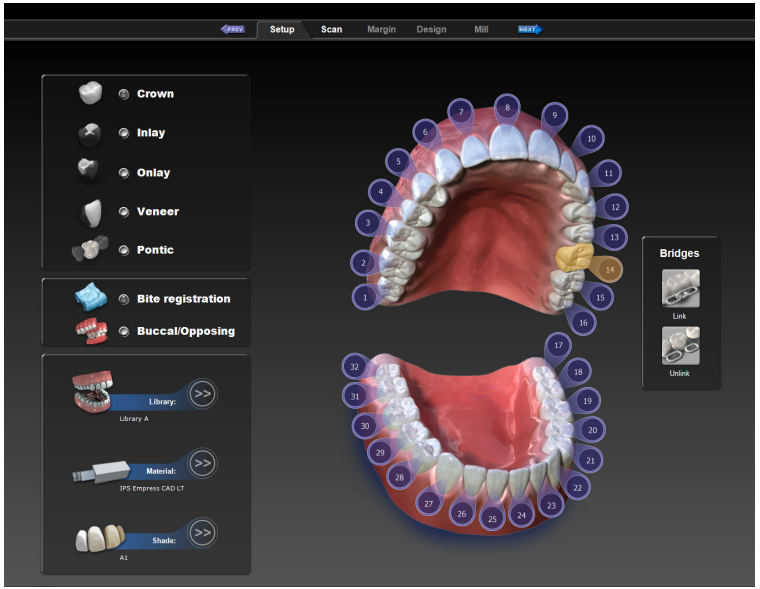
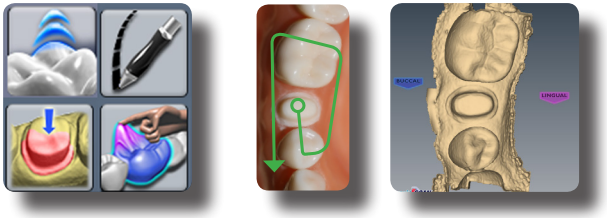
E4D TECHNOLOGIES





Design Center
Quick Reference

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Caution: US Federal law restricts the E4D scanner to sale by or on the order of a dentist.

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Log on to our website www.e4d.com for these additional resources:

- Resources tab - log in to ECO Community*
  - **Online Training Videos**
  - **Chairside Chats - practical "how to" presentation updated weekly**
  - **Online community and forum**
  - **User Manual**
  - **Exercise Workbook**
  - **Quick Reference Guides**

  **To register for the ECO Community and access these resources, go to www.e4d.com/eco*
- Education tab
  - **Intermediate and advanced course descriptions**
  - **Course planner and calendar**
  - **Links to online registration**

Online Help is available in the software by clicking 

Contact Customer Support

phone: 800.537.6070
fax: 972.479.1106
email: customersupport@e4d.com

Home Screen

Click  on any tab to save and return to the Home screen. Click  to view/edit the settings for the current tab.

Click  on any tab to view online Help. Click Sky or E4D Studio to import a case.

Add New Patient:

1. Click **Add.** 
2. Type patient **Name.**
3. Click **Enter.** 

Select Existing Patient:

1. Select patient from the list.

Existing restorations appear on the right.

Start New Restoration:

1. Click **Start New Restoration.**

Setup screen appears.

Open Existing Restoration:

1. Select the existing restoration from the list.
2. Click **Open Existing Restoration.**

Setup screen appears. Select desired tab.

Setup Screen

Select:

1. **Tooth**
2. **Restoration Type**
3. **Occlusal Data Type**
4. **Library**
5. **Material**
6. **Shade**

Single Restoration

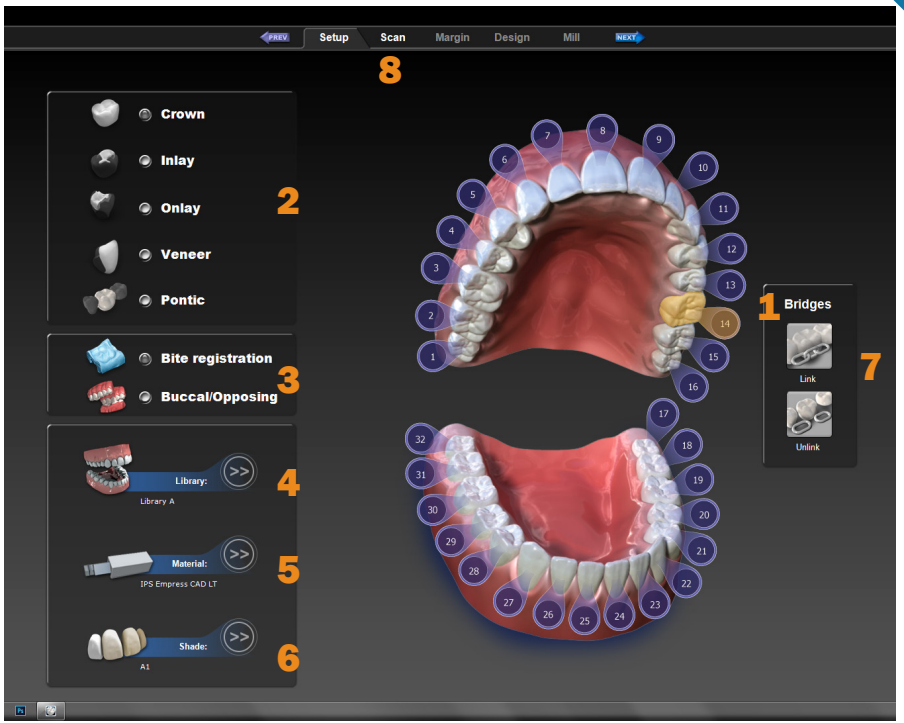
Multiple Restorations:
Repeat the steps for each tooth.

Bridge

7 Link the restorations to create a bridge.

8 Click the **Scan** tab.

See the Blocks page for more information.



Block Selection

The block selection chart provides general direction on what block or category of block is recommended for different types of restorations. Please understand that the clinical situations and parameters (preparation, occlusion, patient compliance) are all factors in the success of the final restoration regardless of the material.

Material \ Restoration		Anterior - full crown	Anterior - veneer	Posterior - full crown	Inlay/ Onlay	Implant	Bridges
3M	Paradigm MZ100					Provisional Only	
	Lava Ultimate						
Ivoclar Vivadent	IPS Empress CAD HT						
	IPS Empress CAD LT						
	IPS Empress CAD Multi						
	IPS e.max CAD HT						Anteriors Only
	IPS e.max CAD LT						Anteriors Only
	IPS e.max CAD Impulse						
	Telio CAD						Provisional Only
	Zirlux FC2						
D4D	Burn Out Blocks (BOB)	For cast or pressed indications only.					

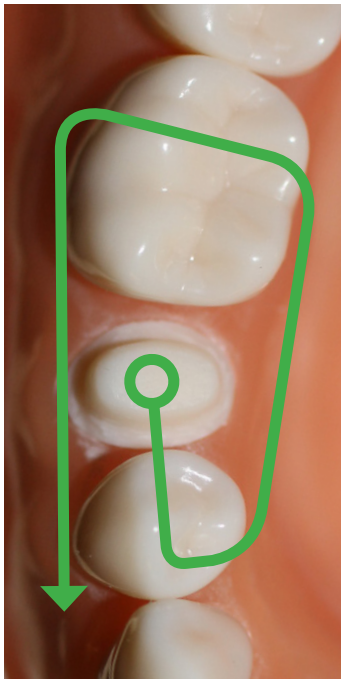
Primary indication

Secondary indication

With manufacturer caution

Scanning

Begin at the location of the circle in the diagram below. Move in half tooth (or smaller) increments and take overlapping scans. Use small rotations at the corners of the diagram. As you go down the buccal and lingual sides, the wand can be held at close to 90°.



Scanning Pattern

Scanned Model

Desktop operators may prefer to have the Live View rotated if the scanner is facing the operator. Click **Rotate** to change the Live View if needed.

1. Turn OFF bright lights; they can interfere with scanning.
2. **Scan.**
3. Rotate and evaluate the model using **Highlight Low Data Areas.**

4. Take more scans to fill in any low data areas (dark blue/purple) on the prep and interproximal areas.
5. **Trim Model** if needed.
6. If an Impression was scanned of the prep or Clone, click **Impression Mode** which inverts the scans to look like a traditional model. This is NOT used on scans of a bite registration.

Scan Occlusal Data (See next page)

Scanning Occlusal Data

The proposal's occlusion can be evaluated and designed using:

- Bite registration
- Buccal bite and opposing dentition
- Clone a waxup or existing anatomy before preparation

Scan Clone

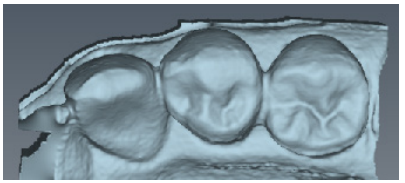
1. Click **Scan Clone.**
2. Scan the pre-operative tooth or wax-up with the same scanning techniques used for the prepared anterior or posterior tooth.
3. Prepare the tooth.
4. On the Scan tab, click **Scan Prep.**

Scan Bite Registration

1. Click **Scan Bite Registration.**
2. Capture occlusal details (90%) of proximal dentition for template alignment.
3. Use **Trim Model** to trim away excess data.
4.  Click **Select Bite Area** and circle the opposing dentition on the template.

Scan Opposing

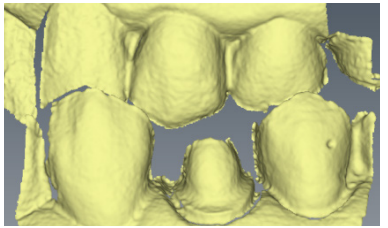
1. Click **Scan Opposing.**
2. Starting with an occlusal view, scan the occlusal surfaces of the opposing dentition. Include the same number of teeth as the preparation model. Ensure there is good cusp tip data on both the lingual and buccal sides.



3. Roll to the buccal and scan the buccal side of the opposing dentition. Include gingival data; do not stop halfway down the tooth.
4. Use **Trim Model** to trim away excess data.

Scan Buccal Bite

1. Click **Scan Buccal Bite.**
2. Press the articulated model down firmly or have the patient bite down firmly and tell them not to move. If the teeth shift during scanning, the alignment may be incorrect.



3. Scan at a 90° angle to the teeth. Scan the sides of the teeth that were captured in the preparation and opposing models. Ensure some gingival data is captured.

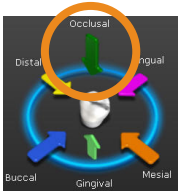
Orientation

See the User Manual for instructions on centering the preparation and using multiple orientations.

Orientation activates automatically when the Margin tab is selected for the first time.

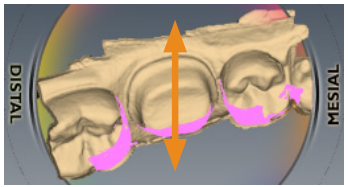
Orientation is a critical part of the entire design process. The position of the model affects the position of the library tooth before Autogenesis™ is applied. If the wand was positioned properly on the first scan, only small adjustments should be needed.

To adjust the model, use the LEFT mouse button.



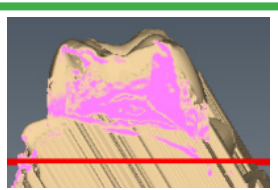
1 From the **Occlusal** – ensure you are looking straight down at the occlusal plane of the teeth (not tilted to the lingual or buccal).

Good

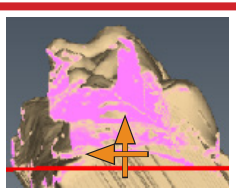


Poor

2 From the **Distal** – Evaluate the cusp heights of the proximals. Align the cusps and axial walls according to the Curve of Spee.



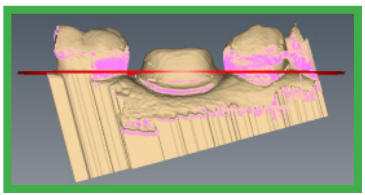
Good



Poor

To reduce the pink undercut indicators, accept the Orientation, draw the margin, then reactivate Orientation. When the margin is drawn, the undercut indicators appear only inside the margin.

3 From the **Buccal** - ensure the marginal ridges of the proximals are parallel to the red line.



4 From the **Occlusal** - ensure you can visualize the margin around the entire preparation. If you cannot, it may influence the fit of your restoration.

5 Click **Orientation** to accept the current position.

Margin Tab

1 Set Orientation (see previous page)

2 Draw the margin using **Trace, Lasso,** or **Paint.** Trace is the most popular selection.

3 Edit the margin using **Move Margin** or **Add Segments.**

Click **Align Buccal Scans** to align the preparation, opposing, and buccal models.

Preview Library appears after the margin has been edited and the editing tools deselected. Click to use the library tooth as an aid to verify and adjust Orientation.

Crown

Click the **Design** tab.

Partial

1 Designate a **Selection Area.**

2 Click **Design** tab.

Margin Aids

Show Features highlights areas with high contours. This often aids in finding the margin.

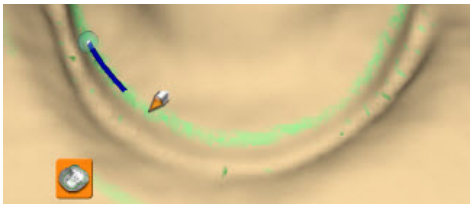
View ICE Preparation toggles between model view and ICEverything view. Use only in intraorally scanned cases with equigingival or subgingival margin areas.

Toggle Margin to show or hide the margin.

Trace

1 Click **Trace.** 

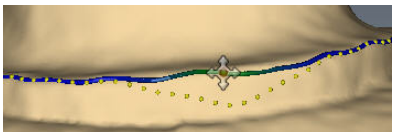
2 Click along the margin in small increments. The system creates straight lines between each click; a blue dot marks the starting point. Connect to the starting point to finish the margin.



Show Features is recommended as an aid in finding the edge of the margin, it is not necessary for using the Trace tool. Draw the margin in the middle of the green high contour indication.

Editing Margins

Move Margin

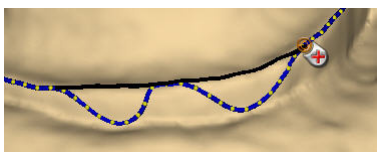


1 When using Trace, **Move Margin** is activated by default. Click to activate if necessary.

2 Position the pointer on the margin line; click and hold down the mouse button.

3 Drag the margin into position and release the mouse button. The system automatically redraws the margin. Repeat as needed.

Add Segments



1 Click **Add Segments.**

2 Start and end by clicking on a good part of the margin. Click to add a new line across the gap. Use multiple clicks to create a curve if necessary.

Selection Area (for inlays and onlays)

With the Selection Area tool, you define the area where the computer will place the restoration. This is important on partial restorations. When the margin is drawn, a reminder appears. If a Selection Area is not designated, Autogenesis™ will create a proposal, but it may not be correct. A Selection Area can be defined after the proposal has been generated, but the library needs to be reapplied.

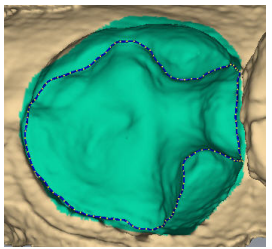
1 Click **Selection Area.**

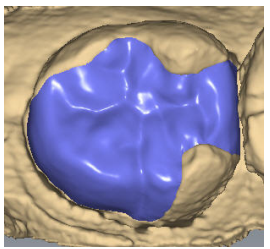
2 Click **Add to Selection.**

3 Use the mouse to draw a line around the entire tooth, down to the gums. The selected area is highlighted.

4 Click the **Design** tab.

Autogenesis applies the library tooth to the selected area.





Buccal Bite Alignment

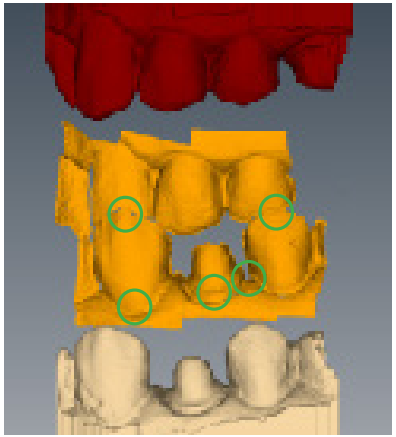
On Buccal/Opposing cases, the Design tab is not available until after the buccal and opposing have been aligned with the preparation model.

1 Click **Align Buccal Scans.** 

Three models appear.

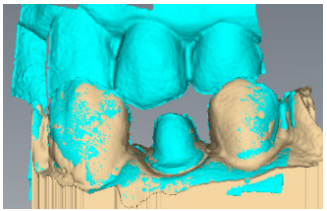
2 Click **Grab Model.** 

3 Click directly on a distinctive feature (such as a cusp tip, groove, unique gingiva, etc. - examples circled in green below) in the buccal bite and drag the model until the pointer is directly over the same distinctive feature on the preparation model.

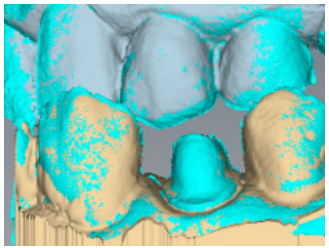


The buccal bite model changes color and snaps into place.

4 Click directly on a distinctive feature in the opposing model and drag the model until the pointer is directly over the same distinctive feature on the buccal bite model.

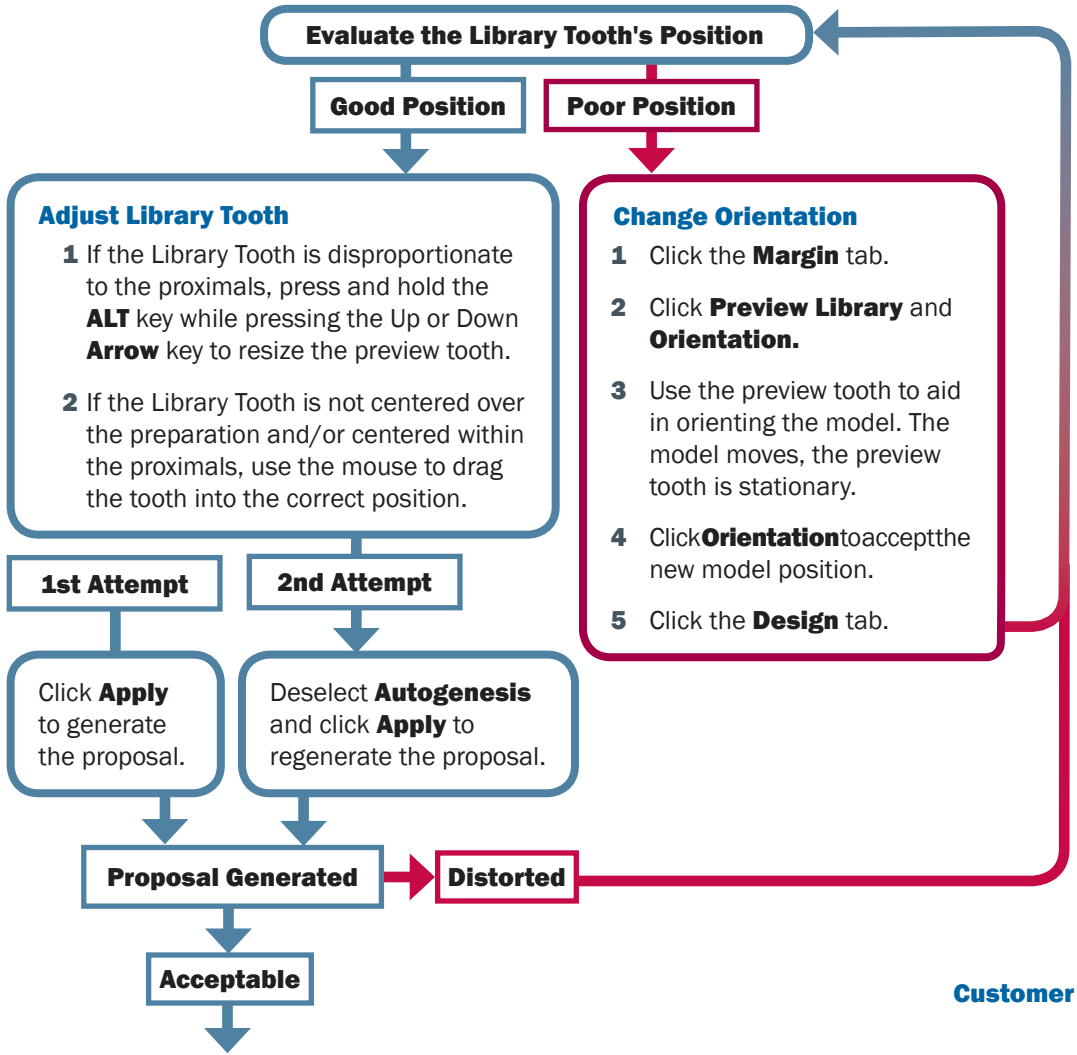


The opposing model changes color and snaps into place. Your alignment should resemble the following.



If you are not satisfied with the alignment, click **Reset** to start over

Design Tab


Evaluate the Library Tooth's Position
Good Position
Poor Position
Adjust Library Tooth
1 If the Library Tooth is disproportionate to the proximals, press and hold the ALT key while pressing the Up or Down Arrow key to resize the preview tooth.
2 If the Library Tooth is not centered over the preparation and/or centered within the proximals, use the mouse to drag the tooth into the correct position.
Change Orientation
1 Click the Margin tab.
2 Click Preview Library and Orientation.
3 Use the preview tooth to aid in orienting the model. The model moves, the preview tooth is stationary.
4 Click Orientation to accept the new model position.
5 Click the Design tab.
1st Attempt
2nd Attempt
Click Apply to generate the proposal.
Deselect Autogenesis and click Apply to regenerate the proposal.
Proposal Generated
Distorted
Acceptable

Global Positioning

Adjust the overall position of the tooth in relation to the proximals using Incremental Tools.

1 Alignment **(Move)**

2 Rotation **(Rotate)**

3 Height **(Expand)**

Esthetic Adjustments

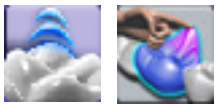
Go to Freeform Change Tools. Evaluate the following and adjust if needed. Rubber Tooth is recommended for these changes.

1 Material Thickness

2 Contours

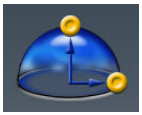
3 Marginal Ridges

4 Embrasures



Design Tab

Area of Influence - The Area of Influence appears with many of the Freeform Change Tools and can be used to adjust the depth and/or width of the affected area.



Occlusal Contacts

1 To display the bite registration or opposing dentition, click **View Bite Registration** once to make it appear and a second time to make it translucent.

2 Use **Contact Refinement** or **Rubber Tooth** and **Slice Plane** to adjust the contacts.

Popular goal: white/brown/black

Your office preference:

Bite Registration _____ Buccal Bite _____

3 Click **View Bite Registration** until it is deactivated.

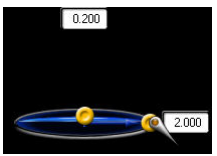
Proximal Contacts

1 Click **View Contacts.**

2 Click **Hide Model.**

Popular goal: 50 microns (Aqua blue color)

Your office preference: _____



3 For large changes, use **Expand** under Incremental Change Tools to increase or decrease. For smaller changes, use **Smooth** if the contact is too heavy and use **Dropper** if it's too light. Change the Area of Influence to be broad and shallow.

Material Thickness

1 Click **View Material Thickness.**

2 Use **Rubber Tooth** to adjust the thickness. Adjust the Area of Influence to be smaller for pit changes and larger for axial walls.

Goals:

Axial Walls = Green

Occlusal Surface = Dark Green/Blue

3 Click **View Bite Registration** and **View Contacts** to ensure occlusal contacts are still in desired range.

Click the **Mill** tab.

Mill Tab

1 Look for orange or red shading (thin material) on the proposal. Return to the Design tab to increase the material thickness to remove these colors.

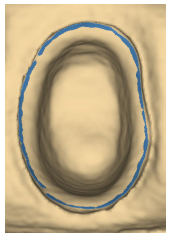
Sprue location good?

Yes

3 Select the **Block** size from the list. If there are no block sizes listed, try a different sprue location or click Settings and select a different material.

4 Click **Sim** and select **Standard.**

5 Click **Gingival** to view the model from below.



Is the blue visible anywhere other than the margin?

Yes

Try a Detailed Simulation.

If blue is still visible on the axial walls, return to the Design tab and increase the spacer.

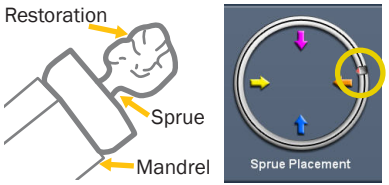
Repeat the Sim.

Repeat steps until satisfied with the Sim.

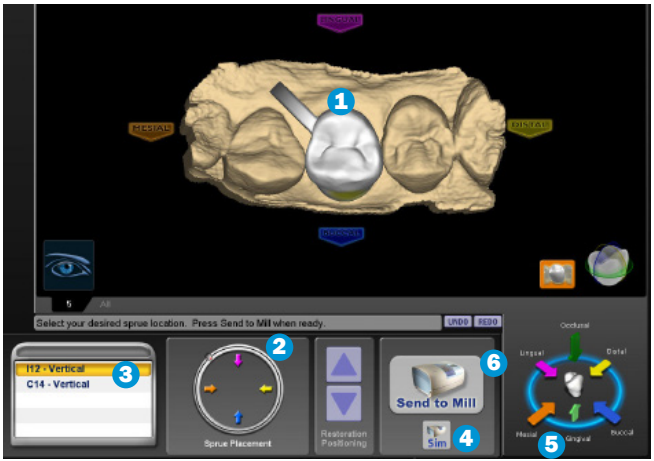
No

6 Click **Send to Mill.**

No



2 To change the location of the sprue, click and drag the placement indicator (circled in yellow) along the circle that represents the exterior of the restoration or click one of the arrows.



After the restoration is milled, remove the sprue and clean thoroughly with toothbrush and water, ultrasonic, or steam clean.

How to use the mouse

 **Select** position pointer on item and click left button to select	 **Rotate Model** press and hold the right button, then drag	 **Zoom Model** rotate the wheel button to change the size of the model on the screen	 **Move Model** up/down, left/right: press and hold the wheel button, then drag.

How to use the Skyball™

The Skyball enables you to pan, zoom, and rotate separately or at the same time. The base of the Skyball does not move, only the cap (top half), moves.

Place the Skyball with the cord facing away from you. Place your fingers on the raised areas of the cap. This helps orient you to match the up/down/left/right of the cap to what's on the screen.

Pan - Use side-to-side motions to move the model straight up and down or left and right.

Zoom - Pull up or push down on the cap to zoom in and out.

Rotate - Tilt the cap in the direction that you want to rotate the model.

Press the right button to re-center the model on the screen. This acts the same as the Occlusal arrow in View Controls. This also re-enables the mouse for moving the model. However, once the Skyball is used, the mouse is deactivated.