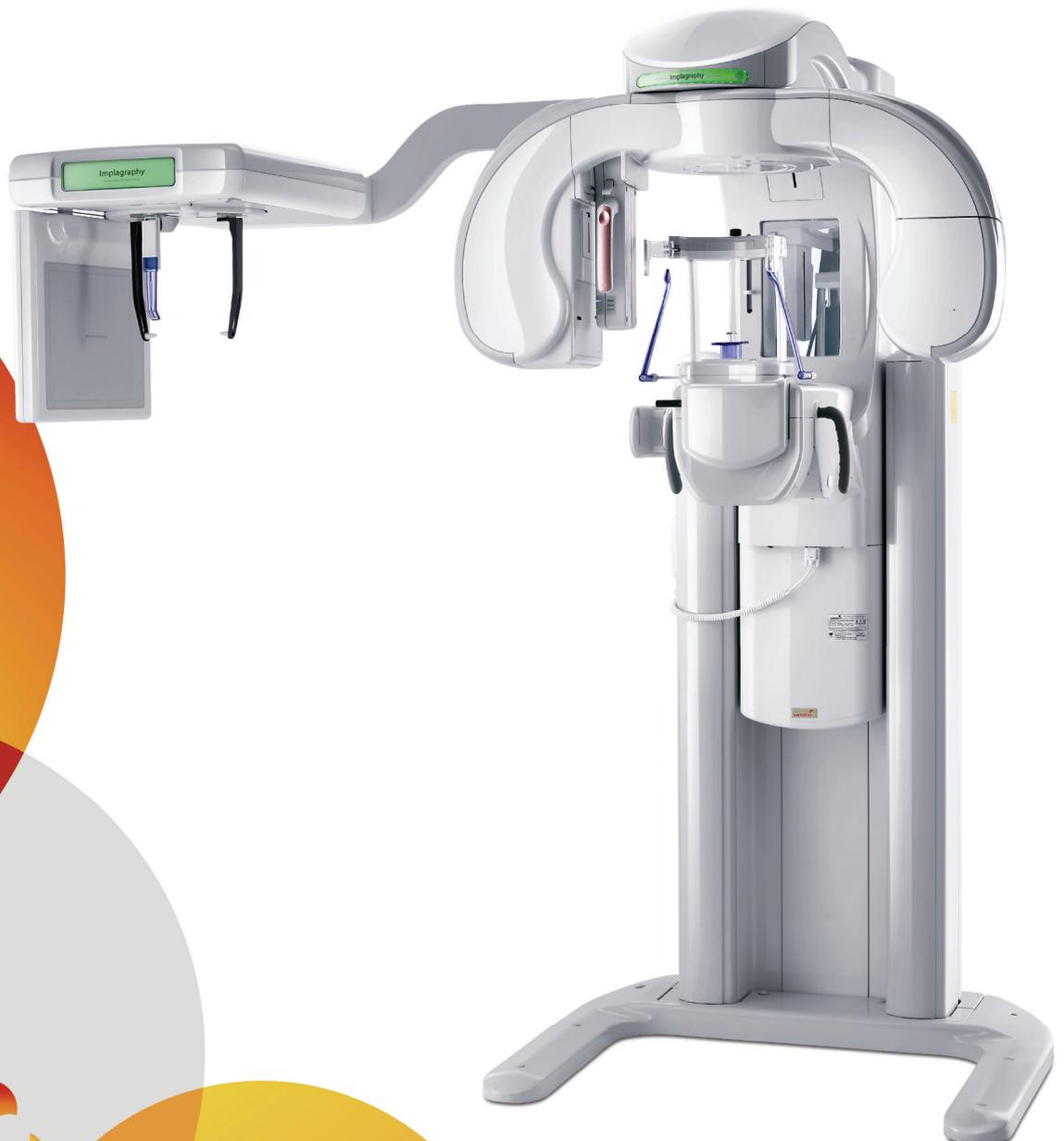


World's Best Dental Imaging Company

# Picasso-Trio User Manual







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This user manual contains a description, installation of imaging software, operational instructions and other useful information for the Picasso-Trio digital imaging system.

## Conventions in this guide

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This symbol indicates a *note* to help you get the best performances from the system. Carefully read these notes to bring about the best performance possible.



This symbol indicates a *warning* that should be obeyed with extreme cares. When missed, it may cause severe damage or physical injuries.



The radiation symbol warns you about radiation dangers.



This indicates a compulsory action or instruction.

---

## Note to the user



**X-rays can be harmful and dangerous if not used properly. The instructions and warnings contained in this manual must be followed carefully.**

**As a manufacturer of radiology equipment that conforms to stringent protection standards in force throughout the world, we guarantee a maximum degree of protection against radiation hazards.**

**The room in which your radiology unit is to be installed must comply with all official regulations applicable to protection against radiation. You must install your radiology unit in a room protected against x-ray emission.**

---



# Chapter 1 Product Introduction

## 1.1 Picasso-Trio Overview

**Picasso-Trio** is the diagnostic system which consists of digital Panoramic and Computed Tomography X-ray system with Cone Beam Technology. It's a system based on digital and computed tomography. Especially, the advanced digital imaging process allows considerably efficient diagnosis, all kind of management information, real-time sharing of image information on network. It's equipped with the CT sensor to capture 3-D X-ray Computed Tomogram Scanned Image

- |                           |  |
|---------------------------|--|
| • Movement Technology     | Multi-motor with digital trajectory control<br>Motorized carriage movement   |
| • Patient Positioning     | CT - Triple [Mid-Sagittal / Vertical / Horizontal] laser beam positioning<br>Pano - Double [Mid-Sagittal / Frankfurt] laser beam positioning |
| • Patient Positioning Aid | Chinrest, bite block, head-rest, mirror  |
| • Voice Instruction       | English (typical)  |

## 1.2 Features

The key features that the Picasso-Trio provides are as follows.

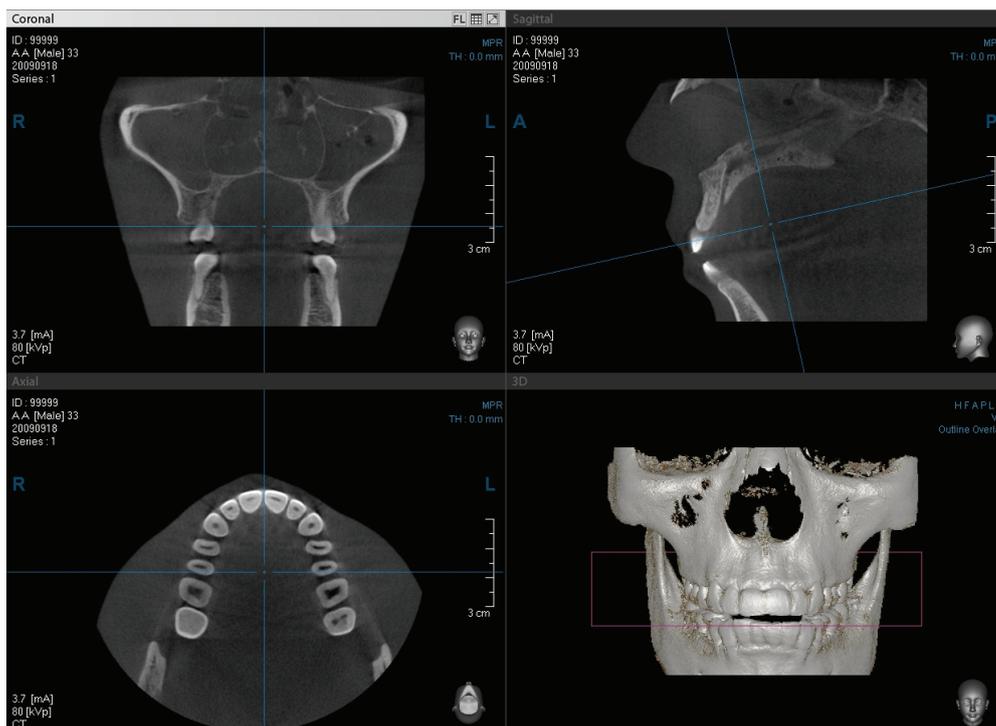
- Picasso-Trio, the first dental CT system with digital panoramic and Cephalometric in the world, provides the high quality digital image.
- With Picasso-Trio it is not required to purchase a CT and a panoramic system each separately.
- Picasso-Trio helps the patients to understand the diagnosis result by viewing the invisible part with a 3-D viewer program, Ez3D2009.
- The disk space for installation is no bigger than that of a general panoramic system.
- The FOV (Field Of View) is optimized for the Implant surgery.
- Its image can be sliced by the thickness of 0.1 mm (or thicker).

- Picasso-Trio is equipped with a headrest for CT examination program mode, so the position of the patients should be fixed correctly. (Accessories for Panoramic system are supplied apart)
- Picasso-Trio minimizes the X-ray dose for the safety of the patients compared with other Dental CT systems.
- You can set and control the Examination Program Mode with a console PC.
- Picasso-Trio supports the DICOM Format.
- Picasso-Trio supports publishing the image via CD.

## 1.3 Examination programs

### 1.3.1 CT

- 3D Volume Rendering
- Axial View
- Coronal View
- Sagittal View
- Cross-Sectional View
- Panoramic View
- MPR – Multi-Planar Reconstruction
- Region of Interest [ROI] – Analysis Bone Density [Hounsfield Units]





### 1.3.2 Panoramic

In each program the compensation for the spinal column is obtained by means of exposure parameter modulation, optimized in accordance with the selected anatomic program.

- Normal Panoramic
- High Resolution Panoramic
- Segment Panoramic (Horizontal and Vertical)
- Orthogonal Panoramic
- Bite-Wing Panoramic
- TMJ PA & Lateral Open/Close mouth: 4 views [Right Open–Right Close–Left Close–Left Open] are taken on the same image
- Maxillary Sinuses PA & Lateral



### 1.3.3 Anatomic programs

- Patient Type: CT - Adult, Weak
- Pano : Man/Woman/Child
- Examination Region: Dental CT(FOV, mm\*mm) -120x85, 80x80, 80x50,50x50
- (voxel size : High mode :0.2/Normal mode 0.3)
- Pano – Standard, TMJ, Sinus, Front/Left/Right
- Arch Shape: Pano – Adult, Child

### 1.3.4 Image Processing

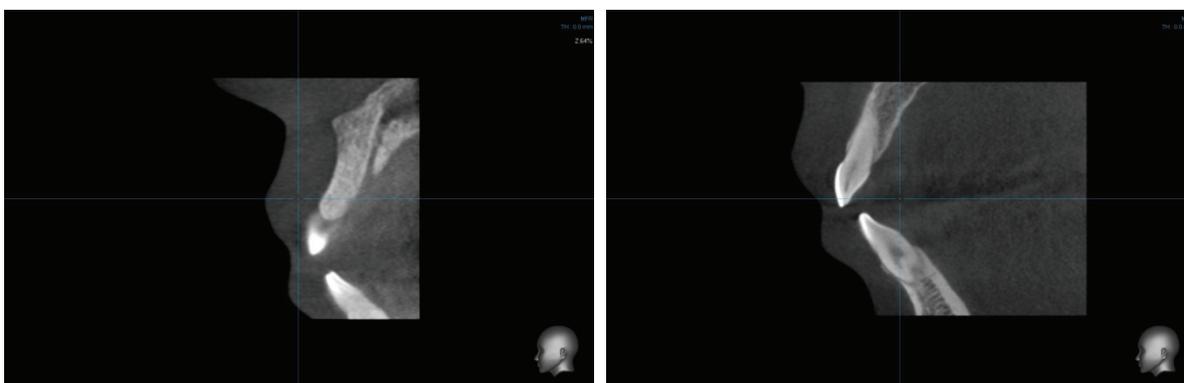
CBCT Examination Programs: Normal, Metal Artifact Reduction

\* Metal Artifact: Please select “Metal” for patient with 1 ~ 2 crowns.

## 1.4 File Size

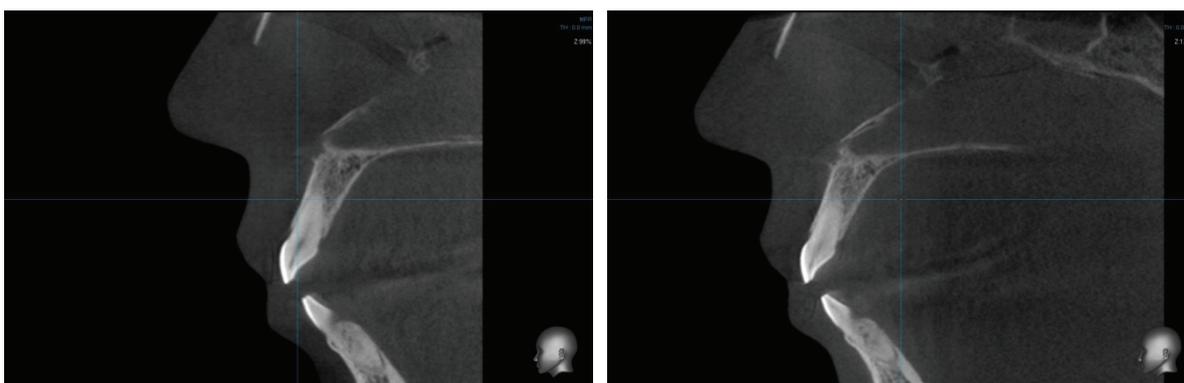
	RAW	Slice	DCM
120x85	826K	703K	703K
80x80	594K	312K	312K
80x50	372K	312K	312K
50x50	259K	120K	120K

## 1.5 Image coverage area by the FOV size



5x5

8x5



8x8

12x8.5



## 1.6 Locations of the functional units



### Descriptions:

- ① **Digital X-ray Sensor:** used for the image acquisition in the panoramic mode. This sensor is detachable, with attached in sensor holder.
- ② **X-ray Generator tube head:**  
The X-ray tube is a vacuum tube that produces X-rays.
- ③ **CT X-ray sensor module :**  
A sensor that detects the images while being X-rayed in the CT mode

- ④ **Vertical Carriage** : moves up/down the rotating system
  
- ⑤ **Column** :  
Column for both Pano. & Ceph
  
- ⑥ **Head Support** :  
Fixing the patient's position during the image capture to secure the optimal image
  
- ⑦ **Ceph Sensor**: used to capture the image when the cephalometric mode is activated.
  
- ⑧ **Hand Frame**: is equipped with the Chin rest and Hand Holder to provide the patient firm grip and comfortable rest for chin
  
- ⑨ **Base Stand**  
This is to support the whole system in a stable and secure way.



**The above information may vary according to the model.**

---



## 1.7 Accessory List

The Picasso-Trio comes with the following components as standard accessories.

- Ear rod right
- Ear rod left
- Chin support
- Normal chin
- Sinus chin
- Non chin
- TMJ chin
- Bite chin
- Disposable bag
- X-ray exposure switch with extensible cable
- Headrest Adult / Child
- Headrest band
- Headrest disposable felt

## Chapter 2      Warning and Safety

### 2.1      Warnings

1. You are responsible for the operation and maintenance of this unit. Only legally qualified persons can operate this unit. DO NOT open the cover of the unit. When necessary, have a trained authorized service technician carry out inspection and maintenance operations.
2. Install this Unit in an x-ray room that complies with current installation standards. From this location, you must be able to maintain visual or audio communication with the patient. This Unit must be permanently connected to the ground with a fixed power supply cable.
3. DO NOT place the PC and the peripheral equipment connected to it in the immediate vicinity of the patient in the Unit. Leave at least 2m distance between the patient and the Unit.
4. To obtain maximum image quality and visual comfort, position the screen to avoid direct light reflections from internal or external lighting.
5. X-ray equipment is hazardous to patients and the operator if you do not observe the exposure safety factors and operating instructions.
6. DO NOT place objects within the field of operation of the Unit.
7. The patient should wear a protective lead-lined shoulder apron.
8. Disinfect any parts of the Unit that come into contact with the patient and the operator after each patient has been exposed to x-rays.
9. While adjusting the height of the Unit, ensure that the patient is kept clear of the mechanism.
10. When the Unit is not in use, ensure that the ON/OFF switch is set to OFF (O).
11. To dispose of the Unit or its components, contact a service technician.
12. Ask the patient to remain still until the Unit arm has stopped moving and the RESET movement has completed.
13. DO NOT use this Unit in conjunction with oxygen-rich environments. This Unit is not intended for use with flammable anesthetics or flammable agents.



## 2.2 Safety precautions



**Make sure to observe the following instructions.**

1. Follow the specified process of operation for the safety of the users and patients.
2. Check the conditions of the product such as power, PC, and cable before using.
3. When capturing image, make sure to let Cooling Time (a process of cooling down the X-Ray tube) pass before proceeding to the next imaging status, in accordance with a voice announcement from the device after capturing image.
4. Place this product away from water, moisture, or foreign substance since this product is a precision medical electronic device.
5. Turn off the power, immediately, if the product is exposed to water or foreign substance during use, resulting in abnormal operation. Contact the agent for technical support.

## 2.3 Radiation Protection Policy



**Users should comply with rules and regulations of your country on radiation safety and protection since they differ among countries.**

1. User should wear lead apron or use protection wall to protect him / her from radiation during the imaging process.
2. User should provide protection devices such as lead apron to patient during the imaging process.
3. Children or pregnant women should consult with the doctor in charge before imaging.
4. User should be at least 2 m (6 feet) away from the equipment during imaging.
5. Equipment should be located inside an X-ray shield facility. During imaging; the worker should watch inside carefully, through the window, from outside the shield facility.
6. User should continuously check the patient and the equipment status during imaging.
7. User should immediately stop imaging if equipment malfunctions.

## 2.4 Manufacturer Liability Policy

The manufacturers / sellers of X-ray equipments, such as this product, only assume responsibility for a safe and normal operation of the product in the following cases *if*

1. The product is installed by our authorized agent.
2. The product is installed in accordance with cautions and conditions for installation.
3. A genuine product is used, as approved by our company.
4. Maintenance / repair service is performed by our authorized agent.
5. The product is normally used in accordance with the user's manual.
6. Equipment damage or accident is not attributable to a mistake of the customer.



## Chapter 3 Electrical safety

### 3.1 Electric hazards

Electricity-related hazards include electric shock and burns, arc-flash burns, arc-blast impacts and others. The Picasso-Trio carries the high voltage and a strong current inside the system. Thus the extreme caution is mandatory to operate this system with the safety guideline.

1. **Electric shock and burns.** An electric shock occurs when electric current passes through the body. This can happen when touching an energized part. If the electric current passes across the chest or head, death can result. At high voltages, severe burns can result.
2. **Arc-flash burns.** An electric arc flash can occur if a conductive object gets too close to a high-amp current source or by equipment failure (for instance, while opening or closing disconnects). The arc can heat the air to temperatures as high as 35,000° F, and vaporize metal in the equipment. The arc flash can cause severe skin burns by direct heat exposure and by igniting clothing.
3. **Arc-blast impacts.** The heating of air and vaporization of metal creates a pressure wave that can damage hearing and cause memory loss (from concussion) and other injuries. Flying metal parts are also a hazard.
4. **Falls.** Electric shocks and arc blasts can cause falls, especially from ladders or unguarded scaffolding

### 3.2 Electric safety principle

1. **De-energize whenever possible.**
2. **Plan every job.** The approach and step-by-step procedures to complete the work at hand must be discussed and agreed upon between all involved employees before beginning. Write down first-time procedures. Discuss hazards and procedures in a job briefing with supervisors and other workers before starting any job. It is the employer's responsibility to have or develop a checklist system for working on live circuits, if such a scenario arises.
3. **Identify the hazards.** Conduct a job hazard analysis. Identify steps that could create electric shock or arc-flash hazards.

4. **Minimize the hazards.** De-energize any equipment, and insulate, or isolate exposed live parts so contact cannot be made. If this is impossible, obtain and wear proper personal protective equipment and tools.
5. **Anticipate problems.** If it can go wrong, it might. Make sure the proper PPE and tools are immediately available for the worst-case scenario.

### 3.3 Electric Safety Do's and Don'ts

To avoid being hurt around electricity, remember these tips and use common sense.

#### Do's

- Pull the plug itself, not the cord attached to it.
- Disconnect the equipment that sparks and have it repaired immediately.
- Always disconnect equipment before cleaning them.
- Keep combustible materials away from lamps or heating devices.
- Turn off the equipment when it is left for a while
- Follow manufacturers' instructions when operating electrical devices. All electrical devices should carry an Underwriters Laboratory approval tag.
- Make sure outdoor electrical outlets are covered with weatherproof covers.
- Use extension cords only for temporary applications.
- Keep electrical cords away from hot appliances.
- Keep this equipment clean and free of dust, lint and grease.
- Keep work areas clean and dry. Sparks can ignite wood scraps, sawdust and solvents.
- Use moisture resistant cords when outside. Certain outlets for outdoor appliances or tools should have a ground fault interrupter (G.F.I). This type of circuit breaker, installed in an outlet, protects the user from shock.
- Use heavy duty cords when using power tools.
- When utilizing adapters, make sure to screw in the wire for grounding.
- Wear rubber soled shoes when operating power tools.
- Make sure your power tools are grounded or certified double insulated.

#### Don'ts

- Never turn on this equipment when standing or sitting in water. Shocks can be fatal.
- Never overload a circuit by plugging in too many appliances.



- Plug three-way grounded plugs into appropriate outlets. Never tamper with the third prong.
- Never install cords under rugs where they will become worn by foot traffic.



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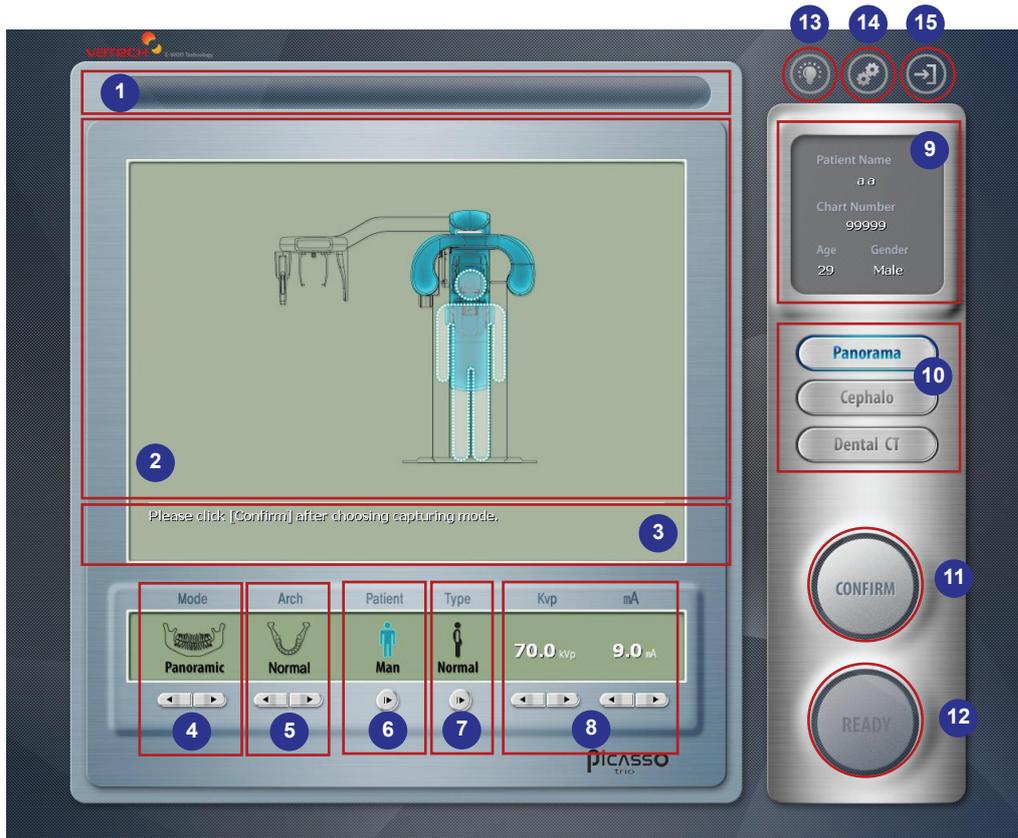
**Ground Fault Circuit Interrupt (GFCI) - A device whose function is to interrupt the electric circuit to the load when a fault current to ground exceeds a predetermined value that is less than that required to operate the over-current protective device of the supply circuit.**

---

## Chapter 4 Picasso-Trio Details

### 4.1 The imaging software overview

#### 4.1.1 Panoramic program



1. **Progressive bar:** indicates how much the image acquisition is in progress in real time
2. **Imaging window:** shows the currently selected imaging status as the acquisition proceeds and displays in real time the progressive image
3. **Commanding instruction window:** instructs the operator what to do in sequential steps before taking image.
4. **Mode:** Select capture mode.

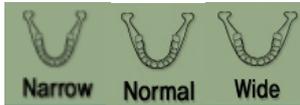
**Panoramic, Left, Front, Right, TMJ Open, TMJ Close, Sinus**





5. **Arch:** Select Arch type according to the patient's type.

**Narrow, Normal, Wide**



6. **Patient type Selection:** Select the patient type among man, woman and child.

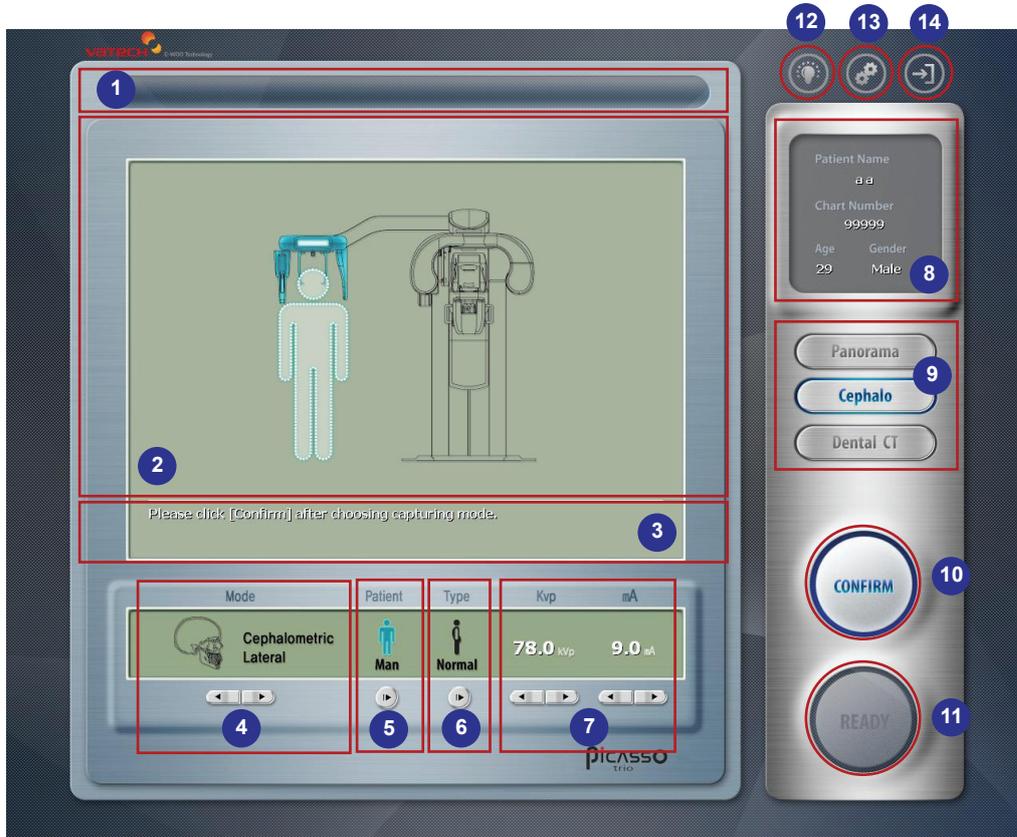


7. **Bone density selection:** Bone density is characteristic of the individual patient. Thus select the most appropriate bone density.



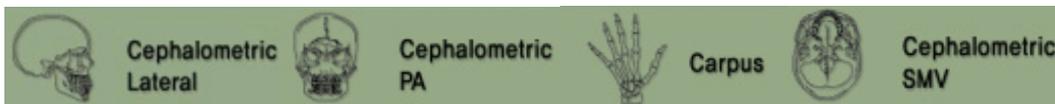
8. **KVp/mA adjustment:** this function is used to fine-adjust kVp and mA to reflect a variation of bone density of the individuals into the X-Ray dose to have a better image.
9. **The patient's info.** shows the information of the patient whose image is currently taken.
10. **Select Examination program:** Select Panorama/Cephalo/Dental CT.
11. **Confirm:** click this button for the all the parameters to take effects before taking image
12. **Ready:** Click this button to put the unit on ready state. *The X-Ray exposure does not be activated until the exposure switch is held down.*
13. **Beam:** to turn on the beam light to align the patient.
14. **Environmental control:** This function enables the users to set various parameters to manipulate the unit before imaging. There is also a program called **Utility** to replace the HyperTerminal using the serial communication protocol.
15. **Exit:** terminate the imaging program and exit to Desktop window

## 4.1.2 Cephalometric program



1. **Progressive bar:** indicates how much the image acquisition is in progress in real time
2. **Imaging window:** shows the currently selected imaging status as the acquisition proceeds and displays in real time the progressive image
3. **Commanding instruction window:** instructs the operator what to do in sequential steps before taking image.
4. **Mode:** Select capture mode.

### Cephalometric Lateral, Cephalometric PA, Carpus, Cephalometric SMV



5. **Patient type selection:** Select the patient type among man, woman and child.



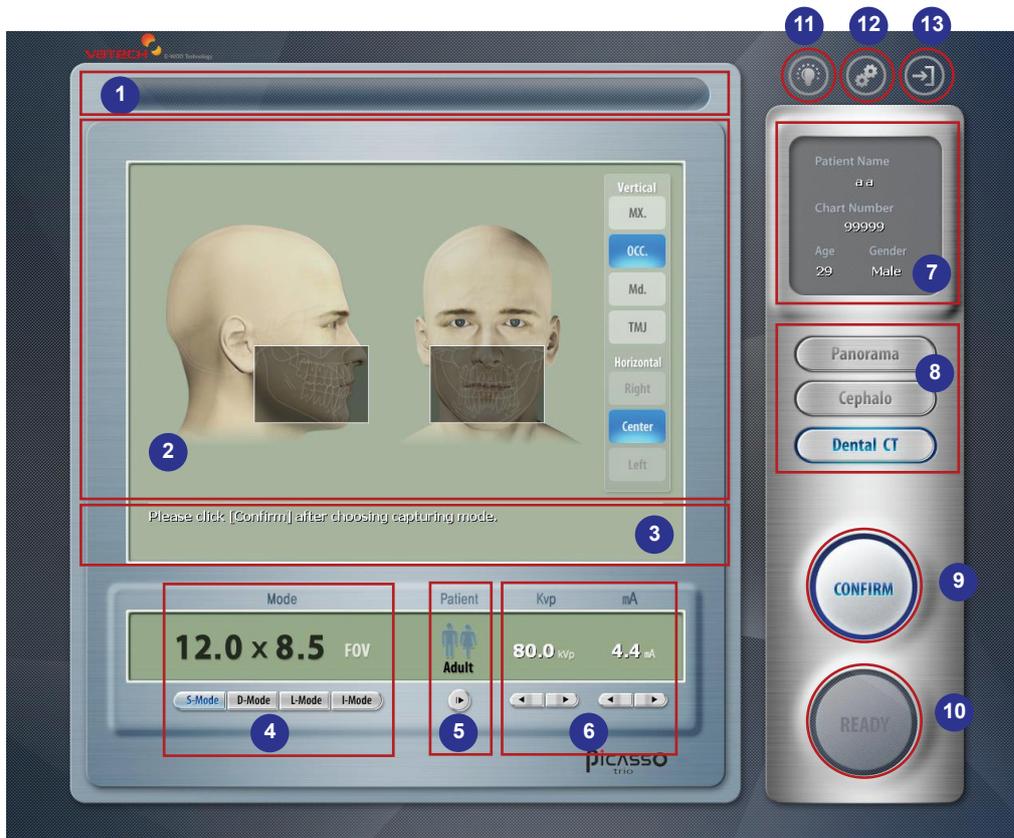


6. **Bone density selection:** Bone density is characteristic of the individual patient. Thus select the most appropriate bone density for the patient to be imagined



7. **KVp/mA adjustment:** this function is used to fine-adjust kVp and mA to reflect a variation of bone density into the X-Ray dose to have a better image.
8. **The patient's info.:** shows the information of the patient whose image is currently taken.
9. **Select Examination program:** Select Panorama/Cephalo/Dental CT.
10. **Confirm:** click this button for the all the parameters to take effects before taking image
11. **Ready:** Click this button to put the unit on ready state. *The X-Ray exposure doe not be activated until the exposure switch is held down.*
12. **Beam:** to turn on the beam light to align the patient. Press it again when it turns off.
13. **Environmental control:** This function enables the users to set various parameters to manipulate the unit before imaging. There is also a program called **Utility** to replace the HyperTerminal using the serial communication protocol.
14. **Exit:** terminate the imaging program and exit to Desktop window

## 4.1.3 Dental CT Program



1. **Progressive bar:** indicates how much the image acquisition is in progress in real time
2. **CT image display window:** shows the image in real time that builds gradually frame by frame.
3. **Commanding instruction window:** instructs the operator what to do in sequential steps before taking image.
4. **FOV size selection:** select the size of field of view
5. **Patient type selection:** Select the patient type, adult or child.



6. **KVp/mA adjustment:** this function is used to fine-adjust kVp and mA to reflect a variation of bone density into the X-Ray dose to have a better image.
7. **The patient's info.:** shows the information of the patient whose image is currently taken.
8. **Select Examination program:** Select Panorama/Cephalo/Dental CT.
9. **Confirm:** click this button for the all the parameters to take effects before taking image



10. **Ready:** Click this button to put the unit on ready state. *The X-Ray exposure doe not be activated until the exposure switch is held down.*
11. **Beam:** to turn on the beam light to align the patient.
12. **Environmental control:** This function enables the users to set various parameters to manipulate the unit before imaging. There is also a program called **Utility** to replace the HyperTerminal using the serial communication protocol.
13. **Exit:** terminate the imaging program and exit to Desktop window

## Chapter 5 Digital acquisition system

### 5.1 Computed Tomography Detector

- Technology: CMOS photodiode array (Active Pixel Sensor: APS)
- Pixel size: 200um
- Frame rate: 30 fps
- Gray scale: 14 bits
- Active area: 144 mm \* 121.4 mm
- Limiting Resolution: 2.5 lp/mm in detector space

### 5.2 Panoramic Image Detector

- Technology CMOS sensor with Cesium Iodide (CsI) scintillator screen.
- Pixel size 96 $\mu$ m
- Active area 6.144 mm \* 147.456 mm
- Limiting Resolution 5.2lp/mm
- Gray scale 12 bit

### 5.3 3D Image Viewer

#### 5.3.1 Ez3D2009 standard

EZ3D2009 Standard is three-dimensional dental image viewer for prompt and accurate diagnosis with many useful functions as "various MPR function", "two-dimensional analysis" and "three-dimensional animating work" by loading DICOM format CT image, and more.

- Easy conversions through various rendering method as VR (Volume Rendering)/MIP/minIP/X-ray
- More accurate 3-D image by MPR rotating, curve, 3-D zoom rendering mode
- Cross-sectional view function for fast analysis
- Convenient color management system of objects, color-map, opacity graph, preset files and more.



- Main Tool

**<View>**

- ◆ Pan: Move image in the pane
- ◆ Rotate: 3D/2D rotation
- ◆ Zoom: Zoom in/out the image
- ◆ Windowing: Adjust image brightness and coloring
- ◆ Invert: Invert image brightness and coloring
- ◆ Text overlay: Show image information
- ◆ VOI (View of Interest) overlay

**<Measure>**

- ◆ Distance: Ruler for 2 point, and Tapeline for various points
- ◆ Angle
- ◆ Profile: HU (Hounsfield Unit) = CT Number
- ◆ Area: Measure the area by drawing ROI (Region of Interest)
- ◆ ROI (Region of Interest)

**<Segmentation>**

- ◆ Draw Mask
- ◆ 3D Picker
- ◆ Mask Overlay

**<Output>**

- ◆ Capture: Pane, Region, Full screen
- ◆ Print
- ◆ CINE player

**<Task>**

- ◆ **MPR**
  - Rotating axis: Move, rotate, adjust thickness
  - Oblique slice
- ◆ **Curve**
  - Cross-sectional

**<Fine tuning>**

- ◆ Opacity adjusting function

**<3D Zoom>****<Implant Simulation>****<Canal Drawing>****<EzReport>****<DICOM Print>****<STL Export>****<Memory Export (3D Basic)>****5.3.2 Ez3D2009 Professional**

EZ3D2009 Professional supports following value-added functionality with all functionality at EZ3D2009 Standard

- Dynamic Detail View
- CD Export-2D, 3D(Pro)
- Volume Measure

**5.3.3 Ez3D2009 Premium**

Ez3D2009 Premium supports following value-added functionality with all functionality at Ez3D2009 Professional.

- Auto Canal Drawing
- Knowledge Info.
- Auto Cross-Sectional
- Tooth Detachment

**5.4 Database & File Server, 2D Image Viewer (EasyDent)**

- One click operation
- User friendly graphic interface
- Various image format support
- Various image process & accurate measure tool



- Main Tools

- < **Edit** >

- ◆ Initialize
    - ◆ Edit Image (Rotation)

- < **View (Construction of Screen)** >

- ◆ Overlay
    - ◆ Information
    - ◆ Memo

- < **Patient Management** >

- ◆ Patient
    - ◆ Export
    - ◆ User Account Manager

- < **Draw Tool** >

- ◆ Free Draw
    - ◆ Line
    - ◆ Poly-Line

- < **Measure Tool** >

- ◆ Distance
    - ◆ Continuous Distance
    - ◆ Angle

- < **Image Processing** >

- ◆ Invert
    - ◆ Sharpen
    - ◆ Film Effect

- < **Tool (Image Analysis)** >

- ◆ Magnifier
    - ◆ Slide
    - ◆ Profile

## < Implant Simulation >

- ◆ Add Implant
- ◆ Add Implant Crown

## < Various View Mode >



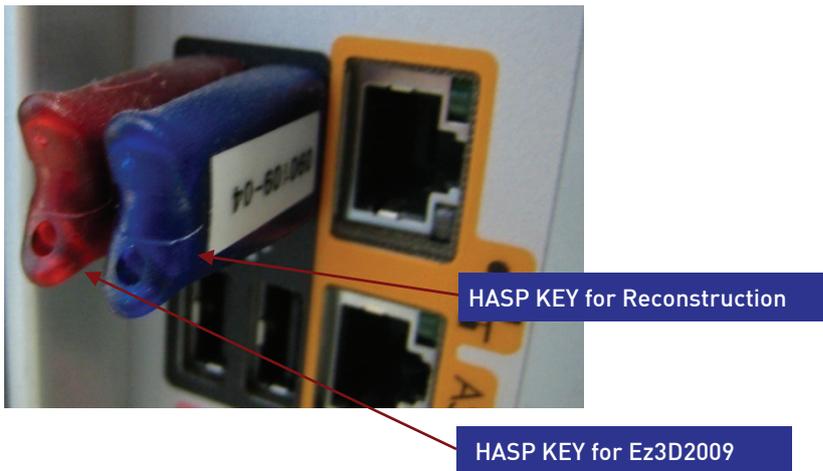
## 5.5 PC System Requirements

Components	Imaging program	Image viewer	Remarks
Model	HP Workstation XW4600		
CPU	Intel Xeon 5420 2.50 12M/1333QC 1 <sup>st</sup> CPU	Intel Xeon 5420 2.50 12M/1333QC 1 <sup>st</sup> CPU	
Operating system	Microsoft XP Professional Service Pack 2	Microsoft XP Professional Service Pack 2	
RAM	HP 4GB(2X2GB) DDR2-667 ECC FBD RAM		RAM has a major impact on system performance.
Video card	Geforce GTX260	Geforce GTX260	The video RAM has a major impact on system performance.
HDD	HP500GB SATA 3Gb/s NCQ 7200 1 <sup>st</sup> HDD	HP1000GB SATA 3Gb/s NCQ 7200 1 <sup>st</sup> HDD	
Network Card	Broadcom 5751 Netxtreme Gigabit PCI3 NIC	Broadcom 5751 Netxtreme Gigabit PCI3 NIC	
Serial port	PCI Serial Card		
ODD	HP 16X DVD+/- RW SuperMulti SATA 1 <sup>st</sup> Drive	DVD+/-RW	
Monitor	Min. resolution 1280*1024	Min, resolution 1280*1024	Monitor is vital in displaying quality images. Low-quality screens will prevent you from proper diagnoses and treatment

## Chapter 6 Preparing for imaging

### 6.1 HASP key installation

To capture, view and analyze images, the driver software for two keys first should be installed properly. Please refer to the HASP driver installation section for further details.



### 6.2 Starting the image viewer software

Make sure that

- All the connections between the Picasso-Trio and the PC are properly connected.
- The PC is turned on.

To start the image viewer software, follow these steps.

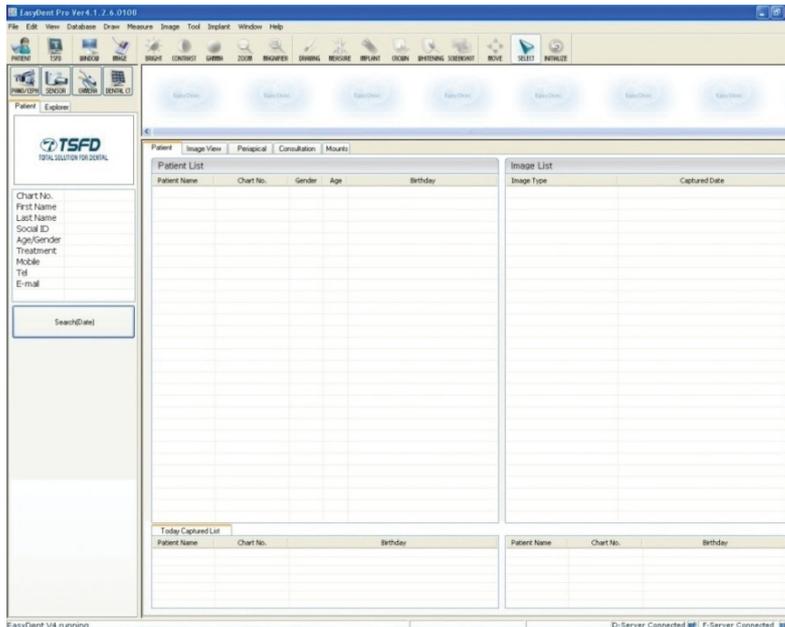
1. On your desktop, double-click **EasyDent** or **Start > All Programs > EasyDent**. Then a blank EasyDent main screen will be displayed.
2. Either create or open an existing patient record.



## 6.3 Creating a new patient record

To create a new patient record, follow these procedures.

1. Run “**EasyDent**”, then the following main screen will come up.



From the menu bar, select **Database > New > Add**. Then the following dialog box will pop up.



For the detailed management on how to make use of this software, please refer to the EasyDent user manual.

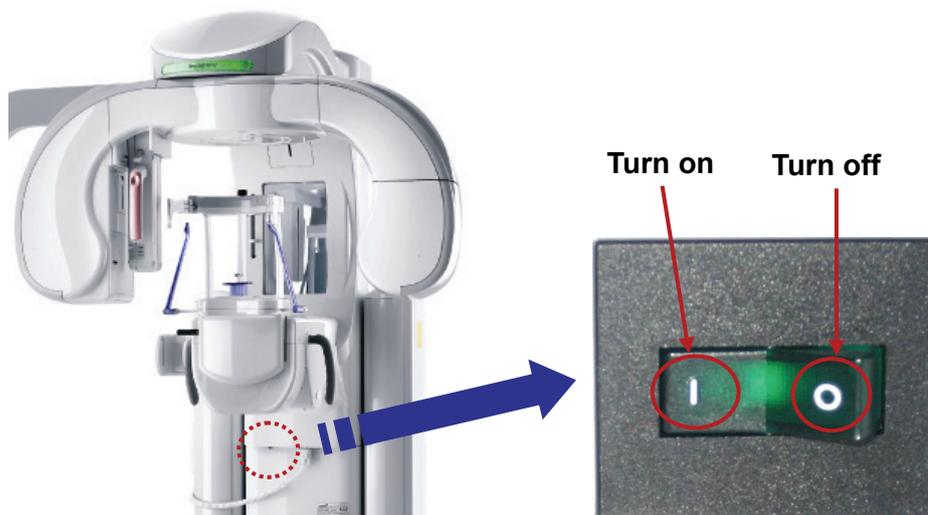
2. Enter the required patient information. **Chart number, first name** and **Last name** are required fields to be filled in.
3. Other fields, although optional, are recommended to be filled in.
4. Once all the necessary parameters are entered, Click **Add** to save configurations.

## 6.4 Turing on the Picasso-Trio

Before switching on the equipment, check that installation of the unit is complete.

To switch on the unit, follow these steps.

1. Press the **ON/OFF** switch on the column.



To increase the operating life of the X-Ray tube, if the equipment has not been used for long time, you must pay special care before use.

2. Once the previous procedures are done, the equipment is now ready to be used for acquisition.



## 6.5 Calling the imaging software

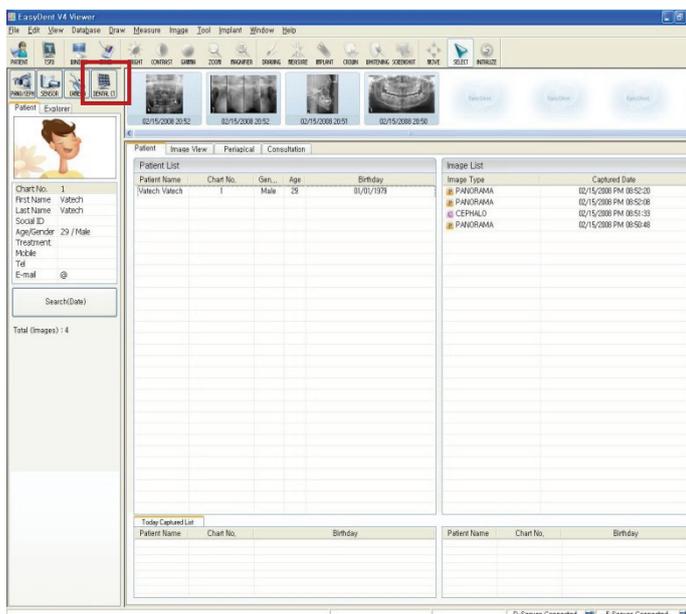
To get access to the image capture mode, take the following steps.

1. Run **EasyDent** program.

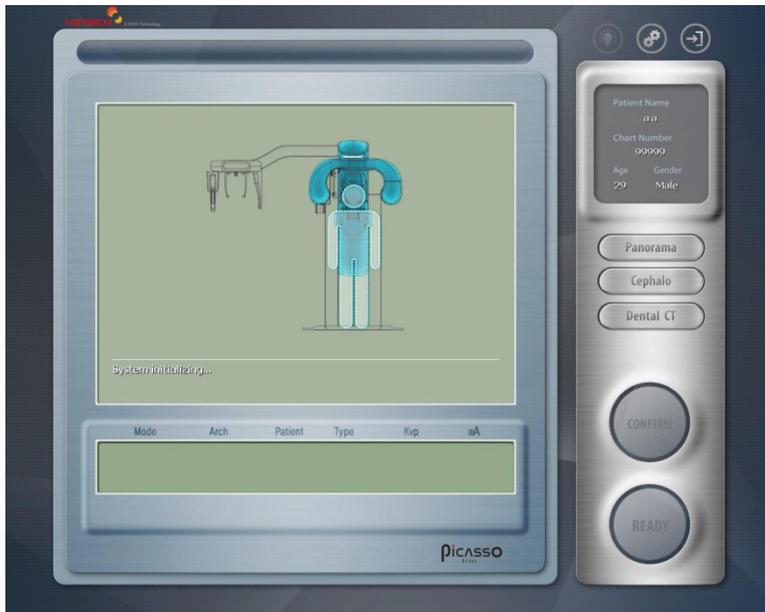


At this point, it is assumed that you have already registered a new patient or have already chosen patient's data from the database.

2. From the main screen, click the **Dental CT** icon on the upper left the screen to *run the imaging capture program*.



Then the following main screen will appear on the desktop window.



The above figure shows the main window of the imaging software of which primary purpose is to control the equipment and acquire images.

Now it is time to launch exposure and acquire images.

***Go to the next chapter to get access to a specific imaging mode.***



## Chapter 7 Acquiring panoramic images

### 7.1 Acquiring standard image

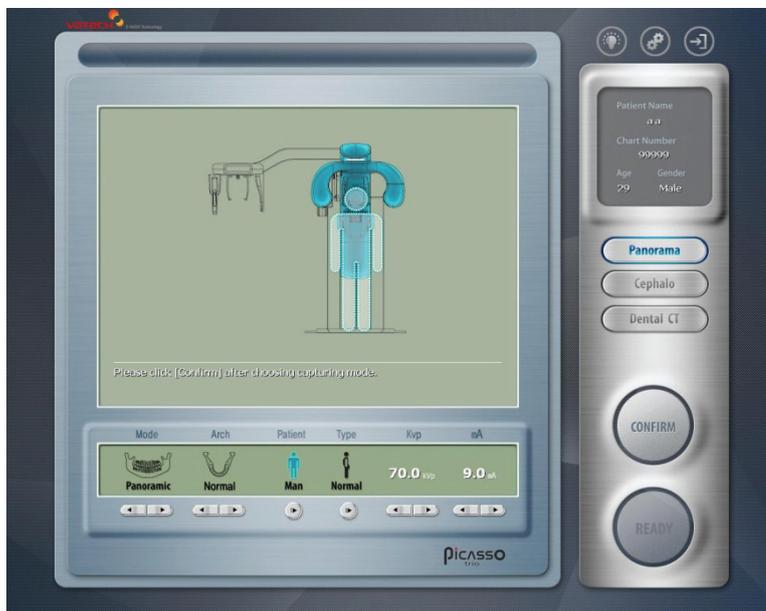
Before acquiring image, make sure that you have:

- Reset a rotating unit of equipment to starting position for new entry.
- Selected the patient record you have created.
- Have the imaging capture software on PC.

#### 7.1.1 Preparing the unit and setting the acquisition parameters

From the main screen on the PC, do the following procedures to prepare the parameters for a specific patient and mode.

1. From the main screen of the imaging program, locate the **Panorama** button and click it.



2. Select the patient's arch and gender.
3. Select the bone density and adjust “**kVp/mA**” finely, if necessary using Up/Down arrows.

- Click **"Confirm"** to reflect the set parameters into imaging environment.  
Then the command text window will read **"The system is moving to capture initial position. Please wait..."**

The system is moving to capture initial position.  
please wait...

- Now it is time to position the patient.



It is necessary to adjust exposure parameters manually to reflect the patient's unique features like structure of bone and its density. This is done through kVp/mA fine adjustment.

Refer to the look-up table for details in APPENDIX.

### 7.1.2 Preparing and positioning the patient

To prepare and position the patient, follow the next steps.



Correct posture is very important factor for the best image possible.  
This is because it reduces the shadow of spinal column that may be transferred to the reconstructed image.

- Have the patient remove all jewelry and metallic objects, such as earrings, hair pins, spectacles, dentures, and orthodontic appliances. These items can cause shadow images that may obscure diagnosis.

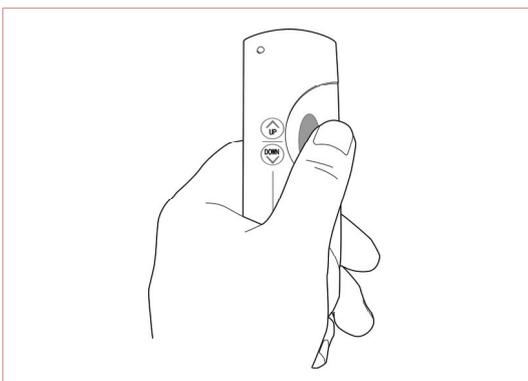
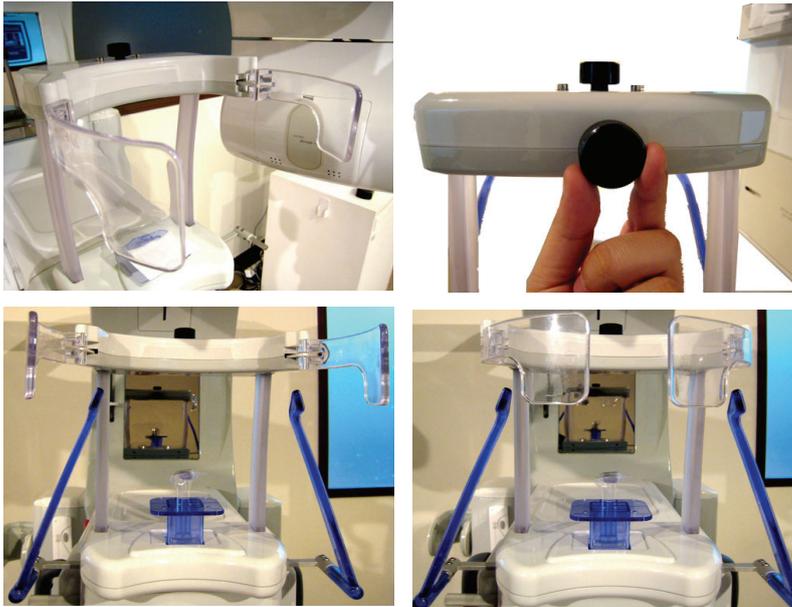


- Insert the normal chinrest and bite block in the unit's chinrest receptacle. Place a hygienic cover over the bite block.

- It is recommended that the patient wear a lead apron for protection against any possible scatter radiation.



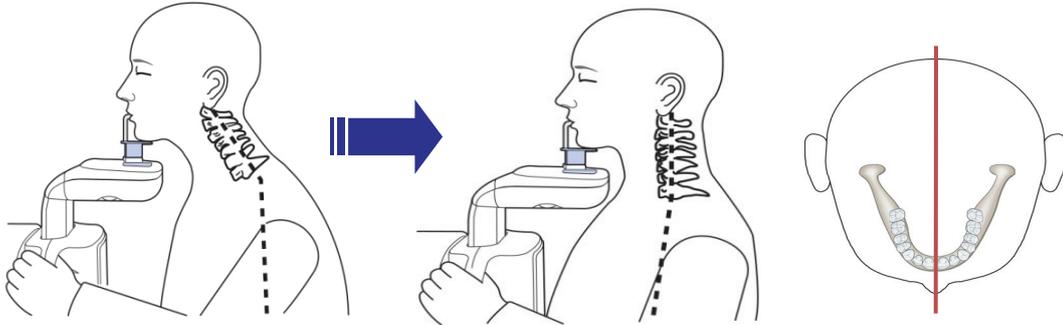
4. Guide the patient to stand at the center of the system at upright position. It is better if the patient comes closer to the system as much as possible. Ask the patient to step forward and to hold the patient handles firmly.
5. It is time to fasten the patient's head to the headrest so as not to move while imaging. Adjust the head rest with rotating the thumb wheel to open and close.



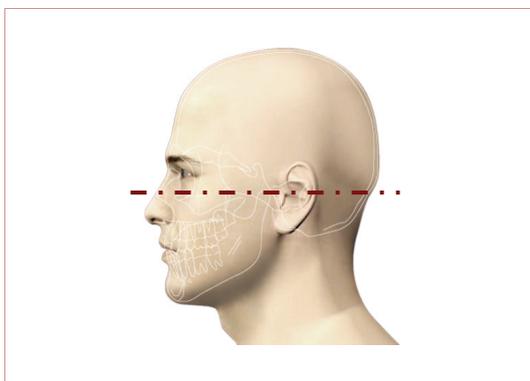
6. Adjust the height of system to fit the patient using the column up / down switch until the chinrest is on the level of the patient's chin. Position the patient's chin on the normal chinrest.

7. The mid-sagittal positioning laser beam for the vertical alignment and the horizontal positioning laser beam for a Frankfurt plane alignment are activated by touching **Beam** button on the main screen.

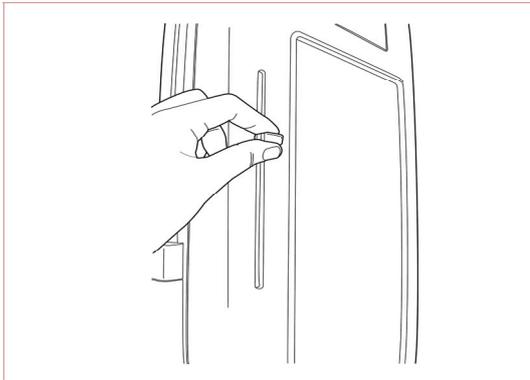
8. Ensure that the patient's shoulders remain level and their neck is relaxed. The cervical spine should be straight and upright. To prevent magnifications on the left and right sides of the final image, make sure that the vertical laser beam is positioned at the center of the occipital bone.



9. Have the patient bite the bite block along the grooves using their upper and lower incisors. Ensure that the chin is in good contact with the chinrest.



10. Position the head of the patient to properly align their Frankfort plane with the horizontal laser beam. For proper positioning, adjust in which way the patient's head is tilted by adjust the unit slightly upward or downward using the column up/down switch. The Frankfort plane is the line from the infra-orbital point to the superior edge of the External Auditory Meatus(EAM).



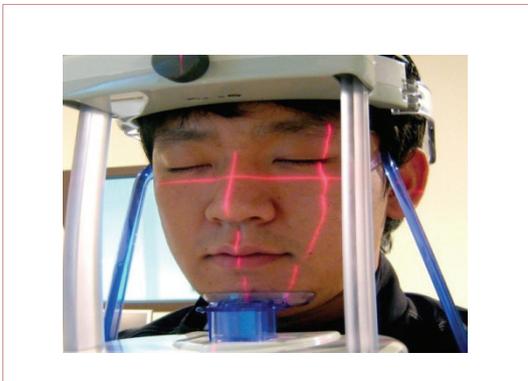
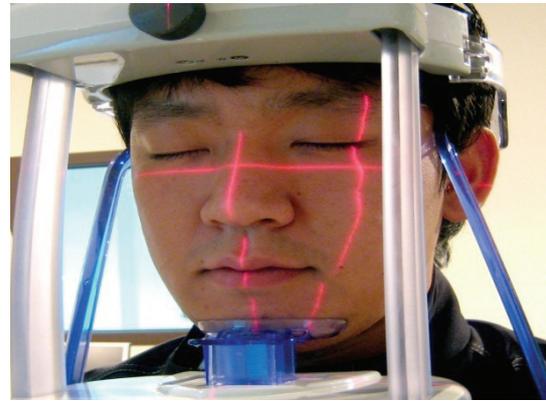
11. The horizontal laser beam, located at the side of the column, can be adjusted up or down to accommodate different head sizes. This is done by manually moving the horizontal laser beam lever up or down.



12. Using the temple support wheel button, adjust the temple supports to fit snugly on either side of the patient's head. The patient's head should be immobilized. The temple support wheel button is located at the front of the patient chinrest.

13. Have the patient close their lips and keep their tongue positioned towards the palate throughout the exposure cycle.

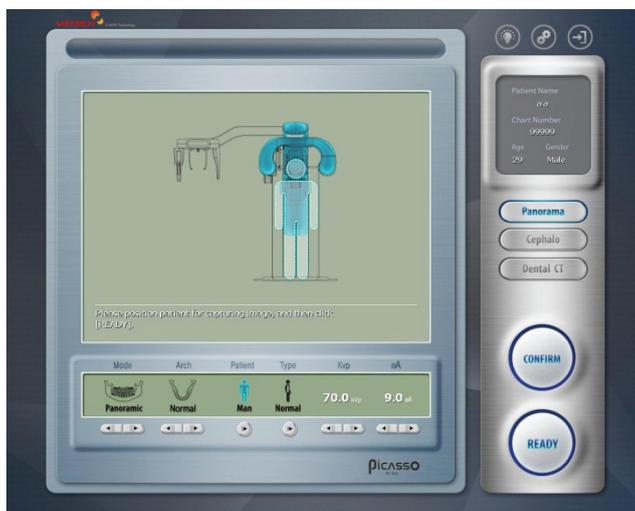
- For a patient with no teeth, the vertical laser beam should be positioned on the patient's mid-sagittal line. The horizontal laser beam should be aligned along the Frankfort plane.



- Ensure that the patient's eyes are closed. Ask the patient to remain still, swallow and place the tongue in contact with the palate and to breathe through the nose. Press and hold the exposure switch button until image acquisition is complete.

- Press the **'Ready'** button when you finish adjusting the patient positioning. Then the rotating unit will move to the position for panoramic imaging.

From there, upon clicking **Confirm** button, it will transform into the **Ready** button. And the Ready button will be active.



Now it is ready to launch the X-ray.



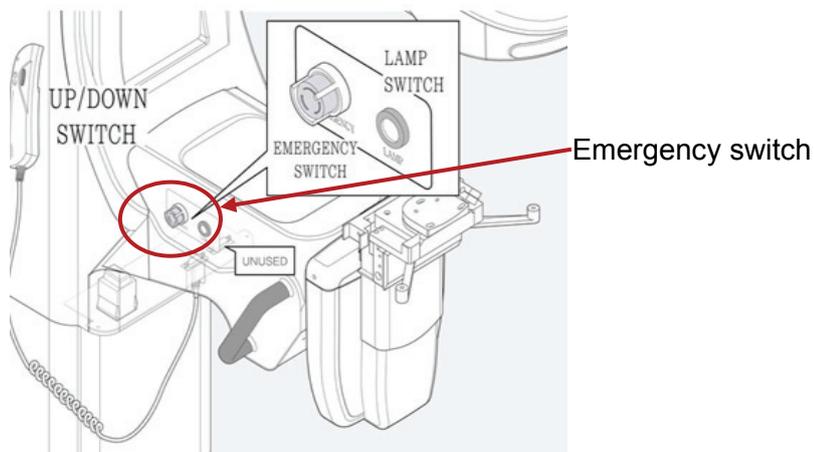
### 7.1.3 Launching the exposure

To launch the X-ray emission, do following steps.

1. Leave X-Ray room and close the door. You must keep eye contact with the patient during acquisition.



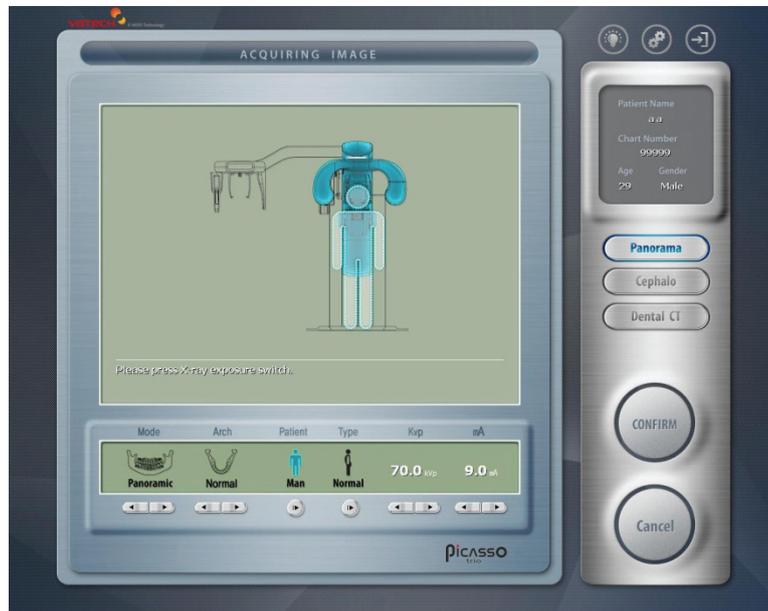
***In cases of any problems, release the exposure switch button or press the red emergency stop button on the column. (See the following figure)***



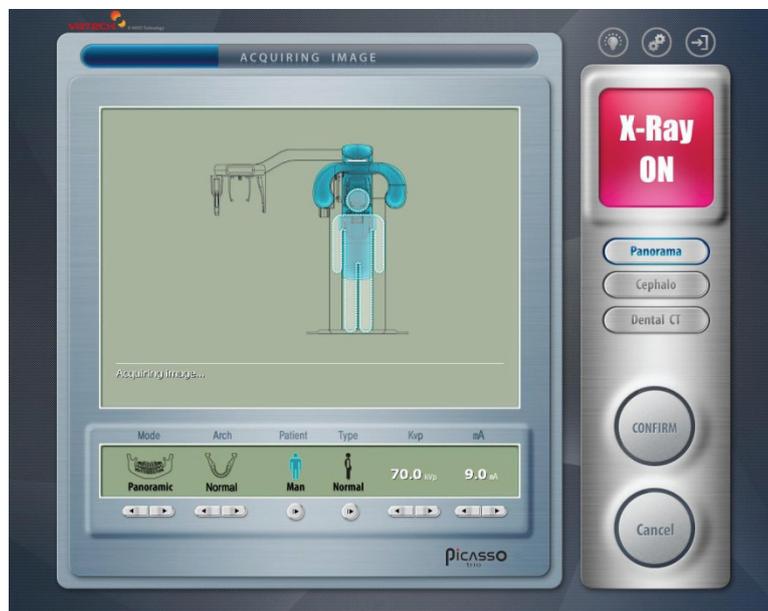
2. Launch X-ray with exposure switch. ***Press and hold it until the end of acquisition.*** Observe the LED lamp on the top of unit turns orange indicating X-ray emission. Image appears on the image capture program on PC in real time.

The following figure shows the acquisition now going on in sequence.

- ① Please X-Ray exposure switch.



- ② Acquiring image and X-Ray is ON.

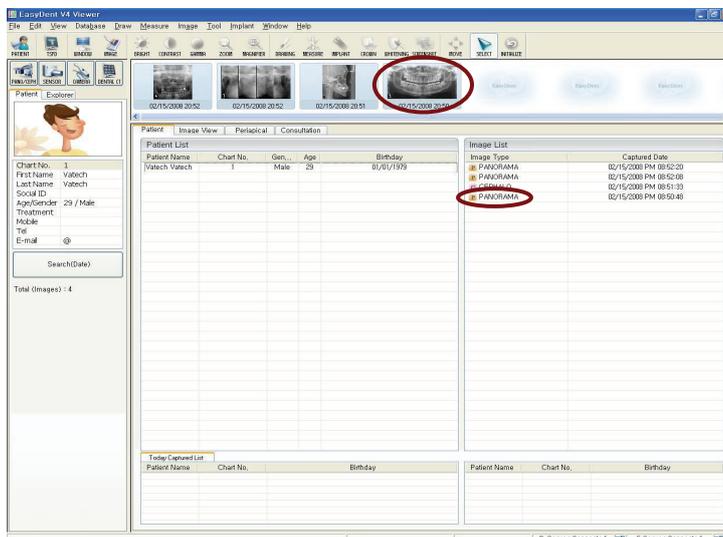




③ Saving the image.



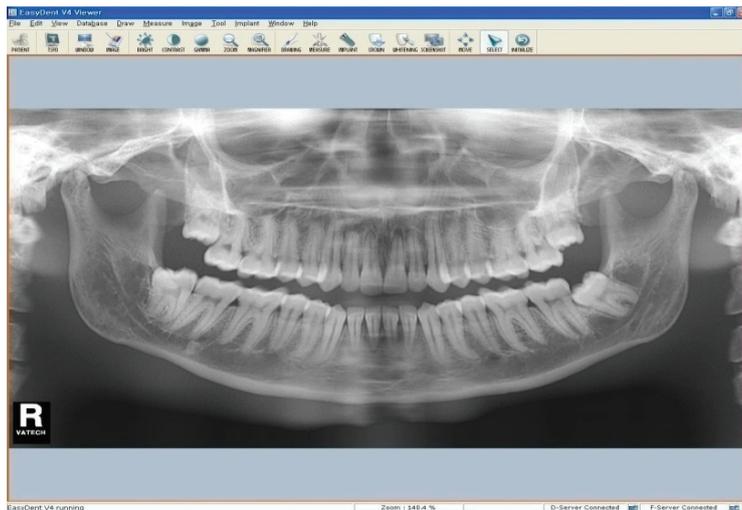
When the acquisition finished, the acquired image automatically transferred to the **EasyDent** control.



When you press the name of the patient in the patient list after imaging, the image list is reconfigured. Image most recently captured appear on the left as shown in the figure. Double click on it to check the image in detail.

Resultant Panoramic image can be checked through **EasyDent V4** Viewer.

The next image is picked as an illustrative purpose only.



3. Check image quality.
4. Do the following when the acquisition is finished.
  - Open temple supports & Head rest and release the patient.
  - Remove the hygiene barrier of the bite block.
  - Reset the rotating unit for the next acquisition.



## 7.2 Acquiring TMJ(Temporomandibular Joint)image

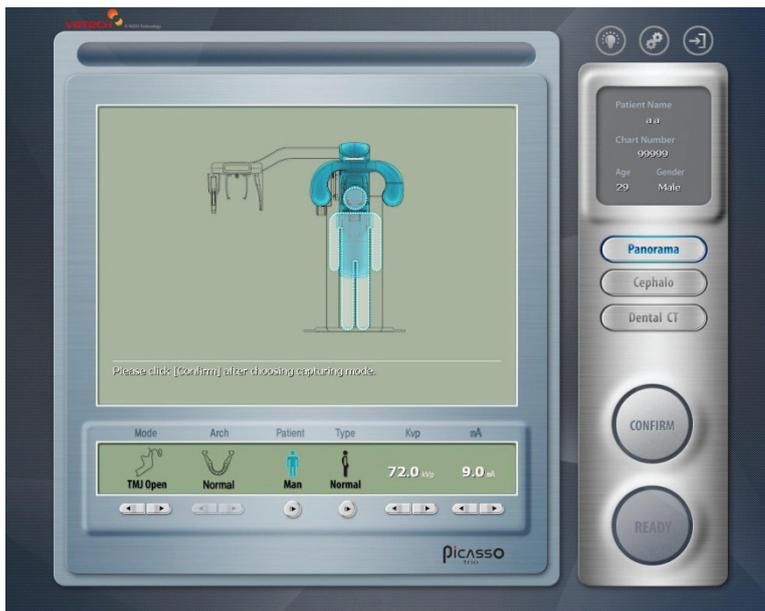
Before acquiring image, make sure that you have:

- Reset a rotating unit of equipment to starting position for new entry.
- Selected the patient record you have created.
- Have the imaging capture software on PC.

### 7.2.1 Preparing the unit and setting the acquisition parameters

From the main screen on the PC, do the following procedures to prepare the parameters for a specific patient and mode.

1. From the main screen of the imaging program, locate the TMJ (Open) button and click it.



2. Select the patient's gender.
3. Select the bone density and adjust “**kVp/mA**” finely, if necessary, using Up/Down arrows.
4. Click “**Confirm**” to reflect the set parameters into imaging environment.

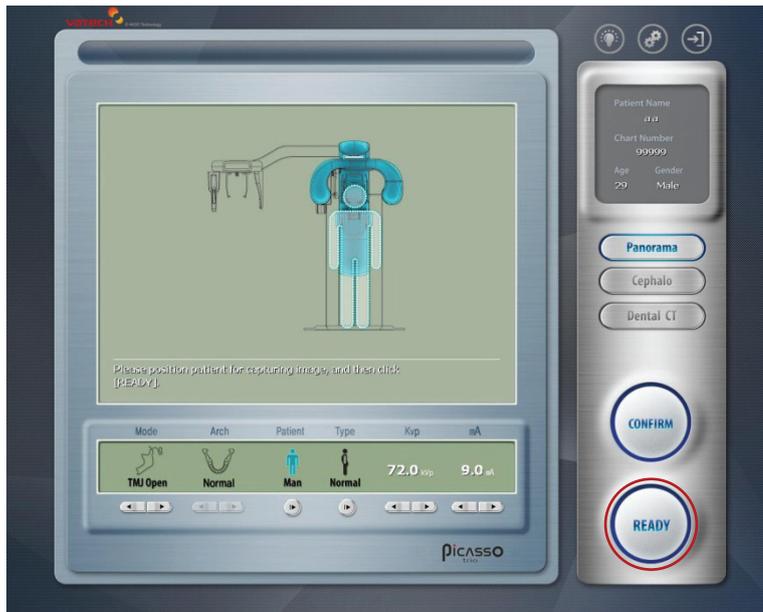


NOTE

It is necessary to adjust exposure parameters manually to reflect the patient's unique features like structure of bone and its density. This is done through kVp/mA fine adjustment.

Refer to the look-up table for details in APPENDIX.

5. It is time to position the patient and "Ready" button will get active.



## 7.2.2 Preparing and positioning the patient

To prepare and position the patient, follow the next steps.



IMPORTANT

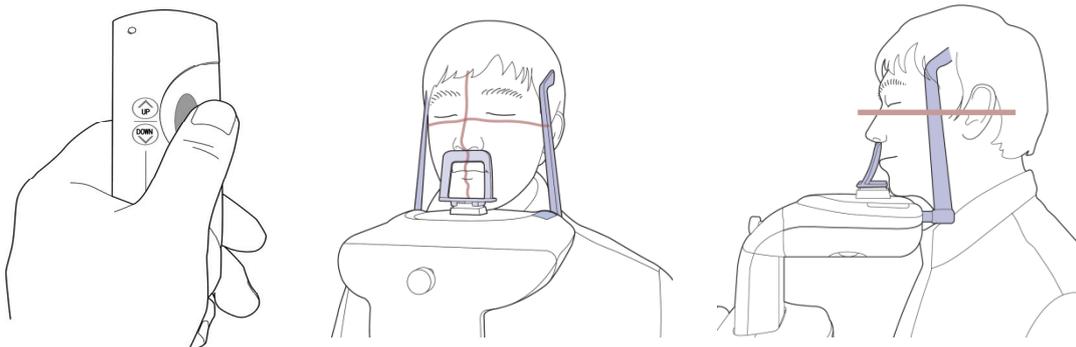
**Correct posture is very important factor for the best image possible. This is because it reduces the shadow of spinal column transferred to the reconstructed image.**

1. Have the patient remove all jewelry and metallic objects, such as earrings, hair pins, spectacles, dentures, and orthodontic appliances. These items can cause shadow images that may obscure diagnosis.

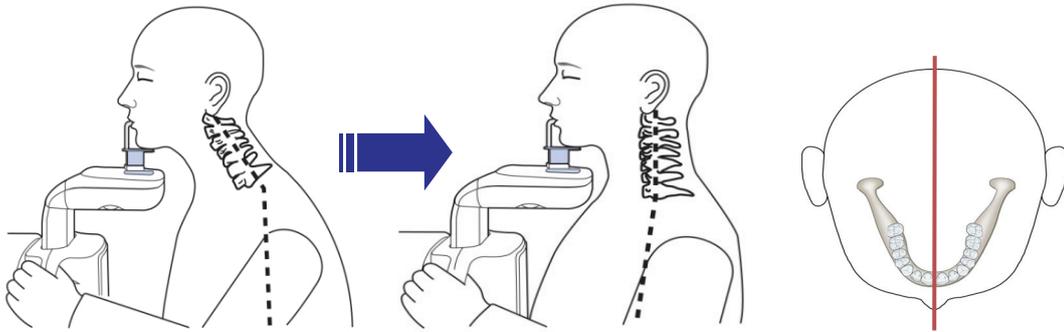


2. Please insert the TMJ chinrest.

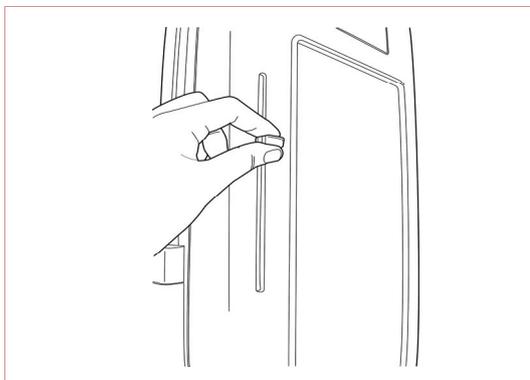
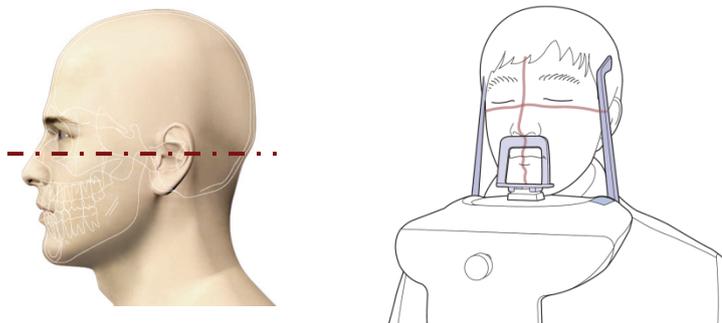
3. It is recommended that the patient wear a lead apron for protection against any possible scatter radiation.
4. Guide the patient to stand at the center of the system at upright position. It is better if the patient comes closer to the system as much as possible. Ask the patient to step forward and to hold the patient handles firmly.
5. It is time to fasten the patient's head to the headrest so as not to move while imaging. Adjust the head rest with rotating the thumb wheel to open and close.
6. Adjust the height of the system using the column up/down switch until the patient's chin is resting on the chinrest. The top of the TMJ chinrest should be in contact with the patient's acanthion point.



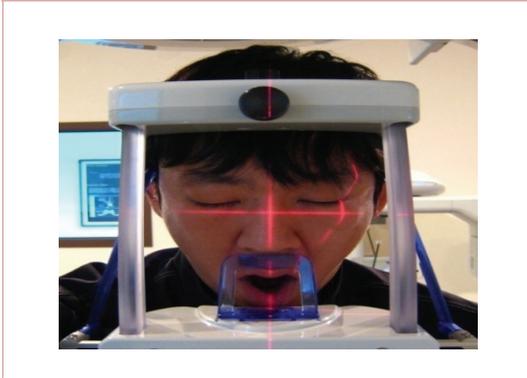
7. Ensure that the patient's shoulders remain level and their neck is relaxed. The cervical spine should be straight and upright. To prevent magnifications on the left and right sides of the final image, make sure that the vertical laser beam is positioned at the center of the occipital bone.



8. Position the head of the patient to properly align their Frankfort plane with the horizontal laser beam. For proper positioning, adjust in which way the patient's head is tilted by adjust the unit slightly upward or downward using the column up/down switch. The Frankfort plane is the line from the infra-orbital point to the superior edge of the External Auditory Meatus(EAM).



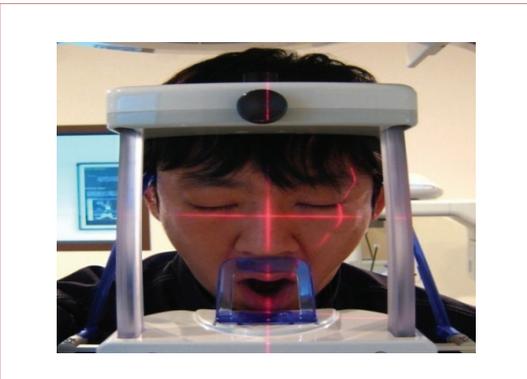
9. The horizontal laser beam, located at the side of the column, can be adjusted up or down to accommodate different head sizes. This is done by manually moving the horizontal laser beam lever up or down.



10. For TMJ – Open imaging, the patient's mouth should be opened as wide as possible. The top of the TMJ chinrest and the patient's acanthion point must remain in contact.

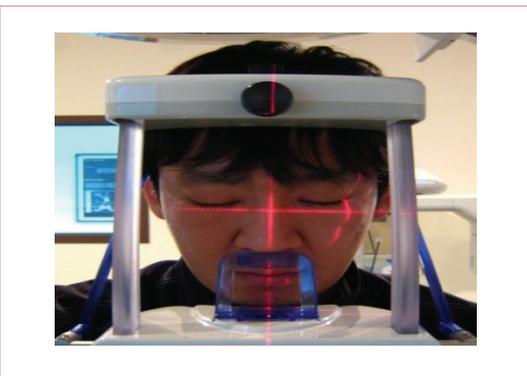


11. Using the temple support wheel button, adjust the temple supports to fit snugly on either side of the patient's head. The patient's head should be immobilized. The temple support wheel button is located at the front of the patient chinrest.



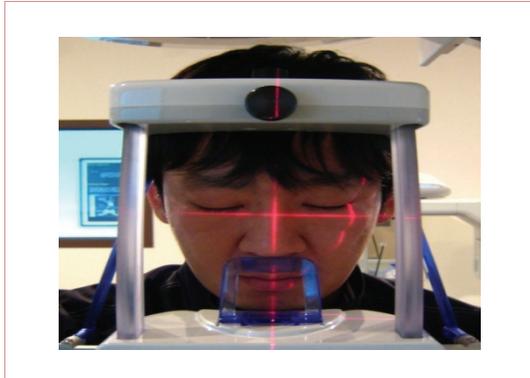
12. Have the patient open their lips and keep their tongue positioned backwards the palate throughout the exposure cycle.

13. Ensure that the patient does not move during image acquisition. To expose, press and hold the exposure switch until TMJ – Open image acquisition is completed.



14. To subsequently take the TMJ–Closed image, the patient's mouth will now remain closed. The upper lip must make contact with the TMJ Chinrest.

15. Have the patients close their lips and rest their tongue at the bottom of their mouth throughout the exposure cycle.

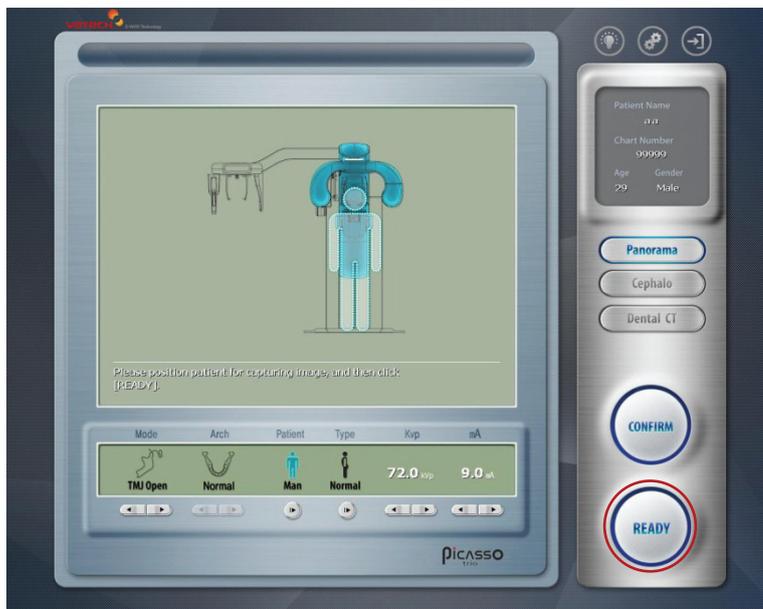


16. Position the head of the patient to properly align their Frankfort plane with the horizontal laser beam. For proper positioning, adjust in which way the patient's head is tilted by adjust the unit slightly upward or downward using the column up/down switch. The Frankfort plane is the line from the infra-orbital point to the superior edge of the External Auditory Meatus (EAM).

17. Ensure that the patient's eyes are closed. Ask the patient to remain still, swallow and place the tongue in contact with the palate and to breathe through the nose.

18. Press the **'Ready'** button when you finish adjusting the patient positioning. Then the rotating unit will move to the position for panoramic imaging.

It will transform into the **Ready** button.





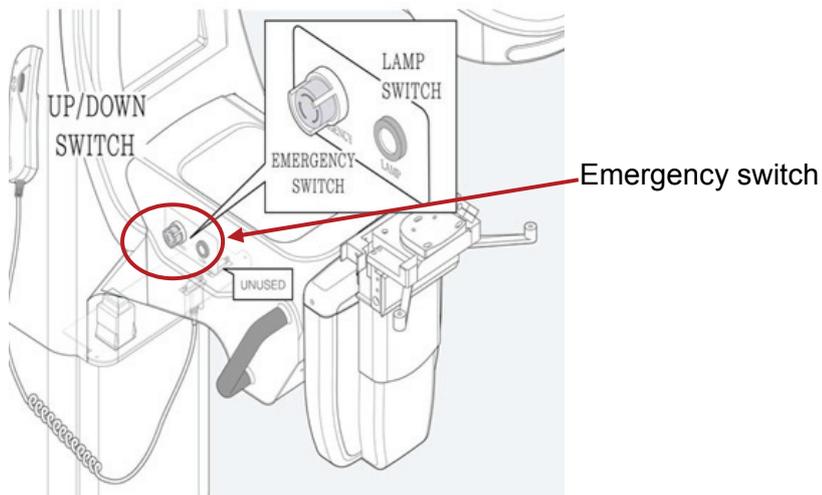
### 7.2.3 Launching the exposure

To launch the X-ray emission, do following steps.

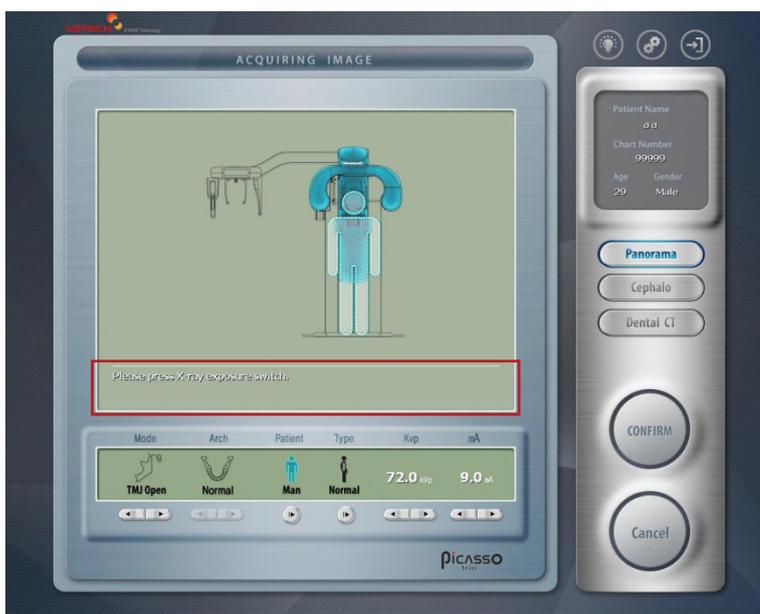
1. Leave X-Ray room and close the door. You must keep eye contact with the patient during acquisition.



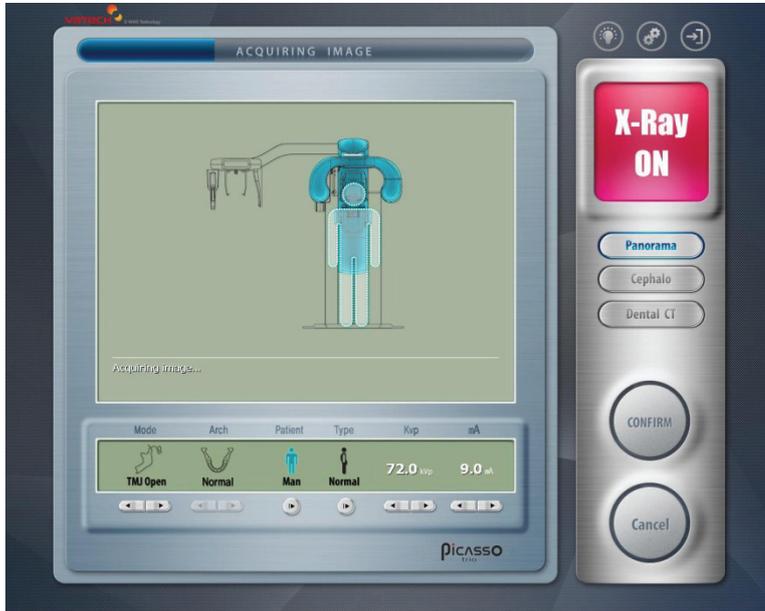
**In cases of any problems, release the exposure switch button or press the red emergency stop button on the column. (See the following figure)**



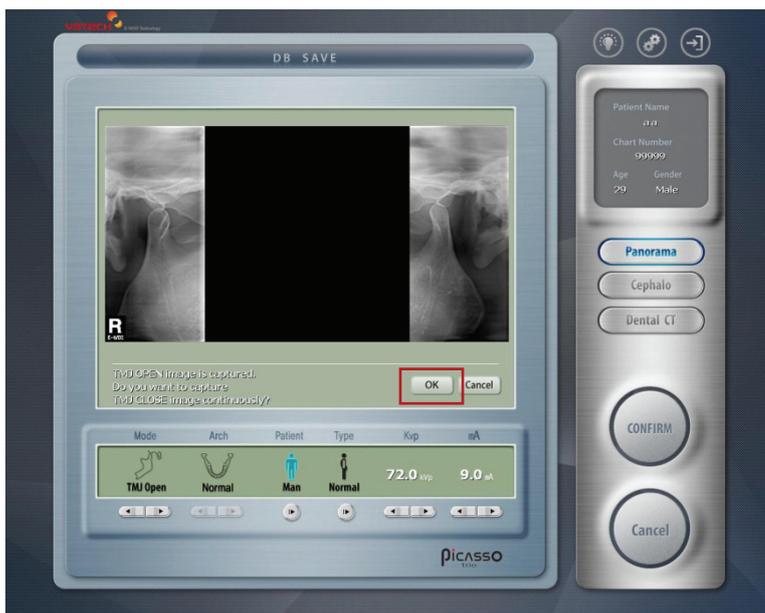
2. Launch X-ray with exposure switch. **Press and hold it until the end of acquisition.**

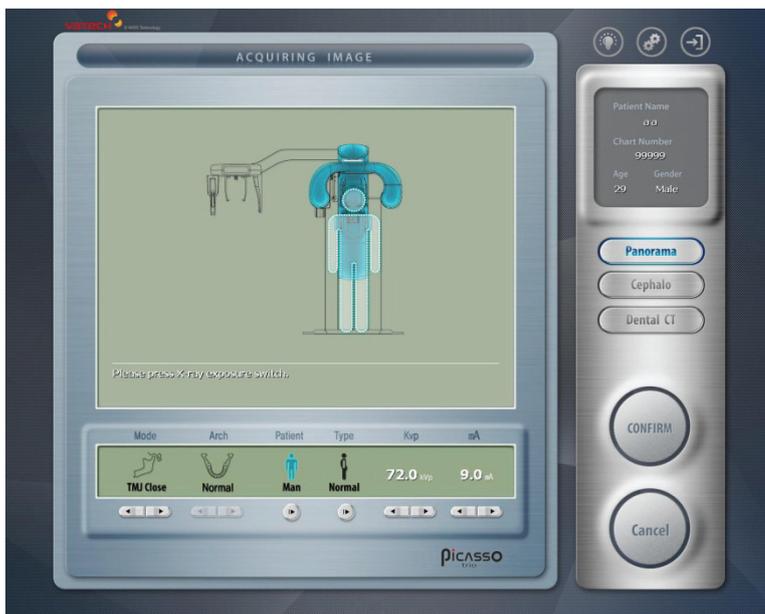
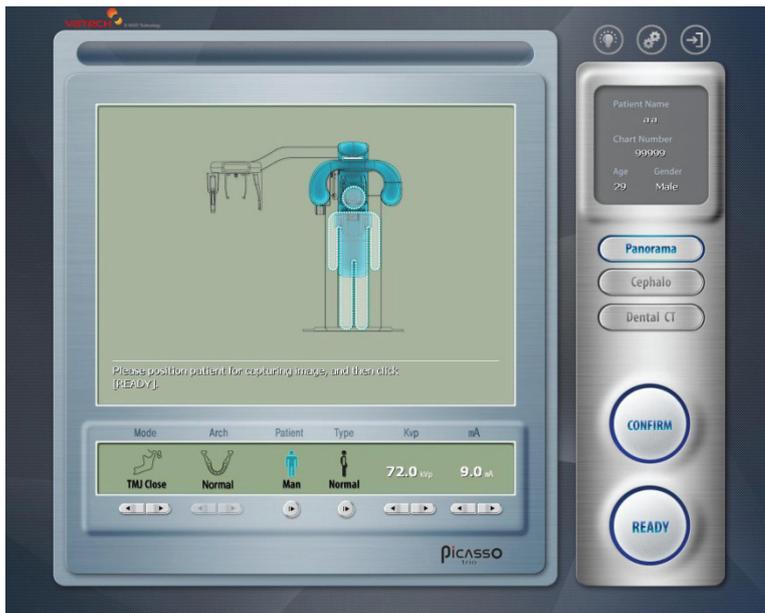


3. Observe the LED lamp on the top of unit turns orange indicating X-ray emission. Image appears on the image capture program on PC in real time. The following figure shows the acquisition now going on.



4. TMJ Open image is captured and you are asked to continue to capture the **Close** mode image. If yes, then ask the patient to close the mouth. You may check if the patient's position is still correct. And click **"OK"** to capture the Close mode image.

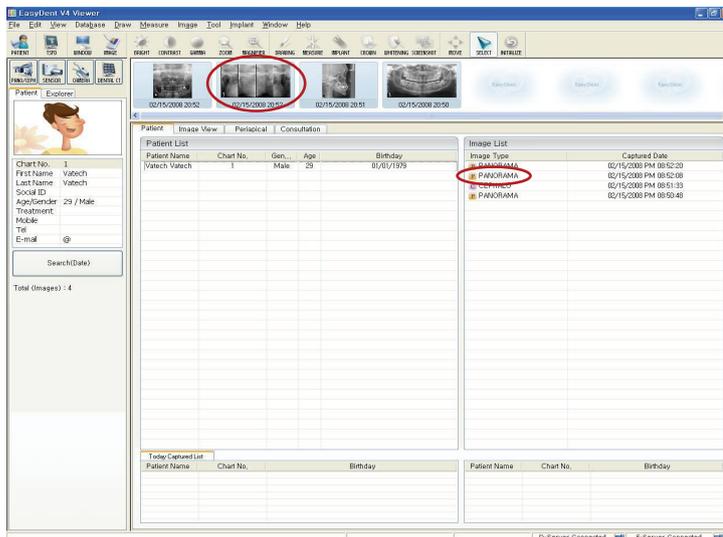




- You are asked to save the captured image after looking into the image on the left window. If it is satisfactory, click "OK"



After acquisition of image, it will be optimized for the process, as the next figure shows. When the acquisition finished, the acquired image automatically transferred to the **EasyDent** control.

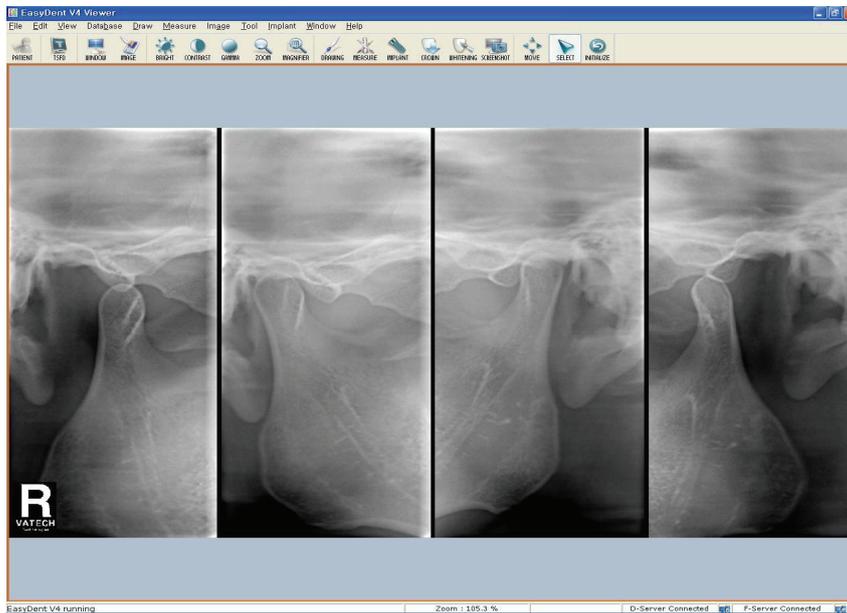


When you press the name of the patient in the patient list after imaging, the image list is reconfigured. Image most recently captured appear on the left as shown in the figure. Double click on it to check the image in detail.

Resultant Panoramic image can be checked through **EasyDent V4 Viewer**.



The next image is picked as an illustrative purpose only.



6. Check image quality.
7. Do the following when the acquisition is finished.
  - Open temple supports & Head rest and release the patient.
  - Remove the hygiene barrier of the bite block.
  - Reset the rotating unit for the next acquisition.

## 7.3 Acquiring Sinus image

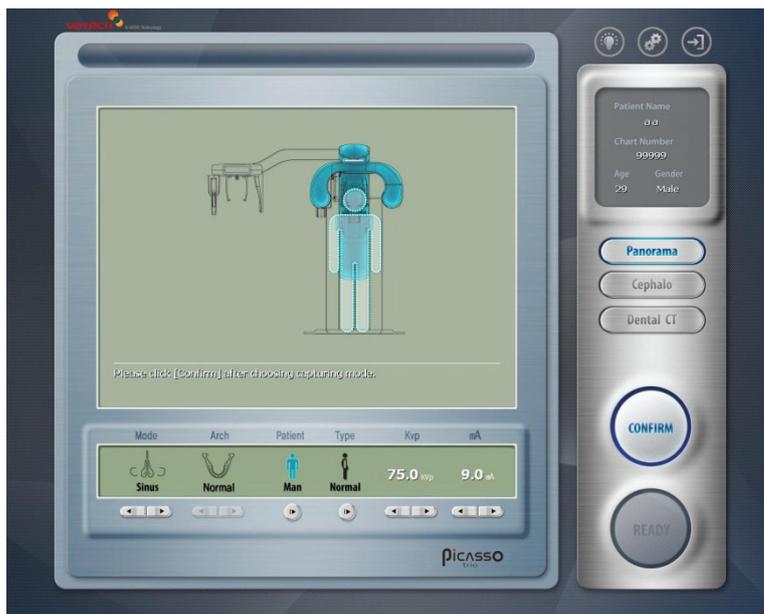
Before acquiring image, make sure that you have:

- Reset a rotating unit of equipment to starting position for new entry.
- Selected the patient record you have created.
- Have the imaging capture software on PC.

### 7.3.1 Preparing the unit and setting the acquisition parameters

From the main screen on the PC, do the following procedures to prepare the parameters for a specific patient and mode.

1. From the main screen of the imaging program, locate the **Sinus** button and click it.



2. Select the patient's gender.
3. Select the bone density and adjust "**kVp/mA**" finely, if necessary using Up/Down arrows.
4. Click "**Confirm**" to reflect the set parameters into imaging environment.



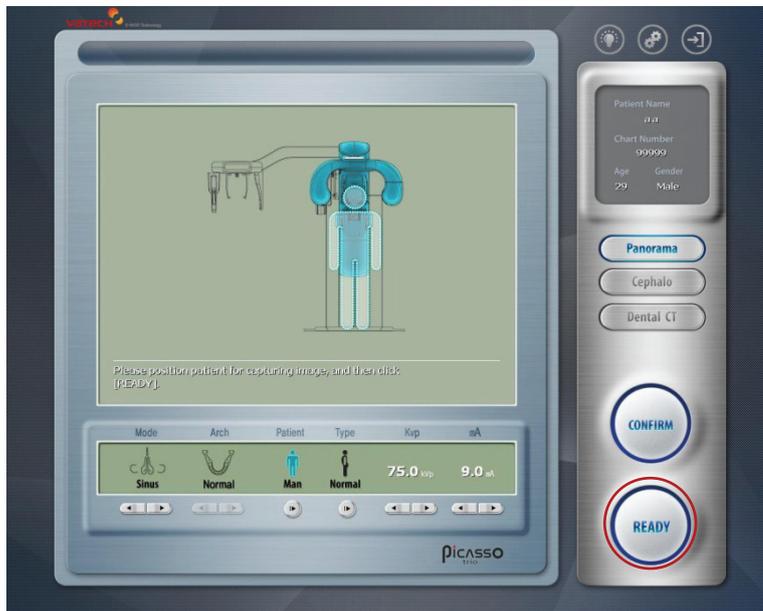
NOTE

**It is necessary to adjust exposure parameters manually to reflect the patient's unique features like structure of bone and its density. This is done through kVp/mA fine adjustment.**

**Refer to the look-up table for details in APPENDIX.**



- It is time to position the patient and “Ready” button will get active.



### 7.3.2 Preparing and positioning the patient

To prepare and position the patient, follow the next steps.



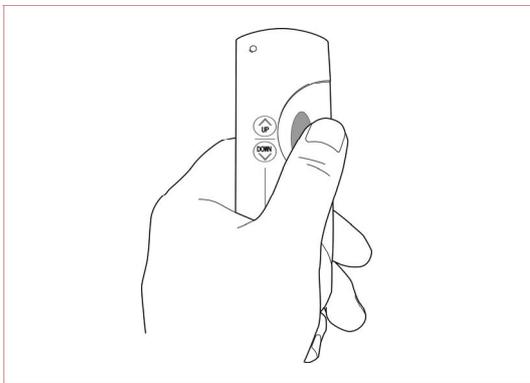
**Correct posture is very important factor for the best image possible.  
This is because it reduces the shadow of spinal column transferred to the reconstructed image.**

- Have the patient remove all jewelry and metallic objects, such as earrings, hair pins, spectacles, dentures, and orthodontic appliances. These items can cause shadow images that may obscure diagnosis.



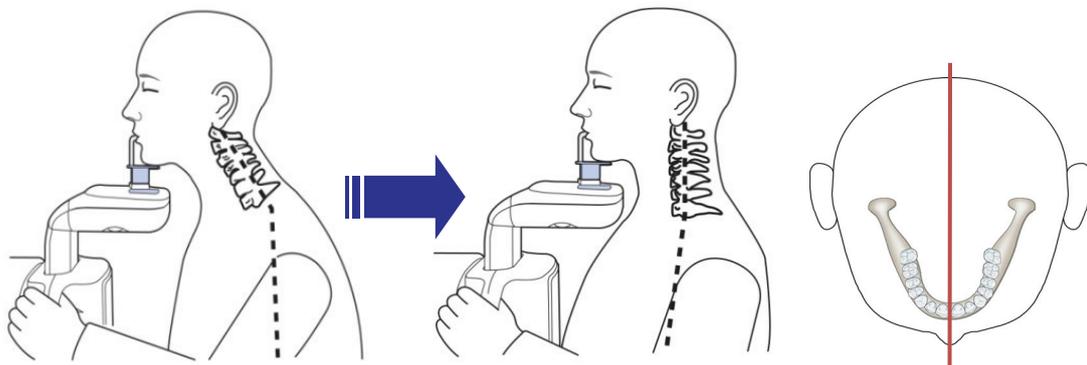
- Insert the Sinus chinrest

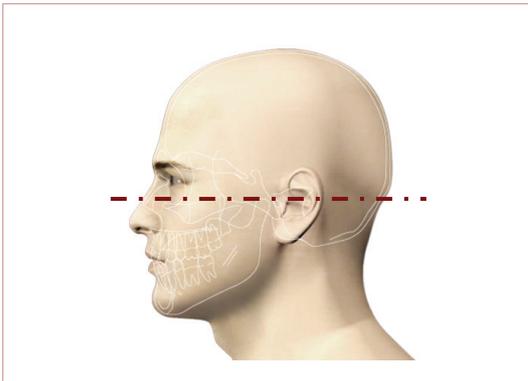
3. It is recommended that the patient wear a lead apron for protection against any possible scatter radiation.
4. Guide the patient to stand at the center of the system at upright position. It is better if the patient comes closer to the system as much as possible. Ask the patient to step forward and to hold the patient handles firmly.
5. It is time to fasten the patient's head to the headrest so as not to move while imaging. Adjust the head rest with rotating the thumb wheel to open and close.



6. Adjust the height of the system using the column up/down switch until the patient's chin is resting on the sinus chinrest.

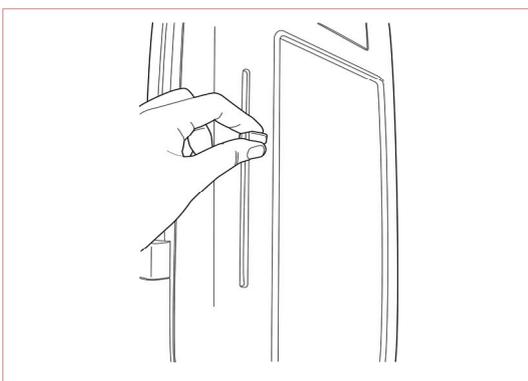
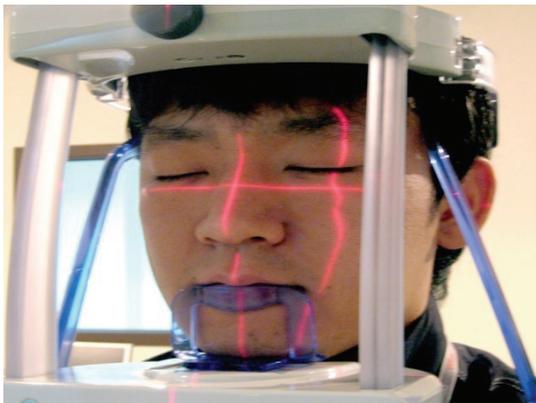
7. Ensure that the patient's shoulders remain level and their neck is relaxed. The cervical spine should be straight and upright. To prevent magnifications on the left and right sides of the final image, make sure that the vertical laser beam is positioned at the center of the occipital bone.





from the infra-orbital point to the superior edge of the External Auditory Meatus(EAM).

9. The horizontal light should fall on the tip of patient's nose. Therefore, you have to tilt the patient's head 10~15 degrees upward.

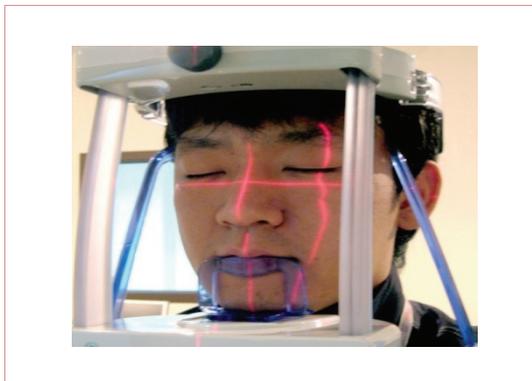


10. Adjust the horizontal laser beam along the patient's Inferior Orbital Fissure. The horizontal laser beam, located at the side of the column, can be adjusted up or down to accommodate different head sizes. This is done by manually moving the horizontal laser beam lever up or down.



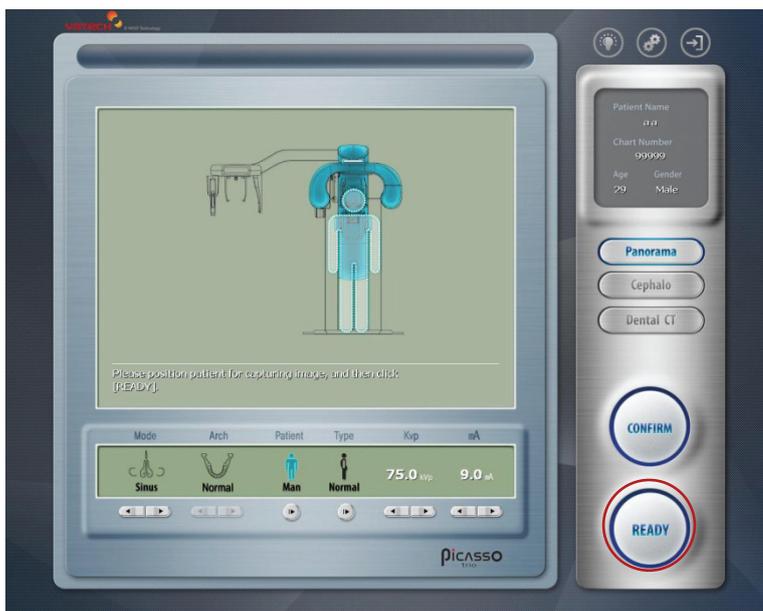
11. Using the temple support wheel button, adjust the temple supports to fit snugly on either side of the patient's head. The patient's head should be immobilized. The temple support wheel button is located at the front of the patient chinrest.

12. Have the patient close their lips and keep their tongue positioned towards the palate throughout the exposure cycle.



13. Ensure that the patient's eyes are closed. Ask the patient to remain still, swallow and place the tongue in contact with the palate and to breathe through the nose. Press and hold the exposure switch button until image acquisition is complete.

14. Press the **'Ready'** button when you finish adjusting the patient positioning. Then the rotating unit will move to the position for panoramic imaging. From there, upon clicking **Confirm** button, it will transform into the **Ready** button.





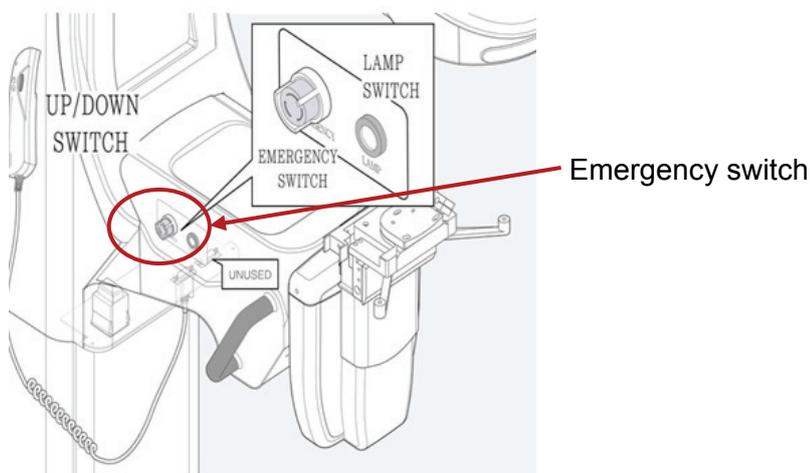
### 7.3.3 Launching the exposure

To launch the X-ray emission, do the following steps.

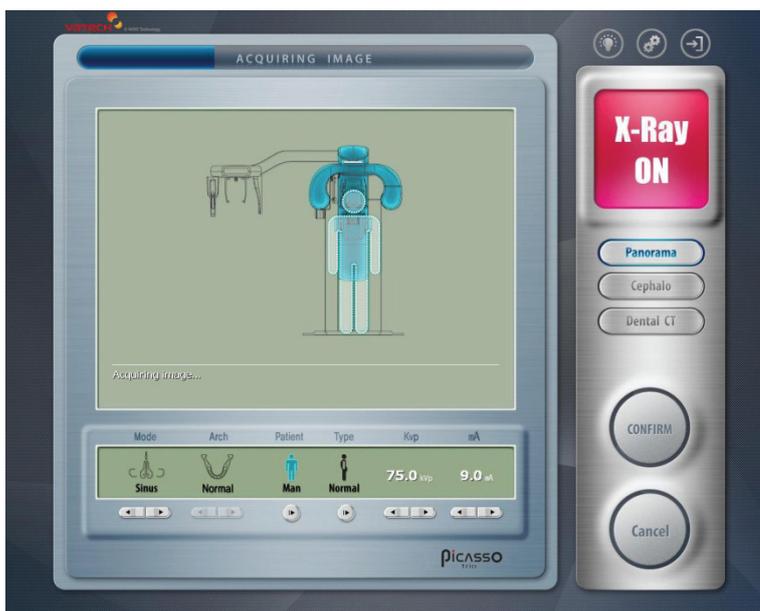
1. Leave the X-Ray room and close the door. From outside of the x-ray room, you must consistently monitor and pay attention to the patient during acquisition.



**In cases of any problems, release the exposure switch button or press the red emergency stop button on the column. (See the following figure)**



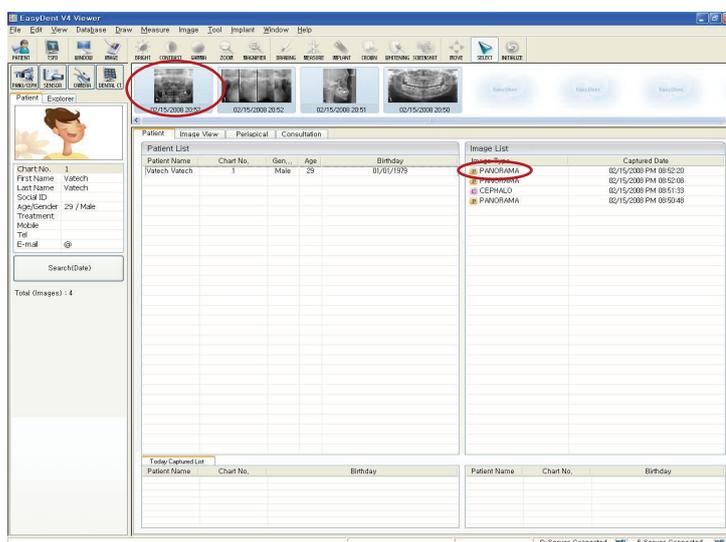
2. Launch X-ray using the exposure switch. Press and hold it until the end of acquisition. Observe the LED lamp on top of the system, as it should turn orange, indicating X-ray emission. And you can see that imaging is progressing gradually.



- You are asked to save the captured image after looking into the image on the left window. If it is satisfactory, click "OK"

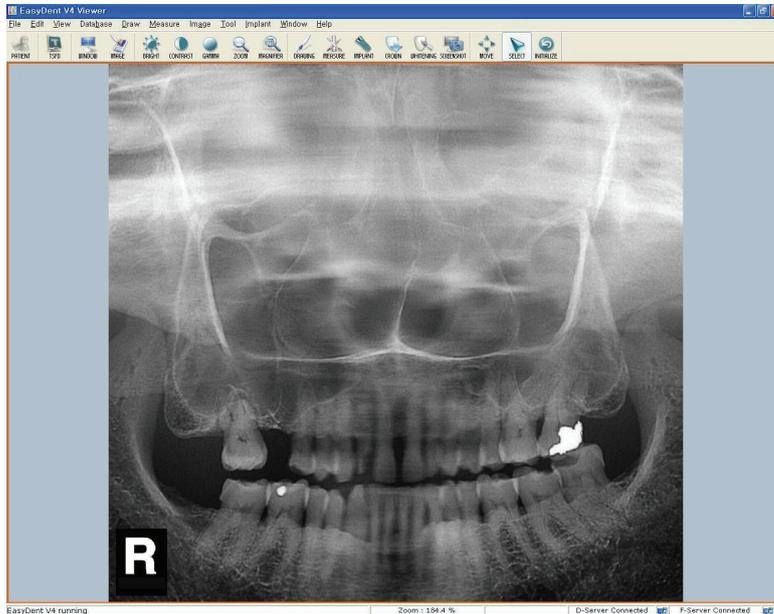


The acquired image appears on the image capture program of the PC in real time. When the acquisition is finished, the acquired image is automatically transferred to the **EasyDent** program.





When you click the name of the patient on the patient list of EasyDent, the image list will be reconfigured. A recently captured image appears on the thumbnail images, as shown in the figure. Double click the image to check it in detail.



4. Check image quality.
5. Do the following when the acquisition is finished.
  - Open temple supports & Head rest and release the patient.
  - Remove the hygiene barrier of the bite block.
  - Reset the rotating unit for the next acquisition.

## Chapter 8 Acquiring Cephalometric images

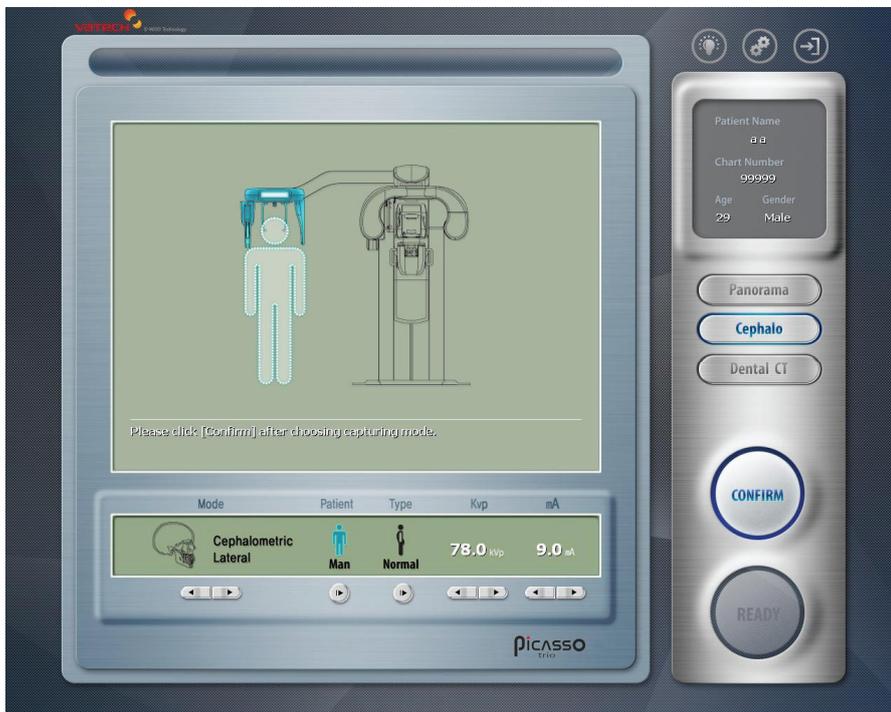
Before acquiring image, make sure that you have:

- Reset a rotating unit of equipment to starting position for new entry.
- Selected the patient record you have created.
- Have the imaging capture software on PC.

### 8.1 Setting the acquisition parameters at Lateral mode

From the main screen on the PC, do the following procedures to prepare the parameters for a specific patient and mode.

1. Click the **Cephalometric** button from main screen to enter the Cephalometric imaging mode



2. Select the **Lateral** mode.
3. Select the patient's gender.



4. Select the bone density and adjust “**kVp/mA**” finely, if necessary using Up/Down arrows.
5. Specify the exposure time.
6. Click “**Confirm**” to reflect the set parameters into imaging environment.  
Then the command text window will read “**The system is moving to capture position. Please wait.....**”

The system is moving to capture initial position,  
please wait...

6. Now it is time to position the patient.



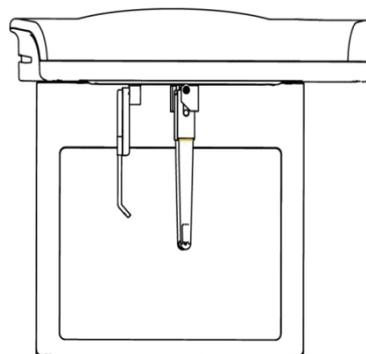
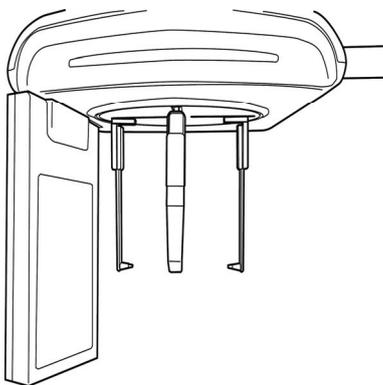
**It is necessary to adjust exposure parameters manually to reflect the patient’s unique features like structure of bone and its density. This is done through kVp/mA fine adjustment.**

**Refer to the look-up table for details in APPENDIX.**

### <Preparing and positioning patient>

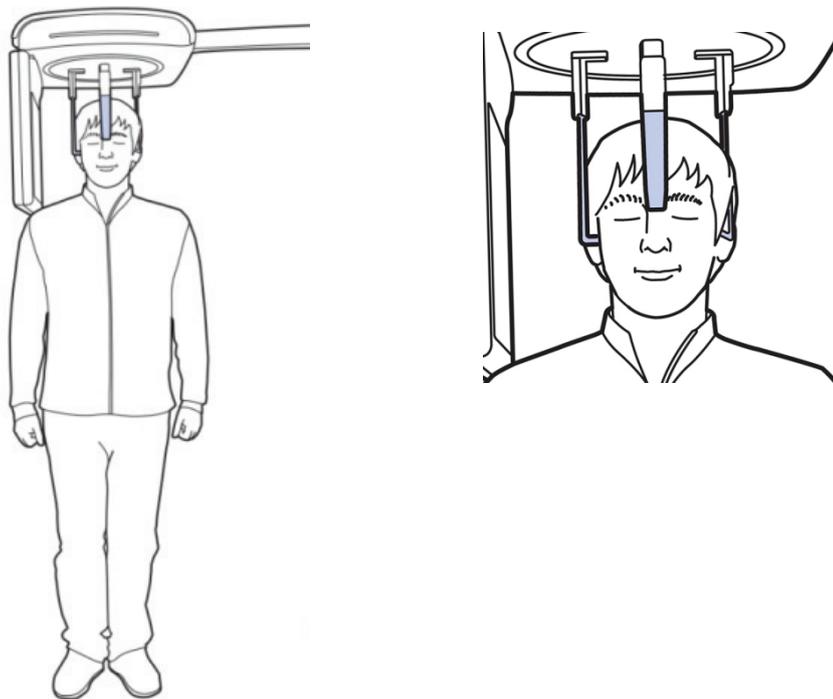
To prepare and position the patient, follow the next steps.

1. Have the patient remove all jewelry and metallic objects, such as earrings, hair pins, spectacles, dentures, and orthodontic appliances. These items can cause shadow images that may obscure diagnosis.
2. Flip the nasal positioner downwards, then Rotate and place the ear rods along the patient’s ears. Adjust the distance of the ear rods, as shown in the illustration.

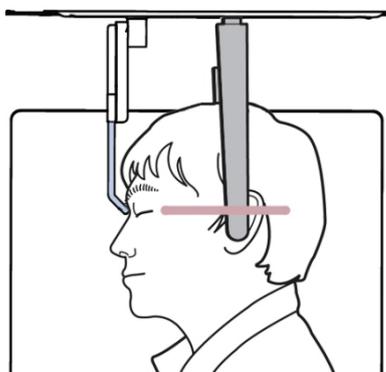


3. It is recommended that the patient wear a lead apron for protection against any possible scatter radiation.
4. Guide the patient to the Cephalometric Unit.

5. Rotate and place the ear rods along the patient's ears. Make sure that the rods are comfortably yet firmly in place.



6. For proper positioning, the patient's OML(Orbitomeatal Line) should be parallel to the floor. Adjust the nasal positioner on the nation point.



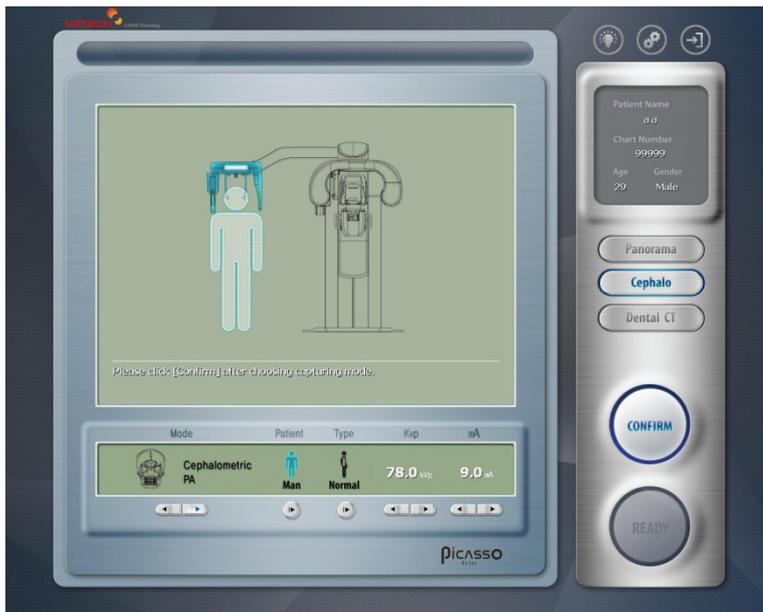
7. Ask the patient to stand upright. Make sure that the patient's shoulders are level and the neck is relaxed.
8. Please click '**Ready**' for the next stage.  
Please go to the **clause 8.5**.



## 8.2 Setting the acquisition parameters at PA mode

From the main screen on the PC, do the following procedures to prepare the parameters for a specific patient and mode.

1. Click the **Cephalometric** button from main screen to enter the Cephalometric mode



2. Select the **PA** mode using the arrow  
There are 4 modes
3. Select the patient's gender.
4. Select the bone density and adjust "**kVp/mA**" finely, if necessary using Up/Down arrows.
5. Specify the exposure time.
6. Click "**Confirm**" to reflect the set parameters into imaging environment.

Then the command text window will read "**The System is moving to capture initial position. Please wait.....**"

The system is moving to capture initial position.  
please wait...

7. Now it is time to position the patient.



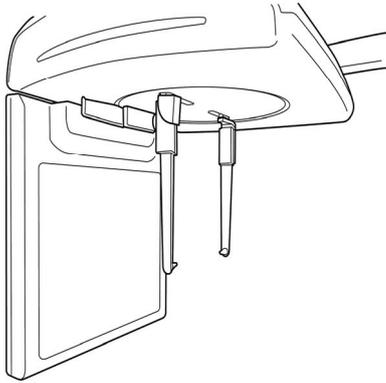
It is necessary to adjust exposure parameters manually to reflect the patient's unique features like structure of bone and its density. This is done through kVp/mA fine adjustment.

Refer to the look-up table for details in APPENDIX.

### <Preparing and positioning the patient>

To prepare and position the patient, follow the next steps.

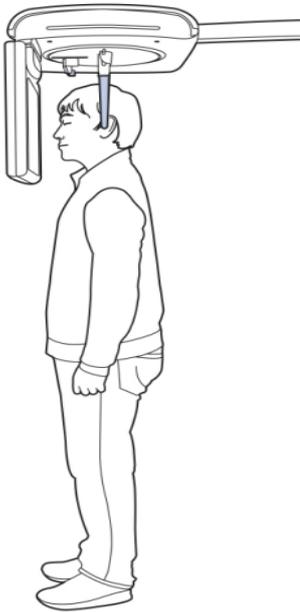
1. The nasal positioner should be flipped sideways upward to prevent image obstruction.
2. Adjust the distance of the ear rods, as shown in the illustration.



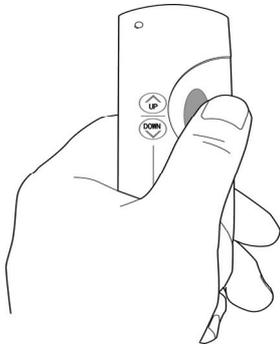
3. Have the patient remove all jewelry and metallic objects, such as earrings, hair pins, spectacles, dentures, and orthodontic appliances. These items can cause shadow images that may obscure diagnosis.
4. It is recommended that the patient wear a lead apron for protection against any possible scatter radiation.
5. Guide the patient to the Cephalometric Unit.



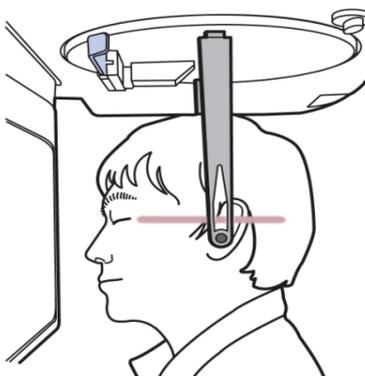
6. Ask the patient to stand upright. Make sure that the patient's shoulders are level and the neck is relaxed.



7. Adjust the height of the unit to fit the patient. Press the Up & Down button of the Column switch to adjust the carriage until the ear rods are properly positioned adjacent to the patient's ears.



8. As a gauge for proper positioning, the Frankfort Plane should be parallel to the floor.

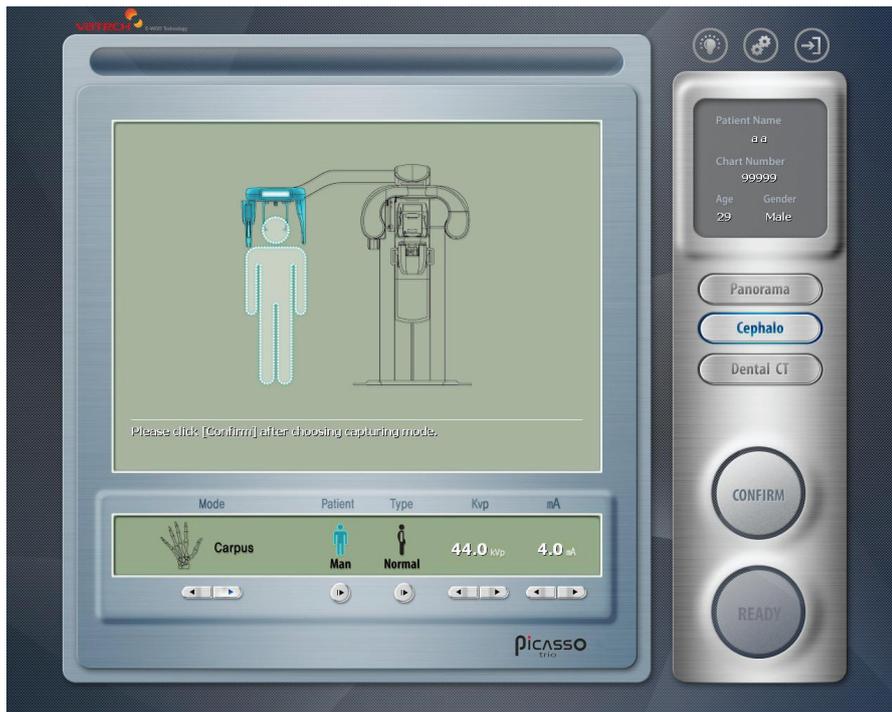


9. Please click '**Ready**' for the next stage.

### 8.3 Setting the acquisition parameters at Carpus mode

From the main screen on the PC, do the following procedures to prepare the parameters for a specific patient and mode.

1. Click the **Cephalometric** button from main screen to have the carpus mode



2. Select the **Carpus** mode using the arrow  
There are 4 modes
3. Select the patient's gender.
4. Select the bone density and adjust "**kVp/mA**" finely, if necessary using Up/Down arrows.
5. Specify the exposure time.
6. Click "**Confirm**" to reflect the set parameters into imaging environment.  
Then the command text window will read "**The System is moving to capture initial position. Please wait.....**"

The system is moving to capture initial position, please wait...

7. Now it is time to position the patient.



It is necessary to adjust exposure parameters manually to reflect the patient's unique features like structure of bone and its density. This is done through kVp/mA fine adjustment.

Refer to the look-up table for details in APPENDIX.

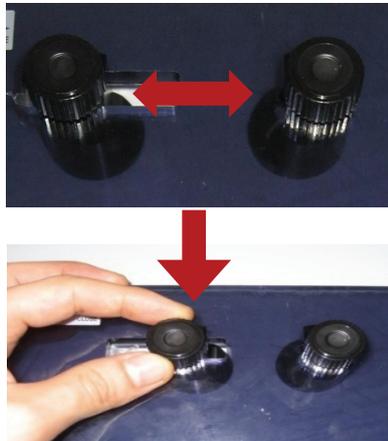
### <Preparing and positioning the patient>

To prepare and position the patient, follow the next steps.

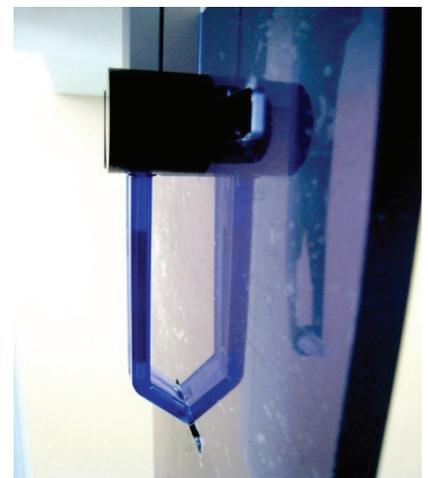
1. Attach the Accessory.



Hole



2. Align the above hole to the nasion pointer and adjust the left and right knobs to fasten it.



### 3. Positioning of the carpus.





## 8.4 Setting the acquisition parameters at SMV mode

From the main screen on the PC, do the following procedures to prepare the parameters for a specific patient and mode.



**SMV is an abbreviation of Cephalometric Submento-vertical.**

1. Click the **Cephalometric** button from main screen.



2. Select the **SMV** mode turning the arrow.
3. Select the patient's gender.
4. Select the bone density and adjust "**kVp/mA**" finely, if necessary using Up/Down arrows.
5. Specify the exposure time.
6. Click "**Confirm**" to reflect the set parameters into imaging environment.  
Then the command text window will read "**The system is moving to capture initial position. Please wait.....**"

The system is moving to capture initial position,  
please wait...

7. Now it is time to position the patient.



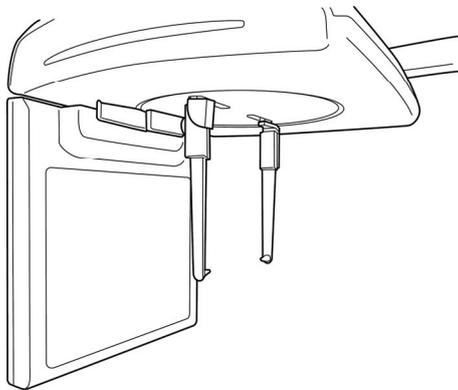
It is necessary to adjust exposure parameters manually to reflect the patient's unique features like structure of bone and its density. This is done through kVp/mA fine adjustment.

Refer to the look-up table for details in APPENDIX.

### <Preparing and positioning patient>

To prepare and position the patient, follow the next steps.

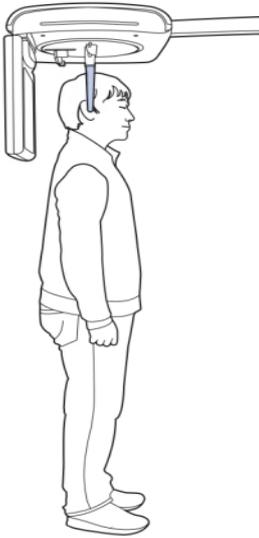
1. The nasal positioner should be flipped sideways upward to prevent image obstruction.



2. For head positioning, adjust the distance of the ear rods.
3. Have the patient remove all jewelry and metallic objects, such as earrings, hair pins, spectacles, dentures, and orthodontic appliances. These items can cause shadow images that may obscure diagnosis.
4. It is recommended that the patient wear a lead apron for protection against any possible scatter radiation.
5. Guide the patient to the Cephalometric Unit.



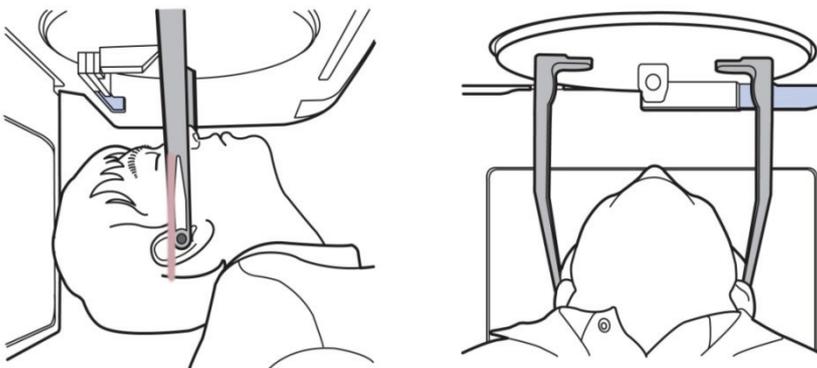
6. Ask the patient to stand upright and to face the x-ray tube.



7. Place the ear rods along the patient's ears. Make sure that the rods are comfortably, yet firmly in place.



8. For proper positioning, the patient's Frankfort plane should be perpendicular to the floor.



9. Please click '**Ready**' for the next stage.  
Please go to the **clause 8.5 Launching x-ray exposure**.

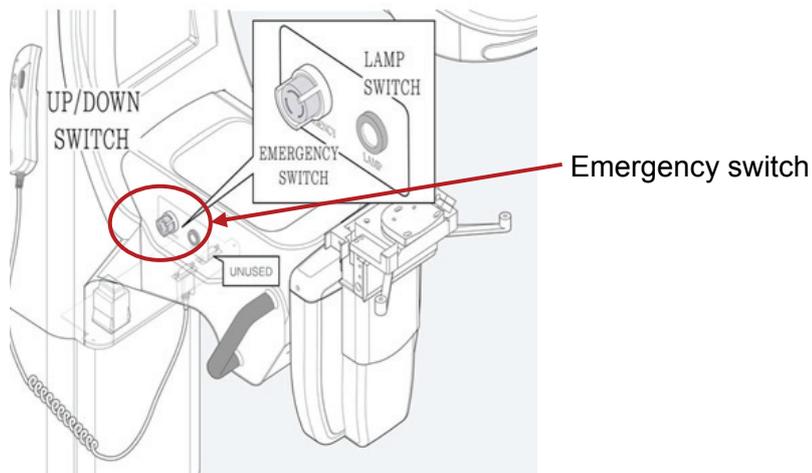
## 8.5 Launching x-ray exposure

To launch the X-ray emission, do following steps.

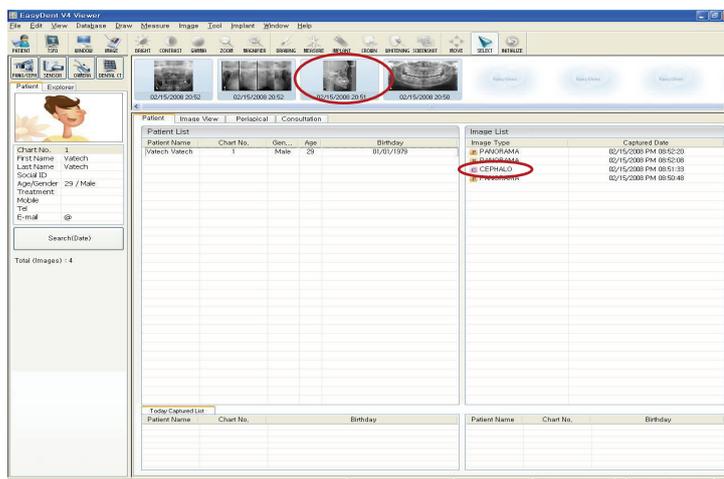
1. Leave X-Ray room and close the door. You must keep eye contact with the patient during acquisition.



**In cases of any problems, release the exposure switch button or press the red emergency stop button on the column. (See the following figure)**



2. Launch X-ray with exposure switch. **Press and hold it until the end of acquisition.** Observe the LED lamp on the top of unit turns orange indicating X-ray emission. Image appears on the image capture program on PC in real time. When the acquisition finished, the acquired image automatically transferred to the **EasyDent.**



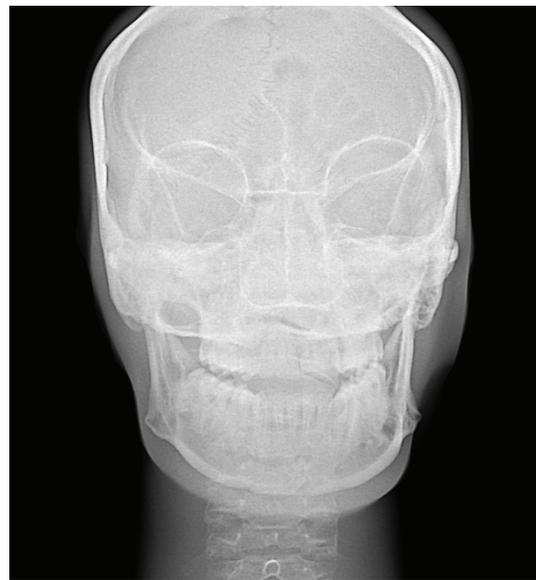


When you press the name of the patient in the patient list after imaging, the image list is reconfigured. Image most recently captured appear on the left as shown in the figure. Double click on it to check the image in detail.

Resultant Panoramic image can be checked through **EasyDent V4 Viewer**



Lateral mode



Posterior-Anterior (PA mode)

3. Check image quality.
4. Do the following when the acquisition is finished.
  - Open temple supports and release the patient.
  - Remove the hygiene barrier of the bite block.
  - Reset the rotating unit for the next acquisition.

## Chapter 9 Acquiring CT image

Before acquiring image, make sure that you have:

- Reset a rotating unit of equipment to starting position for new entry.
- Selected the patient record you have created.
- Have the imaging capture software on PC.

### 9.1 Preparing the unit and setting the acquisition parameters

From the PC, do the following procedures to prepare the parameters for a specific patient and mode. This instance, however, explains the case of taking images with the FOV size of 12x8.5cm. But these procedures are applicable to any FOV size in the same ways.

1. Click the **Dental CT** button from main screen.



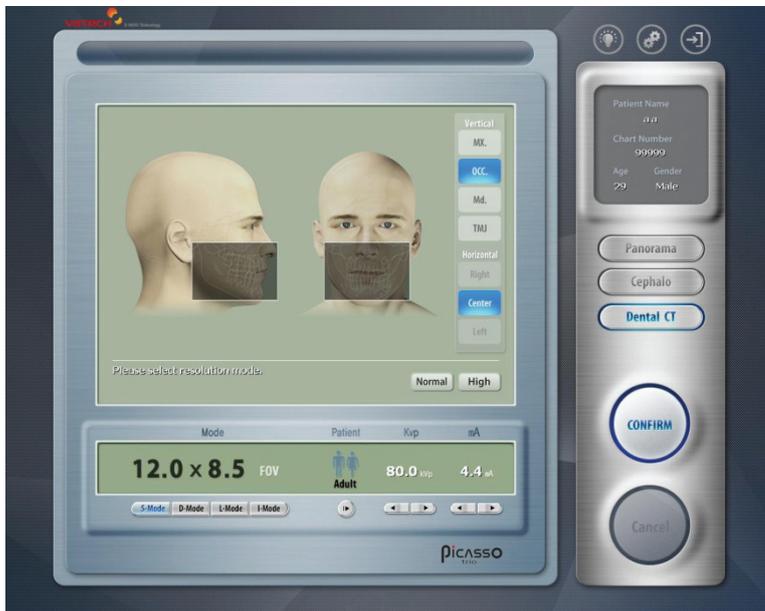
2. Select a specific FOV size of your interest.
3. Select the **Patient** type.
4. Adjust the **kVp** and **mA** fitting the current patient nature.
5. Click **Confirm** button for parameters to take effect.



6. Select the **Quality** mode.



7. Select the **Resolution** mode.



8. Select the **Metal Artifact** mode.



## 9.2 Preparing and positioning patient

### <Preparing the patient to the nature>

1. Insert the headrest into the unit.
2. Please adjust the chinrest.
3. Adjust the Headrest to provide the best comfort to the patient.
4. Use the Beam to align the patient.

### <Positioning the patient>



**Correct posture is very important factor for the best image possible. This is because it reduces the shadow of spinal column transferred to the reconstructed image.**



**Taking positions at CT imaging mode is virtually the same as that at standard panoramic mode.**

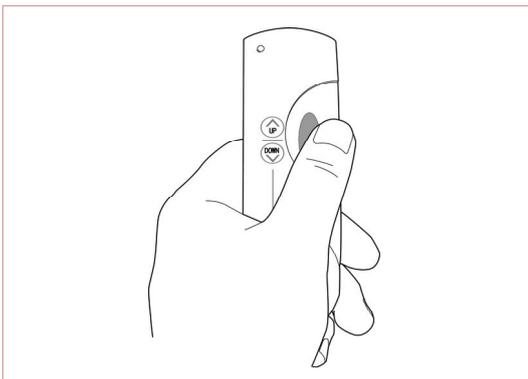


1. Ask the patient to remove all jewelries and other objects such as earrings, hair pins, spectacles, dentures or orthodontic appliances. Shadows caused by these opacities may obscure diagnosis.



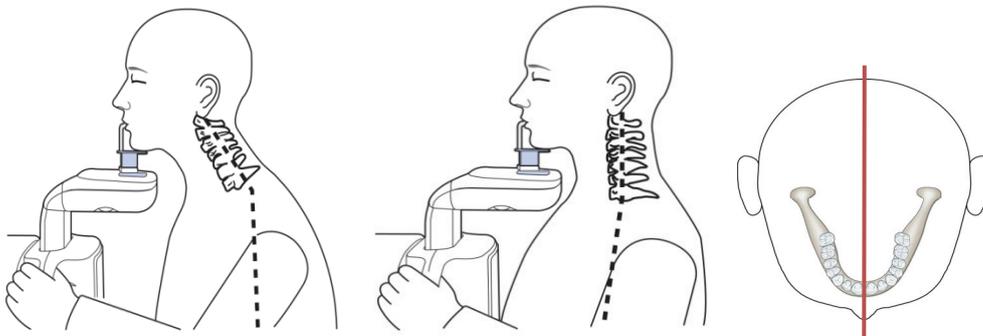
2. Insert the normal chinrest and bite block rod in hygienic cover on the chinrest.

3. Have the patient wear protective clothing. It is recommended that the patient wear protective clothing, like lead apron, for protection against radiation.
4. Guide the patient to stand at the center of the system at upright position. It is better if the patient comes closer to the system as much as possible. Ask the patient to step forward and to hold the patient handles firmly.
5. It is time to fasten the patient's head to the headrest so as not to move while imaging.

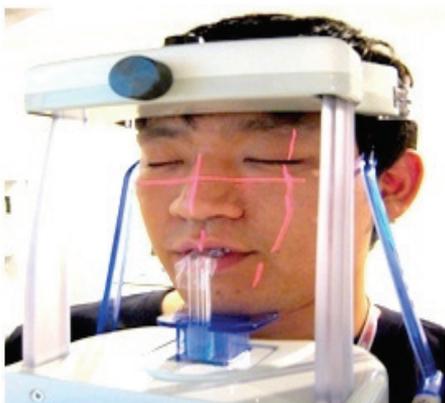


6. Adjust the height of system to fit the patient using the column up / down switch until the chinrest is on the level of the patient's chin. Position the patient's chin on the normal chinrest.

7. Make sure that the patient's shoulders are level and the neck is relaxed. The cervical spine should be straight and upright. If the vertical beam does not get through the center of the occipital bone, the panorama image would appear to have different magnifications on the right and on the left sides, or a ghost image would appear.



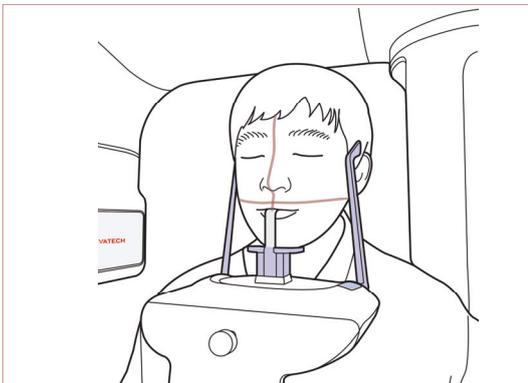
8. Make sure that the bite block is covered with hygienic cover. The patient should be instructed to bite the bite block along its grooves using his/her upper and lower incisors, with the chin in good contact with the chinrest.



**Position of each horizontal light beam varies with the FOV size selected currently. Thus it is required to let the horizontal beam fall on the middle of the region of interest.**



9. Adjust the temples support to fit snugly on the patient's temples by turning the temple support wheel button, which is located at the rear of the patient support table. The head should be immobilized using the temples support.



10. For CR imaging, the horizontal light should be aligned the patient's occlusion. But the beam cannot be adjusted. So, to properly align the patient's occlusion along the Horizontal beam, adjust the height of the chinrest using the up/down control buttons.



**If you want to take a clear image of a particular area, adjust the chinrest using Up/down buttons of the LCD panel, so the light will be focused on the area.**

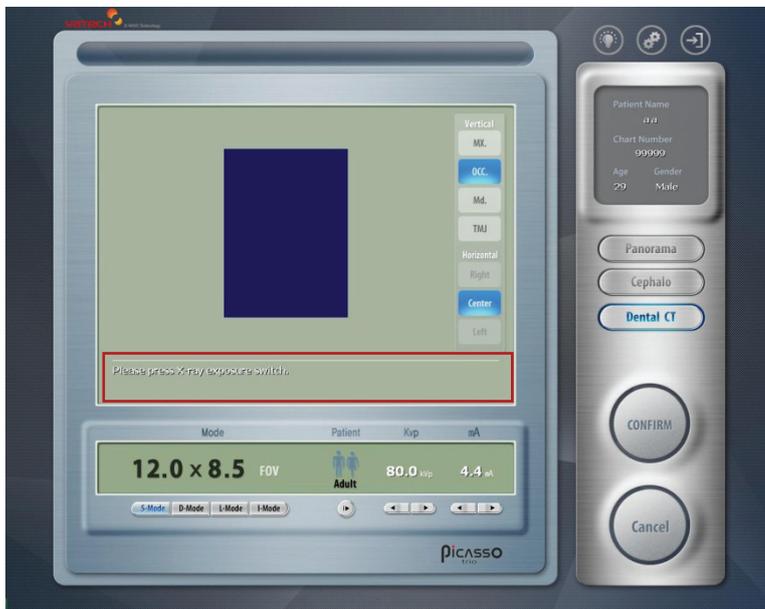
- 1. To focus on the maxillary area, the horizontal light should be aligned at 1.5cm above the patient's occlusion.**
- 2. To focus on the mandible area, the horizontal light should be aligned at 1.5cm below the patient's occlusion.**

11. The patient's tongue should be positioned towards the palatal area and should not move throughout the exposure cycle, while the lips should be closed.
12. Make sure that the patient's eyes are closed. Press and hold the exposure switch until the acquisition of image is completed.

13. Please click **'Ready'** for the next stage. Then rotating unit will move to starting position for the CT imaging mode.



14. By clicking **"Ready"**, the following screen will come up. And you are asked to hold down the exposure switch.





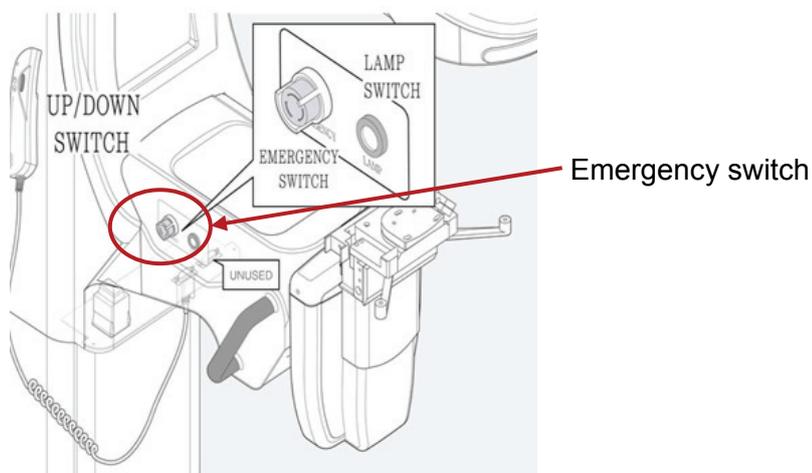
### 9.3 Launching exposure

To launch the X-ray emission, do following steps.

1. Leave X-Ray room and close the door. You must keep eye contact with the patient during acquisition.



**In cases of any problems, release the exposure switch button or press the red emergency stop button on the column. (See the following figure)**



2. Launch X-ray with exposure switch. Press and hold it until the end of acquisition. Observe the LED lamp on the top of unit turns orange indicating X-ray emission. Image appears progressively on the image capture program on PC in real time.



Upon releasing the exposure switch, then image reconstruction will begin.  
Now reconstructing the image taken

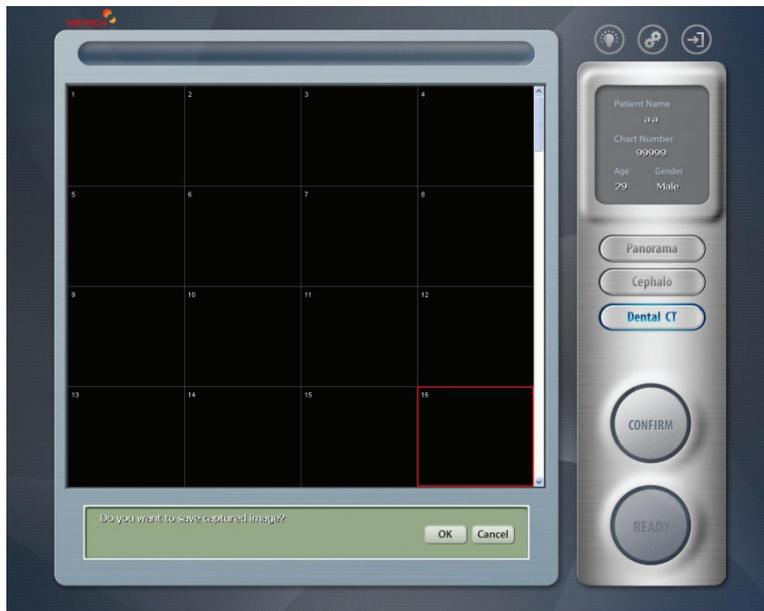


Converting to DICOM format file





Finally acquired image is displayed on the split windows.



You are asked **“Do you want to save captured image?”**

If yes, click **“OK”**, otherwise do **“Cancel”**, which usually is the case when you are not satisfied with the image result.

After saving, the **Ez3D2009** will run automatically.



## Chapter 10 Maintenances

### 10.1 Storage and transportation

- Ambient temperature: **-20 °C ~ 50 °C**
- Relative humidity: 10%~ 90%
- Ambient, atmospheric pressure: 500~1060 hPa
- Although it can be allowed to be stored up to 10 degree of slope, it is recommended that equipment be used and stored on flat, even surface.

### 10.2 Sterilization and disinfection

- Sterilization and disinfection should be performed thoroughly for the items like handle frame, chinrest and bite block among other things, with which patients' contacts frequently are made.
- Disinfect the affected area with 2% ammonia solution and in particular the bite block used by previous users should be sterilized for more than 15 min. at **121 °C**.
- Ultrasonic cleansing, if necessary, should be carried out.

### 10.3 Regular maintenance and treatment

- Don't unplug various kinds of cables by force.
- Don't keep equipments or items susceptible to water or humidity.
- Keep those in places not affected by temperature, ventilation, sun light, dust, salt and so forth.
- Avoid the area vulnerable to some degree of slope, vibration and shock.
- Avoid area near to chemical storage and gas-filled storage.
- Keep miscellaneous materials well organized for next use.
- In case of cleaning equipment, wipe gently the surface with soft, dry tissue evenly.  
In extreme case of water or any forms of liquid being spilled into the inside equipment, turn off equipment immediately and ask help for a qualified person.



## 10.4 Regular checkup

- Equipment and components should be maintained on regular basis.
- When you are trying to use equipment after it has left unused for long time, always make sure that equipment are running without any problems and then put into operation.
- Qualified persons only are allowed to get access to equipment.
- Confirm voltage frequency and power consumption meet the requirement specified on the equipment.
- Make sure that the equipment is well grounded.

## 10.5 General Notes

### 1. Preoperational stage

- ① Check the very basic things like switch contact and polarity and cable conditions are met with requirement.
- ② Equipment ground condition is satisfactory.

### 2. In-use stage

- ① Keep always eyes on the patient and equipment during operation to make sure something wrong might happen.
- ② If so, stop operation immediately and care must be taken to correct problems.
- ③ In case of equipment malfunctioning, there are few things that can be done on the field except for replacing fuses. Do not make wild guess to jump into wrong decision. Always ask help from the manufacturer for the further information.
- ④ Never try to revise equipment, including wires or cables. There is nothing that can be changed on the field. By doing so, it can cause problems that may be beyond the repair.

## 10.6 X-Ray generation and warning

- ① Use the extended cable, while taking image, to make operators less susceptible to X-Ray source.
- ② This equipment is made dental service and generates X-Ray safely.
  - A. But inappropriate handling may do the patient and operator harm.
  - B. Thus the unauthorized never try to operate this equipment, let alone to repair.
- ③ The operators have all the responsibilities to check conditions of equipment regularly.
  - A. This is well defined in the code of manual and in internal education session.
- ④ Any means of warning signal should be employed to keep patient and operator on alert when something unexpected happens.
- ⑤ For the pregnant and the patient having needs for particular attention, consult with medical doctor before taking images.
- ⑥ Always keep in mind that all the requirements and conditions specified on the international law should be applied for installing and using this kind of X-Ray equipment.

## 10.7 Daily maintenance tasks

Accessories	Maintenance tasks
Panoramic bite block	Sterilize with cold sterilization or autoclave up to 134 degree before the next patient is X-rayed
Temple support	Sterilize the head support and chinrest with medical-grade 76% alcohol disinfectant before next patient is X-rayed
Chinrest(panoramic, sinus and TMJ)	Sterilize the head support and chinrest with medical-grade 76% alcohol disinfectant before next patient is X-rayed
All components that come into contact with patient and operator	Sterilize components with medical-grade 76% alcohol disinfectant before next patient is X-rayed
Outer covers of Unit	Wipe the unit with a dry cloth at the end of each day's operation.  <b>Do not use detergents or solvents to clean outer covers of the unit.</b> <b>WARNING</b>



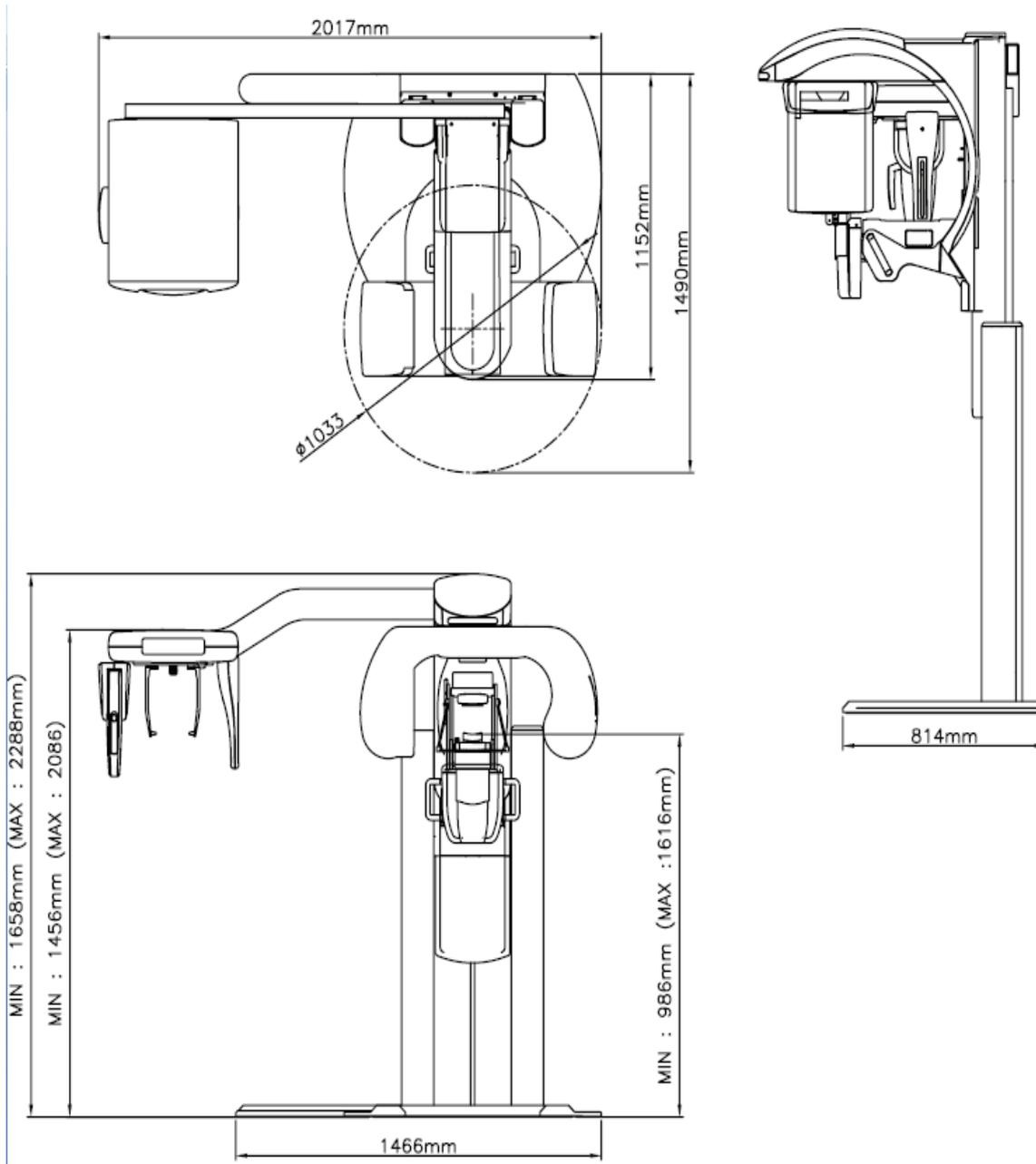
## Chapter 11 Product specifications

The following table describes the technical specifications for the Picasso-Trio digital imaging unit.

### 11.1 General specifications

Specification		Picasso-Trio	
		Panoramic	CT
X-ray beam		-	Cone Beam
Detector		CMOS sensor with Cesium Iodide (CsI) scintillator screen	CMOS photodiode array (Active Pixel Sensor: APS)
Grayscale Resolution(bit)		12bit	14bit: 16384 gray levels
Scan Time	Normal Mode	9.7sec	15sec
	High Mode	13.5sec	24sec
FOV(cm)		-	5X5/ 8X5/8X8/12X8.5 Multi FOV
Reconstruction time	Normal Mode	Real Time	Depends on the PC(see the following clause for the details)
	High Mode	-	
Voxel Size(mm)		-	0.2mm~0.3mm
Patient position		Standing	
Focal Spot		0.5mm	
Max. Anode Voltage to ground		100 kVp	
Max. tube current		24mA	
Image magnification		1.306	1.6
FOD(focal spot to object distance)		450.7	422.7
ODD(object to detector distance)		137.7	252.4
FDD (focal spot to detector dist.)		588.4	675.1
Weight		310Kg	
Height	Max.	2288mm	
	Min.	1658mm	
Length x Width		2017mm x814mm	
Power supply		AC110/230V±10% @50/60 Hz	

## 11.2 Product dimension



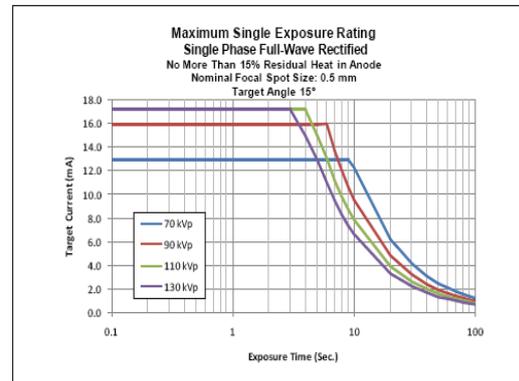
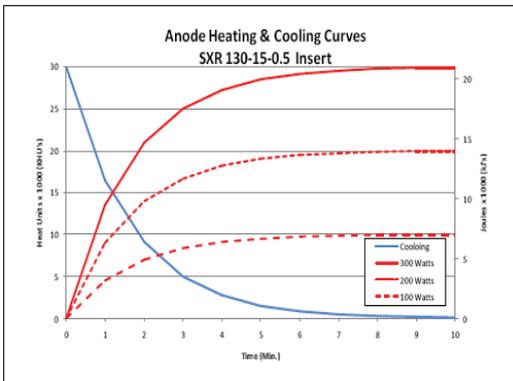
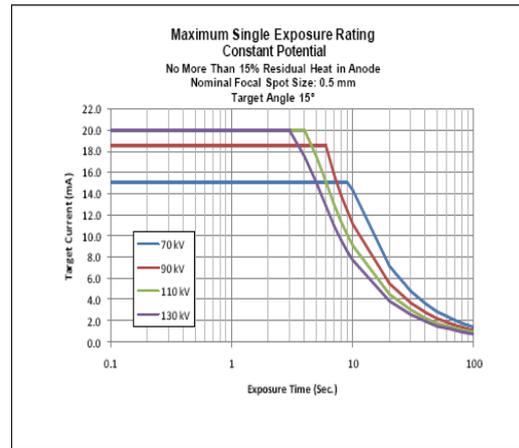
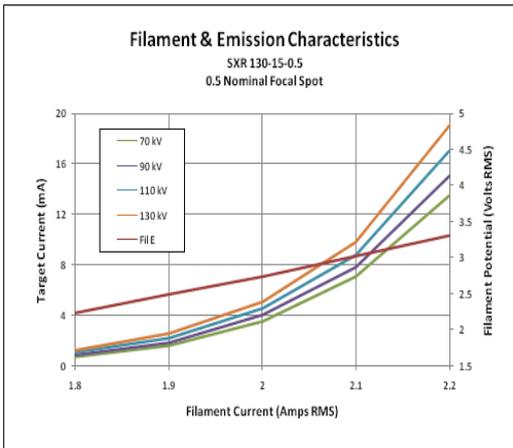


### 11.3 X-Ray generator

Anode voltage	Max.	90 kV
	Min.	50 kV
Beam current		4 ~ 10 mA
Focal spot size		0.5 mm
Radiation angle		5 degree
Operation		Continuous
Dimensions(mm)	Controller	220X161X65 mm
	X-ray generator	260X119X179 mm
Weight(Approx.)	Controller	1.3 Kg
	X-ray generator	8.0 Kg
Max. power		900 W
Model		EXG3

### 11.4 X-Ray tube

Physical characteristics	Focal spot	0.5 mm nominal
	Target angle	5 degrees
	Target metal	Tungsten
	Filament	Tungsten
	Inherent filtration	At least 0.8mm Al equivalent @50kV
Thermal characteristics	Anode heat storage	40 KHU's(28KJ)
	Max. anode heat dissipation	265W (370HU/s)
Electrical characteristics	Max. Tube potential	100 kVp
	Max. continuous exp	2.1 mA



## 11.5 Collimator

- Primary collimator: Changeable by FOV Size  
Motorized positioning for PANO

	FOV size	Collimator Size
1	5X5	8.9X8.8
2	8.5X5	12.9X8.8
3	8.5X8.5	12.9X14.9
4	12X8.5	16.9X14.9



## 11.6 Exposure time

### 1. CT Examination Programs

High / Normal: 24 sec / 15 sec

### 2. Panoramic Examination Programs

Mode	Imaging mode	Time(Second)
<b>Standard (High)</b>	Normal	13.5
	Child	11.2
<b>Standard (Normal)</b>	Normal	9.7
	Narrow	9.7
	Wide	9.7
	Child	8.2
<b>TMJ</b>	Open	8.0
	Close	8.0
<b>Sinus</b>	Lateral	7.0
	PA	10.8

## 11.7 Image reconstruction time

<Dental CT mode>

FOV Mode(mm)	Voxel Size	Scan time	Recon time (sec)	Reconstruction time (Metal function)
120X85	0.2mm	High (24 sec)	62	It takes twice the time compared to reconstruction without metal function.
		High(metal)	119	
	0.3mm	Normal (15sec)	26	
		Normal_MAR	62	
85X85	0.2mm	High (24 sec)	36	
		High(metal)	86	
	0.3mm	Normal (15sec)	19	
		Normal_MAR	48	
85X50	0.2mm	High (24 sec)	23	
		High(metal)	57	
	0.3mm	Normal (15sec)	17	
		Normal_MAR	43	
50X50	0.2mm	High (24 sec)	20	
		High(metal)	51	
	0.3mm	Normal (15sec)	13	
		Normal_MAR	36	



Image reconstruction time can be changed by computer specification and/or its working condition.

\*These data was obtained on the computer system: HP Workstation XW 4600, Windows XP ENG, 2GB RAM.



## 11.8 Environmental characteristics

- Operating temperature 10 - 30 °C
- Operating relative humidity 30 – 75%
- Operating atmospheric pressure 700 – 1060 hPa
- Transport and storage temperature -20 - 70 °C
- Transport and storage relative humidity <90% non- condensing
- Transport and storage atmospheric pressure 500 – 1060 hPa

## 11.9 Standards and Regulations

### 11.9.1 Standards

This product is designed and produced to meet the following standards:

**EN 60601-1, EN 60601-1-3, EN 60601-2-7, EN 60601-2-28, EN 60601-2-32,**

**EN 60601-1-2, EN 61000-3-2, EN 61000-3-3**

**EN ISO 9001, EN ISO 13485**

### 11.9.2 Marks & Graphic symbols



**TYPE B Equipment**



**Radiation hazard**

## Chapter 12 Emergency measures

If a problem occurs while operating the product, do take the very basic emergency measures by consulting the following tables. If problem persists, please request support through the customer support information service at point of contact appeared on the back of this manual.

If device is not moving	
Cause	Resolution
Power failure	Check the power supply to the device.
Initialization status	Wait until the device has initialized and then try again.
Control PC connection failure	Check the connection status of Serial Port (RS232) connecting PC and device.

If exposure switch is not working	
Cause	Resolution
Ready status	Check whether it is ready for capturing at the imaging program.

If imaging cannot be performed	
Cause	Resolution
Initialization status	Wait until the device has initialized and then try again. If the same problem persists, turn it off and start again.

If laser beam is turned off by itself and patient alignment cannot be performed	
Cause	Resolution
Time assigned for alignment expired	Press LAMP Button and carry out patient alignment.



**X Moisture may cause fatal damage to the electric equipments. Be careful not to allow leakage or penetration of water around it.**



## Chapter 13 Disposal of the units

In order to reduce the environmental contamination, this unit is basically designed to be as safe as possible to use and dispose. Many parts inside and outside the unit except for some like X-ray tube are environment-friendly and can be recycled for the next uses.

All parts and components containing hazardous materials must be disposed of according to the regulation governing these issues.

Part	Main materials to be disposed	Recyclable materials	Waste disposal site	Hazardous waste Needs separate collection
Frame and covers	Aluminum and plastics	•		
Motors		•		
Boards		•		
Cables and transformer	Copper	•		
	Steel	•		
	Oil		•	
Packing	Wood	•		
	Cardboard	•		
	Paper	•		
X-Ray tube				•
Sensor head	Return sensor head to E-WOO			
Other parts			•	

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If you do not properly set the device setting, causing the device to malfunction or fail, we cannot guarantee any responsibility.

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CE symbol grants the product compliance to the European Directive for Medical Devices 93/42 as a class IIB device. Authorized by **Grand-Duche De Luxemburg**.

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