

Simplant® 18

Instructions for Use

CE
0123

 **Dentsply
Sirona**
Implants

NOTE:

These instructions for use are designed to kick start the hands-on practice of the Simplant software.

The document contains numerous screenshots showing you - feature per feature - exactly where to click and what do to in the Simplant software.

0. Introduction

0.1 - Caution	3
0.2 - Indications for Use	3
0.3 - Contraindications	3
0.4 - Product information	3
0.5 - Software license and maintenance	4
0.6 - Warnings	4
0.7 - Precautions	4
0.8 - Adverse Reactions	4
0.9 - Step-by-Step Instructions	4
0.10 - Manufacturer	5
0.11 - Technical Support	5
0.12 - Identifications of symbols used	5

1. Installation

1.1 - System Requirements	6
1.2 - System Installations	6

2. Overview

2.1 - Start the Simplant application	7
2.2 - The Simplant user interface	8
2.3 - The view windows	9
2.4 - View navigation	11
2.5 - Task panel	17

3. Simplant start

3.1 - Open an existing project	18
3.2 - Import new CT images	19
3.3 - Save your project	22

4. Segment

4.1 - Advanced volume rendering	23
4.2 - Manual segmentation techniques	26

5. Prepare for planning

5.1 - Dual Scan wizard	46
5.2 - Optical scan wizard	52
5.3 - Draw the panoramic curve	59
5.4 - Draw the nerve	60
5.5 - Create Virtual Teeth	61
5.6 - Create graft volume	67
5.7 - Make measurements	70

6. Plan implants

6.1 - The implant library	72
6.2 - Planning implants	80

7. Order Simplant guide

7.1 - The design of the guide	102
7.2 - The ordering of the guide	107

0. Introduction

0.1 – Caution



US federal law restricts this product for sale by or on order of a dentist or physician. Simplant software may only be used by technicians/clinicians who have had the appropriate education and training.

The output must be verified by the responsible clinician. The 3D reconstructions must be compared to the slice images and verified for approval by the responsible clinician.

The clinician must exercise his/her professional judgment in any decision to follow or to not follow the treatment plan made in the Simplant software.

User must take appropriate measures and steps to protect his computer and any private data stored on his computer from harm and uncontrolled access by other people. Therefore it is strongly advised to use firewall and anti-virus software appropriate for the environment of use; and to close all open planning files when you leave your computer.

0.2 – Indications for Use

Simplant is intended for use as a software interface and image segmentation system for the transfer of imaging information from a medical scanner such as a CT scanner. It is also intended as pre-planning software for dental implant placement and surgical treatment.

0.3 – Contraindications

There are no absolute contraindications for treatment planning with Simplant 18 software besides the ones that are applicable for implant treatment in general.

0.4 – Product information

Simplant 18 software helps clinicians determine suitable locations for implants taking into account surgical aspects as well as desired functional and esthetic results.

Simplant 18 software functionality includes:

- Reading and 3D reconstruction of (CB) CT slice images
- Implant planning
- 3D transparency tool for investigation of the position of the nerve and the implants
- Assessment of bone density
- Simplant Library: A comprehensive selection of implants, abutments and Simplant Guide solutions
- mySimplant order web page: Ordering of a Simplant Guide for precise transfer of the implant plan to the patient's mouth

0.5 – Software license and maintenance

Simplant 18 software is protected by a license and maintenance agreement and may be used only in accordance with the terms in this agreement. Some of the features offered by Simplant may require an additional license. New software features are protected by the active status of the maintenance agreement. It is the responsibility of the clinician to always use the Simplant software in combination with the latest Simplant Library, even when not using the latest Simplant software version. For this reason, Simplant software automatically notifies clinicians when a new version of the Simplant Library is available online. At that moment, the Simplant user can download and install the new Simplant Library.

0.6 – Warnings



Always check collision warnings. When two implants are placed too close to each other or too close to a nerve, a collision warning is shown. The safety zone around an implant to which this warning applies can be extended or narrowed by the user.

Always verify drill depth control due to the length of the drills.

Always calculate the Simplant Guide design before ordering a Simplant Guide. For Simplant Guide solutions where drill depth and/or implant depth can be controlled with guided surgery instruments, the Simplant software will inform the user about the possibilities for depth control when calculating the Simplant Guide design.

If the user modifies the planned implant position, the Simplant Guide design will be deleted and a warning will be given. Simplant software performs several checks to avoid unexpected behavior, and warning messages appear to inform about possible risks.

While accuracy with Simplant guided surgery is higher than for non-guided surgery, linear and angular deviations are to be expected when using either non-guided or guided surgery, as linear and angular deviations have been reported in experimental and clinical studies. Therefore, it is important to keep a safety distance also when using guided surgery.

0.7 – Precautions



Precise measurements should be done on the cross-sectional and axial slice images (2D). The quality of the images in Simplant software depends on the quality of the scanned images. To obtain optimal results, please use the scan parameters specified in the Simplant scanning guidelines .

For scans taken with an inter-slice distance of 1 mm the accuracy of the 3D reconstructions in the software varies between 0.1 to 0.2 mm. The use of larger inter-slice distances is not recommended. As measurements of the anatomy in the software may be influenced by such factors as the initial scan settings, image artefacts and 3D reconstruction parameters, the user is recommended to take into account a safety zone of 0.2 mm relative to critical anatomical structures.

0.8 – Adverse Reactions

There are no adverse reactions for treatment planning with Simplant 18 software besides the ones that are applicable for implant treatment in general.

0.9 – Step-by-Step Instructions

Step-by-step instructions can be found in the next chapters of this document.

0.10 – Manufacturer



Dentsply Implants NV,
Research Campus 10,
3500 Hasselt, Belgium

Phone +32 16 84 14 00 fax +32 16 84 14 01
e-mail: simplant-info@dentsplysirona.com
www.dentsplysirona.com

0.11 – Technical support

Technical support and information on known software bugs and anomalies can be found on www.simplant.academy.org or can be requested via technical support: simplant-service@dentsplysirona.com
Electronic instructions for use can be found on www.simplant.academy.org and a paper copy can be requested via technical support: simplant-service@dentsplysirona.com

0.12 – Identifications of symbols used



CE Mark



Consult Instruction for Use
(available in electronic format at website)



Manufacturer



Caution, warning



US Federal law restricts
this device for sale by or
on order of a physician
or clinician



Date of manufacture



Catalogue
number



Information is given to
the user



An unexpected condition occurred



A question is
asked to the user

1. Installation

1.1 – System requirements

Minimum requirements:

- Intel Core 2 Duo or AMD Athlon II or above with CPU clock speed of or above 2.0 GHz
- 2 GB of RAM
- Microsoft Windows 7 SP1/8.1/10/Mac system (booted in Windows under Boot Camp for using the advanced volume rendering)
- 2 GB of free hard disk space (assumes cases are deleted daily & only 3 cases are scanned per day)
- Graphics card with full DirectX9.0c compliance, HW vertex processing, Shader Model 3.0 support and 128 MB of video memory for using the advanced volume rendering
- Minimum screen resolution 1024x768 pixels
- One of following browsers: Internet Explorer 11, Firefox 50, Chrome 55, Edge on Windows 10
- Internet connection for ordering Simplant guides online, automatic license renewal and automatic updates

Recommended:

- Intel Core i5 or AMD Phenom II or AMD FX CPUs or above with CPU clock speed of or above 2.6 GHz
- 4 GB of RAM or above
- Microsoft Windows 7 SP1/10
- At least 20 GB of free hard disk space
- AMD or NVIDIA discrete graphics card with full DirectX 10.1 compliance and 1 GB of video memory
- One of following browsers: Internet Explorer 11, Firefox 50 or later, Chrome 55 or later, Edge on Windows 10
- Internet connection
- Scroll mouse and keyboard
- Diagnostic monitor: at least 1440x900 pixels resolution

1.2 – System Installations

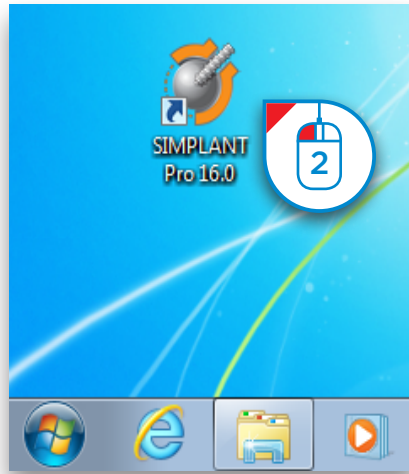
Simplant installation from the website

1. We recommend that you close all other applications before installing Simplant software
2. Browse to the website www.simplant.com and go to “Download the Simplant software”, and follow the instructions.

2. Overview

2.1 - Start the Simplant application

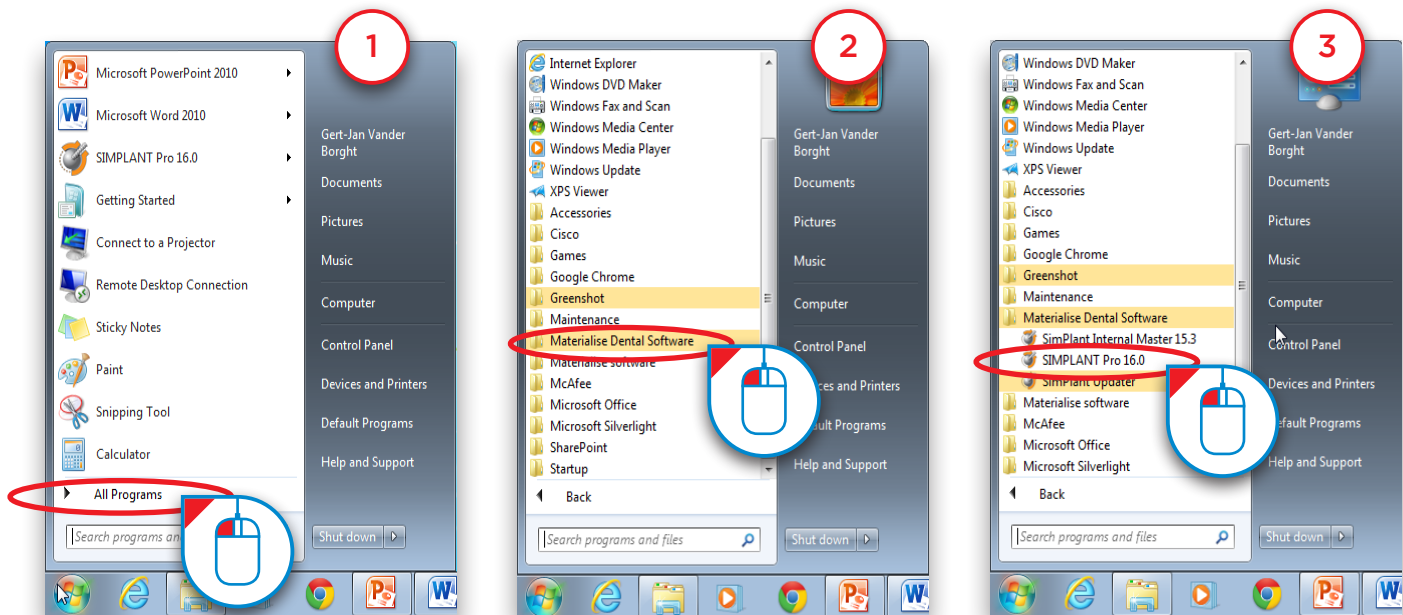
To start the Simplant application, double-click the Simplant icon on your desktop.



You can also start the Simplant application from the Windows 'Start Menu'.

In the Start Menu, select 'All Programs' (1).

From the list of programs, select the 'Simplant' folder (2). Finally, select the Simplant icon (3).



2.2 – The Simplant® user interface

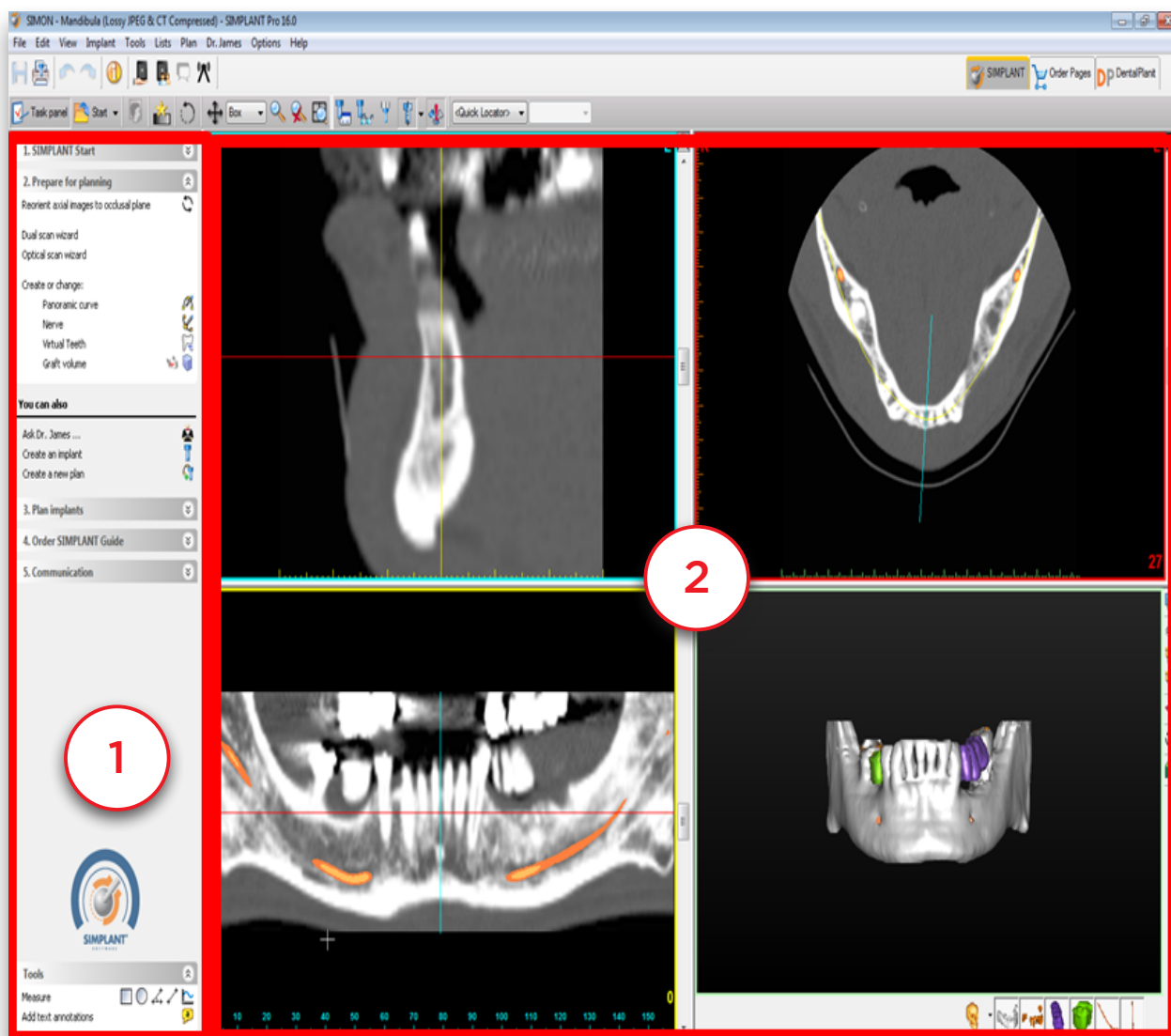
When you open an existing Simplant project, the screen below appears. In this screen you can distinguish two important areas:

(1) The 'Task Panel':

The Task panel guides you step by step through the Simplant application. In this manual we will be using the Task Panel for practically every functionality.

(2) The four view windows:

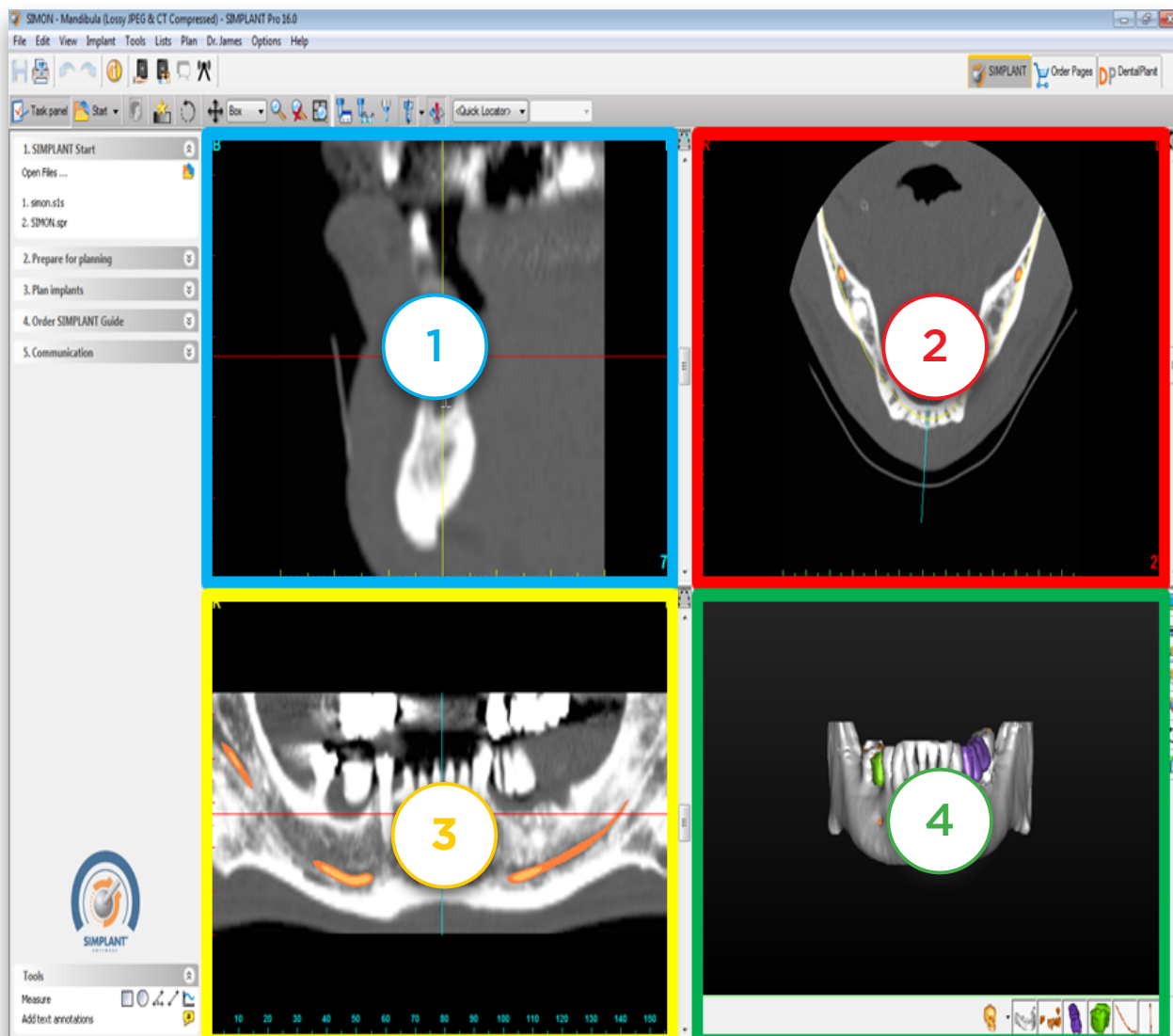
By default, Simplant displays four view windows – three 2D views and one 3D view.



2.3 – The view windows

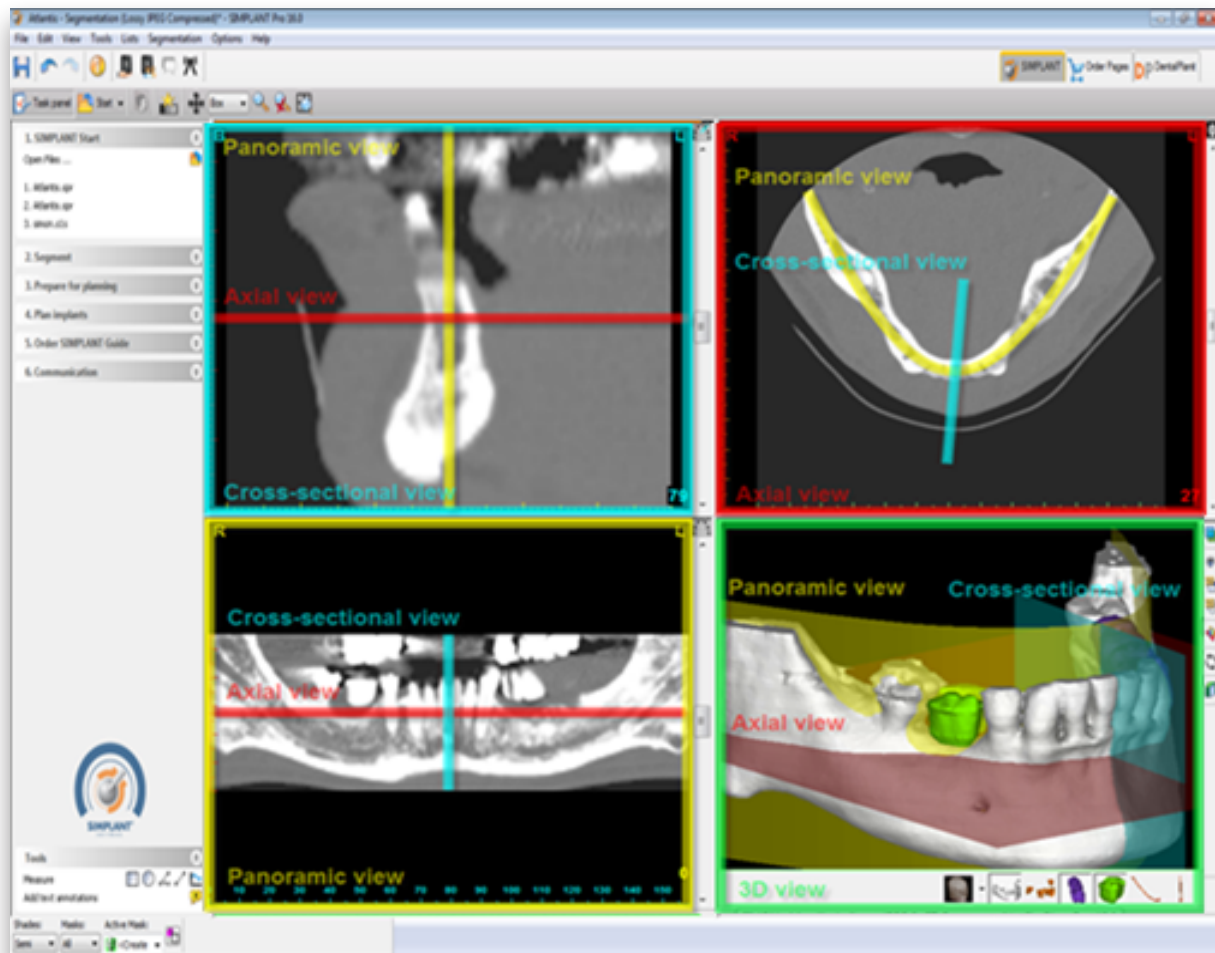
Each of the four view windows has a separate color code:

- (1) The **cross-sectional** view (top left window): This view shows the 2D cross-sectional slices.
- (2) The **axial view** (top right window): This view shows the 2D axial slices.
- (3) The **panoramic view** (bottom left window): This view shows the 2D panoramic slices.
- (4) The **3D view** (bottom right window): This view shows the 3D model.



Around each of the four view windows you can see a colored border. In the three 2D view windows you can also notice colored lines. Each of these lines represents a view. For example, the cross-sectional view window has a blue border and is visible as a blue line in the axial view window and the panoramic view window.

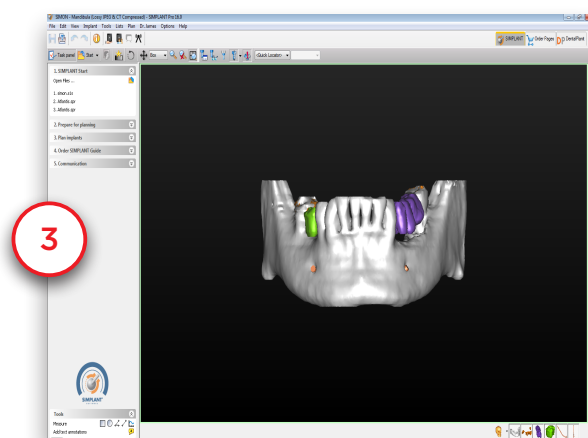
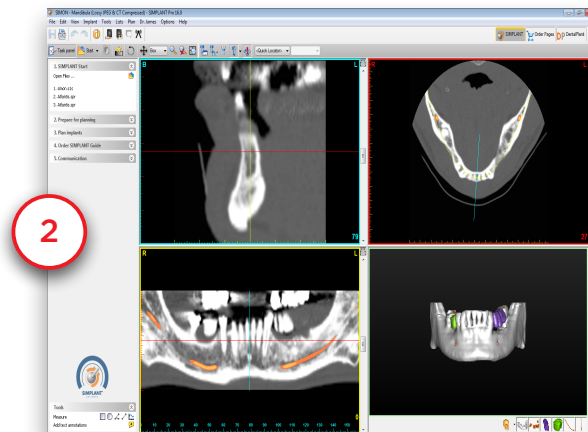
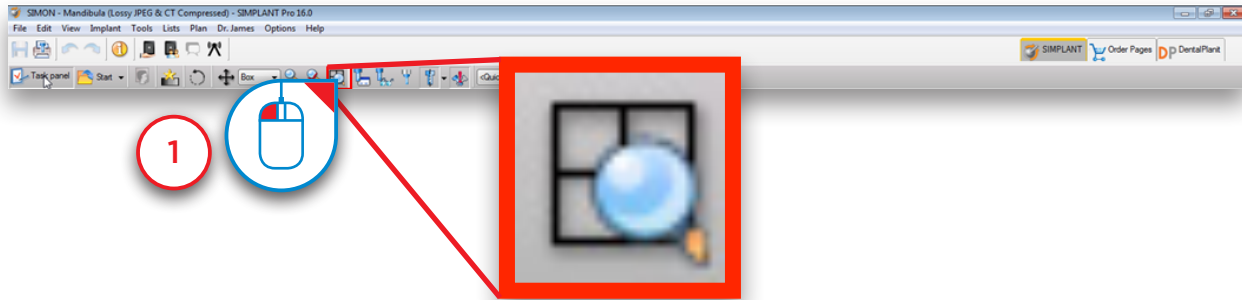
Notice that when you click a random point in one of the 2D view windows, the other 2D view windows automatically jump to the slice on which this point is positioned. The same functionality is present in the 3D view window. When you click a point on the bone model here, the three 2D view windows automatically jump to the slice on which this point is positioned.



2.4 - View navigation

2.4.1 - Zoom to fullscreen

To get a more detailed look of each of the four view windows, you can zoom to full screen. You can zoom to full screen by clicking the 'Zoom to Full Screen' icon in the Simplant menu bar (1). Afterwards, click with the left mouse button in one of the four view windows (2). The window is now zoomed to full screen (3). Click the 'Zoom to Full Screen' icon a second time to zoom out again.



2.4.2 - Scroll through the slices in the 2D view windows

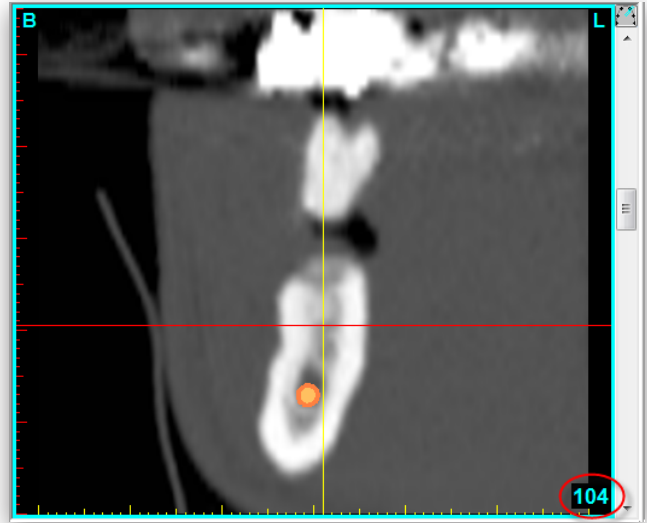
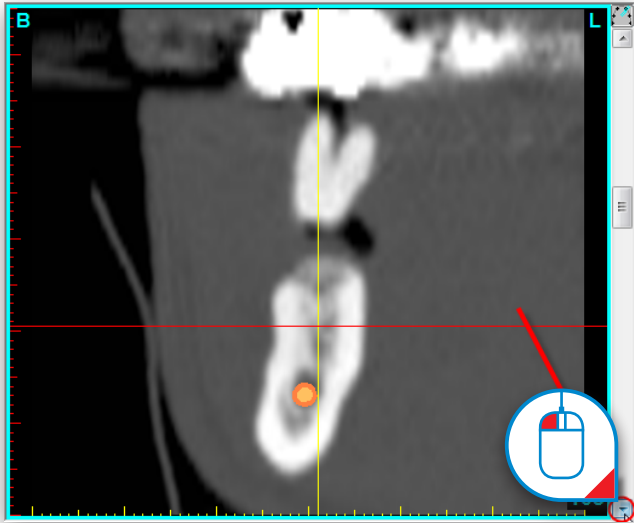
In the 2D view windows you can easily scroll through the different slices. There are two alternatives to scroll through the slices:

A Use the slider bar

B Use the mouse wheel button

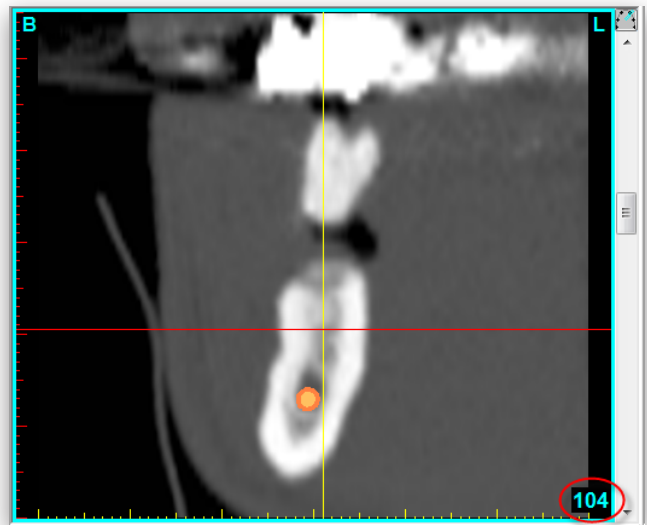
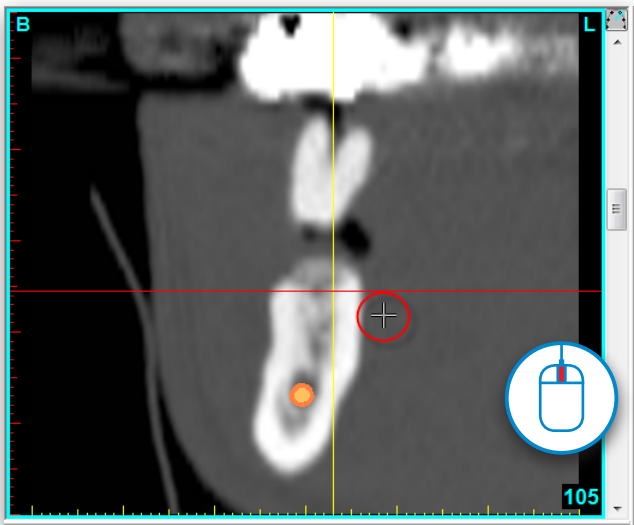
A. Use the slider bar

In the 2D view windows you can use the slider bar to scroll through the slices.



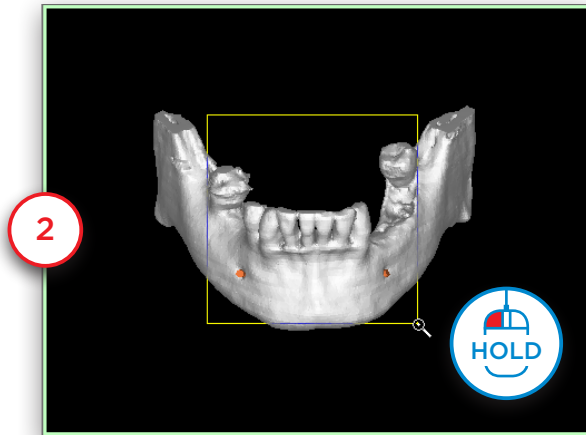
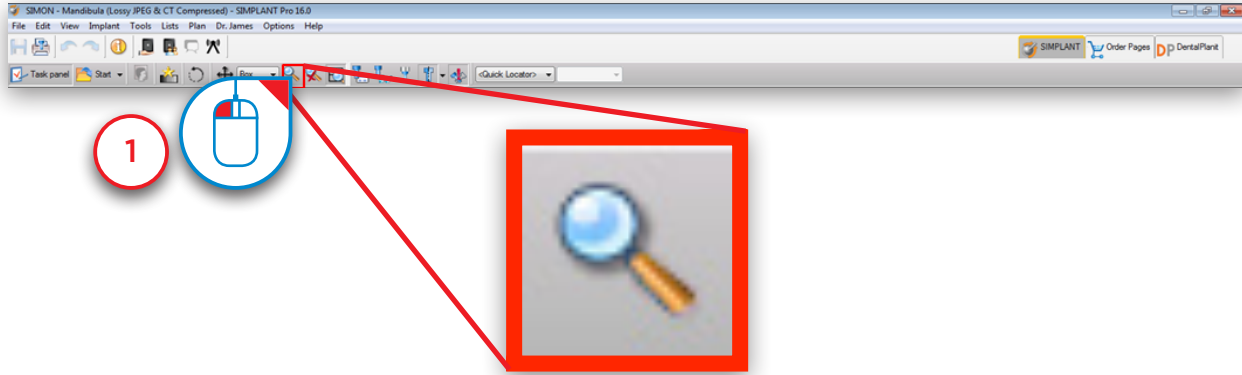
B. Use the mouse wheel button

Position the mouse cursor somewhere in the 2D view window area and scroll the mouse wheel to scroll through the slices.



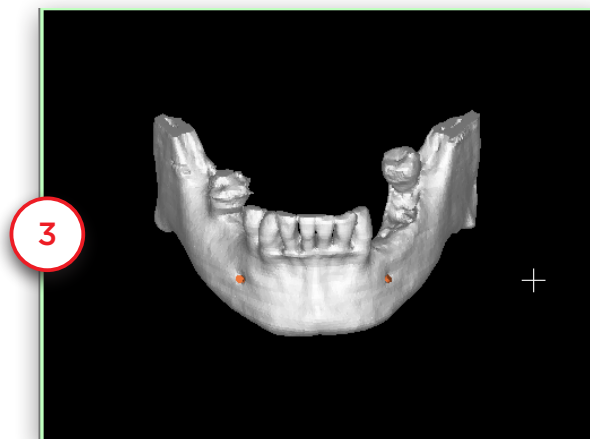
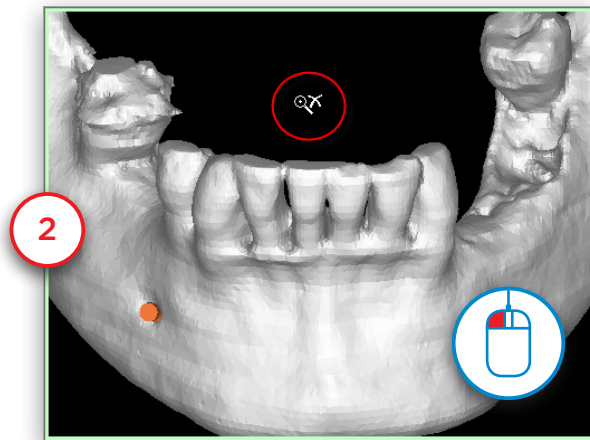
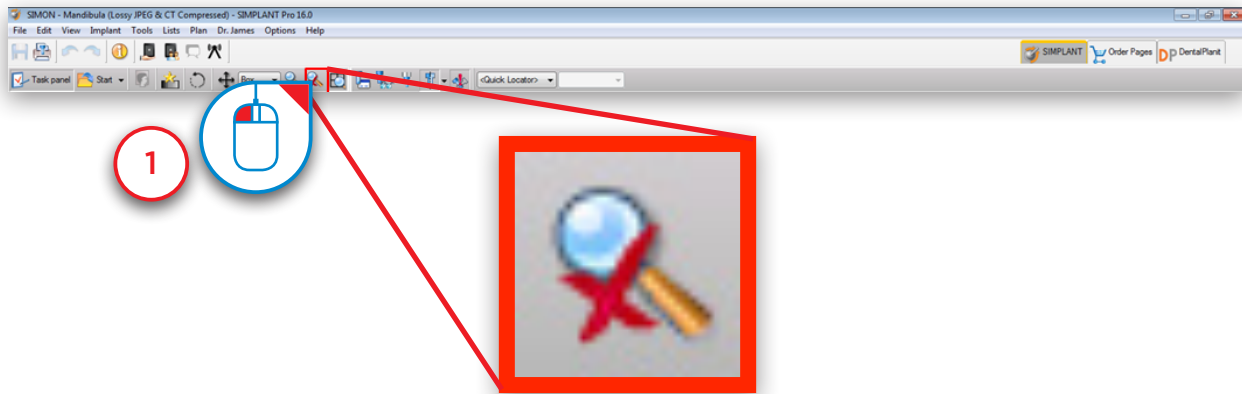
2.4.3 - Zoom in

To get a better look in each of the four view windows, you can zoom in on the images. First, click the 'Zoom' icon in the Simplant menu bar (1). In one of the view windows, click and hold the left mouse button and drag a square around the area that you would like to zoom in on (2). When you release the mouse button the zoom function is applied (3).



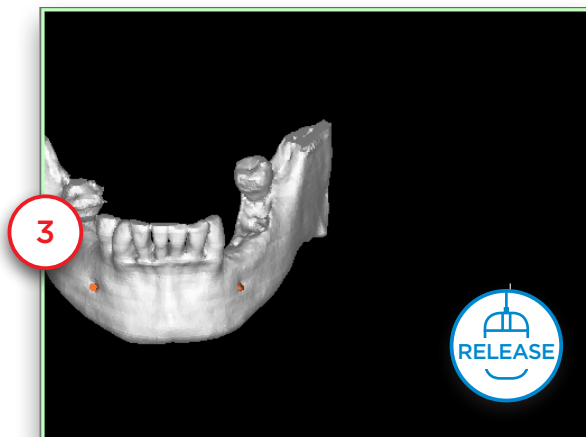
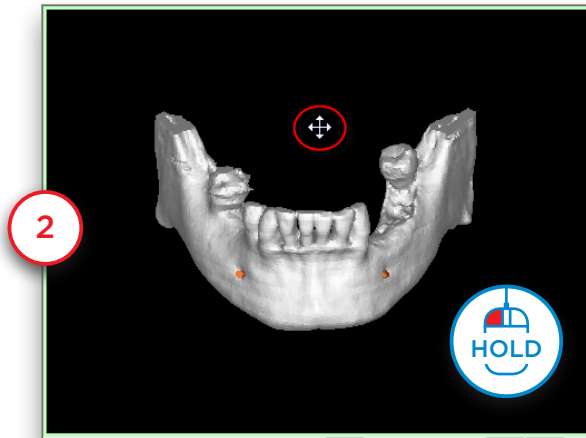
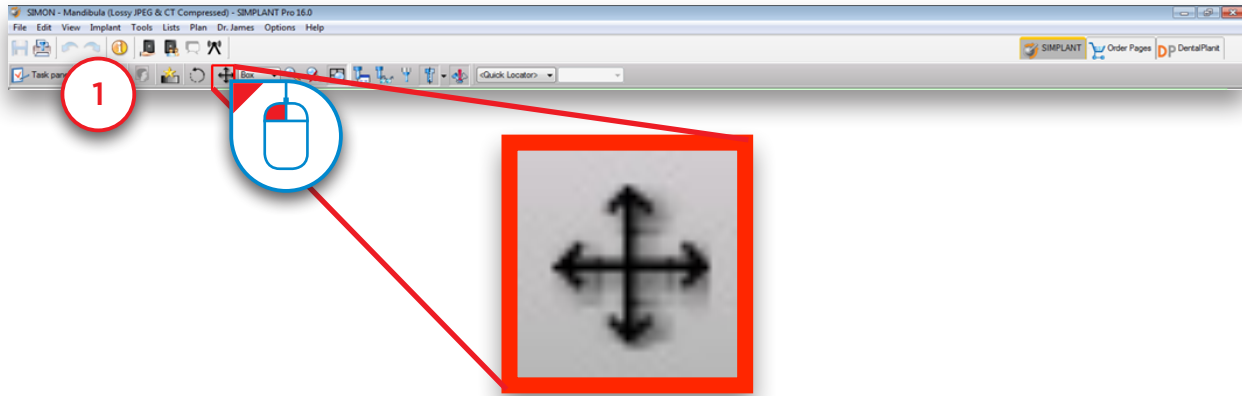
2.4.4 - Unzoom

To zoom out again, first click the 'Unzoom' icon in the Simplant menu bar (1). Click with the left mouse button somewhere inside the view window (2). The view window is now zoomed out again (3).



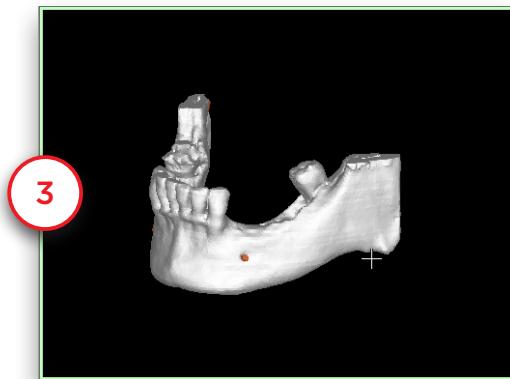
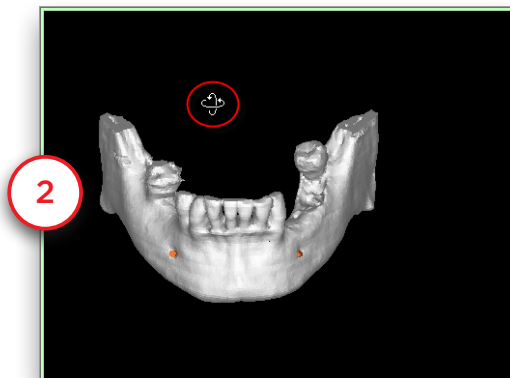
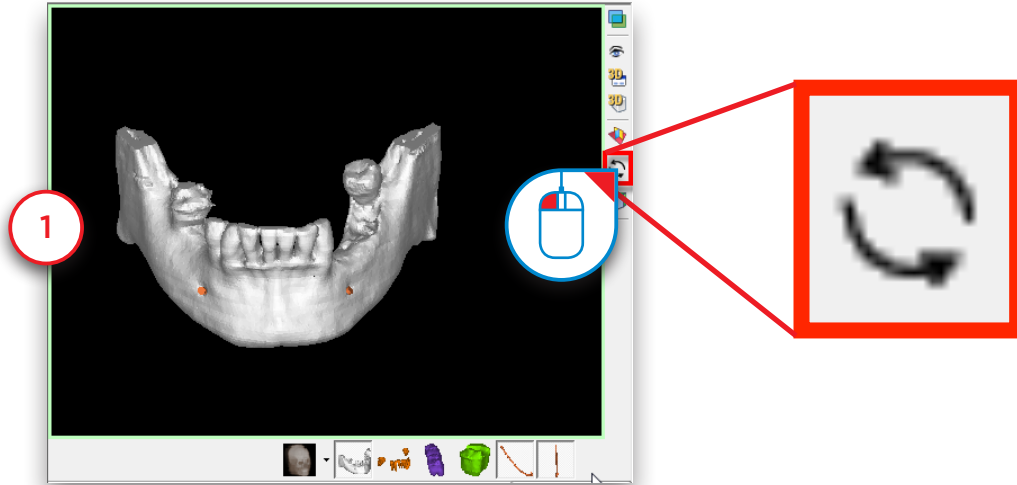
2.4.5 - Pan

To pan the view, first click the 'Pan Once' icon in the Simplant menu bar (1). Position the mouse cursor somewhere in the view window and click and hold the left mouse button while dragging the mouse to pan the view (2). Release the mouse button to finish (3).



2.4.5 - Rotate

To rotate the view, first click the 'Rotate Once' icon on the right side of the 3D view window (lower right window) (1). Position the mouse cursor somewhere in the view window and click and hold the left mouse button while dragging the mouse to rotate the view (2). Release the mouse button to finish (3).



2.5 – Task Panel

The Task Panel guides you through every step of the software. In the rest of the instructions for use we will explain the step by step typical workflow of a Simplant project using the Task Panel. The Task Panel consists of following steps:

1. Simplant Start:

Here you can open an existing Simplant project file or start a new Simplant Project by importing CT images.

2. Segment:

In Simplant you have to create a 3D model from the 2D CT images before you can start your implant planning . This is called a “segmentation” and can be done using this part of the Task Panel.

3. Prepare for planning:

In this step you can draw a panoramic curve, draw a nerve, place Virtual Teeth or place a bone graft.

4. Plan implants:

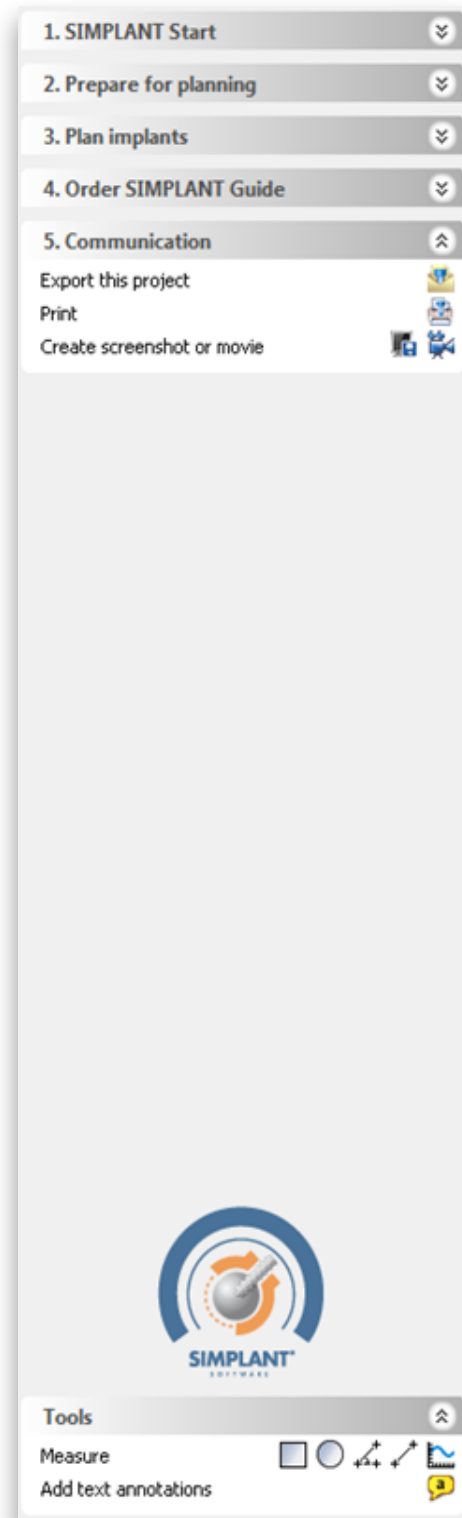
In this step the actual planning of the implants takes places. Draw, specify and modify the implants that you would like to use in your project.

5. Order Simplant Guide:

After you have finished your implant planning, you can design and order a Simplant Guide through the mySimplant order web page.

6. Communication:

Export your project to the Simplant View format, Print your project or create a screenshot or movie of it.

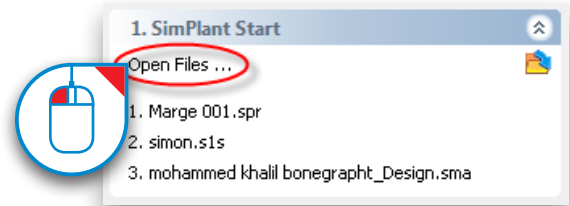


3. Simplant Start

To start a new Simplant project, click 'Open Files'.

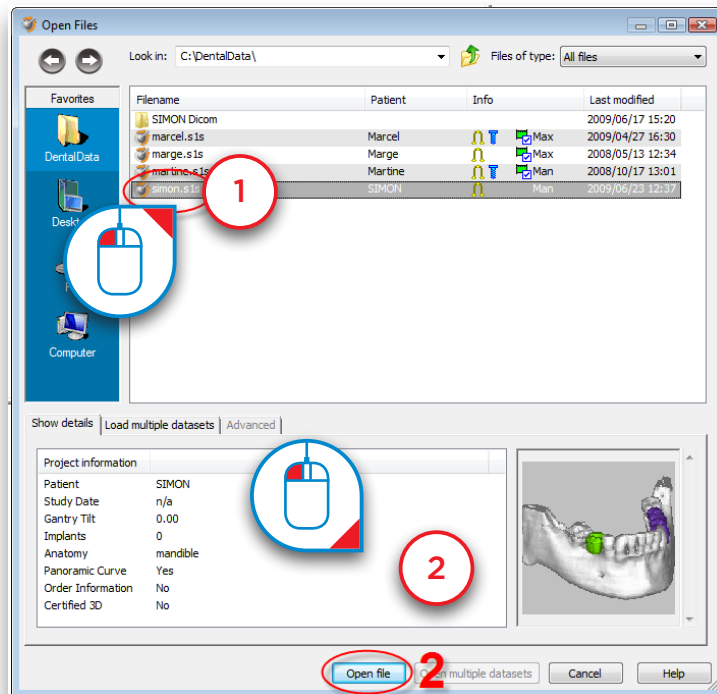
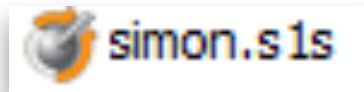
You can either work with an existing project or import new CT images:

- 3.1 Open an existing project.
- 3.2 Import new CT images.



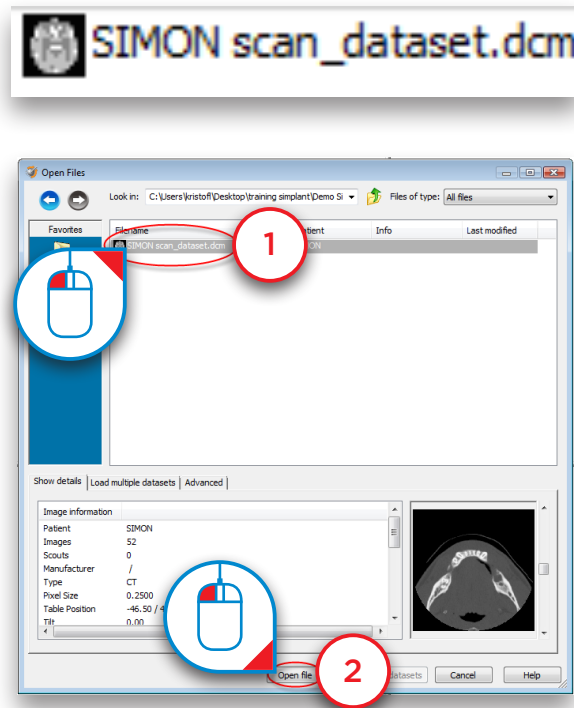
3.1 - Open an existing project

Select the file you would like to open from the list (1) and click 'Open file' (2). Note that the default location for storing Simplant projects is "C:\DentalData".

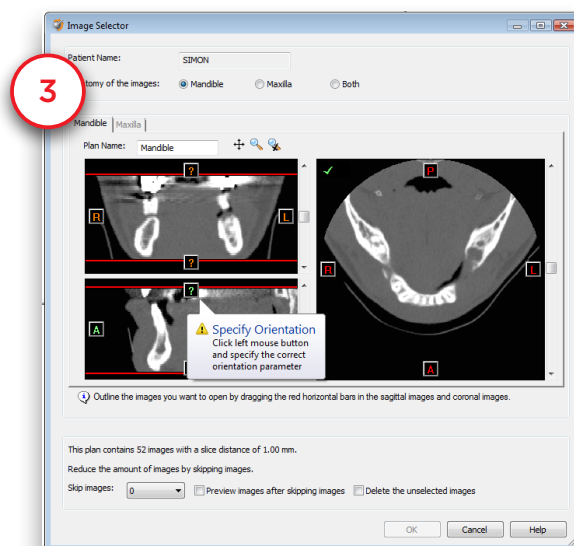


3.2 – Import new CT images

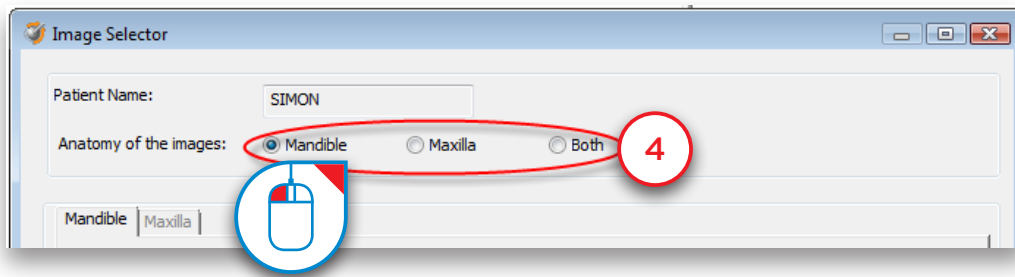
Navigate to the folder on your computer where the CT images that you want to import are stored. Select the “.dcm” file (1) and click ‘Open file’ (2) to import the images.



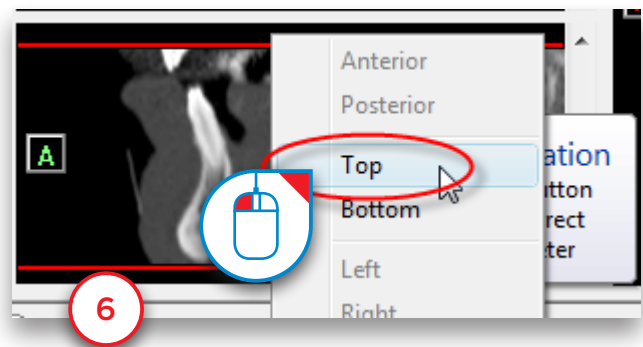
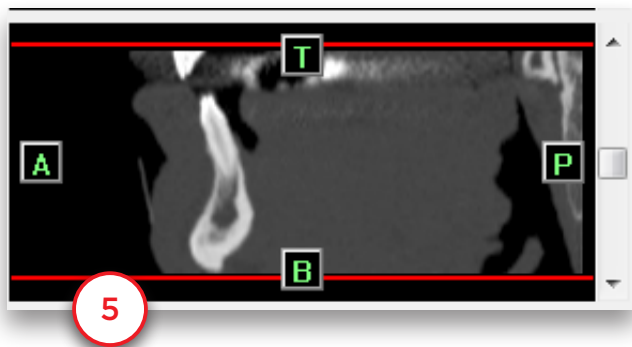
The ‘image selector’ window opens up (3). Here you can select which CT images you want to include in your Simplant project.




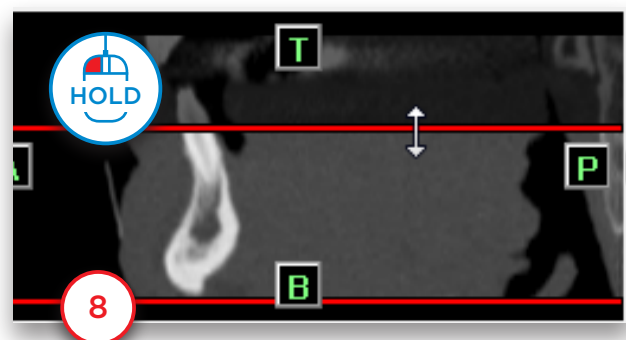
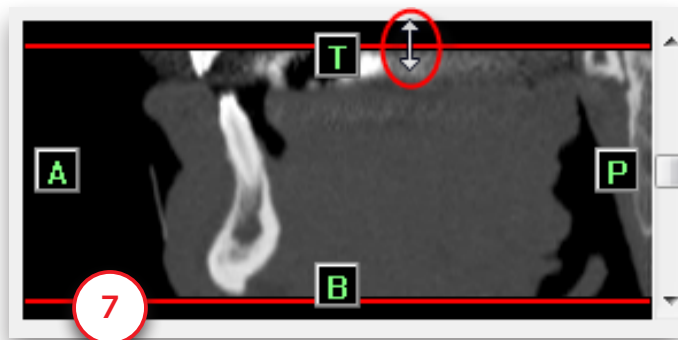
First, select the anatomy of the images: Mandible, Maxilla or Both (4).



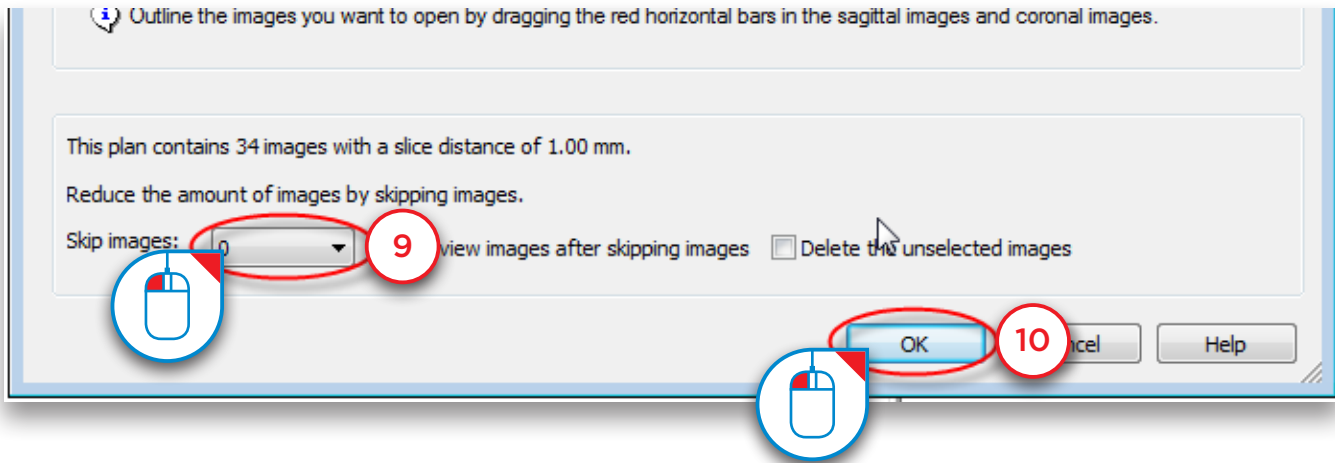
Simplant will enter the orientation of the CT images (5). Click **T** or **B** and select 'Top' or 'Bottom' to change the orientation (6). If the orientation is not included in the image data you will have to enter it yourself.



Hold your mouse cursor over one of the red lines until the  icon appears (7). Click and hold the left mouse button and drag the mouse cursor to move the red line (8). This changes the area of CT images that will be included in the Simplant project.



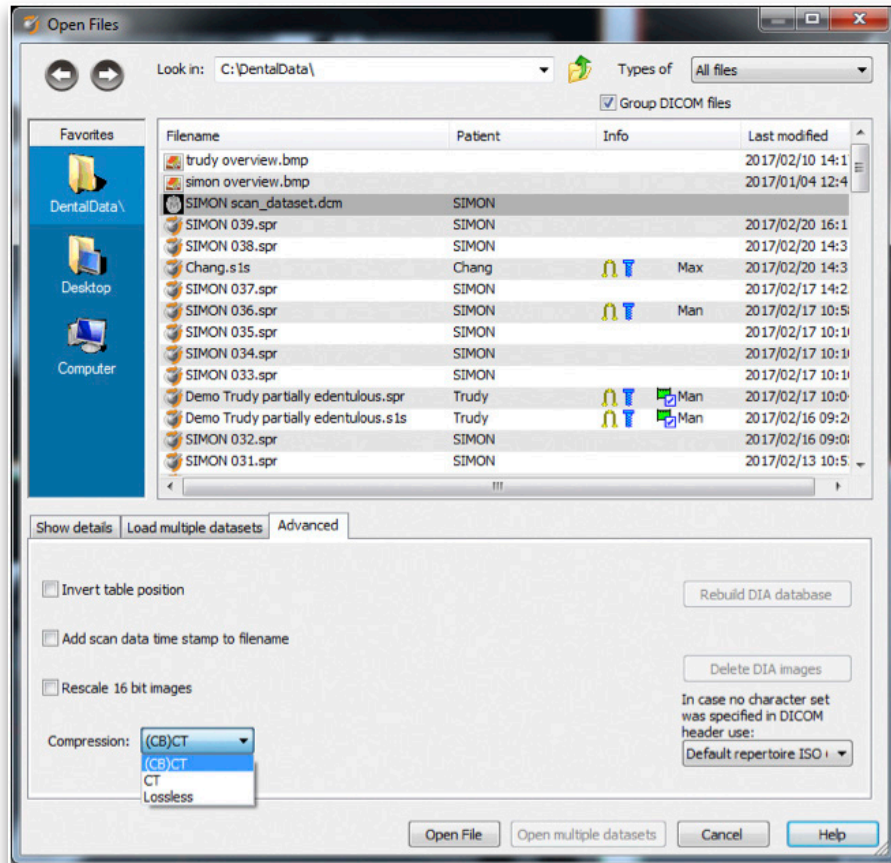
Select whether you would like to skip images or not (9) and click 'OK' to import (10).



When importing images in Simplant noise reduction can be applied to the images to remove unwanted modifications to the signal as a result of data capture, transmission, and processing of conversion from the scanner. By default, noise reduction is performed.

The appropriate noise reduction to be applied can be selected in "compression" field of the 'Advanced' tab:

- CB (CT): default setting - noise reduction for images originating from a (CB)CT scanner
- CT: noise reduction for images originating from a CT scanner
- Lossless: no noise reduction is performed



3.3 Save your project

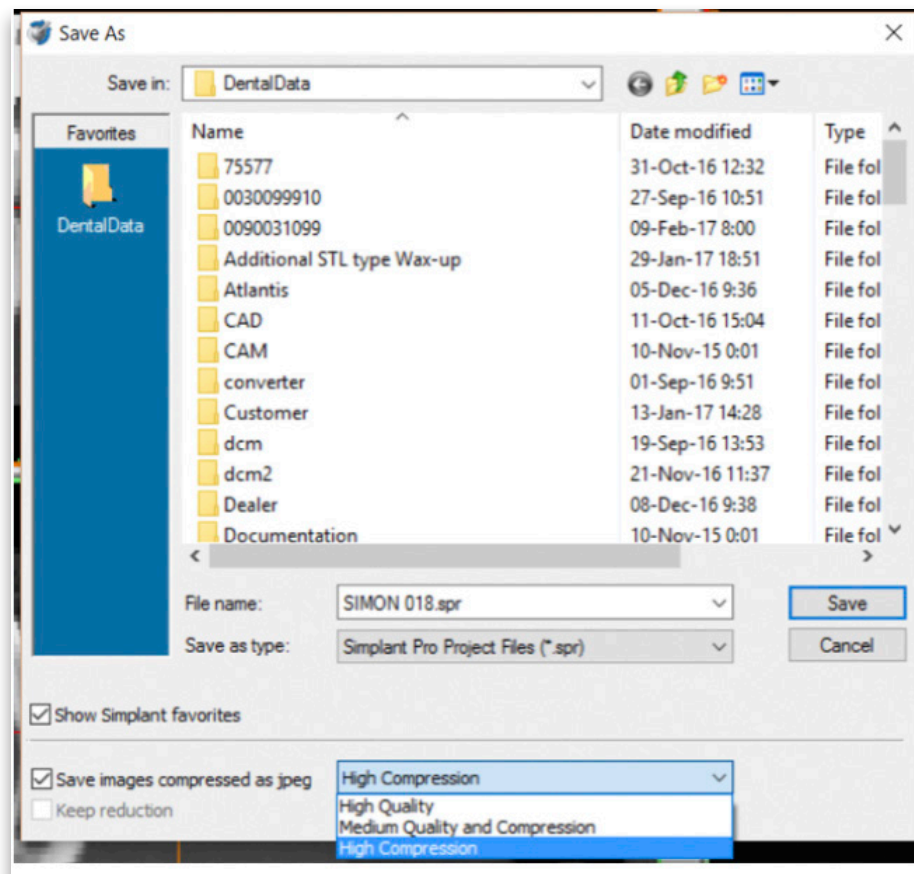
You can save a plan locally via the “Save” button in the main toolbar, or via the ‘File’ menu/‘Save Project’.

By default, no compression is applied. When you choose ‘Save As’ you have the option to save the images as compressed jpeg images.

It is possible to choose between the following compression presets:

- High Quality: compression ratio = 15%
- Medium Quality and Compression: compression ratio = 40%
- High Compression: compression ratio = 80%

Adding compression results in irreversible loss of information. This means that upon re-opening of the file, the images will be an approximation of the original images. Depending on the degree of compression, visually appreciable differences can be seen in the image as compared to the original image. Higher compression implies a larger reduction in file size, but a higher likelihood of image differences as compared to the original image.



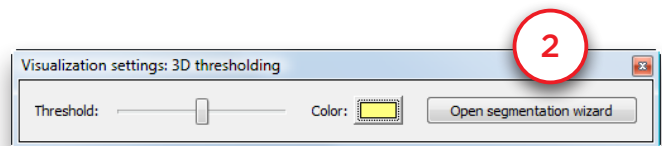
4. Segment

4.1 – Advanced volume rendering

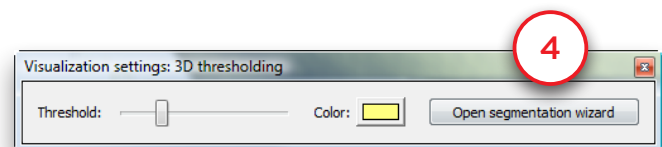
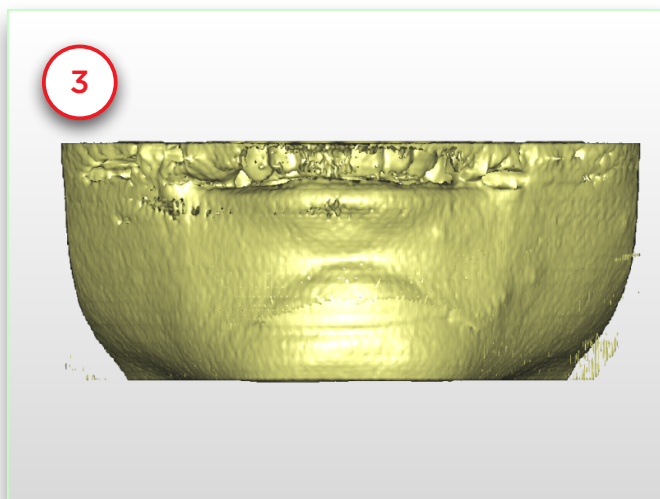
In Simplant, there is an 'advanced volume rendering' 3D visualization tool. This feature immediately shows an excellent 3D visualization without the use of the conventional segmentation tools.

NOTE: Please take a look at the system requirements required for this feature. This feature requires a high quality video card. If your computer does not support this feature, you will be able to work with the standard volume rendering tool.

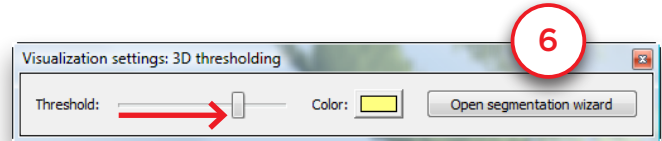
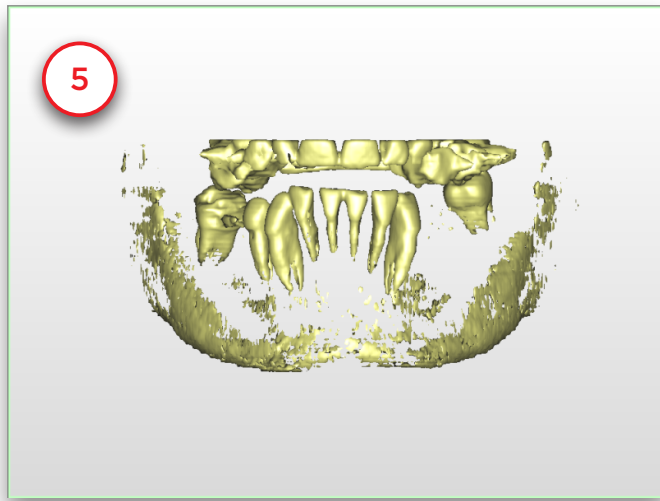
When you import Dicom images in Simplant, the '3D thresholding' is automatically generated (1). The toolbar 'Visualization settings 3D thresholding' is also displayed (2).



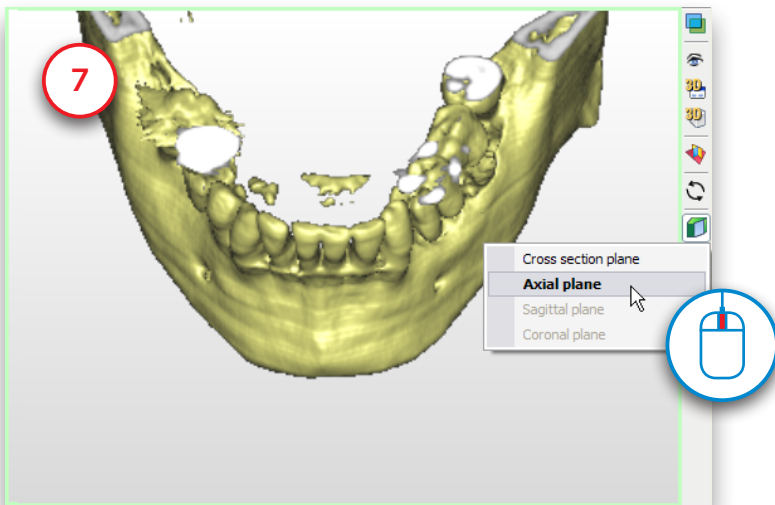
You can change the threshold value to show soft tissue (3). To do this drag the 'Threshold' slider to the left (4).



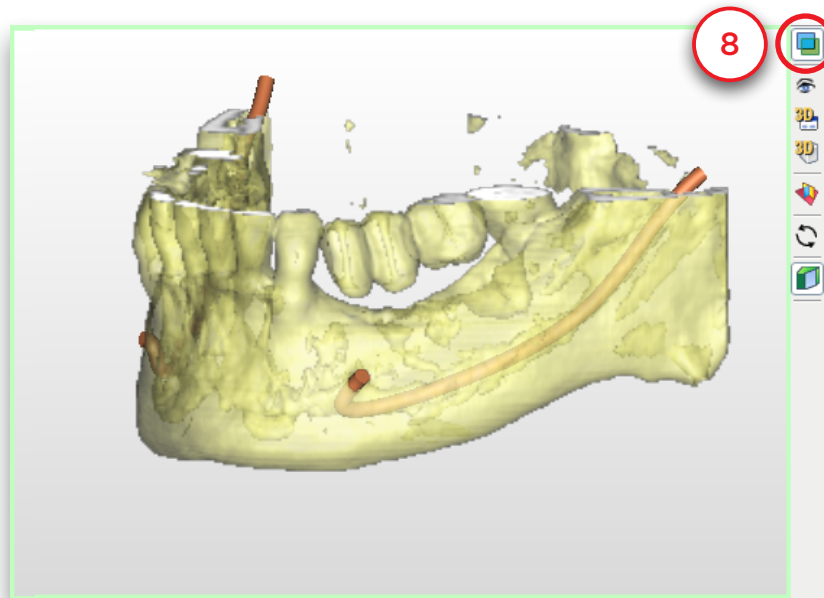
You can change the threshold value to show the teeth (5). To do this drag the 'Threshold' slider to the right (6).



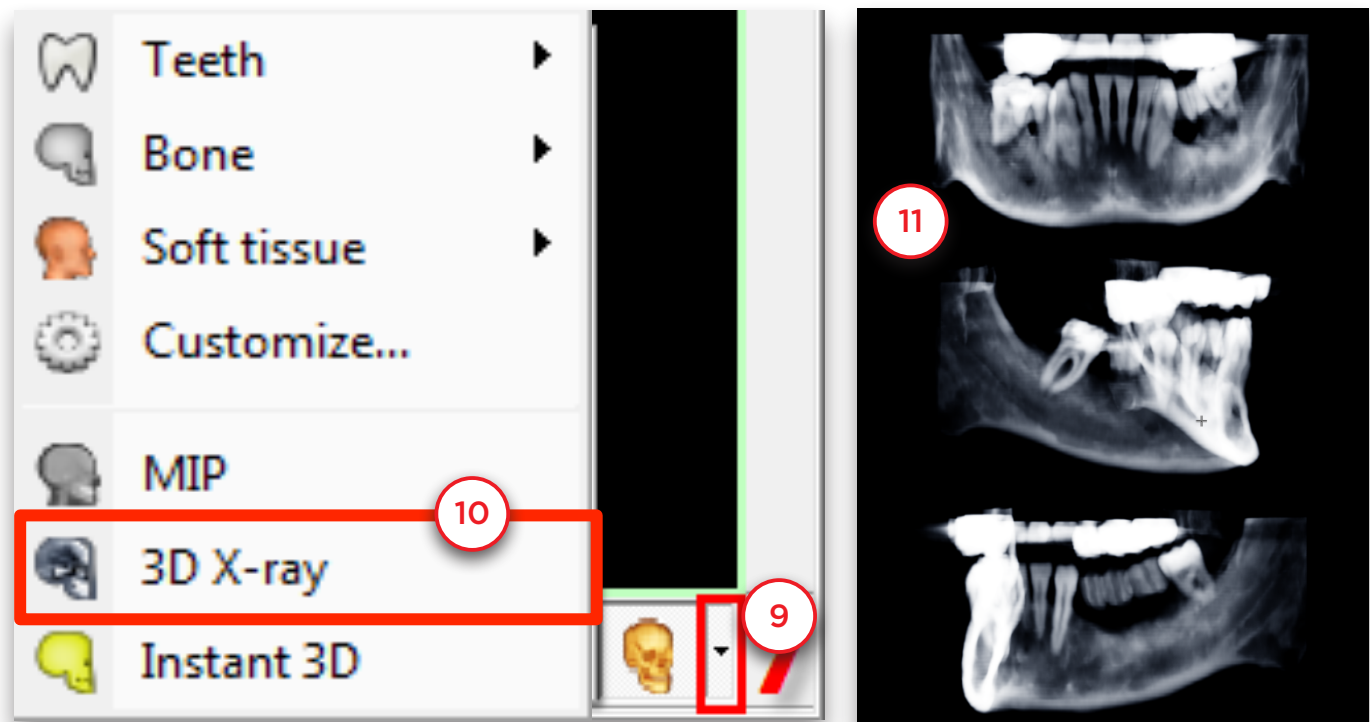
You can use the clipping tool (7) to remove the upper teeth and see the occlusal plane of the mandible teeth. Use the scroll wheel to move the clipping plane up or down.



You can use the transparency tool (8) to visualize the anatomical structures or planned implants inside the bone.

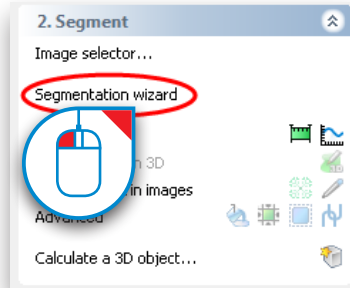


You can also generate a '3D X-ray'. In the lower right of the screen click the arrow next to the small skull icon (9). From the pop-up menu select '3D X-ray' (10). Now the 3D X-ray object is visible. You can rotate the X-ray object to view it from different angles (11).



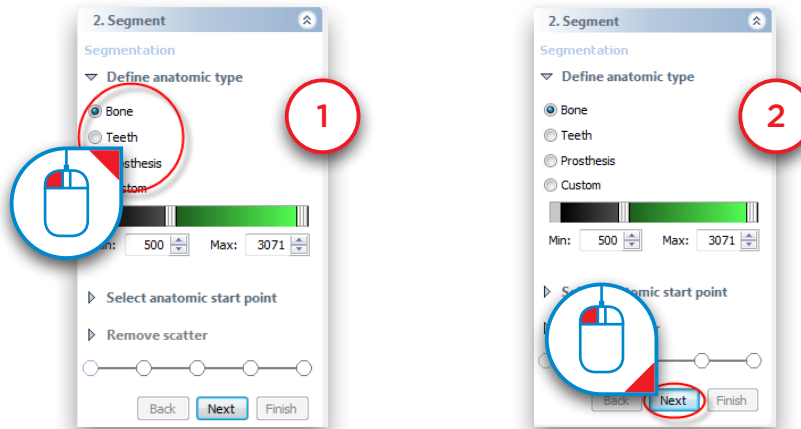
4.2 – Manual segmentation techniques

In the previous step we have imported CT images into Simplant. The first thing we need to do is create a 3D model from these 2D CT images. This process is called 'segmentation'. We will perform this segmentation by using the 'Segmentation wizard'.



The Segmentation Wizard

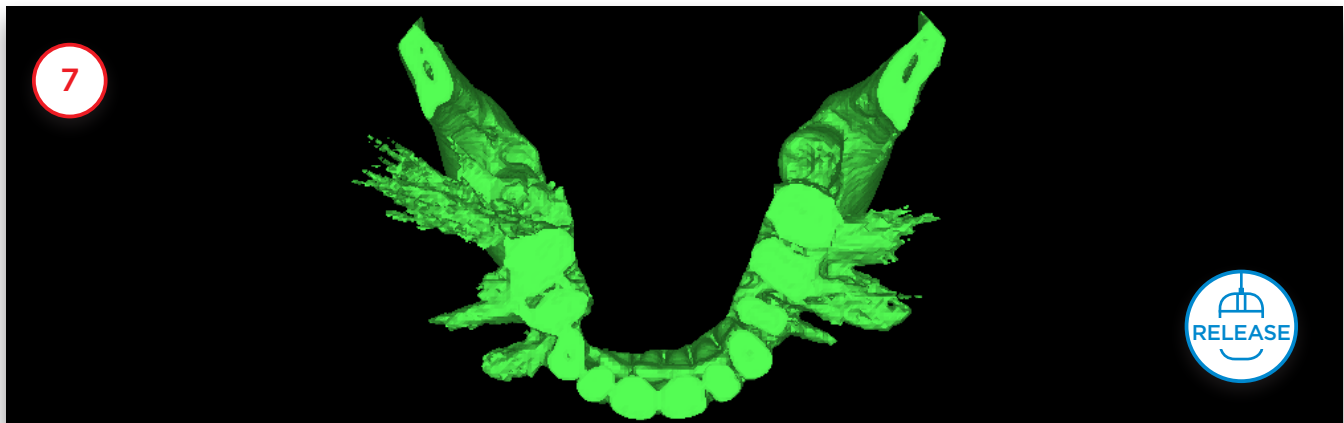
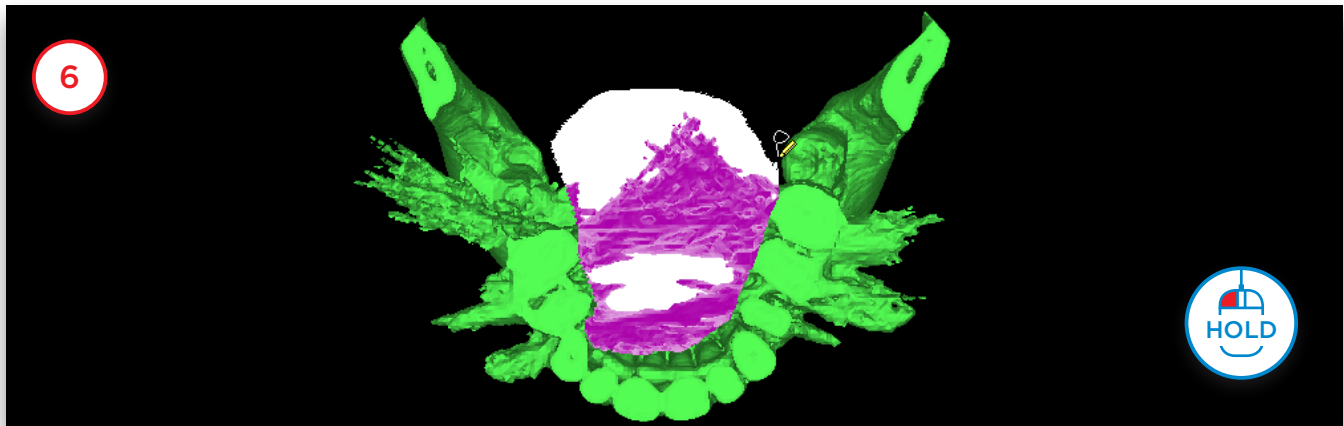
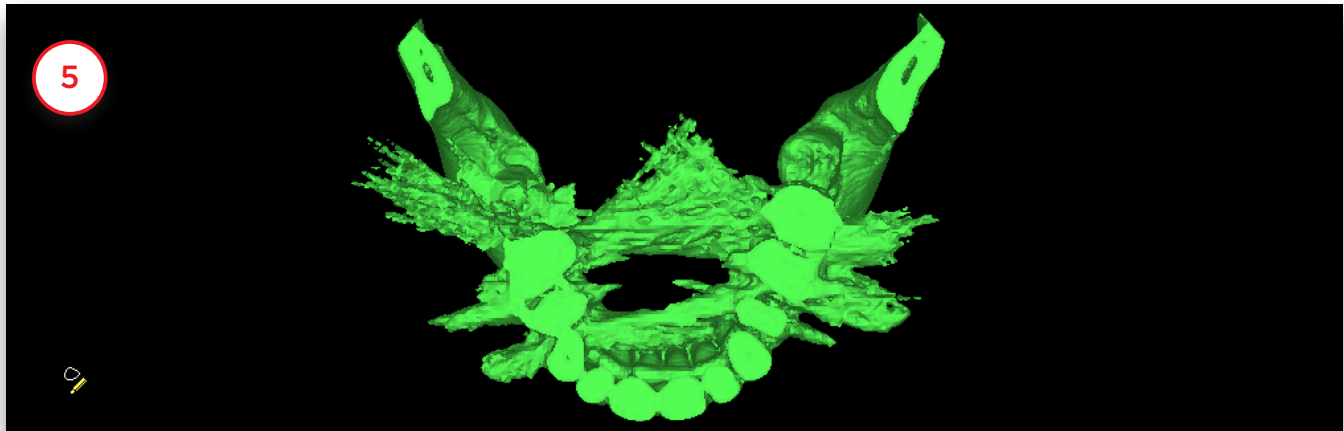
Define the type of anatomy that you would like to segment: the bone model, the teeth or the prosthesis (1) and click 'Next' to continue (2).



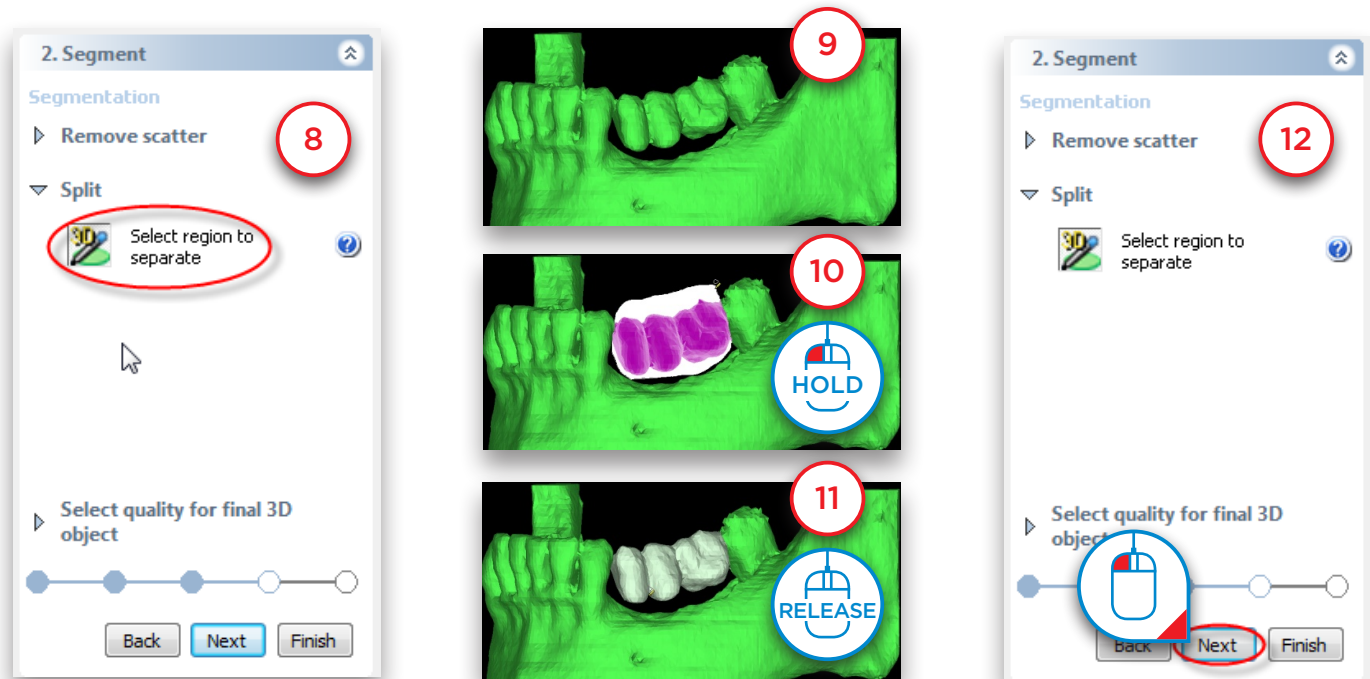
Click an internal bone point in one of the axial slices (3) and click 'Next' to continue (4).



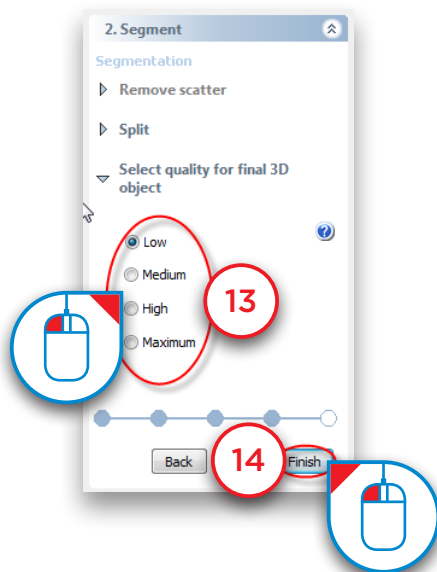
The next step is to remove the scatter in the 3D model. Simplant zooms the 3D view window to fullscreen (5). To remove the scatter, click and hold the left mouse button and drag a circle around the area that you would like to remove (6). Release the mouse button to finish (7).



After removing the scatter you can split the 3D model in two separate models: one for the bone and one for the prosthesis (8). Rotate the 3D model in a way that you have a clear view on the scan prosthesis (9). Click and hold the left mouse button and drag a circle around the area that you would like to remove to separate the scan prosthesis (10). Release the mouse button to finish the operation (11). The separated 3D model now has a different color. Click 'Next' to continue to the final step of the Segmentation Wizard (12).



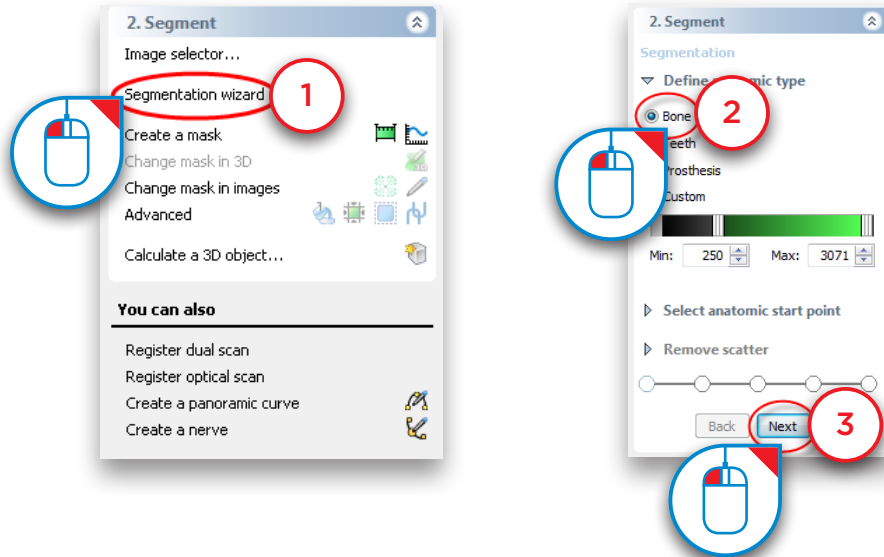
To finalize the 3D model select the quality of the model (13) and click 'Finish' (14).



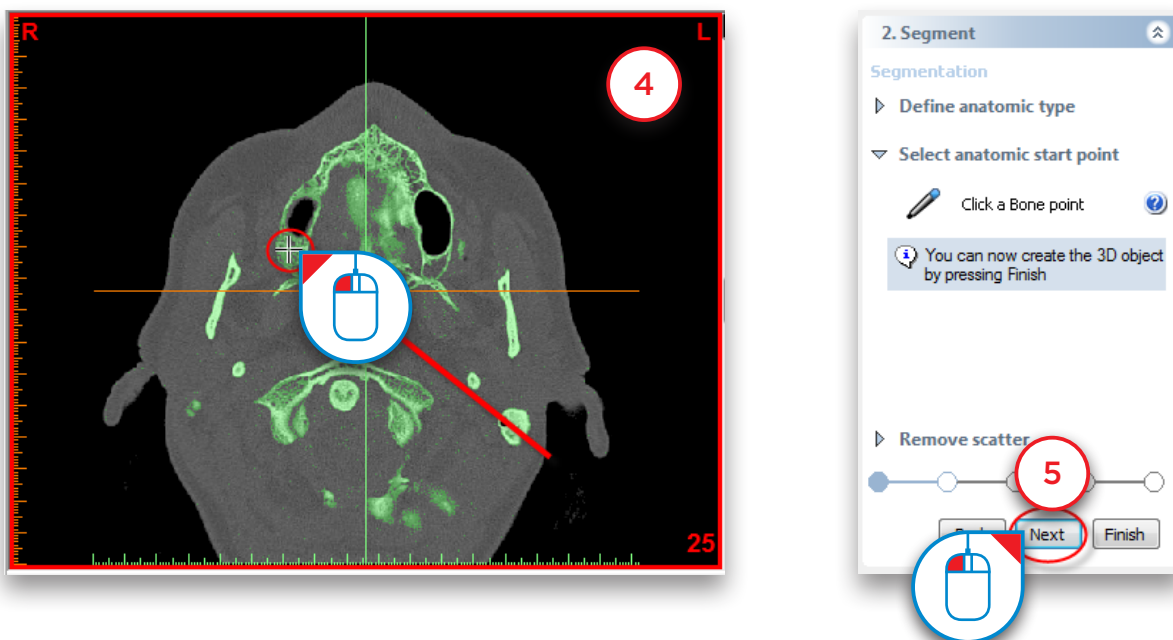
Advanced segmentation: scan prosthesis

When following the Single Scan procedure, the patient wears a special scan prosthesis during the scan. The scan prosthesis is produced by a dental lab and is fabricated using a mixture of barium sulfate. Because of this special composition, the prosthesis is clearly visible in the CT images and can be segmented separately. In this section we will explain how you can perform such a segmentation.

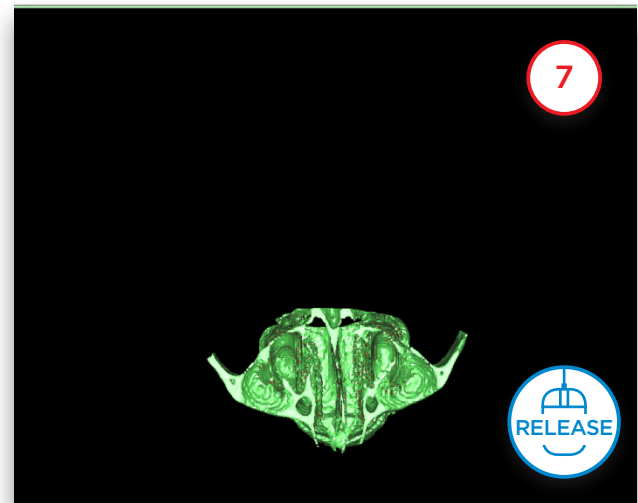
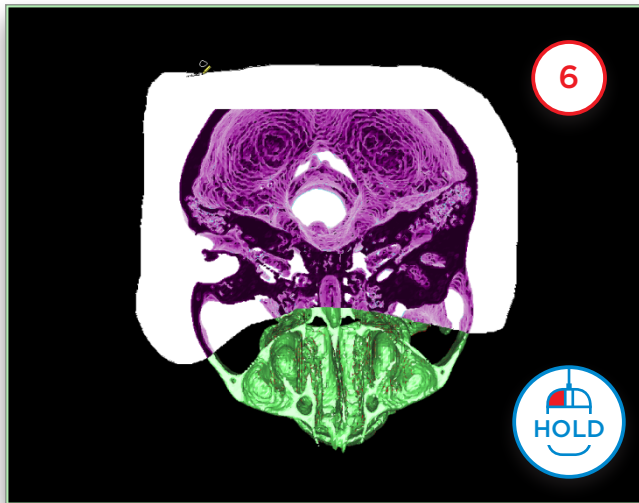
The first thing we need to do is create a segmentation of the patient's jaw using the 'Segmentation wizard'. In the Task Panel under '2. Segment' select 'Segmentation wizard' (1). Select 'Bone' as anatomic type (2) and click 'Next' to continue (3).




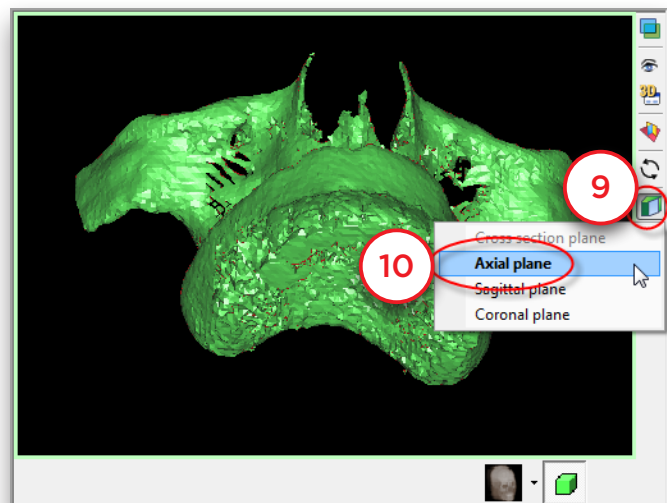
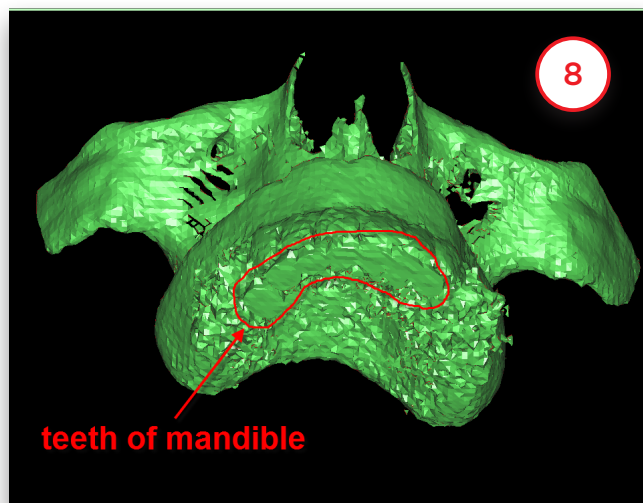
Click an internal bone point (4) and click 'Next' to continue (5).



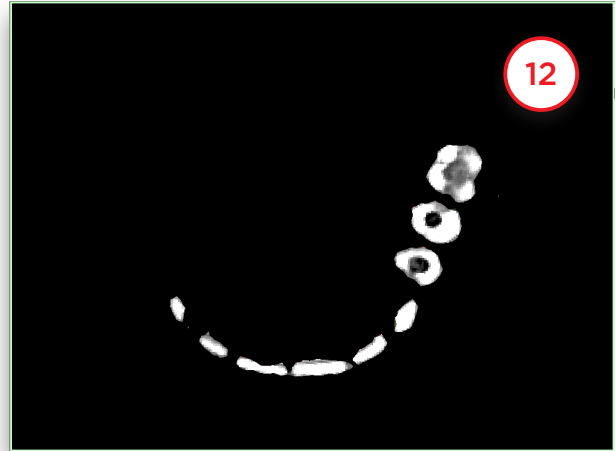
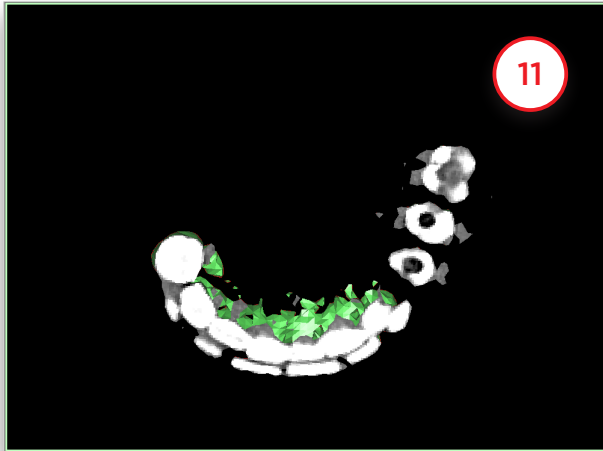
Now click and hold the left mouse button and drag a circle around the area of the bone model that you would like to remove (6). Release the mouse button to remove the part (7).



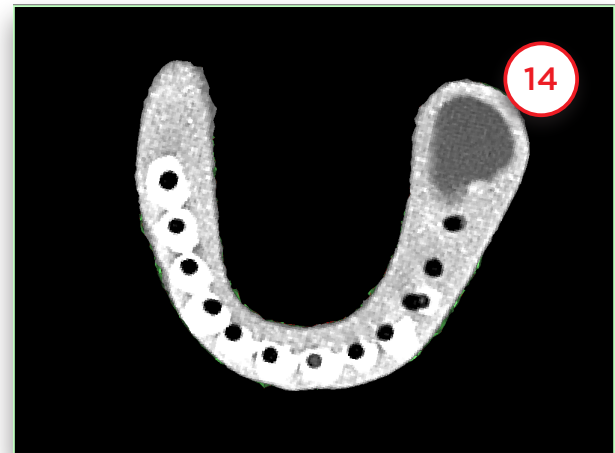
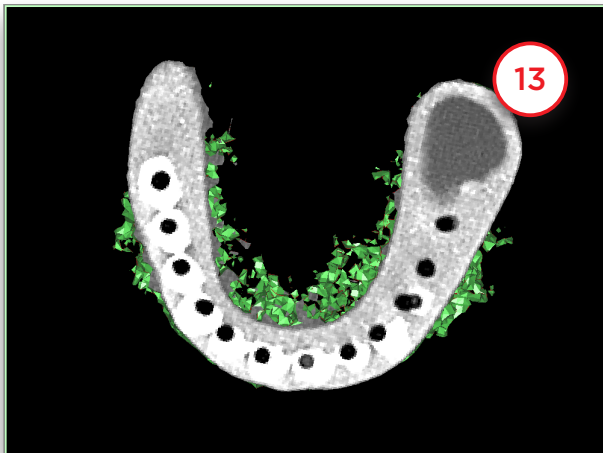
In the 3D model you can notice that part of the teeth of the mandible are attached to the scan prosthesis (8). We will remove these teeth using a clipped view. To enable clipping, click the clipping icon  (9). From the drop-down menu select 'Axial plane' (10).



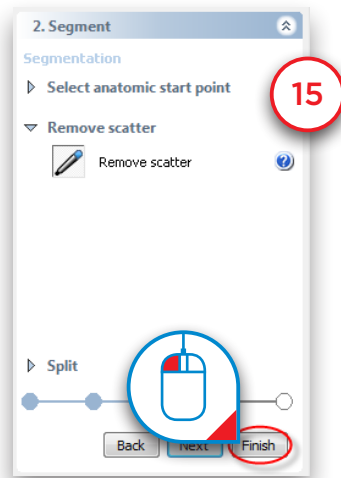
Scroll to the right slice using the mouse wheel button (11) and remove the bottom teeth from the prosthesis model (12).



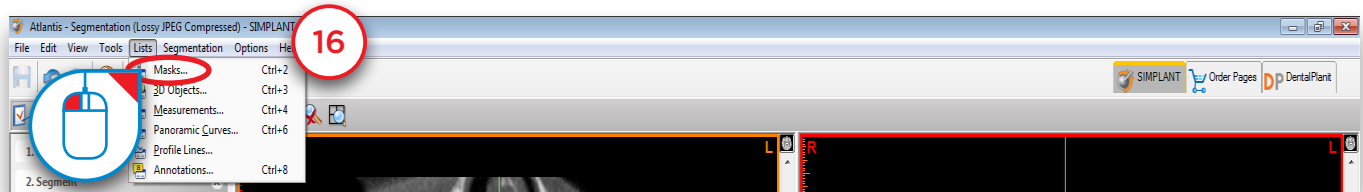
Scroll with the mouse wheel to navigate through the slices (13) and remove the remaining scatter around the prosthesis (14).



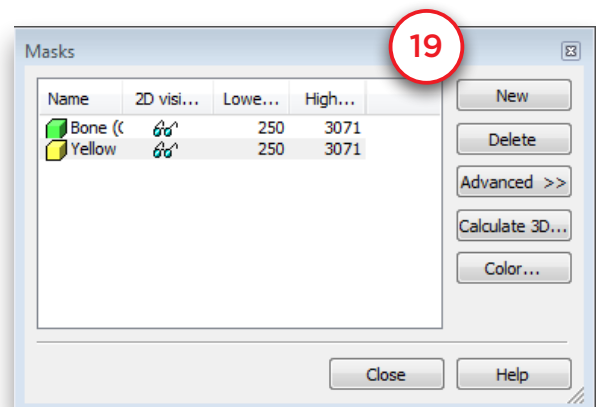
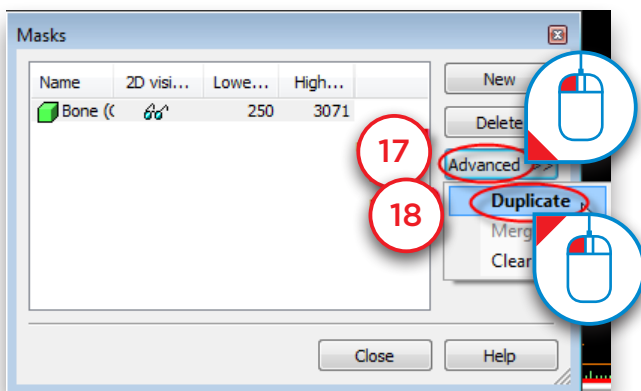
Click 'Finish' to exit the Segmentation Wizard (15).



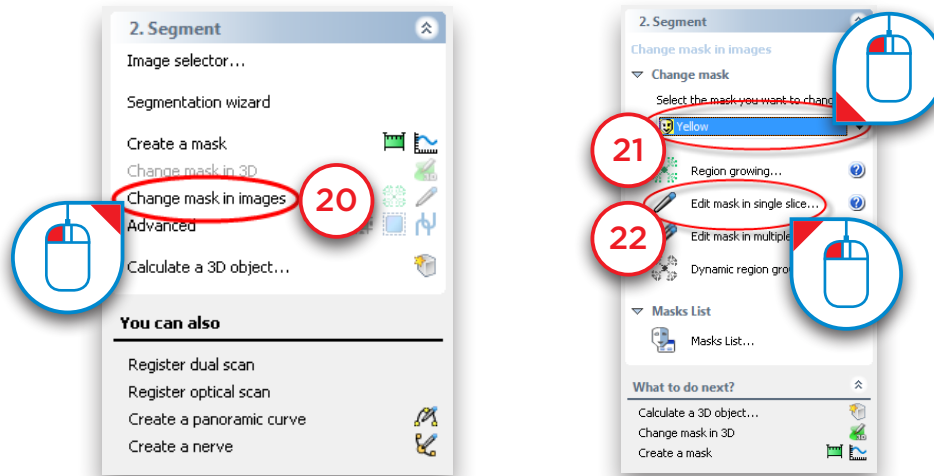
Now we are going to create a duplicate of the mask that we just created. In the Simplant menu, navigate to 'Lists>Masks' (16).



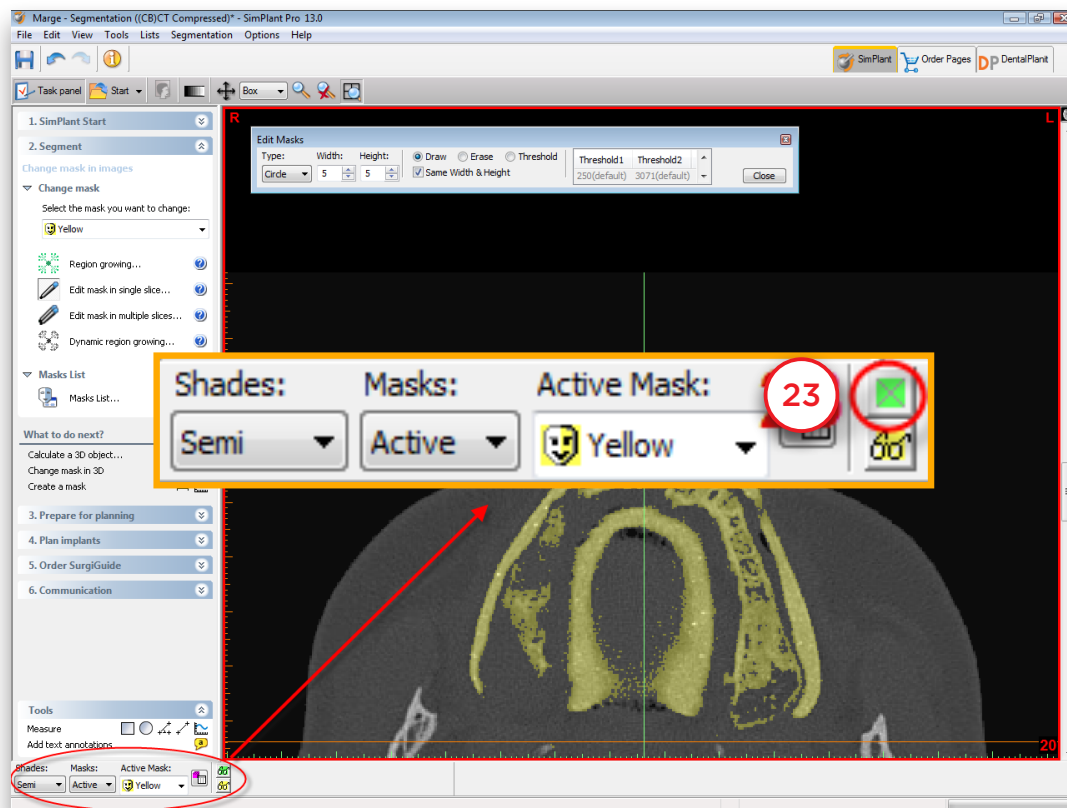
In the 'Masks' dialog click the 'Advanced' button (17) and from the drop-down menu select 'Duplicate' (18). A new copy of the green mask is created (19). This new (yellow) mask will become the mask for the bone model.



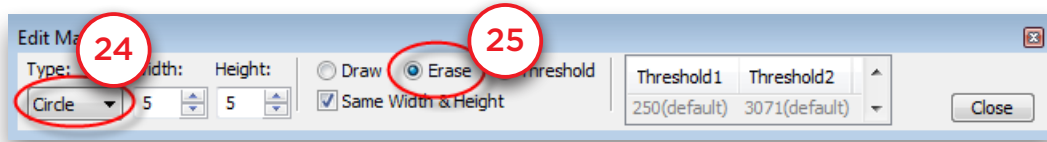
Now we will edit the yellow mask in the 2D images. We are going to remove the scan prosthesis from this mask to create a bone model mask. In the Task Panel under '2. Segment' select 'Change mask in images' (20). Afterwards, select the yellow mask as mask that you would like to change (21) and select 'Edit mask in single slice' (22).



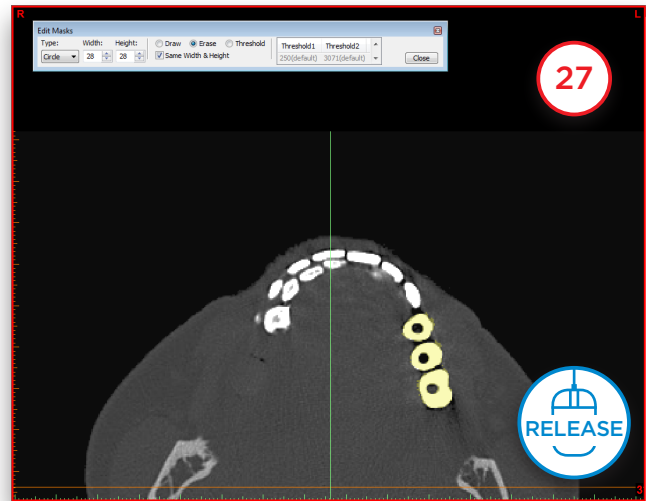
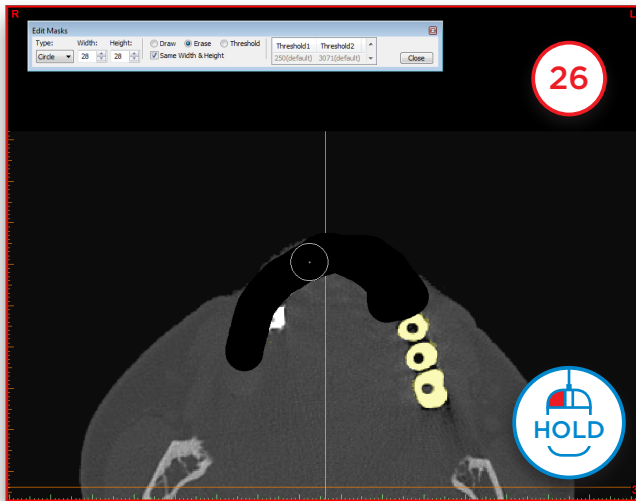
On the bottom left you of the window you can find the 'Masks' dialog. Click the  icon to make the green mask invisible (23).



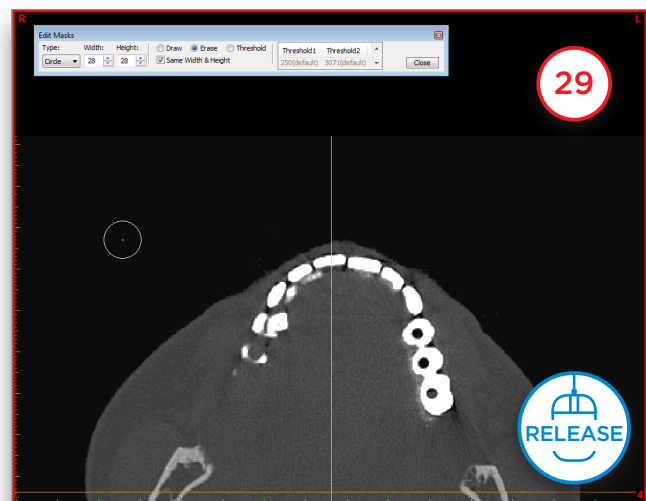
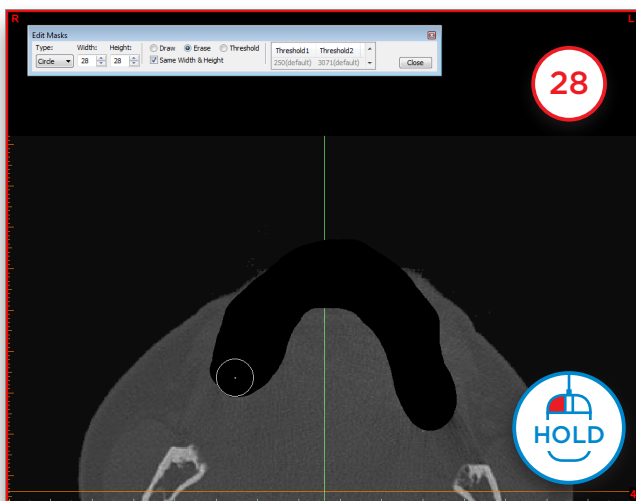
In the 'Edit Masks' dialog select 'Circle' as type (24) and select 'Erase' (25).



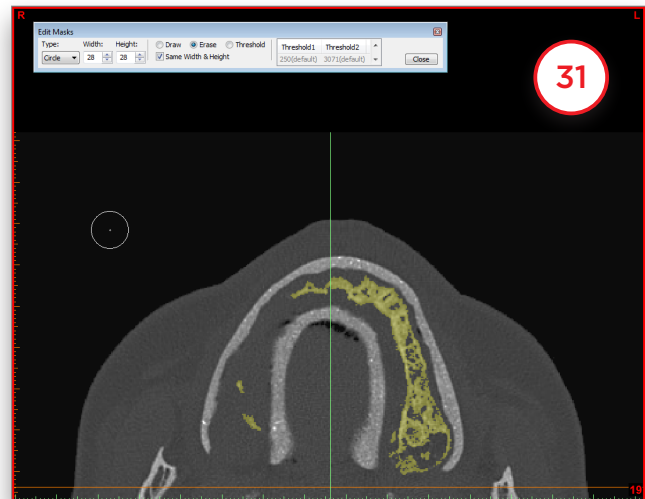
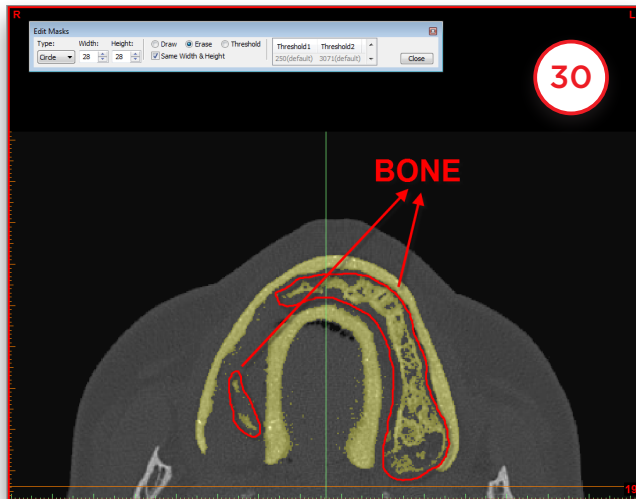
Now you can erase the redundant parts of the yellow mask slice per slice. Click and hold the left mouse button and trace the area of the mask that you wish to remove (26) (the traced area colors black). Release the mouse button to finish (27). Notice that the yellow mask has disappeared on the places that you have traced.



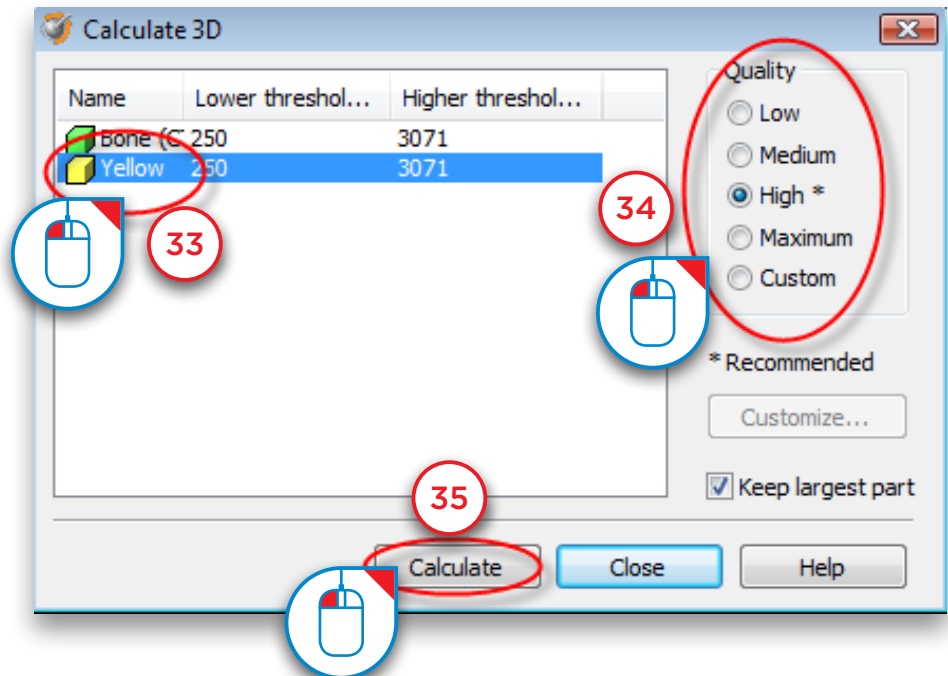
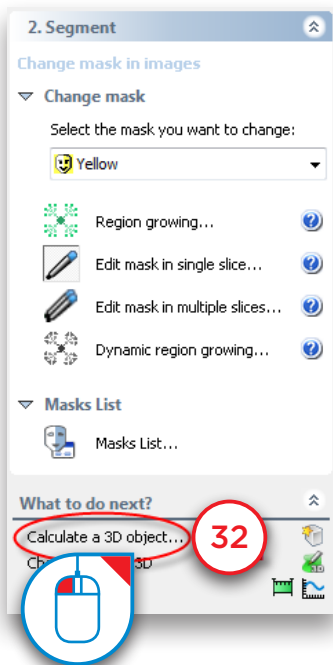
Now scroll to the next slice. Remove the redundant parts of the yellow mask here in the same way as you did in the previous slice (28-29).



Repeat this for every slice in which you have to clean up the yellow mask. In the region of the scan prosthesis be sure not to erase the bone part of the mask. For example, in slice 19, you can see both bone and prosthesis material. You can easily distinguish the porous bone parts from the prosthesis parts in the slices visually (30). Only erase the prosthesis parts from the mask (31).

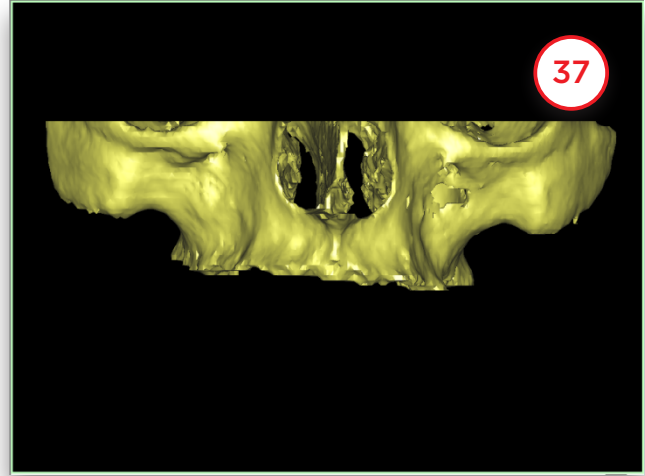
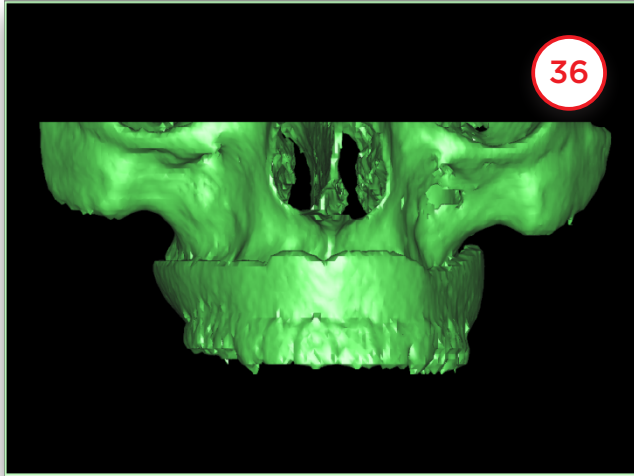


Now we need to calculate a 3D object again from the altered yellow mask. Select 'Calculate a 3D object' (32). In the 'Calculate 3D' dialog select the 'Yellow' mask (33), choose the quality of the 3D object (34) and click 'Calculate' (35) to finish.

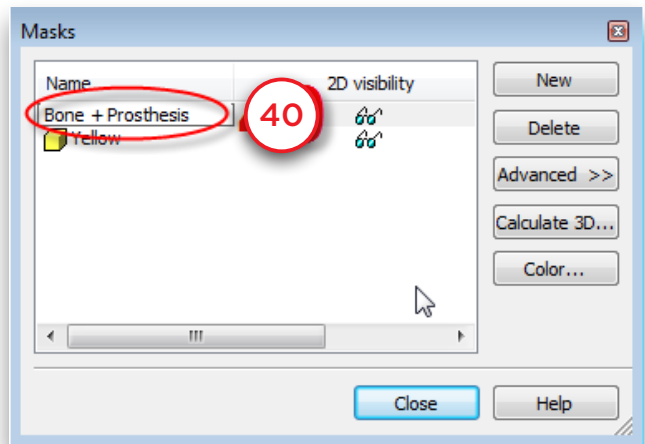
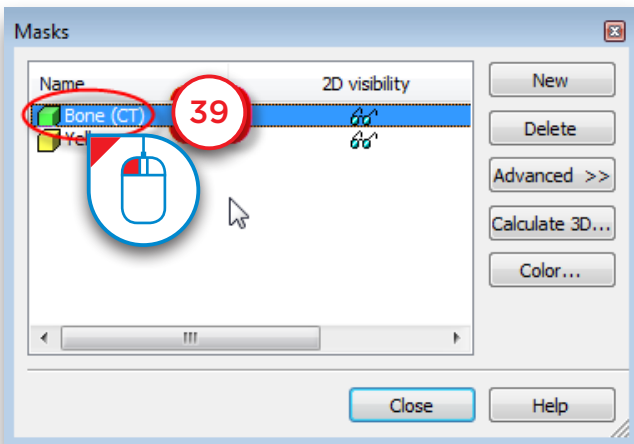
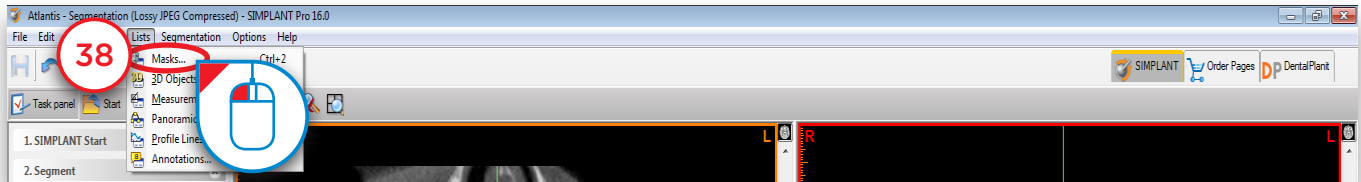


At this point we have created two masks:

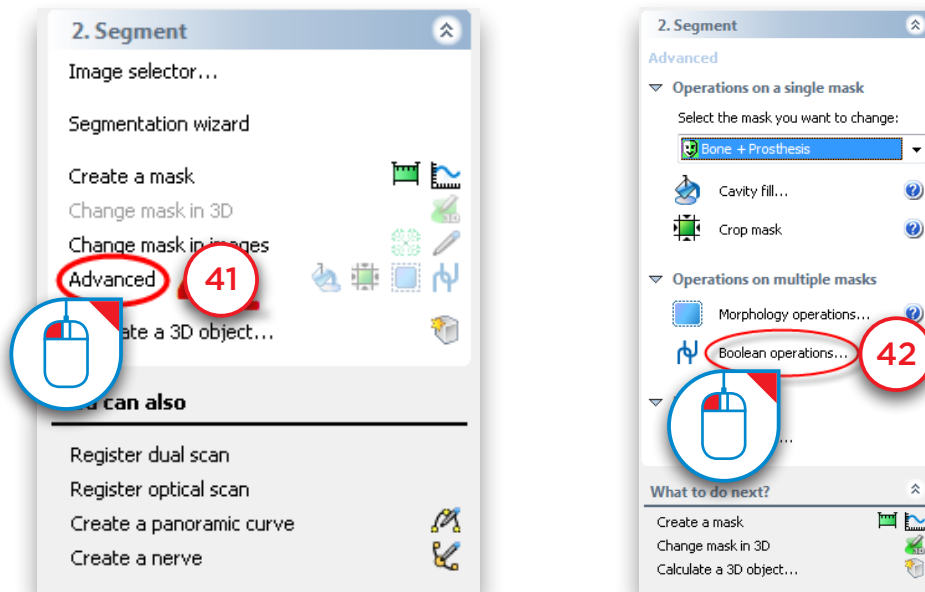
- One mask consisting of the bone and the prosthesis (the green mask) (36)
- Another mask consisting of the bone (the yellow mask) (37)



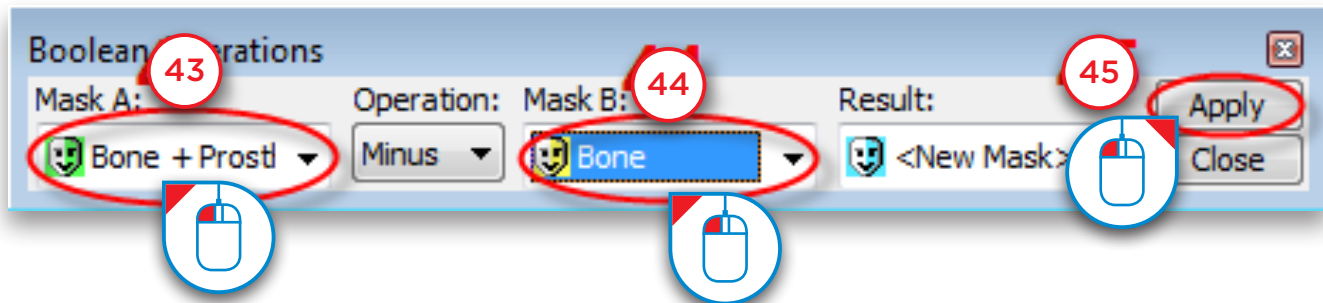
Now we will rename these two masks. In the Simplant menu select 'Lists>Masks' (38). In the 'Masks' dialog click the name of the mask with the left mouse button (39). Type the new name for the mask ("Bone + Prosthesis" for the green mask and "Bone" for the yellow mask) (40).



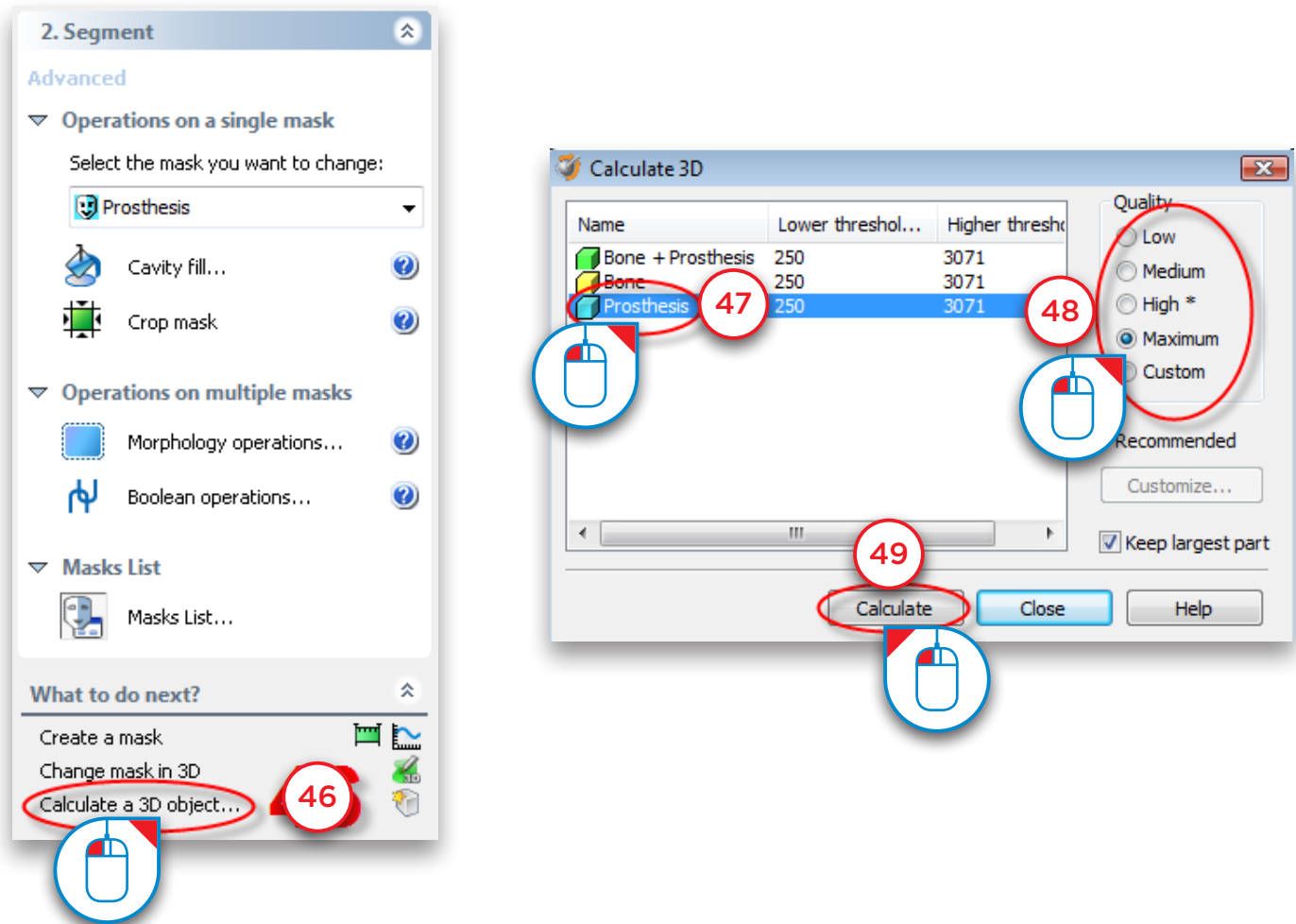
Now we will create a third mask by subtracting the yellow mask from the green mask using 'Boolean Operations'. This third mask will consist of the prosthesis. In the Task Panel under '2. Segment', select 'Advanced' (41). Afterwards, select 'Boolean operations' (42).



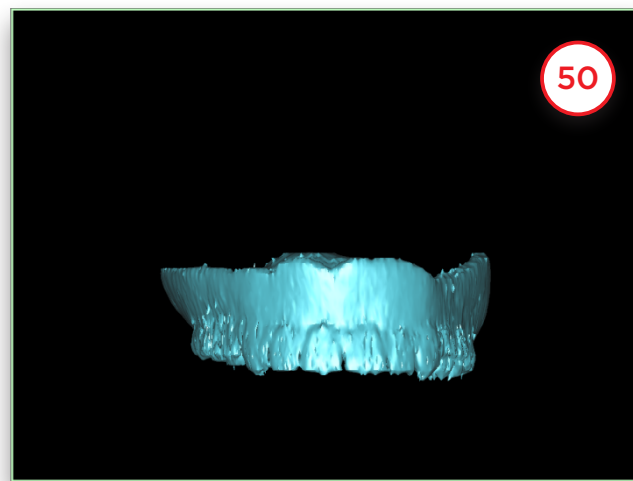
The 'Boolean Operations' dialog appears. Select the green "Bone + Prosthesis" mask as 'mask A' (43) and the yellow "Bone" mask as 'mask B' (44) and click 'Apply' (45). This creates a new (blue) mask that represents the separate prosthesis. Rename this mask to "Prosthesis" in the same way that you did for the other masks (38-40).



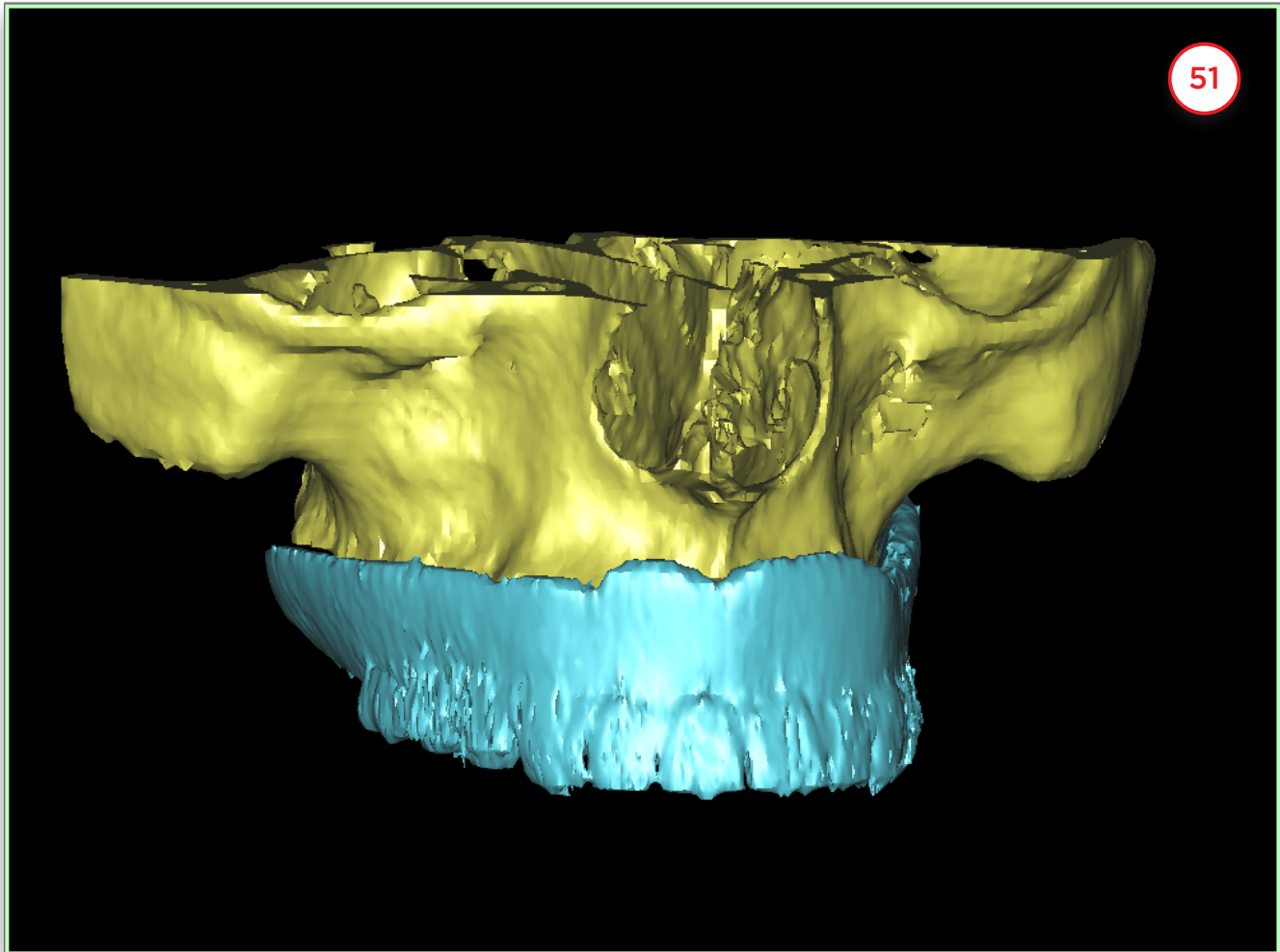
The next thing we have to do is create a 3D model from this mask. In the Task Panel, select 'Calculate a 3D object' (46). In the 'Calculate 3D' dialog, select the blue 'Prosthesis' mask (47), select the quality of the 3D model (48) and click 'Calculate' (49).



The result is a separate 3D model of the scan prosthesis (50).

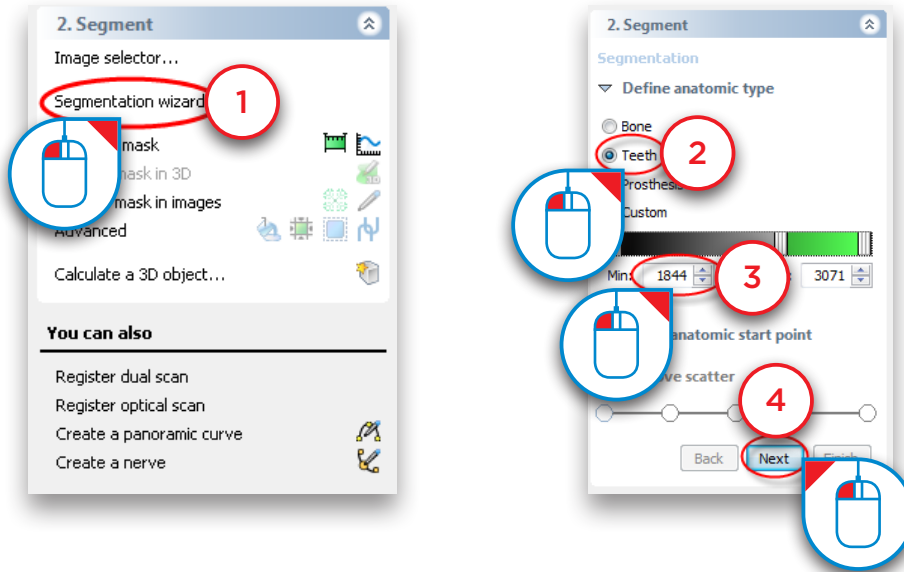


The final result is a separate segmentation of both the bone model and the prosthesis model (51).

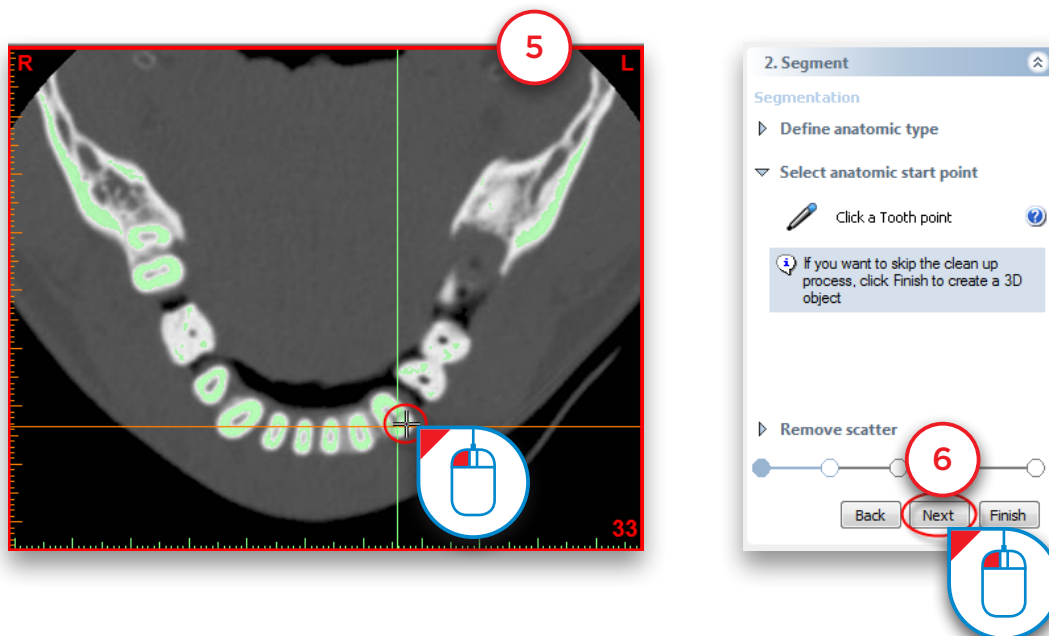


Advanced segmentation: teeth

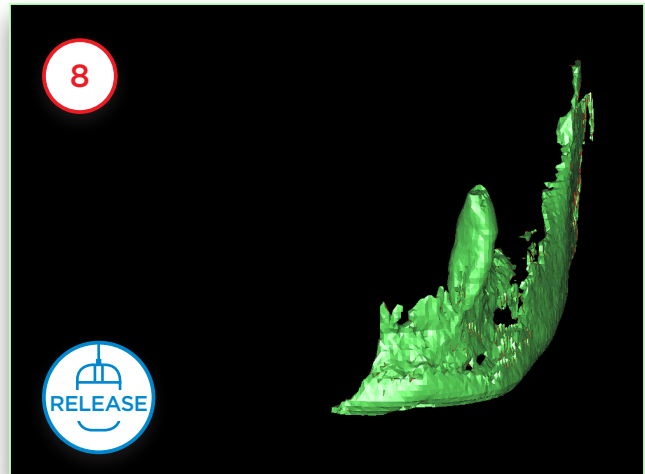
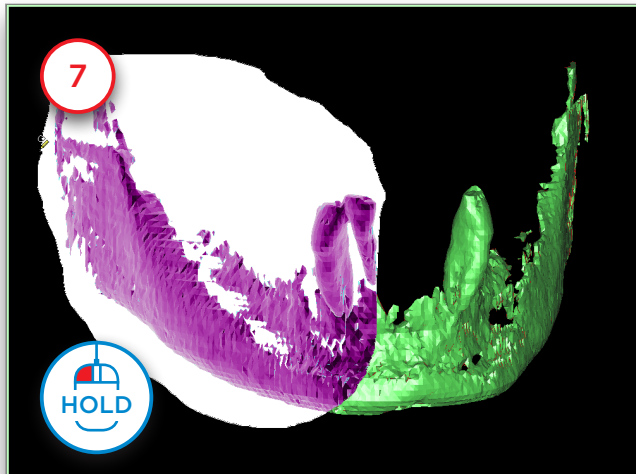
In this section we will explain how you can perform a separate segmentation of the teeth. In the Task Panel under '2. Segment', select 'Segmentation wizard' (1). Select 'Teeth' as anatomic type (2). Set the minimum threshold value to around "1800" (3) and click 'Next' to continue (4).



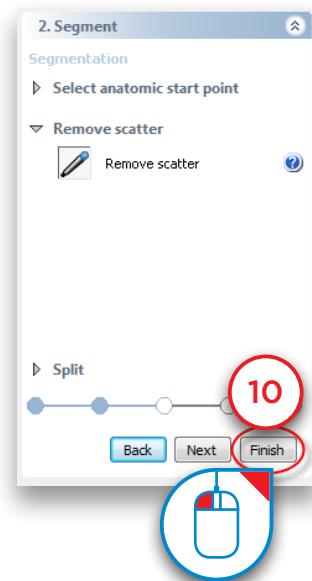
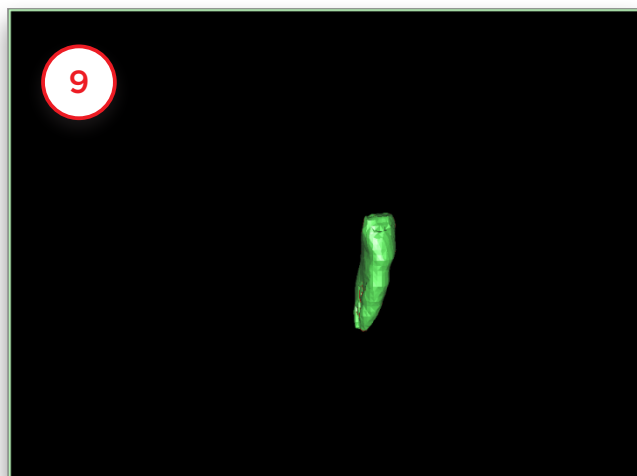
Click with the left mouse button somewhere inside the tooth surface (5). Click 'Next' to continue (6).



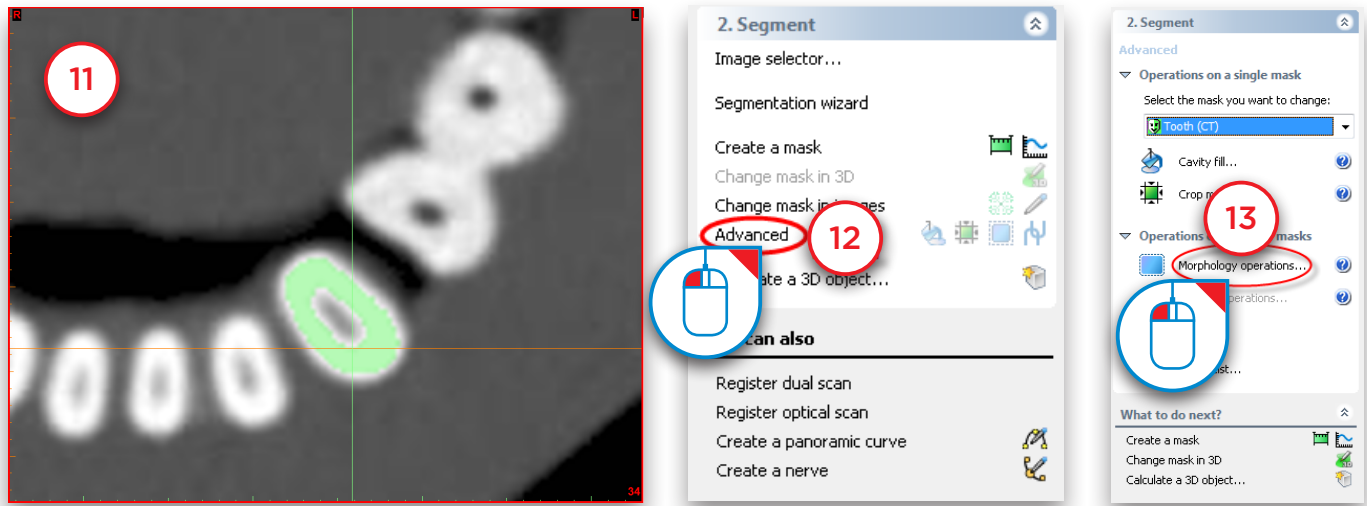
Click and hold the left mouse button and drag a circle around the area that you want to remove from the model (7). Release the mouse button to finish (8).



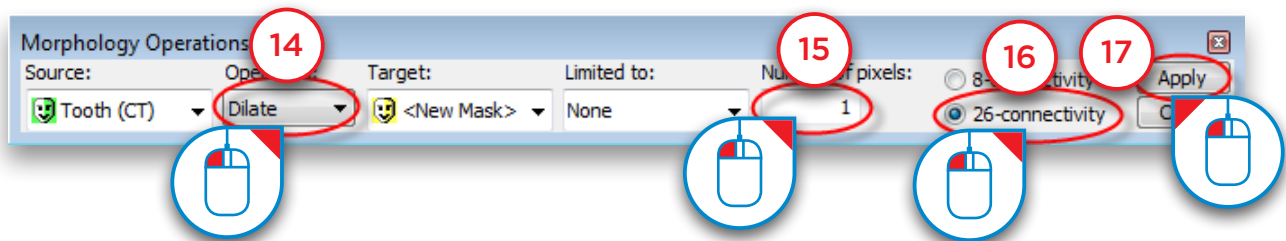
Use the method described above to remove the rest of the bone material. Now only the tooth remains (9). Click 'Finish' to end the Segmentation Wizard (10).



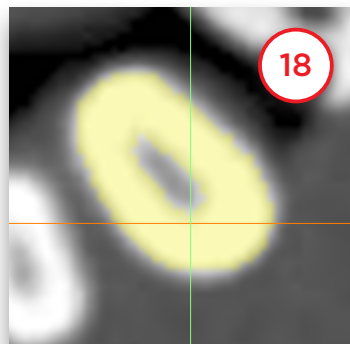
The segmentation is not yet perfect however. When you take a closer look at the green mask in the axial slices you can see that the edge mask doesn't correspond to the (white) edge of the teeth (11). In the next steps we will 'dilate' the mask to fix this. In the Task Panel under '2. Segment' select 'Advanced' (12). Afterwards, select 'Morphology operations' (13).



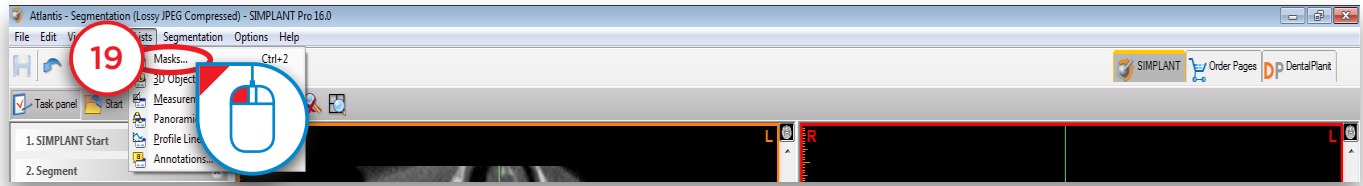
In the 'Morphology operations' dialog, select 'Dilate' (14). Set the 'Number of pixels' to "1" (15). Select '26-connectivity' (16) and click 'Apply' to finish (17).



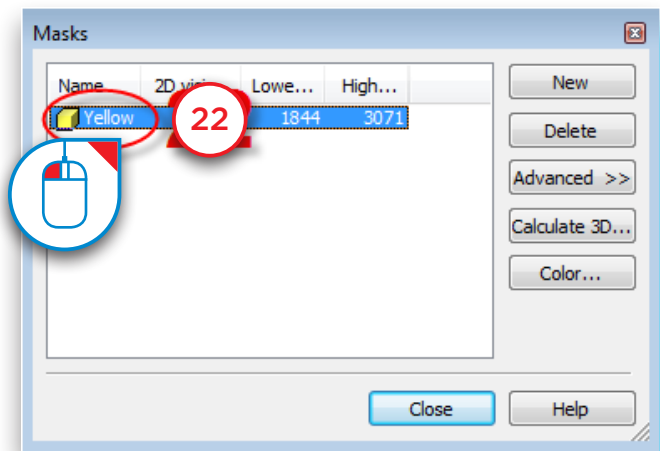
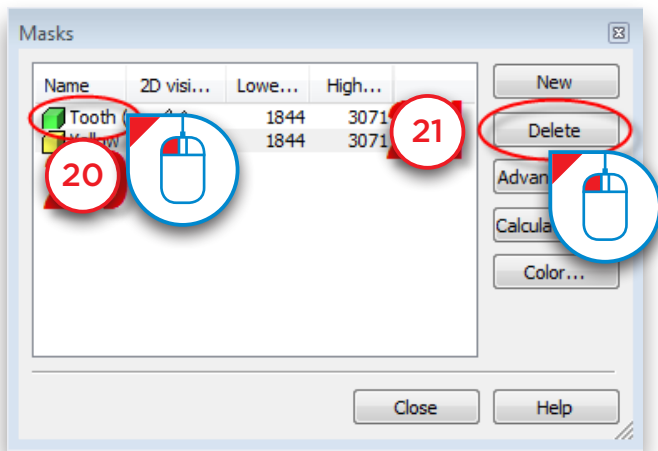
Notice that the newly created yellow mask corresponds with the tooth edge (18)



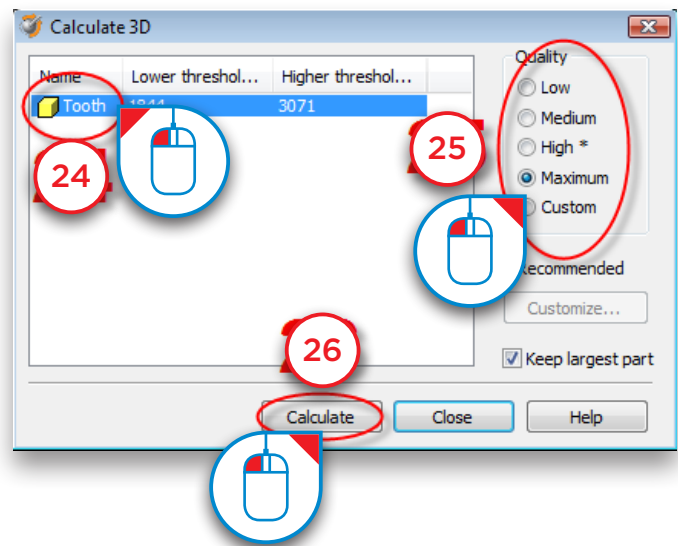
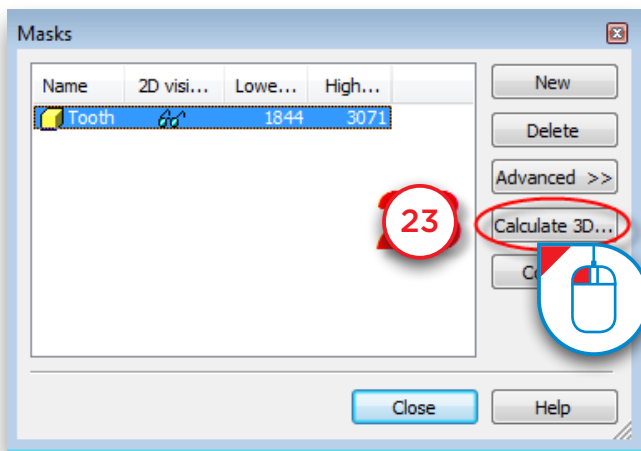
In the Simplant menu navigate to 'Lists>Masks' (19).



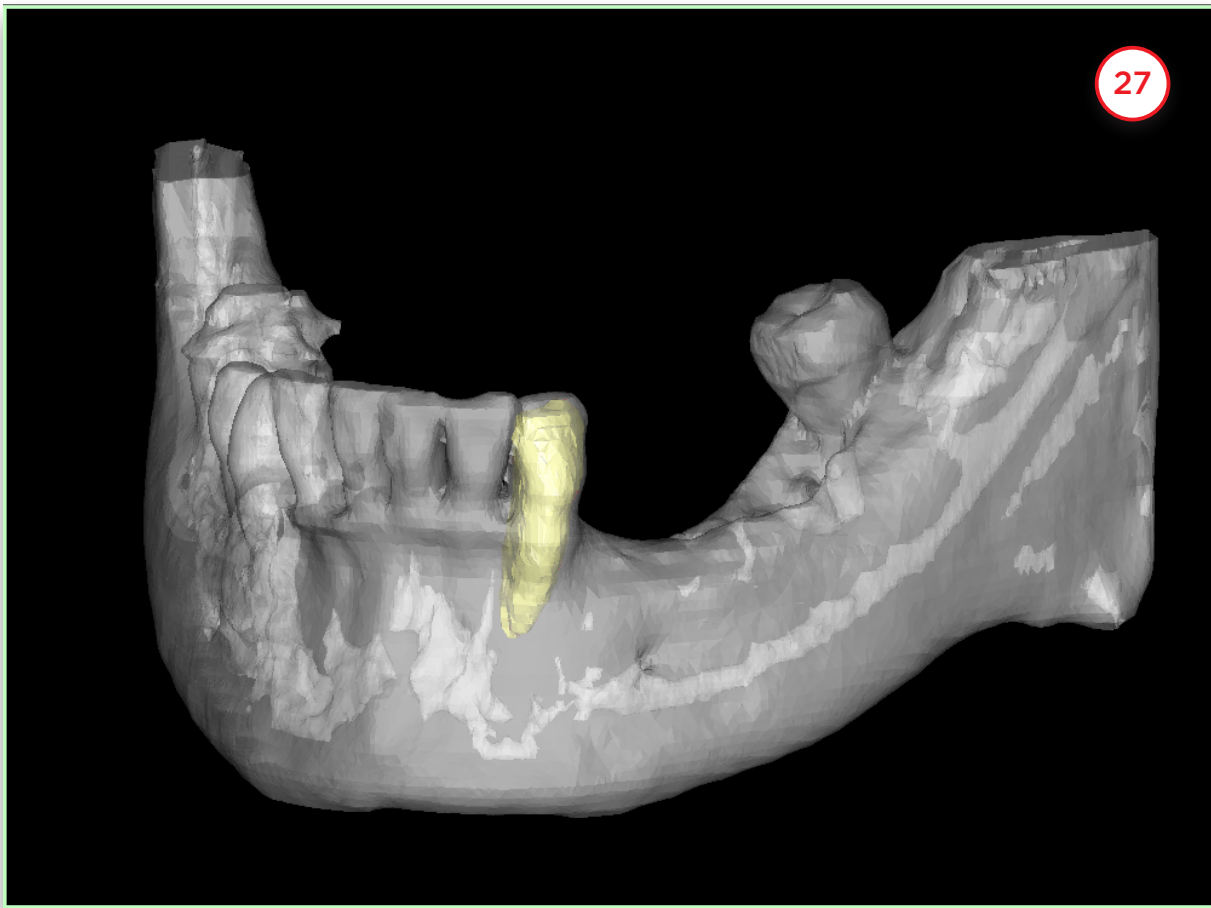
In the 'Masks' dialog left-click the green 'Tooth' mask (20) and click the 'Delete' button to remove it (21). Afterwards, left-click the yellow mask and type "Tooth" to rename this mask (22).



Click the 'Calculate 3D' button (23). In the 'Calculate 3D' dialog select the yellow 'Tooth' mask (24), select the quality of the 3D model (25) and click 'Calculate' (26).



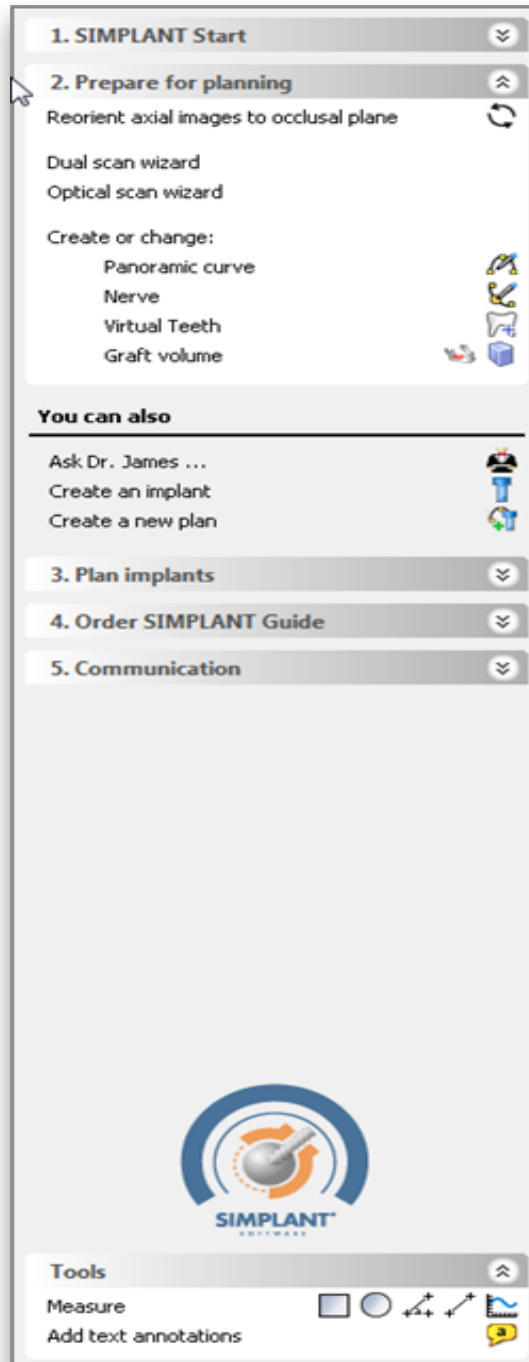
We now have completed the separate segmentation of a tooth (27).



5. Prepare for planning

After opening the project, it can be prepared for the actual planning:

- 5.1 Dual scan wizard
- 5.2 Optical scan wizard
- 5.3 Draw the panoramic curve
- 5.4 Draw the nerve
- 5.5 Create Virtual Teeth
- 5.6 Create bone graft
- 5.7 Make measurements



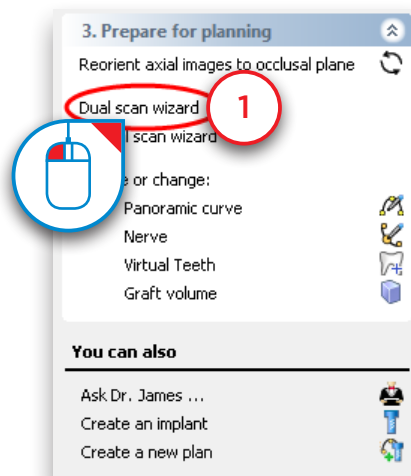
5.1 – Dual Scan Wizard

To be able to use the Dual Scan wizard you need two scans:

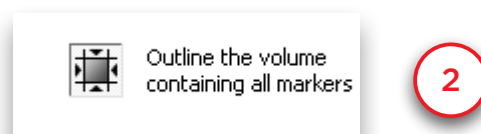
(A) a scan of the patient with the scan prosthesis

(B) a separate scan of the scan prosthesis

In the Task Panel under '*Prepare for planning*' select '*Dual Scan wizard*' (1).



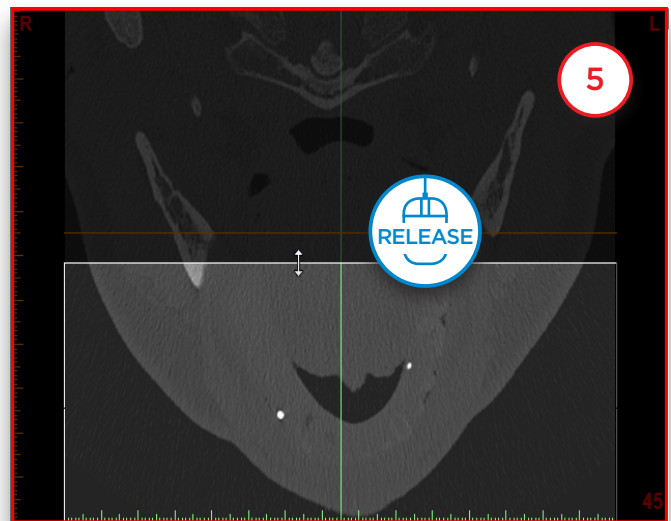
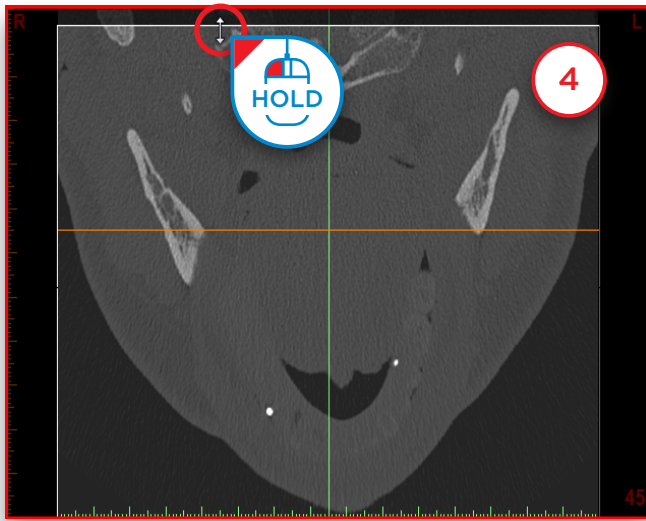
In the next step, Simplant is going to search for the Dual Scan Markers on the scan prosthesis in the patient scan (A). The Markers are obviously only located in the area of the scan prosthesis. To prevent Simplant to search for Markers in the entire 3D model, you need to outline the volume that contains all the Markers (2). This outlining can be done in the three 2D view windows.



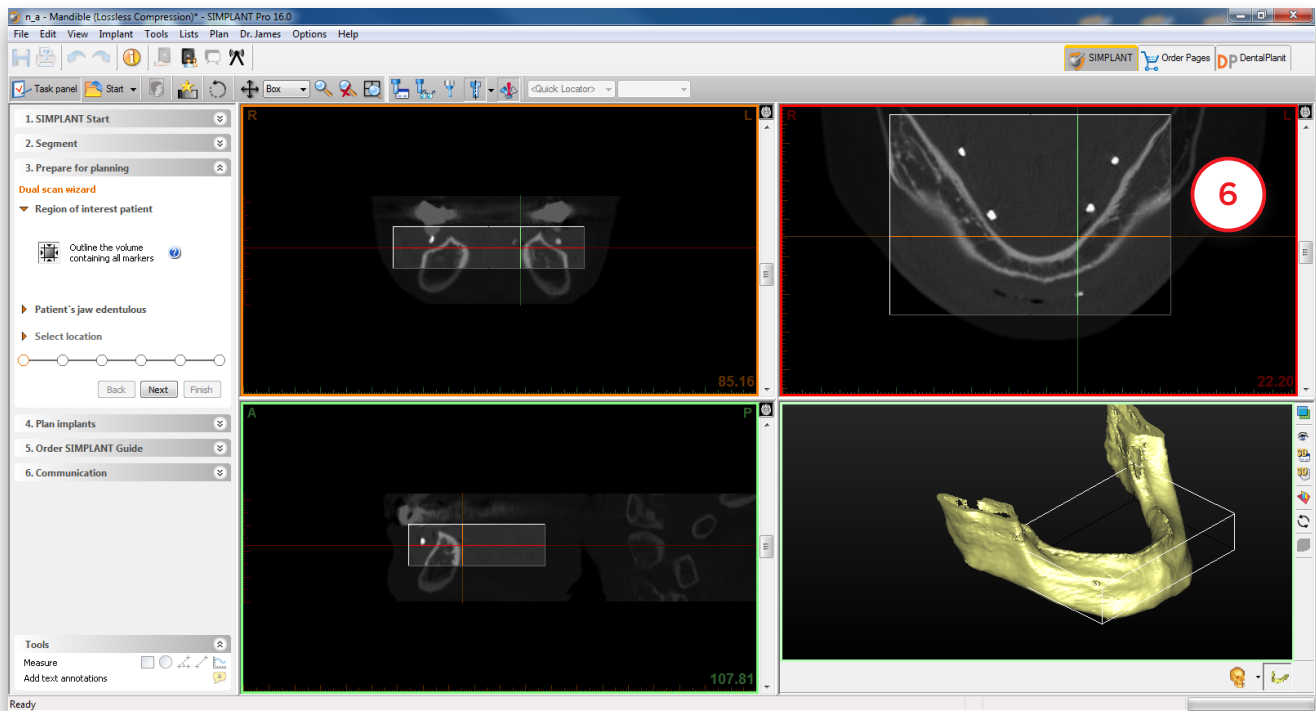
In the 2D view windows you can now see a square that indicates the area that Simplant will search for Markers in. To change this area, move your mouse cursor over one of the edges of such a square until the mouse cursor changes into following icon (3):



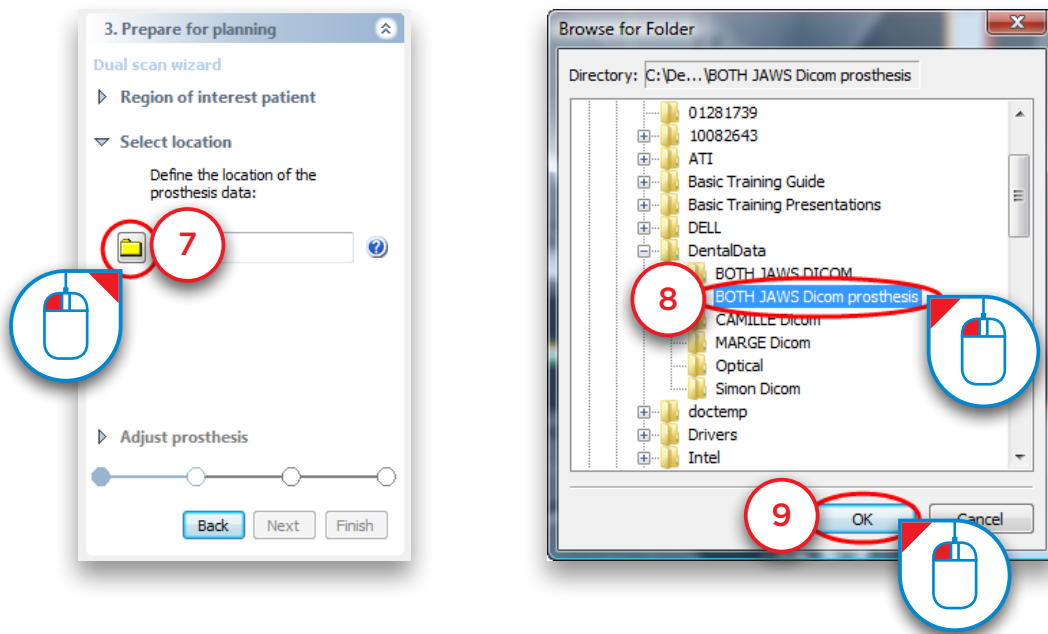
Now click and hold the left mouse button and move the mouse cursor to change the dimensions of the square (4). Release the mouse button to finish the operation (5). Repeat this for all the sides of the square until the selected area is narrowed down to the area containing the Markers.



The selected area should look like the area selected in the window shown below (6). Only the area of the scan prosthesis is selected. Make sure all markers are in the box area.



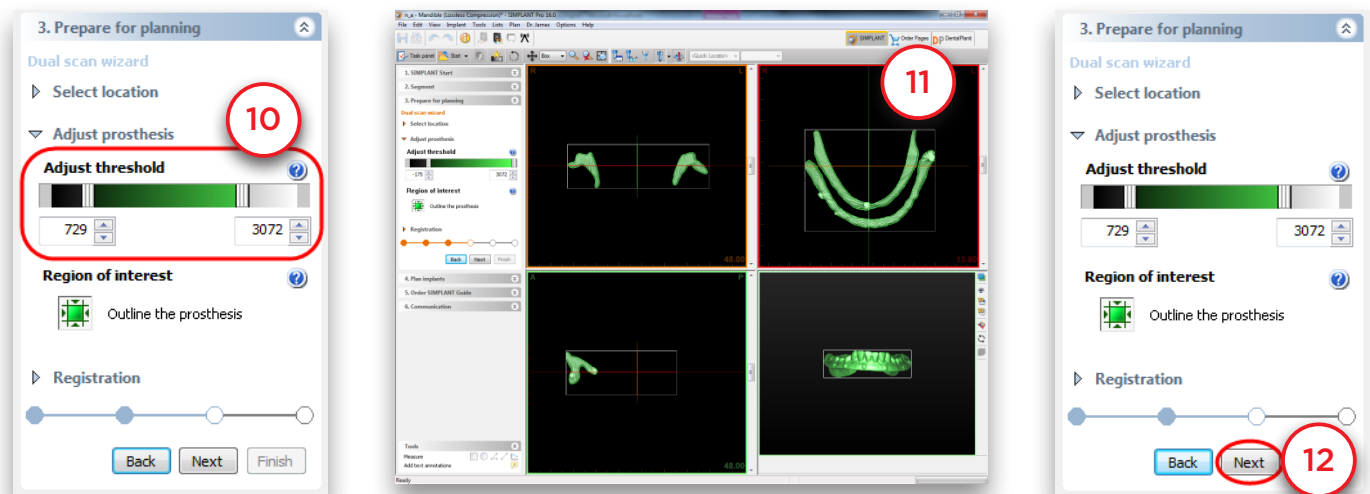
Define the location of the prosthesis data (7). Browse for the folder where your CT images are stored (8). Click 'OK' to continue (9).



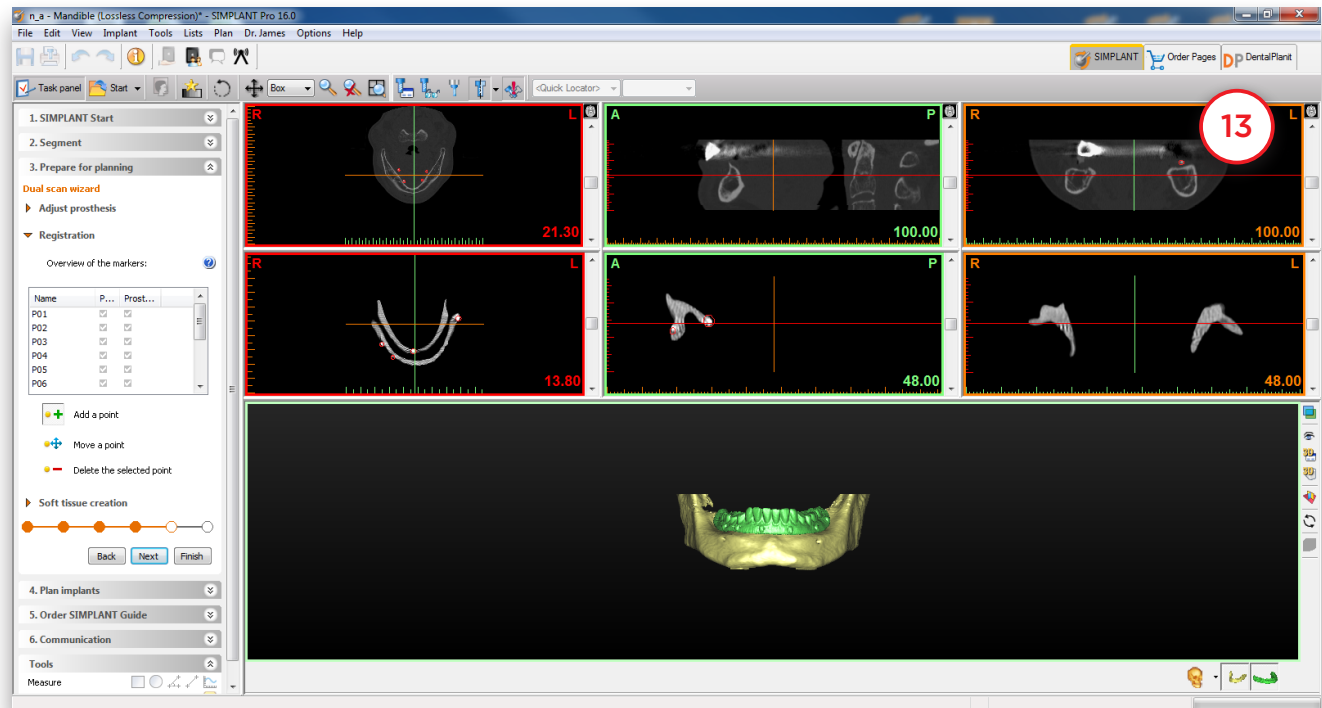
Adjust the threshold of the prosthesis if necessary (10).

[NOTE: only adjust the treshold if necessary! If protocol was followed, the treshold will not have to be adjusted]

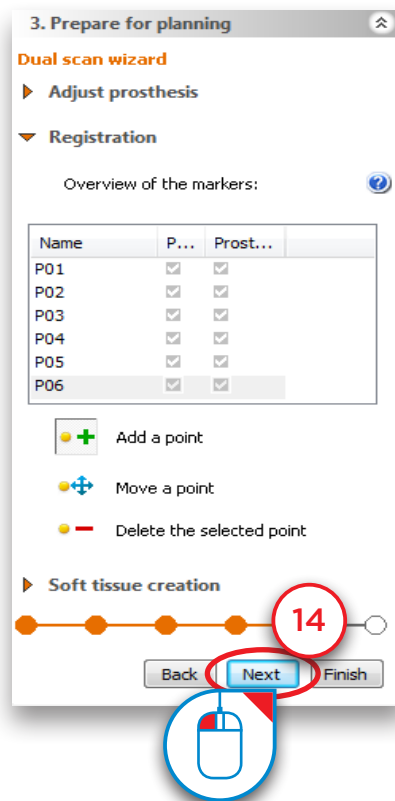
Outline the volume of the prosthesis in the same way you did in step 4 and 5 (11). Click 'Next' to continue (12).



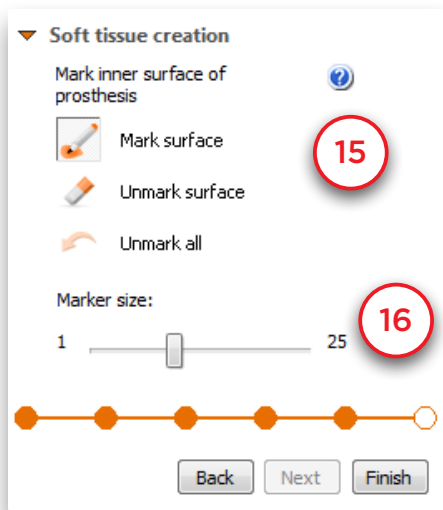
Simplant now matches the 3D model of the prosthesis on the 3D model of the patient automatically (13).



Click 'Next' to continue to the last step: Soft tissue creation (14).

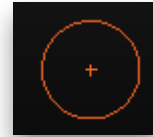


You can mark the inner surface of the prosthesis and create a 3D object of the soft tissue surface.

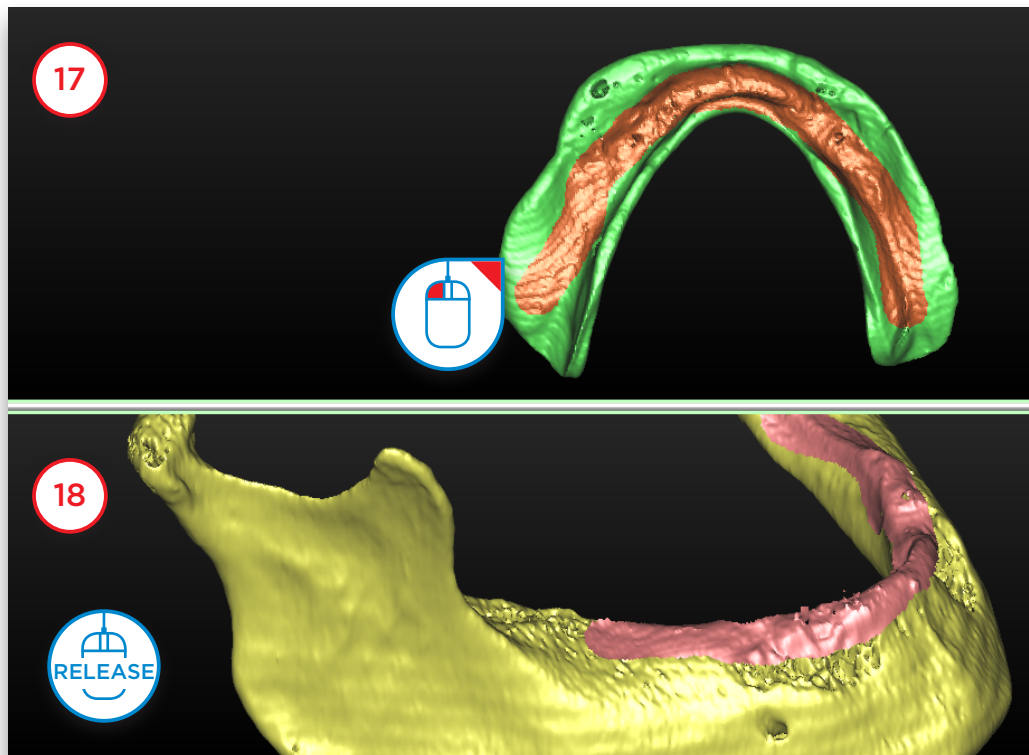


Choose if you want to mark or unmark the surface (15)

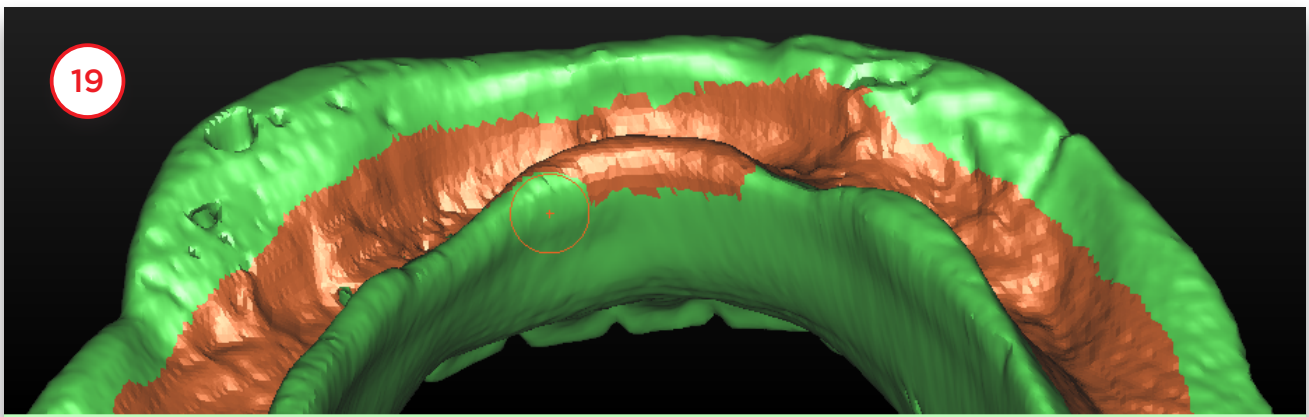
Choose the marker size (16)



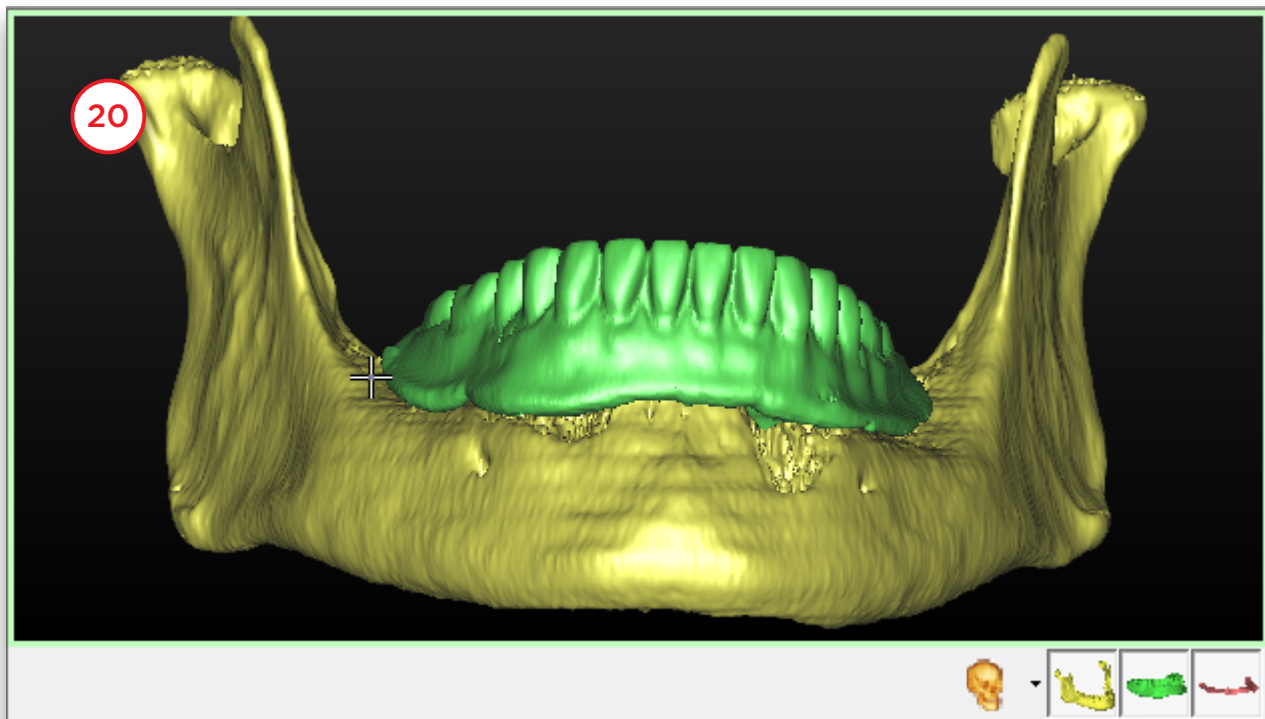
Hold the left mouse button and mark the soft tissue surface (17). When you release the mouse button the 3D object of the soft tissue is created in the 3D view (18).



Now you can finetune the soft tissue 3D object by rotating the prosthesis and marking or unmarking. In (19) we unmark a piece of the prosthesis that was incorrectly marked.



When you are ready, click 'Finish'. The result is a 3D object of the prosthesis and a 3D object of the soft tissue.(20).



5.2 – Optical Scan Wizard

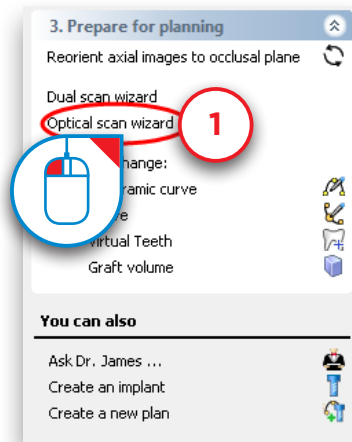
To be able to use the Optical Scan wizard you need two scans:

(A) a scan of the patient with the scan prosthesis

(B) an optical scan of the plaster cast or an intraoral scan

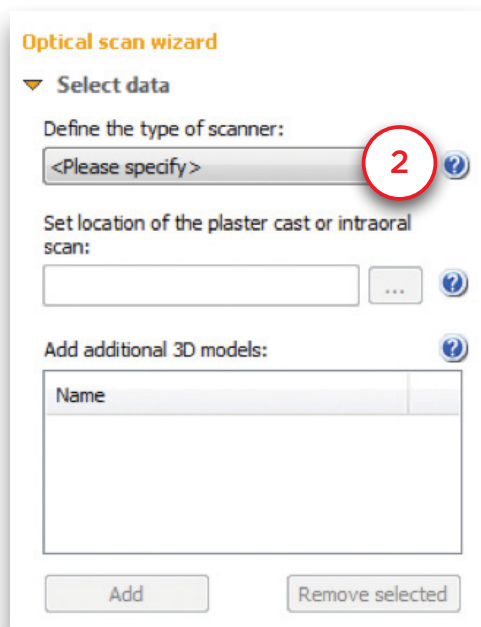
If available, you can add a wax-up and an antagonist (or any other additional 3D files from a 3rd party software).

In the Task Panel under 'Prepare for planning' select 'Optical scan wizard' (1).



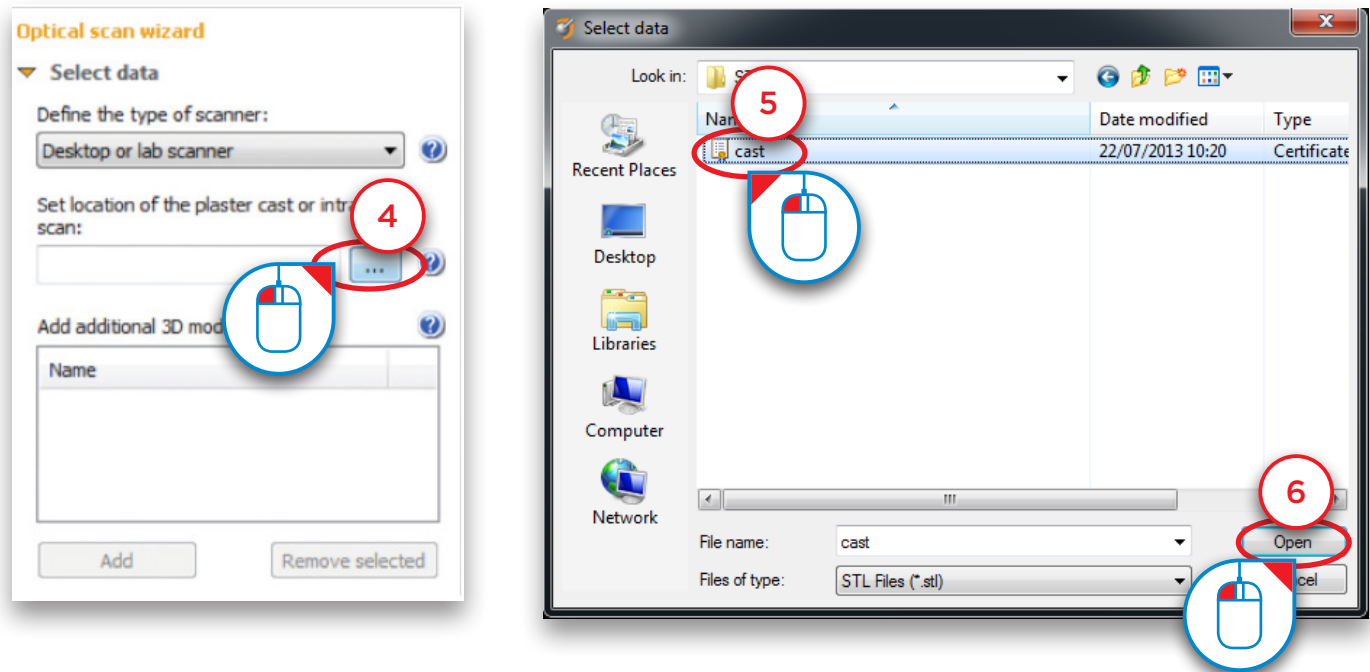
First you need to define the scanner type (2).

Select which scanner was used to scan the plaster cast from the list (3).

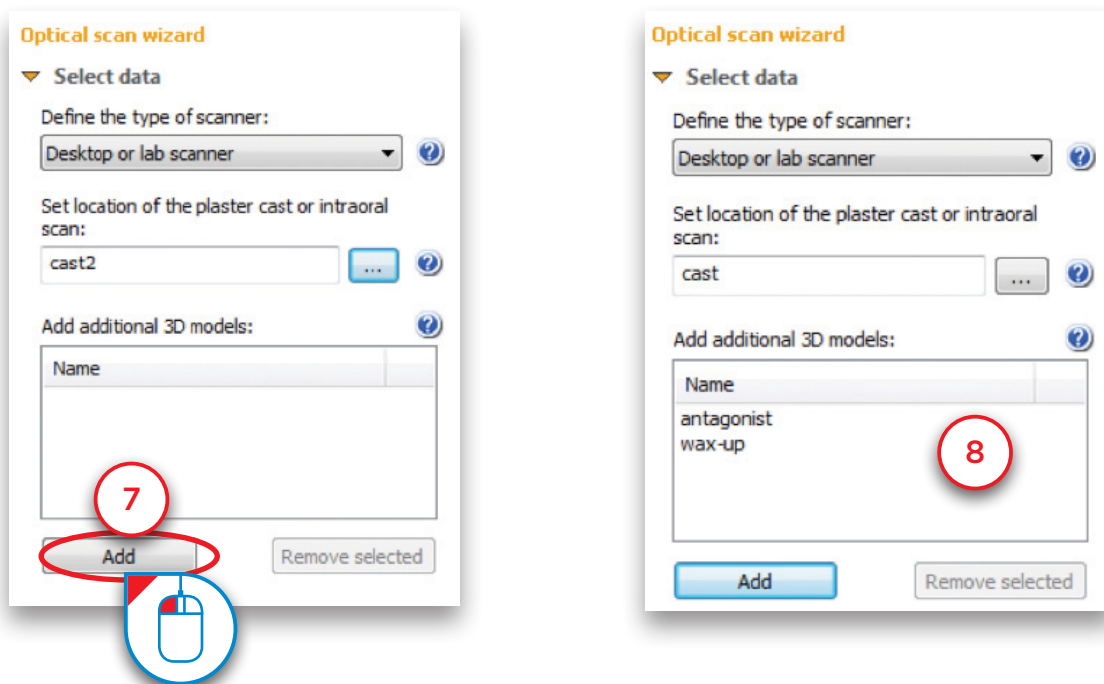


- 3 Desktop or lab scanner
- Intraoral scanner

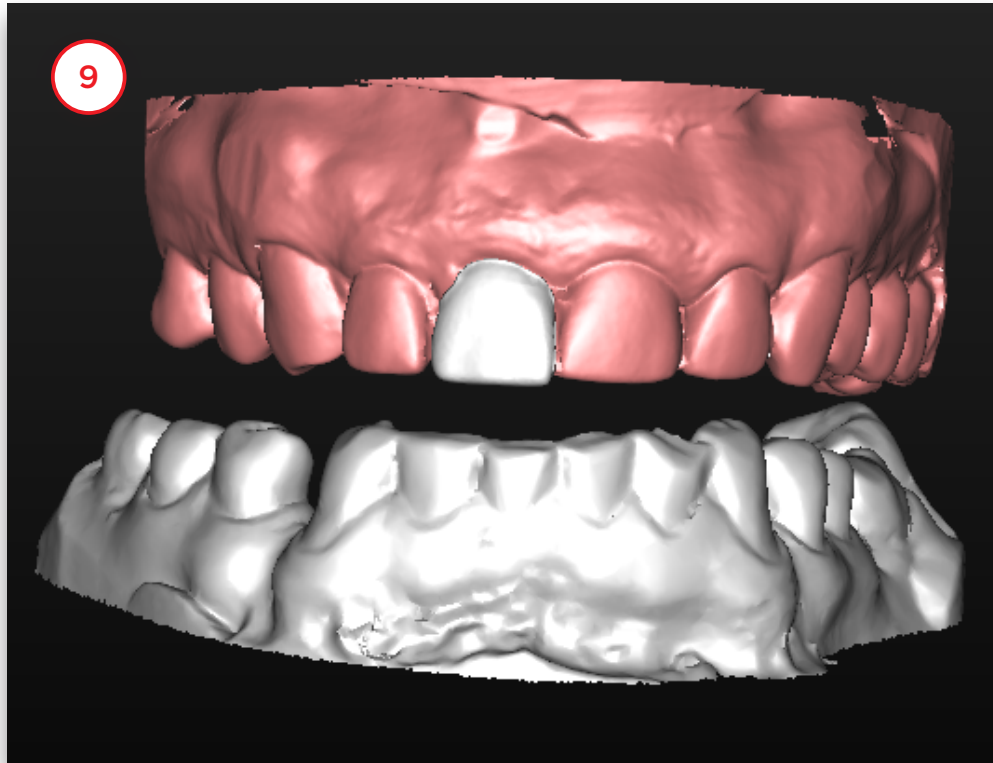
Now you need to locate the dental or lab scan data, or intraoral scan data (4). In the 'Open' dialog browse for the file (5) and click 'Open' to continue (6).



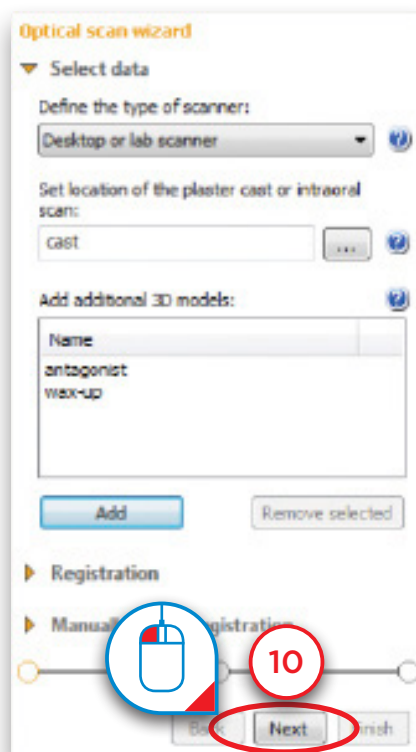
It is now also possible to add additional 3D models like a wax-up or an antagonist. Click 'Add' to select additional files (7). The files will be added in the correct position to your project (8).



All files have now been imported (in this case the plaster cast model, wax-up and antagonist). This is how they look like before the matching with the CT images (9).



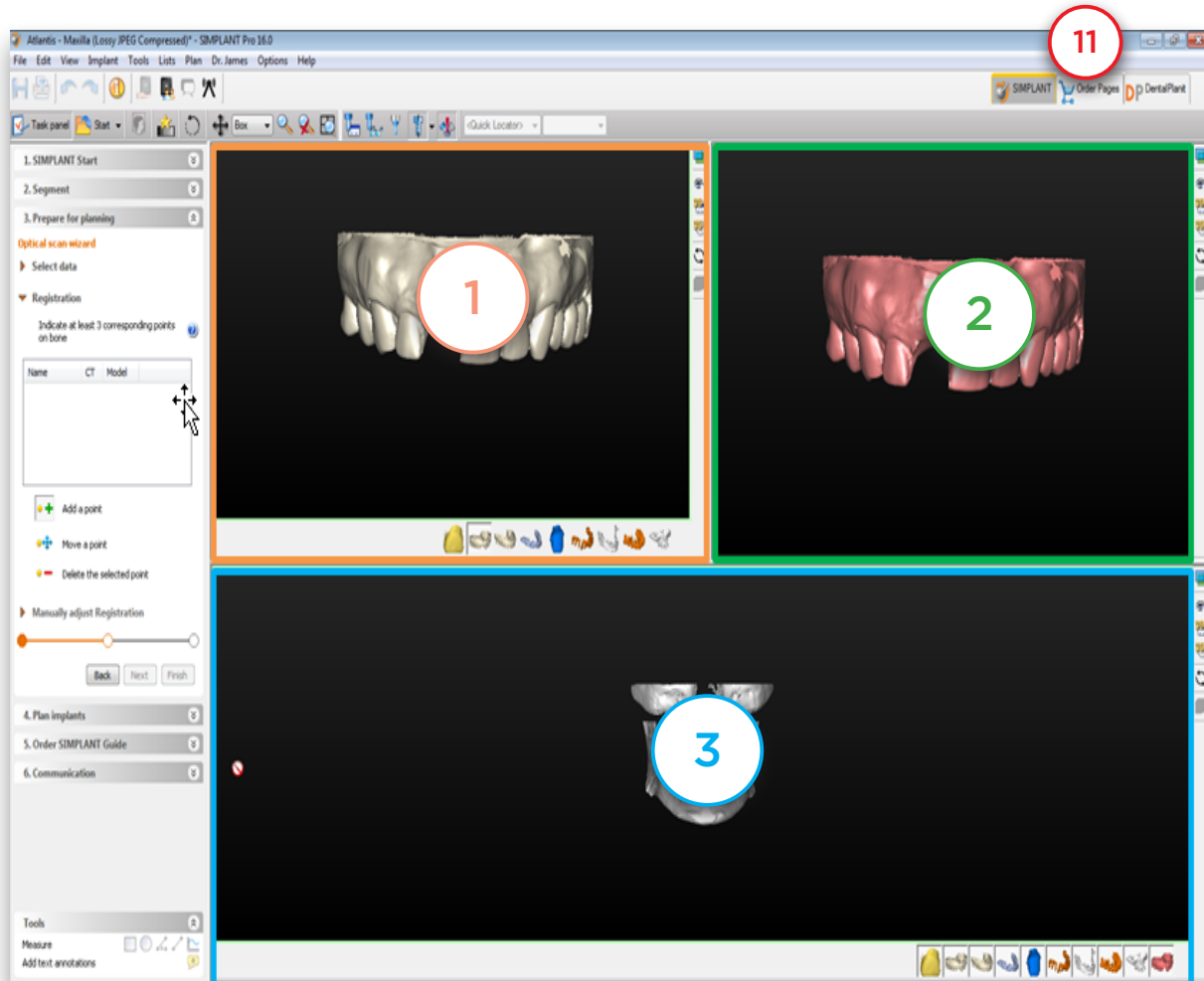
Click 'Next' in the wizard to go to the Registration step (10).



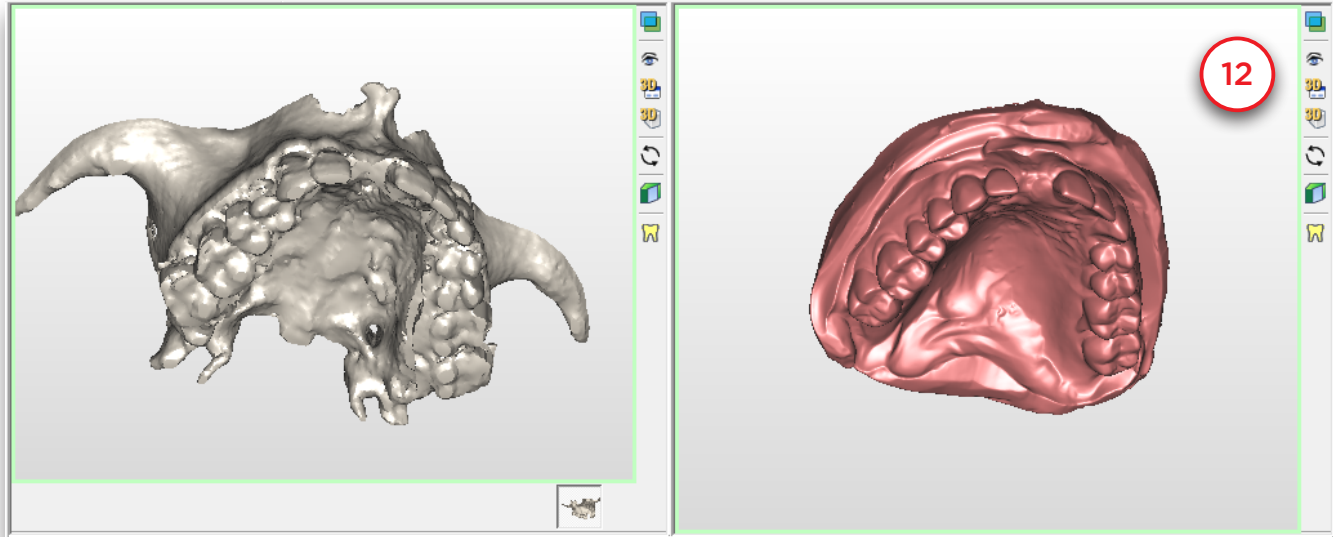
In the following step, three 3D view windows are shown (11):

- (1) The 3D view of the patient's jaw
- (2) The 3D view of the plaster cast model
- (3) The combined 3D view of the patient's jaw and the plaster cast model

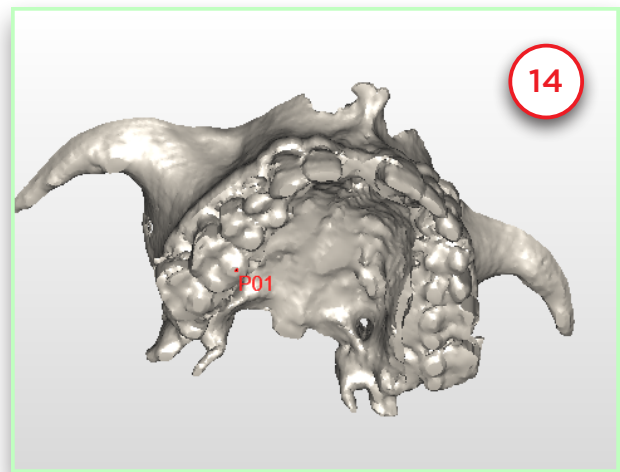
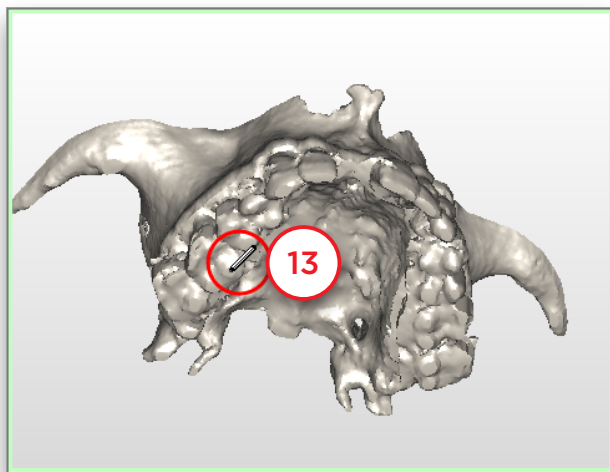
As you can see in the image below, the position of the plaster cast model does not yet match the position of the patient's jaw. In the next step we will match these two positions.



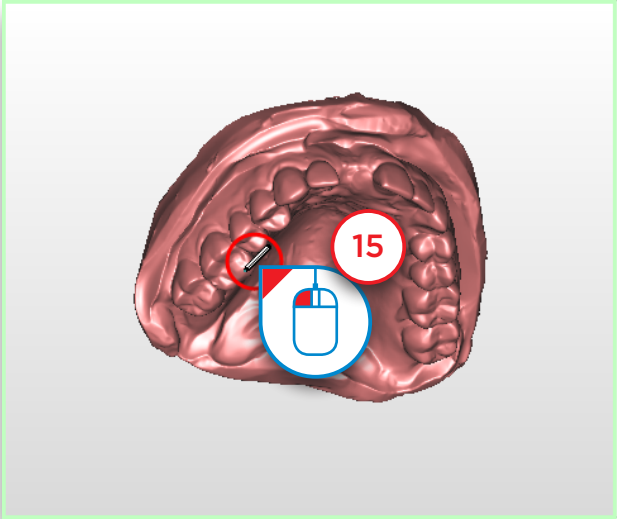
The matching of the two 3D models is done based on the information of the tooth tips. Simplant recognizes the similar geometry of these tooth tips in both 3D models and matches the models based on this information. However, Simplant can not perform this operation fully automatic. The user still needs to select the corresponding tooth tips in both 3D models (a minimum of three tooth tips preferably on dispersed locations in the mouth). To be able to select the corresponding tooth tips you first need to rotate the separate 3D models (views (1) and (2)) in order to view them both from a similar perspective (12).



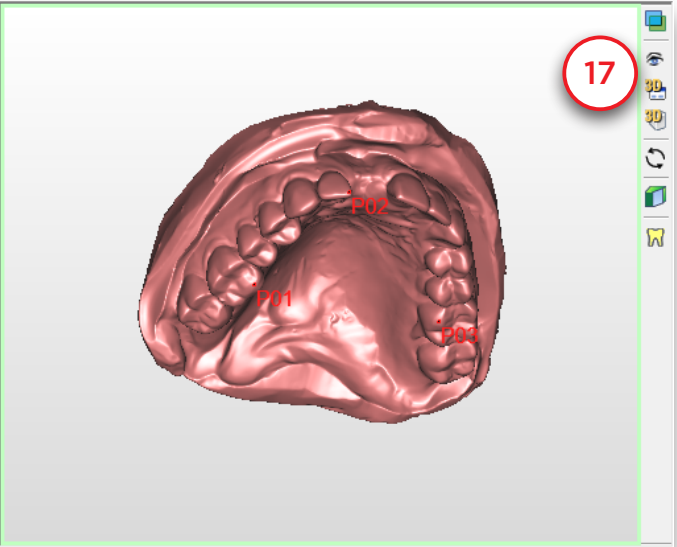
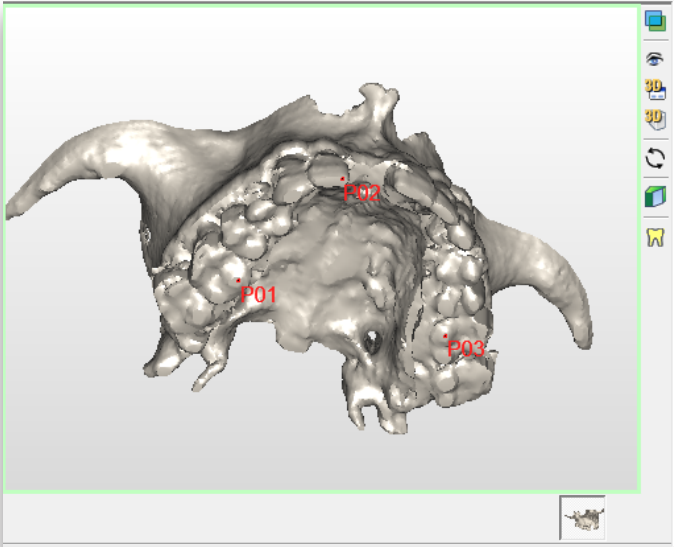
First click a tooth tip point with the left mouse button in the 3D view of the patient's jaw (view (1)) (13). The point that you selected is now marked as 'PO1' (14).



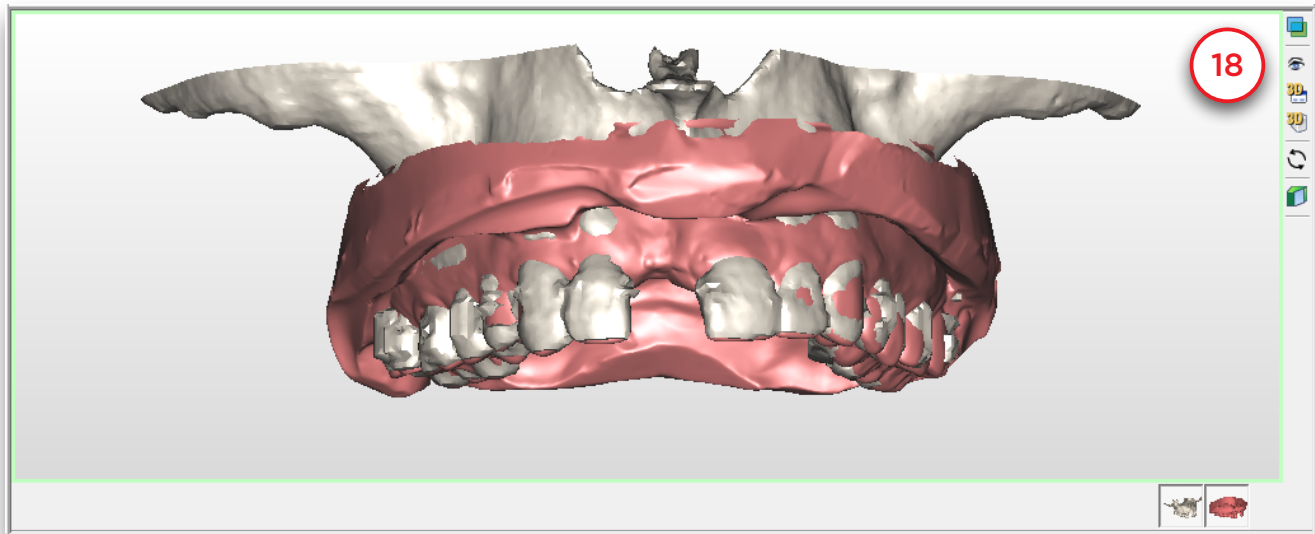
Now you can select the same tooth tip in the 3D model of the plaster cast (view (2)). Click the tooth tip point with the left mouse button (15). The point that you selected also gets marked as 'PO1' here (16).



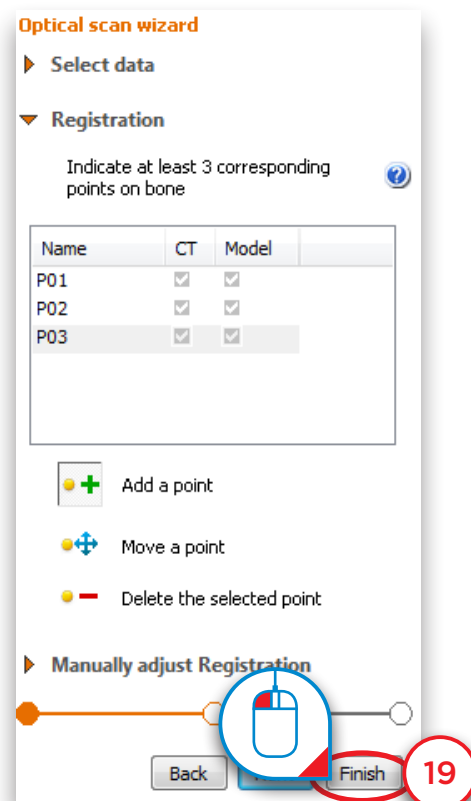
Repeat this operation for at least two more tooth tip points (17).



In the combined 3D view window (view (3)) you can see that the two 3D models are now matched on each other (18). Also, the additional 3D models (in this case the wax-up and the antagonist) will move along with the plaster cast when the position is changed.

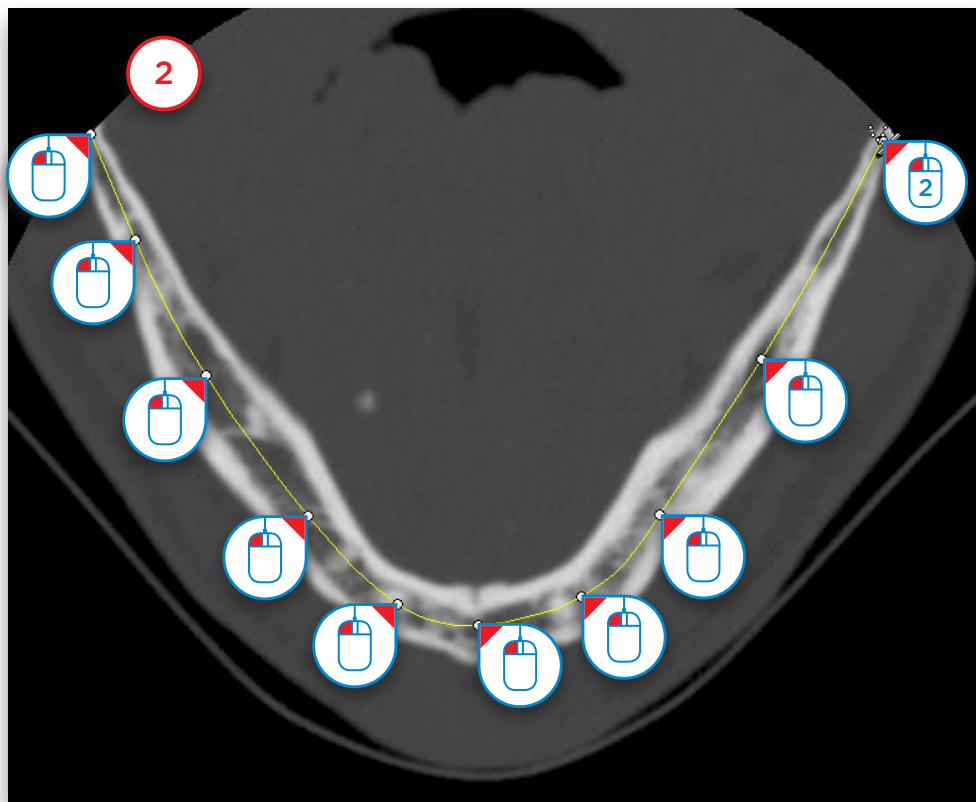
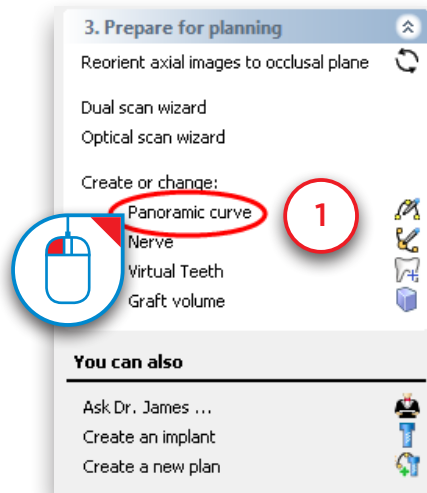


Click 'Finish' to exit the Optical Scan wizard (19).



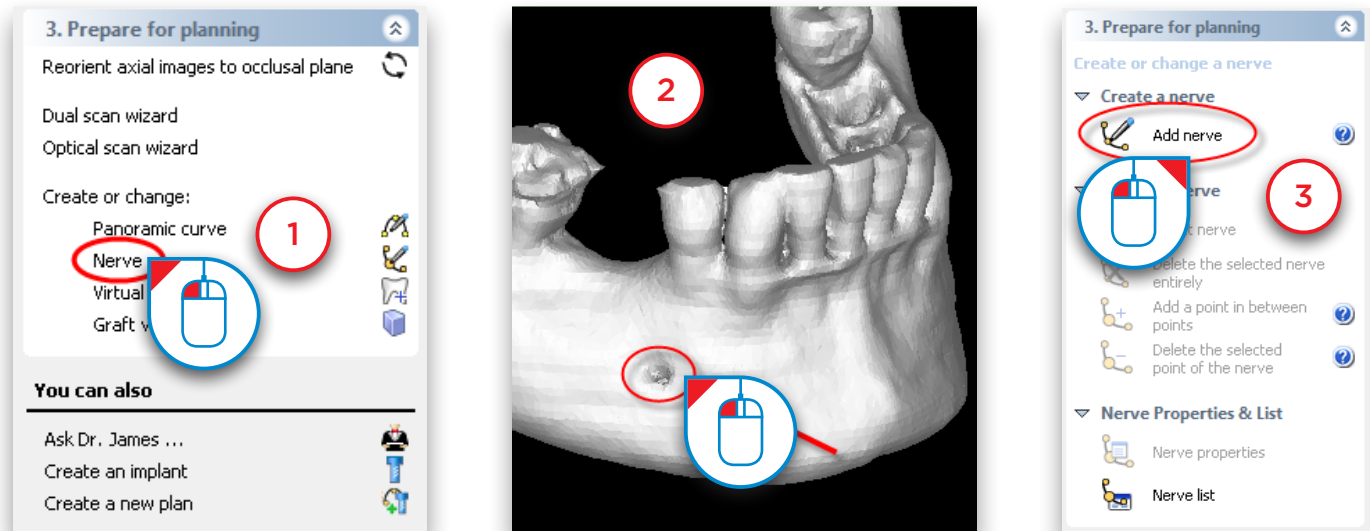
5.3 - Draw the Panoramic Curve

Select '*Panoramic curve*' in the task panel (1). Now you can start drawing the panoramic curve in the axial view (top right window). Click a number of points inside the bone to draw the panoramic curve and double-click the last point to finish the curve (2).

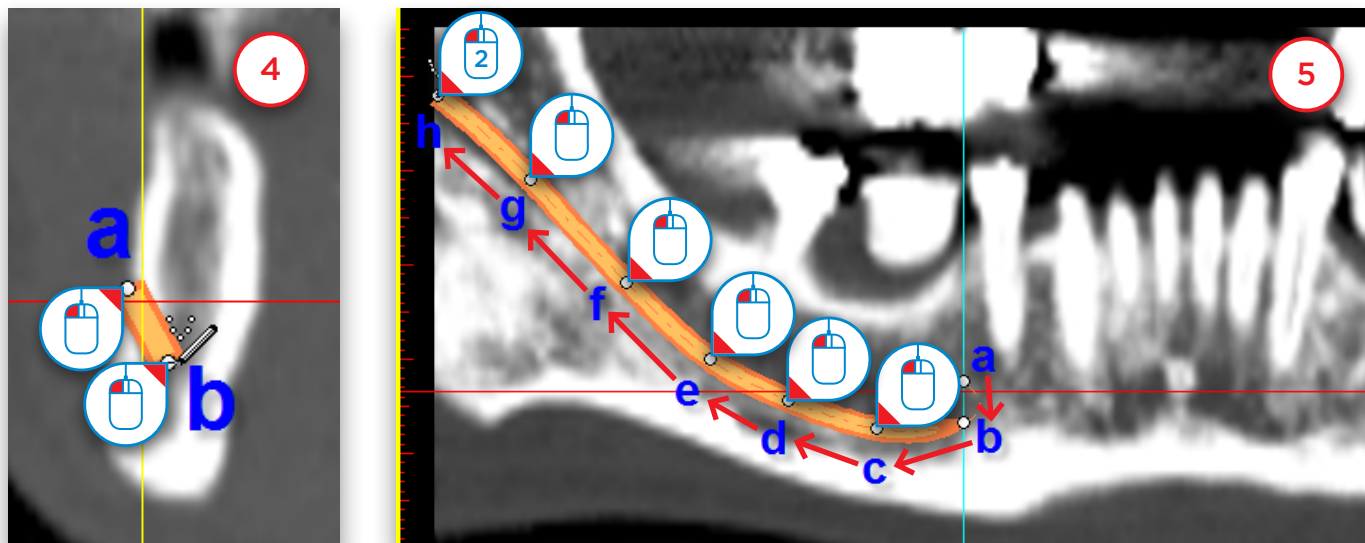


5.4 - Draw the Nerve

Select 'Nerve' in the Task Panel to start drawing the nerve (1). In the 3D view window, click the entry point of the nerve in the mental foramen to move to the right slice in the 2D view windows (2). Click 'Add nerve' to start drawing the nerve in the 2D view windows (3).



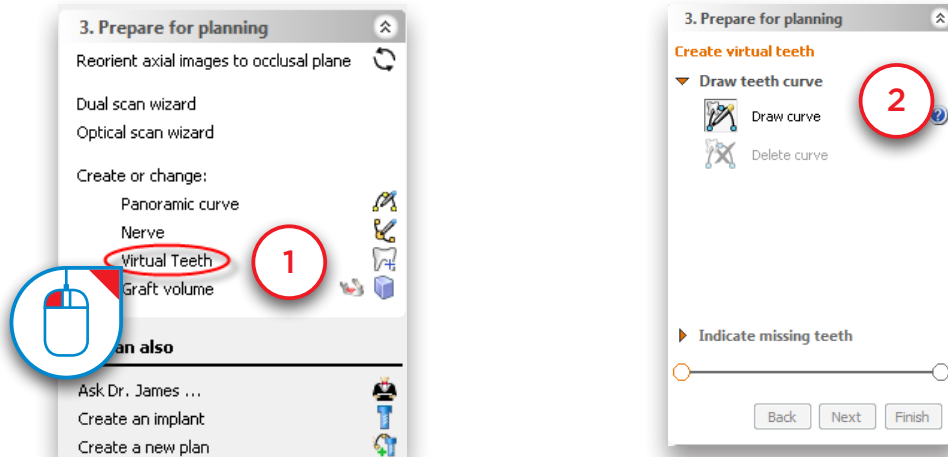
The cross-sectional view window (top left window) is already positioned on the right slice to start drawing the nerve. In this window, click the left mouse button to define the first points of the nerve (4) (points a and b). We will draw the rest of the nerve in the panoramic view window (bottom left window). Move the mouse cursor over to this panoramic view window and continue drawing the nerve here (5) (points c to h). To finish drawing the nerve, double-click on the last point (point h).



5.5 – Create Virtual Teeth

In this section we will explain how to place and modify Virtual Teeth.

In the Task Panel under *'Prepare for planning'* select *'Virtual Teeth'* (1). You will then enter the Virtual Teeth wizard (2). First we need to draw a teeth curve. The procedure is the same as drawing a panoramic curve. We will however draw the curve at tooth level and not at bone level. The virtual teeth are placed along the path of the teeth curve. You can also draw the curve while scrolling through the axial images, if necessary.

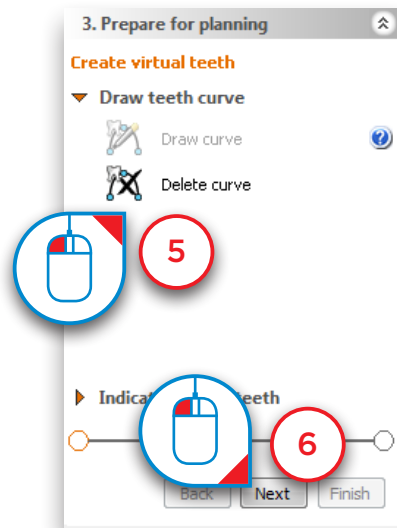


The axial images will be shown in full screen so you can draw the panoramic curve.

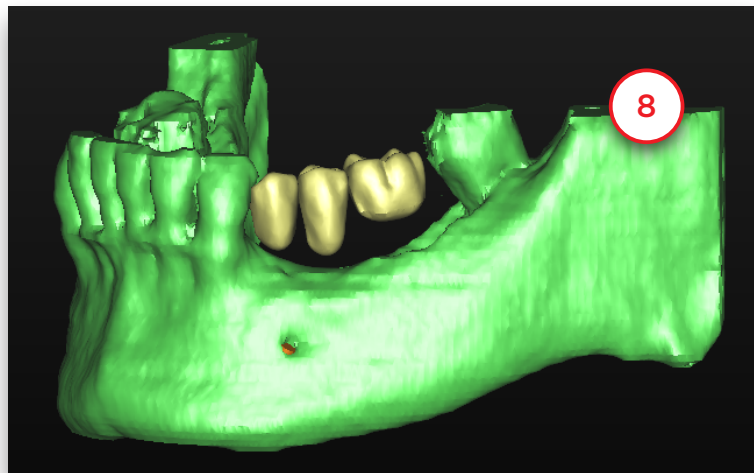
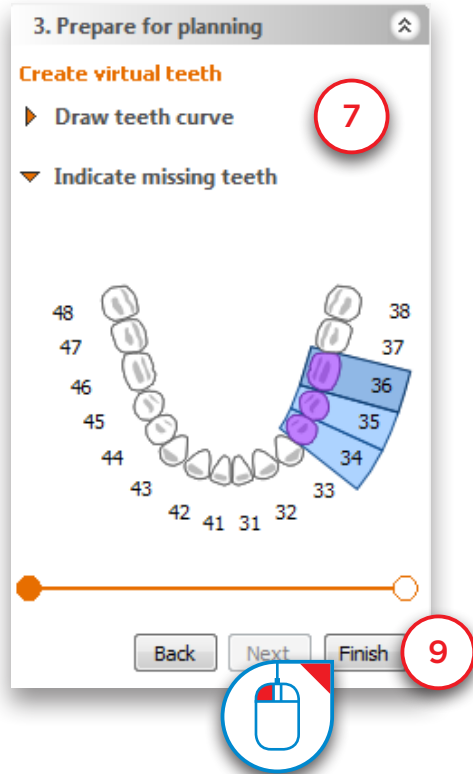
Scroll to a slice in which you can see the tooth tips clearly and draw a panoramic curve that follows the curvature of the teeth. It is best to draw the curve at the buccal side. (3)




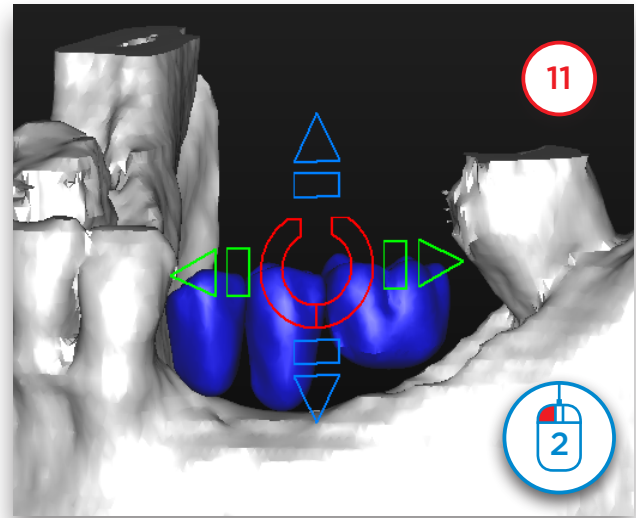
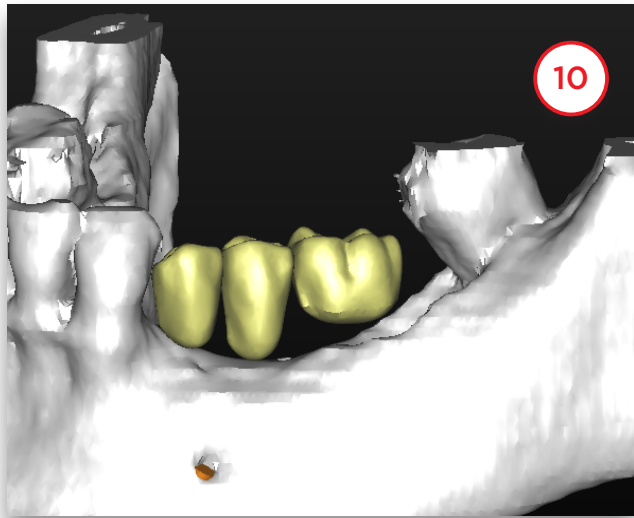
If you are not pleased with the panoramic curve you have drawn you can click 'Delete curve' and draw a new curve (5). If the curve is well drawn, click the 'Next' button to go to the next step (6).



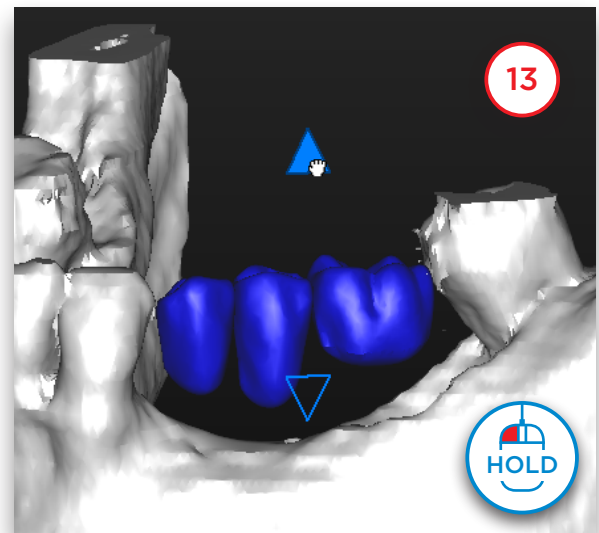
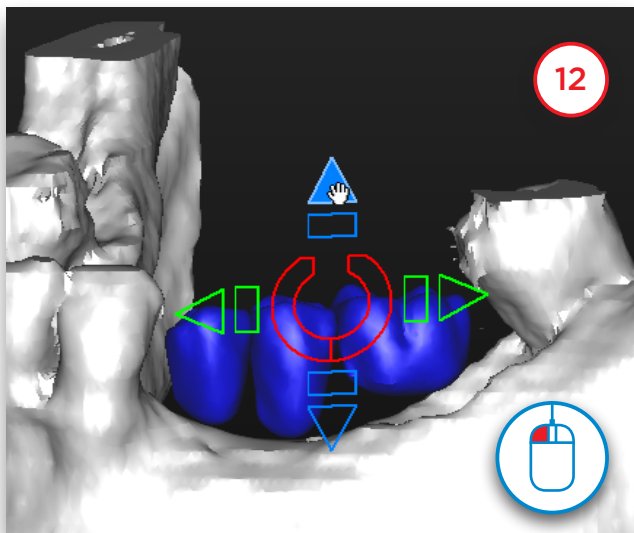
Select the teeth that you would like to create (7). The teeth will directly be added to the 3D view (8). Click 'Finish' to exit the wizard (9).



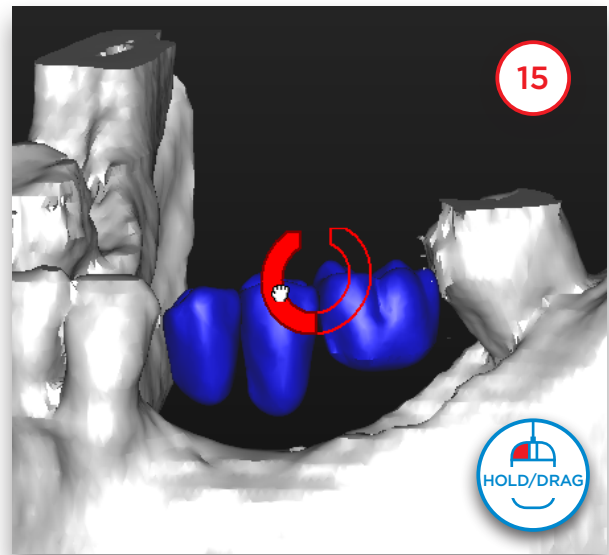
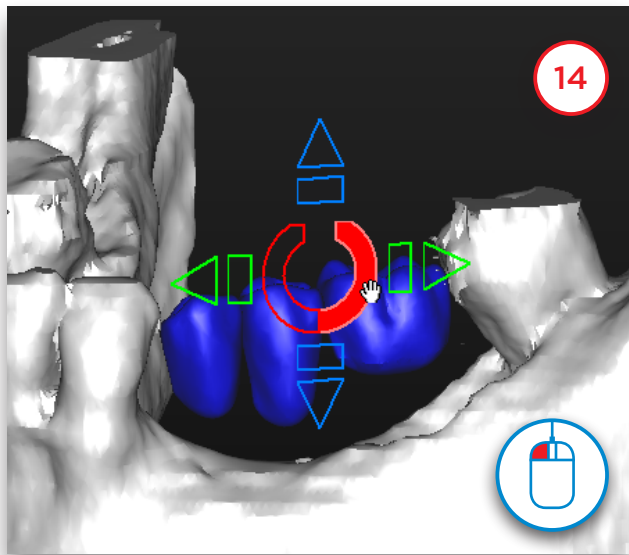
The three Virtual Teeth have been created (10). However, their position is not yet perfect. In the next steps we will show how you can change the position of the teeth. First we will move the 3 teeth together. To select all teeth hover over one of the teeth. A tooth symbol will be added to your cursor:  When you see this icon 'double click' to select all teeth (11). You will see the positional icon appear.



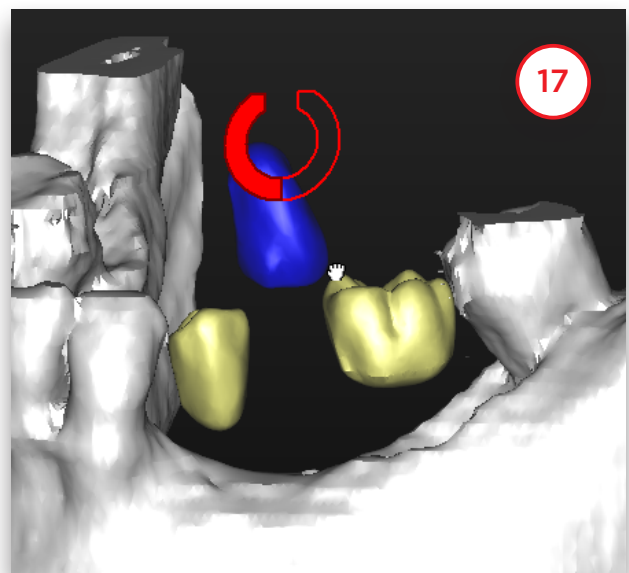
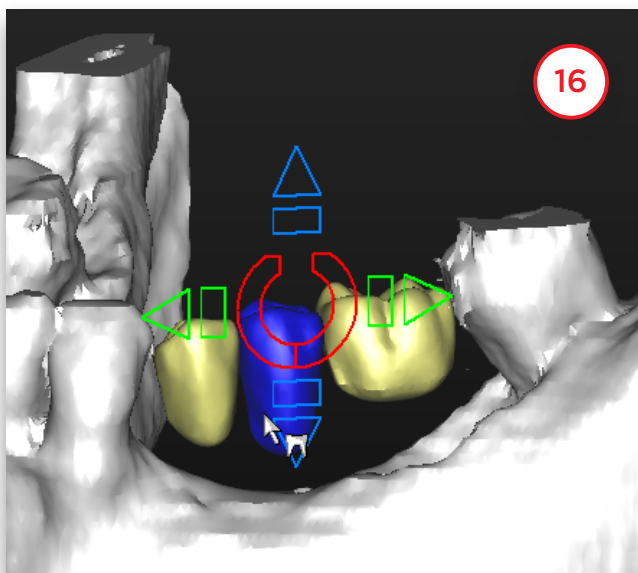
Use the arrows to move the teeth. You can do this in 2 ways. Click on an arrow to move the teeth in that direction (12). The other way to move the group of teeth is to click on an arrow and hold the left mouse button. Then drag the mouse in the direction in which you want to move the teeth (13). This is the fastest way to make changes to the teeth positions.



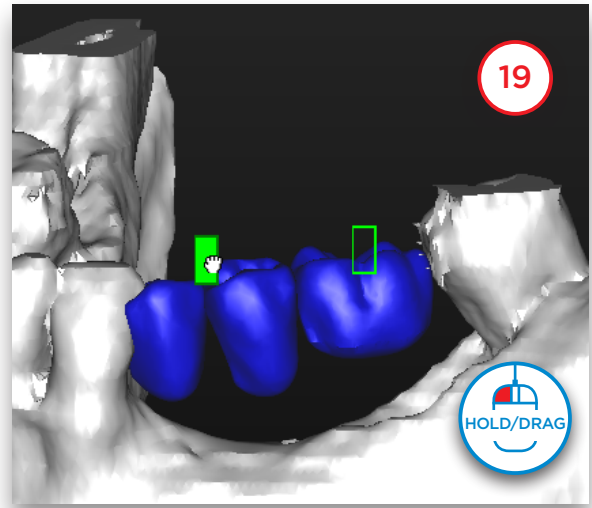
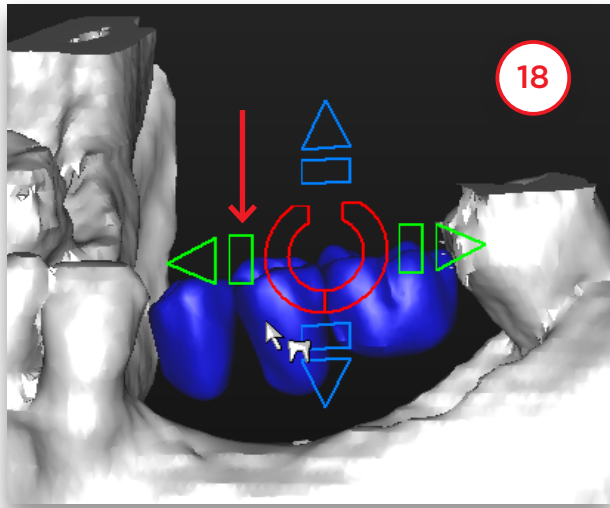
It is also possible to rotate the teeth. To do this use the round symbol in the middle of the positional icon. Either click the icon (14) or click, hold and drag the mouse (15).



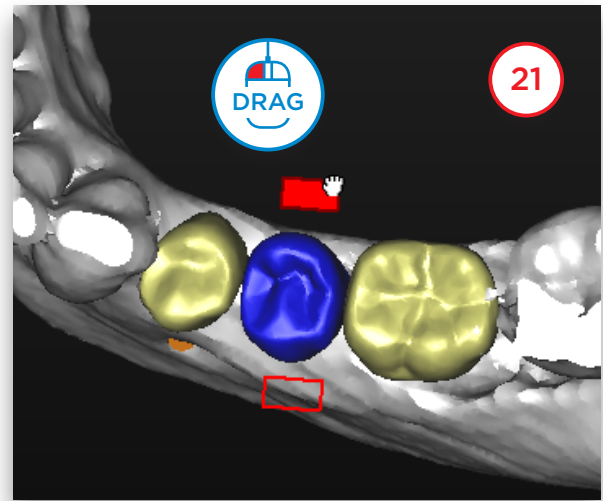
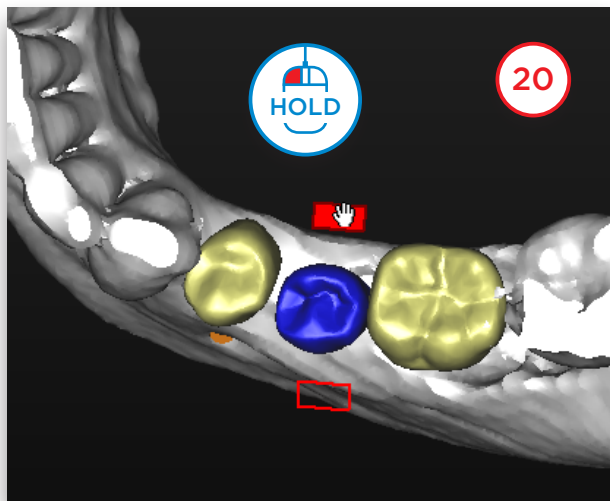
To make changes to the position of a single tooth click on a tooth to select it (16). Don't double click or you will select all teeth. Now it is possible to move and rotate the selected tooth. In (17) you can see an example of a rotated tooth.



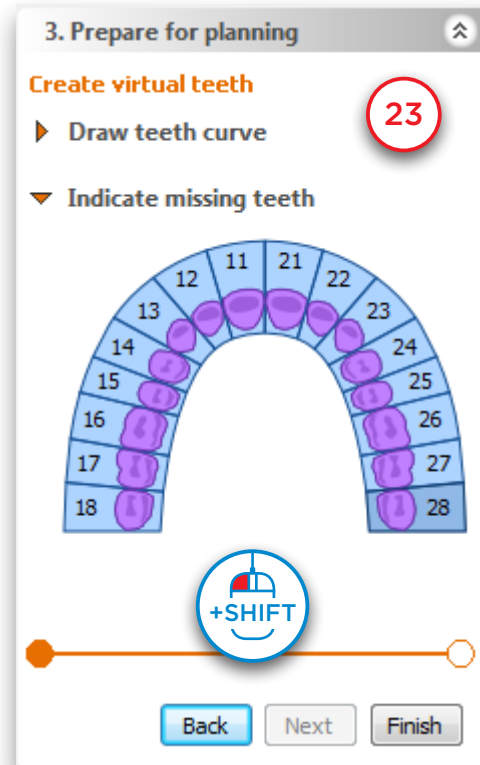
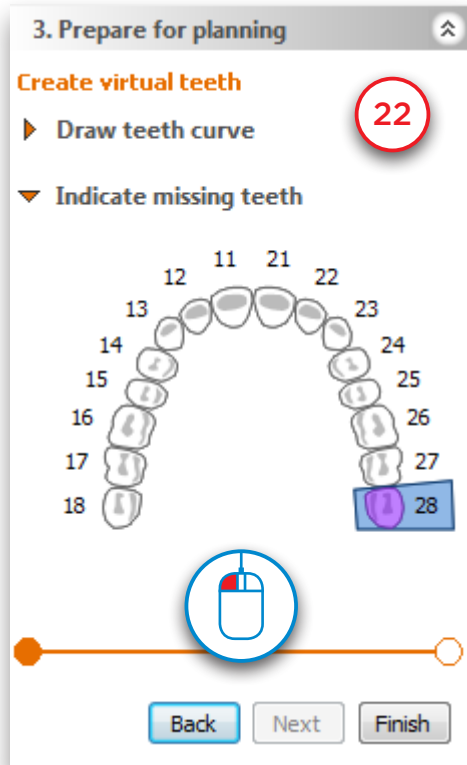
We can also change the size of the virtual teeth. We can do this by using the rectangular shapes (18). Click and hold the left mouse button. If we drag with the mouse we can change the size of the teeth in that direction. In this example we'll shrink the teeth by moving the mouse to the right and enlarge them by moving to the left (19).



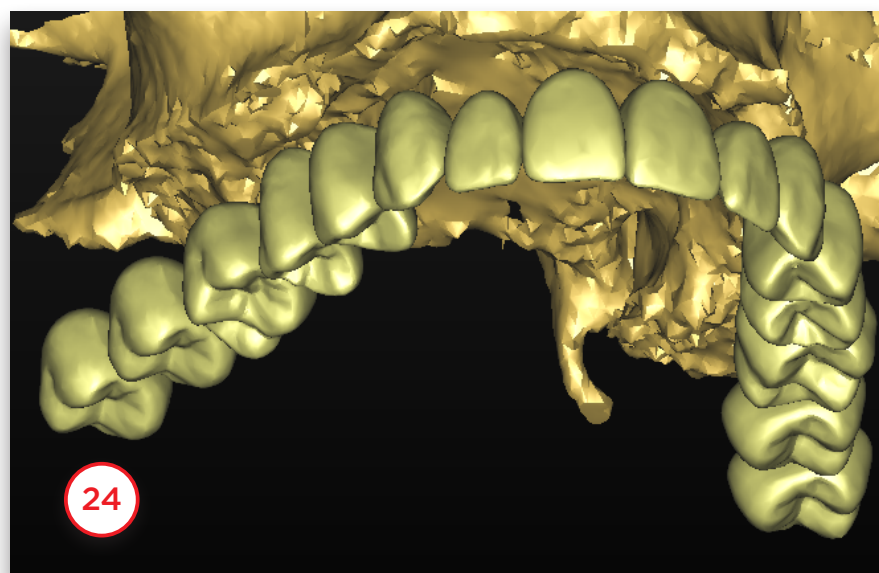
Changing the size of a single tooth is done in the same way. Select a single teeth and use the rectangular icon (20) (21). The positional icon will change with the viewing direction of the 3D view. This way we can move the teeth in every clinical direction.



When we have a fully edentulous jaw we can create a full set of teeth by using the virtual teeth wizard. First select the outer tooth of the bridge (22). Then move your mouse to the other outer tooth, hold in the Shift key and click the tooth. All the teeth in between will be selected (23).

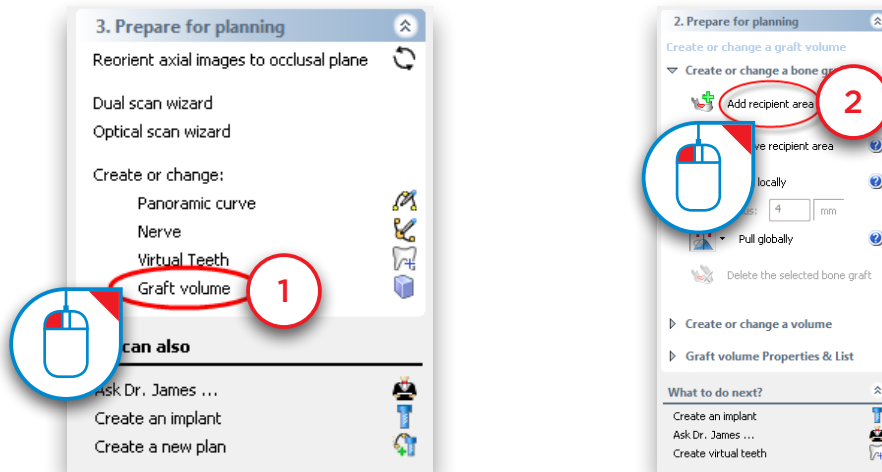


The result is a full arch of virtual teeth (24).

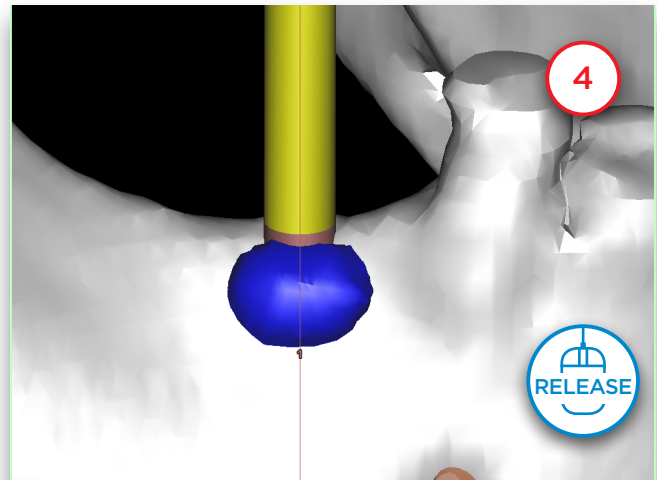
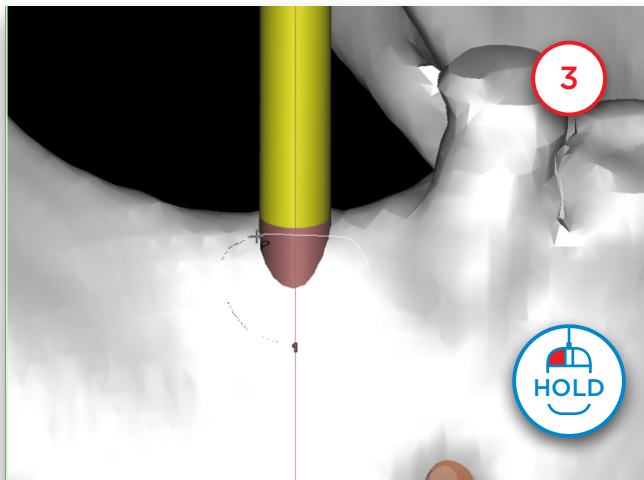


5.6 – Create Graft Volume

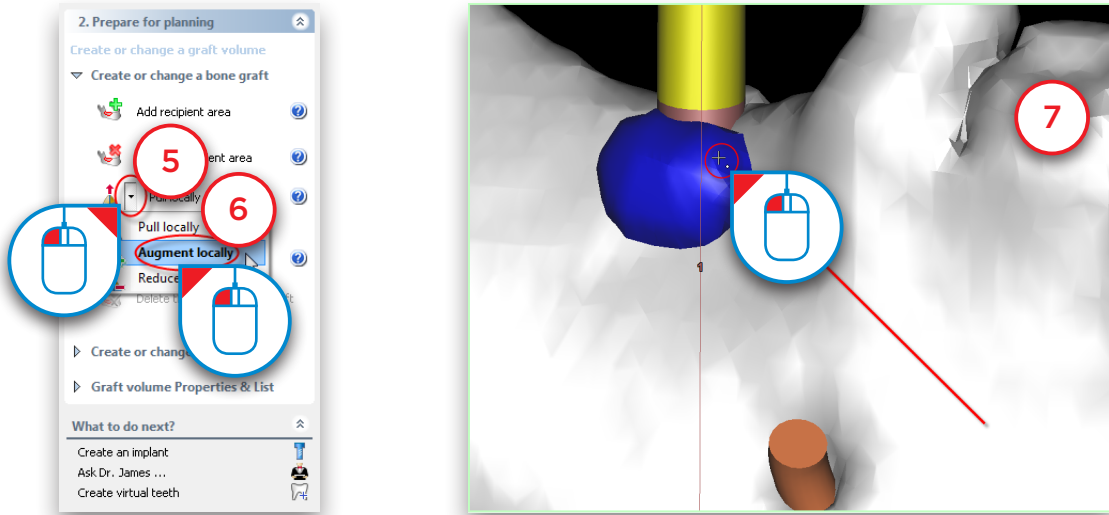
In this section we will create and modify a graft volume. In the Task Panel under 'Prepare for planning' select 'Graft volume' (1). Afterwards, select 'Add recipient area' (2).



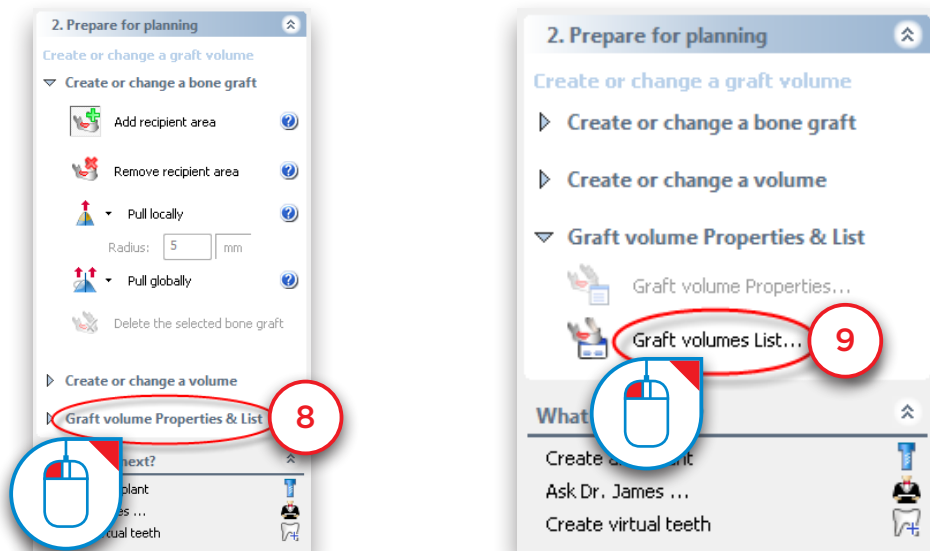
To create a graft volume, click and hold the left mouse button and draw a circle around the area where you would like to place the bone graft (3). When you release the mouse button, a blue volume appears (4). This blue volume is the graft volume.



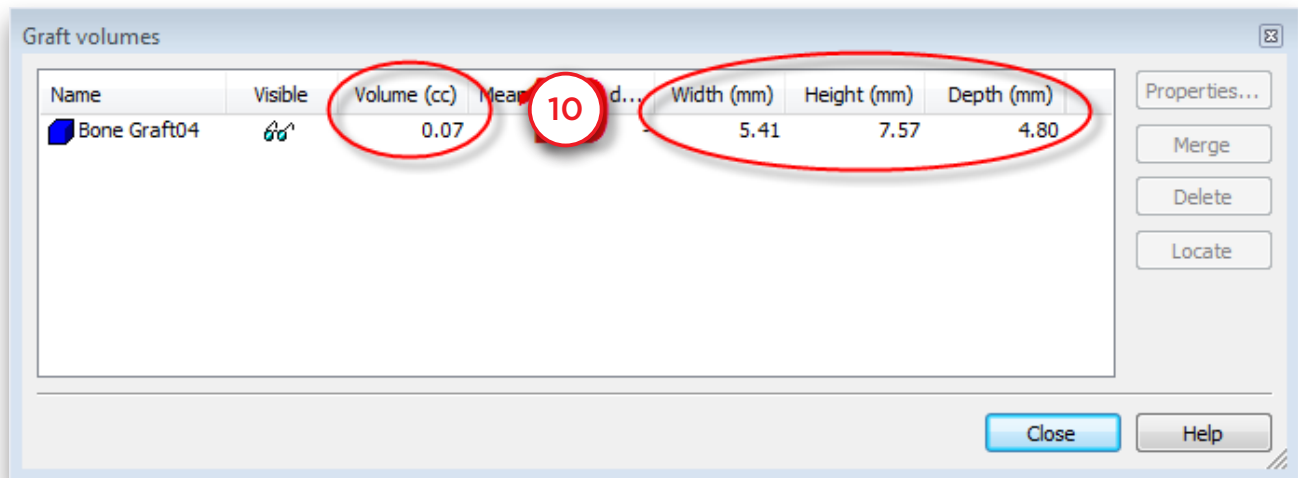
Now you can modify the graft volume that you have selected. In the Task Panel click the arrow next to 'Pull locally' (5). From the drop-down menu select 'Augment locally' (6). Now you can increase the thickness of the graft volume by clicking somewhere on it with the left mouse button (7). In the same way you can reduce the thickness of the graft volume by using the 'Reduce locally' tool.



Next we can review the dimensions of the graft volume that we have just created. In the Task Panel select 'Graft volume Properties & List' (8). Afterwards, select 'Graft volumes List' (9).



In the 'Graft volumes' window, you can check the dimensions of the bone graft (10).



5.7 – Make measurements

Before you start placing implants you might want to make some measurements on the bone area where you would like to place the implant. You can:

5.7.1 Measure distance

5.7.2 Measure angle

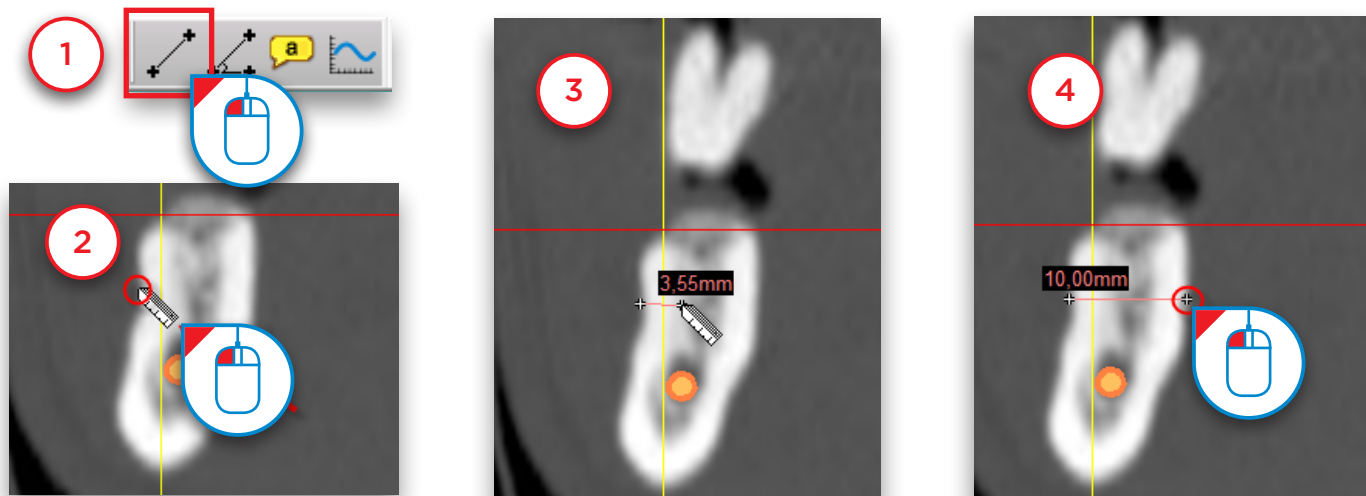
5.7.3 Measure density

5.7.4 Profile line

5.7.1 – Measure distance

Click the measure icon on the toolbar (1). Click the first point of the measurement (2). Move the mouse cursor to measure the distance in respect to the first point (3). Click the second point of the measurement (4).

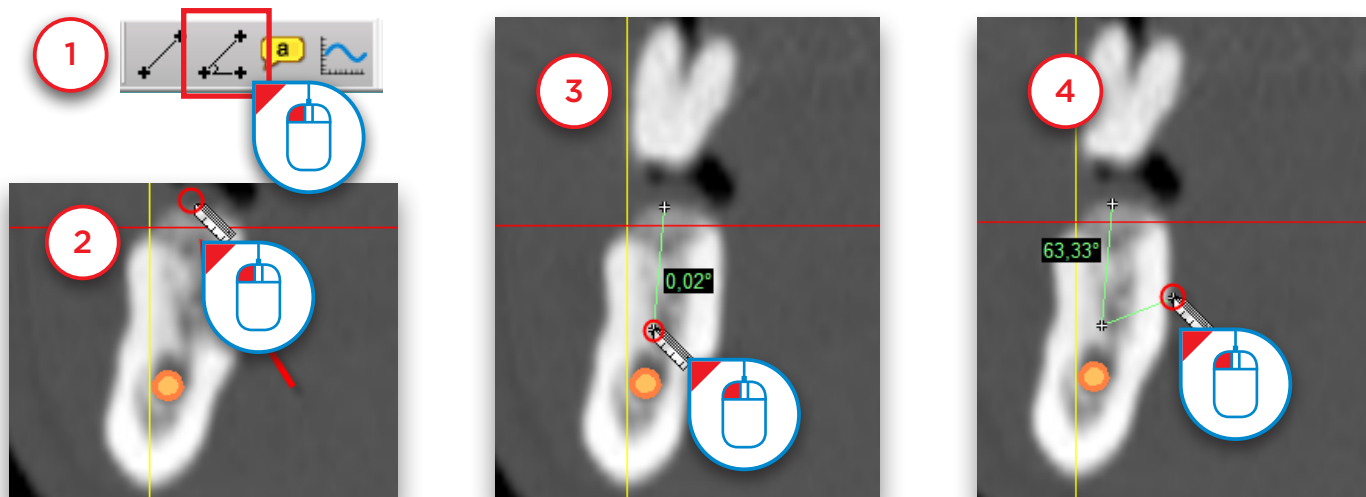
Measuring accuracy for point-to-point distances: +/- 0.1mm.



5.7.2 – Measure angle

Click the measure angle icon on the toolbar (1). Click the first point of the measurement (2). Move the mouse cursor to measure the distance in respect to the first point (3). Click the second point of the measurement (4).

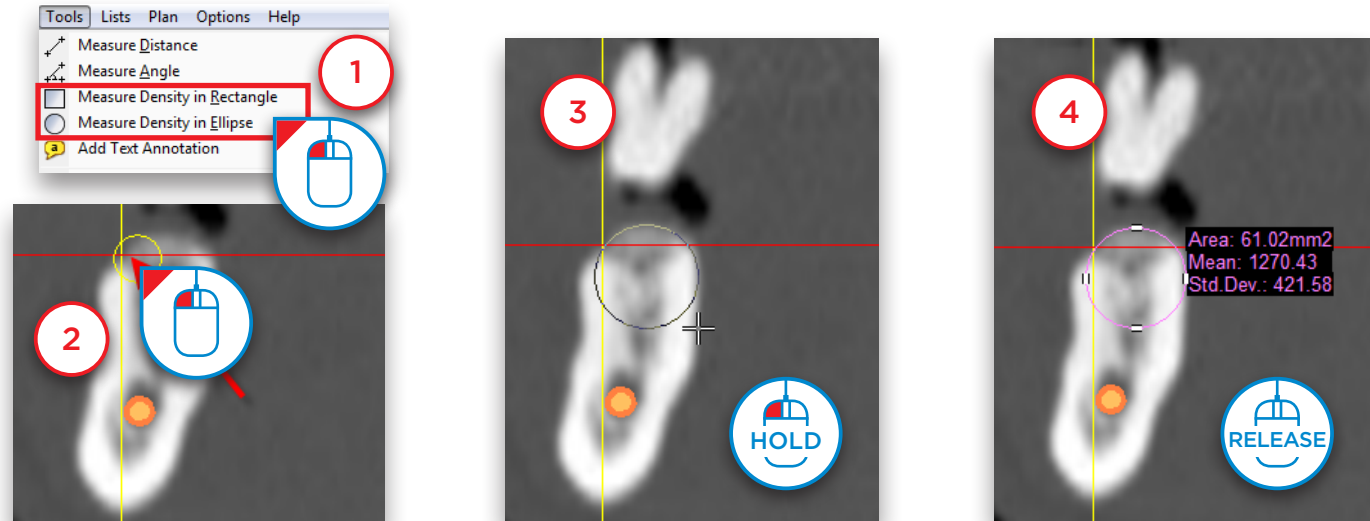
Measuring accuracy for angle measurements: +/- 1 degree.



5.7.3 - Measure density

You can measure the average bone density in a surface within the bone. You have the option to measure within a square surface or within an elliptical surface.

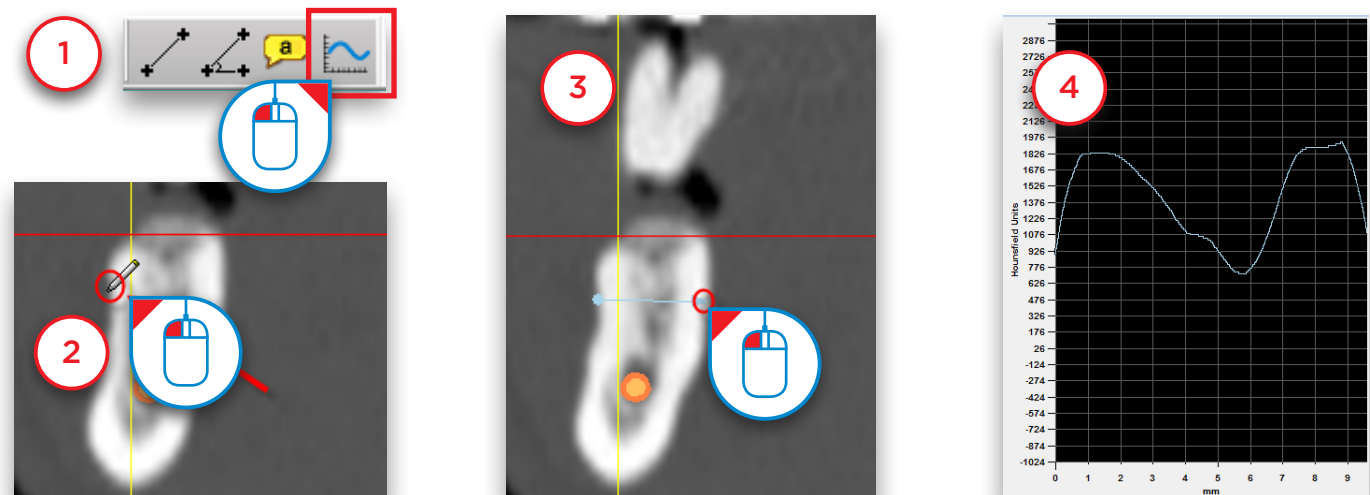
Click one of the two measure bone density icons in the Tools menu (1). Click the first point of the measurement (2). Click and hold the left mouse button to drag a circle around the area that you are interested in (3). Release the mouse button to see the results of the measurement (4).



5.7.4 - Profile line

You can create a profile line of the bone density.

Click the profile line icon on the toolbar (1). Click the first point of section of the bone that you want to calculate the profile line for (2). Click the second point of the line (3). The profile line is now shown (4).



6. Plan Implants

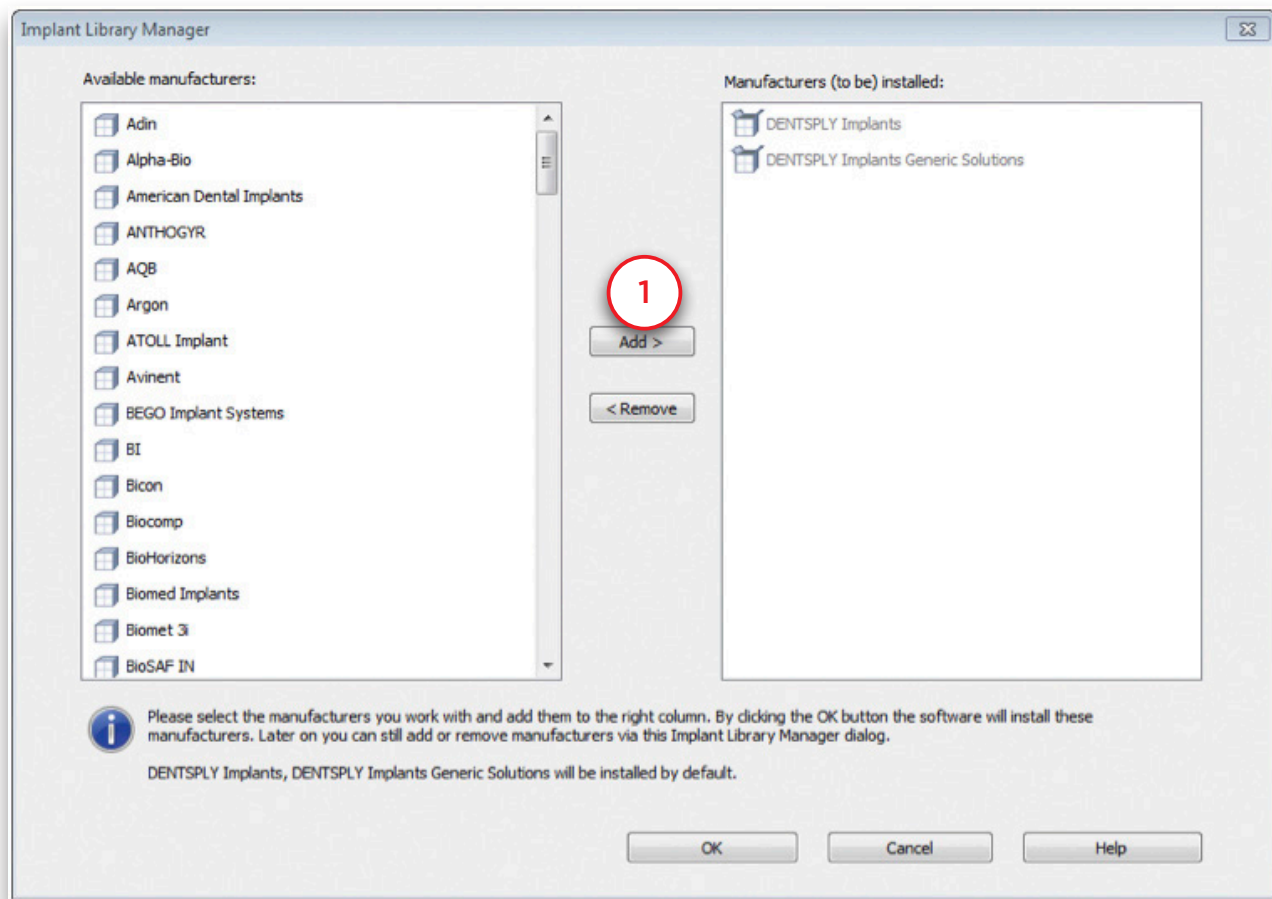
6.1 – The Implant Library

6.1.1 Set up your implant library

When running Simplant the first time after installation, you are asked to set up the implant library.

In the 'Implant Library Manager' select the manufacturers you are working with and click the 'add>' (1) button. Dentsply Sirona Implants and the generic guide solutions of Dentsply Implants are installed by default.

By clicking 'OK' the installation of the library starts.



Simplant informs you when updates are available for the brands you've installed. We advise you to always install the updates. Simplant will also inform you when new brands became available in the Simplant library. You can install them via the 'Implant Library Manager'. To access the implant library manager select 'Implant' from the menu, then 'Implant Library Manager'.

6.1.2 The Implant Library

Here you will find an introduction on how to use the implant library. To access the implant library, place an implant and then specify it (**see also section 6.2.3**).

The implant library consists of following tab pages:

6.1.2.1 Implant

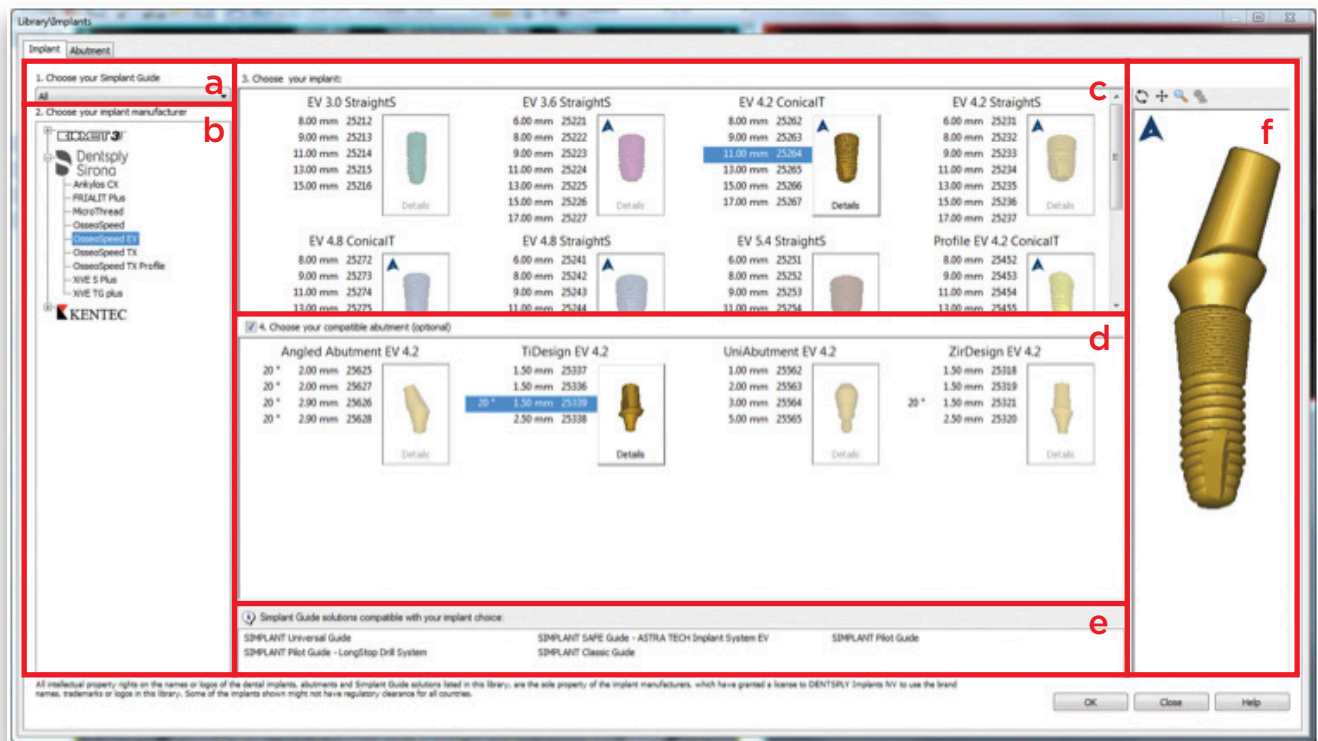
6.1.2.2 Abutment

6.1.2.3 Fixation screws

6.1.2.1 - Implant

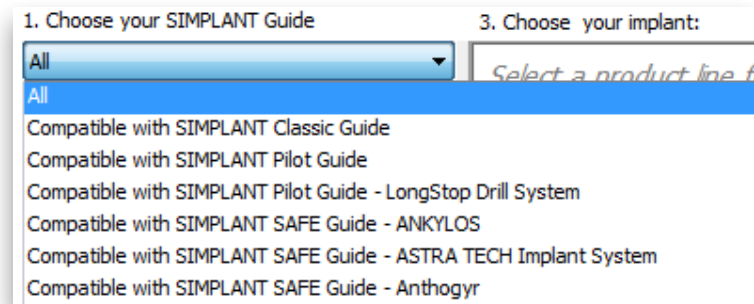
On this tab you get an overview of all the available implants in the Simplant software. On this tab, following areas can be distinguished:

- a** Choose your Simplant Guide
- b** Choose your implant manufacturer
- c** Choose your implant
- d** Choose your compatible abutment
- e** Simplant Guide solutions compatible with your implant choice
- f** Show Preview



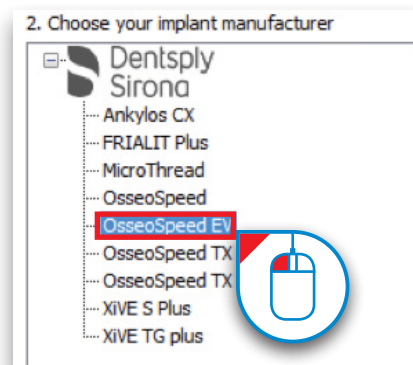
a. Choose your Simplant Guide


Here you can choose which Simplant Guide you would like to use in advance of selecting your implants. This way only the compatible implants will be shown. For instance, when you select 'Compatible with Astra Tech Implant System' only those implants that are compatible with the Astra Tech Implant System guide will be visible.

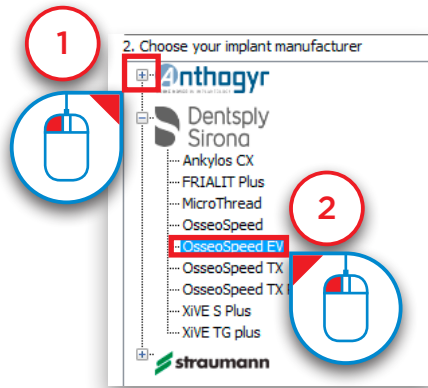


b. Choose your implant manufacturer

Here you can choose the implant manufacturer and product line of implants you would like to use.

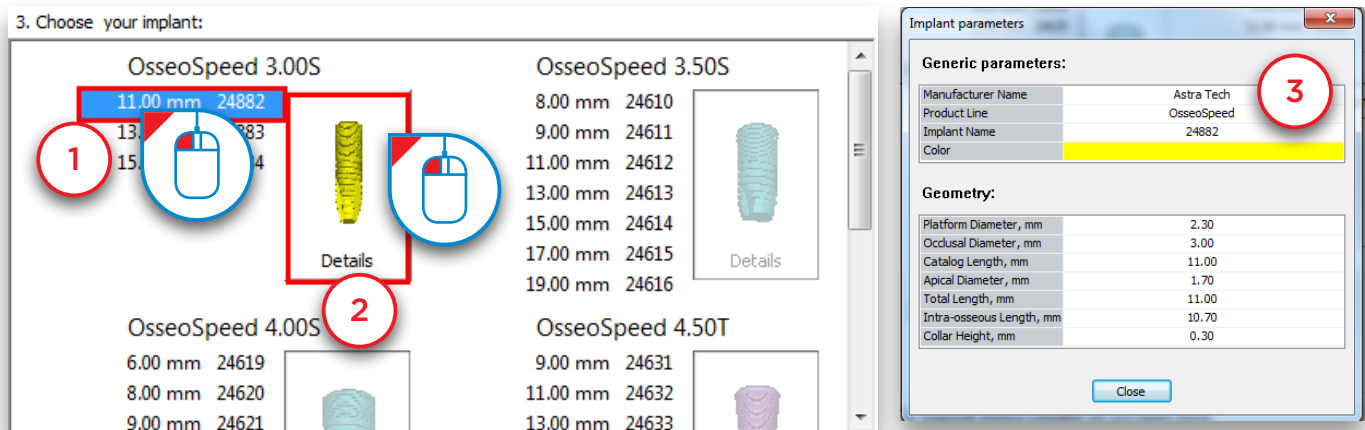


Click the  sign to open up an implant manufacturer's product line overview (1), and select a product line from the list (2).



c. Choose your implant

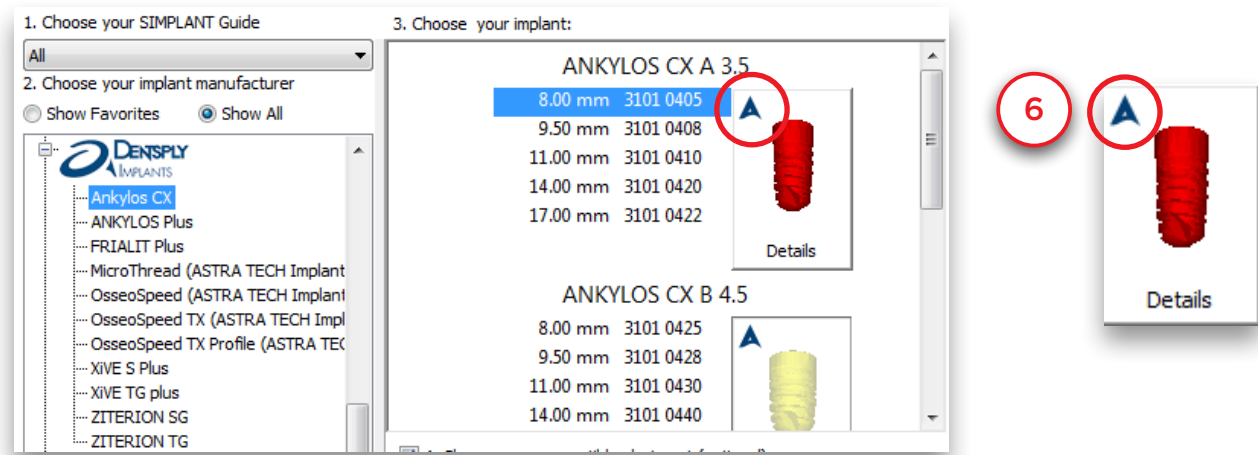
Here you can select a specific implant you would like to use (1). If you click the 'Details' button (2), the 'Implant parameters' dialog pops up (3).



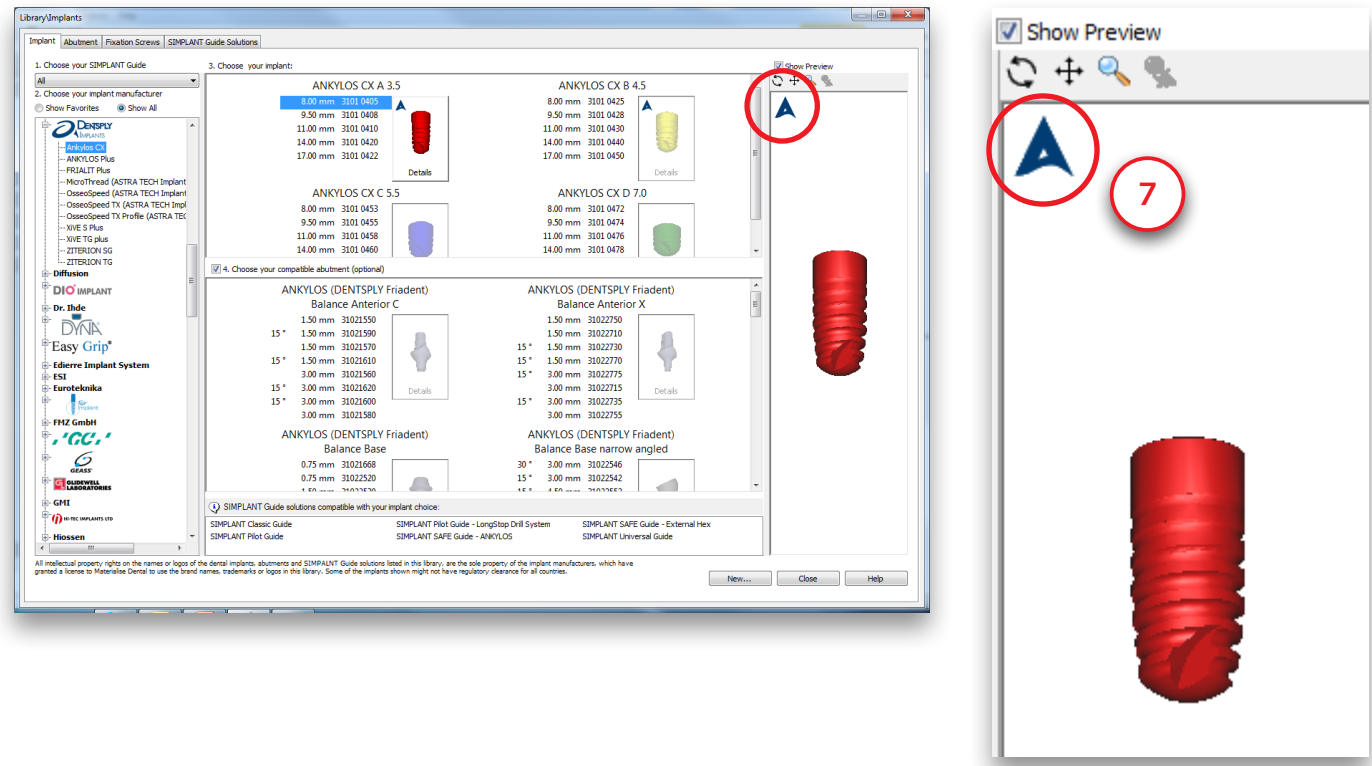
When you right-click on an implant you can choose to set it as the default implant for your mandible and/or maxilla projects (4).



Some implants are compatible with the Immediate Smile – Featuring Atlantis Abutment solution. When planning such an implant, you will be able to order a patient-specific Atlantis Abutment together with the Simplant SAFE Guide. These implants have the Atlantis icon in the top left corner of the 'Details' button(6).

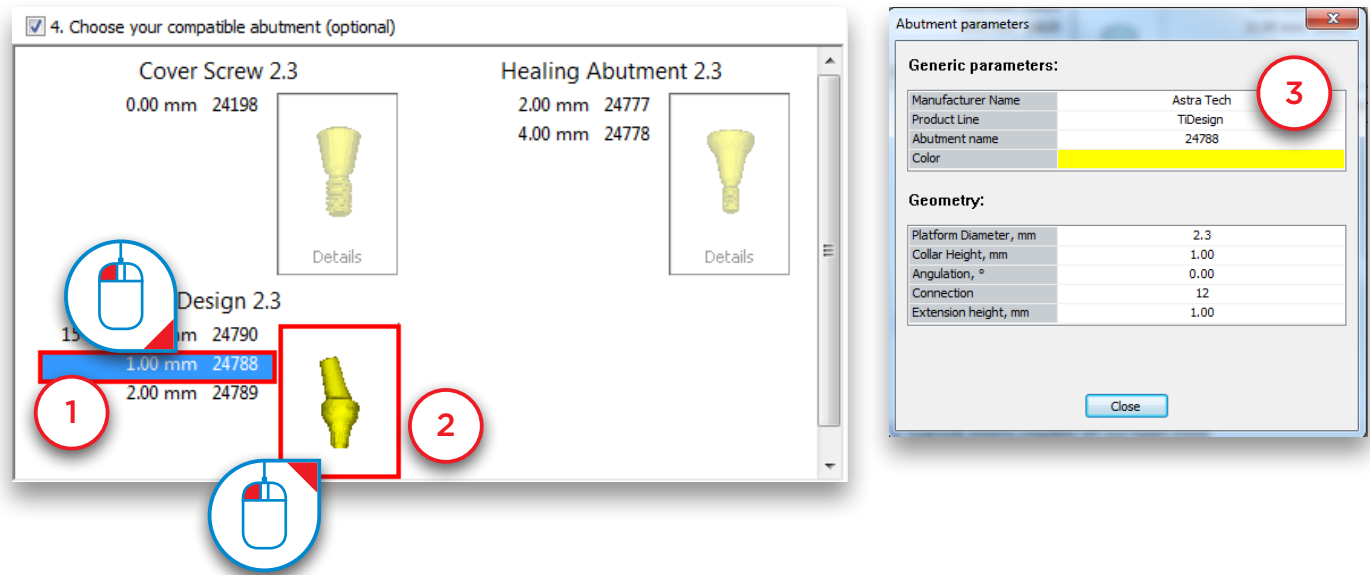


It is also shown in the top left corner of the implant preview window (7).



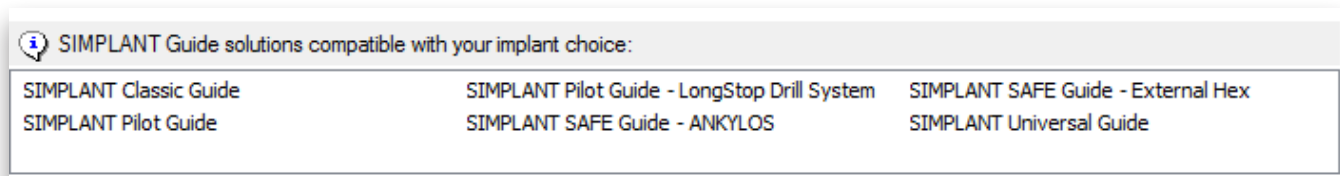
d. Choose your compatible abutment

Here you can select a specific abutment you would like to use (1). Only the abutments that are compatible with the selected implant are shown here. If you click the 'Details' button (2), the 'Abutment parameters' dialog pops up (3).



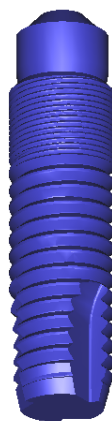
e. Simplant® Guide solutions compatible with your implant choice

In this area all the Simplant Guide solutions are shown that are compatible with the implant you have selected.



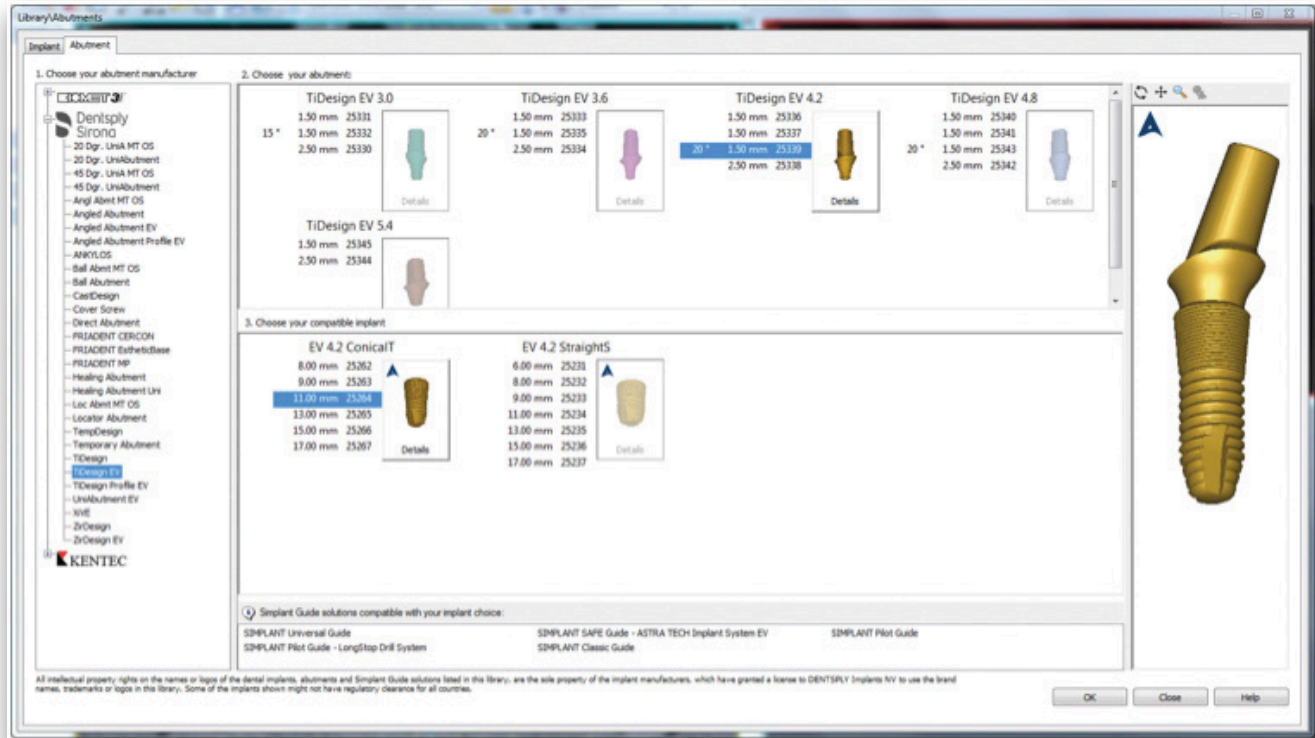
f. Simplant® Guide solutions compatible with your implant choice

In this area all you can see a 3D preview of the implant you have selected.



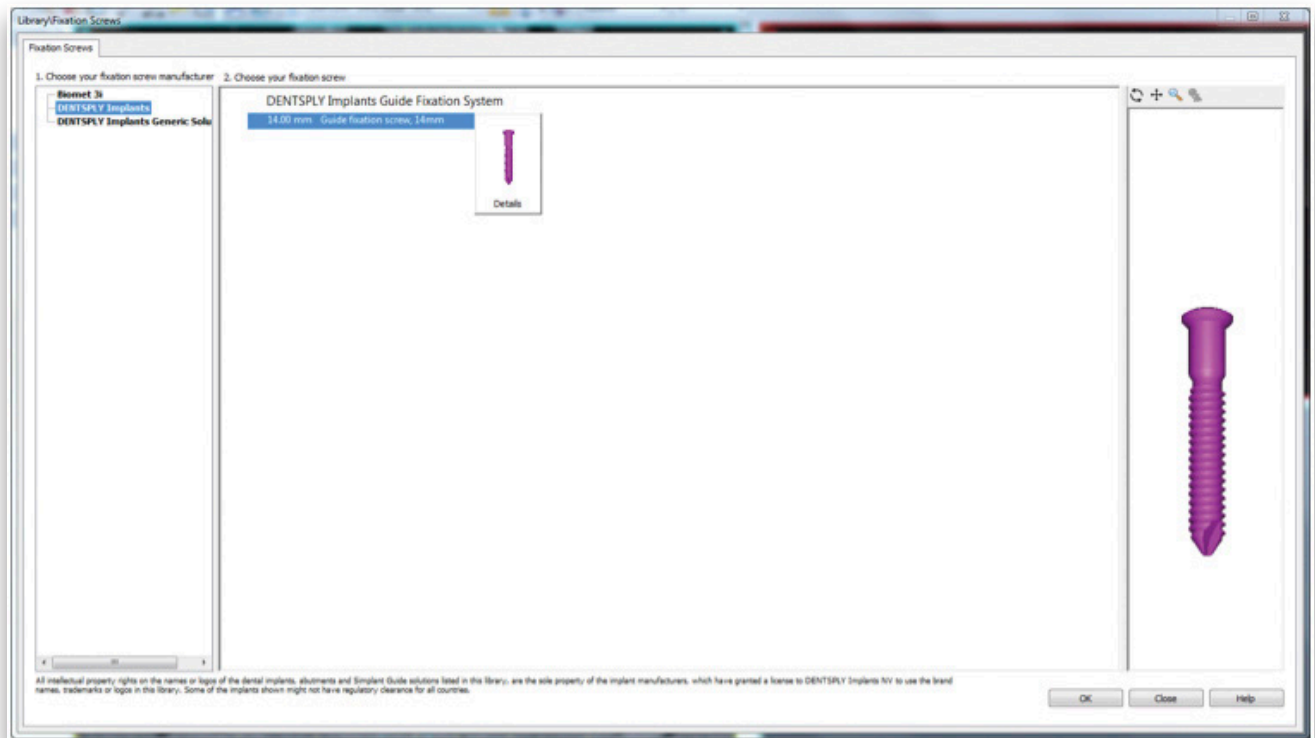
6.1.2.2 - Abutment

On this tab you get an overview of all the available abutments in the Simplant software. This tab is very similar to the 'Implant' tab.



6.1.2.3 - Fixation Screws

This tab is very similar to the 'Implant' tab.



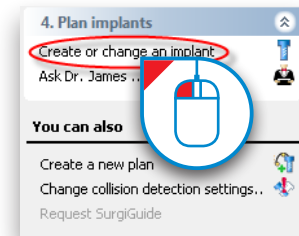
6.2 – Planning Implants

Select 'Create or change an implant' in the Task Panel to start placing implants.

There are two ways to place an implant:

6.2.1 'Place an implant': 1-click method

6.2.2 'Draw an implant': 2-click method



After placing the implants you can:

6.2.3 Specify the implant type

6.2.4 Visualize the guiding tubes

6.2.5 Change the position and length of the implant

6.2.6 View the implant properties

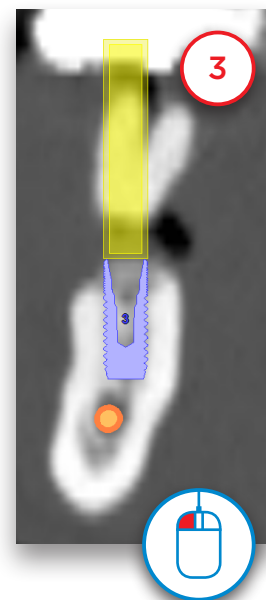
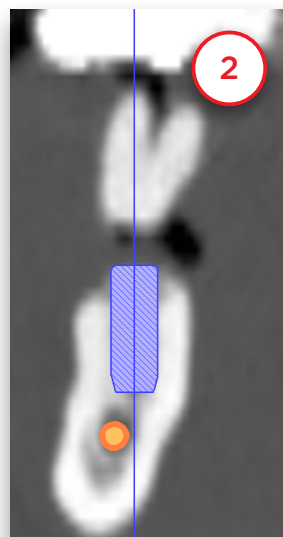
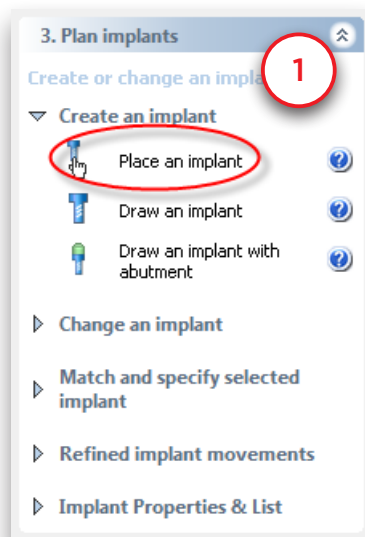
6.2.7 View implant relations

6.2.8 View the implants list

6.2.9 Check for collisions

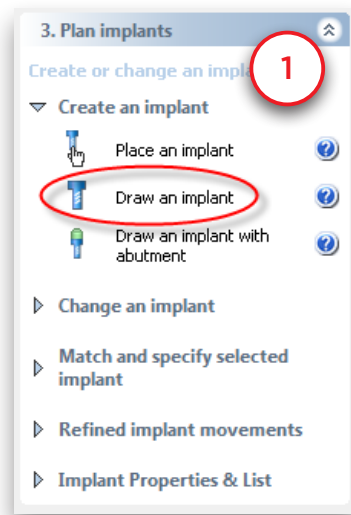
6.2.1 – Place an Implant

Select 'Place an implant' in the Task Panel (1). In one of the 2D view windows, position your mouse cursor on the location where you would like to place the implant (2). Press the left mouse button once to drop the implant on that location (3).

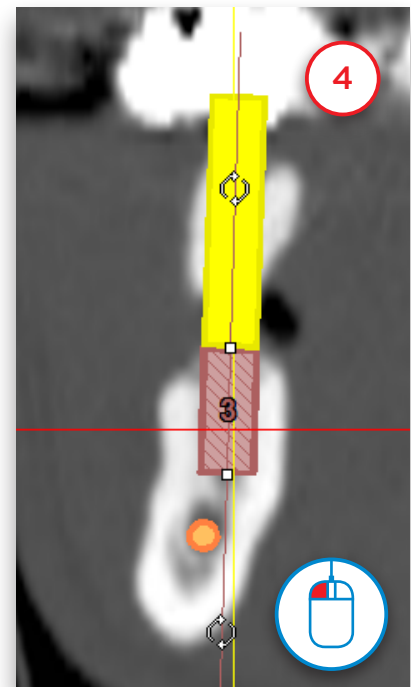
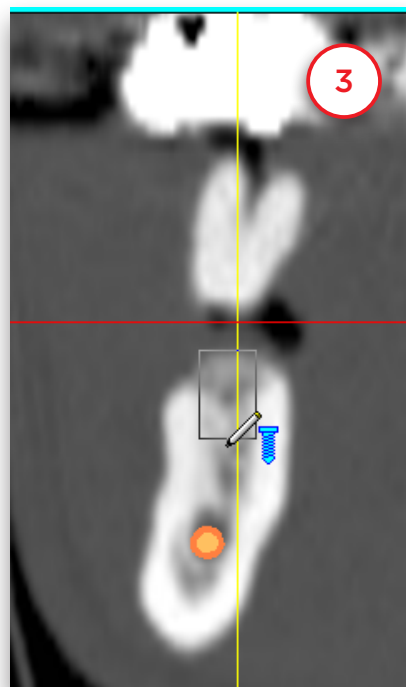
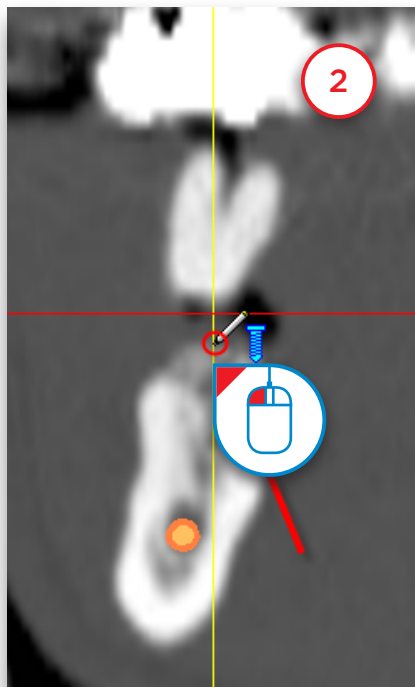


6.2.2 - Draw an Implant

Select 'Draw an implant' in the Task Panel (1). With this function you can define an implant with two mouse clicks.

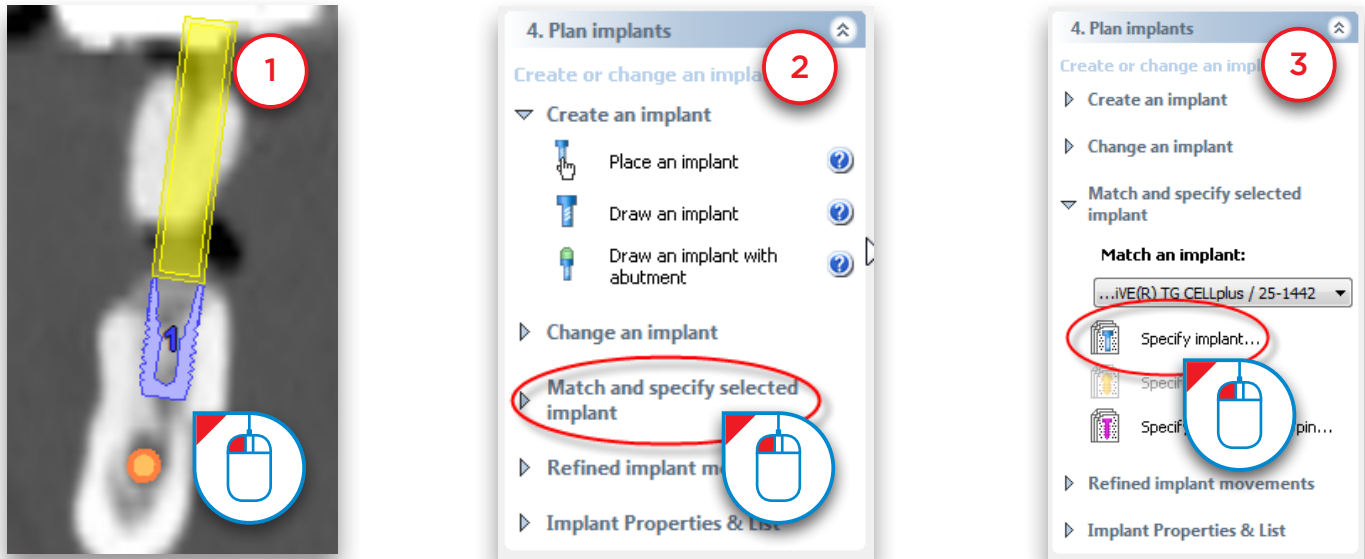


The first click defines the point of entry for the implant (2). After you have selected this point, you can define the length and orientation of the implant by moving the mouse cursor (3). Finally, when you are satisfied with the implant size and orientation, you can click a second time with the left mouse button to place the implant (4).

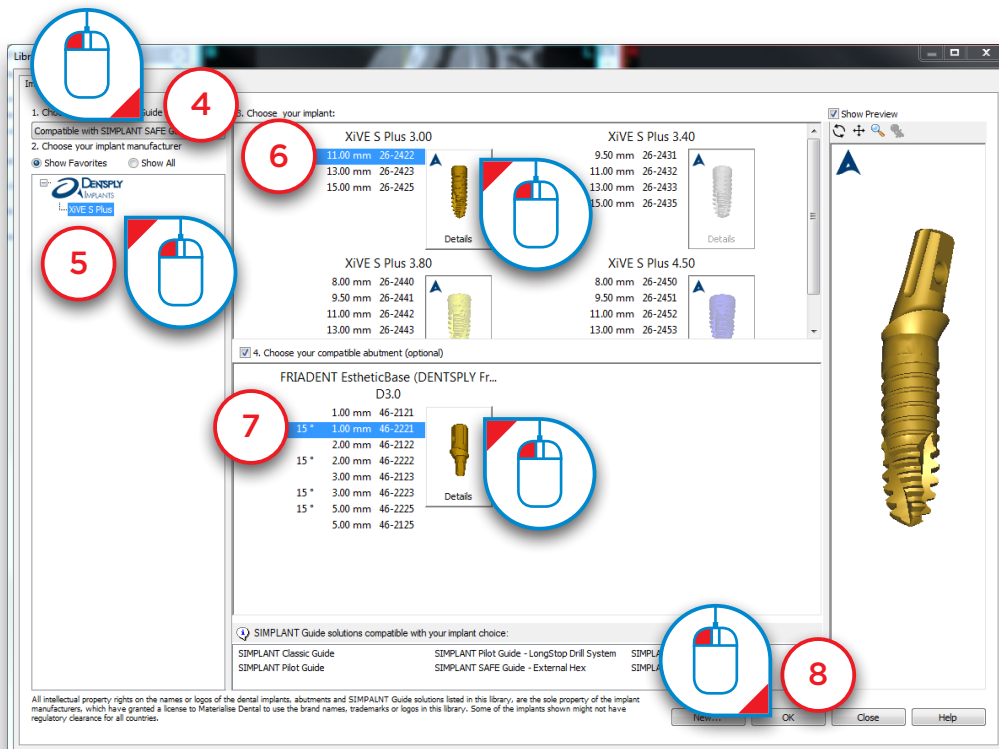


6.2.3 - Specify the Implant Type

After you have placed the implant, you still need to specify the type of implant that you would like to use. To specify the implant type, first click somewhere on the implant surface to select it (1). In the Task Panel, select 'Match and specify selected implant' (2) followed by 'Specify implant' (3).



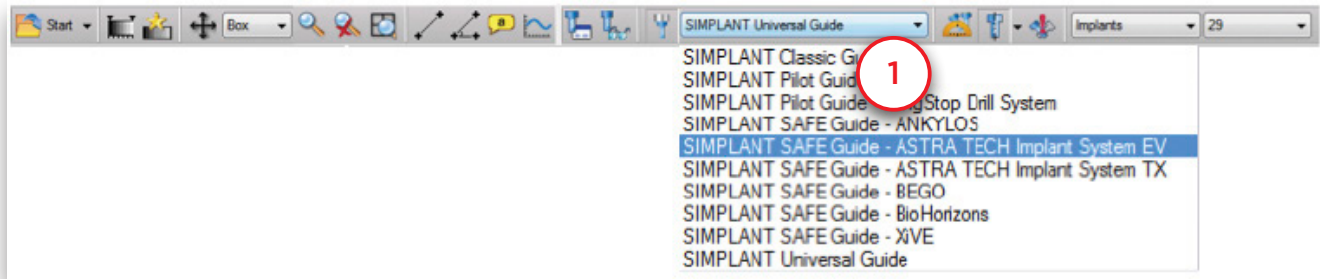
The 'Implants library' window now appears. Here you can select the specific type of implant that you would like to use. First, choose what type of Simplant Guide you want to use (4). This can be a SAFE, Universal or Pilot guide. Then select the product line that you would like to use (5). Finally, select the implant that you would like to use (6), the abutment you would like to use (7), and click 'OK' (8) to make the changes effective in your planning.



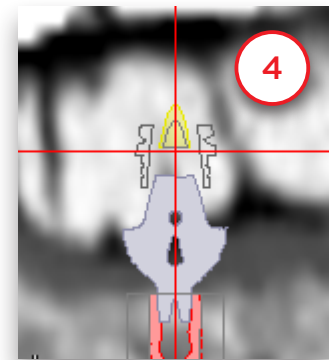
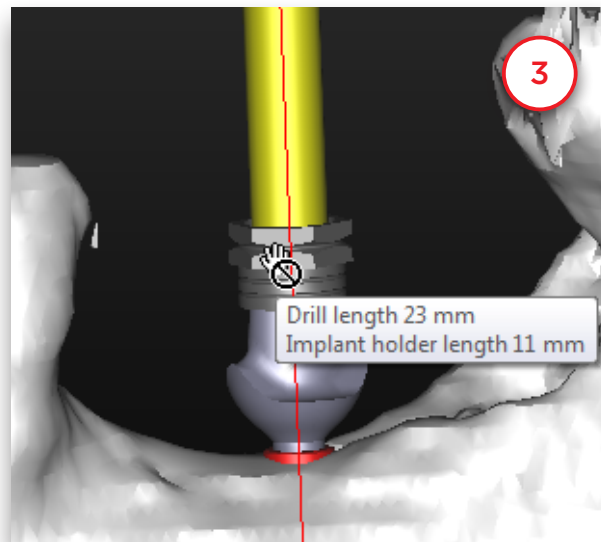
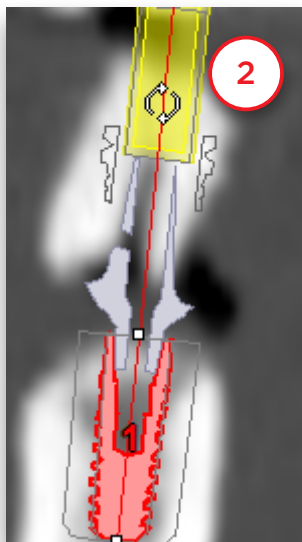
6.2.4 - Visualize the guiding tubes

By default Simplant shows a preview of the Universal guiding tubes when planning implants.

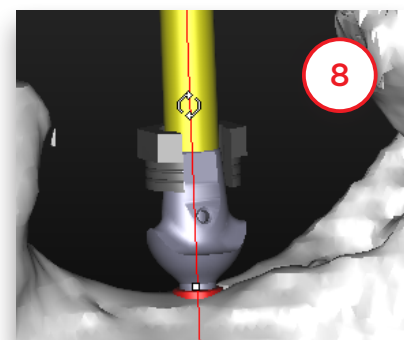
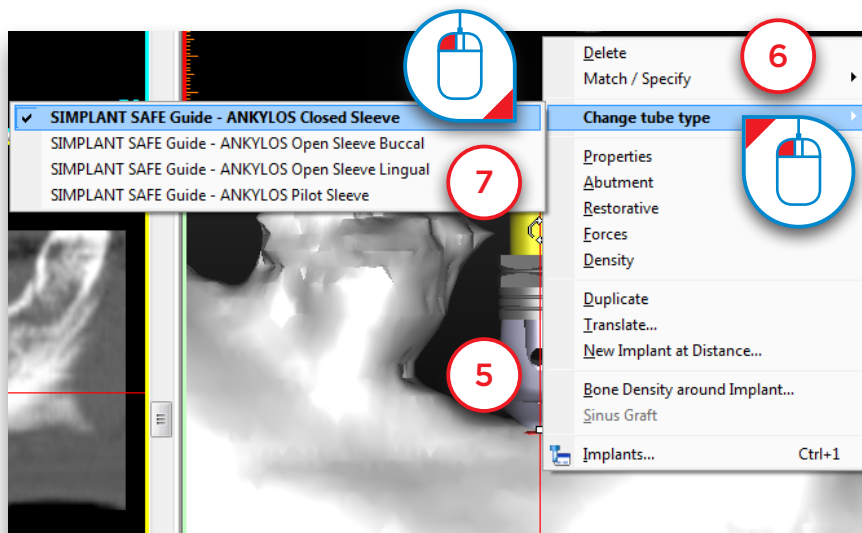
You can easily change the tube system to your preferred guide system via the dropdown in the main toolbar (1).



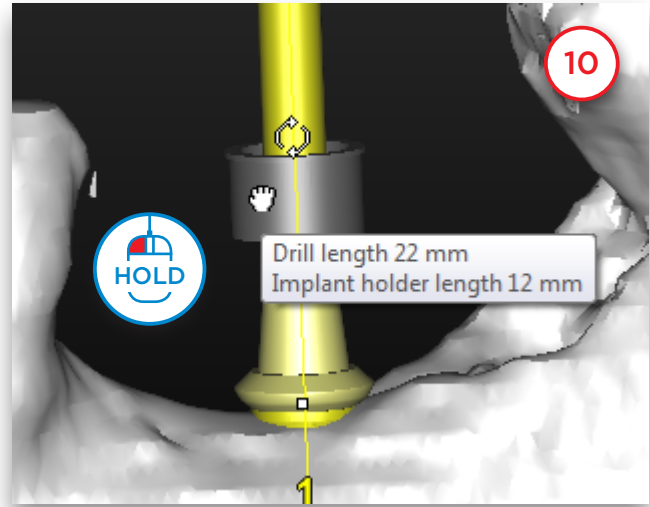
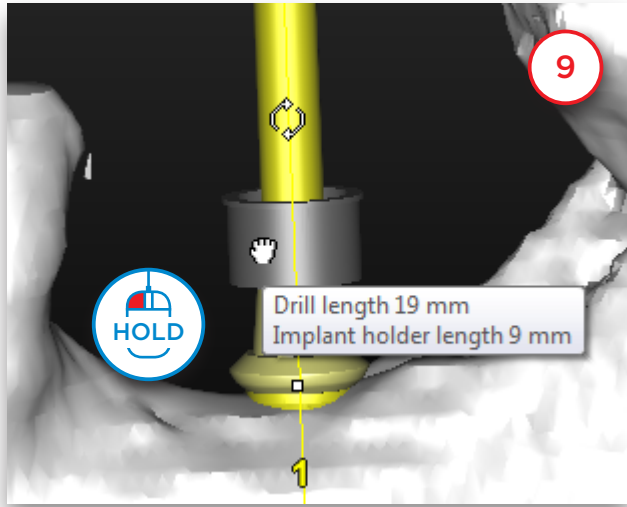
You can see the position of the tube in the cross-sectional view (2), in the 3D view (3) and in the panoramic view (4). If you click on the tube in the 3D view as shown in (3) you will see a pop-up with information on drill length and implant holder length.



If you select a system with different tube types you can change this type by right clicking on the implant (5), clicking on 'Change tube type' (6) and clicking on a different tube type (7). You can see the open sleeve in (8).






If we choose a system which allows different prolongations we can change the tube position. An example of such a system is Biomet Navigator. We can do this by clicking on the tube and holding the mouse button (9). Move the mouse up the move the guiding tube up (10).




6.2.5 - Change the position and length of the implant

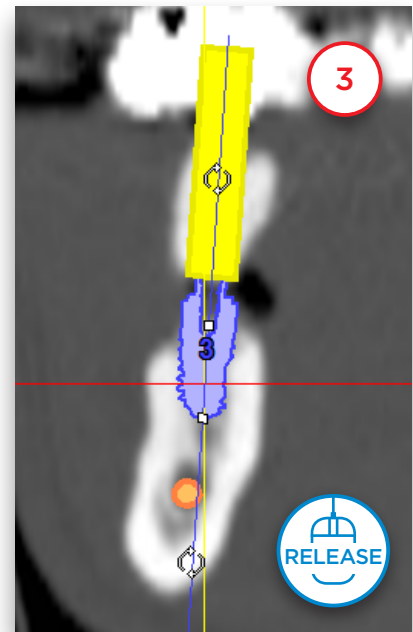
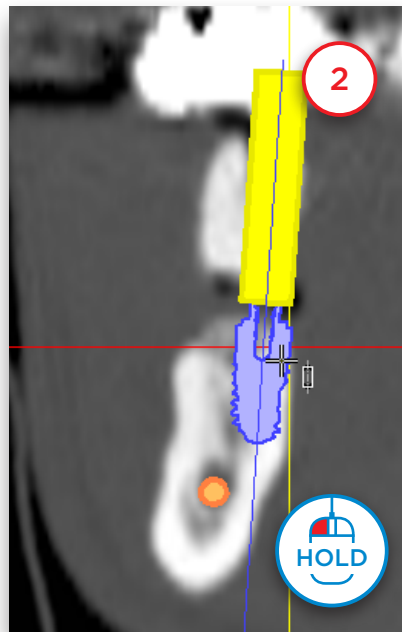
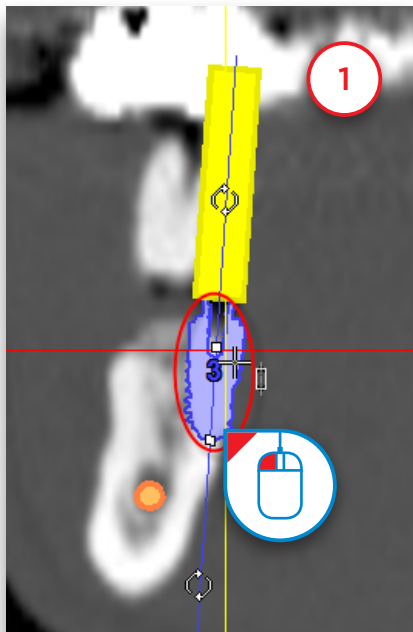
During the planning, you might want to change the position or length of the implants. Three types of modifications to the implant can easily be made:

- A** Move the implant  **B** Rotate the implant  **C** Change the length of the implant 



A. Move the implant

Position the mouse cursor on the implant area (1) until you see the move icon appear next to your mouse cursor: 

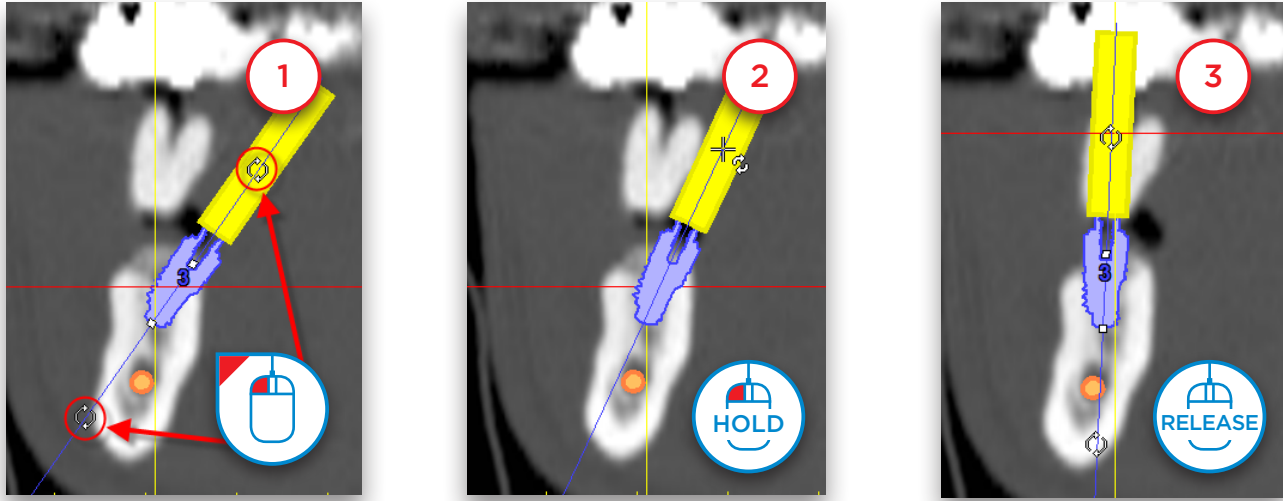
Click and hold the left mouse button and move the mouse cursor to drag the implant to a new location (2). Release the mouse button to finish (3).





B. Rotate the implant

Position the mouse cursor on one of the two rotate icons (1)  until you see the rotate icon appear next to your mouse cursor: 

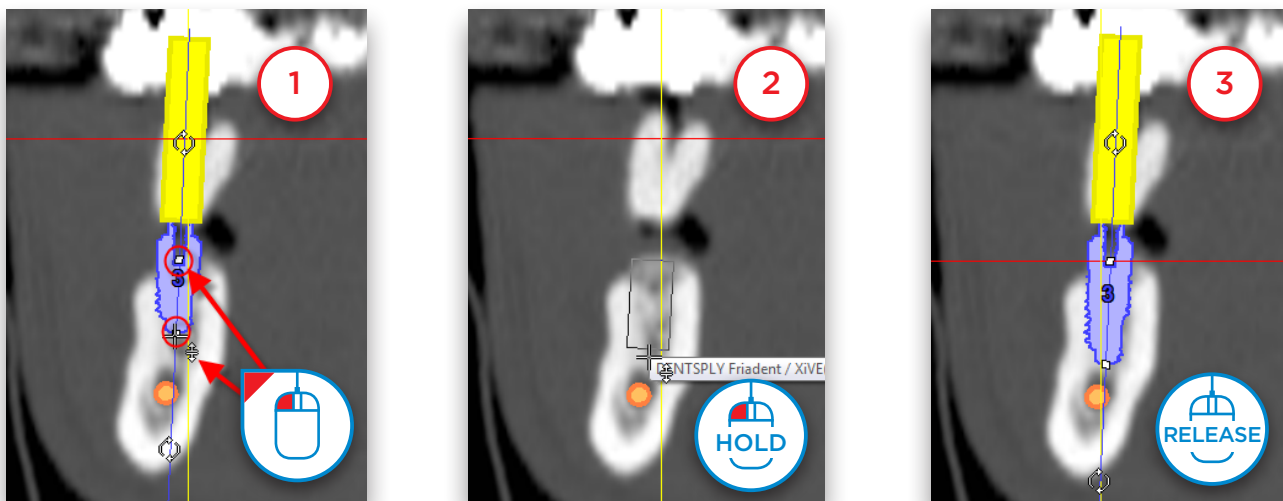
Click and hold the left mouse button and move the mouse cursor to rotate the implant (2). Release the mouse button to finish (3).



C. Change the length of the implant

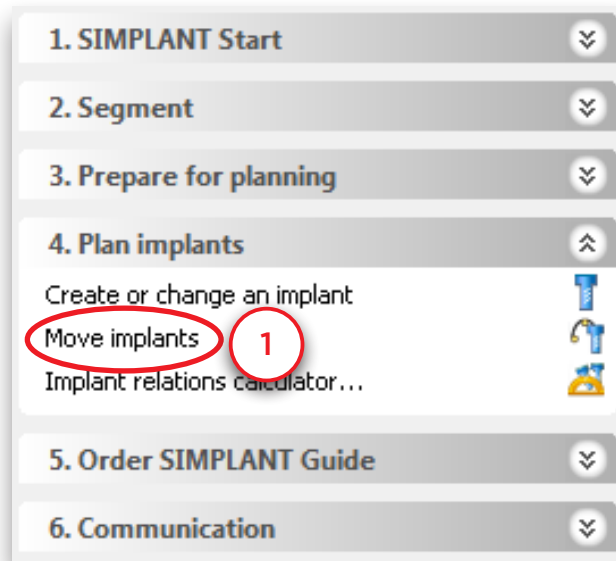
Position the mouse cursor on one of the two following icons  (1) until you see the 'change length' icon appear next to your mouse cursor: 

Click and hold the left mouse button and move the mouse cursor to change the length of the implant (2). Release the mouse button to finish (3). Notice that Simplant automatically jumps to the next possible implant within the product line that you were using.

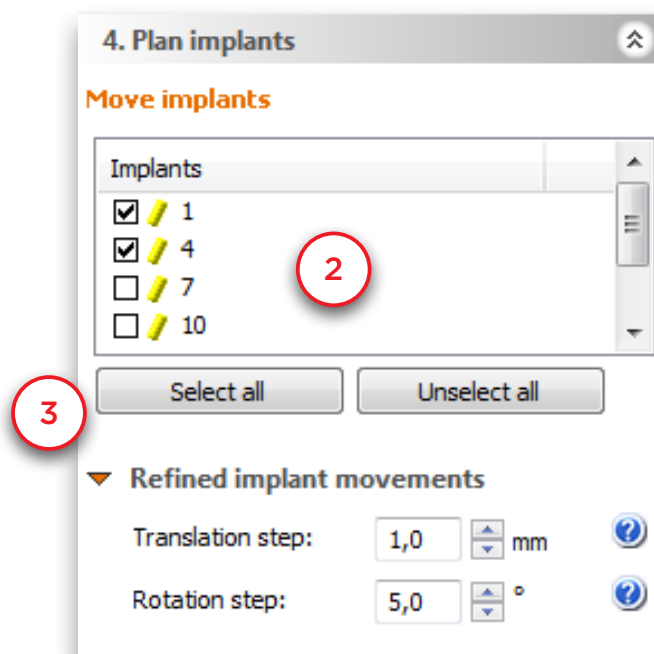


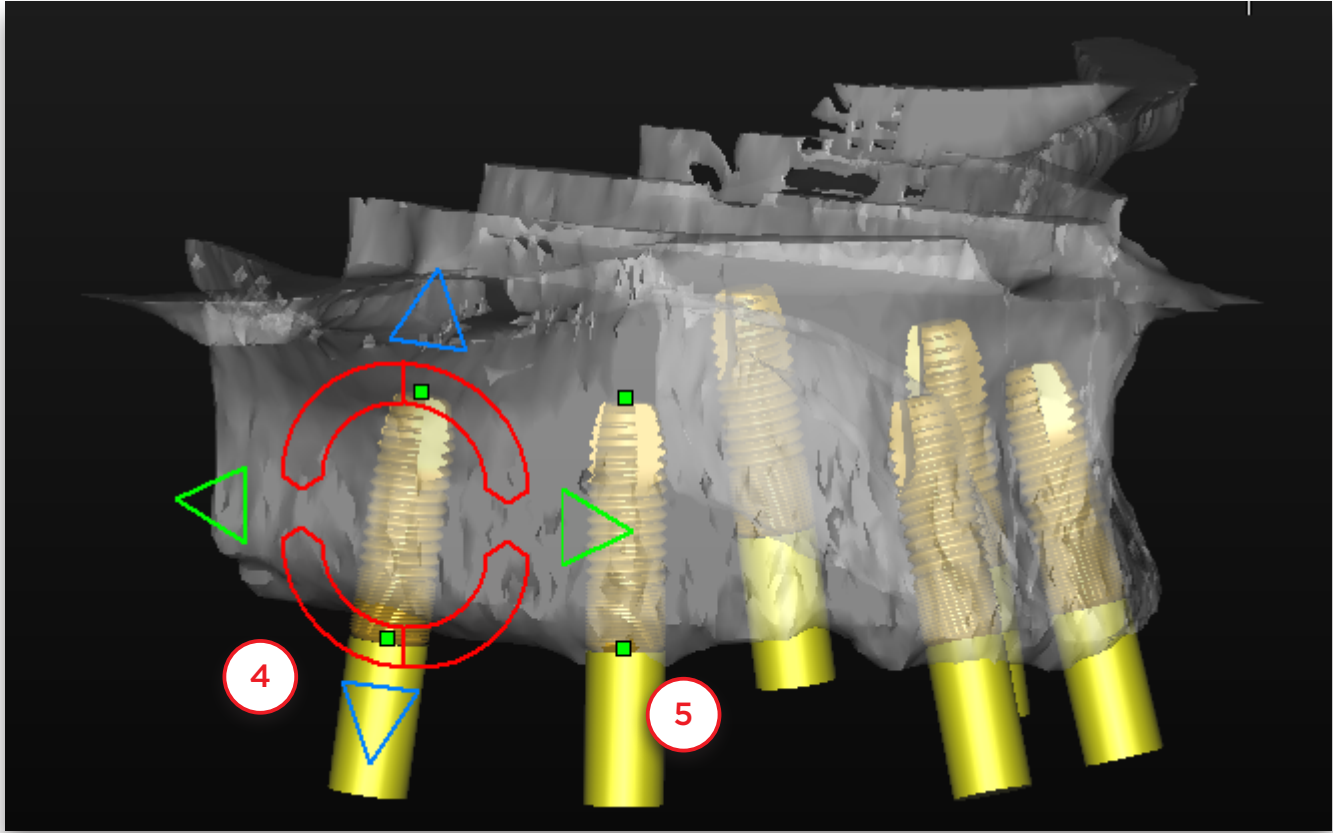
D. Move multiple implants

To change the position of one or multiple implants at the same time click the “*Move implants*” link in the Task Panel (1)

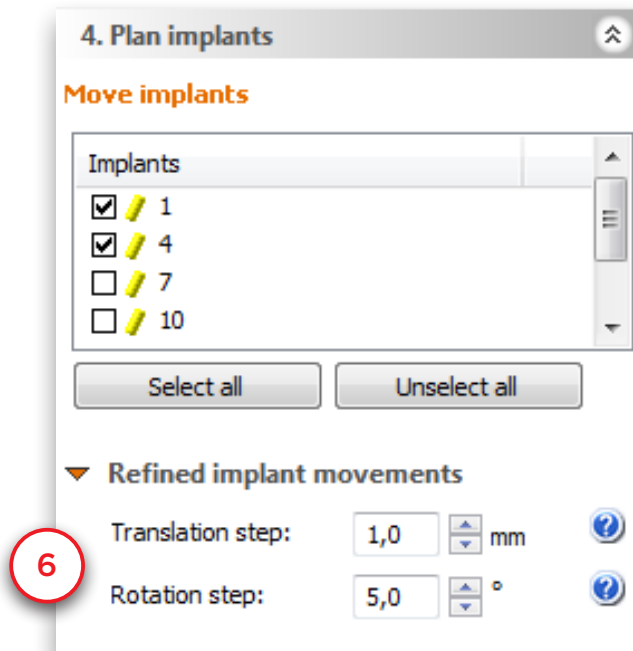


Select the implants you want to translate or rotate in the implant list (2). You can quickly select all the planned implants by clicking the “*Select all*” button (3). Another way of selecting implants is holding the Control-key and clicking them in one of the four view windows to select or deselect them (4). You can see which implants are selected: the occlusal and apical points are marked with a green rectangle (5).

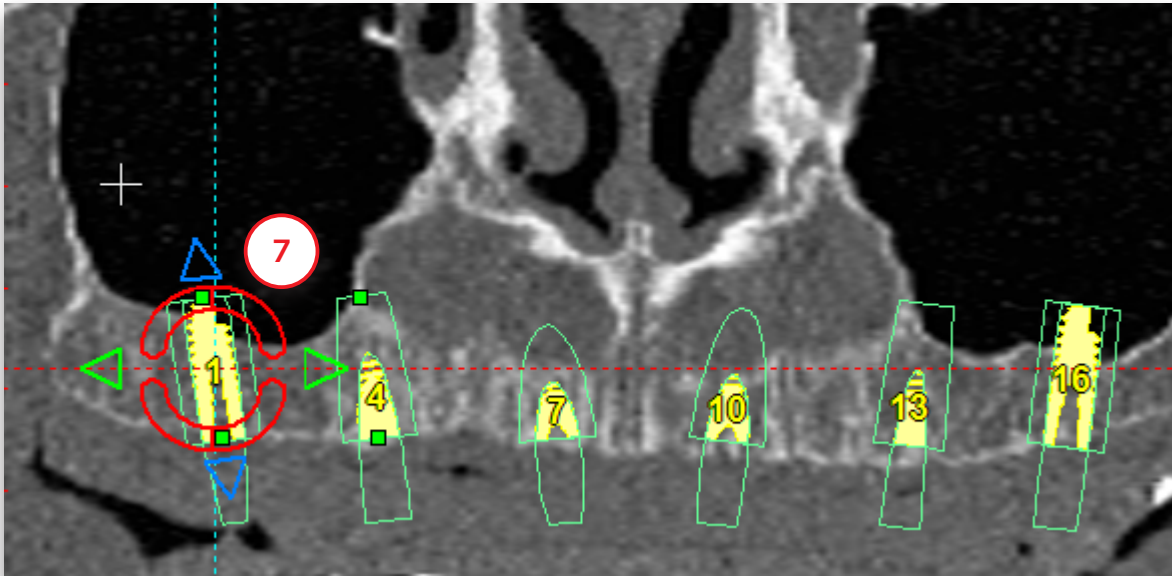




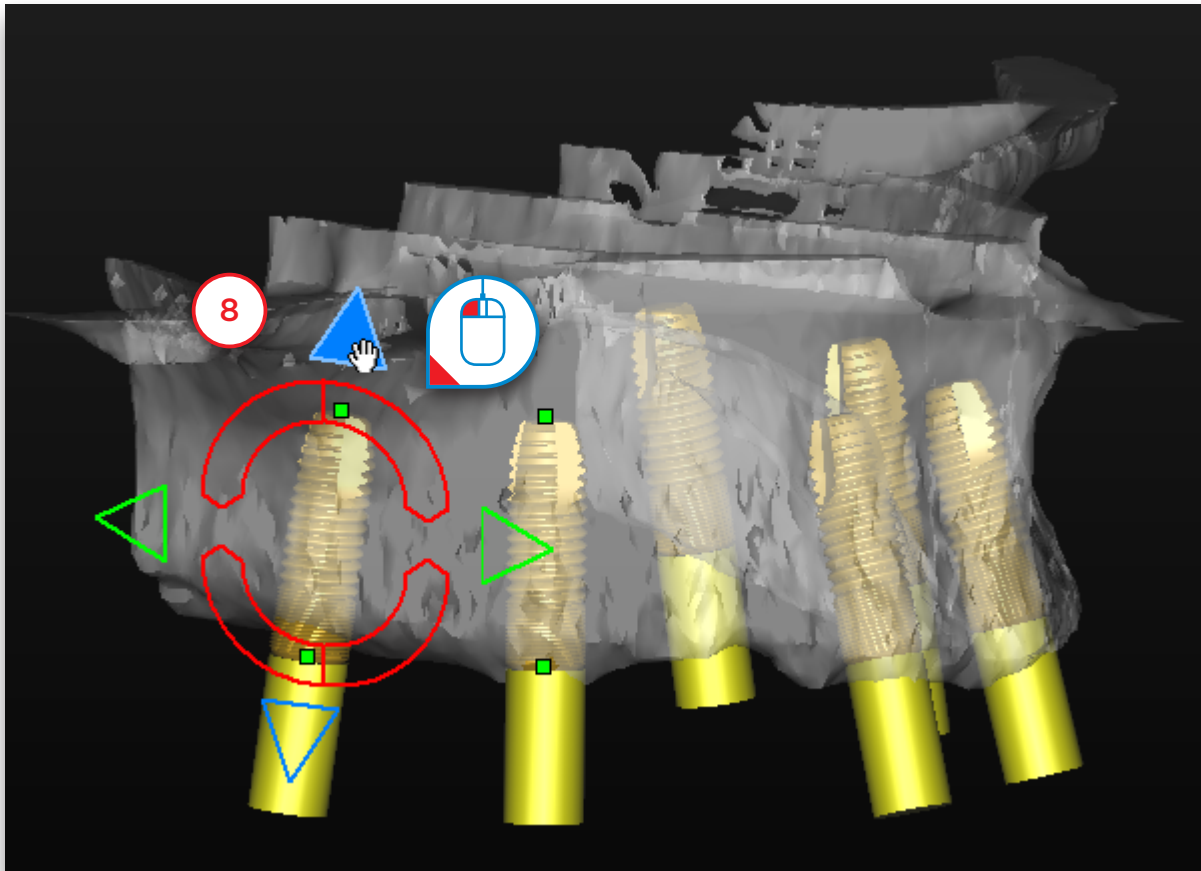
Choose the translation or the rotation step (6). You can only change these values if you selected at least one implant.



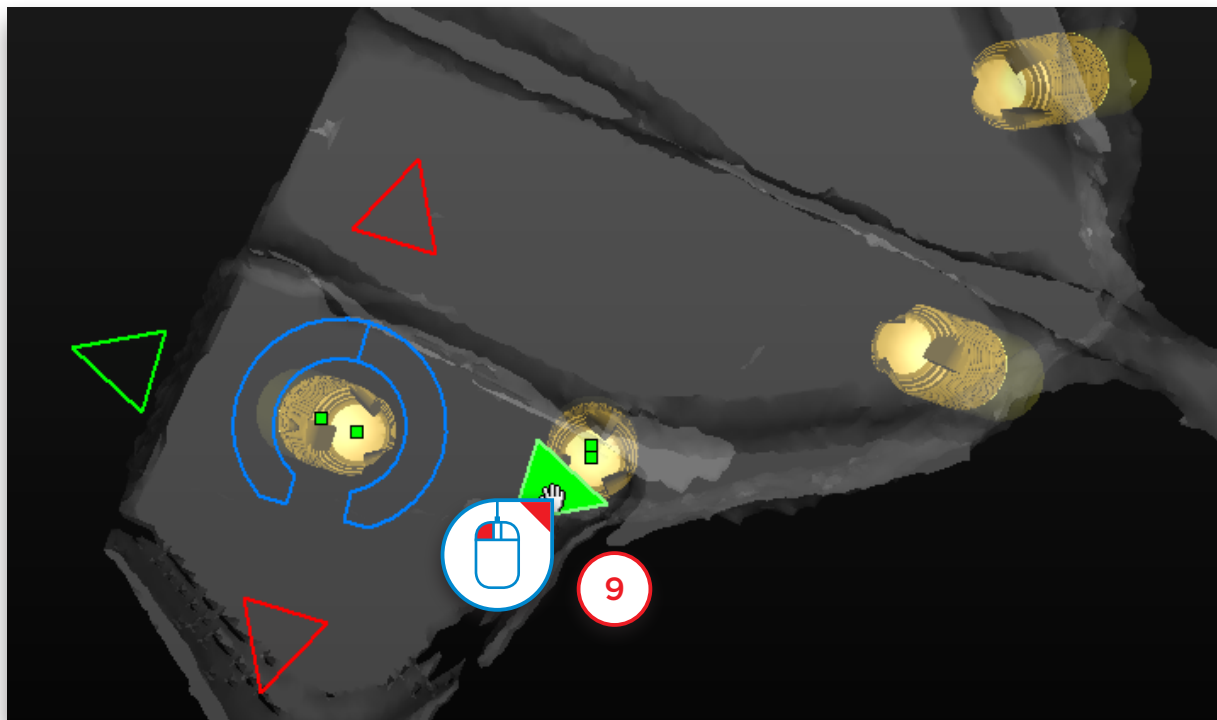
Now you can move or rotate the selected implants in all clinical directions by using the handles shown in the 4 view windows (7).



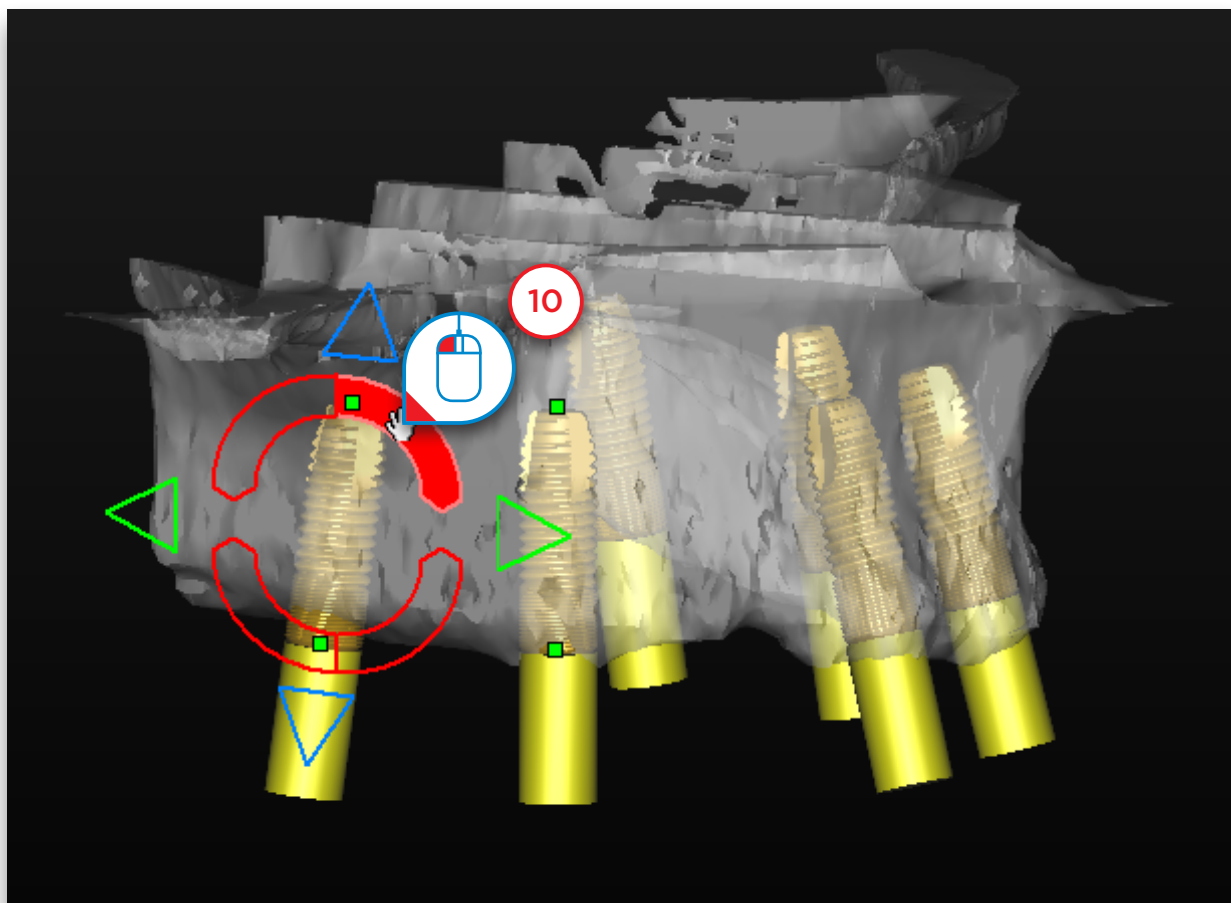
Click the arrows to translate the implants (8). All selected implants will be translated in this direction - not only the implant where the handle is shown.



If you look at the implants from a different angle the handle will change and you will be able to move the implants in different directions (9).

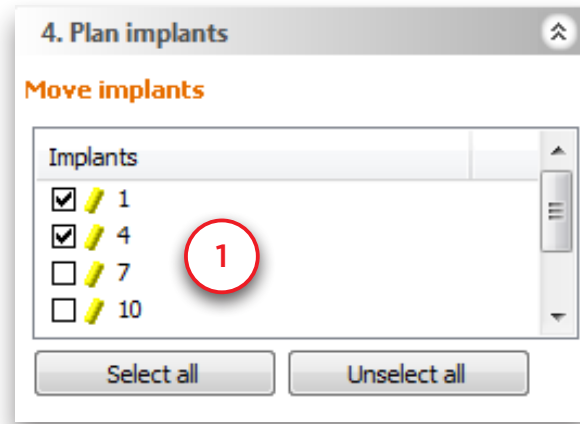


To rotate the selected implants use the curved handles (10)

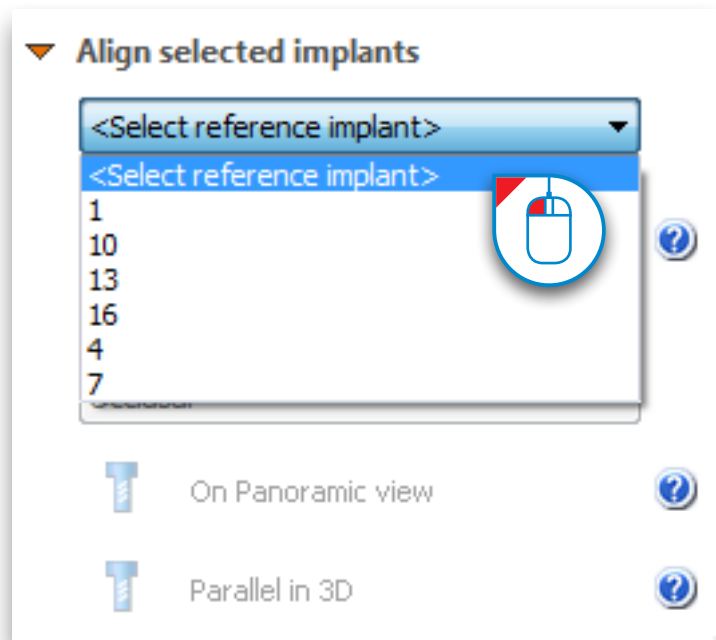
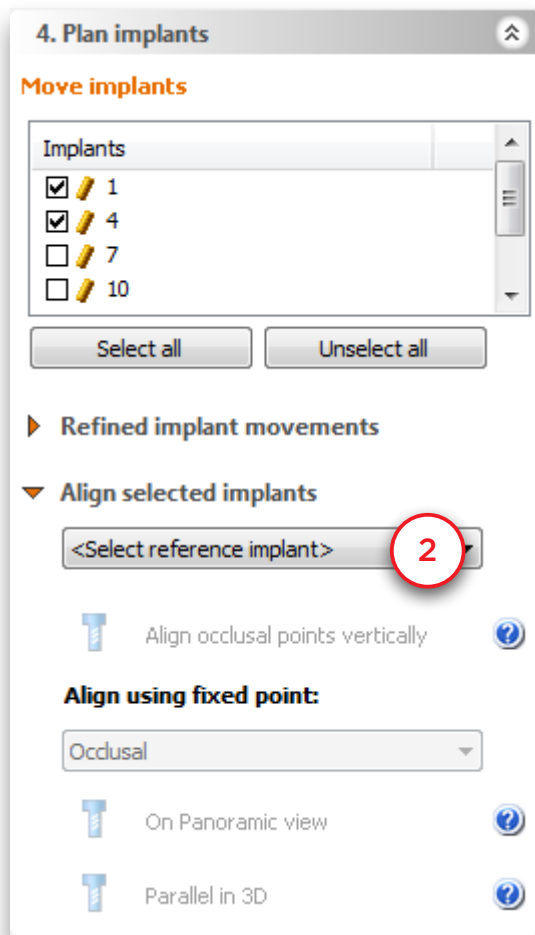


E. Align implants

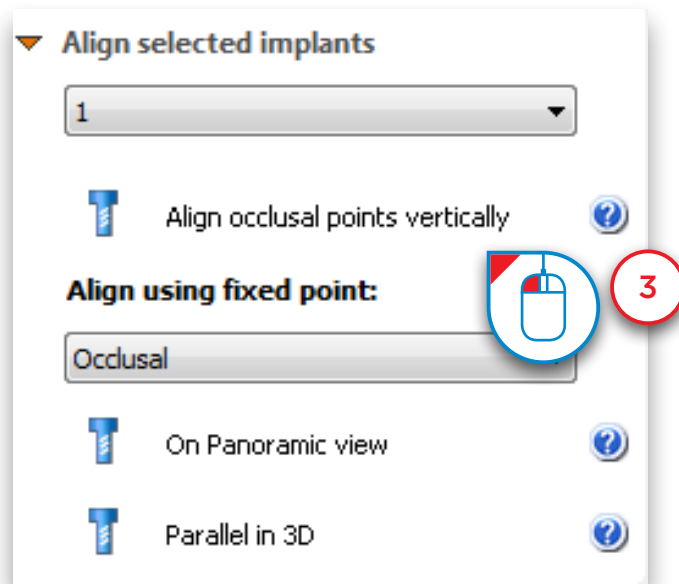
To easily align implants select the implants you want to align using the implant list (1).



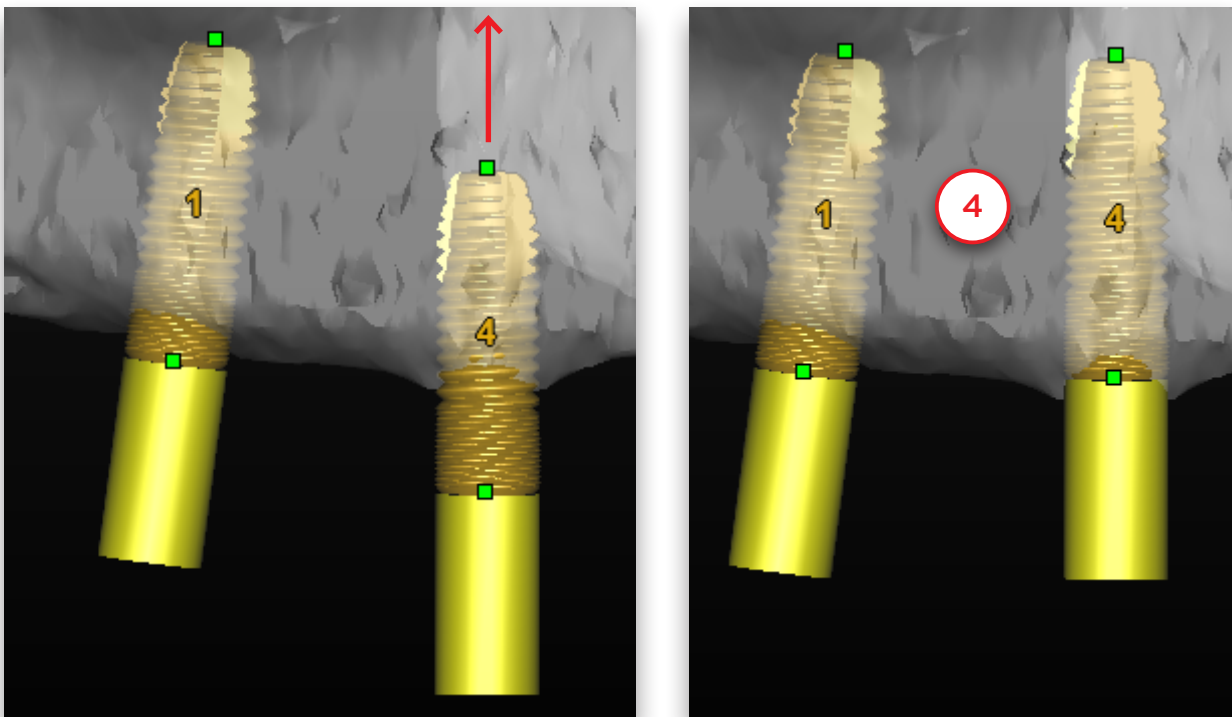
Now you can select the reference implant (2). All selected implants will be aligned with the chosen reference implant. Note that you can choose every planned implant, even the implants that were not selected in the implant list.



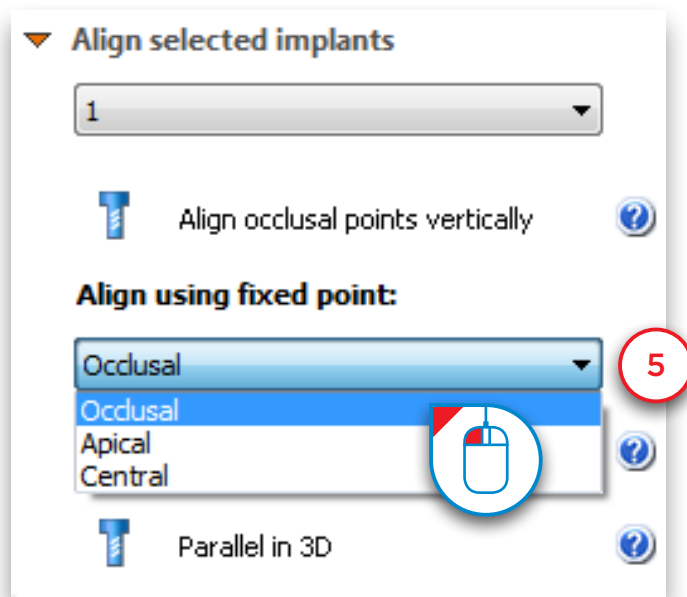
There are 3 different alignment options: Align occlusal points vertically, align implants on the panoramic view and align implants on the 3D view. Click 'Align occlusal points vertically' (3).



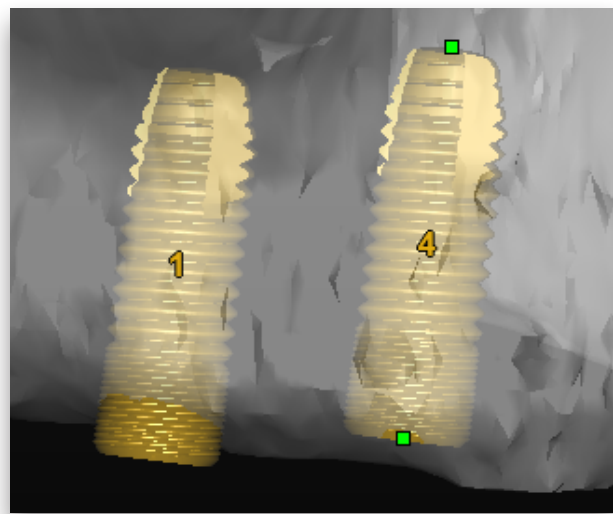
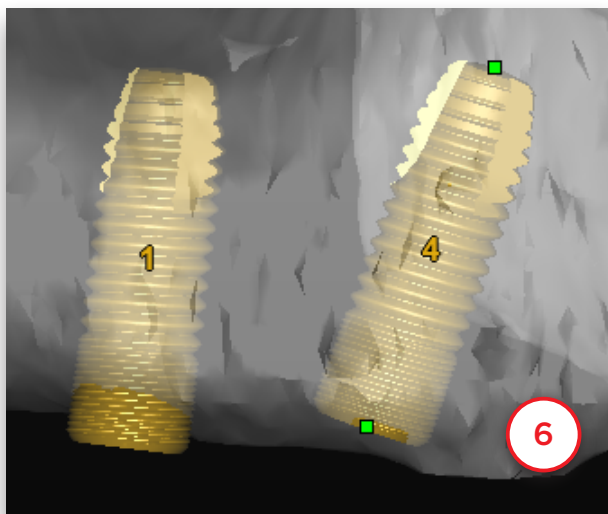
Since implant 1 is the reference implant the occlusal point of implant 4 will be placed at the same level as the occlusal point of implant 1 (4).



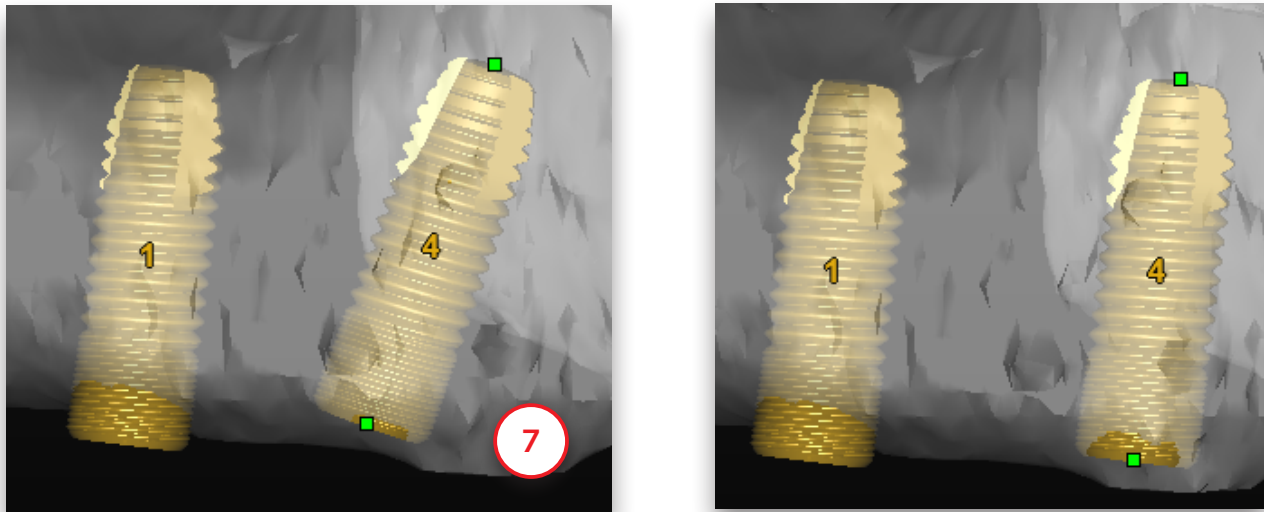
To make implants parallel to the reference implant select the fixed point first (5). This point will stay fixed during the alignment.



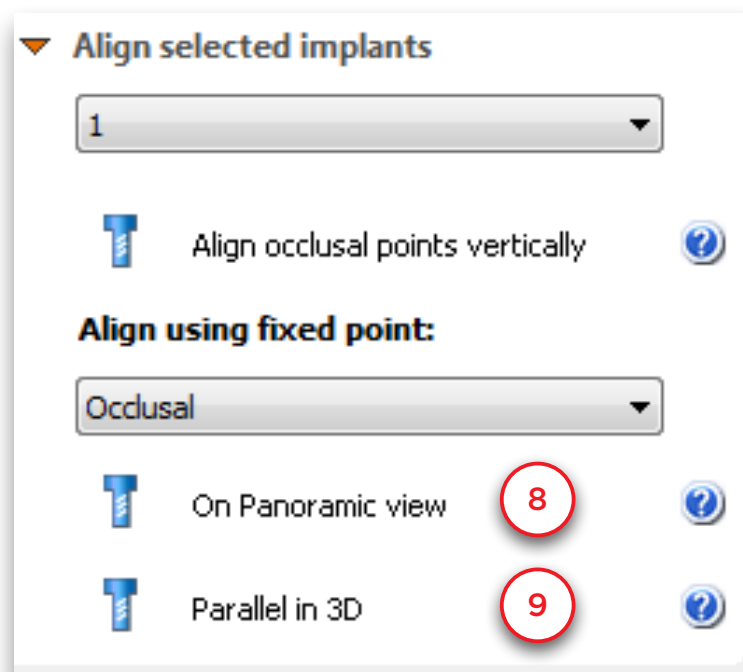
Here below you can see the result when we choose implant 1 as the reference implant and align implant 4 on the 3D view, keeping the occlusal point fixed (6).



When we keep the apical point fixed instead you can see the result below (7)

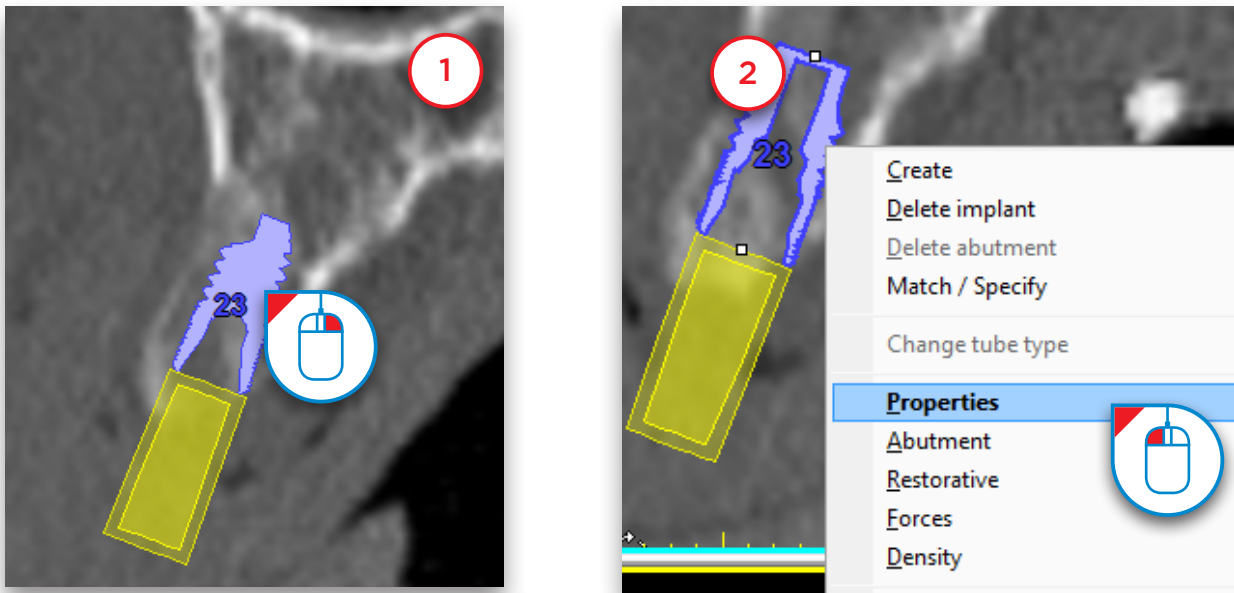


You have the choice between aligning the implants on the panoramic curve (8) or on the 3D view (9). Parallel on the panoramic curve means the implants will have the same bucco-lingual and mesio-distal angle as the reference implant. The moved implants will be parallel to the reference implant in the panoramic view. When you choose parallel in 3D the implants will be completely parallel to the reference implant in 3D.

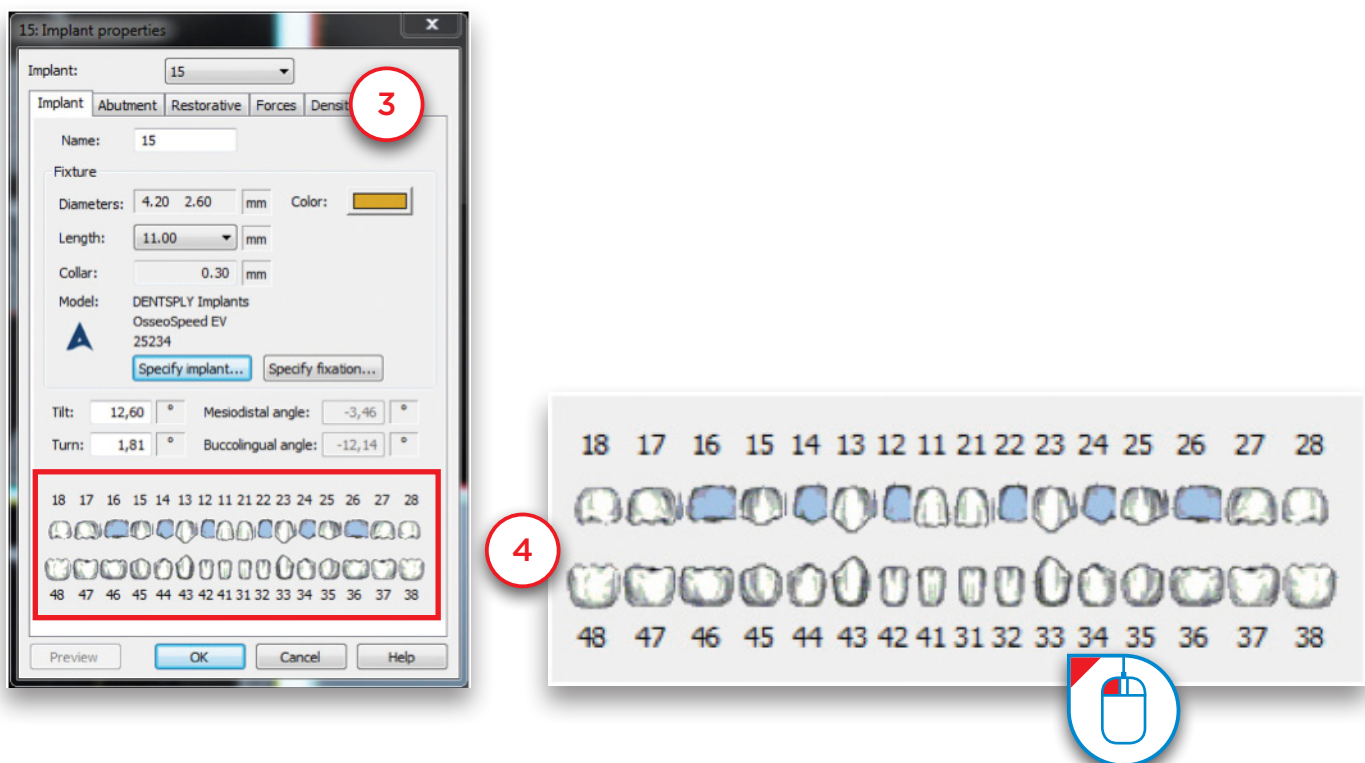


6.2.6 - View the implant properties

After you have created the implant you might want to review its properties. This can be done in the 'Implant properties' window. To open this window click with the right mouse button somewhere on the implant (1). Select "Properties" in the pop-up menu (2).

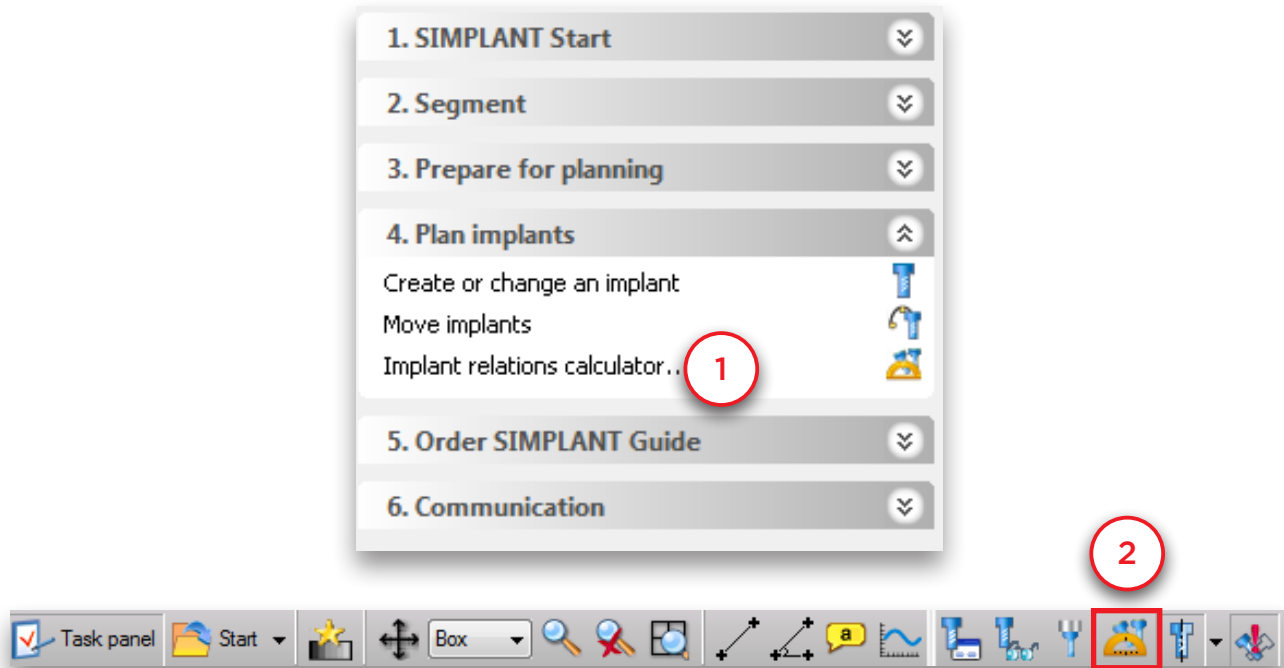


In the 'Implant properties' window (3) you can check the properties of the implant and change them if necessary. On the bottom of this window you can indicate at which tooth position the implant is located (4). This will also change the implant label and make it easy to find your implants in the planning.

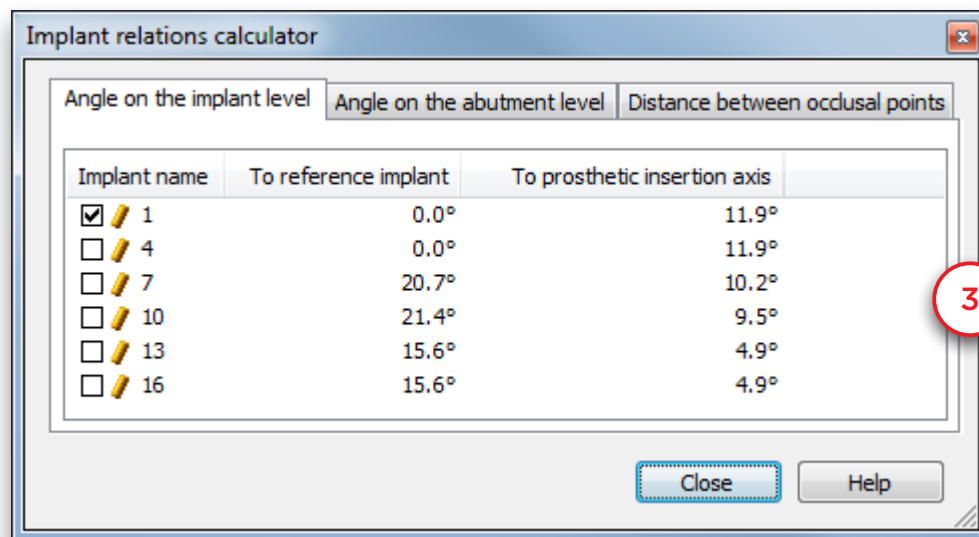


6.2.7 - View implant relations

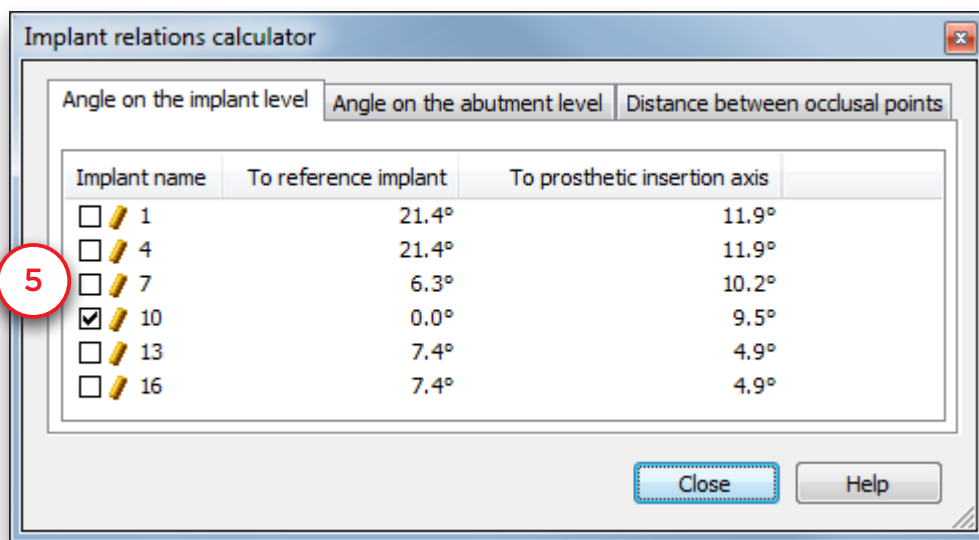
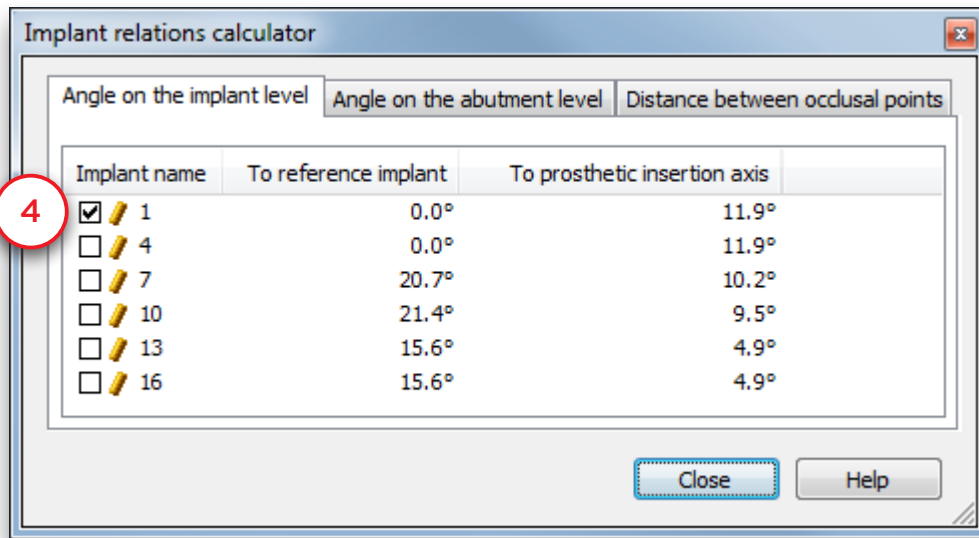
The “*Implants relations calculator*” allows you to measure the distance and the angle between the implants you planned. You can open the “Implants relations calculator” by clicking the link in the task panel (1) or the icon in the toolbar (2).



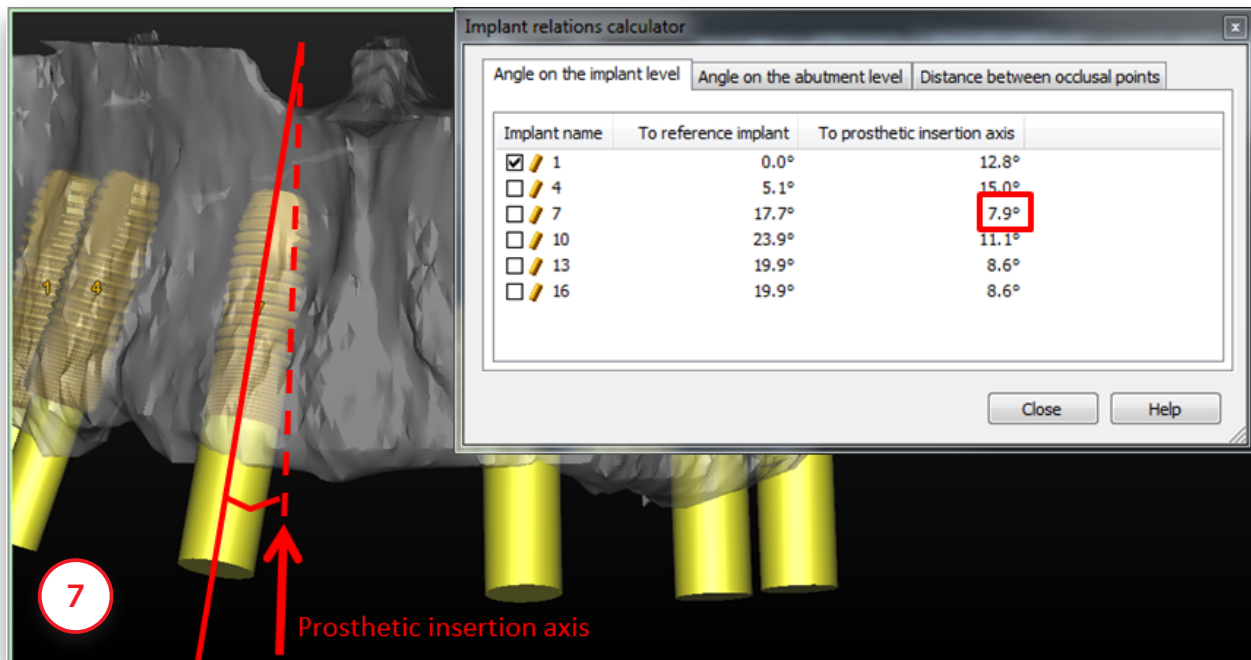
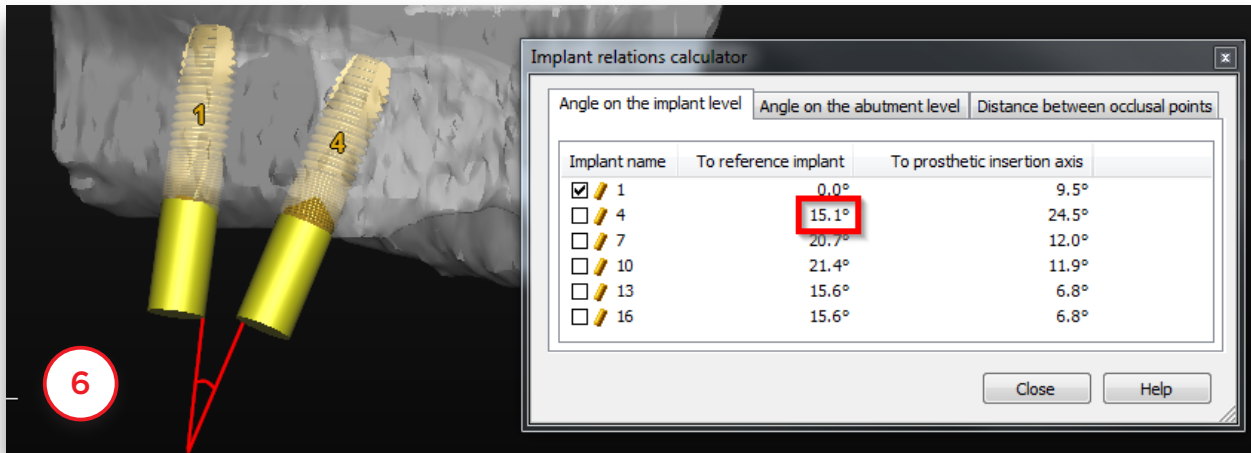
There are 3 tabs: Angle on implant level, angle on abutment level and distance between occlusal points (3).



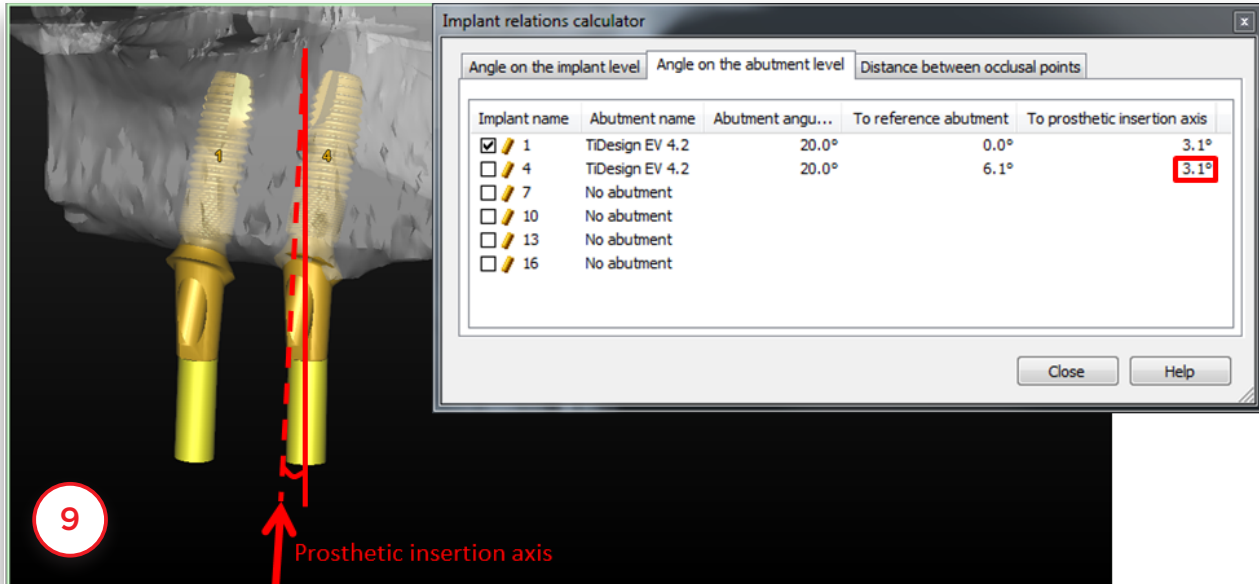
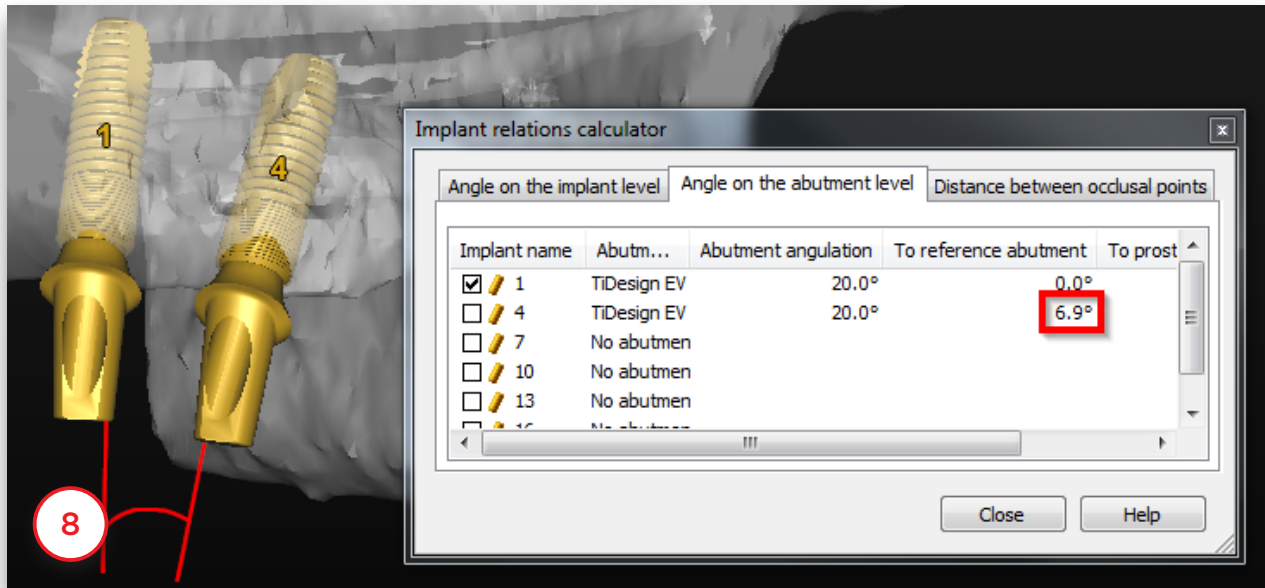
All calculations are based on the implant that is selected as the reference implant. The reference implant is marked by a checkmark (4). Click another implant as reference implant (5) and the measurements will change.



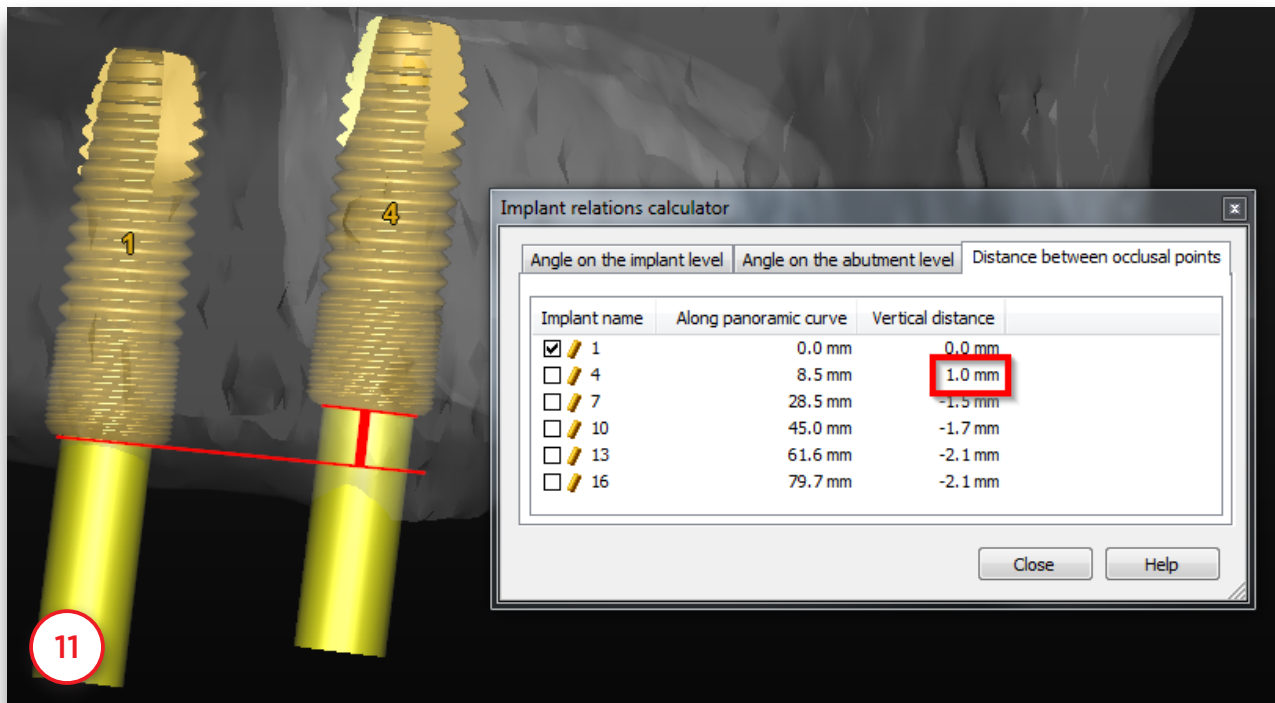
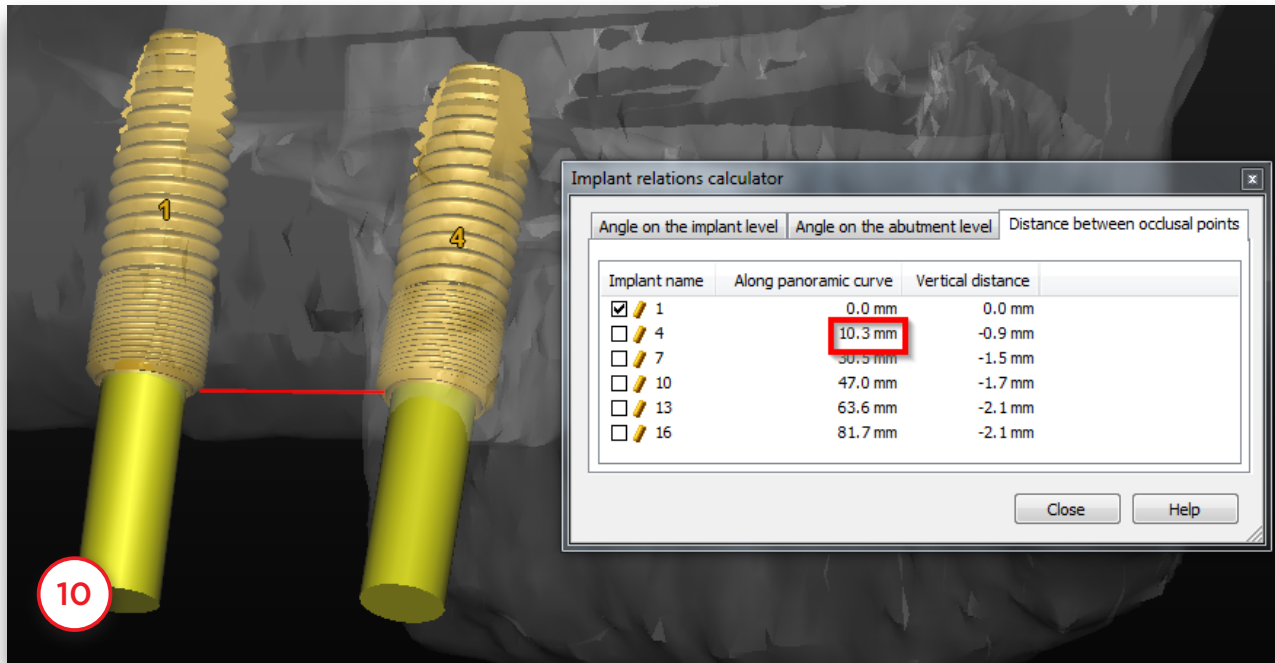
On the first tab you can see the angle between implants (6) and the angle to the prosthetic insertion axis. The prosthetic insertion axis is the average direction of all implants (calculated by Simplant) (7).



The second tab shows the angle between the abutments (8). When no abutments are planned no calculations are shown. The prosthetic insertion axis is the average direction of all abutments (calculated by Simplant) (9).

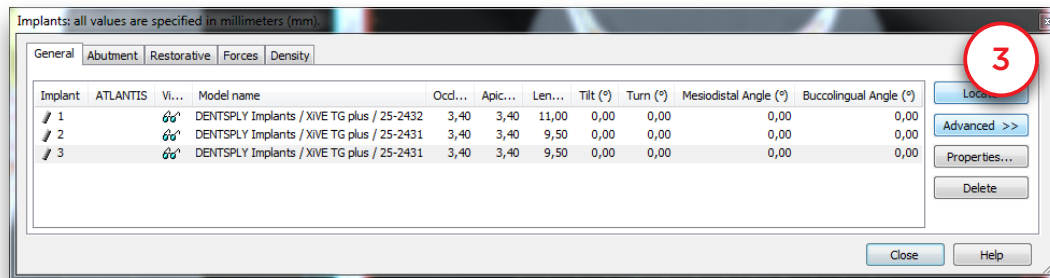
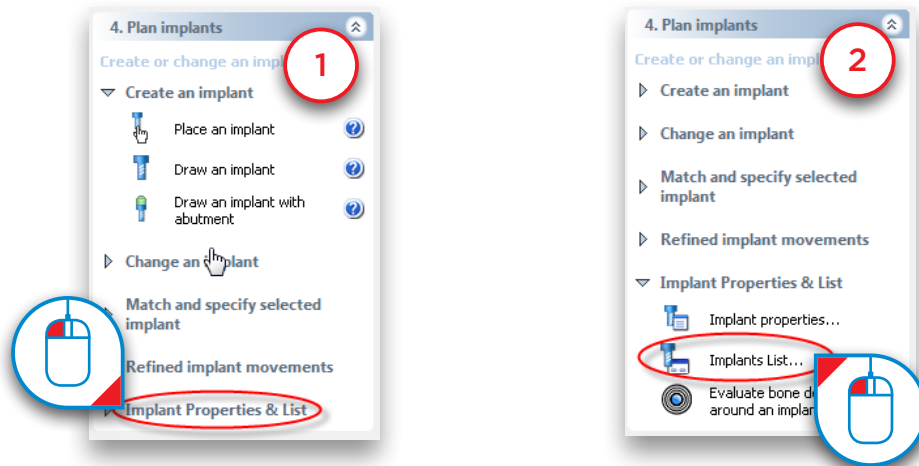


The third tab shows the distance between the occlusal points. You can see the distance along the panoramic curve (10) and the vertical distance (11).



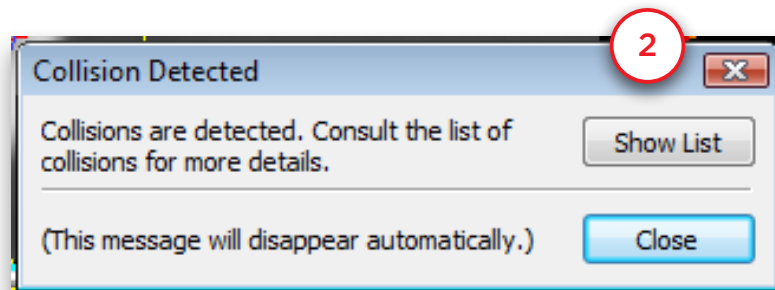
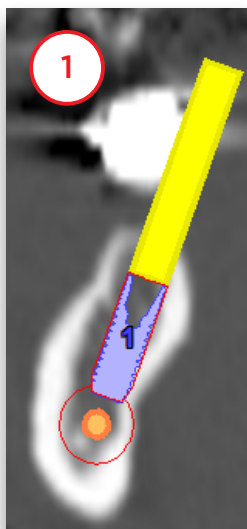
6.2.8 - View the implants list

If you have placed many implants in one project, it can be useful to have an overview of all the implants. The 'Implants List' provides such an overview. To access this list select 'Implant Properties & List' in the Task Panel (1) followed by 'Implants List' (2). This opens up the implants list (3)



6.2.9 - Check for collisions

An important feature of the Simplant software is the 'Collision detection' function. When an implant collides with a nerve or another implant (1), a warning message automatically appears on your screen (2). The software also generates a list of all the collisions detected in your project.



7. Order Simplant Guide

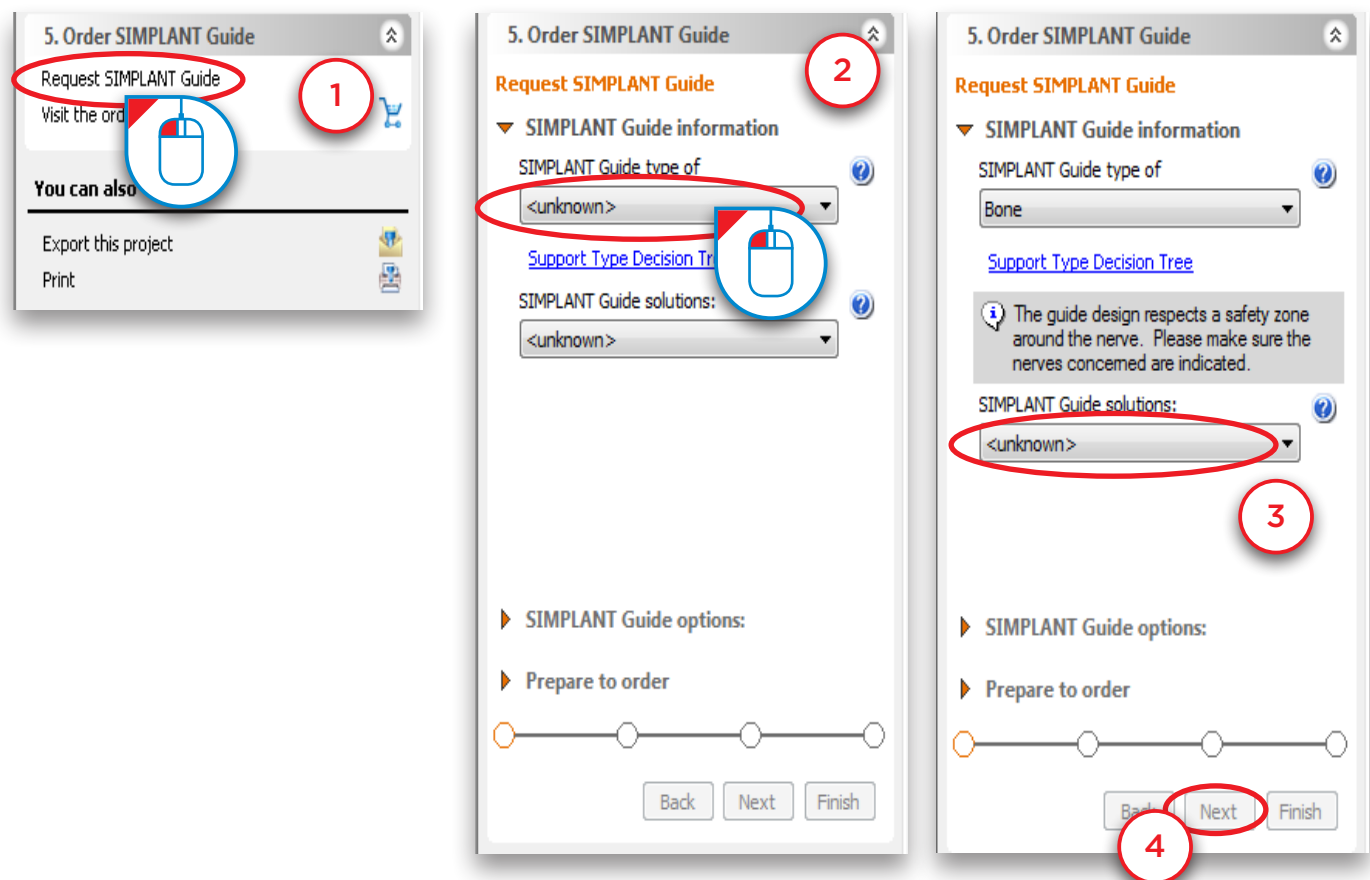
The ordering of a Simplant Guide consists of two steps:

7.1 The design of the Simplant Guide

7.2 The ordering of the Simplant Guide on the 'mySimplant order web page'

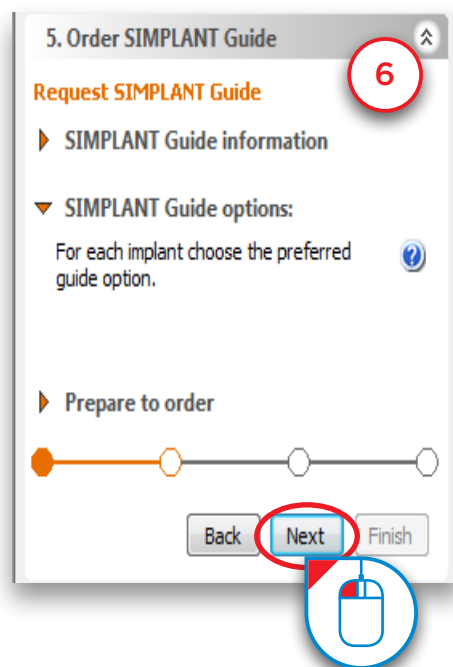
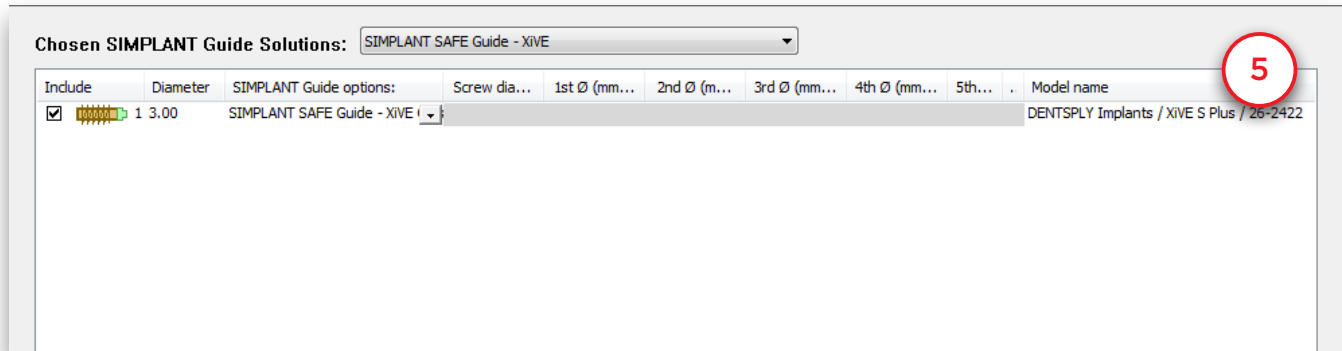
7.1 - The design of the guide

In the Task Panel select 'Request Simplant Guide' (1). Select what type of support you would like to use: bone-, mucosa- or tooth-supported (2). Simplant will now show you the possible Simplant Guide solutions for the implants that you have placed. Select the Simplant Guide solution that you would like to use (3) and click 'Next' (4).



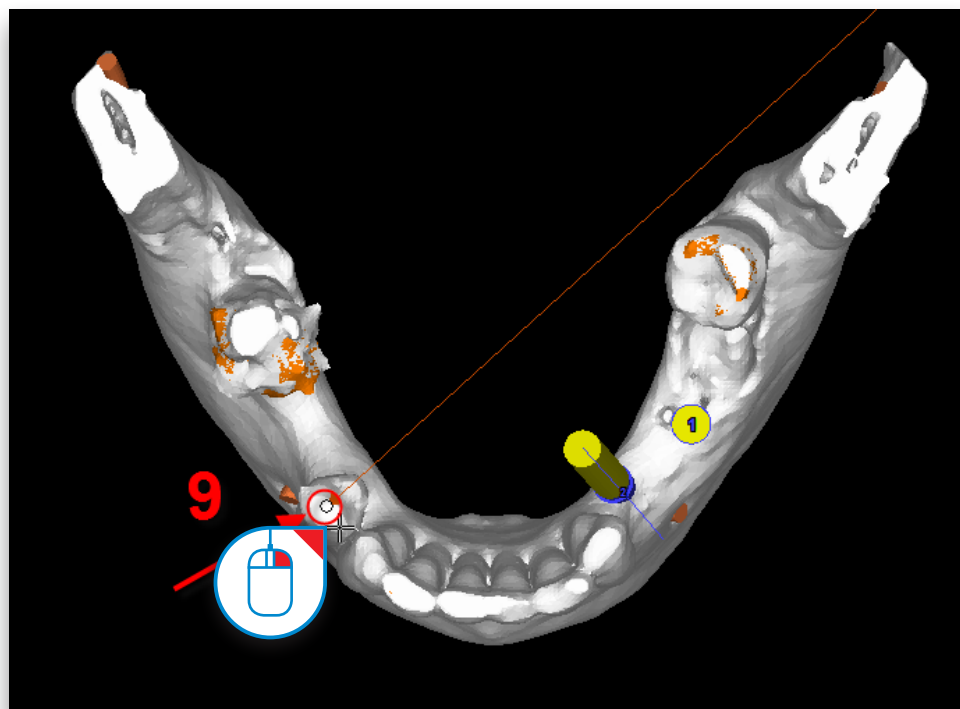
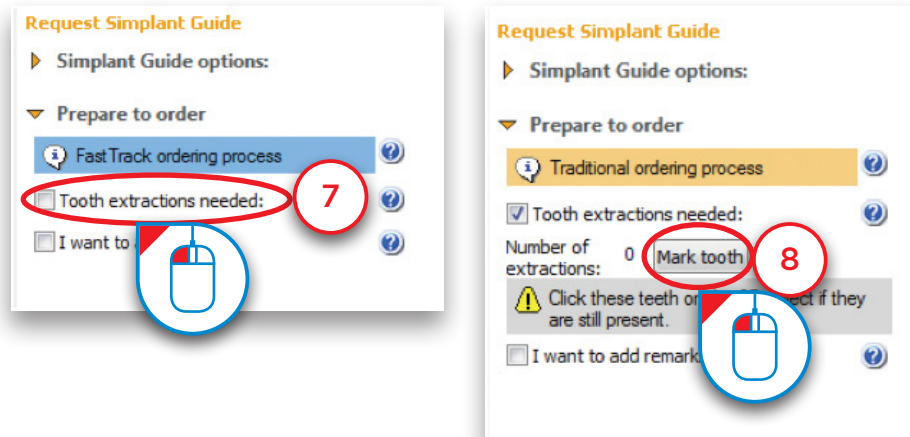
Simplant® SAFE Guide

If you have added fixation screws to your planning, please verify and if needed adjust the fixation screw diameter (5). Click 'Next' to continue (6).

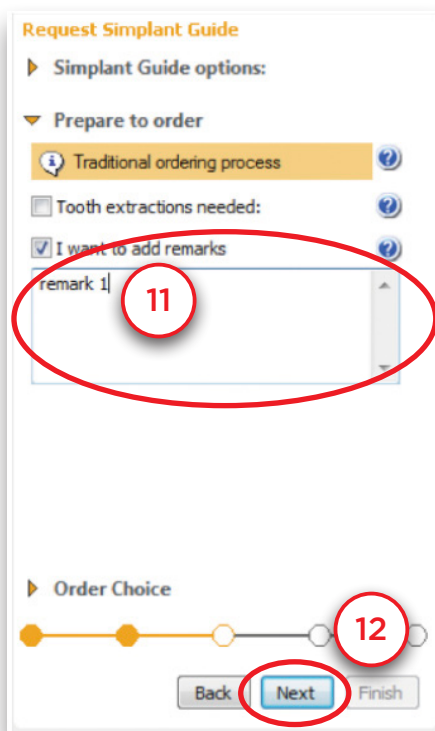
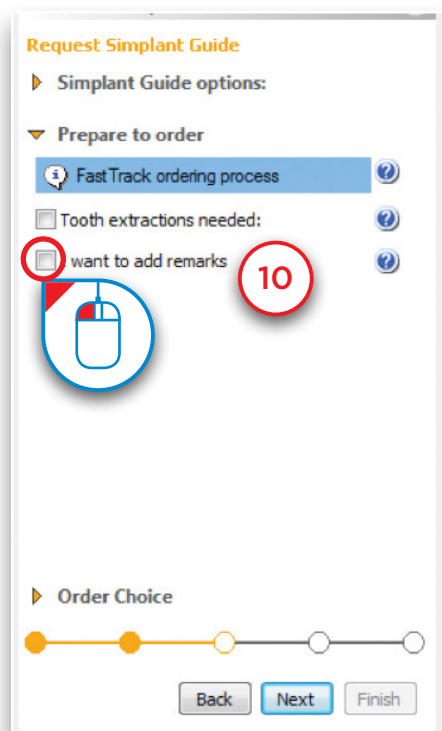


Simplant informs you if your order will follow the FastTrack ordering process (=48hrs manufacturing) or the Traditional ordering process. Your order will follow the FastTrack process if all digital data is available for the case (it is the plaster cast for tooth-supported guide, prosthesis for mucosa-supported guide and a certified bone model in case of a bone-supported guide). When tooth extractions are needed, or when remarks are added your order will follow the Traditional ordering process.

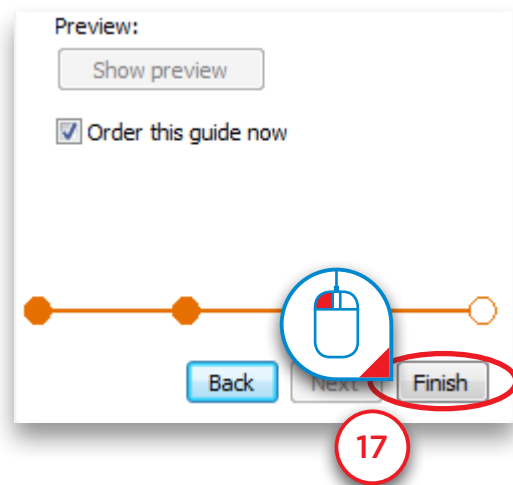
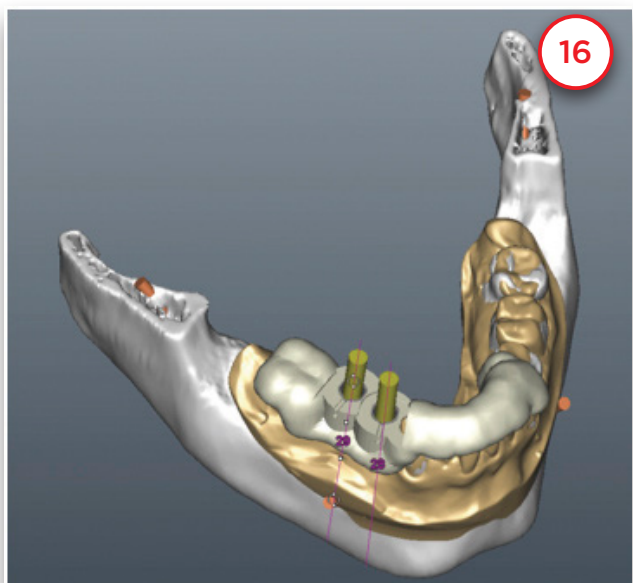
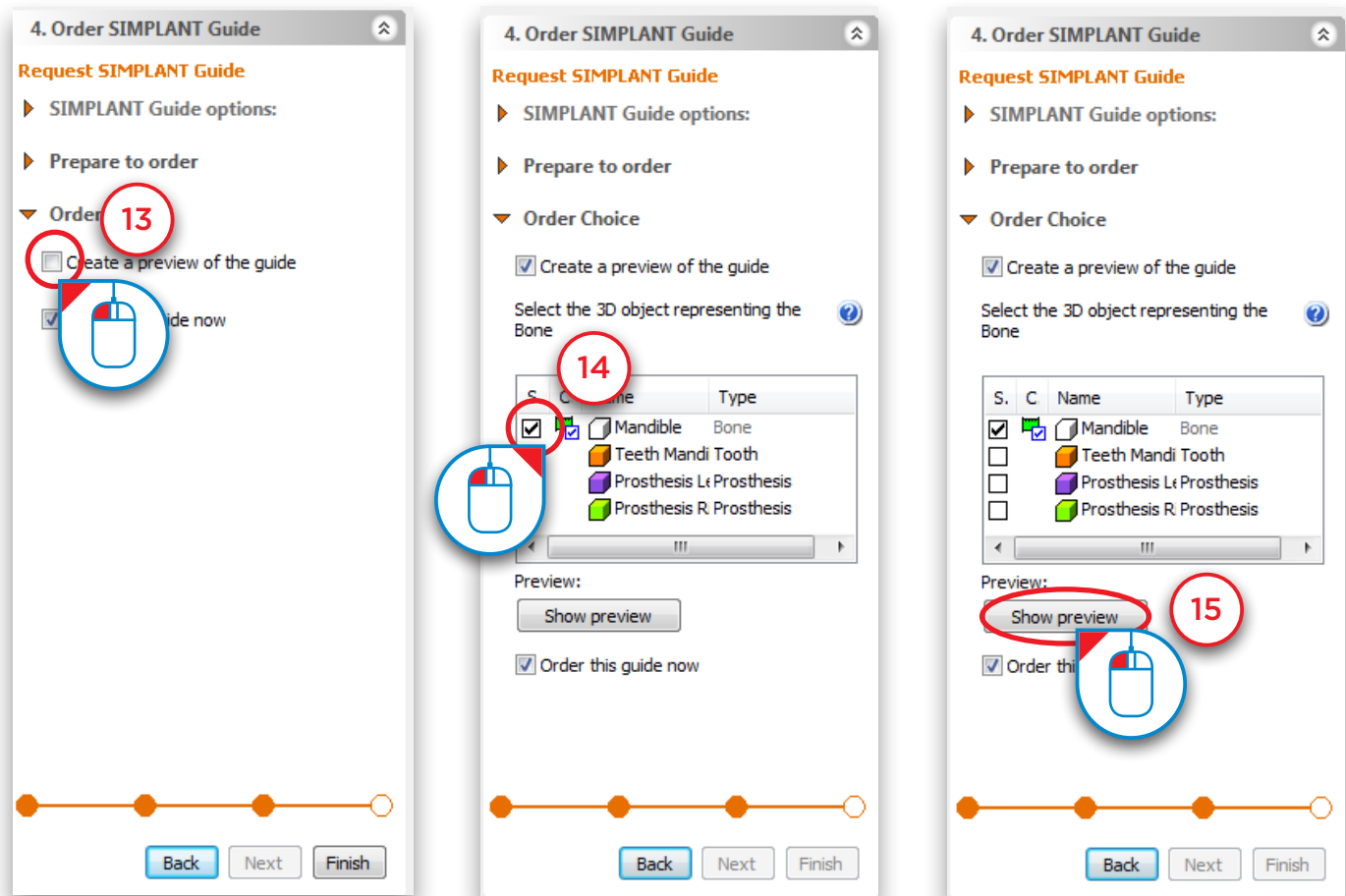
Check the box next to "Tooth extractions needed" if you are planning on doing tooth extractions (7). Click 'Mark tooth' (8). In the 3D view, click with the left mouse button to mark the tooth that you are going to extract (9).



Check the box next to "I want to add remarks" if you would like to add some remarks (10). Type your remarks in the remarks area (11). Click 'Next' to continue (12).



Check the box next to “Create a preview of the guide” if you would like to create a preview (13). Select the 3D model representing the bone (14). Click ‘Show preview’ (15). Simplant now calculates a preview of the Simplant Guide which is shown in the 3D view (16). Click ‘Finish’ to continue to the mySimplant order web page (17).



7.2 – The ordering of the Guide on the mySimplant order web page

When clicking 'order this guide now' your Simplant file is uploaded to the mySimplant order web page. You are directed to the mySimplant order web page where you can proceed with the completion of the prescription form.

About Dentsply Sirona Implants

Dentsply Sirona Implants offers comprehensive solutions for all phases of implant therapy, including Ankylos®, Astra Tech Implant System® and Xive® implant lines, digital technologies, such as Atlantis® patient-specific solutions and Simplant® guided surgery, Symbios® regenerative solutions, and professional and business development programs, such as STEPPS™. Dentsply Sirona Implants creates value for dental professionals and allows for predictable and lasting implant treatment outcomes, resulting in enhanced quality of life for patients.

About Dentsply Sirona

Dentsply Sirona is the world's largest manufacturer of professional dental products and technologies, with a 130-year history of innovation and service to the dental industry and patients worldwide. Dentsply Sirona develops, manufactures, and markets a comprehensive solutions offering including dental and oral health products as well as other consumable medical devices under a strong portfolio of world class brands. As The Dental Solutions Company™, Dentsply Sirona's products provide innovative, high-quality and effective solutions to advance patient care and deliver better, safer and faster dentistry. Dentsply Sirona's global headquarters is located in York, Pennsylvania, and the international headquarters is based in Salzburg, Austria. The company's shares are listed in the United States on NASDAQ under the symbol XRAY.

Visit www.dentsplysirona.com for more information about Dentsply Sirona and its products.

THE DENTAL
SOLUTIONS
COMPANY™

