

BIOQUANT OSTEO 2013, Version 13.2.6

The following release notes cover features in the release of BIOQUANT OSTEO 2013 for Windows 7, v.13.2.60 software.

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Combined Installation Program

The BIOQUANT OSTEO Installation program for the Windows 7 32-bit and Windows 7 64-bit versions have been combined. The installation program will detect which Windows 7 version you have and install the correct version of BIOQUANT OSTEO.

Read the BIOQUANT OSTEO Getting Started Handbook for directions on installing the BIOQUANT OSTEO Program and the required BQ-V imaging board.

BIOQUANT Plug-in Consolidation

BIOQUANT OSTEO's plug-ins have been consolidated and upgraded with more features.

Topic Contents

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- BIOQUANT SCAN (page 3)
- BIOQUANT Topograper add-on (page 4)
- BIOQUANT OSTEO Core Software Change (page 4)

BIOQUANT Imaging Extensions add-on

If you had the Imaging Toolkit plug-in and/or Stereology Toolkit plug-in, you have been upgraded to the BIOQUANT Imaging Extensions add-on. This add on contains:

- **Imaging Toolkit box**
See “Imaging Toolkit Enhancements” on page 30.
- **MicroCT Navigator box**
See “Dicom Image Support / MicroCT Navigator” on page 20.
- **Stereology Grids**
See “Stereology for Bone” on page 31.

BIOQUANT SCAN

Non-commercial License Users: If you had the Automated Imaging Toolkit plug-in and a motorized stage, you have been upgraded to BIOQUANT SCAN.

BIOQUANT SCAN performs automated imaging on fixed tissue sections on glass slides and fixed cells in well plates. It supports bright-field, wide-field fluorescence, darkfield, polarized, and phase contrast imaging. Scans are stored in the calibrated BIF image format for analysis and may be exported to the BMP format for publications.

BIOQUANT SCAN includes the BIOQUANT Imaging Extensions add-on.

BIOQUANT SCAN requires an ASI motorized stage. It can be used with a Ludl motorized stage, however the stitching quality will be degraded.

The Auto Sequential Imaging and Time Lapse Imaging boxes are no longer available. The functionality of Auto Sequential Imaging is found in BIOQUANT SCAN. Time Lapse Imaging can still be performed at one location using the Imaging Toolkit box.

BIOQUANT Topograper add-on

The BIOQUANT Topograper add-on remains the same as in previous version. See “BIOQUANT Topograper Add-on Enhancement” on page 42.

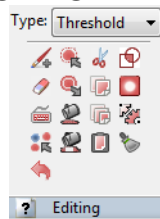
BIOQUANT OSTEO Core Software Change

The BIOQUANT Topo Reader plug-in is no longer included with the BIOQUANT OSTEO core software. The Topo Reader plug-in was used primarily to print and save just the 2D topography to a file. This can now be done in the OSTEO core software by choosing Save Navigator Image plus Current Topo from the Save Single Image list in the Image Region.

Threshold Editing New Feature: Clean

There is a new Threshold Editing tool named  Clean.

Figure –Editing Region: Threshold Type



The Clean button is the bottom button in the 4th column.


Clean deletes all thresholded objects less than a user-specified minimum size. This makes it easier to remove non-specific thresholding from marrow space.


Topic Contents

- Quick Procedure (page 5)

- Adjusting the Clean Tool (page 5)

Quick Procedure

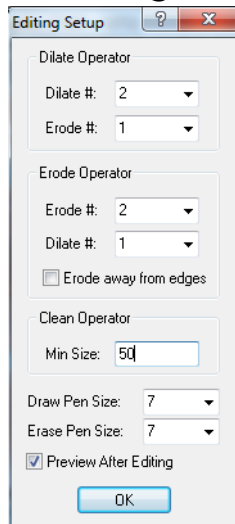
1. Threshold the image.
2. Clicks the  Clean button.

When the user clicks the  Clean button, the system deletes small thresholded objects.

Adjusting the Clean Tool

To adjust the size of the thresholded objects that are cleaned:

Figure –Editing Setup box





Adjust the Clean Operator Min Size.

1. In the Editing region (Threshold Type), click the Threshold Edit Setup button.

2. On the Editing Setup box, increase or decrease the Clean Operator Min Size.

This value is in pixels and is remembered across BIOQUANT sessions.

3. Click OK to close the Editing Setup box.
4. In the Threshold region, click Refresh to restore the original threshold.
5. In the Editing region (Threshold Type), click the  Clean button again to test the new settings.

Note: Once the Clean Operator has been adjusted for your sample, you can assign  Clean to a Quick Batch Script, along with other threshold editing features. The Quick Batch Script can be run before clicking Preview in the Measurement region (General Type). See “Batch Measurement Enhancements” on page 10.

Osteoid Type Enhancements

The Osteoid Type in the Measurement region, has the following enhancements:

Topic Contents

- Fill Threshold when Preview (page 7)
- Osteoid Type Array Continuity (page 7)
- Reverse Osteoid Surface (page 7)

Fill Threshold when Preview

- When the user clicks the Preview button and then clicks on an osteoid, any holes in the osteoid automatically fill with threshold. Then the system preview outlines the osteoid.

Osteoid Type Array Continuity

- The Width, Surface, and Volume arrays are now remembered across BIOQUANT sessions.

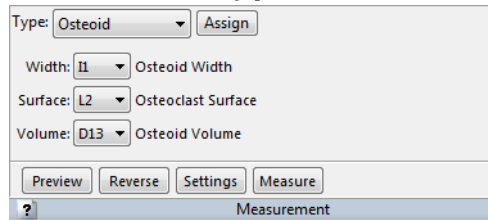
Reverse Osteoid Surface

A “Reverse” feature has been added that allows the user to reverse the slide of the osteoid seam that designates the osteoid surface. For most osteoid seams, the shorter side is the cellular surface. In some pathologies, however, the cellular side is longer. Clicking the Reverse button automatically switches the cellular surface to the longer side.

Procedure Snippet

- a. Threshold the osteoid.
- b. In the Measurement region (Osteoid Type), click “Preview” and then click on the osteoid in the Image window to preview outline it.
- c. Click “Set Ends” and then click two points on the osteoid tracing in the Image window to indicate the ends of the osteoid surface.

At this point the text on the “Set Ends” button changes to “Reverse.”

Figure —Osteoid Type: Reverse button

The Reverse button shows up after Set Ends has been clicked.

- d. Examine the image. The cellular surface of the osteoid tracing is indicated by pink Xs. If the wrong side is indicated, click the “Reverse” button. The Image window tracings are refreshed and the opposite side of the osteoid now has the pink Xs, indicating osteoid surface.
- e. If satisfied, click the “Measure” button to record with Osteoid measurements.

dLS Type Enhancements

The dLS Type in the Measurement region has the following enhancements.

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- dLS Type Array Continuity (page 8)
- Faster dLS Definition (page 9)

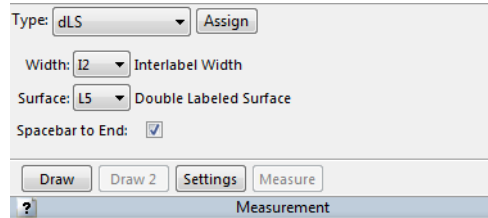
dLS Type Array Continuity

- The Width and Surface arrays are remembered across BIOQUANT sessions.

Faster dLS Definition

The “Draw 1” and “Draw 2” buttons have been combined into a single “Draw” button by default.

Figure –dLS Type: Draw button



Procedure Snippet

- a. Click the Draw button.

The cursor enters the Image window.

- b. Trace the first surface.

If Spacebar to End is OFF, continuously hold down the left mouse button as you trace the first surface. The tracing is complete as soon as you release the left mouse button.

If Spacebar to End is ON, click with the left mouse button to define consecutive points along the first surface. The first surface tracing is complete when you tap the spacebar.

- c. Trace the second surface.

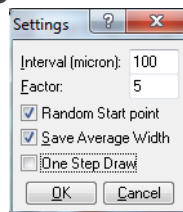
If Spacebar to End is OFF, continuously hold down the left mouse button as you trace the second surface. The tracing is complete as soon as you release the left mouse button and the cursor immediately exits the Image window.

If Spacebar to End is ON, click with the left mouse button to define consecutive points along the second surface. The second surface tracing is complete when you right click to exit the Image window.

- d. If satisfied, the click the Measure button to record the dLS measurements.

Note: To return the interface to the previous Draw 1 and Draw 2 buttons, on the dLS Type, click the Settings button and uncheck “One Step Draw.” This scenario is most often used if there are more than two labels. Draw 2 can be used multiple times to define second and third labels using the original Draw 1 tracing.

Figure –Settings



Uncheck One Step Draw.

Batch Measurement Enhancements

Batch Measurement has several enhancements in this version.

Topic Contents

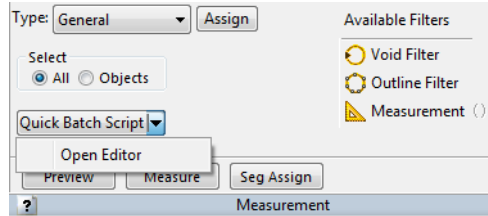
- Measurement Region: Batch Script Enhancements (page 10)
- Batch Measurement Editor Enhancements (page 11)

Measurement Region: Batch Script Enhancements

The Measurement region, General Type, has the following Batch Measurement enhancements.

- A new Quick Batch Script button/arrow combo has been added to the General Type.

Figure –General Type: Quick Batch Script



Click the arrow to open a list.
Click the button to run the Quick Batch Script.

- If you click the Quick Batch Script button directly, BIOQUANT immediately runs the batch script assigned as the Quick Batch Script.
- If you click the Quick Batch Script arrow, a drop list opens with the “Open Editor” option. If you choose the Open Editor open, the Batch Measurement Editor box opens.

Batch Measurement Editor Enhancements

The Batch Measurement Editor box has the following enhancements.

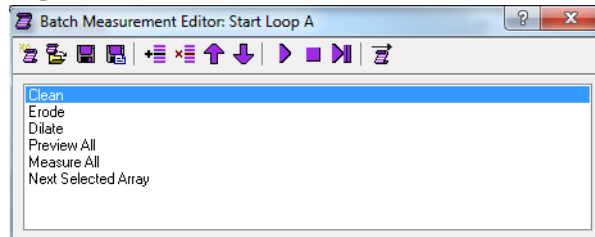
Topic Contents

- New Batch Script Steps (page 12)
- Assign to Quick Batch Script (page 12)

New Batch Script Steps

The following steps can now be added to a Batch Script:

Figure –Batch Measurement Editor



- Editing: Threshold: Clean
- Editing: Threshold: Keep Objects
- Editing: Threshold: Draw Threshold
- Editing: Threshold: Erase Threshold
- Navigation: Load Next Dicom Image

Available with the BIOQUANT Imaging Extensions add-on.

Note: Measure Field has been removed as a batch script option.

Assign to Quick Batch Script

The current Batch Script can be assigned as the Quick Batch Script that is associated with the Quick Batch Script button in the Measurement region (General Type).

Procedure Snippet

- a. On the Batch Measurement Editor box, open the Batch Script that is to be assigned to the Quick Batch Script button.

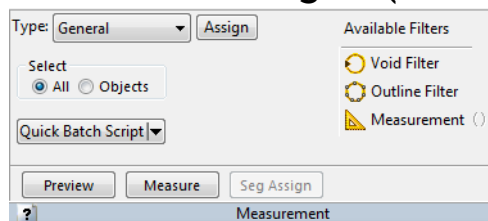
NOTE: If you have just created a new batch script, save it to a Batch Script file before assigning it.

- b. On the Batch Measurement Editor, click the  Assign to Quick Batch Script button.

The Batch Measurement Editor box title bar now has the Batch Script name with “>>> Quick Batch” appended.

- c. Now in the Measurement region (General Type), click the Quick Batch Script button to run the batch script.

Figure —Measurement region (General Type)



Click the Quick Batch Script button to run the script.

QImaging Enhancements

The QImaging Camera has several enhancements.

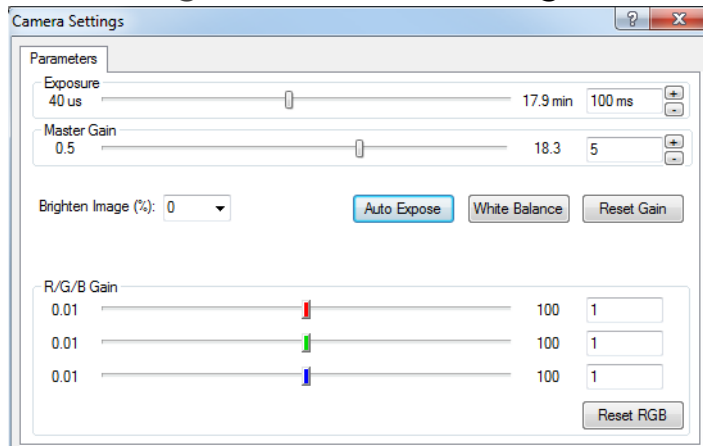
Topic Contents

- Camera Settings: R/G/B Gain (page 14)
- QImaging EXi Aqua Camera Support (page 15)

Camera Settings: R/G/B Gain

Using the new R/G/B Gain controls, the brightness of different fluorescent labels can be adjusted in the image. This makes measuring interlabel width easier with multiple fluorochromes like calcein and alizarin red labeling since red labels often appear dimmer than green labels.

Figure –Camera Settings



To optimize an image of multi-channel fluorescence, we suggest:

1. Turn the output of your excitation source to maximum.
2. Set the exposure time of the camera to 100ms (milliseconds).
3. Set the master gain to 5.
4. Set the individual color gains, red, green, and blue, to 1. Generally speaking labels which emit green light are very bright and it's not necessary to raise the green gain above 1.
5. If the green labels are too strong, turn down the strength of the excitation source. Many fluorescent lamps have a dial to attenuate the strength of the light and help preserve the sample.

6. Raise the gain levels for red and blue to balance those labels with the green labels.
7. Close the Camera Settings box and proceed as before.

QImaging EXi Aqua Camera Support

BIOQUANT now has QImaging EXi Aqua camera support. The EXi Aqua provide regulated cooling to 0 degrees Celsius and a 14-bit dynamic range.

Image Region / Image Menu Enhancements

The following enhancements have been made to items on the Image region and Image menu.

Topic Contents

- Image region (Image File Type): Open Single / Open Sequence Changes (page 16)
- Image region (Image File Type): Save Image Changes (page 16)
- Image region (Live Image Type): Background Enhancements (page 16)
- Image menu: Background Box Enhancements (page 18)

Image region (Image File Type): Open Single / Open Sequence Changes

- PNG files are now supported and have been added to the File Type list.
- Imaging Extensions add-on: The DCM format is now in the File Type list.

DCM is the Dicom image format.

To load a single DCM image, use Open Single.

To load a series of DCM images, use Open Sequence.

If you are loaded a series of DCM images, the image sizes must be 1280x960 or smaller to load into the MicroCT Navigator.

Otherwise, the first image in the series will load into the Large Image Navigator.

- The TGA image format is no longer supported and has been removed from the File Type list.

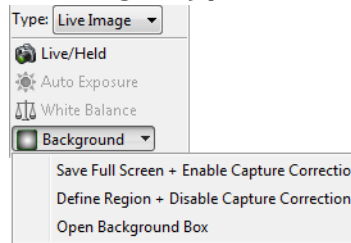
Image region (Image File Type): Save Image Changes

- The TGA image format is no longer supported and has been removed from the File Type list.

Image region (Live Image Type): Background Enhancements

The Background feature on the Image region (Live Image Type) has been enhanced. The Background Correct button has been renamed Background and is now a drop list that contains the following:

Figure –Live Image Type: Background list



Click Background to open a list.

- **Save Full Field + Enable Capture Correction**

Saves the current Image window as a background reference image. Also enables capture correction. Afterward, whenever Live/Held is clicked, the image will be corrected using the Background reference image before it is placed in the Image window.

This feature is used to correct the captured image for uneven lighting. It is also required for accurate Average Density measurements.

- **Define Region + Disable Capture Correction**

Puts the cursor into the Image window so that the user can define a background sample region. Also disables capture correction.

The feature is used to save a background reference image when working with densitometry on images from another source.

This feature is required for Integrated Optical Density.

- **Background Box**

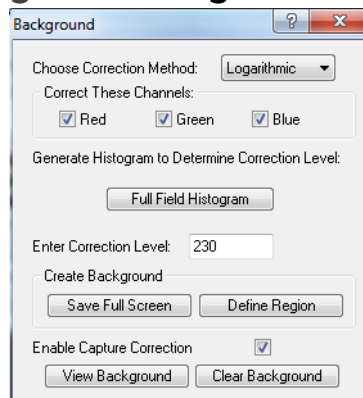
Opens the Background box. The Background box contains the settings for the Save Full Field and Define Region Background features.

Image menu: Background Box Enhancements

The Background box can be opened by choosing Background from the Image menu. Alternatively, it can be opened by going to the Image region (Live Image Type) and choosing Open Background Box from the Background list.

The Background box has the following enhancements.

Figure –Background box



- Several items have been renamed.
 - “Choose Correction Source” has been renamed “Create Background.”
 - “Save Full Field” has been renamed “Save Full Screen.”
 - “Build Partial Field” has been renamed “Define Region.”
 - “Background Correct Image?” has been renamed “Enable Capture Correction.”
- The Correction Level has been defaulted to 230 and is now remembered across BIOQUANT sessions if changed.

General Enhancements and Issue Resolutions

The following general enhancements and issue resolutions to the BIOQUANT OSTEO core software have been made.

- **Number of Data Sets Limit:** An error message has been added if the user tries to add more than 1000 data sets to a data volume.
- **Calculations box: Update button:** The Update button now works if the user has modified the data set using Modify Data Set.
- **The OSTEO Template Volume::Bone Basic Template has changed.**
The equation for P2 BV/TV has changed.
New equation: $P2/P1*100;\%$ where P2 is BV and P1 is TV.
Previous equation: $P1/P2*100;\%$ where P1 is TV and P2 is BV.
- **General interface improvements** have been made, specifically dialog box sizes have been standardized.

BIOQUANT Imaging Extensions Add-on Enhancements

The BIOQUANT Imaging Extension add-on contains the Imaging Toolkit, MicroCT Navigator, and Stereology Tools.

Topic Contents

- Image Size Enhancements (page 19)
- Dicom Image Support / MicroCT Navigator (page 20)
- Imaging Toolkit Enhancements (page 30)
- Stereology for Bone (page 31)

Image Size Enhancements

The BIOQUANT Imaging Extensions have special algorithms that allow the user to open BIF or BMP images up to 4 GB in size.

In BIOQUANT OSTEO, BMP, TIF, JPG, and PNG images can be opened up to around 1 GB, depending on system resources. BIF images up to 4 GB can be opened.

Dicom Image Support / MicroCT Navigator

BIOQUANT now supports the dicom image format. Single images, such as X-rays, can be opened into the Large Image Navigator. Series of images, such as a MicroCT image set, can be loaded into the MicroCT Navigator.

- New MicroCT support files:
 - A new MicroCT Template has been added to the OSTEO Template Volume.
 - Sample Images can be found in Sample Images\DICOM 2-D X-ray and in Sample Images\DICOM microCT.
 - A guide that walks you through a simple MicroCT protocol can be found in the Guides region by clicking the Open button and choosing Measure - MicroCT.
- Dicom single images, such as X-rays, are opened using Open Single in the Image region (Image File Type).

NOTE: If the Dicom image is larger than 1280x960, it will open in the Large image Navigator.

- Dicom series of images, such as an image set from a MicroCT, are opened using Open Sequence in the Image region (Image File Type).

To open the Dicom image set, in Open Image Sequence, click the first file name in the set, then click Open.

The Dicom series of images is loaded into the MicroCT Navigator.

NOTE: The MicroCT Navigator can current load series of images with up to 1280x960 resolution. If you try to load an image series with resolution larger than 1280x960, the first image will open in the Large Image Navigator.

- The MicroCT Navigator has the following features:

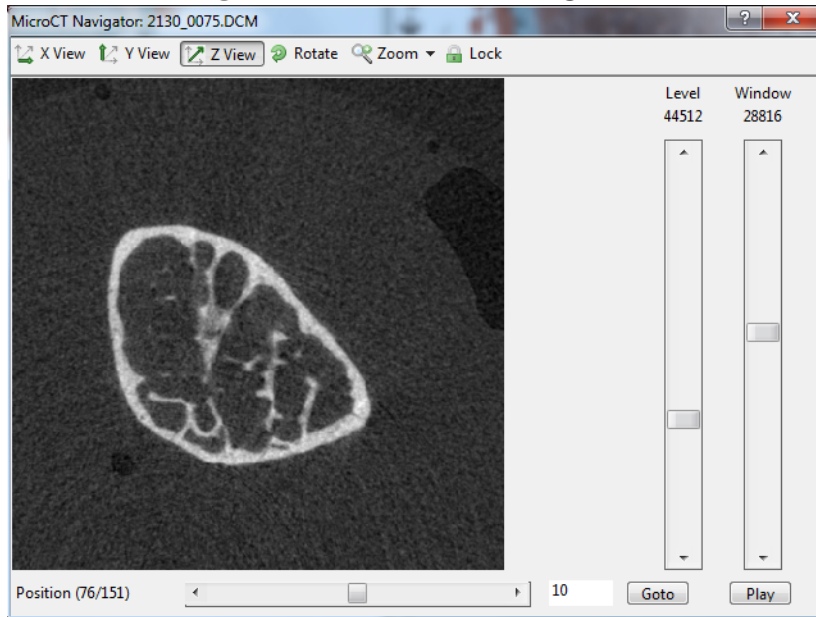
The MicroCT Navigator allows the BIOQUANT system to view and analyze trabecular and cortical structure from MicroCT data exported as serial 2D Dicom files. Dicom is a cross-vendor format used by many microCT manufacturers for compatibility with other software systems. Calibration data, when available, will be read from the DICOM file and the Parameters region will display "Dicom" for the magnification. Also, the Z position of tracings will be stored in the measurement tracing topography.

The MicroCT Navigator is used to sequence through a Dicom series of images generated by a MicroCT. The X view, Y view, and

Z view of the image stack can be rotated. Level and Window adjustments can be made at any view.

When the user has positioned the image stack at the desired location, the settings can be locked and the image moved to the Image window for measurement.

Figure –MicroCT Navigator



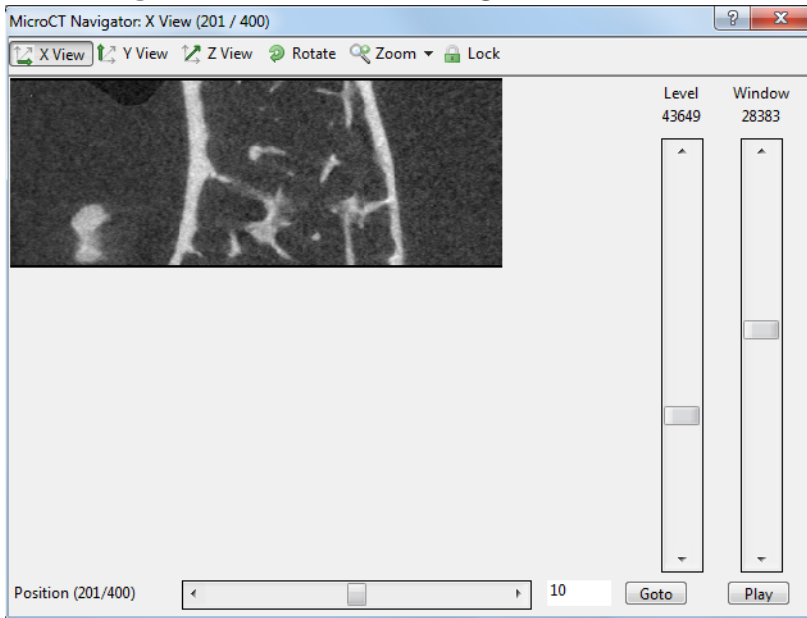
- X View

View the microCT volume from along the X axis, perpendicular to the Y and Z view. The anatomical orientation of the sample

in X View will depend on the orientation of the sample when it was scanned.

This view requires BIOQUANT to recalculate the image planes so performance may be slower.

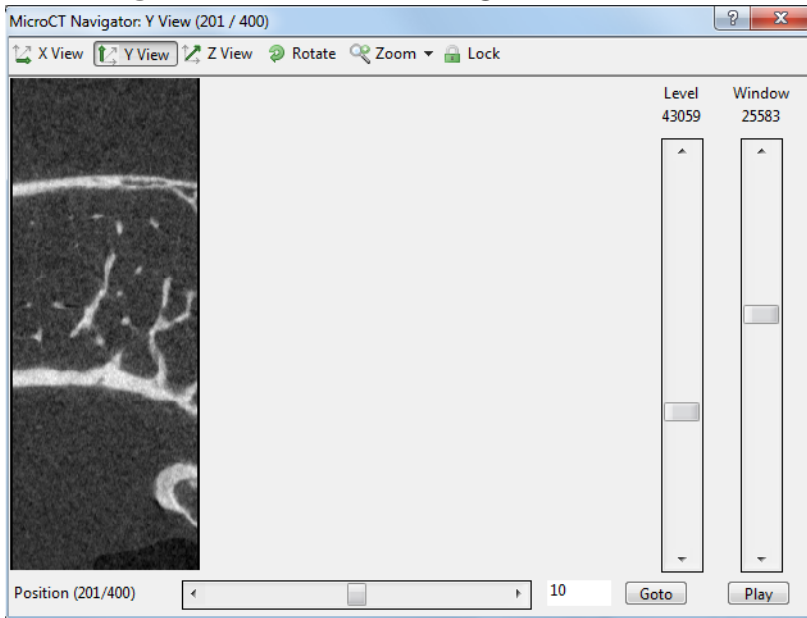
Figure –MicroCT Navigator - X View



- Y View

View the microCT volume along the Y axis, perpendicular to the X and Z view. This view requires BIOQUANT to recalculate the image planes so performance may be slower.

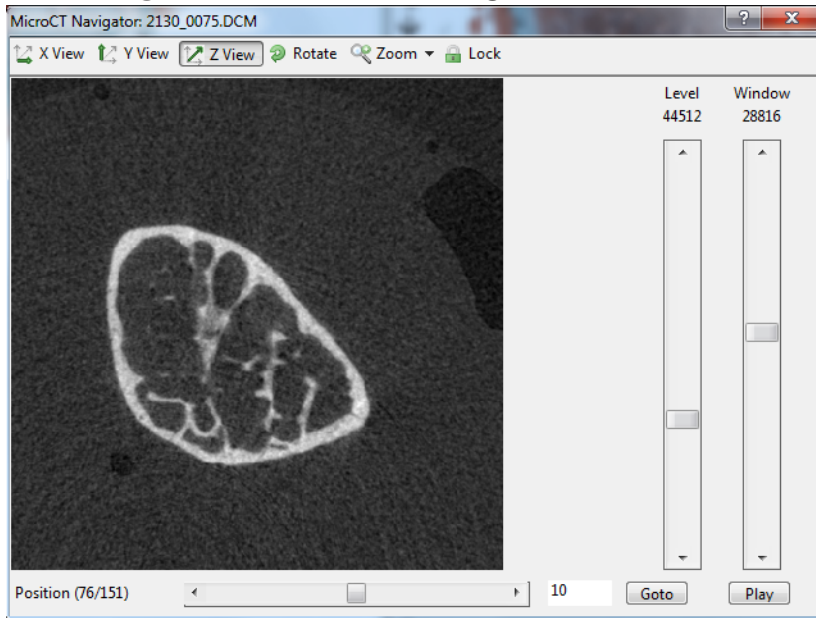
Figure –MicroCT Navigator - Y View



- Z View

View the microCT volume along the Z axis. This is the native plane of section of the images and offers the fastest performance.

Figure –MicroCT Navigator - Z View



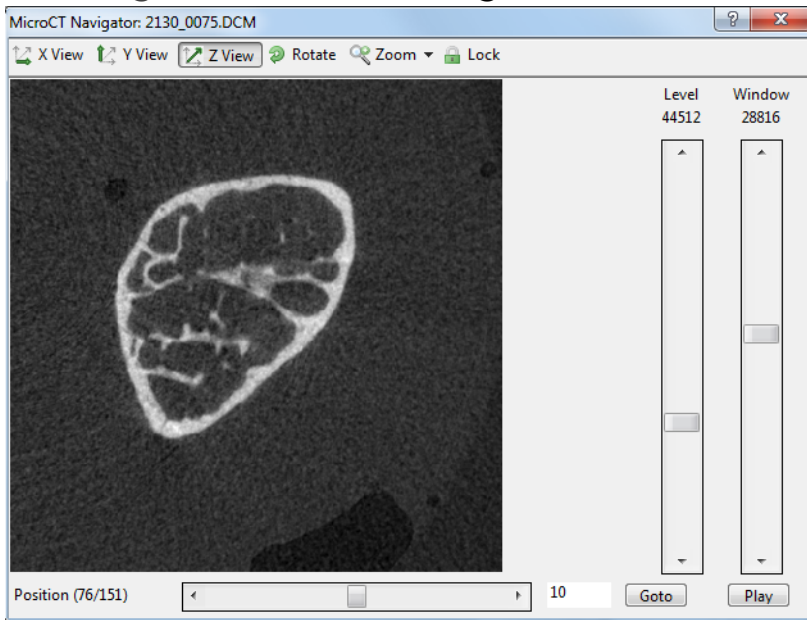
- Rotate

Turn the image clockwise in 90 degree increments.

If in Z View, the image will remain rotated as you sequence through image positions in the series.

In X View or Y View, the image will revert to the original rotation when you sequence to a different image position.

Figure –MicroCT Navigator - Rotate

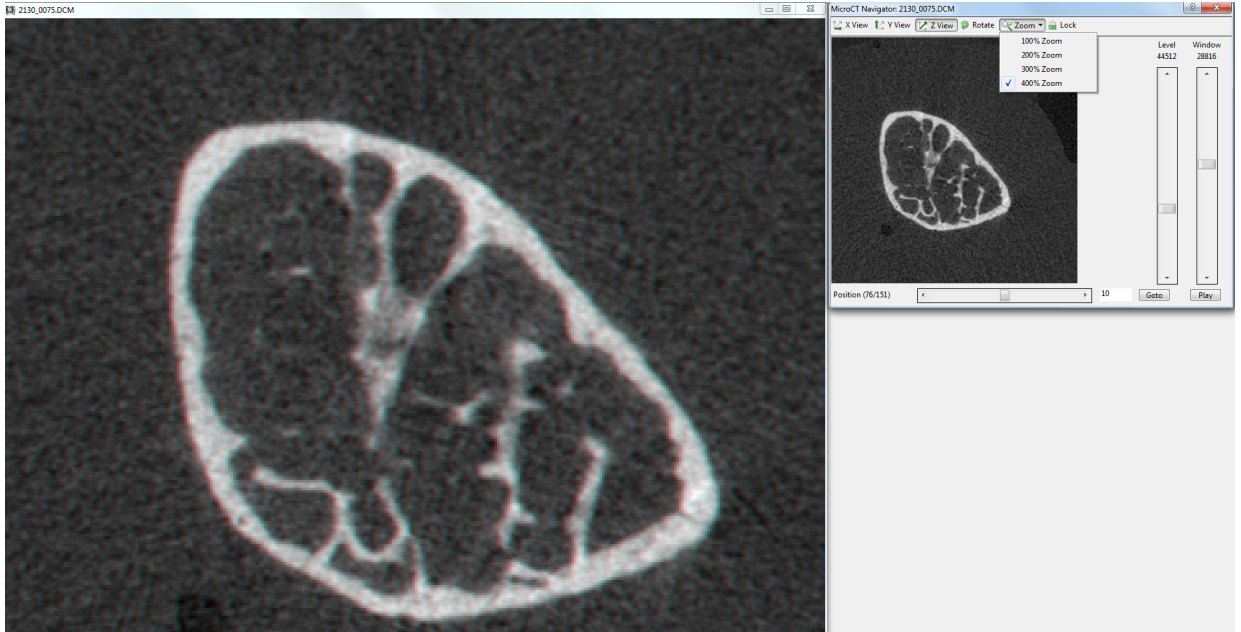


- Zoom

Increase the size of the image sent to the Image window by 200%, 300%, or 400%. The maximum size of the image in the

Image window is 1280x960. For zoom levels larger than 1280x960, the image is cropped equally from all edges.

Figure –MicroCT Navigator - Zoom

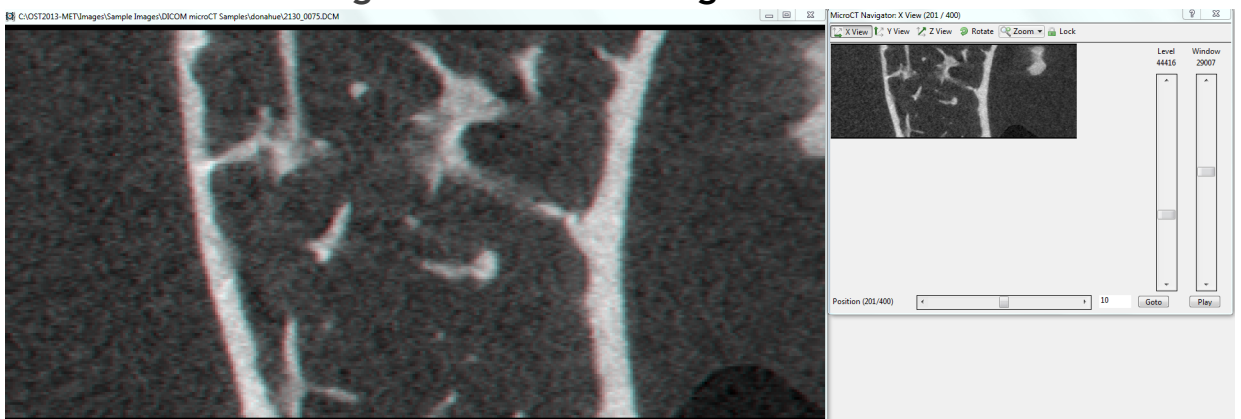


- Lock

Send the current image in the MicroCT Navigator to the Image window.

If the Dicom file header contained calibration information, in the Parameters region, the Mag will say “Dicom” after you lock the image on the MicroCT Navigator.

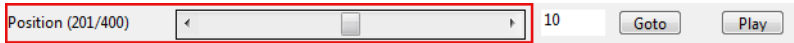
Figure –MicroCT Navigator - Zoom



- **Position Slider**

Quickly move through the volume. Click on either side of the moving box to jump 10 images forward or backward. Click the left or right arrow buttons to move one image at a time. Click and drag the slider to move to a specific position.

Figure –MicroCT Navigator - Position Slider



- **Goto**

Type in a specific image number then click the Goto button to jump to a specific image.

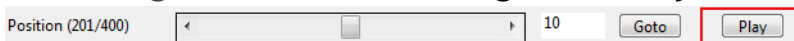
Figure –MicroCT Navigator - Goto



- **Play/Pause**

Click Play to move sequentially through the sample along the selected axis. Click Pause to stop. When the end of the sample is reached, play is continued in the reverse order.

Figure –MicroCT Navigator - Play

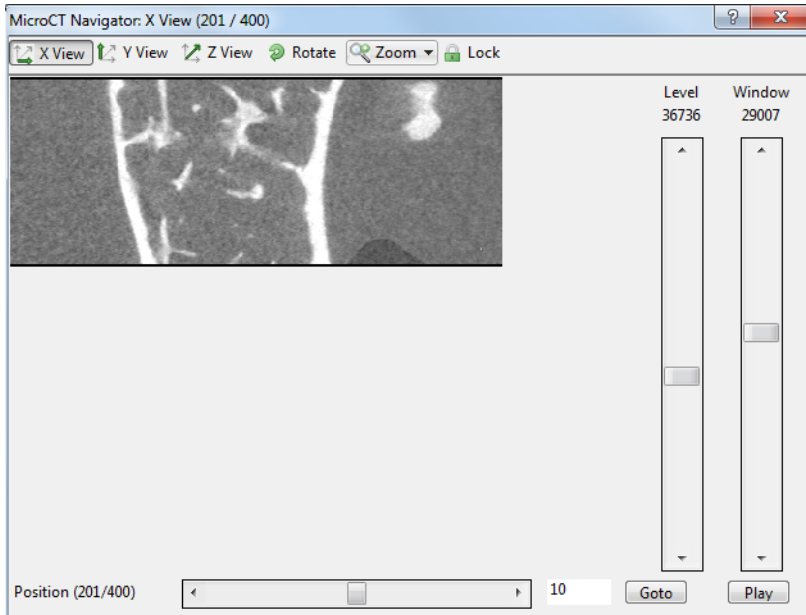


- **Level**

The level slider temporarily adjusts the brightness of an image in the microCT volume. The optimal level value is read from the

Dicom header or calculated if the header does not contain a level value. Moving to the next image will reset the level value.

Figure –MicroCT Navigator - Level

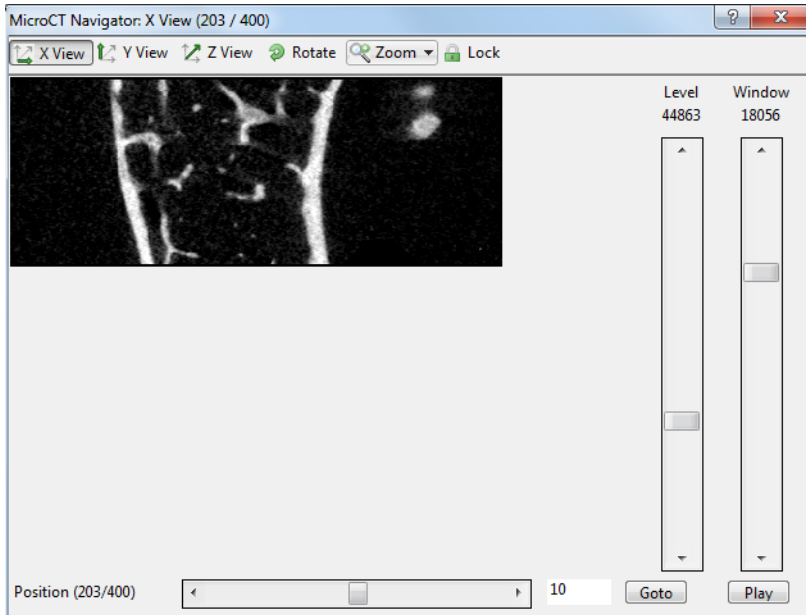


- **Window**

The window slider temporarily adjusts the contrast of an image in the microCT volume. The optimal window value is read from the Dicom header or calculated if the header does

not contain a window value. Moving to the next image will reset the window value.

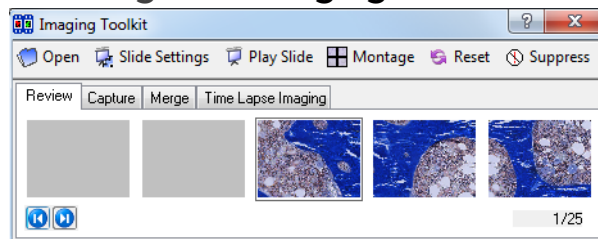
Figure –MicroCT Navigator - Window



Imaging Toolkit Enhancements

The Imaging Toolkit box has the following enhancements:

Figure –Imaging Toolkit

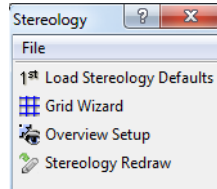


- The interface has been improved. Buttons have been given text labels and the number of thumbnails visible has increased from three to five.
- The thumbnails generated from large unsaved montages are no longer scrambled.

Stereology for Bone

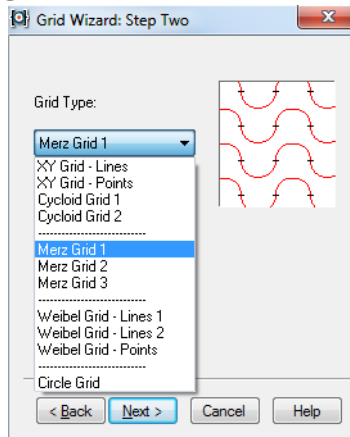
The Stereology Tools have been modified for use with bone and added to the BIOQUANT Imaging Extensions add-on.

Figure –Stereology Box



- A new OSTEO Template Volume::Bone Stereology Protocol Template, plus supporting Selected List, Calculations List, Sample Image and Guide. See the Stereology Tools protocol in the BIOQUANT OSTEO Manual.
- A new OSTEO Template Volume::Bone Stereology Initial Template for users that would like to create their own stereology protocol.
- Grids Wizard generates various grids in various sizes. Available grids include:

Figure –Grid Wizard Box



XY Grid - Lines

XY Grid - Points

Cycloid Grid 1

Cycloid Grid 2

Merz Grid 1

Merz Grid 2

Merz Grid 3

Weibel Grid - Lines 1

Weibel Grid - Lines 2

Weibel Grid - Points

Circle Grid

- The following Stereology features from Life Science are not currently available for OSTEO: Optical Fractionator Project features, Discetor Setup, Rotator/Nucleator Probe, Sine-weighted Lines Probe.

BIOQUANT SCAN Add-on Enhancements

BIOQUANT SCAN includes support for multi-slide high resolution image scanning. It supports either the user's microscope with Scanning Upgrades or the OSTEOIMAGER scanning microscope.

Topic Contents

- SCAN Enhancements (page 33)
- OSTEOIMAGER Enhancements (page 42)

SCAN Enhancements

The BIOQUANT SCAN program has been enhanced in many ways. For an updated Scan Multiple Slides or Scan Well Plate protocol, see the BIOQUANT OSTEO Manual.

Scan Multiple Slides / Scan Well Plate Box

Figure —Scan Multiple Slides Box

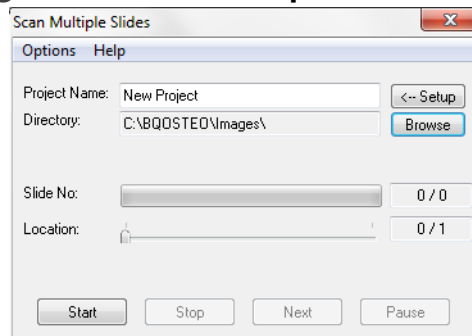
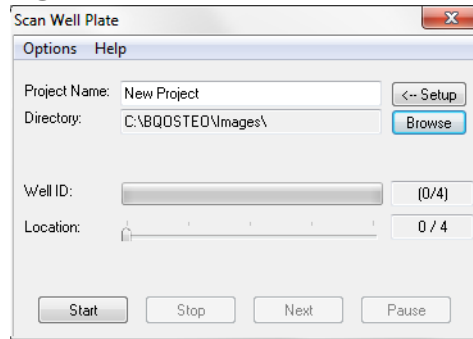


Figure –Scan Well Plate Box

- The Create Montage After Image Capture checkbox has been removed. This feature is now on the new Options menu. From Options choose Montage After Capture. This feature is checked by default.

Uncheck this option only if you are making very large montages and you want to eliminate the time it takes to generate the large montage before capturing the next montage.

If this option is unchecked, use the Imaging Toolkit in the core BIOQUANT OSTEO system or the BIOQUANT OSTEO Satellite system to load the image series and then create the montage.

- Buttons have been renamed:

Start Grab is now Start.

Stop Grab is now Stop.

Grab Next is now Next.

- The File menu and Tools menu have been removed.

The File menu had one menu item, Exit. Use the close button in the upper right corner of the box to close the box.

The Tools menu had one menu item, Create Montage. Use the Imaging Toolkit to create the montage if Montage After Capture is not on.

- The Scan Multiple Slides box and Scan Well Plate Box will be closed if a BIF image is loaded or if the Topo>Stage option is turned off.

Scan Multiple Slides / Scan Well Plate Setup Box

Figure –Scan Multiple Slides Setup Box

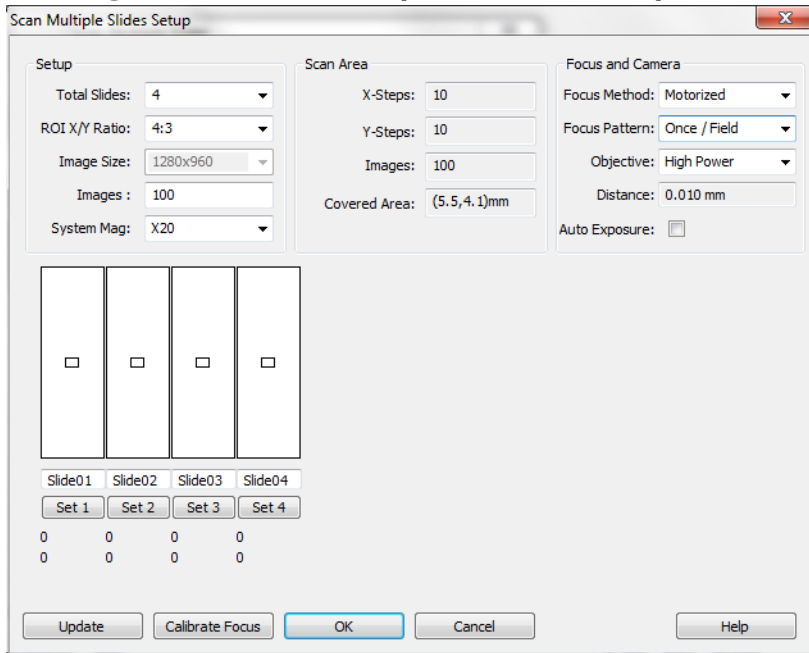
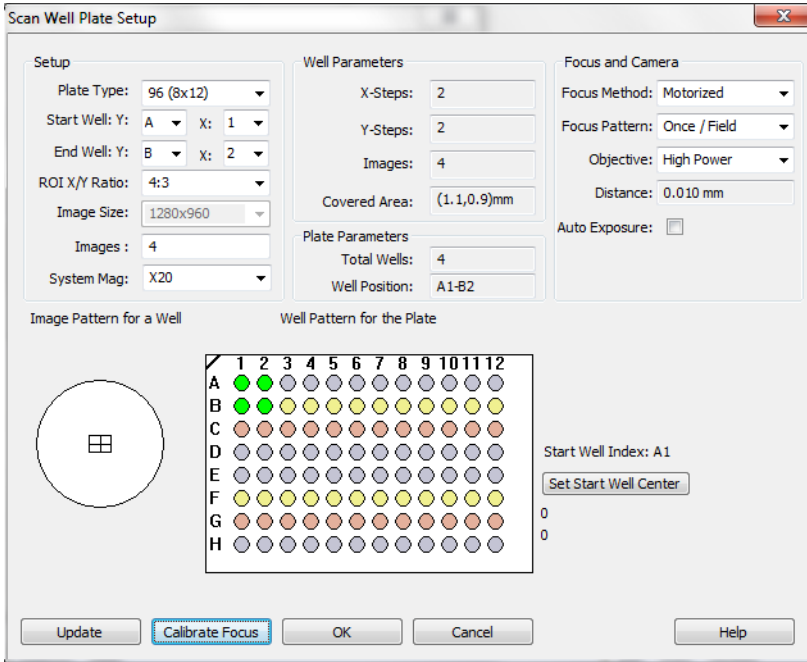


Figure –Scan Well Plate Setup Box



- New Focus and Camera region:

There is a new Focus and Camera region on both the Scan Multiple Slides Setup and Scan Well Plate Setup boxes. This region offers enhanced options for choosing auto focus patterns and allowing the user to manually focus on field based on a focus pattern. It also activates the Auto Exposure box.

This region replaces the Auto Focus and Pre Focus check boxes from the previous version.

Focus Method

Choose from the following:

- Motorized

Use the motorized auto focus attached to the microscope or OSTEOIMAGER scanning microscope. The Auto Focus hardware module is required for this option.

- **Manual**

The user will manually focus the microscope whenever it stops. Stop locations are based on the Focus Pattern (see below). This is a good choice if you have an XY motorized stage without the Auto Focus module.

- **None**

No focus method will be used. This is a good choice if your specimen is flat and really doesn't need focus. This option makes image capture faster than choosing Motorized or Manual

Focus Pattern

Choose from the following:

- **Once/Field**

Motorized: Perform auto focus on every field captured.

Manual: Stop once per field and wait for the user to focus. When the user clicks the Next button, continue with capture.

None: Focus Pattern is grayed out.

- **Once / 2 Fields**

Motorized: Perform auto focus every other field captured.

Manual: Stop on every other field and wait for the user to focus. When the user clicks the Next button, continue with capture.

None: Focus Pattern is grayed out.

- **Once / 3 Fields:**

Motorized: Perform auto focus every third field captured.

Manual: Stop on every third field and wait for the user to focus. When the user clicks the Next button, continue with capture.

None: Focus Pattern is grayed out.

- **Once / Slide or Once / Well**

Motorized: Perform auto focus once per slide/well.

Manual: Stop once per slide/well and wait for the user to focus. When the user clicks the Next button, continue with capturing the entire slide/well.

None: Focus Pattern is grayed out.

Objective

Objective is used to set the search range for auto focus. On a high power lens, the auto focus uses a faster, shorter z axis search range because the depth of field is short. On a low power lens, the auto focus uses a longer, slower z axis search range because the depth of field is deeper.

This option is ignored if the Focus Method is Manual or None.

Choose from the following:

- **High Power**

Choose this option if you are capturing images using a high powered objective with N.A. of 0.2 or higher. Often this means the condenser cap is in.

- **Low Power**

Choose this option if you are capturing images using a low powered objective with N.A. of 0.1 or lower. Often this means the condenser cap is out.

Distance

Distance displays the size of the search range for the auto focus. This value changes based on the Objective designated above.

Auto Exposure

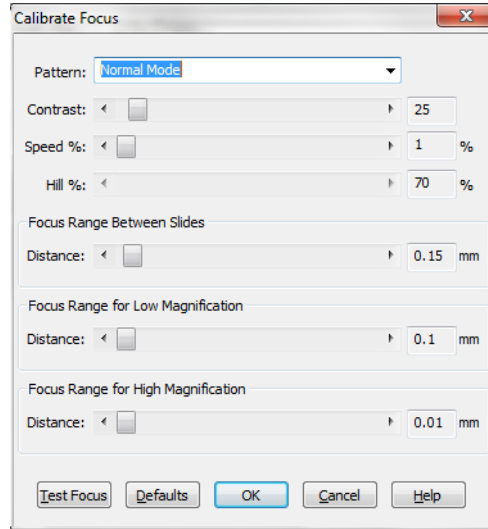
- To perform an Auto Exposure every time an image is captured, check the Auto Exposure box.

This option defaults to OFF. Auto Exposure will change the lighting across the montage. If it is OFF, the lighting will be more consistent in the montage.

This option might be turned ON if there is a large hole in the middle of the section would be overexposed without Auto Exposure.

- The Auto Focus Setup button has been renamed Calibrate Focus.
- The Calibrate Focus box has been enhanced:

Figure –Calibrate Focus Box



Pattern

Normal Mode: Use for everything except deep, thick cell cultures.

Hill Detect: Use for deep, thick cell cultures. It will focus on the top layer of cells.

Contrast

This value controls how sensitive the auto focus is to changes in the focus of the sample. The lower the value, the more sensitive the auto focus is and the higher the chance of a false positive due to dust or other debris. The higher the value, the more tolerant the auto focus is of minor changes in the image focus and the more likely the system is to leave the Z position unchanged. The default value is 25. Useful ranges are between 10 and 200.

Speed %

This value controls the speed of the Z axis while searching for optimal focus. The default is 1%, which is the slowest, most precise setting.

Hill

This value controls the sensitivity of the hill detect mode. Lower values make the algorithm more sensitive to individual cells on the surface of the culture. Higher values allow the algorithm to ignore individual cells and find the larger culture surface. The default is 70%.

Focus Range

Between Slides Distance: This value controls how far the auto focus will search when changing slides in order to find the next slide. If the system can not find the next slide when switching slides increase this value. The useful range for this value is between 100 and 500 microns. The default value is 150 microns.

For Low Magnification Distance: This value controls how far the auto focus will search when moving between adjacent fields on the same section if Objective is set to Low Power on the Setup dialog box. The default value is 100 microns.

For High Magnification Distance: This value controls how far the auto focus will search when moving between adjacent fields on the same section if Objective is set to High Power on the Setup dialog box. The default value is 10 microns.

OSTEOIMAGER Enhancements

- Software control over the bright field light source has been added.
From the Scan menu, choose either:
 - Turn Light On
 - Turn Light Off
- Software control over the objective lens selection has been added.
From the Scan menu, choose either:
 - Move to Next Objective
 - Move to Previous Objective

BIOQUANT Topographer Add-on Enhancement

- When you go to Topographer with Save Topo Array checked, when you return it is still checked.