Tizian™ Creativ RT
CAD-Modelling Software for Dental Technology

Software Version 3.932
Instruction Manual
Description of the software

Three-dimensional models are created with help of this CAD-Construction Software Tizian™ Creativ RT. These CAD models serve as input data for CNC-milling.

1. Opening the software

The workflow icon opens the modelling software Tizian™ Creativ RT (one left click on the mouse).

The modelling software will automatically open the scanned situation entered in the workflow.

Example:

The screen is divided into different areas.

1. **Scanned model**
   The virtual model create by the scanner software, on which the technical construction is carried out.

2. **Function field „guide“**
   This guides you through the virtual modelling.

3. **Function field „show and hide groups“**
   In this function field you will find a list of the particular tooth areas of the virtual models. By setting or deleting the check marks, those areas are displayed or hidden.
On top right side of the screen, you will find 3 icons:

- Minimize the CAD-software display
- Downsize CAD-software window
- End CAD-software

2. Operation/keyboard shortcuts

The software functions such as entering and confirming commands as well as turning, moving and scaling the three-dimensional model are operated with different mouse and keyboard shortcuts. Please find them below:

- right mouse button: turning the virtual model by permanently pressing the button and moving the mouse at the same time
- left mouse button: confirms the entries/selection by clicking once
- both mouse buttons: moves the model within one plane by permanently pressing both buttons and moving the mouse at the same time
- mouse wheel: Pressing briefly changes the rotation axis in the line of vision (a green spot lights up briefly to confirm). The model is centered on the screen. Scrolling changes the values in the slider controls and zooms the model in or out (zoom function).
- Shift: when used in the function "wax knife": removal of material when used in the function "smoothing": increased removal of material
- Strg (Ctrl): scaling
- arrow keys: moving the model within the same plane

3. Bridge modelling (by following example)

Created in workflow: Start screen of the CAD-software:
3.1 Preparation margin detection

When opening the software, the following function field is found on the left side of the screen:

The function field is divided into two tabs, 1. Detect, 2. Correct/Draw. The tabs are selected by left-clicking. The white tab is active, the grey one is inactive.

The preparation margin must be determined separately for each stump. The software offers the stumps to be designed in the correct order (in this picture, tooth 16 is displayed).

**Note:** It is important to ensure that the correct tooth is worked on. Mix-ups lead to mistakes and problems with the further design of the teeth (e.g. models are loaded with an incorrect stump).

To begin the calculation, move the cursor (cross) onto the preparation margin of the requested stump (black cross in red circle). The line displayed in the red circle represents the magnified cutting plane about the cross. The apex of the of the curve is the ideal starting position for the calculation of the preparation margin. The blue arrow shows the current position of the cursor. When you press the left mouse button the calculation begins.

The determined margin will be displayed in red, the point already set will be displayed in pink.

The button **Add point** offers the possibility to set other points, which can be incorporated in the calculation of the preparation margin. This especially makes sense when working on very challenging preparations where the automatic preparation margin calculation does not provide a satisfactory result.

Points that are incorrectly placed can be removed with **Remove Point**. Click on **Remove Point** and then press on the point to be removed. **Adjust light** changes the illumination/shading of the model. The first time, the calculation of the preparation margin starts automatically. After adding and/or deleting further points another calculation will follow only after pressing **Start.** **Stop** stops the calculation and **Clear** erases all points.
The functions of the second tab **Correct/Draw** can optimize the determined preparation margins:

The preparation margin will be displayed as a green string of balls. When moving the cursor onto one of these balls and pressing the left mouse button, any of these balls can be moved and the margin with them. The line displayed in the red circle represents the magnified cutting plane around the selected ball (orange).

Other balls can be created by clicking on the line.

Particular can be moved with by clicking **Move**. This will not have impact on the neighboring points.

The margin is moved dynamically with **Up/Down** (the mouse jumps to the next point automatically). To do so, move the cursor along the preparation margin.

**Draw** facilitates adding margin segments and/or changing the run of the curve. After drawing the changed margin segment, this will be added to the source margin when activating **Accept drawing changes**.

**Move margin up/down:**
With help of the slider or a numerical value, the complete preparation margin can be moved. To do so, move the slider or enter the value, afterwards activate **Move**.

The **Undo** reverses the last entry. The **Redo** button repeats the last entry.

To finish the work step **Preparation margin detection** press **Next**. If there are more stumps to prepare, the function field **Preparation margin detection** will open again. Repeat the described procedure with the stump that the software requests.

The stumps already processed marked white for better identification. The designation can be found above each stump.

**Back** can always reverse a work step.

When all stumps are prepared, open the next work step by pressing the **Next** button.
**Tip: Changing the rotation axis**
Generally, the rotation axis is in the middle of the complete model which means that the complete model is always rotated. When optimizing the preparation margin it is expedient to change the rotation axis so that only the selected tooth stump is rotated.

To do so, the stump must be rotated into the occlusal view. Afterwards, place the cursor arrow in the middle of the occlusal surface and click the mouse wheel once. A briefly illuminated green point marks the new rotation axis. In this case, the selected new rotation axis leads through the tooth stump (z-axis).

3.2 Insertion direction

While the calculation of the insertion direction is running, the left dialog field is shown on the screen. After the calculation has been concluded, the right dialog field will appear.

![Image of insertion direction dialog](image)

The picture shows the bridge construction created in the workflow.

The box for **Unique insertion direction for bridges** is checked.

Click the orange triangle under **Define insertion direction for** to receive a list of those objects for which an insertion direction is to be determined. In the example it is a bridge 16-11.

The crowns belonging to the object shown in the list will be displayed grey-transparent on screen.
If the construction is not created as a 6-unit bridge in the workflow, but as a bridge 11-13 with three single copings on 14, 15, and 16, the following dialog field will appear.

In this case, the drop-down menu contains the following entries:

Meaning of different colors in the tooth scale:

- **grey teeth**: insignificant
- **lightblue teeth**: support posts (displayed transparent)
- **darkblue teeth**: pontics
- **white teeth**: single crowns

**Defining the insertion direction**

Select the point of view looking down onto the occlusal surface of the grey copings. Other view points will lead to faulty calculations of the insertion direction.

Align the crowns so that all margins are visible. Any undercuts visible in the according view will be displayed red.

Afterwards, click the button **view → insertion direction**.

Check the insertion direction by changing the view. Undercuts/shadows are highlighted. Different colors mark the different thickness of the undercuts. Find a description the color scale in the field **Undercut marker**.

Click **next** to finish the workstep insertion direction and start the next workstep.
3.3 Crown bottom (edge and cement gap design)

As long as the calculation of the insertion direction is running, on the screen will appear the left dialogue field. After the finished calculation the modulation is displayed as follows.

Pink Arrow: The stump has undercuts, which may not be milled if a four-axis-milling unit is used (defective areas) or which could result in a hollow space in the object if they are blocked out up to the prep margin (see p. 10, tab undercuts).

Green Arrow: The stump is free of critical areas.

The function field Guide – Crown Bottoms is divided into three tabs (pages). Switch between the pages by clicking on the corresponding tab. Conclude the workstep by clicking Next. Changes will be saved automatically. Pressing Back will lead to the workstep "insertion direction".

The parameters on the tab Gap affect the fit of the crown.

The parameters can be modified by moving the slider or by changing the numerical value. The changes are immediately adopted in the 3D model.

The cement gap applied is displayed in a golden color. The crown border displayed in pink does not contain a cement application.

Thickness: Thickness of the cement gap

Start: Start of the cement gap

End: end of the cement application

Additional distance: Offers the possibility to create additional occlusal or cervical space. This could be necessary i.e. when producing knife edge preparations.
The parameters on the tab **Border** affect the border design of the crowns.

The four parameters are explained with an illustration.

The parameters are changed by moving the slider or by changing the numerical values.

The changes are immediately adopted in the 3D model.

In general:
- The longer the segment 1, the more stable is the border.
- The longer the segment 2, the more stable (bulging) is the border.
- The smaller the angle 3, the more stable the border.

The tab **Undercuts** offers the possibility not to block out the undercuts.

If you put a check mark in the box next to **Don't block out undercuts**, undercuts will not be blocked out on this stump.

Define the angle for the insertion direction used for blocking out with the slider **Angle**. 0° means insertion direction = blocking out direction

Slider **Size** determines the area around the preparation line which shall not be blocked out. **Apply** implements the changed parameters.

**Example**: A value of 1 mm means that all undercuts in a distance of more than 1 mm from the border are blocked out. Entering this information avoids hollow spaces in the border areas, i.e. protruding borders.

**Tip**: In case of conically prepared or strongly divergent stumps, it is recommended to set the value **Size** to 0 mm and to accept a slightly protruding border (open margin). Otherwise, an extreme amount of fitting would have to be done when using a 4-axis-system. For better identification, these open margins are displayed in pink when selecting **Show Undercuts**.

The information under **Milling** must not be changed, as the milling machine needs this information (diameter of the smallest milling bur + 0.1 mm tolerance).

Finish this workstep by pressing **Next**.
3.4 Offset coping

After the calculation is finished, the model will be displayed as shown below. Offset copings were set over the stumps 15 and 16, as created in the workflow. In the next step, anatomic crowns are designed over the copings displayed in red. Generally, offset copings are created first, anatomic crowns are created subsequently.

![Offset coping diagram](image)

The function field **Guide – Free-forming** is divided into three tabs (pages). Switch between the pages by clicking on the corresponding tab.

The functionalities on tab **Anatomic** are going to be explained in point 3.7.1. When working with offset copings, the functions “complete tooth” and “tooth area” can be used (see p. 13).

The tab **Free** offers the virtual wax knife as well as the smoothing tool.

**Add/Remove (virtual wax knife)**

Material is applied by pressing the left mouse button and moving the cursor over the desired area. Material is removed by pressing the left mouse button and the Shift-key simultaneously while moving the cursor over the desired area.

The system will not go below the selected minimum thickness of the coping.

**Smooth/Flatten**

Press the left mouse button and simultaneously move the cursor over the surface to be smoothed. Some material will be removed during smoothing. When pressing the left mouse button and the Shift-key simultaneously for smoothing, more material is removed during smoothing.

For details on the **Brush** functions please see point 3.7.2.

Press **Back** to return to the workstep crown bottoms.

Pressing **Next** finishes the work step **Offset-Coping**.
3.5 Positioning of anatomic crowns

As long as the calculation of tooth positioning is running, the window on the left will be displayed. The model is displayed as shown below. All finished offset copings are displayed in white.

After the calculation is finished the window shown below will appear and the model teeth (displayed in yellow) will be loaded over the stumps, which were until then displayed in red.

Tooth positioning follows in this workstep:

- **Move Tooth**
  Move individual teeth by selecting this button.

- **Rotate Tooth**
  Rotate individual teeth by selecting this button.

- **Scale Tooth**
  Change the size of individual teeth by selecting this button.

  **Tip:** The closer to the outside margin of the crown the cursor is applied, the smaller the effect which makes scaling much easier.

The alternative **All directions** offers the possibility to make modifications in all directions. Selecting one of the other alternatives below allows only modifications in the selected direction.
Tip: Select **Move tooth - all directions** to use functions additional to the moving functions by means of so-called hot keys.

1. Ctrl + left mouse click = turn the tooth
2. Shift + left mouse click = zoom

### 3.6 Positioning of anatomic crowns

After clicking **Next**, the positioned teeth will be adjusted to the stumps. The below window appears during calculation. The adjusted teeth will be displayed as shown below.

![Positioning of anatomic crowns](image)

### 3.7 Free-forming

After the teeth were adjusted to the stumps, the function field **Guide - Freiformen** opens. It contains three tabs (pages). This field offers tools to design the teeth and to modify their appearance. Switch between the pages by clicking on the corresponding tab.

#### 3.7.1 Anatomic

After pressing the corresponding button, the position of the selected tooth sector is changed. Place the cursor on the according tooth area, keep the left mouse button pressed and move the tooth into the desired position.

**Cusps:** Changes the position of the cusps.

**Tooth Parts:** Changes the position of the tooth parts.

**Entire Tooth:** Changes the position of the entire tooth.

**Ridge:** Changes the position of individual ridges.
3.7.2 Free-forming (wax knife, smoothing)

Add/Remove (virtual wax knife)
Material is added by pressing the left mouse button and moving the cursor over the desired area. Material is removed by pressing the left mouse button and the Shift-key simultaneously while moving the cursor over the desired area.

The system will not go below the selected minimum thickness of the coping.

Smooth/Flatten
Press the left mouse button and simultaneously move the cursor over the surface to be smoothed. Some material will be removed during smoothing. When pressing the left mouse button and the Shift-key simultaneously for smoothing, more material is removed during smoothing.

Brush or Wax Knife

Strength: Change the quantity of material being added or removed by moving the slider (moving the slider to the right = more material).

Brush Size: Change the diameter of the wax knife by moving the slider (moving the slider to the right = bigger diameter)

Brush Type: There are three different wax knife shapes. The select list is opened by clicking on the orange triangle.

1. Standard (round) 2. Knife point (for fissures) 3. Cylinder
3.7.3 Pontic

The functions on the Pontic tab allow the user to adjust the pontics to the gingiva.

**Spacing**
The distance to the gingiva is set by moving the slider or changing the numeric value.

After setting the required distance, the calculation is started by pressing the **Adapt to gingiva** button.

If the pontic sits high above the gingiva, it can be moved and adjusted to the gingiva by setting a check in the box next to **Pull down to gingiva** and then pressing the button **Adapt to gingiva**.

![Before adapting to the gingiva](image1.jpg)  ![After adapting the gingiva](image2.jpg)

If the Next button is pressed without previously adapting to the gingiva, the following dialog field opens:

**Ja/Yes**
Adaption will start subsequently.

**Nein/No**
No adaption will be carried out.

**Tip:**
After adapting to the gingiva, hide the jaw data and smooth the bottom of the pontic with help of the according free-forming function.

Pressing **Next** finishes the workstep **Free-forming**.
3.8  Adaption to an antagonist and to neighboring teeth

Once free-forming is concluded, the function field Guide - Antagonist/anterior adaption will open. This workstep includes the adaption to antagonists and to neighboring teeth. Switch between the pages by clicking on the corresponding tab.

3.8.1  Occlusion settings, static

A dynamic occlusion setting is only possible with the additional tool **Virtual Articulator**.

### Cut Intersections
Cuts intersections without consideration of the tooth shape.

### Shape-Preserving Adaptation
Adapts intersections to the antagonist while conserving the tooth shape.

### Distance Anatomic Parts (anatomic distance)
The distance that is to be between crown and antagonist after adaption, can be preset here.

To obtain the best possible result, first adapt while conserving the tooth shape, then remove the remaining faulty contacts by pressing **Cut Intersections**.

**Tip:** With help of the tool **Distance to Antagonists** the distances can be displayed accurately in terms of color. For the use of this tool, please see point 12.1.

**Note:** If the construction you are designing contains offset copings, the following dialog field will open when using the above mentioned tool. It merely informs the user that an adjustment of occlusion cannot be carried out for offset copings. Confirm with **ok**.
3.8.2 Adjustment procedure for interproximal contacts

**Cut Intersection**
Cuts intersections without consideration of the tooth shape.

**Shape-Preserving Adaptation**
Adapts intersections to the antagonist while conserving the tooth shape.

**Distance Anatomic Parts (anatomic distance)**
The distance that is to be between crown and antagonist after adaption, can be preset here.

**Pull sideways to adjacent teeth**
Produces contact points with a neighboring tooth.

The best result will be achieved as follows:

To obtain the best possible result, first adapt while conserving the tooth shape, then remove the remaining faulty contacts by pressing **Cut Intersections**.

**Example:**

<table>
<thead>
<tr>
<th>before the adaptation</th>
<th>after the adaptation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(faulty contacts are displayed in blue)</td>
<td>(contact points have been generated)</td>
</tr>
</tbody>
</table>

Pressing **Next** finishes the workstep **Adaptation to an Antagonist and Neighbor Teeth**.
3.9 Reduction (shrinkage) of anatomic crowns/pontics

Following, the function field Guide - Shrinking will open. This workstep includes the reduction of the anatomic crown/pontics to make room for the ceramic facing.

**Shrinking**

**Minimum Thickness**
Wall thickness that cannot be undercut.

**Depth**
To make room for the ceramic facing, the fully anatomic form is reduced by this distance.

**Exclude parts**
**Exclude selected parts**
Offers the possibility to mark areas which are not to be reduced, e.g. charting the collars (see below). These areas are displayed in violet.

**Brush Thickness:** Brush diameter, i.e. moving the slider to the right will expand the brush.

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**Example - Collars:**

**Less shrinkage on lingual side**
**Lingual**
The amount of reduction on the lingual side is adjusted with the slider or by changing the numerical value.

**Apply only to anterior teeth**
If this box is checked, only the anterior teeth will be reduced lingually by the preset rate (100 % = no shrinkage).

Pressing **Apply** will start the reduction.

Pressing **Next** will finish the workstep **Free-forming**.
3.10 Positioning of the Reduced Pontic

This workstep offers the possibility to correct the position of the reduced pontic (displayed in yellow in the below right picture). All functions of the function field are defined in point 3.5/page 12.

Pressing Next will finish the workstep.

3.11 Connector Design

Subsequent to free-forming the Guide - Connector will open. This workstep includes the connector composition.

There are three ways to position connectors freely.

1. Move the entire connector

Click the left mouse button to move the entire connector. After releasing it, it will reintegrate into the bridge construction.

2. Changing the position of the connector (docking points)

Each connector has two docking points displayed in light yellow. Left-click while keeping Ctrl pressed to move those points. Release the buttons to fix the point in its new position.
3. Forming while keeping the docking points in place

After selecting a connector, keep the **left mouse** and **Ctrl** buttons pressed to shape the connector. The docking points will be kept in place.

The **dialog field** shown below has **two tabs**.

Define the basic parameters in tab **Shape** to define the basic parameters of the connectors.

![Dialog field](image)

**Basic parameters:**

- **Set connector cross section**
  Generates connectors with a preset width.

- **Set connector height and width**
  Generates connectors with a preset height and width.

- **Cross Section**
  Moving the slider or changing the numerical value will change the connector width. To implement the changes, press **Apply cross section/shape change**.

- **Visualize connector thickness**
  Displays the course of the connector width in terms of color.

- **Shapes**
  The selected cross section shape is displayed in yellow.

  Switch between the black shapes by clicking. To implement the changes, press **Apply cross section/shape change**.

**Note: Changing individual connectors**

The preset size and shape always apply for all connectors. Once the modellation is finished, individual connectors can be modified by subsequent modification. Please also see point 11.3.
Free-form i.e. individually create the connectors with help of so-called **control points** in tab Free.

The connectors are displayed in different colors.

The **color scale** illustrates the different connector thicknesses.

The connectors are separated into three lines. The so-called **control points** are set along those lines. Those points can be moved to the desired spot by clicking them with the left mouse button and grabbing them. The values above the connectors show the present dimension.

**Examples:**

Pressing **Next** will finish the workstep.
Connecting crowns subsequently:

To connect crowns that were not connected in the workflow, proceed as follows:

Right click onto the crown to be connected. The following menu will open:

To create a connector, press the buttons **Connect to mesial neighbor** respectively **Connect to distal neighbor**.

The new connector will be inserted into the construction.

Repeat this process until all required connectors are created.

!!! It is very important to define a common insertion direction for a bridge !!!

3.12 Saving the construction

The bridgework is automatically merged into one complete structure. The finished bridge is displayed in green.

**Remove existing merged parts**

Erases the final complete structure. The single components are preserved.

**Optimize for selective laser melting**

Optimized the complete structure which is to be milled, i.e. passages are smoothed additionally.

Pressing **Finish** will open the following screen:
This structure can be modified retroactively. Please also see point 11.

Press this button to close the software and to return to the workflow.

The following dialog field opens:

Confirm with **Ja/Yes** to save the scene in the project directory, i.e. to be able to reload the scene when opening the software again. The user can also save each workstep at any time. After closing the software and reopening, the user can resume his work at the position saved last.

4. **Fully anatomic bridges (anatomic crown and pontic)**

The procedure to create a fully anatomic bridge is mostly the same as the procedure to create a reduced anatomic bridge.

Please also see points 3.1-3.12
5. Overpressed crowns

Overpressed crowns correspond to fully anatomic crowns which are created up to the anatomical equator. The margin must be waxed on manually.

Starting with finding the prep margin all the way to producing a reduced anatomical crown, the procedure for the production of overpressed workpieces is identical to the procedure of a bridge modellation shown in the study case.

Please also see: 3.1-3.9

The following function field opens after saving the reduced anatomic crown. The overpressed crown is created. The different colors on the crown display the different distances to the anatomy.

Cut Off
In accordance with the position of the slider, the overpressed crown is cut off below or above the anatomical equator respectively below or above undercuts.

Spacing
Length of the overpressed crown. Move slider to the right: Extends the overpressed crown in the line of vision. Move slider to the left: Shortens the overpressed crown in the line of vision. To guarantee the fit, material is removed or added at the opposite end.

Thickness
Minimum wall thickness of the overpressed crown.

Determination of the Insertion Direction

This field combines two functions: Cutting and distance. Each change is carried out in the line of vision. The preselected insertion of the crown or bridge construction is not altered.

Pressing Next will finish this workstep.
The bridge construction is then automatically calculated to a full structure. The finished construction is displayed in grey.

After pressing **Finish**, the overpressed crown and the anatomic coping are displayed on screen.

The structure displayed can be altered subsequently. Please see 11.

Press this button to close the software and to return to the workflow.

The following dialog field opens before closing the software definitely:

Confirm with **Ja/Yes** to save the scene in the project index, i.e. the scene can be reloaded when opening the software once again.
6. Primary Telescope / Conic Crown

Starting with finding the prep margin all the way to producing a reduced anatomical crown, the procedure for the production of overpressed workpieces is identical to the procedure of a bridge modelling shown in the study case.

Please see 3.1-3.9

Tip: Design the crown in a round bodied way, if possible. This course of action avoids faulty areas in the borders of the primary telescopes.

The following dialog field opens automatically after saving the reduced anatomic crown. The primary telescope is created.

The primary telescopes are separated into four sections (vest., mes., ling., dist.). The design parameters (angle, start point, end point) of primary telescopes can be set independently with help of sliders. At the beginning, all four sections are marked yellow. This means that parameter settings are adopted for all sectors. Left click a yellow sector to change it to grey. The settings of the grey sectors are saved and further changes will not be adopted for this sector. Left click the grey area to return it to yellow. Settings can be adopted again.

Example 1

Dist./Ling./Mes. = yellow,
i.e. the altered creation parameters are only applied to these areas.

Vest. = grey,
i.e. this area is blocked, no modifications are applied.
Example 2

Dist./Ling./Mes. = yellow,
i.e. the altered creation parameters are only applied to these areas.

Vest. = grey
i.e. this area is blocked, no modifications are applied.

Angle
Positioning angle (>0°) for the generation of a conical crown.

Begin
Length of the shoulder (border).

End
Length of the parallel surface.

Tip: Select a greater length in mesial and distal direction than in vestibulary and lingual direction to obtain a perfect shape.

Apply
Application of the selected parameters.

Insertion Axis
Opens the following text field:

Back Next

- Insertion Axis
  - Default
  - Set from view

Default
Applies the preselected insertion of individual crowns.

Set from view
Applies an insertion direction in the user's line of vision. Choose that line vision which sees the stumps from occlusal direction. Ensure that the alignment of the stumps allows a view of all borders. Afterwards, press the button Set from View.

Tip: Hide the telescopes with help of the function field "Show/Hide Groups". This will simplify the adjustment.

Pressing Next will finish this workstep.

The construction is then automatically calculated to a full structure. The finished construction is displayed in grey.

After pressing Next, the primary telescopes are displayed on the screen. The displayed construction can be altered subsequently. Please see 11.
Press this button to close the software and to return to the workflow.

The following dialog field opens before closing the software definitely:

Confirm with Ja/Yes to save the scene in the project index, i.e. the scene can be reloaded when opening the software once again.

7. Inlay/onlay/veneer

The procedure (sequence of the individual worksteps, setup of dialog fields) for the production of inlays/onlays/veneers is analog to the procedure for the production of crowns and bridges.

Please see 3.1-3.9

Therefore, we do not describe every individual workstep, but only point out the characteristics.

7.1 Finding the prep margin

Before the automatic calculation is started, the prep margin must be designated with at least four points. Because of the very challenging cavities, the calculation of the prep margin follows a very complex algorithm. Therefore, it may make sense to designate more than four points.

Example:
7.2 Insertion Direction

Due to the complex geometry, the program will immediately ask for the insertion axis after the task "determination of prep margin" is concluded. The insertion will be optimized as described in 3.2.

7.3 Inlay bottoms

The function field **Guide – Create inlay bottoms** is separated into two tabs. Click the tabs to switch between them. Click **next** to finish the workstep. Any changes will be saved automatically when clicking next. Press **back** to return to the workstep insertion direction.

The parameters in the tab **Gap** will influence the fit of the inlay.

The cement gap created will be displayed golden. The inlay margin displayed in pink will not receive a cement application.

**Thickness:** Thickness of the cement gap

**Start:** Start of the cement gap

**Margin thickness:** Thickness of the inlay margin

The tab **Undercuts** facilitates not blocking out certain undercuts.

Check the box **Don't block out undercuts** to refrain from blocking out undercuts on the stump.

Determine the area around the prep margin that is not to be blocked out with help of the slider **Size**.

Do not change the settings under **Milling**. They contain important information for the milling process.

Pressing **Apply** will adopt the changed parameters.
7.4 Tooth placement

All functions are described in 3.5.

7.5 Saving

Clicking Next in the function field Free-forming will automatically save the construction data. The structure displayed can be altered subsequently. Please see 11.

Press this button to close the software:

8. Inlay shells

Inlay shells are equivalent to offset copings. The procedure of the instruction is mostly analog to that of the fully anatomic inlays.

Please see 3.1-3.9.

After the construction of the inlay bottoms and optimization of the insertion direction, a shell is uploaded instead of a fully anatomic crown. The inlay shell can now be modified with the virtual wax knife in the following workstep Free-forming (please see 3.7.2).
Clickin **Next** in the function field **Free-forming** will automatically save the construction data.

**Note:** When selecting inlay shell it is impossible to constructed a glued or Maryland bridge. To create these objects, select **Inlay**.

**9. Wax up / reduced wax up**

This function adapts wax model scans to preparation stumps and optionally facilitates shrinking the construction. The scanned model as well as the scanned wax up are uploaded after opening the CAD software. The procedure is exemplified with the help of a 3-unit bridge with attachment for connecting units.

**Important:** Only select abutment teeth in the workflow, otherwise the software will inquire for a prep margin for pontics.

**Example: 3-unit bridge with attachment for connecting units**

**9.1 Determination of prep margins**

For the determination of the prep margin, please see 3.1.
9.2 Crown Bottoms

For the correct handling of the tools for fitting and for border design, please see point 3.3.

Example:
Wax up before adaption to the stumps.

Pressing Next will automatically adapt the wax up to the stumps.

Wax up after adaption to the the stumps:

9.3 Free-forming

For handling of the free-forming tools (adding/removing material and smoothing), please see 3.7

Wax up while adding material:
9.4 Shrinking

The construction may be reduced by a defined coefficient when selecting **Wax up reduced**. No reduction is carried out, if the slider **Depth** is set to the very left end and/or the numerical value is set to 0 mm.

Please see 3.9. for operation of shrinkage tools.

![Shrink the wax up:](image)

9.5 Free-forming of reduced constructions

There is another opportunity to free-forming after reduction. Please see 3.7 for operation.

9.6 Saving

Pressing Next in the function field **Free-forming** will automatically save the construction data. When pressing **Finish**, the wax up will be displayed on screen. This displayed structure can be altered subsequently. Please see 11.

**Saved construction:**

![Saved construction:](image)
Press this button to close the software and to return to the workflow.

The following dialog field opens before closing the software definitely:

```
Close
Save current scene in the project directory?
Ja Nein Abbrechen
```

Confirm with **Ja/Yes** to save the scene in the project index, i.e. the scene can be reloaded when opening the software once again.

**10. Primary Attachments**

This function is not available in this software version.

**11. Subsequent modification of the construction**

All saved and/or finished constructions can be altered subsequently. To do so, select the according case in the workflow (button **Load**) and open it with the button **CAD**.

The modelling software will open and the following dialog field will appear on screen:

```
Load
A saved scene exists for this project. Do you wish to load this scene?
If you chose 'Yes', you can resume working with your saved data.
If you chose 'No', only the scan data will be loaded, and you can start constructing from scratch.
Ja Nein
```

- **Ja/Yes** the saved scene will be loaded (modelled construction)
- **Nein/No** the scan data is loaded to restart modellation

After pressing **Ja/Yes**, the modellation is reloaded:

Three different procedures are available for subsequent modifications:

1. Subsequent modification of the complete construction (free-forming)
2. Subsequent modification of individual construction groups, e.g. all connectors.
3. Subsequent modification of individual areas of the construction, e.g. individual connectors.

11.1 Subsequent modification/free-forming of the complete construction

This tool is suitable for modifications that concern the complete construction, e.g. removing material from the complete construction.

Clicking into the background with the right mouse button will open the following drop down menu:

Select **Freeform merged reconstruction** (highlighted blue).

This opens the below function field **Guide - Freeforming** and the construction is displayed in **gelb** on screen. This means that the freeforming tools can be used on the complete construction. Please see 3.12 for all functions.

Pressing the **Next** will open the following dialog field:

Press **Ja/Yes** to save any changes.

If any data was saved already, the following dialog field is opened instead:

Confirm with **Ja/Yes** if you do not need the initial data any longer. These data will be overwritten with a new data set and thus deleted irrevocably.
11.2 Modification of individual construction groups

It is possible to modify individual construction groups subsequently, e.g. all connectors.

To do so, some constructions already saved, i.e. the millable STL-data must be deleted.

Clicking the right mouse button into the background will open the following drop down menu:

![Drop down menu](image)

This will open the following list:

![List of constructions](image)

Find the list with the different constructions that can be deleted under **Delete**.

Select the list which contains those parts of the construction that you would like to modify subsequently. The parts are listed separately in the dialog field above the button.

In this procedure, the data set is **not** deleted. The scan file is displayed on screen after deleting.
Checking different parts in the dialog field **Show/Hide groups** will display the complete picture or parts of it.

![Show/Hide groups dialog](image)

After some previously saved parts were deleted and the data set was completed, click into the background to activate the functions for modification.

The items inside of the red frame designate those construction groups that can be modified subsequently.

Selecting one of these items will open the according function field. The modifiable groups are displayed in yellow in the construction.

**For handling of the function fields:**
- Please see 3.3 for "crown bottoms"
- Please see 12.1 for "loading custom tooth models"
- Please see 3.5 for "correct placement"
- Please see 3.9 for "reduce teeth"
- Please see 3.12 for "connectors"

**Important:**
After all modifications are carried out, save them, i.e. create a millable STL-file. If the user does not save the construction manually all modifications will be cancelled.
To do so, click into the background and select **Save restorations**.

The following dialog field will open:

Click **OK** to calculate the present construction with all its modifications.

After finishing this process, save it by pressing **Cancel**. This will start the creation of a new millable STL-file.

After pressing **Finish**, the saved construction is displayed in a greenish color.

Press this button to close the software and to return to the workflow.

Confirm with **Ja/Yes** to save the scene in the project directory, i.e. to be able to reload the scene when opening the software again.

If another scene has been saved previously, the user is asked whether he would like to overwrite this previously saved scene. Confirm with **Ja/Yes** to save the modifications.
11.3 Modification of individual construction segments

Individual segments of the construction, e.g. certain connectors, can be modified subsequently. This function gives the user the advantage that individual segments can be modified separately, e.g. connectors receive different geometries or diameters.

To modify separate crown segments, delete constructions already saved, i.e. millable STL-files.

For the procedure, please see 11.2.

The file of the scene is not deleted in this procedure. After deleting the below picture is shown on screen. To see the entire situation, check all segments in the dialog field Show/Hide groups.

To modify separate segments of the construction, independently from the other segments, click them with the right mouse button.

Example: Subsequent modification of connectors

Clicking the connector with the right mouse button will open the below drop down menu.

Select Connectors (highlighted in blue). This will open the following function field.

For its use, please see 3.12.
Only the selected connector will be displayed in yellow, i.e. this connector can be modified individually.

Pressing Ok will save the modifications and display the modified construction on screen.

Important:
After finishing all modifications, they must be saved manually, i.e. a millable STL-file must be created. If the modifications are not saved manually they are cancelled.

Select Save restaurations (highlighted in blue).

The following dialog field will open:

This will open the following dialog field. Pressing OK will save the construction presently displayed, with all the modifications that were done.

After finishing this process, save it by pressing Cancel. This will start the creation of a new millable STL-file

After pressing Finish, the saved construction is displayed in a greenish color.

Press this button to close the software and to return to the workflow.
12. Subsequent modification of the antagonist

Click the background to receive a list of additional functions. Select Edit Antagonist to open the following dialog field:

Cut antagonist scans subsequently, i.e. independently from the scan software, with this function.

We recommend to cut the antagonist in the scan software in principle.

To cut the antagonist scan, proceed as follows:

Circle the area to be removed by left clicking. Each click creates a green point. Set the last point onto the start point. Double-clicking will finish marking the area and the marked area is displayed in orange.

Click Delete to remove the marked area.

Cut antagonist scan:
13. Additional functions

This program features two different kinds of additional functions. One type is selected by clicking into the background with the right mouse button, the other type is activated by clicking the construction with the right mouse button. These functions can be activated during the modelling or after concluding the modelling.

13.1. Additional functions activated by clicking into the background

Below, please find a description of all icons/functions.
Subsequent free-forming of the entire construction, see 11.1

Save millable STL-files, see 11.2 and 11.3

Delete millable STL-files, see 11.2 and 11.3

Restart the articulator movements.

Show/hide tooth axes.

Mirror teeth and use as situation models. Function can only be started after finishing the modellation.

Subsequently modify, i.e. cut the antagonist.

Contains a list of additional functions, which are listed below.

Saves the present scene to a memory location of the user's choice.

Saves the present scene to the project directory. All scenes previously saved are overwritten.

Closes the project and returns to workflow.

The point view contains the following functions:

The Guide guides the user through the individual work steps. This function opens automatically after the software is started.

Facilitates altering the shadows on the model respectively switching off the lighting of the model. To change the lighting, turn the model into the desired position and click on Magic Lantern.
Facilitates switching between fully anatomic and reduced shapes. Select the desired tooth in the tooth scale beforehand.

Measures distances of any kind. Select start and end point on the model.

Facilitates the creation of a sectional plane through the construction, i.e. individual areas can be faded in or out. To do so, turn the construction into the desired position. Following, open this function, set a check into the field **Activated** and create the sectional plane by moving the slider.

Facilitates fading in or out of individual construction areas. To do so, set or remove the check in front of the construction groups in the list.

Displays the distances of the construction towards impression, opposing jaw and neighbouring teeth in terms of color.

Relates different scan data to each other, e.g. maxilla, mandible or vestibular scan. This action is only necessary, if Tizian Scan respectively the Tizian workflow are not used.

Facilitates subsequent modification of the complete construction. Please see 11.

Offers product information, e.g. the software version.

Creates screenshots.

Change general software settings, e.g. language.
13.2 Additional functions activated by clicking the object

These buttons are for the most part identical to those already described in 12.1. Therefore, we will only describe those not already shown above.

Additional buttons are:

- Creation of an offset coping.
- Enlarges the construction display.
- Saves the present scene to the project directory. Modifications saved previously will be overwritten.
- Facilitates the selection of different modes of displaying the virtual model.

Below are the different ways of displaying the virtual model:

- Opaque
- Wire mesh
- Scatter plot
- Flat Shading
- Transparent
13.3 Additional functions when subsequently modifying or deleting construction parts

After saved parts were deleted, click the background to activate the following functions:

- **Set Insertion Direction...** Sets the insertion direction. Please see 3.2

- **Crown bottoms...** Create crown bottoms.

- **Freeform...** Free-form the selected construction part.

- **Load custom tooth models...** Facilitates the selection of other model teeth, e.g. premolar instead of molar in a bridge. To do so, select the desired tooth in the tooth scale and confirm.

- **Correct placement...** Correct tooth placement.

- **Connectors...** Redesign connectors.

- **Reduce teeth...** Reduce fully anatomic shapes.

- **Set minimum thickness...** Determine the minimum wall thickness of the framework.

- **Delete Connector** Deletes individual connectors.