

# PrexViewer User's Manual

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Rev. 2.2.1

**PreXion, Inc.**

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# Preface

## 1-1 Disclaimer

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PrexViewer is a review software application. Please refer to PreXion3D Viewer Software [of the PreXion3D Scanner] for clinical diagnostics. By running the PrexViewer software you acknowledge having read the disclaimer.

## 1-2 About PrexViewer

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PrexViewer Data CD(“Data CD”) is generated by PrexViewer CDMaker(“CD Maker”).  
The PrexViewer can run without installation on Windows computers and laptops.

## 1-3 Rendering Features

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### 1.3.1 3DVR

This is a 3D volume rendering image. It is abbreviated as VR.  
Volume rendering is a visualization method that uses volume data consisting of cubes called voxels. This is used to visualize the 3D image to the interior, and image is displayed by adding colors and shadows that have been calculate using the light penetration and reflection.



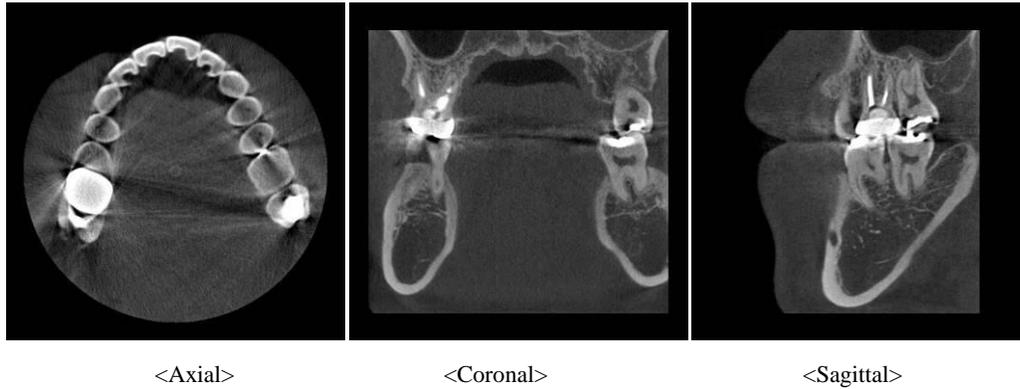
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## 1.3.2 MPR (Multi Planar Reconstruction)

MPR stands for the Multi Planer Reconstruction method. This method stacks the slices to create solid volume data which can be used to display freely generated cross-section images.

Cross sections from different angles can be displayed based on multiple three-dimensionally imaged image data such as horizontal cross sections (Axial) and vertical cross sections (Sagittal).

This is used to make a detailed check of the affected area and other applications.



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## 1.3.3 RaySum (Ray Summation)

This is the ray summation method. The CT value is added to the projected rays to create an image that mimics a simple X-ray photograph.



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## 1.3.4 MIP (Maximum Intensity Projection)

Maximum Intensity Projection provides a display that emphasizes the areas with the highest CT values. This is displayed in a 3D monochrome image. This is used to easily identify the overall shape, implant areas, etc.



### **CAUTION**

- An MIP image differs from a simple X-ray projection image.

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## 1.3.5 MinIP (Minimum Intensity Projection)

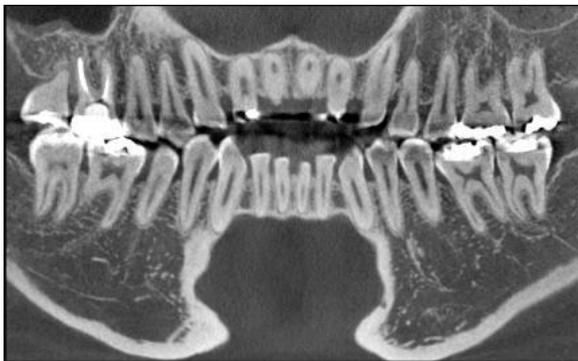
Minimum Intensity Projection provides a display that emphasizes the areas with the lowest CT values. This is used to check nerve holes and similar areas.



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## 1.3.6 Panoramic CPR

This is a panoramic image. Discretionary cross sections of 3D volume data are joined together to form a single image. This makes it possible to see the entire tooth alignment in one view.



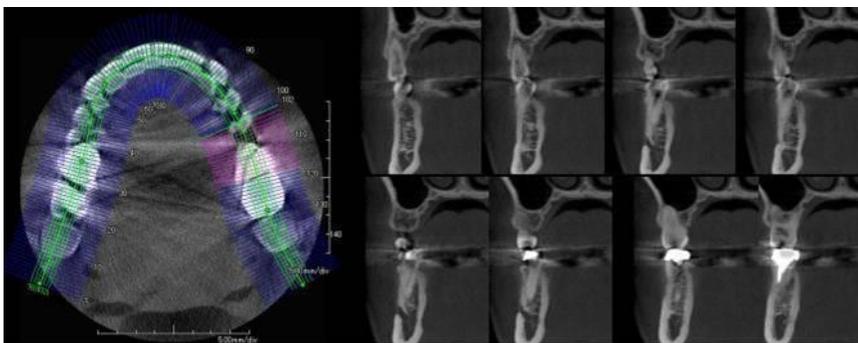
### CAUTION

- This differs from images taken using a panorama X-ray machine.

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## 1.3.7 Panorama Cross Section

This displays the discretionary cross sections of a panorama CPR image.



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## 1-4 Minimum System Requirement

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Operating System: WindowsXP Service Pack2, Windows7  
CPU: Intel Pentium4 or later (SSE2 feature must be required)  
Memory: 512MB  
Optical drive: CDROM (x52 or faster recommended)  
Display: 1024x768 pixel

## 1-5 Unsupported Functions

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This product does not support following functions.

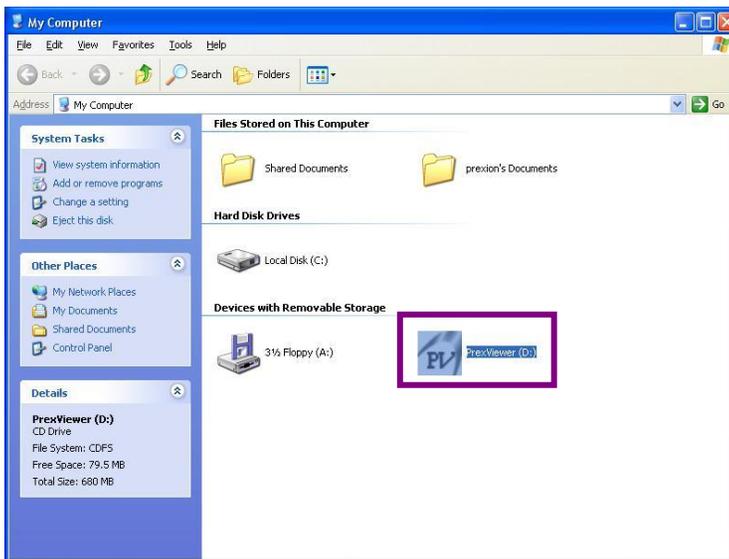
- Printing
- 2D/3D protocol (movie)
- DICOM file import/export
- Save Scene
- Simple Report/Interactive Report
- Multi Data
- Mask
- Implant Planning
- Fusion

# Starting PrexViewer

These methods are used to adjust the image display. The display settings for angle, color, image information, and other items can be set.

## 2-1 Launch Viewer

1



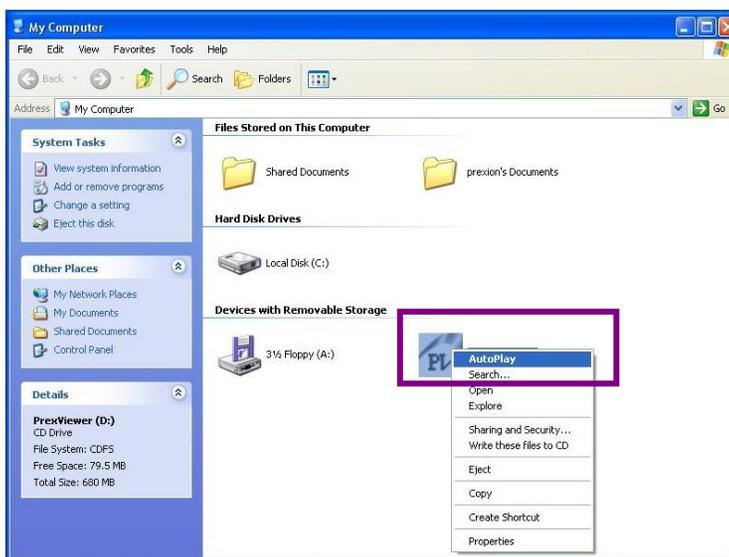
### Operation

Insert the Data CD into the optical drive.

The PrexViewer will start automatically.

If viewer does not start, Double click 'My Computer' icon on Desktop, and then right click the optical drive.

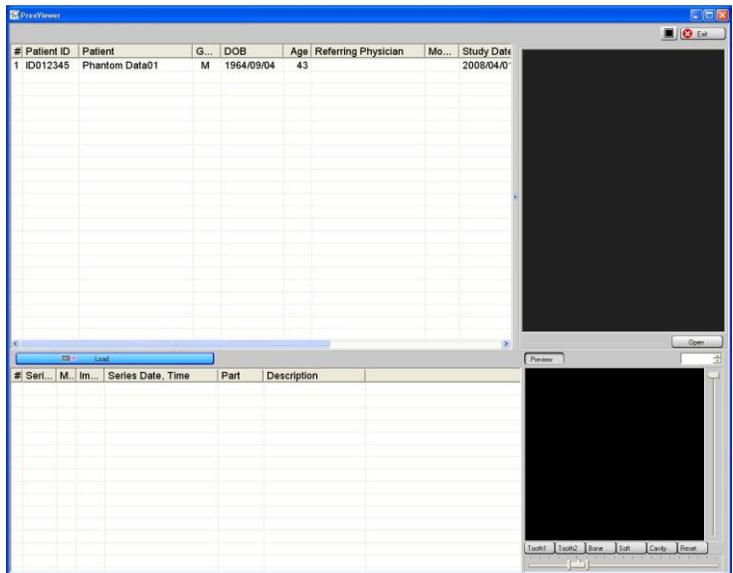
2



### Operation

Select AutoPlay from menu.

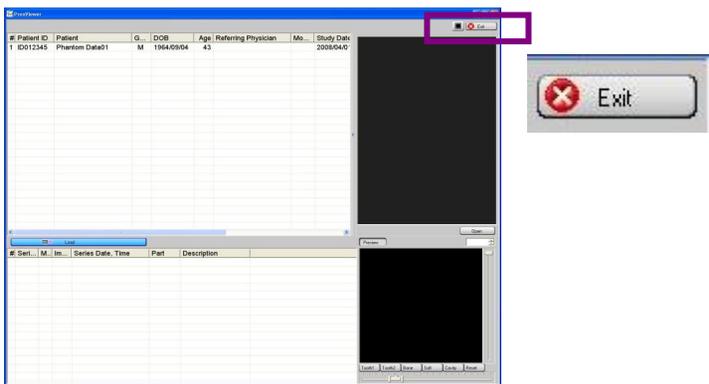
3



**Operation**

PrexViewer will be launched

4

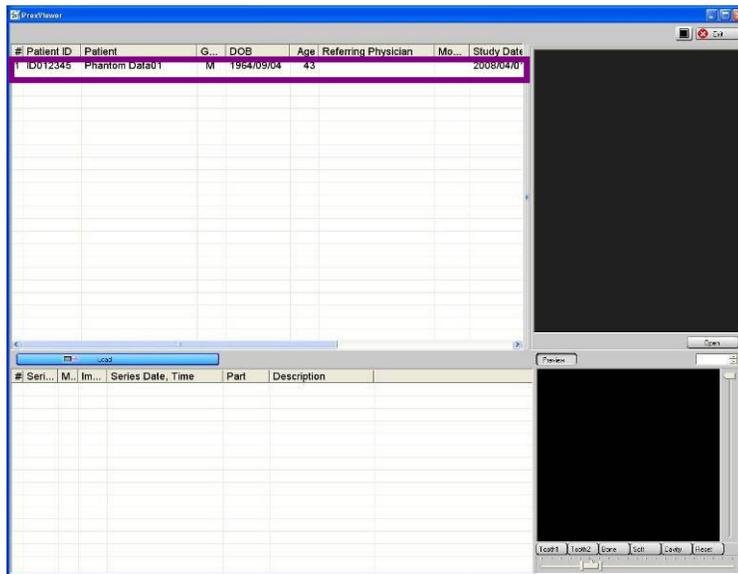


**Operation**

To exit from PrexViewer, click Exit button.

## 2-2 Loading Data

1



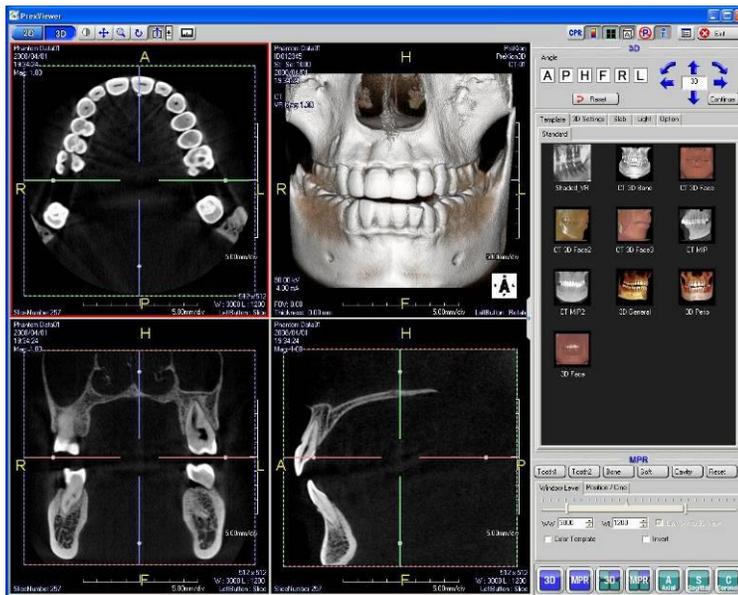
### Operation

Double click the examination to be read.

### Note

- The data can be read from the series list. Double click on the series to be read or right click on the series and then click on **Open 3D View**.

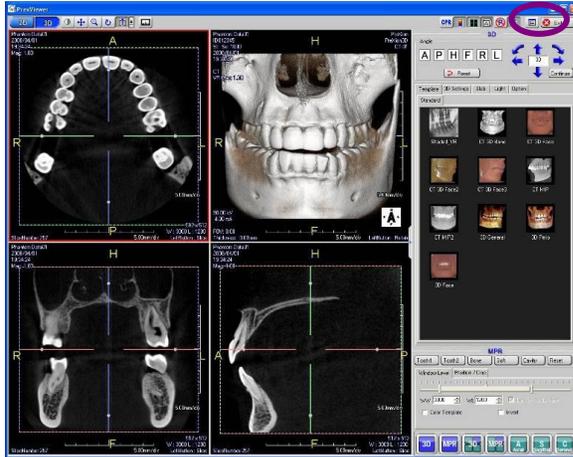
2



### Operation

The **Review** screen is displayed. Of the series included in the selected examination, the series with the most images is read.

3



### Operation

To return to **Patient** screen, click Patient List button.

## 2-3 Display Adjustment

The tool buttons at the top left are used to zoom, rotate, and change the display position of the images.

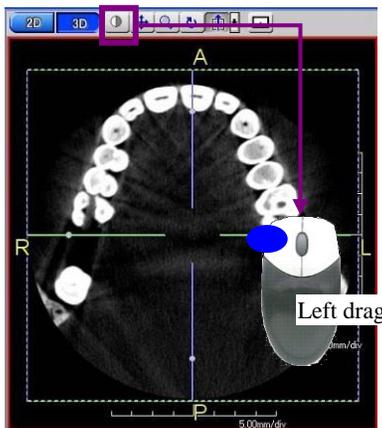


### Note

- Adjustment can also be performed from the menu that is displayed by a right click.

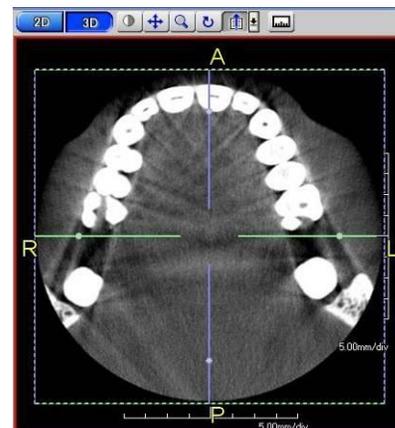
### 2.3.1 Window Level

After clicking on the button, drag on the screen display view image to change the window level. The window level can also be changed without using a button by dragging on the screw display view image with the right and left buttons at the same time.



When not using a button

Simultaneous  
right and left drag

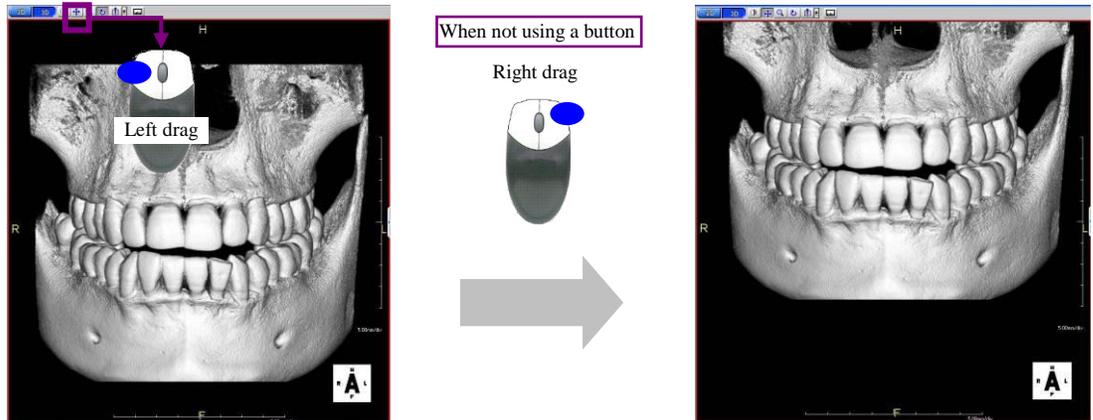


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## 2.3.2 Panning

After clicking on the button, drag right or left, up or down on the screen display view image to change the display position.

The display position can also be changed without using a button by using the mouse right button to drag right or left, up or down on the screen display view image.

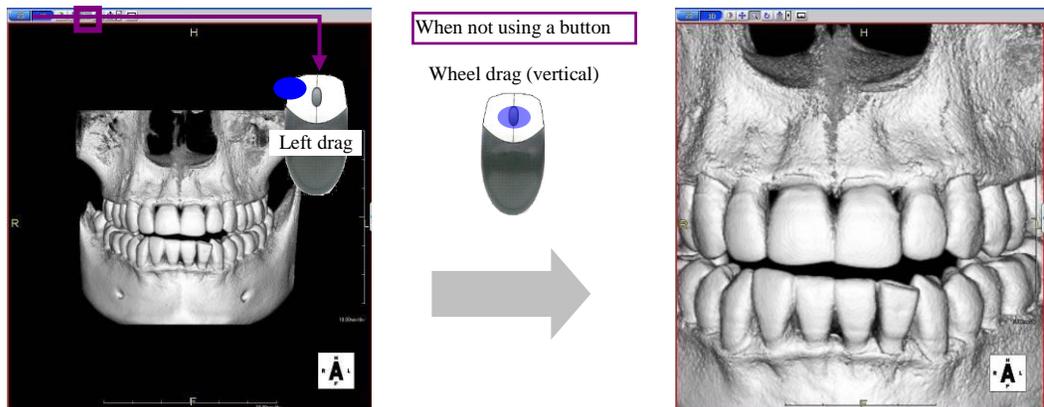


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## 2.3.3 Zoom In/Out

After clicking on the button, drag on the screen display view image to zoom in or zoom out the display.

The zoom can also be done without using a button by dragging the wheel button up or down on the screen display view image.



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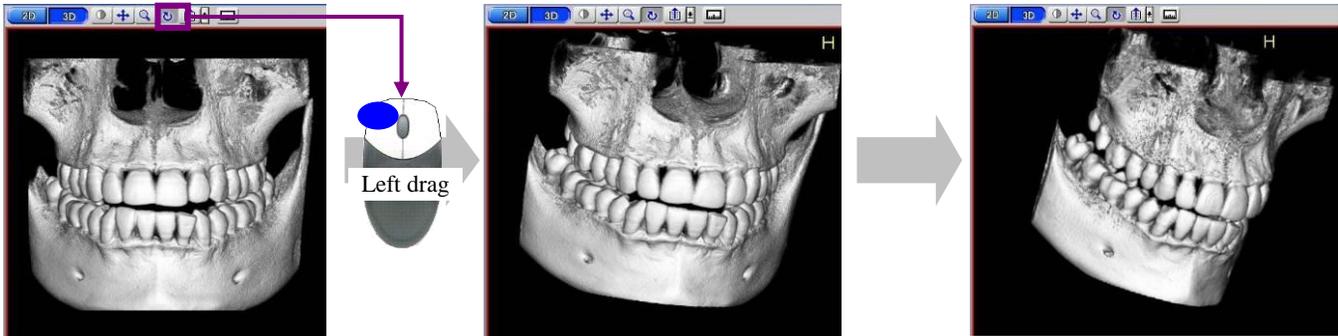
## 2.3.4 Rotation

This is used with the 3DVR image display.

After clicking on the button, drag on the screen display view 3DVR image to rotate the image display.

This cannot be used for MPR images.

Select this button when changing the screen.



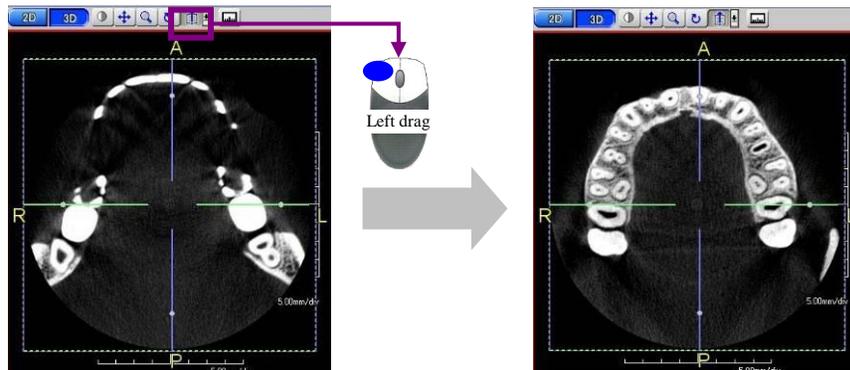
---

## 2.3.5 Slice

This is used with MPR image displays.

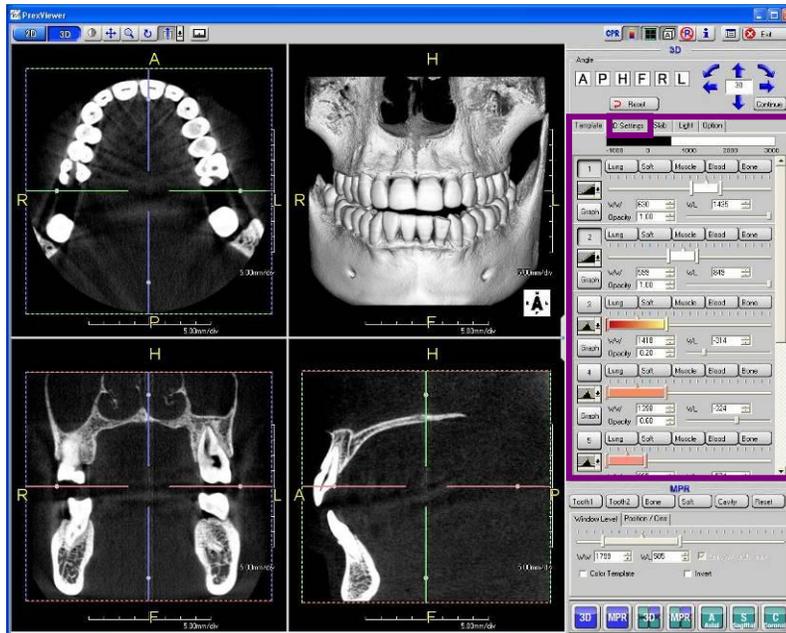
After clicking on the button, drag on the screen display view MPR image to move the slice. Click on the [▼] button to specify the slice movement speed.

This cannot be used for 3DVR images.



## 2-4 3DVR Image Adjustment

The **3D Settings** tab is used to adjust the 3DVR image display.



<3DVR Example>

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## 2-5 MPR Image Adjustment

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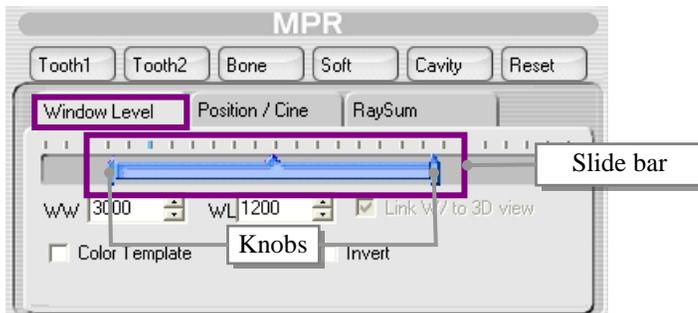
The MPR image display can be adjusted using the MPR operation panel.

### 2.5.1 Window level adjustment

Window level adjustment is set using the **Window Level** tab of the MPR operation panel.

This adjustment can be set by directly inputting the window width value in **WW** and the window level value in **WL**.

In addition, the slide bar can be dragged to set the window level and both knobs of the slide bar can be dragged to set the window width.



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### 2.5.2 RaySum Display

The three basic windows slice thickness can be set using the **RaySum** tab of the MPR operation panel. Check the box for **RaySum** and then select **Thickness** from the list.

To move by the selected RaySum mode thickness, remove the check from the box for **Snap to Slab**.



#### **CAUTION**

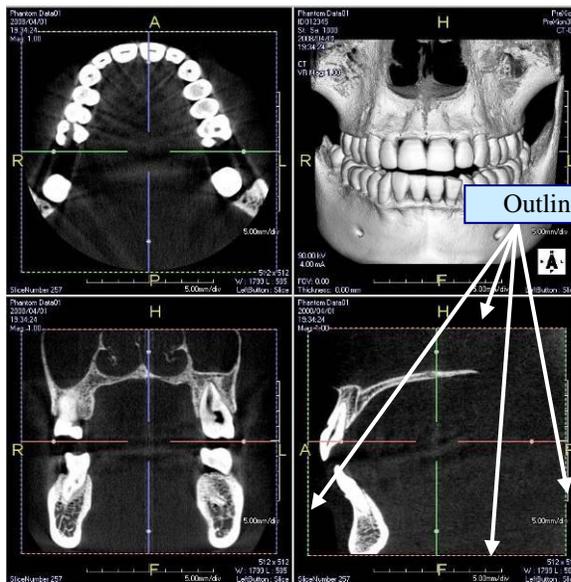
- When a check is placed in the box for **Snap to Slab**, the normal MPR image slices are moved one at a time.

# Cutting

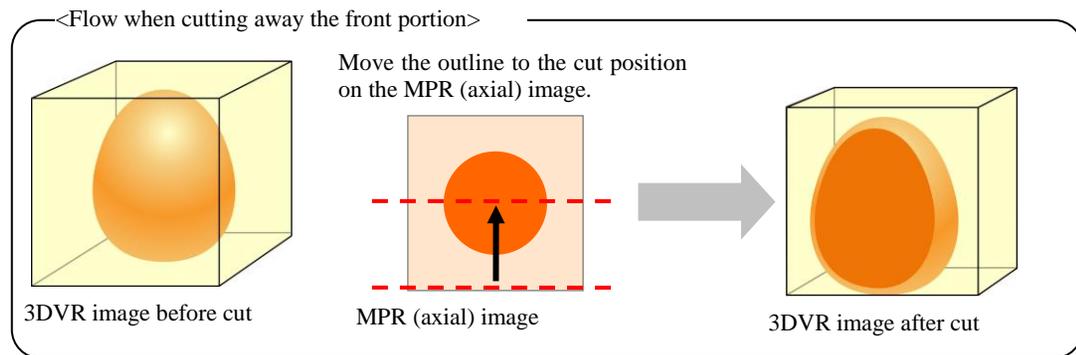
Freely cutting any area allows you to remove unnecessary information and display only the area of interest.

## 3-1 Using an Outline

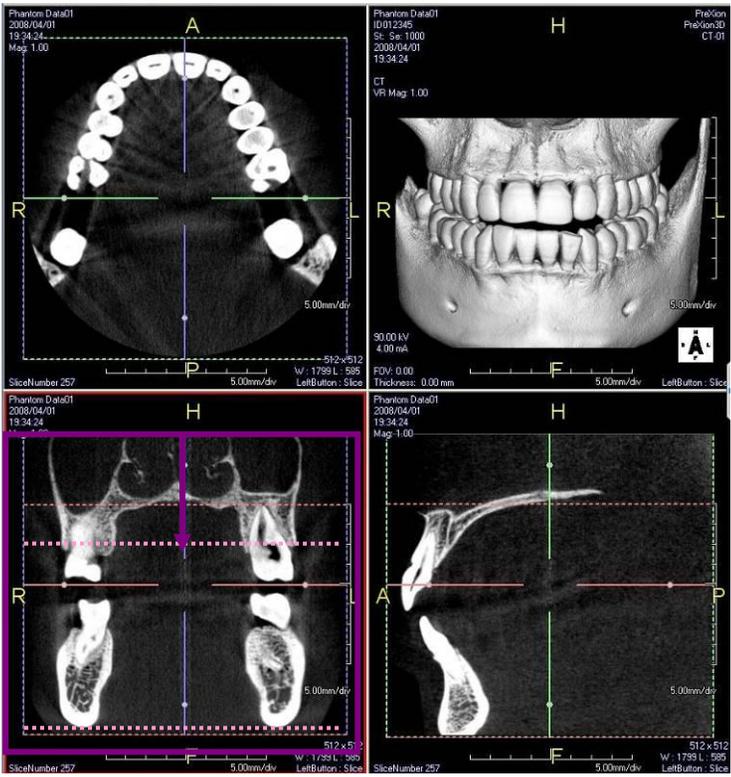
An outline and anchor points are displayed when an MPR is displayed. The outline on the MPR image can be dragged to cut the 3DVR image.



An outer frame broken line is displayed on each image.



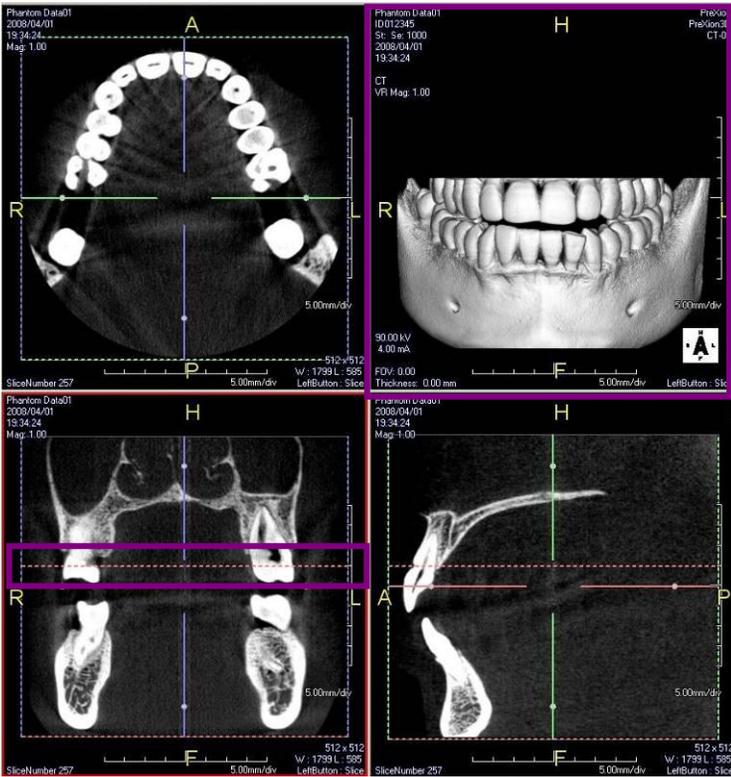
1



**Operation**

Drag the outline to the area to be cut on the MPR image.

2



**Operation**

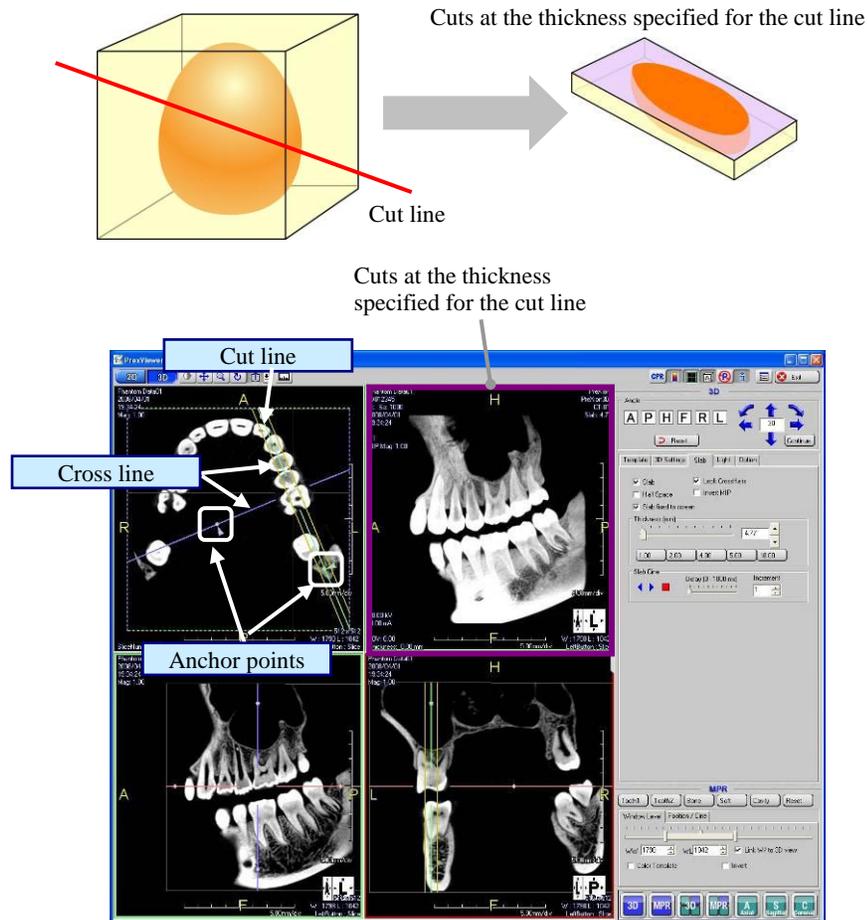
The area in front of the drag is cut off and the cut 3DVR image is displayed.

## 3-2 Using the Slab Function

This function can be used to cut at a diagonal to the oblique coordinates or create a cut image that leaves just a specified thickness (slab).

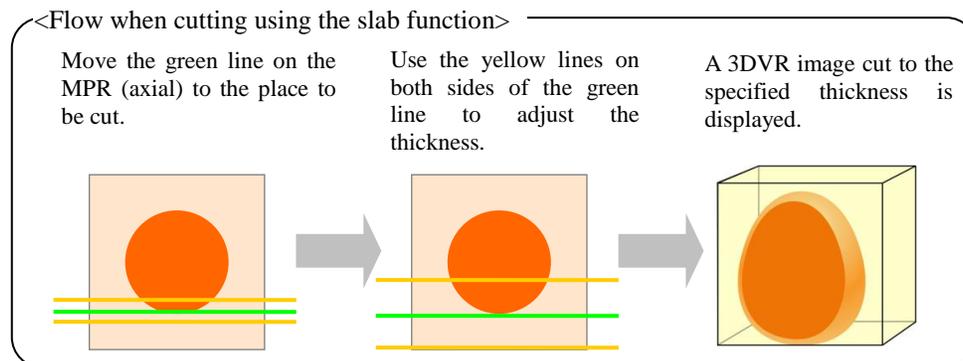
An oblique can be created by dragging the cross line and anchor point.

Aligning the cut with the tooth alignment makes it possible to create an MIP image of just the required area and a MinIP image that shows an overall image of a neural tube.

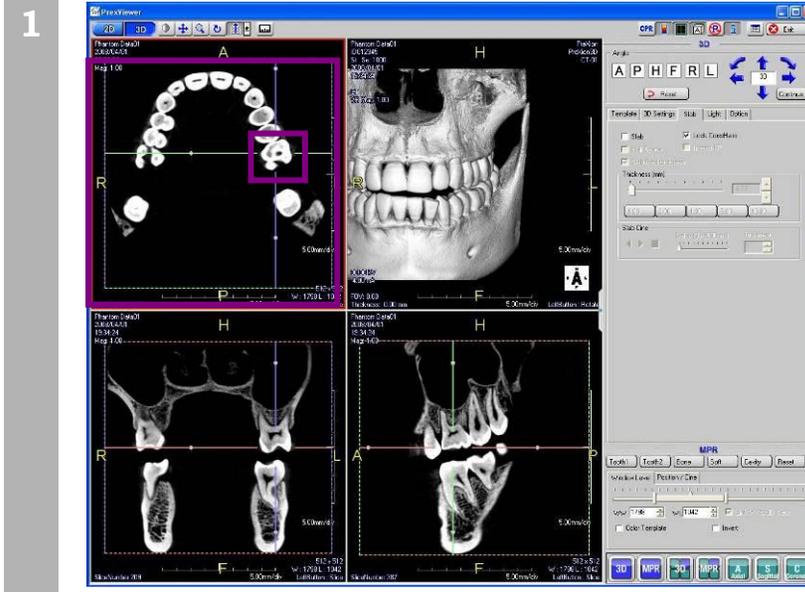


### Note

- An oblique is a discretionary cross-section image. A discretionary diagonal image is called a double oblique.



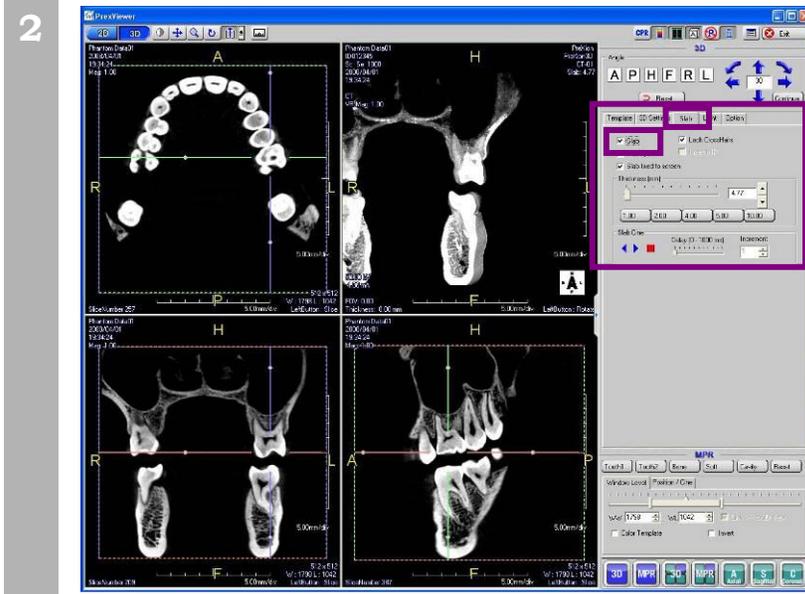
## 3.2.1 Example Use of the Slab Function



### Operation

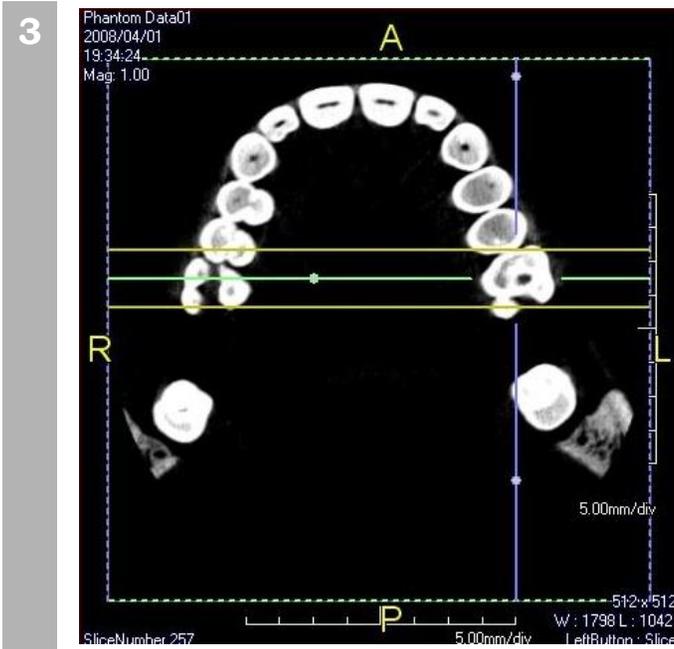
Move the center of the cross lines to the area to be shown by the Slab function.

The cross lines are moved by dragging them at their center.



### Operation

Click on the **Slab** tab of the 3D operation panel and place a check in the box for **Slab**.



**Operation**

Move the cross lines and anchor points to adjust the display area.

Drag the displayed yellow line to change the thickness of the displayed area.



**Operation**

The 3DVR image cut the set slab thickness is displayed.

**Note**

- Drag the anchor points to change the cut direction.
- Right click on the 3DVR image to switch between MPR, MIP and MinIP images.

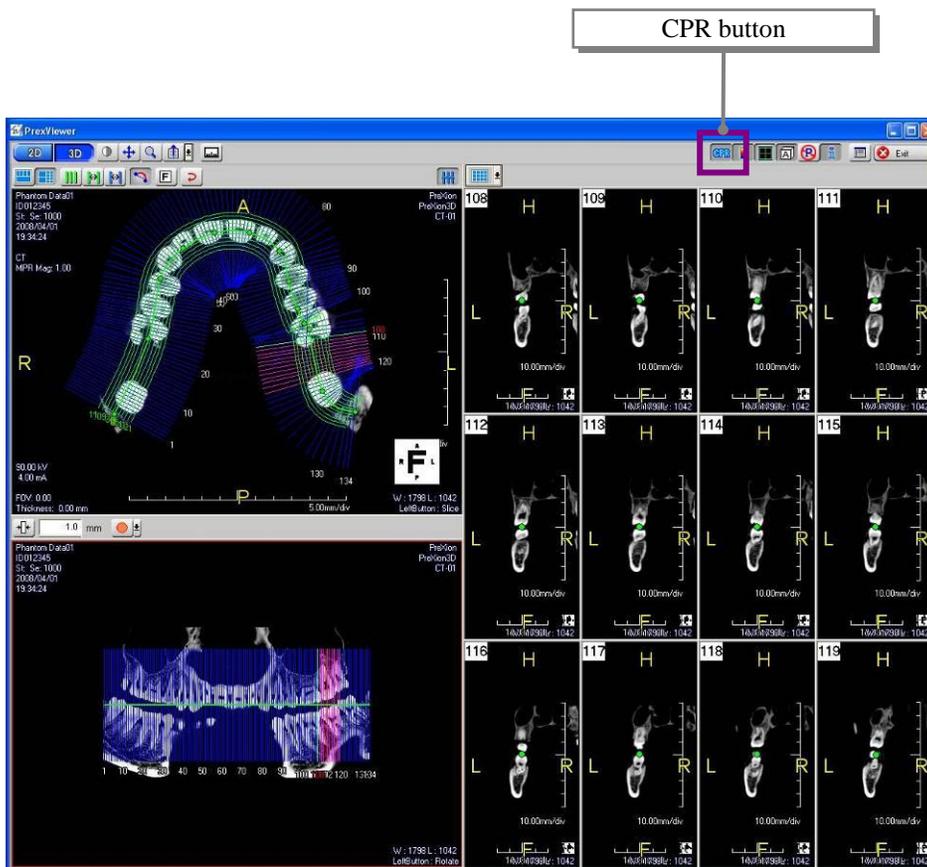
# CPR Function

Curved Planar Reconstruction (CPR) is one type of MPR method. With MPR straight line cross sections are displayed, but with CPR free curve cross-section views (cross-section images) are displayed. This function can be used to create discretionary cross-section images.

## 4-1 CPR Mode Screen

Click on the [CPR] button from the tool buttons at the top right of the **Review** screen to switch to the CPR mode.

A free curve can be drawn in the CPR mode and displayed and analyzed as a continuous cross-section view.



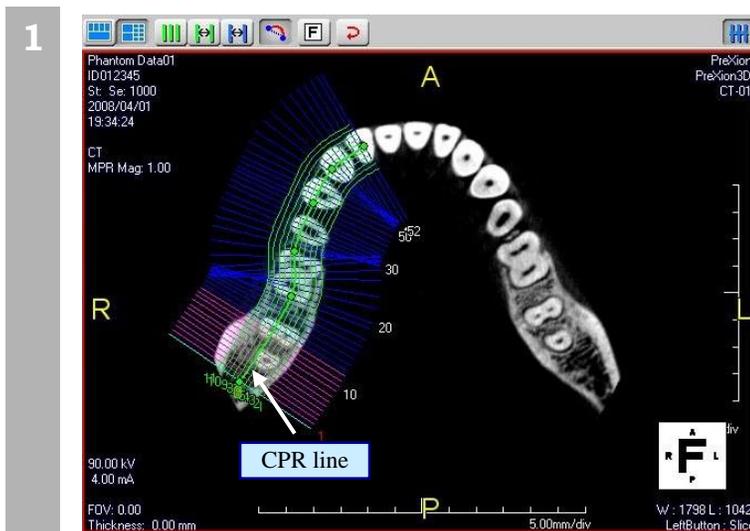
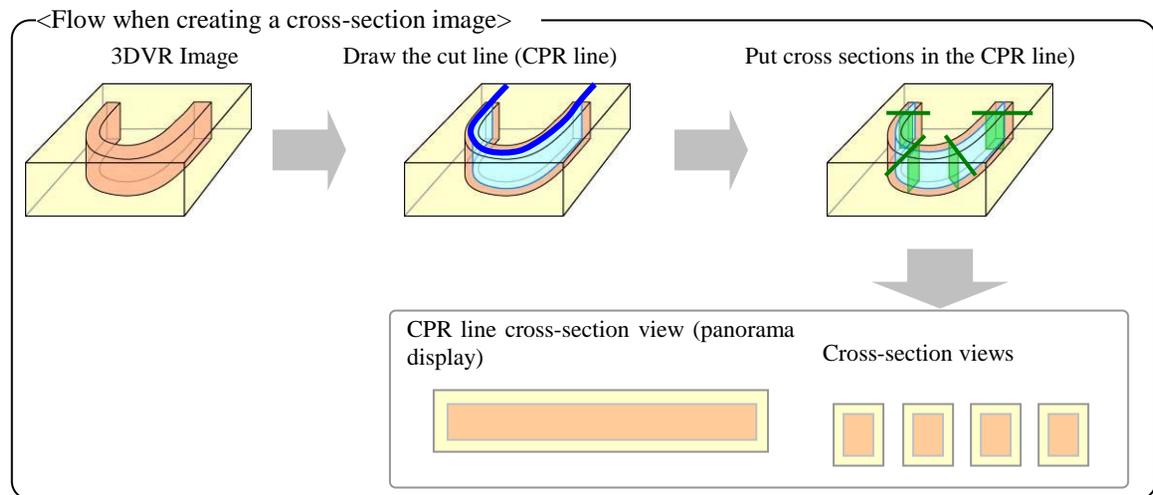
## 4-2 Creating Cross-Section Images

A continuous horizontal cross-section view is called a cross-section image.

When a curve is drawn in the CPR mode screen, a cross-section view that intersects with the drawn curve (CPR line) is created.

The intersecting lines are called cross-sections and continuous horizontal cross-section views corresponding to the number of displayed cross sections are created.

The CPR line cross-section view is displayed as a panoramic image.



### Operation

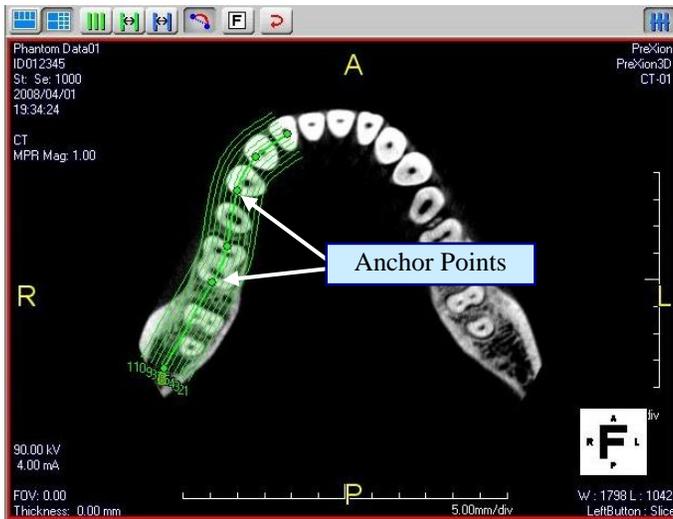
Click on while holding down the **Ctrl** key at the MPR view and draw a discretionary CPR line.

A green line will be drawn.

### Note

- To clear the drawn CPR line, click on the [Reset] button from the CPR tool buttons.
- The lines shown on both sides of the drawn CPR lines show the CPR line slice.

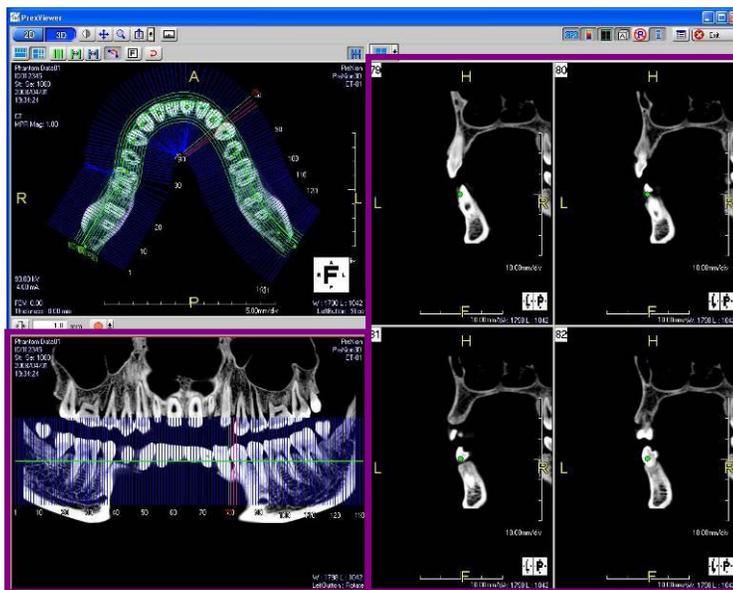
2



**Operation**

Drag the anchor points to correct the drawn CPR line.  
To delete the anchor points, click on while holding down the **Shift** key.

3



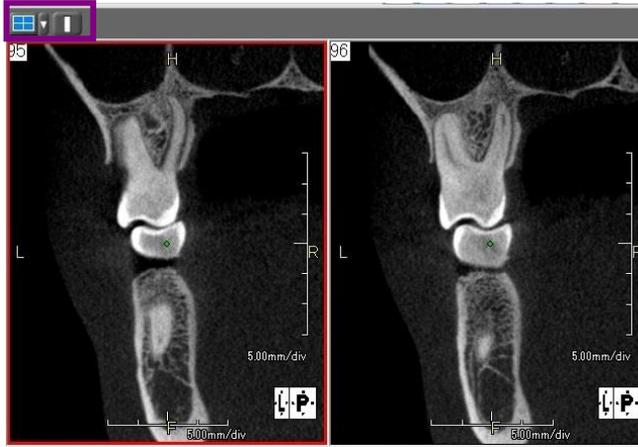
**Operation**

The cross-section images for the drawn CPR line are displayed in the cross-section view.  
The drawn CPR line panoramic image is displayed in the panorama view.

## 4.2.1 Switching Cross-Section Images to RaySum Images

Cross-Section images with CPR mode can be switched to RaySum Images.

1



### Operation

Display the cross-section image and click  button on the top of the screen.

2



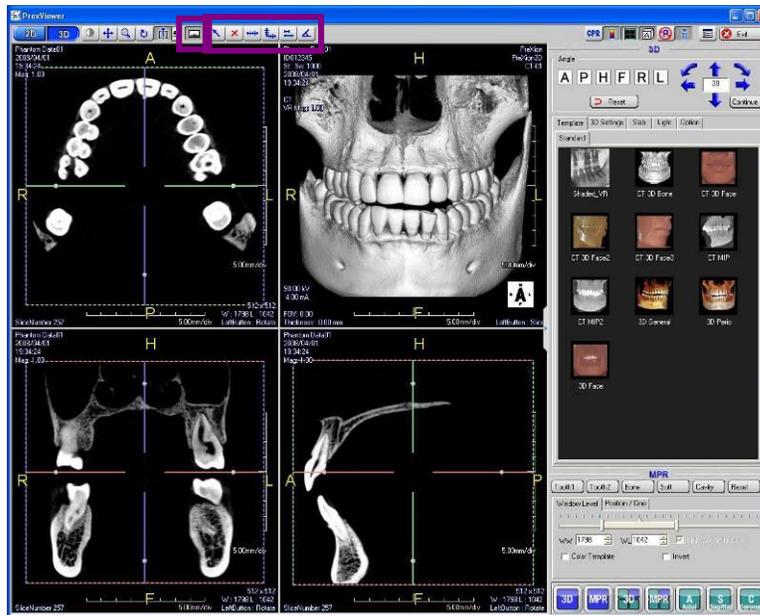
### Operation

1. Check the box of [RaySum].
2. Select the thickness from the pull down menu.
3. Click [OK] button, the cross-section image switched to RaySum image is displayed.

# Measurement Function

The discretionary distance on an image, the surface area of an area of interest, signal values, and other values can be measured in the **Review** screen.

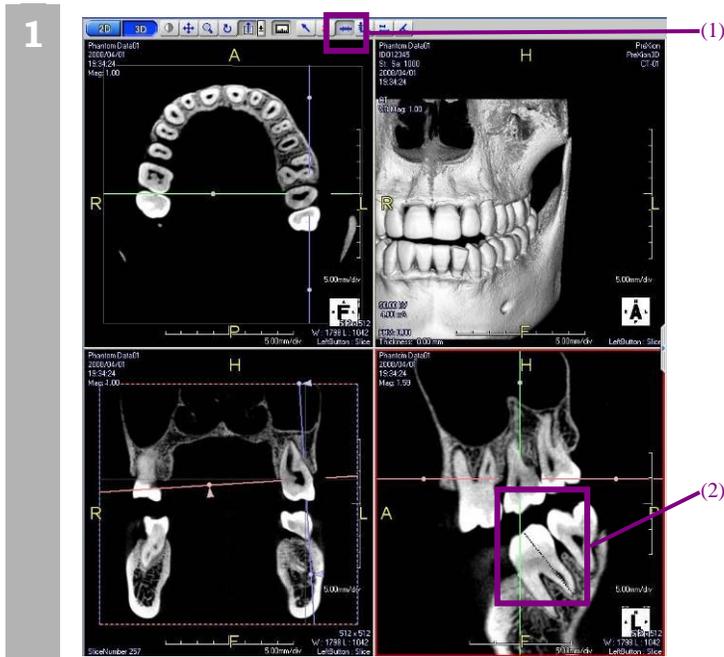
The Measurement menu is used for measurements. The Measurement menu is displayed by clicking on the [Measurement] button of the tool buttons at the top left of the **Review** screen.



Button	Name	Description
	Select	Select and move measurement result values, lines, etc.
	Delete	Delete measurement results, lines, etc.
	Distance	Measure straight lines. Drag to draw a straight line. Displays the length.
	Multiple Distance	Line Measure curve distance. Click on to draw a curve. Double click on the end point to display the measurement results.
	Relative Distance	Measure the relative distance of multiple lines. Drag to draw a straight line. The first line is used as the reference and the distance relative value for the second and subsequent lines is displayed.
	Angle	Measure the angle of two straight lines. Drag to draw a straight line. The first line is used as the reference and the angle with the second is displayed.

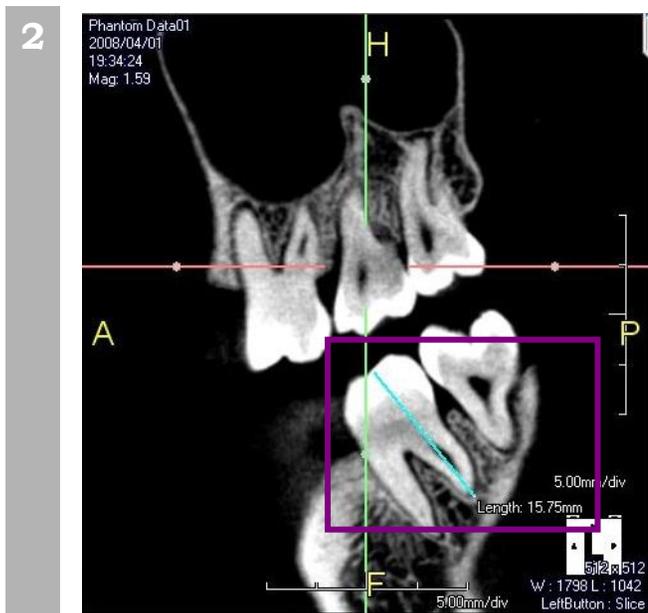
# 5-1 Measuring Distance

This is used to measure the distance of the drawn line.



## Operation

1. Click on the [Distance] button.
2. Drag on the area of the image to be measured to draw a straight line.

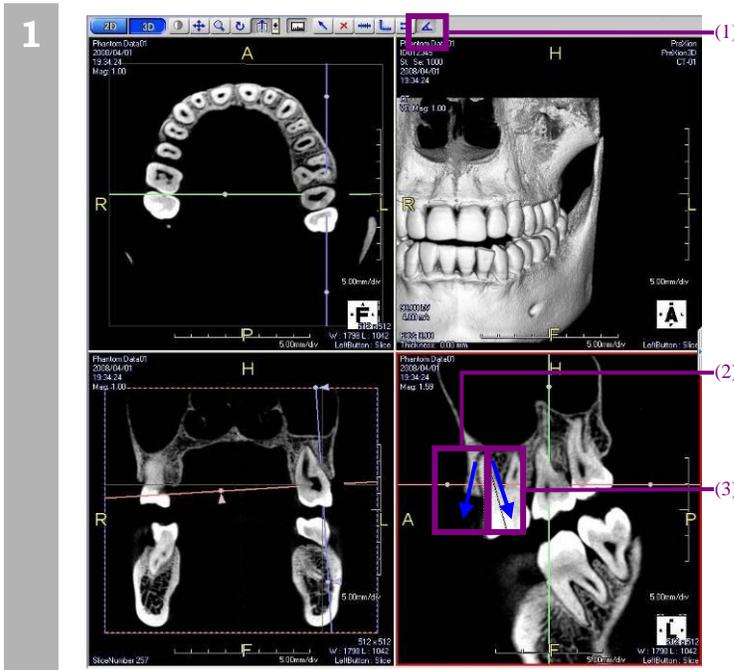


## Operation

Display the measurement results.

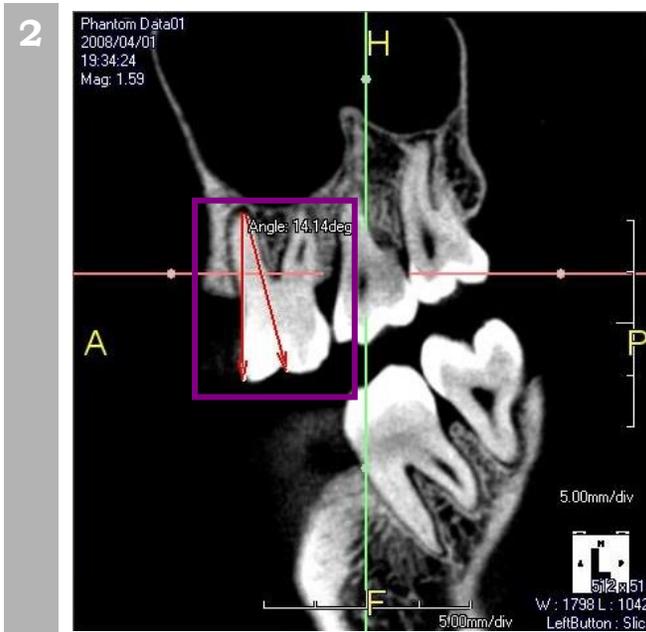
## 5-2 Measuring the Angle

This is used to measure the angle between the drawn lines.



### Operation

1. Click on the [Angle] button.
2. Drag on the discretionary position on the image to draw a straight line.
3. From the starting point of the first line drag to draw a straight line.



### Operation

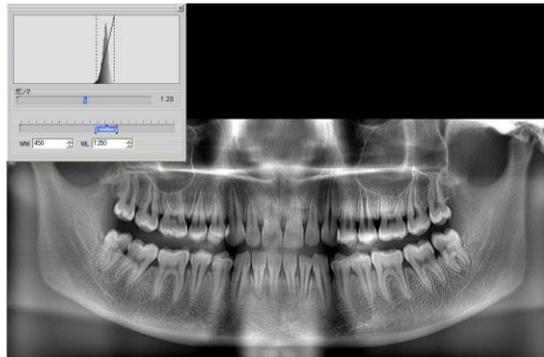
The measurement results are displayed.

# Panoramic Image Display

The Panoramic image can be loaded from the Patient List screen. The image is displayed in various ways.

- ◆ Adjustment of Gamma setting and Window Level

The Gamma setting, Window Level (WL) and the Window Width (WW) can be changed.



▶ Refer to 6-2 Gamma Setting and Window Level.

- ◆ Preset

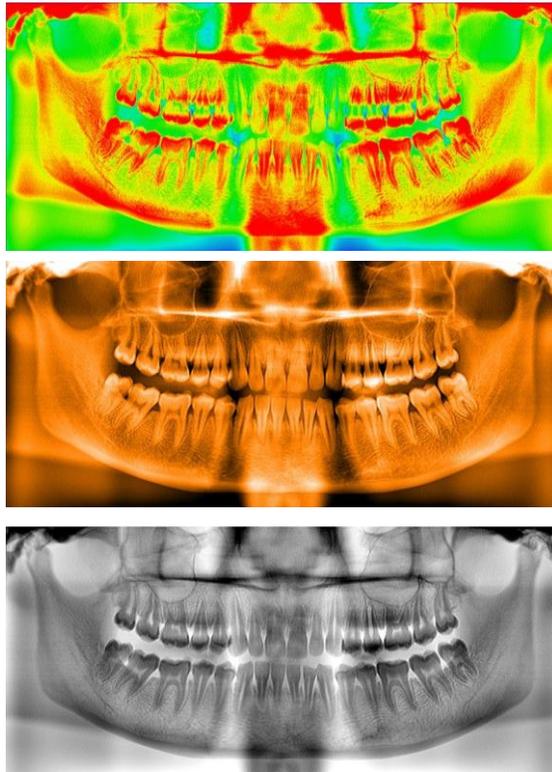
Only by clicking a button, one of five presets of Gamma setting, Window Level and Window Width can be applied.

▶ Refer to 6-3 Preset.

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- ◆ Color Templates

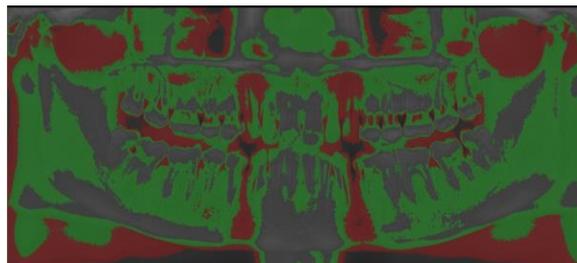
Color templates such as sepia-toned, inverted color can be applied.



▶ Refer to 6-4 Color Template.

- ◆ Color Map

The area which has the pixel value of your interest can be tinted with colors.



▶ Refer to 6-5 Color Map.

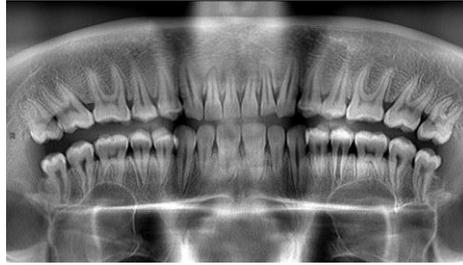
- ◆ Edge Filter

The image filter can be applied to the image. Two filters of edge enhancement.



- ◆ Flip

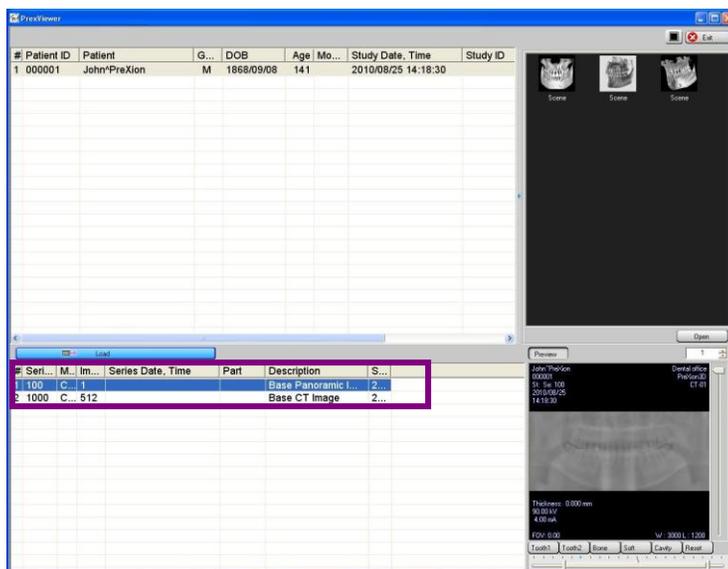
The image can be flipped vertically and/or horizontally.



## 6-1 Load Panoramic Image

Load a panoramic image into Panoramic Image View from Patient List. When the scan is done, an panoramic image is generated in Series 100.

1

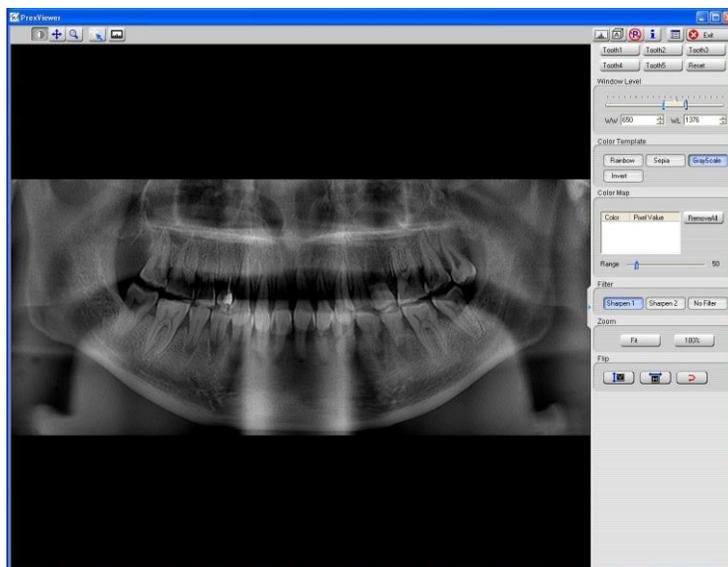


### Operation

Click the Study data in the upper list of Patient List screen to display the Series List at the bottom of the screen.

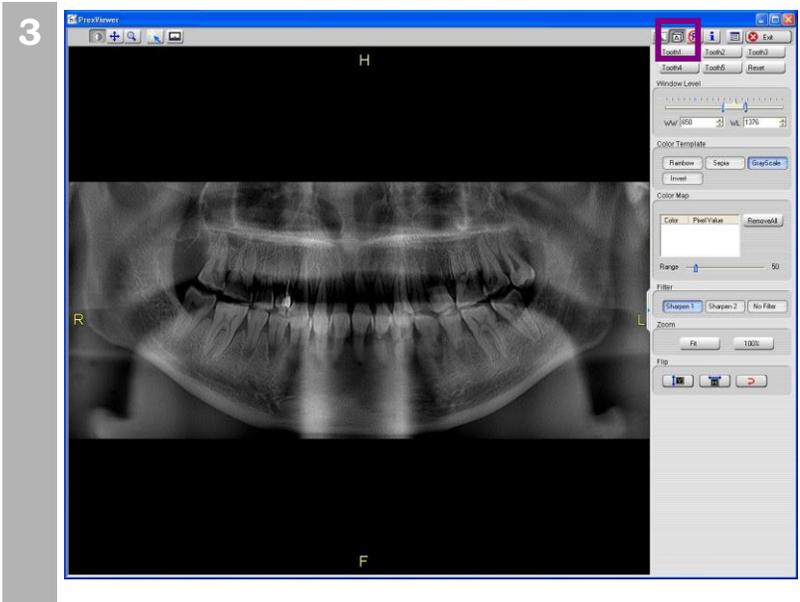
Double click the series that has the number 100. It must have only one image in it.

2



### Operation

The panoramic image is loaded immediately in the Panoramic Image View.



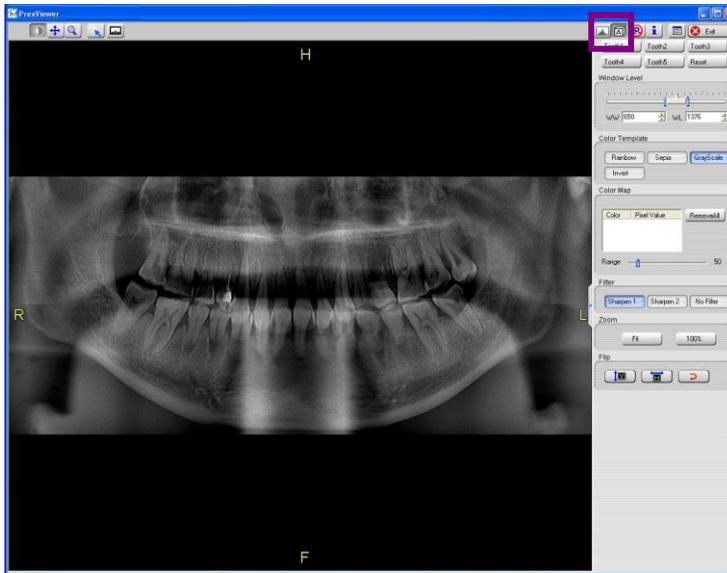
**Operation**

Click on [Enable/Disable Orientation], the orientation display is displayed.

## 6-2 Gamma Setting and Window Level

The Gamma setting, the Window Level and the Window Width can be adjusted.

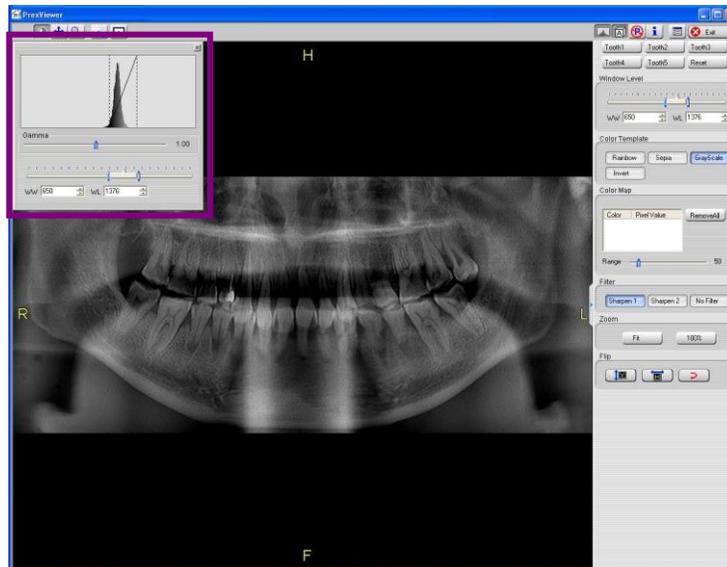
1



### Operation

Click on the icon for Panorama Histogram floating panel on upper right of the screen.

2

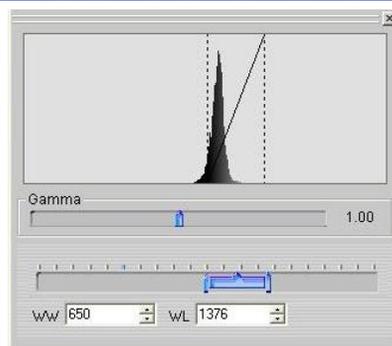


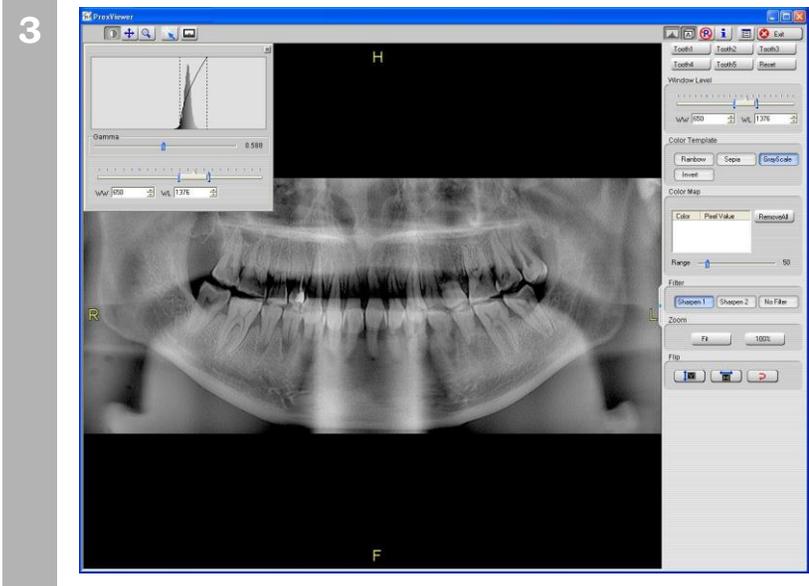
### Operation

The Panorama Histogram floating panel is displayed.

You can change Gamma setting, Window Level and Window Width here.

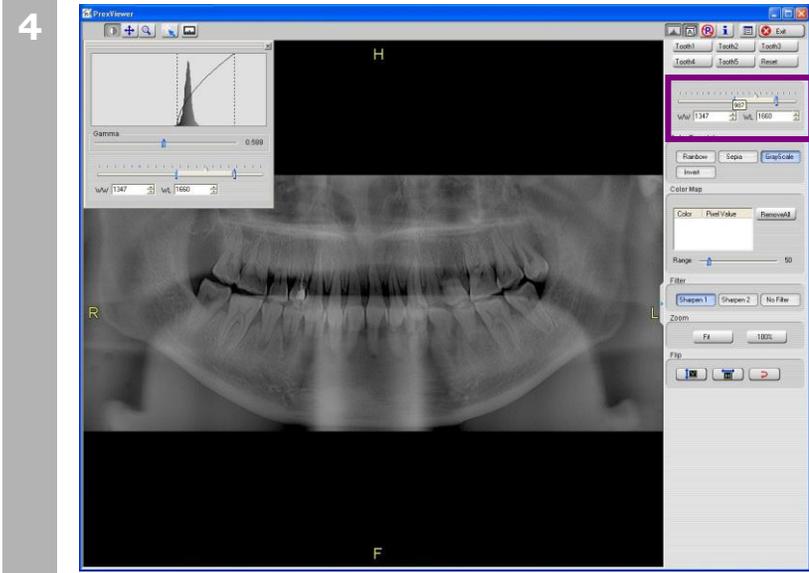
Note that Window Level and Window Width can be changed by mouse operation described in 2-3 Display Adjustment.





**Operation**

An example of Gamma setting. Gamma is set to 0.58.

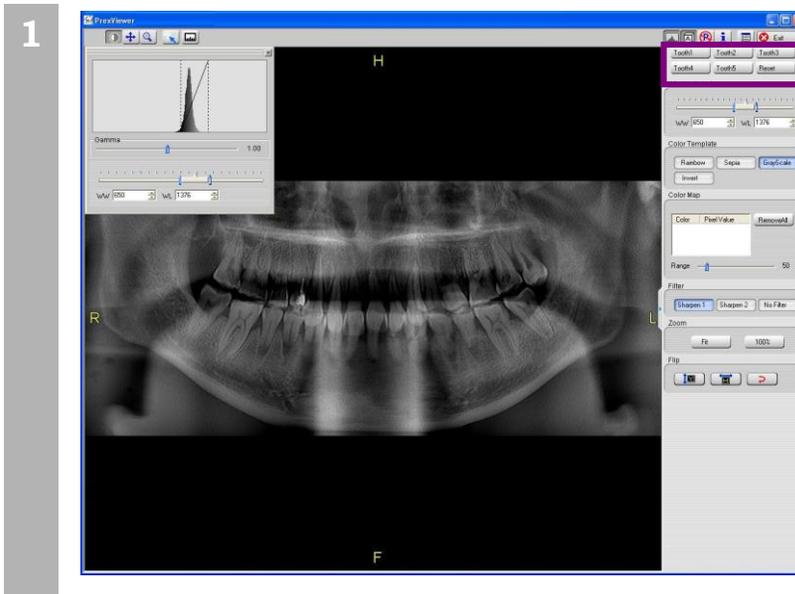


**Alternative Operation**

The Window Level and the Window Width can be adjusted in the panel on the right side of the screen, too.

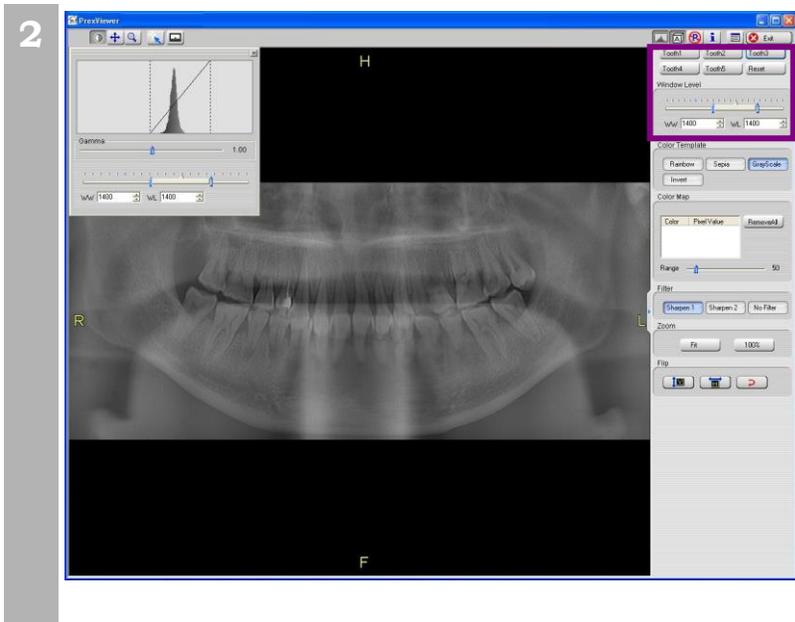
## 6-3 Preset

You can apply the preset Gamma setting, window level and the window width to the image.



### Operation

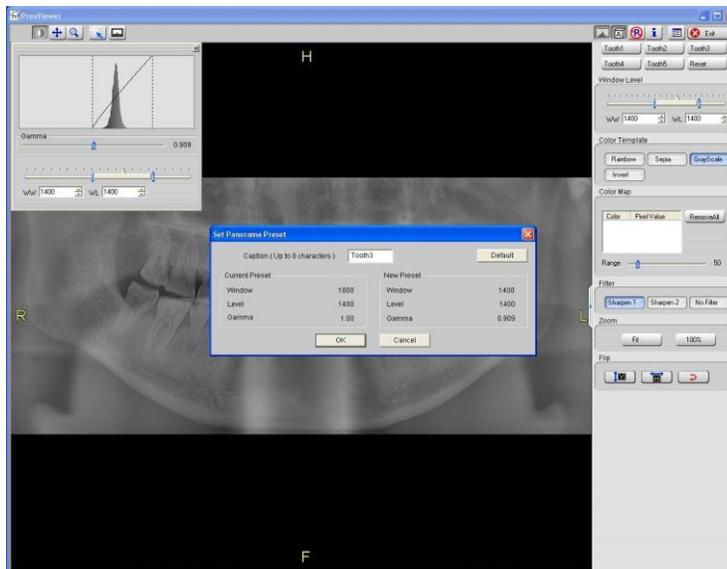
Click one of the buttons in [Preset] section in the panel. (e.g. Click [Tooth2])



### Operation

The preset Gamma setting, window level and the window width is applied to the image.

3



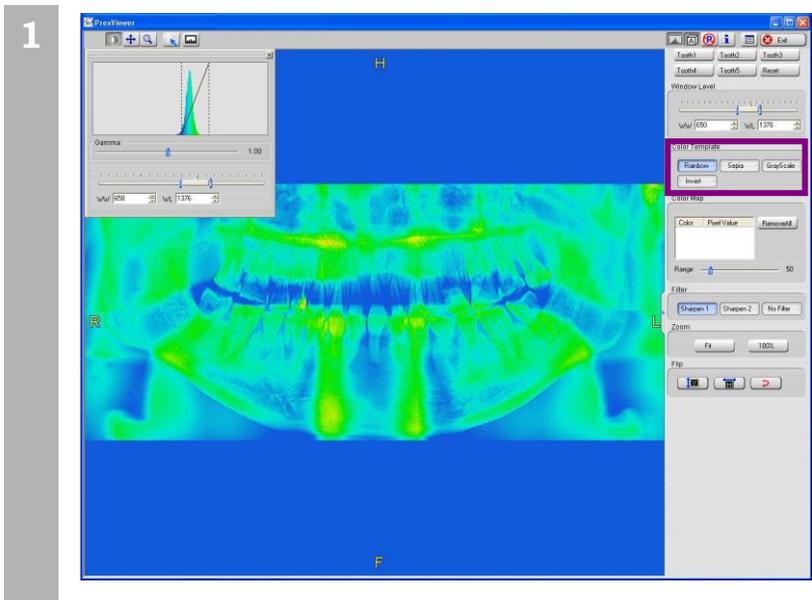
### Operation

To change the preset value, right click [Preset] button after adjusting the Gamma, window level and window width. Input the new button name on the Set Panorama Preset window and click [OK] button.

[Default] button reverts the values to the factory setting.

## 6-4 Color Template

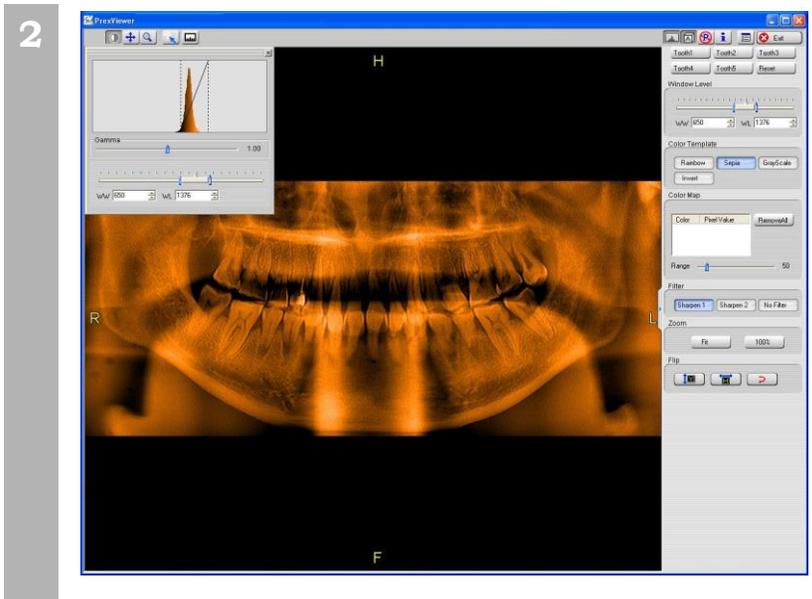
Different types of the color template can be applied.



### Operation

Click one of the buttons in [Color Template] section in the panel.

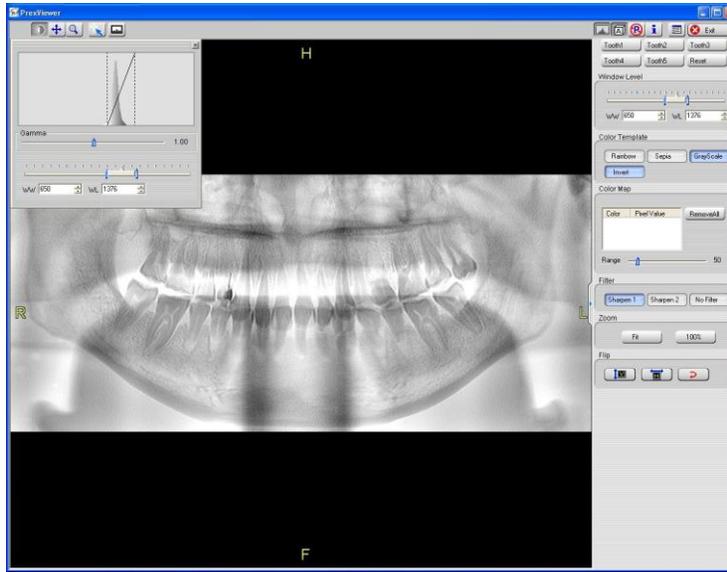
If you choose [Rainbow], the image is switched to the color gradation from blue to red.



### Operation

If you choose [Sepia], the image will be switched to brownish-red.

3

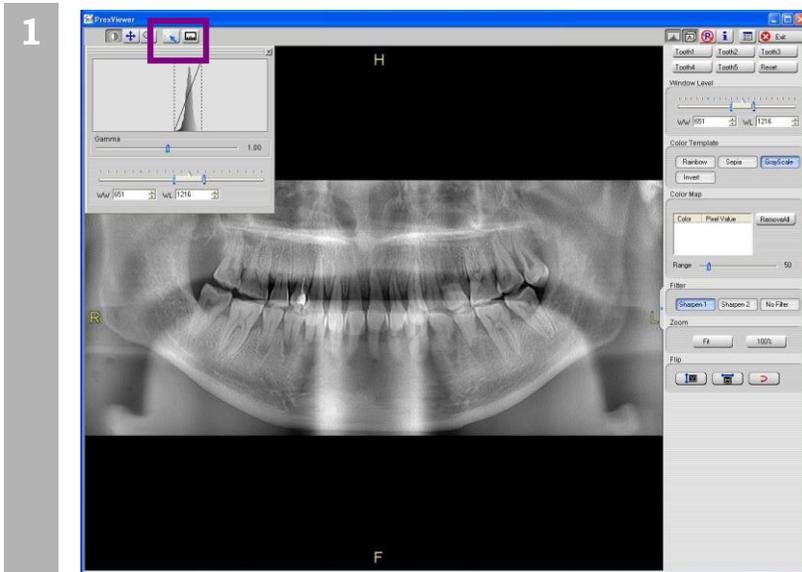


### Operation

If you choose [Invert], the color of the image will be inverted.

## 6-5 Color Map

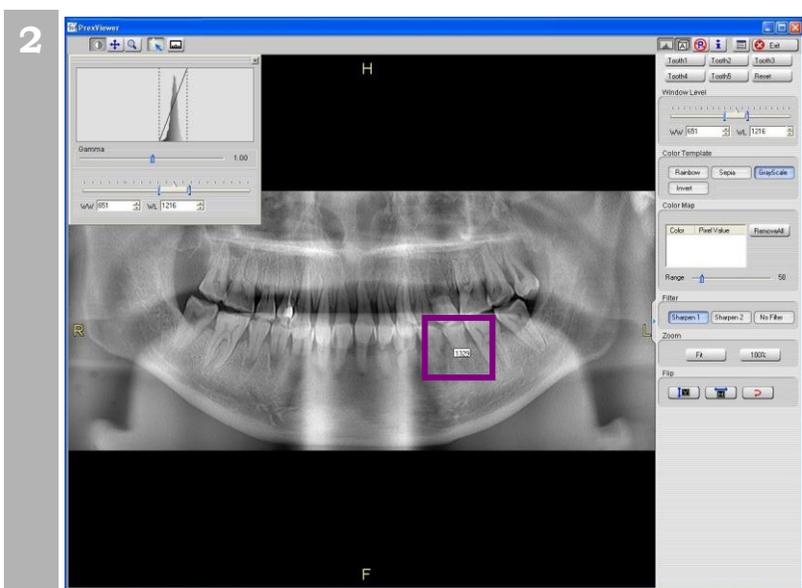
You can color the area which has the specified pixel value range.



### Operation

Click on [Display pixel value] button.

You can start from the 2<sup>nd</sup> operation below without this step. In that case, the pixel value cannot be checked in the 2<sup>nd</sup> operation because the pixel value is not displayed.



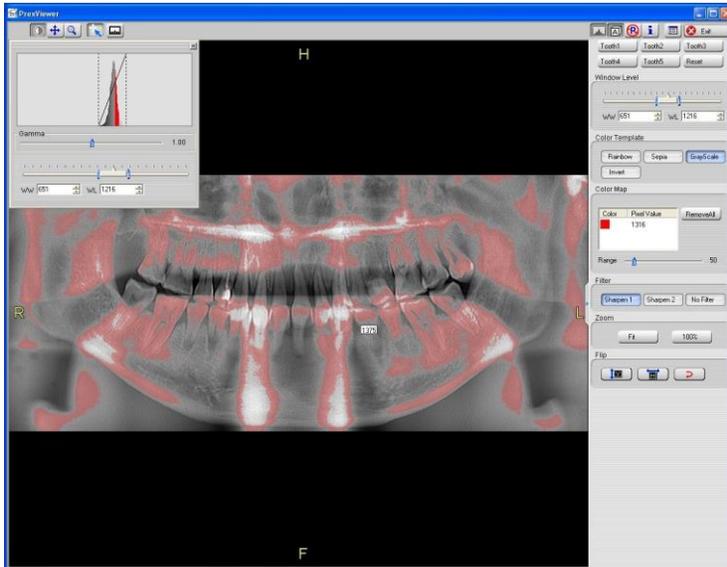
### Operation

Move the cursor and double click on the pixel which has the pixel value you are interested in. This pixel value will be the center value.

### CAUTION

- In the panoramic image, the CT value is not displayed but the pixel value.

3

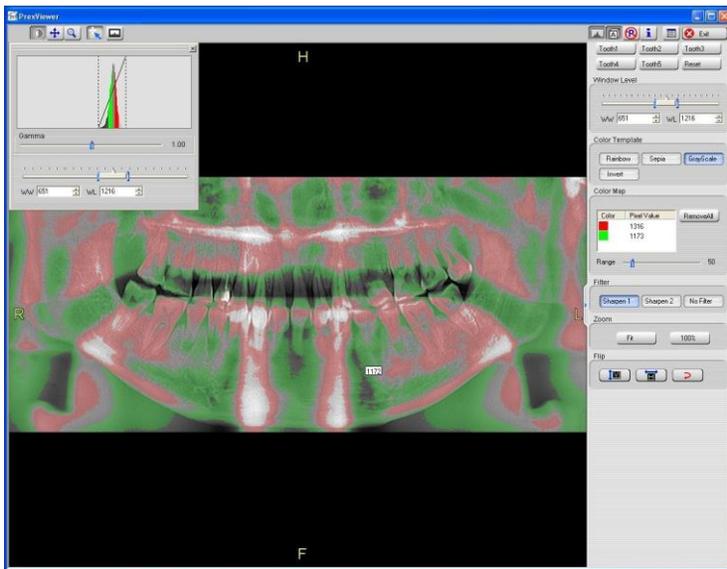


**Operation**

The area that has pixel value close to the center value (the center value  $\pm$  range) is colored.

The original image can be observed even if colored, only when you chose the Gray color template.

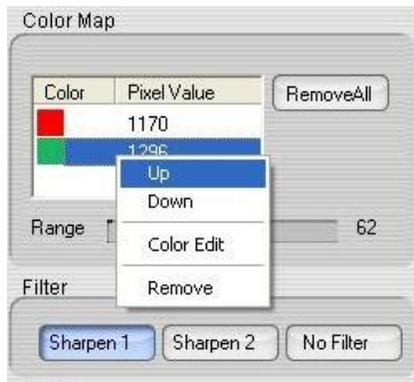
4



**Operation**

Double click again to add another area of pixel value range. You can have up to three areas.

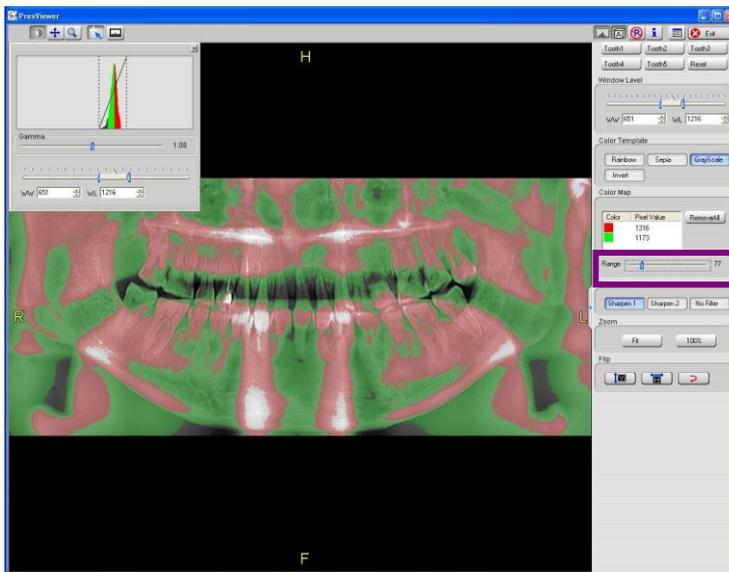
5



**Operation**

You can change the color of the area.  
 Right click the row to show the pull down menu.  
 Select [Color Edit] to change colors.  
 Select [Up] or [Down] to change the lap order.  
 Select [Remove] to remove the colored area.

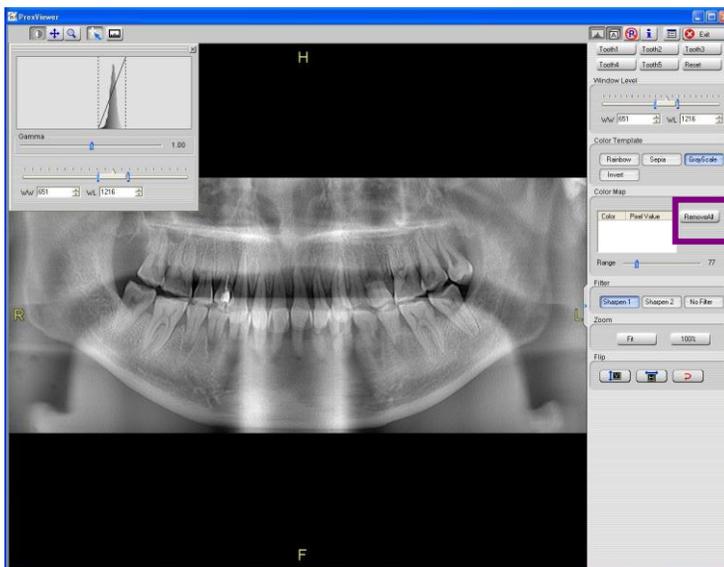
6



**Operation**

Use the range slider bar to adjust the range of pixel value to color.

7

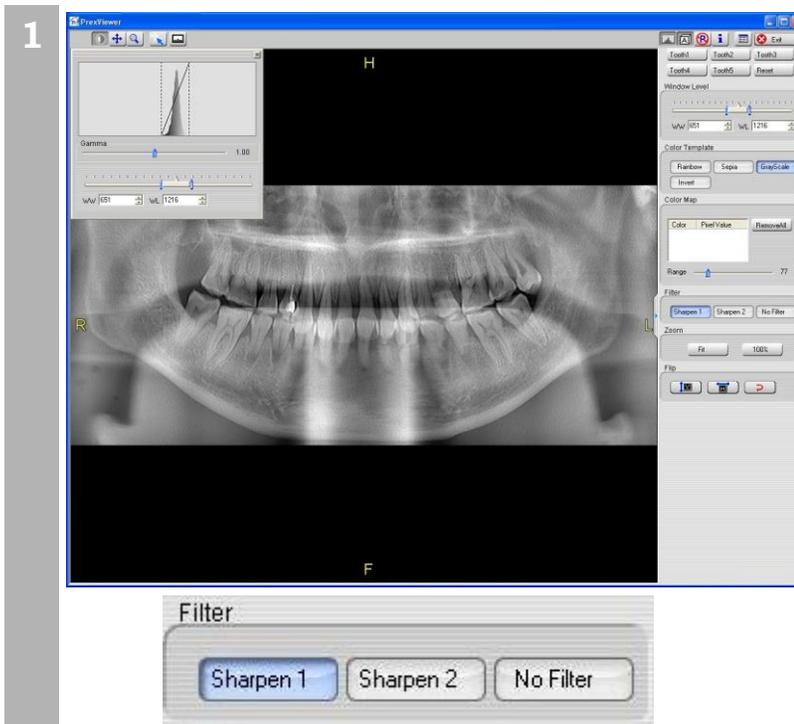


**Operation**

Click [Remove All] button to remove all the colored areas.

## 6-6 Edge Filter

You can apply the image filter that enhances edges.

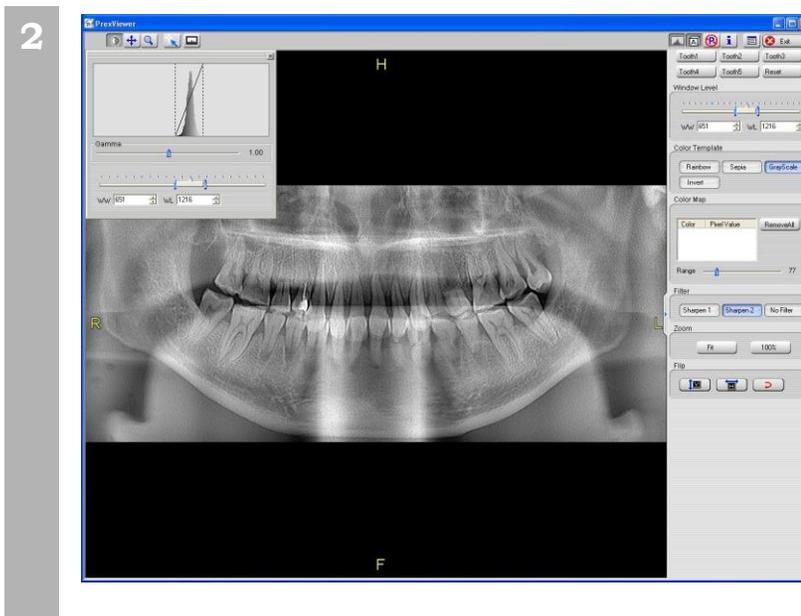


### Operation

Click one of the filter buttons in the [Filter] section of the panel to apply the image filter.

### Note

- [No Filter]: The original image
- [Sharpen 1]: Edge enhance. When you load an image, this filter is applied.
- [Sharpen 2]: Stronger edge enhancement than Sharpen 1.

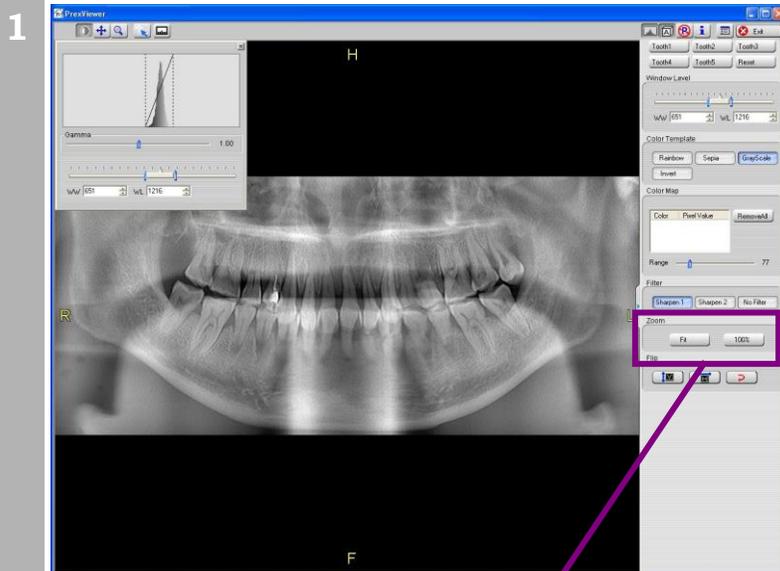


### Operation

This is an example of [Sharpen 2]

## 6-7 Zoom shortcuts

There are two zooming shortcut buttons in the [Zoom] section of the panel.



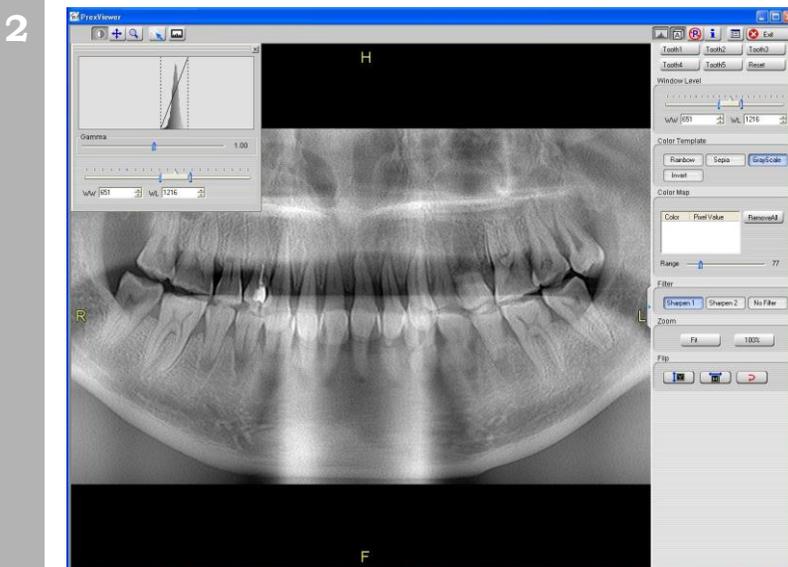
### Operation

Click [Fit] button to make the image fit the current viewing area. Left is an example result.

Click [100%] button to make the image pixel-by-pixel magnification. Pixel-by-pixel means that 1 pixel of image corresponds to 1 pixel of LCD display.

### Note

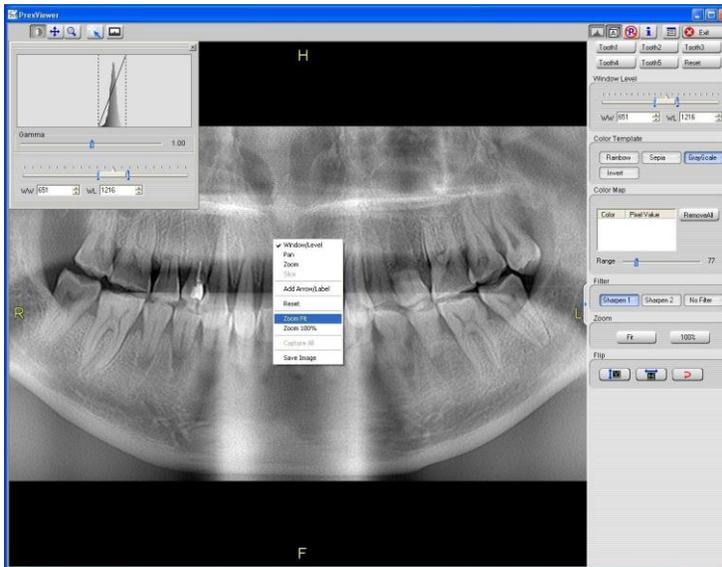
- The display magnification ratio will be changed when you perform another zooming operation.
- The display magnification ratio is changed when you show or hide the operation panel on the right side of the screen.



### Operation

Left is an example result of [100%] zoom.

3

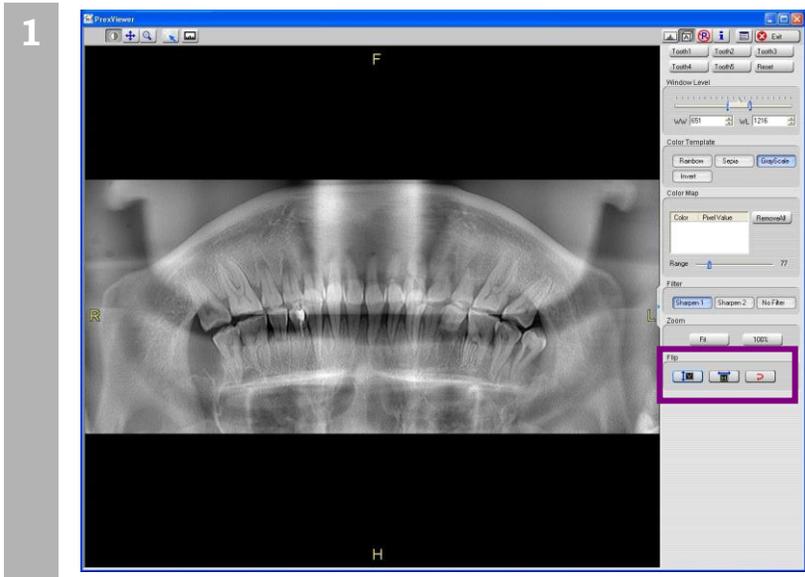


### Alternative Operation

Right click on the screen, the menu is displayed. The same operation as using [Zoom] button can be done from the menu.

# 6-8 Flip

The image can be flipped horizontally and/or vertically. Please note that the image is displayed the other way round in right and left. Enable the orientation display and indicate LR code to avoid misidentifying.

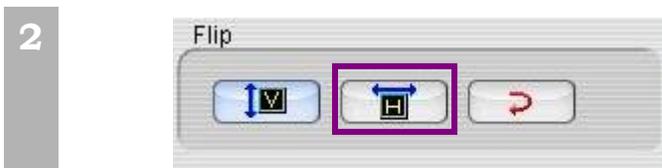


### Operation

Click [VFlip] button to flip the image vertically.

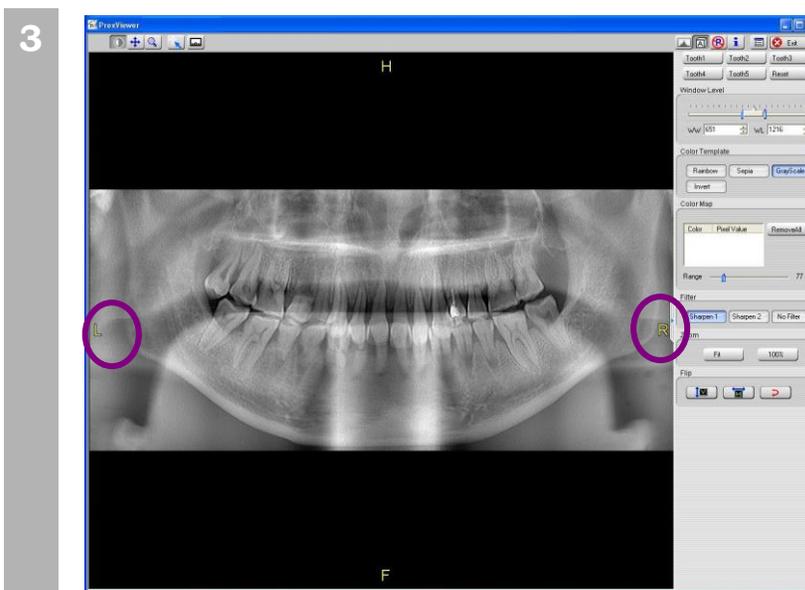


The button is highlighted to indicate the image is flipped.



### Operation

Click on [HFlip] button to flip the image horizontally.

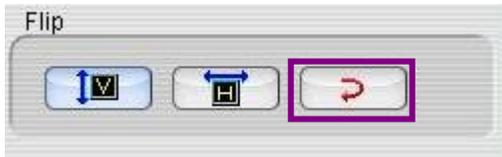


### Operation

This is an example of horizontally flipped image. Make sure to enable the orientation display.

- ▶ Refer to 6-1 Load Panoramic Image for the orientation display.

4



**Operation**

Click [Reset] button to revert to the original status.

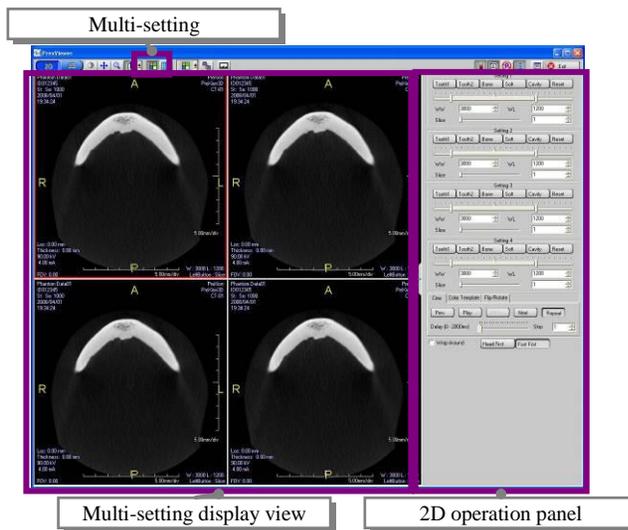
# 2D Image Display

Multiple 2D images can be displayed at the same time just like for film diagnosis. Multiple displays of one slice or simultaneous display of multiple slices are possible.

The types of slice multiple displays are explained below.

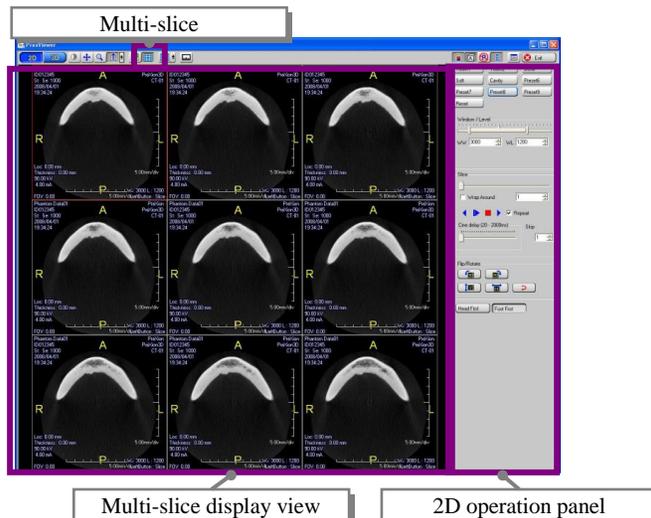
- ◆ Multi-setting Display

This shows multiple displays of one slice. Each display is shown at a different angle, so several angles can be checked at one time. This is shown by clicking on the [Multi-setting] button on the left side.



- ◆ Multi-slice display

This displays multiple slices at one time. This allows the differences of each cross section to be checked. This is shown by clicking on the [Multi-slice] button on the right side.

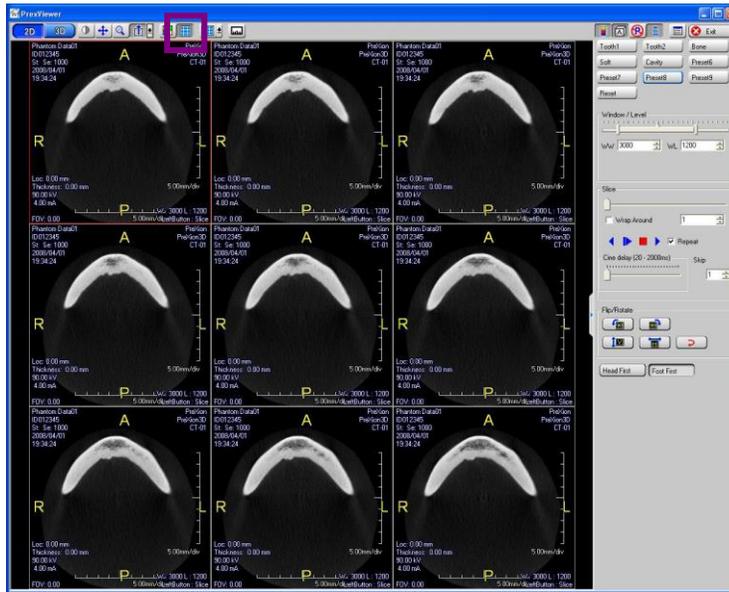


# 7-1 Changing the Layout

The multi-setting display layout can be changed from 1×1 to 2×2, and the multi-slice layout can be changed from 1×1 up to 5×5.

This section explains the method for changing the multi-slice display layout.

1



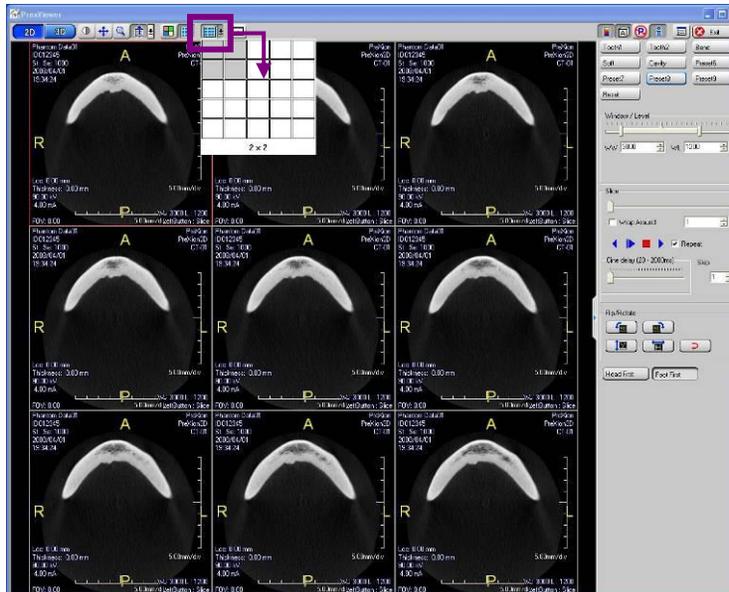
## Operation

Click on the [Multi-slice] button.

## Note

- For the Multi-setting display, click on the left side [Multi-setting] button.

2



## Operation

Click on the [Change Layout] button and drag the number to be displayed to change to the number of images you want to display.



## 7-2 Adjustment of the Multi-setting Display

The top left tool buttons and 2D operation panel can be used to adjust the 2D image display.

### Note

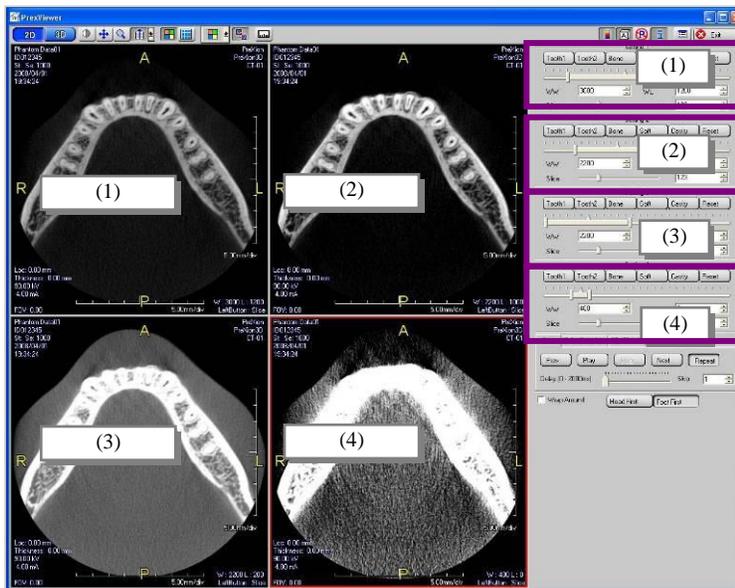
- The top left tool buttons are used in the same manner as when working with 3D images.

### ■ Window Level Adjustment

This is used to adjust the displayed slice image window width and window level.

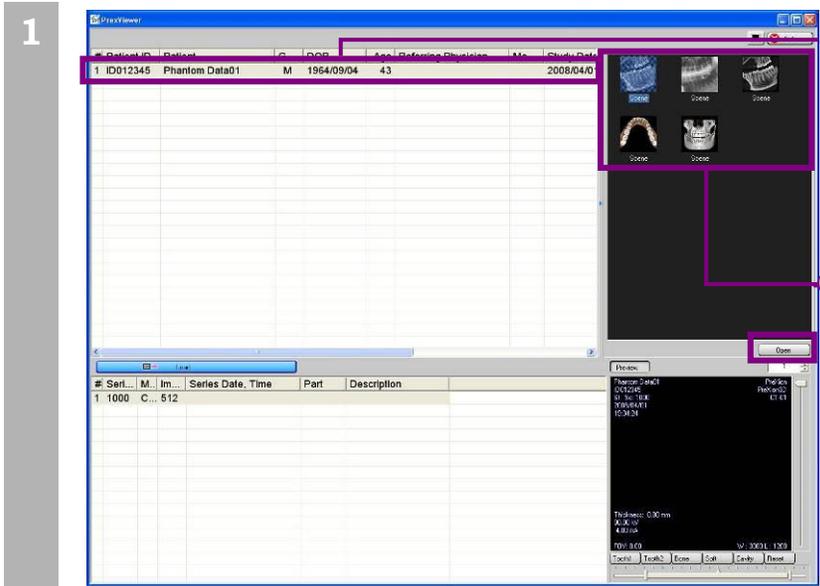
This can be set for each displayed slice. The setting method is the same as for 3D display.

The slices are set in the order of top left, top right, bottom left, bottom right from the top of the 2D operation panel.



# Scene

PrexViewer can load Scenes which saved in PreXion3D Viewer.

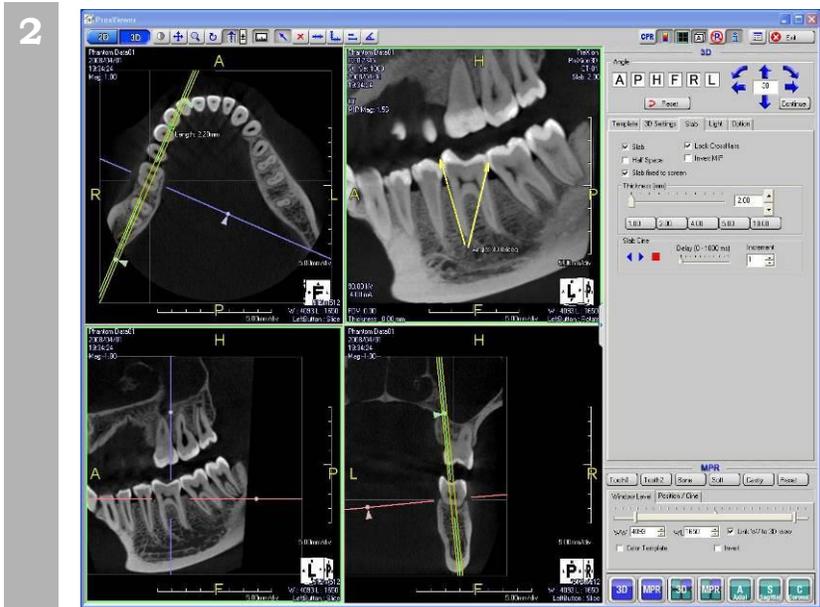


## Operation

4. Select the examination containing the scene to be opened.

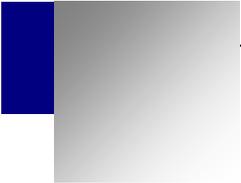
The saved scenes are displayed as thumbnail images.

5. Select the thumbnail image of the scene to be opened and click on the [Open] button or double click on the thumbnail image.



## Operation

The display changes to the Review screen and the scene is displayed.



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## Contact Information

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