

**American Board of Orthodontics (ABO)
Model Conversion Utility User Guide**

Updated 7/26/2017

Authorized Users

All orthodontists who have made application for ABO examination will be authorized to register and activate this software using the ABO ID# and email address on record.

Orthodontic departments and digital model providers who wish to become authorized must make a request by email to Clinical@AmericanBoardOrtho.com .

Orthodontic Departments should include the following in the body of your email:

- School Name
- School Address
- Name of your digital model product
- Head of Department must make the request and include telephone and email
- Designated individual who will initially operate the ABO Utility (may be a resident); include telephone and the email address to be used in activation of the Utility

Digital model providers should include the following in the body of your email:

- Company Name
- Company Address
- Name of your digital model product
- Head of Software Development for digital models, including telephone and email
- Designated individual who will test your product by using the ABO Utility; include telephone and the email address to be used in activation of the Utility

System Requirements

Minimum:

Windows XP (SP3) or Vista, 32-bit
Pentium 4 (1GB RAM w/XP or 2GB RAM w/Vista)
NVidia GeForce GTS 250 – 3D Graphics Card
10 GB free hard drive space

Recommended:

Windows 7 Pro 64-bit; Intel Core 2 Duo (2GB RAM);
nVidia GeForce GTX 650Ti 1GB; 80GB hard drive

Not Recommended:

ATI Graphics Card or Intel Graphics Card

Install, Registration and Activation

1. If you are in a secured environment, you may need to contact your system administrator for rights to download and install.
2. Click the hyperlink for **ABO Model Conversion Utility (exe)** from the ABO website.
3. If a File Download dialog box appears, select **RUN**; otherwise, the Installer will be saved to a location on your computer.
4. If User Account Control asks permission to make changes to this computer, reply **YES** or **OK**.
5. Run the Installer's **Setup Expert** and follow the instructions. Store the Utility at C: Program Files or a location of your choice. A shortcut for the Utility will appear on your desktop.



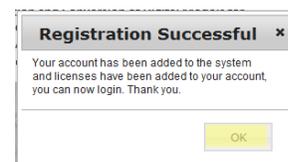
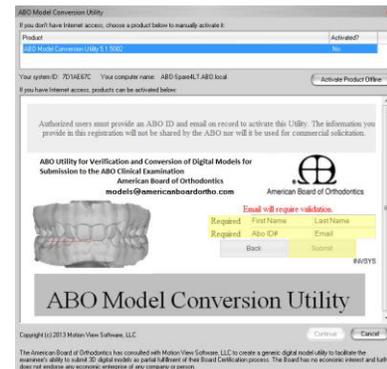
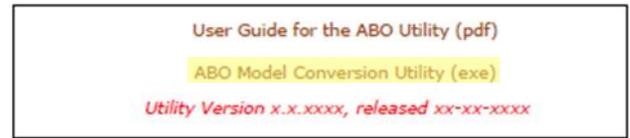
If you have successfully registered a previous version of the Utility, go to [Multiple Installations of the ABO Utility](#).

6. You should be connected to the Internet on your first launch of the Utility. A registration window appears.
 - Select **REGISTER ACCOUNT**,
 - Enter your **First and Last Name**, 5-character **ABO ID#** and the **Email** address on record with the ABO.
 - Click **SUBMIT**.
7. An automated system will send an activation password to the email address provided.
8. Collect the **Password** from your email account. Enter it here and click **VALIDATE PASSWORD**.

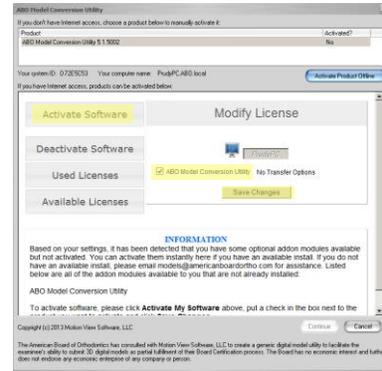
This same password will be used for multiple installations.

9. Your registration will be confirmed as successful. Click **OK**.

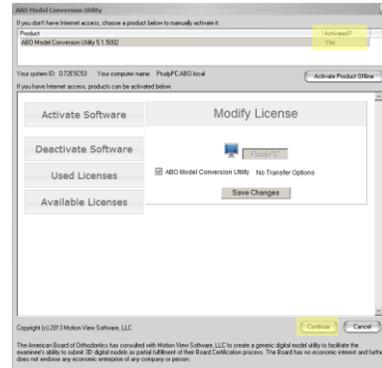
Thumbnail images are provided to verify you are at the correct window of the Utility. Images are not needed to understand the instructions. Please follow each instruction exactly.



- In the Activate Software window, place a **checkmark** at ABO Model Conversion Utility. Click **SAVE CHANGES**.

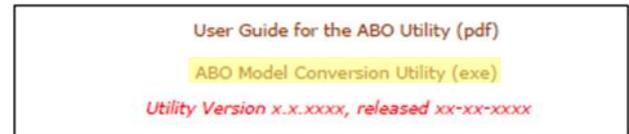


- The activation window will report **Yes** for Activated. You may click **CONTINUE** if you are ready to use the Utility.

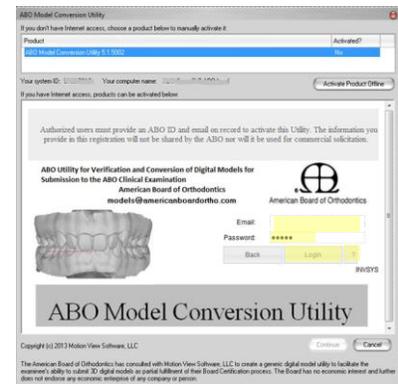
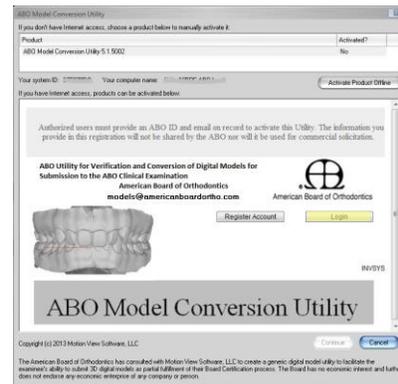


Multiple Installations of the ABO Utility

- Candidates for certification will be authorized for a maximum of four installations. Download and install the latest version of the **Utility** from the ABO website using previous instructions.
- Launch the Utility while under an Internet connection. Click **LOGIN** at the activation window.



- Enter the same **Email** address used for initial registration and the activation **Password** you received.
 - If your password is unknown, click the **?** and submit your email address for a response.
 Click **LOGIN** again.



- You will activate the new installation using previous instructions.

Import and Export a Digital Model

1. Imported model/s must be a file format of PLY, STL or OBJ.
2. Click **NEW**.
3. Enter a **first name identifier** and **last name identifier** of your choice for your patient. This name is not transmitted to the ABO. Click **IMPORT**.
4. Navigate and **select a digital model** belonging to your patient. Click **IMPORT**.

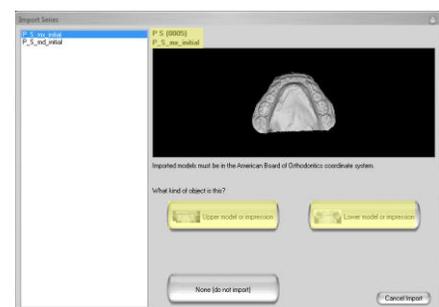
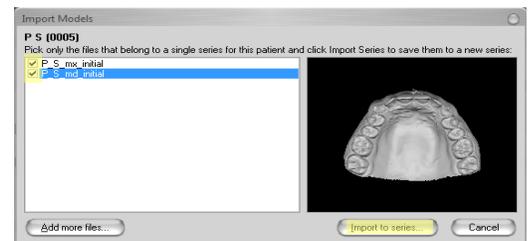
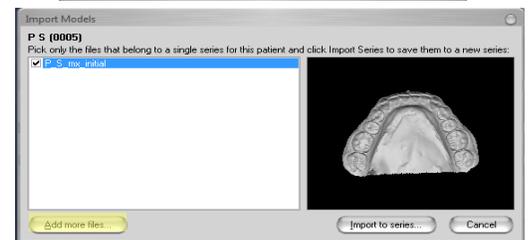
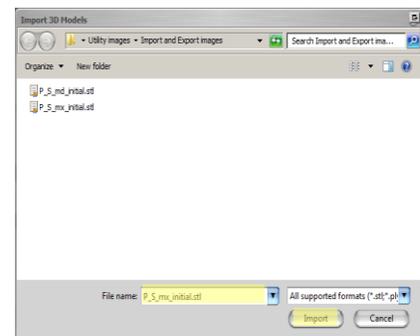
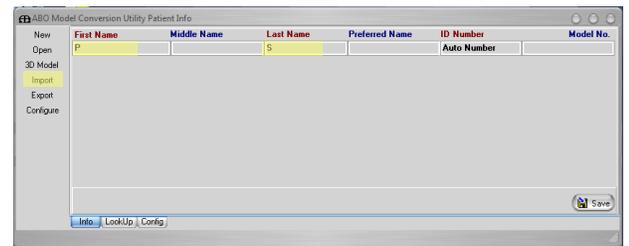
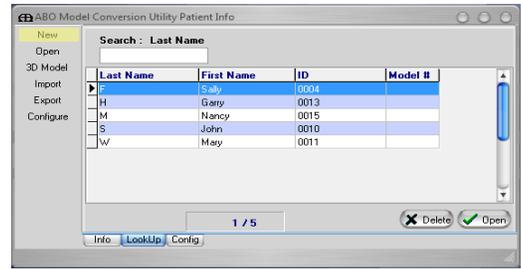
If the digital model is not acceptable, take note of the exact error message and follow this link to [Unsuccessful Import](#).

5. If there is more than one file to import (i.e. MX and MD for one timepoint):

- Click **ADD MORE FILES**.
- Navigate to next file for the patient and click **IMPORT**.
- Place a **checkmark** by the MX and MD model/s for a single timepoint. Click **IMPORT TO SERIES**.

If no single item in the list represents a complete MX or MD model, follow this link to [Unsuccessful Import](#).

- Identify each model on display by clicking the button **UPPER MODEL...** or **LOWER MODEL...** while the model is displayed with its **filename** above. Each unidentified model displays itself automatically.



- Name the series with an identifier of your choice that describes the patient and the timepoint. Click **SAVE**.

If the import was unsuccessful, take note of the exact error message and follow this link to [Unsuccessful Import](#).

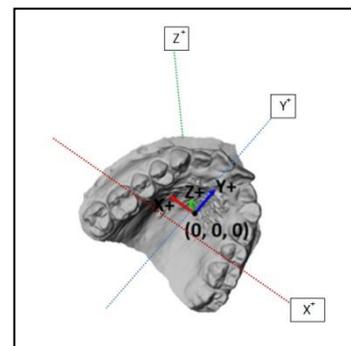
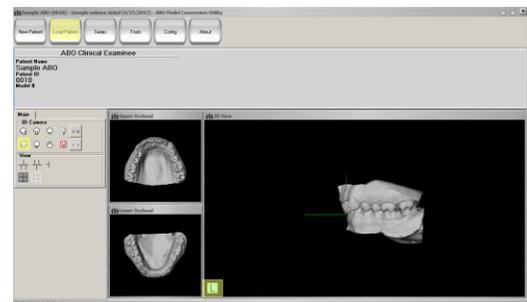
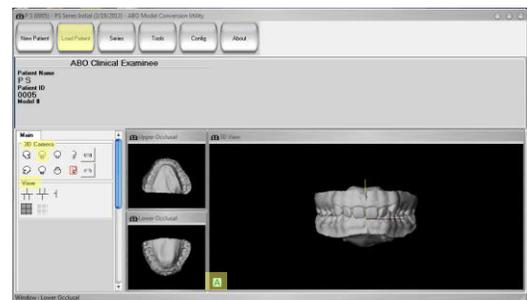
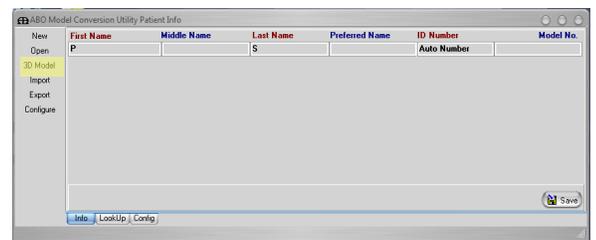
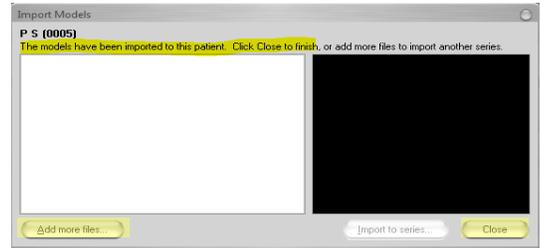
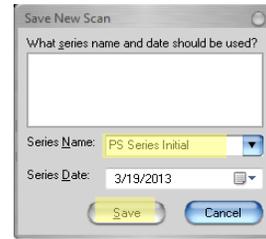
- A message under the model name will tell you that **the models have been imported to this patient**.
- If there are progress models for this patient, select **Add more files..**, go back to Step #5 and repeat these steps.
- Click **CLOSE**.

6. Click **3D MODEL**.

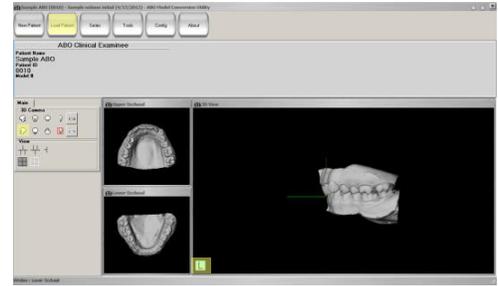
7. Verify that your model is oriented correctly and conforms to ABO specifications.

- Use the **3D Camera** and **View** buttons in the left panel to provide different views.
 - Without rotating the model, make sure each view matches the button label (hover over button).
 - Half-view buttons are toggled off to return to full view.
- Rotate the model by click and drag with the mouse.
- Use the scroll wheel to zoom the image and the mesh.
- Pan the model by dragging with the middle mouse button or holding down the scroll wheel then drag.
- Double-click the model to bring it back to initial size and orientation.
- Verify correct orientation of the model by using the **Cube** at lower left of the main 3D view. View of the model should match face of the cube:
 - Anterior, Posterior, Superior, Inferior, Right, Left**
- The intersection of the 3 lines in the main 3D view corresponds to the origin of the model.
 - The lines from posterior to anterior and from left to right must lie on the occlusal plane.
 - The lines from posterior to anterior and from inferior to superior must lie on the mid-sagittal plane.
 - The intersection of the lines must lie approximately half-way between the posterior and anterior ends of the model.
 - If you are unable to locate these lines at all, the origin is nowhere close and its location is not ABO compliant.

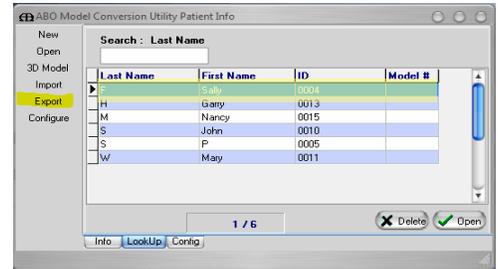
If your model is not compliant with ABO specifications and you decide not to proceed with an export, exit the Utility.



8. Click **LOAD PATIENT**.

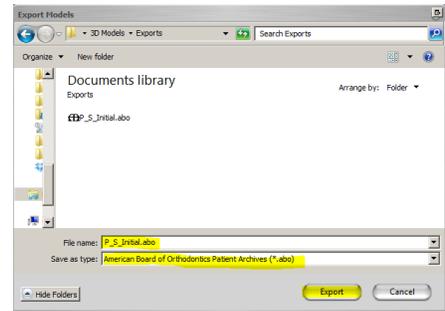


9. Highlight the patient by clicking the row.
Click **EXPORT**.

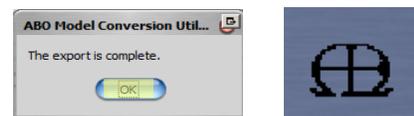


10. Navigate to a Save location of your choice.

- **Rename the file** to a patient identifier of your choice. This filename is not retained by the ABO.
- **Save-as-Type** is: American Board of Orthodontics (*.abo).
- Click **EXPORT**.



11. A popup window will tell you the export is complete. Click **OK**. You will notice an **ABO logo icon** identifies your exported model.



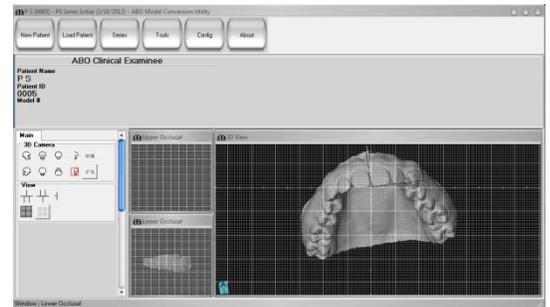
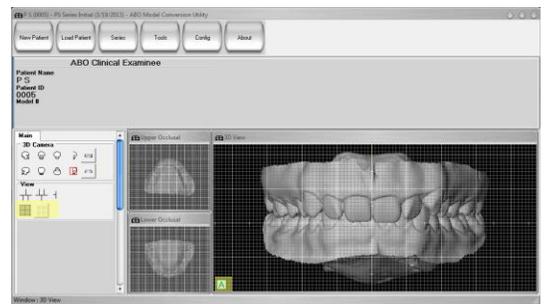
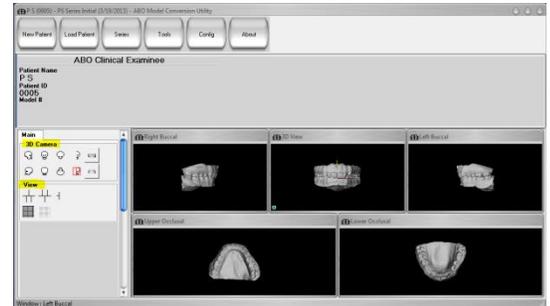
When you are ready, you will log into the Case Submission Portal to upload your converted models (.abo).*

If you wish to measure for DI using the Utility's 3D Model Viewer, move on to [Score Discrepancy Index](#).

Score Discrepancy Index

If you plan to use the **ABO Model Conversion Utility** as an aid to score Discrepancy Index, here are some guidelines:

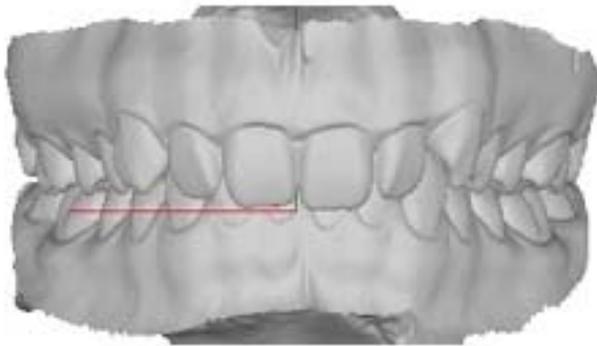
1. Go to **Patient Info** and click the patient row.
 - Click **3D MODEL**.
2. **3D Camera** icons
 - display various orientations of the model
 - separate the maxilla and mandible
 - allow half-view buttons to be toggled to full view
3. **View** icons
 - display various layouts
 - include a **mesh overlay** to allow one to count in mm
4. Use mouse controls to
 - click and drag to rotate the image
 - scroll with wheel to zoom the image and the mesh
 - pan the model by dragging with the middle mouse button or holding down the scroll wheel and drag
 - double-click the model to bring it back to initial size and orientation
5. Measure distance for the DI category by counting each square of the mesh as 1 mm.
6. Round up to the next full mm.
7. Record your score for the category into the ABO Discrepancy Index Form.
8. Repeat for all DI categories.



Unsuccessful Import

1. If your digital model could not be imported due to a technical error in its construction, provide your digital model provider with the exact error message.
2. If your digital model was not acceptable due to an invalid file format, you must verify the export procedure of your digital model software.
3. If your digital model is not contained in either one file or two files that include the maxillary arch and the mandibular arch, you have an invalid file format and must consult your digital model provider.
4. Exit the Utility.

The American Board of Orthodontics (ABO) Model Conversion Utility User Guide



American Board of Orthodontics

**ABO Utility for Verification and Conversion of
Digital Models for Submission to the ABO
Clinical Examination.**

American Board of Orthodontics
Clinical@AmericanBoardOrtho.com

Authorized Users Must Have:

1. A valid ABO ID number
2. A valid e-mail address registered with the ABO
3. Authorization by the ABO to activate this software.
4. Orthodontic departments and digital model providers who wish to become authorized must make a request by e-mail to Clinical@AmericanBoardOrtho.com .

Orthodontic Departments Should Include in the Body of Your E-mail:

1. School Name
2. School Address
3. Name of your digital model product
4. Head of Department must make the request and include telephone and e-mail address
5. Designated individual who will initially operate the ABO Utility (may be a resident); include telephone and the email address to be used in activation of the Utility

Scanner Software Companies Should Include in the Body of Your Email:

1. Company Name
2. Company Address
3. Name of your digital model product
4. Head of Software Development for digital models, including telephone and email address
5. Designated individual who will test your product by using the ABO Utility: include telephone and the email address to be used in activation of the Utility

System Requirements

Minimum:

Windows XP (SP3) or Vista, 32-bit

Pentium 4 (1GB RAM x/XP or 2GB RAM w/Vista

Nvidia GeForce GTS 250 – 3D Graphics Card

10 GB free hard drive space

Recommended:

Windows 7 Pro 64-bit; Intel Core 2 Duo (2GB RAM);

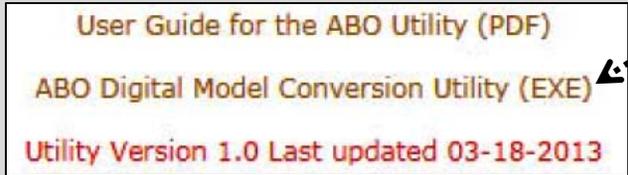
nVidia GeForce GTX650Ti 1GB; 80GB hard drive

Not Recommended:

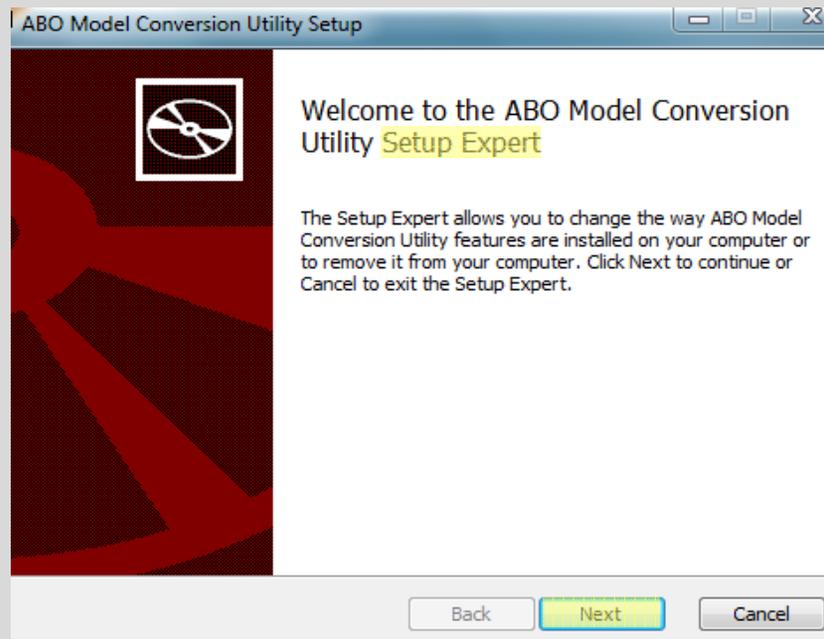
ATI Graphics Card or Intel Graphic Card

Install, Registration, and Activation

Please follow each instruction exactly.

1. If you are in a secured environment, you may need to contact your system administrator for rights to download and install.
2. Click the hyperlink for ***ABO Model Conversion Utility (exe)*** from the ABO website.
3. If a File Download dialog box appears, select ***Run***; otherwise, the installer will be saved to a location on your computer.
4. If User Account Control asks permission to make changes to this computer, reply ***Yes*** or ***OK***.

Install, Registration, and Activation



5. Run the Installer's *Setup Expert* and follow the instructions.

Store the program at C: Program Files or a location of your choice. A shortcut for the *Utility* will appear on your

desktop.

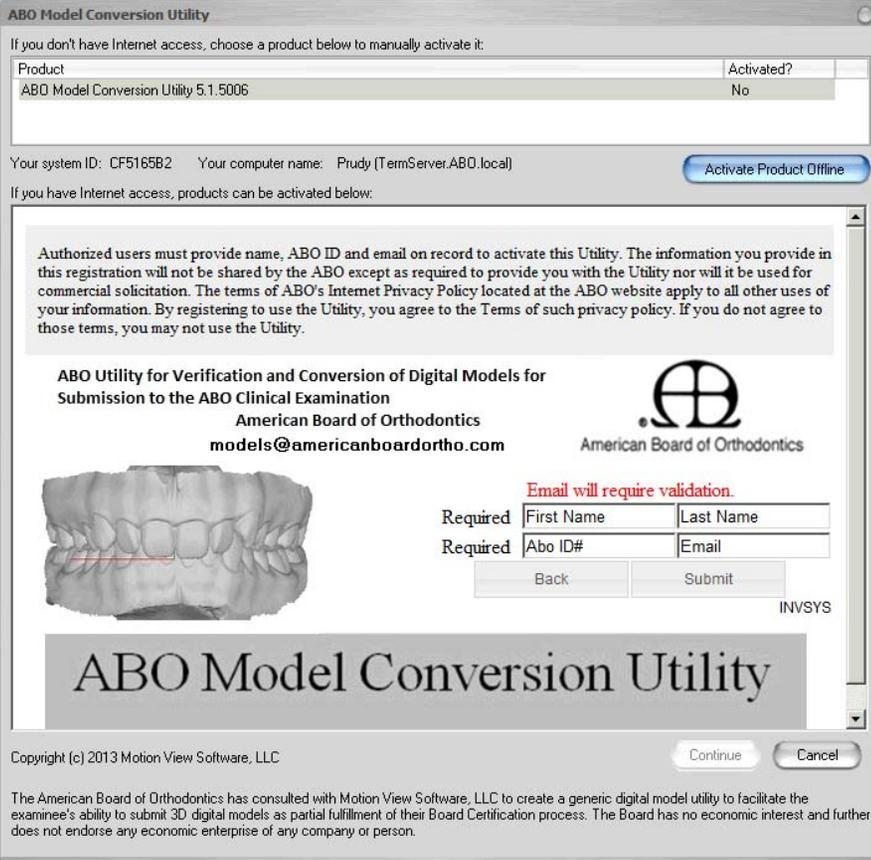


Install, Registration, and Activation

If you have successfully registered a previous version of the Utility, go to [Multiple Installations of the ABO Utility](#).

6. You should be connected to the Internet on your first launch of the Utility. Double click on the **Utility**  and a registration window appears.

- Select Register Account
- Enter your First and Last Name
- Enter 5-character ABO ID#
- Enter Email address on record with the ABO.
- Click Submit.



ABO Model Conversion Utility

If you don't have Internet access, choose a product below to manually activate it:

Product	Activated?
ABO Model Conversion Utility 5.1.5006	No

Your system ID: CF5165B2 Your computer name: Prudy (TermServer.ABO.local) [Activate Product Offline](#)

If you have Internet access, products can be activated below:

Authorized users must provide name, ABO ID and email on record to activate this Utility. The information you provide in this registration will not be shared by the ABO except as required to provide you with the Utility nor will it be used for commercial solicitation. The terms of ABO's Internet Privacy Policy located at the ABO website apply to all other uses of your information. By registering to use the Utility, you agree to the Terms of such privacy policy. If you do not agree to those terms, you may not use the Utility.

ABO Utility for Verification and Conversion of Digital Models for Submission to the ABO Clinical Examination
American Board of Orthodontics
models@americanboardortho.com


American Board of Orthodontics



Email will require validation.

Required	First Name	Last Name
Required	AbO ID#	Email

[Back](#) [Submit](#)

INVSYS

ABO Model Conversion Utility

Copyright (c) 2013 Motion View Software, LLC [Continue](#) [Cancel](#)

The American Board of Orthodontics has consulted with Motion View Software, LLC to create a generic digital model utility to facilitate the examinee's ability to submit 3D digital models as partial fulfillment of their Board Certification process. The Board has no economic interest and further does not endorse any economic enterprise of any company or person.

Install, Registration, and Activation

7. An automated system will send an activation password to the email address provided.
8. Collect the Password from your email account; enter it here, and click VALIDATE PASSWORD

This same password will be used for multiple installations.

9. Your registration will be confirmed as successful. Click OK

Registration Step Two

An email with the password has been sent to [redacted]. Please check your email for the instructions and information.

Email Address: [redacted]

Password: [redacted]

If you did not receive the email, please check your spam folder. If it is not there, you can resend it by closing this box and clicking Submit again.

Registration Successful

Your account has been added to the system and licenses have been added to your account, you can now login. Thank you.

Install, Registration, and Activation

10. In the Activate Software window, place a Checkmark at ABO Model Conversion Utility.

Click Save Changes.

ABO Model Conversion Utility

If you don't have Internet access, choose a product below to manually activate it:

Product	Activated?
ABO Model Conversion Utility 5.1.5002	No

Your system ID: 7D1AE67C Your computer name: ABO-Spare4LT.ABO.local Activate Product Offline

If you have Internet access, products can be activated below:

Activate Software

Deactivate Software

Used Licenses

Available Licenses

Modify License

ABO-Spare4L

ABO Model Conversion Utility No Transfer Options

Save Changes

INFORMATION

Based on your settings, it has been detected that you have some optional addon modules available but not activated. You can activate them instantly here if you have an available install. If you do not have an available install, please email models@americanboardortho.com for assistance. Listed below are all of the addon modules available to you that are not already installed:

ABO Model Conversion Utility

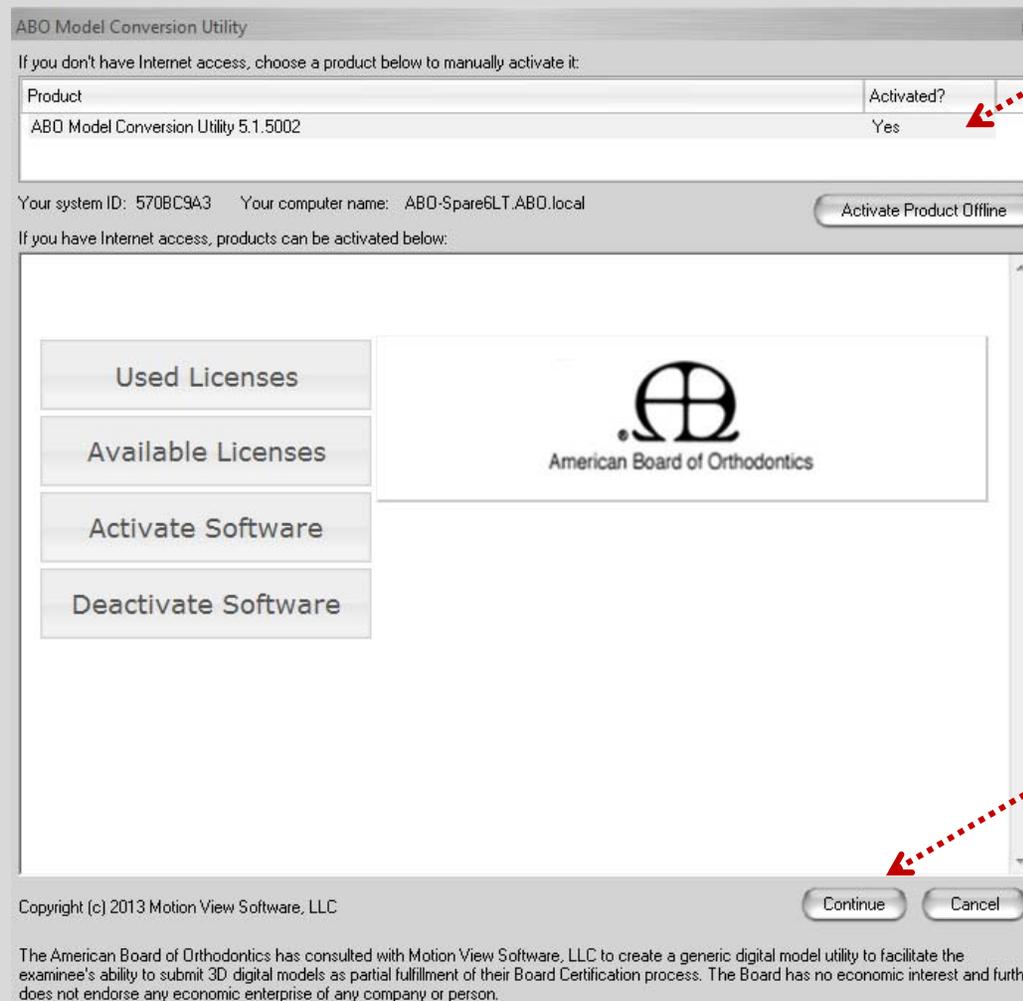
To activate software, please click **Activate My Software** above, put a check in the box next to the product you want to activate and click **Save Changes**

Copyright (c) 2013 Motion View Software, LLC Continue Cancel

The American Board of Orthodontics has consulted with Motion View Software, LLC to create a generic digital model utility to facilitate the examinee's ability to submit 3D digital models as partial fulfillment of their Board Certification process. The Board has no economic interest and further does not endorse any economic enterprise of any company or person.

Install, Registration, and Activation

11 The activation window will report Yes for Activated. You may click Continue if you are ready to use the Utility.



Multiple Installations of the ABO Utility

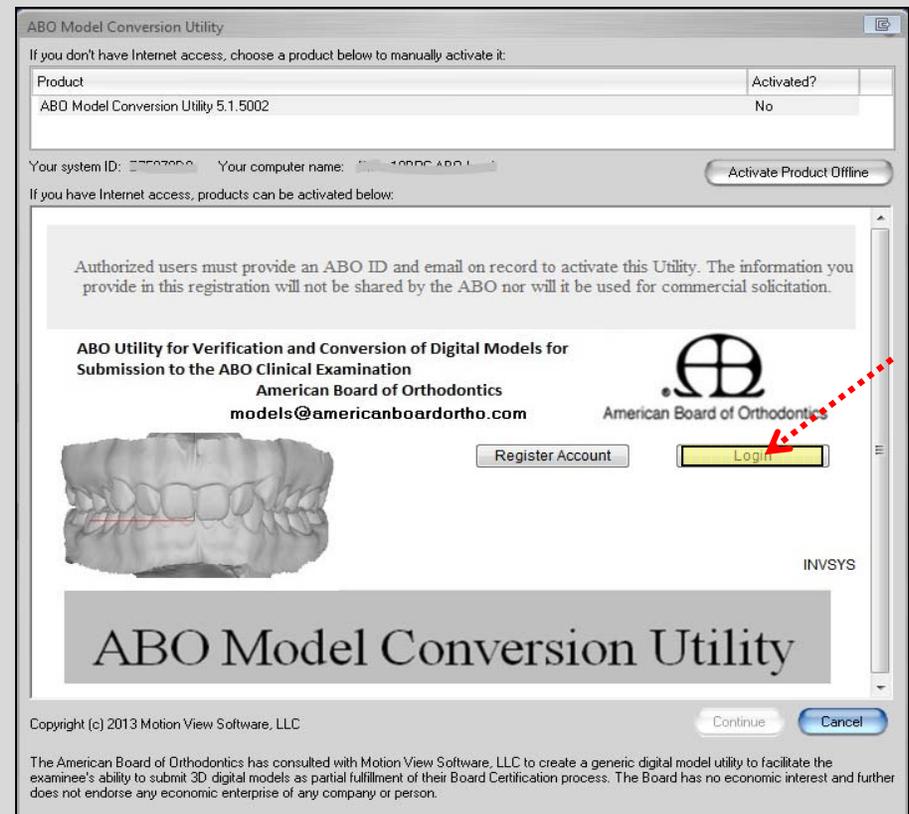
1. Candidates to the ABO will be authorized for a maximum of four installations. Download and install the latest version of the Utility from the ABO website using previous instructions.

2. Launch the Utility while under an Internet connection. Click Login at the activation window.

User Guide for the ABO Utility (pdf)

ABO Model Conversion Utility (exe)

Utility Version x.x.xxxxx, released xx-xx-xxxx



Multiple Installations of the ABO Utility

3. Enter the same Email address used for initial registration and the activation Password you received.

a. *If your password is unknown, click the ? and submit your email address for a response.*

b. Click Login again.

4. You will activate the new installation using previous instructions.

ABO Model Conversion Utility

If you don't have Internet access, choose a product below to manually activate it:

Product	Activated?
ABO Model Conversion Utility 5.1.5002	No

Your system ID: D72E5C53 Your computer name: PrudyPC.ABO.local Activate Product Offline

If you have Internet access, products can be activated below:

Authorized users must provide an ABO ID and email on record to activate this Utility. The information you provide in this registration will not be shared by the ABO nor will it be used for commercial solicitation.

ABO Utility for Verification and Conversion of Digital Models for Submission to the ABO Clinical Examination
American Board of Orthodontics
models@americanboardortho.com



American Board of Orthodontics

Email:

Password:

Back Login ?

INVSYS

ABO Model Conversion Utility

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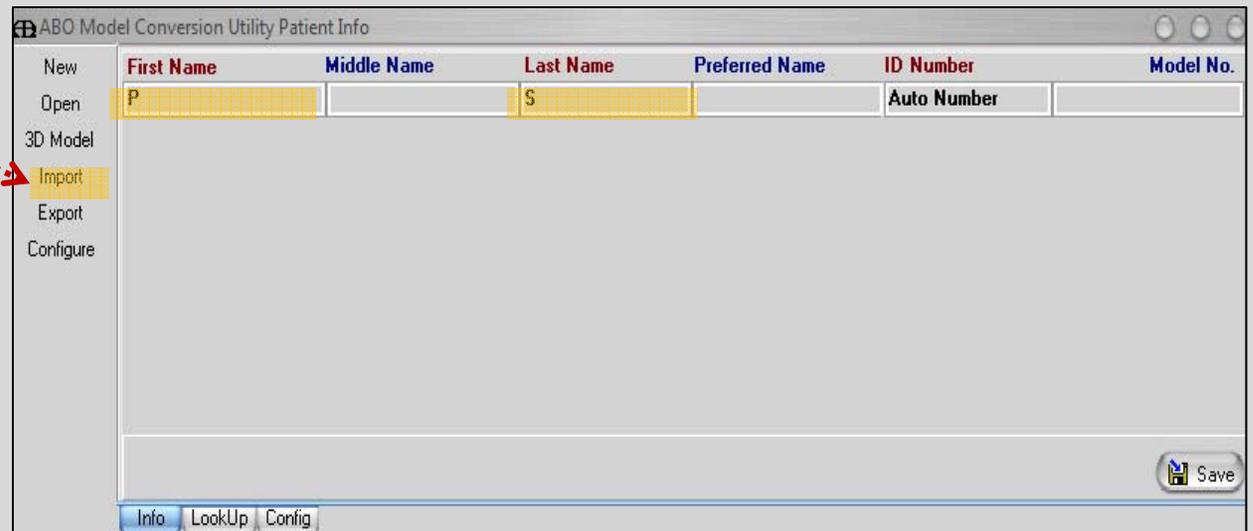
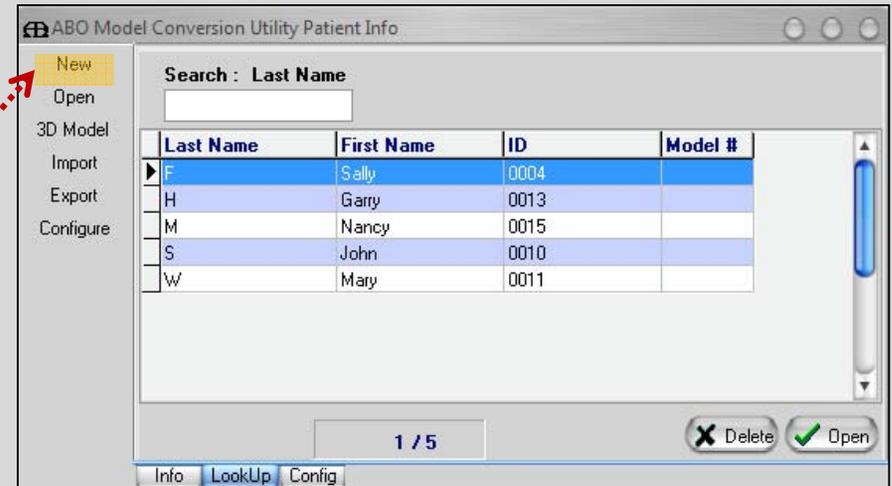
The American Board of Orthodontics has consulted with Motion View Software, LLC to create a generic digital model utility to facilitate the examinee's ability to submit 3D digital models as partial fulfillment of their Board Certification process. The Board has no economic interest and further does not endorse any economic enterprise of any company or person.

Import and Export Digital Model Images

1. Imported model/s must be a file format of PLY, STL or OBJ.
2. Click New.
3. Enter a first name identifier and last name identifier of your choice for your patient.

This name is not transmitted to the ABO.

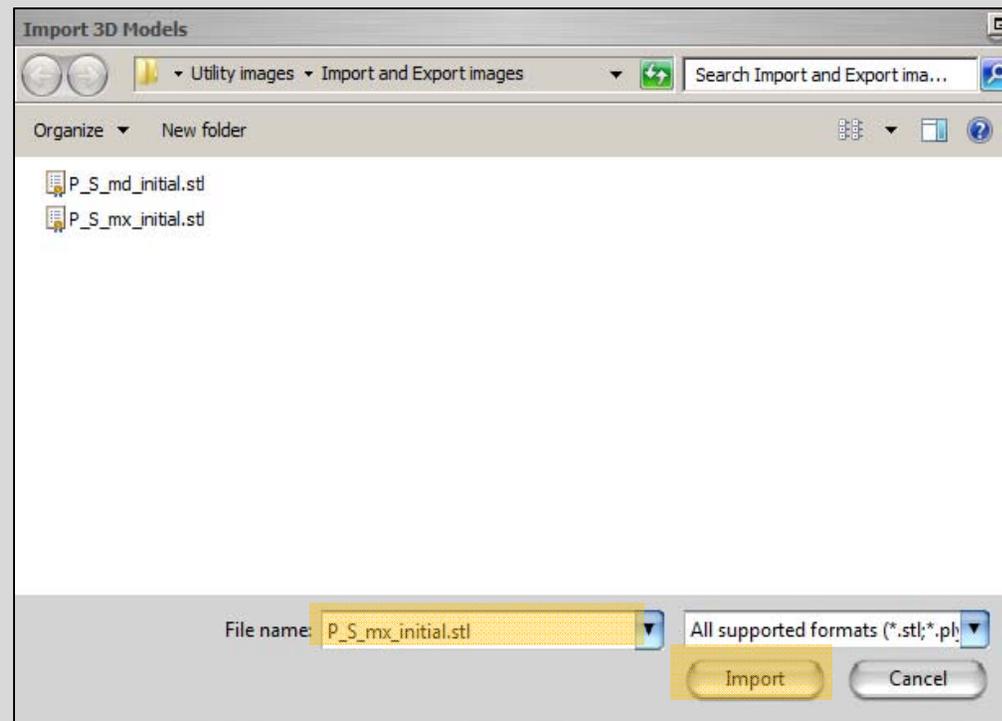
Click Import.



Import and Export Digital Model Images

4. Navigate and select a digital model belonging to your patient.

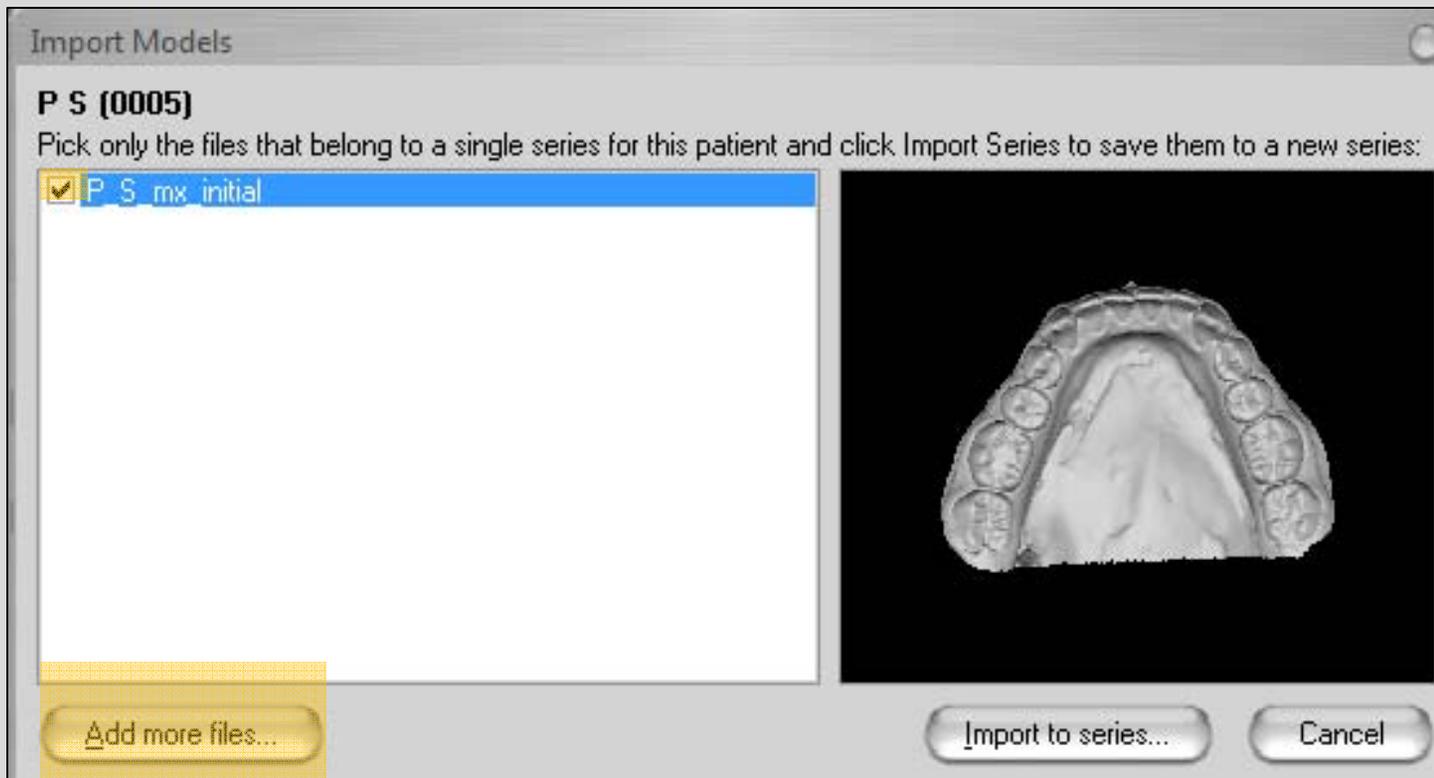
Select Import.



If the digital model is not acceptable, take note of the exact error message and go to Unsuccessful Import.

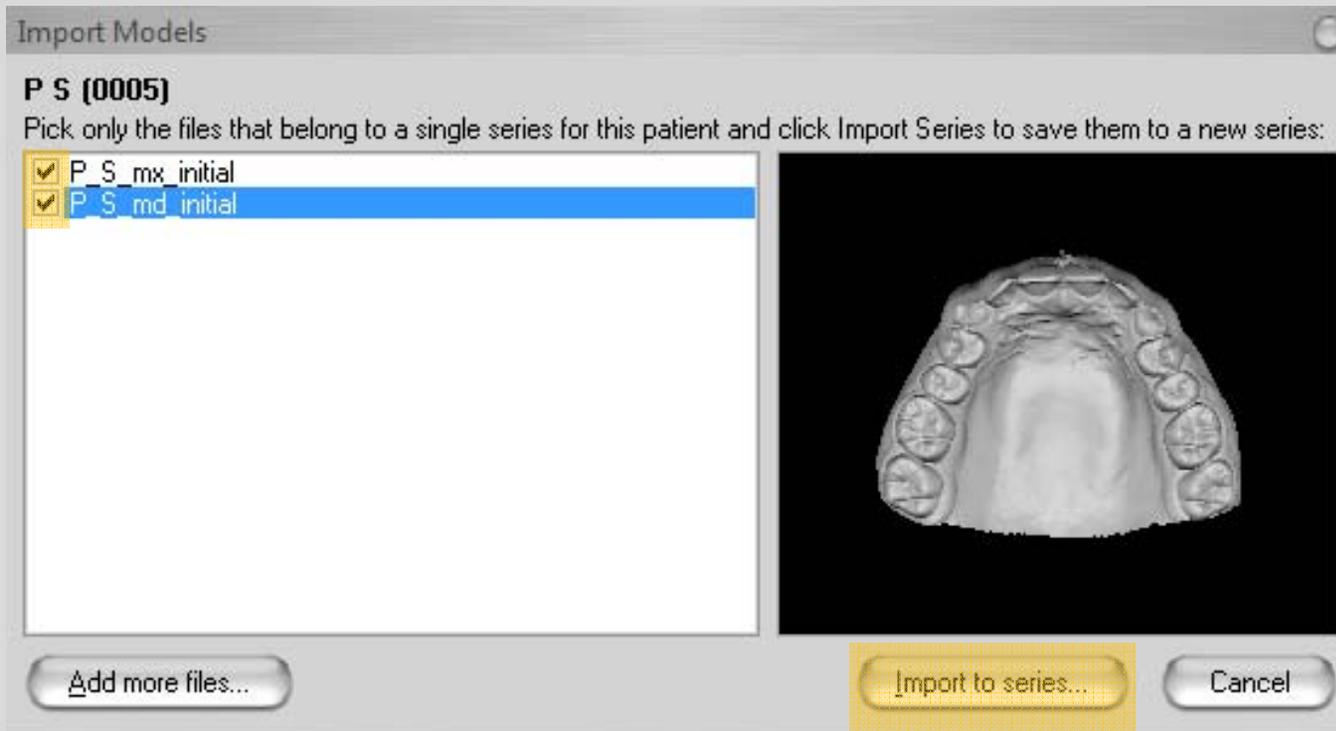
Import and Export Digital Model Images

5.
 - a. If there is more than one file to import (i.e. MX and MD for one timepoint)
Click [Add More Files.](#)
 - b. Navigate to next file for the patient
and Click [Import.](#)



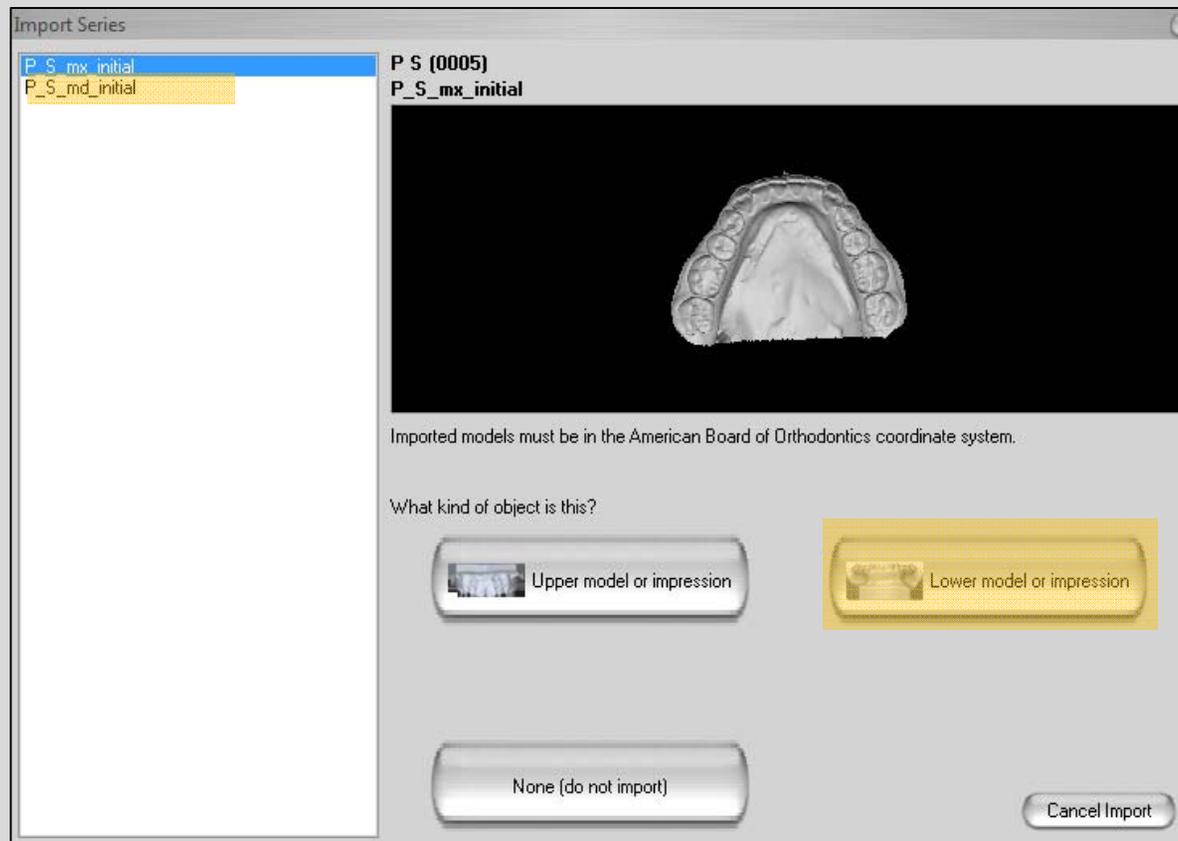
Import and Export Digital Model Images

- c. Place a checkmark by the MX and MD model/s for a single timepoint.
Click Import to Series.



Import and Export Digital Model Images

- d. Identify each model on display by selecting the button Upper Model... or Lower Model... while the model is displayed with its filename above. Each unidentified model displays itself automatically. In this exemplar the maxillary model had already been identified



Import and Export Digital Model Images

- e. **Name the series** with an identifier of your choice that describes the patient and the time-point. Click **Save**.

If the import was unsuccessful, **take note of the exact error message** and go to **Unsuccessful Import**

Save New Scan

What series name and date should be used?

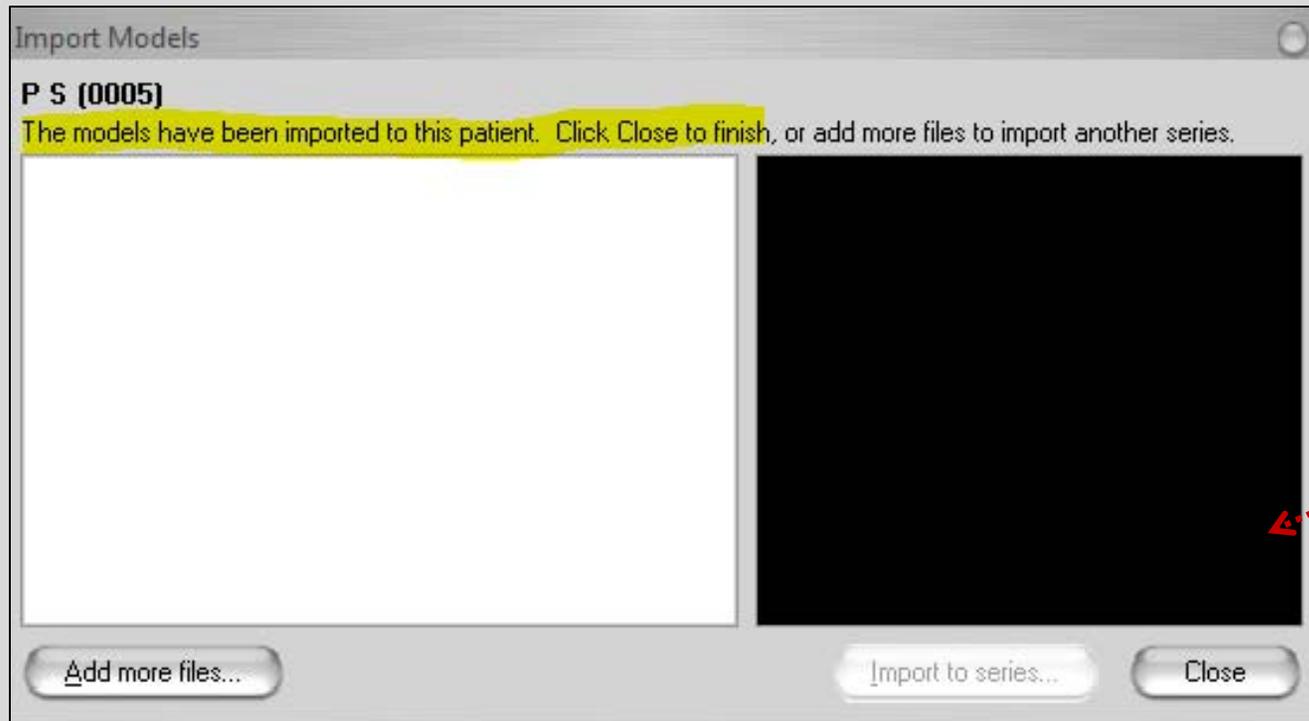
Series Name: PS Series Initial

Series Date: 3/19/2013

Save Cancel

Import and Export Digital Model Images

- f. A message under the model name will tell you that the models have been imported to this patient
- g. If there are progress models for this patient, select Add more files.., go back to Step #5 and repeat these steps.
- h. Click Close.



Import and Export Digital Model Images

6. Select 3D Model

ABO Model Conversion Utility Patient Info

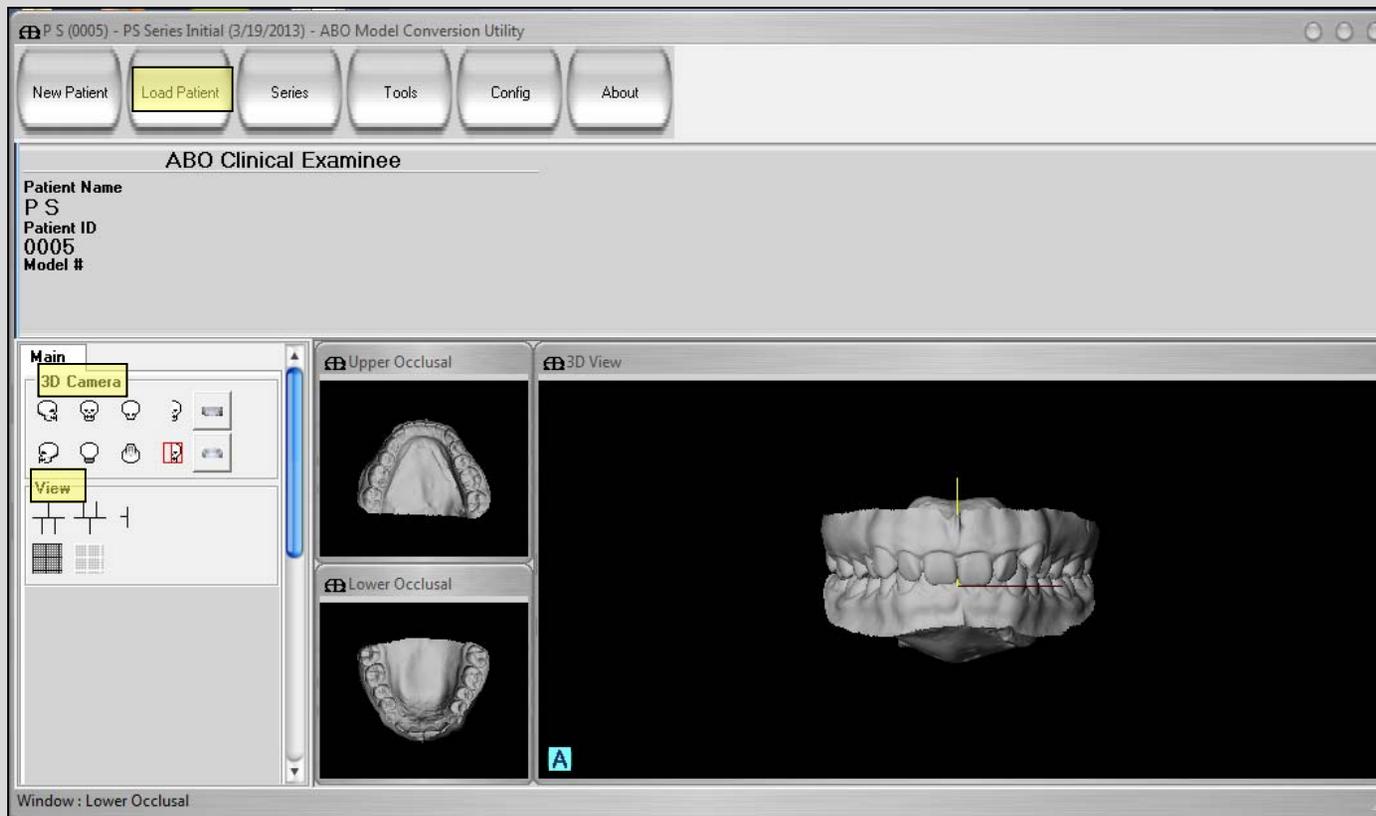
First Name	Middle Name	Last Name	Preferred Name	ID Number	Model No.
P		S		Auto Number	

Menu items: New, Open, 3D Model, Import, Export, Configure

Buttons: Info, LookUp, Config, Save

Import and Export Digital Model Images

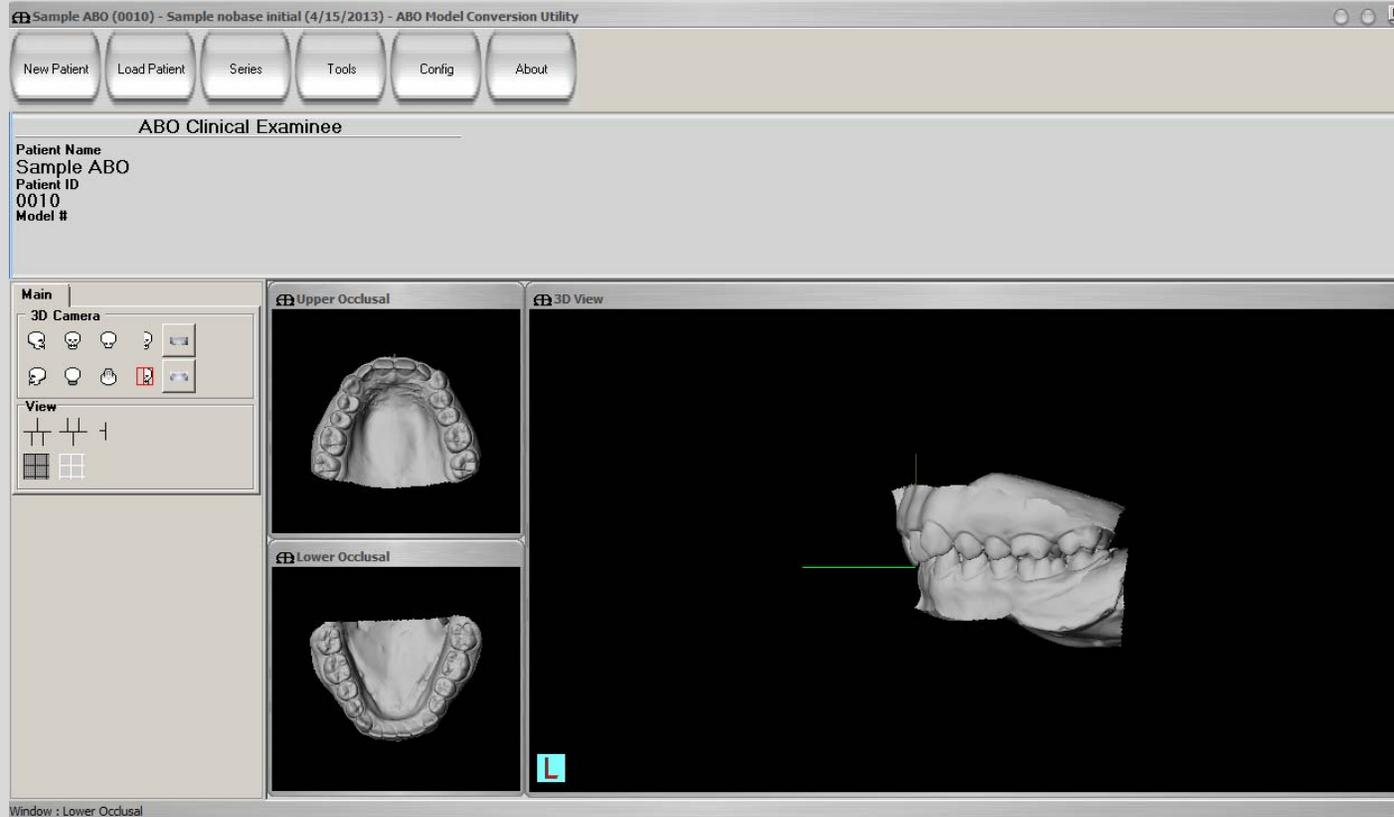
- Verify that your model is oriented correctly and conforms to ABO specifications.
 - Use the **3D Camera** and **View** buttons in the left panel to provide different views.
 - Without rotating the model, make sure each view matches the button label (hover over button).
 - Half-view buttons are toggled off to return to full view.
 - Rotate the model by click and drag.
 - Use the scroll wheel to zoom the image and the mesh.
 - Pan the model by dragging with the middle mouse button or holding down the scroll wheel then drag.



Import and Export Digital Model Images

7. (Continued)

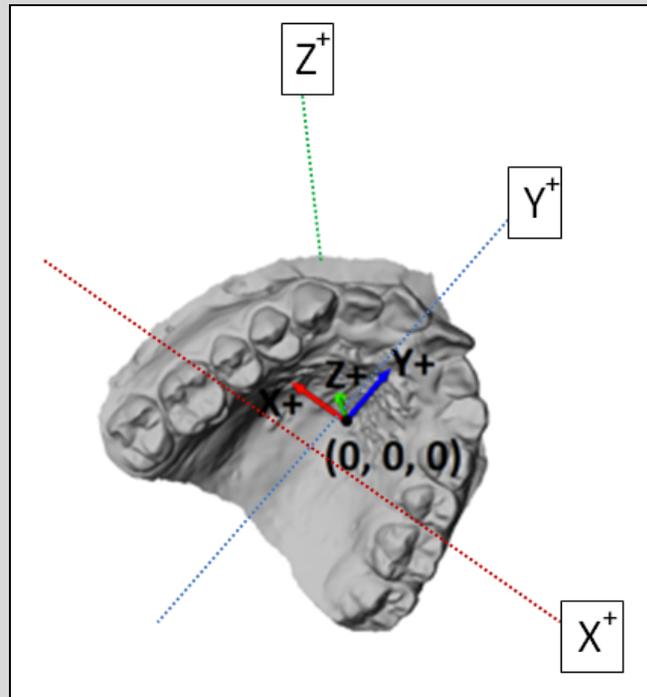
- Double-click the model to bring it back to initial size and orientation.
- Verify correct orientation of the model by using the Cube at lower left of the main 3D view. View of the model should match face of the cube:
 - **A**nterior, **P**osterior, **S**uperior, **I**nferior, **R**ight, **L**eft



Import and Export Digital Model Images

7. (Continued)

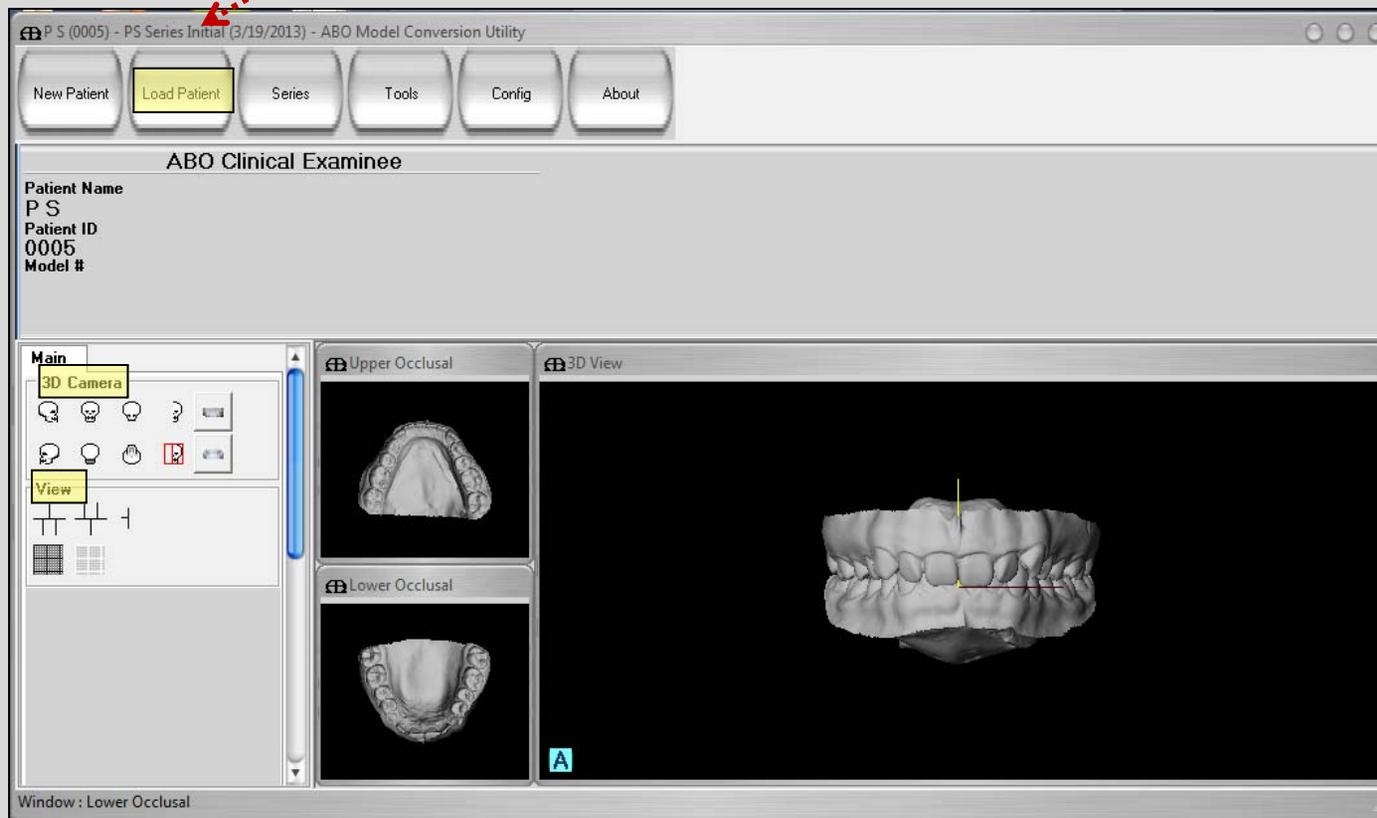
- The intersection of the 3 lines in the main 3D view corresponds to the origin of the model
 - The lines from posterior to anterior and from left to right must lie on the occlusal plane.
 - The lines from posterior to anterior and from inferior to superior must lie on the mid-sagittal plane.
 - The intersection of the lines must lie approximately half-way between the posterior and anterior ends of the model.
 - If you are unable to locate these lines at all, the origin is nowhere close and its location is not ABO compliant.



Import and Export Digital Model Images

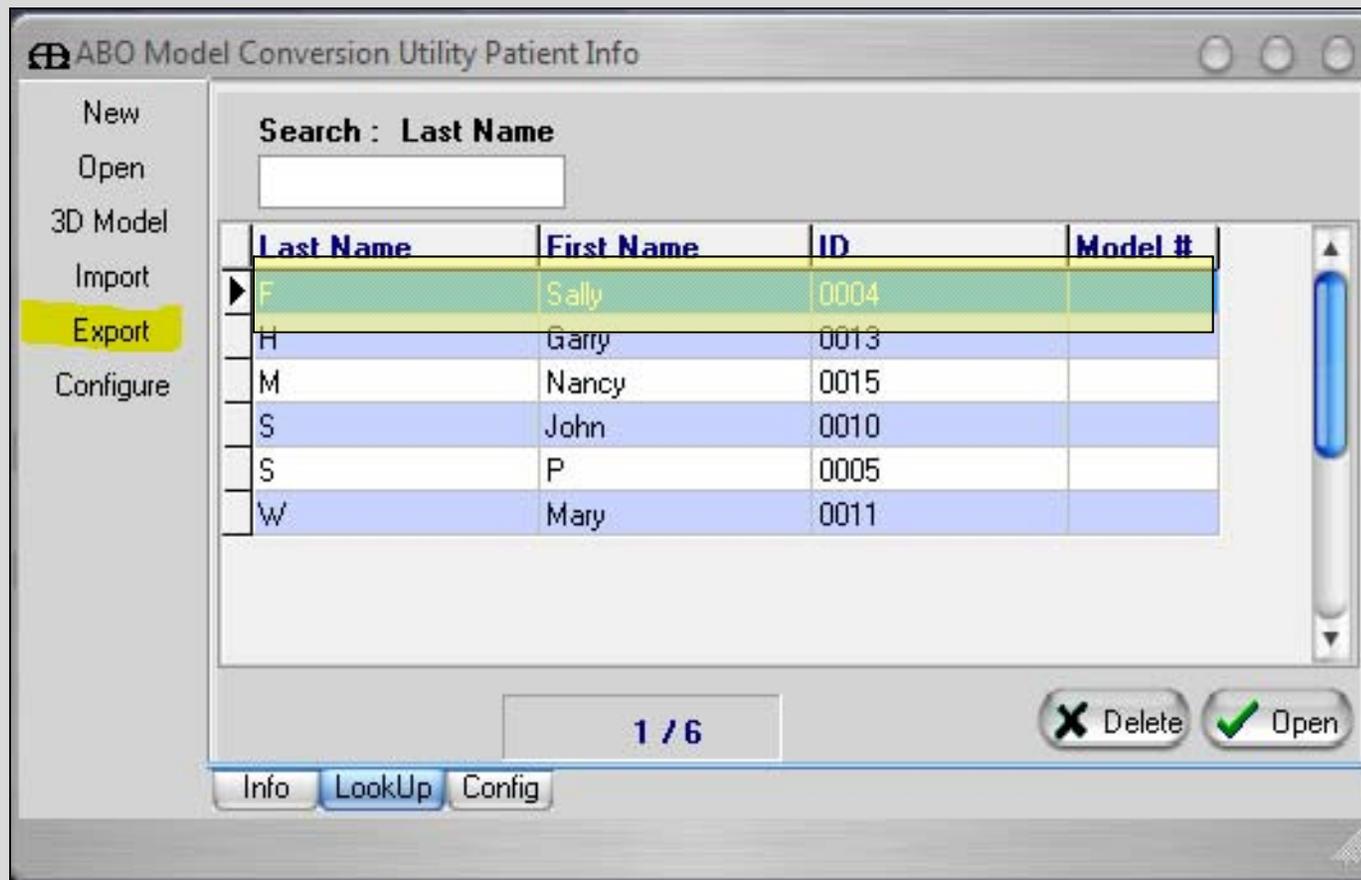
If your model is not compliant with ABO specifications and you decide not to proceed with an export, exit the Utility.

8. Click Load Patient



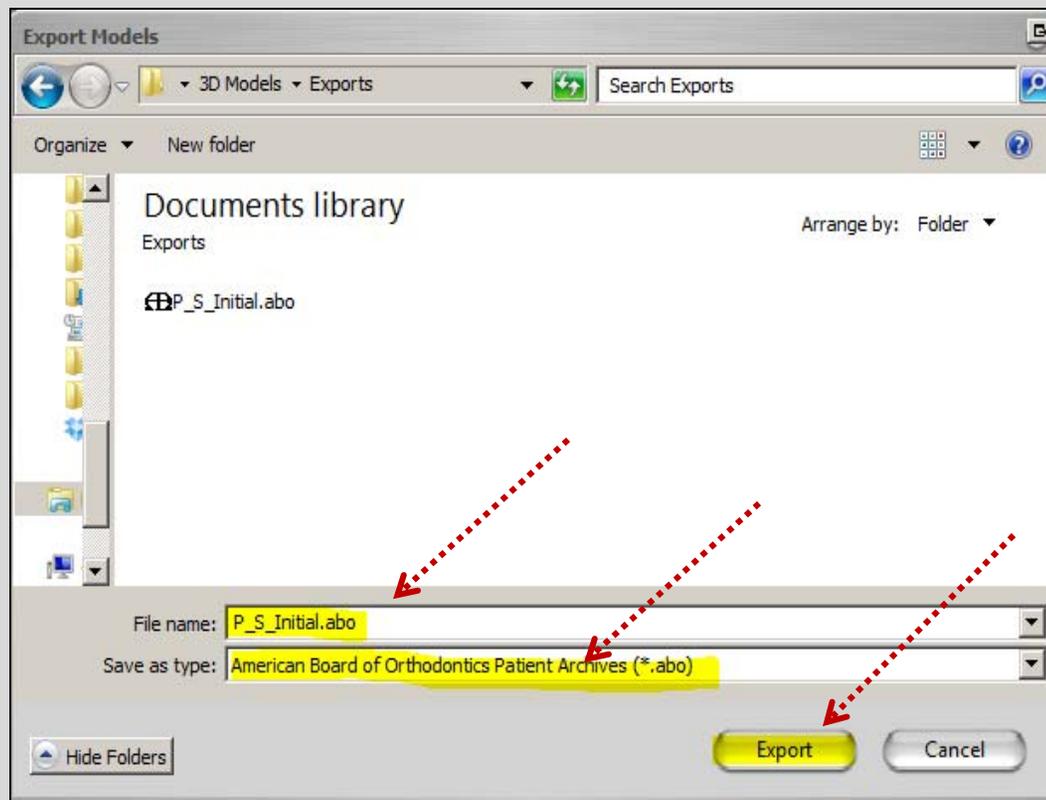
Import and Export Digital Model Images

9. Highlight the patient by clicking the row.
Click [Export](#)



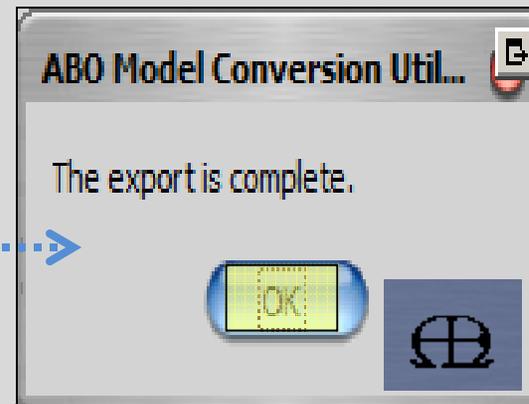
Import and Export Digital Model Images

10. Navigate to a Save location of your choice.
 - a. Rename the file to a patient identifier of your choice. This filename is not retained by the ABO.
 - b. Save-as-Type is: American Board Orthodontics (*.abo).
 - c. Click Export.



Import and Export Digital Model Images

11. A popup window will tell you the export is complete. Click **OK**. You will notice an **ABO logo icon** identifies your exported model.



2

*When you are ready, you will log into **ABO Clinical Exam Electronic Submission** to upload your converted models (*.abo).*

3

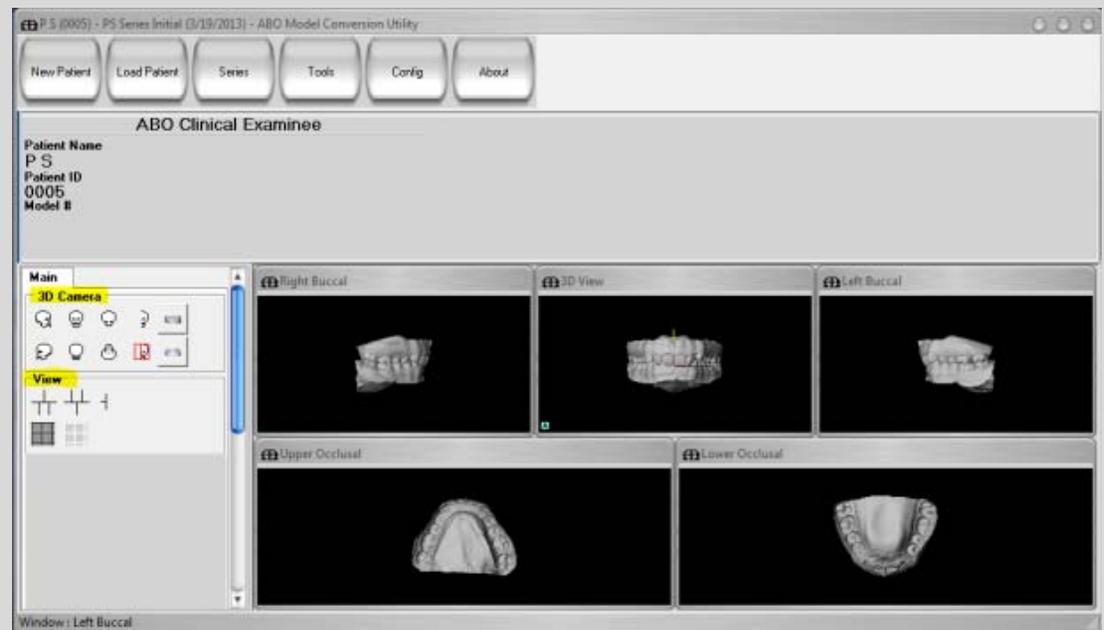
*If you wish to measure for DI using the Utility's 3D Model Viewer, continue to **Score Discrepancy Index**.*

Next Slide Please

Scoring ABO Discrepancy Index (DI)

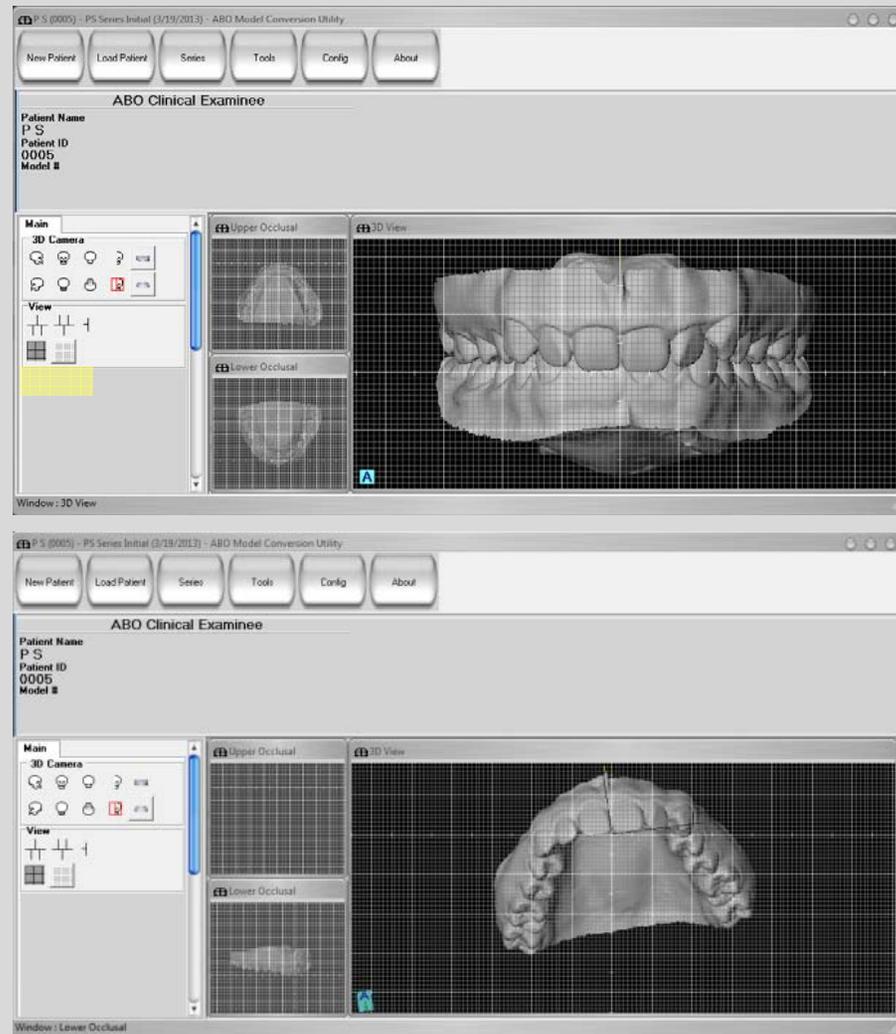
If you plan to use the *ABO Model Conversion Utility* as an aid to score Discrepancy Index, here are some guidelines:

1. Go to [Patient Info](#) and click the patient row. Then click [3D Model](#)
2. **3D Camera** icons
 - Display various model orientations
 - Separate the maxilla and mandible
 - Allow half-view buttons to be toggled to full view



Scoring ABO Discrepancy Index (DI)

3. View icons
 - Displays various layouts
 - Include a mesh overlay to allow one to count in mm.
4. Use mouse controls to
 - Click and drag to rotate the image
 - Scroll with wheel to zoom the image and the mesh
 - Pan the model by dragging with the middle mouse button or holding down the scroll wheel and drag
 - Double click the model to bring it back to initial size and orientation
6. Measure distance for the DI category by counting each square of the mesh as one (1) mm.
7. Round up to the next full mm.
8. Record your score for the category into the ABO DI Form.
9. Repeat for all DI categories.



The American Board of Orthodontics (ABO) Model Conversion Utility User Guide



Unsuccessful Import

1. If your digital model could not be imported due to a technical error in its construction, provide your digital model provider with the exact error message.
2. If your digital model was not acceptable due to an invalid file format, you must verify the export procedure of your scanner software.
3. If your digital model is not contained in either one file or two files that include the maxillary arch and the mandibular arch, you have an invalid file format and must consult your digital model provider.
4. Exit the Utility.