UPCAD

UP3D DENTAL SYSTEM

User Manual

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CONTENTS

01 /Install UP3D DentalSystem

1) Download the software installation package from http://www.up3d.cn

Installation package: UP3D DentalSystem 2022-version number.exe

Components include: Orders management (DentalStation), UPCAD(CAD), Model Viewer (Viewer), and Dongle Manager(Dongle Manager) etc.

2) Double-click the installation package, after the language selection box pops up, select your installation language.

UP3D DentalSystem supports multiple languages: Chinese, English, Russian, Korean, Italian, Bulgarian, Turkish, etc. Users can choose their preferred language.

3) Click the OK button to enter the installation guide

4) Click the Next button, select installation directory. The software is installed by default at C:\UP3D. (Make sure the installation disk has enough free space)

5) Click the Next button, select the components that need to install, select all by default.

6) Click the Next button to add a shortcut

7) Click the Next button to create a desktop icon

8) Click the Install button to start the installation

9) The installation is complete

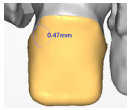
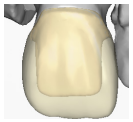
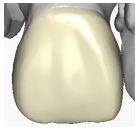
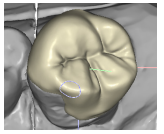
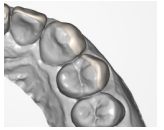
After the software installation is complete, the UP3D DentalSystem and related software shortcuts will be created on the desktop.

02 /UPCAD

UPCAD is a 3D design software developed specifically for dental restorations, which provides fast and easy modelling tools and processes, and makes the complex dental restoration design simple and direct.

2.1 Scope of use

UPCAD design software supports following design types:

Rapid prototyping coping	
Coping	
Reduced coping	
Crown	
Coping bridge	
Crown bridge	
Post and core	
Inlay/Onlay	
Veneer	

2.2 Main interface

Diagram 1

The main interface is composed of these areas as follows:

①Navigation panel ②Visible navigation ③Properties panel

④Application panel ⑤Advanced setting ⑥Tooth position diagram

⑦Order information ⑧Shortcut keys prompt message

2.3 Design process

Coping design process:

Mark tooth position→Detect the margin line→Insertion direction→Gap generation→Coping→Morphing→Export

Crown design process:

Mark tooth position→Detect the margin line→Insertion direction→Gap generation→Template→Morphing→Export

Reduced coping design process:

Mark tooth position→Detect the margin line→Insertion direction→Gap generation→Template→Reduce→Morphing→Export

Inlay/Onlay design process:

Mark tooth position→Detect the margin line→Insertion direction→Gap generation→Template→Morphing→Export

Entire design process including all types:

Mark tooth position→Detect the margin line→Insertion direction→Gap generation→Coping→Template→Reduce→Bridge→Morphing→Export

2.3.1 Mark tooth position

Purpose: Mark the working scope of all the dies.

Steps:

-Based on the tooth position diagram, find the margin line on the buccal side of the die, then click to mark.

-Find the top of the center area of the missing tooth, then click to mark.

> For easier marking, the orientation of the model can be adjusted to a top view (Buccal side toward to the outside, same as the tooth position diagram)
> If there are multiple unmarked teeth, the tooth position diagram will inform each unmarked tooth one by one.
> Inlay, onlay and veneer can be marked on any position of the die, but try to mark it around the margin line.

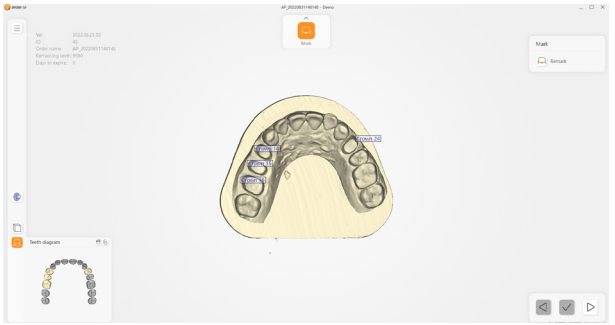


Diagram 2

-Incorrect or inaccurate marking:

Drag the marker by using the left mouse button to the correct position to complete the adjustment.

Click the Remarking button under the properties panel, it will clear the marker that already exists, so you can place a new marker.

-Complete the marking

After all the dies complete the marking steps, click the Next button under the Application panel to enter the next step.

2.3.2 Detect the margin line

Purpose: Generate and edit margin line for all non-missing teeth

Steps:

1) Software will automatically detect and generate a green margin line after entering this step

> ⚠ Margin line cannot automatically be recognized for inlay, onlay and veneer. It requires manual operation for detecting the margin line.

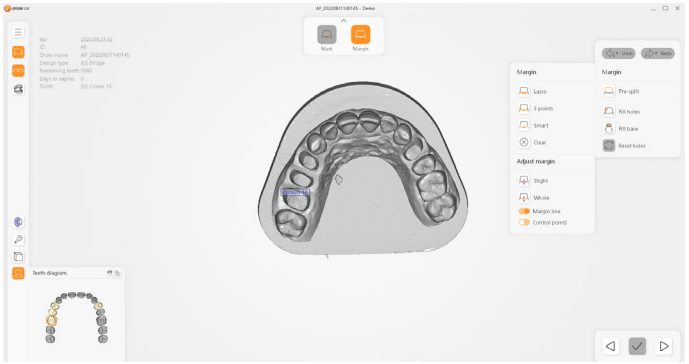


Diagram 3

2) Click the die on the tooth position diagram or [Next] button to switch the dies

3) If the margin line is not generated when entering this step, a prompt will pop up: the margin line of one die is not generated, you should select [Lasso]/[3 points]/[Smart] button to re-edit and generate the margin line.

① [Lasso]: Select the starting point around the margin line of the current die (red dot), follow the same direction, click to select the margin dot (green dot), until the last dot is connected to the first dot, the margin line is complete. Every adjacent two points will have a margin line to connect, users can click to add more control points when the margin line is not in its ideal position to help complete detecting the margin line.

② [3 points]: Click 3 points around the clear margin line area, the margin line will complete detecting automatically.

③ [Smart]: Click 1 point around the clear margin line area, if it is successfully detected, the margin line will complete the detection automatically. If it fails to detect, then click 2 more points around the margin line area to complete the detection.

4) When the margin line needs to be modified, users can use the following methods to adjust the margin line.

① Drawing:

Left click and drag the mouse can start the drawing, which the margin line will show red color. After releasing the mouse, the margin line will be reconstructed according to the red line from the drawing.

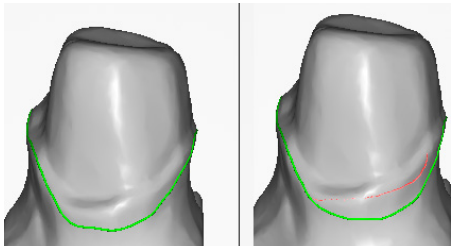


Diagram 4

② Single click:

Left click the mouse around the margin line that needs to be modified, the margin line will be automatically adjusted. Ctrl+mouse wheel will adjust the clicking range.

③Slightly adjust:

Select [Slightly] button, the view will be shown as the current view direction, the red line on the die will be the cross-section. 2D cross-sectional view in the lower left corner of the interface can help to find the correct margin line.

The blue point in the 2D diagram is the blue point of the cross-section on the red line of the die. The control point can be moved by the keyboard [↑]/[↓] keys, [←]/[→] keys to switch the control points.

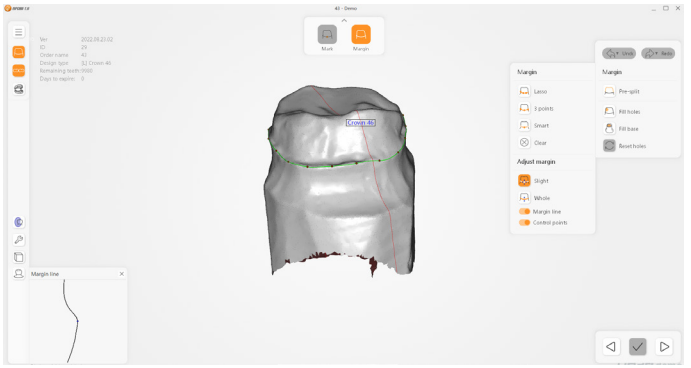


Diagram 5

④ Control points:

Move control points: show control points, users can edit the margin line on both sides of the current control point by dragging it.

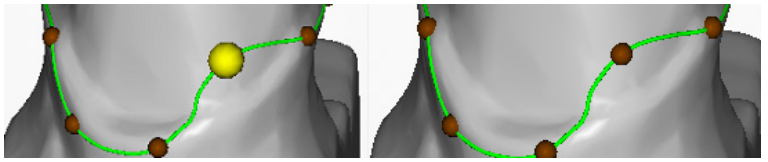


Diagram 6

Add control points: In the area where there is no control point on the margin line, click the left button to add a control point.

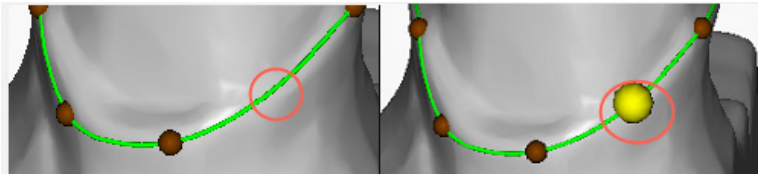


Diagram 7

Delete control points: Click the control point on the margin line, when the control point turns yellow, press [Delete] button or click right button of the mouse to delete the control point.

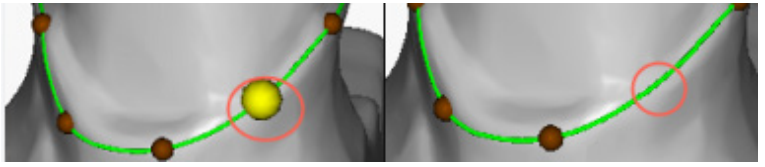


Diagram 8

⑤ Overall adjust: Ctrl+[↑]/[↓] button to adjust the overall margin line. Alt+mouse wheel to control the overall range of the margin line.

5) Other function

① Pre-split: After generating the margin line, click the [Pre-split] button, the crown part divided by the margin line can be generated.

② Show/hide margin line: Shows or hides the margin line of the current tooth position.

④ Control point distance adjustment: Ctrl+mouse wheel, the point distance of the

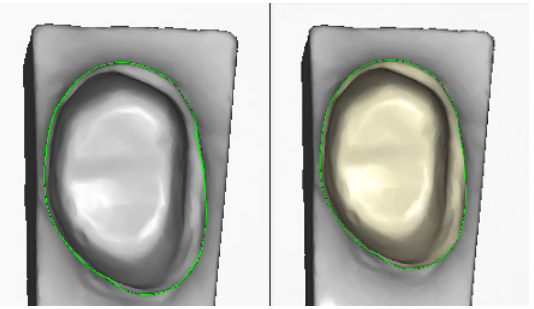


Diagram 9

control points on the margin line will change correspondingly with its distance data.

6) After all of the margin line detection is complete, click [next] in the application panel to enter the next step.

2.3.3 Insertion direction

Purpose: Stimulate the seating direction situation when the dentist put the restoration on the patient's mouth. (For non-bridge tooth position).

Generate inner margin line to distinguish shoulder and non-shoulder areas. Undercuts are used to detect all non-bridge tooth position in the current insertion direction.

Steps:

1) Insertion direction:

When entering the insertion direction step, the first design tooth direction will be shown. The software will automatically generate the best direction, which is the direction where the restoration is seated.

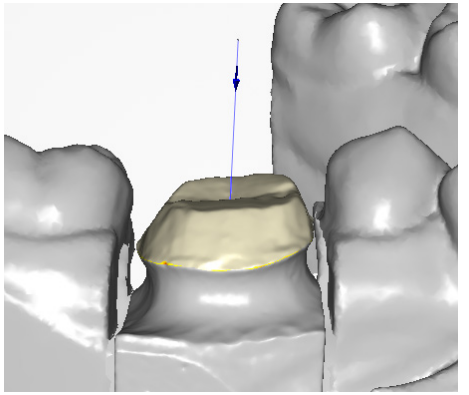


Diagram 10

2) Undercut:

As shown in Diagram 11, the undercut area will be displayed by default on the model, and the undercut depth will be displayed by the color scale (different undercut colors represent different depths).

You can choose whether to observe the undercut through the [Undercuts] option and the [Undercut depth] option in the operation panel, which is the total area of the undercut.

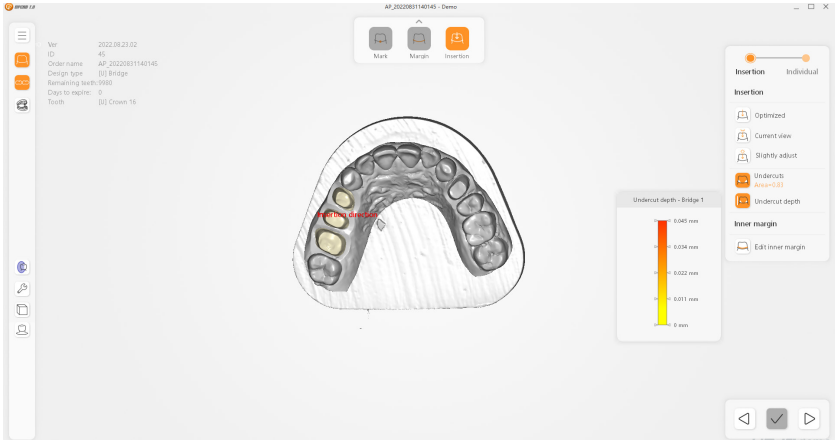


Diagram 11

3) View model:

The [View model] button in the operation panel allows the model to be viewed in the insertion direction.

4) Modify or adjust the direction:

① When needs to change the insertion direction:

Rotate the model in the scene, click [Current view] on the panel or press the [G] button to recalculate the insertion direction in the direction of the current view, and the undercut depth and area have been recalculated.

② Slightly adjust the insertion direction:

Select the [Slightly adjust] button of insert direction on the operation panel to adjust in the scene.

There are 8 blue arrows on the restoration that needs to be slightly adjusted.

Click the arrows according to the current view to adjust the insertion direction.

After each blue arrow is activated, the red curve in that direction is the direction of slight adjustment.

The adjustment range can be modified on the panel, as shown in Diagram 12.

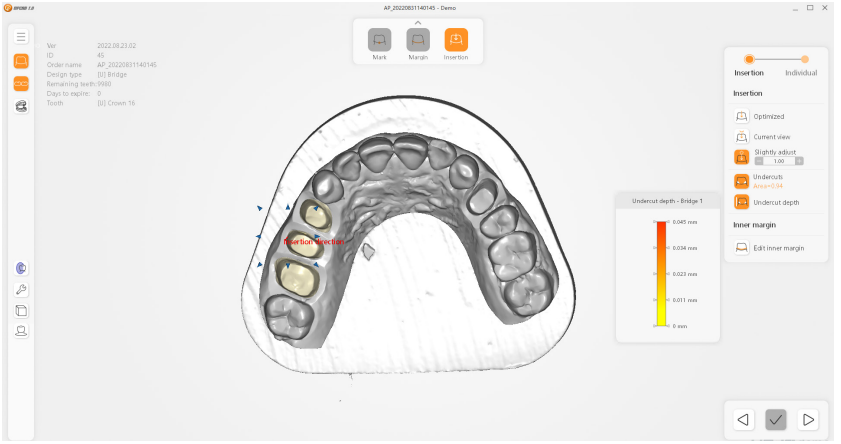


Diagram 12

5) Individual insertion direction

When the restoration type is a bridge, it may be necessary to set the insertion direction of individual teeth.

Click the [Individual] page on the panel (as shown in Diagram 13 and 14) to switch to a tooth position of the current restoration, and the insertion direction of the first tooth position is defined by default.

Other operations of the individual insertion direction are the same as the bridge insertion direction. Unchecking the [Individual] button will cancel the individual insertion direction setting.

⚠	Switch the tooth position by clicking on the tooth or clicking on the tooth position diagram

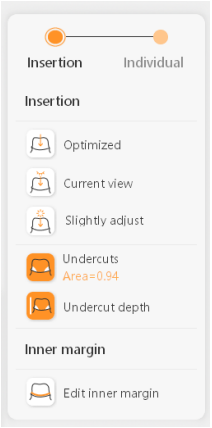


Diagram 13

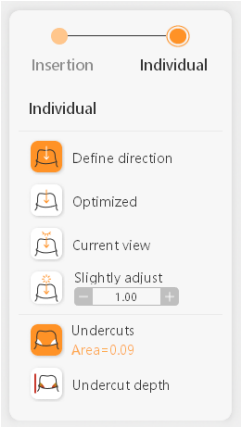


Diagram 14

6) Edit Inner margin line:

Each non-pontic tooth has a red inner margin line. When the [Edit Inner margin] button is selected, the inner margin line can be edited.

① Select [Control points] button, there will be brown balls with equal distances on the red line. Click the left mouse button to drag the ball, and the inner margin line will change with the position of the ball.

② Click the [Margin line offset] button, and set the movement parameters in the parameter box, that is, the distance between the margin line and the inner margin line (width of the shoulder).

③ Click the [Generate] button, the inner margin line will be regenerated according to the set value. Turn on the [Generate all] switch and then click [Generate] to reset the shoulder widths of all teeth according to the offset setting as diagram 15.

Diagram 15

7)Click the [Next] button on the application panel to switch to the next tooth position or enter the next step.

2.3.4 Gap generation

Purpose: To create the gaps (space for cement when the patient wears the restorations) for all non-pontic tooth positions.

Remove undercuts for all non-pontic teeth: removes the undercuts created by the current insertion direction.

Provides drill compensation for all non-pontic tooth positions.

Steps:

1) After entering the gap step, the software will automatically generate all the gaps

2) When the currently generated gap does not meet the requirement, you can modify the parameters according to the requirement in the parameter panel. After the modification is completed, click [√] on the application panel to regenerate the gap:

① Gap type: types of different materials. Select the type in the drop-down box. When different material is selected, the parameters will automatically follow the changes. These parameters are also set in advance in the settings and can be modified according to requirements.

② Extra cement gap: non-shoulder area gap

③ Cement gap: shoulder area gap

④ Occlusal gap: occlusal gap

⑤ Occlusal offset: adjustment of the occlusal area. Positive value means offset upward (maxillofacial), negative value means offset downward. If you feel that the range of the occlusal area is not right, you can try to adjust the insertion direction.

3) Remove undercut:

① The [Remove undercut] switch is turned on by default. If it is not needed, turn off the button and regenerate.

② If the tooth is concave, you can turn on the switch for removing the post and core undercut (after turning off [Remove undercut] switch, the switch for removing the undercut post and core will be hidden).

4) Drilling compensation: compensates for the places where the milling tool is difficult to process during milling.

①The [Drilling compensation] switch is turned on by default, if it is not needed, turn off it and regenerate.

②Drilling compensation radius adjustment (same as gap adjustment, after turning off [Drilling compensation], the parameters of drilling radius are automatically hidden).

-Click [Apply all] button, it will prompt: Do you want to apply the current parameters to other tooth positions of the same type?

-Click [Yes]: all the gaps of the same type of teeth are all generated and displayed and the parameters are the same as the current tooth position.

-Click [No]: all the gaps of the same type of teeth are all generated and displayed and the parameter is its own parameter.

-Click [Cancel]: Cancel all the applications.

5) After gaps of all teeth are generated, click [Next] on the application panel to enter the next step.

Diagram 16

2.3.5 Coping

Purpose: To generate copings for all teeth positions need to be restored.

Steps:

1) After entering the coping generation step, the software will automatically generate all copings.

2) When the currently generated coping does not meet the requirements, you can modify the parameters on the parameter panel according to the requirements. After the modification is completed, click the [√] button in the application panel to regenerate the coping:

① Coping style: Select the style in the drop-down box, when different material is selected, the parameters will automatically follow the changes. This parameter is also set in advance in the settings, and can be modified according to requirements.

② Thickness: the thickness of the coping.

③ Margin line offset: The horizontal offset of the margin line.

④ Offset angle: The angle between the horizontal offset extension line and horizontal offset margin line.

⑤ Extension offset: The offset of the horizontal extension of the margin line.

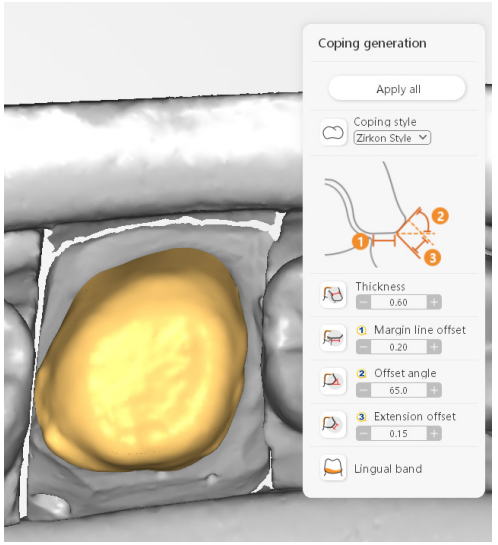


Diagram 17

3) Lingual band:

① According to the parameter settings, set whether to turn on the [lingual band] by default. When it needs to be generated, click [lingual band] to turn on the function.

-Start angle: The starting position of the lingual band area, a blue point.

-End angle: The position where the lingual band area ends, a red point.

-Offset: The width of the lingual band area.

> ⚠ Select the start point and end point with the mouse (the selected point is green), you can change the start angle and end angle by dragging the green point (only effective for dragging in the shoulder area).

② [Lingual band] button is used to hide or show the sub-panel.

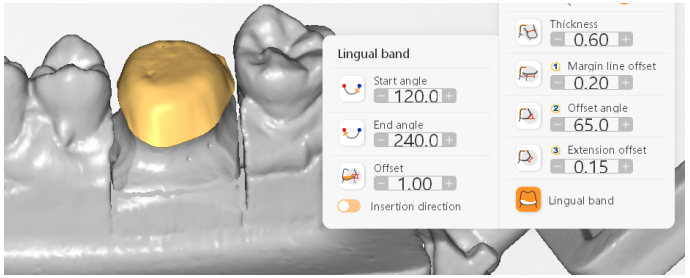


Diagram 18

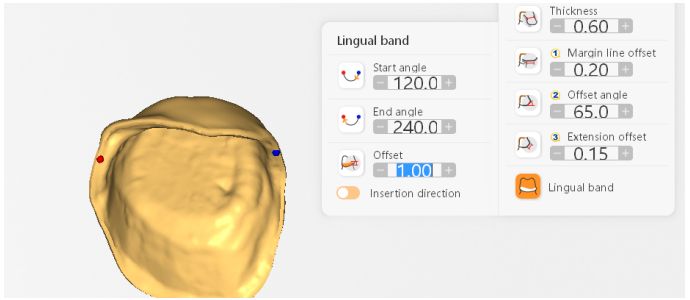


Diagram 19

4) Apply all: Click [Apply all] to apply the default parameters or designed parameters to all copings of the same type.

-When clicks [Apply all], it will prompt: Do you want to apply the current parameters to other teeth positions of the same type?

-Click [Yes]: all the parameters of the same type of teeth are all generated and displayed. The parameters are the same as the current tooth position.

-Click [No]: all the parameters of the same type of teeth are all generated and displayed. The parameter is its own parameter.

-Click [Cancel]: Cancel all applications.

5) After all copings are generated, click [Next] on the application panel to enter the next step.

2.3.6 Template

2.3.6.1Template editing

Purpose: To adjust the position of the template and improve the shape of the template, you can also re-select the template.

Template editing

1) Align Template

Switch to the [Align template] page, and the editing method of [Translate and rotate] is selected by default. On the [Align template] page, you can adjust the position of the template with different editing methods.

-Adjust curve: Select the template and move the mouse and the template on the curve will zoom and adjust the curve radian as a whole.

-Translate and rotate: Select the mouse to move the translation template, Ctrl+left button to rotate the template.

-Translate on curve: Translate the template on the curve.

-Zoom: Ctrl+mouse wheel to zoom in and out of the template.

-Fix: Click the template to display red, and the template is fixed and will not be adjusted (independent template will not activate the fix function).

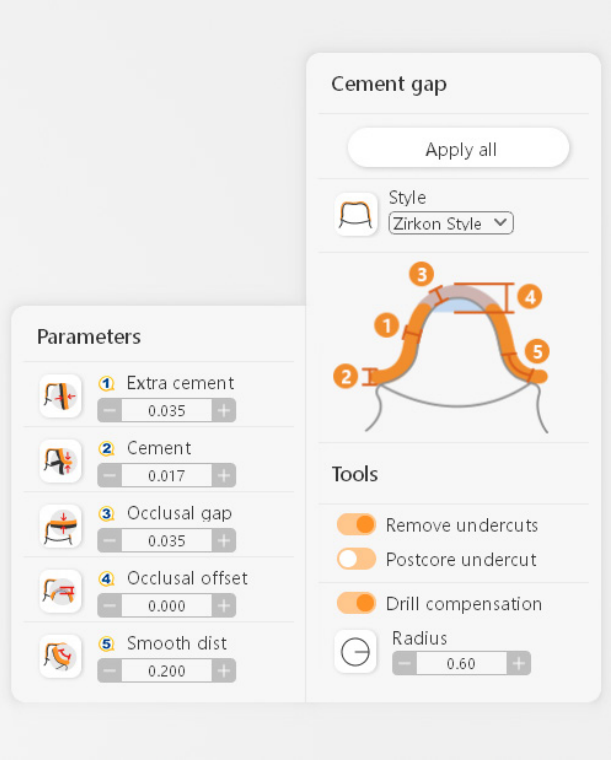


Diagram 20

-Translate and rotate curve: The template on the same curve is the unit, and the curve is adjusted by overall translation and rotation. Activating the [All curves] button, when the curve is translated and rotated, all the curves on the model will be adjusted at the same time.

-Zoom adaptively: Select the template, click Zoom adaptively, the size of the template will calculate the appropriate template size according to the relationship between the size of the tooth, the opposite jaw, and the adjacent teeth. Activate [Apply all] button, it will apply to all templates (except bridge templates) when is adaptive.

-Realign: Reset the adjustment data of all templates under the [Align template] operation.

-Reedit: Reset all data to the initial data state.

2) Sculpt template

After the template is automatically loaded, [Sculpt template] will be enabled by default, and [Morphing] and [All directions] are selected by default.

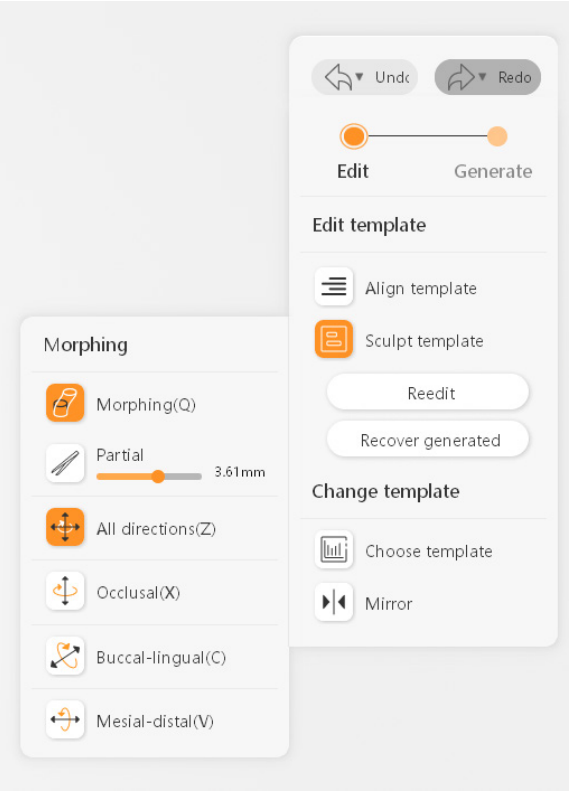


Diagram 21

-All directions: Edit the entire template. (Left button: translate the template in any direction, Ctrl+mouse wheel: overall zoom the template, Ctrl+left button: overall rotate the template.

-Occlusal direction: Edit the occlusal direction of the template. (Left button: translate the template in the occlusal direction, Ctrl+mouse wheel: zooming the template in the occlusal direction, Ctrl+left button: rotating the template in the occlusal direction.

-Buccal and lingual direction: Edit the buccal and lingual direction of the template. (Left button: translate the template in the buccal and lingual direction, Ctrl+mouse

wheel: zoom the template in the buccal and lingual direction, Ctrl+left button: rotate the template in the buccal and lingual direction).

-Mesial and distal direction: Edit the template in the mesial and distal directions. (Left button: translate the template in the mesial and distal directions, Ctrl+mouse wheel: zooming the template in the mesial and distal directions, Ctrl+left button: rotating the template in the mesial and distal directions).

Transform: Shift+left button to drag the template for transformation.

Partially transform: Click the [Partial] button, click or drag the left button to adjust a specific part of the tooth (the mouse wheel or drag and drop the control bar to change the radius of the tool).

> ⚠ Undo or redo the edit by using Ctrl+z , Ctrl+y or via the Undo/Redo button on the application panel.

3)Switch template

Choose template:

① Click the [Choose template] button, the template library of the current tooth position will pop up, and the template library provides a variety of different shapes of teeth.

Double click the template or click the button below the template to select the desired template, and the template of the scene will be updated automatically (move the mouse to the corresponding template position, scroll the wheel button to zoom in and out of the template, right-click to rotate the template, and the mouse wheel to translate the template).

② Apply all: When the [Apply all] button is turned on, replacing the template means replacing the same type of template for all tooth positions. Those with no corresponding template or the generated tooth position will not change.

③ When another tooth template is needed for the current tooth, click the tooth in the tooth position diagram on the left side of the template library (the default is the current tooth), and browse or select the corresponding template in the template library of the selected tooth.

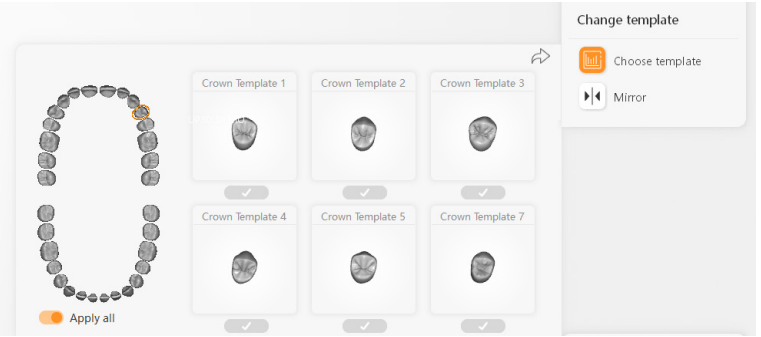


Diagram 22

Mirror template: The left side is the healthy tooth, and the right side is the restoration tooth, copy healthy tooth as template for restoration tooth.

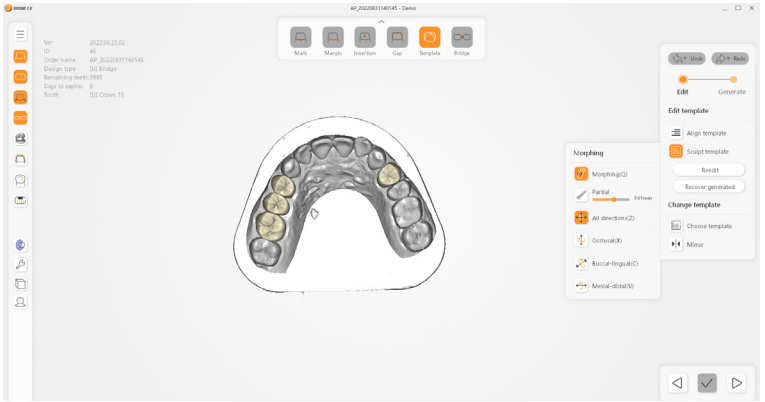


Diagram 23

① Select the [Mirror template] button

② With the buccal side of the healthy tooth facing outward, left-click on the center of the occlusal surface, and the margin line of the healthy tooth will be surrounded by a blue line. Click the [Clear] button to reselect.

③ Drag the control point to adjust the blue line. The method of deleting the control points is the same as the method of deleting the control points of the margin line. When the [Show control points] button is turned off, the control points will be hidden.

④ Mirror: Click the [Mirror] button to complete the mirror copy of the template (the copy of the symmetrical template needs to reverse the mesial and distal directions).

When the mirror function is executed, click other tools in the property panel to automatically exit the mirror function.

⑤ Copy only: Click the [Copy only] button to complete the template copy. Only copy the template on the same side, the mesial and distal directions remain unchanged.

⑥ After mirror or copy only function is executed, the original template on the selected tooth in the teeth diagram will be replaced by the template of the selected healthy tooth. In the case of a bridge template, the template will be automatically closed after mirroring is performed.

2.3.6.2 Template generation

1) When the currently generated crown parameters do not meet the requirements, you can modify the parameters on the parameter panel according to the requirements. After the modification is completed, click [√] on the application panel to generate the crown.

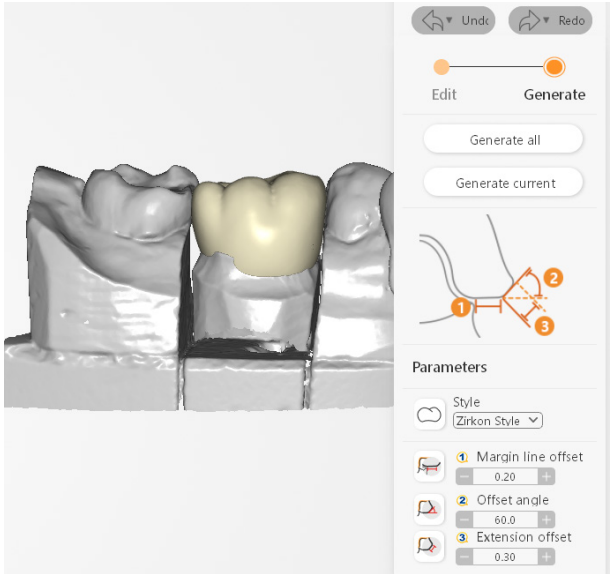


Diagram 24

-Crown style: Select the style in the style drop-down box. When selects different materials, the parameters will automatically follow the changes, this parameter is also set in advance in the settings, and can be modified according to requirements.

-Margin line angle for inlay: The angle of the inlay type restoration margin line, which can be modified in the parameter box.

-Margin line offset: The horizontal offset of the margin line, the parameters can be modified in the parameter box.

-Extension offset angle]: The angle between the horizontal offset extension line and the margin line, the parameters can be modified in the parameter box.

-Extension offset: The offset of the horizontal extension of the margin line, the parameters can be modified in the parameter box.

-Generate all templates: Apply the parameters on the panel to the templates of all teeth positions.

-Generate current tooth template: Apply the parameters on the panel to the currently selected tooth.

2) Click the Apply button to generate all crowns

3) Generate pontic:

1. Generate crown pontic

It is the same as generating a crown, but the pontic does not need to set the parameters.

2. Generate coping and reduced pontic

Same as crown pontic

3. Generate various types of crowns on the bridge

①Generate all the crowns at once according to the sequence of the order

②When there are multiple types of crowns that need to be loaded into the template at the same time, all the templates can be loaded at the same time.

4) Generate inlay, onlay and veneer:

Place the template at the exact position in the editing interface, and click the [Generate] button to generate inlay, onlay, and veneer.

After all crowns are generated, click [Next] on the application panel to enter the next step.

5) After all crowns are generated, click [Next] on the application panel to enter the next step.

2.3.7 Reduced coping

Purpose: To generate reduced copings for all teeth positions to be restored.

1) Sculpt page:

When enters the reduced step will directly enter the sculpt page to edit the model, you can refer to the bridge design steps.

2) Reduced page:

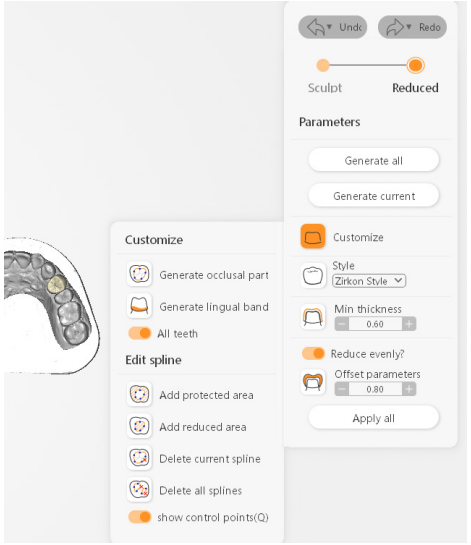


Diagram 25

1. Click the [Reduced page] button to switch to the reduced page.

[Generate all]: Apply the panel parameters to all teeth positions to generate a reduced coping.

[Generate current tooth position]: Apply the panel parameters to the current tooth position to generate a reduced coping.

[Style]: Select the style in the drop-down box of the reduced coping style. When selects different materials, the parameters will automatically follow the changes, this parameter is also set in advance in the settings, and can be modified according to requirements.

[Minimum thickness]: The minimum thickness of the reduced coping.

[Reduce evenly]: Open by default.

① Reduced evenly: [Reduce evenly] button is on

If the parameters are appropriate, directly [Apply] to generate a reduced coping. When the currently generated reducing parameters do not meet the requirements, you can modify the parameters according to the requirements in the parameter panel. After the modification is completed, click the [Apply] button in the application panel to generate the reduced coping.

② Not reduced evenly: [Reduce evenly] button is off

If the parameters are appropriate, directly [Apply] to generate a reduced coping. When the currently generated reducing parameters do not meet the requirements, you can modify the parameters according to the requirements in the parameter panel. After the modification is completed, click the [Apply] button in the application panel to generate the reduced coping.

The parameters of the crown include: buccal and lingual reduced value, mesial and distal reduced value, and occlusal reduced value.

The parameters of the pontics include: buccal and lingual reduced value, mesial and distal reduced value, occlusal reduced value, and gingival compensation reduced value.

Apply all: The panel parameters are applied to all the reduced copings.

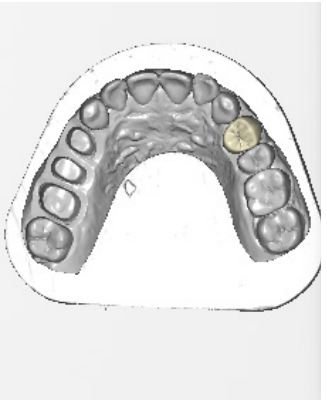


Diagram 26

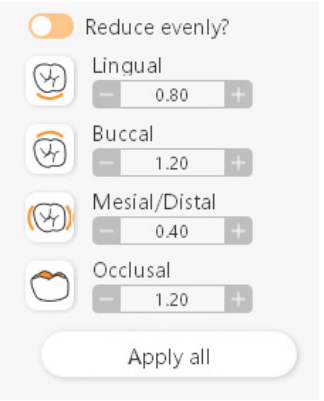


Diagram 27

2. Click the [Apply] button to generate all reduced copings.

3. After all the reduced copings are generated, click [Next] on the application panel to enter the next step.

2.3.8 Bridge design steps

Purpose: To connect multiple adjacent single crowns, or bridges between non-missing teeth and missing teeth to form a fixed bridge.

1. Model editing operation, tools include:

Free morphing: Refer to the morphing when editing the crown template. But the crown only has the function of deformation in the morphing state.

Partial morphing: Refer to the morphing when editing the crown template.

Add wax: Add material, click on the restoration surface to add material, drag the mouse to add wax continuously.

Reduce wax: Remove material, click on the restoration surface to reduce material, drag the mouse to reduce wax continuously.

Partial smooth: The surface is partially smoothed, click the restoration surface to perform smoothing, drag the mouse to continue smoothing.

Strong smooth: Partially strong smoothing on the surface, click on the restoration surface to perform smoothing, the force is strong and the effect is more obvious, mainly suitable for sharp places.

Global smoothing: Smooth the restoration as a whole.

Initialize: Restore the restoration to its original shape.

> ⚠ To adjust the size of the wax range, press and hold Shift + the mouse wheel to adjust the size of the wax range, and you can also slide the slider to change.
>
> To adjust the wax strength value, press and hold Ctrl + mouse wheel, adjust the size of the strength value and also change by sliding the slider.

Cut: Click [Cut] to expand the cutting sub-panel

① Minimum thickness: Execute minimum thickness compensation. (The area marked with color indicates that the set thickness is not reached)

Minimumthickness execution effect:

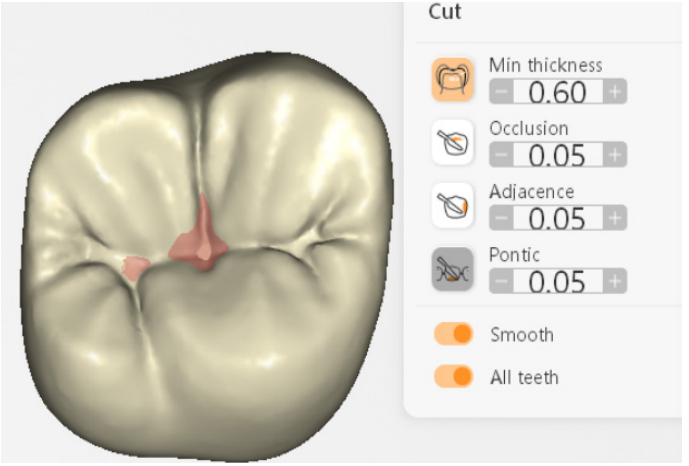
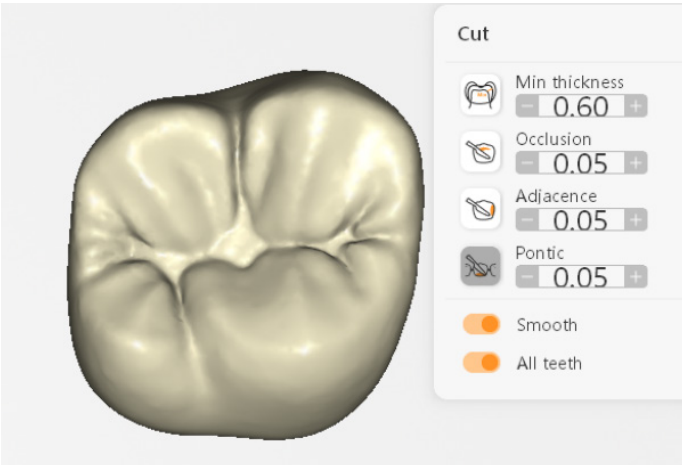


Diagram 28 Before performing the minimum thickness



Diagaram 29 After performing the minimum thickness

② Occlusal cut: Cut the occlusal collision area (the blue range indicates the collision area).

The effect of occlusal cut is shown in diagram 30 and 31.

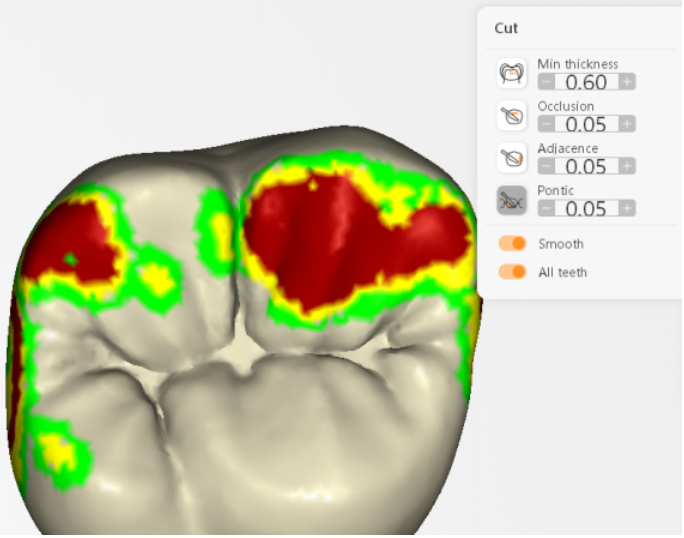


Diagram 30 Before occlusal cutting

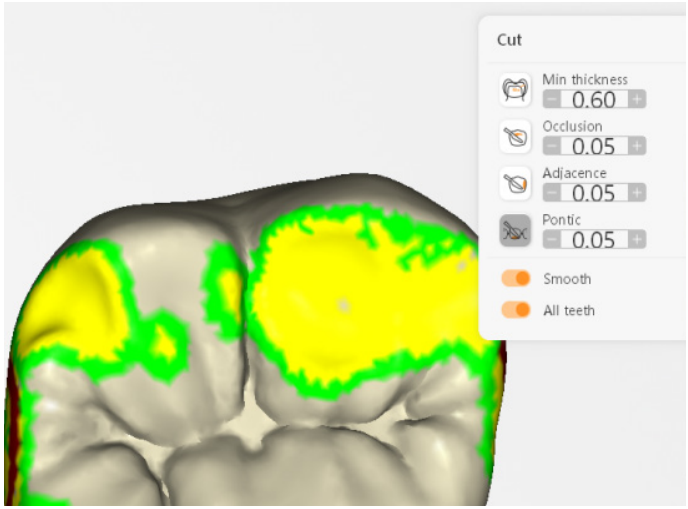


Diagram After occlusal cutting

③ Adjacent tooth cut: Cut off the collision area on the mesial and distal.

The execution effect of adjacent tooth cut is shown in diagram 32 and 33.

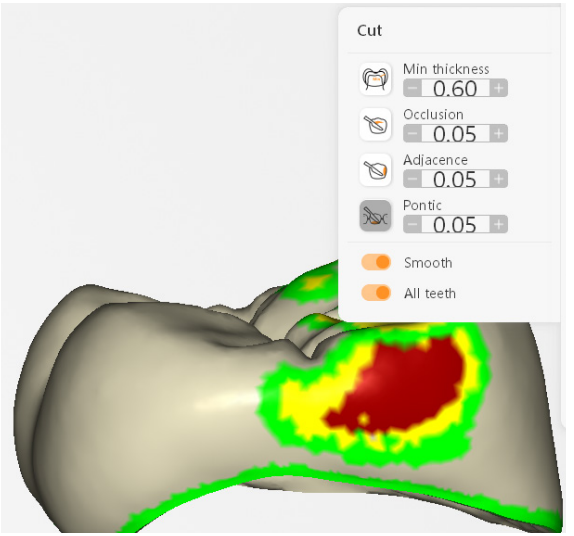


Diagram 32 Before adjacent tooth cutting

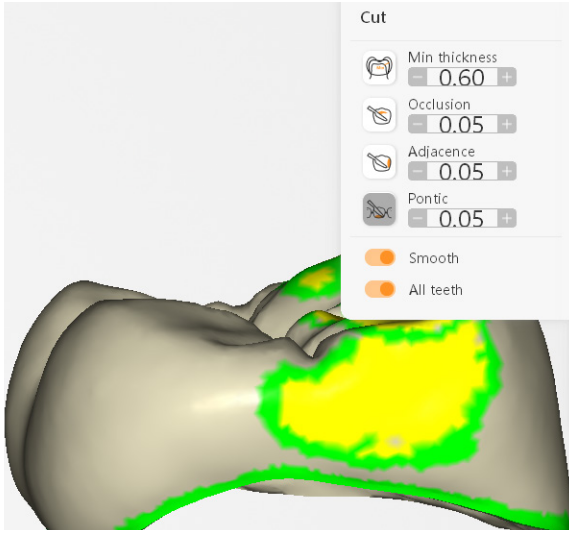


Diagram 33 After adjacent tooth cutting

④ Pontic cut: Cut the bottom contact area of the pontic

Pontic cut result is shown as diagram 34 and 35.

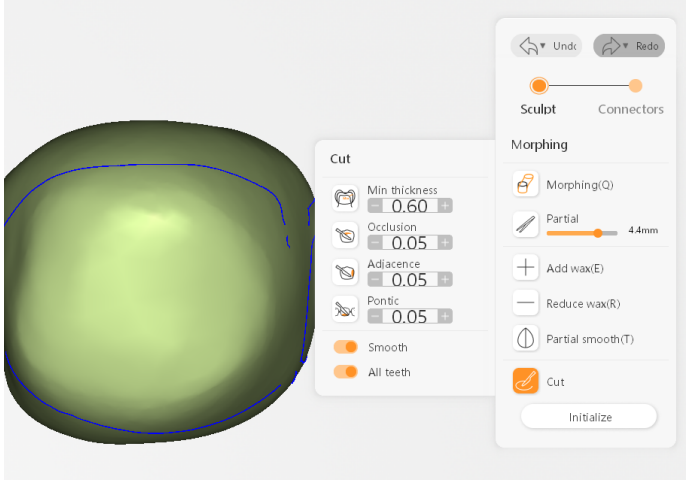


Diagram 34 Before pontic cutting

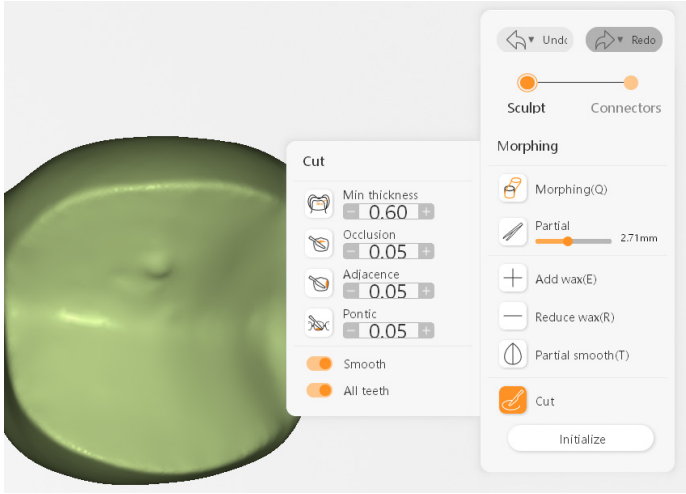


Diagram 35 After pontic cutting

2. Edit connectors

1) Free Editing

① Connectors list: Open connectors drop down button will show the connectors list, at the end of each connector, Y means existing, N means not existing.

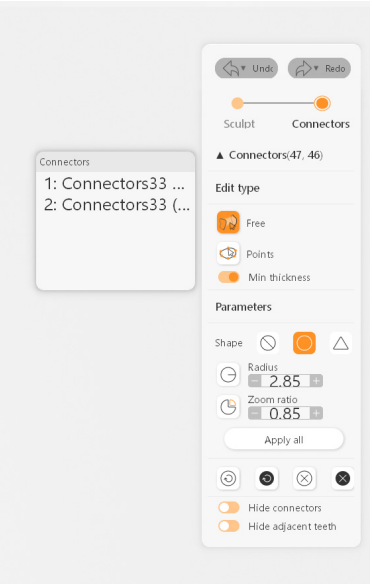


Diagram 36

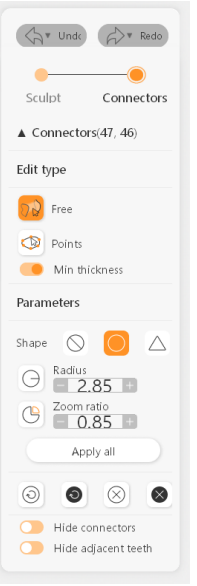


Diagram 36

② Click [Free editing] on property panel will show the connector parameters panel, and the connector can be moved by dragging the left mouse button.

③ Connector parameters

-Shape: Circle and Triangle

-Radius: Adjust the radius size

-Zoom ratio: Adjust the interproximal gap value of the middle of the connector

-Reset all: Reset all connector parameters to initial parameters

-Reset current: Initialize current connector parameters

-Delete all: delete all connectors of this tooth bridge

-Delete current: delete the currently selected connector

-Hide connector: Hide all connections of the bridge

-Hide adjacent teeth: hide the adjacent teeth on both sides of the current connector

2) Points editing

① Click the [Points editing] button on the property panel to display the operation panel for points editing.

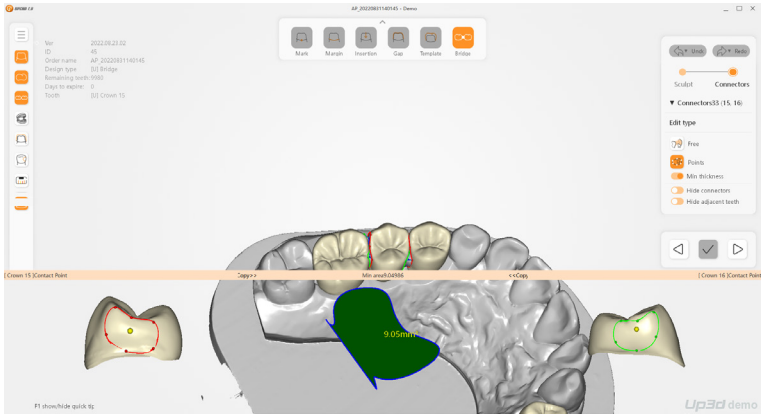


Diagram 37

② Drag the control points on the restoration directly to adjust the position of the connector.

③ Area display: Display the cross-sectional view of the connector. When the area of the connector is too small, it will display red, and when it is normal, it will display green.

3) After all single crown morphing is completed and the connector is adjusted, click [Next] on the application panel to enter the next step.

2.3.9 Sculpting

Purpose: To adjust and sculpt the surface of the crown

1. Single crown sculpting, refer to the bridge design steps

2. Sculpt after bridge is merged

1) Sculpt tools: For sculpting the overall bridge, refer to the sculpting of a single crown.

2) After the bridge is merged, the [Morphing] and [Cut] operations cannot be performed.

2.3.10 Export

Purpose: To export the restoration data in preparation for nesting.

Steps:

1) Click the [√] button on the application panel, and the following dialog box will pop up automatically.

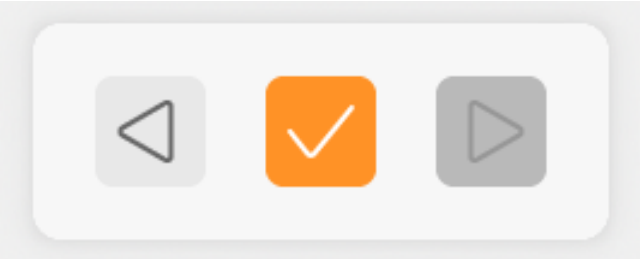


Diagram 38

2) Click the [OK] button to complete the export.

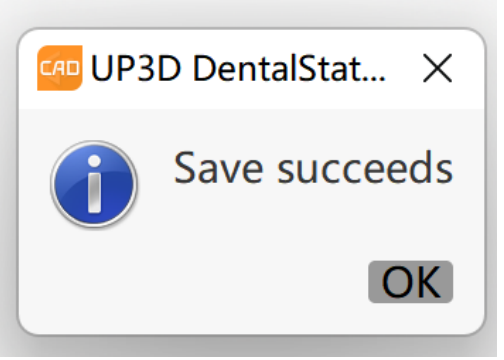


Diagram 39

2.3.11 Other functions

1) View switching

Switch the views in the Viewing panel. You can also use [↑][↓][←][→] on the keypad to control the view direction, but the first-time entry does not work.

2) Shortcut keys description

In each design state, [F1] will be displayed below the scene: display and hide shortcut keys, press [F1] or click the text to display the shortcut keys.

Diagram 40

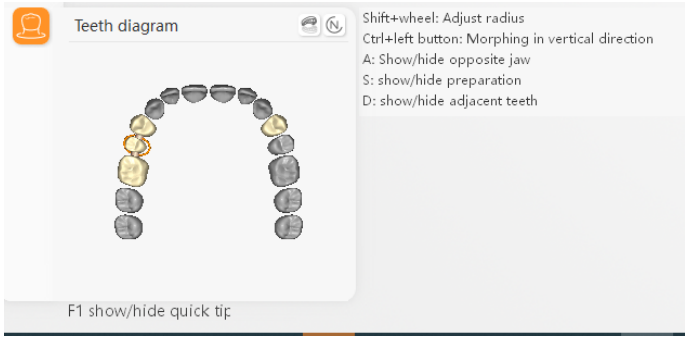


Diagram 41

3) Parameter modification method in each state

① Enter parameters in the parameter box.

② Use the mouse wheel to increase or decrease the parameter.

③ Click the left and right buttons on the edge of the box to increase or decrease the parameters.

Diagram 42

4) Show/Hide panel: Right click in the scene, select the specified panel name in the pop-up panel to display and hide the panel. (As shown in Diagram 43, it is checked, that is, the panel is displayed)

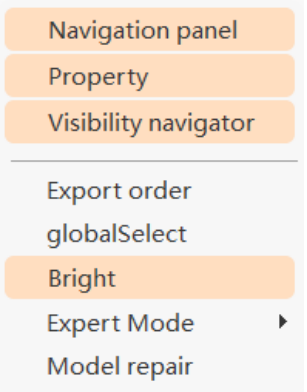


Diagram 43

5) Tools in the visible navigation panel

① Tools list:

	Show/hide the marker point of the preparation
	Turns on/off the 2D section function
	Show/hide the bounding box of crowns or bridges
	Crop the adjacent teeth
	Show/hide the distance from the mouse point to the preparation
	Shows/hides the thickness of the mouse point
	Show/hide the distance between the mouse point and the adjacent tooth
	Show/hide the distance from the mouse point to the opposite jaw
	Show/hide restoration/preparation (Shortcut key S)

	Show/hide opposing jaws (Shortcut key A)
	Show/hide adjacent teeth (Shortcut key D)
	Show/hide minimum thickness layers
	Show/hide output restorations. (Shortcut key F)
	Show/hide collision lines for crowns
	Show/hide quantification map
	Show/hide the collision quantification map of the crown
	Shows/hides the thickness quantification map of the crown
	Show/hide uncut quantification map of crowns

② Tools notes:

When mouse is over the icon, there will be text prompt corresponding function of the icon.

Click the icon above to show/hide the corresponding part, and you can also change the transparency of the corresponding part by dragging the slider or mouse wheel.

The 2D section is mainly used for viewing 2D views and measurements.

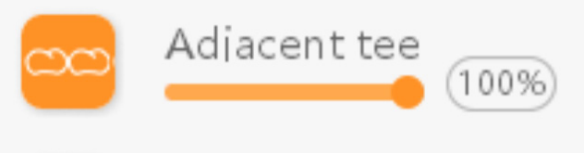


Diagram 44

③ The following focuses on the function of 2D section:

Turn on the [2D section] function, and the 2D section view window will be displayed at the lower left of the main working area. When the section in the scene changes, the view changes in real time.

Generate section: Click and drag the mouse on the model or tooth position to form a section.

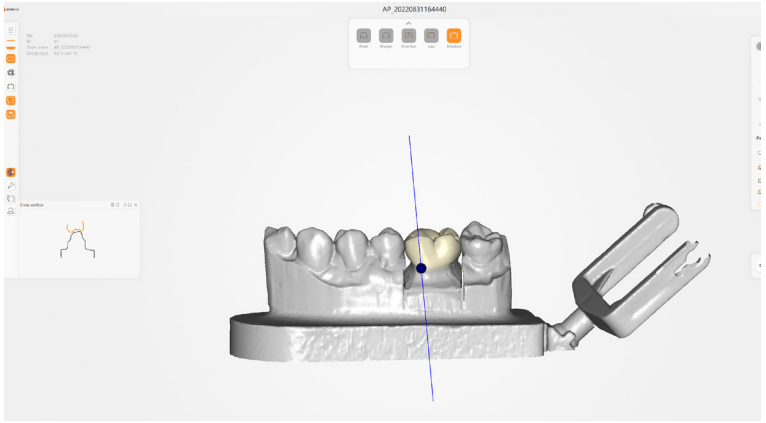


Diagram 45

Translation of section: Select the blue control ball at the center of the section of the scene. When the ball turns yellow, drag the ball to translate the section.

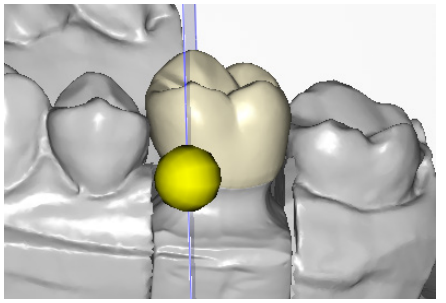


Diagram 45

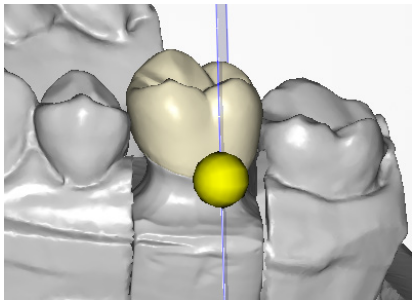


Diagram 47

Section Rotation: When the mouse crosses the edge of the section, the edge of the section will turn yellow. At this time, click the left button of the mouse on the section for any position, there will be a light blue ball, move the ball, you can rotate the section along the red orbit.

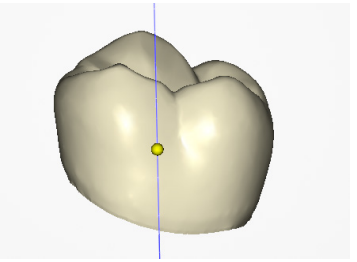


Diagram 48

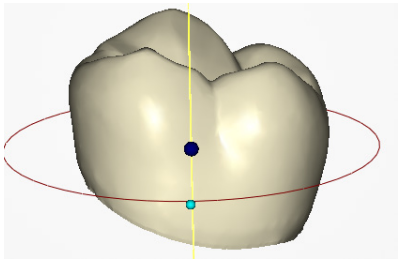


Diagram 49

Measure distance: Click two points on the 2D view to measure the distance between two points. In the scene model, the two currently selected points will also be automatically positioned.

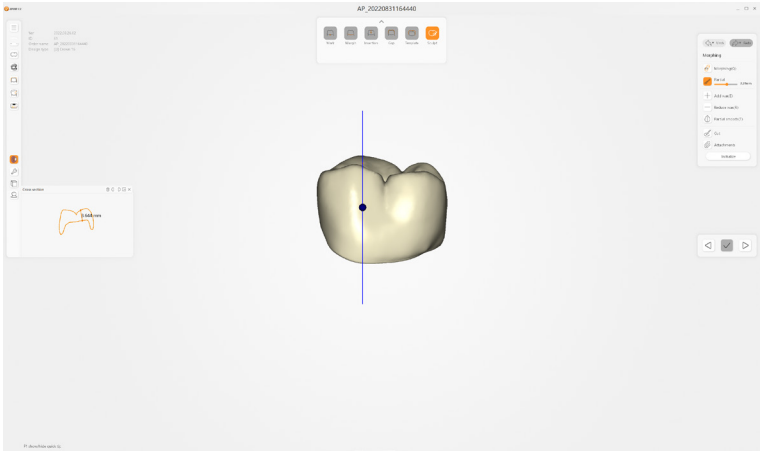


Diagram 50

Buttons function in section view:

Translate and zoom in 2D section view is same as scene model.

Clear: Clear the measurement data.

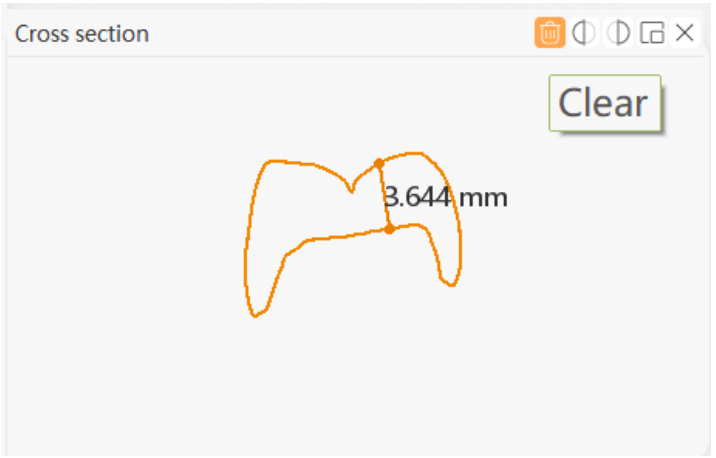


Diagram 51

Crop left: Taking the current section as the limit, hides the left model in the scene for easy observation.

Crop right: Taking the current section as the limit, hides the right model in the scene for easy observation.

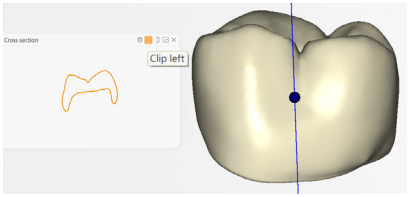


Diagram 52

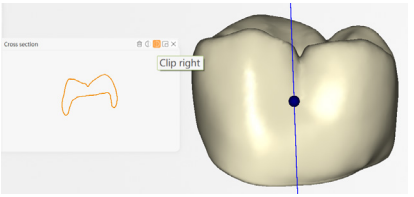


Diagram 53

Zoom: Restore the result position and size in the 2D section view.

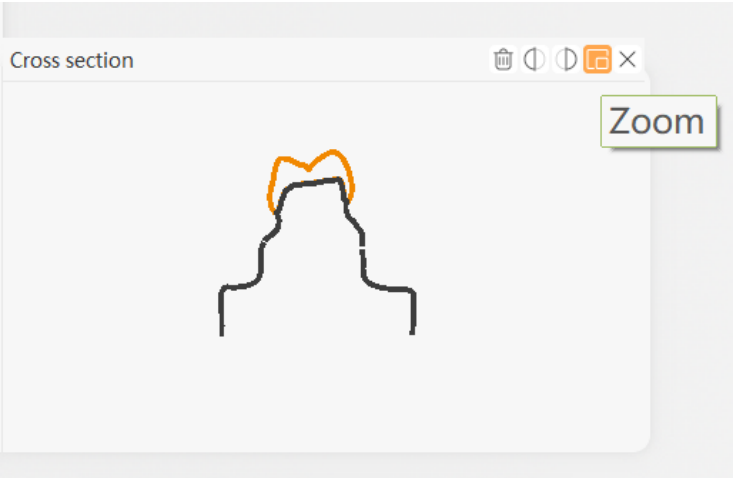


Diagram 54