PC-4000

A Guide To Getting The Best Images

> ➢ Troubleshooting Images
> ➢ Frequently asked Questions
> ➢ Software Guide

![Panoramic logo]

How to use this guide

NOTE: Please be sure your questions are answered or your issues resolved before attempting to take repeated exposures.

If this guide does not answer your questions, or if you have further issues, do not hesitate to call our Technical Support Team at 800-654-2027.

The next page has examples of issues that may occur with your digital images such as stretching, blurring, or other problems with the diagnostic quality. If the issue you are having is close to the example, follow the guide to the designated page for tips to remedy it.

Most of these issues can be fixed with a few clicks in the Panoramic Dental Imaging software. A more in-depth explanation of the software and its functions begins on page 19.

Do your images look like this?

All of the following images were taken on a skull phantom, your images may differ slightly.
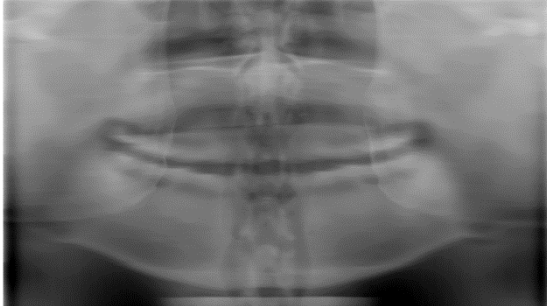
Extremely blurry, no teeth in focus. Spine is visible. See page 5 for a quick fix.
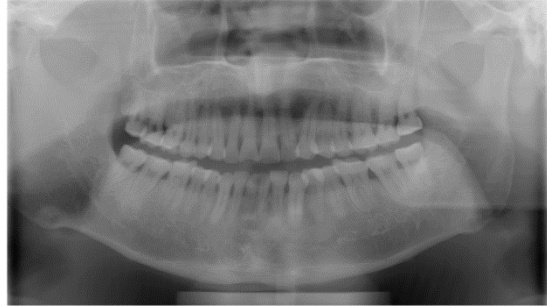
One side stretched. Mandibular rami or condyles not symmetrical. See page 7

Mandibular incisors shortened. V-shaped mandible. See page 8.

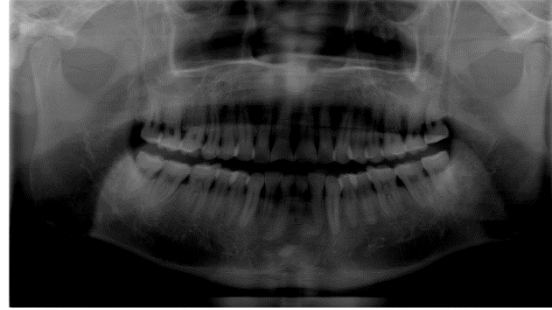Teeth/Mandible flat. No detail in maxillary roots. See page 9.

White artifact in image. See page 10.

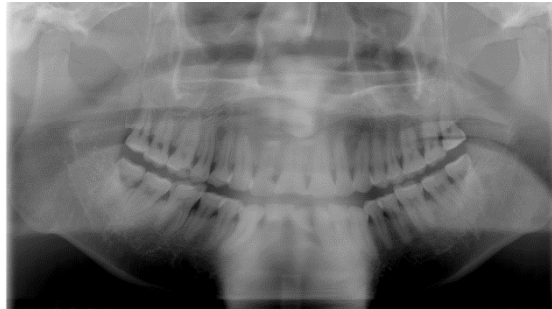White column through middle of image. See page 11.

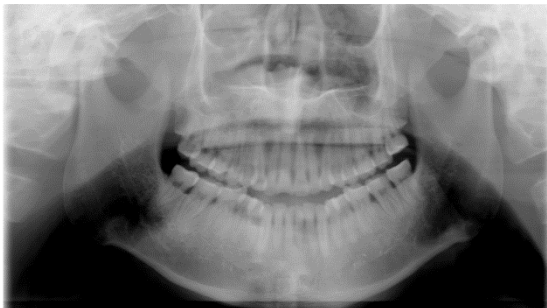Dark line through maxillary roots. See page 12.

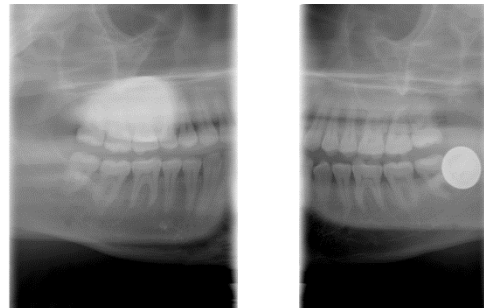Overall very dark image. See page 13.

Overall very light image. See page 14

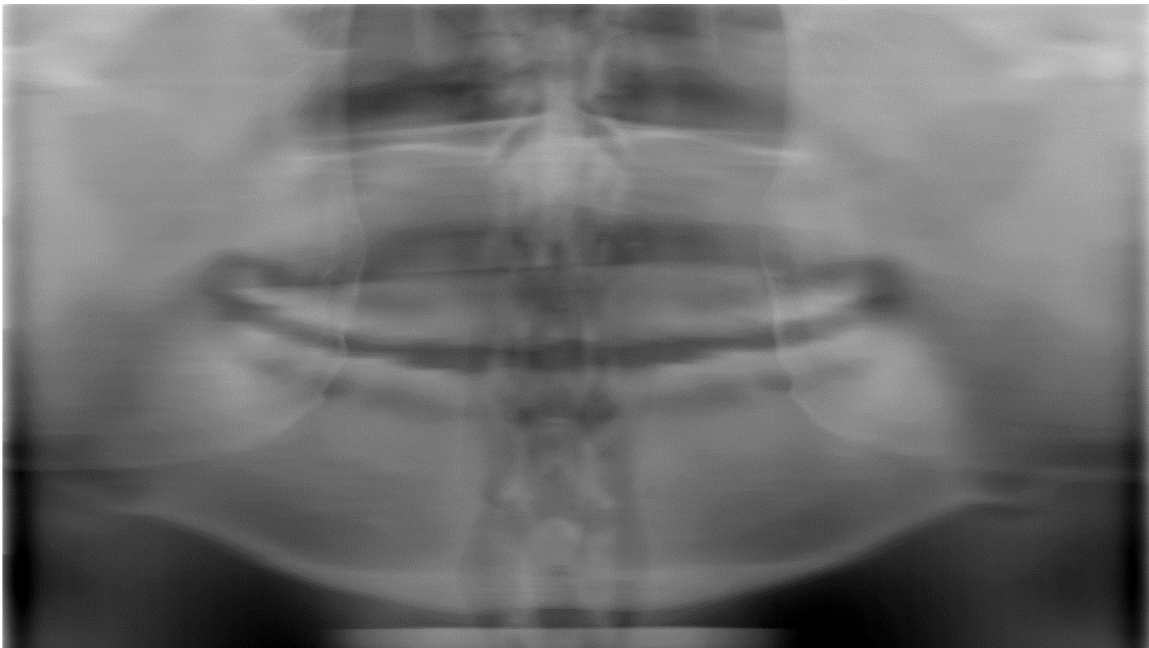Anteriors magnified/distorted. See page 15


Anteriors compressed/distorted. See page 16

Streaks/blurs on bitewing. See page 17

![panoramic logo]

Extremely blurry:

This will happen when the exam selected on the machine does not match the exam on the software; the image has been taken backwards. This image can be fixed without taking another exposure. Simply navigate to Tools > Dataset tools > Flip dataset direction as pictured here:
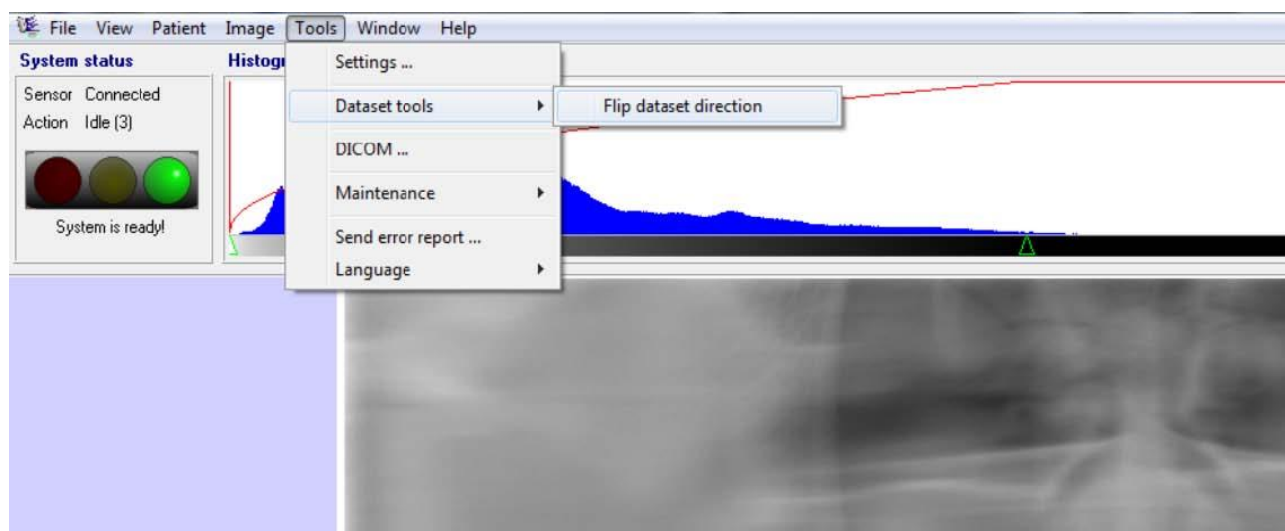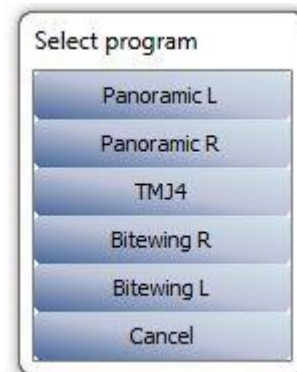

The image will reload and be fixed. To prevent this from happening in the future, be sure to check

that the exam in the top right of the software matches the one selected on the machine:
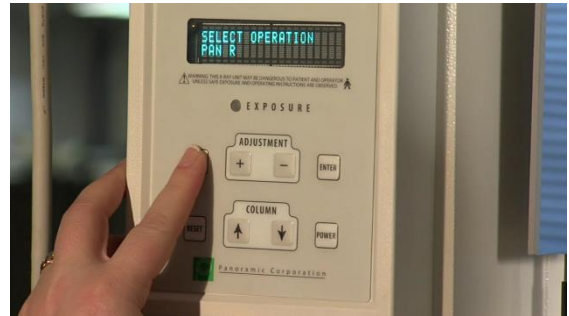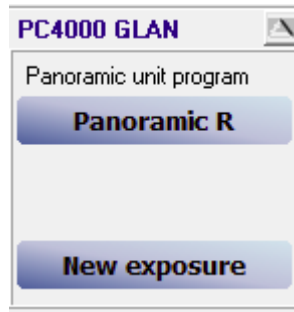
To change the exam in the software, click the button and select the one you wish to take. The sensor will need to be connected before the button will be active.

One side stretched/Condyles are not symmetrical:

This is most often caused by the patient being positioned off center, or looking to one direction. Use the mirror to check that the patient's midsagittal plane is centered with the red line on the forehead support.

If necessary, ask the patient to close their eyes during the exposure to prevent them from trying to follow the sensor's rotation.

Mandibular incisors shortened/V-shaped mandible:

This is caused by the chin being angled downward; the Frankfort plane is not parallel to the ground.

Double check the positioning of the Frankfort plane with the red lines on the temple supports.

Chin angled too low.

The Frankfort plane (red line) must be parallel to the ground.
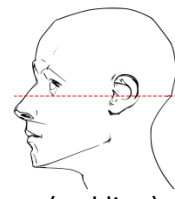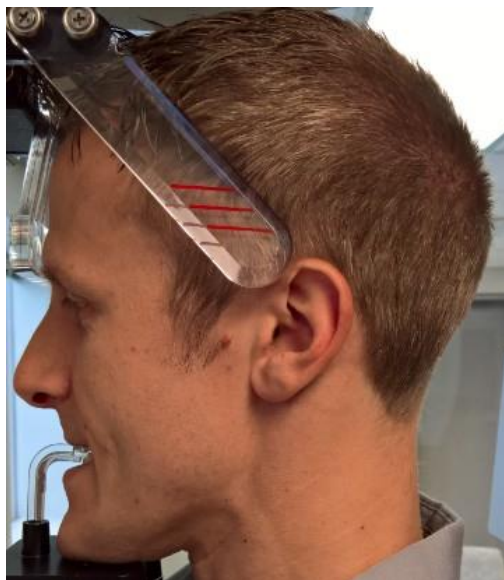
Teeth/Mandible Flat. No detail in maxillary roots:

This is caused by the chin being angled upward; the Frankfort plane is not parallel to the ground.

Double check the positioning of the Frankfort plane with the red lines on the temple supports.
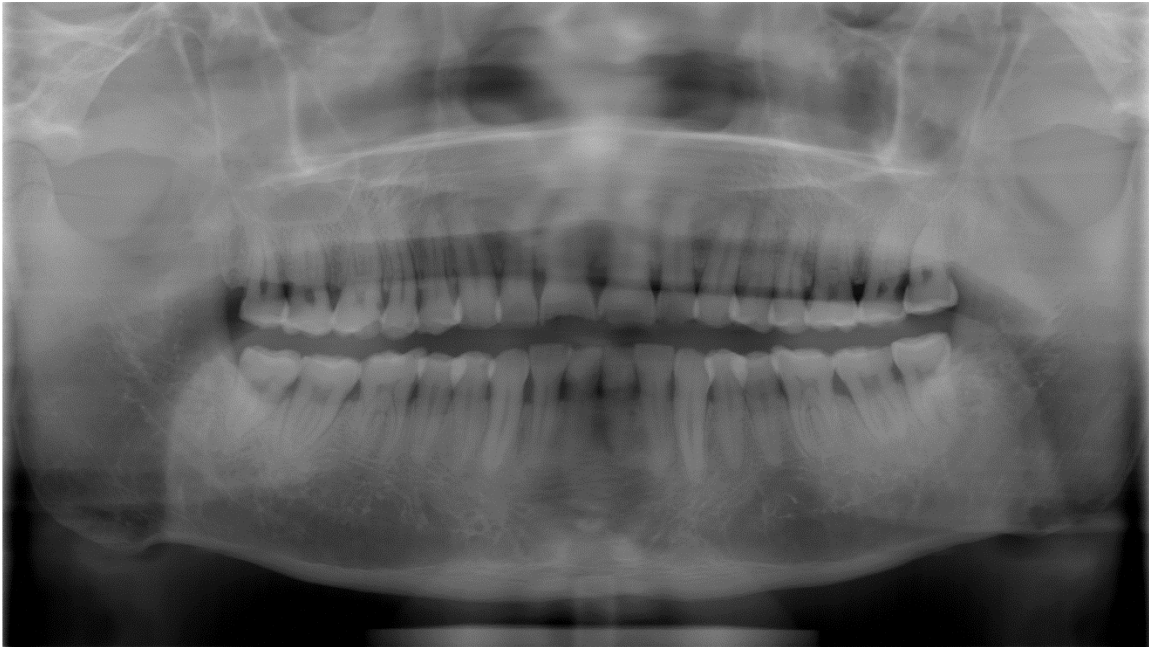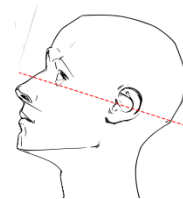

Chin angled too high.
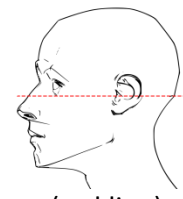
The Frankfort plane (red line) must be parallel to the ground.

White artifact in image:

This will occur any time there is a foreign object that blocks the radiation. This is most often caused by a lead apron being too high on the back of the patient's neck, or the patient did not remove all jewelry prior to the exposure.

Note: a thyroid collar should never be used during a panoramic x-ray as it would cause a similar problem.

White column through the middle of the image:

This is a shadow caused by the patient's spine. Since the beam travels slightly upward from the back of the next, it is recommended to have the patient step forward to open up the vertebrae and allow the radiation to pass through to the sensor. The Panoramic Dental Imaging program can compensate for this a little, but double check the patient's positioning.

Note: this position can be awkward for the patient, and some encouragement may be needed.

The Basic Equalized preset or the Equal Vertical image enhancement option in our Panoramic Dental Imaging program may help compensate for the spinal shadow as well. See page 22 for more info.
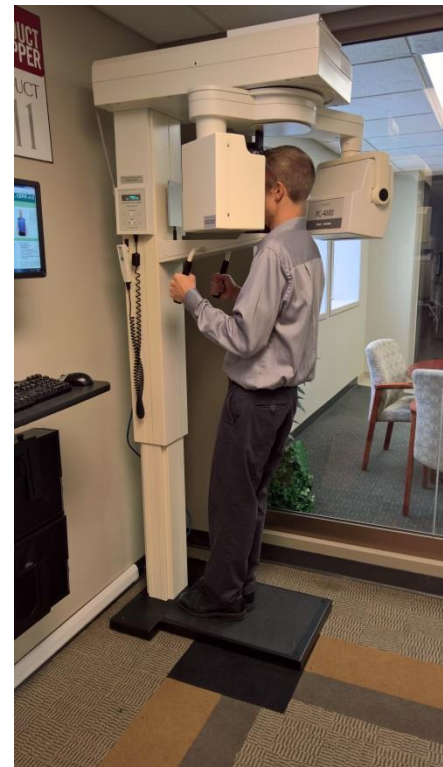
Feet under handle bars, back angled slightly.

Dark line through maxillary roots:

This is the palatoglossal air space, which will be visible on the image if the patient did not keep their tongue on their palate. Without the added density of the tongue, the air space becomes over exposed.

Depending on the level of over exposure, some of the missing detail in the image may be recovered with an adjustment to the overall contrast.

A detailed explanation of the contrast enhancements available in our Panoramic Dental Imaging software begins on page 20.

Overall very dark image:

This is either caused by overexposure, or the brightness/contrast of the image needs to be adjusted in the acquisition software.

To be sure that the correct amount of kVp was used, check the guide on the side of the forehead support after adjusting the temple supports against the patient's head. The recommended kVp is noted by the smallest visible number.

If the recommended kVp was used and the image is still very dark, the brightness and contrast may just need to be adjusted. A full description of the brightness and contrast enhancements begins on page 20.

Overall very light image:

This is either caused by underexposure, or the brightness/contrast of the image needs to be adjusted in the acquisition software.

To be sure that the correct amount of kVp was used, check the guide on the side of the forehead support after adjusting the temple supports against the patient's head. The recommended kVp is noted by the smallest visible number.
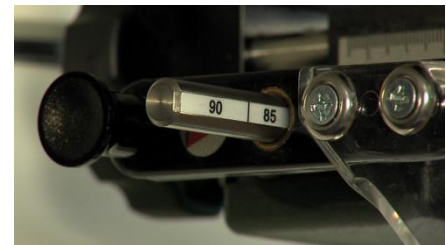
If the recommended kVp was used and the image is still very light, the brightness and contrast may just need to be adjusted. A full description of the brightness and contrast enhancements begins on page 20.

Anterior teeth magnified/distorted:

This is caused by the patient biting too far back on the bite guide. The teeth are further away from the sensor and get magnified.
Be sure to check that the patient is biting on the groove of the bite guide; this will ensure they are properly positioned in the focal trough.
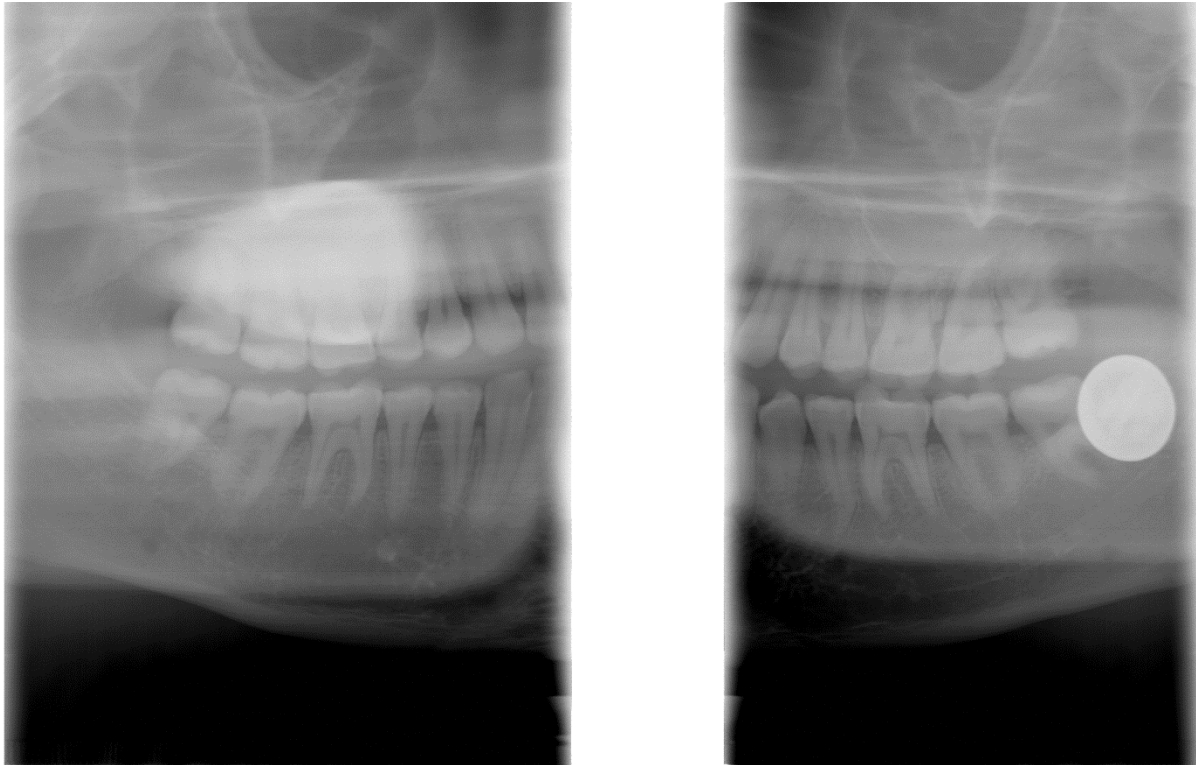
Anterior teeth compressed/distorted:

This is caused by the patient biting too far forward on the bite guide. The teeth are further away from the sensor and get magnified.

Be sure to check that the patient is biting on the groove of the bite guide; this will ensure they are properly positioned in the focal trough.

Streaks/Blurring on bitewing:

This is a reflection from the patient's previous dental work. Any crowns or fillings made from a radiopaque material is subject to cause streaking on extra-oral bitewings due to the unique positioning required for this exam.

The two shots below highlight how much the change in positioning from panoramic to bitewing can affect the placement of artifacts in the image. The image on the left is a panoramic on a test skull with a metal object placed near the molar. The image on the right is the same skull and metal object positioned for a bitewing.
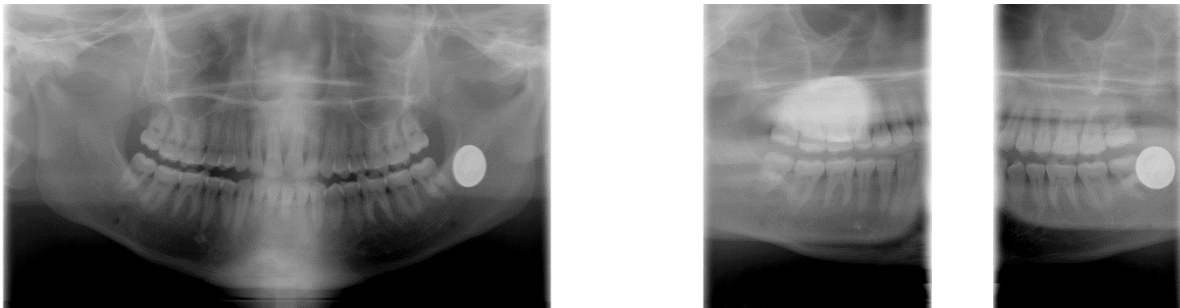
The geometry of the rotating arm and angle of the tube head to the sensor prevents the ghost image of the metal object from appearing on the panoramic image. The change in positioning for the bitewing exam moves the metal object into the path of the sensor twice, causing it to appear on

the image in two places.

Due to the potential for streaking, the extra-oral bitewing feature is not recommended on patients with prior dental work, and should only be used as a supplement if an intraoral is not possible.

Software User Guide

Panoramic Dental Imaging is an image acquisition software with robust processing options. It is solely meant to capture the image from the digital sensor, manipulate it to your liking, and pass it along to the storage option most convenient for you.

Although the software can save images locally or to a location of your choice, it can also interface with most image management software via a TWAIN driver that is installed along with the software. If needed, please call our Technical Support staff at 800-654-2027 to set up a bridge between your image management and Panoramic Dental Imaging.

Launching the software:

If Panoramic Dental Imaging has not been bridged with an image management software, it can be launched by double-clicking the icon on the desktop.

If it has been bridged with an image management software, refer to that software's manual as the process will vary. Feel free to contact our Technical Support staff if you have any questions regarding this.

Image Acquisition:

When the sensor connects to the software, the green light will illuminate. Double check that the mode displayed in the top right matches the exam you wish to take. (In this example, it is set to Panoramic L)

If it is not set to the exam you wish to take, click the button and select it from the drop-down box.


Once the mode is set and the green light is illuminated, the software is ready to acquire the image.
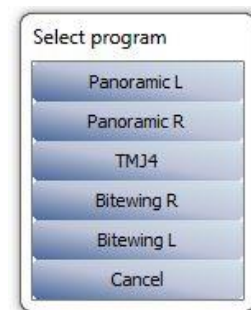
Preliminary Image Processing:

It is best to adjust the image in Panoramic Dental Imaging as close to your desired result as possible before saving, even if the image is going to be saved into an image management with its own image processing tools.

The most common adjustment you will need to make is to the brightness and contrast of the image. This is done via the histogram.
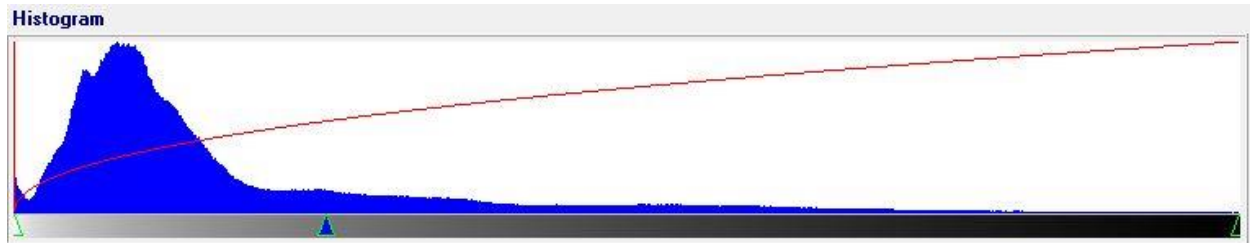

A histogram is a graphical representation of how often a color appears in an image. At the bottom of the graph, you will see a color gradient going from white on the left to black on the right, as well as three small triangles. The histogram above shows that most of the colors in the image are a light gray, so the overall image will be fairly light.

The small triangles at the bottom can be clicked and dragged to adjust the brightness and contrast of the image. The middle triangle is the overall brightness (gamma) of the image, shifting it to either the white side or the black will result in lightening or darkening it.

The triangles on either side can be moved to clip that side of the color spectrum, the net effect is a change to the contrast of the image. Most of the time, only the middle and far right triangles will need to be adjusted. Some examples of the adjustments are on the next page.
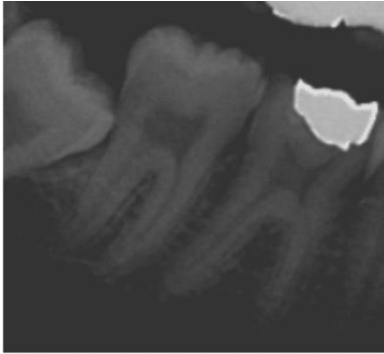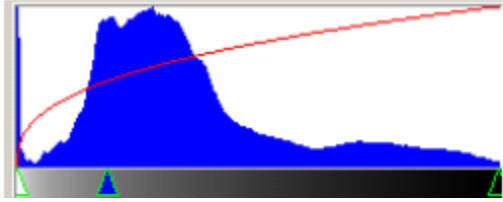
The middle triangle is shifted to the left, lengthening the darker area of the gradient, thus darkening the overall image.
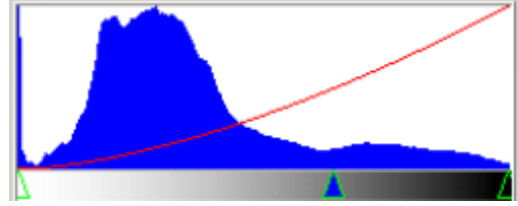
The middle triangle is shifted to the right, lengthening the lighter area of the gradient, thus lightening the overall image.
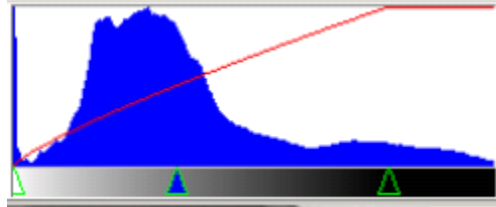

The right triangle is shifted toward the left, clipping the black area and resulting in a change to the contrast.

You may need to experiment with the brightness and contrast to see what combination looks best

to you. Although we recommend adjusting the histogram for each exam to best match the patient's unique anatomy, it is possible to save the histogram settings to a desired result.

In the tool bar at the top of the software, select Image > Histogram > Save current histogram settings as defaults.

The histogram will automatically adjust to those settings on subsequent images.
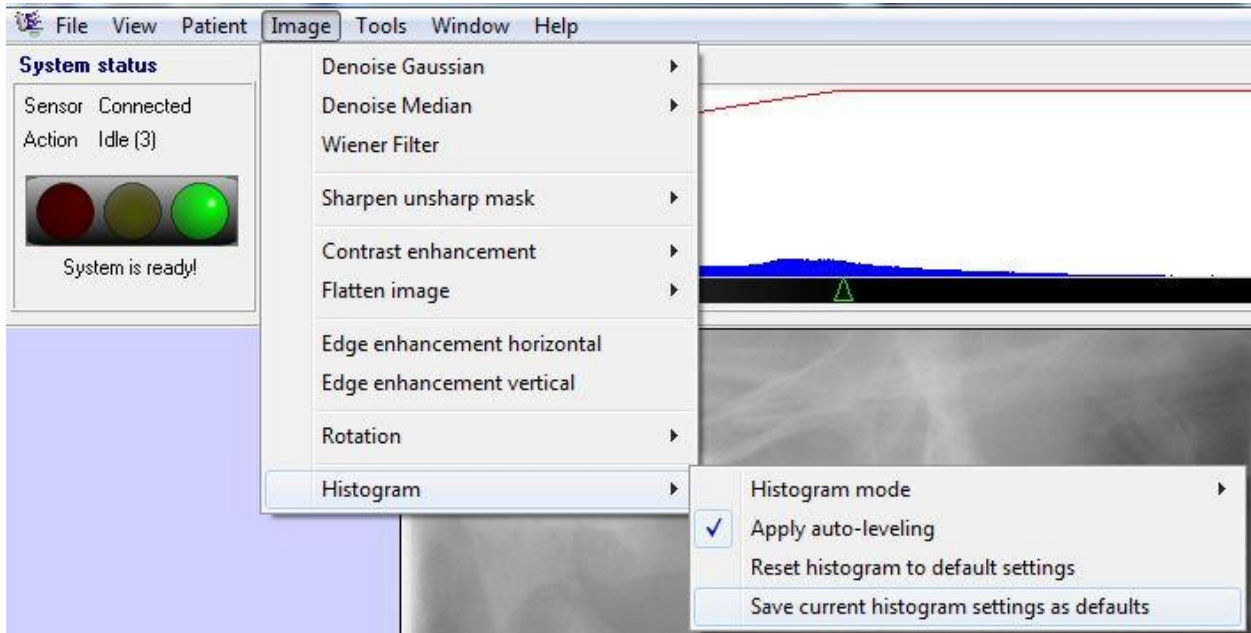

You can also reset the histogram to the default settings from this menu should you ever need to.
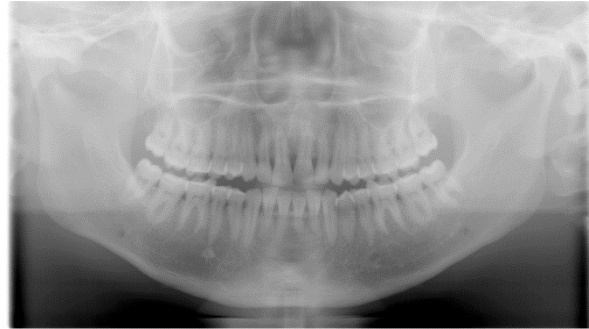
The Panoramic Dental Imaging software can also compensate slightly for spinal column shadow using the Equal Vertical tool under the Enhancement options at the top right of the software window.
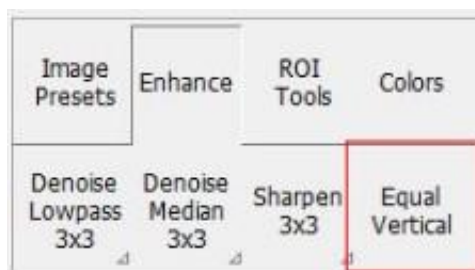
Below are some examples of before and after the Equal Vertical has been applied.
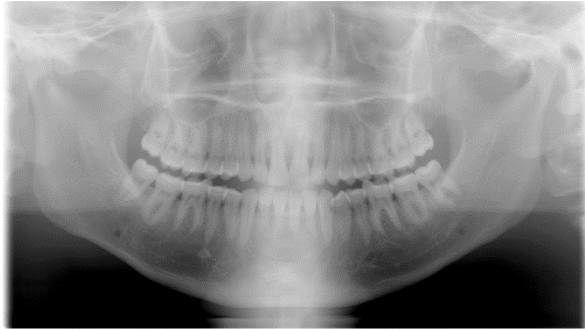
Before Equal Vertical	After Equal Vertical

Note: You may need to adjust the brightness and contrast after applying this operation as the white level will have changed.

The image can be further enhanced with the Boost buttons located under the Image Presets option at the top right of the software window.
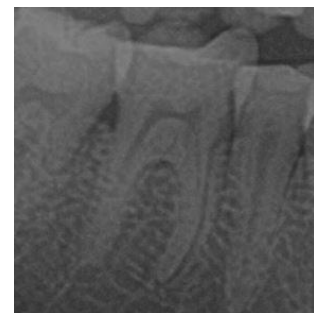

Basic is the default, and Basic Equalized is simply the default image with Equal Vertical applied. The Boosted and Boosted Strong options will enhance the edges detected in the software as well as the contrast. Below are examples of the Boosted and Boosted Strong preset in comparison to the default:
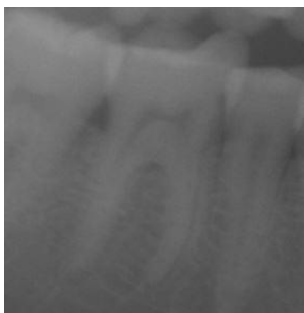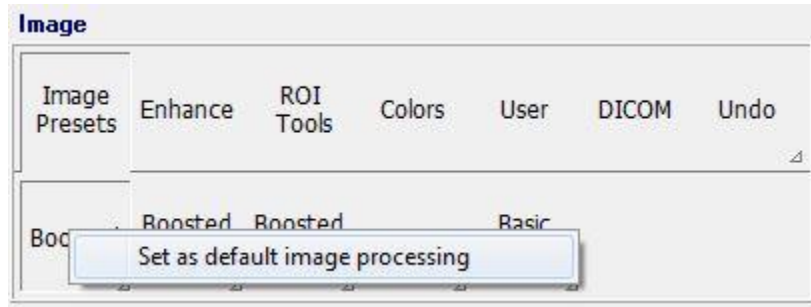

| Basic (Default)	Boosted	Boosted Strong

If you wish to save any of these as your default image processing, simply right-click the button and select the option:


Any other settings or enhancements that were applied can also be assigned for ease of use. If you find that you are repeatedly applying the same filters or enhancements, you can save it either as the default image processing that will automatically be applied to each new image, or as a separate button.
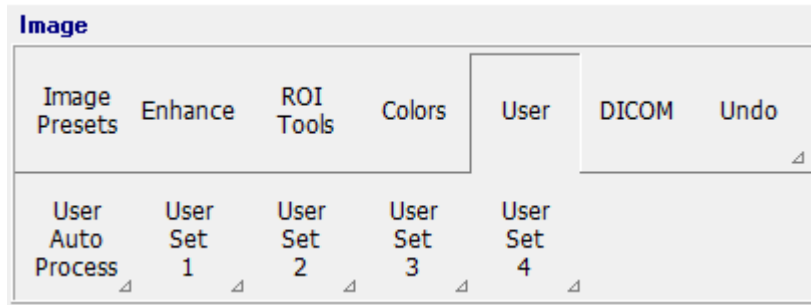
After the image is set to your liking, click the User section in the top right of the software. There is an option for 5 total presets, but the User Auto Process will be automatically applied to each new image as it scans in. Simply right click the button you wish to set, and select the appropriate option.
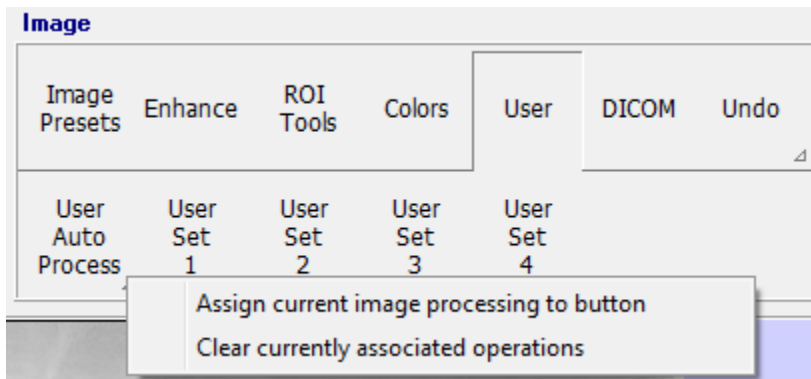
The window that pops up will give a list of the filters that were applied, as well as the option to save the histogram settings. All of the presets except for the User Auto Process can be renamed.
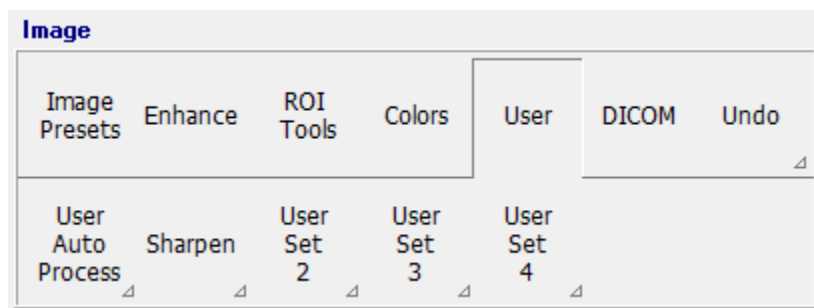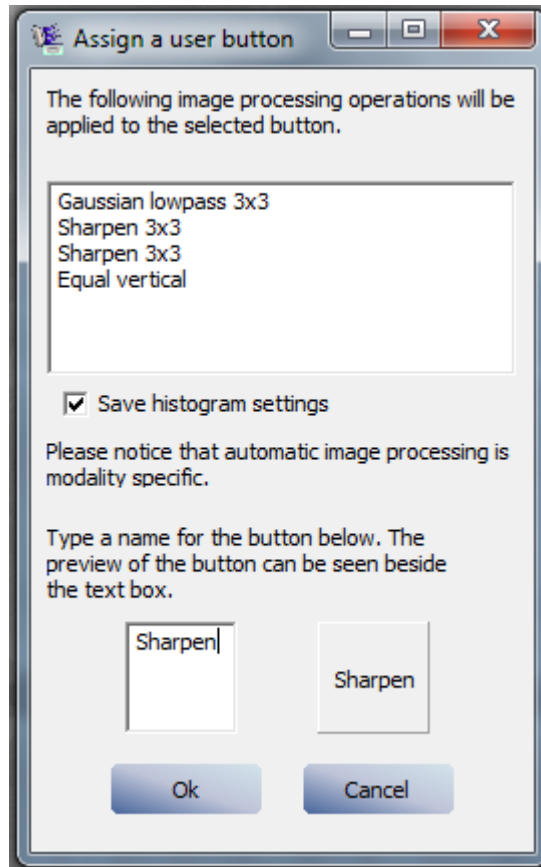

The next time you wish to apply those filters or enhancements, just navigate back to the User section and click the button.

Saving the Image

The process for saving the image will vary depending on your work flow and network setup. Panoramic Dental Imaging can interface with most image management software suites through a TWAIN driver.

If it is launched through your imaging software, a small TWAIN box will appear at the bottom right with the option to Save full image. This button just passes the image to the image management and saves directly to the patient database.

Save ROI is for saving just a region of interest and is rarely used.
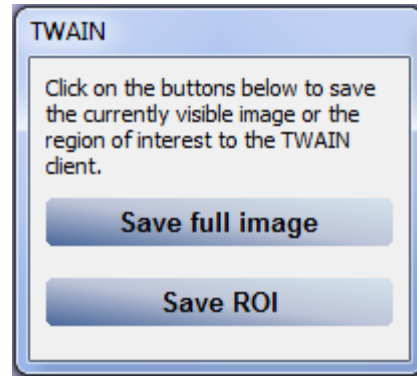
Due to the wide range of imaging software suites available, the process for launching the acquisition software through TWAIN will vary greatly. Feel free to call our Technical Support Team at 800-6542027 for assistance with setting up the bridge and learning how to use it.

If the acquisition software has not been bridged with an image management, or if there are any issues with the bridge, the image can just be saved locally as a picture under File > Save Image or Save Image As.