are represented on the axial slice position view) and modify the criteria used to generate the axial views (lower right).

NOTE: If the study was computed using Tru-Pan, the Panoramic Map View displays a **Tru-Pan** label on the image.

- **3D Model View (lower left)** shows a three-dimensional representation of the anatomy of interest displayed on the Implant Planning Screen. Dragging the cursor across the

image rotates the 3D image in the direction of the cursor. Double right click-and-hold the mouse button horizontally rotates the image. The mouse scroll wheel is active to scroll through the slices.

- **Cross Section Views (lower right)** shows cross section details of the anatomy of interest as specified on the axial slice position view and the panoramic map view. The mouse scroll wheel is active to scroll through the slices.

Patient position indicators are used on the Implant Planning Screen to indicate the orientation of the displayed data. These are:

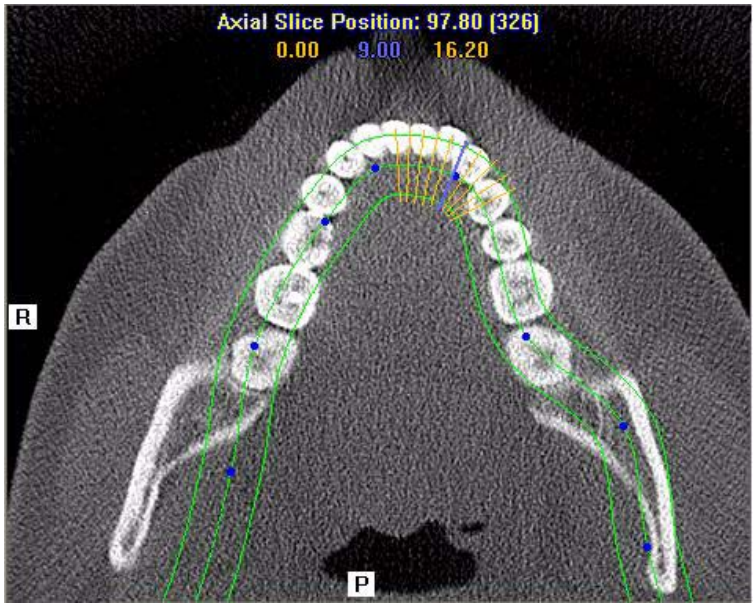
R = Right Side

P = Posterior

B = Buccal

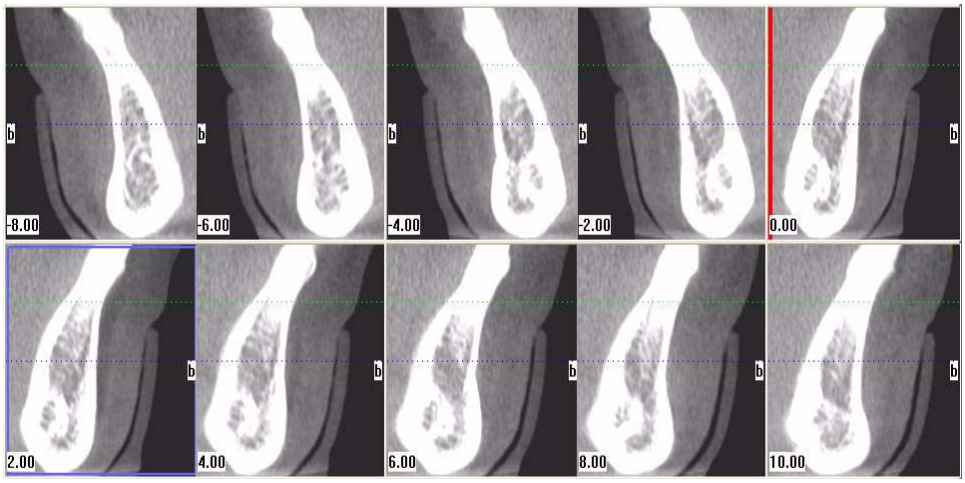
To use the Implant Planning Screen:

1. Click and drag the blue dots on the axial slice position view to adjust the image displayed on the panoramic map view.



To correlate the mouse position on the axial slice position view to the panoramic map view, hold down the **C** key on keyboard and move the mouse. A yellow mark shows the correlated position.

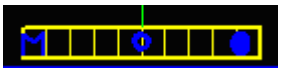
The blue hash mark represents the center line of the axial slices displayed on the cross section views. (The corresponding center cross section slice is displayed with a blue frame in the cross section views.) The orange hash marks represent the other axial slices displayed on the cross section views. At the top of the axial slice position view, the positions of the rightmost axial cross section, center cross section, and leftmost cross section are displayed.



The cross section views are located as indicated by the hash marks displayed in the axial slice position view. If the 0.00 position is displayed, it is outlined in red. All slices to the patient's right side are displayed as negative numbers. All slices to the patient's left side are displayed as positive numbers.

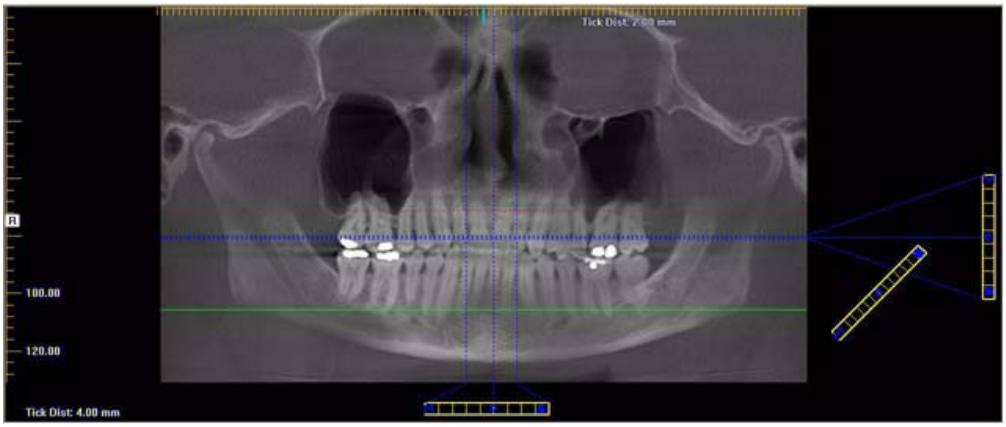
2. Use the panoramic map view to modify the position of the cross section views (which are represented on the axial slice position view) and modify the criteria used to generate the cross section views (at the lower right of the Implant Planning Screen):

   a. Drag the **O** in the center of the horizontal slice control (bottom of view) left or right to change the location of the center axial cross section. Changes made here are reflected on the axial slice position view and the cross section views.

   b. Drag the solid dot on the right side of the diagonal slice control (bottom right) to adjust the slice thickness displayed on the panoramic map view.

.



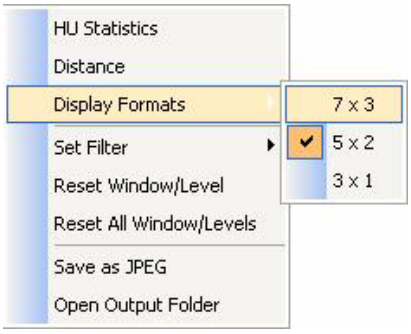
c. Drag the **O** in the center of the diagonal slice control to adjust the pan focal trough.

d. Drag the **O** in the center of the vertical slice control (right side of view) up or down to change the height of anatomy viewed in the cross section views. Changes made here are reflected on the axial slice position view and the cross section views.

e. Drag the solid dot on the right side of the vertical slice control to adjust the slice thickness displayed on the cross section views. Changes made here are reflected on the cross section views.

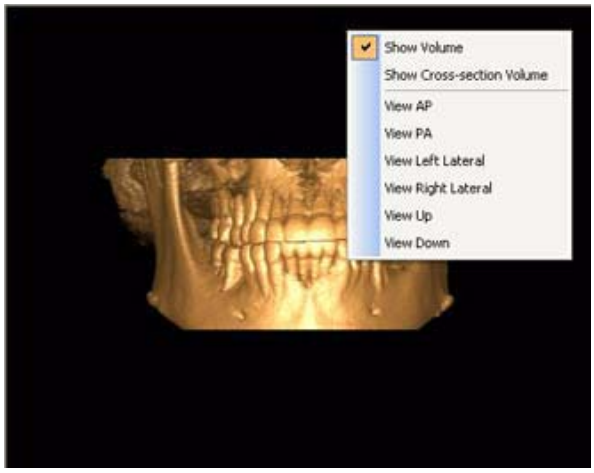
3. Individual cross section images can be zoomed in by double-clicking them. Double-clicking again returns the image to normal zoom.

4. Right-clicking on a cross section brings up a popup menu. Selecting one of the submenu items from the Display Formats menu item changes the number of displayed cross sections to correspond to the selected submenu item. For example, selecting the 3 x 1 menu item causes the Implant Planning Screen to include three cross section images in a single row.



To Use the 3D Model View

1. Right-click in the 3D Model view to display a popup menu.



2. Select desired option to change the view.
   - Show Volume - Displays a full 3D volume model of the image area displayed between the red and green lines on the Panoramic Map View. To change the view, adjust the lines and select Show Volume option.
   - Show Cross-section Volume - Displays a cross-section of the 3D volume model for the cross section that is selected on the Panoramic Map View. To change the view, adjust the cross section and select Show Cross-section Volume option.

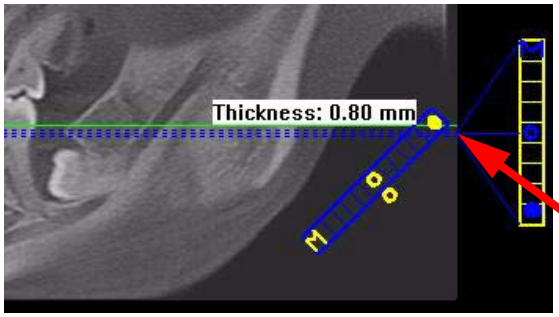
   The remaining options change the view as follows for either the full volume or cross-section model.
   - View AP - Displays view from anterior to posterior.
   - View PA - Displays view from posterior to anterior.
   - View Left Lateral - Displays lateral view of model from left.
   - View Right Lateral - Displays lateral view of model from right.
   - View Up - Displays model from the bottom looking up.
   - View Down - Displays model from the top looking down.
3. To rotate any of the views, click on the view and drag in any direction.

Estimate the Nerve Canal

The Estimate Nerve Canal feature can be used to mark the left, right or both nerve canals, based on your needs. It is important to manipulate the imagery so that you can fully visualize the nerve canals prior to initiating this feature.

Prior to Beginning a Nerve Canal Estimate (Tru-Pan Enabled):

1. Double-click the **panoramic view** image to display the Implant Planning screen.
2. On the **panoramic map view**, click the solid dot on the diagonal slice control to check the slice thickness. If thickness is over 1.0 mm (1.2 mm for voxel sizes greater than or equal to 0.3 mm), drag the solid dot down to reduce the slice thickness. Slice must be no thicker than stated above to be able to mark points in the **panoramic map view**.



3. Use the following tools to manipulate the images to bring the nerve canal(s) into clear focus on the **axial slice position view**:
   - **Window/Level** to adjust brightness/contrast.
   - **Zoom** to zoom in on the image.
   - **Pan** to view the desired portion of the image.

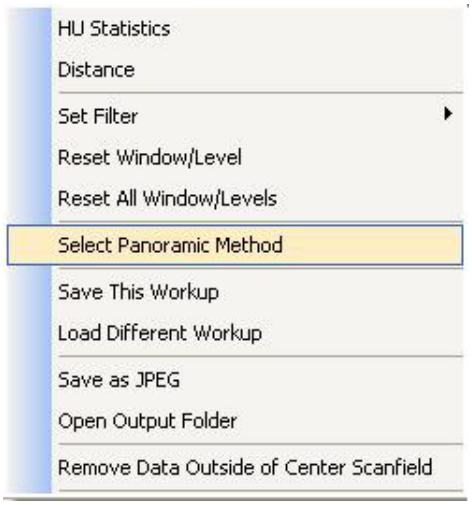


4. After you have adjusted the images to visualize the nerve canal(s), go to ***Estimate Nerve Canal***.

Prior to Beginning a Nerve Canal Estimate (Tru-Pan Disabled, Manual Adjustment of Contourlines):

1. Set Panoramic Method to Manual Arch Settings, if not already selected.

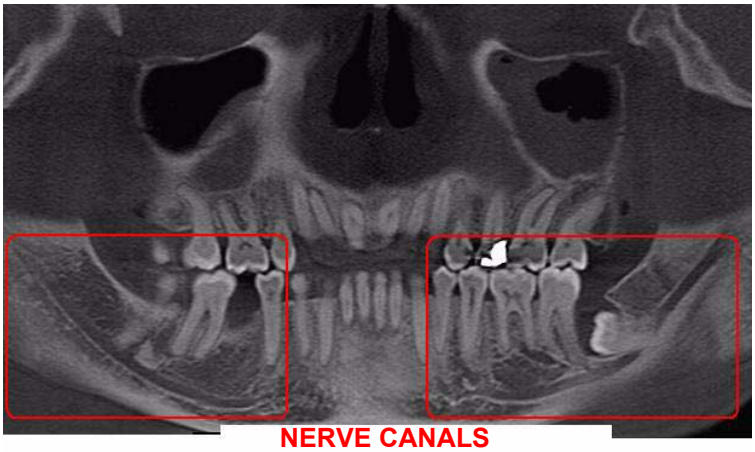
   a. On the Preview screen, right-click on an image view and choose **Select Panoramic Method**.

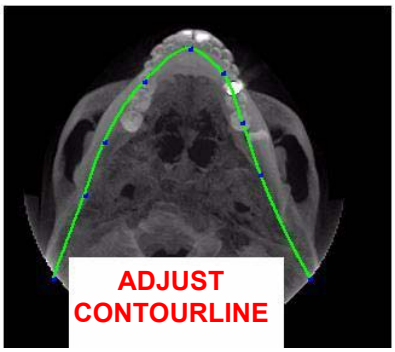


   b. On the Panoramic Method dialog, select **Manual Arch Settings** method and click **OK.**

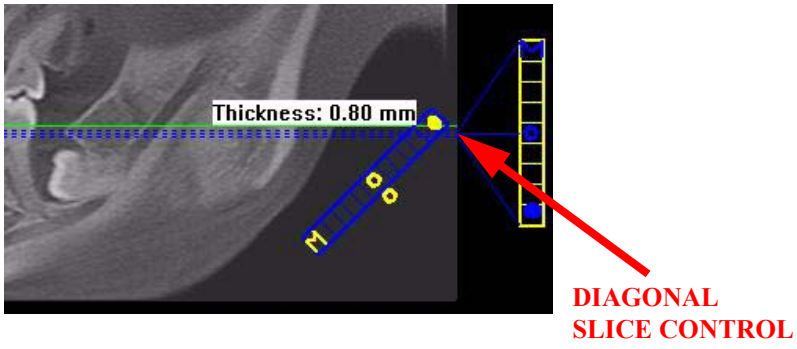
   c. On the Contourline Setup dialog, select the **Mandible** checkbox and click **OK**. The mandible contourline is displayed.

2. On the **axial view**, click and drag the blue dots on the contourline as needed to bring the nerve canal(s) into view on the **panoramic view**.

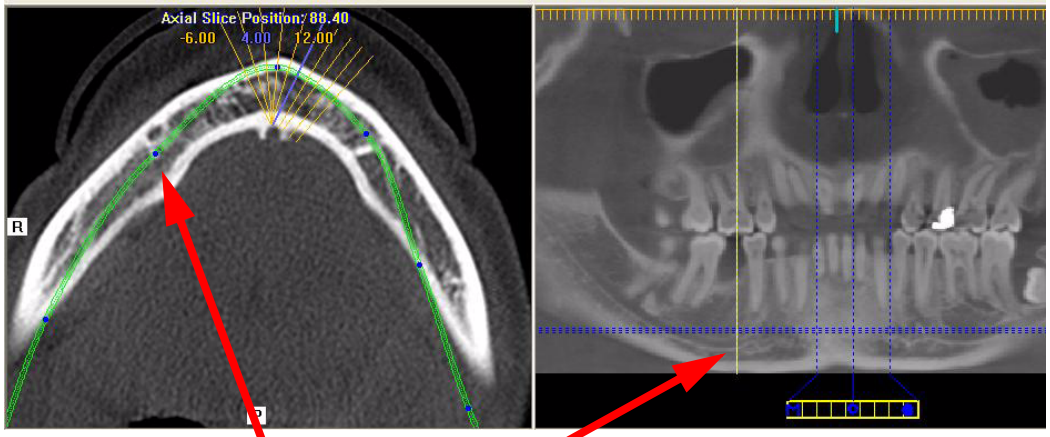




3. Double-click the **panoramic view** image to display the Implant Planning screen.
4. On the **panoramic map view**, click the solid dot on the diagonal slice control to check the slice thickness. If thickness is over 1.0 mm (1.2 mm for voxel sizes greater than or equal to 0.3 mm), drag the solid dot down to reduce the slice thickness. Slice must be no thicker than stated above to be able to mark points in the **panoramic map view**.



5. On the **axial slice position view**, click and drag the blue dots to adjust the contourline to bring the nerve canal(s) into clear focus. When you hover on a dot, a yellow line is displayed on the **panoramic map view** showing the location you are adjusting. Continue buccal-lingual adjustments as needed along the contourline to clearly visualize the nerve canal(s).



BLUE DOT ON AXIAL SLICE POSITION VIEW CORRESPONDS TO YELLOW LINE ON PANORAMIC MAP VIEW

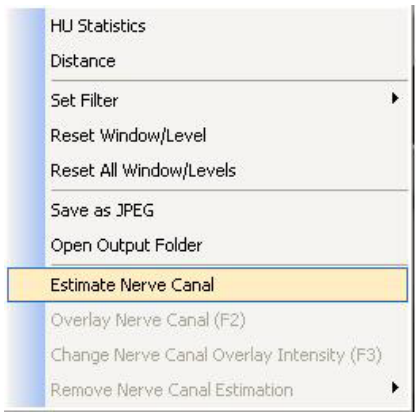
6. You may also need to use the following tools to manipulate the images to bring the nerve canal(s) into clear focus:
   - **Window/Level** to adjust brightness/contrast.
   - **Zoom** to zoom in on the image.
   - **Pan** to view the desired portion of the image.

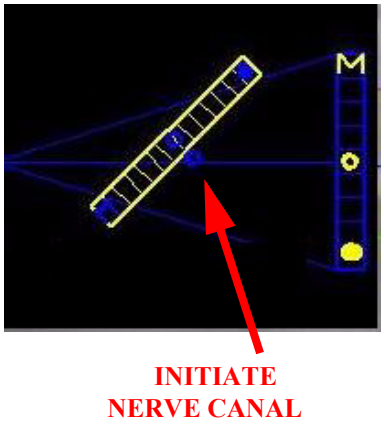
7. After you have adjusted the images to visualize the nerve canal(s) on the **axial slice position view**, go to ***Estimate Nerve Canal***.

Estimate Nerve Canal

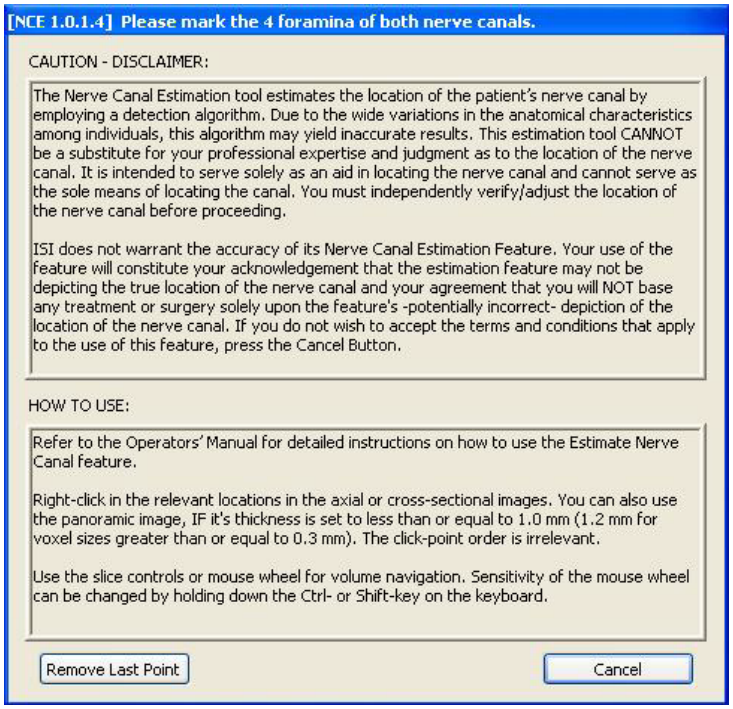
NOTE: A combination of the **axial slice position**, **panoramic map**, and **cross-section views** can be used to mark the nerve canal(s) in any order desired. The following steps describe the recommended workflow. You may choose to use a different workflow to estimate the nerve canal(s).

1. From the Implant Planning view, right-click to select **Estimate Nerve Canal,** or click the **O** outside the center of the diagonal slice control.

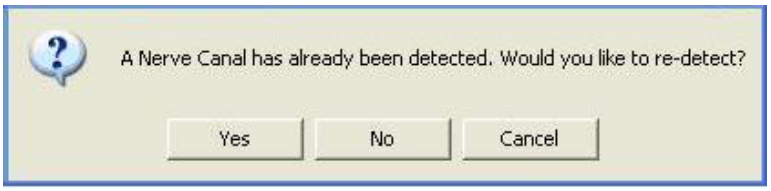




The nerve canal dialog is displayed.



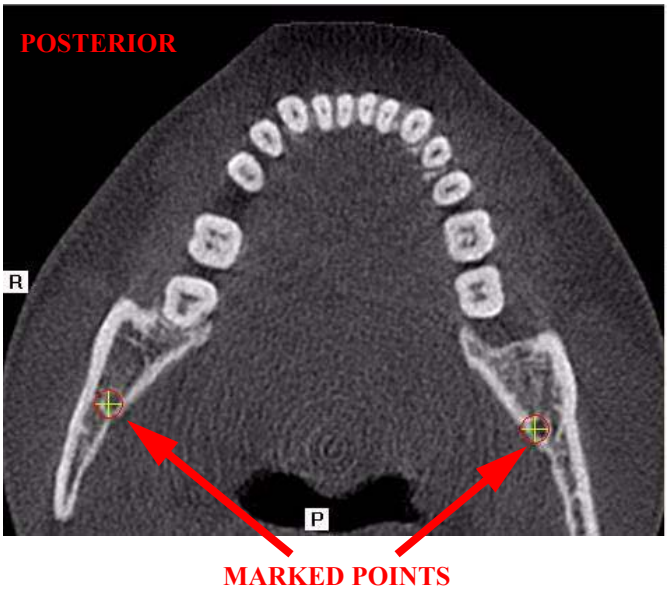
NOTE: If a previous nerve canal estimate is detected by the system when the Estimate Nerve Canal option is selected, a dialog is displayed:



Click **Yes** to remove current estimation and begin nerve canal estimation from scratch or click **No** or **Cancel** to cancel the action.

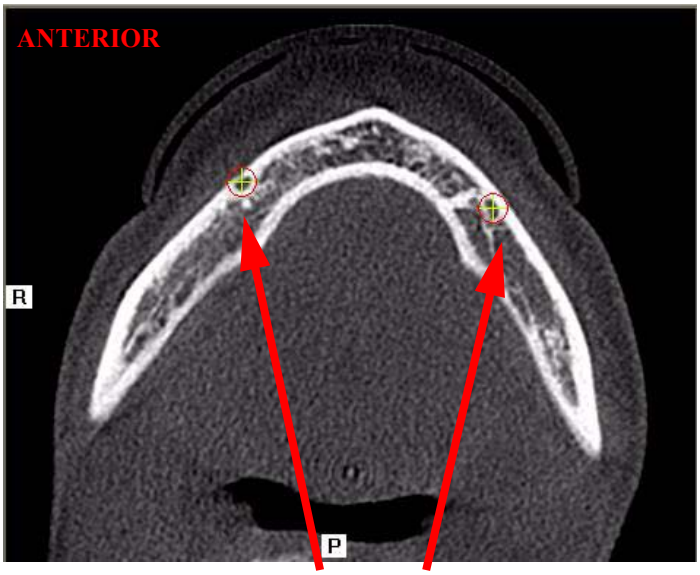
NOTE: When using the mouse wheel to scroll through slices, you can hold down the **Shift** key or **Ctrl** key to change the sensitivity of the mouse wheel.

2. On the **axial slice position view**, use the mouse wheel to scroll through the axial slices to locate the posterior position of the nerve canal(s). Right-click to mark each point. A cross is displayed on both the **axial slice position** and **panoramic map views**.



3. Use the mouse wheel to scroll through the axial slices to locate the anterior position of the nerve canal(s). Right-click to mark

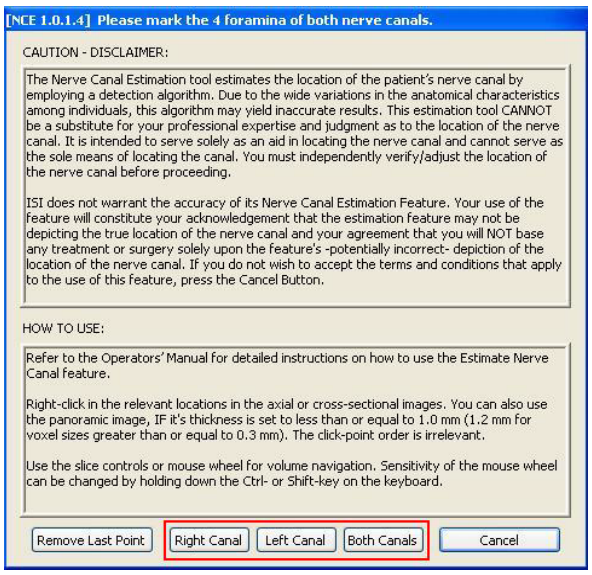
each point. A cross is displayed on both the **axial slice position** and **panoramic map views**.



NOTE: At a minimum, you must mark the four foramina to estimate both nerve canals (two foramina if only marking the left or right canal).

4. To remove a point, click **Remove Last Point**. Points are removed in last-created to first-created order.

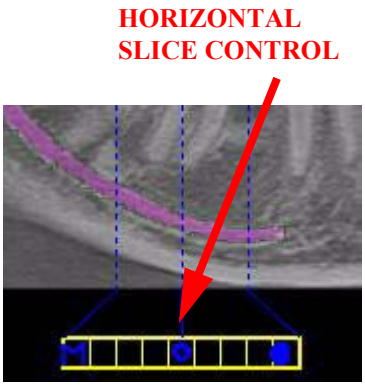
5. When points are selected for the Right, Left or Both canals, one or all of the following buttons are displayed. Click the desired button to calculate and display the overlay for the selected nerve canal(s).

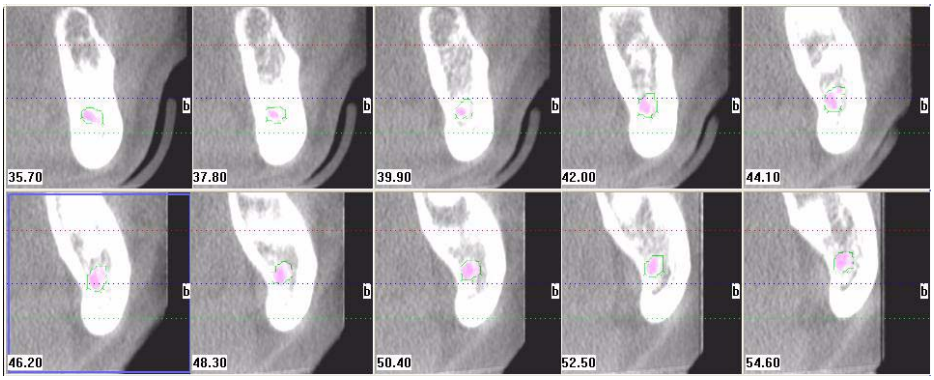


6. View and check the marked nerve canal(s) on the **cross section view**:

   a. Click and drag the center **O** on the horizontal slice control to display the desired cross section.

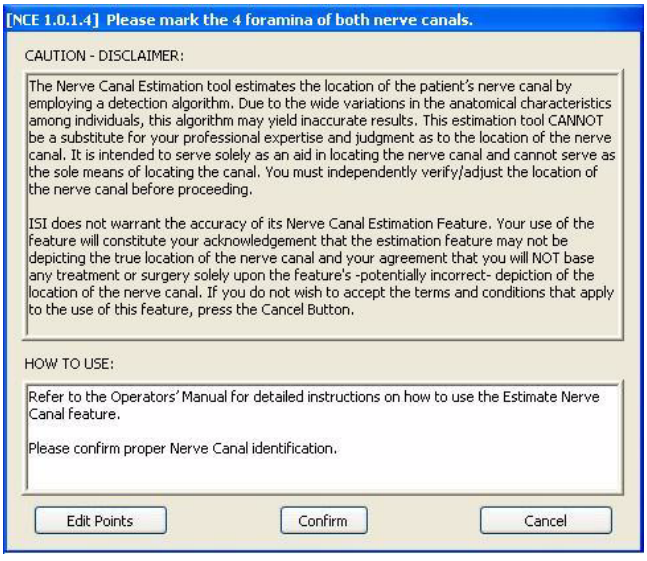
   b. On the cross section view, check that the nerve canal markings are roughly in the center of the cross section of each tooth.





7. To change the nerve canal estimate by adding or removing points:

   a. Click **Edit Points**. The points previously selected on the **panoramic map view** can be edited.



b. Add additional points as needed on the **axial slice position** and/or **panoramic map** views. If the estimate is slightly off, you may be able to recalculate it by adding additional points without having to remove points.

c. To remove points, click **Remove Last Point** button. Points are removed in last-created to first-created order.

d. When points are selected for the Right, Left or Both canals, click desired button to redisplay the overlay for the selected nerve canal(s).

e. Repeat steps 6 and 7 until you are satisfied with the nerve canal markings

8. To confirm the nerve canal estimate, click **Confirm**. The marked canals can be viewed on the **axial slice position**, **panoramic map** and **cross section views**.

9. To save the workup:

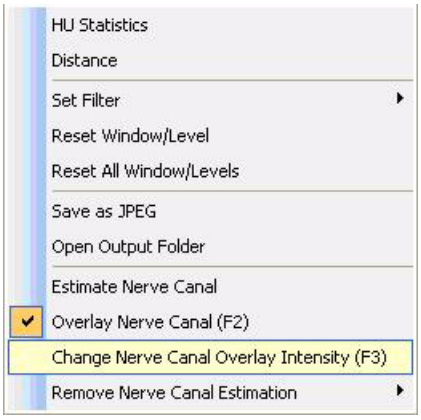
   a. Click **Screen** and select **Preview Screen**.

   b. On Preview screen, right-click to select **Save this Workup**.

Overlay the Nerve Canal

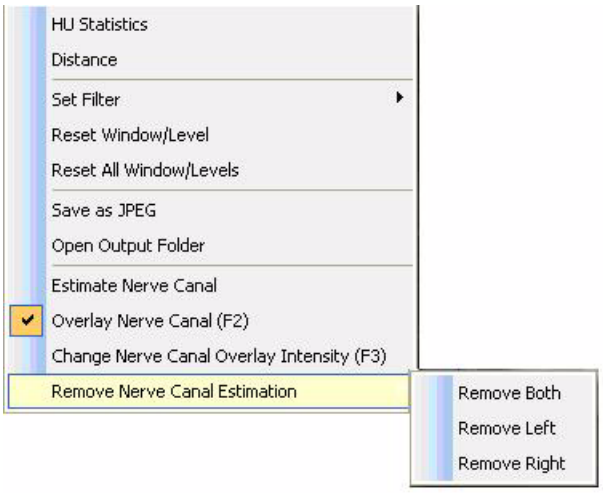
1. Right-click and select **Overlay Nerve Canal**, or press **F2** key. Nerve canal is overlaid in pink. Selecting this option in succession toggles the overlay on and off.

2. To change the intensity of the overlay, right-click and select **Change Nerve Canal Overlay Intensity,** or press **F3** key. Selecting this option in succession toggles the overlay intensity brighter or dimmer.



Remove a Nerve Canal Estimation

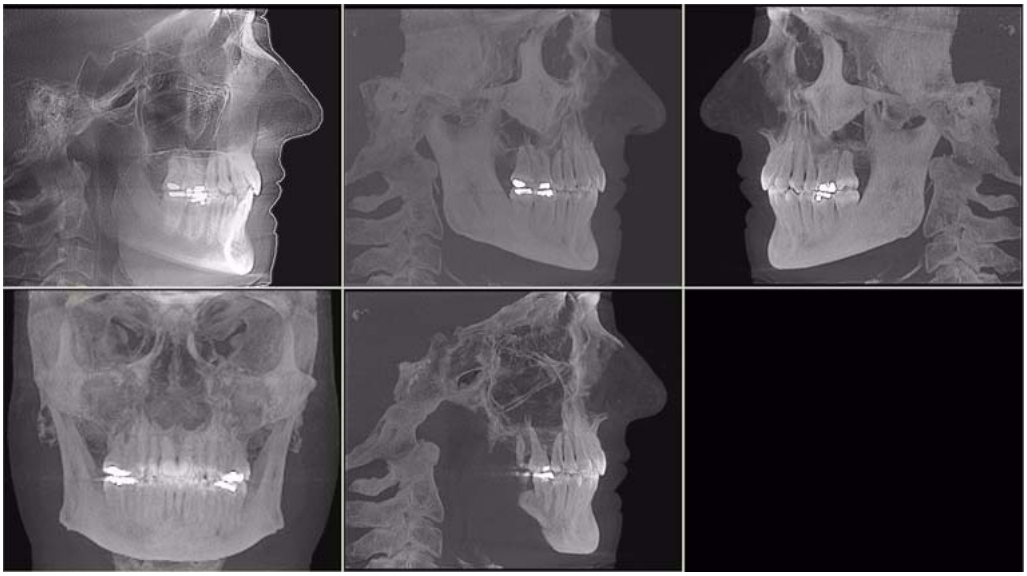
1. Right click, select **Remove Nerve Canal Estimation** and choose one of the three options on the drop-down, depending on the estimation to be removed.



2. On the dialog, click **Yes** to remove the nerve canal estimate.

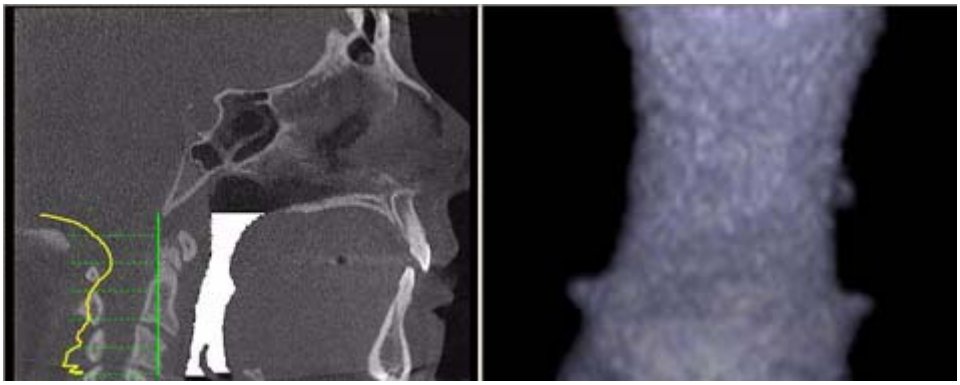
Ceph Screen

Double-clicking the Sagittal View on the Preview Screen displays the Ceph Screen.



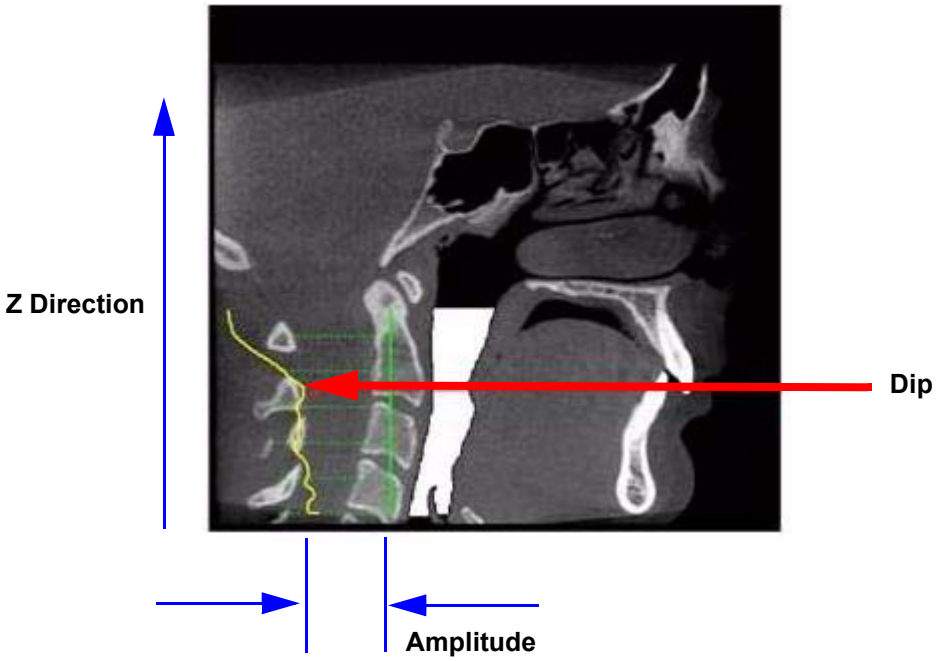
The Ceph screen displays the Lateral Cephs in Radiographic and MIP mode as well as a Coronal View in MIP mode, all at the thickness of the volume. The last image is a Mid Sagittal Slice at 20mm thick.

Right-clicking the blank view at the bottom right of the Ceph screen displays a single item popup menu. Clicking **Tag Airways** generates a 3D view of the airways for the patient in the blank view. In addition, the tagged airway data is graphed in the view at the bottom center of the Ceph screen.



In the example below, the plot shows the opening of the airway along the vertical axis of the graph. The green vertical line is the zero line in the graph. The yellow curve shows the 3D width of the airway along the Z direction of the volume and is proportional to the 3D airway voxel volume in each corresponding axial slice. The red line passes through an area in the airway which is narrower relative to the surrounding area. This is depicted by a dip in the yellow curve toward the green vertical zero line of the graph.

Since a constriction could be present in the depth of the image, a single image may not be sufficient to assess airway volume. However, the curve is accurate since it is created from the airway volume contained in each slice along the Z direction. The amplitude at every point in the yellow curve is a true 3D representation of the airway volume at the corresponding axial slice location.

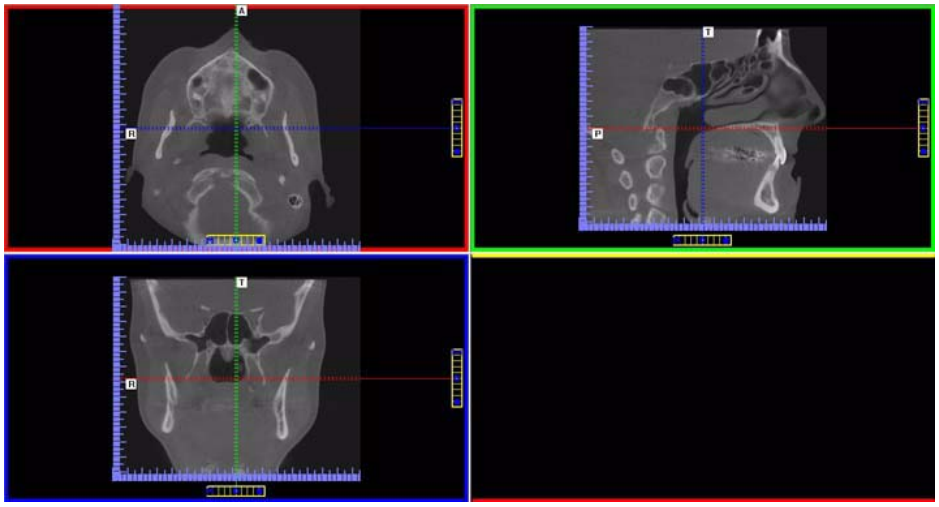


To remove the airway information from the View, right click the airway view and select **Untag Airways**.

If **Tag Airways** is reselected after certain image manipulations have occurred, a dialog is displayed. Click **OK** in the dialog, then in the Mid Sagittal image, click the airway below the flap. The airway tag is displayed.

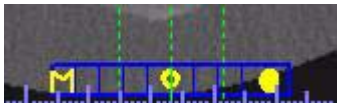
MPR Screen

Double-clicking the Coronal View on the Preview Screen displays the MPR Screen.



The MPR Screen allows scrolling through the Axial (upper left), Sagittal (upper right), and Coronal (lower left) slices. The resulting selections are displayed in the lower right view of the MPR Screen. The mouse scroll wheel is active to scroll through the slices.

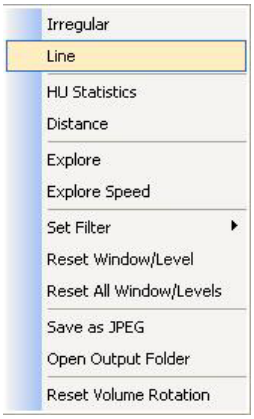
To use the MPR Screen:



1. To move the slice location, drag the hollow circle (center of tool) in any of the views. The slice lines are color coded to correlate to the associated view that it is adjusting.
2. To adjust the slice thickness, click the solid circle (end of tool) and drag the mouse to spread or tighten slice thickness.

NOTE: If a linear or non-linear slice is created starting from the right side of the image to the left (patient left to right), be aware that the resulting slice is displayed in reverse.

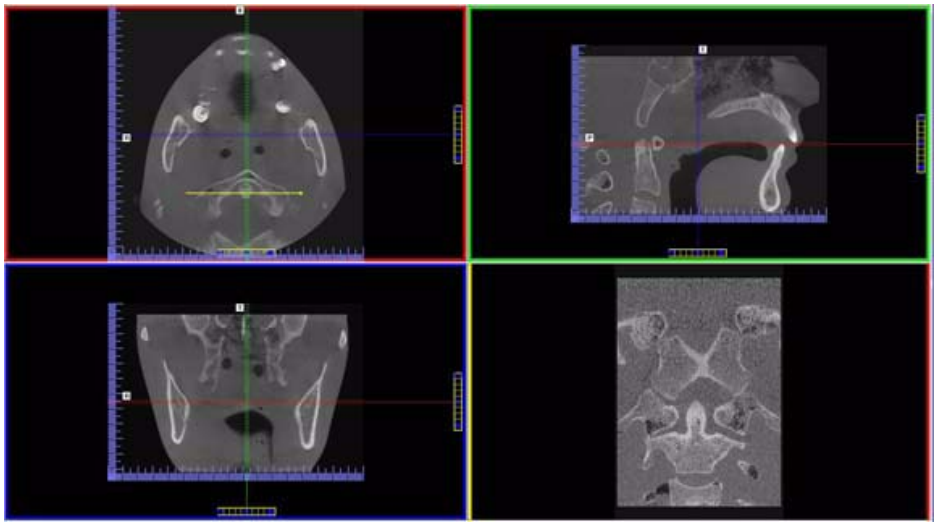
To view the result of a linear slice:



1. To view a linear slice, right click the view and select **Line**.

   A pointer cursor is displayed.

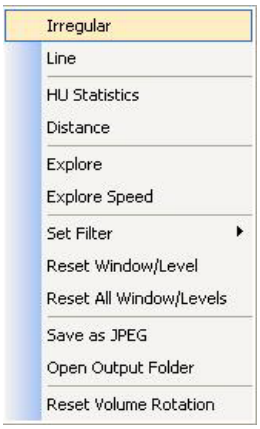
2. Drag to position the linear slice.



The resulting slice is displayed (lower right of the MPR Screen.)

3. To reposition the line, drag either end point of the line.

To view the result of a non-linear (irregular) slice:

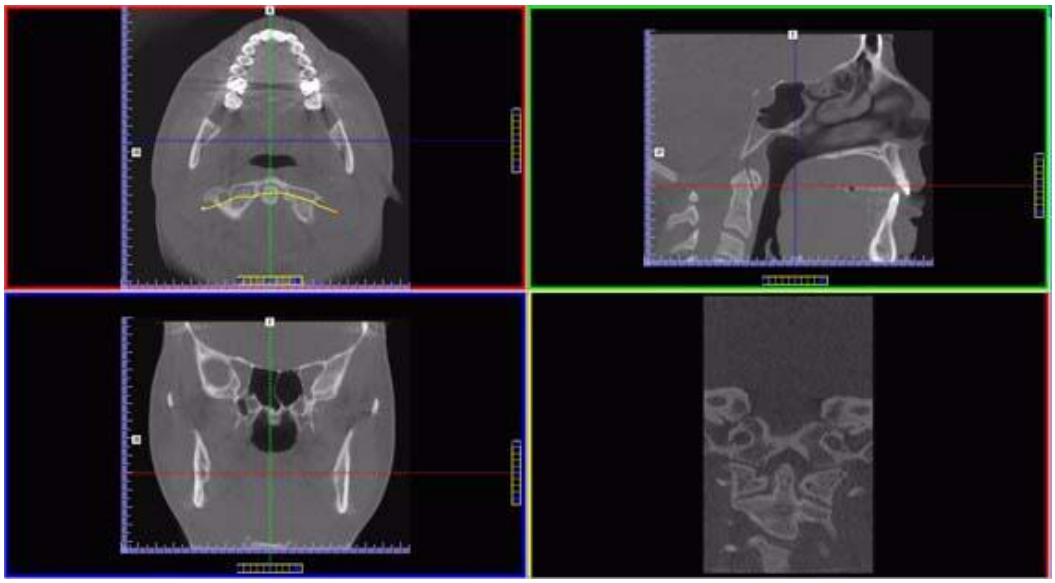


1. To view a non-linear slice, right click view and select **Irregular**.

   A pointer cursor is displayed.

2. Drag cursor to create slice as desired.

   The resulting slice is displayed in the view at the lower right of the MPR Screen.

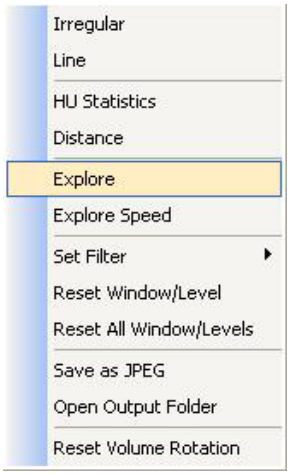


3. To reposition the line, drag either end point of the line.

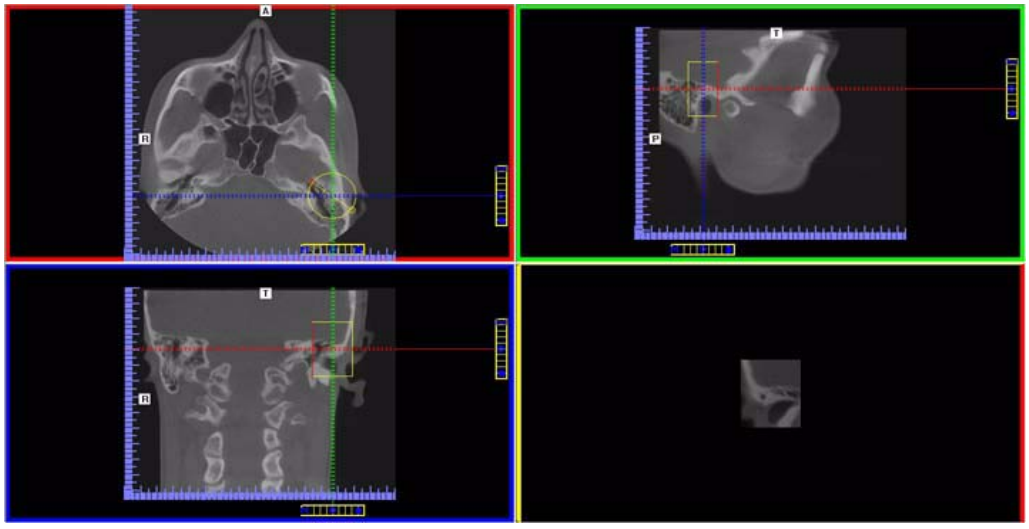
To explore additional cut planes in an animated (consecutive) fashion:

4. To view additional cut planes, right-click view and select **Explore**.

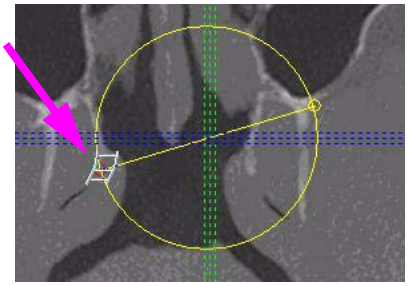
   A pointer cursor is displayed.



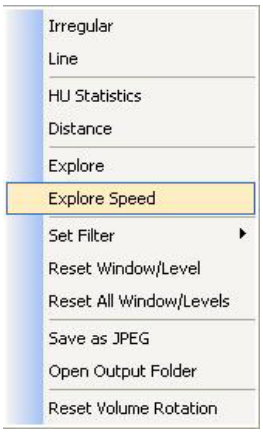
5. Drag the center of the circle to position the cut planes slice.



6. Move the cursor over the red end point and the cursor changes to a film icon.
7. Click cursor to start the animation which plays in the lower right view.



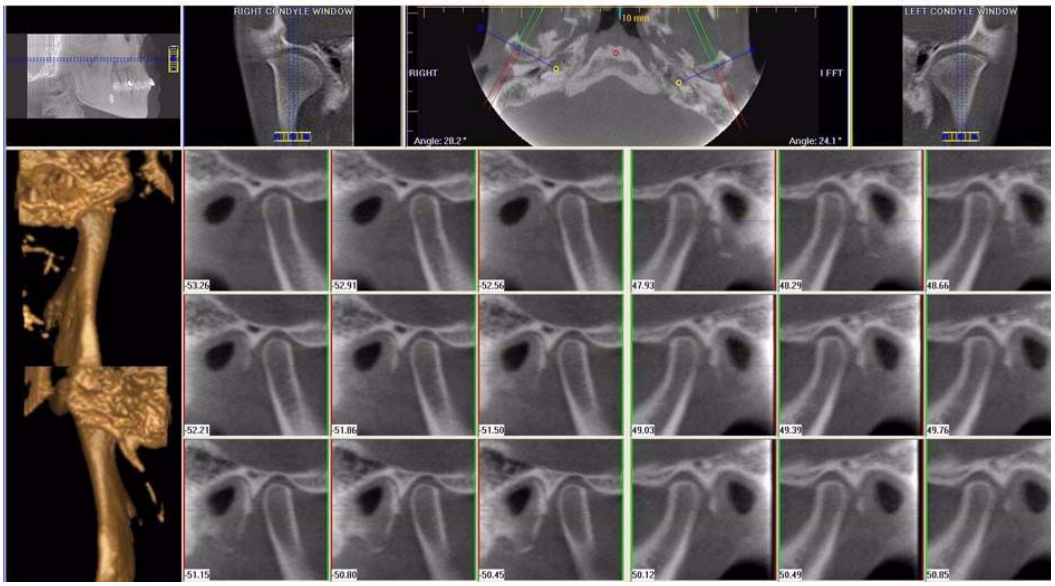
8. To adjust the playback speed, right-click any image and select **Explore Speed**



9. Enter desired animation speed in the *Movie Playback Speed* field.
10. Click **OK**.

TMJ Screen

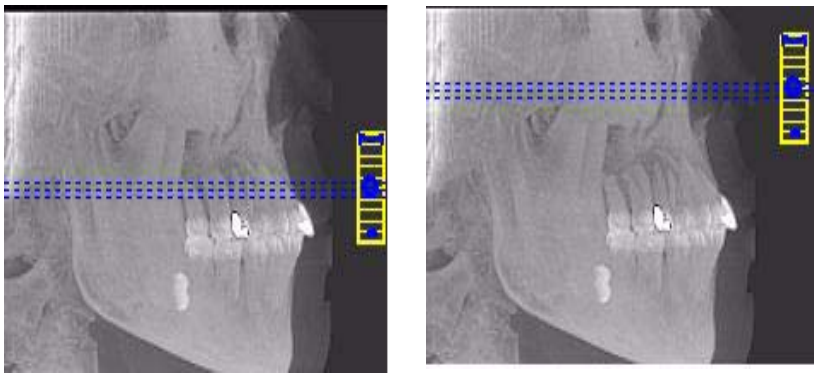
Double-clicking the Axial View on the Preview Screen displays the TMJ Screen.



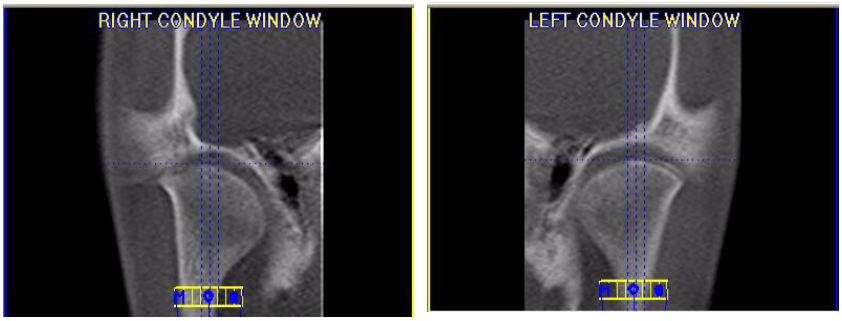
TMJ Screen enables condyle mapping and creating corresponding coronal slice views.

To use the TMJ Screen:

1. If necessary, pan the Axial (SMV) View (upper left) down in the window to see the condyles. (See *Pan Feature*.)
2. Use the scroll bar center (**O**) tool to locate the condyles for proper mapping.



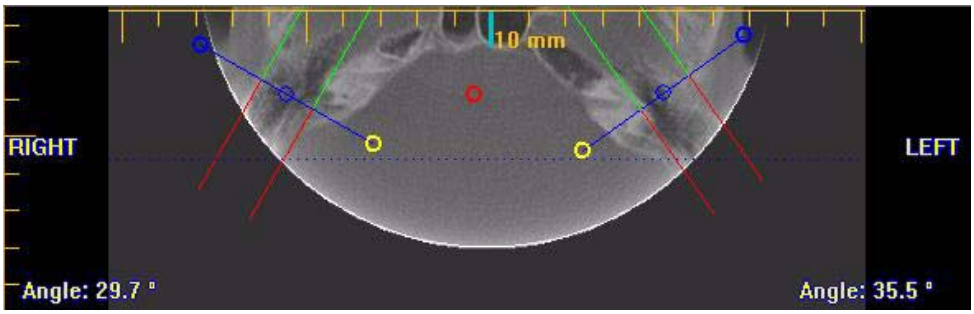
3. Drag center (**O**) tools from the RIGHT and/or LEFT CONDYLE WINDOWS to move the slice locations of the cross section views.



4. Drag the solid circle tool (right edge of slice control) to adjust the slice thickness of the cross section views.

To create lateral slices:

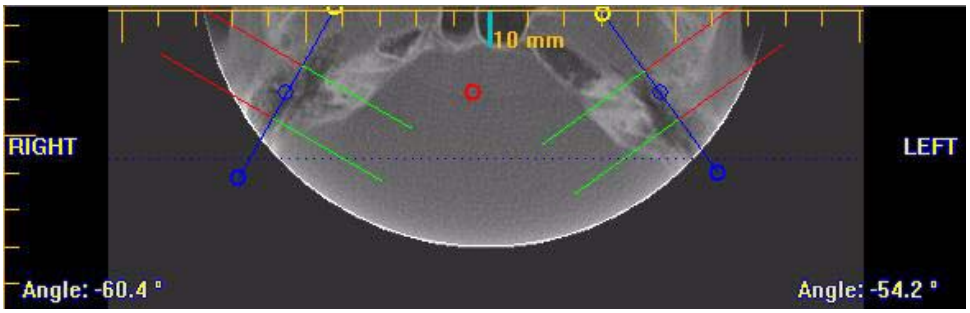
5. Drag the center blue circles on the Axial View to move the corresponding Condyle Map.



6. Drag the yellow and blue end circles to adjust the angle of each Condyle Map.

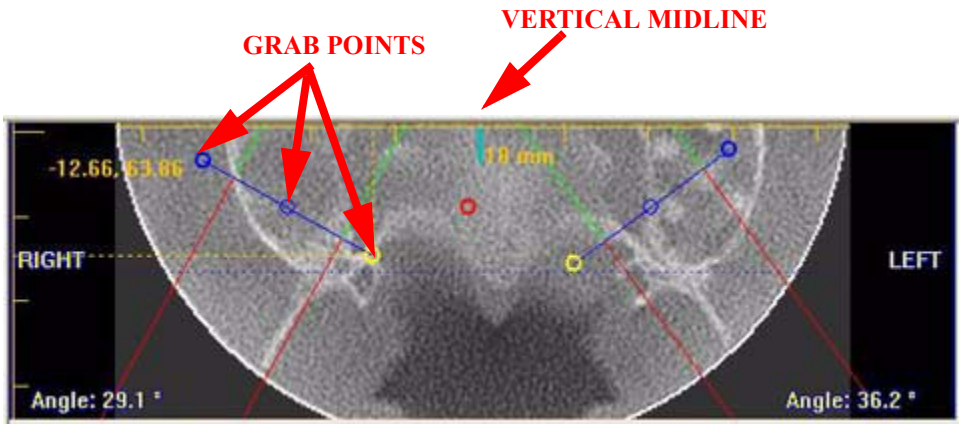
   Green markings indicate the anterior of the Condyle.
   Red markings indicate the posterior of the Condyle.

7. To create Coronal Slices, click the red circle.



To measure:

8. Click and drag any of the grab points on either side of the vertical midline. A set of measurements is displayed.



In the example above, the first number, -12.66, is the horizontal distance in millimeters of the grab point to the vertical midline. The second number, 63.86, is the distance in millimeters from the anterior start of the image. When the patient's left and right side grab points are touched, these numbers give an indication of symmetry.

The vertical midline represents the center of the slice and is determined by the point fartherest anterior from the contour line when the contour line is created.

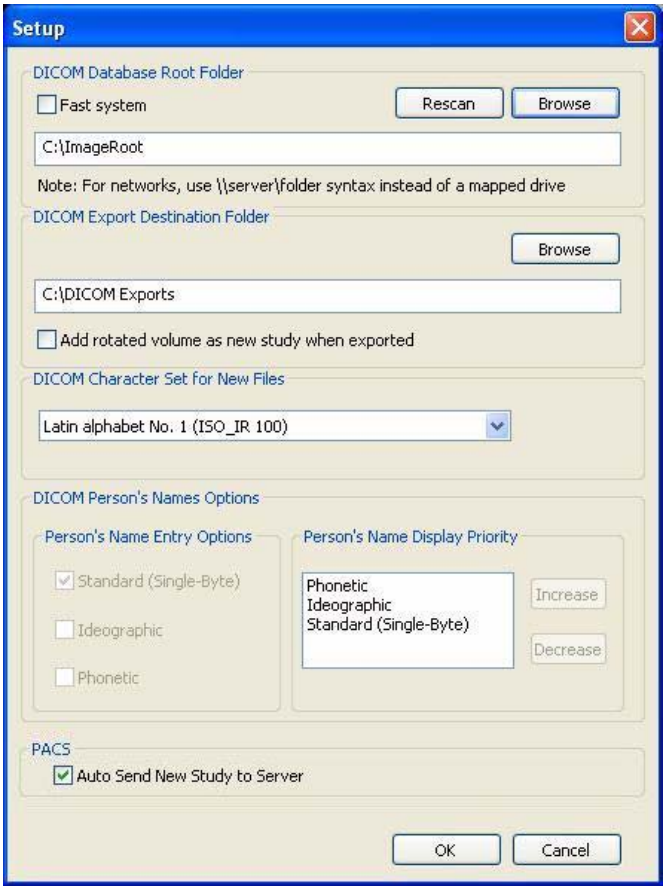
Chapter 10 Tools

DICOM Setup

DICOM (Digital Imaging and Communications in Medicine), is an industry standard for digital images which is a means for medical imaging products to share images.

DICOM Database and DICOM Export Setup

1. From the top Main menu, select **Tools > Setup**.



- **DICOM Database Root Folder -** contains patient data that is required for creating DICOM images.
- **DICOM Export Destination Folder** – this path selection determines where the DICOM images are to reside when executing the ***Export DICOM*** procedure.

2. Click **Browse** for each field.
3. Choose a path for the *DICOM Database Root Folder* and the *DICOM Export Destination Folder*.

   If required, click **Make New Folder**.
4. Click **OK**.

Fast System

For Networked Environments only where multiple computers are sharing the database, if appropriate, check the Fast System checkbox. This identifies the current computer as one of the fast machines on the network, which gives it preference to be chosen as master.

Rescan

The Rescan option is used to request a rescan of the entire patient/study list database. Rescan rebuilds the patient/study list if it is suspected that the list is corrupted. A database Rescan can run in the background.

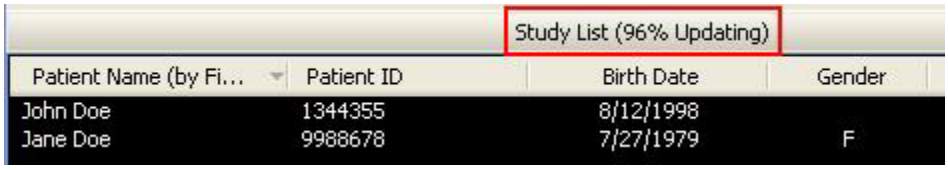
CAUTION

A Rescan can be a time-consuming operation, depending on the size of the database.

To initiate a rescan:

1. Select **Tools > Setup**.
2. Click **Rescan** button. A dialog is displayed stating: *"Patient List Rescan is now in progress and will continue until completion. You may continue working."* Click **OK**. A Rescan can not be cancelled.

3. The rescan progress is displayed at the top of the Study List.



Add Rotated Volume

The **Add rotated volume as a new study when exported** checkbox is used to export a rotated volume study as a new study. See ***Export a Rotated CT study*** for more information. This checkbox must also be selected if rotated studies are to be sent automatically as part of the Auto Send feature. See ***PACS*** for information on setting up Auto Send.

PACS

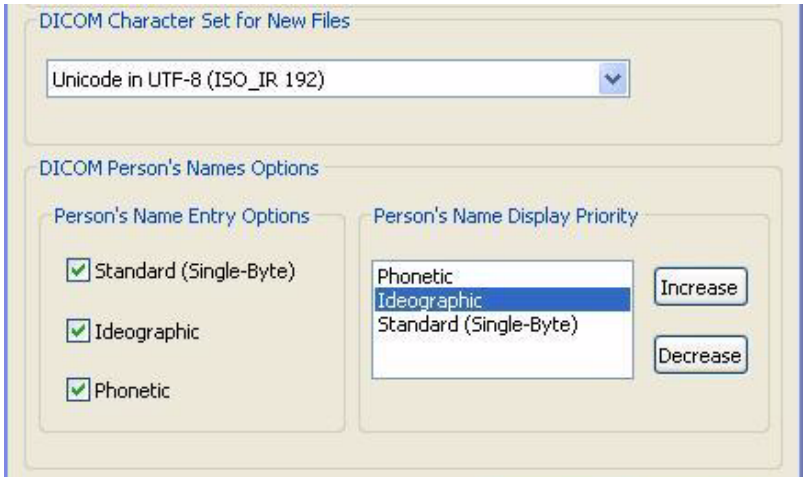
To enable the DICOM Auto Send feature, select the **Auto Send New Study to Server** checkbox. This option is only active on a VisionQ system, not in standalone Vision.

DICOM Character Set for New Files

This procedure describes how to select the character set to be used in your DICOM files. The character sets that are supported by your DICOM system are dependent on the 3rd party software and DICOM PACS servers that are part of your configuration. Check your DICOM Conformance Statement for the character sets that are supported.

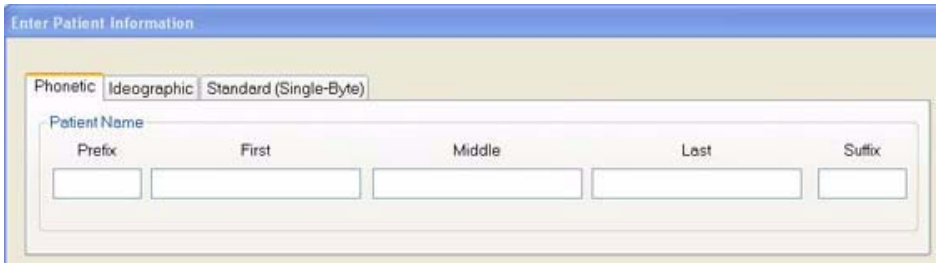
NOTE: The selected DICOM character set is only applicable for new data that is entered after the selection is made. You can not change the character set of existing files.

1. Select the desired DICOM character set.
   - Latin Alphabet No. 1 (ISO_IR_100)
   - Unicode in UTF_8 (ISO-IR 192)

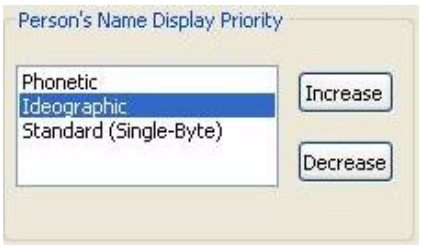


2. For Unicode, you can select to enter names in one or more entry options: Standard (Single Byte), Ideographic, and Phonetic. For Latin Alphabet, Standard (Single Byte) is the only available entry option.

   These selections determine the tabs that are available for data entry of names on the Enter Patient Information window (see ***Add New Patient***).



3. The person name type which is displayed throughout Vision is determined by the *Person's Name Display Priority* setting. If a person has multiple name types defined, then the one which is the highest on the priority list will be displayed. Any additional entry options are stored in the DICOM file, and are only viewable if you change the corresponding entry option to the highest priority.



   For example, if you select to enter both an Ideographic and a Phonetic name for a person, and want the Ideographic name to

be displayed in Vision, select **Ideographic** in the Person's Name Display Priority window, and click **Increase** to move it to the top of the list. If you later want to view the Phonetic name, set Phonetic to the highest priority. Latin Alphabet names will always appear as single byte entries, even if Standard (Single Byte) is set as the lowest priority.

4. To save selections, click **OK**. A dialog is displayed informing that Vision must be restarted for changes to take effect.
5. Click **OK** on the dialog. Vision will close.
6. Restart Vision and continue operations.

Check Read/Write Access to Image Database

This function tests the ability of Vision to read/write to the image root folder. Vision requires Write Access to this path to store or update Status information. Also displayed is the total disk space that is available in the Image Root directory.

Please consult with your Network Administrator if this test indicates a failure.

1. From Main menu, select **Tools > Check Read/Write Access to Image Database**

The *Read/Write Access Test Dialog* window is displayed.

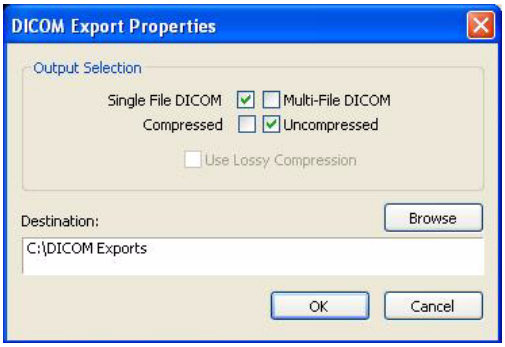
2. Ensure that all tests have passed. Click **OK** to close.

Export DICOM

Export DICOM enables both original CT and PAN (DX) studies and rotated CT studies to be exported. Files are placed in the DICOM Export Destination Folder specified on the Setup dialog, from where they can be placed on a network or other media.

Export an Original CT or PAN study

1. Click (highlight) a patient from the Study List. Allow time for the Patient Image to load.
2. From the Main menu, select **Tools > Export DICOM > Original Study**.
3. Select desired Output Selections.



NOTE: For PAN studies, only the Destination field can be changed on the DICOM Export Properties dialog.

- **Single File DICOM -** one large image file (recommended)
- **Multi-File DICOM -** a separate file for each image slice, resulting in many small files. Some earlier model viewers require this format.
- **Compressed -** files are compressed to save space (smaller file size)
- **Uncompressed -** files are converted to DICOM and stored (original file size)
- **Use Lossy Compression** - files are compressed using lossy wavelet compression. Lossy compressed images are not intended for Hounsfield measurements.
- The *Destination* field was setup at the start of this section.

4. Click **OK**. A *Please Wait* dialog displays until export is done.

Export a Rotated CT study

A rotated study is a study with volume rotation applied. After a study is rotated, the **Export DICOM >Rotated Study** option becomes active. When this option is selected, a rotated study is exported to the specified DICOM Export Destination Folder.

1. Click (highlight) a patient from the Study List. Allow time for the Patient Image to load.
2. See ***Rotating Views*** for instructions on how to rotate a study.
3. From the Main menu, select **Tools > Export DICOM > Rotated Study**. A *Please Wait* dialog displays until export is done.

If the **Add rotated volume as a new study when exported** checkbox is selected on the Setup dialog, the rotated study is exported as a new study and will be listed as a separate study in the patient's Study List when it is imported. The Rotated column in the Study List indicates if the study is rotated.

If Auto Send is enabled on the system and the **Add rotated volume as a new study when exported** checkbox is selected on the Setup dialog, then the rotated study is automatically sent to the specified PACS. See ***Add Rotated Volume*** and ***PACS*** for more information on these options.

Export Sure Smile Studies

Studies to be sent for Sure Smile processing must be acquired at:

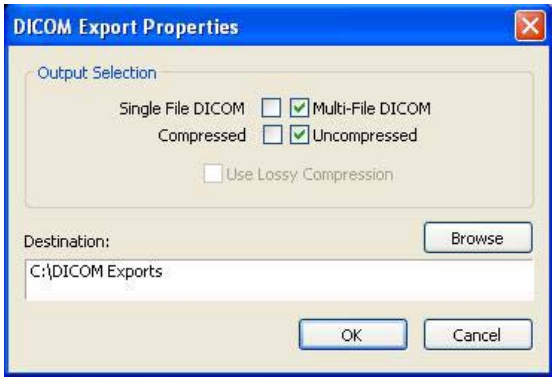
Size: **Diameter 16 cm, Height 13 cm**
Resolution: **0.25 voxel, 26.9 Seconds**
Quantum IQ: **NOT selected**

Studies then must be reconstructed at :
Size: **Diameter 16 cm, Height 8 cm**
Resolution: **0.2 voxel, 26.9 Seconds**
Quantum IQ: **NOT selected**

See ***Viewing and Reconstructing Raw Patient Scans*** for instructions on reconstructing a scan.

1. Select patient and study from the Study List. Allow time for the Patient Image to load.

2. From the Main menu, select **Tools > Export DICOM**.
3. Select **Multi-File DICOM** and **Uncompressed** options.



4. Ensure Destination is set to **C:\DICOM Exports**. If not, browse to this location.
5. Click **OK**. Wait for study to uncompress.
6. When the DICOM Export is complete, you can begin the transfer of data to OraMetrix for Sure Smile processing.

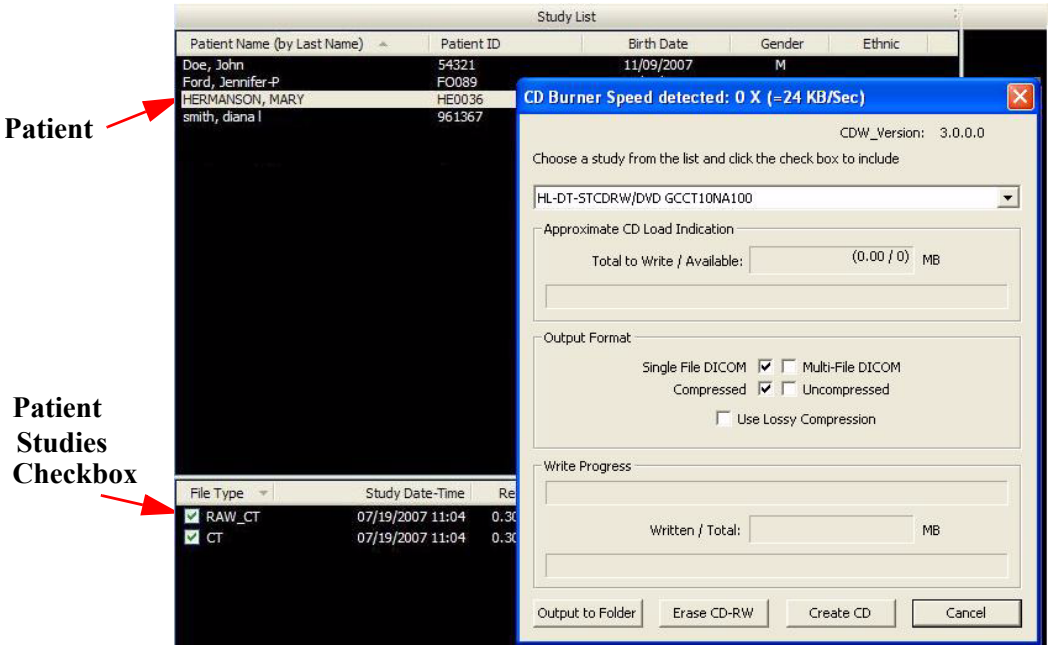
Create Export CD

The internal DVDR drive provides an alternative means for archiving images or transferring patient images to referring Physicians.

NOTE: It is recommended to use a blank CD for recording. Upon completion of the writing process, verify that all required information was written to the CD.

To create a DICOM CD:

1. From the top Main menu, select **Tools > Create Export CD**.



2. Select desired Output Selections.
   - **Single File DICOM -** one large image file (recommended)
   - **Multi-File DICOM -** a separate file for each image slice, resulting in many small files. Some earlier model viewers require this format.
   - **Compressed -** files are compressed to save space (smaller file size)
   - **Uncompressed -** files are converted to DICOM and stored (original file size)
   - **Use Lossy Compression** - files are compressed using lossy wavelet compression. Lossy compressed images are not intended for Hounsfield measurements.
3. Select (highlight) Patient from Study List.
4. Select Patient Studies by enabling check-boxes.
5. Click **Create CD**.
6. A confirmation window is displayed and CD ejects when CD is complete.
7. Click **OK**. Insert CD and check content on CD to ensure data was captured.

Erase CD-RW

This Erase CD option can only be used if using re-writable CDs.

1. From the top Main menu, select **Tools > Create Export CD**.

   The CD Burner window is displayed (shown above).

2. Click **Erase CD-RW**.
3. Click **Yes** when prompted to erase data on CD.

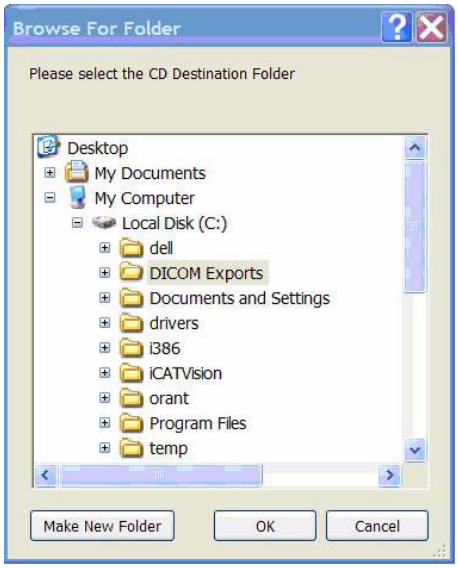
Output to Folder

The *DICOM Export Destination Folder* can be changed using this procedure. For reference, the alternate path to change this folder is **Tools > Setup** which is described at the start of this section.

1. From the top Main menu, select **Tools > Create Export CD**.

The CD Burner window is displayed (shown above "To create a DICOM CD".)

2. Select **Output to Folder**. A *Browse For Folder* is displayed.



3. Choose a path for the *DICOM Export Destination Folder*.

   If required, click **Make New Folder**.

4. Click **OK**.

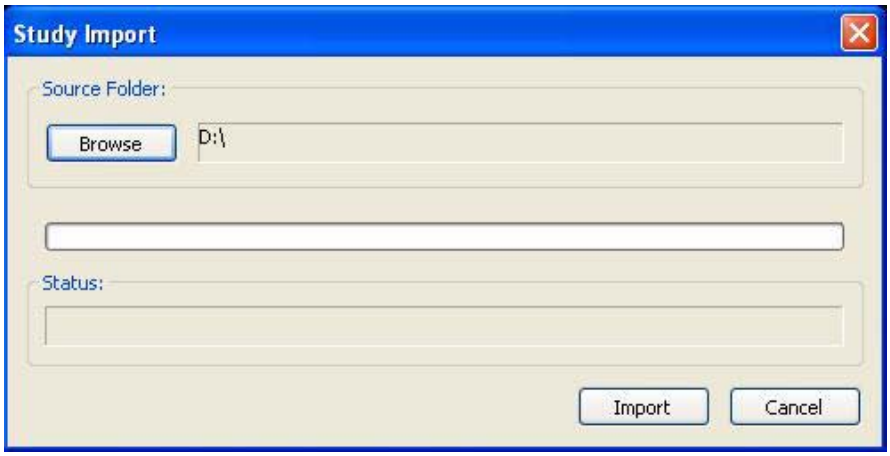
Import Study

CAUTION

To add patient studies to the database, follow the procedure below. Do not use Windows Explorer to copy studies to the database. Manually copying a study to the database using a method other than the one described below will require a potentially time-consuming rescan operation.

Import Study can be used to import a patient study created on an iCATVision system from an outside source, such as from a CD or network, into the database. The study is validated prior to being copied to ensure compatibility with Vision.

1. Select **Tools > Import Study**.



2. Click **Browse** and navigate to the location for the DICOM study to be imported.
3. Click **Import**. The Status bar shows the progress of the import and the status text shows the status of the current operation.

Reporting

Patient reports are generated by inserting patient images into a single or multiple page document. Patient information and text notes can also be inserted as required. Once these reports are created and saved, they are readily available for printing and distribution. Patient reports can also be accessed for editing.

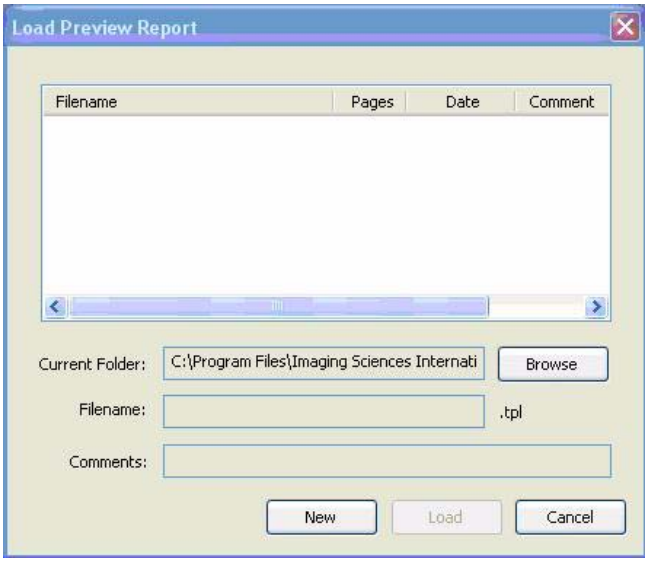
From the top menu bar, select **Tools > Create Report** to display the following three report options:

- Run Report
- Create New Report
- Modify Existing Report
- Exit

Run Report

This feature enables the user to access a sample report to modify and and save as a new patient report.

1. Click (highlight) a patient from the Study List. Allow time for the Patient Image to load.
2. From the Main menu, select **Tools > Create Report**.
3. Click **Run Report** from the box.
4. Use the Browse button to locate a report to Run.



Create New Report

To create a new Patient Report:

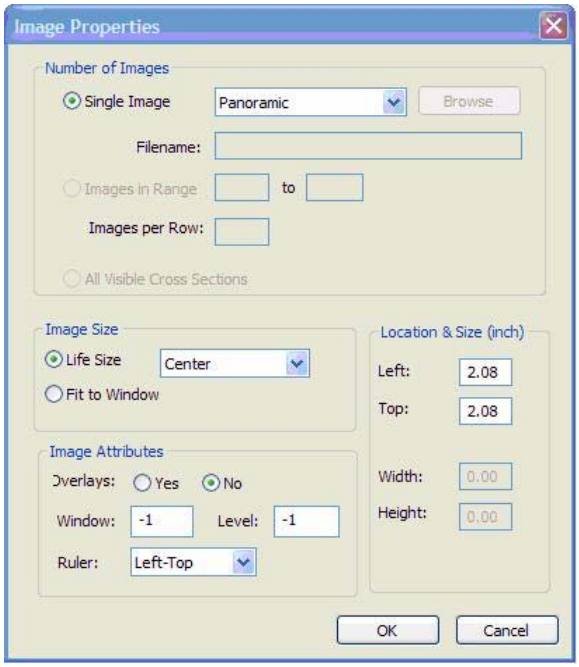
1. Click (highlight) a patient from the Study List. Allow time for the Patient Image to load.
2. From the Main menu, select **Tools > Create Report**.
3. Click **Create New Report** from the box.

Insert Image into Patient Report:

4. Select **Insert > Image** from the Main menu **or** right-click the report page and select **Add Image**.

   Images can be both Vision images and external images (jpg or bmp).

5. Select required parameters and click **OK**.



Number of Images

- **Single Images** – used to select images within Vision or from a file (select FILE)
- **Images in Range** – used to select specific cross sections within Vision
- **All Visible Cross Section** – used to select all currently displayed cross sections

NOTE: When adding a Panoramic image to a report from the Implant Planning screen, (*Panoramic* selected for **Single Images**), be aware that a slice location indicator scale is displayed at the bottom of the image. Each tick on this scale represents the location of a slice. It is NOT a measuring tool. The yellow vertical and horizontal scales (mm) should be used for measuring.

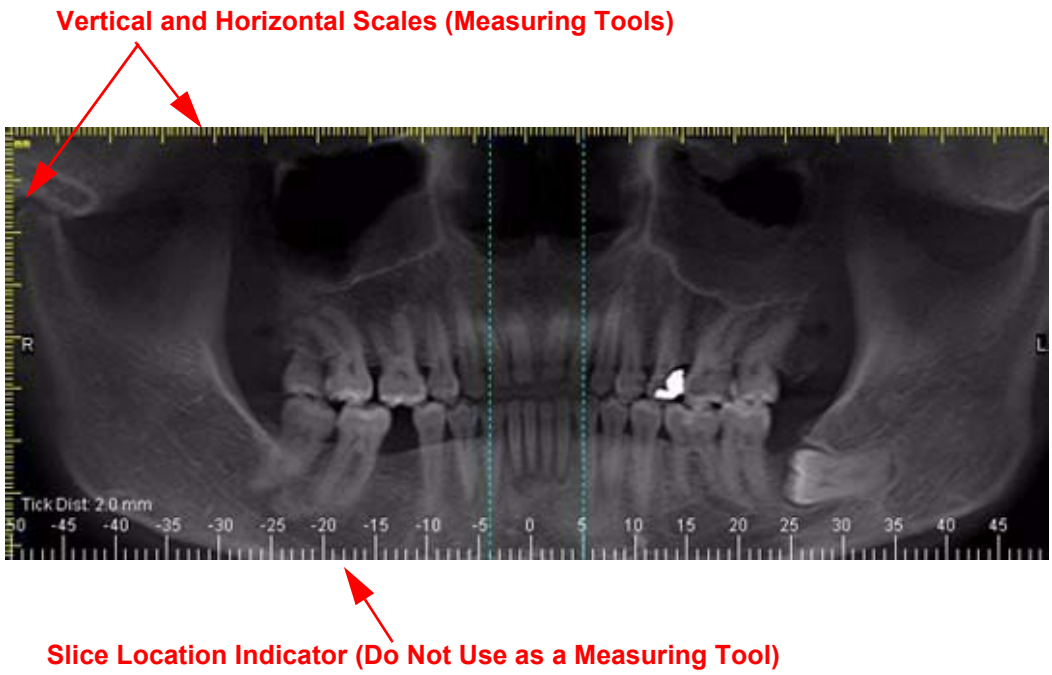


Image Size

- **Life Size** – used to depict the image in life size (able to measure directly on the paper). The drop-down list box allows specifying where the image originated. For example, if Left Top Corner is selected, the image fills in the image box starting in the top left corner.
- **Fit to Window** – used to autofit the image to the available page area.

Image Attributes

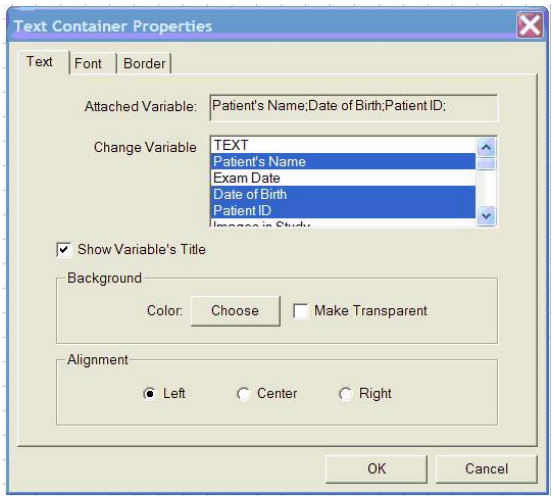
- **Overlays** – when selected, markings that were generated on the image within Vision are displayed
- **Window** and **Level** – adjusts the brightness and contrast
- **Ruler** – designates where the ruler appears on the image

The Image Properties box can be displayed at any time by right-clicking inside the image box and selecting **Properties**.

6. Images can be repositioned or sized by clicking the image and then holding down left mouse button and dragging the cursor.
   - **Cross Arrows –** used to move image
   - **Double Headed Arrow –** used to size image

Insert Text Box:

7. Select **Insert > Text** from the Main menu **or** right-click the report page and select **Add Text**.



8. Select desired variable from the Change Variable list. Holding down the **CTRL** key and selecting multiple variables allows all selected variables to be displayed in one Text box.

   The TEXT selection does not allow multiple variables to be selected.

9. Select **Show Variable's Title** check box to display each title next to the variable information.

10. Backgrounds, Colors, Alignments, Fonts, and Borders are also modified from this menu.

    Double click an existing Text box to display the Text Container Properties box.

11. Images can be repositioned or sized by clicking the image and then holding down left mouse button and dragging the cursor.
    - **Cross Arrows –** used to move Text box
    - **Double Headed Arrow –** used to size Text box

Add Page

12. Select **Insert > Page** from the Main menu **or** right-click a report page and select **Add Page**.

    The new page appends to the end of the report.

13. To change the page properties, select **File > Page Setup** from the Main menu **or** right-click the page and select **Page Properties.**

14. Select required parameters and click **OK**.

Toolbars

The toolbar at the top of the screen can be used to manipulate the text, scroll through pages and preview the report.

Modify Existing Report

This function is used to edit reports that were previously created.

1. From the Main menu, select **Tools > Create Report**.
2. Click **Modify Existing Report** from the box.
3. The Load Preview box is displayed. Select the Patient Report to modify and click **Load**.

   The Patient Report is displayed.
4. Edit the report and select **File > Save Report**.
5. Click the **X** (upper right corner) to close Patient Report.

Start External Applications

The following external applications can be launched from the Tools menu for a loaded study if the supported versions of these applications are installed:

- Dolphin 3D
- 3DMD
- InVivoDental
- TxStudio (Standalone Vision Only)

A confirmation dialog is displayed informing that Vision will terminate and the external application will start.

To open a study for a selected patient using InVivoDental or TxStudio without first loading it, right-click on the study in the Study List and select the appropriate option from the menu.

NOTE: In Standalone Vision, menu options for InVivoDental and TxStudio will only appear if these applications are installed on the workstation.

3DVR is a standalone program that comes with Vision, but runs independently. Launching 3DVR will not terminate Vision. See ***Three Dimensional Volume Rendering (3DVR)*** for more information.

Chapter 11 Calibration

The Panel, Collimators, and Geometry Calibrations can be conducted by the Owner / Operator of the device. It is recommended that the Panel Calibration be performed once a week.

Panel Calibration

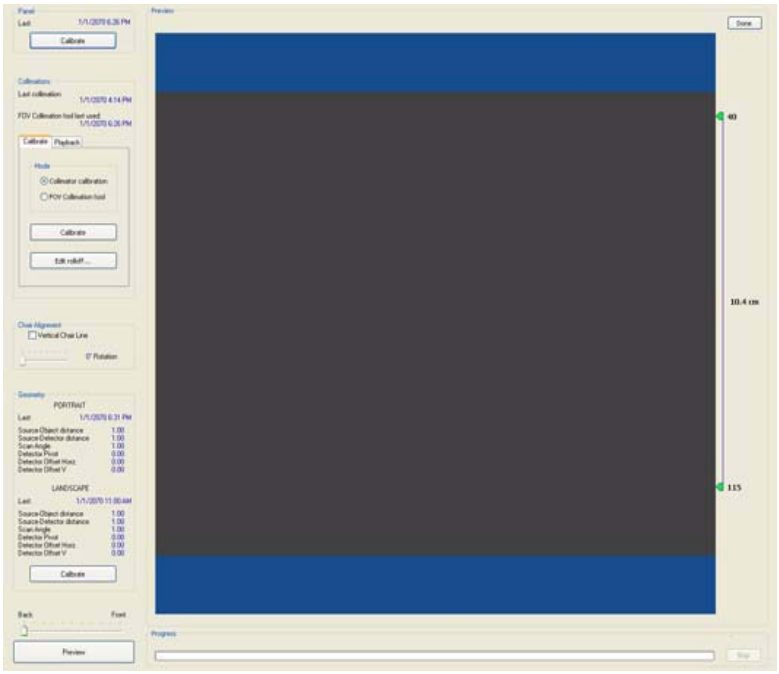
The Panel Calibration is performed for both Portrait and Landscape positions. The entire calibration takes approximately 8 to 10 minutes to complete. The process performs a five mode calibration as listed below:

- Mode 0 (4 x 4) Landscape
- Mode 1 (2 x 2) Landscape
- Mode 2 (2 x 2) PAN (Landscape)
- Mode 3 (4 x 4) Portrait
- Mode 4 (2 x 2) Portrait
- Mode 5 (1 x 1) PAN (Landscape, not supported)

To run the Panel Calibration:

1. Ensure room temperature is in the range of 50 to 95^{o}F (10 to 35^{o}C).
2. From the desktop, double click the **Calibration** icon.

The Calibration screen is displayed.



3. Click the **Calibrate** button (top) in the *Panel* field.

WARNING

The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

A window is displayed *"Remove all objects from the field of view and click OK to start X-ray exposure."*

4. Click **OK**.
5. When prompted, press the **Scan** button on the Control Box. An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.
6. The progress of the scan is displayed on the *Progress* bar at the bottom of the Acquire window. You will be prompted to press the **Scan** button several times as the calibration progresses.

   "Panel Calibration Complete" is displayed when the process is finished. Click **OK**.

Collimators Calibration

It is recommended to perform the Collimators Calibration once a week to ensure optimal image quality. This calibration is also necessary if a mechanical adjustment is made to the Beam Limiter or if image quality has degraded. The Collimator Calibration runs in both Portrait and Landscape positions and takes less than 3 minutes to complete.

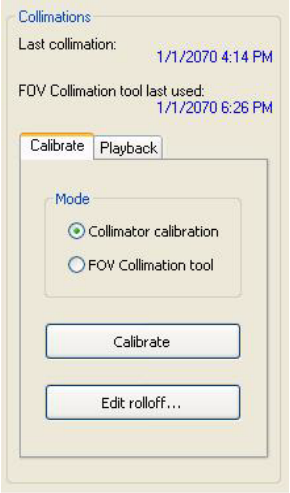
CAUTION

The FOV Collimation tool is for German regulatory compliance only. Do NOT use this tool unless you are qualified to do so.

NOTE: A Panel calibration must be performed prior to a Collimators calibration.

7. In the Collimations field, ensure **Collimator calibration** is selected on the Calibrate tab.
8. Click the **Calibrate** button in the *Collimations* field.

   A window is displayed: *"Starting Collimator Calibration Remove all objects from the field of view and click OK to start X-ray exposure."*

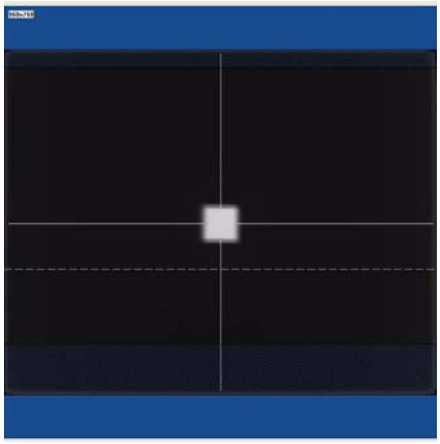


WARNING

The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

9. Click **OK** to start the X-ray exposure.

10. On the Control Box, press **Scan** when prompted. An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.



11. The scan starts in the Landscape and continues into the Portrait mode, displaying three screen shots in both modes.
12. Click **OK** when calibration completes (less than 3 minutes)

Geometry Calibration

It is recommended to perform the Geometry Calibration once a year to ensure optimal image quality or if the image quality is degraded. The Panel Calibration must be performed prior to this. The Geometry Calibration runs in both Portrait and Landscape positions and takes about 12 to 15 minutes to complete.

Perform Geometry Calibration:

13. Mount the Phantom Platform and center the BB Phantom on the platform using the alignment holes on the bottom of phantom. (shown below).

14. Ensure that the BB Phantom is level. Use shims or pieces of paper under the phantom to level it if necessary.

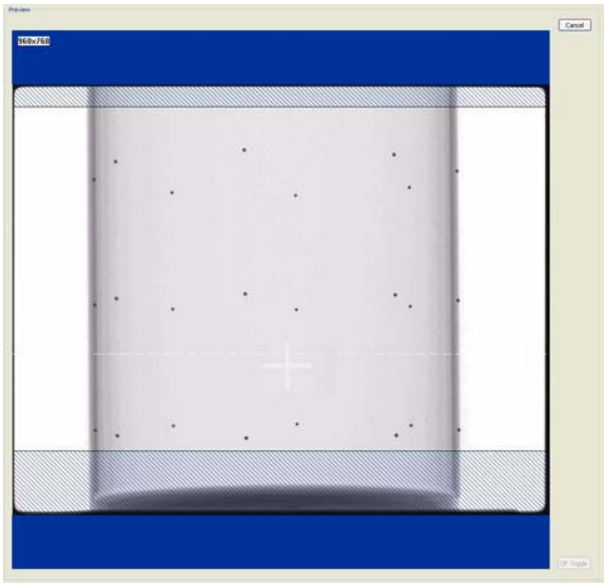
15. Align the BB Phantom crosshair slits with the laser cross beams. For an accurate alignment, the laser beams should penetrate though the phantom crosshair slits and appear on the receptor panel.
16. Click the **Preview** button which is located at the bottom of the Calibration screen.

WARNING

The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

17. The ready window is displayed, click **OK**.
18. On the Control Box, press **Scan** when prompted. An audible alarm is sounded and the X-ray light illuminates during radiation exposure.
19. The BB Phantom image is displayed (shown below).

Back (Volume Center)

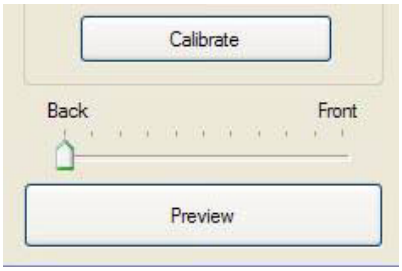


Front (Volume Center)

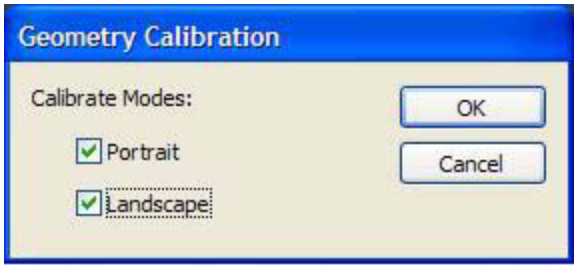
20. Ensure that the phantom is centered, level, and **all** BBs (dots) appear in the Field of View. If required, make adjustments and click **Preview** again. Repeat as required.

    Height adjustments are made by raising or lowering the phantom platform. BBs should not touch the top or bottom lines.

To reposition the phantom right or left on the Preview screen, use the **Back / Front** feature.



21. When the BB Phantom is centered and level, click the **Calibrate** button on the Geometry panel (bottom).
22. Select both the Landscape and Portrait calibration modes.



WARNING

The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

23. Click **OK** to start the X-ray exposure.
24. On the Control Box, press **Scan** when prompted. An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.

25. The calibration starts with the Landscape Scan.

NOTE: Ensure that the metal platform support is below the Field of View (as shown above.)

26. At the start of the scan, red circles are displayed around each BB. At this point, check data (above green progress bar), to ensure the following is displayed:

    Beads detected = 24, Beads valid = 24

27. At the prompt, press **Scan** on the Control Box, to start the Portrait Scan.

28. During the Portrait Scan, ensure the following is displayed:

    Beads detected = 20, Beads valid = 20

NOTE: Check to ensure that all beads are intact on the BB Phantom, if the calibration did not detect a bead at a certain location.

29. Click **OK** when the completion window is displayed and restart Vision software.

Failure to restart Vision software at this point may result in a system failure.

Chapter 12 Quality Assurance

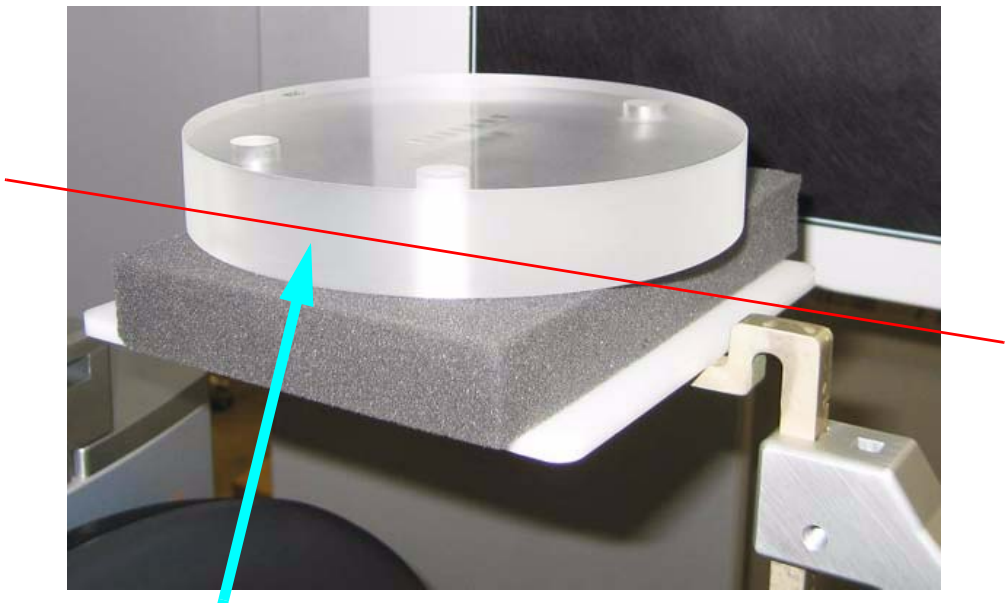
QA Phantom Test

The following Quality Assurance Tests can be conducted by the Owner / Operator of the device. It is recommended that the System Quality Assurance be performed annually or if image quality becomes degraded. For this purpose, the following procedures are provided with a QA Phantom Test and QA Water Test.

This procedure is performed to check the High Contrast Spatial Resolution.

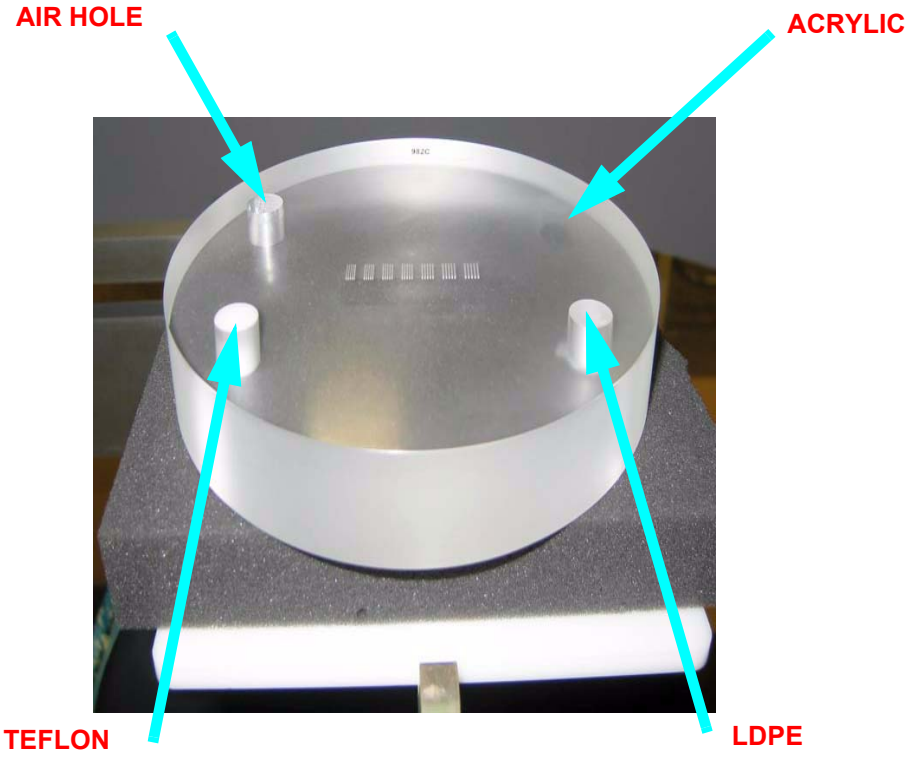
1. Remove Chin Cup and insert Phantom Platform.
2. Place QA Phantom on Platform. Use a piece of foam beneath the phantom to elevate it.
3. Use the alignment lasers to adjust the Phantom Platform height.

   Adjust the height so that the Horizontal Laser is positioned at the center of the QA Phantom.



Horizontal Laser Line through Center of Phantom

4. Center the QA Phantom on the platform with the Air Hole positioned at the left rear of the Gantry (shown below).



NOTE: If the Tru-Pan feature is enabled on your system, you may want to change the default panoramic method to **Manual Arch Settings** or **None** before beginning acquisition of phantom images. The Tru-Pan feature is not designed to be used with phantom images. See ***Changing the Panoramic Method***.

5. Start the test by selecting **File > New Patient** from the Main menu.
6. From the Select Patient screen, click **Add**.

   In Patient Name field, enter **QA Test** in the *First* field and **Line Pair** in the *Patient ID* field. Click **OK**.
7. On the Select Patient screen, click **OK**. The Acquisition window is displayed.
8. From the **Volume** tab in the Acquisition window, select the following:

   Size of Reconstruction Volume: **Diameter 16cm - Height 6cm maxilla**
   Resolution: **.2 voxel, 26.9 Seconds**
   Quantum IQ: **NOT selected**

9. Click **Preview** to check the phantom position.

WARNING

The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

10. Click **OK** and press the **Scan** button on the Control Box when prompted. An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.
11. The Phantom Platform must appear below the Field of View and the Phantom must be centered. Adjust the Phantom Platform to achieve the proper height.
12. To move the phantom to the right or left, use the **Back / Front** feature.

If required, make adjustments and click **Preview** again. Repeat as required.

WARNING

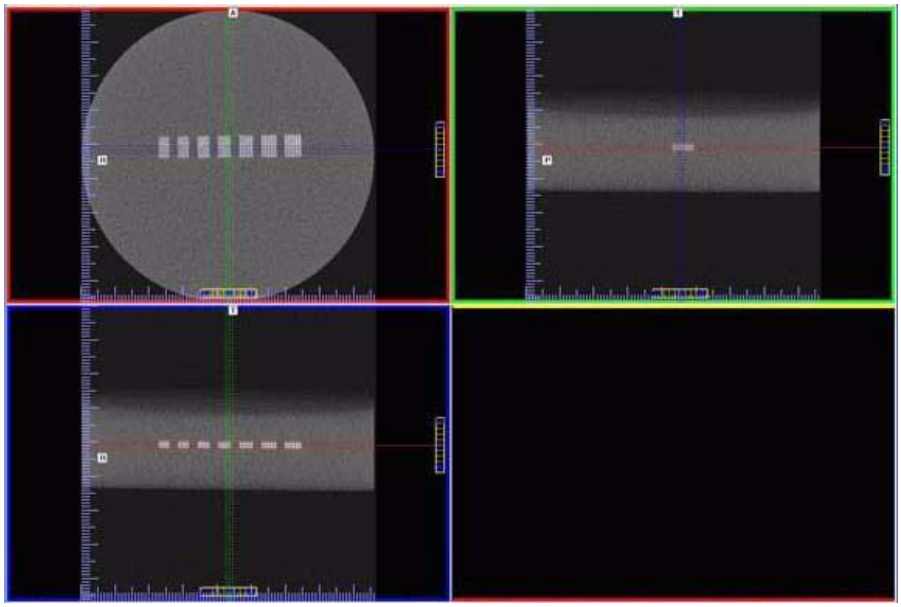
The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

13. Click **Capture** to start the scan process.
14. Click **OK** and press the **Scan** button on the Control Box when prompted. An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.
15. When the scan is completed, the image will load in the Panoramic View.
16. If displayed, select **Cancel** at the *Contourline Setup* prompt.

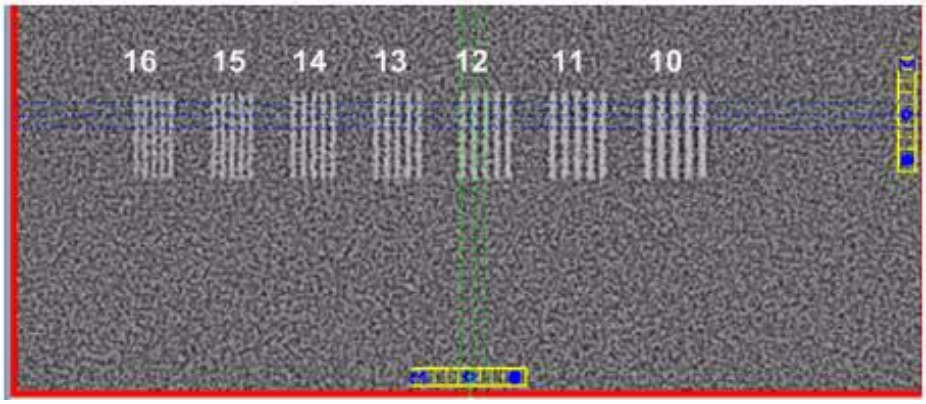
17. The following preview screen is displayed.

Line Pair Evaluation

18. Access the QA Test images for evaluation by double clicking **Coronal View** (bottom image, 2nd from the right).
19. The image below is displayed. In the upper right corner view, slide the Vertical and Horizontal lines to the Line Pairs centers as shown below.



20. Zoom Line Pair image (upper left). To zoom, start at the upper right corner of image and hold down left mouse button and drag cursor across the image.



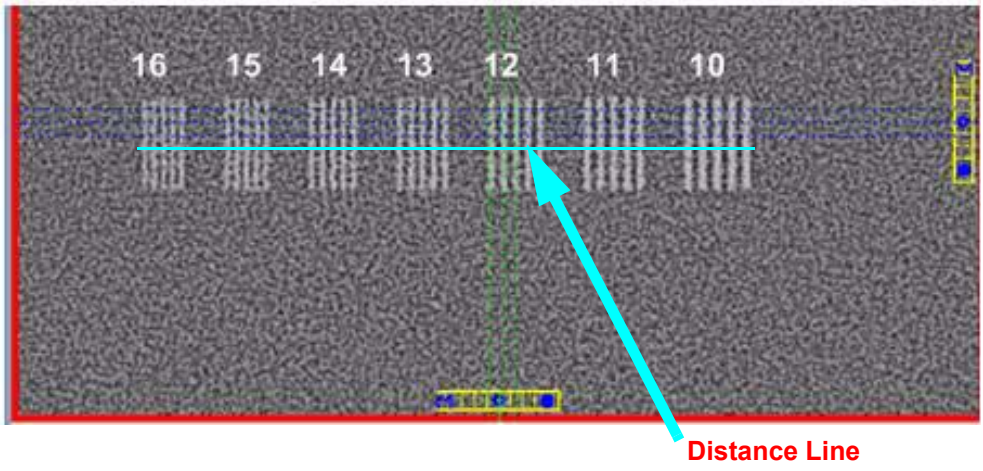
21. Right click the image and select **Set Filter > Hard**.
22. Adjust Brightness and Contrast level for the best image quality. Evaluate the image.

    Line Pair - Line Pairs consists of a resolution of 10 lines per cm (5 dark with 5 light). Line Pairs 10 through 16 are displayed in the image (shown above).

    The picture depicts expected appearance of the **Line Pairs per cm** present within the QA Phantom.
23. Verify that definition is present within line pairs 10, 11, and 12. Compare image quality to the image shown above.

Distance Measurement Test

To ensure measurement accuracy, this procedure checks Distance measurements.



24. Right click view and select **Distance**.
25. Drag the Distance cursor to draw a line from the outside line of set 16 to the outside line of set 10, as shown above.
26. The measurement (displayed in upper corner of image) should be between 41 and 42 mm.
27. Call Technical Support, if the measured value is not within this range.

Hounsfield Unit (HU) Measurements

This procedure checks consistency in various measurements. The positioning and dimension of each Region of Interest (ROI) is very important. Be consistent between each assessment to achieve the minimum deviation.

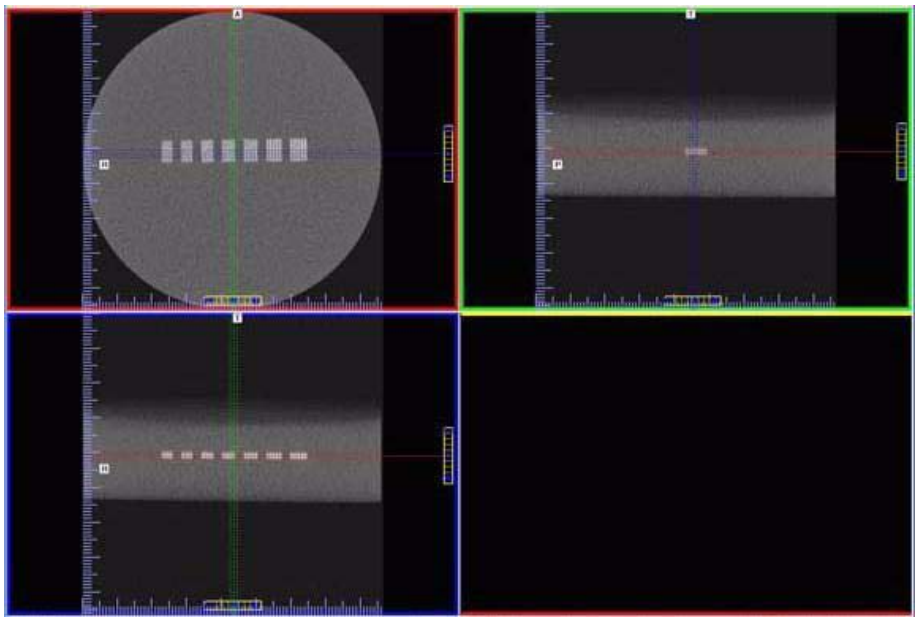
28. Perform a second scan (described in steps 5 - 16) using the following settings:

    On Patient Information panel:
    Enter **QA Test** in the *First Name* field and **Hounsfield** in the *Patient ID* field.

    On the **Volume** tab:
    Size of Reconstruction Volume: **Diameter 16cm - Height 13cm**
    Resolution: **.4 voxel, 8.9 Seconds**
    Quantum IQ: **NOT selected**

29. From the preview scan, access the QA Test images for evaluation by double clicking **Coronal View**. (bottom image, 2nd from the right).

30. In the upper right corner view of the Coronal View, slide the Vertical and Horizontal lines to the centers as shown below.



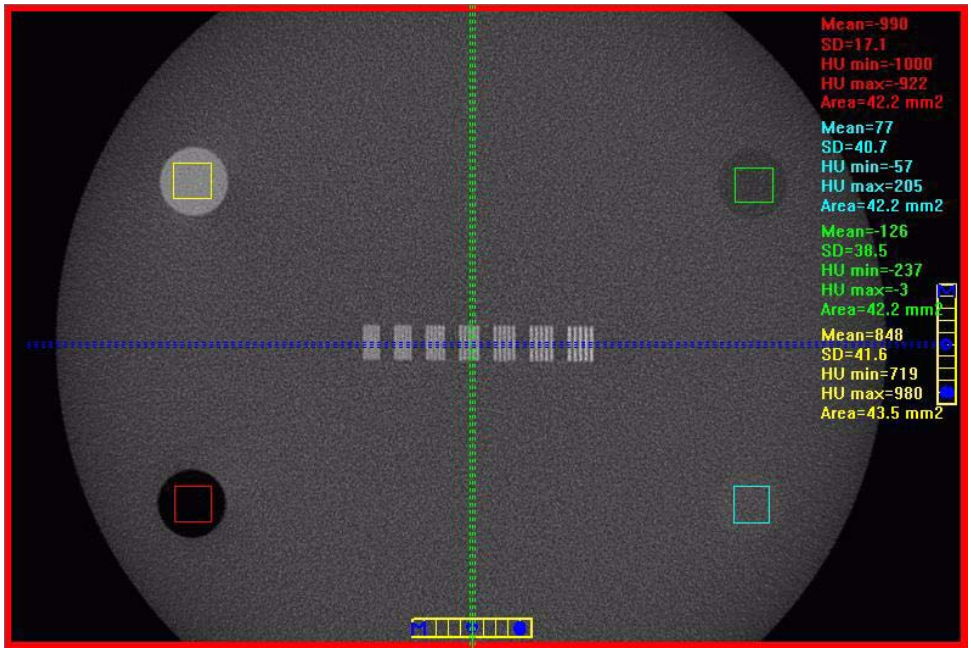
31. Zoom the Axial image (upper left). To zoom, start at the lower right corner of the image and hold down left mouse button and drag cursor across the image.

    For consistency, ensure that the slice selection to be measured is setup as follows.

    a. Right click top-left image and select **Set Filter > Normal**

    b. At the bottom of the scale, click and hold the cursor on the ● symbol. The slice thickness is displayed. Slide the cursor up to change the value to 0.4mm.

c. Move the position of the slice to the middle of the phantom as shown in the figure.



32. Right click the image and select **HU Statistics** from the menu (also, right click to turn off HU Statistics).
33. Area of ROIs should be at least 40mm^2 but less than 46mm^2.

    Use the Region Tool to define a ROI in the center of each circle of material implanted within the QA phantom.
34. Record the Hounsfield value of each material. See table below.

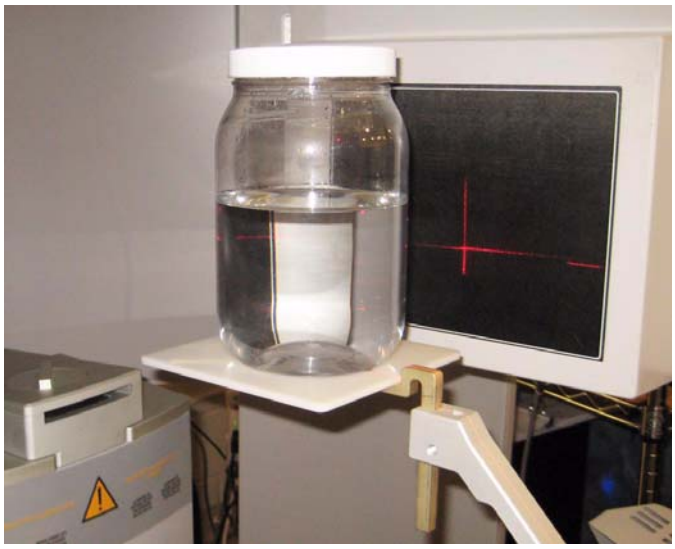
Material	Mean Scan Value (Hounsfield Units)	Lower Limit	Upper Limit	Mean
Air (Black) (lower left)		-1000	-980	-990
Acrylic (Light Gray) (lower right)		-50	200	75
LDPE (Dark Gray) (upper right)		-250	-50	-150
Teflon (White) (upper left)		580	1160	870

35. Call Service, if any of the four measured values exceed the Lower or Higher limit.

QA Water Phantom Test

The Water Phantom Test is a noise level and uniformity test. The HU measurements are taken at five different regions within the Water volume. It is important that the Water Phantom provided is used for these tests.

1. Remove Chin Cup and insert Phantom Platform.
2. Half-fill Phantom with distilled water and carefully place on platform.



3. Using the Alignment Lasers, center the water bath with the horizontal laser across the center of the water depth.

NOTE: If the Tru-Pan feature is enabled on your system, you may want to change the default panoramic method to **Manual Arch Settings** or **None** before beginning acquisition of phantom images. The Tru-Pan feature is not designed to be used with phantom images. See ***Changing the Panoramic Method***.

4. Start test by selecting **File > New Patient** from the Main menu.
5. From the Select Patient screen, click **Add**.

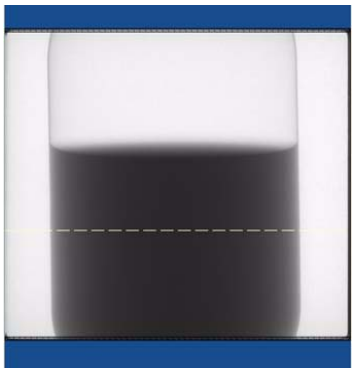
   In the Patient Name field, enter **Water Calibration** in the *First* field and **Noise Test** in the *Patient ID* field. Click **OK**.
6. On the Select Patient screen, click **OK**. The Acquisition window is displayed.
7. From the **Volume** tab in the Acquisition window, select the following:

Size of Reconstruction Volume: **Diameter 16cm - Height 13cm**
Resolution: **.4 voxel, 8.9 Seconds**
Quantum IQ: **NOT selected**

WARNING

The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

8. Click **Preview** to check the phantom position.
9. Click **OK** and press the **Scan** button on the Control Box when prompted. An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.



10. The white dotted line in the preview screen is used to align water height. The line should appear near the middle of the water height.

    Adjust the Phantom Platform to achieve the proper height. Use the menu **Back/Front** arrow-slide to adjust the phantom side-to-side position.

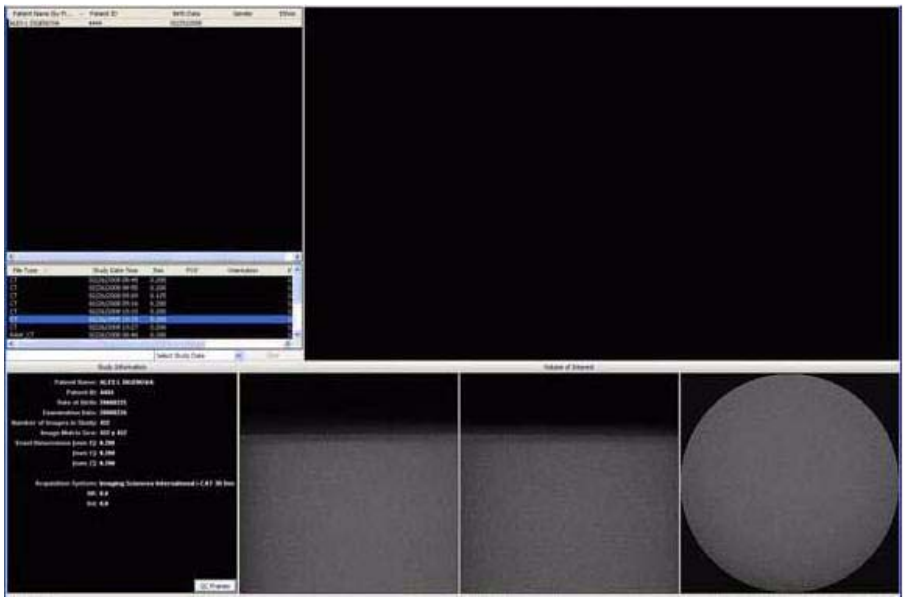
    If required, make adjustments and click **Preview** again. Repeat as required.

WARNING

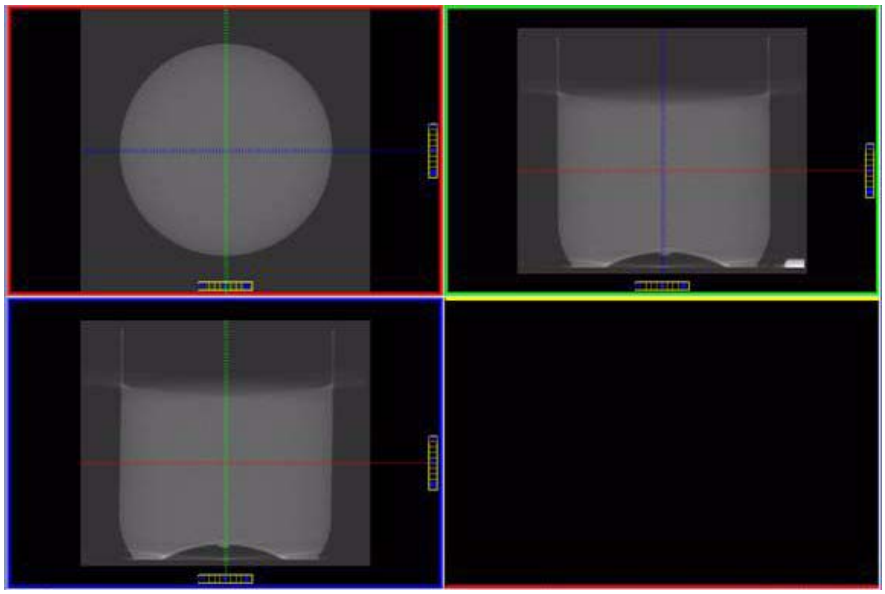
The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.

11. Click **Capture** to start the scan process.
12. Click **OK** to start the scan process.

13. Press the **Scan** button on the Control Box when prompted. An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.



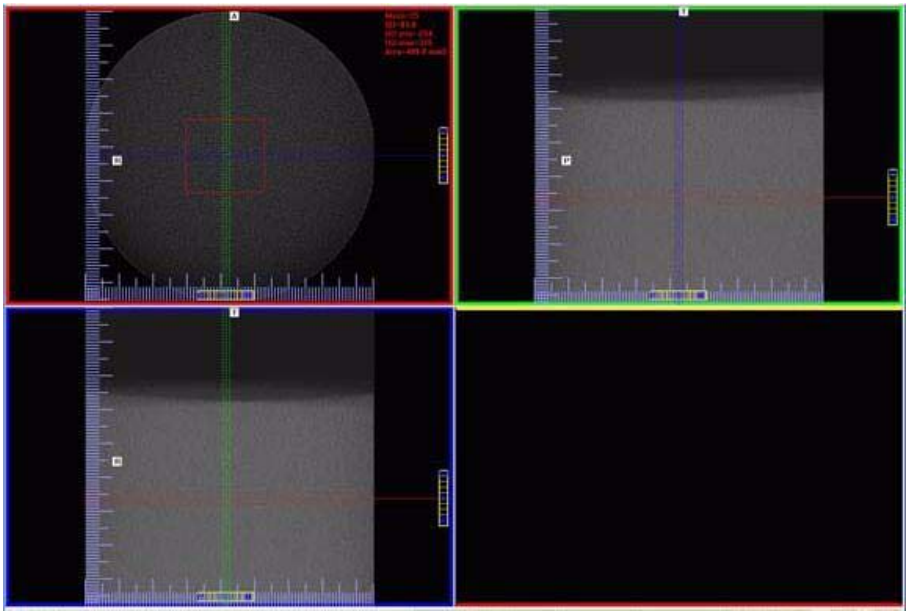
14. Select **Cancel** at the *Contourline Setup* prompt, if displayed.
15. Access the HU measurement image for evaluation by double clicking **Coronal View** (bottom image, 2nd from the right).



16. The red dotted line, in the upper right screen, should appear in the middle of the water height. Use the Center Line Positioning tool to make the height adjustment.

Noise Level Test

17. Zoom the Axial image (upper left). To zoom, start at the lower right corner of the image and drag the cursor across the image.
18. At the bottom of the top-right image scale, click and hold the cursor on the ● symbol. The slice thickness is displayed. Slide the cursor up to change the value to 0.4 mm



19. Right click the image and select **HU Statistics** from the menu (also, right click to turn off HU Statistics).

    Use the Region Tool to define a ROI (Region of Interest) in the center of Water, as shown above.

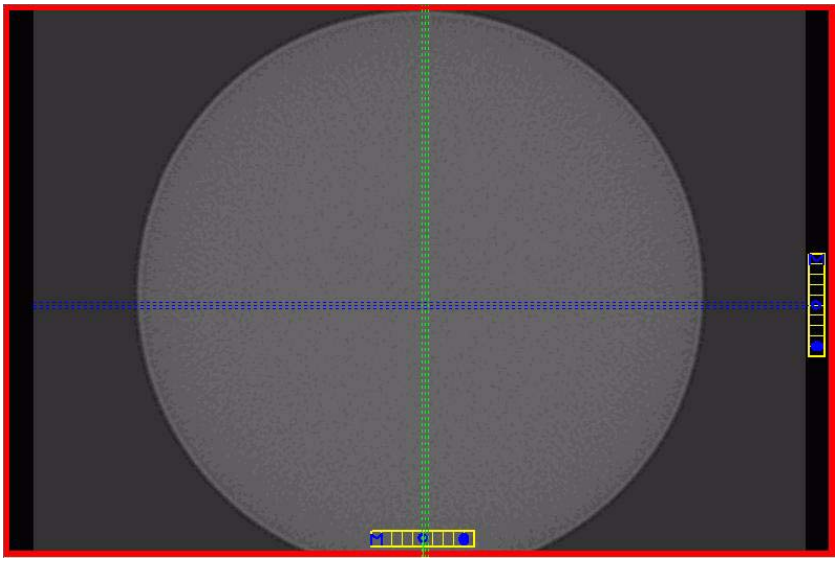
    HU Area (box size) should be approximately 400.0 mm^2
20. Note and record the Mean and Standard Deviation values of both the Water and Air areas. See chart below.

Measured Values	Water	Air
Mean		
Expected Values	0 (-70 to +70)	-1000 (-50 to +50)
SD		

NOTE: Do not close image. This image is also used for the Uniformity Test (next procedure).

Uniformity Test

21. Use the Noise Level Test dataset (previous procedure), if not available, perform steps 1 to 13.

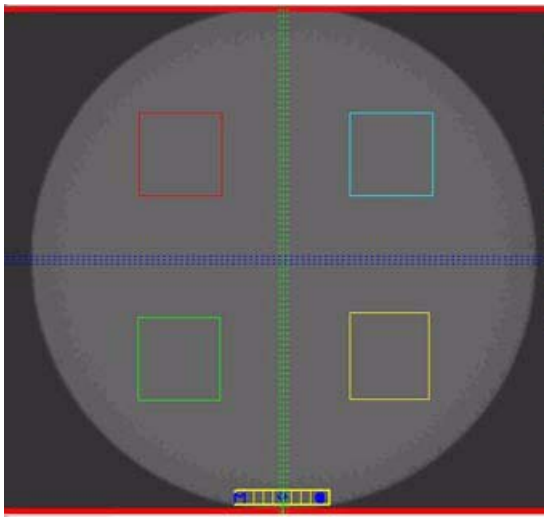


If using the Noise Level Test, right click the HU data (upper right corner of image) and select **Remove all measurements**.

22. Right click the image and select **HU Statistics** from the menu (also, right click to turn off HU Statistics).

NOTE: Four regions is the number of regions that can be displayed at one time. Creating another region (fifth) will overwrite the first.

The HU Area (box size) should be approximately 400.0 mm^2.



23. Note and record the Mean and SD values of the four regions. See chart below.
24. After recording values, **a fifth ROI is required from the center of the water area**. The fifth measurement replaces the first measurement, since four measurements are the limit.
25. Note and record the Mean and SD values of the center ROI.

Measured Values	Upper Left	Upper Right	Lower Left	Lower Right	Center
Mean					
SD					

26. Subtract each **Mean Value** from the **Mean Value** of the center ROI. If the difference is **greater than 90**, make sure phantom is correctly centered in FOV and re-measure. If the difference is still **greater than 90**, call ISI Technical Support.

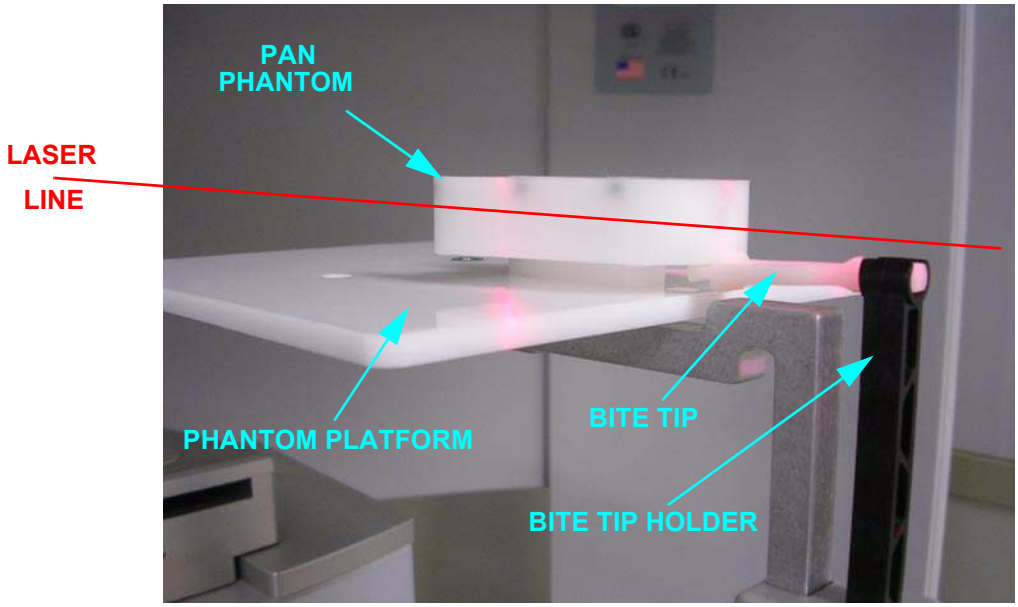
PAN Phantom Test

PAN Phantom Test is used to validate the PAN scan data capture.

To perform a PAN Phantom Test:

1. Prepare the Bite Tip by inserting the narrow edges of the Bite Tip down into the Bite Tip Holder uprights. Then turn the Bite Tip a 1/4 turn to lock into place.
2. Insert the Phantom Platform and Bite Tip Holder into the Positioning Block. The Bite Tip should rest on top of the platform.
3. Place PAN Phantom on platform with balls facing up and top of arch resting on Bite Tip.
4. Press the Alignment Light button on the Patient Alignment Panel to display lasers. Use the Horizontal Laser to adjust the height of the phantom as shown below. Use the Vertical Laser to center the phantom on the platform.

Lasers are available while the Volume tab is selected (not PAN).

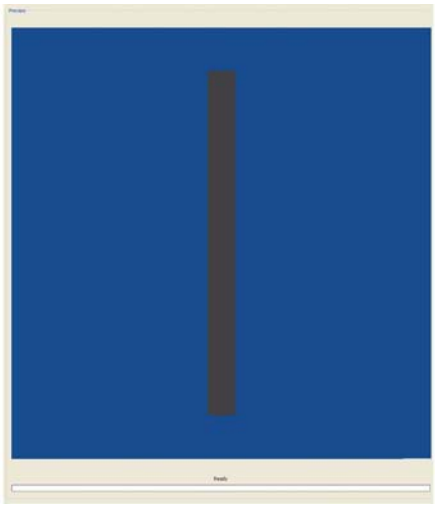


5. Start test by selecting **File > New Patient** from the Main menu or right click an existing image from database and select **Acquire New Scan**.
6. From the Select Patient window, click **Add**.

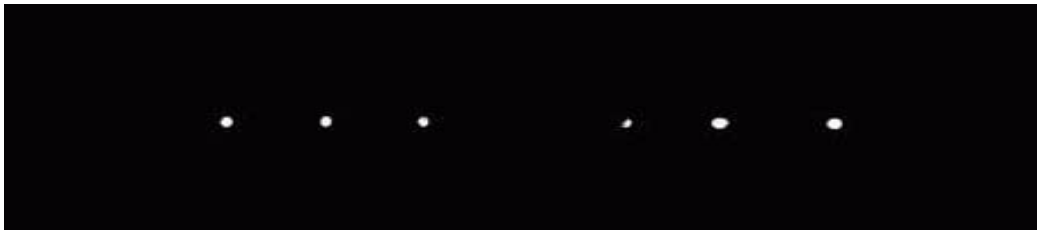
   In the Patient Name field, enter **PAN Test** in the *First* field and **QA** in the *Patient ID* field.
7. On the Select Patient window, click **OK**. The Acquisition window is displayed.
8. Click the **Pan** tab in the Acquisition window and select, *Exposure:* **Large**
9. Click the **Capture** button to start the test.

WARNING

The X-ray device may be dangerous to the Patient and operator if you do not observe and follow the operating instructions. Do not operate this system unless you have received training to perform a procedure.



10. The system moves approximately 1/4 rotation to the Home Position and then displays the scan parameters.
11. Click **OK** to start the scan process.
12. Press **Scan** button on Control Box. An audible alarm is sounded and the X-ray ON light is illuminated during radiation exposure.
13. The PAN scan runs a few minutes and then displays the reconstructed image.



14. Adjust the Brightness/Contrast by dragging the cursor across the image (vertical/horizontal). All seven metal balls should become visible as shown below.

Good Image Quality

15. The image above is an example of a system properly aligned for PAN scanning. All but two of the metal balls are circular in shape.

Poor Image Quality

16. The image above is an example of a system that is not properly aligned for PAN scanning. This is easily seen by the fact that only two metal balls are circular. Elongation of the Metal Balls indicate that the phantom is not in the middle of the focal trough due to poor chair alignment.
17. Check chair alignment if all seven balls do not appear circular.

Radiation Output Test

It is recommended that a check of the kVp(eff) and Radiation Output of the X-ray source be performed annually by a **qualified Physicist.**

The incident Absorbed Dose at the detector may be measured using a dosimeter. Tests are performed to assess output value and to check for tube output consistency and timer accuracy.

1. Attach a dosimeter to the detector such that the sensor is positioned where the vertical (coronal) and horizontal (axial) lasers intersect.
2. Perform a Diameter 16cm scan 8.9 second, Height 13 cm, 0.4 voxel and record time and dose from meter.

Measured Dose

The table below shows measurements performed on the detector for a landscape mode standard scan.

Tube Potential (kV)	**120**
Selected Scan Time (seconds)	**8.9**
Number of Frames	**309**
Approximate Exposure Time (seconds)	**3.7**
Displayed mAs	**18.54**
Measured Exposure at Detector (mR)	**188**
Measured Exposure at Detector / mAs (mR/mAs)	**10.14**
Measured Exposure at 1m (mR/mAs)	**4.69**
Measured Dose at 1m (μGy/mAs)	**41.07**
Dose at Detector per Frame (μGy/fr)	**5.33**
Tube Output (μGy/mAs @ 1m)	**41.07**
Distance Source to Detector (cm)	**68**
Frame Time (seconds)	**0.012**
Conversion Factor for Absorbed Dose (R to Gy)	**0.00876**

Interpretation

1. The dose per frame at the detector may be calculated by:

   Dose per frame at Detector = Dose at Detector / Number of Frames

   Where Number of Frames = 309 for 8.9 second scan

   = 619 for 26.9 second scan

2. The tube output per mAs may be normalized to 1m using the inverse square law for the purposes of assessing consistency of tube output:

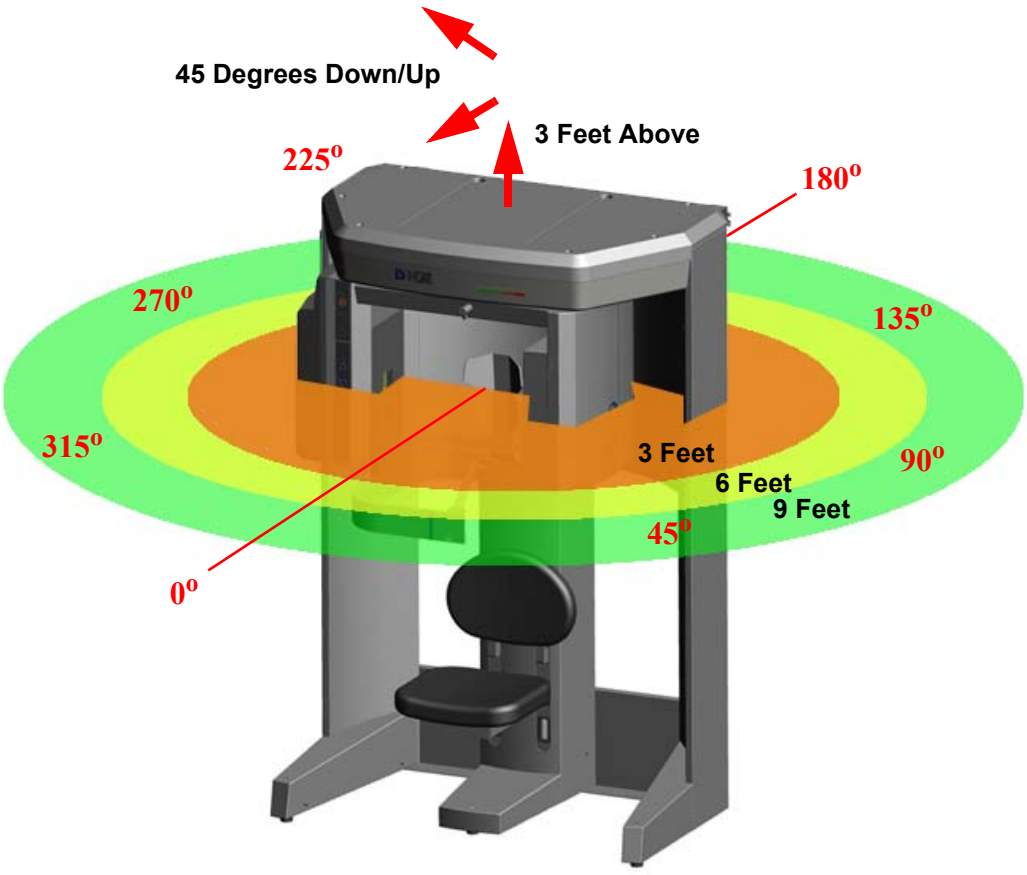
$$\text{Tube Output } (\mu\text{Gy/mAs}) = \frac{\text{Dose at Detector} \times (\text{Source to detector distance})^2}{\text{Displayed mAs}}$$

Where Source to detector distance = 0.68m for the system.

Chapter

13 Radiation Environment Survey

The direct and scattered beams can produce serious bodily injuries to Patients and persons in the surrounding area. Adequate precautions must always be taken to avoid or reduce exposure to the useful beam, as well as scattered radiation. Refer to the following figure and related table to determine scattered beam measurements.



Conditions of Operation – 8.9 and 26.9 Second Scans

All data was acquired using Radcal Model 9010 Radiation monitor, with 10X5-180 chamber. The data was acquired in concentric circles of radii listed in table below A Phantom Laboratories head phantom was placed within the beam to act as the scattering agent. Model SK150 has real bone as the structural component and proprietary Urethane filler that simulates the response of tissue. The Survey Meter was placed at a height of 112 cm [44 in] while the mid-point of the beam exit window was located 118 cm [46.5 in] above the floor.

Locations listed in the table are for 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°. Looking out from the system 0° was located directly in front.

This table consists of data gathered with the system operating at 120 kVp(eff), 5 mA with an assumed use and occupancy factor of 1.

Scatter Measurements for 8.9 Second Scans

8.9 second scan using pulsed X-ray: 309 frames, 12 ms pulse width at 5 mA taken in Diameter 16cm scanning mode. Based on this, the estimated workload is:

10 scans per week yielding a workload of 3.1 mA-min/week
25 scans per week yielding a workload of 7.8 mA-min/week
50 scans per week yielding a workload of 15.5 mA-min/week

Diameter 16cm 8.9 Second Scan

Location	Distance in Feet [meter]	Exposure (mR)	Exposure (μR)	Exposure mR/mAs	10 scans/wk mR/wk	25 scans/wk mR/wk	50 scans/wk mR/wk
0°	3 [0.91m]	0.33	332.1	0.018	3.3	8.3	16.6
	6 [1.82m]	0.09	86.7	0.005	0.9	2.2	4.3
	9 [2.74m]	0.04	40.4	0.002	0.4	1.0	2.0
45°	3 [0.91m]	0.35	347.7	0.019	3.5	8.7	17.4
	6 [1.82m]	0.09	91.5	0.005	0.9	2.3	4.6
	9 [2.74m]	0.04	42.5	0.002	0.4	1.1	2.1
90°	3 [0.91m]	0.36	359.1	0.019	3.6	9.0	18.0
	6 [1.82m]	0.09	86.2	0.005	0.9	2.2	4.3
	9 [2.74m]	0.04	36.3	0.002	0.4	0.9	1.8
135°	3 [0.91m]	0.08	81.4	0.004	0.8	2.0	4.1
	6 [1.82m]	0.02	21.6	0.002	0.2	0.5	1.1
	9 [2.74m]	0.01	10.8	0.001	0.1	0.3	0.5
180°	3 [0.91m]	0.09	88.8	0.005	0.9	2.2	4.4
	6 [1.82m]	0.02	24.6	0.001	0.2	0.6	1.2
	9 [2.74m]	0.01	10.9	0.001	0.1	0.3	0.5
225°	3 [0.91m]	0.08	84.0	0.005	0.8	2.1	4.2
	6 [1.82m]	0.02	23.2	0.001	0.2	0.6	1.2
	9 [2.74m]	0.01	9.8	0.001	0.1	0.2	0.5
270°	3 [0.91m]	0.31	306.6	0.017	3.1	7.7	15.3
	6 [1.82m]	0.08	79.2	0.004	0.8	2.0	4.0
	9 [2.74m]	0.03	34.8	0.002	0.3	0.9	1.7
315°	3 [0.91m]	0.36	362.5	0.020	3.6	9.1	18.1
	6 [1.82m]	0.10	95.6	0.005	1.0	2.4	4.8
	9 [2.74m]	0.04	42.4	0.002	0.4	1.1	2.1
3 Feet above		0.05	49.2	0.003	0.5	1.2	2.5
3 Feet above + 3 Outward		0.12	120.2	0.006	1.2	3.0	6.0

Scatter Measurements for 26.9 Second Scan

26.9 second scan using pulsed X-ray: 619 frames, 12 ms pulse width at 5 mA taken in Diameter16cm scanning mode. Based on this, the Estimated workload is:

10 scans per week yielding a workload of 6.2 mA-min/week
25 scans per week yielding a workload of 15.5 mA-min/week
50 scans per week yielding a workload of 61.0 mA-min/week

Diameter 16cm 26.9 Second Scan

Location	Distance in Feet [meter]	Exposure (mR)	Exposure (μR)	Exposure mR/mAs	10 scans/wk mR/wk	25 scans/wk mR/wk	50 scans/wk mR/wk
0°	3 [0.91m]	0.66	664.2	0.018	6.64	16.61	33.21
	6 [1.82m]	0.17	173.4	0.005	1.73	4.34	8.67
	9 [2.74m]	0.08	80.8	0.002	0.81	2.02	4.04
45°	3 [0.91m]	0.70	695.4	0.019	6.95	17.39	34.77
	6 [1.82m]	0.18	183.0	0.005	1.83	4.58	9.15
	9 [2.74m]	0.09	85.0	0.002	0.85	2.13	4.25
90°	3 [0.91m]	0.72	718.2	0.019	7.18	17.96	35.91
	6 [1.82m]	0.17	172.4	0.005	1.72	4.31	8.62
	9 [2.74m]	0.07	72.6	0.002	0.73	1.82	3.63
135°	3 [0.91m]	0.16	162.8	0.004	1.63	4.07	8.14
	6 [1.82m]	0.04	43.2	0.002	0.43	1.08	2.16
	9 [2.74m]	0.02	21.6	0.001	0.22	0.54	1.08
180°	3 [0.91m]	0.18	177.6	0.005	1.78	4.44	8.88
	6 [1.82m]	0.05	49.2	0.001	0.49	1.23	2.46
	9 [2.74m]	0.02	21.8	0.001	0.22	0.55	1.09
225°	3 [0.91m]	0.17	168.0	0.005	1.68	4.20	8.40
	6 [1.82m]	0.05	46.4	0.001	0.46	1.16	2.32
	9 [2.74m]	0.02	19.6	0.001	0.20	0.49	0.98
270°	3 [0.91m]	0.61	613.2	0.017	6.13	15.33	30.66
	6 [1.82m]	0.16	158.4	0.004	1.58	3.96	7.92
	9 [2.74m]	0.07	69.6	0.002	0.70	1.74	3.48
315°	3 [0.91m]	0.73	725.0	0.020	7.25	18.13	36.25
	6 [1.82m]	0.19	191.2	0.005	1.91	4.78	9.56
	9 [2.74m]	0.08	84.8	0.002	0.85	2.12	4.24
3 Feet above		0.10	98.4	0.003	0.98	2.46	4.92
3 Feet above + 3 Outward		0.24	240.4	0.006	2.40	6.01	12.02

Conditions of Operation – PAN Scans

All data were acquired using 2 Technical Associates Mark V integrating ion chamber meters. Measurements were made in concentric circles of radii listed in the tables below. An AAPM head phantom was placed in the beam to act as a scattering agent. The center of the ion chamber was placed at the same height as the center of the beam.

Locations listed in the table are for 0, 45, 90, 180, 225, 270 and 315 degrees. Looking out from the system, 0 degrees is directly in front. The two calibrated integrating ion chambers were used simultaneously to measure dose resulting from scatter at each location. The integration time for each mode was the entire scan time. The scatter phantom used was the AAPM head phantom used for measuring patient dose. In each case the highest of the two readings was used. In all cases, the readings were in good agreement with each other.

Scatter Measurements for 20 Second PAN Scan, Large 2x2

Location	Distance in Feet [meter]	Exposure (mR)	Exposure (μR)	Exposure mR/mAs	10 scans/wk mR/wk	25 scans/wk mR/wk	50 scans/wk mR/wk
0°	3 [0.91m]	0.115	115.0	1.15	1.15	2.88	5.75
	6 [1.82m]	0.033	33.0	0.33	0.33	0.83	1.65
	9 [2.74m]	0.013	13.0	0.13	0.13	0.33	0.65
315°	3 [0.91m]	0.120	120.0	1.20	1.20	3.00	6.00
	6 [1.82m]	0.028	28.0	0.28	0.28	0.70	1.40
	9 [2.74m]	0.012	12.0	0.12	0.12	0.30	0.60
270°	3 [0.91m]	0.099	99.0	0.99	0.99	2.48	4.95
	6 [1.82m]	0.021	21.0	0.21	0.21	0.53	1.05
	9 [2.74m]	0.008	8.0	0.08	0.08	0.20	0.40
225°	3 [0.91m]	0.025	25.0	0.25	0.25	0.63	1.25
	6 [1.82m]	0.004	4.0	0.04	0.04	0.10	0.20
	9 [2.74m]	ND	0.0	0.00	0.00	0.00	0.00
180°	3 [0.91m]	0.031	31.0	0.31	0.31	0.78	1.55
	6 [1.82m]	0.006	6.0	0.06	0.06	0.15	0.30
	9 [2.74m]	0.002	2.0	0.02	0.02	0.05	0.10
135°	3 [0.91m]	0.029	29.0	0.29	0.29	0.73	1.45
	6 [1.82m]	0.005	5.0	0.05	0.05	0.13	0.25
	9 [2.74m]	0.001	1.0	0.01	0.01	0.03	0.05
90°	3 [0.91m]	0.095	95.0	0.95	0.95	2.38	4.75
	6 [1.82m]	0.021	21.0	0.21	0.21	0.53	1.05
	9 [2.74m]	0.008	8.0	0.08	0.08	0.20	0.40
45°	3 [0.91m]	0.128	128.0	1.28	1.28	3.20	6.40
	6 [1.82m]	0.032	32.0	0.32	0.32	0.80	1.60
	9 [2.74m]	0.012	12.0	0.12	0.12	0.30	0.60
3 Feet above		0.010	10.0	0.10	0.10	0.25	0.50
3' up/down and 3' out		0.244	244.0	2.44	2.44	6.10	12.20

NOTE: Measurements of **ND** denote "non-detectable", less than 0.001 mR.

Scan Times and Settings

	Voxel Size (mm)	kV	mA	# of Frames	mAs	Acquisition Times
360^{O} Scans	0.4 / 0.3	120	5	600	37.10	17.8
	0.4 / 0.3	120	5	300	18.54	8.9
	0.25 / 0.2 / 0.125	120	5	600	37.07	26.9
Half Scan	0.4 / 0.3	120	5	160	10.11	4.8
	0.25 / 0.2 / 0.125	120	5	320	20.27	14.7
PAN Large		94	5	1200	100.04	20
PAN Small		84	5	1100	91.7	18.3

NOTE: Scan times and settings are preselected and fixed. Scan Time has no affect on electrical power output.

Linearity of Radiation Output: <.025 COV

Dose and Imaging Performance Information

The Computer Tomography Dose Index (CTDI) was measured using a 10cm, 3cc, pencil ionization chamber from Radcal Corporation (10X9-3CT) in conjunction with a Radcal Corporation 16cm diameter cylindrical CT head phantom (20CT6). This phantom has one hole at the center and four more at 90° intervals, 1cm inside the outer circumference. The procedure used was as follows:

- The phantom was positioned with its axis perpendicular to the tomographic plane at the center of rotation, and its height adjusted such that its middle was at the same height as the horizontal laser line.
- The pencil ionization chamber was inserted into one of the holes and the other four were filled with acrylic rods.
- The phantom was scanned using one of the standard protocols and the exposure E recorded.
- The $CTDI_{100}$ at this location was calculated using the formula:

  $CTDI_{100} = E \,.f.\, L / T$

  Where:
  E is the exposure in mR
  f is the factor to convert Roentgens to absorbed dose (rad). A value of 0.87 for the conversion in air was used.

  L is the active length of the chamber, 10cm
  T is the vertical dimension of the beam.
- The derived quantity $CDTI_w$ (weighted) was calculated as follows:

  $CTDI_w = 1/3.CTDI_{center} + 2/3.mean(CTDI_{periphery})$
- The CTDI in free air was also measured, i.e. without the phantom in place, at the same location as the central hole occupied: i.e. the $CTDI_{Free\text{-}air}$

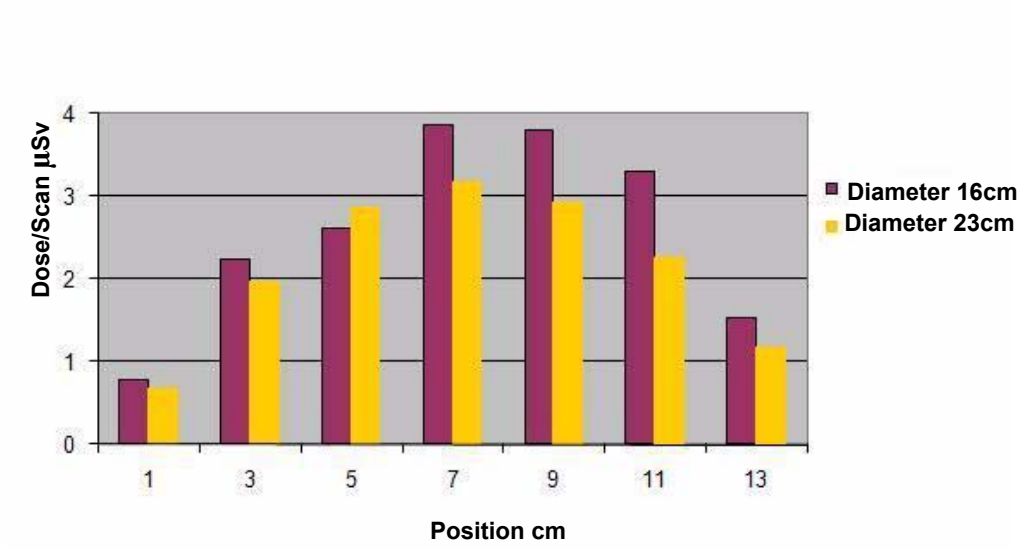
The $CTDI_w$ and the $CTDI_{Free\text{-}air}$ were measured for the CT scanning modes available and the results are in the table below.

Acq. Time (sec)	Diameter 16 cm														Diameter 23 cm	
	13 cm		11 cm		10 cm		8 cm		6 cm maxilla		6 cm mandible		4 cm		17 cm	
	CTDI w	CTDI Free air	CTDI w	CTDI Free air	CTDI w	CTDI Free air	CTDI w	CTDI Free air	CTDI w	CTDI Free air	CTDI w	CTDI Free air	CTDI w	CTDI Free air	CTDI w	CTDI Free air
8.9	2	2.5	2.5	3.15	2.5	3.15	2.5	3.15	3.15	4	2.5	2	3.15	4	1	1.25
26.9	4	5	5	6.3	5	6.3	5	6.3	6.3	8	5	4	6.3	8		
4.8	1.25	1.25	1.25	1.6	1.25	1.6	1.25	1.6	1.6	2	1.25	1	1.6	2		
14.7	2.5	2.5	2.5	3.15	2.5	3.15	2.5	3.15	3.15	4	2.5	2.5	3.15	4		

Dose Profile

The dose profile was measured using ThermoLuminescent Dosimeters (TLD) placed at 2cm intervals vertically in the central column of the acrylic head phantom used for CTDI measurements, starting at the bottom position. The TLD chips were 3mm x 3mm x 1mm thick in size and purchased from Global Dosimetry, Irvine, California. Two cm acrylic plugs were placed between the TLDs to space the TLDs and fill the space. The profile was measured for both Diameter 23cm and Diameter 16cm scans for standard scans of 8.9s. The TLDs were measured and the doses in mrem were converted to µSv. The results are presented in the figure and table below.

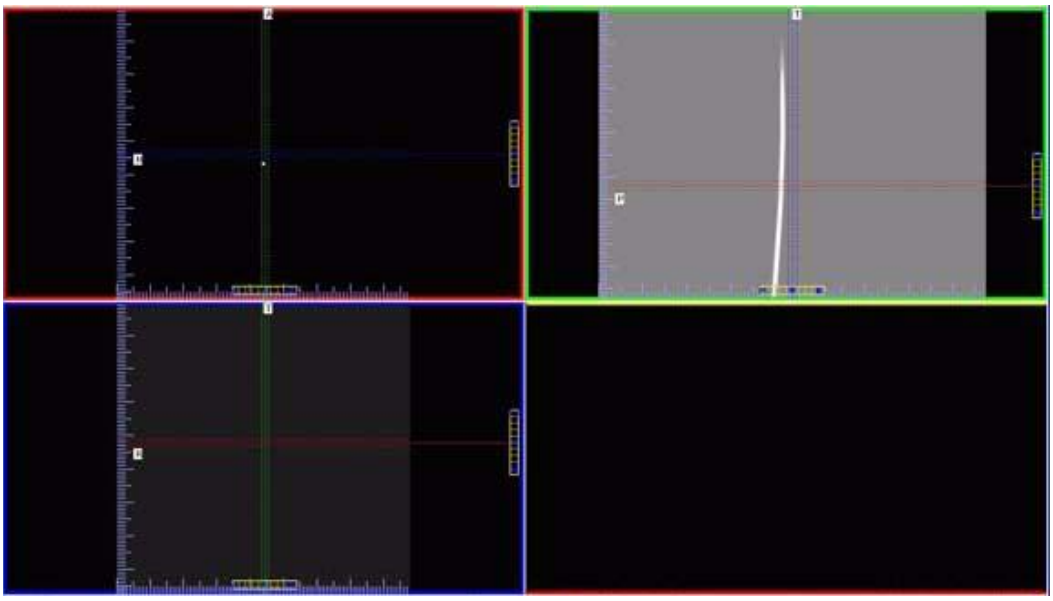
Vertical Dose Profile for Standard 8.9s Scans



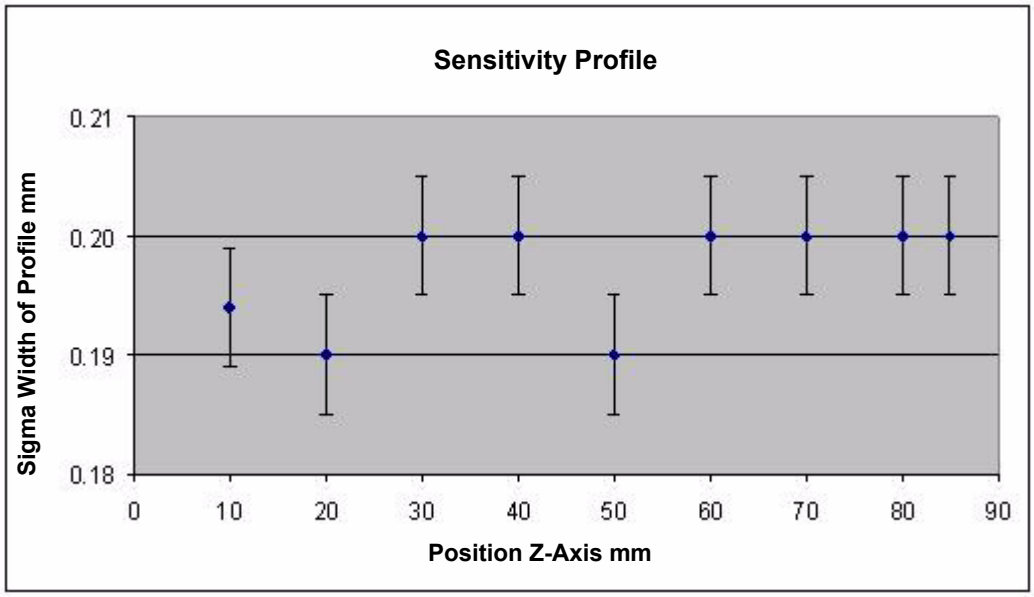
	Dose/Scan µSv	
Position cm	Diameter 16cm	Diameter 23cm
1	0.8	0.7
3	2.2	2.0
5	2.6	2.9
7	3.9	3.2
9	3.8	2.9
11	3.3	2.3
13	1.5	1.2

Sensitivity Profile

A 40 µm diameter Tungsten wire was scanned using the standard Diameter 16cm protocol with 0.2mm voxel resolution. The wire was held vertically at the system isocenter.



The Hounsfield units of the reconstructed image of the wire was measured at several slice positions with 0.2mm width and the resulting profile was compared against a Gaussian curve. For each location, the width of the wire as measured by the standard deviation of the Gaussian curve was converted to a Full-Width Half-Maximum (FWHM) value using the conversion factor of 2.3548 and was plotted and determined to be a measure of the sensitivity of the system.



Drywall Attenuation

The attenuation due to typical drywall found in offices was measured. A simulated wall was constructed from two sheets of 5/8-inch thick gypsum wallboard, spaced 4 inches apart, mounted on a wood frame. The wall was placed between a scatter source (a head phantom) and a Radcal Model 9010 Radiation monitor with 10X5 -180 dosimeter chamber. The system was operated in a regular scanning mode, and the radiation was measured with and without the drywall. The results are below:

	Measured Radiation mR		
Distance from Head	**3 ft (0.91m)**	**6 ft (1.82m)**	**9 ft (2.74m)**
No Drywall	344.0	82.5	38.2
With Drywall	204.5	49.8	23.2
Transmission	59%	60%	61%
Attenuation	41%	40%	39%

Therefore, the effect of a typical drywall or wallboard is to reduce the X-ray radiation by about 40%. Please note that there may be differences depending on the wall construction and composition, and that this is an approximate guide only.

Recommended Operating Requirements

Local agencies or government bodies or international standards may dictate requirements for installation of the system in order to protect personnel and the public from exposure from the radiological output of the device. Consult your local agencies, government bodies, or international standards for actual requirements which apply.

It is recommended that a **qualified Physicist or Radiologist** determine where appropriate, the applicable lead shielding to be installed in the area around the system equipment. Below are some other common requirements that may apply to your location:

- The Computer Workstation and X-ray Operator should be located behind a properly shielded permanent barrier. A viewing window (or alternative method such as a mounted mirror) should be present to enable the X-ray Operator to view the Patient and operate the computer while the exposure is present.
- Operators should consider the use of a lead apron to protect the anatomical areas of the medical personnel working in the areas exposed to radiation.
- The Operator Control Box and Acquisition Computer shall be located within 1 meter [3.28 ft] from a door. If not, an interlocked door may be required.
- A room door may be required.
- Radiation warning signs may be required next to the entrance to the room.
- A Warning light may be required by the entrance to the room.
- A shielding plan should be performed where the system is being installed. Some local agencies or government bodies require that a shielding plan be conducted by a **qualified Physicist or Radiologist** and a copy of the shielding plan be submitted and approved prior to installation of the system.
- An area radiation survey by a **qualified physicist or Radiologist** may then be required within 30 days of initial clinical use of the system. This survey may be required to be submitted to the local agency or government body.

- An annual radiation survey may be typically required. This survey is typically required to be submitted to the local agency or government body.
- A phantom or patients may be used for system training. Employees of the facility may not be used for this training.
- The system shall be registered with the local agency or government body.

X-ray Tube Assembly

Imaging Sciences International utilizes the SXR 130-15-0.5 X-ray Tube from Superior X-Ray Tube Company to manufacture the X-ray head assemblies.

Nominal X-Ray Tube Voltage	**120 kV**
Max. Tube Current	**7 mA**
X-Ray Tube Nominal Anode Input Power	**65 W**
X-Ray Tube Maximum Anode Heat Content (HU = Kvp x mA x Time in Seconds)	**30,000 HU**
X-Ray Tube Single Load Rating	**120kV, 5mA**
Max. X-Ray Tube Assembly Heat Content	**120K HU**
Max. Continuous Heat Dissipation of Tube Assy	**65W**
High Voltage Supply Requirements	**120 VAC at 10 amps**
Loading Factors Concerning Leakage Radiation: **CT Scan = 120kV 5mA 12 mS x 618 or 309** **PAN Scan = 94kV 5mA**	

Operator Data

Available focal spot size (mm):
0.5

Available target angle: **15°**

Anode construction:
Vacuum cast copper with tungsten target

Cathode construction:
Vacuum tube nickel with tungsten filament

Max. Tube operating voltage:
130 kVp Full wave rectified

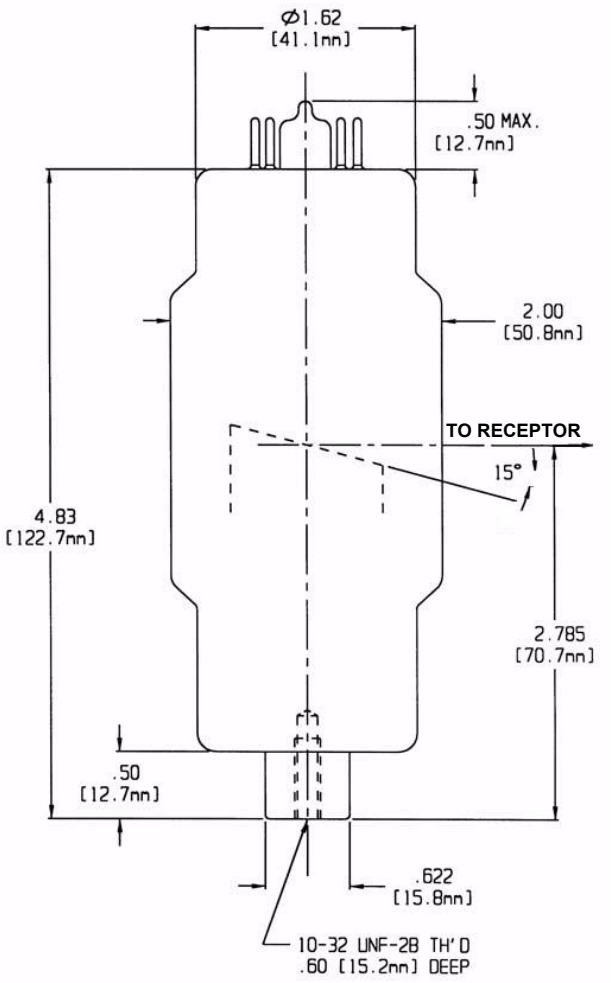
Inherent filtration/Window material:
2.0 mm/Glass

Cooling Method:
High dielectric transformer oil

Conditioning of Tube Head:

Must be at or above 22°C before first scan.

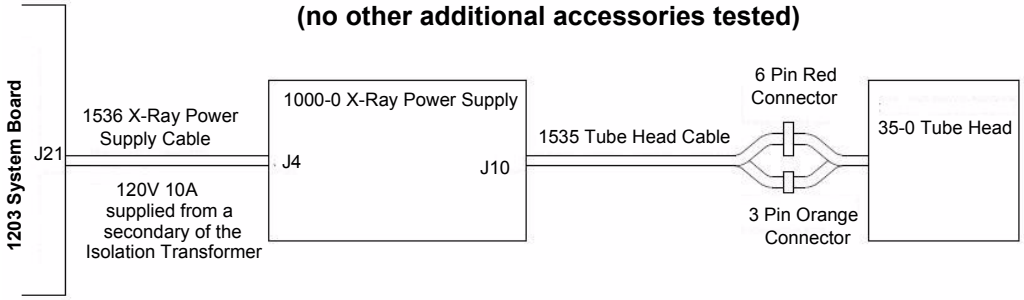
No system parts are connected to a Protected Earth Terminal.



SXR-130-15-0.5
FOCAL SPOT

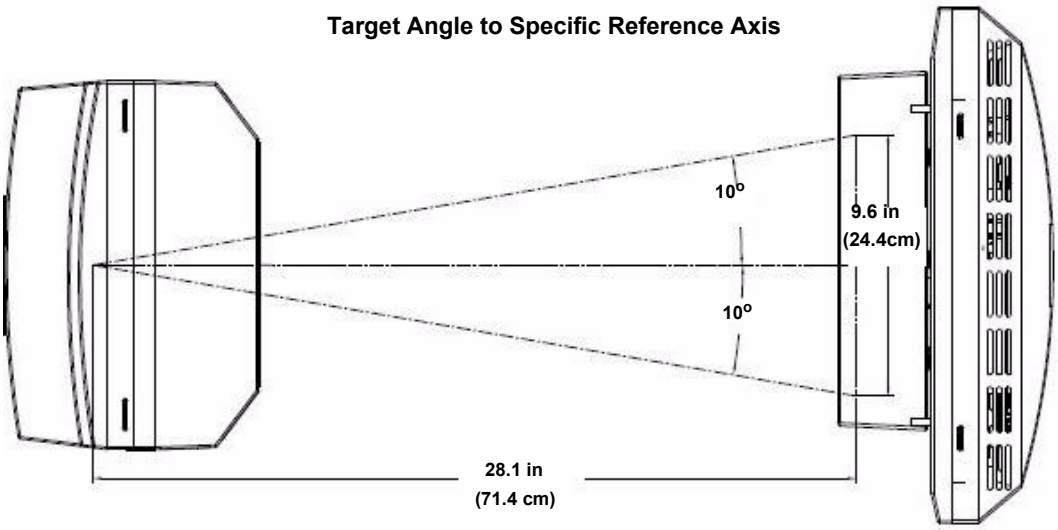
X-Ray Tube Voltage	X-Ray Tube Current	Normal Electrical Power
84 kV	5mA	420W
94 kV	5mA	470W
120 kV	5mA	600W

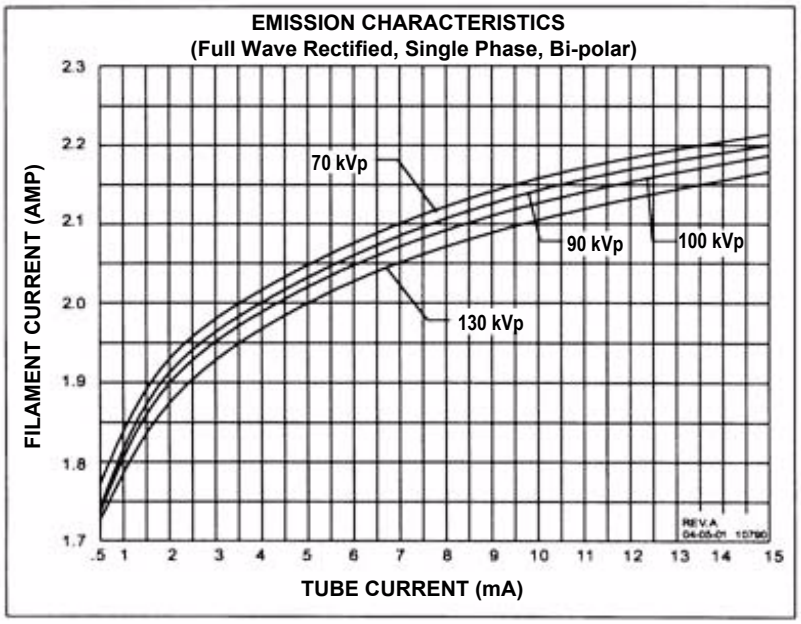
X-Ray Power Supply Tube Head Assembly Tested (no other additional accessories tested)



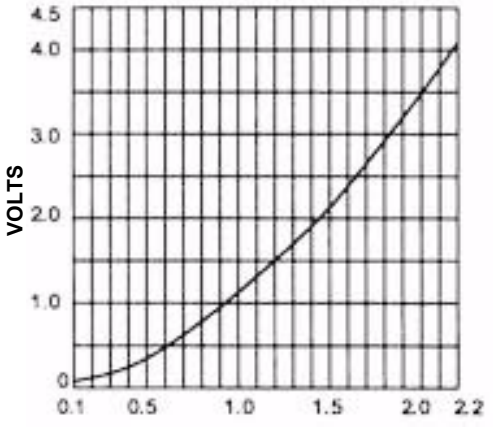
X-Ray Tube Head Markings

Target Angle to Specific Reference Axis



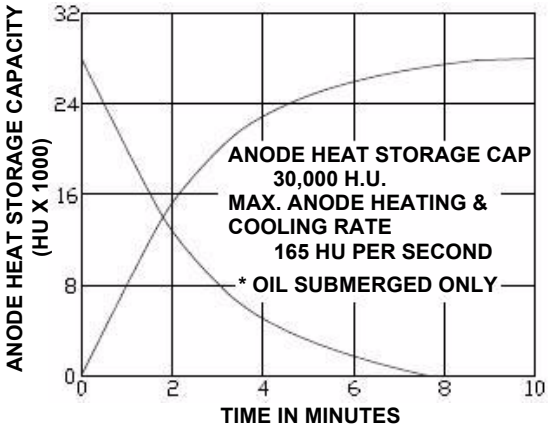


FILAMENT VOLT/AMPS CHARACTERISTICS:
60 Hz AC & DC



AMPS

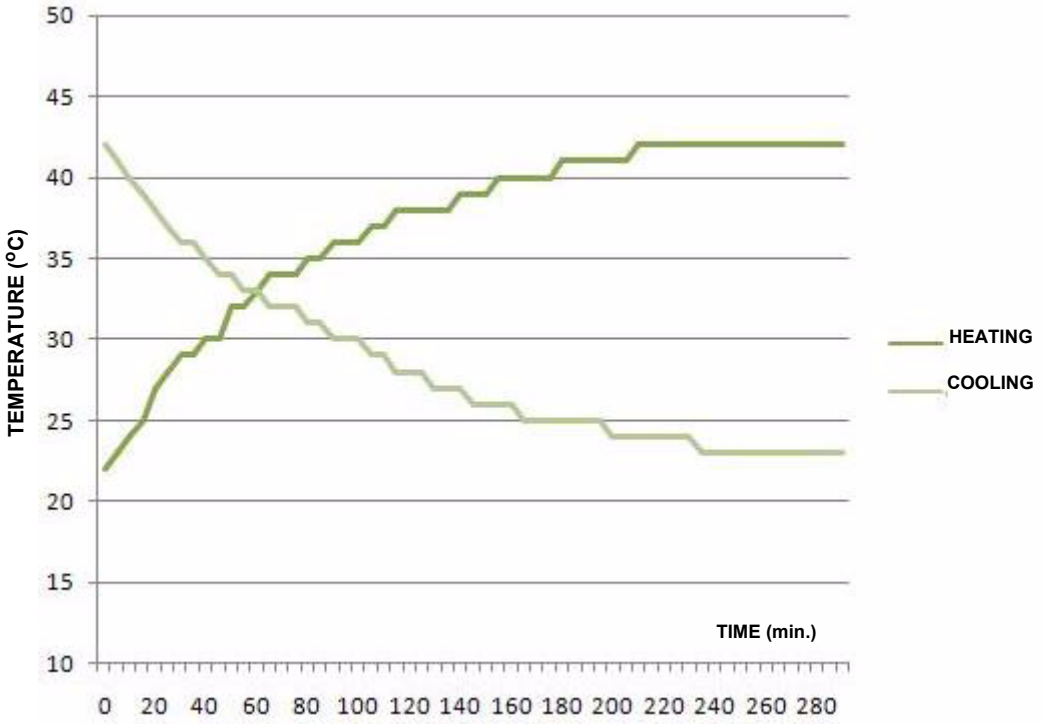
ANODE HEATING/COOLING CURVE



H.U. (Heat Units) = kVp (Kilovolts Peak) x mA (eff) x Time (sec.)
Joules = .707 x H.U.

SXR-130-15-0.5

X-Ray Tube Head Heating and Cooling Chart



CONDITIONS FOR X-RAY TUBE HEAD HEATING AND COOLING TEST
MACHINE CYCLED IN PAN MODE: 1 SCAN EVERY 5 MINUTES
PAN MODE SETTINGS: 94KV 5MA 20SEC SCAN
AMBIENT TEMPERATURE: 22°C

Chapter 14 Product Information

Technical Specifications

X-ray Source

Tube Voltage:	120 kVp(eff)
Tube Current:	3-7 mA
Voltage Wave Shape:	Constant Potential
Focal Spot:	0.0197 inches (0.5 mm)
Duty Cycle:	3%

Source to Sensor distance: 28.1 inches (71.4 cm)

Source to Patient distance*:19.5 inches (49.53 cm) (center of rotation)

* The patient must be properly positioned in the Head Support Positioner Mechanism for each patient for all applications in order to have the focal spot to skin distance as large as possible.

Minimum Filtration (at 120 kVp(eff)) (mm of aluminum equivalent): 10 mm or greater

Maximum Rated Continuous Tube Operation: 130 kVp @ 0.5 mA

Maximum Rated Pulsed Tube Operation: 130 kVp @ 1mA

NOTE: Leakage technique factors are measured at the maximum specified energy.

Maximum Deviation: kV: +/- 5 kV

mA: + 10%

Timer: ± .01 seconds or 5%, whichever is greater

Maximum Excursion: 15 kV at 120 kV

X-ray Beam Size: Rectangular cone 9.37” wide x 1.97” to 7.56” high
(23.8 cm width x 5 cm to 19.2 cm height)

PAN option: Rectangular cone 0.39” width x 6.30” height
(1cm width x 16 cm height)
(Automatically collimated not to exceed image detector readable area)

Image Detector: Amorphous Silicon Flat Panel (readable area), 9.37" width x 7.56" height (23.8 cm width x 19.2 cm height)

Sensor Front Panel Attenuation Value: Less than 1mm of aluminum equivalent (information for reference only)

Gray Scale: 14 bit

Voxel Size: 0.4/0.3/0.25/0.2 mm

Image Acquisition: Single 360 degree rotation (maximum)

Scan Time: 26.9/8.9 seconds

Field of View: (standard) 6.50 inches diameter x 5.33 inches height (maximum) (16.5 cm diameter x 13.5 cm height (maximum))

Extended Field of View: (optional) 9.15 inches diameter x 6.67 inches height (maximum) (23.2 cm diameter x 17 cm height (maximum))

Note: Maximum values can be collimated down.

Primary Reconstruction: Less than 2 minutes for 26.9 second scan @ 0.4 voxel

Secondary Reconstruction: Real Time

Stopping Distance and Angle: Hard stop is at -45^{o} and 470^{o} (reference is the gantry at the home position being 0^{o}). Platform travel is 69 mm.

Power Requirements

The Scanner requires a Dedicated Line. A Surge Protector is recommended. The Scanner is suitable for continuous connection to a power supply in stand-by mode.

Line Voltage: 100VAC, 115VAC, 200VAC or 230VAC (Factory Set)

Line Voltage Regulation requirement: + 10%

Line Current: 15 Amps (100V), 10 Amps (115V), 7.5 Amps (200V) or 5 Amps (230V)

Line Frequency: 50 Hz / 60 Hz

Phase: Single

Main Circuit Breaker: 15 Amps (100V), 10 Amps (115V), 7.5 Amps (200V), or 5 Amps (230V)

Nominal Electrical Input Power to Supply: Volume Scan = 300W (120kV, 5mA); PAN Scan (Large) = 625W (94kV, 5mA). Scan Time has no affect on electrical power output.

Nominal Maximum Electrical Input Power at 100 kV: 850W (100 kV, 7mA). Scan Time has no affect on electrical power output.

Apparent Resistance of Supply Mains

For the purpose of obtaining the apparent resistance of supply mains, resistance is determined according to the following formula:

$$R = \frac{U0 - U1}{I1}$$

Where:
U0 is the no-load Mains Voltage
U1 is the Mains Voltage under load.
I1 is the Mains Current under load.

Circuit Breaker Assembly	U0	U1	I1	Apparent Resistance
100VAC	100.3VAC	96.8VAC	5.22A	0.67ohms
115VAC	115.4VAC	113.0VAC	4.36A	0.55ohms
200VAC	200.4VAC	194.1VAC	2.62A	2.40ohms
230VAC	230.8VAC	223.0VAC	2.31A	3.37ohms

Weight

Total Weight: 510 lbs. (231.3 kg)

Tube Head Pod: 35.5 lbs. (16.1 kg)

Receptor Pod: 57 lbs. (25.9 kg)

X-Ray Power Supply: 9 lbs. (4.1 kg)

Environmental Specifications

Operating

50 to 95 degrees Fahrenheit

(10 to 35 degrees Celsius)

10% to 90% Relative Humidity, non-condensing

Transportation and Storage

-4 to 158 degrees Fahrenheit

(-20 to 70 degrees Celsius)

10% to 90% Relative Humidity, non-condensing

Acquisition Computer

Acquisition Computer requires a Dedicated Line and a Surge Protector is recommended.

Patient Support Chair

Overall dimensions:
28.5"d x 24"w x 43"h (72.4 cm x 61 cm x 109.2 cm)

Weight: 125 lbs (56.7 kg)

Seat height adjustment: 14" to 29" (35.65 cm to 73.7 cm)

Maximum patient weight: 400 lbs (181 kg)

Complies with IEC 60601-2-32:1994

Disposal

Follow local regulations on disposal of waste parts. The *X-ray source assembly, image sensor* and *all electronic circuits* should be regarded as non environmental friendly waste product**.** The system does not generate, or require the use of, any materials that require special disposal instructions as part of regular operation.

Extension Cords

Do not use any extension cords which are not provided with the system. Be aware that multiple portable socket outlets or extension cords are not to be connected to the system.

External Item

Do not connect any items or equipment to this system which are not part of the system.

Cleaning

Routinely clean and disinfect all items which come in contact with the patient. Use Opti-Cide$^{3®}$ Solution and/or Wipes from Biotrol International, or equivalent cleaner and disinfectant. Opti-Cide$^{3®}$ is a broad-spectrum disinfectant that is effective in three minutes. See Opti-Cide$^{3®}$ label for full instructions.

Electromagnetic or other Interference (Emissions and Immunity)

The system was tested and it was determined that a ferrite bead was necessary on the Ethernet cable in order to meet the class A (non-residential) limits. With the system configured with the ferrite bead, it complied with the criteria contained in IEC 60601-1-2 Edition 2.1 Issued 2004/11/01 and JIST0601-1-2 Issued 2002/07/025.

Test Name	Test Level/ Equipment Class	Results / Notes	Immunity Performance Criteria Met
Emissions Testing			
Radiated Emissions	Class A; Group 1	Compliant	-
Conducted Voltage Emissions	Class A; Group 1	Compliant	-
IEC61000-3-2 Harmonic Current Emissions	Class A	Compliant	-
IEC61000-3-3 Voltage Changes, Voltage Fluctuations and Flicker	Class A	Compliant	-
Immunity Testing			
61000-4-2 Electrostatic Discharge	± 6 kV Contact, ±8 kV Air	Compliant	A
61000-4-3 Radiated Immunity	80 MHz - 2.5 GHZ, 3 V/M, 80% AM with 1kHz	Compliant	A
61000-4-4 Electrical Fast Transients	±2 kV Power Supply Lines, ±1 kV Input/Output Lines	Compliant	A
61000-4-5 Surge Immunity	±1 kV Line to Line, ± 2kV Line to Earth	Compliant	A
61000-4-6 Conducted Immunity	150 kHz - 80 MHz, 3 Vrms	Compliant	A
61000-4-8 Power Frequency Magnetic Field	3 A/M	Compliant	A
61000-4-11 Voltage Dips and Short Interruptions	>95% dip for 0.5 periods	Compliant	A
	60% dip for 5 periods	Compliant	A
	30% dip for 25 periods	Compliant	A
	>95% dip for 5 seconds	Compliant	C[1]

[1] During the 5 second voltage dropout, the system powered down and then, through normal operation of the controls, was able to be restored to normal operation.

Equipment Standards

The System was tested and/or evaluated against and found compliant to the following standards/requirements:

UL 60601-1	IEC 60601-2-28
CSA C22.2 No. 601.1	EN 980
JIS Z4701	EN/ISO 13485
JIS Z4703	IEC/EN 60601-2-32
JIS T0601	IEC/EN 60825-1
IEC/EN 60601-1	CE-MDD 93/42/EEC
IEC/EN 60601-1-1	LVFS 2003:11 (Swedish regulation, transposing the MDD 93/42/EEC)
IEC/EN 60601-1-2	CMDCAS (Canadian Medical Device Regulation)
IEC/EN 60601-1-3	ISO 10993-1
IEC/EN 60601-1-4	ISO 14971
IEC 60601-2-7	

Equipment Class

Protection against electric shock: Class I

Applied part has degree of protection against electric shock: Class B

Class of equipment against ingress of liquids: Ordinary Equipment, IPX0

Radiated emissions: Class B

Preventive Maintenance Schedule - for Owner / User

Daily: Routine Dusting - all surfaces

Monthly: Clean all surfaces and check for failed/faulty indicator lights.

Yearly: Check for satisfactory image quality.

IT IS THE RESPONSIBILITY OF THE USER TO INSURE THAT THE EQUIPMENT IS MAINTAINED IN COMPLIANCE WITH THE MANUFACTURER'S RECOMMENDED MAINTENANCE SCHEDULE. THE MANUFACTURER AND THE ASSEMBLER / INSTALLER ARE RELIEVED FROM RESPONSIBILITY IN THOSE CASES WHERE NON-COMPLIANCE WITH THE STANDARD RESULTS FROM THE USER'S FAILURE TO HAVE THE MANUFACTURER'S RECOMMENDED MAINTENANCE PERFORMED.

The actual maintenance inspection and consequent service must be accomplished either by an authorized dealer or by a competent serviceman of the user's choice who has adequate training in those aspects of the Performance Standards of the Radiation Control for Health and Safety Act of 1968 that are applicable to this equipment.

Neither the inspection nor service is part of the equipment warranty. (To be arranged for by the Owner or User with the Dealer's Service Department).

Planned Maintenance - 12 Month Schedule

The Planned Maintenance philosophy for this system is based upon the assumption that a periodic inspection of the equipment, along with periodic cleaning and calibration, will maintain image quality.

The system requires normal periodic inspection and maintenance. Scheduled periodic inspections are necessary to detect problems which can result from excessive wear, loose items, chafing wires, and mis-adjusted parts from continual system use.

In addition to mechanical inspection and calibration, a series of image performance tests are to be conducted. These tests verify that the system meets or exceeds operational specifications and that it will provide continued excellent image quality.

Planned maintenance is to be performed annually by a factory trained Service Representative.

Cleaning

Cleaning the equipment frequently, especially if corroding chemicals are present is a function of the Operator. Unless otherwise instructed, use a cloth moistened with warm water and mild soap. Do not use strong cleaners and solvents as these may damage the finish.

Be careful when cleaning to avoid liquid leaking inside the Gantry.

WARNING

USE EXTREME CARE WHEN WORKING INSIDE THE SYSTEM. VOLTAGES ARE PRESENT WHEN THE SYSTEM COVERS ARE OFF. ACCIDENTAL CONTACT WITH THESE VOLTAGES MAY CAUSE SERIOUS INJURY OR DEATH.

Planned Maintenance Checklist

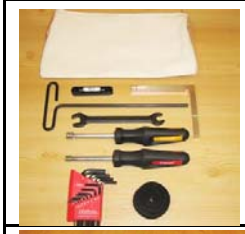
Perform Calibrations	
	Panel Calibration
	Collimator Calibration
	Geometry Calibration
Check Detector Pivot (displayed under Geometry, both Portrait and Landscape)	
	Ensure Detector Pivot is between **-0.05 & 0.05**. If measurements are not within tolerance, call Service to have Receptor Panel leveled.
Perform QA Water Phantom Tests	
	Noise Level Test (Landscape Mode)
	Uniformity Test (Landscape Mode)
	Noise Level Test (Portrait Mode)
	Uniformity Test (Portrait Mode)
	PAN Phantom Test
	Radiation Output Test (performed by qualified Personnel, per local requirements)
Check Chair Alignments	
	Check Chair Center Alignment (using Chair Center Locator)
	Check Chair Level (using Chair Center Locator)

Check Laser Alignments	
	Check Centerline Alignment (using Chair Center Locator)
	Check Crosshair Laser (align with notches on Receptor Panel Cover)
Inspect Tube Housing Components	
	Certification Label
	Warning and Indicators
	Oil Leaks
	Physical Damage
	Mounting System Stability
Inspect Beam Limiting Device	
	Physical Damage
	Certification Label
Check/Inspect X-Ray Controller	
	Visual Warning Indicator
	Audible Exposure Signal
	Certification Label

Replaceable Parts

There are no equipment parts designated as repairable in the field by the owner/user of the equipment. Contact Service if repairs are needed.

Supplemental Components

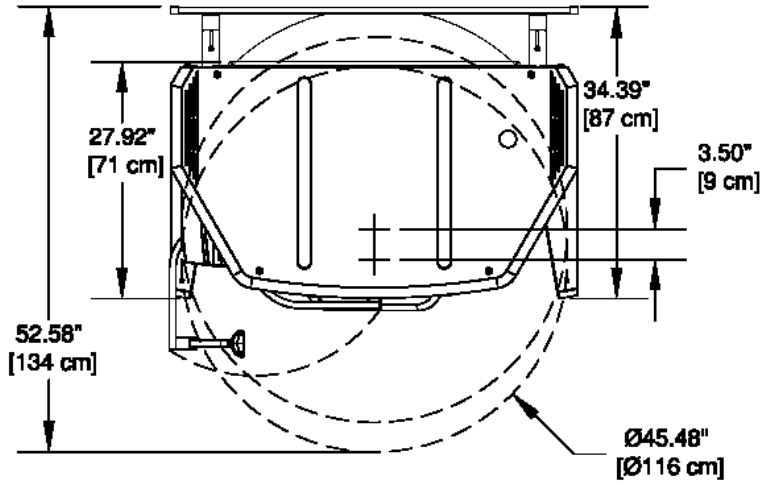
	**Patient E-stop** **Part #** 1304-0 **Quantity** 1		**Carbon Fiber Head Rest** **Part #** 27-0 **Quantity** 1
	**Glide** **Part #** 1000179 **Quantity** 4		**Head Restraint Band** **Part #** 27-1 **Quantity** 50
	**Tool Kit** **Part #** 5-0 **Quantity** 1		**Velcro Head Restraint Kit** **Part #** 903-0 **Quantity** 1
	**Booster Seat** **Part #** 1000196 **Quantity** 1 Available on request		**Phantom Assembly** **Part #** 14-1-0 **Quantity** 1
	**Foot Stool** **Part #** 1000197 **Quantity 1**		**Line Pair Phantom** **Part #** 13-00 **Quantity** 1
	**Chin Cup** **Part #** 9140-0026-0006 **Quantity** 1		**Water Phantom Jar** **Part #** 1000224 **Quantity** 1
	**Cable Clips** **Part #** 101-6 **Quantity** 6		**Foam Disk** **Part #** 1000323 **Quantity** 1

	**Chair Center Locator** **Part #** 26-16 **Quantity** 1		**Platform Assembly** **Part #** 14-4-0 **Quantity** 1
	**Operators' Manual** **Part #** 990400 **Quantity** 1		

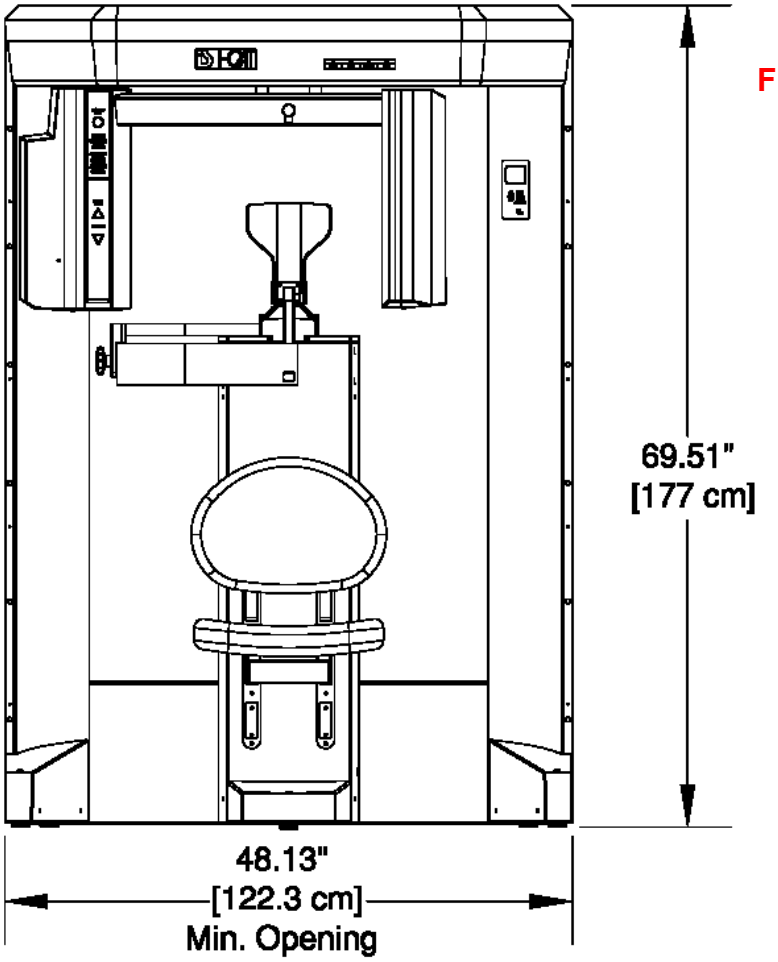
Optional PAN Scan Accessories

	**Bite Tip Holder** **Part #** 980220 **Quantity** 2		**PAN Head Holder** **Part #** 33-0 **Quantity** 1
	**Position Alignment Tool** **Part #** 33-19 **Quantity** 1		**Bite Tip** **Part #** 26-15 **Quantity** 25
	**Pan Phantom** **Part #** 12-0 **Quantity** 1		**Chin Rest** **Part #** 26-12 **Quantity** 1

System Gantry Dimensions



TOP VIEW



FRONT VIEW

Chapter 15 Networking Support Setup

Networking Support Overview

Networking support within VisionQ and standalone Vision creates a convenient mechanism for sharing image data within an office or clinic. Using network storage provided and maintained by the customer, system software monitors the connection and allows scanning to proceed even if the network is temporarily broken. Then, the software will automatically update the server with new patient scans when the connection is restored.

NOTE: The customer is responsible for providing the network accessible storage at their location, including security, backup, and archive functions.

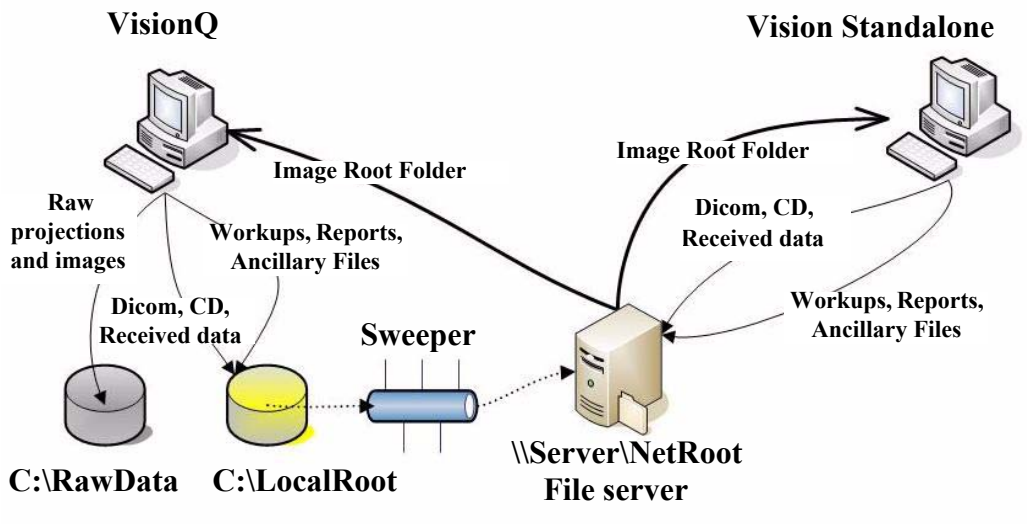
Networking Data Flow

When the Image Root Folder is set to a location on the local disk, networking software is automatically disabled, and all data acquisition goes to the local disk. But if the Image Root Folder is setup on a remote network shared folder, acquired data flow is altered somewhat and networking software takes part in the flow. In this case, VisionQ stores newly-acquired, DICOM-format projection data (RAW_CT) and reconstructed images (CT) on its local disk (in C:\LocalRoot), *regardless* of the Image Root Folder setting. If a study is immediately viewed or manipulated, that work is also saved locally. At the same time, the networking software's background Sweeper service automatically tries to copy this new data to the designated Image Root Folder.

For VisionQ and standalone Vision, the Study List displayed on the left side is derived from the Image Root Folder on the network server. Previously-acquired studies are also manipulated from that location. Because of this, there is a delay from the time an acquisition or reconstruction completes to the time when the study is displayed on the Study List.

If the Study List database update process cannot be performed by the computer that has been designated by the system to be the master, slave computers will receive the following message at the top of the Study List: "*Study List updates blocked by the computer named...*". Investigate the problem with the identified master computer.

Note that changes made to studies on the network by a standalone Vision computer are not transferred back to the VisionQ local disk.



If network breaks, VisionQ cannot access Study List, but can continue to scan patients.

If network breaks, Vision cannot access Study List. Network must be restored.

Network Support Installation/Setup

Provide Network Storage

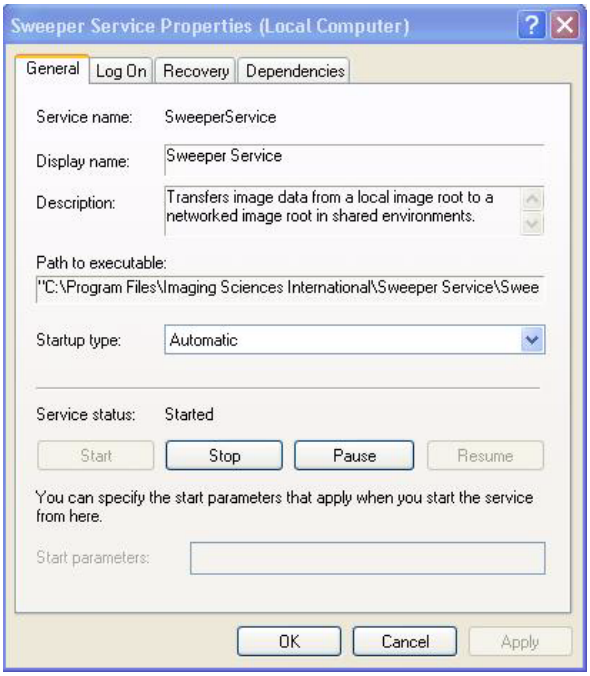
The customer is required to provide network storage that is accessible to all of its operators. If a new user is created on the Acquisition PC, it must be setup with administrator privilege as this is required for the sweeper service and reconstruction software. To verify proper operation, log in as **each** of the system operators and use Windows Explorer to navigate to the intended networked shared folder, using \\server\folder syntax. Create a new text document, enter text into it, save it, and then delete it. **Do not proceed unless this succeeds for every operator.**

Install Sweeper Service

1. Double-click the SweeperSetup icon in the Program Files\Imaging Sciences International\iCAT Software folder to execute the program. A setup wizard is displayed.
2. Click **Next** on all wizard screens to install the Sweeper service.
3. When complete, click **Close** on the Installation Complete screen.

Configure Sweeper Service

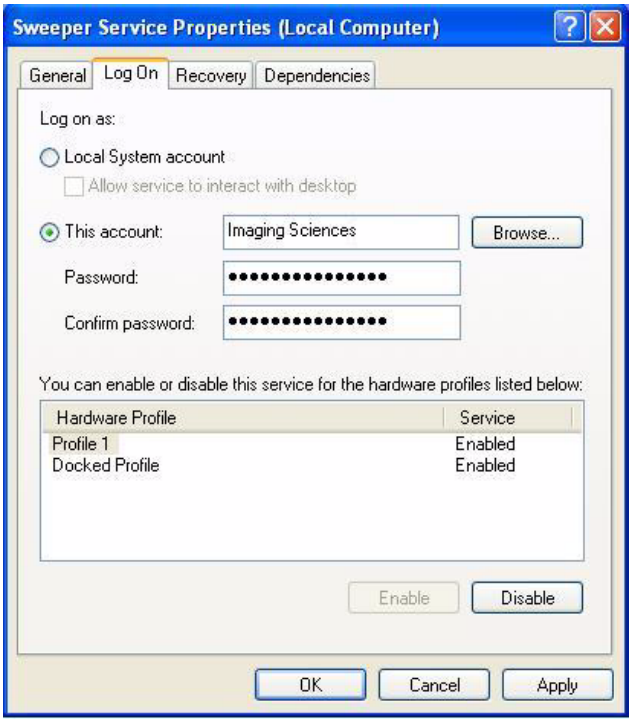
1. Access **Control Panel > Administrative Tools > Services** and double-click Sweeper Service.
2. On General tab, confirm Startup type is set to Automatic.



3. Click Log On tab:
   a. Click **This account** radio button.
   b. Enter and confirm an account and a password.

NOTE: Be sure to use the same account that was used to log on to the computer.

   c. Click **OK**.



Migrate from Standalone to Server

NOTE:

- Perform this procedure only if upgrading or migrating from an existing standalone setup.
- If the existing network setup shares a portion of the local disk of the VisionQ computer, it is still considered standalone and this procedure should be followed.

1. Using the Sweeper controller, stop the Sweeper service if it is running or paused.
2. Start VisionQ and reconstruct any scans that have not yet been reconstructed.
   a. Make a note of the standalone Image Root Folder name using **Tools > Setup**. (It is probably C:\DATAFRAMES.) Do not change the name at this time.
   b. Exit VisionQ.
3. Using Windows Explorer, navigate to the Image Root Folder and delete any files named proj0000.raw, proj0001.raw, ..., proj2000.raw.

4. If a folder named **bak** is present in the Image Root Folder, the proj0000.raw files in it, as well as the bak folder itself, can be deleted.
5. Check that the folder C:\LocalRoot does not exist. If it does exist, check if it is empty. If it is empty, remove it. If it is not empty, call Technical Support for help. Continue only when C:\LocalRoot does not exist.
6. Using Windows Explorer, change the name of the Image Root Folder to C:\LocalRoot.

Change Image Root Folder

1. From VisionQ or standalone Vision, select **Tools > Setup**.
2. Under DICOM Database Root Folder, enter or browse for the Image Root Folder on the network server and click **OK**. Use Universal Naming Convention syntax, such as \\server\NetRoot, to identify the network location and not a mapped drive syntax.

Start the Sweeper

Start the Sweeper service. After 30 seconds, it will start transferring any prior scan data to the server. Watch it for a few minutes in case there are any network or configuration problems.

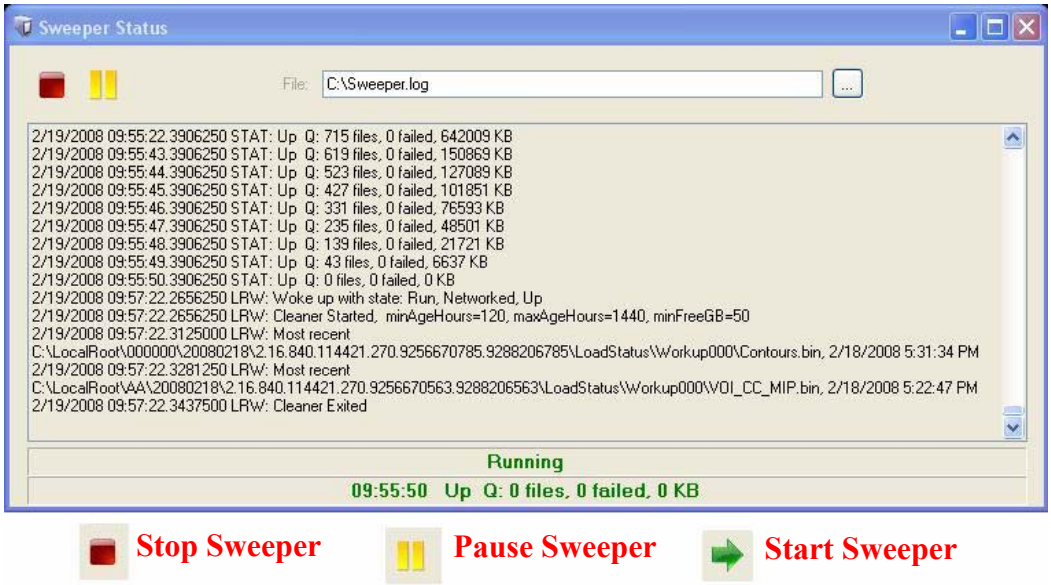
Sweeper Service

The Sweeper service starts automatically on system power-up and stops on system shutdown. It copies any changed files from the local disk (C:\LocalRoot) to the network Image Root (but only if the local file is bigger than its network counterpart.) It retries failed transfers when the network is up. The Sweeper service will suspend data copying and declare itself "Down" if the network disk has less than 1 GB of free space. It will automatically resume when more space is made available by the user.

The Sweeper service periodically cleans the local disk by deleting all studies older than 60 days. If there is less than 50 GB of free space available on the local drive, the oldest study that is at least 5 days old is deleted. Studies that are less than 5 days old are never automatically deleted.

Sweeper Controller

The Sweeper controller provides the user interface to the Sweeper service and is accessed by clicking the Sweeper icon in the system tray. If the controller screen is accidently closed, click **Start > All Programs >Imaging Sciences >SweeperController.exe** to restore.



Stop Sweeper **Pause Sweeper** **Start Sweeper**

The Status screen allows the user to start/stop and pause/resume the Sweeper service. It displays the Sweeper log file C:\Sweeper.log, extracts status from the log, and displays it at the bottom of the screen. It reduces to a system tray icon showing the Sweeper state and a tooltip with the current status.

Working

Idle

Down

Tooltip shows:
- **Time**
- **Network Status**
- **# of files in Transfer Queue**
- **# of files that Failed at Least Once**
- **# of bytes in Transfer Queue**

Network Failures

In the event of a network failure, the best action is to try to quickly restore the network. If that is not possible, fallback operations are available.

No Network Access at Startup

When VisionQ or standalone Vision is first launched, it tests whether the Image Root Folder is accessible on the network. If it is not, the No Network Access dialog is displayed. Use fallback operations if desired. Fallback operations differ for VisionQ and standalone Vision.

Fallback Operations For VisionQ

If there is no network access for VisionQ, the best approach is to fix the network. When the network is restored, click **Retry** on the No Network Access screen and continue work as usual.

If network access cannot be quickly restored and scanning must continue:

1. Click **Cancel** to fallback and use C:\LocalRoot.
2. Scan patients.
3. Exit VisionQ and restore the network as soon as possible. Any changes made to studies such as workups, reports, or jpegs will be swept to the server when the network connection is restored.

   NOTE: Fallback is temporary until VisionQ exits unless the user manually changes the setup, which is not recommended.

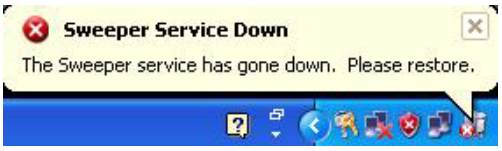
Fallback Operations For Vision

If there is no network access for standalone Vision, it is essential to fix the network because C:\LocalRoot is most likely empty. When the network is restored, click **Retry** on the No Network Access screen and continue work as usual.

Network Fails During Operations

If a network failure occurs during use of VisionQ or standalone Vision, the following occurs:

- The Study List goes blank (since it comes from the server which is no longer accessible).
- Error messages are displayed in the Sweeper log file.
- The Sweeper icon in the system tray of VisionQ changes to the down state and a balloon is displayed for the state change.



NOTE: Be aware that unsaved workups, reports, or jpegs may be lost as a result of a network failure.

Try to restore the network. If the network can be restored, operations can continue. If the network cannot be quickly restored and scanning must continue, new scans will be safely stored locally, but will not be transferred to the server until the connection is restored. Therefore, new scans will not appear on the Study list, which will remain blank. To see these new scans in the list, exit and follow the fallback operations for VisionQ.

Limitations of Networking Support

Known limitations of networking support are:

- There is a network transfer delay between acquisition or reconstruction, and the appearance of the study on the Study List. Although they may not appear on the list immediately, the images are available for review and workup on the scanner immediately.
- There is no study locking mechanism to prevent two users from simultaneously editing or updating the same study. Clinic workflow must ensure this does not happen. However, if it does occur, only workups, and not patient scan data, are at risk of being lost.
- Unsaved workups, reports, or jpegs may be lost as a result of a network failure that happens during the save operation.

Chapter 16 Remote System Import and Export

Remote System Import and Export Overview

The VisionQ Remote Service application enables the import of patient demographic details and sends the DICOM datasets generated after a scan to a PACS server. The Remote Service also allows querying and retrieving of desired datasets to a Vision workstation, which can be viewed with the Vision Standalone application. This service functions to reduce data entry redundancy and to synchronize the output generated by VisionQ to a remote system once the study acquisition is completed. The Remote Service application is available to all VisionQ customers.

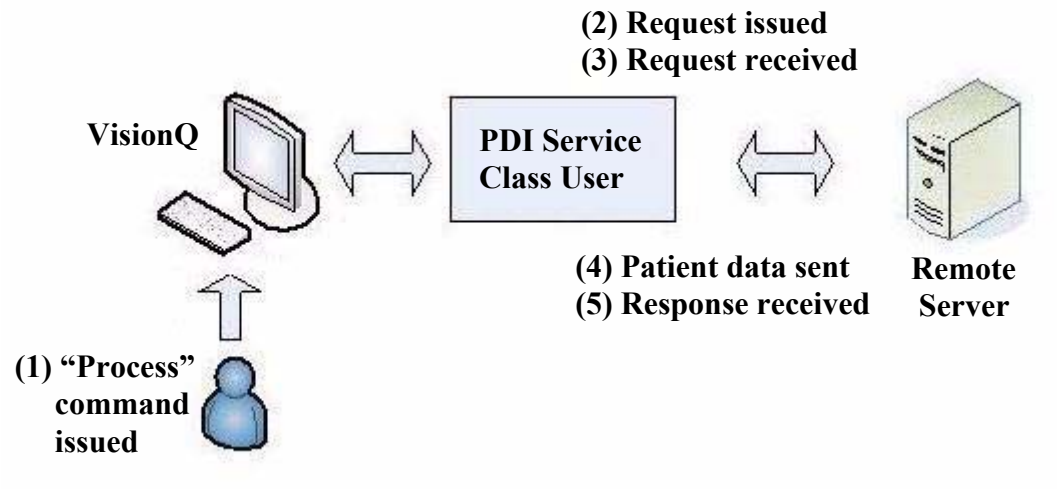
Remote System Import

VisionQ provides two ways to import “scheduled” patient data into the system:

- DICOM Worklist - this interface requests and displays patient records that match the user-specified criteria from the remote DICOM Worklist server.
- Practice Management (PM) - this interface loads and displays patient records from an XML file, generated by the PM server.

Users can choose which of the two interfaces is suitable for their workflow and set up the interface accordingly.

When the VisionQ user selects to import data, the PDI service class user (PDI.dll) issues a DICOM C-FIND request to pull patient records from the remote system. All VisionQ “scheduled” patient records are sent from the Worklist or PM system to VisionQ.



Import Installation and Setup

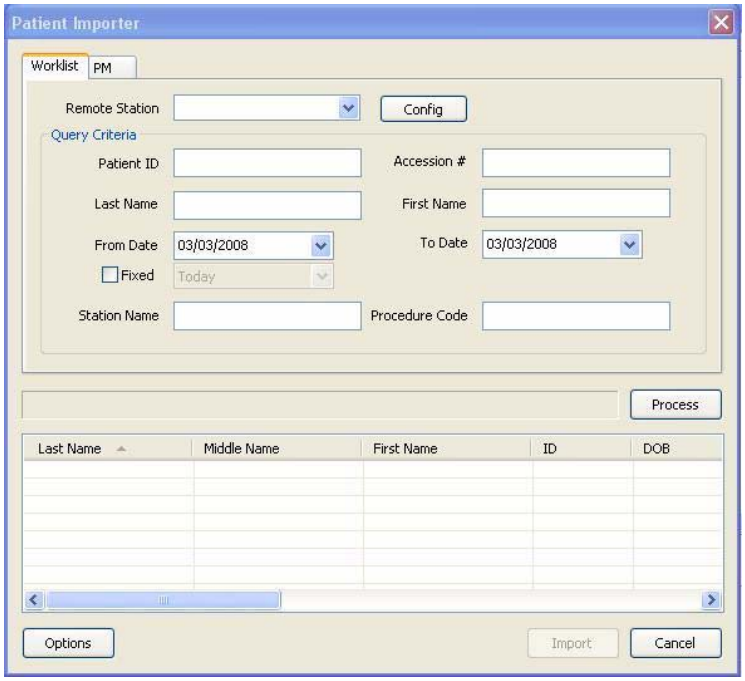
If the PDI.dll has not been installed, place the PDI.dll in the same folder where the VisionQ.exe resides. The PDI.dll must be in place before setup can continue.

Determine which interface type, DICOM Worklist or PM, is to be used for import, and follow the appropriate setup procedure below.

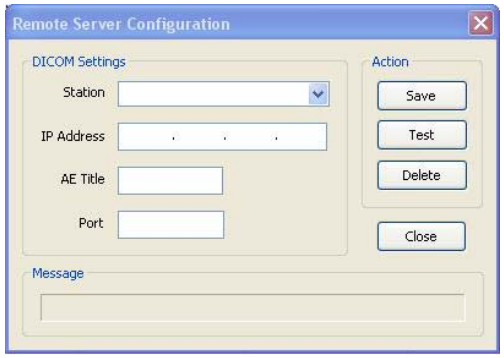
Set Up DICOM Worklist Interface

1. Start VisionQ.
2. From the VisionQ Main menu, select **File > New Patient**.

3. Click **Import**. The Patient Importer screen is displayed.

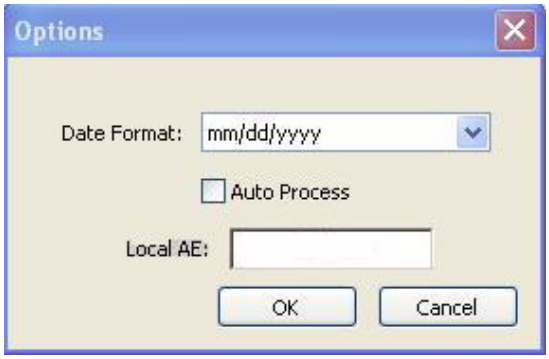


4. Click **Config**.



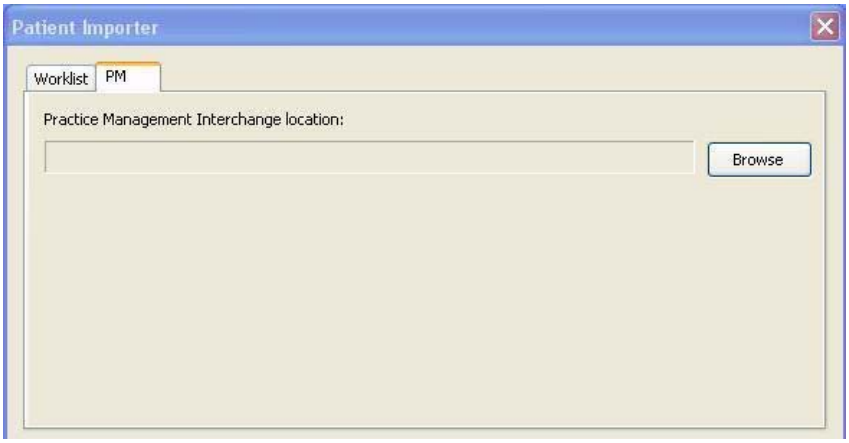
5. Enter Station name, IP Address, AE Title, and Port number for the remote server from where files are to be imported.
6. Click **Save**, and then **Close**.
7. Click **Cancel** on Patient Importer to close window.

NOTE: The **Options** button on the Patient Importer window enables setting of the date format and the AE title for the local Acquisition computer, and enables auto process. These settings are optional and do not have to be changed.



Set Up Practice Management Interface

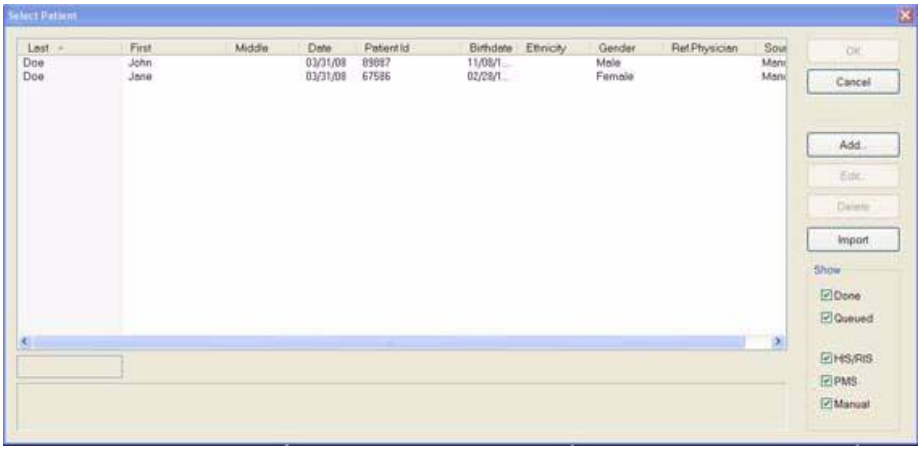
1. Start VisionQ.
2. From the VisionQ Main menu, select **File > New Patient**.
3. Click **Import**. The Patient Importer screen is displayed.
4. Click the **PM** tab.



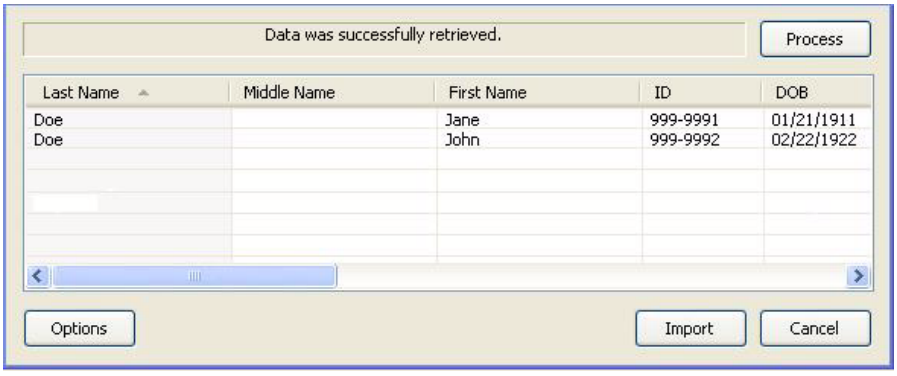
5. Click **Browse** and browse to the PM Interchange location. This is the location where an XML file, generated by the PM server, is saved.
6. Click **Cancel** on Patient Importer to close window.

Import Patient Data

1. From the VisionQ Main menu, select **File > New Patient.**
2. Click **Import**.



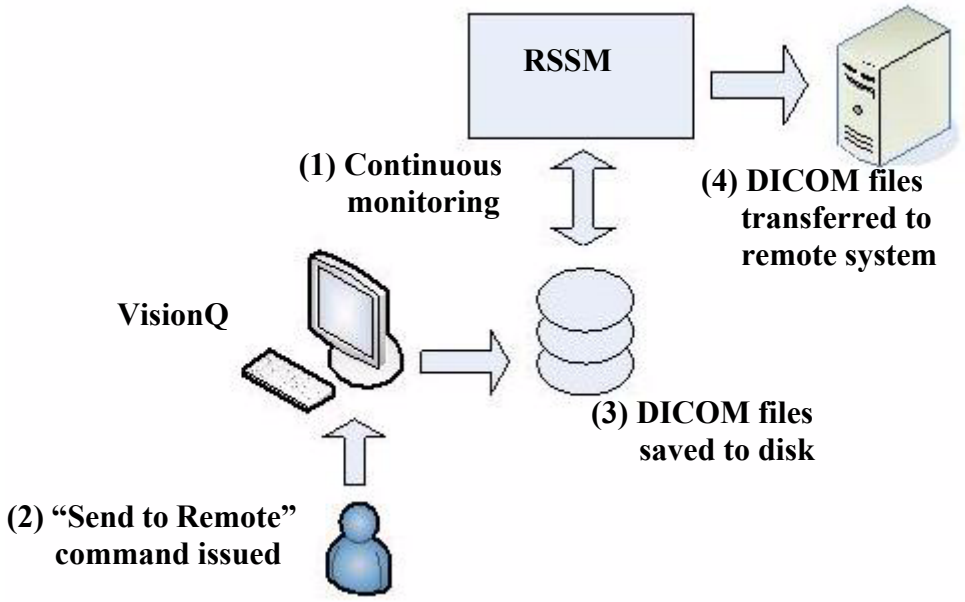
3. On the Patient Importer screen, click **Process.** Patient data is retrieved from the remote system and listed at the bottom of the screen.



4. Select (highlight) a patient on the list and click **Import**.
5. The Acquisition screen is displayed for the selected patient.

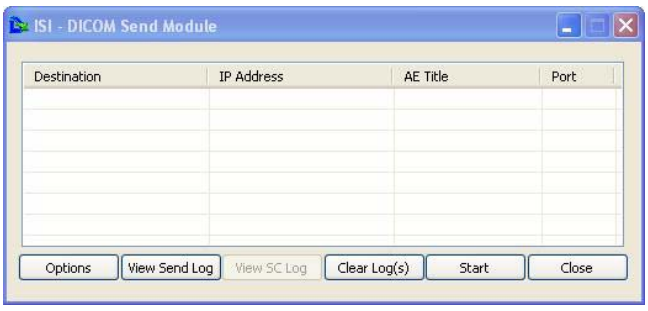
Remote System Export (RSSM)

VisionQ enables DICOM images to be transferred from the VisionQ to a remote system, such as a Picture Archive and Communications System (PACS). The Remote Service Send Module (RSSM) enables the transfer using DICOM storage protocol (C-STORE). RSSM continuously monitors the local folder that is setup to receive the images to be exported. When DICOM images are exported to the folder, RSSM transfers them to the user-defined remote destination.

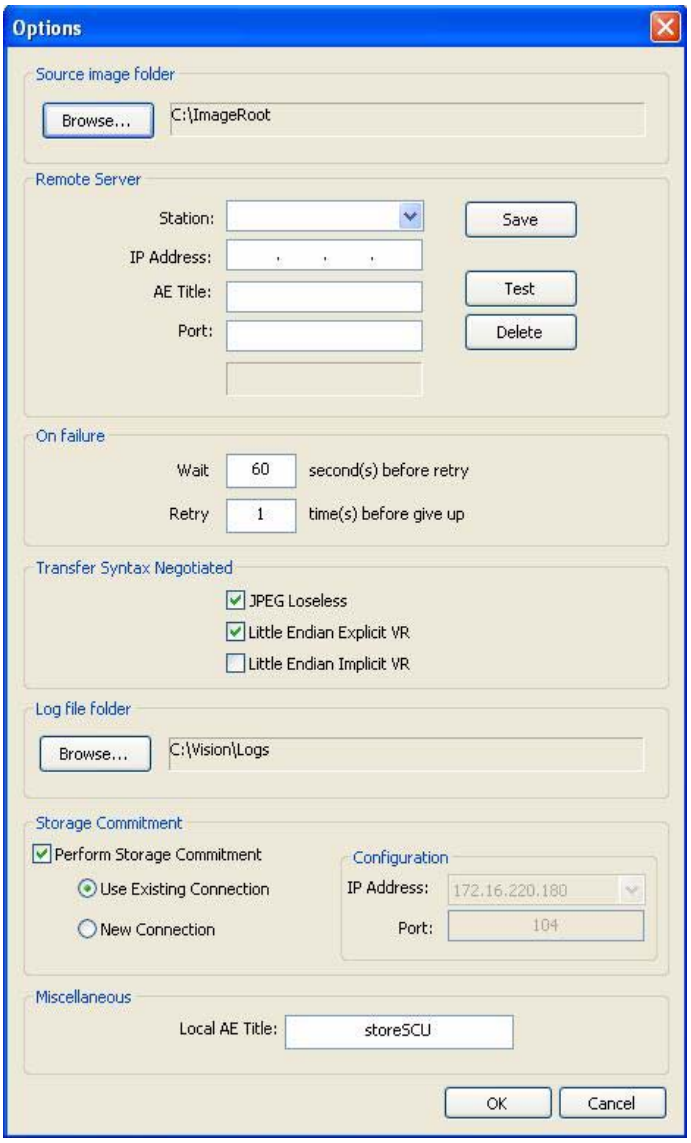


RSSM Installation and Setup

1. Place the RSSM.exe in the same folder where the VisionQ.exe resides.
2. Double-click RSSM.exe. The DICOM Send Module is displayed.



3. Click **Options**.



4. Click **Browse** in **Source image folder** section and browse to the folder where the DICOM files are to be placed for export. Create a new folder if desired. Do NOT use the current image root or local root folder.

5. In **Remote Server** section:

   a. Enter Station name, IP Address, AE Title, and Port number for remote DICOM server (C-STORE SCP).

   b. Click **Save**.

   c. Click **Test** to perform DICOM validation (C-ECHO) to check whether the remote server is accessible.

6. In **On failure** section, select the amount of time (in seconds) to wait after a send operation fails before trying again. Also, enter the number of times to retry a failed send operation. The status of a send operation is displayed in the Study List under the PACS heading.
7. In **Transfer Syntax Negotiated** section, select desired transfer syntax to be used to send CT/PAN datasets to the selected PACS server. Multiple options can be selected and at least one option must be selected.
   - JPEG Lossless
   - Little Endian Explicit VR (Value Representation)
   - Little Endian Implicit VR

   The transfer syntax(es) selected should be based on the compatibility and/or preference of the PACS configuration. For example:
   - A PACS may support JPEG Lossless, but not for 16-bit data. Since the data generated from the scanner is 16-bit data, JPEG Lossless would not be selected as an option, in this case.
   - A PACS configuration may prefer Little Endian Implicit, in which case, this option should be selected.

   The RSSM log displays status as to whether a transfer syntax was accepted or rejected by the PACS server, or if no transfer syntax is accepted.

```
04/28/10 07:40:43  SOP Verfication Process.
04/28/10 07:40:43  Connecting to Remote_E_Server.
04/28/10 07:40:43  Transfer Syntax proposed to server:
04/28/10 07:40:44  Little Endian Implicit VR
04/28/10 07:40:44  Transfer Syntax accepted for CT dataset: Little Endian Implicit
04/28/10 07:40:44  Transfer Syntax accepted for PAN dataset: Little Endian Implicit
04/28/10 07:40:44  Remote_E_Server is active.
04/28/10 07:40:54  === Start sending images ===
```

8. Click **Browse** in the **Log file folder** section and browse to the folder where the RSSM log file is to reside.
9. In the Storage Commitment section, select the **Perform Storage Commitment** checkbox if you want to enable storage commitment of sent DICOM images. When selected, two radio buttons become active:

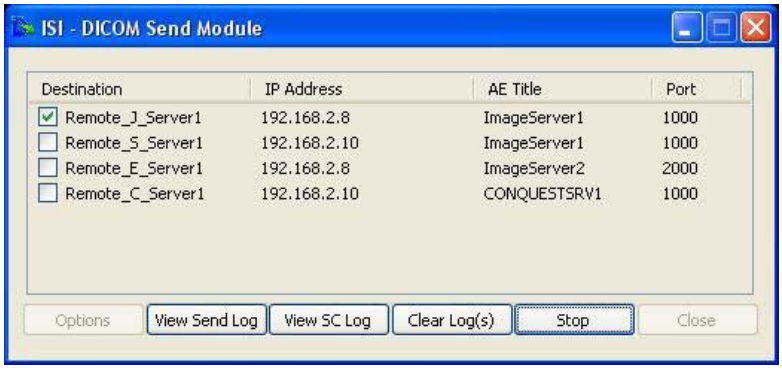
- Select **Use Existing Connection** to use the same connection for sending a Storage Commitment request and receiving a Storage Commitment response from the PACS server.

  - or -

- Select **New Connection** to receive Storage Commitment responses on a new connection initiated by the PACS. In the Configuration section, enter the IP Address and Port for the server that will send the Storage Commitment response.

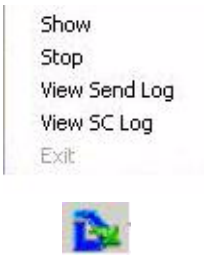
A Storage Commitment request is sent after all the DICOM files of a study are sent successfully. The status of a Storage Commitment operation is displayed in the Study List under the PACS heading.

NOTE: If Storage Commitment is enabled, only one server can be selected from the DICOM Send Module dialog for sending of DICOM files. If you try to enable Storage Commitment with multiple servers selected, a dialog is displayed informing you to select only one server before enabling Storage Commitment.



10. In the **Miscellaneous** section, enter Local AE Title for the VisionQ system.
11. Click **OK**.
12. Click **Close** on the DICOM Send Module.

RSSM Logs



While RSSM is transferring data to the remote system, an icon is displayed in the system tray. Right-click the icon to display a popup menu.

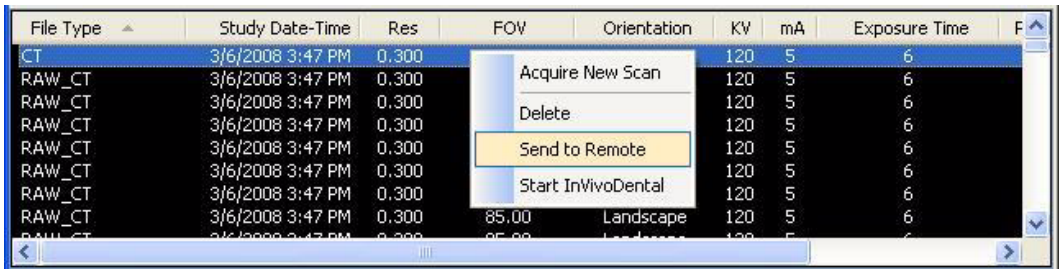
The RSSM logs can be accessed by selecting the option for the desired log or by selecting **Show.** The **Show** option displays the DICOM Send Module with the following options:

NOTE: The buttons that are active on the DICOM Send Module dialog will depend on whether or not Storage Commitment is enabled with the **New Connection** option.

- **View Send Log** - Displays Send log. This log shows the transfer syntax used and the sent status for each file.
- **View SC Log** - This option is active only when Storage Commitment is enabled and **New Connection** is selected. Displays the Storage Commitment log which shows the storage commitment status of each study.
- **Clear Log(s)** - Clears Send log and SC log of all previous activity.
- **Clear Queue** - Clears the queue of all studies. A study is queued when RSSM has exhausted all attempts to transmit the study.
- **Start/Stop** - Toggles to either start or stop RSSM.
- **Close** - Closes the DICOM Send Module window.

Send Patient Data to a Remote System

1. With a Patient selected in the Study List, right-click on the scan to be sent and select **Send to Remote.**



2. A dialog is displayed and the dataset is transferred.
3. If a previous export session has not been successfully transferred, a warning is displayed.
4. Check the RSSM log to determine status of the last transmitted file. If file did not transfer successfully, investigate the cause, such as a network failure to the remote system and correct the problem.

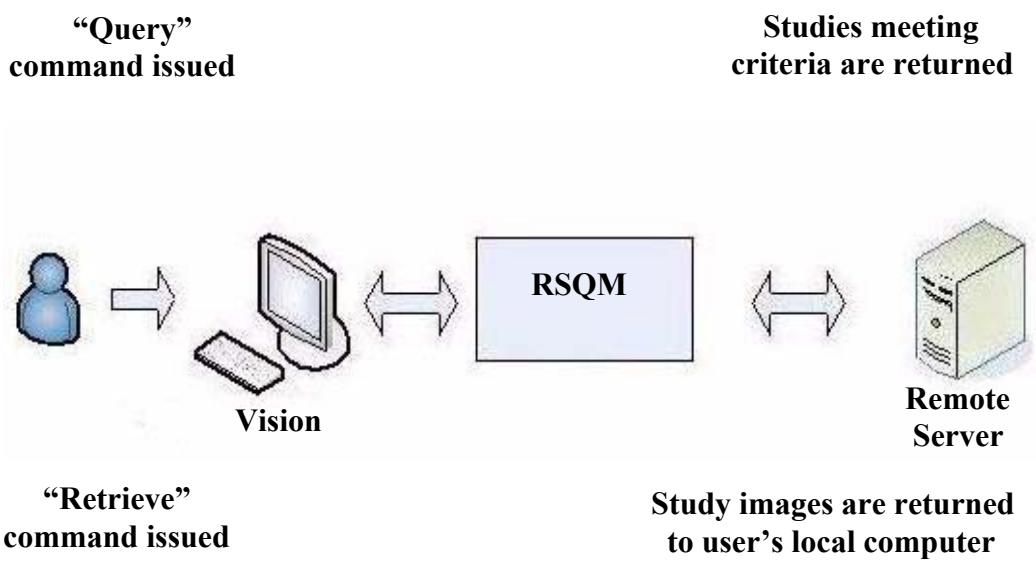
   If the file no longer needs to be transferred, click **Yes** to overwrite the previous session.

   If the file needs to be sent, click No to cancel and wait for previous file to transfer.

RSQM

The Remote Service Query/Retrieve Module (RSQM) enables CT or iPAN (DX) images to be requested and retrieved from a remote system, such as a Picture Archive and Communications System (PACS) using DICOM service protocols (C-FIND and C-MOVE). The retrieved images can then be viewed and manipulated in the Vision Standalone application.

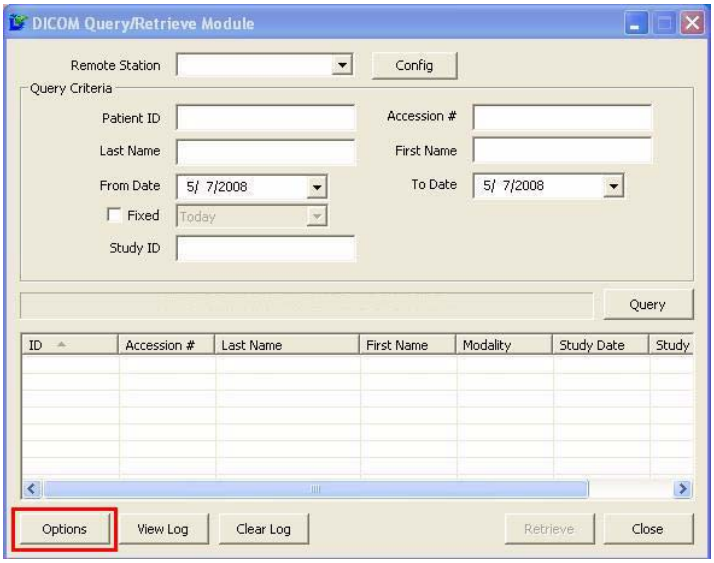
When the user issues a Query command in RSQM, all studies scanned on the remote system that meet the search criteria are returned. After a study is located, the user can retrieve the images for the study from the remote server. The remote server transfers the images to the user's local computer, where they are stored. It is recommended that the storage location be set to the same root folder as the Vision viewer.



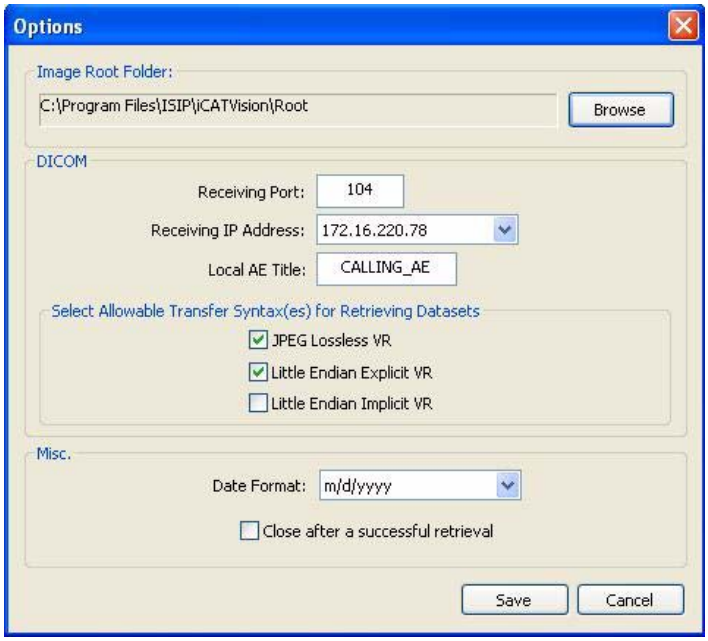
RSQM Installation and Setup

1. Place the RSQM.exe in the desired location. It is recommended to place it with the iCATVision.exe, but is not required.

2. Double-click RSQM.exe. The DICOM Query/Retrieve Module is displayed.



3. Click **Options**.



4. Click **Browse,** and browse to the Image Root folder to select it as the default storage location on the local computer.
5. In **DICOM** section, enter Receiving Port, Receiving IP Address, and Local AE Title. This data must match the data entered on the Query/Retrieve (PACS) server side so that the two machines can communicate.

6. In **Select Allowable Transfer Syntax(es) for Retrieving Datasets** section, select transfer syntax to be accepted by RSQM for retrieving datasets from a PACS. Usually the transfer syntax selected for sending datasets to a PACS should be selected for retrieval as well. Multiple options can be selected and at least one option must be selected.
   - JPEG Lossless
   - Little Endian Explicit VR (Value Representation)
   - Little Endian Implicit VR

   The transfer syntax(es) enabled should be based on the compatibility and/or preference of the PACS configuration from which the datasets are retrieved.

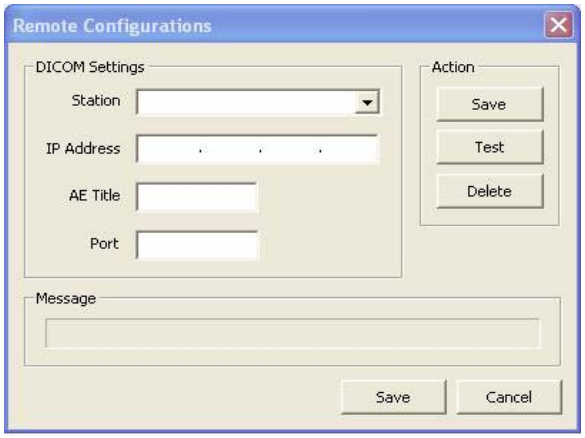
   The RSQM log displays status as to which transfer syntax is enabled and accepted by RSQM to retrieve datasets. It also shows if a study was retrieved successfully.

```
4/29/2010 10:01:01 Connecting to server.
4/29/2010 10:01:01 Sending retrieval request for Study-2.16.840.114421.222222.9304771903, Series-
2.16.840.114421.80311.9307108740.9338644740
4/29/2010 10:01:01 Association Request Recieved from server
4/29/2010 10:01:09 JPEG Lossless TS accepted for CT dataset.
4/29/2010 10:01:09 Recieved Image 0
4/29/2010 10:01:09 Recieved Image 1
4/29/2010 10:01:09 Recieved Image 2
4/29/2010 10:01:09 Recieved Image 3
4/29/2010 10:01:09 Recieved Image 4
4/29/2010 10:01:09 Recieved Image 5
4/29/2010 10:01:09 Recieved Image 6
4/29/2010 10:01:09 Recieved Image 7
4/29/2010 10:01:09 Recieved Image 8
4/29/2010 10:01:10 Recieved Image 9
4/29/2010 10:01:10 Recieved Image 10
4/29/2010 10:01:10 Recieved Image 11
4/29/2010 10:01:10 Recieved Image 12
4/29/2010 10:01:10 Recieved Image 13
4/29/2010 10:01:10 Recieved Image 14
4/29/2010 10:01:10 Recieved Image 15
4/29/2010 10:01:10 Recieved Image 16
4/29/2010 10:01:10 Recieved Image 17
4/29/2010 10:01:10 Recieved Image 18
4/29/2010 10:01:10 Recieved Image 19
4/29/2010 10:01:10 Recieved Image 20
4/29/2010 10:01:10 Recieved Image 21
4/29/2010 10:01:10 Recieved Image 22
4/29/2010 10:01:10 Recieved Image 23
4/29/2010 10:01:10 Recieved Image 24
4/29/2010 10:01:10 Recieved Image 25
4/29/2010 10:01:10 Recieved Image 26
4/29/2010 10:01:11 Recieved Image 27
4/29/2010 10:01:11 Recieved Image 28
4/29/2010 10:01:11 Association Release Request Recieved.
4/29/2010 10:01:11 Study was retrieved successfully.
```

7. In **Misc.** section, select the desired date format to be used. If you want the RSQM window to close after retrieving a study, select the **Close after a successful retrieval** checkbox.
8. Click **Save**.

Query and Retrieve Images

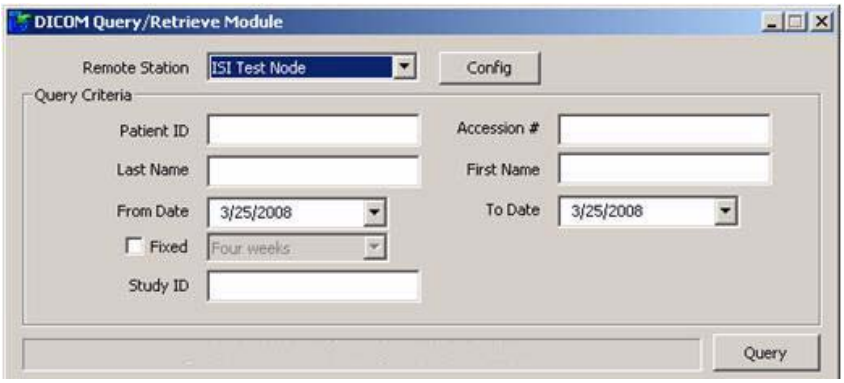
1. Double-click RSQM.exe. The DICOM Query/Retrieve Module is displayed.
2. Click **Config.**
   a. Enter Station name, IP Address, AE Title, and Port number for the DICOM node, such as a PACS, from where studies are to be queried and retrieved. This information may be provided by hospital IT or PACS personnel.
   b. Click **Save**.



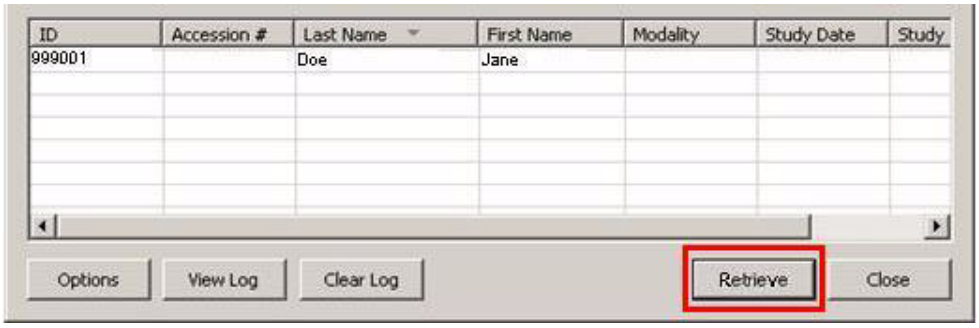
3. The Query Criteria default is to retrieve all studies scanned by the DICOM node selected above for the current day, or for a fixed period of time if the Fixed option is selected. Click **Query** to execute the default query.

   To enter different query criteria to narrow or widen the search:

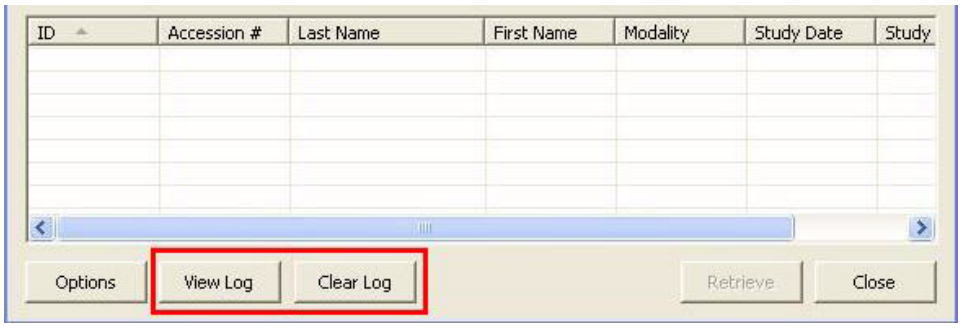
   a. Enter desired search criteria in the Query Criteria area.
   b. Click **Query**. Studies meeting the criteria are returned from the remote server.



4. To retrieve images for a study:
   a. Select a study from the list.
   b. Click **Retrieve**. The images for the selected study are retrieved from the remote server and copied to the local computer in the folder that was specified during setup, usually ImageRoot.



   c. The study is displayed on the Study List in Vision.
5. If desired, click **View Log** to review the transactions that were completed or check for failures. To clear the log, click **Clear Log**.



Status Messages

The following list defines the status messages that may be displayed on the DICOM Query/Retrieve Module screen.

Invalid retrieval IP address. Please select new one

The IP number selected in an option box is no longer valid. Open the options dialog and select a new one from the list.

Cannot use wildcard character with patient ID

A wildcard character is not allowed to be used for querying a patient ID.

Cannot use wildcard character with accession number

A wildcard character is not allowed to be used for querying an accession number.

Begin the retrieval process...

A study is about to be retrieved.

Unable to start retrieval. Please check network configuration

Cannot initiate the DICOM receiver module. Please check that the network configuration was entered correctly and completely.

Cannot find network configuration for selected server

The selected server is no longer valid. Please reconfigure the remote station or choose new destination.

Connecting...

RSQM is trying to communicate with the remote station.

Study list was queried successfully

Study was retrieved successfully

Requested operation was completed successfully.

Unable to send request to server. Please try again

RSQM is unable to request a list of studies from remote server.

Invalid command received from server. Please try again

Remote server does not return a valid respond to RSQM.

Query module failed communicating with server

RSQM does not understand the server's response.

No data found against the request

Cannot find study that matches the selected criteria.

Retrieving selected study from server...

RSQM is retrieving selected study from remote server.

Unable to retrieve all files for the study

RSQM is unable to retrieve all files that are part of the selected study. User should try to retrieve the study again.

Communication with server failed. Study retrieval failed

RSQM was unable to communicate with the remote server.

S***erver doesn't support the retrieval service***

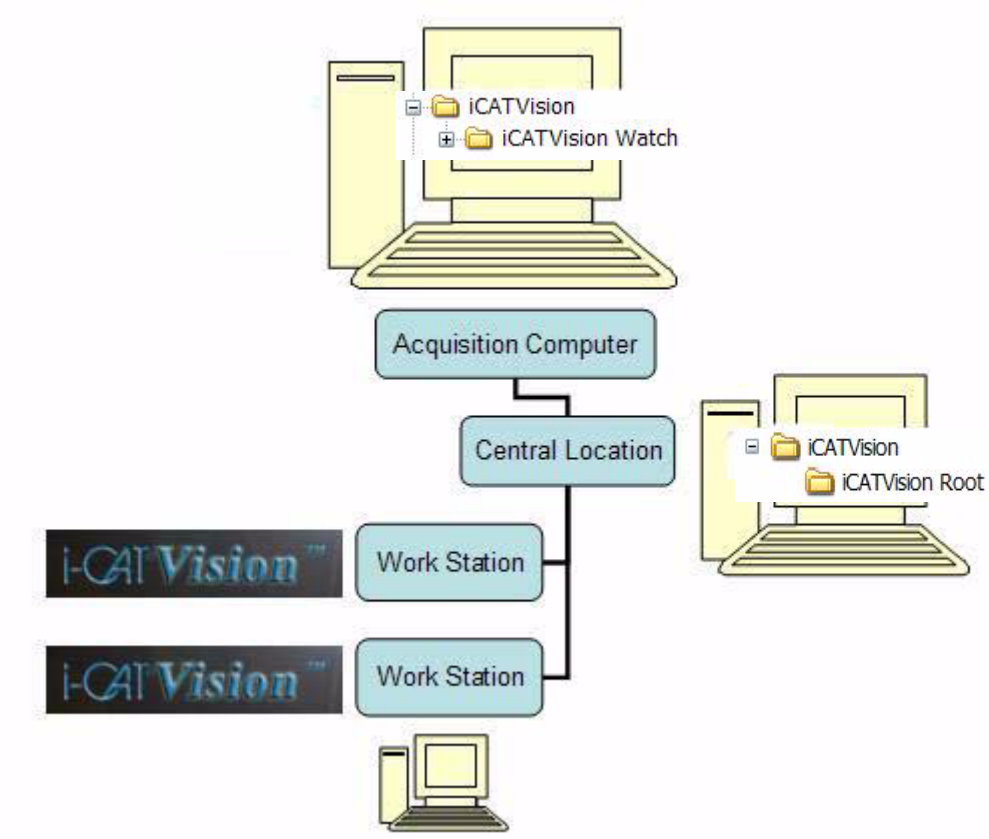
The selected server does not support DICOM retrieval service.

Unable to connect to the server. Please check server configuration

RSQM was unable to connect to the remote server.

Appendix A iCATVision & iCATTransfer

iCATVision standalone is used to view images that have been acquired by an iCAT® Acquisition Computer. We are pleased to provide iCATVision free of charge to anyone with access to iCAT® scans with no limit on usage and the number of copies.



Workstation Minimum Requirements

- Pentium 3 Intel Core Duo 2.4 GHz or better
- 2 GB of RAM minimum, 4 GB preferred
- ATI Radeon HD 4650 or nVidia Geforce 9800 GT chip minimum or ATI Radeon HD 5770 GPU (no integrated Intel GPUs, must be a dedicated GPU)
- Windows XP Professional, Vista, Windows 7 Professional or Ultimate (32-bit or 64-bit modes)
- Video should have display capabilities of 1600 x 1200 resolution
- 18- or 19- inch monitor recommended
- 40 GB Hard Drive or larger
- CD/DVD Drive
- Integrated Gigabit Ethernet Network Connection

Laptop Minimum Requirements

- Intel Core Duo 2 GHz or better
- 2 GB of RAM minimum, 4 GB preferred
- ATI Radeon HD 4650 or nVidia Geforce 9800 GT chip minimum or ATI Radeon HD 5770 GPU (no integrated Intel GPUs, must be a dedicated GPU)
- Windows XP Professional, Vista, Windows 7 Professional or Ultimate (32-bit or 64-bit modes)
- 40 GB Hard Drive or larger
- CD/DVD Drive
- Integrated Gigabit Ethernet Network Connection

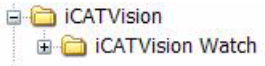
File Structure Setup

1. On the iCAT® Acquisition Computer, create an iCATVision folder under the C: drive.
2. Create a subfolder under iCATVision called **iCATVision Watch**

   This is where the DICOM 3 data is exported. NOTE: Only DICOM files are placed here, NO FOLDERS.

File structure on iCAT® Acquisition Computer:

C:\



NOTE: It is not recommended to have the Watch folder located on a server because it would slow down the Network speed.

3. On the server or central storage location, create another folder named iCATVision.
4. Under this iCAT Vision folder create a sub folder named **iCATVision Root**

   File structure on server/central storage location:

   C:\

   If a server/central storage location is not available, then create the iCATVision Root directory on the iCAT® Acquisition Computer's C: drive under the iCAT Vision Folder.

Create a new Folder

1. Open the folder where the new folder is to reside.
2. Right click and select **New > Folder**.
3. Type the name for the new folder.

Install iCATVision

1. Unzip the iCATVision.zip file to the iCAT Vision folder, it unzips to iCATVision.exe.
2. Double click the .exe file to execute the program.

   A shortcut can be created for this program onto the desktop.

To unzip a file:

Right-click file and click **Extract** on the shortcut menu.

To create a shortcut:

Right click file and select **Send to > Desktop (create shortcut)**.

iCATVision Setup

NOTE: Refer to ***DICOM Character Set for New Files*** for additional DICOM setup options.

1. From iCAT Vision select **Tools > Setup**.
2. Under *DICOM Database Root Folder,* browse to the iCAT Vision\ iCAT Vision Root and click **OK**.

   (This may be on the C: drive or on a networked drive).

   Setup is the same on all networked and non-networked computers or workstations.
3. A prompt to restart iCATVision software is displayed, click **OK**.

NOTE: It is currently recommended that when using iCAT Data for 3rd party software, perform a separate DICOM export from iCAT®. The data will be interchangeable when third party systems start accepting compressed DICOM.

iCATTransfer

NOTE: iCATTransfer is not required for iCAT® 17-19 Systems.

iCATVision is restricted to iCAT® DICOM scans and necessitates an "authentication" of DICOM data (Digital Imaging Communications). Authentication is performed by a program called "iCATTransfer" which is installed and executed on the iCAT® Acquisition Computer (computer capturing the scan) or another computer on the same network, in special cases. iCATTransfer authenticates and stores all newly exported DICOM data (from iCAT® software, to the Watch folder, and then to the Image Root folder.) The Image Root folder typically resides on a server or another central storage location.

If the computers are on the same network as the iCATTransfer, then there is direct access to the patient images. If running outside this network (e.g. a referring doctor's office), then patient data may be transferred via a CD to the remote computer's Image Root folder.

To reiterate, iCATVision only accepts iCAT® DICOM data that is authenticated by iCATTransfer. **Images from iCAT® 17-19 Systems do not require iCATTransfer.**

Install iCATTransfer

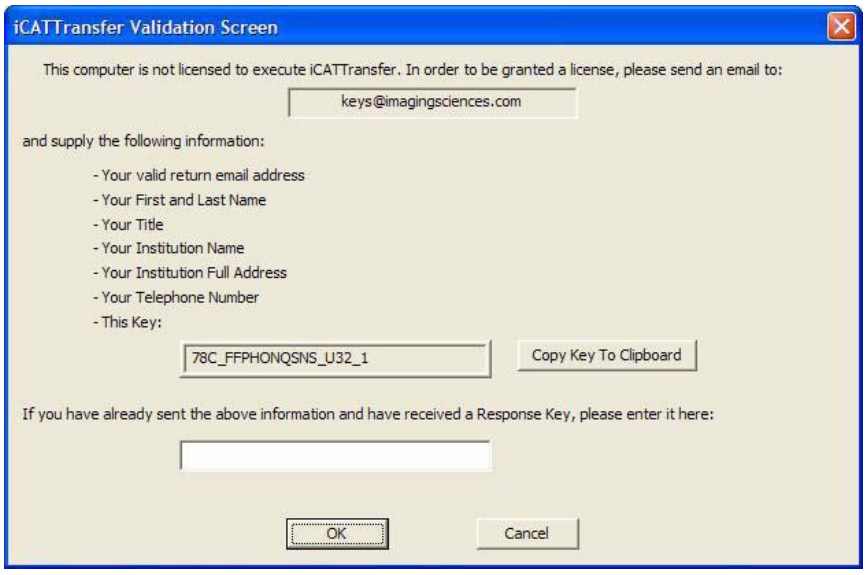
1. Unzip the iCATTransfer.zip file to the iCAT Vision folder, it unzips to iCATTransfer.exe.
2. Double click the .exe file to execute the program.

   A shortcut can be created for this program onto the desktop.

   To unzip a file: Right-click the file and click **Extract** on the shortcut menu.

iCATTransfer Passcode

When iCATTransfer is first launched, it opens to the iCATTransfer Validation Screen (below). Instructions are displayed to send an e-mail to Imaging Sciences at keys@imagingsciences.com with your customer information and the authentication code shown on screen. We will return an e-mail with the Passcode to be entered into the iCATTransfer Validation Screen.



The program then opens, click **accept** to accept the License Agreement and then follow the instructions below.

iCATTransfer Setup

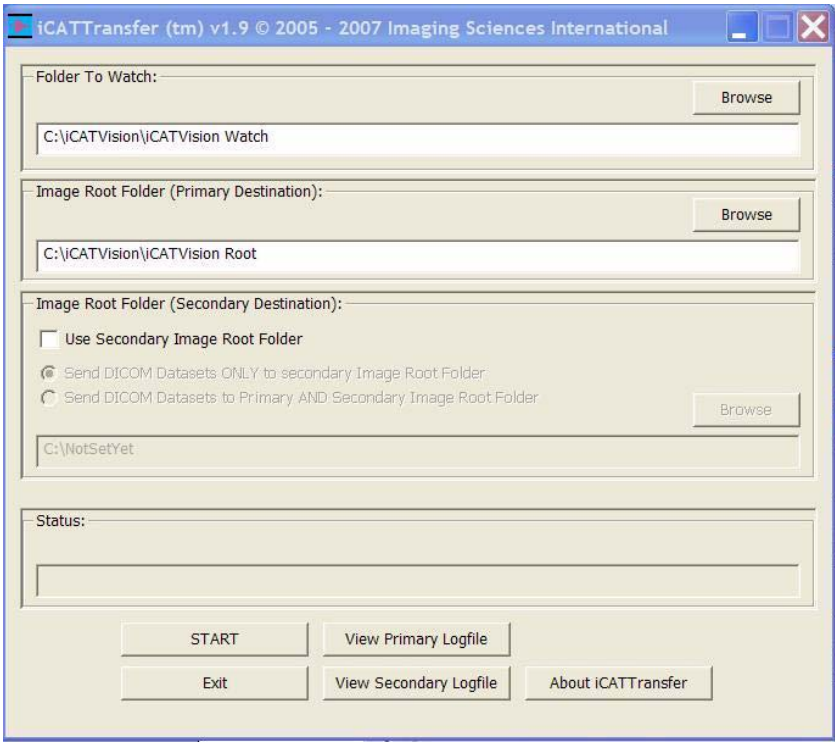
The program must be configured to "watch" for exported DICOM data from iCAT® in order to authenticate and transfer it to the image root directory. The program needs to be running in the background in order to detect the exportation of the DICOM Data. The iCATTransfer program can be placed into the StartUp Menu of the iCAT® Acquisition Computer (or server).

Putting iCATTransfer into the StartUp Menu

1. Right click the **START** button and select **OPEN**.
2. Double click **Programs** folder to open and then double click the **StartUp** folder to open.
3. Copy the iCATTransfer.exe file into this StartUp folder.

Configure iCATTransfer

1. Launch iCATTransfer, the following window is displayed.



2. Under *Folder to Watch*, Browse to **iCATVision\ iCATVision Watch** folder and select. (This is most likely on the C: drive of the iCAT® Acquisition Computer).

3. Under *Image Root Folder (Primary Destination),* Browse to **iCATVision Root** folder and select. (This is most likely on a server/central storage location).
4. Click **Start**. This saves the preset Watch and Root destinations.

NOTE: If START is not clicked the transfer program will not work.

Remember, iCATTransfer must be running in order for the data to transfer (iCATTranfer can be minimized).

Accessing i-CAT® DICOM Data

iCATTransfer requires data to be exported from the iCAT® software in DICOM3 format.

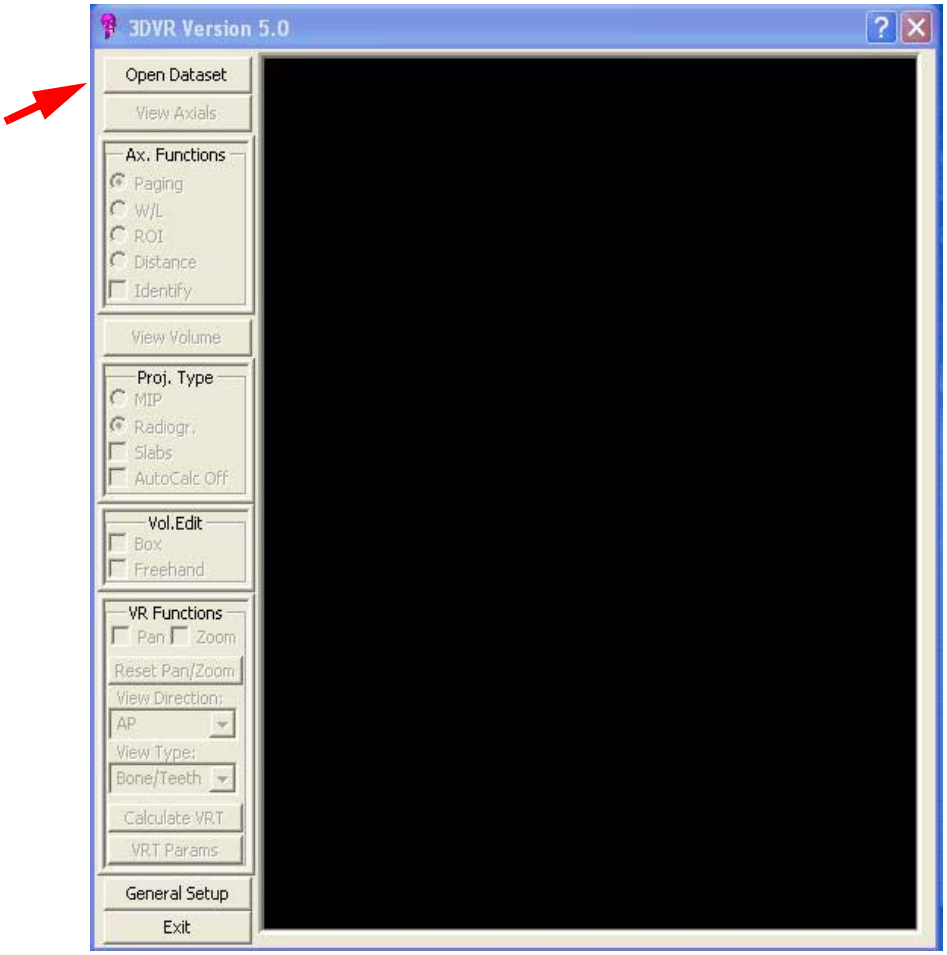
Appendix B Three Dimensional Volume Rendering (3DVR)

Open Database

3DVR is a standalone program which runs independently and is not part of Vision.

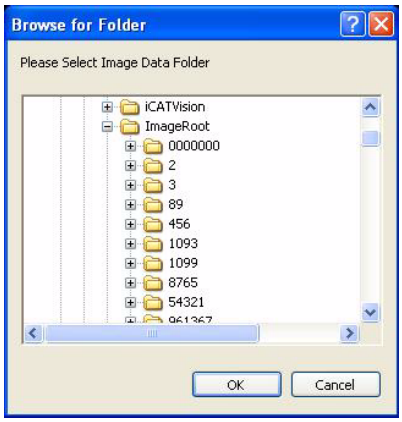
1. To open 3DVR, double click the 3DVR icon.

   The Program Main menu is displayed.



To get started, an image dataset must be loaded. The case MUST be in DICOM format.

If importing a case from Vision, make sure to export the case in *DICOM3-Multi File* format.



2. Click **Open Dataset**, a browse window is displayed.
3. Select the drive/folder for the DICOM dataset and click **OK**.

   The first view displayed is an *Axial* slice.

   The **Axial Functions** menu, under the *View Axial* button, is enabled.

Axial Functions

There are 5 tools under Axial Functions.

- Paging
- W/L (Window Level)
- ROI (Region of Interest)
- Distance
- Identify

Paging

Paging is the tool that allows for scrolling through all the axial slices of the dataset. Notice at the top of the DVR window, the axial slice number currently displayed is next to the word DVR. In this sample it is slice 10 of 256.

To scroll through each slice:

1. Click **Paging** Radio button.
2. Drag the cursor either UP or DOWN to scroll through the axial slices.

   Dragging the cursor upward scrolls towards the top of the skull and ragging downward scrolls towards the bottom of the skull.

W/L (Window/Level)

W/L is a tool to adjust Grayscales (Brightness / Contrast).

To adjust Brightness/Contrast:

1. Click **W/L** Radio button.
2. Drag cursor Left/Right to adjust Contrast and Up/Down for Brightness.

   The W/L values are displayed at the top of screen.

ROI (Region of Interest)

ROI is a tool used for determining Hounsfield Units.

To activate the ROI tool:

1. Click **ROI** Radio button.
2. Drag cursor to create a box around region of interest. Release the mouse button to move box, then click again to complete the box.

   Calculated items are displayed (upper left corner.) The displayed values are:

   - Mean
   - SD (Standard Deviation)
   - HU min (minimum Hounsfield Units)
   - HU max (maximum Hounsfield Units)
   - Area

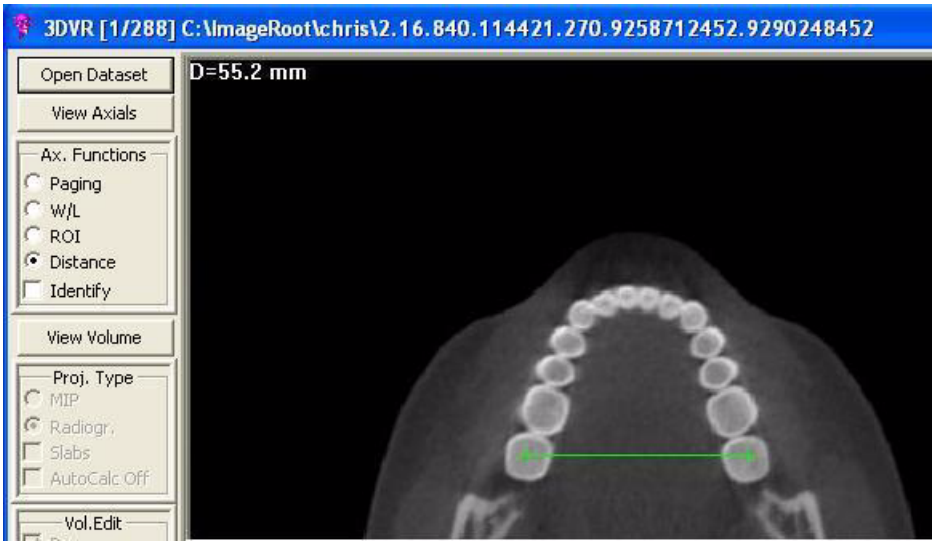
Distance

The distance tool measures linear distance.

To activate Distance tool:

1. Click **Distance** radio button.
2. Drag cursor from point to point to create a measurement line (see below in green).

   Linear measurement is displayed in millimeters (upper left corner.)



Identify

The Identify tool identifies areas of interest at different densities. It is defaulted to detect the most dense anatomy or material.

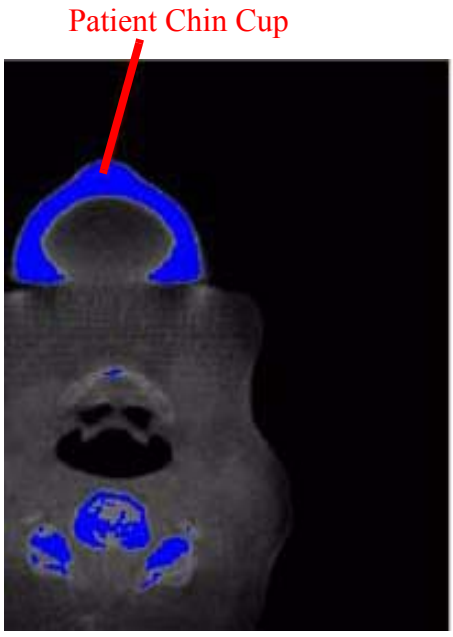
This tool is often used to remove a piece of anatomy from the image. One major use is to remove the Patient Chin Cup that may appear in the scan. See the sample below (Patient Chin Cup highlighted in blue.)

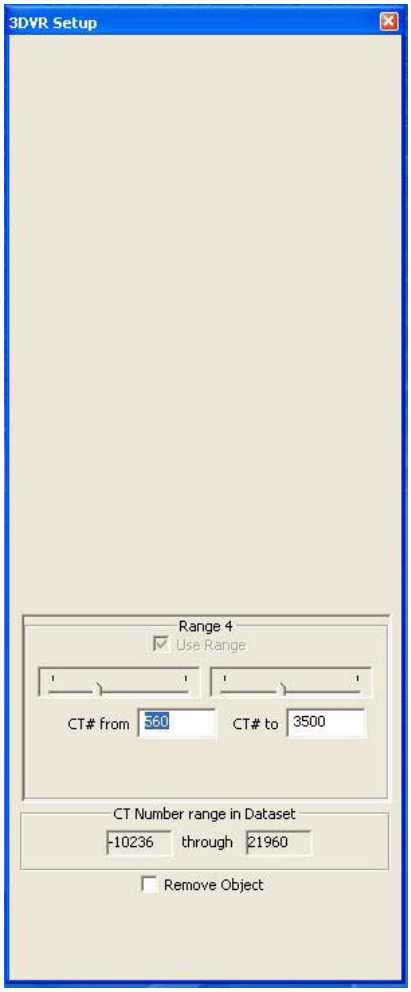
To activate Identify tool:

1. Click **Identify** Box.

   The 3DVR Setup window is displayed and the dense material in the Axial window is highlighted in blue.

2. Drag cursor on 3D image to rotate.





Display the slice range of interest:

3. On the Axial screen, drag the cursor either UP or DOWN to scroll through the axial slices.

   Dragging the cursor upward scrolls towards the top of the skull and ragging downward scrolls towards the bottom of the skull.

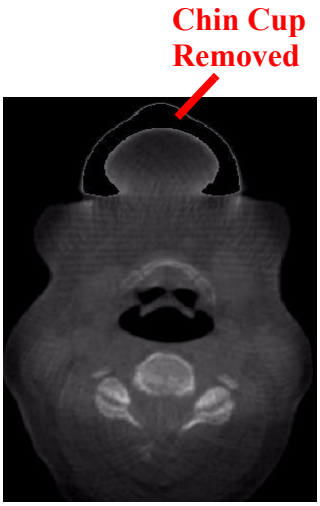
   or

   On the 3DVR Setup screen, select a Range (1 to 4). Ranges are adjusted by using the slide bars or type a new range number in the box.

Remove Object

To remove a piece of anatomy from image:

1. Click the **Remove Object** box to enable (checkmark).
2. Then click the object of interest highlighted in blue.
3. Close 3DVR Setup window by clicking **X** (upper right corner of window).
4. Scroll through the Axial views to verify that the object is removed from the image (was white, now black).



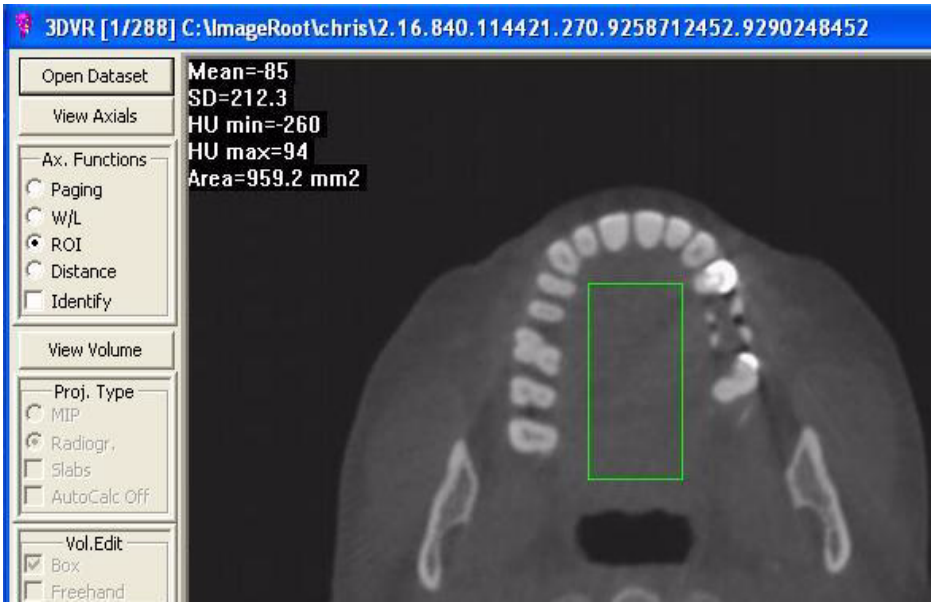
NOTE: Please be aware that any adjoining anatomy or material will also be removed, if there is continuity, or "leakage". This includes any adjoining tissue in the rest of the volume that is not necessarily visible in this particular axial view.

Hounsfield Unit Calibration Offset

Before proceeding to the View Volume functions, first enter a calculated offset into the General Setup for Hounsfield Units. The value that is required is based on the ROI function.

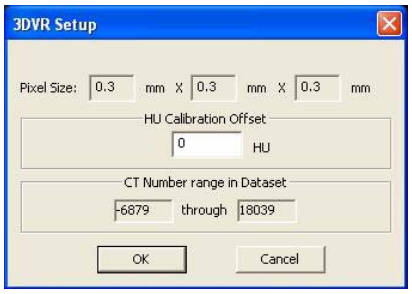
1. Enable the **Paging** button.
2. Scroll to the tongue area in the axial view which is just above the maxillary crowns. (look for a region that has relatively even grayscales).
3. At this location, enable the **ROI** function.

4. Drag the cursor in the area between the dental arch, making sure not to include any teeth or bone. This displays the Hounsfield data.



The **MEAN** value is the data of interest in this calculation. It reads a value (most likely a negative value). Whatever this number is, we want to add a value that will result in the Mean being around positive 50. In this example, the Mean reads -85 and we want the Mean to be +50, therefore the offset calculation will be +135.

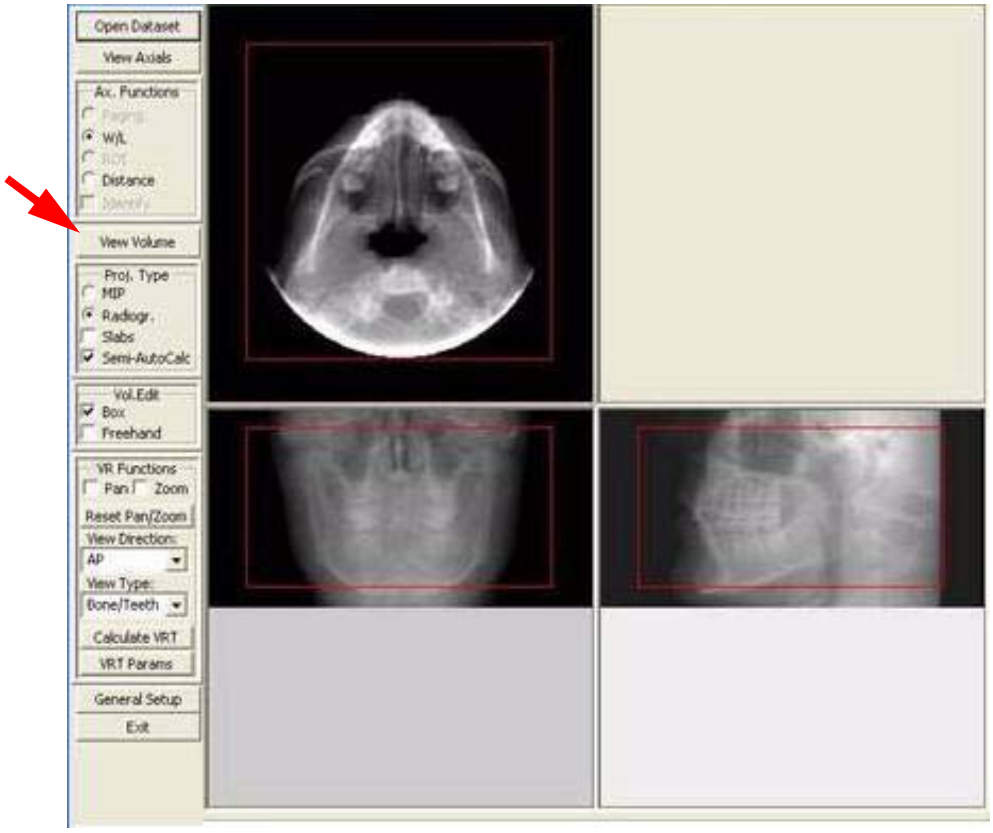
5. Click the **General Setup** button on the menu bar.
6. Enter Calculation Offset which currently has a value of 0.
7. Click **OK**.



View Volume

View Volume allows viewing all 3 projections of the 3D data: Axial, Coronal and Sagittal. Also enables the creation of 3D Renderings.

Enable View Volume Tools, click the **View Volume** button.



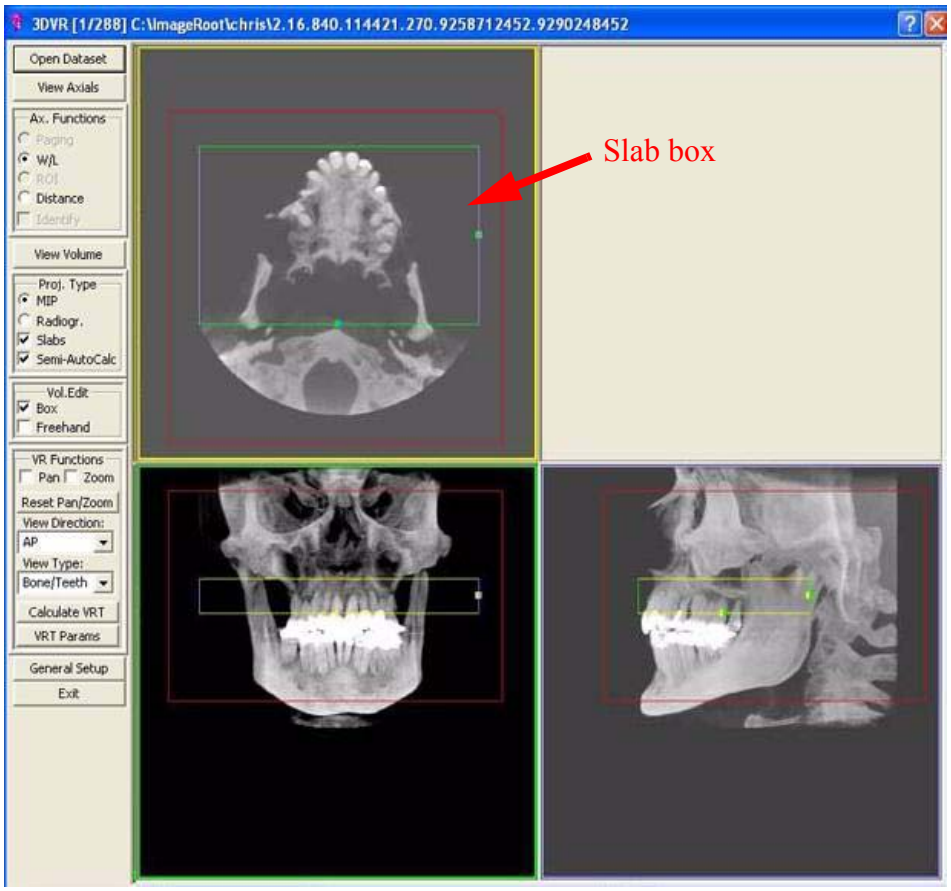
Projection Type

Projection Type enables viewing 3D data in 2 different projections or modes: **Radiographic** and **MIP**.

- **Radiographic** mode - The above example has Radiographic mode enabled. The Axial, Coronal, and Sagittal views are all in Radiographic mode.

NOTE: Window/Level can be adjusted in each of the 3 views by dragging the cursor in each window.

- **MIP** mode - Maximum Intensity Projection (views displayed below.)
- **Slabs** - Displays an additional box in each window which can be sized and moved to change the areas of interest in the other windows.
- **Auto/Semi Auto Calc** - calculates the image displays as the Slab boxes are adjusted.



Volume Edit

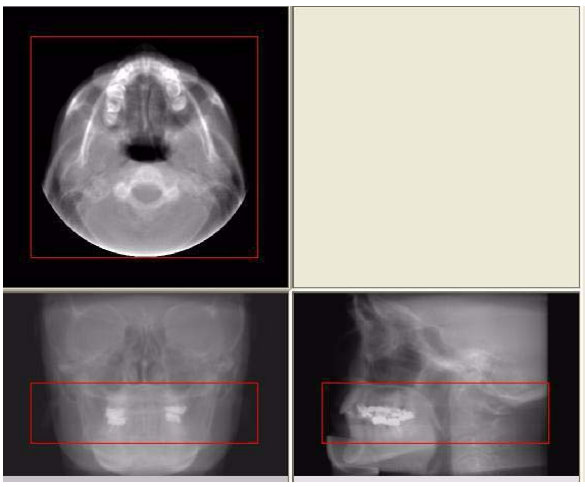
Volume Editing is used to select an area of interest to create a 3D rendering. The two methods used are **Box** and **Freehand**.

- Box - with this option, each of the 3 views are displayed with a red box around the data. Boxes can be resized to select different areas of interest.
- **Freehand -** drag the cursor around an area of interest in the Axial view (see below). This selects a new area of interest in the Coronal and Sagittal views.

Again, the selected data is used to calculate the 3D image. Once the area of interest is determined, the 3D image can be displayed by utilizing the VR Function tools.

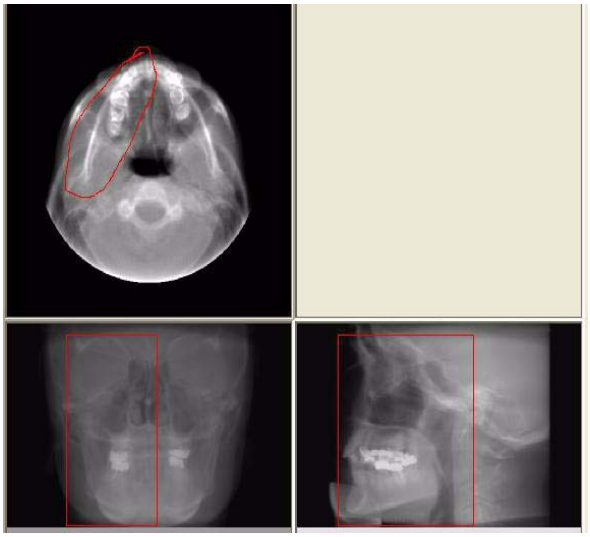
Box Editing

In this sample, we resized the box from the Coronal view to include only a portion of the upper and lower jaw. Note how this resized the matching area in the Sagittal view.



Freehand Editing

In this sample, we used the Freehand tool to draw an area of interest in the Axial view of only the right side of the jaw. Notice how the boxes resized the matching areas in the Coronal and Sagittal views.



VR Functions

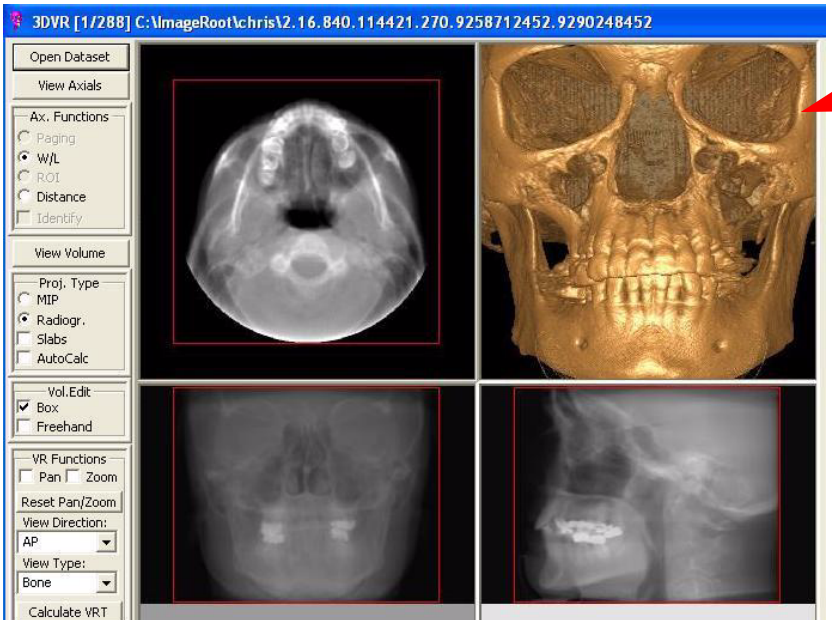
VR Functions (Volume Rendering) is a tool used for selecting the type of 3D image to create.

To Create a 3D Image:

1. From the first **View** drop-down menu select a direction to display. The choices are:
   - AP (Anterior Posterior)
   - PA (Posterior Anterior)
   - LL (Left Lateral)
   - RL (Right Lateral)
   - Up
   - Down

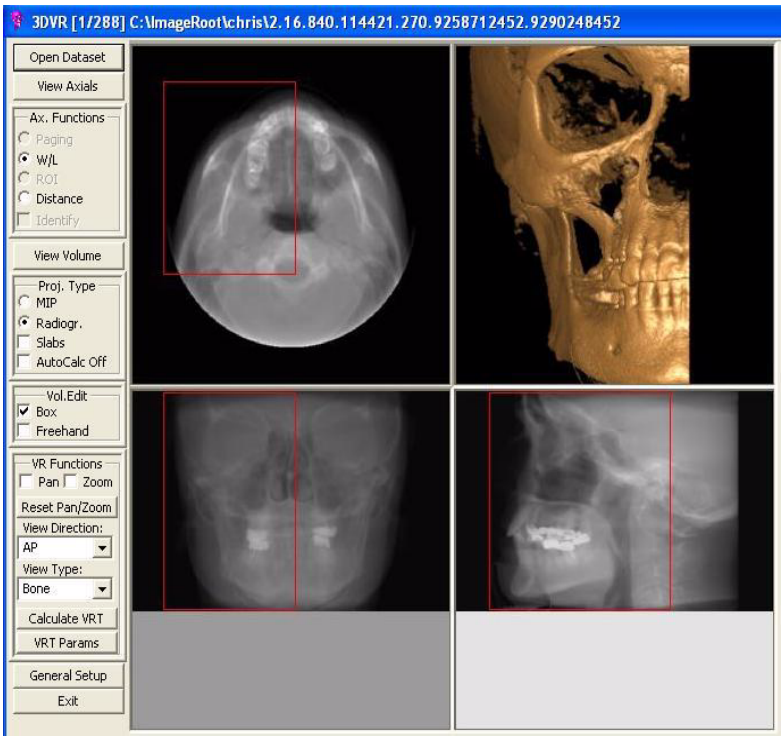
2. From the second **View** drop-down menu select the type of display. The choices are:
   - Bone/Teeth
   - Bone
   - Skin
   - Sinus/Bone
   - TMJ
   - Transparent Skin
3. Click the **Calculate VRT** button.

   This displays the 3D image (upper right box.)



NOTE: Remember that the 3D data is calculated using the boxed or freehand selected areas of interest in the Axial, Coronal & Sagittal views. In this sample, the entire volume data is selected in all 3 views.

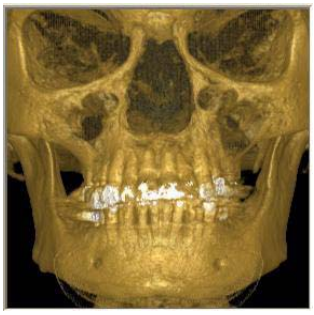
Below is a sample of a 3D image calculated from the selected volume area seen below.



In this sample, only a portion of the volume data is boxed, which is reflected in the 3D image

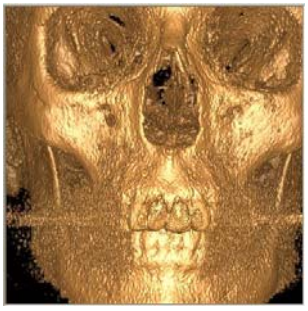
Sample of View Types

Bone/Teeth

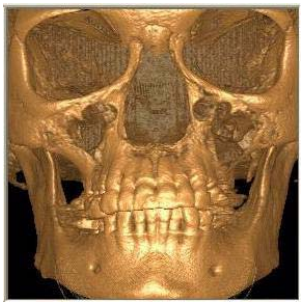


Skin

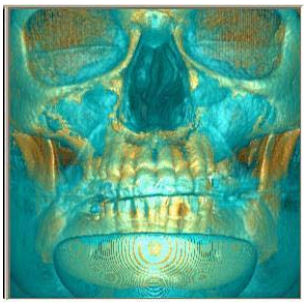
TMJ



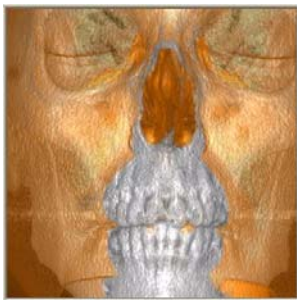
Bone



Sinus/Bone



Transparent Skin

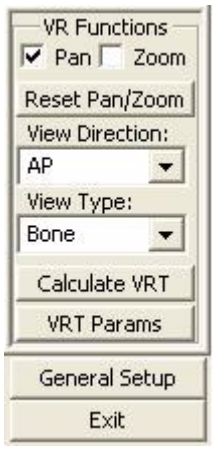


Each View Type has its own Parameters, which can be viewed by clicking the **VRT Params** button.

The 3Dimage can be rotated, enlarged or changed to another direction or type. These functions can be performed from the top right corner viewing area or the 3D image can be enlarged to a Full Screen (Right click on the 3D image and select **View Full Screen**).

PAN

Move the 3D image within the window by dragging cursor on image.



Zoom

Zoom 3D image. Drag cursor on image. UP to Zoom OUT / Down to Zoom IN.

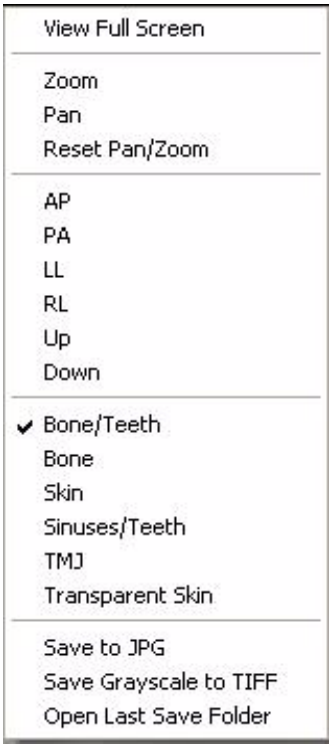
Reset Pan/Zoom

Resets 3D image to original position and size.

Rotate 3D Image

To **Rotate** the 3D image, both the Pan and Zoom functions must be disabled (unchecked). Drag the cursor on the 3D image in the desired rotation direction.

Pop Up Menu



Pop Up Menu contains the same VR Functions and also some additional functions. To access the Pop Up Menu, right click the 3D image.

Save to JPG

Saves full color 3D image in current working folder (adds .jpg extension). The current working folder is the folder opened from the *Open Dataset*.

Save Grayscale to TIFF

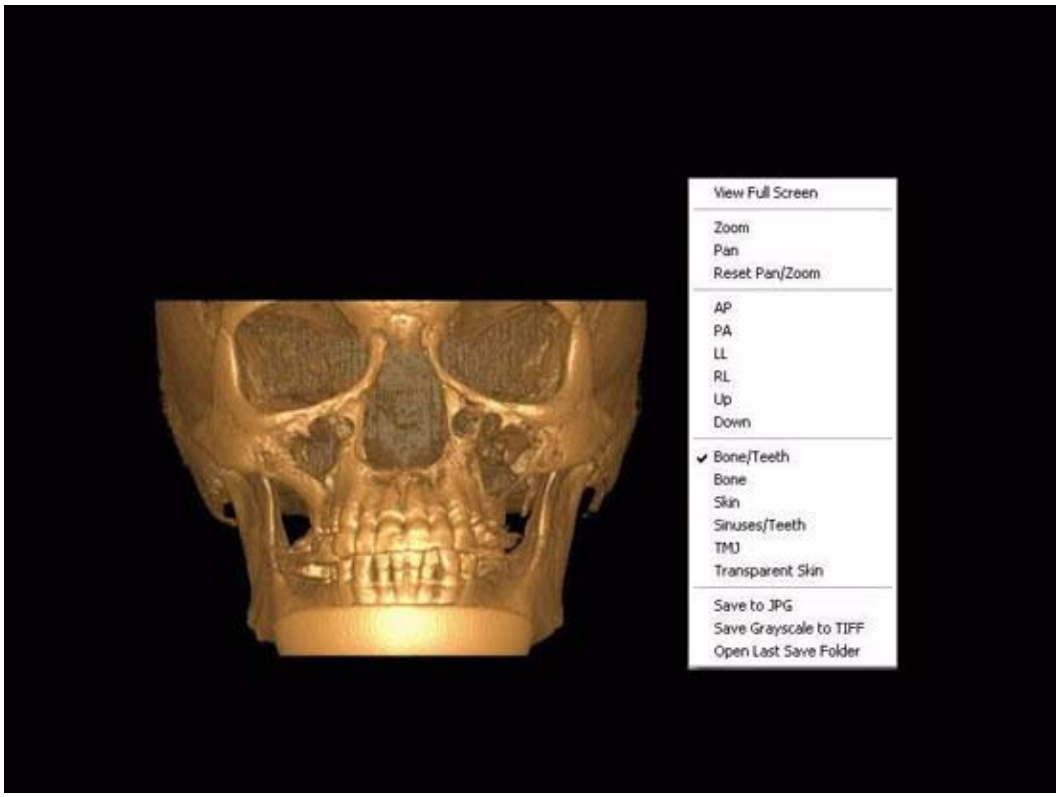
Saves 3D image in current working folder (adds .tiff extension). The current working folder is the folder opened from the *Open Dataset*.

Open Working Folder

Opens the file structure where the JPG and TIFF picture files are saved. The current working folder can be changed.

View Full Screen

Full Screen displays the 3D image on the entire computer screen. All the same manipulation functions and 3D options are used in this display. Right click to display Pop Up menu to utilize functions.



To return to the original viewing format, press <Esc> or select Close from the popup menu.

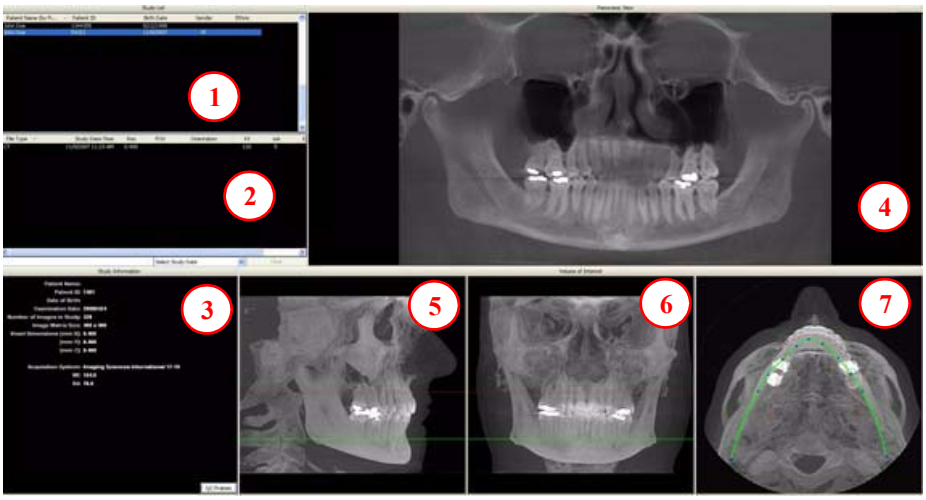
To close the DVR software, click the **EXIT** button at the bottom of the Menu Bar

Quick Reference

Navigating the Interface

This guide shows how to:

- View reconstructed images
- Use main features and tools to optimize an image.



Tools for Viewing this Image

HIDING THE STUDY LIST

Study List can be hidden by selecting **Tools > Hide Study List**. To show, select **Tools > Show Study List**.

CURSOR TOOLS

ROTATION TOOL - Hover cursor over the lower right corner of the desired view. Cursor changes to the rotation tool. This feature is disabled on studies using Tru-Pan.

BRIGHTNESS / CONTRAST TOOL - Drag cursor up, down, left, and right to adjust brightness and contrast. Use Reset Window/Level options on Pop Up menu to reset brightness and contrast settings.

MIP/RADIOGRAPH - The system software enables displaying images as MIP or Radiograph. Move cursor to the top right of any image. The cursor becomes an **M**, toggle a selection.

MAXILLA and MANDIBLE CONTOUR LINES - can be repositioned with a click and drag to the desired location.

REMINDER

Images are displayed as if you are looking at the patient from the front.

TO DISPLAY PATIENT IMAGE

1. Click Patient Name.
2. Click Patient Scans

DISPLAYED VIEWS

3. Patient Study Info
4. PANORAMIC View
   Opens to **IMPLANT** Screen

   Right-click to select Panoramic Method for displaying images.
5. SAGITTAL View
   Opens to **CEPH** Screen
6. CORONAL View
   Opens to **MPR** Screen
7. AXIAL View
   Opens to **TMJ** Screen

MEASUREMENTS

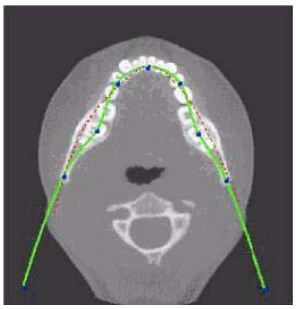
HU Statistics
(Bone Density) Right click a view and select **HU Statistics**. Drag and click to define an area. Statistics appear in upper right corner. A maximum of 4 HU stats can be taken at a time in a normal view and 2 in a cross section view.

Distance
(Linear Measurement) right click a view and select **Distance**. Point, click, drag, and release to draw a line. A measurement in mm appears in upper left corner. A maximum of 9 distance measurements can be taken at a time in a normal view and 4 in a cross section view.

Right click and select **HU Stats** or **Distance** again to turn the tool off

Right click the actual measurement statistic to remove, inactivate, or activate them.

Suggestions for Adjusting Panoramic Map



Start adjusting the Panoramic map from the Preview Screen. It is recommended to center the anterior point at midline and then move the next two points up closer to the anterior point on each side. Place them a few teeth away from anterior center. Then move the next two points closer to the molars.

NOTE: If the Tru-Pan feature is set as the default on your system, you do not need to adjust the panoramic map.

Filtering Defaults

There are already filters applied to all images. The filters are defaulted as seen below.

1. Preview Screen: **Hard** on Panoramic and **Sharpen Mild** for all others.
2. Implant Screen: **Sharpen Mild** on Axial Slice and Cross Sections **- Hard** on Panoramic Map.
3. TMJ Screen: **Hard** for top row images and **Sharpen Mild** for Condyle Ceph Images.
4. MPR Screen: **Sharpen Mild** all images.
5. Ceph Screen: **Sharp** for Upper Left Right Lateral and **Hard** for all others.

These defaults can always be changed by clicking **Tools > Filter Settings > Set Filters.** They can also be changed "on the fly" by right clicking an individual image, selecting **Filter Setting > Set Filter** and clicking the desired option (Smooth, Normal, Hard, Sharp, Very Sharp). They can be changed back to the default by clicking **Tools > Filter Settings > Reset to Default**.

Removing Circumference Artifact

Circumference Artifact are seen visually in the Preview Screens as horizontal lines in the Coronal and Sagittal images and a white partial circle around the axial image. This can be removed from the dataset by right clicking the screen and selecting **Remove Data Outside of Center Scanfield**. The data re-calculates and the image is displayed without that artifact.

Saving and Loading Workups

Created plans can be saved for retrieval. When a plan is changed and an attempt to exit or switch patients is made, the program prompts to save the workup. To save the workup, click **Yes**. A window is displayed to **Create New Workup**. Click this button and enter a new title for the workup or choose an existing workup name (if one) from the list to overwrite. Once the workup is named, click **OK** to save.

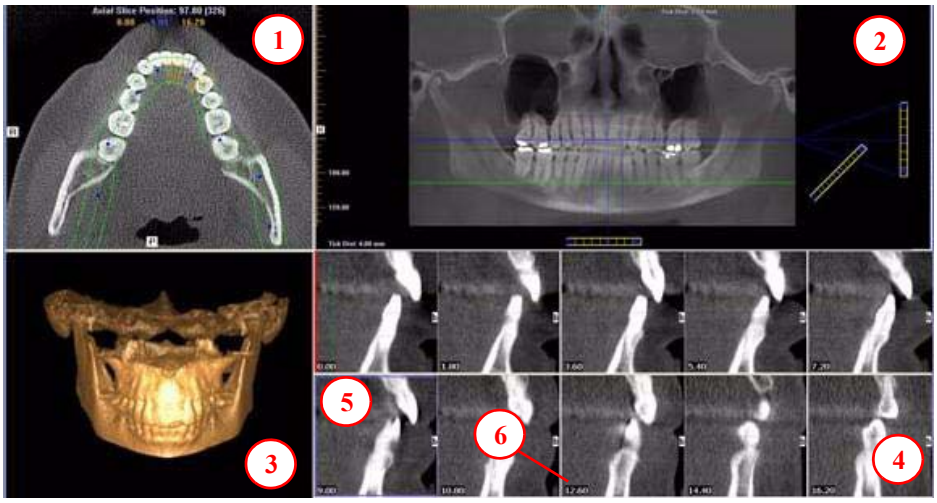
Or, before exiting or switching patients, from the Preview Screen, right click to access the pop up menu and select **Save this Workup**. Then proceed as instructed above.

To load a workup, click a Patient Name, and Patient Image, and then a workup. To select another workup (if there are multiple workups), right click the screen to access the pop up menu and select **Load Different Workup**. Then select the workup from the list.

Keyboard Shortcuts

Alt + **S** - Opens Setup dialog
Alt + **F** - Opens File menu
Alt + **T** - Opens Tools menu
Alt + **R** - Opens Screen menu
Alt + **H** - Opens Help menu

Implant Planning Screen



- Double click an individual Cross Section to zoom in. Double click again to reduce to original size.

LABELS:

The following labels on the images help clarify the orientation of the anatomy:

- R: Right Side (Axial, Pan)
- P: Posterior (Axial)
- B: Buccal (Cross Sections)

POP UP MENUS

Right click views to display a Pop Up menu containing a subset of these options:

- HU Statistics
- Distance
- Display Formats: The default is 5 x 2. The other options are 7 x 3 and 3 x 1.
- Set Filters
- Save as JPEG
- Open Output Folder
- Estimate Nerve Canal

CURSOR TOOLS

- All views, except the 3D Model, have Brightness/Contrast, Rotate, Drag, Zoom and Pan. 3D Model only has Rotate.
- The mouse scroll wheel is active on the Axial Slice Position, 3D Model and Cross Sections to scroll through slices.
- **Back Tool**: to exit out of a planning screen back to the Main Display, move cursor to the very top left corner of screen until **X** is displayed and click. Or click the **Screen** option on the Main Menu bar.

REMINDER

Implant Screen is acquired by double clicking Panoramic View from Preview window or selecting it from the Screen menu.

DISPLAYED VIEWS

1. AXIAL SLICE POSITION
2. PANORAMIC MAP
3. 3D MODEL
4. CROSS SECTIONS
5. Center Slice is outlined in Blue.
6. Slice Location Number

Slice Location numbers start at “0” for center of anatomy or midline. (The “0” slice is outlined in Red). All slices to the patient’s right are negative #’s. All slices to the patient’s left are positive #’s.

Midline is determined by axial map.

PAN TOOLS

1. **Horizontal Tool Bar**
   Drag the center control button of tool left to right to move the slice location of the Cross Sections. The center slice is outlined in Blue on the Cross Sections.

   Drag the right control button of tool to the right to adjust the slice thickness of the Cross Sections.
2. **Diagonal Tool Bar**
   Drag the top control button of the tool to adjust slice thickness of Panoramic View.

   Drag the center control button of the tool to adjust Pan Focal Trough. Not functional with the Tru-Pan feature.

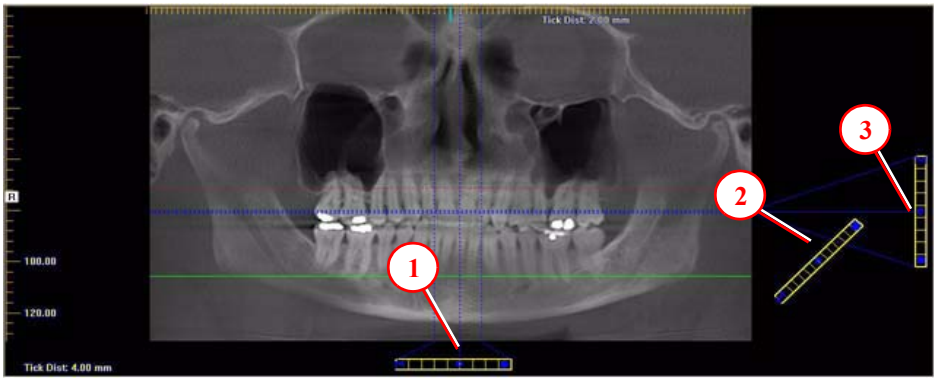
3. **Vertical Tool Bar**
   Drag the control button of the center tool up or down to adjust height of anatomy viewed in the Cross Sections and Axial.

   NOTE: Click the **M** tool to change the Pan view from Radiographic to MIP.

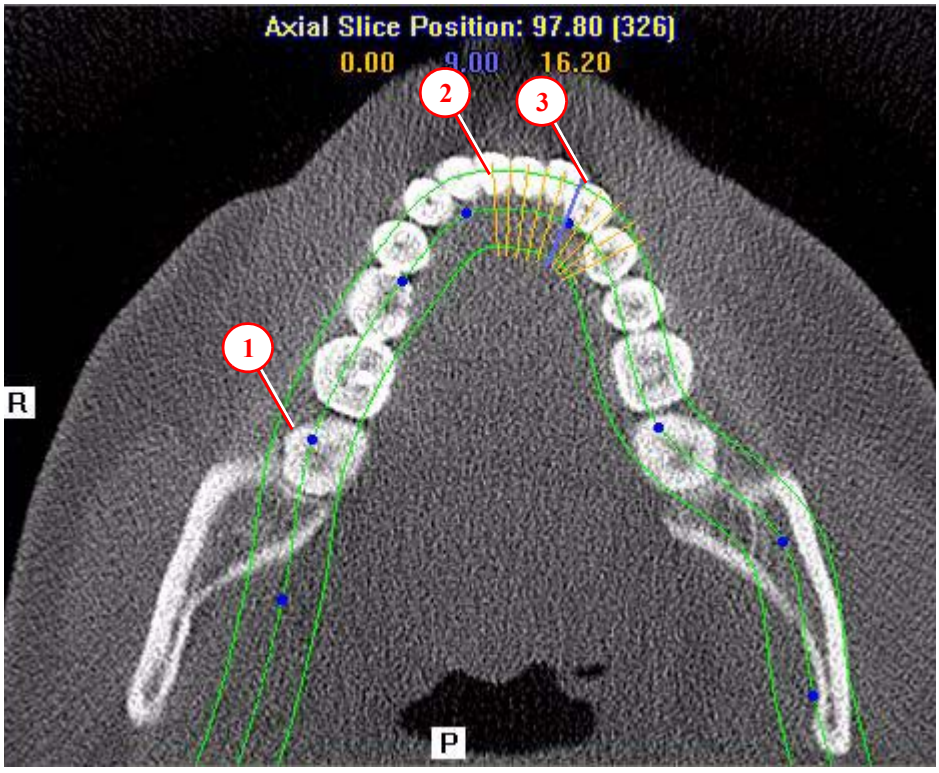
AXIAL TOOLS

1. Drag blue dots to adjust Pan Map.
2. Orange hash marks are Slice Location Indicators.
3. Blue hash mark represents the centerline of the axial slices displayed on the Cross Section views.

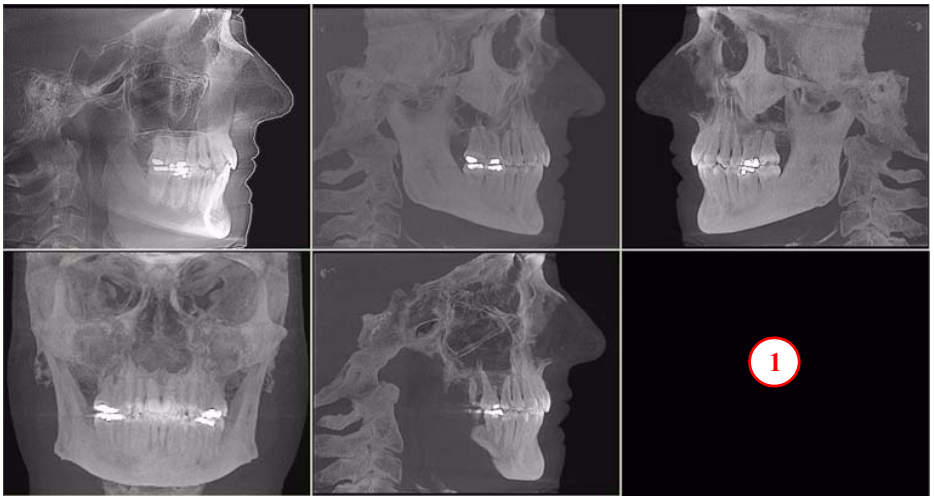
Panoramic Map



Axial Slice Position



Ceph Screen



1. Right click blank screen and select **Tag Airways**. This generates a 3D view of the airways for the patient in the blank view. In addition, the tagged airway data is displayed in the view at the bottom center of the Ceph screen.

REMINDER

Ceph Screen is acquired by double clicking Sagittal View from Preview window or selecting it from the Screen menu.

DISPLAYED VIEWS

The Ceph Screen displays the Lateral Cephs in Radiographic and MIP mode as well as a Coronal View and a Mid Sagittal Slice (15mm thick).

CURSOR TOOLS

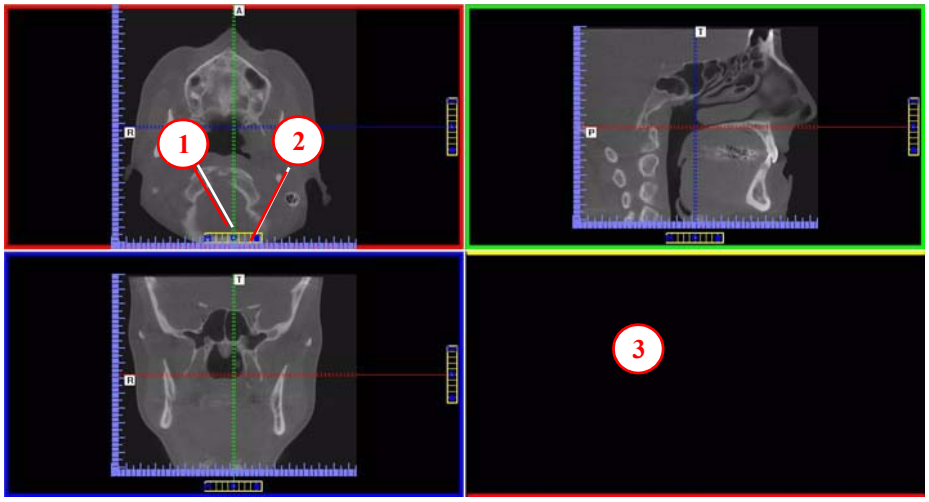
All views have Brightness/Contrast, Zoom and Pan.

POP UP MENUS

Right click to display the Pop Up menu to select:

- Set Filters
- Save as JPEG
- Open Output Folder

MPR Screen



1. Drag center tools from any view to move slice location. The views are colored coded to correlate which view will adjust.
2. Drag tool to the right for horizontal and bottom for vertical bars to adjust slice thickness of the corresponding color coded view.
3. Right click any of the 3 views and select Irregular, Line, or Explore for additional cut planes to be displayed in the blank area.

REMINDER

MPR Screen is acquired by double clicking Coronal View from Preview window or selecting it from the Screen menu.

DISPLAYED VIEWS

The MPR Screen allows scrolling through the Axial, Sagittal, and Coronal Slices. Mouse scroll wheel is active to scroll through slices.

CURSOR TOOLS

All views have Brightness/Contrast, Zoom and Pan.

POP UP MENUS

Right click to display the Pop Up menu to select:

- Irregular
- Line
- HU Statistics
- Distance
- Explore
- Explore Speed
- Set Filters
- Save as JPEG
- Open Output Folder
- Reset Volume Rotation

REMINDER
TMJ Planning Screen is acquired by double clicking Axial View from Preview window or selecting it from the Screen menu.

DISPLAYED VIEWS
TMJ Screen enables condyle mapping and creating corresponding coronal slice views.

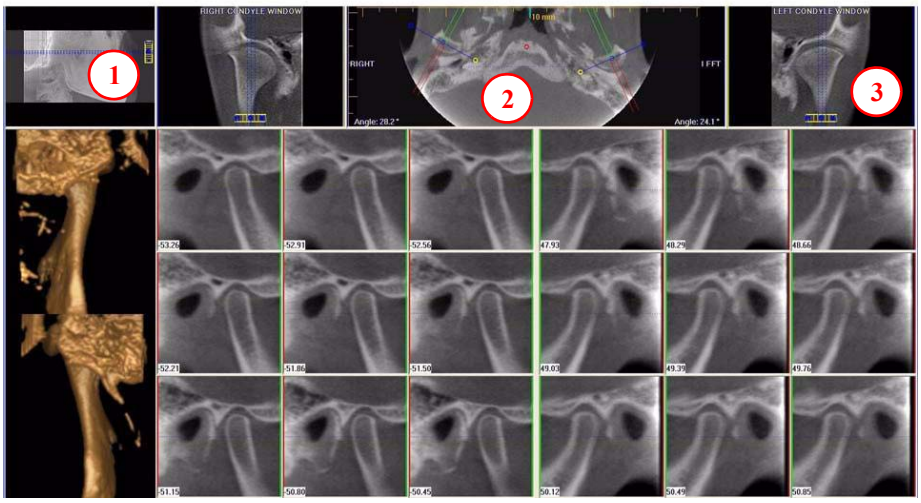
CURSOR TOOLS
All views have Brightness/Contrast, Zoom and Pan.

POP UP MENUS
Right click to display the Pop Up menu to select:

- Set Filters
- Save as JPEG
- Open Output Folder

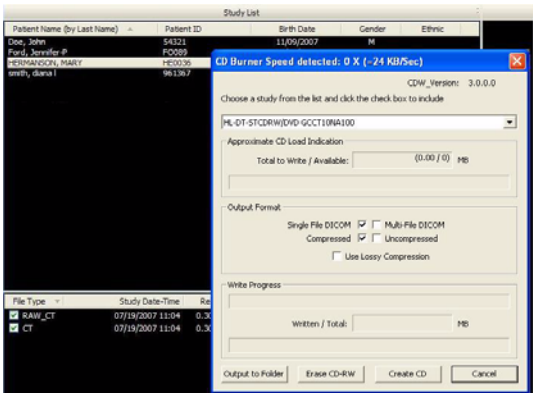
HINT
It may be necessary to first drag the Axial (SMV) view down in the window to see the condyles. Move the cursor to the lower left of the SMV (axial) view until displayed is the "P" for pan tool to drag the image downward.

TMJ Planning Screen



1. Drag center tool to scroll up and down Sagittal view to locate condyles in the Axial view to display condyles properly for mapping.
2. **Create Lateral Slices:**
   Drag **center blue circles** to move condyle map (do this for each condyle)
   Drag **yellow** and **blue** end circles to adjust the angle of each condylar map.
   Green markings indicate anterior to condyle.
   Red marking indicate posterior of condyle.
   Create Coronal Slices: Click red circle on either end map to create Coronal views.
3. **Horizontal Tool Bar:** Drag center tool left to right to move slice location of Cross Section views. Drag tool right to change slice thickness of Cross Section views

Create Export CDs



1. From the top Main menu, select **Tools > Create Export CD**.
2. If you have multiple CD drives, select the hardware from the drop down list. If using a CD-RW and need to erase data, choose Erase CD-RW.
3. Click the patient for burning to CD. If selecting multiple patients, hold down the CTRL key and click on additional patients. All highlighted patients are copied to the CD.
4. Click **Create CD** in CD burner window. A message is displayed when the burn is complete and the CD ejects.

NOTE:
Make sure to Save Workups before attempting to burn to a CD,

Install Case Studies from CDs

The program will auto-run when the CD is inserted into the computer drive. The User can choose to install the program and the case(s) Permanently or Temporarily. Once installed, the program opens and the new case is highlighted in the study list and ready to be loaded. Just click the patient name.

Appendix
D System Labels

English

Symbol	Descriptions	Locations
	Emergency Stop	Patient Emergency Stop, Control Box
	General Warning	Control Box, X-Ray Source, Gantry, Chair Assembly, Rear Overhead, Chair Gate, X-Ray Power Supply
	Laser	X-Ray Source, Gantry, Patient Alignment Panel
	Power	Control Box, Front Overhead
	Ready	Control Box, Front Overhead
	Seat Weight	Seat Assembly
	Fault	Control Box, Front Overhead
	Warning Ionizing Radiation	Control Box
	Follow Operating Instructions for Use	Control Box
	X-Ray Radiation	Control Box
	Turns Unit On Turns Unit Off Start the Scan	Control Box
	Seat Height Adjustment	Patient Alignment Panel

Symbol	Descriptions	Locations
	Maximum Lifting Capacity	Chair Assembly
	X-Ray On X-Ray On Lamp Fuse	Control Box, Front Overhead Rear Overhead
	Pinch Point	Seat Assembly, Chair Gate
	Warning Electrical Hazard	Rear Overhead
	Type B (Body) applied part complies with IEC 60601-1	Rear Overhead
	Non-Ionizing Radiation	Rear Overhead
	Recycle	Rear Overhead
	Chair Cable	Rear Overhead
	Control Box Cable	Rear Overhead
	Interlock Cable	Rear Overhead
	Warning Cable	Rear Overhead
	Network Cable to Workstation Computer Cable	Rear Overhead

Symbol	Descriptions	Locations
	Breaker Switch On/ Off	Rear Overhead
	Output for Interlock	Rear Overhead
	AC In	Rear Overhead
	Manufactured For Manufactured By Model No. Serial No.	Tube Head Assembly, X-Ray Power Supply, X-Ray Controller, Beam Limiter, Rear Overhead, Leg

Symbol	Descriptions	Locations
	Interlock Fuse	Rear Overhead
	X-Ray Supply Fuse	Rear Overhead
	Fuse	Rear Overhead
	Continuous: Intermittent	Rear Overhead, X-Ray Power Supply

Label	Location
Emergency Stop	Patient Emergency Stop
Caution: This X-ray unit may be dangerous to patient and operator unless safe exposure factors and operating procedure are observed. Unauthorized use is prohibited.	Control Box
Caution: Laser Radiation Do Not Stare Into Beam **<1mW 635nm Class II Laser Product**	X-Ray Source
Caution Laser Radiation Do Not Stare Into Beam **<1mW 670nm Class II Laser Product**	Gantry
Maximum Lifting Capacity **≤ 182 KG (≤400 Lbs)**	Chair Assembly
Warning Pinch Point **Keep Hands Clear** **Seat Weighs 6.8 KG (15 lbs)**	Seat Assembly
Modes of Operation: Continuous & Intermittent	Rear Overhead
Warning Pinch Point **Keep Hands Clear**	Chair Gate
Modes of Operation: Continuous & Intermittent **Complies with IEC 60601-2-7 and IEC 60601-2-28** **Capacitor Has >300VDC** **Wait 5 Minutes for Capacitor Discharge before Handling** **Do Not Use Grounded Test Equipment on this Unit**	X-Ray Power Supply
Do Not Use with i-CAT Scan **Only Use with i-PAN Scan** **Push to Release Label**	i-PAN Head Positioner

Français

Symbole	Descriptions	Emplacement
	chaiseArrêt d'urgence	d'arrêt d'urgence pour le patient, boîtier de commande
	avertissement général	boîtier de commande, source de rayons X, portique, chaise, ensemble supérieur arrière, porte de chaise, bloc d'alimentation des rayons X
	laser	source de rayons X, portique, panneau d'alignement du patient
	alimentation	boîtier de commande, ensemble supérieur avant
	prêt	boîtier de commande, ensemble supérieur avant
	poids du siège	siège
	défaillance	boîtier de commande, ensemble supérieur avant
	avertissement de rayonnement ionisant	boîtier de commande
	suivre le mode d'emploi	boîtier de commande
	rayonnement de rayons X	boîtier de commande
	met l'appareil en marche éteint l'appareil lance lascannérisation	boîtier de commande

Symbol	Descriptions	Emplacement
	capacité maximale de levage	chaise
	rayons X activés fusible de voyant des rayons X en marche	boîtier de commande, ensemble supérieur avant ensemble supérieur arrière
	point de pincement	siège, porte de chaise
	avertissement de danger électrique	ensemble supérieur arrière
	Le partie appliqué type B (corps) conforme à la norme CEI 60601-1	ensemble supérieur arrière
	rayonnement non ionisant	ensemble supérieur arrière
	recycler	ensemble supérieur arrière
	câble de chaise	ensemble supérieur arrière
	câble de boîtier de commande	ensemble supérieur arrière
	câble d'interverrouillage	ensemble supérieur arrière
	Câble d'avertissement	ensemble supérieur arrière

Symbole	Descriptions	Emplacement
	réglage de la hauteur du siège	panneau d'alignement du patient
	disjoncteur marche/ arrêt	ensemble supérieur arrière
	sortie pour interverrouillage	ensemble supérieur arrière
	entrée c.a.	ensemble supérieur arrière
	Fabriqué pour Fabriqué par N° de modèle N° de série	ensemble de tête de tube, bloc d'alimentation des rayons X, contrôleur de rayons X, limiteur de faisceau, ensemble supérieur arrière, jambe

Symbol	Descriptions	Emplacement
	Câble réseau vers câble d'ordinateurde poste de travail	ensemble supérieur arrière
	fusible d'interverrouillage	ensemble supérieur arrière
	fusible d'alimentation des rayons X	ensemble supérieur arrière
	fusible	ensemble supérieur arrière
	Continu : Intermittent	ensemble supérieur arrière, bloc d'alimentation des rayons X

Étiquettes	Emplacement
D'arrêt d'urgence	d'arrêt d'urgence pour le patient
Attention : Cette unité à rayons X peut poser des dangers pour le patient et l'opérateur, sauf si des facteurs d'exposition et une procédure d'exploitation sans danger sont observés. Une utilisation non autorisée est interdite.	boîtier de commande
Attention : rayonnement laser, ne pas regarder dans le faisceau Produit laser <1mW 635nm Classe II	source de rayons X
Attention : rayonnement laser, ne pas regarder dans le faisceau Produit laser <1mW 670nm Classe II	portique
Capacité maximale de levage ≤ 182 kg	chaise
Avertissement de point de pincement Dégager les mains Le siège pèse 6,8 kg	siège
Modes de fonctionnement : Continu et Intermittent	ensemble supérieur arrière
Avertissement de point de pincement Dégager les mains	porte de chaise
Modes de fonctionnement : Continu et Intermittent Conforme aux normes IEC 60601-2-7 et IEC 60601-2-28 Le condensateur a une tension de >300 V c.c. Attendre 5 minutes que le condensateur se décharge avant manipulation Ne pas utiliser l'équipement d'essai mis à la terre sur cet appareil	bloc d'alimentation des rayons X
Ne pas utiliser avec les scannérisations i-CAT Utiliser avec les scannérisations i-PAN seulement Étiquette Appuyer pour dégager	positionneur de tête i-PAN

Deutsch

Symbol	Beschreibung	Standort
	Notausschalter	Patienten Notausschalter, Steuereinheit
	Allgemeine Warnung	Steuereinheit, Röntgenquelle, Gantry, Stuhl-Bauteil, Rückseite Overhead-Einheit, Stuhlschranke, Röntgenstrahlen-Stromversorgung
	Laser	Röntgenquelle, Gantry, Patienten-Ausrichtungskonsole
	Stromversorgung	Steuereinheit, Vorderseite Overhead-Einheit
	Bereit	Steuereinheit, Vorderseite Overhead-Einheit
	Gewicht Sitz	Sitz-Bauteil
	Fehler	Steuereinheit, Vorderseite Overhead-Einheit
	Warnung vor ionisierender Strahlung	Steuereinheit
	Bedienungsanleitung befolgen	Steuereinheit
	Röntgenstrahlung	Steuereinheit
	Schaltet Gerät ein Schaltet Gerät aus Startet den Scan	Steuereinheit
	Sitzhöhenverstellung	Patienten-Ausrichtungskonsole
	Unterbrechungsschalter Ein/Aus	Rückseite Overhead-Einheit

Symbol	Beschreibung	Standort
	Maximale Hebekapazitat	Stuhl-Bauteil
	Röntgen ein Sicherung Lampe Röntgen ein	Steuereinheit, Vorderseite Overhead-Einheit Rückseite Overhead-Einheit
	Quetschgefahr	Sitz-Bauteil, Stuhlschranke
	Warnung Stromschlaggefahr	Rückseite Overhead-Einheit
	Typ B (körper) die teilweise im Einklang mit IEC 60601-1	Rückseite Overhead-Einheit
	Nicht-ionisierende Strahlung	Rückseite Overhead-Einheit
	Recycling	Rückseite Overhead-Einheit
	Stuhlkabel	Rückseite Overhead-Einheit
	Kabel Steuereinheit	Rückseite Overhead-Einheit
	Kabel Verriegelung	Rückseite Overhead-Einheit
	Kabel Warnung	Rückseite Overhead-Einheit
	Netzwerkkabel zur Workstation Computerkabel	Rückseite Overhead-Einheit
	Sicherung Verriegelung	Rückseite Overhead-Einheit

Symbol	Beschreibung	Standort
	Ausgang für Verriegelung	Rückseite Overhead-Einheit
	Eingangsspannung	Rückseite Overhead-Einheit
	Hergestellt für Hergestellt von Modell-Nr. Serien-Nr.	Röhrenkopfbaugruppe, Röntgenstrahlen-Stromversorgung, Röntgen-Steuereinheit, Strahlenbegrenzer, Rückseite Overhead-Einheit, Standfuß

Symbol	Beschreibung	Standort
	Sicherung Röntgen-Versorgung	Rückseite Overhead-Einheit
	Sicherung	Rückseite Overhead-Einheit
	Kontinuierlich: Intermittierend	Rückseite Overhead-Einheit, Röntgenstrahlen-Stromversorgung

Etiketten	Standort
Notausschalter	Patienten-Notausschalter
Achtung: Wenn die Bestimmungen für sichere Aufnahmebedingungen und die Bedienungshinweise nicht beachtet werden, kann vom Röntgengerät möglicherweise eine Gefahr für Patienten und Bediener ausgehen. Verwendung nur durch autorisierte Personen.	Steuereinheit
Achtung: Laserstrahlung - nicht in den Laserstrahl blicken <1mW 635 nm Klasse II Laserprodukt	Röntgenquelle
Laserstrahlung - nicht in den Laserstrahl blicken <1mW 670 nm Klasse II Laserprodukt	Gantry
Maximale Hebekapazität ≤ 182 kg (≤ 400 lbs)	Stuhl-Bauteil
Warnung Quetschgefahr Hände fernhalten Sitz wiegt 6,8 kg (15 lbs)	Sitz-Bauteil
Betriebsarten: Kontinuierlich & Intermittierend	Rückseite Overhead-Einheit
Warnung Quetschgefahr Hände fernhalten	Stuhlschranke
Betriebsarten: Kontinuierlich & Intermittierend Entspricht Normen IEC 60601-2-7 und IEC 60601-2-28 Kondensator hat >300 V DC Vor Manipulationen 5 Minuten warten, bis sich Kondensator entladen hat Keine geerdeten Testgeräte an dieser Einheit verwenden	Röntgenstrahlen-Stromversorgung
Nicht mit i-CAT-Scan verwenden Nur mit i-PAN-Scan verwenden Etikett Zum Entriegeln drücken	i-PAN Kopf-Positionierer

Italiano

Simbolo	Descrizione	Località
	Arresto di emergenza	arresto di emergenza, quadro comandi
	Attenzione generale	quadro comandi, sorgente di raggi X, Gantry, gruppo poltrona, parte posteriore del gruppo sopraelevato, barra mobile della poltrona, X-Ray alimentazione raggi X
	Laser	sorgente di raggi X, Gantry, pannello di allineamento del paziente
	Alimentazione	quadro comandi, parte anteriore del gruppo sopraelevato
	Pronto	quadro comandi, parte anteriore del gruppo sopraelevato
	Peso del sedile	gruppo sedile
	Guasto	quadro comandi, parte anteriore del gruppo sopraelevato
	Attenzione radiazioni ionizzanti	quadro comandi
	Per l'uso seguire leistruzioni operative	quadro comandi
	Radiazione a raggi X	quadro comandi
	Accende l'unità Spegne l'unità Avvia la scansione	quadro comandi
	Regolazione altezza sedile	pannello di allineamento del paziente

Simbolo	Descrizione	Località
	Capacità massima di sollevamento	gruppo poltrona
	Raggi X attivati Fusibile segnale luminoso	quadro comandi, parte anteriore del gruppo sopraelevato parte posteriore del gruppo sopraelevato
	Pericolo di schiacciamento	gruppo sedile, barra mobile della poltrona
	Avvertenza Pericolo di natura elettrica	parte posteriore del gruppo sopraelevato
	Le parte applicate Tipo B (corpo) conforme alla norma IEC 60601-1	parte posteriore del gruppo sopraelevato
	Radiazione non ionizzante	parte posteriore del gruppo sopraelevato
	Riciclare	parte posteriore del gruppo sopraelevato
	Cavo poltrona	parte posteriore del gruppo sopraelevato
	quadro comandi Cable	parte posteriore del gruppo sopraelevato
	Cavo interblocco	parte posteriore del gruppo sopraelevato
	Attenzione Cavo	parte posteriore del gruppo sopraelevato
	Cavo di collegamento tra rete e postazione computer	parte posteriore del gruppo sopraelevato

Simbolo	Descrizione	Località
	Interruttore On/Off (acceso/spento)	parte posteriore del gruppo sopraelevato
	Uscita per interblocco	parte posteriore del gruppo sopraelevato
	Ingresso CA	parte posteriore del gruppo sopraelevato
	Prodotta per Prodotta da N. modello N. serie	gruppo testa del tubo, alimentazione raggi X, unità di controllo raggi X, limitatore del fascio, parte posteriore del gruppo sopra-elevato, piede

Simbolo	Descrizione	Località
	Fusibile interblocco	parte posteriore del gruppo sopraelevato
	Fusibile erogazione raggi X	parte posteriore del gruppo sopraelevato
	Fusibile	parte posteriore del gruppo sopraelevato
	Continuo: intermittente	parte posteriore del gruppo sopra-elevato, alimenta-zione raggi X

Etichette	Località
Arresto di emergenza	Arresto di emergenza per il paziente
Attenzione: questa unità a raggi X può essere pericolosa per il paziente e l'operatore se non sono osservate le procedure d'uso e i fattori per un'esposizione sicura. È vietato l'uso da parte di persone non autorizzate.	quadro comandi
Attenzione: Radiazione laser Evitare l'esposizione diretta degli occhi <1mW 635 nm Prodotto laser di Classe II	sorgente di raggi X
Attenzione Radiazione laser Evitare l'esposizione diretta degli occhi <1mW 670 nm Prodotto laser di Classe II	Gantry
Capacità massima di sollevamento ≤ 182 kg (≤ 400 LB)	gruppo poltrona
Attenzione Pericolo di schiacciamento Attenzione alle mani Il sedile pesa 6,8 kg (15 lbs)	gruppo sedile
Modalità di funzionamento: continuo e intermittente	parte posteriore del gruppo sopraelevato
Attenzione Pericolo di schiacciamento Attenzione alle mani	barra mobile della poltrona
Modalità di funzionamento: continuo e intermittente Conforme alle normative IEC 60601-2-7 e IEC 60601-2-28 **Il condensatore è caricato con >300 VCC Attendere 5 minuti per far scaricare il condensatore prima di toccarlo con le mani** **Non utilizzare apparecchiature di test collegate a massa su questa unità**	alimentazione raggi X
Non utilizzare con i-CAT Scan Utilizzare esclusivamente con i-PAN Scan Etichetta Premere per il rilascio	posizionatore testa i-PAN

Polski

Symbol	Opis	Położenie
	Wyłącznik awaryjny	awaryjnego wyłącznika pacjenta, Panel sterujący
	Ogólne ostrzeżenie	Panel sterujący, Aparat rtg, Gantry, Fotel, Z tyłu u góry, Brama fotela, Zasilanie aparatu rtg
	Laser	Aparat rtg, Gantry, Panel ustawiania pacjenta
	Zasilanie	Panel sterujący, Z przodu u góry
	Gotowość	Panel sterujący, Z przodu u góry
	Ciężar fotela	Siedzisko
	Błąd	Panel sterujący, Z przodu u góry
	Warning Ionizing Radiation	Panel sterujący
	Postępować wg instrukcji użytkowania	Panel sterujący
	Promieniowanie rentgenowskie	Panel sterujący
	Włącza urządzenie Wyłącza urządzenie Rozpoczyna skanowanie	Panel sterujący
	Regulacja wysokości fotela	Panel ustawiania pacjenta
	Przełącznik przerywacza Wł./ Wył	Z tyłu u góry

Symbol	Opis	Położenie
	Maksymalna nośność	Fotel
	Aparat rtg włączony Bezpiecznik kontrolki pracy aparatu rtg	Panel sterujący, Z przodu u góry Z tyłu u góry
	Ryzyko zmiażdżenia	Siedzisko, Brama fotela
	Ostrzeżenie:Niebezpieczeństwo porażenia prądem	Z tyłu u góry
	Typ B (ciało) stosowane części jest zgodny z normą IEC 60601-1	Z tyłu u góry
	Promieniowanie niejonizujące	Z tyłu u góry
	Nie wyrzucać. Przetwarzać ponownie	Z tyłu u góry
	Przewód fotela	Z tyłu u góry
	Przewód panelu sterujący	Z tyłu u góry
	Przewód blokady	Z tyłu u góry
	Przewód ostrzegawczy	Z tyłu u góry
	Kabel sieciowy łączący ze stacją roboczą	Z tyłu u góry
	Bezpiecznik blokady	Z tyłu u góry

Symbol	Opis	Położenie
	Wyjście dla blokady	Z tyłu u góry
	Gniazdo zasilania	Z tyłu u góry
	Wyprodukowanych dla Produkowane przezy Nr modelu Numer seryjny	Tubus, zasilanie aparatu rtg, kontroler rtg, ogranicznik wiązki, z tyłu u góry, podpórka

Symbol	Opis	Położenie
	Bezpiecznik zasilania aparatu rtg	Z tyłu u góry
	Bezpiecznik	Z tyłu u góry
	Tryby działania: Ciągły i przerywanyt	Z tyłu u góry, Zasilanie aparatu rtg

Oznaczenia	Położenie
Wyłącznik awaryjny	Awaryjnego wyłącznika pacjenta
Przestroga: Urządzenie RTG może być niebezpieczne dla pacjenta i operatora w razie nieprzestrzegania instrukcji obsługi. Nie wolno obsługiwać tego systemu bez odpowiedniego przeszkolenia w zakresie danej procedury.	Panel sterujący
Uwaga: Promieniowanie laserowe. Nie patrzeć prosto w wiązkę. <1mW 635 nm Urządzenie laserowe klasy II	Aparat rtg
Nie patrzeć prosto w wiązkę. <1mW 670 nm Urządzenie laserowe klasy II	Gantry
Maksymalna nośność≤ 182 kg (≤ 400 funtów)	Fotel
Ostrzeżenie: ryzyko zmiażdżenia Nie wkładać rąk Fotel waży 6,8 kg (15 funtów)	Siedzisko
Tryby działania: Ciągły i przerywany	Z tyłu u góry
Ostrzeżenie: ryzyko zmiażdżenia Nie wkładać rąk	Brama fotela
Tryby działania: Ciągły i przerywany Zgodny z normami IEC 60601-2-7 i IEC 60601-2-28 Napięcie kondensatora wynosi >300V(DC) Poczekać 5 min na rozładowanie się kondensatora przed jego obsługą. Nie używać uziemionych urządzeń kontrolnych na tym urządzeniu	Zasilanie aparatu rtg
Nie używać w skanowaniu i-CAT Używać tylko w skanowaniu i-PAN Oznaczenie Wciśnij, by zwolnić	Uchwyt głowy i-PAN

Português

Símbolo	Descrição	Local
	Parada de emergência	Parada de emergência do paciente, Painel de controle
	Aviso geral	Painel de controle, Fonte de raios X, Gantry, Unidade da cadeira, Painel superior traseiro, Acesso à cadeira, Fonte de aliment-ação de raios X
	Laser	Fonte de raios X, Gantry, Painel de alinhamento do paciente
	Alimentação	Painel de controle, Painel frontal superior
	Pronto	Painel de controle, Painel frontal superior
	Peso do encosto	Unidade do encosto
	Falha	Painel de controle, Painel frontal superior
	Atenção: Radiação ionizante	Painel de controle
	Siga as instruções de operação e usoe	Painel de controle
	Radiação X	Painel de controle
	Liga a unidade Desliga a unidade Inicia a varredura	Painel de controle
	Ajuste da altura do encosto	Painel de alinhamento do paciente

Símbolo	Descrição	Local
	Capacidade de elevação máxima	Unidade da cadeira
	Raio X ligado Fusível da lâmpada de raios X ligado	Painel de controle, Painel frontal superior Painel superior traseiro
	Ponto de esmagamento	Unidade do encosto, Acesso à cadeira
	Atenção: risco de choque elétrico	Painel superior traseiro
	A parte aplicada Tipo B (corpo) cumpre com a norma IEC60601-1	Painel superior traseiro
	Radiação não-ionizante	Painel superior traseiro
	Reciclar	Painel superior traseiro
	Cabo da cadeira	Painel superior traseiro
	Cabo do Painel de controle	Painel superior traseiro
	Cabo de bloqueio	Painel superior traseiro
	Cabo de alarme	Painel superior traseiro
	Cabo de rede para cabo do computador da estação de trabalho	Painel superior traseiro

Símbolo	Descrição	Local
	Liga/desliga disjuntor	Painel superior traseiro
	Saída para cabo de bloqueio	Painel superior traseiro
	Entrada de CA	Painel superior traseiro
	Fabricado por Fabricado para N° do modelo N° de série	Unidade do cabeçote do tubo, fonte de alimentação de raios X, controlador de raios X, painel superior traseiro, extensões

Símbolo	Descrição	Local
	Fusível de bloqueio	Painel superior traseiro
	Fusível de fonte de raios X	Painel superior traseiro
	Fusível	Painel superior traseiro
	Contínuo: Intermitente	Painel superior traseiro, Fonte de alimentação de raios X

Etiquetas	Local
Parada de emergência	Parada de emergência do paciente no painel
Cuidado: Se os fatores de exposição e procedimentos operacionais de segurança não forem observados, esta unidade de raio X pode ser perigosa para o paciente e operador. Proibido o uso não autorizado.	Painel de controle
Cuidado: Radiação de laser. Não olhe diretamente para o feixe. Laser <1mW 635nm Classe II	Fonte de raios X
Cuidado. Radiação de laser. Não olhe diretamente para o feixe. Laser <1mW 670nm Classe II	Gantry
Capacidade de elevação máxima ≤ 182 kg (≤ 400 lbs)	Unidade da cadeira
Atenção: ponto de esmagamento Mantenha as mãos afastadas O encosto pesa 6,8 kg (15 lbs)	Unidade do encosto
Modos de operação: Contínuo e intermitente	Painel superior traseiro
Atenção: ponto de esmagamento Mantenha as mãos afastadas	Acesso à cadeira
Modos de operação: Contínuo e intermitente Compatível com IEC 60601-2-7 e IEC 60601-2-28 O capacitor possui >300 Vcc Espere 5 minutos para o capacitor descarregar antes de manuseá-lo Não utilize equipamento de teste aterrado com esta unidade	Fonte de alimentação de raios X
Não utilizar com tomógrafo i-CAT Utilizar com tomógrafo i-PAN somente Pressione para liberar a etiqueta	Posicionador do cabeçote i-PAN

Español

Símbolo	Descripción	Ubicaciones
	Parada de urgencia	Parada de urgencia del paciente, Cuadro de control
	Advertencia general	Cuadro de control, Fuente de rayos X, Estructura de soporte, Montaje de la silla, Parte superior posterior, Puerta de la silla, Fuente de alimentación de rayos X
	Láser	Fuente de rayos X, Estructura de soporte, Alineación del paciente
	Encendido	Cuadro de control, Parte superior frontal
	Preparado	Cuadro de control, Parte superior frontal
	Peso del asiento	Montaje del asiento
	Fallo	Cuadro de control, Parte superior frontal
	Advertencia de radiación ionizante	Cuadro de control
	Siga las instrucciones de funcionamiento	Cuadro de control
	Radiación de rayos X	Cuadro de control
	Activa la unidad Desactiva la unidad Inicia la exploración	Cuadro de control
	Ajunste de la altura del asiento	Alineación del paciente

Símbolo	Descripción	Ubicaciones
	Capacidad máxima de elevación	Montaje de la silla
	Rayos X activados Fusible del indicador luminoso de rayos X activados	Cuadro de control, Parte superior frontal Parte superior posterior
	Punto de compresión	Montaje del asiento, Puerta de la silla
	Advertencia de riesgo eléctric	Parte superior posterior
	La parte aplicada Tipo B (cuerpo) cumple con las normas IEC60601-1	Parte superior posterior
	Radiación no ionizante	Parte superior posterior
	Reciclaje	Parte superior posterior
	Cable de la silla	Parte superior posterior
	Cable del cuadro de control	Parte superior posterior
	Cable de bloqueo	Parte superior posterior
	Cable de advertencia	Parte superior posterior
	Cable de red a la estación de trabajo, cable informático	Parte superior posterior

Símbolo	Descripción	Ubicaciones
	Interruptor de encendido y apagado	Parte superior posterior
	Salida de bloqueo	Parte superior posterior
	Entrada de CA	Parte superior posterior
	Fabricado para Fabricado por Nº de modelo Nº de serie	Montaje del cabezal del tubo, fuente de alimentación de rayos X, controlador de rayos X, limitador del haz, parte superior posterior, pie de soporte

Símbolo	Descripción	Ubicaciones
	Cable de bloqueo	Parte superior posterior
	Fusible de la fuente de alimentación de rayos X	Parte superior posterior
	Fusible	Parte superior posterior
	Continuo: Intermitente	Parte superior posterior, Fuente de alimentación de rayos X

Etiqueta	Ubicacione
Parada de urgencia	Parada de urgencia del paciente
Precaución: Esta unidad de rayos X podría ser peligrosa para el paciente y el usuario salvo que se siga el procedimiento operativo y los factores de exposición segura. Queda prohibido el uso no autorizado.	Cuadro de control
Precaución: radiación láser; no mire fijamente el haz de luz. **Producto láser de clase II, <1mW 635 nm**	Fuente de rayos X
Precaución: radiación láser; no mire fijamente el haz de luz. **Producto láser de clase II, <1mW 670 nm**	Estructura de soporte
Capacidad máxima de elevación ≤ 182 kg (≤ 400 lb.)	Montaje de la silla
Advertencia de punto de compresión Mantenga las manos alejadas **El peso del asiento es de 6,8 kg (15 lb.)**	Montaje del asiento
Modos de funcionamiento: continuo e intermitente	Parte superior posterior
Advertencia de punto de compresión **Mantenga las manos alejadas**	Puerta de la silla
Modos de funcionamiento: continuo e intermitente **Cumple las normativas IEC 60601-2-7 y IEC 60601-2-28** **El condensador dispone de >300 V de CC** **Conceda 5 minutos a la descarga del condensador antes de manipularlo** **No use equipos de prueba conectados a tierra en esta unidad**	Fuente de alimentación de rayos X
No lo utilice con el escáner i-CAT Utilícelo únicamente con el escáner i-PAN **Etiqueta Pulsar para soltar**	Posicionador del cabezal i-PAN

Svenska

Symbol	Beskrivning	Platser
	Nödstopp	Nödstoppspanel för patient, Kontrollbox
	Allmän varning	Kontrollbox, Röntgenstrålkälla, Ställning, Stolenhet, Ovandelens baksida, Stolgrind, Röntgenströmförsörjning
	Laser	Röntgenstrålkälla, Ställning, Inriktningspanel för patient
	Ström	Kontrollbox, Ovandelens framsida
	Klar	Kontrollbox, Ovandelens framsida
	Stolens vikt	Stolenhet
	Fel	Kontrollbox, Ovandelens framsida
	Varning om joniserande strålning	Kontrollbox
	Följ bruksanvisningen	Kontrollbox
	Röntgenstrålning	Kontrollbox
	Slår på enheten Slår av enheten Startar skanningen	Kontrollbox
	Justering av stolshöjdt	Inriktningspanel för patient
	Automatsäkringen På/Av	Ovandelens baksida

Symbol	Beskrivning	Platser
	Max. lyftkapacitet	Stolenhet
	Röntgen PÅ Lampsäkring för Röntgen PÅ	Kontrollbox, Ovandelens framsida Ovandelens baksida
	Klämpunkt	Stolenhet, Stolgrind
	Varning för elektrisk risk	Ovandelens baksida
	Typ B (Kropp) som delvis överensstämmer med IEC 60601-1	Ovandelens baksida
	Icke-joniserande strålning	Ovandelens baksida
	Återvinning	Ovandelens baksida
	Stolkabel	Ovandelens baksida
	Kabel för Kontrollbox	Ovandelens baksida
	Förreglingskabel	Ovandelens baksida
	Varning – kabel	Ovandelens baksida
	Nätverkskabel till	Ovandelens baksida
	Förreglingssäkring	Ovandelens baksida

Symbol	Beskrivning	Platser
	Utgång för förregling	Ovandelens baksida
	Växelström in	Ovandelens baksida
	Tillverkad för Tillverkad av Modellnr Serienr	Rörets huvudenhet, röntgenströmförsörjningen, röntgenstyrenheten, strålbegränsaren, ovandelens baksida, ben

Symbol	Beskrivning	Platser
	Röntgen-tillförselsäkring	Ovandelens baksida
	Säkring	Ovandelens baksida
	Kontinuerligt: Intermittent	Ovandelens baksida, Röntgenströmförsörjning

Etikett	Plats
Nödstopp	Nödstoppspanel för patient
OBS! Denna röntgenapparat kan vara farlig för patient och operatör om inte säkra exponeringsfaktorer och driftsprocedurer iakttas. Obehörig användning är förbjuden.	Kontrollbox
Var försiktig! Laserstrålning – titta INTE in i strålen **<1mW 635nm laserprodukt, klass II**	Röntgenstrålkälla
Var försiktig! Laserstrålning – titta inte in i strålen **<1mW 670nm laserprodukt, klass II**	Ställning
Max. lyftkapacitet **≤ 182 kg (≤ 400 pund)**	Stolenhet
Varning – klämpunkt **Håll händerna fria** **Stolen väger 6,8 kg (15 pund)**	Stolenhet
Funktionslägen: Kontinuerligt och Intermitten	Ovandelens baksida
Varning – klämpunkt **Håll händerna fria**	Stolgrind
Funktionslägen: Kontinuerligt och Intermittent **Uppfyller kraven i IEC 60601-2-7 och IEC 60601-2-28** **Kondensator har >300 V likström** **Vänta 5 minuter för urladdning av kondensatorn före hantering** **Använd ej jordad testutrustning på denna enhet**	Röntgenströmförsörjning
Använd EJ med i-CAT-scan Använd endast med i-PAN-scan **Tryck för att lösgöra etikett**	i-PAN huvudpositionerare

简体中文 *(Chinese)*

符号	描述	位置
	紧急停止	病人紧急停止、控制箱
	常规警告	控制箱、 X 射线源、台架、椅装置、背顶架、椅挡板、X 射线电源
	激光	X 射线源、台架、病人校准面板
	电源	控制箱、前顶架
	就绪	控制箱、前顶架
	椅重	椅装置
	故障	控制箱、前顶架
	电离辐射警告	控制箱
	遵守使用操作说明	控制箱
	X 射线辐射	控制箱
	打开装置 关闭装置 启动扫描	控制箱
	椅高调节	病人校准面板
	断路器开 / 关	背顶架
	联锁输出	背顶架

符号	描述	位置
	最大承重量	椅装置
	X 射线开 X 射线开指示灯 保险丝	控制箱、前顶架 背顶架
	夹点	椅装置、椅挡板
	电力危险警告	背顶架
	B 型 （ 身体 ）适用于部分符合国际电工委员会 60601-1	背顶架
	非电离辐射	背顶架
	回收	背顶架
	椅电缆	背顶架
	控制箱电缆	背顶架
	联锁电缆	背顶架
	电缆警告	背顶架
	连接工作站计算机电缆的网络电缆	背顶架
	联锁保险丝	背顶架
	X 射线源保险丝	背顶架

符号	描述	位置
	交流输入	背顶架
	客户 制造商 型号 序列号	管头装置、 X 射线电源、 X 射线控制器、限束器、背顶架及支脚
		腿

符号	描述	位置
	保险丝	背顶架
	持续：间断	背顶架、 X 射线电源

标签	位置
紧急停止	病人紧急停止
注意：使用此 X 射线装置时，必须遵守安全曝光因数与操作程序，否则可能会对病人与操作员造成危害。未经授权严禁使用。	控制箱
注意：激光辐射，请勿直视射线 <1mW 635nm II 类激光产品	X 射线源
注意：激光辐射，请勿直视射线 <1mW 670nm II 类激光产品	台架
最大承重量 ≤ 182 公斤 (≤400 磅)	椅装置
夹点警告 手勿接触 椅重 6.8 公斤 (15 磅)	椅装置
操作模式：持续与间断	背顶架
夹点警告 手勿接触	座位挡板
操作模式：持续与间断 符合 IEC 60601-2-7 与 IEC 60601-2-28 电容器电压 >300VDC 操作前请等 5 分钟以便电容器放电 请勿在此装置上使用 "接地测试设备"	X 射线电源
请勿使用 i-CAT 扫描 只能使用 i-PAN 扫描 按下以释放标签	i-PAN 磁头定位器

繁體中文 *(Taiwan)*

符號	描述	位置
	緊急停止	病患緊急停止、控制箱
	一般警告	控制箱、X 光源、台架、椅裝置、背頂架、椅擋板以及 X 光電源
	雷射	X 光源、台架、病患校準面板
	電源	控制箱、前頂架
	就緒	控制箱、前頂架
	椅重	椅裝置
	故障	控制箱、前頂架
	游離輻射警告	控制箱
	遵守使用操作說明	控制箱
	X 光輻射	控制箱
	開啟裝置 關閉裝置 啟動掃瞄	控制箱
	椅高調節	病患校準面板
	斷路器開 / 關	背頂架
	聯鎖輸出	背頂架
	交流輸入	背頂架

符號	描述	位置
	最大起重量	椅裝配
	X 光開 X 光開指示燈 保險絲	控制箱、前頂架 背頂架
	夾點	椅裝置、椅擋板
	電力危險警告	背頂架
	B 型（身體）適用於部分符合國際電工委員會 60601-1	背頂架
	非游離輻射	背頂架
	回收	背頂架
	椅纜線	背頂架
	控制箱纜線	背頂架
	聯鎖纜線	背頂架
	纜線警告	背頂架
	連線工作站電腦纜線的網路纜線	背頂架
	聯鎖保險絲	背頂架
	X 光源保險絲	背頂架
	保險絲	背頂架

符號	描述	位置
	製造商為 由製造 型號 序號	管頭裝配、X 光電源、X 光控制器、限束器、背頂架及支腳

符號	描述	位置
	持續：間斷	背頂架、X 光電源

標籤	位置
緊急停止	病患緊急停止
注意：使用此 **X** 光裝置時，必須遵守安全曝光因數與操作程序，否則可能會對病患與操作員造成危害。未經授權嚴禁使用。	控制箱
注意：雷射輻射，請勿直視光 **<1mW 635nm II** 類雷射產品	X 光源
注意：雷射輻射，請勿直視光 **<1mW 670nm II** 類雷射產品	台架
最大起重量 **≤ 182** 公斤 **(≤400** 磅 **)**	椅裝配
夾點警告 手勿接觸 椅重 **6.8** 公斤 **(15** 磅 **)**	椅裝配
操作模式：持續與間斷	背頂架
夾點警告 手勿接觸	椅擋板
操作模式：持續與間斷 符合 **IEC 60601-2-7** 與 **IEC 60601-2-28** 電容器電壓 **>300VDC** 操作前請等 **5** 分鐘以便電容器放電 請勿在此裝置上使用 「接地測試裝置」	X 光電源
請勿使用 **i-CAT** 掃瞄 只能使用 **i-PAN** 掃瞄 按下以釋放標籤	i-PAN 磁頭定位器

한국어 *(Korean)*

기호	설명	위치
	비상 정지	환자 비상 정지 , 제어 상자
	일반 경고	제어 상자 , X- 선 광원 , 갠트리 , 의자 조립체 , 뒤쪽 머리 위 , 의자 출입문 , X- 선 전원 공급기
	레이저	X- 선 광원 , 갠트리 , 환자 위치 조정 패널
	전원	제어 상자 , 앞쪽 머리 위
	준비됨	제어 상자 , 앞쪽 머리 위
	좌석 무게	좌석 조립체
	고장	제어 상자 , 앞쪽 머리 위
	경고 . 이온화 방사선	제어 상자
	사용 설명서에 따라 사용할 것	제어 상자
	X- 선 방출	제어 상자
	장치 켜기 장치 끄기 스캔 시작	제어 상자
	좌석 높이 조정	환자 위치 조정 패널
	회로 차단기 켜기 / 끄기	뒤쪽 머리 위
	연동 장치 출력	뒤쪽 머리 위

기호	설명	위치
	최대 하중 능력	의자 조립체
	X- 선 켜짐 X- 선 켜짐 램프 퓨즈	제어 상자 , 앞쪽 머리 위 뒤쪽 머리 위
	틈새 주의	좌석 조립체 , 의자 출입문
	경고 . 전기 위험	뒤쪽 머리 위
	타입 B (바디) IEC 60601-1 준수와 일부 적용	뒤쪽 머리 위
	비이온화 방사선	뒤쪽 머리 위
	재활용	뒤쪽 머리 위
	의자 케이블	뒤쪽 머리 위
	제어 상자 케이블	뒤쪽 머리 위
	연동 장치 케이블	뒤쪽 머리 위
	경고 . 케이블	뒤쪽 머리 위
	네트워크 케이블에서 워크스테이션 컴퓨터 케이블	뒤쪽 머리 위
	연동 장치 퓨즈	뒤쪽 머리 위
	X- 선 공급 퓨즈	뒤쪽 머리 위

기호	설명	위치
	AC 입력	뒤쪽 머리 위
	제조 의뢰사 제조사 모델 번호 일련 번호	튜브 헤드 조립체 , X- 선 전원 공급기 , X- 선 제어기 , 빔 제한 장치 , 뒤쪽 머리 위 , 다리

기호	설명	위치
	퓨즈	뒤쪽 머리 위
	연속 : 간헐	뒤쪽 머리 위 , X- 선 전원 공급기

레이블	위치
비상 정지	환자 비상 정지
주의 : 이 **X-** 선 장비는 안전 노출 계수와 사용 설명서를 따르지 않을 경우 환자와 조작자에게 위험할 수 있습니다 . 비인가 사용은 금지됩니다 .	제어 상자
주의 : 레이저 방출 . 빛을 똑바로 쳐다보지 말 것 **<1mW 635nm** 클래스 **II** 레이저 장비	X- 선 광원
주의 . 레이저 방출 . 빛을 똑바로 쳐다보지 말 것 **<1mW 670nm** 클래스 **II** 레이저 장비	갠트리
최대 하중 능력 **≤ 182 KG (≤400 Lbs)**	의자 조립체
경고 . 틈새 주의 손을 가까이 하지 말 것 의자 무게 **6.8 KG (15 lbs)**	좌석 조립체
작동 모드 : 연속 , 간헐	뒤쪽 머리 위
경고 . 틈새 주의 손을 가까이 하지 말 것	의자 출입문
작동 모드 : 연속 , 간헐 **IEC 60601-2-7** 및 **IEC 60601-2-28** 을 준수함 축전기 전압 **>300VDC** 다루기 전에 **5** 분 동안 축전기가 방전되기를 기다릴 것 이 장치에 접지된 검사 장비를 사용하지 말 것	X- 선 전원 공급기
i-CAT 스캔과 함께 사용하지 말 것 반드시 **i_PAN** 스캔과 함께 사용할 것 눌러서 분리 레이블	i-PAN 머리 위치 조정기

日本語 *(Japanese)*

シンボル	説明	場所
	緊急停止	患者緊急停止、コントロールボックス
	一般警告	コントロールボックス、X 線照射源、ガントリー、チェアアッセンブリ、後部オーバーヘッド、チェアゲート、X 線電源装置
	レーザー	X 線照射源、ガントリー、患者位置調整パネル
	電源	コントロールボックス、前部オーバーヘッド
	準備完了	コントロールボックス、前部オーバーヘッド
	座席重量	シートアッセンブリ
	エラー	コントロールボックス、前部オーバーヘッド
	イオン照射に注意	コントロールボックス
	操作ガイドに従ってください	コントロールボックス
	X 線照射	コントロールボックス
	ユニットオン ユニットオフ スキャン開始	コントロールボックス
	座席の高さ調整	患者位置調整パネル
	ブレーカースイッチオン / オフ	後部オーバーヘッド
	インターロックへ出力	後部オーバーヘッド

シンボル	説明	場所
	最大リフト能力	チェアアッセンブリ
	X 線オン X 線オンランプ ヒューズ	コントロールボックス、前部オーバーヘッド 後部オーバーヘッド
	ピンチポイント	シートアッセンブリ、チェアゲート
	感電に注意	後部オーバーヘッド
	タイプ B （ボディ）IEC 60601 から 1 に準拠一部適用されます	後部オーバーヘッド
	非イオン照射	後部オーバーヘッド
	リサイクル	後部オーバーヘッド
	チェアケーブル	後部オーバーヘッド
	コントロールボックスケーブル	後部オーバーヘッド
	インターロックケーブル	後部オーバーヘッド
	警報ケーブル	後部オーバーヘッド
	ワークステーションコンピュータケーブルにつながるネットワークケーブル	後部オーバーヘッド
	インターロックヒューズ	後部オーバーヘッド
	X 線供給ヒューズ	後部オーバーヘッド

シンボル	説明	場所
	AC イン	後部オーバーヘッド
	販売元 製造元 モデル番号 シリアル番号	チューブヘッドアッセンブリ、X 線電源装置、X 線コントローラ、ビームリミッタ、後部オーバーヘッド、レッグ

シンボル	説明	場所
	ヒューズ	後部オーバーヘッド
	継続 断続	後部オーバーヘッド、X 線電源装置

ラベル	場所
緊急停止	患者緊急停止
注意 このX線ユニットは、安全照射要項や操作安全手順に従わない場合、患者や作業員に危険をもたらす可能性があります。許可のない使用厳禁	コントロールボックス
注意 レーザー照射 – レーザー光線を直視しないでください <1mW 635nm Class II レーザー製品	X 線照射源
注意 レーザー照射 – レーザー光線を直視しないでください <1mW 670nm Class II レーザー製品	ガントリー
最大リフト能力 ≤ 182 KG (≤400 Lbs)	チェアアッセンブリ
ピンチポイントに注意 手を近づけないでください 座席重量 6.8 KG (15 lbs)	シートアッセンブリ
操作モード 継続および断続	後部オーバーヘッド
ピンチポイントに注意 手を近づけないでください	チェアゲート
操作モード 継続および断続 IEC 60601-2-7、IEC 60601-2-28 に適合 キャパシタ容量 >300VDC 操作を始める前にキャパシタが放電するまで 5 分お待ちください このユニットに接地テスト機器を使用しないでください	X 線電源装置
i-CAT スキャンと併用しないでください i-PAN スキャンのみを使用してください ラベルリリース (押す)	i-PAN ヘッドポジショナー

Česky

Symbol	Popis	Umístění
	Nouzové zastavení	Nouzový vypínač pacienta, ovládací skříňka
	Všeobecné varování	Ovládací skříň, RTG zdroj, otočný portál, blok sedačky, zadní strana horního modulu, zábrana sedačky, napájení rentgenu
	Laser	RTG zdroj, otočný portál, ovládací panel polohy pacienta
	Napájení	Ovládací skříňka, čelní část horního modulu
	Připraveno	Ovládací skříňka, čelní část horního modulu
	Hmotnost sedáku	Blok sedáku
	Závada	Ovládací skříňka, čelní část horního modulu
	Varování – ionizující záření	Ovládací skříňka
	Dodržujte pokyny k obsluze	Ovládací skříňka
	RTG záření	Ovládací skříňka
	Zapnutí přístroje Vypnutí přístroje Spuštění snímkování	Ovládací skříňka
	Nastavení výšky sedáku	Ovládací panel polohy pacienta
	Vypínač jističe	Na zadní straně horního modulu

Symbol	Popis	Umístění
	Maximální nosnost	Blok sedačky
	RTG spuštěn Pojistka rentgenky	Ovládací skříňka, čelní část horního modulu Na zadní straně horního modulu
	Může dojít k přiskřípnutí	Blok sedáku, zábrana sedačky
	Varování: Nebezpečí zásahu elektrickým proudem	Na zadní straně horního modulu
	Části v kontaktu s pacientem: typ B, odpovídá IEC 60601-1	Na zadní straně horního modulu
	Neionizující záření	Na zadní straně horního modulu
	Recyklujte	Na zadní straně horního modulu
	Kabel sedačky	Na zadní straně horního modulu
	Kabel ovládací skříňky	Na zadní straně horního modulu
	Kabel pojistky dveří	Na zadní straně horního modulu
	Kabel varovného systému	Na zadní straně horního modulu
	Síťový kabel k prac. stanici Kabel počítače	Na zadní straně horního modulu
	Pojistka pojistného okruhu dveří	Na zadní straně horního modulu

Symbol	Popis	Umístění
	Výstup pro pojistku dveří	Na zadní straně horního modulu
	Vstup síť. napájení	Na zadní straně horního modulu
	Výrobce Vyrobeno pro Č. modelu Sériové č.	blok rentgenkové hlavice, napájení rentgenu, řídicí jednotka rentgenu, omezovač paprsku, zadní strana horního modulu, noha přístroje

Symbol	Popis	Umístění
	Pojistka napájení rentgenu	Na zadní straně horního modulu
	Pojistka	Na zadní straně horního modulu
	Průběžný Přerušovaný	Zadní strana horního modulu, napájecí zdroj rentgenu

Štítek	Umístění
Nouzové zastavení	Nouzový vypínač pacienta
Upozornění: Pokud nedodržíte pokyny k použití a bezpečné expoziční parametry, tento rentgenový přístroj může být nebezpečný pro pacienta i obsluhu. Použití neoprávněnými osobami je zakázáno.	Ovládací skříňka
Upozornění: Laserové záření – nedívejte se do paprsku <1mW 635 nm – laserový výrobek II. třídy	RTG zdroj
Upozornění: Laserové záření – nedívejte se do paprsku <1mW 670 nm – laserový výrobek II. třídy	Otočný portál
Maximální nosnost ≤ 182 kg	Blok sedačky
Varování: Může dojít k přiskřípnutí Nesahejte na mechanismus **Hmotnost sedačky 6,8 kg**	Blok sedáku
Provozní režimy: kontinuální a přerušovaný	Na zadní straně horního modulu
Varování: Může dojít k přiskřípnutí Nesahejte na mechanismus	Zábrana sedačky
Provozní režimy: kontinuální a přerušovaný **Splňuje požadavky norem IEC 60601-2-7 a IEC 60601-2-28** **Kondenzátor nabit na >300 VDC** **Před manipulací vyčkejte 5 minut, než se kondenzátor vybije** **U této jednotky nepoužívejte uzemněné testovací nástroje**	napájecí zdroj rentgenu
Nepoužívejte při snímkování v režimu i-CAT **Pouze ke snímkování v režimu i-PAN** **Štítek uvolňovací páčky**	Polohovací mechanismus opěrky hlavy pro režim i-PAN

Nederlands

Symbool	Beschrijvingen	Locaties
	Noodstop	Noodstop voor patiënt, bedieningseenheid
	Algemene waarschuwing	Bedieningseenheid, röntgenbron, portaal, stoel, overhead achter, stoelpoort, röntgenvoedingstoevoer
	Laser	Röntgenbron, portaal, patiëntuitlijningspaneel
	Voeding	Bedieningseenheid, Overhead voor
	Klaar	Bedieningseenheid, Overhead voor
	Gewicht stoel	Stoel
	Storing	Bedieningseenheid, Overhead voor
	Waarschuwing ioniserende straling	Bedieningseenheid
	Volg bedieningsinstructies voor gebruik	Bedieningseenheid
	Röntgenstraling	Bedieningseenheid
	Schakelt apparaat in Schakelt apparaat uit Begint de scan	Bedieningseenheid
	Aanpassing stoelhoogte	Patiëntuitlijningspaneel
	Beveiligingsschakelaar Aan/Uit	overheadgedeelte achter

Symbool	Beschrijvingen	Locaties
	Maximaal hefvermogen	Stoel
	Zekering voor lampje Zekering voor lampje "Röntgenstraling AAN"	Bedieningseenheid, Overhead voor Overhead achter
	Klemgevaar	Stoel, stoelpoort
	Waarschuwing elektrisch gevaar	overheadgedeelte achter
	Type B (Frame) toegepast onderdeel voldoet aan IEC 60601-1	overheadgedeelte achter
	Non-ioniserende straling	overheadgedeelte achter
	Recyclen	overheadgedeelte achter
	Kabel van stoel	overheadgedeelte achter
	Kabel bedieningseenheid	overheadgedeelte achter
	Beveiligingskabel	overheadgedeelte achter
	Waarschuwingskabel	overheadgedeelte achter
	Netwerkkabel naar werkstationcomputer kabel	overheadgedeelte achter
	Beveiligingszekering	overheadgedeelte achter

Symbool	Beschrijvingen	Locaties
	Output voor beveiliging	overheadgedeelte achter
	Wisselstroom in	overheadgedeelte achter
	Vervaardigd voor Vervaardigd door Modelnummer Serienummer	Röntgenkop, röntgenvoeding, röntgenbediening, straalbegrenzer, overhead achter, poot

Symbool	Beschrijvingen	Locaties
	Zekering röntgenvoeding	overheadgedeelte achter
	Zekering	overheadgedeelte achter
	Continu : intermitterend	Overhead achter, röntgenvoeding

Etiket	Locatie
Noodstop	Noodstop voor patiënt
Voorzichtig: Dit röntgenapparaat kan gevaarlijk zijn voor de patiënt en de bediener, tenzij veilige blootstellingsfactoren en bedieningsprocedures in acht worden genomen. Onbevoegd gebruik is verboden.	Bedieningseenheid
Voorzichtig: Laserstralen: niet in de straal kijken <1mW 635 nm Klasse II Laserproduct	Röntgenbron
Voorzichtig: Laserstralen: niet in de straal kijken <1mW 670 nm Klasse II Laserproduct	Portaal
Maximaal hefvermogen ≤ 182 kilo	Stoel
Waarschuwing Klemgevaar Handen uit de buurt houden Stoel weegt 6,8 kg	Stoel
Gebruiksmodi: Continu en intermitterend	overheadgedeelte achter
Waarschuwing Klemgevaar Handen uit de buurt houden	Stoelpoort
Gebruiksmodi: Continu en intermitterend Voldoet aan IEC 60601-2-7 en IEC 60601-2-28 Condensator heeft >300 VDC Wacht 5 minuten tot de condensator is ontladen voordat u deze hanteert Geen geaarde testapparatuur met deze eenheid gebruiken	voeding van röntgenapparaat
Niet met i-CAT-scan gebruiken Uitsluitend met i-PAN-scan gebruiken Etiket Duwen om te openen	hoofdpositiebeugel voor i-PAN

Русский язык

Знак	Описание	Расположение
	Экстренная остановка	Экстренная остановка пациента, пульт
	Общее предупреждение	Блок управления, источник рентгеновского излучения, гентри, узел кресла, задняя панель верхнего узла, ограждение кресла, блок питания источника рентгеновского излучения
	Лазер	Источник рентгеновского излучения, гентри, панель регулировки положения пациента
	Питание	Блок управления, передняя панель верхнего узла
	Готовность	Блок управления, передняя панель верхнего узла
	Вес сиденья	Узел кресла
	Отказ	Блок управления, передняя панель верхнего узла
	Предупреждение об ионизирующем излучении	Блок управления
	При использовании соблюдайте инструкции по эксплуатации	Блок управления
	Рентгеновское излучение	Блок управления

Знак	Описание	Расположение
	Максимальная грузоподъемность	Узел кресла
	Предохранитель лампы Предохранитель лампы X-Ray On (рентгеновская установка включена)	Блок управления, передняя панель верхнего узла Задняя панель верхнего узла
	Точка защемления	Узел кресла, ограждение кресла
	Предупреждение о связанной с электричеством опасности	Задняя панель верхнего узла
	Соприкасающаяся с пациентом деталь, тип B (тело) соответствует IEC 60601-1	Задняя панель верхнего узла
	Неионизирующее излучение	Задняя панель верхнего узла
	Утилизировать	Задняя панель верхнего узла
	Кабель кресла	Задняя панель верхнего узла
	Кабель блока управления	Задняя панель верхнего узла
	Блокировочный кабель	Задняя панель верхнего узла

Знак	Описание	Расположение
	Включает питание блока Выключает питание блока Запускает сканер	Блок управления
	Регулировка высоты кресла	Панель регулировки положения пациента
	Размыкатель вкл./выкл.	Задняя панель верхнего узла
	Выход для блокировки	Задняя панель верхнего узла
	Вход напряжения переменного тока	Задняя панель верхнего узла
	Произведено для Производитель Модель № Серийный номер	Узел головки трубки, блок питания источника рентгеновского излучения, контролер источника рентгеновского излучения, ограничитель пучка, верхний узел, стойка

Знак	Описание	Расположение
	Предупреждение о кабеле	Задняя панель верхнего узла
	Сетевой кабель к рабочей станции Компьютерный кабель	Задняя панель верхнего узла
	Предохранитель системы блокировки	Задняя панель верхнего узла
	Предохранитель источника рентгеновского излучения	Задняя панель верхнего узла
	Предохранитель	Задняя панель верхнего узла
	Непрерывный : прерывистый	Задняя панель верхнего узла, блок питания источника рентгеновского излучения

Этикетка	Расположение
Экстренная остановка	Экстренная остановка пациента
Предостережение: если не следить за факторами безопасного экспонирования и не соблюдать процедуру эксплуатации, то эта рентгеновская установка может представлять опасность для пациента и оператора. Использование без разрешения не допускается.	Блок управления
Предостережение: лазерное излучение, не смотрите на луч <1мВт, 635 нм, лазерный прибор II класса	Источник рентгеновского излучения
Предостережение: лазерное излучение, не смотрите на луч <1мВт, 670 нм, лазерный прибор II класса	Гентри
Максимальная грузоподъемность ≤ 182 кг (≤400 фунтов)	Узел кресла
Предупреждение о точке защемления Держите руки на расстоянии **Вес сиденья 6,8 кг (15 фунтов)**	Узел сиденья
Рабочие режимы: непрерывный и прерывистый	Задняя панель верхнего узла
Предупреждение о точке защемления Держите руки на расстоянии	Ограждение кресла
Рабочие режимы: непрерывный и прерывистый Соответствует IEC 60601-2-7 и IEC 60601-2-28 **Конденсатор имеет напряжение >300 В пост. тока Прежде чем прикасаться к конденсатору, подождите в течение 5 минут, пока он не разрядится** **Не используйте с этим блоком заземленное испытательное оборудование**	Источник питания источника рентгеновского излучения
Не использовать со сканером i-CAT Использовать только со сканером i-PAN Этикетка «Нажать для отпускания»	Устройство регулировки положения головы i-PAN

Român

Simbol	Descriere	Locații
	Oprire de urgență	Oprire de urgență pentru pacient, Caseta de control
	Avertizare generală	Caseta de control, sursă raze X, cadru, ansamblu scaun, partea posterioară a dispozitivului suspendat, poartă scaun, sursă de alimentare raze X.
	Laser	Sursă raze X, cadru, panou aliniere pacient
	Pornire	Caseta de control, parte frontală dispozitiv suspendat
	Pregătit	Caseta de control, parte frontală dispozitiv suspendat
	Greutate scaun	Ansamblu scaun
	Eroare	Caseta de control, parte frontală dispozitiv suspendat
	Atenție radiație ionizantă	Caseta de control
	Urmați instrucțiunile de operare pentru utilizare	Caseta de control
	Radiație raze X	Caseta de control
	Pornește unitatea Oprește unitatea Pornire scanare	Caseta de control
	Ajustarea înălțimii scaunului	Panou de aliniere a pacientului
	Întrerupător deschidere/ închidere	Parte posterioară dispozitiv suspendat

Simbol	Descriere	Locații
	Capacitate maximă de ridicare	Ansamblu scaun
	Raze X pornite Siguranță lampă raze X pornite	Caseta de control, parte frontală dispozitiv suspendat Parte posterioară dispozitiv suspendat
	Punct prindere	Ansamblu scaun, poartă scaun
	Atenție pericol de şoc electric	Parte posterioară dispozitiv suspendat
	Componentă aplicată de tip B (corp) corespunde IEC 60601-1	Parte posterioară dispozitiv suspendat
	Radiație neionizantă	Parte posterioară dispozitiv suspendat
	Reciclare	Parte posterioară dispozitiv suspendat
	Cablu scaun	Parte posterioară dispozitiv suspendat
	Cablu caseta de control	Parte posterioară dispozitiv suspendat
	Cablu blocare la distanță	Parte posterioară dispozitiv suspendat
	Cablu de avertizare	Parte posterioară dispozitiv suspendat
	Cablu de rețea la stația de lucru computerizată	Parte posterioară dispozitiv suspendat
	Siguranță blocare la distanță	Parte posterioară dispozitiv suspendat

Simbol	Descriere	Locații
	Ieșire blocare la distanță	Parte posterioară dispozitiv suspendat
	Intrare curent alternativ	Parte posterioară dispozitiv suspendat
	Produs pentru Producător Model nr. Număr serie	Ansamblu cap tub, sursă de alimentare raze X, regulator raze X, limitator fascicul, parte posterioară dispozitiv suspendat, postament

Simbol	Descriere	Locații
	Siguranță sursă raze X	Parte posterioară dispozitiv suspendat
	Siguranță	Parte posterioară dispozitiv suspendat
	Continuu: Intermitent	Parte posterioară dispozitiv suspendat, sursă de alimentare raze X

.

Etichetă	Locație
Oprire de urgență	Oprire de urgență pacient
Avertizare: Această unitate cu raze X poate fi periculoasă pentru pacient și operator în cazul în care nu sunt respectați factorii de siguranță la expunere și procedurile operatorii. Este interzisă utilizarea neautorizată.	Caseta de control
Avertizare: Radiație laser - nu priviți înspre fasciculul de raze <1mW 635 nm Produs laser Clasa II	Sursa de raze X
Avertizare Radiație laser - nu priviți înspre fasciculul de raze <1mW 670 nm Produs laser Clasa II	Cadru
Capacitate maximă de ridicare ≤ 182 kg (≤400 Lbs (livre))	Ansamblu scaun
Avertizare punct de prindere Feriți-vă mâinile **Greutate scaun 6,8 kg (15 livre)**	Ansamblu scaun
Moduri de operare: Continuu și intermitent	Parte posterioară dispozitiv suspendat
Avertizare punct de prindere Feriți-vă mâinile	Poartă scaun
Moduri de operare: Continuu și intermitent Corespunde IEC 60601-2-7 și IEC 60601-2-28 **Condensator HAS >300 Vcc Așteptați 5 minute pentru descărcarea condensatorului înainte de manipulare** **Nu utilizați echipamente de testare cu împământare pentru această unitate**	Sursa de alimentare raze X
Nu utilizați cu scaner i-CAT Utilizați doar cu scaner i-PAN Apăsați pentru a elibera eticheta	Dispozitiv de poziționare cap i-PAN

Türkçe

Sembol	Tanımlar	Konumlar
	Acil Durdurma	Hasta Acil Durdurma, Kumanda Kutusu
	Genel Uyarı	Kumanda Kutusu, X-Işını Kaynağı, Gantri, Sandalye Aksamı, Arka Ana Cihaz, Sandalye Kapısı, X-Işını Güç Kaynağı
	Lazer	X-Işını Kaynağı, Gantri, Hasta Hizalama Paneli
	Güç	Kumanda Kutusu, Ön Destek
	Hazır	Kumanda Kutusu, Ön Ana Cihaz
	Koltuk Ağırlığı	Koltuk Aksamı
	Hata	Kumanda Kutusu, Ön Ana Cihaz
	İyonize Radyasyon Uyarısı	Kumanda Kutusu
	Kullanım Talimatlarına Uyun	Kumanda Kutusu
	X-Işını Radyasyonu	Kumanda Kutusu
	Üniteyi Açar Üniteyi Kapatır Taramayı Başlatır	Kumanda Kutusu
	Koltuk Yüksekliği Ayarı	Hasta Hizalama Paneli
	Şalter Anahtarı Açık/Kapalı	Arka Ana Cihaz

Sembol	Tanımlar	Konumlar
	Maksimum Kaldırma Kapasitesi	Sandalye Aksamı
	X-Işını Açık X-Işınının Açık Olduğunu Gösteren Lamba Sigortası	Kumanda Kutusu, Ön Ana Cihaz Arka Ana Cihaz
	Sıkışma Noktası	Koltuk Aksamı, Sandalye Kapısı
	Elektrik Tehlikesi Uyarısı	Arka Ana Cihaz
	Tip B (Gövde) uygulanan bölüm IEC 60601-1 ile uyumludur.	Arka Ana Cihaz
	İyonize Olmayan Radyasyon	Arka Ana Cihaz
	Geri Dönüşüm	Arka Ana Cihaz
	Sandalye Kablosu	Arka Ana Cihaz
	Kumanda Kutusu Kablosu	Arka Ana Cihaz
	Bağlantı Kablosu	Arka Ana Cihaz
	Kablo Uyarısı	Arka Ana Cihaz
	Çalışma İstasyonu Bilgisayarı Kablosuna Giden Ağ Kablosu	Arka Ana Cihaz
	Bağlantı Sigortası	Arka Ana Cihaz

Sembol	Tanımlar	Konumlar
	Bağlantı Çıkışı	Arka Ana Cihaz
	AC Girişi	Arka Ana Cihaz
	Kimin için Üretildiği Üretici Model No. Seri No.	Boru Kafası Aksamı, X- Işını Güç Kaynağı, X-Işını Denetleyici, Işın Sınırlayıcı, Arka Ana Cihaz, Ayak

Sembol	Tanımlar	Konumlar
	X-Işını Kaynağı Sigortası	Arka Ana Cihaz
	Sigorta	Arka Ana Cihaz
	Sürekli: Aralıklı	Arka Ana Cihaz, X-Işını Güç Kaynağı

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Etiket	Konum
Acil Durdurma	Hasta Acil Durdurma
Dikkat: Güvenli ışınlama faktörlerine ve çalıştırma prosedürüne uyulmadığı sürece, bu X-Işını ünitesi hasta ve operatör için tehlikeli olabilir. Yetkisiz kullanımı yasaktır.	Kumanda Kutusu
Dikkat: Lazer Radyasyonu, Işına Doğrudan Bakmayın **<1mW 635nm Sınıf II Lazer Ürünü**	X-Işını Kaynağı
Dikkat Lazer Radyasyonu, Işına Doğrudan Bakmayın **<1mW 670nm Sınıf II Lazer Ürünü**	Gantri
Maksimum Kaldırma Kapasitesi **≤ 182 KG (≤400 Lbs)**	Sandalye Aksamı
Sıkışma Noktası Uyarısı **Elleri Açıkta Tutun** **Koltuk Ağırlığı 6,8 KG (15 lbs)**	Koltuk Aksamı
Çalışma Modları: Sürekli ve Aralıklı	Arka Ana Cihaz
Sıkışma Noktası Uyarısı **Elleri Açıkta Tutun**	Sandalye Kapısı
Çalışma Modları: Sürekli ve Aralıklı **IEC 60601-2-7 ve IEC 60601-2-28 ile uyumludur** **Kapasitör >300VDC'dir** **Kullanmadan önce Kapasitörün boşalması için 5 dakika bekleyin.** **Bu ünitede topraklı test ekipmanı kullanmayın**	X-Işını Güç Kaynağı
i-CAT Tarama ile kullanmayın **Yalnızca i-PAN Tarama ile kullanın** **Serbest Bırakmak için Basın Etiketi**	i-PAN Kafa Konumlayıcı

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