



# Planmeca Romexis®

*user's manual*



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## **Appendix E: CENTRALIZED UPDATE OF PLANMECA DENTAL UNIT SOFTWARE**

The manufacturer, assReleased 25 January 2017embler and importer are responsible for the safety, reliability and performance of the unit only if:

- installation, calibration, modification and repairs are carried out by qualified authorised personnel
- electrical installations are carried out according to the appropriate requirements such as IEC 60364
- equipment is used according to the operating instructions.

Planmeca pursues a policy of continual product development. Although every effort is made to produce up-to-date product documentation this publication should not be regarded as an infallible guide to current specifications. We reserve the right to make changes without prior notice.

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# Chapter A: GENERAL

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## 1 INTRODUCTION

This manual describes how to use the Planmeca Romexis™ imaging software.

### NOTE

Read this manual carefully before using the system.

### NOTE

This manual is valid for the Planmeca Romexis software version 4.5.0.R or later. Please see X-ray unit manuals for availability of specific features.

### NOTE

The Planmeca ProMax 3D X-ray units, other digital X-ray units and intraoral video cameras have separate manuals, which should be used in conjunction with this manual.

Planmeca Romexis is a registered trademark of Planmeca company.



Planmeca Romexis imaging software fulfils the requirements of Directives 93/42/EEC and 2011/65/EU (RoHS).

### 1.1 Intended use

Planmeca Romexis is a medical imaging software intended for use in dental and medical care as a tool for displaying and visualizing dental and medical 2D and 3D image files from imaging devices, such as projection radiography and CBCT. It is intended for use by radiologists, clinicians, referring physicians and other qualified individuals to retrieve, process, render, diagnose, review, store, print, and distribute images.

Planmeca Romexis is also a preoperative software application used for dental implant planning. Based on the planned implant position a model of a surgical guide for a guided implant surgery can be designed. The designed data can be exported to manufacture a separate physical product.

Additionally, Planmeca Romexis includes monitoring features for Planmeca devices for maintenance purposes. The software is designed to work as a stand-alone or as an accessory to Planmeca imaging and Planmeca dental unit products in standard PC. The software is for use by authorized healthcare professionals. Use of the software for implant planning requires that the user has the necessary medical training in implantology and surgical dentistry.

Indications of the dental implants do not change with guided surgery compared to conventional surgery.

Planmeca Romexis is also intended to be used for monitoring, recording, storing and displaying mandibular jaw positions and movements relative to the maxilla.

#### INDICATIONS FOR USE

This device is not indicated for mammography use.

## 1.2 Introduction to digital imaging

Digital images are composed of small dots called pixels. Similarly the 3D images are composed of voxels, three dimensional pixels. The size of each pixel sets an absolute upper limit on what can be observed. Refer your X-ray unit's documentation for detailed information on maximum resolution, image dimensions and exposure times.

Each pixel in an image is represented by a numerical value in the computer memory. Because of the numerical (non-physical) nature of the image, the brightness and contrast of the image can be altered and various image enhancements can be performed. It is necessary to take into account the effects of image enhancement when using manipulated images for diagnosis. The numerical nature of the image sets an upper limit to the detectability of contrast differences (e.g. in radio translucency) in digital images. This contrast resolution is expressed in terms of number of bits used in capturing and storing the image or in number of grey levels that the system can record. See below for values of Planmeca equipment:

Device	Number of bits	Gray levels
Dimax (all modes)	12	4096
Promax 3D (all modes)	12 (15 bit raw processing)	4096

Most computer screens can display 256 (8 bit) grey levels or less and it has been shown that the human eye can barely differentiate contrast differences in the order of 1/32 - 1/64 (5/6 bits). However, the eye automatically adapts to the lighting conditions, and this together with proper use of the light box makes it possible to detect smaller variations in film contrast. It is therefore necessary to capture and record images at a higher contrast resolution than 256 grey levels (8 bits). More contrast latitude also allows more variations in exposure factors (kV/mA).

#### NOTE

##### IMPORTANT SAFETY NOTICE!

Image processing can significantly alter the visibility of both large and small structures (i.e. bone loss and caries), which may result in either too many false positive or false negative findings, if care is not taken.



### 1.3 Securing the image data

Planmeca Romexis uses database system for storing patient data and image meta information. Image data is stored into the file system as individual files. Both the database and the image data in the file systems need to be backed up and stored securely.

#### NOTE

Planmeca claims no responsibility for the end users' data security or for any malfunction in the computer system that may lead to loss of data.

### 1.4 Image acquisition

The system is designed to automate the acquisition of images with minimum intervention from the user. Provided that the user has selected the correct patient in Planmeca Romexis software, the acquisition procedure and archiving of the image(s) is almost exactly the same as with conventional film based imaging systems, except that archiving is fully automated and no film processing is required. The employed exposure technique is automatically stored with each image.

### 1.5 Settings

Planmeca Romexis provides various user settings. A range of parameters and other options can be set to permit control over the main procedures. The default settings have been chosen for a typical Planmeca Romexis environment. If required, they can be easily modified in the Planmeca Romexis Configuration application, see Planmeca Romexis Technical manual (publication number 10037884).

### 1.6 Archiving

The archiving of images in Planmeca Romexis is organized under patient names. The image data is stored in the file system. The exposure values and basic patient data are stored in the database. Multiple users can store and retrieve images to and from the system simultaneously.

#### Long term archive

Long Term Archive (LTA) allows old images to be moved to a more permanent storage based on the date of acquisition. For more information on long term archive see Planmeca Romexis Technical manual (10037884).

#### NOTE

The long term archive is not a backup system and appropriate backups should be maintained in addition to LTA media.

The approximate disk space requirements for different image formats are the following:

Table 1: Disk space requirements for 2D images

Format	Without compression	Without JPEG 1
Dimax2/3 normal resolution, panoramic	5.0 MB	0.8 MB
Dimax2/3 normal resolution, cephalometric	7.0 MB	0.95 MB
Dimax2/3 enhanced resolution 2, panoramic	8.9 MB	1.1 MB
Dimax2/3 enhanced resolution 2, cephalometric	12.5 MB	1.9 MB
Dimax2/3 high resolution 2, panoramic	20 MB	2.2 MB
Dixi2/3 B0 normal resolution	560 kB	180 kB
Dixi2/3 B1 normal resolution	940 kB	310 kB
Dixi2/3 B2 normal resolution	1.3 MB	430 kB
Dixi2/3 B0 high resolution 2	2.2 MB	720 kB
Dixi2/3 B1 high resolution 2	3.8 MB	1.2 MB
Dixi2/3 B2 high resolution 2	5.2 MB	1.7 MB
ProSensor S0 normal resolution	1,0 MB	
ProSensor S1 normal resolution	1,4 MB	
ProSensor S2 normal resolution	2,0 MB	
ProSensor HD S0 normal resolution	1,0 MB	
ProSensor HD S1 normal resolution	1,4 MB	
ProSensor HD S2 normal resolution	2,0 MB	
ProSensor HD S0 high resolution	na	
ProSensor HD S1 high resolution	5,4 MB	
ProSensor HD S2 high resolution	8,0 MB	

1) The actual achievable values depend on the individual image.

2) Because of the extensive disk space requirements and the additional X-ray radiation necessary for achieving the same (low) level of noise (quantum mottle), the user should carefully evaluate the advantages of using the enhanced/high resolution mode.

## NOTE

### IMPORTANT SAFETY NOTICE!

JPEG conversion is a so called lossy compression, the use of which can lead to loss of details in an image. Therefore it cannot be guaranteed that the diagnostic value of the compressed image is equivalent to the value in the original image. While several studies (see e.g. IADMFR/CMI'97 Advances in Maxillofacial Imaging: The loss of image quality in panoramic radiography using image compression, C.G.H Sanderink et al.) indicate that the loss of data may be insignificant, Planmeca cannot guarantee that it is safe to use compressed image data for diagnostic purposes.

Table 2: Disk space requirements for 3D images

3D X-ray Unit	File Format	Maximum File Size
ProMax 3D s	DICOM 3.0 (multi frame)	270 MB
Promax 3D Classic	DICOM 3.0 (multi frame)	570 MB
Promax 3D Plus	DICOM 3.0 (multi frame)	430 MB
ProMax 3D Max	DICOM 3.0 (multi frame)	430 MB
ProMax 3D Mid	DICOM 3.0 (multi frame)	977 MB
	<b>Note!</b> For stitched volumes the disk space requirement is double the maximum file size as the original volumes are stored in addition to the stitched final volume	

## 1.7 Processing and restoring images

Image processing may radically alter the appearance and possibly the diagnostic value of the image. However, it is always possible to restore the image to its original state or undo modifications one by one.

## 1.8 Measuring images

The measurement tools allow both geometric and relative intensity (i.e. radio-translucency or brightness/contrast) measurements.

When performing geometric measurements it should be noted that image processing (even mere brightness/contrast adjustment) can alter the apparent geometry of the objects in the image. Also because of the normal distortions (most notably varying magnification) associated with normal projection X-ray imaging the measurements must be based on known reference objects in the image. For this purpose a calibration tool is provided in the Planmeca Romexis software.

When performing intensity measurements it should be noted that after certain image processing the relative intensities of the objects may be affected by their neighbouring objects, which may affect the reliability of e.g. bone density measurements with the help of a calibration step wedge. The only image processing procedures guaranteed *not to change* the relative intensities so that measurements are independent of the measurement position, are the brightness/contrast and level adjustment. No guarantee can be given between the intensity measurements of two different images.

## 1.9 Annotating images

Images can be annotated with markers and text. These annotations appear as an overlay on the image and can thus be turned on and off as desired. The annotations do not affect the actual image.

## 1.10 Printing

Planmeca Romexis supports DICOM and Windows compatible printers.

## 1.11 DICOM support

Planmeca Romexis supports the following DICOM (Digital Imaging and Communications in Medicine) services:

- **DICOM Storage SCU** (optional),  
see section 15 “DICOM STORAGE (OPTIONAL)” on page 96.
- **DICOM Storage Commitment SCU** (optional),  
see section 15 “DICOM STORAGE (OPTIONAL)” on page 96.
- **DICOM Query Retrieve SCU** (optional),  
see section 3 “RETRIEVING IMAGES FROM DICOM PACS SERVERS (OPTIONAL)” on page 27.
- **DICOM Worklist SCU** (optional),  
see section 17.1 “Downloading and uploading cases using Planmeca Romexis Cloud” on page 97.
- **DICOM Modality performed procedure step MPPS SCU** (optional),  
see Planmeca Romexis Technical manual (10037884).
- **DICOM Print SCU** (optional),  
see section 14.4 “Printing images with DICOM compatible printers (optional)” on page 95.
- **DICOM Import**, single and multi-frame,  
see section 6.1 “DICOM import” on page 58.
- **DICOM Export**, single and multi-frame,  
see section 12.2 “Exporting images using DICOM export” on page 82.
- **DICOMDIR Media Storage**,  
see section 11 “DICOMDIR MEDIA STORAGE” on page 79.

## 1.12 Disclaimer

### NOTE

#### IMPORTANT SAFETY NOTICE!

Planmeca claims no responsibility for the end user's data security or for any malfunction in the computer system that may lead to data loss. User organization must take care of protecting the computer and the network by using up-to-date virus and malware protection software and fire wall.

Since image processing and digital subtraction radiography can significantly alter the visibility of both large and small structures (i.e. bone loss and caries), which may result in either too many false positive or false negative findings, Planmeca claims no responsibility for the software use, actions or diagnoses made by the end-user.

The qualities of the monitor can strongly affect image quality. The monitor qualities change as it gets older.

To correct under/overexposed images adjust gamma and/or contrast/brightness levels. Only in case these adjustments do NOT improve the image take a new image with different exposure values.

Cone beam computed tomography (CBCT) imaging is based on complex mathematical algorithms that produce high fidelity images. However various sources may cause imaging artifacts that may lead to incorrect diagnoses if not properly interpreted. Image interpretation should only be done by trained professional familiar with CBCT imaging as well as limitations and artifacts of the Planmeca ProMax 3D X-ray units.

### NOTE

Please note that as a generic viewing application Planmeca iRomexis and mRomexis Mobile are not approved for diagnostic use and shall not be used as such.

## 2 GETTING STARTED

### 2.1 Starting the software



Double-click this button on your desktop to start the Planmeca Romexis software.

### 2.2 Planmeca Romexis license activation

The functions in the Planmeca Romexis application are controlled by license and user rights. In order to use the application the license must be activated.

#### NOTE

Depending on the installed license and user rights the functions described in this manual can vary.

#### 2.2.1 Automatic online activation

A dialog requesting for activation will pop up when Planmeca Romexis Client is started (until activated) after new and updated Planmeca Romexis server installations. A period of 30 days is given to activate the Planmeca Romexis license.

When connected to the Internet activate the license by filling in user name and email address.

A screenshot of a software dialog box for license activation. The text inside reads: "Planmeca Romexis license has not been activated." followed by "Days left to activate license: 30". There are two radio button options: "Automatic activation" (which is selected) and "Manual activation". Under "Automatic activation", there is a text field for "Licensed to" containing "Planmeca Product Development", and three text input fields for "First name", "Last name", and "Email". Below these fields are two buttons: "Activate now!" and "Activate later". At the bottom left, there is a blue hyperlink for "Privacy Policy".

## 2.2.2 Manual activation

When there is no fixed Internet connection available the license can be manually activated using a mobile, for example. If manual activation is selected the following dialog appears. Follow the instructions in the dialog and web page.

### NOTE

Use the end customer details, not the dealer's.

Planmeca Romexis license has not been activated.

Days left to activate license: 30

Automatic activation

Manual activation

1. Go to Planmeca Romexis license activation page at ['https://activate.planmeca.com/romexis/'](https://activate.planmeca.com/romexis/)

2. Type or copy and paste the following key to the activation web site:

3. After activation, type or paste the activation key from web page to the text box below.

[Privacy Policy](#)

**PLANMECA**

Planmeca Romexis - Manual Licence Activation Page

End Customer Details Required Fields

Licensed to

First Name

Last Name

E-Mail Address

Installation ID

Enter 25 character Installation ID from Planmeca Romexis  
Format: #####-#####-#####-#####

Installation ID


Activation ID

Copy the following Activation ID to Planmeca Romexis

Activation ID

Planmeca Oy  
+358 20 7795 500  
www.planmeca.com

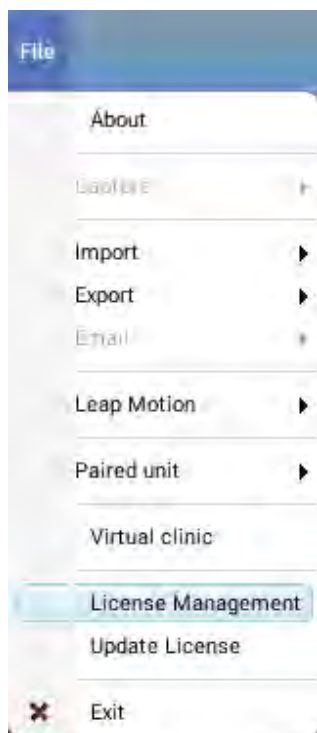
Privacy Policy



### 2.2.3 Transferring license to another installation

If transferring the license from one Planmeca Romexis server installation to another it must be first released from the current workstation.

To release the license select **License management** from the *File* menu.



Romexis Product License is activated.

In order to move this license to different environment, you have to release the activated license.

License can be released by user with administrator privileges.

Romexis is licensed to: 'Planmeca Product Development'

You can deactivate the Romexis License with working Internet connection

License activation times left: 1

[Release license](#)



## 2.3 Login

Enter user name and password and click **OK**.

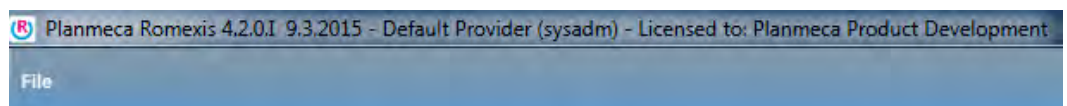


### NOTE

The appearance of the *Login* window may differ from the view below depending on the settings configured by your administrator, see the [Planmecca Romexis technical manual \(10037884\)](#).

The Planmecca Romexis application opens in *Patients* module.

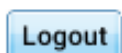
The name of the current user is shown in the title bar on top of the window.



To login as different user click this button.

### NOTE

If you are trying to log in while another user is currently logged in, all patient records are closed but the current views will be stored and shown when the patient is next accessed by the user. This allows authorized personnel to view and modify patient status using their own credentials. If you log out no views will be stored and the patient data will be opened with default view when accessed next time.



To logout click the **Logout** button. All currently opened files will be closed.

## 2.4 Planmeca Romexis modules



### NOTE

The visibility of the modules and their functions are controlled by license and user rights. Depending on the installed license and user rights the functions described in this manual can vary.

The Planmeca Romexis software consists of several software modules.

1. **Patients** module for patient selection and management
2. **File** module for managing patient information
3. **Record** module for recording medical/dental history and clinical record
4. **2D imaging module** for X-ray and other imaging
5. **Smile design** module for digital smile design
6. **3D** module for ProMax 3D images (optional)
7. **CAD/CAM** module (optional)
8. **Clinic management** module (optional)
9. **Report** module
10. **Admin** module

The Admin module is described in detail in the Planmeca Romexis Technical manual (10037884).

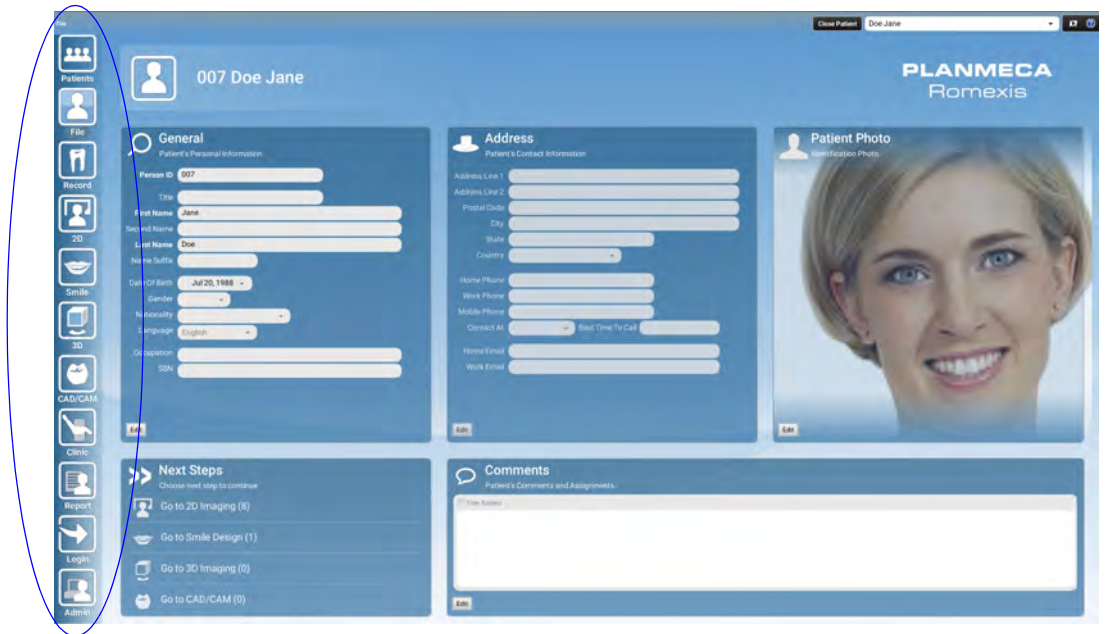
To access the modules move your mouse on the left side of the screen and click the button of the module you want to open.

### 2.4.1 Showing hiding module buttons

To display the module buttons continuously right-click on any module button and select **Turn hiding off**.



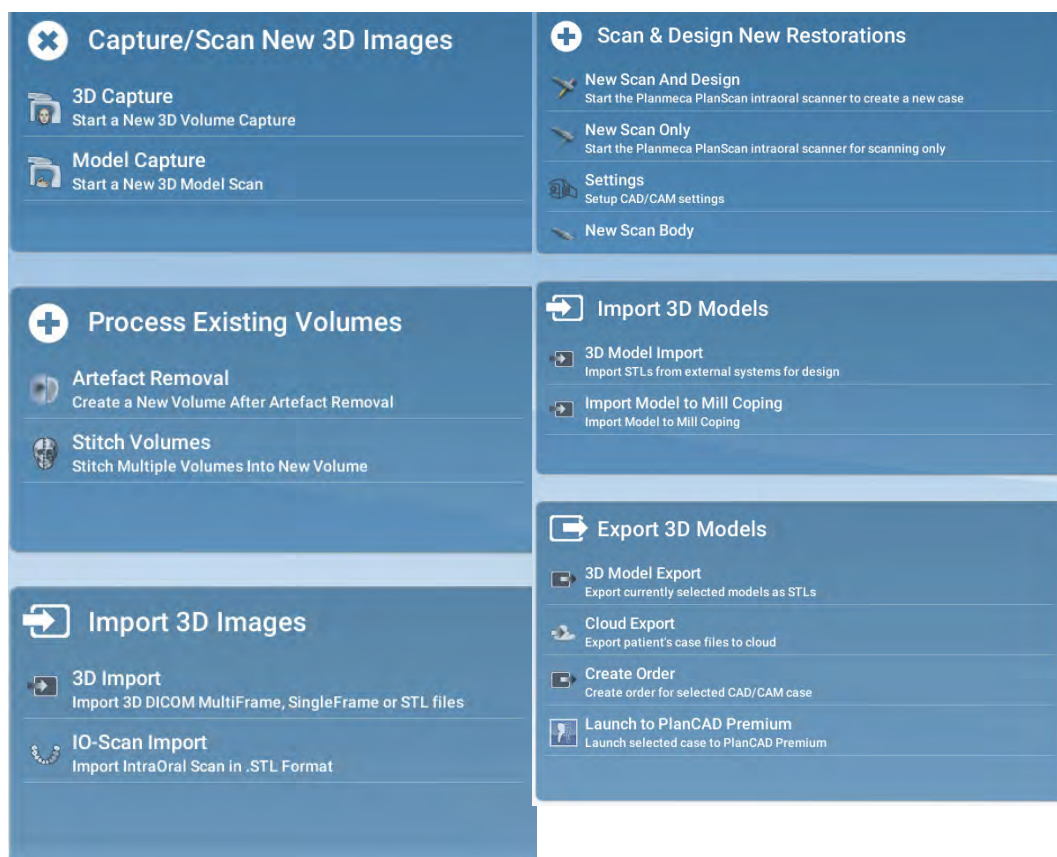
The module buttons will stay visible on the left side of the window.



## 2.4.2 Main functions

The most important functions of each module are collected to the module's main page and can be accessed directly by clicking the button of the task you want to perform.

The functions can be used to capture, scan, process, import and export images.



The functions are explained in detail later in this manual under corresponding titles.

### NOTE

With a low resolution the additional texts under the short-cuts may not show.

### 3 PLANMECA ROMEXIS SHORT CUT COMMANDS

The following abbreviations are used in the short cut commands table:

**LMB** = Left mouse button,

**RMB** = Right mouse button,

**MMB** = Middle mouse button

On Mac operating systems **Ctrl** + mouse commands are interpreted as right mouse click. Therefore, to perform the Windows **Ctrl** + **Shift** + mouse command on Mac, use the command **Ctrl** + **Shift** + **fn** + instead.

Alternatively the MacOS mouse commands can be changed to equivalent of those on Windows in MacOS *System Preferences*.

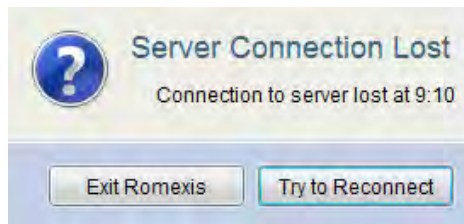
<b>GENERIC SHORTCUTS</b>			
<b>All text fields</b>			
	<b>Windows OS</b>	<b>Mac OS</b>	<b>Comments</b>
Copy	Ctrl + C	Ctrl + C	
Paste	Ctrl + V	Ctrl + V	
Cut	Ctrl + X	Ctrl + X	
<b>OK / Cancel &amp; Yes / No prompt dialogs</b>			
OK	Enter	Enter	
Cancel	Esc	Esc	
<b>Lists &amp; scrollable tables</b>			
Move	Cursor keys & PageUp / PageDown	Cursor keys & PageUp / PageDown	
<b>Annotations</b>			
Delete selected annotation	Delete (or Del)	fn + Backspace	
<b>3D MODULE</b>			
<b>General</b>			
Crop	O	O	
Reset orientation	R	R	
Reset view	R + Shift	R + Shift	
Save view	V	V	
Toggle show/hide annotation overlay	C	C	
<b>Slice views</b>			
Open short-cut menu	RMB click	RMB click	

Zoom/slice while key down	A hold	A hold	
Manipulate volume/cross-hairs while key down	D hold	D hold	
Measure	W toggle	W toggle	
measure polyline	W + Shift toggle	W + Shift toggle	
Add angle	G toggle	G toggle	
Add text	E toggle	E toggle	
Add arrow	E + Shift toggle	E + Shift toggle	
Square	B toggle	B toggle	
Cube	B + Shift toggle	B + Shift toggle	
Ellipse	L toggle	L toggle	
Ellipsoid	L + Shift toggle	L + Shift toggle	
<b>3D rendering</b>			
Rotate CBCT volume	LMB + hold	LMB + hold	
Move object (implant, crown, IO Scan)	Ctrl + Shift + hold + LMB Alt+Shift + hold + LMB	Ctrl + Shift + Fn hold + RMB	Moving of selected objects can be prevented from the right-click menu.
Rotate object (implant, crown, IO Scan)	Ctrl + Shift + hold + RMB Alt + Shift + hold + RMB	Ctrl + Shift + Fn hold + RMB	
Move rendered volume	LMB + Alt + hold	LMB + Alt + hold	
Increase/decrease the size of the <i>Paint ROI to trim</i> tool	Alt + hold + mouse wheel	Alt + hold mouse wheel	
Rotate image while <i>Paint ROI to trim</i> tool is selected	Alt + hold + LMB	Alt + hold + LMB	
Drag to crop volume	RMB + hold	RMB + hold	

Recentre volume on a new point (surface rendering only)	RMB click	RMB click	
Pan/move CBCT volume	MMB Alt + LMB	Mouse button 3 + hold Alt + LBM / cmd + LMB	
Zoom in/out	Mouse wheel scroll	Mouse wheel scroll	
<b>Implant slice views</b>			
Drag horizontally to rotate implant / crown	RMB + hold	RMB + hold	
<b>Fitted model import</b>			
Drag to crop CBCT volume Drag to pan/move surface model	RMB + hold	RMB + hold	
Pan/move CBCT volume	MMB + hold	MMB + hold	
Rotate CBCT volume	LMB + hold	LMB + hold	
Zoom in/out	Mouse wheel scroll	Mouse wheel scroll	
<b>Virtual ceph</b>			
Tilt volume	Ctrl + RMB	Ctrl + RMB	
Adjust contrast & brightness	Ctrl + LMB	Ctrl + Mouse button 3	
Drag to crop volume	RMB + hold	RMB + hold	
Pan/move	Alt + LMB MMB	Mouse button 3 + Hold / Alt + LBM / cmd + LMB	

## 4 RECOVERING LOST IMAGES

In case the connection to the server is lost during image acquisition the following window appears.



In such case you may:

- Try to re-establish the connection by clicking **Try to reconnect**
- or
- Exit Romexis

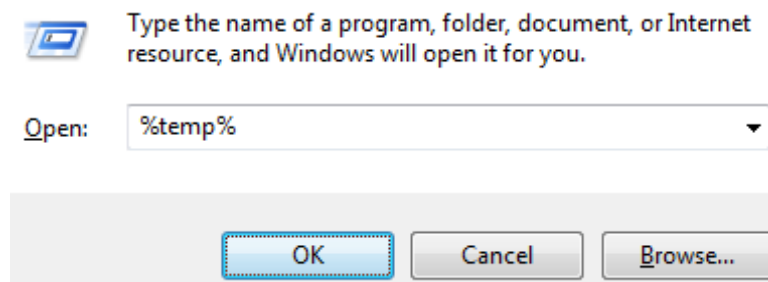
Although the connection to the server was lost, radiation continues to be emitted and the exposure is being taken normally.

### 4.1 Recovering 2D images

1. Click the Windows key + R on your key board.



2. In the opening window type *%temp%* and click OK.

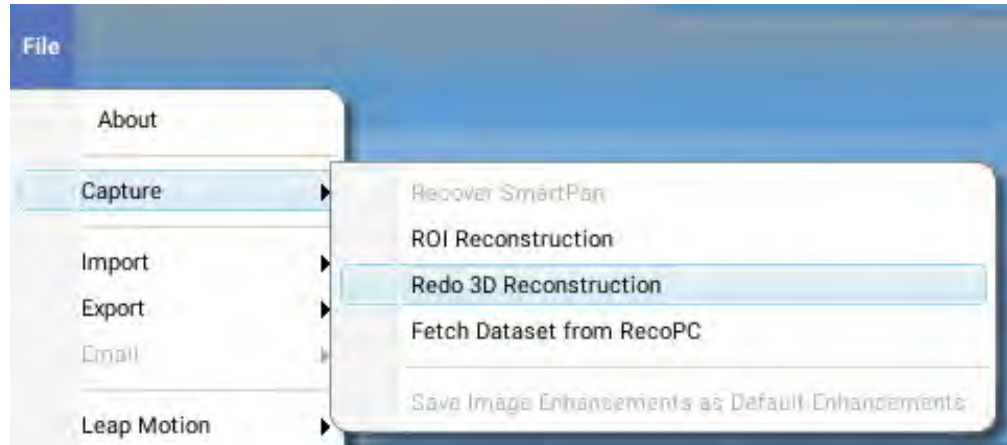


The images are saved to the *%temp%* folder.

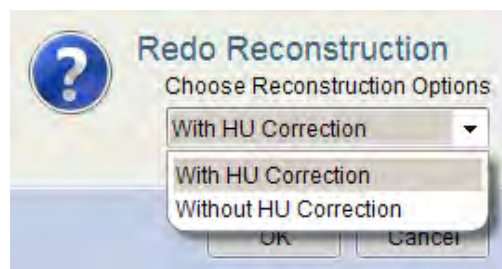


## 4.2 Recovering 3D images

1. Open the patient whose images you want to search.
2. Go to *3D* module
3. From the *File* menu select *Capture > Redo 3D Reconstruction*.



4. Select the correct imaging sequence from the list (based on the time of exposure for example.)
5. Select whether to apply HU correction to the recovered 3D volume.



6. Choose the correct exposure and click **OK**.  
The 3D volume will be automatically downloaded and added to the Volumes list.

### NOTE

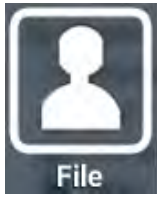
If you accidentally downloaded the wrong volume you can inactivate it and try again. In case the correct volume cannot be found please contact your local Planmeca technician as the exposure may still be recoverable by other means.

# Chapter B: PATIENTS AND FILE MODULES

---



In Patients module you can manage patients including searching, editing, assigning patient to a specific user and inactivating patients.

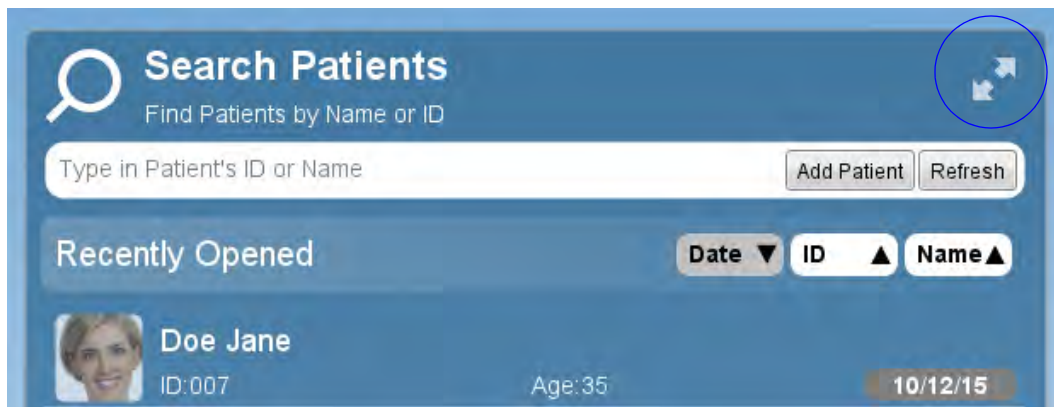


The information of the current patient is managed in the *File* module.

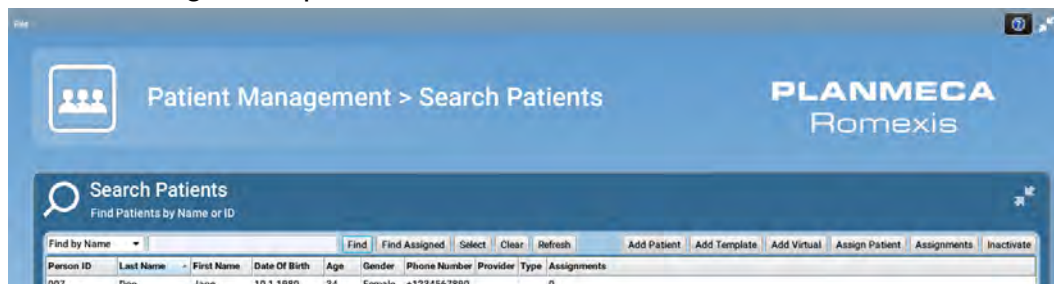
## 1 SEARCHING PATIENTS

### 1.1 Expanding search fields

Click on the arrow on the top right corner of any of the fields.



The full dialog view opens.



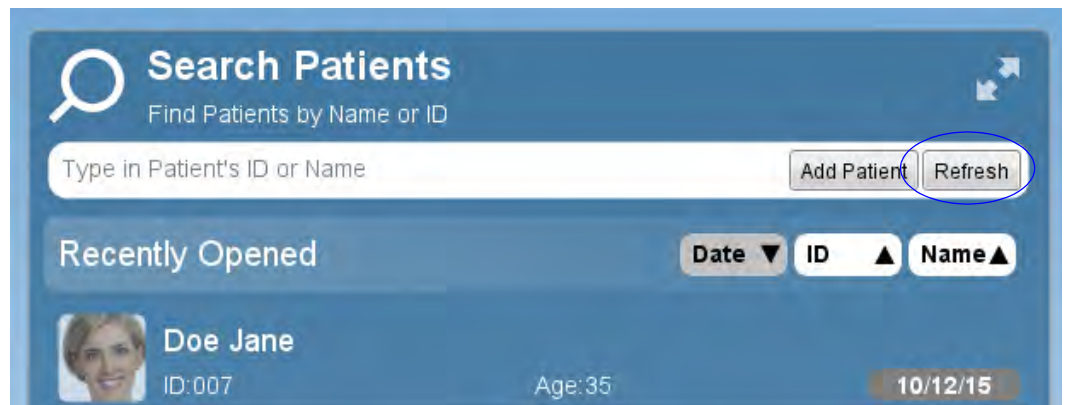
## 1.2 Sorting patients

Patients in the patient list can be sorted by date, ID or name by clicking these buttons.



## 1.3 Refreshing patient list

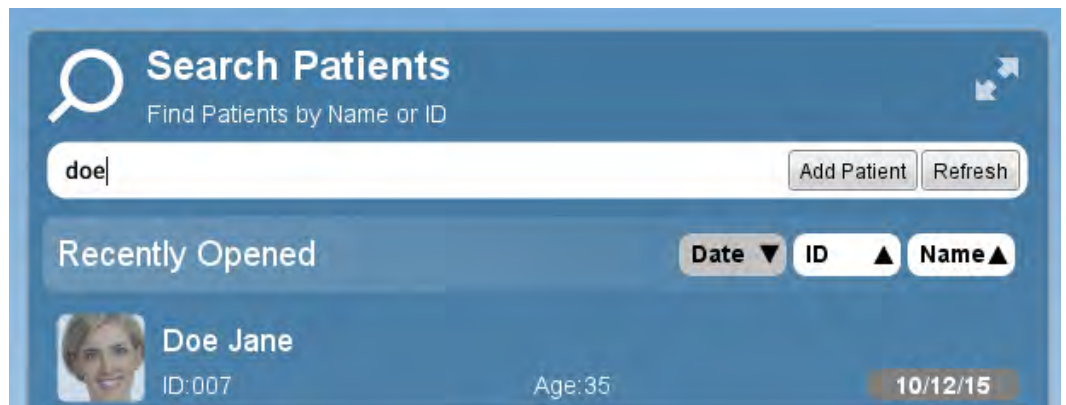
Clicking the **Refresh** button updates the patient data from the server so that up-to date information shows on all computers connected to the same server. For example a patient added on another client computer will also show on the current user's computer after refreshing the patient list.



## 1.4 Searching patients by name or ID

Start entering the name or the ID in the search field.

The software automatically returns patients corresponding to the entered search term.



To search patients by a captured image, see section 1.5 “Searching patients by image” on page 22.

## 1.5 Searching patients by image

Patients can be searched by image comment or diagnosis, image type, and date.

Enter or select the desired search term and click **Find**.

The patients that match the search criteria appear in the list.

To open the patient click the patient on the list.



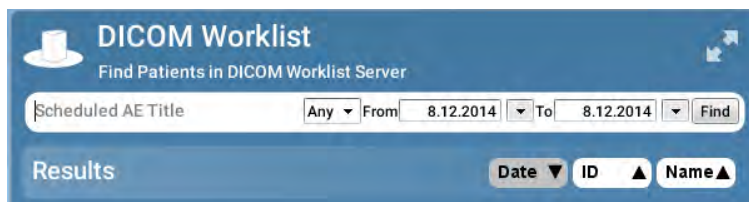
The screenshot shows a search interface titled "Find by Image" with the subtitle "Find Patients by Image Type or Date". The search criteria are: "Comment or Diagnosis" (with a dropdown menu set to "Any"), "From" (8.12.2014), and "To" (8.12.2014). A "Find" button is located to the right of the date fields. Below the search bar, the word "Results" is displayed on the left, and sorting options "Date", "ID", and "Name" are on the right, each with a small triangle indicating sort order.

## 1.6 Searching patients using DICOM worklist

The DICOM worklist search can be used to query and retrieve patients from a central patient archive.

Search can be filtered by scheduled imaging modality or date range.

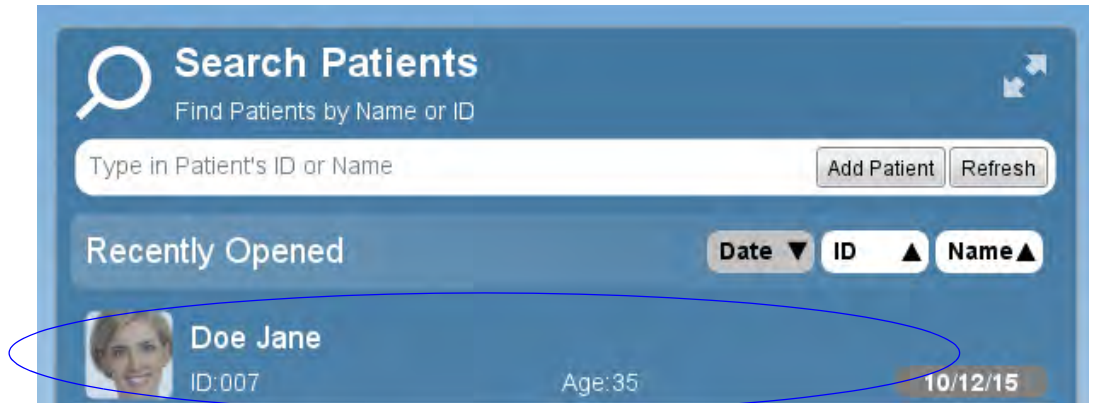
When selected, a patient is automatically added to the Planmeca Romexis database if not already registered. If a near match exists in the database the user will be asked on how to proceed.



The screenshot shows a search interface titled "DICOM Worklist" with the subtitle "Find Patients in DICOM Worklist Server". The search criteria are: "Scheduled AE Title" (with a dropdown menu set to "Any"), "From" (8.12.2014), and "To" (8.12.2014). A "Find" button is located to the right of the date fields. Below the search bar, the word "Results" is displayed on the left, and sorting options "Date", "ID", and "Name" are on the right, each with a small triangle indicating sort order.

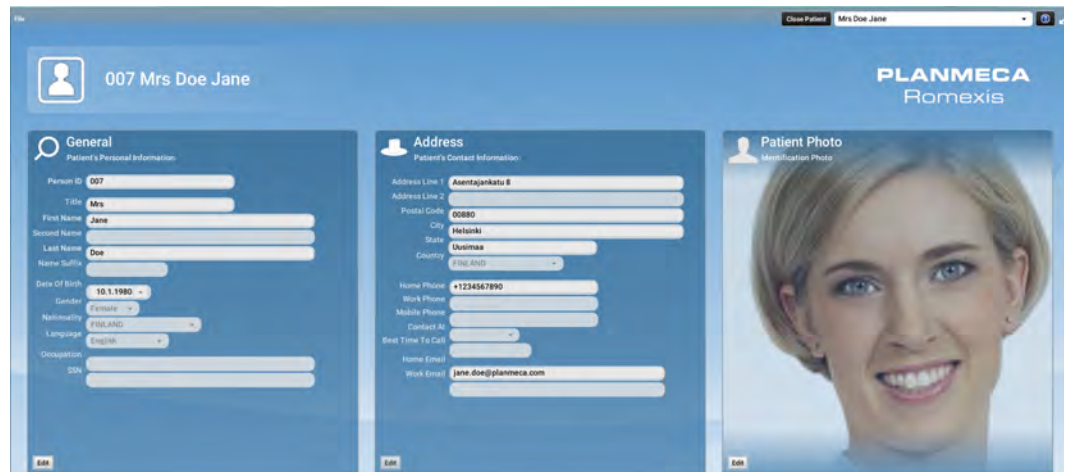
## 2 MANAGING PATIENTS AND IMAGES

1. Click the patient on the list.

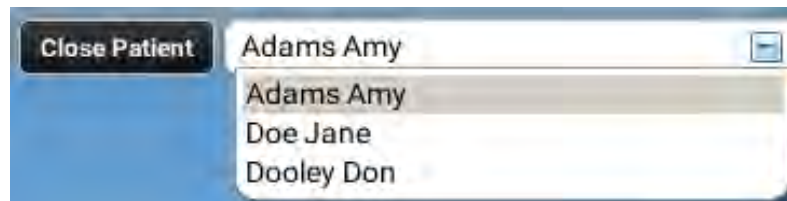


If the reason for accessing the patient is requested select the appropriate reason and click **OK**. The access reason is saved and displayed in the dental record under the patient case history.

The selected patient opens in *File* module.



Several patients can be open but only one is displayed at a time.

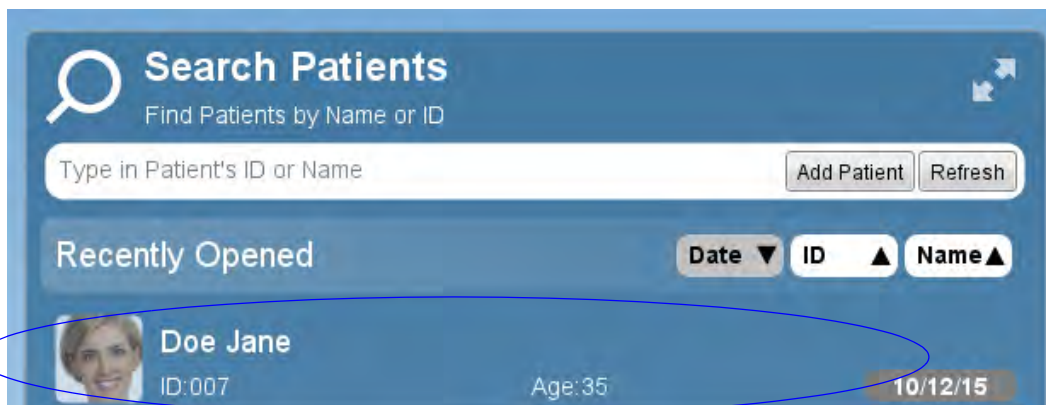


To close the active patient click the **Close patient** button.



## 2.1 Editing patients

1. Click on the patient you want to edit to open it.



Edit

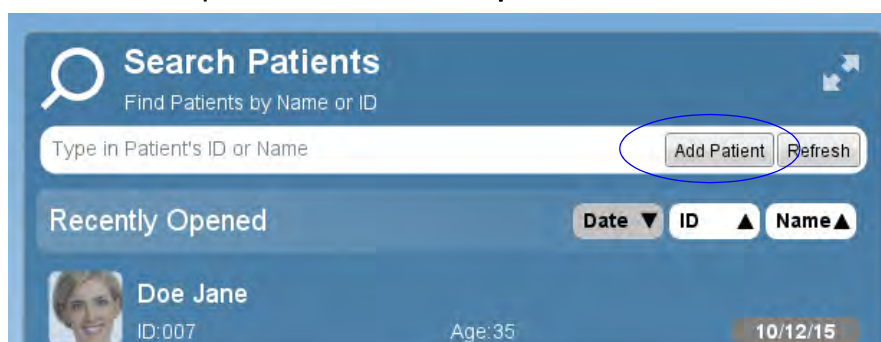
2. Click the **Edit** button on the field you want to edit and modify the desired information.

Save Patient..

3. Click the **Save Patient** button.

## 2.2 Adding patients

1. To add a new patient click the **Add patient** button.



2. Enter the necessary information and add a photo if desired.  
The obligatory fields are *Patient ID*, *First name* and *Last name*.

The screenshot shows the PLANMECA Romexis patient management interface. At the top, it displays '007 Mrs Doe Jane' and the PLANMECA Romexis logo. The main area is divided into several sections:

- General (Patient's Personal Information):** Includes fields for Person ID (007), Title (Mrs), First Name (Jane), Second Name, Last Name (Doe), Name Suffix, Date Of Birth (10.1.1980), Gender (Female), Nationality (FINLAND), Language (English), and Occupation.
- Address (Patient's Contact Information):** Includes fields for Address Line 1 (Ahentajankatu 8), Address Line 2, Postal Code (00800), City (Helsinki), State (Uusimaa), Country (FINLAND), Home Phone (+1234567890), Work Phone, Mobile Phone, Contact ID, Next Time To Call, Home Email, and Work Email (jane.doe@planmecca.com).
- Patient Photo (Identification Photo):** Shows a photo of a woman with blonde hair, identified as Mrs. Jane Doe.
- Next Steps:** A section with a 'Go to 2D Imaging' button.
- Comments:** A section for 'Patient's Comments and Assignments'.

3. To save the patient into the database click the **Save patient** button.  
To view the newly created patient on the list perform new search.

### 2.2.1 Adding template and virtual patients

Template and virtual patients can be used for educational purposes.

The supervisors can create template patients with specific medical/dental history and images to simulate possible patient cases. The cases can then be copied into virtual patients and assigned to individual students to work on. Thus each of the students have their own virtual patient(s) but with a shared clinical case.



Click this button on the *Search patients* field.

#### Template patients

Click the **Add template** button.

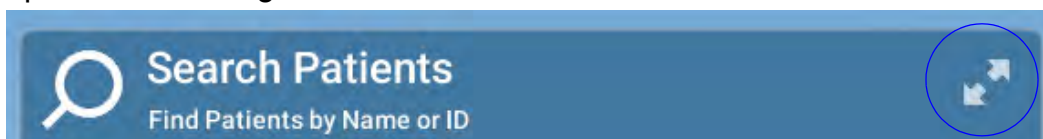
#### Virtual patients

1. Select the template patient from the patient list.
2. Click the **Add virtual** button. The name of the student can be included in the name e.g. *Jane's Child Patient*.

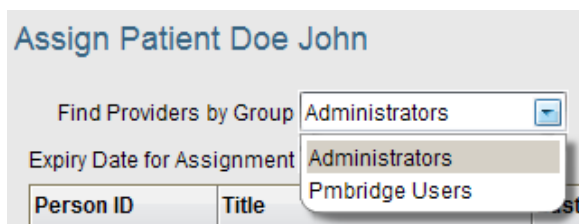
To distinguish template and virtual patients from real patients *Template* or *Virtual* can be added in the *Type* column.

## 2.3 Assigning patients

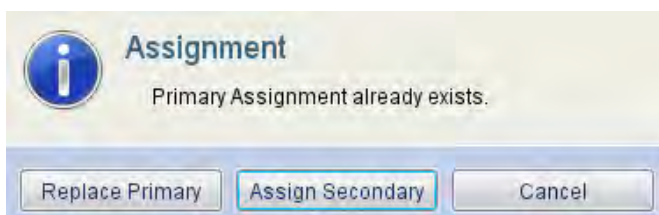
1. Open the full dialog view of the *Search Patients* field.



2. Select the patient you want to assign from the patient list and click the **Assign patient** button.
3. Choose the provider you want to assign the patient to. Click **OK**.



A patient can have one primary provider and several secondary providers. If a patient already has one provider and the **Assign patient** button is clicked the following dialog appears.



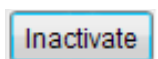
- To reassign the patient to a new primary provider click the **Replace primary** button.
- To assign the patient to a secondary provider click the **Assign secondary** button.



To view the provider(s) assigned to the patient click the **Assignments** button. The assigned providers appear in the patient list.

## 2.4 Inactivating patients

Open the full dialog view of the *Search Patients* field.



To remove a patient from the patient list select the patient and click the **Inactivate** button.

All patient information with images are preserved in the Planmeca Romexis database. To restore patient data see section "Reactivate and empty trash" in the Planmeca Romexis technical manual (10037884).



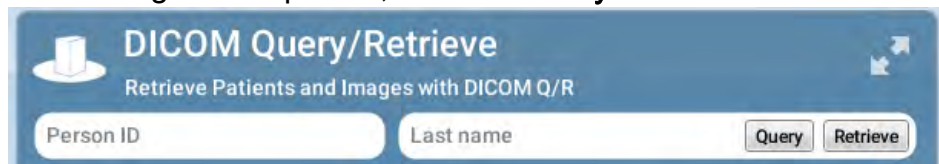
### 3 RETRIEVING IMAGES FROM DICOM PACS SERVERS (OPTIONAL)

The DICOM Query Retrieve is used for retrieving images from DICOM PACS servers. The images can first be queried and then selected for retrieval to the local storage.

The retrieved the images can be processed independently of the remote server.

To send processed images back to the DICOM PACS server use DICOM Storage, see section 15 “DICOM STORAGE (OPTIONAL)” on page 96 for more information.

To list images for a patient, click the **Query** or **Retrieve** button.



The image shows a search interface titled "DICOM Query/Retrieve" with the subtitle "Retrieve Patients and Images with DICOM Q/R". It features two input fields: "Person ID" and "Last name". To the right of these fields are two buttons labeled "Query" and "Retrieve".

To retrieve the selected images, click the **Study** button (in the expanded view).



The image shows an expanded version of the "DICOM Query/Retrieve" form. It is divided into two main sections: "Patient" and "DICOM". The "Patient" section contains fields for "Person ID" (with the value "070564-123x") and "Last Name" (with the value "Planmeca"). The "DICOM" section contains fields for "Q/R AE Title" and "Calling AE Title" (with the value "ROMEXIS\_3"). To the right of these fields are three buttons: "Query", "Retrieve", and "Study". The "Study" button is circled in blue.

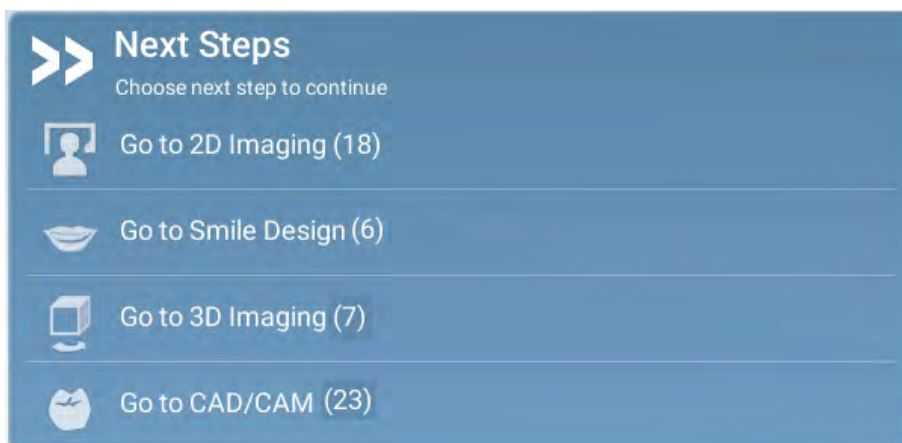
## 4 MANAGING CASES USING PLANMECA ROMEXIS CLOUD

For detailed description see section 17 "CLOUD EXPORT" on page 97.

## 5 USING SHORTCUTS TO OTHER MODULES

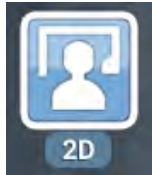


To access directly the 2D imaging, 3D imaging, Smile design and CAD/CAM modules for opening images click these buttons on the lower left corner of the *File* module view.



# Chapter C: 2D IMAGING MODULE

## 1 OVERVIEW



In the *2D imaging* module you can browse patient images, capture, process, store, import and export radiographs and photos.



### NOTE

The image capturing options will not be visible in the 2D imaging module if Planmeca X-ray device driver DIDAPI is not installed. On how to install Didapi see Planmeca Romexis installation manual (publication number 10014600).

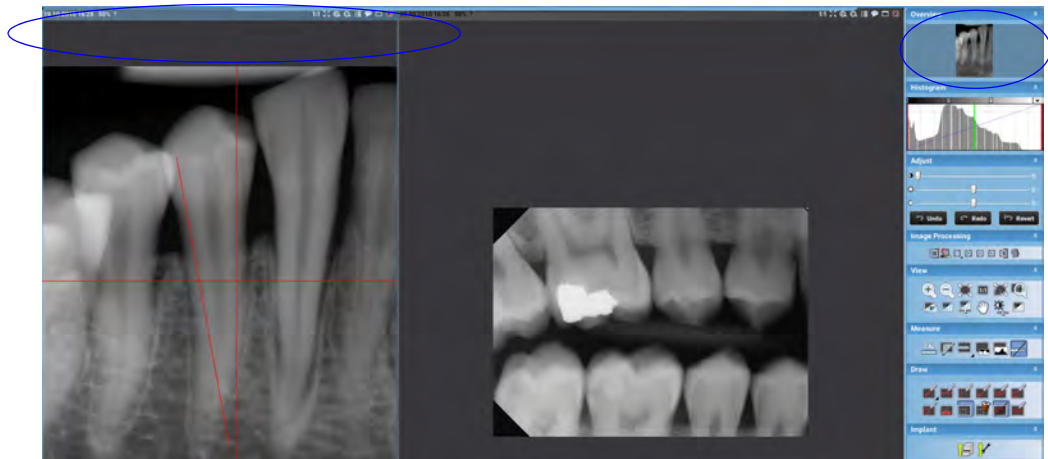
### 1.1 Opening 2D images

Select the image(s) to open and double-click on the image or click **View selected**.

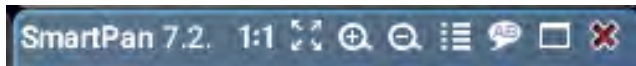
The image(s) open in full size.

The tools on the vertical tool bar on the right side of the image(s) affect the settings of the selected image only.

The thumbnail of the selected image shows on the top right corner of the window.



The header of the currently selected image shows in blue.

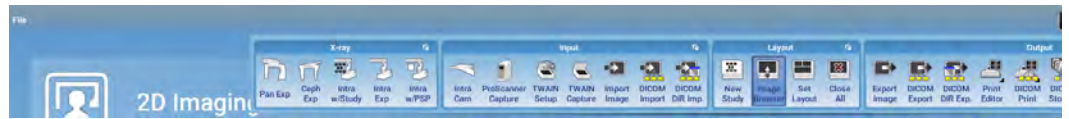


The header of the other open images show in gray.

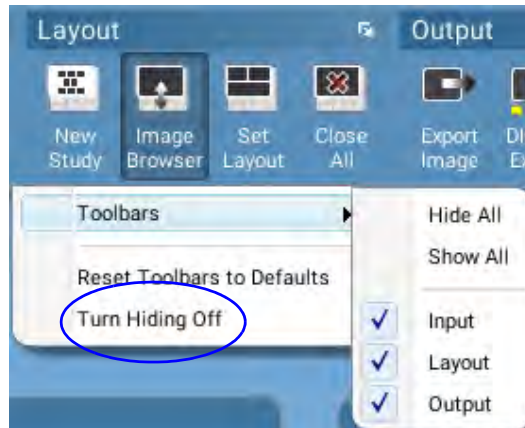


## 1.2 Adjusting toolbar visibility

The top toolbar appears when moving the cursor to the top (middle) of the screen.



If you want the toolbar to show all the time right-click on the toolbar and select **Turn Hiding Off**.



The toolbar now remains visible on top the screen.



## 2 PANORAMIC IMAGING

### 2.1 Capturing panoramic images

#### NOTE

Image capturing buttons are not be visible if Didapi is not installed. On how to install Didapi see section

#### NOTE

In case the user does not have the right to capture images without an approval of the supervisor the capture buttons are disabled until image acquisition request for the current user/active patient/image type combination has been approved. On how to define user rights see section "Users" in the Planmeca Romexis technical manual (10037884).

1. Click the panoramic exposure button on the main page of the 2D imaging module



or



on the top toolbar

The *Panoramic Exposure* window appears.

When the X-ray unit is in the ready state the message *Waiting for Ready* appears.

2. Prepare the patient for exposure and select the exposure parameters.
3. Drive the X-ray unit to the ready position.

#### NOTE

The L sign denotes the patient's left side.

When the panoramic unit is in ready position the message *Waiting for Exposure* appears.

4. Take an exposure.

The message *Saving the image* appears and the image is automatically stored into the database.

5. When all exposures have been taken click **Done** to return to the **2D imaging module**.

## 2.2 SmartPan imaging

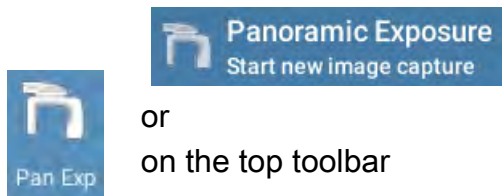
Certain Planmeca Promax 3D model X-ray units can take both 3D and 2D images with the same sensor. The 2D imaging modes include panoramic, bite-wing and sinus exposure modes. SmartPan images are stored as a stack of one auto focus panoramic image and of 9 panoramic images each with a different panoramic focal layer. These layers can be viewed at a later time after exposure and rejected in preference of the autofocus image.

The SmartPan autofocus image is automatically generated using the sharpest layer in each exposure segment. The autofocus image combines the layers into one optimum image.

For the 2D SmartPan images only the 127µm pixel size is available.

### 2.2.1 Capturing SmartPan panoramic images

1. Click the panoramic exposure button on the main page of the 2D imaging module.



or  
on the top toolbar

The *Panoramic Exposure* window appears.

When the X-ray unit is in ready state the message *Waiting for Ready* appears.

2. Prepare the patient for exposure and select the exposure parameters.
3. Drive the X-ray unit to the ready position. Refer to your Planmeca X-ray unit's User's manual if uncertain.

When the X-ray unit is in the ready position the message *Waiting for Exposure* appears.

4. Take an exposure.

After exposure the message *Saving the image* appears and the image is automatically stored into the database.

When all the exposures have been taken click **Done** to return to the *Imaging* module. When the panoramic unit is in ready position the message *Waiting for Exposure* appears. You can now expose the X-ray as normal.

The middle layer is shown as a preview. All layers are automatically stored for later viewing and processing.





## 2.2.2 Opening and viewing SmartPan images



The SmartPan images are stored as a stack of 10 images indicated by a stack symbol.

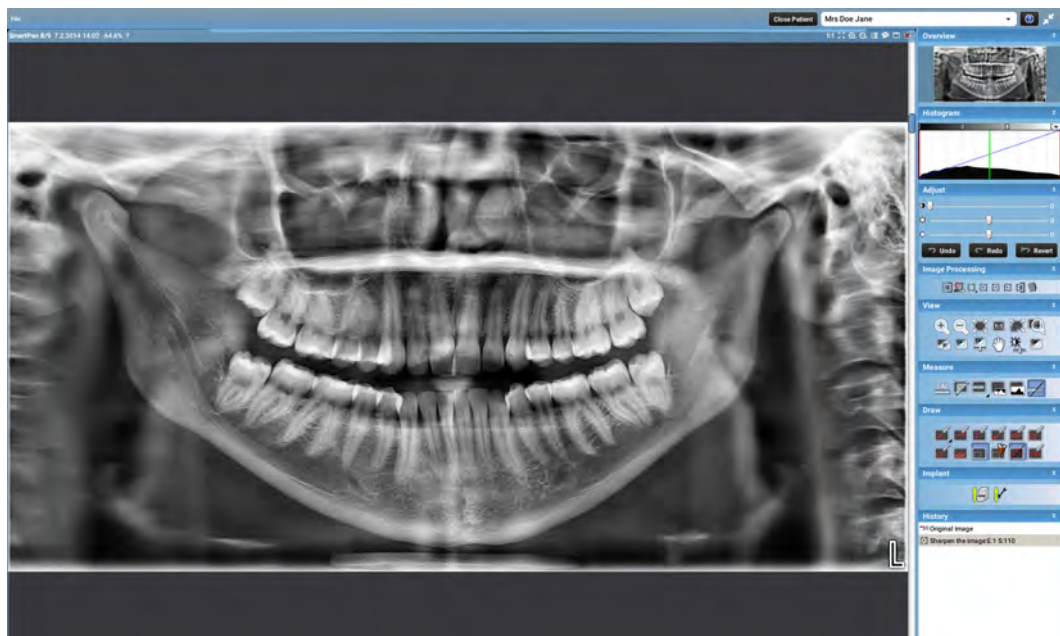
The SmartPan images can be opened as single images or moved between panoramic focal layer. Normally the 10/10 layer is an autofocus layer where the sharpest vertical segments in each layer have been combined into one sharp image.

1. Double-click the SmartPan in the image browser.
2. Select whether to open the images as a stack or as single images.

### NOTE

After exposure SmartPan image is automatically opened as a stack image.

When the image is opened as a stack a scroll bar will appear on the right side of the image that allows for browsing between panoramic focal layers.



The current layer is indicated on the layer currently shown (e.g. 8/9).

To move the focal layer towards anterior scroll down and towards posterior scroll up the image.

To navigate between layers scroll the mouse wheel.

### NOTE

If any of the single panoramic images in a SmartPan stack are open the SmartPan stack image will be opened as read only.



### 2.2.3 Processing SmartPan stack images

In general the viewing, measurements and drawings are applied to all images in the stack and zooming will affect all images in the stack even those not currently shown. The exceptions to this rule are listed below:

#### NOTE

If a SmartPan stack is opened as separate image(s) all processing will be applied to opened images only.

Processing that apply to stack	Processing that affect single image only
Zoom	ROI: It is not possible to set a Region of Interest (ROI) on SmartPan images
Pan	Calibration: Each image in the stack must be calibrated separately.
Magnifier	Measurements: Specific to each image.
Overview	Line Profile: Shows the profile for the images currently showing in the stack
Contrast/Brightness	Annotations: Specific to each image.
Show Annotations	Select Annotation
	Delete Annotation

Exceptions for image specific tools

- Image processing history shows the history of the current image, not the one of the whole stack.
- Comments and diagnosis in the image properties are applied to the entire stack while rotating and mirroring is disabled.

### 2.2.4 Moving and inactivating SmartPan images

By selecting *Move to other patient* you can move the whole SmartPan stack or only the current/open stack image.

By inactivating a stack image you can inactivate a single image in the stack or the whole stack.

### 2.2.5 Adding SmartPan images to studies

The SmartPan stack images can be added to studies containing free panoramic slot(s). When added to studies, single stack images can be moved to different slots. Also single images can be removed from layout. However only the topmost images in the stack can be dragged and deleted.

## 2.2.6 Importing and exporting SmartPan images

### **DICOM / DICOMDIR import**

To import SmartPan images as a stack use DICOMDIR import of a SmartPan stack that has been exported using DICOMDIR. Multiple SmartPan stack images can also be imported using DICOM Import. The images belonging to the same SmartPan exposure are automatically added to the stack.

### **DICOM / DICOMDIR export**

With DICOM export, only the currently shown stack image is exported. With DICOMDIR export all stack images are added to the DICOMDIR fileset by default.

### **Bitmap export**

In bitmap export only the currently shown stack image is exported to a bitmap file.

## 2.2.7 Printing SmartPan images

By default the currently shown stack image is automatically added into the layout in the print editor see section 14 “PRINTING IMAGES WITH PRINT EDITOR” on page 87.

To print all layers open the stack as single images, or add them in the print editor using the Image Browser.

## 3 CAPTURING CEPHALOMETRIC IMAGES

### NOTE

Image capturing buttons are not be visible if Didapi is not installed. On how to install Didapi see section

### NOTE

In case the user does not have the right to capture images without an approval of the supervisor the capture buttons are disabled until an image acquisition request for the current user/active patient/image type combination has been approved. On how to define user rights see section "Users" in the Planmeca Romexis technical manual (10037884).

1. Click the cephalometric exposure button on the main page of the 2D imaging module



or  
on the top toolbar.

The *Cephalometric Exposure* window appears. When the X-ray unit is in ready state the message *Waiting for Ready* appears.

2. Prepare the patient for exposure and select exposure parameters.
3. Drive the X-ray unit to ready position. Refer to your Planmeca cephalometric X-ray unit's user's manual for more information.

The message *Waiting for Exposure* appears.

4. Take an exposure.

The message *Saving the image* appears and the image is stored into the database.

5. When all exposures have been taken click **Done**.

## 4 CAPTURING INTRAORAL IMAGES

Planmeca Romexis can be used to capture intraoral images with Planmeca ProSensor, Planmeca ProScanner and intraoral cameras.

Intraoral images can be captured either as a study into a template or as single images. For single image capture see section 4.2 "Capturing single intraoral images" on page 39.

### NOTE

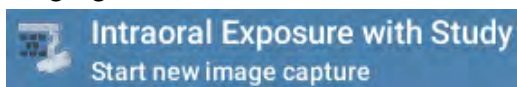
Image capturing buttons are not be visible if Didapi is not installed. On how to install Didapi see section

### NOTE

In case the user does not have the right to capture images without an approval of the supervisor the capture buttons are disabled until an image acquisition request for the current user/active patient/image type combination has been approved. On how to define user rights see section "Users" in the Planmeca Romexis technical manual (10037884).

### 4.1 Capturing intraoral images into a study

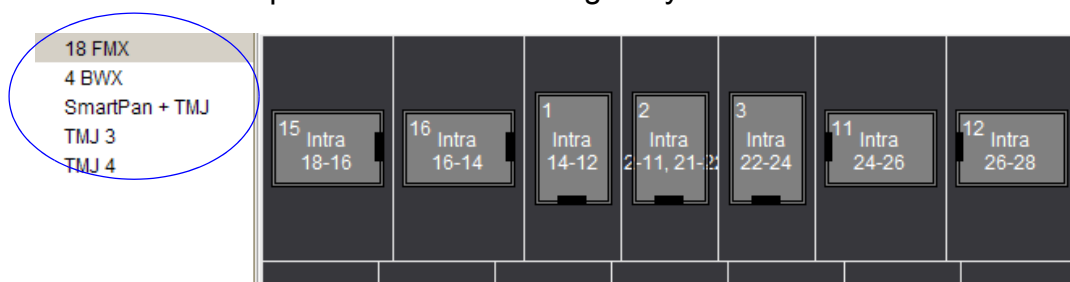
1. Click the intraoral exposure with study button on the main page of the 2D imaging module



or  
on the top toolbar

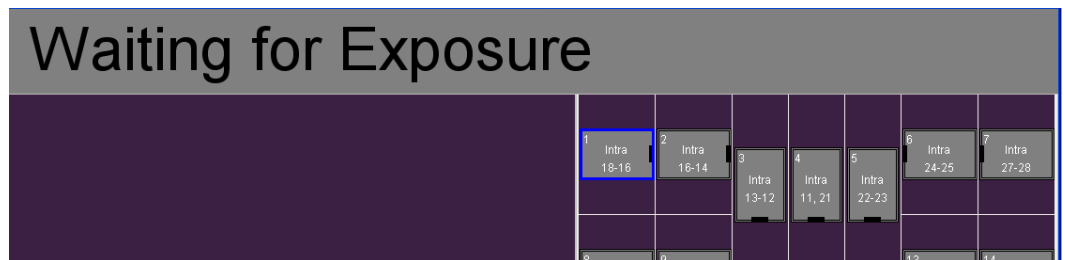
2. Select the desired study template from the list.

At the beginning of the list there are empty templates and at the bottom of the list there are previous studies arranged by date.



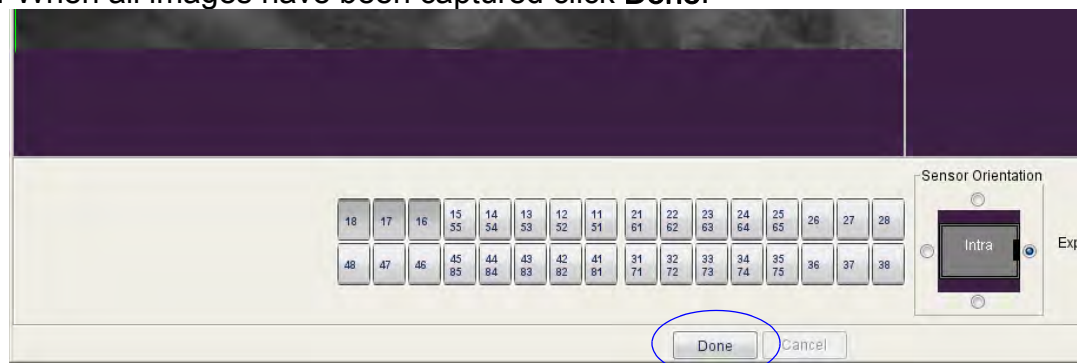
While capturing images into a study Planmeca Romexis browses through the template in a predefined order, denoting the current image to be captured by a blue border around the slot.

3. Follow the tooth numbering and sensor orientation as shown on the top, and predefined in the template.



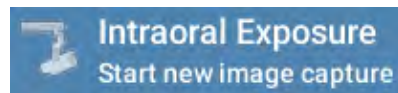
To cancel the exposure click **Cancel**. The captured images are saved and the incomplete study is preserved for later use.

4. When all images have been captured click **Done**.



## 4.2 Capturing single intraoral images

1. Click the **Intraoral exposure** button on the main page of the 2D imaging module



or

**Intra Exp** button on the top toolbar

The *Intraoral Exposure Window* appears. When the X-ray unit is in ready state the message *Waiting for exposure* appears on top of the window.

2. Prepare the patient for exposure and select exposure parameters.

### NOTE

For more information see [Planmeca Intra X-ray unit's user's manual](#).

3. Take an exposure as usual.

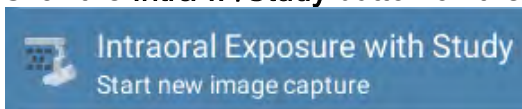
After exposure the message *Saving the image* appears and the image is automatically stored into the database.

4. Define the tooth numbers and sensor orientation and take the next exposure.
5. When all exposures have been taken click *Done* to return to the 2D imaging module.

## 4.3 Capturing images with Planmeca ProSensor

### 4.3.1 Capturing ProSensor images into a study

1. Click the **Intra w /Study** button on the main page of the 2D imaging module



or on the top toolbar

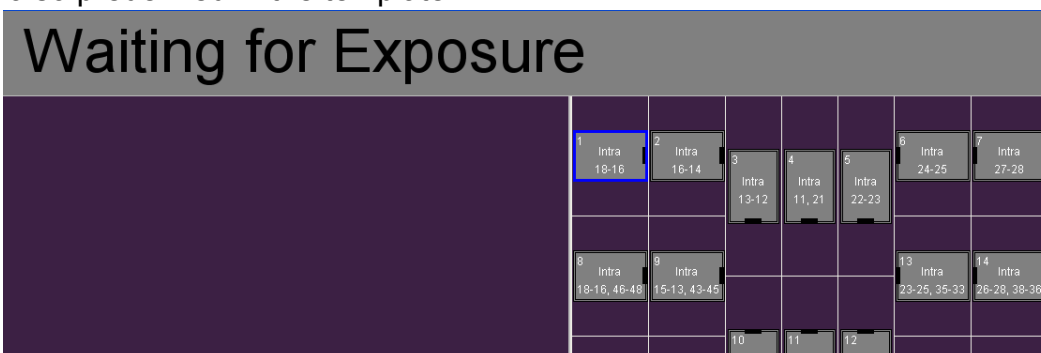
2. Select the desired study template from the list.

At the beginning of the list there are empty templates and at the bottom of the list there are previous studies arranged by date.



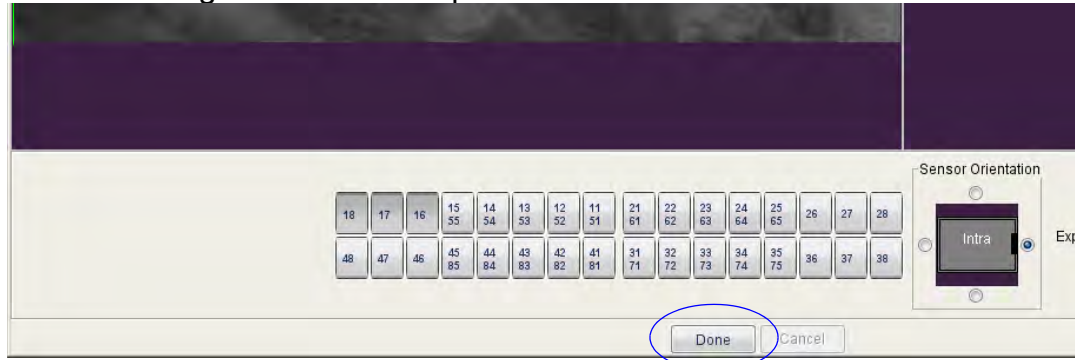
While capturing images into a study Planmeca Romexis browses through the template in a predefined order, denoting the current image to be captured by a blue border around the slot.

3. Follow the tooth numbering and sensor orientation as shown on the top, also predefined in the template.



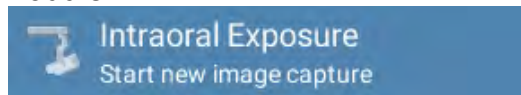
The captured images are saved and the incomplete study is preserved for later use.

- When all images have been captured click **Done**.



### 4.3.2 Capturing single ProSensor images

- Click the **Intraoral exposure** button on the main page of the 2D imaging module



or



the **Intra Exp** button on the top toolbar.

The *Intraoral Exposure Window* appears. When the X-ray unit is in ready state the message *Waiting for exposure* appears on top of the window.

- Prepare the patient for exposure and select exposure parameters.

#### NOTE

For more information see [Planmeca Intra X-ray unit's user's manual](#).

- Take an exposure as usual.  
After exposure the message *Saving the image* appears and the image is automatically stored into the database.
- Define the tooth numbers and sensor orientation and take the next exposure.
- When all exposures have been taken click *Done* to return to the 2D imaging module.

## 4.4 Capturing intraoral images with Planmeca ProScanner

### 4.4.1 Standalone Planmeca ProScanner

#### Capturing images

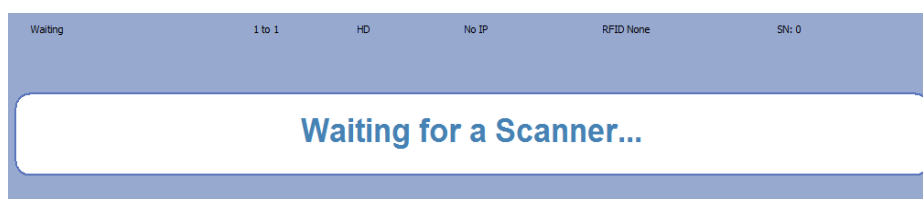


1. Click **ProScanner capture** button.

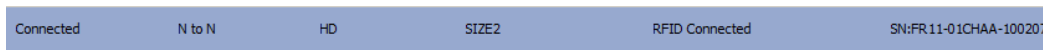
#### NOTE

If the ProScanner capture is not enabled check the *ProScanner Capture Enabled* check box in the Admin module's *Local settings* tab see section "LOCAL SETTINGS" in the Planmeca Romexis technical manual (10037884).

The following image capturing dialog opens.

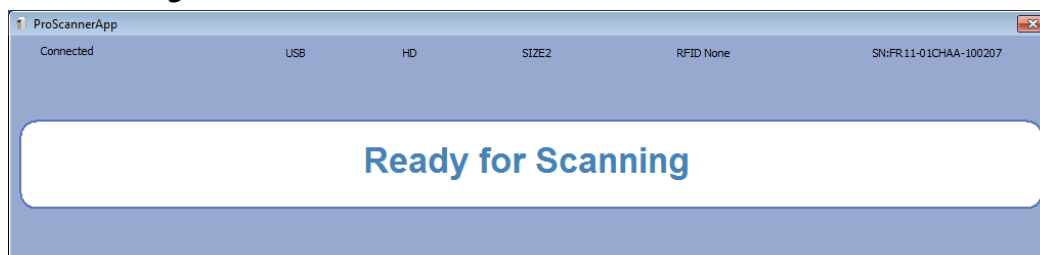


The following texts at the top of the window are shown (from left to right):



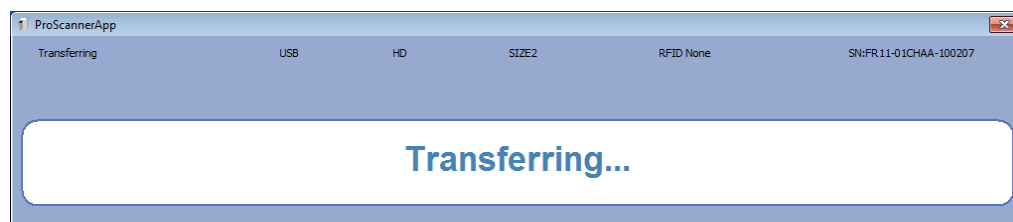
- 1 Scanner status
- 2 Connection type
- 3 Resolution
- 4 Imaging plate size
- 5 RFID status
- 6 SN with number

When the scanner is connected and ready the status will change to *Ready for Scanning*.



2. Take exposures as instructed in the Planmeca ProScanner user's manual and your intraoral X-ray unit's user's manual.
3. Scan the image as instructed in the Planmeca ProScanner user's manual.

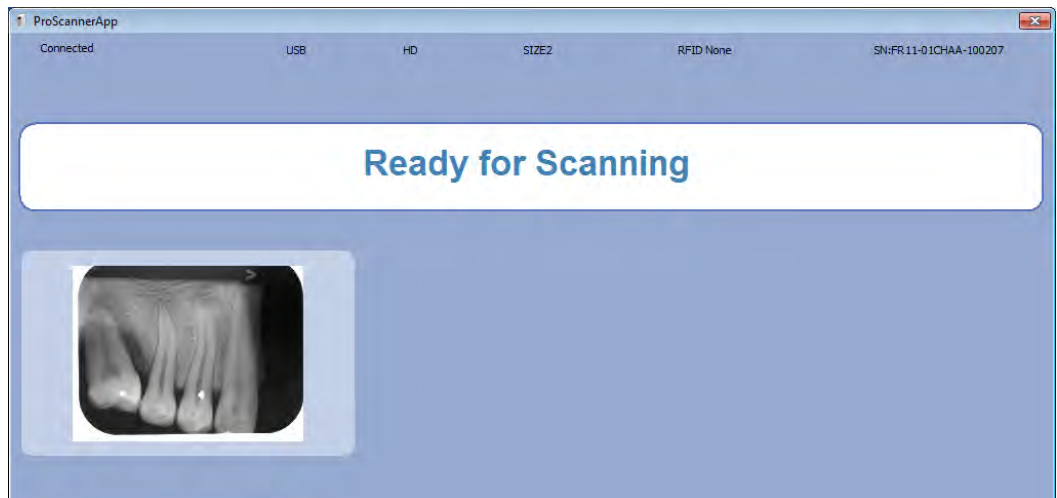
The image is first transferred from scanner to Planmeca Romexis.



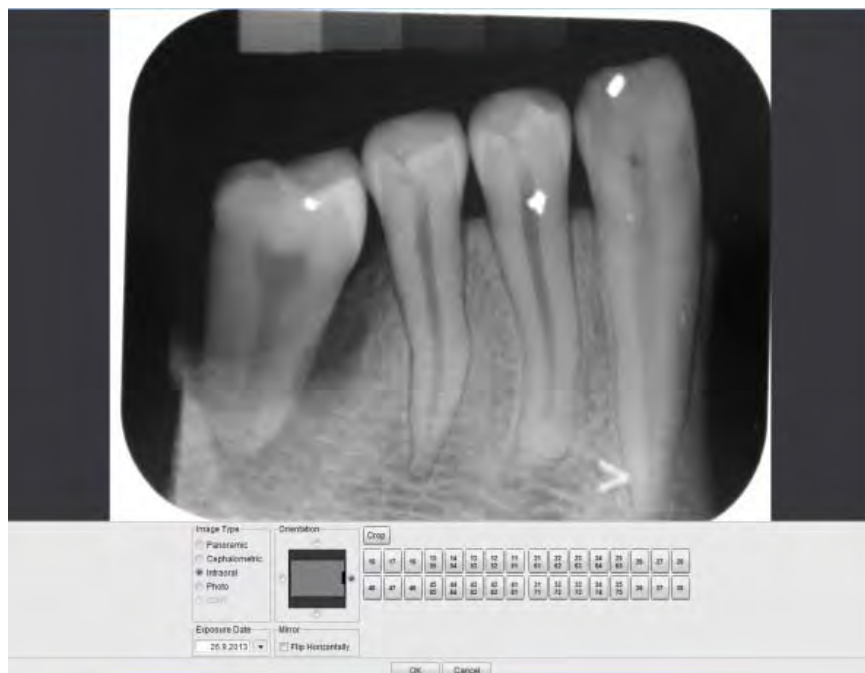


Once the transfer is complete a preview image will appear on the image capturing window.

When the status on the top bar changes to *Ready for scanning*, next image can be scanned.



4. To scan several images, keep the image capturing dialog window open and scan the images one by one. For each image, a preview will appear on the screen.
5. When all images have been scanned, click **Done**.
6. In the opening window, give the orientation and the type of the image.



The opening dialog window will be shown for each image.

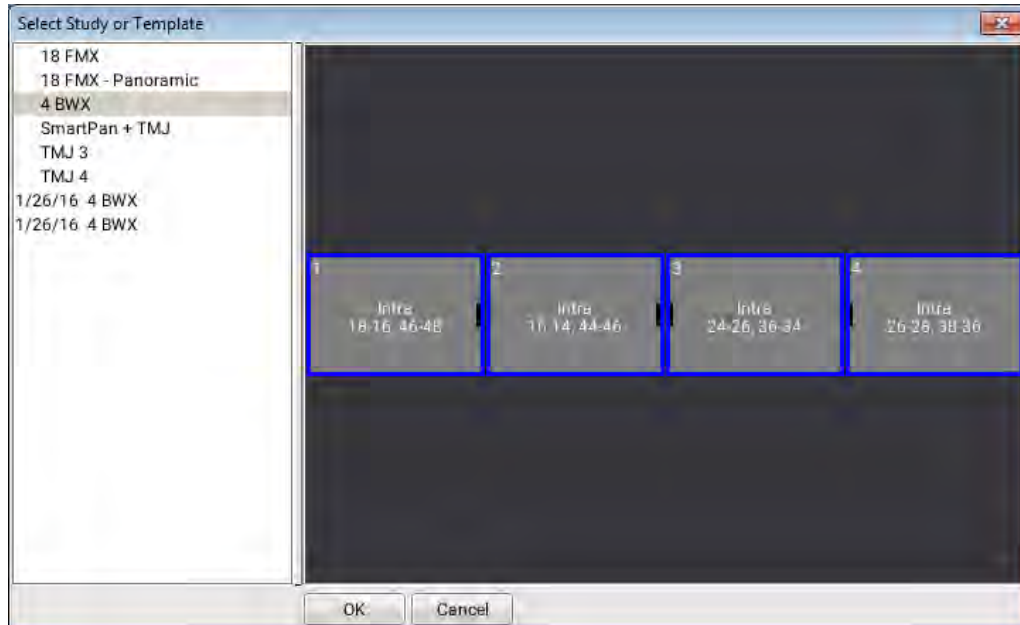
7. Click **OK**.

The images will open in the 2D imaging module.

## Capturing ProScanner images into a study



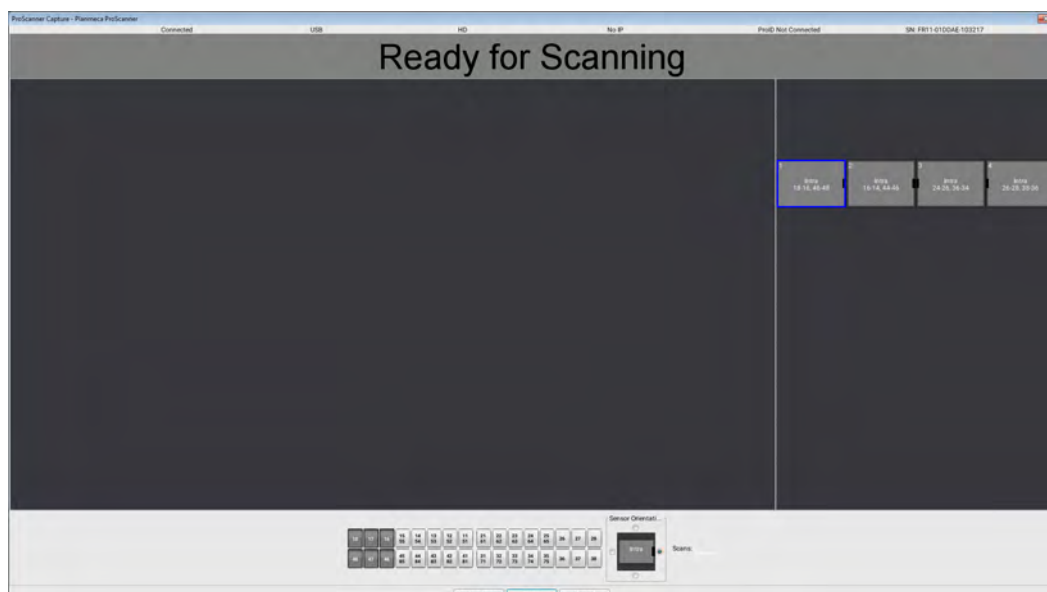
1. Click the **ProScanner Capture w/Study** button.
2. Select an empty study template or an existing previous study from the list and click **OK**.



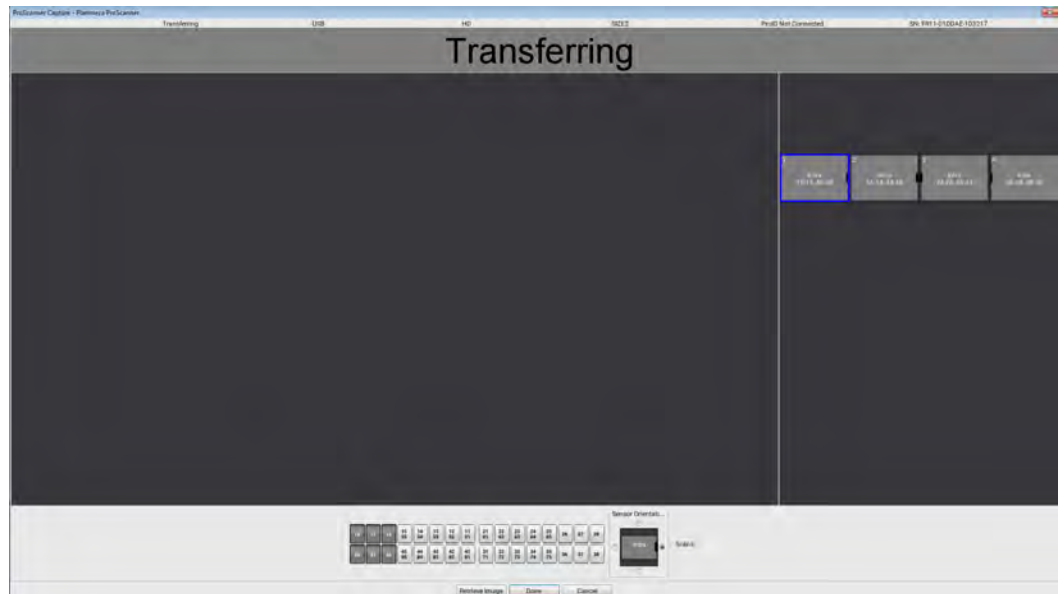
3. The imaging window opens. For the explanation of status messages on top of the window see section 4.4.1 "Standalone Planmeca ProScanner" on page 42.

When the message *Ready for scanning* appears the scanning can be started.

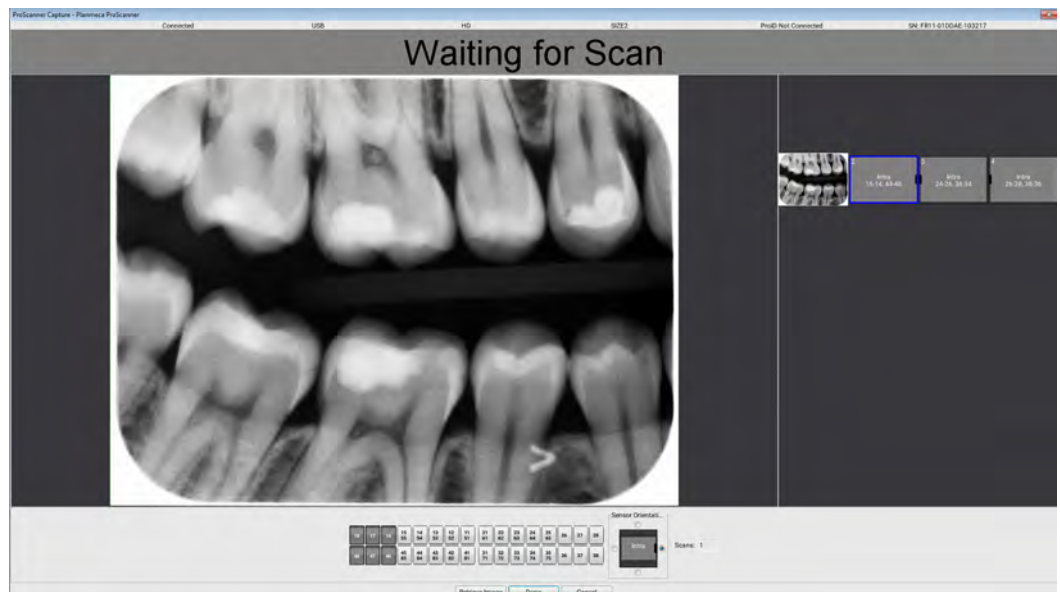
While capturing images into a study Planmeca Romexis browses through the template in a predefined order, denoting the current image to be captured by a blue border around the slot. If you want to change slot click on the desired slot.



4. Take exposures as instructed in the Planmeca ProScanner user's manual and your intraoral X-ray unit's User's manual.
5. Scan the image as instructed in the Planmeca ProScanner user's manual. The image is first transferred from scanner to Planmeca Romexis.

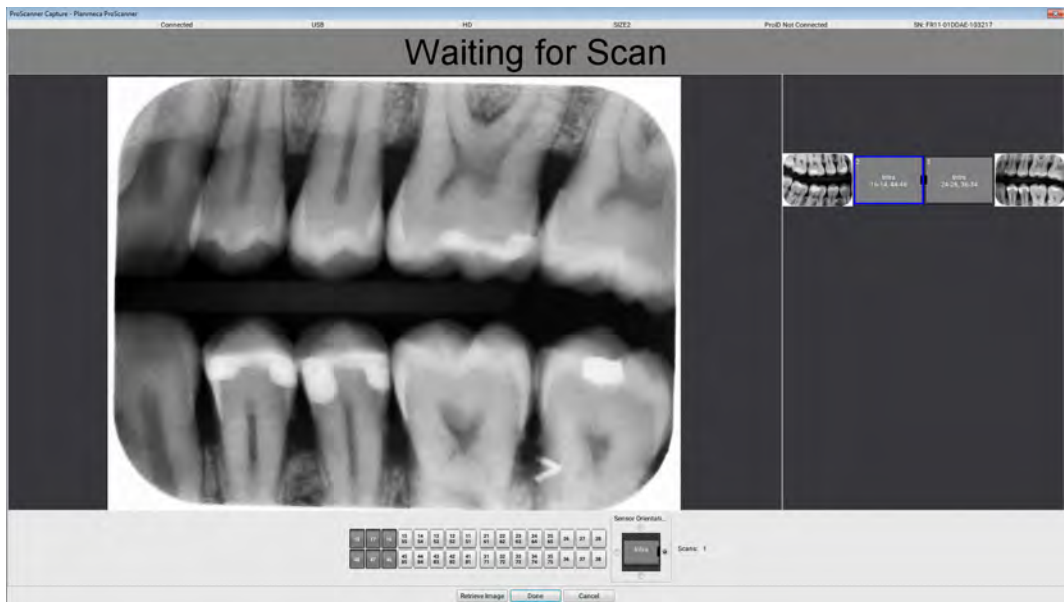


The scanned image appears on the selected slot.



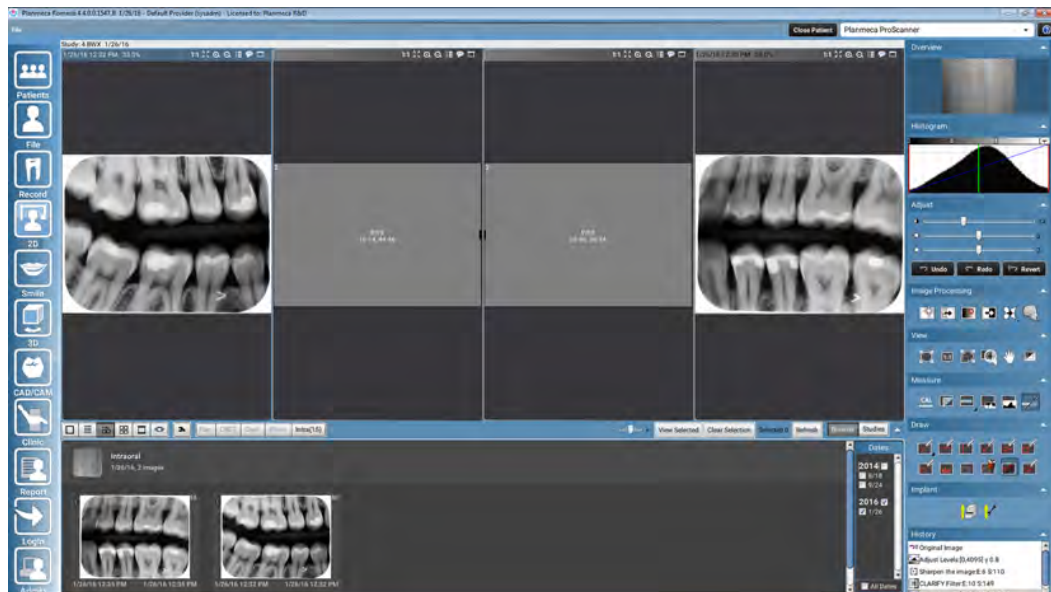
If the image was not successful and a retake is required, reselect the same slot and scan again. The new image will be placed on top of the old one in the same slot. The number of images in the slot will be indicated with a number in the lower left corner of the slot.

6. Continue scanning.

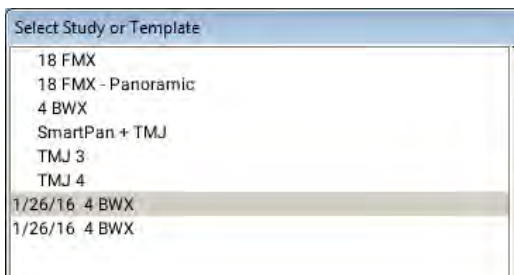


7. When finished click **Done**.

The study appears in Planmeca Romexis 2D imaging module.



If you want to continue capturing images later into the same study, restart imaging and select the study from the list.



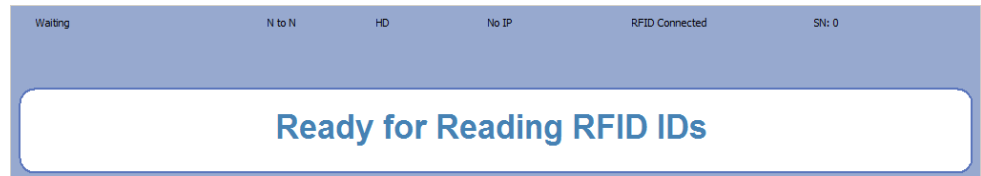
## 4.4.2 Capturing images with Planmeca ProScanner using Planmeca ProID reader

### Capturing images



1. Click **ProScanner capture**.

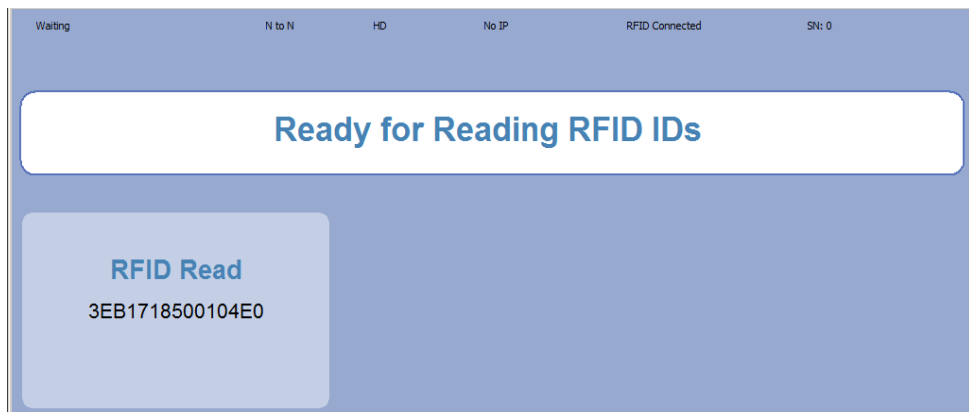
The image capturing dialog will open.



2. Show the image plate to the reader as instructed in Planmeca ProScanner User's manual.

When the image plate is successfully read by Planmeca ProID an imaging plate template will appear on the screen.

The text *RFID read* and the serial number of the plate will show on the plate template.

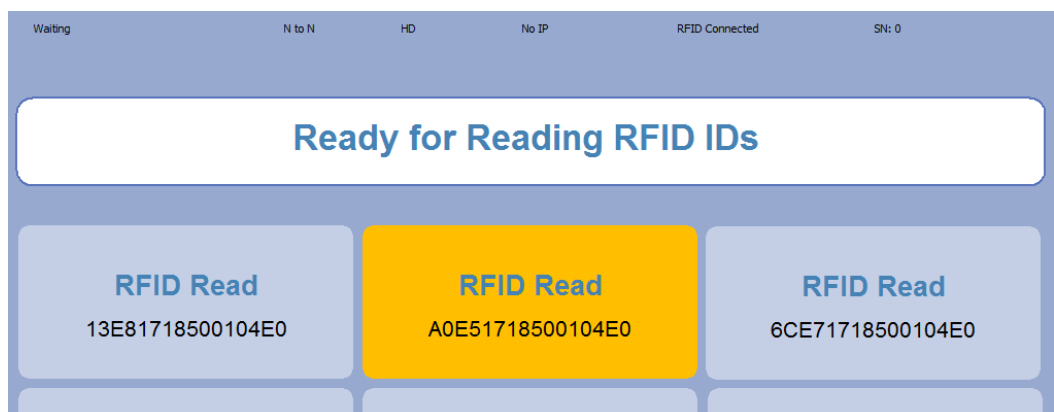


To scan multiple images in the same session repeat Step 2 to all plates.

For each scanned plate a new template will appear on the screen.

Maximum of 6 templates can be displayed on the screen at a time. If more RFID's are read with ProID, the templates will be divided to several pages. To move between pages, use the buttons in the middle of the screen.

An imaging plate can be scanned only once during one imaging session. If a plate is read again with ProID, the template in question will blink in yellow.



**NOTE**

Image capturing window must remain open on the same workstation where the imaging plates are read with Planmeca ProID until all images have been scanned. Never close the image capturing window before all images appear on the screen.

3. Take the exposure as instructed in the Planmeca ProScanner User's manual and your intraoral X-ray unit's User's manual.
4. Scan the image as instructed in Planmeca ProScanner User's manual. As images are scanned, a preview of the image will appear on the template.
5. When all the images have been scanned and appear on the screen, click **Done**.



6. In the opening window, select orientation and image type.



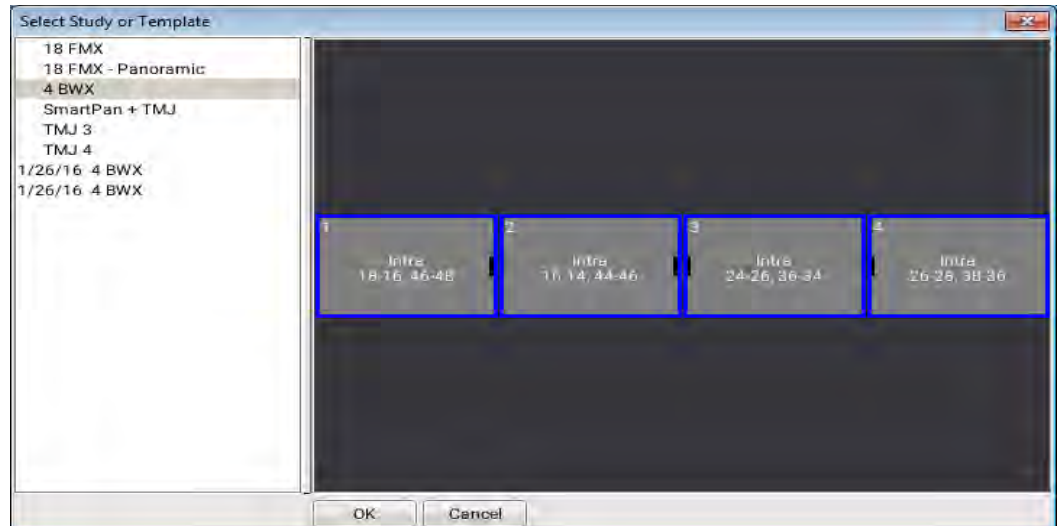
7. Click **Done**.  
The dialog window will be shown to all scanned images one by one.  
The images will appear in the Planmeca Romexis 2D imaging module.



## Capturing ProScanner images into a study

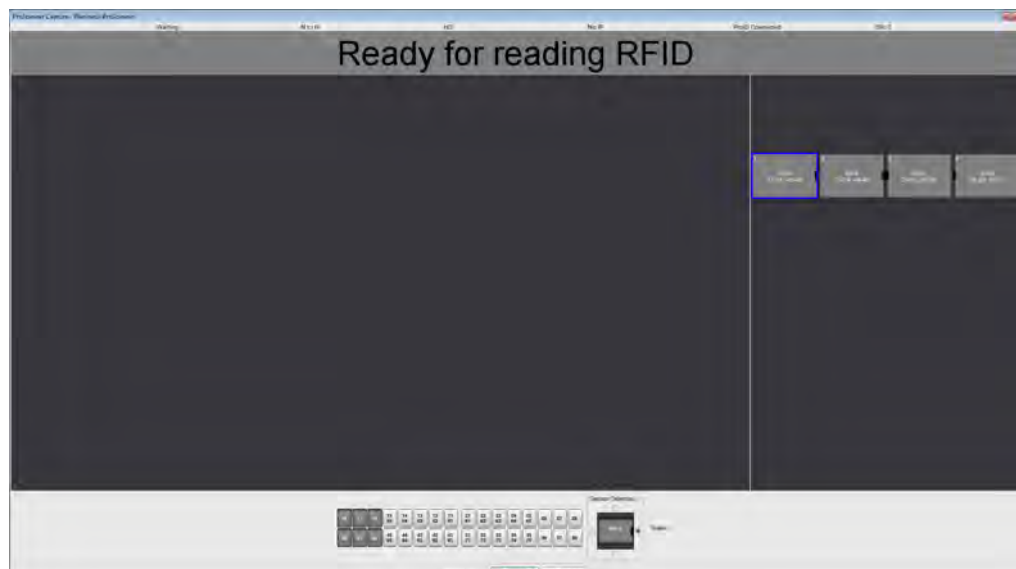


1. Click the **ProScanner Capture w/Study** button.
2. Select an empty study template or an existing previous study from the list and click **OK**.



3. The imaging window opens. See section 4.4.1 "Standalone Planmeca ProScanner" on page 42 for the explanation of status messages on top of the window.
4. When the message *Ready for reading RFID* appears the imaging plates can be shown to the RFID reader. Show the imaging plate to the Planmeca ProID reader as instructed in the Planmeca ProScanner User's manual.

While using study Planmeca Romexis browses through the template in a predefined order. The dark blue colour around the slot indicates where the currently read plate will be placed. If you want to change slot click on the desired slot before reading the plate.



When the plate has been read the text RFID read will appear on the slot and the colour of the slot changes to light blue.



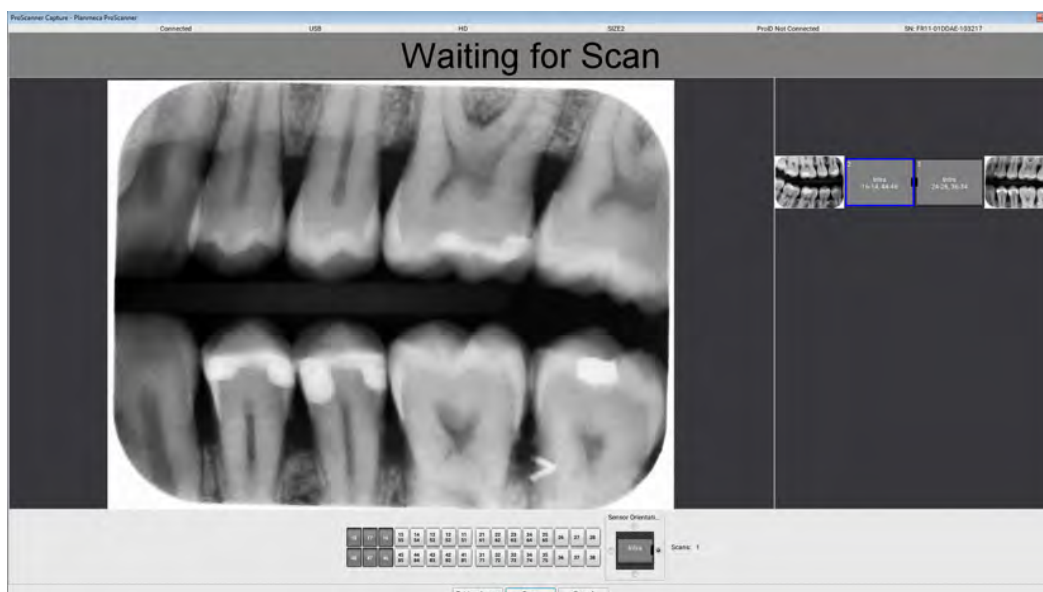
If the wrong slot was selected, click on the desired slot and read the plate again. The plate will be moved to the selected slot.

5. Take exposures as instructed in the Planmeca ProScanner user's manual and your intraoral X-ray unit's user's manual.

#### NOTE

Image capturing window must remain open on the same workstation where the imaging plates are read with Planmeca ProID until all images have been scanned. Never close the image capturing window before all images appear on the screen.

6. Scan the image as instructed in the Planmeca ProScanner User's manual. The scanned images appear in the imaging window on the correct slots.

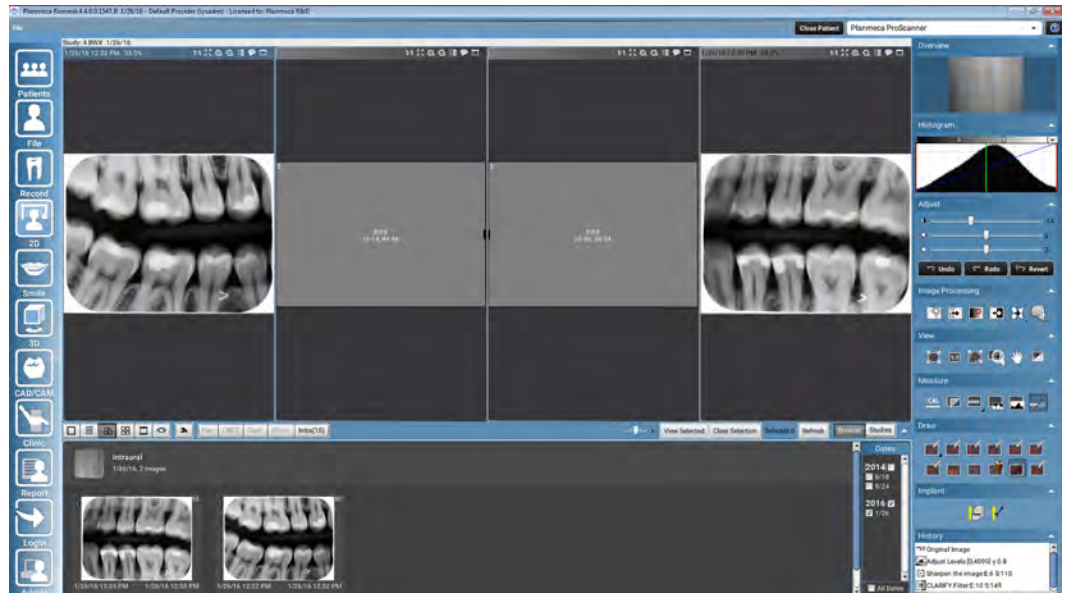




If an image was not successful and a retake is required, reselect the slot and show the plate again to the reader. The text RFID Read will appear on the reactivated slot.

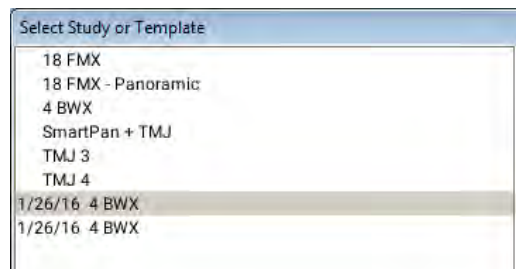
Once the image has been scanned it appears on top of the old one in the selected slot. The number of images in the same slot will be indicated with a number in the lower left corner of the slot.

To continue click **Done**.



7. The study appears in Planmeca Romexis 2D imaging module.

If you want to continue capturing images later into the same study, restart imaging and select the study from the list.



## 4.5 Recovering Planmeca ProScanner images

### 4.5.1 Recovering images automatically

See section "TWAIN auto recovery" in the Planmeca Romexis technical manual (10037884) for more information.

### 4.5.2 Recovering images manually

1. Select the patient and open ProScanner imaging window.

2. Click the **Retrieve images** button.

A list of images on the scanner opens.

3. Select an image from the list and click **OK**.

The image is retrieved from the scanner and appears in the imaging window.

#### **NOTE**

**Make sure the retrieved image belongs to the selected patient.**

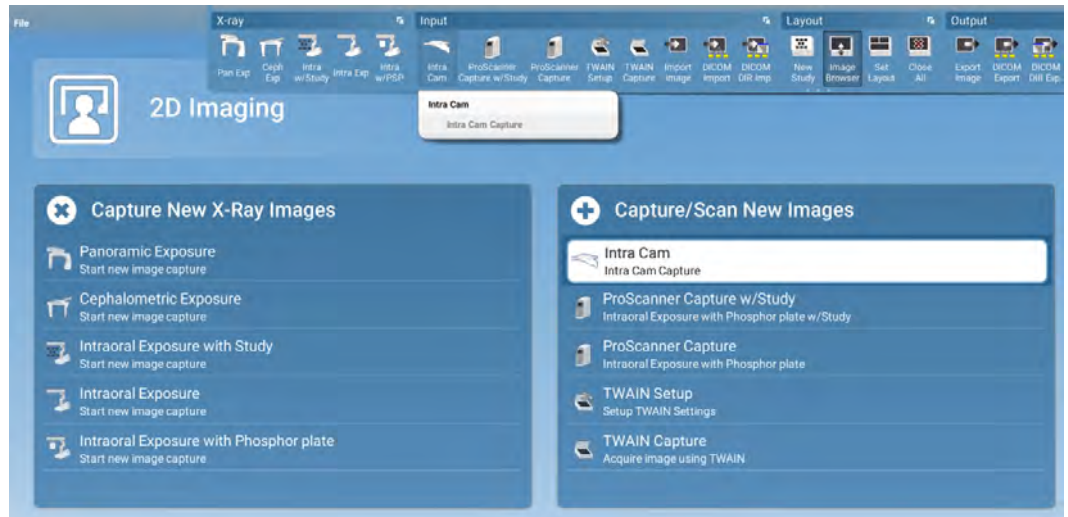
## 4.6 Capturing Planmeca intraoral camera images

### NOTE

For detailed description on how to install and use the intraoral camera see the Planmeca Compact i and Planmeca Sovereign user's manuals.



1. Start the intraoral camera by clicking on the **Intra Cam** button in the *Capture/Scan New Images* section or at the top toolbar.



2. Move the camera in patient's mouth to capture an intraoral video.



### 4.6.1 Freezing and saving images

Freeze

To capture an intra-oral image click on the **Freeze** button at the bottom of the imaging window.

Save

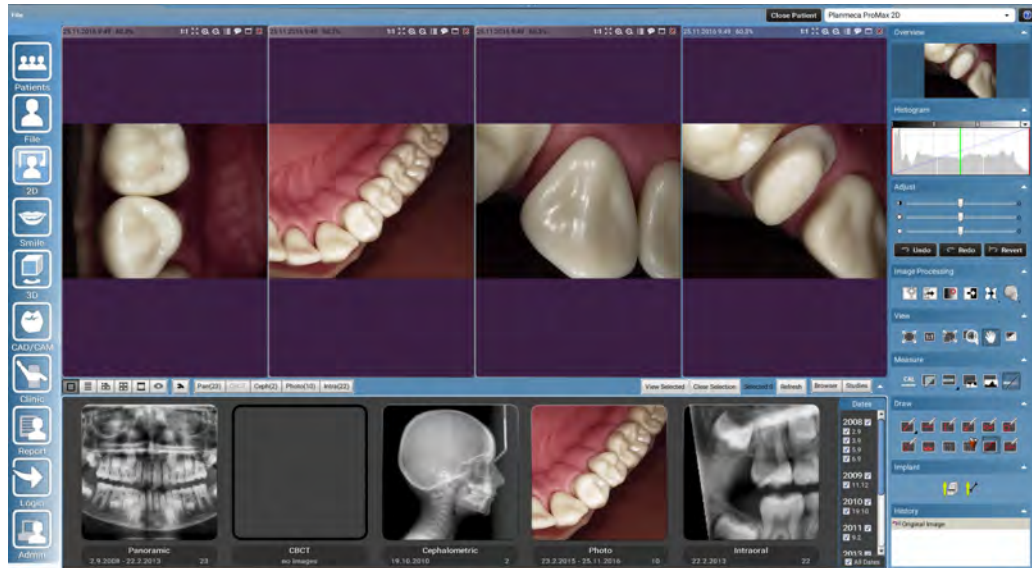
To save the captured image to patient's images click on the **Save** button.



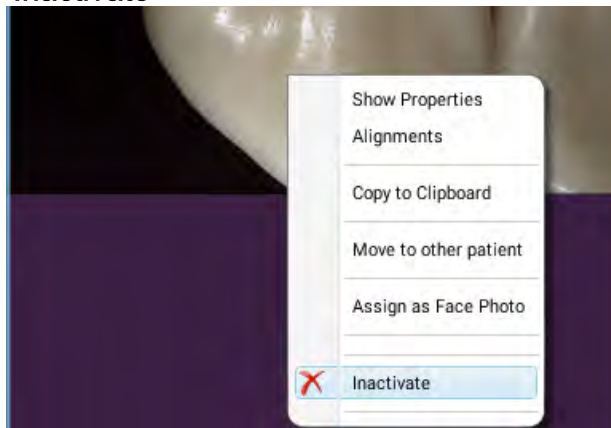
You can unfreeze the image by clicking on the **Resume** button.

When you have saved the images, click on the **Done** button at the bottom of the intraoral camera window.

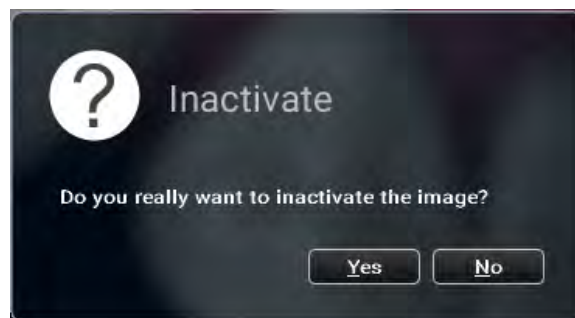
The images will be saved to patient's images and can be viewed in and opened from the Image browser.



To delete the image from the patient's images check that the **Pan** tool is inactive then right-click on the image you want to delete and select **Inactivate**.



Select **Yes**.



If you wish to return to the intraoral camera window from the Image browser, click on the **Intra Cam** button.

## 5 TWAIN CAPTURE



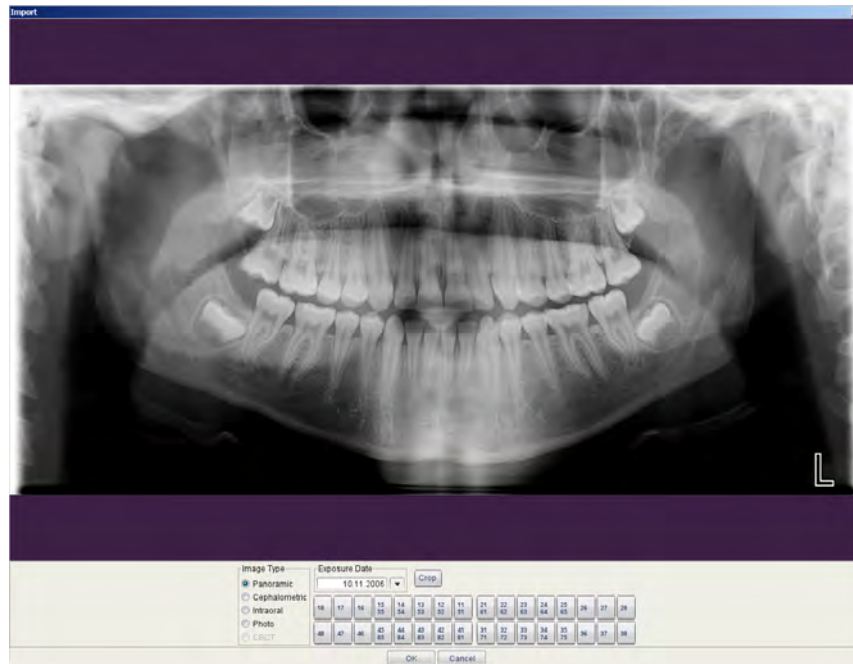
To acquire an image from the TWAIN device click the **Acquire image using TWAIN** button to start the TWAIN interface. Refer to the user's manual of your scanner/camera for more information on how to proceed with the device you are using.



## 6 IMPORTING IMAGES



1. Click this button.
2. Browse to the image folder and select the images you want to import.  
To select several images press and hold down the **Shift** or **Ctrl** key while selecting files.
3. Select the image type, and, for intraoral images, define the tooth numbers.



If you are importing multiple images you are prompted separately for each image:

- If you click *Cancel* to skip a single image when importing multiple images, Planmeca Romexis will ask: “Continue importing images?”.
- If you want to continue importing the rest of the images select **Yes**.

### Cropping image during import

1. Click the **Crop** button.
2. Click and drag the mouse on top of the image to specify the area of interest for cropping.

A green rectangle marks the area currently selected. When the area has been selected the rectangle turns red.

## 6.1 DICOM import



DICOM 3.0 format images can be imported using the *DICOM Import* function similar to other images. For more information on the import process, see section “TWAIN auto recovery” in the Planmeca Romexis technical manual (10037884).

### 6.1.1 DICOM import with patient data

To import a DICOM image and to create a new patient from the information included in the DICOM file, use the *DICOM with Patient* option available in the File menu.

## 6.2 DICOMDIR import

DICOMDIR Import allows you to import a set of multiple patients with their patient information and images from DICOMDIR into Romexis.

### NOTE

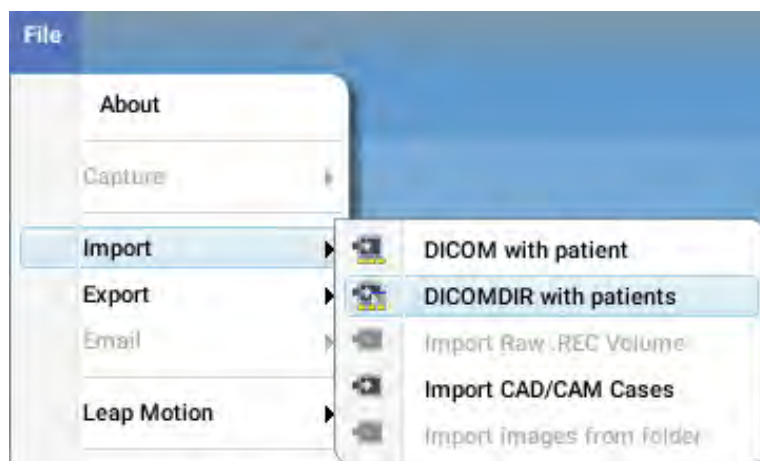
Before you start using DICOMDIR import or make sure that the user has appropriate import and export images permissions granted in the *Admin* module (For more information on permissions see section “Groups” in the Planmeca Romexis technical manual (10037884)).



1. Click this button.

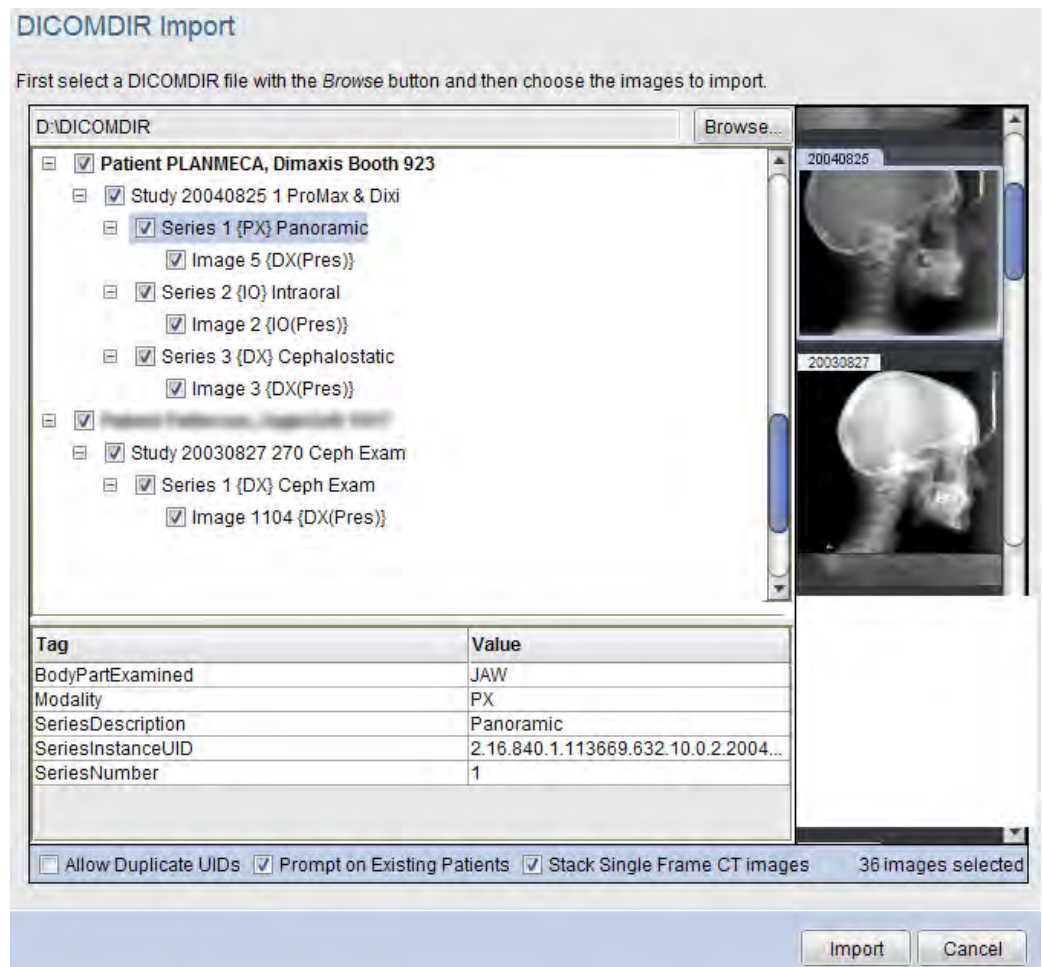
or

Select **DICOMDIR with patients** from the *File* menu.



2. Click the **Browse** button to select the DICOMDIR file you want to import. A tree list opens showing each patient in the DICOMDIR file and the images it contains. The DICOM tags of the selected image are displayed at the bottom of the window and its thumbnail highlighted on the right.
3. Select all images you want to import and deselect any unwanted patients and images.



4. Click **Import**.

If a patient with the same name is already found in the database, you will be asked whether to import the images to the existing patient or create a new one. Verify that you have the correct patient before continuing.

If necessary new patient entries are created and the selected images are imported to them.

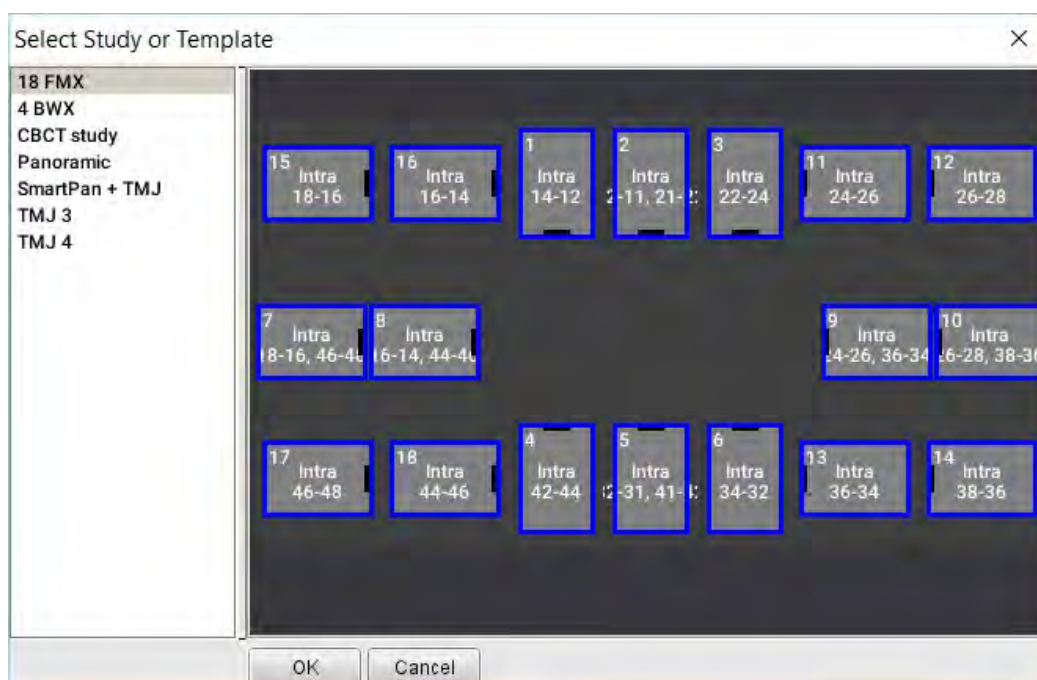
All images in the database that have an image UID (Unique Identifier) will be rejected unless *Allow duplicate UIDs* option has been enabled.

To import SmartPan images as stacks instead of separate images check the option *Stack single frame CT images*.

## 7 STARTING A NEW STUDY



1. To start a new study click this button.
2. Select the suitable template and click **OK**.



To add images to an empty study, see section “Adding an image to a study” on page 70.

To capture images directly into a template, see section 4.1 “Capturing intraoral images into a study” on page 38.

## 8 BROWSING 2D IMAGES

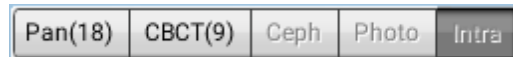


The *Image browser* is intended for browsing 2D images.

The browser shows all images of the patient grouped according to the image type (panoramic, CBCT, cephalometric, and intraoral, images and photos).

When the *Imaging* module is opened the Image browser opens by default at the bottom of the screen.

To open and close the image browser click the **Image browser** button on the top toolbar.



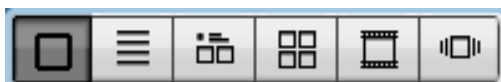
The images are grouped as follows:

- **Pan:** Panoramic and SmartPan exposures and scans.
- **CBCT:** 2D snapshots generated in the *3D* module.
- **Ceph:** Cephalometric exposures and scans, including virtual cephalometric images, see section 12.13 “Virtual ceph” on page 322.
- **Photo:** Intraoral video camera images, scans and imported photos from hand-held cameras.
- **Intra:** Bite-wing and periapical exposures and scans with specified tooth sites. Intraoral images with no specified tooth sites are placed into the *Other* subcategory.

Intraoral images can be further divided into three sub-categories:

- **Periapical**
- **Bitewing**  
and
- **Other** based on selected tooth sites.

## 8.1 Browsing images in different browsing modes



### All categories (image types) browsing mode

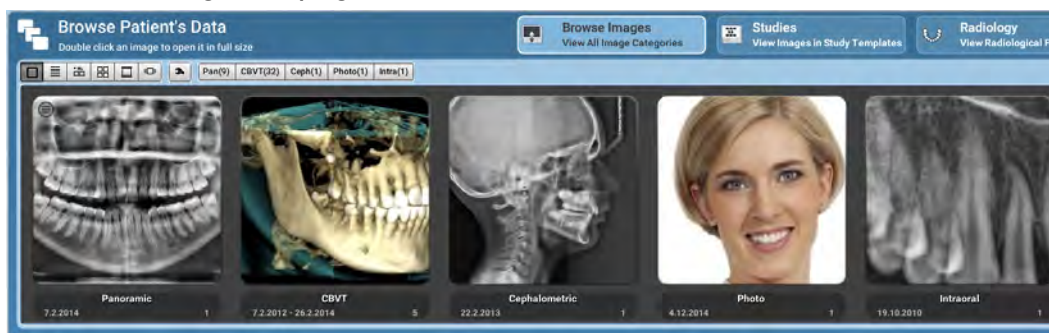
Groups images according to image type. The type, exposure dates and number of images are shown under the thumbnail.

To view a preview of all images of the selected image type move the mouse over the thumbnail from left to right.

To open the image currently in the thumbnail double-click the thumbnail.

To open all images in an image type category click the currently shown thumbnail. The images open in *Grid* mode see section "Grid" on page 63.

To modify the viewing settings right-click on the thumbnail and select the desired options, for detailed information see section 8.2 "Adjusting image browser settings" on page 65.



### Image list

Displays a list of all patient images.

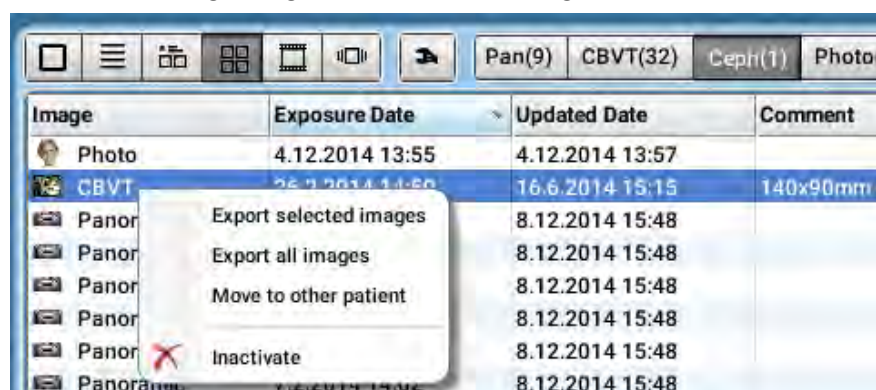
To select multiple images click and drag the images, or use **Shift** or **Ctrl** keys on your keyboard.

To export selected the images right-click on one of them and select **Export selected images**.

To export all images right-click on the list and click **Export all images**.

To move images to another patient, right-click on the image and select **Move to other patient**.

To delete images right-click on the image and select **Inactivate**.

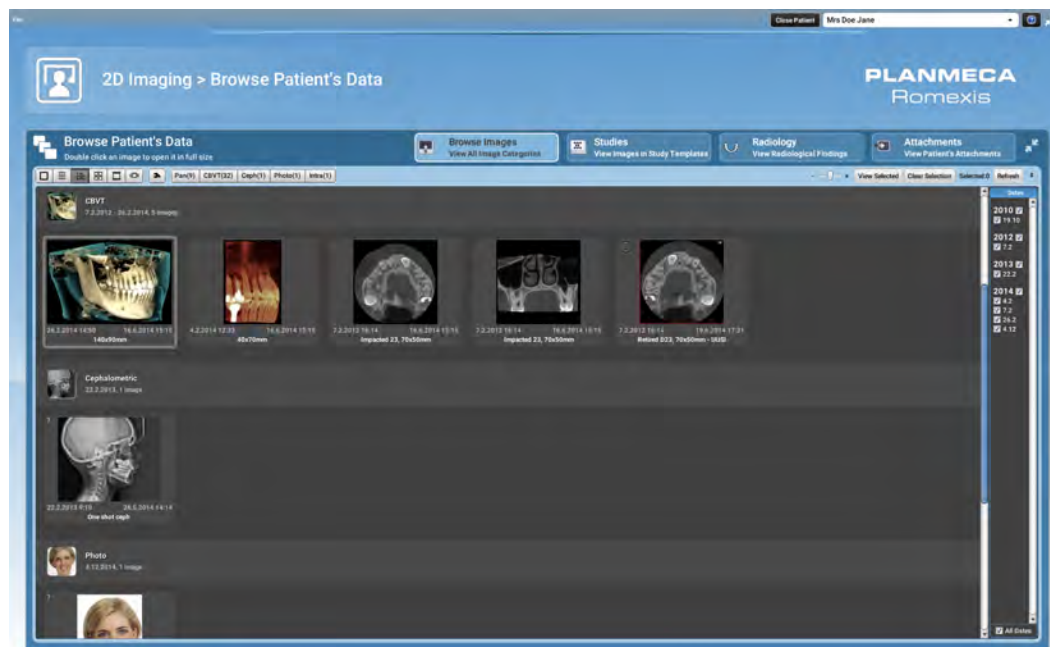




## All Images

Shows an overview of all patient images: Image type, exposure dates and number of images are shown in each image type category.

To collapse/expand a category click on the smaller thumbnail next to the category title.



To move to the next row of images in the same category or to the next category title scroll the mouse wheel.



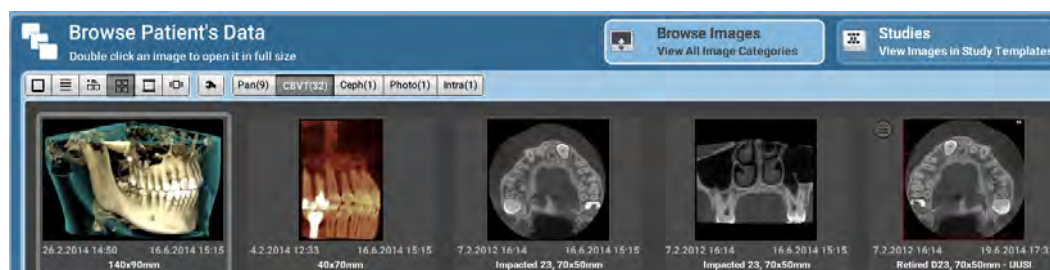
## Grid

Shows images of the selected image type in grid format. In the grid browsing mode the maximum number of images are shown.

If the Image Browser is set to hide automatically when an image is opened in the *Image Viewer*, the browser will automatically reappear when all images have been closed in the Image Viewer.

To reopen the image browser click this button on the top toolbar.

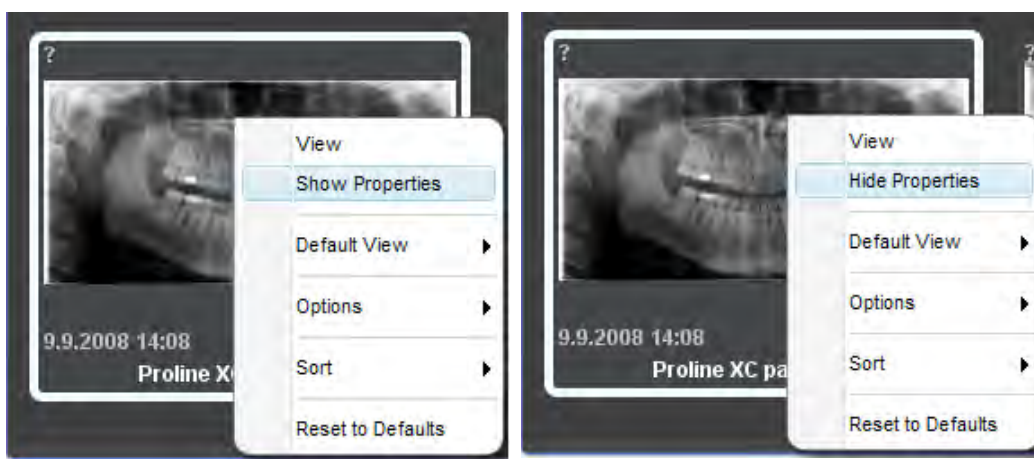
The image type (e.g. CBCT), exposure dates range and the number of images are displayed in the image browser title bar.



To view a detailed description of image properties right-click the thumbnail and select **Show Properties**.



To hide properties right-click the thumbnail and select **Hide Properties**.



### Film-strip

Images are displayed from left to right in film-strip format.

To browse images one-by-one use the mouse wheel.

To view the full range of images use the scroll bar at the bottom of the screen.

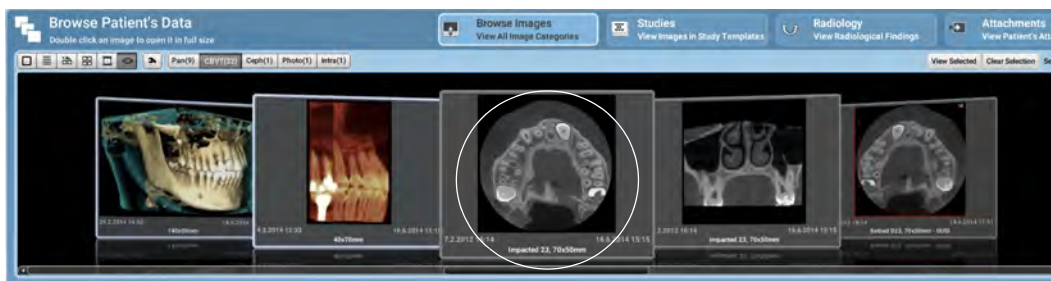


### Carousel

Images are displayed from left to right in a 3D carousel.

To scroll images one-by-one use the mouse wheel or the scroll bar at the bottom to view the full range of images.

In the carousel mode only the middle image (largest image in front and centre) can be selected, highlighted or opened.



## 8.2 Adjusting image browser settings

The settings are user specific and the latest settings of each user will be recorded.

To access the *Settings* menu click this button.



The image browser settings can be used to define:

- **Default view:** The view mode in which the browser opens when opening a patient file

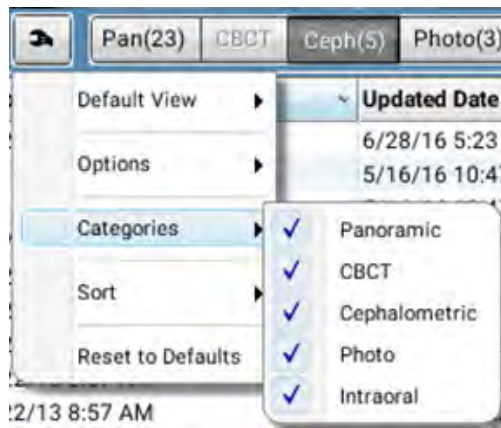


- **Options** shown on the screen with image thumbnail

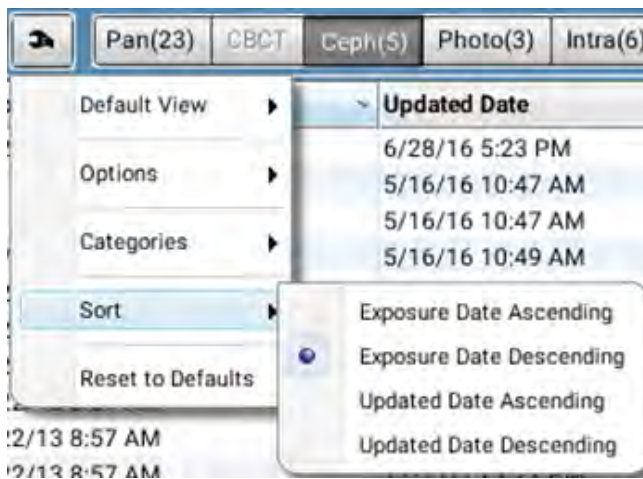


- *Divide IntraOral to Categories*  
Organizes intraoral images into separate categories according to the teeth numbers.
- *Small Category Headings*  
Makes the image category headings smaller in the All Images browsing mode.
- *Close Browser on Double Click*  
Closes the image browser when an image is opened by double-clicking on it.
- *Show Zoom Animation*  
Makes the images open with a zooming animation effect.
- *Don't Close Open Images When Capturing*  
Does not close the currently open images when a new one is being captured.

- **Categories** shown on the top edge of the image browser

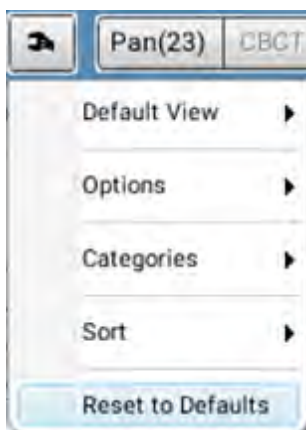


- **Sort order**



and to

- **Reset browser to defaults.**



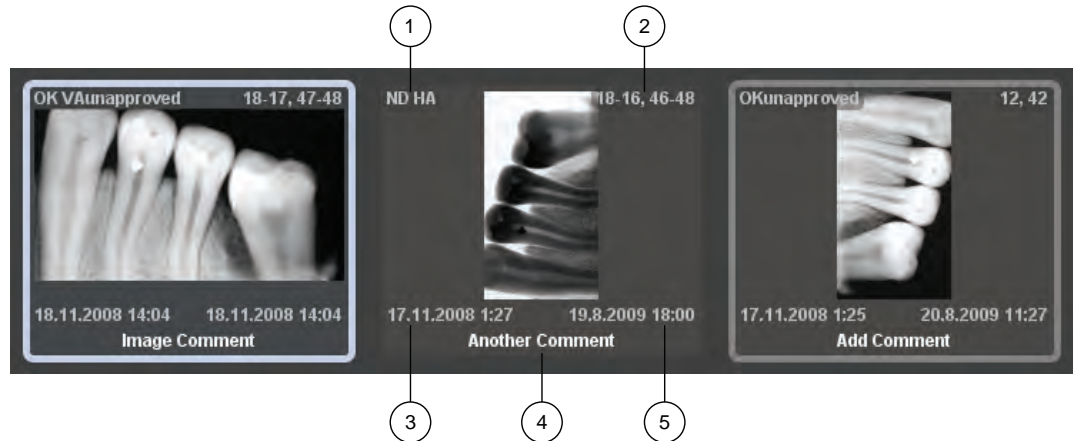


### 8.3 Image thumbnails explanation

The border of the selected image shows in light blue.

The border of the currently highlighted image shows in light grey.

The selected image shows in white.



1 Image evaluation

Available only in Dental record module

2 Specified tooth sites

3 Exposure date

4 Comment

5 Last updated

If both exposure date and update date do not fit into the thumbnail even though both are configured to be shown only the exposure date is shown.

To open an image double-click the thumbnail.

To open multiple images in the Image Viewer use the **View selected** button.

To open images directly into the Image Viewer double-click on the thumbnails.

#### Adding and editing image comment

1. Click on the image comment field.
2. Type the text in the comment field.

#### Symbols on top of thumbnails

The following symbols may appear on top of the image thumbnails:



SmartPan stack image with multiple layers.



Image stored into Long Time Archive. Full size image becomes available for viewing when restored from Long Time Archive.



Image belonging to a study



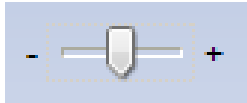
Image contains an attached diagnosis that can be viewed in the image properties dialog.



Image with a cephalometric tracing

### Adjusting thumbnail size

To change the size of the image thumbnail use this slider. The size setting is remembered separately for each view mode. The approximate viewing position inside a category is preserved when changing thumbnail sizes.



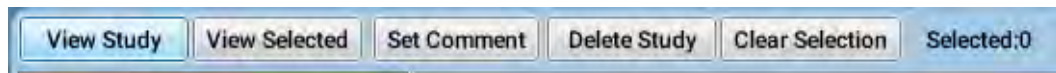
### 8.4 Adjusting image browser window size



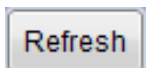
To **expand / collapse** the image browser window click the arrow to view the browser in full screen or in default height.

### 8.5 Selecting / deselecting images

To view/open selected images in full size click the **View selected** button. To clear the currently selected image(s) click the **Clear selection** button. The number of currently selected images is shown in the *Selected* field. When the option *Close browser on double-click* is enabled and you want to open multiple images, first select the images and then click on the **View selected** button.



### 8.6 Refreshing the image browser



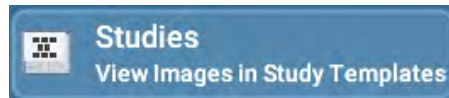
When new exposures of the same patient have been taken at another workstation and the images do not yet show on the current workstation they can be reloaded and updated from the server by clicking **Refresh**.

### 8.7 Filtering and selecting images by date



- The dates of all images are shown in the *Dates* field.
- To filter images by exposure date check the dates of the images you want to view.
- To filter images by year check the dates of the images you want to view on the screen.
- To reset the filter to show all images first deselect **All dates** option and then reselect it.

## 8.8 Viewing studies



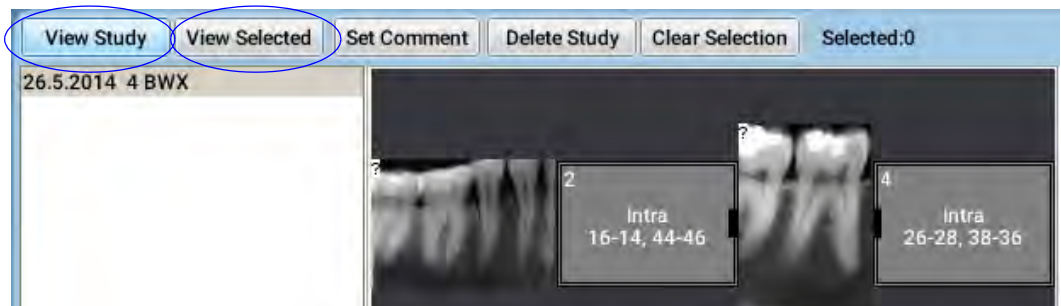
A study is a collection of related images of one patient. A study is always based on a study template where tooth numbers and exposure order can be predefined.

### 8.8.1 Opening a study

To open a preview click the name of the study.

To open an image from a study select the desired image in the preview and click **View selected** or double-click the image

To view all images in a study click the **View study**. For more information on studies see section 23.1 “Show properties” on page 125.



For creating image templates, see section "Templates" in the Planmeca Romexis technical manual (10037884).

For capturing images into a study, see section 4.1 “Capturing intraoral images into a study” on page 38.

✘ To close images click this button on the top right corner of the image you want to close.

### 8.8.2 Arranging images in a study

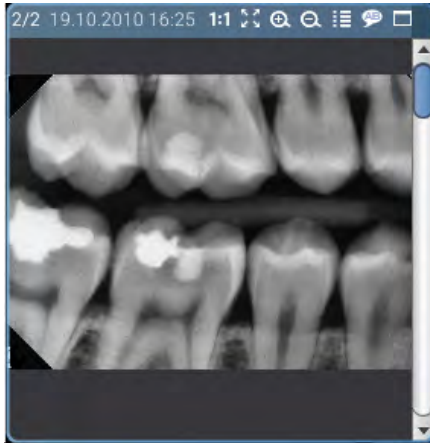
1. Select the study to rearrange and click **View study**.
2. Drag and drop images from one slot to another:
  - If you're dragging an image to an empty slot select **Yes** in the opening dialog.



- If there is already an image in the target slot the you can either move the image on top of the old image or swap the images.



In case there is more than one image in a study slot use the scroll bar to navigate between images.



### Deleting images from study

1. Drag the image outside the study window.

#### NOTE

The image will still remain in Planmeca Romexis as a single image.

2. To delete the image from the study select **Yes** in the opening dialog.

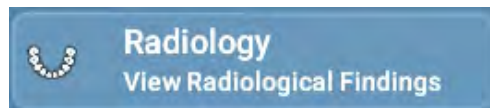
### Adding an image to a study

1. Open the study.
2. Select the image you want to add to the study.
3. Add it to the first empty slot by double-clicking the image.

To hide the study list and reveal the images underneath the image browser click the **Overview** button.

In case you want to add a new image to a slot that already contains an image, detach the old image first. In case you want to move an image to another slot just drag it with the mouse to a new location.

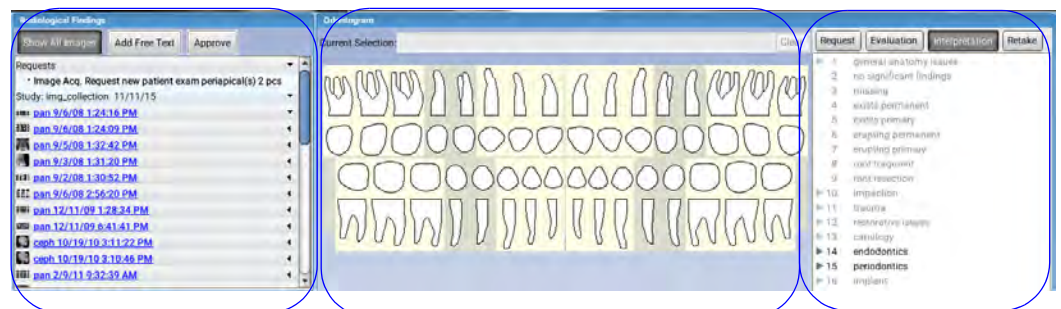
## 8.9 Entering and viewing radiological findings



In the *Radiology* section you can create interpretations of dental findings in radiographs. The findings tool replaces paper check lists. Both 2D and 3D images can be interpreted.

An odontogram is used to indicate location of findings and the findings list can be used for entering findings into a radiological report. Also free text can be added.

The *Findings* section consist of three sub-sections:



Radiological findings

Odontogram

Findings list

### 8.9.1 Using the Radiological findings field

To select images in which you want to mark findings use the Image Browser or click the image links in the *Radiological Findings* field.

To view the list of all images of the current patient click **Show all images**.

#### NOTE

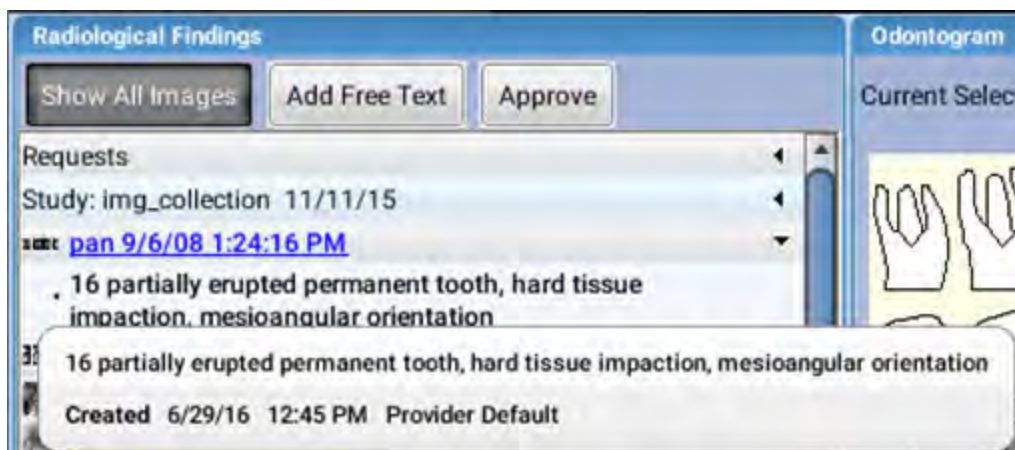
If *Show all images* is not pressed, only the findings of the currently open image will be listed. SmartPan stack is shown as a single image.

When a tooth is selected, the tooth number is shown in the note.

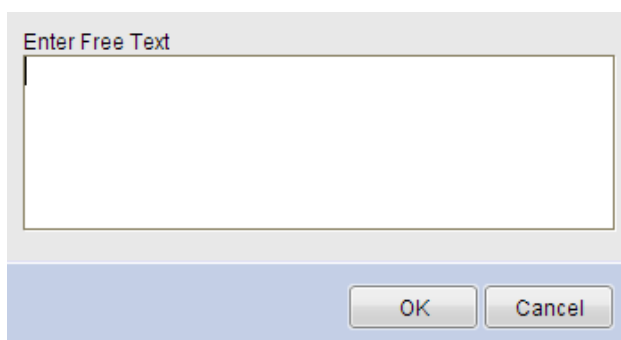
To expand / collapse the findings list for the selected image, click the arrow on the right edge of each image row.

To open the image in the main window click on the image link.

To display all information of the selected finding place your mouse over the finding.

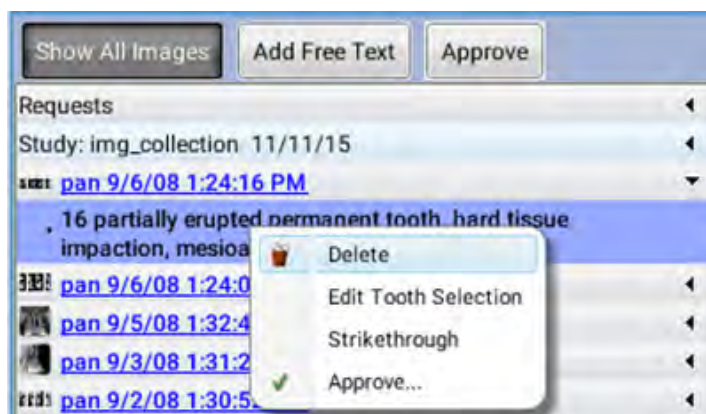


To create a free text note for a selected image click the **Add free text** button. The following window opens. Enter the appropriate text in the field. When finished click **OK**.



Freely added text will be indicated with *Note* marking in the findings row.

To approve a finding or an image capturing request, select the item on the list and click **Approve**.

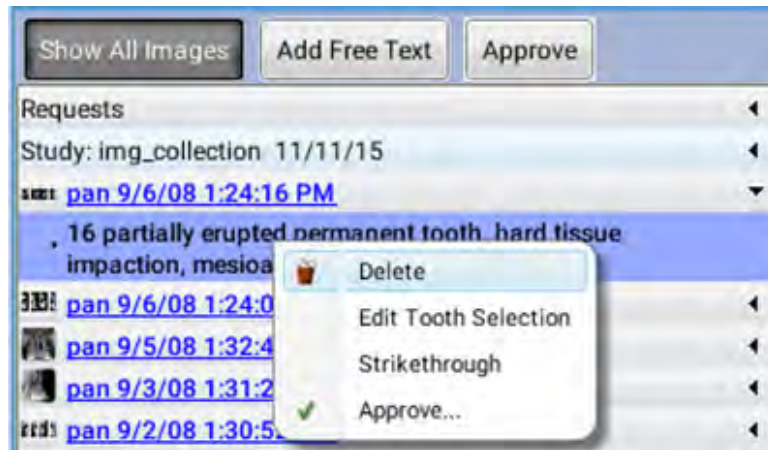


To delete a finding or to edit a tooth selection right-click the finding you want to modify.



To cross out, yet keep a finding or a request in the list select **Strikethrough**.  
To approve a finding select **Approve**.

From the opening pop-up window select **Delete** or **Edit tooth selection**. The modifications will be automatically updated into the odontogram.

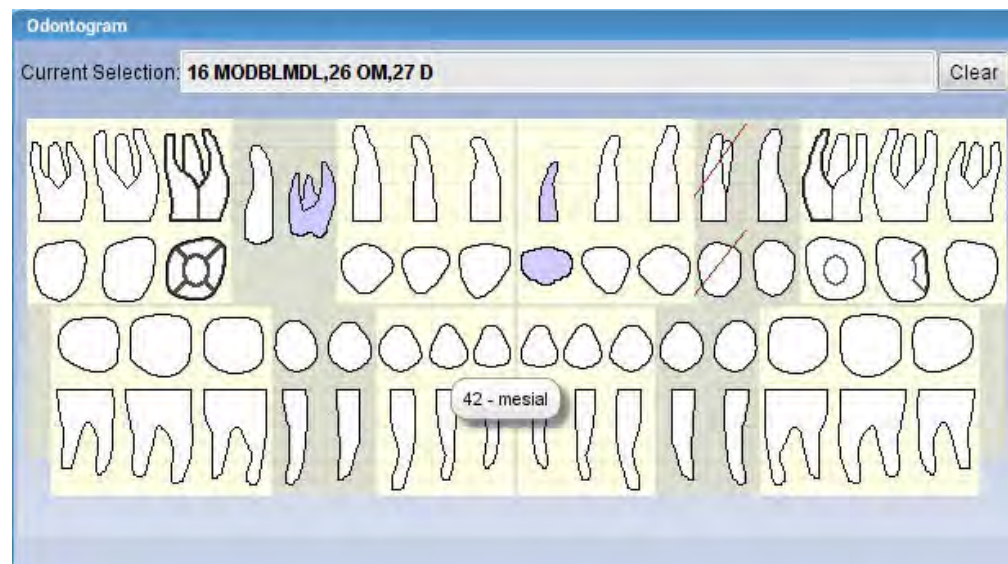


### 8.9.2 Using the odontogram

The odontogram is used to select the tooth to be interpreted or to mark a missing tooth.

To select a tooth click the tooth in the Odontogram. The edges of the selected tooth or tooth parts are marked in **bold**.

Tooth number and selected tooth surfaces are shown in the text box with letters (MODBLMDL).

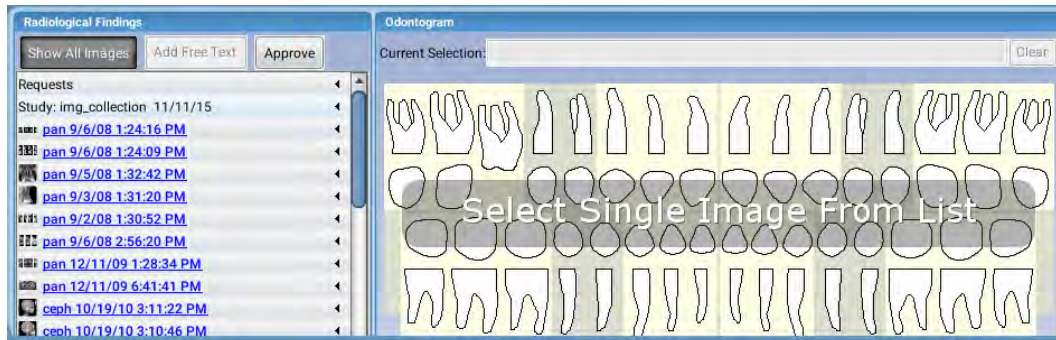


### 8.9.3 Adding a finding to an image using the findings list

1. Open the image in which you want to add a finding.

#### NOTE

If no image has been selected the screen with message *Select single image from list* will appear. To use the findings list first select image.

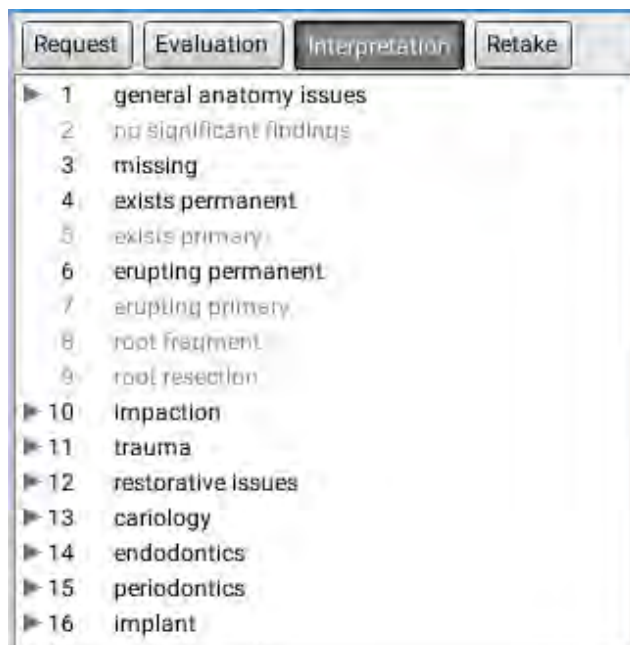


The findings list shows all the possible findings grouped under different fields of dentistry.



If the radiological findings toolbar closes when you open an image (because the image browser is set to be closed by double-clicking), the toolbar can be set visible again by opening the image browser from the upper toolbar.)

2. Add a finding in the image by selecting the appropriate finding from the list and clicking it with the left mouse button.





**NOTE**

If you are trying to select a finding from the list that is not applicable to the current selection in the odontogram, a tool tip explaining why the finding cannot be selected appears. Selection of tooth or part of a tooth might be required.

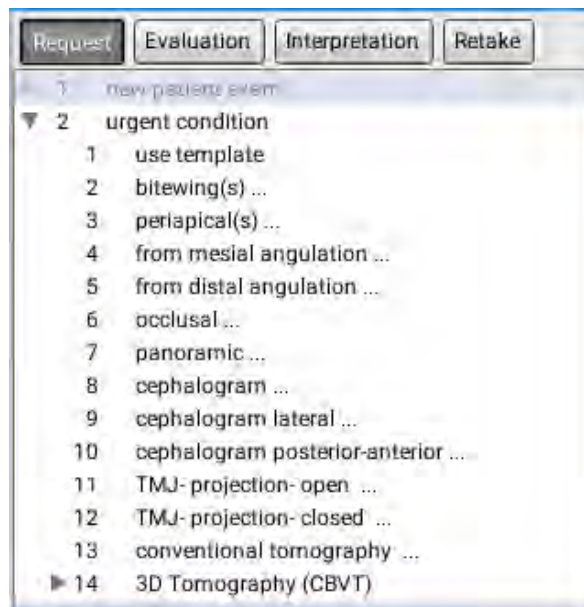


The finding will now appear in the radiological findings field under the image in which the finding was recorded.

All findings are image specific which means that an interpretation can relate to one image only. A study or SmartPan stack is considered as a single image.

#### 8.9.4 Making an image capturing request

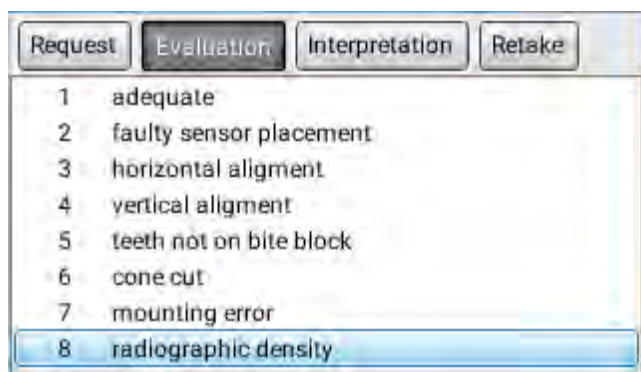
1. Select the reason for image capturing request.



2. Enter the number of images to be taken in the appearing dialog.



## 3. Evaluate the quality of the image.



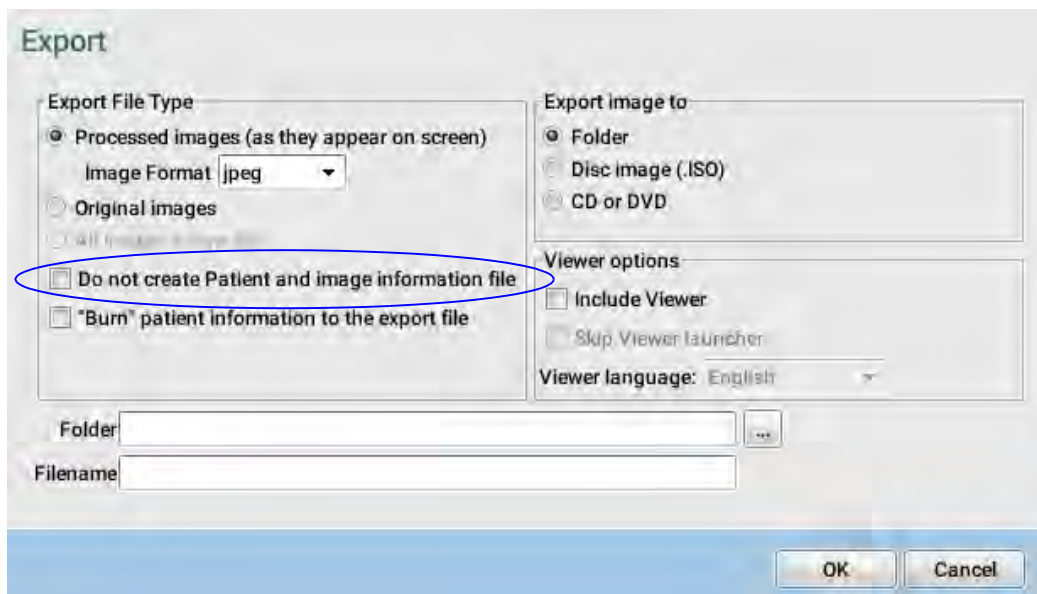
If needed select **Retake** to take a new image.

## 8.9.5 Exporting radiological interpretations



## 1. Click this button on the top toolbar.

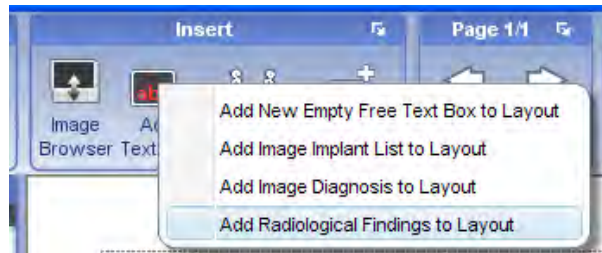
The following window opens.

2. Make sure the option *Do not create patient and image information file* is deselected.3. Click **OK**.

The findings and other parameters are added to a *.txt* file.

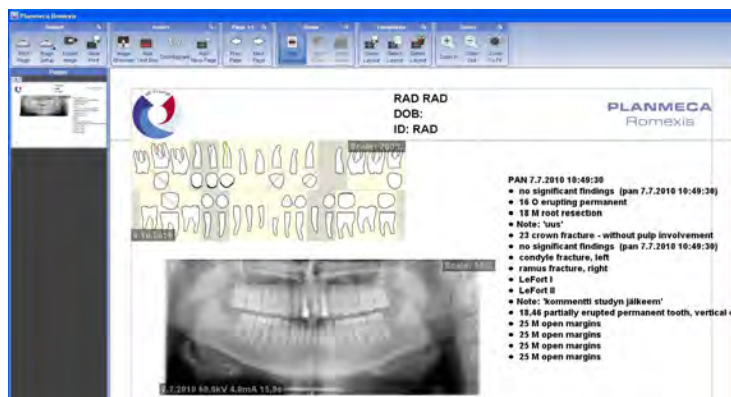
### 8.9.6 Creating and printing a report of radiological interpretations

To add findings of a selected image to a printable layout select *Add Text Box > Add radiological findings to layout*.



To insert the odontogram into a layout click the **Odontogram** button.

If the *Findings* view is selected in *2D imaging module* when print editor is open, the findings and the odontogram are automatically added to the layout.



## 8.10 Attachments

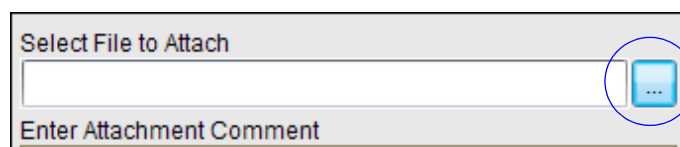


In the *Attachment* view you can add, export, launch or delete document attachments such as PDF and MS Word files etc.

The reports saved in the Planmeca Romexis Cephalometric Analysis module are automatically saved to *Attachments*.

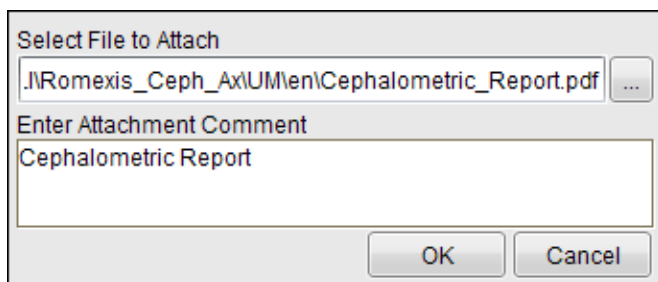
### 8.10.1 Adding attachments

1. To add an attachment go to the *Attachments* view.
2. Click the **Add** button.
3. Browse to the folder where the attachment is stored by clicking the square next to the *Select File to Attach* field.



4. Double-click the file or select the file and click **Open**.  
A comment can be added if desired.

- When finished click **OK**.



The attachment will now show on the *Attachments* view.



### 8.10.2 Viewing attachments

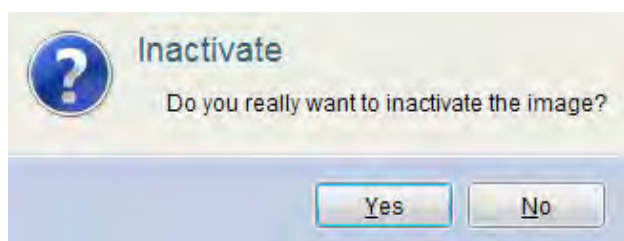
- Select the attachment and click **View**.
- The attachment will open in the program defined as the default program for handling the file type in question in the settings of your operating system.

### 8.10.3 Exporting attachments to disk

- Select the attachment from the list and click **Save**.
- In the opening folder select the location on the disk where you want to export the attachment.

### 8.10.4 Inactivating attachments

- Select the attachment from the list and click **Inactivate**.
- In the following window select **Yes**.



When the attachment is inactivated it disappears from Planmeca Romexis, but will remain in the image folder on the hard drive.

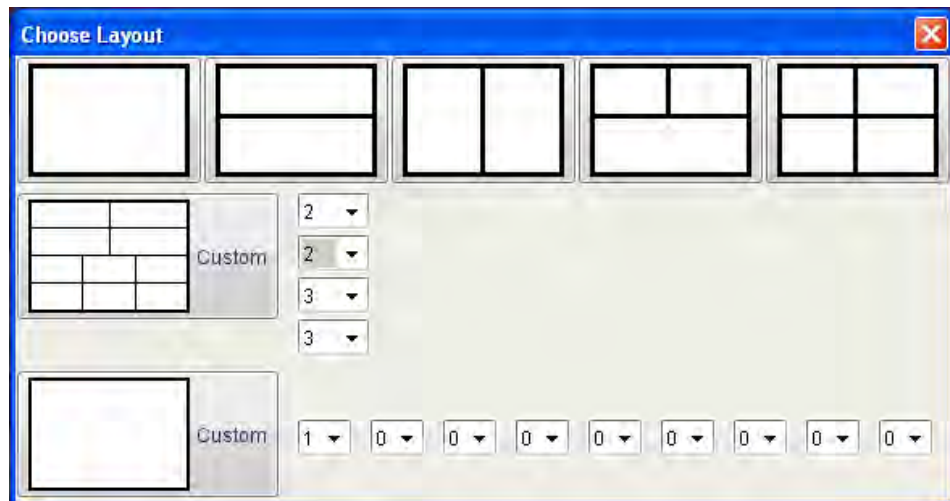
To permanently delete attachments, see section "Reactivate and empty trash" in the Planmeca Romexis technical manual (10037884).

## 9 SETTING THE LAYOUT

The opened and captured images automatically appear in the screen in their maximum size.

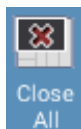


To arrange images opened in the Viewer into a temporary layout click this button.



The layout settings can be used to position multiple images for print layout. If you're using the same layout frequently, it is recommended to define and use a study template instead. On how to use studies see the previous sections and on how to define templates see section "Templates" in the Planmeca Romexis technical manual (10037884).

## 10 CLOSING ALL OPEN IMAGES



All open images can be closed by clicking this button on the top toolbar.

## 11 DICOMDIR MEDIA STORAGE

The DICOMDIR file format specifies a standard way to organize storage and retrieval of DICOM format file sets to and from offline storage such as a CD. A compatible DICOMDIR CD, for example, contains description and access information for all the studies on that CD. Planmeca Romexis supports both DICOMDIR import and export functions.

## 12 EXPORTING IMAGES

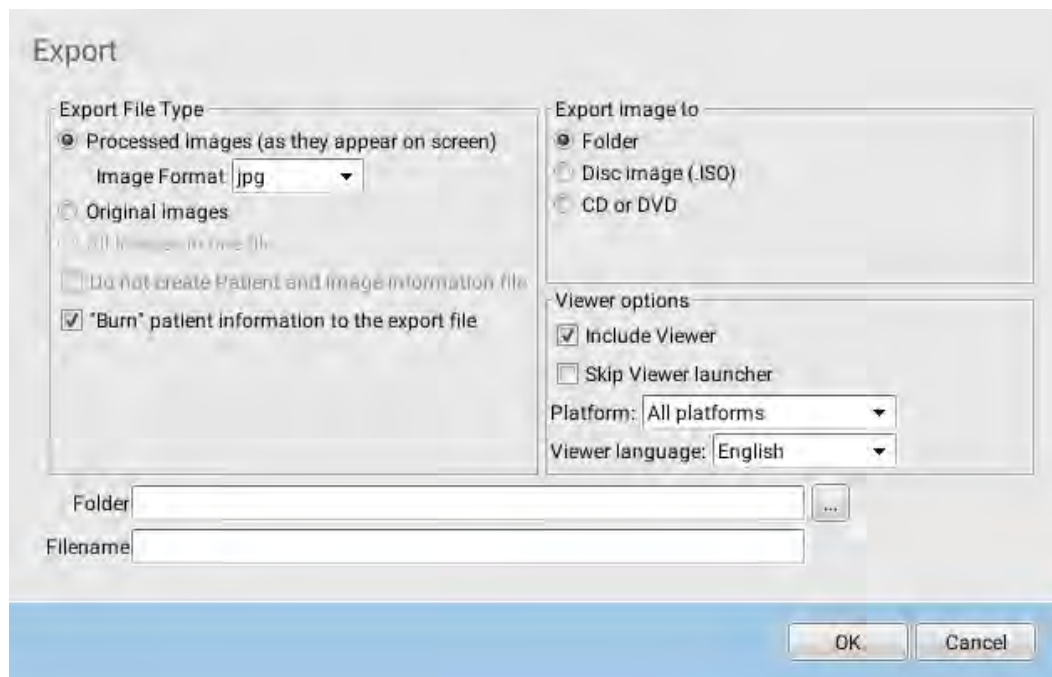


1. Open the image(s) or study that you want to export.
2. Click this button.
3. In the opening window select the appropriate options.

### NOTE

For a detailed description on export options see section 12.1 "Export options" on page 80.

4. To start the export click **OK**.



### 12.1 Export options

#### Export file type

- **Processed images**  
Export image(s) in 8 bit with all enhancements applied.  
Select the appropriate image format from the drop-down menu.
- **Original images**  
Export original image(s) (8 or 16 bits, depending on the original capturing mode).
- **All images in one file**  
Export multiple open images or a study as a single file.  
When exporting as multiple files (option not selected) a sequence number and file extension will be automatically added to the file name.



**NOTE**

By default the *File name* field is empty. To change the default setting to patient name see section "Person" in the Planmeca Romexis technical manual (10037884).

**NOTE**

To export all images select the view *All images in table* in the Image Browser, see section 8 "BROWSING 2D IMAGES" on page 61 or use DICOMDIR Export, see section 12.3 "DICOMDIR export" on page 83.

- Do not create patient and image information file.  
No image related text file will be created.
- "Burn" patient information to the export file.  
Attach the image information directly on the exported image.

**Export image to**

- Folder: Data is exported to a folder
- Disc image (.ISO): Data is exported to a CD/DVD disc image that can be written to a media using 3rd party CD/DVD writer software.
- CD or DVD: Data is written directly to a CD/DVD if a CD/DVD writer is installed.

**Viewer options**

- Include Viewer: Select to includes the Planmeca Romexis Viewer software in the export.
- Skip Viewer launcher: When exporting single image select this option for the Planmeca Romexis Viewer to open without displaying the patient selection dialog in the launcher.
- Platform: If you know on which platform the Viewer will be used, select the appropriate platform from the drop-down menu to optimize Viewer size.
- Viewer language: Set the default language for the exported Planmeca Romexis Viewer software.

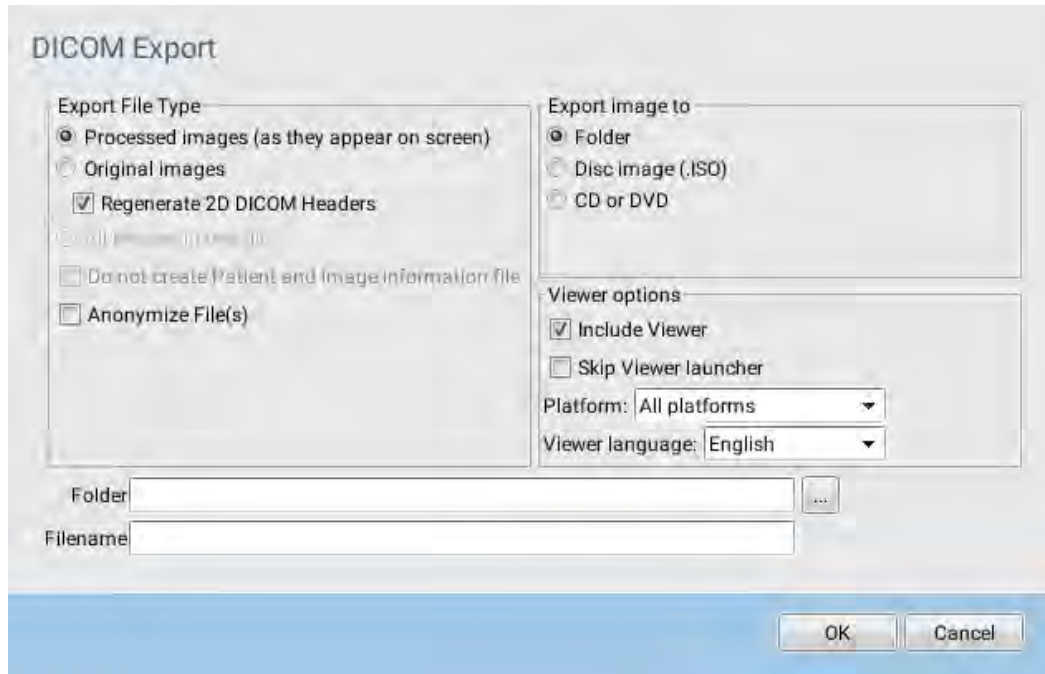


## 12.2 Exporting images using DICOM export



1. Open the images or study that needs to be exported.
2. Click this button.

The following window opens.



3. Select the suitable export options:

### Original images / Regenerate 2D DICOM Headers

If an image originally imported using DICOM import is been exported with DICOM export, a copy of the original imported file will be generated when *Original images* option is selected. However, by selecting the *Regenerate 2D DICOM Headers* option the DICOM header will be re-written as Planmeca Romexis image using the current information instead of the original.

### Anonymize file(s) option

Anonymizes the output file(s) so that any identifying information in the file headers' is cleared including patient ID, name, date of birth as well as accession and study numbers.

### NOTE

For detailed description of the other export options see section 12.1 "Export options" on page 80.

4. Click **OK** to start the export.

## 12.3 DICOMDIR export

DICOMDIR Export can be used to export a set of multiple patient files with patient data and images into a DICOMDIR file structure. A DICOMDIR Directory information file is saved as specified in the *Export To* dialog and all exported DICOM image files are stored into its adjacent sub-folder entitled *images*.

### NOTE

Before starting to use DICOMDIR export, make sure that you have the appropriate import and export permissions, see section "Groups" in the Planmeca Romexis technical manual (10037884).

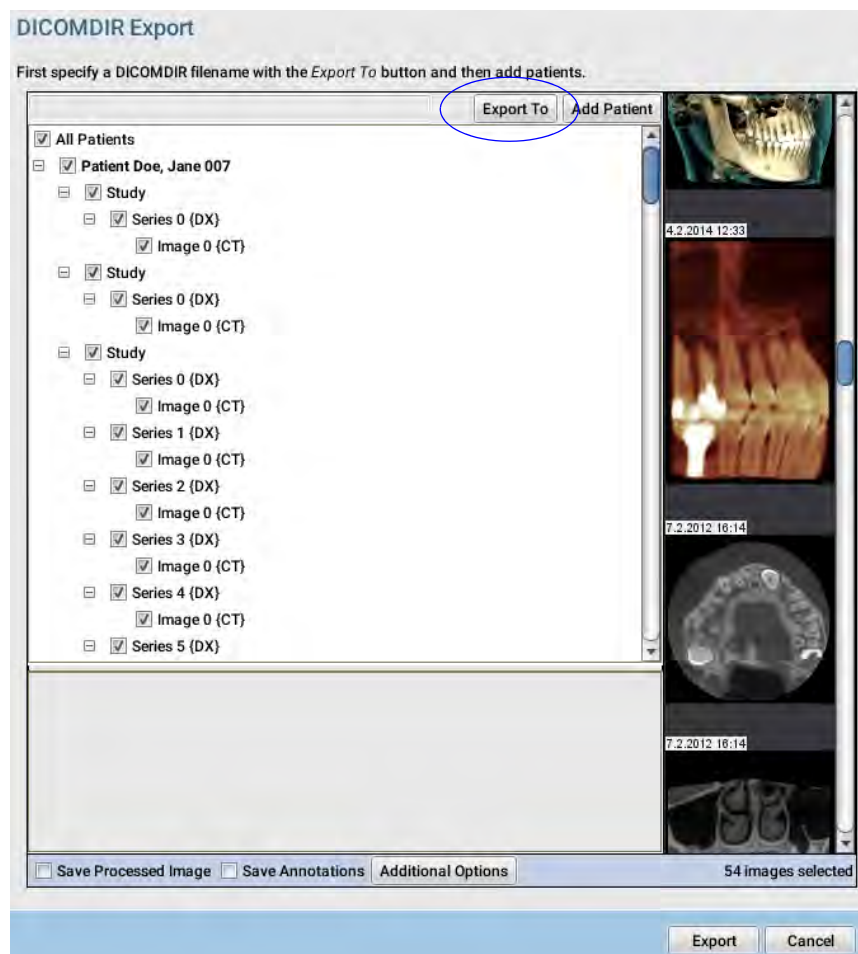


1. Click this button.

If no patient is selected, select *Export > DICOMDIR* from the *File* menu.



2. Click the **Export to** button to select the DICOMDIR file.



3. Browse to the correct folder and enter a file name for the new DICOMDIR file.
4. Add patients to the list by clicking the **Add Patient** button.
5. In the dialog that opens you can search and select a patient to be added into the DICOMDIR file.
6. To add a patient click on it in the list and click **OK**.

All the patients added into the DICOMDIR file will show in the list with all their studies and images in a hierarchical list.

You can browse the item DICOM tags and thumbnails by highlighting an item and referring to the bottom and right edges of the dialog.

To include or exclude options from the final DICOMDIR file check/uncheck the box next to each item.

### **Save processed image**

Images are exported with all processing merged into the image.

### **Save Annotations**

Images are exported with all annotations added in Planmeca Romexis.

## **12.3.1 Additional options**

### **Regenerate 2D DICOM headers**

Enables DICOM headers rewriting using the newest information in database.

### **Anonymize file(s)**

All patient information is removed from the exported DICOM image(s).

### **Export with Romexis Viewer**

A copy of Planmeca Romexis Viewer is exported into the same folder with the DICOMDIR file-set. The contents of the export folder can then be written on a CD using any 3rd party tools and passed on to a customer or referrer.

### **NOTE**

**DICOMDIR file-sets can be opened in Planmeca Romexis Viewer version 2.0 and later.**

When forwarding the DICOMDIR file-set, make sure to include the DICOMDIR Directory information file specified in the Export To dialog and the adjacent \images sub-folder.

### Export DICOMDIR and Romexis Viewer as ISO image

A CD ISO image file that can be written to a CD using any 3rd party CD writer utility is created. Normally double clicking on the exported ISO image file will start the 3rd party CD writing utility if correctly installed. In case *Burn image(s) and Planmeca Romexis Viewer to CD* does not work on your computer use this option.

### Burn DICOMDIR and Romexis Viewer to CD

Allows writing the DICOMDIR file and a copy of the Planmeca Romexis Viewer directly onto a CD. Make sure you have an empty writeable media in the drive before using this option.

### Platform

By selecting the platform shrinks the size of the Viewer package.

### Language

Select the language of the Romexis Viewer interface.

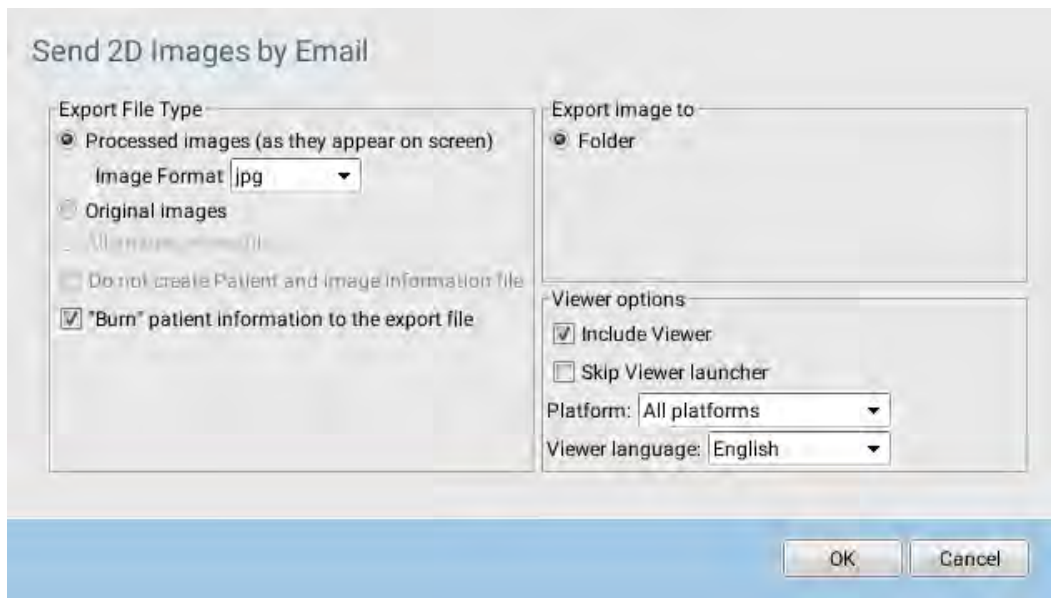


## 13 SENDING 2D IMAGES BY EMAIL

1. From the *File* menu select *Email* > Send 2D images by email.



2. In the following window select the appropriate export options and click OK.



The email service that has been set as your default email will open and the images will be automatically added as attachments.

### NOTE

For detailed description of the other export options see section 12.1 "Export options" on page 80.

## 14 PRINTING IMAGES WITH PRINT EDITOR



The print editor can be used for printing 2D and 3D exposures, photos and DICOM images.

Multiple images of different image types can be added on a single layout. The images can be scaled in size and cropped labels added to the layout.

### 14.1 Creating print pages

1. Click the **Print editor** button.

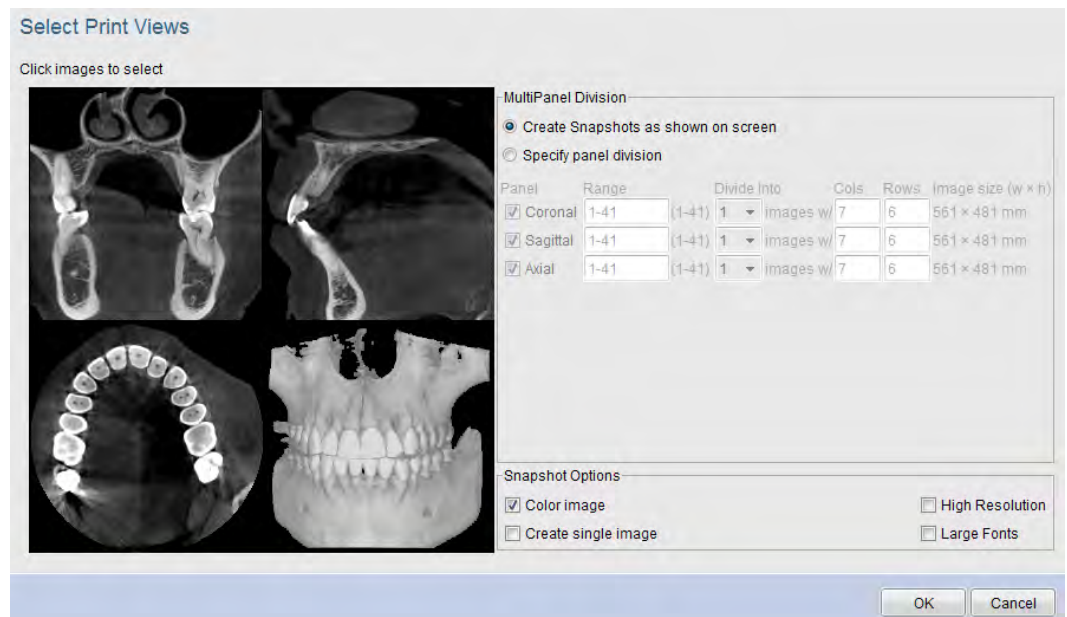
The opened 2D images open directly in the Print editor.

2. Click on the images to include in / delete from the printout.

- To create a print page where images are positioned as in the current screen select **Create snapshots as shown on screen**.
- To specify how the images are divided on the page select **Specify panel division** and enter values for layout.

For more information see section 12.12.1 “MultiPanel division” on page 320.

3. Select the desired snapshot options.
4. Click **OK**.



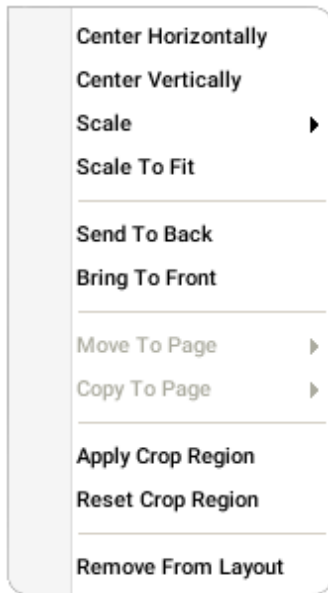
The images open in Print editor.

If necessary adjust the layout by dragging and dropping the images.

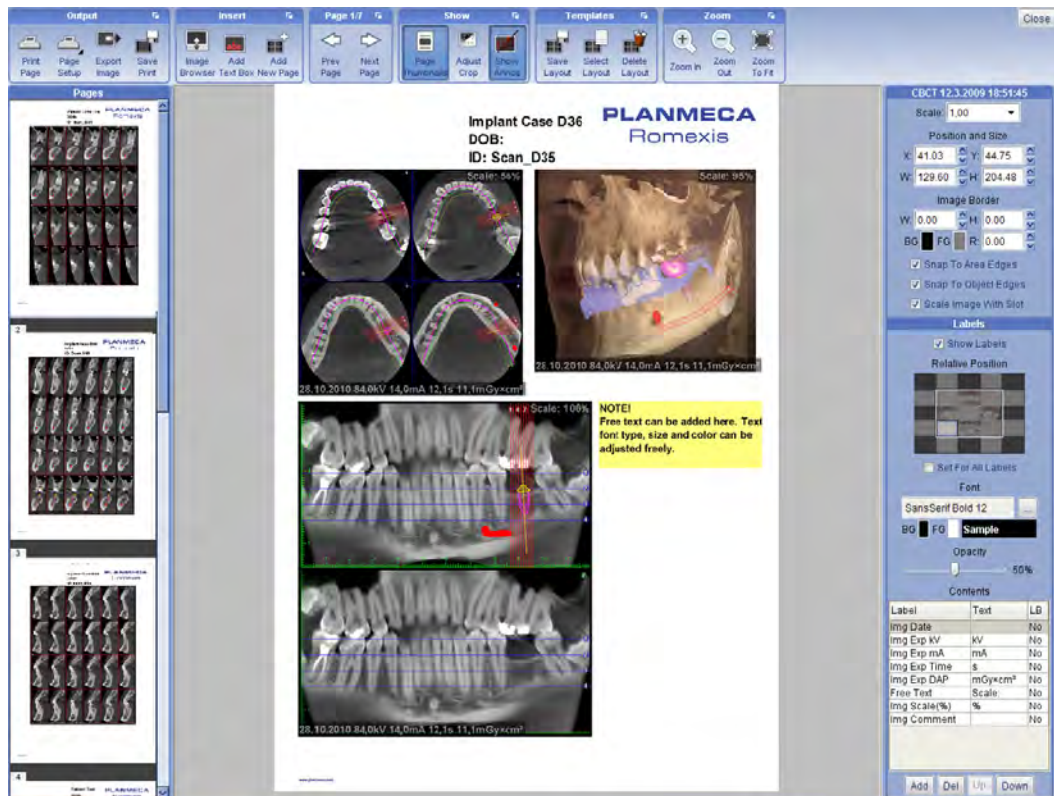
To resize the image drag it from its corners.



To open a shortcut list for layout adjustments right-click the image.



Use the scroll bar or click the thumbnails to browse pages.

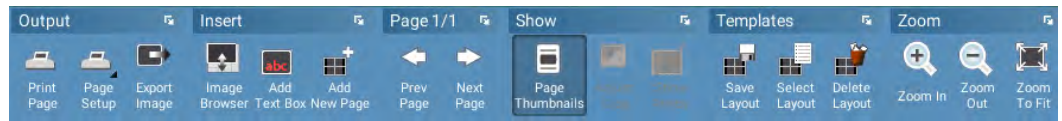


When finished click this button to print the pages.



## 14.2 Using print editor tools

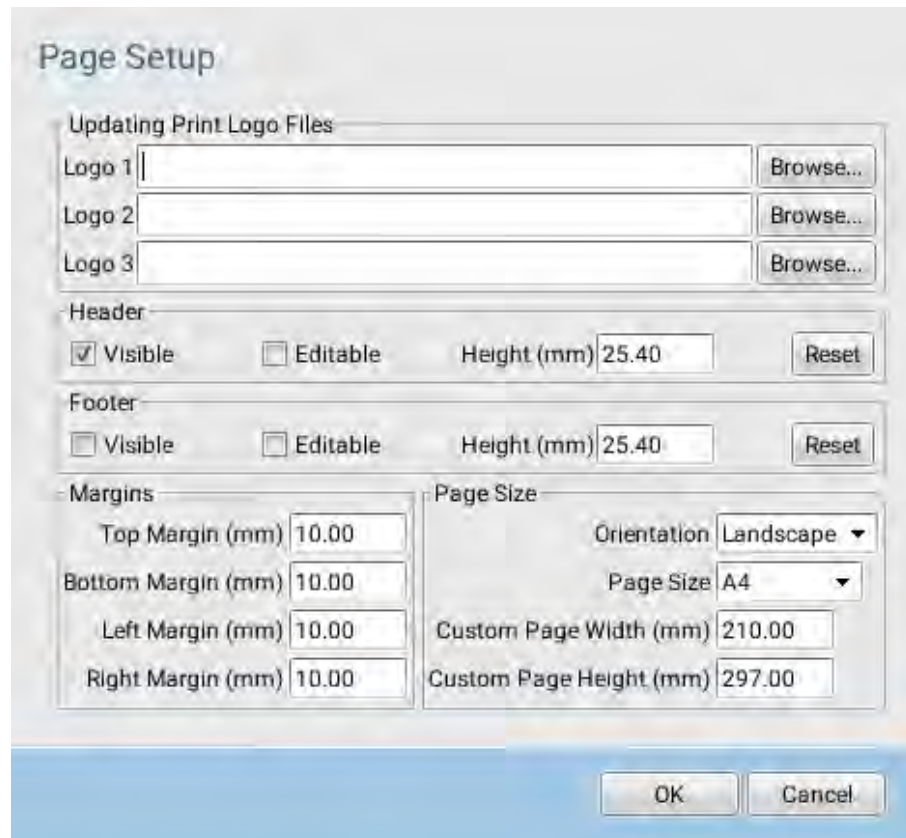
The toolbar on top consists of tools for printing and viewing of print layouts.



### 14.2.1 Setting up print page



1. Start page setup by clicking this button.
2. In the following window you can
  - Browse for logos to be added to the printout
  - Hide or show the header and footer, set them visible, editable and define their height. To reset the default settings click **Reset**.
  - Define the page margins
  - Set the page orientation, size, and define the custom width and height of the pages.



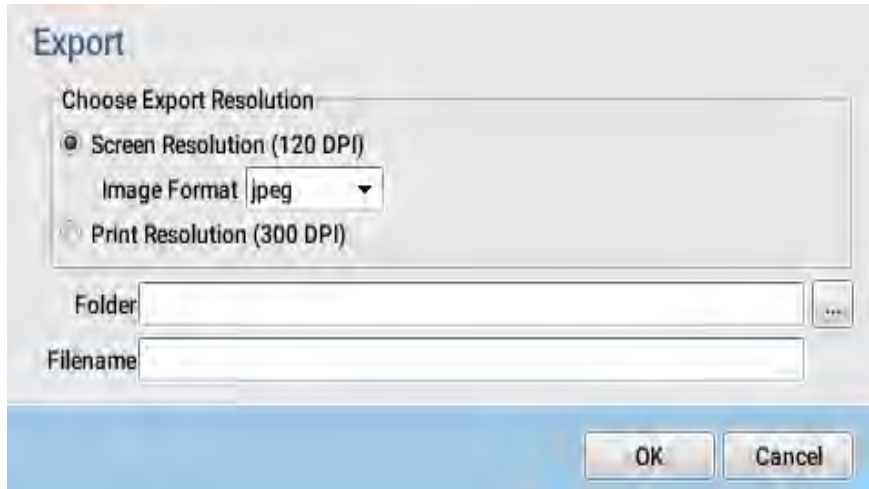
After defining print settings in *Page Setup* window click this button to start the printing.



Saves current print pages as non-editable snapshots into *Imaging* module under photo category. Prints can be recreated by adding snapshots to a new print page in 100% scale.



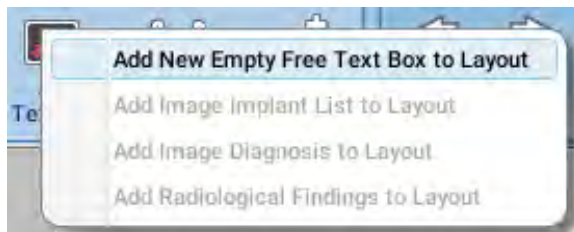
- The layout can be exported as a regular image to the hard disk as follows
1. Click this button.
  2. Select screen resolution, image format, print resolution and export folder and enter file name.
  3. Click **OK**.



To add images into the layout click this button and double-click the desired image in the browser.



Click this button and select the text box type.

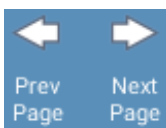


Click on the image where you want to add the text. Type the text to the opening window and click *OK*.

To edit the text later select the text with the *Select annotations* button (see below) and then double-click the text. Edit the text and click *OK*.



- To add new pages to the layout click this button and add
- an empty page with no predefined image slots
  - a copy of the current page and its predefined image slots e.g. to create multiples pages with same layout.



Move to previous or next page in a multi-page layout.



Show/hide the page thumbnails



To crop images in the printout, select the desired image and click **Adjust crop** tool. Draw the crop region with mouse and apply crop from the right-click menu. To cancel cropping right-click the image and select *Reset crop region*.



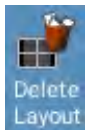
Show / hide annotations from the printout by clicking this button.



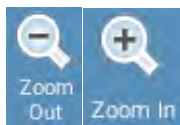
The layouts can be saved for future use as *Named* or *Default* template. The default layout will open every time the Print editor is opened whereas the named layout can be restored from the layout list. The image is inserted into an template slot for the respective image type if existing in the layout.



A saved layout can be opened by clicking this button and selecting the layout from the list. To add images into template double-click the images from image browser.



Click this button and select the layout to be deleted from the list.



The print layout can be zoomed in and out by using the **Zoom In** and **Zoom Out** buttons.



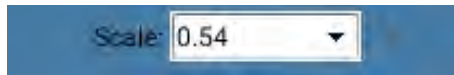
To fit the image to the view to view click this button.

### 14.3 Adjusting images on the layout

The vertical toolbar can be used to adjust the size, position and labels of the images. As the adjustments in the vertical tool bar are image specific it only shows when an image is selected.

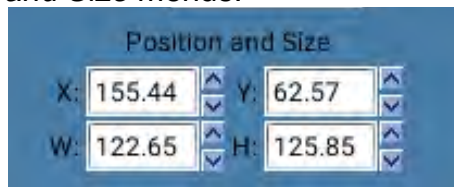
#### Scale

To scale the image select the appropriate scale value from the drop-down menu.



#### Position and size

To change the position of an image on the layout drag the image to a suitable position or type/select the desired location (X, Y) from the *Position and Size* menus.



#### Image border

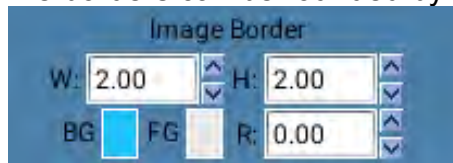
Borders can be added to each image in the print layout.

To change the border size type or select the desired width (W) and height (H).

To change the border fill colour click **BG** and select the desired colour.

To change the border edge colour click the **FG** field.

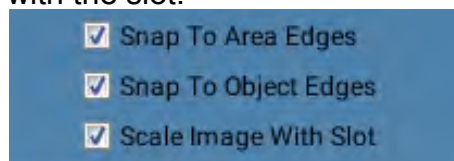
The borders can be rounded by typing / selecting the desired radius (R).



#### Moving images in the layout

By selecting *Snap to area /or object edges* the image is attached to its nearest edges on the print area.

With *Scale image with slot* option the new image is automatically scaled with the slot.



## Labels

The labels can be hidden by deselecting the *Show Labels* option.

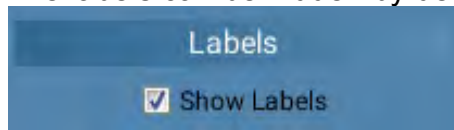


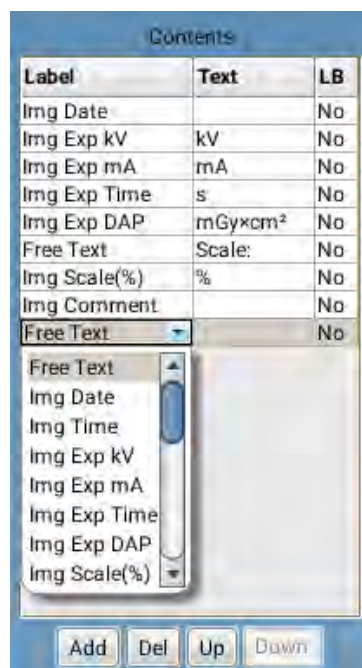
Image labels can be added, edited and deleted from the *Contents* table.

To add a label to a new label row click the **Add** button and select the label type from the drop-down menu.

The text field includes text that is added to the layout after the image property data of the selected label. I.e the text field of the label *Img Exp mA* adds the string "mA" after the image exposure mA, e.g. "10 mA".

To add a line brake after the label row click the *LB* field on the label row. The line brakes can be used if several labels are added to the same area on the layout.

To delete a row select it and click **Del**.



To move a row up and down in the table select the row and click **Up** or **Down**.



When the label is selected from the *Contents* table, its opacity, background (BG) and foreground colour (FG), text font and relative position in the layout can be defined.

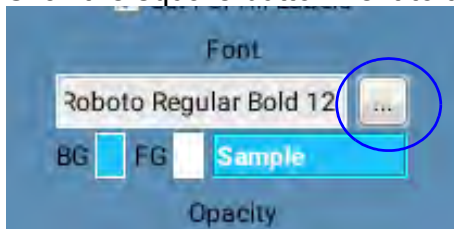
To select the relative position in the layout click on the grey fields of the layout preview.

The changes in the labels show on the print editor layout.

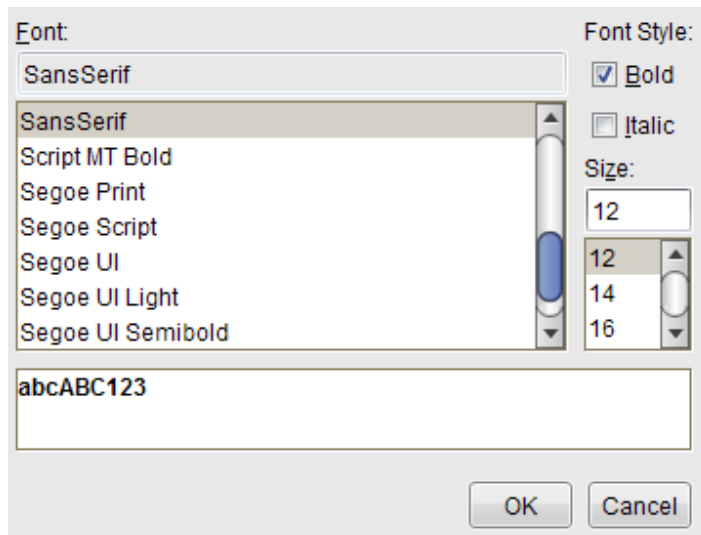


### Editing font

1. Click the square button next to the *Font* field.



2. Select the suitable font, font style and size and click **OK**.









## 15 DICOM STORAGE (OPTIONAL)

With DICOM Full license images can be sent to a remote DICOM application, i.e. DICOM image archive PACS. DICOM Storage needs to be configured in the *Admin* module before the DICOM storage can be used, see section "DICOM storage setup" in the Planmeca Romexis technical manual (10037884).

1. Open the image you want to store.
2. Click the **DICOM storage** button.
3. Click **OK** in the opening dialog.



To check the status of storage transaction, use the *Image Properties* dialog.

DICOM Storage Commitment is also shown in the *Image Properties* dialog next to the storage status. When DICOM Storage is enabled, storage of a single image can be cancelled in the *Image Properties* dialog.

### NOTE

Images can also be automatically stored after capturing, see sections "DICOM configuration" and "External communication" in the Planmeca Romexis technical manual (10037884).

## 16 TRANSFERRING IMAGES TO EXTERNAL APPLICATIONS



Open the image to transfer and click **Launch ext. app.** on the top toolbar. Brightness, contrast, thickness and the position of the image are automatically saved when the image is closed. The currently displayed views can also be saved.

## 17 CLOUD EXPORT

Planmeca Romexis Cloud is a subscription based service integrated into Planmeca Romexis and can be used to transfer images and documents between Planmeca Romexis users. All transfers between account users are encrypted so the users cannot see cases of other users.

To use the cloud export, user account is required. To setup an account see section “Cloud (user account setup)” in the Planmeca Romexis technical manual (10037884).

For more information visit: <http://online.planmeca.com>.

### NOTE

**Planmeca Romexis Cloud is not an image storage or archival service.**

With Cloud Export image(s) and documents can be sent to a recipient who may or may not have Planmeca Romexis installed.

### NOTE

**Sending cases requires an active Planmeca Romexis Cloud subscription or a recipient who accepts reverse charges.**

### 17.1 Downloading and uploading cases using Planmeca Romexis Cloud

#### NOTE

**For receiving and downloading cases in Planmeca Romexis a cloud user account is required. On how to setup an account see section "Cloud (user account setup)" in the Planmeca Romexis technical manual (10037884).**

Select the case on the *Cloud Cases* list.

The screenshot displays the Planmeca Romexis Cloud Management interface. At the top, it shows 'Patient Management > Cloud Management' and the Planmeca Romexis logo. Below this, there are two main sections: 'Cloud Management' and 'Moore Amanda - 200'. The 'Cloud Management' section includes a search bar and a list of 'Cloud Cases' with columns for Patient, Sender, and Date. The 'Moore Amanda - 200' section shows a detailed view of a case, including a timeline of messages and actions. The timeline shows messages from 'svea.dentist@gmail.com' and 'joe.dentalclinic@gmail.com' with timestamps and content. The interface also includes buttons for 'Cloud Export' and 'Reply to Case'.

The progress for the case that is currently being downloaded / uploaded is shown.



Once the download is completed the case can be opened.








Open the case by clicking on it.

The cases are stored in Cloud for thirty days after which they are automatically deleted.

An icon next to a case indicates the latest action concerning the case.



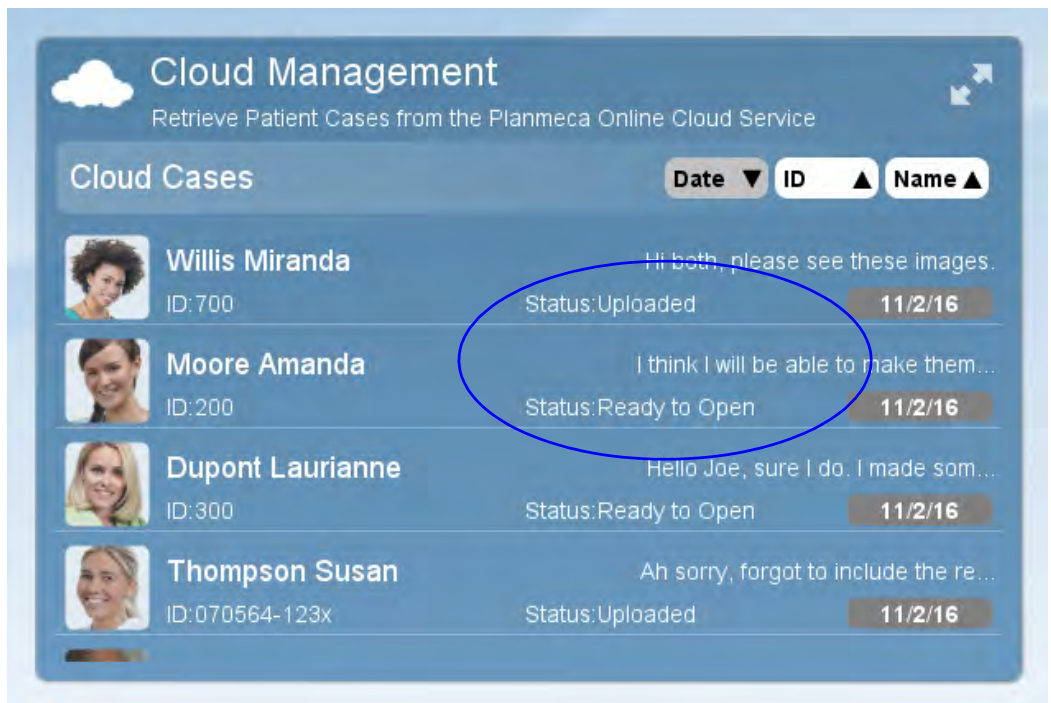
The statuses are as follows.

-  • Received unopened case ready for download at local Planmeca Romexis server.
-  • Unsuccessfully sent (or received) case.
-  • Case sent to the cloud to be downloaded to local Planmeca Romexis server.
-  • Case sent as a reply to a received case
-  • Received and opened case
-  • Sent case the recipient has not yet opened
-  • Sent case the recipient has opened

You can follow the upload progress on the case list.



You can follow the status of the case in the *Cloud Cases* list.

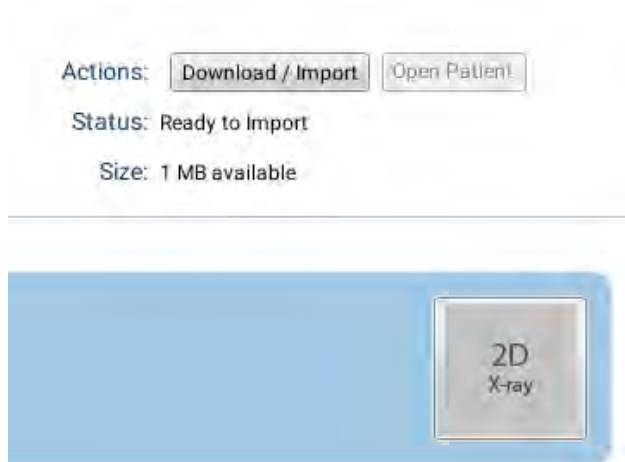


### 17.1.1 Using Download/import and Open Patient buttons

#### Automatic download of cases

The Romexis can be set so that it automatically downloads new cases from the server. For more information on how to do this see Planmeca Romexis Configuration Application in Technical manual. In this case the **Download/Import** button of a case is inactive because the data has already been downloaded if the software has already had time to download all the cases. Note, however, that if for example several consecutive cases have been uploaded to the server you may need to click on the **Download/Import button** to make sure all data will be downloaded.

When the case has been received but the data has not yet been downloaded the generic image thumbnail (in this example 2D X-ray) is shown.



Open Patient

- If the patient in question is not already found in the Romexis database the **Open patient** button is disabled. Once the data is loaded a new patient is created when needed. The **Open patient** button is enabled and the patient can now be opened by clicking on the button.
- If the patient is found in the database the **Open patient** button is enabled. However, if you click on the **Open patient** button without first downloading the data the patient is opened without the new data.





If Romexis is unable to define whether the patient can be found in the database or not you need to select manually the patient for which the data is imported.

The screenshot displays the PLANMECA Romexis Cloud Management interface. The top navigation bar includes 'Patient Management > Cloud Management' and the PLANMECA Romexis logo. Below the navigation, there are buttons for 'Cloud Export' and 'Reply to Case'. The main content area is divided into two sections:

- Cloud Cases:** A list of cases with columns for Patient, Sender, and Date. The list includes:
  - Moore Amanda - 200 (Sender: svesa.dentlab@gmail.com, Date: 11/2/16)
  - Duport Laurianne - 300 (Sender: rrosrablogists@gmail.com, Date: 11/2/16)
  - Thompson Susan - 070564-123x (Sender: joe.dentalclinicloggs@gmail.com, Date: 11/2/16)
  - Mathews George - 999 (Sender: rrosrablogists@gmail.com, Date: 11/1/16)
  - Svensson Anna - 567894 (Sender: svesa.dentlab@gmail.com, Date: 10/31/16)
  - Johansson Pia - 500 (Sender: svesa.dentlab@gmail.com, Date: 10/31/16)
  - Chang Lucy - 008 (Sender: joe.dentalclinicloggs@gmail.com, Date: 10/31/16)
  - Doe John - 014 (Sender: joe.dentalclinicloggs@gmail.com, Date: 10/31/16)
  - Mathews George - 999 (Sender: joe.dentalclinicloggs@gmail.com, Date: 10/17/16)
  - Piaf Amandine - 400 (Sender: joe.dentalclinicloggs@gmail.com, Date: 10/17/16)
- Moore Amanda - 200:** A detailed view of the selected case, showing:
  - From: svesa.dentlab@gmail.com
  - To: joe.dentalclinicloggs@gmail.com
  - Created: 11/10/2016 16:21 | Last Update: 2/11/2016 16:27
  - Actions: Download Images, Open Patient
  - Status: Ready to Open | Size: 1 MB
  - Timeline of messages:
    - 2/11/2016 16:27: svesa.dentlab@gmail.com: "I think I will be able to make them by the end of this month. I updated the smile design based on your comments."
    - 2/11/2016 16:25: joe.dentalclinicloggs@gmail.com: "Oh thanks Svesa! I modified the plan a bit, see attached."
    - 2/11/2016 15:31: svesa.dentlab@gmail.com: "I made a bit of smile design, how does it look like? See also the written description."
    - 11/10/2016 16:21: joe.dentalclinicloggs@gmail.com: "Here another patient of mine. How fast do you think you could deliver the restorations?"

## 17.2 Planmeca Romexis Cloud user requirements and rights

### NOTE

The information regarding Cloud users and requirements are subject to change. For latest information see [Planmeca Online website](#).

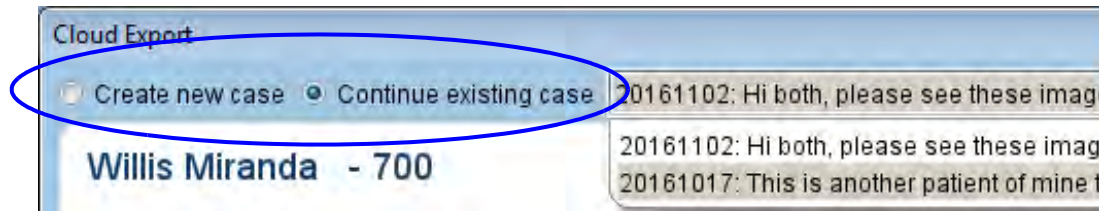
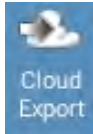
		Casual user	Planmeca Online account holder	Planmeca Romexis Cloud subscriber
What you need	Internet access and e-mail address	X	X	X
	Free Planmeca Online account		X	X
	Planmeca Romexis 3.1.0.R or newer		X	X
	Subscription to Planmeca Romexis Cloud (monthly fee, credit card required)		X	X
What you get	Able to receive images and documents over the internet		X	X
	Able to send and receive images and documents (referrals, reports etc.) over internet		X	X
	Planmeca Viewer + image packages downloaded from e-mail links	X	X	X
	Replace DVDs with online transfers	X	X	X
	Secure transfer and storage for 30 days of patient data in the Cloud	X	X	X
	Automatic notifications of new cases by e-mail.	X	X	X
	Download cases directly in Planmeca Romexis		X	X
	Manage received cases in Planmeca Romexis		X	X
	Send cases (images + documents) to other users directly in Planmeca Romexis			X
	Manage sent cases in Planmeca Romexis			X



## 17.3 Sending cases using Planmeca Romexis Cloud service

### Via Cloud Export button on top toolbar

1. Open a patient or a patient's image in 2D, 3D, or CAD/CAM module.
2. Click on the **Cloud Export** button on the top toolbar.
3. In the opening window select whether to create a new case for that patient or continue an existing one.



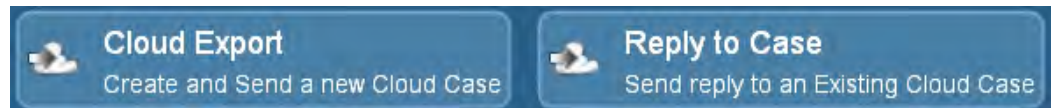
or

### Via Cloud Management

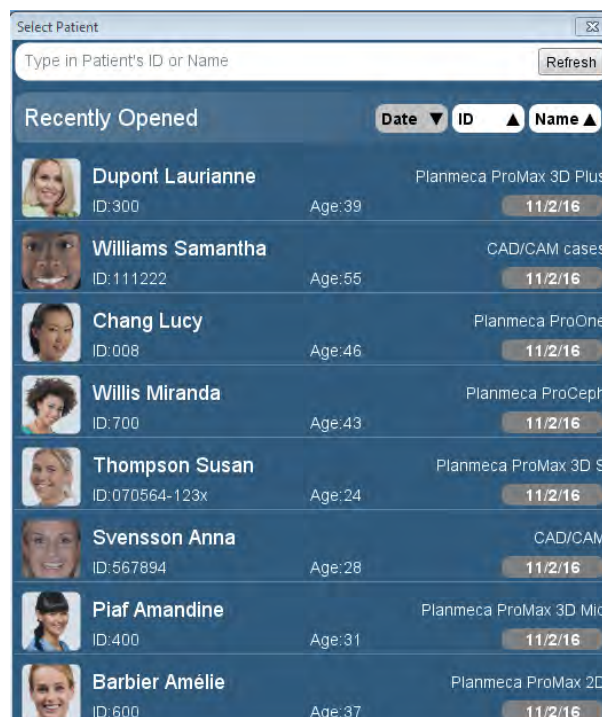
To create a new case click on the **Cloud Export** button

or

To reply to a previously created case select the case and click on the **Reply to case** button.



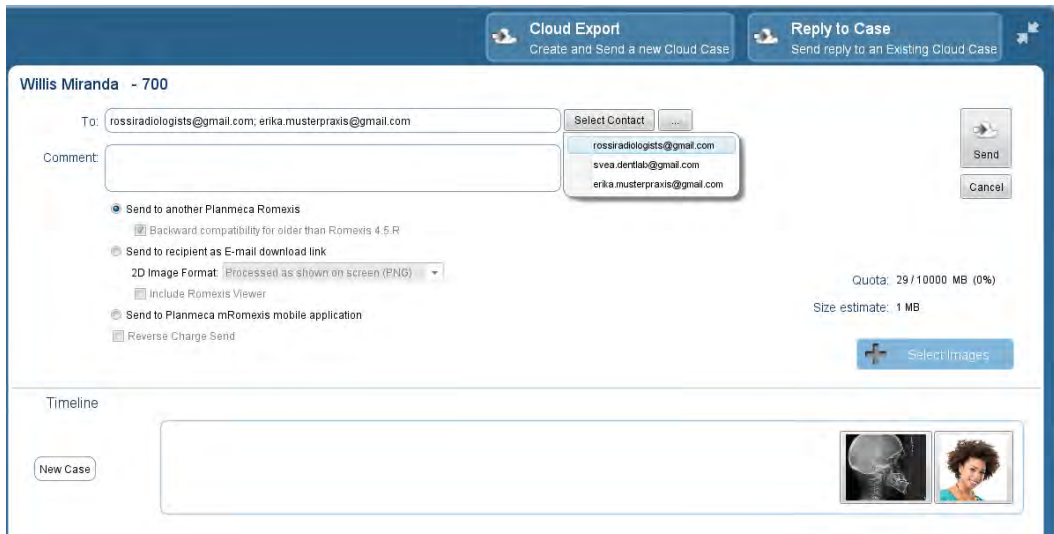
4. Select a patient from the list.



If there are previous Cloud cases with the patient’s data, you can reply to an existing case by clicking on the **Reply to case** button or create a new one by clicking on the **Cloud Export** button.

As the former recipients’ contact information is automatically saved to *My Contacts* list you can select previous contacts by clicking on the **Select Contact** button.

To send the case to a new recipient click on the button with three dots. See also section 3. "Add the returned contact(s) to your contacts by selecting the contact(s) and clicking this button." on page 109.



5. In the *Comment* field add any case related information.



6. Click on **Select Images** button

7. Select the files you want to send and click **Update case**.



**NOTE**

For the attachments to show in the file selection window they must be added to the to the 2D imaging module's Attachments view (see section 8.10 "Attachments" on page 77 for more information.)

**NOTE**

If you are sending a case containing several types of data to Romexis version older than 4.5. the data will appear in the case list as several cases.

- After having added all the necessary data click on the **Send** button.

The case will be uploaded to the cloud for the recipient for later download. An automatic e-mail will be sent to the recipient when there is a new case available for download.

You can continue using Romexis while the case uploads.

To check the status of the transfer and open the uploaded cases go to *Cloud Management*.

The sent and received cases will appear as a list under Cloud Management.

The correspondence chain will appear in the *Timeline* field.

The screenshot displays the Planmeca Romexis Cloud Management interface. The top navigation bar shows 'Patient Management > Cloud Management' and the Planmeca Romexis logo. Below the navigation, there are buttons for 'Cloud Export' and 'Reply to Case'. The main content area is divided into two sections: 'Cloud Cases' and 'Case Details'.

**Cloud Cases:** A list of cases with columns for Patient, Sender, and Date. The cases listed are:

- Moore Amanda - 200 (Sender: svea.dentiac@gmail.com, Date: 11/2/16)
- Dupont Laurianne - 300 (Sender: rostradioclogga@gmail.com, Date: 11/2/16)
- Thompson Susan - 070564-123x (Sender: joe.dentiacinclogga@gmail.com, Date: 11/2/16)
- Matthews George - 999 (Sender: rostradioclogga@gmail.com, Date: 11/1/16)
- Svensson Anna - 567894 (Sender: svea.dentiac@gmail.com, Date: 10/21/16)
- Johansson Pia - 500 (Sender: svea.dentiac@gmail.com, Date: 10/21/16)
- Chang Lucy - 008 (Sender: joe.dentiacinclogga@gmail.com, Date: 10/17/16)
- Doe John - 014 (Sender: joe.dentiacinclogga@gmail.com, Date: 10/17/16)
- Matthews George - 999 (Sender: joe.dentiacinclogga@gmail.com, Date: 10/17/16)
- Piaf Amandine - 400 (Sender: joe.dentiacinclogga@gmail.com, Date: 10/17/16)

**Case Details (Moore Amanda - 200):** This section shows the email header and a timeline of messages. The email header includes 'From: svea.dentiac@gmail.com', 'To: joe.dentiacinclogga@gmail.com', 'Created: 11/10/2016 16:21', and 'Last Update: 2/11/2016 16:27'. The timeline shows the following messages:

- 2/11/2016 16:27: A message from svea.dentiac@gmail.com with the text: 'I think I will be able to make them by the end of this month. I updated the written design based on your comments.'
- 2/11/2016 16:25: A message from joe.dentiacinclogga@gmail.com with the text: 'Oh thanks Svea! I modified the plan a bit, see attached.'
- 2/11/2016 15:31: A message from svea.dentiac@gmail.com with the text: 'I made a bit of smile design, how does it look like? See also the written description.'
- 11/10/2016 16:21: A message from joe.dentiacinclogga@gmail.com with the text: 'Here another patient of mine - How fast do you think you could deliver the restorations?'

### 17.3.1 Using sending options

#### Send to another Planmeca Romexis

When exporting to another Planmeca Romexis application select from the following options as follows:

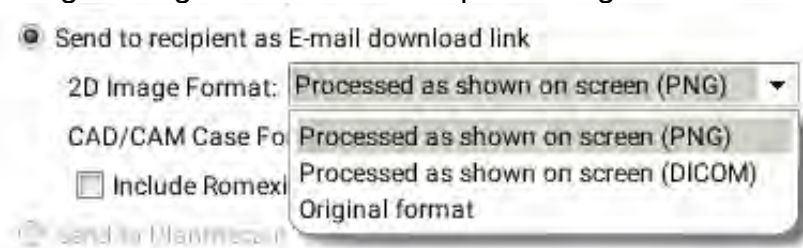
- When sending a new case:  
You may leave the backward compatibility option checked (disabled by default) as the entire case must be sent.
- When recipient is using the Romexis version 4.5.R or newer:  
It is recommended to leave the backward compatibility option unchecked. This reduces the size of the export package as only the new or changed data is exported and automatically combined to the previously sent data.
- When sending a case to Romexis versions older than 4.5.R  
or
- Romexis version of the recipient is unknown:  
Check the backward compatibility option as the entire case must be sent so that the recipient's Romexis version is able to process the received data correctly.



#### Send to recipient as email download link

##### 2D image format

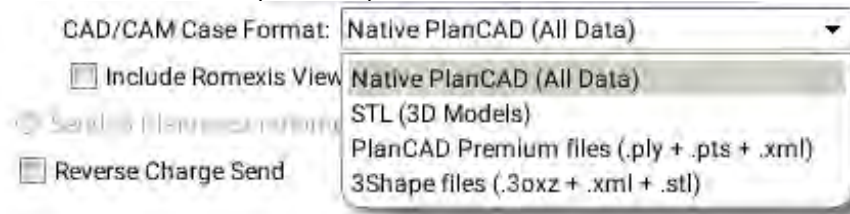
- Processed image in png format
- Processed image in DICOM format
- Image in original format without processing



CAD/CAM case format

If sending from the CAD/CAM module select also the suitable export format:

- STL (3D models only as STL files)
- PlanCAD Premium files (.ply + .pts + .xml)
- 3Shape files (.3oxz + .xml)
- Native PlanCAD (all data)

**NOTE**

CAD/CAM export to 3Shape Dental System™ 2015 in .3oxz format is compatible with 3Shape Dental System 2015 software version 15.5.0. Ditching models in Planmeca PlanCAD® Easy before export is required.

**NOTE**

If Lab Files option is selected, the dialog the E-mail download link option is automatically selected as lab files cannot be imported to Planmeca Romexis by the recipient. However the recipient can download the zip and use Lab Files in 3rd party software.

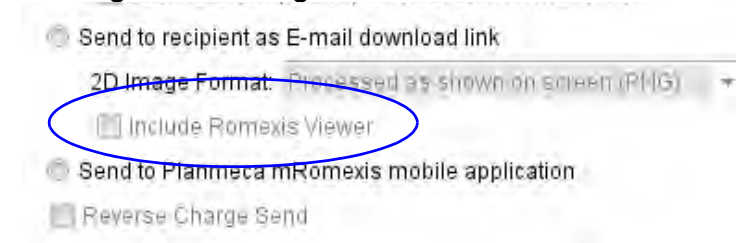
**NOTE**

To save the enhancements to 2D images before upload select *Permanently apply processing to uploaded 2D images*.

Include Romexis Viewer

Enable this option if the recipient does not have Planmeca Romexis installed but wishes to view the case in Planmeca Romexis Viewer installed on computer.

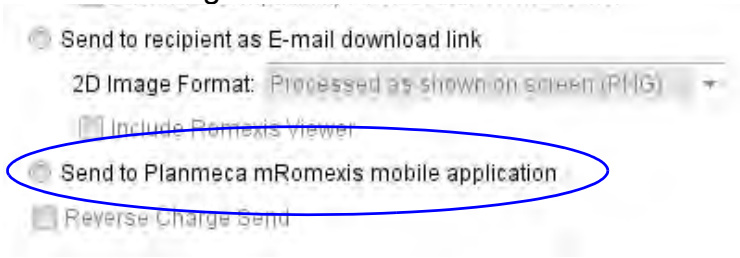
This option selected the recipient does not need any version of Planmeca Romexis or Viewer in order to view the case. This option is closest to creating and sending a Planmeca Romexis Viewer DVD.





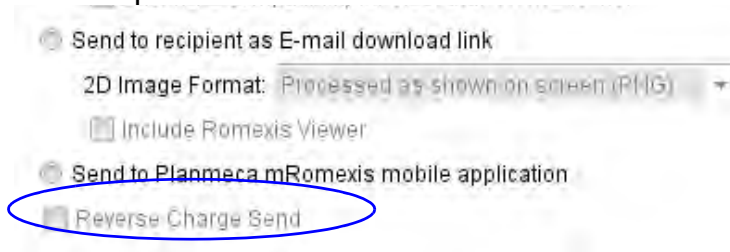
### Send to Planmeca mRomexis

By selecting this option the data is sent in mRomexis compatible format. As mRomexis can only receive 2D images the exported images are converted to 8-bit 2D images.



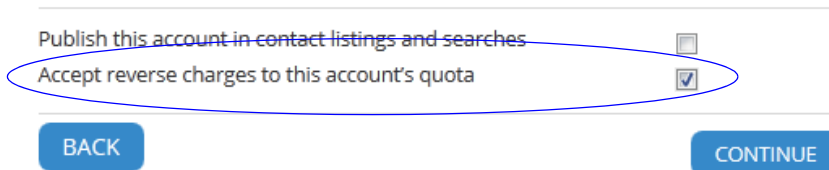
### Reverse charge send

If the recipient has accepted reverse charges sending option in Planmeca Online account settings, the **Reverse charge send** button becomes active and the case to be sent is automatically counted towards the recipient's transfer quota instead of the sender's.



This option can be enabled on the Planmeca Online My Account management page at <http://online.planmeca.com/> by checking the accept reverse charges option.

### Account Details



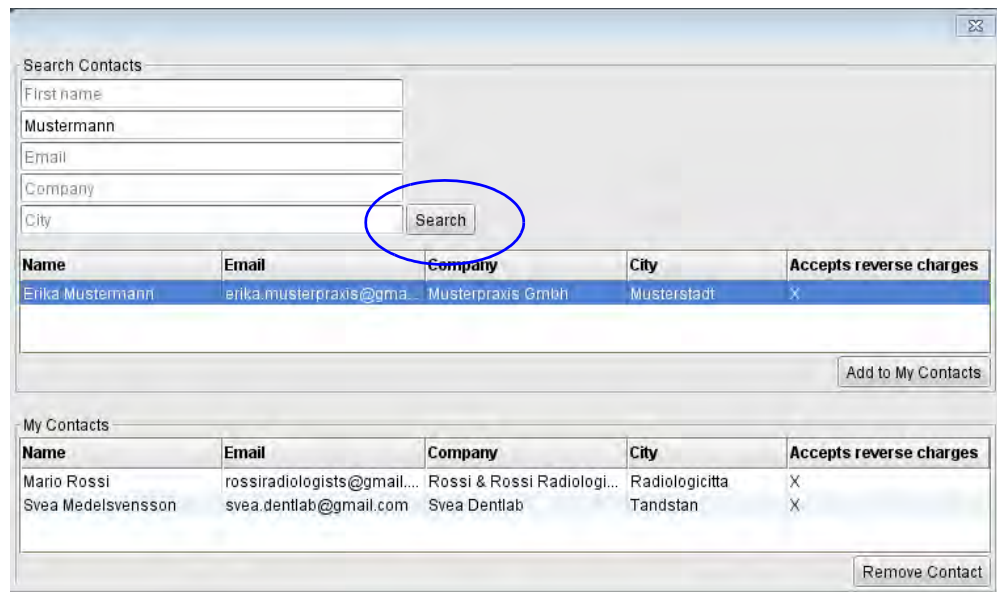


### 17.3.2 Searching other Planmeca Online users

1. Click on the button with three dots next to the recipient field.



2. In the opening window enter your search criteria and click **Search**.



For the users to be visible in searches for other Planmeca Online users they must publish their account by browsing to Planmeca Online My Account page at <http://online.planmeca.com/> and check this option.

#### Account Details

Publish this account in contact listings and searches

Accept reverse charges to this account's quota

BACK CONTINUE

Add to My Contacts

3. Add the returned contact(s) to your contacts by selecting the contact(s) and clicking this button.

The added contact(s) will now show in the *My Contacts* field.

Name	Email	Company	City	Accepts reverse charges
Mario Rossi	rossiradiologists@gmail...	Rossi & Rossi Radiologi...	Radiologicitta	X
Svea Medelvensson	svea.dentlab@gmail.com	Svea Dentlab	Tandstan	X

After sending a case to a new recipient the recipient will be automatically added to *My Contacts* list.

The contacts are tied to the Planmeca Online user account shown under *Additional* tab > *User Account*. If multiple Romexis users are using the same account, they will share the account's *My Contacts* list.

## 18 CEPHALOMETRIC ANALYSIS (CEPH) MODULE

### NOTE

The Cephalometric analysis module has a separate manual (publication number 10031278).

In the Planmeca Romexis® Cephalometric Analysis module, cephalometric analyses and superimpositions can be composed of 2D cephalometric images, facial photos and views of the dental arch. The analyses are used e.g. in orthodontic growth analysis, diagnosis, treatment planning and monitoring as well as in treatment outcome evaluation.



If you have the Ceph module licence the button shows on the top tool bar in the *Imaging* module.

Patient information (date of birth, gender) is passed to Ceph module from Planmeca Romexis and the patient files are automatically saved into Planmeca Romexis database when closing the Ceph module.

## 19 PARTITIONING IMAGES



The partition image tool is intended for partitioning a 2D image in smaller images based on a selected template. A new study with sub-images copied from the original image based on the layout of the selected study template, zoom and overlay parameters, and the smile line control points is created. For example a panoramic image can be partitioned to images that resemble intraoral images.

To partition an image:

1. Open the image to be partitioned.
2. Click on the **Partition image** icon.
3. Select template and click **OK**.



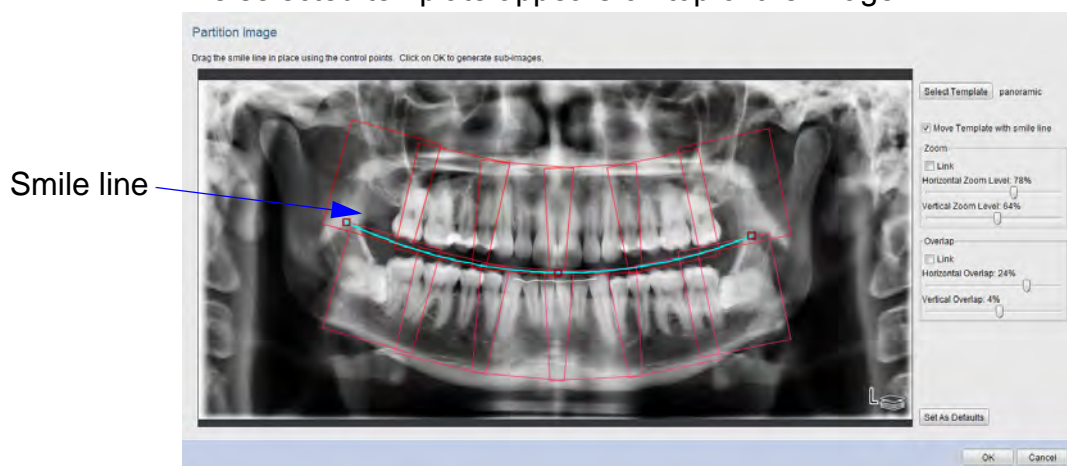
### NOTE

On how to create new templates see section "Templates" in the Planmeca Romexis technical manual (10037884).

### NOTE

Possible Void image types are not taken into account in the partitioning.

The selected template appears on top of the image.



The template is centred horizontally and vertically regarding the smile line.

4. Position the smile line to match the occlusal plane in the radiograph by dragging the control points.

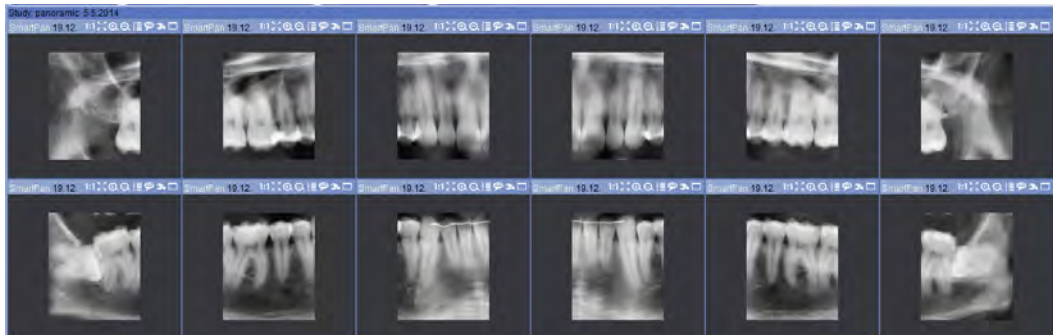
A single image of the template is rotated according to the angle of the smile line.

For adjusting the partitioning of the image you can use:

- *Move template with smile line* option
- To centre the smile line to the image by deselecting it
- To centre the image to the smile line by selecting it.
- *Horizontal* and *Vertical Zoom Levels* sliders to scale the chosen template.
- *Horizontal* and *Vertical Overlap* sliders to control the amount of overlap of single images inside the template.
- *Link* check-boxes to link horizontal and vertical sliders for Zoom and for Overlap so that the aspect ratio of all images is constant.

To save the settings locally for the selected client click **Set as defaults**.

The place of the smile line, chosen template, the *Move template with smile line* option, Zoom and Overlap percentages will be saved.



## 20 ADJUSTING 2D IMAGES

### NOTE

#### IMPORTANT SAFETY NOTICE!

Image processing can significantly alter the visibility of both large and small structures (i.e. bone loss and caries), which may result in either too many false positive or false negative findings, if care is not taken.

### 20.1 Adjusting contrast, brightness and softness

Adjust contrast, brightness and softness by moving the sliders.



Undoes the latest adjustment.

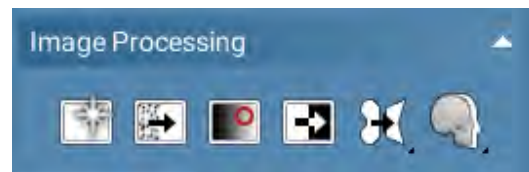


Re-performs the latest adjustment.



Removes filters and grey scale adjustment from the image and shows it without preprocessing as it was when received from the X-Ray unit.

### 20.2 Using image processing tools



#### Clarify filter



This tool can be used to adjust image contrast locally. The filter improves image depth and clarity of all 2D radiographs. The following aspects can be adjusted:

- **Extent:** The extent of the area considered for local contrast enhancement. Low values boost contrast in small areas while high values result in overall enhancement.



- **Strength:** The strength of the filtering effect. The strength of 101 results in an image very close to the original. The maximum strength is 300.



Local contrast applied

No enhancement applied

**NOTE**

Different default values are applied to panoramic, cephalometric and intraoral images. The filter can be used for gray scale images (8 or 12 bit).

**NOTE**

The preview may slightly differ from the final enhancement result.

**Despeckle (noise removal)****Optimize for contrast**

This tool is intended for optimizing a selected region of interest in a radiograph.

The tool uses three algorithms to recalculate the image data. The gamma correction algorithm gives the result where equal steps in object thickness will be displayed on the monitor as equal steps in brightness.

Since the human eye response to the light intensities is non-linear, the second algorithm takes this response into account. Therefore the final result is that equal steps in object thickness will be perceived as equal steps in brightness. However this applies fully only to a homogeneous object. In case of a true object with different tissues having a different attenuation of X-rays, the result will be of weighted averaging.

Thus, the real result is that equal steps in object thickness will be perceived as approximately equal steps in brightness.

The third algorithm shifts the average brightness in a region of interest to the mean of the brightness range of the monitor. This is performed as the perception is optimum in the middle of the brightness range. As this function is used, a selected region of interest will be optimized for diagnostic tasks.

To use the tool select the reference point within the brightest area of a radiograph but NOT in a filling. The ideal reference point should be selected in the sound enamel of the brightest tooth. If there is another area in the a radiograph that is brighter than the enamel, e.g. the compact bone the reference point should be selected in that area.



**NOTE**

It is important to know that other areas than the region of interest may be destroyed with respect to the diagnostic image quality as no radiograph can be optimized simultaneously in all regions and over all brightnesses. For multiple diagnostic tasks, recalculate the radiograph with respect to the different regions of interest.

**Invert image****Adjust sharpness**

Adjusting can be done by using the sliders or by moving the mouse on top of the image.

**Apply Ceph filter**

Use this tool to show more facial soft tissue.

To specify the area of effect adjust the vertical green lines.

To adjust the strength of the filter use the *Gain slider*. higher values will show more tissue. To apply filter on the left edge of the image enable the *Left* option.

**20.3 Viewing tools**

Fits images to viewing window



Shows images in their actual size.



Scales all images in same size

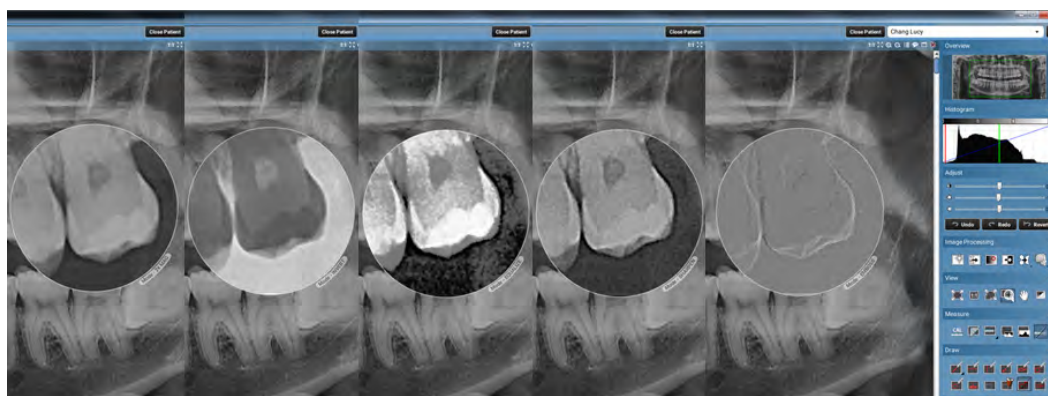


Magnifies the image twice its size.

To switch between filters:

1. Check that the **Pan** tool is inactive then right-click on top of the image in the area you want view.
2. Select the appropriate filter.

You can choose from five filters:



Magnify

Invert

Equalize

Sharpen

Emboss



Moves image on the screen

When enabled, holding down the right or middle mouse button allows brightness/contrast adjustment on top of the image.



Defines the affective area for image processing tools and certain measurements. To view grey scale values of a region use this tool together with for example Histogram.

You can specify multiple regions and to switch between them. The active region is denoted in green and the inactive regions in blue.

To delete the selected region use **Delete Measurements** button or press the **Delete** key.



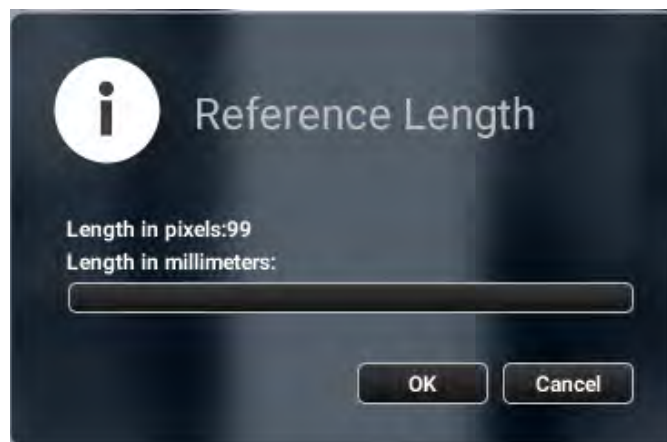
## 20.4 Measurement tools



### Calibrate for measurement

CAL

1. Click this button.
2. Draw the calibration line by dragging with the left mouse button. To finish the line release the button.
3. Enter the length and click **OK**.



### NOTE

You should not use the calibration tool on CBCT snapshots as they are automatically calibrated.



### Measure angle

Click this button. Draw the angle by pressing the left mouse button.

### Measure length

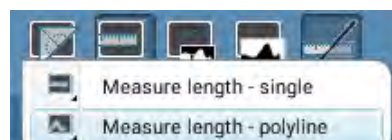
To select between single measurement and polyline measurement press the left mouse button.



**Single measurement** – use to measure length between 2 points (default). Hold down the left mouse button to define measurement, release mouse button to finish.

### Polyline measurement

Use to measure length over multiple points. Draw the line by pressing the left mouse button. Release the button to finish.

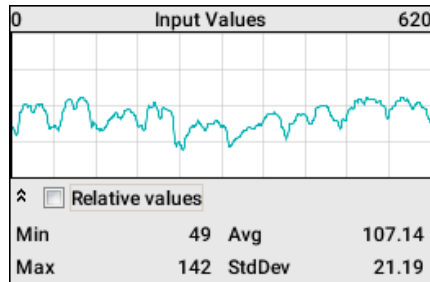


To select colour for measurements see section 3.3.1 "Setting the colour for annotations and measurements" on page 183.



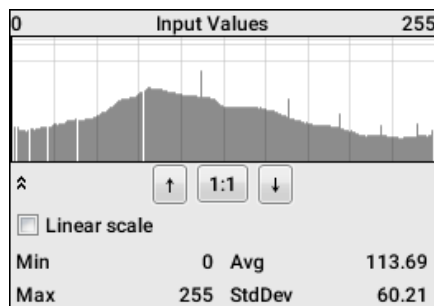
### Line profile

By clicking the **Line Profile** button and drawing a line to the 2D image, the user can view the gray scale profile of the respective line. Min, Max, Average and Standard Deviation of the line profile are also available. If the line profile gray scale values are very near to each other, by ticking the *Relative values* checkbox the variations between these values are emphasized.



### Show histogram

By clicking this button the histogram of the open image/selected region of interest is shown. A histogram is a graphical representation of the gray scale distribution in the image/area. By default the histogram is drawn in square root scale. Linear scale can be enabled by checking the *Linear scale* checkbox. Max, Average and Standard Deviation of the histogram data is also available.



### Show / hide measurements

## 20.5 Drawing tools



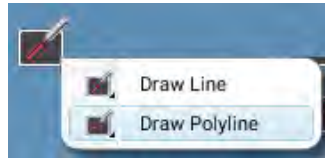
### Draw Line

Draw line over single or multiple points. Draw Line is a dual mode button, hold down mouse button to call up mode selection between single line and polyline drawing.



**Draw single line** - use to draw line between 2 points (default). Hold down left mouse button to define line, release the button to finish.

**Draw polyline** - use to draw line over multiple points. Draw the line by pressing the left mouse button down and release the button to finish.



**Draw horizontal line**



**Draw vertical line**



**Add arrow**



**Draw curve**



**Measure rectangle**



**Measure ellipse**



**Add text**

Click this button and point with the mouse where you want to add the text. Type the text to the opening window and click *OK*.

To edit the text later select the text with the *Select annotations* button (see below) and then double-click the text. Edit the text and click *OK*.

*Add Text Box* button allows adding different free or itemized text lists into printouts. The following options are available:

- *Add Free Text Box to Layout* – Add freely editable text box.
- *Add Image Implant List to Layout* – Add an itemized list of implants (only for 3D print).
- *Add Image Diagnosis to Layout* – Add a copy of the image diagnosis if entered in the Image Properties (only for 2D images or snapshots).



### Select annotations

When an annotation (line, arrow, circle, rectangle, curve) is selected, its colour and line width can be adjusted.

To edit the colour select the annotation and click the color field on top of the image.



Click on the desired colour.



To edit the width and select the annotation and adjust the width using the up and down arrows.



### Delete selected annotations or measurements

Select the annotation/measurement to delete and click this button.



### Show / hide annotations

Shows and hides annotations. Even if the annotations are hidden they are still stored with the image.



### Sketch a free line

Sketch a free line for demonstration purposes.

### NOTE

Sketch lines are not saved or stored and are lost when image is closed.



## 21 USING 2D IMPLANT LIBRARY (OPTIONAL)



The 2D Implant Library can be used to visualize realistic implant models on 2D images. The 2D Implant Library is optional and is available on licence.

### NOTE

When using panoramic imaging mode, magnification of object may appear uneven depending on its position and angle in relation to the focal plane. Use panoramic or other 2D images for treatment planning prudently.

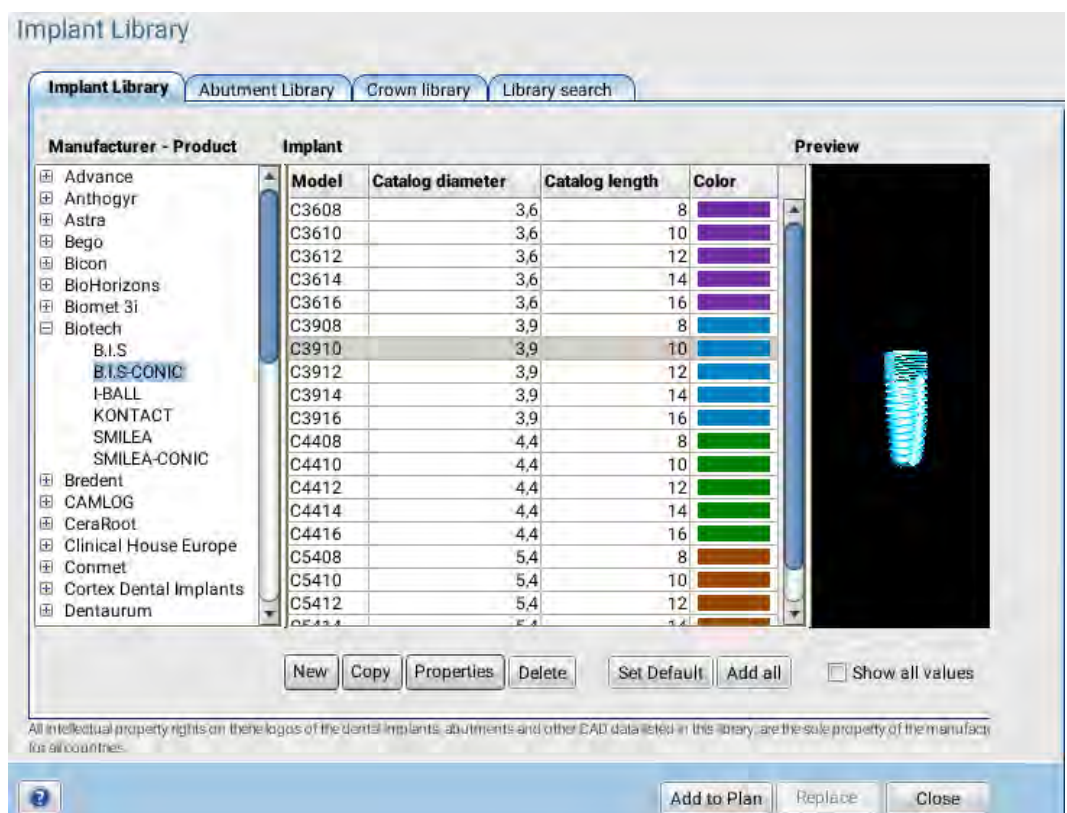
### 21.1 Adding and managing implants in the plan



1. Add an implant into the plan by clicking this button.
2. Select the appropriate implant and properties from the library and click **Add to Plan**.

A box corresponding to implant insertion depth appears next to cursor.

3. Add an implant to the image by placing the box in the implant site and clicking the left mouse button.



To rotate or move an implant activate it by clicking it with the left mouse button.

To rotate an implant drag the implant from its control points.

To move an implant drag the implant with the mouse. When the implant library is open and the implant is activated the corresponding implant type is displayed in the library.

To replace an implant, select another implant from the library and click **Replace**.



To delete an implant select the implant and click **Delete Annotation** or **Delete** key on your keyboard.

#### NOTE

Modifications in the 2D Implant Library, such as adding or deleting implants will also affect the 3D Implant Library.



To edit the properties of the selected implant click this tool. The following window opens.

The screenshot shows a 'Properties' dialog box with the following fields and values:

Field	Value
Manufacturer	Biotech
Product line	B.I.S-CONIC
Model	C3910
Catalog diameter	3.90 mm
Catalog length	10.00 mm
Platform diameter	3.90 mm
Apical diameter	3.14 mm
Occlusal diameter	3.90 mm
Total length	10.00 mm
Collar height	0.30 mm
Intra-osseous diameter	10.00 mm
Intra-osseous length	3.90 mm
Extension angle	0.00
Comment	
Color	Blue

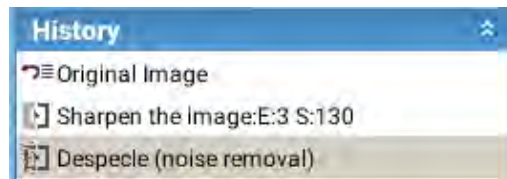
At the bottom, there is a 'Rotation Angle' slider set to 0° and 'OK' and 'Close' buttons.

When finished save the settings by clicking **OK**.

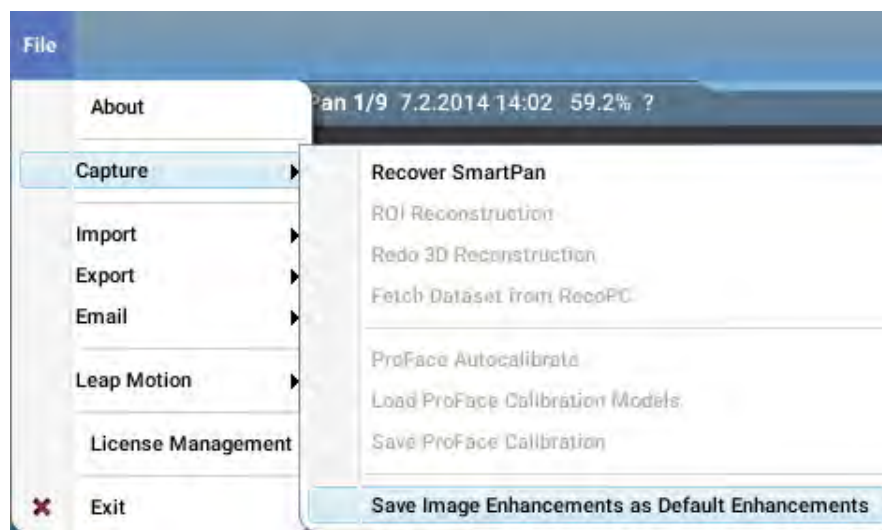
## 21.2 Image processing history

Shows history of image processing.

Click on a task on the history list to revert the image to that state.



To apply the enhancement shown in the list to all new exposures of the same type from the File menu select Capture > *Save image enhancements as default enhancements* option.



For more information on how to review and adjust default enhancements for new exposures, see section "IMAGING" in the Planmeca Romexis technical manual (10037884).

## 22 USING IMAGE SPECIFIC TOOLS



These tools affect the currently selected image only.  
Scale the image 1:1.



Zoom to fit



Zoom in



Zoom out



Show image properties

Opens the *General* tab under *Image properties* window where tooth numbers (for intraoral images) can be defined, the image can be rotated/flipped and the image file info and exposure parameters can be viewed.



Show image diagnosis

Opens the image *Diagnosis* tab under *Image Properties*. Shows and allows editing image diagnosis. The maximum number of characters is 5000.



Maximize the image

When an image is maximized use **Next** and **Previous** buttons to browse other open images in the layout or study.



Close the image

## 23 VIEWING AND ADJUSTING IMAGE PROPERTIES

### 23.1 Show properties

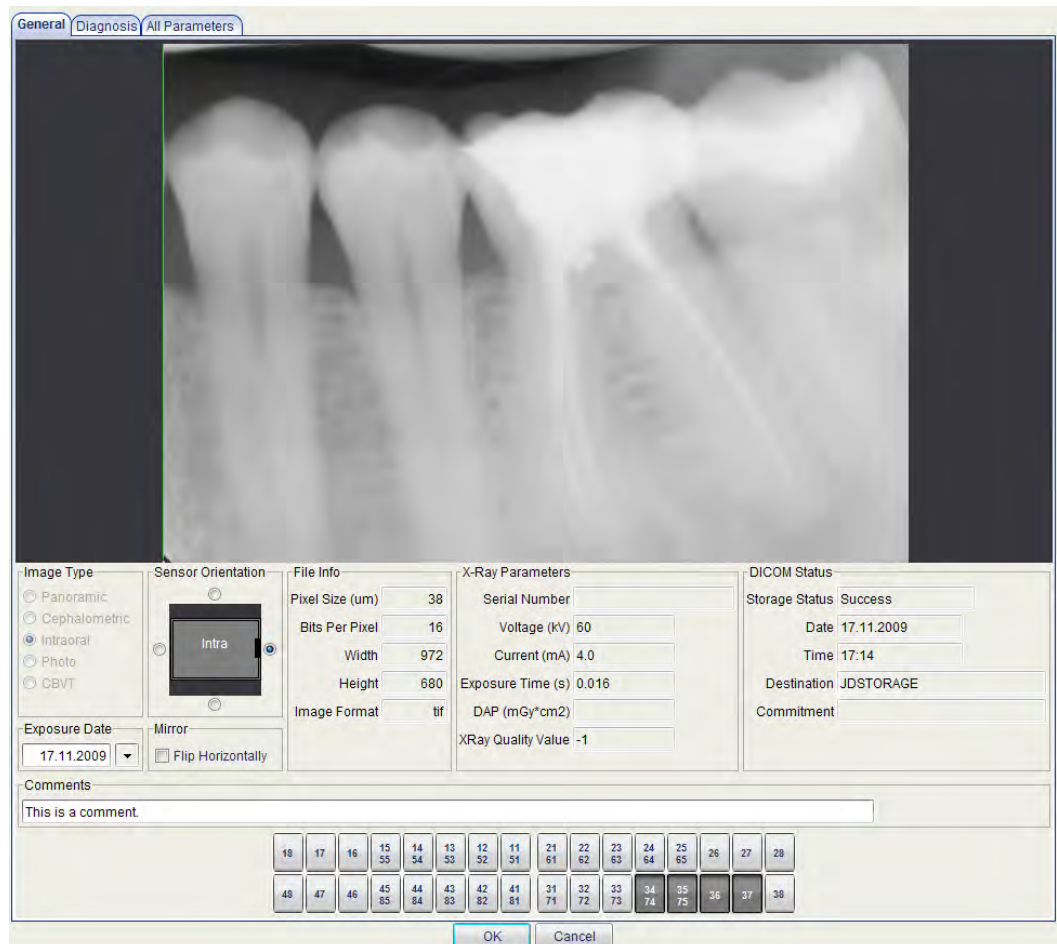
To access the properties of a single image check that the **Pan** tool is inactive then right-click on the image and select **Show properties**.

#### 23.1.1 General tab

Shows general properties for selected image including exposure information. In image properties you can define image type, sensor orientation, exposure date, tooth numbers, and image comments.

If an image has been mirrored or flipped horizontally there is a small dual in the image status bar.

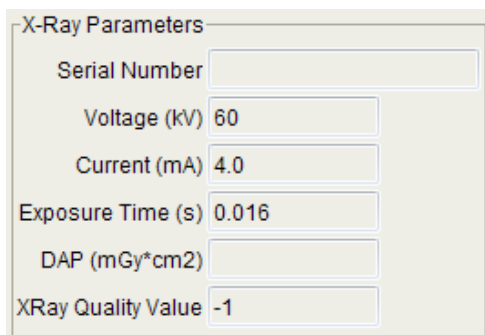
If added comments are shown in the image title bar you can search images by comments in the *Find by Image* tab, see section 4 “MANAGING CASES USING PLANMECA ROMEXIS CLOUD” on page 28.



## X-ray quality value

The quality value is to follow up possible changes of the exposure level over time. The value indicates changes after system start-up and approval when a reference value may be recorded. The quality value is not an absolute measure of dose and should only be used per system. The value also depends on many image processing settings as well as on user. Therefore no exact recommendations are given.

The value mathematically measures the logarithmic average of signal intensity behind the bone tissue using image histogram.



X-Ray Parameters	
Serial Number	
Voltage (kV)	60
Current (mA)	4.0
Exposure Time (s)	0.016
DAP (mGy*cm2)	
XRay Quality Value	-1

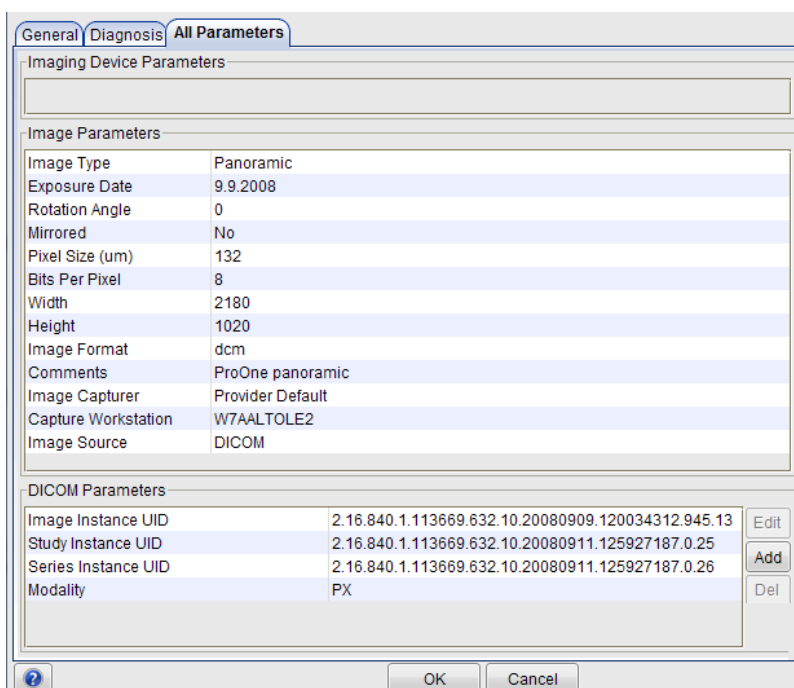
### 23.1.2 Diagnosis tab

Diagnosis of up to 2500 characters can be entered. When finished click OK.



### 23.1.3 All parameters tab

Displays image parameters in detail.



Imaging Device Parameters	

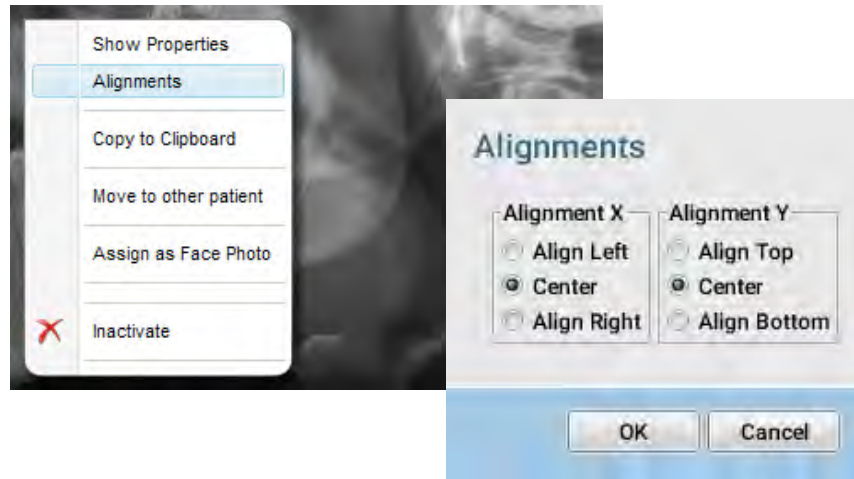
Image Parameters	
Image Type	Panoramic
Exposure Date	9.9.2008
Rotation Angle	0
Mirrored	No
Pixel Size (um)	132
Bits Per Pixel	8
Width	2180
Height	1020
Image Format	dcm
Comments	ProOne panoramic
Image Capturer	Provider Default
Capture Workstation	W7AALTOLE2
Image Source	DICOM

DICOM Parameters		
Image Instance UID	2.16.840.1.113669.632.10.20080909.120034312.945.13	Edit
Study Instance UID	2.16.840.1.113669.632.10.20080911.125927187.0.25	Add
Series Instance UID	2.16.840.1.113669.632.10.20080911.125927187.0.26	Del
Modality	PX	



## 23.2 Alignment settings

1. To access the Alignments dialog check that the **Pan** tool is inactive and right-click on top of an image.
2. From the appearing menu select **Alignments**.

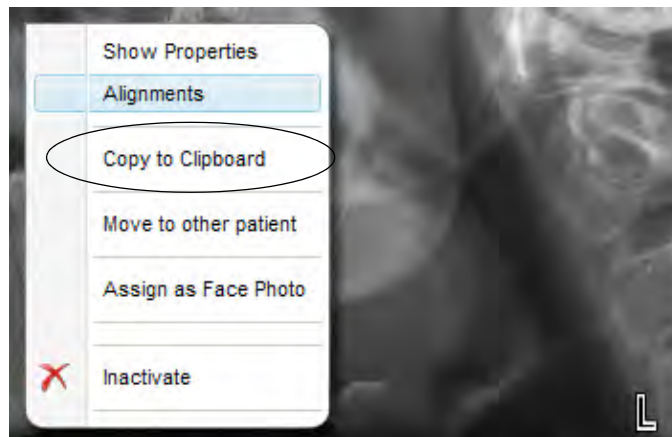


3. Define the alignment of the image inside the layout slot. These settings affect image placement on screen and when selecting the option *Export / All images in one file*.

## 23.3 Copy to clipboard

Check that the **Pan** tool is inactive.

Copy the image to the Windows clipboard by right-clicking on the image and select **Copy to clipboard** from the pop-up menu.



## 23.4 Moving image to other patient

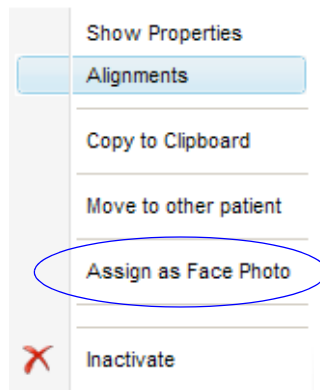
Check that the **Pan** tool is inactive.

Right-click on it and select *Move to other patient* from the pop-up menu.

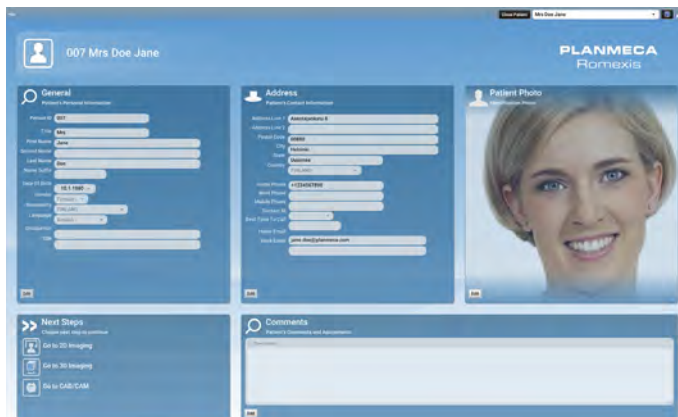
Define the patient to receive the image using the *Search dialog*.

## 23.5 Assign as face photo

Assigns the selected photo as patient's face photo. This feature only works for photographs.



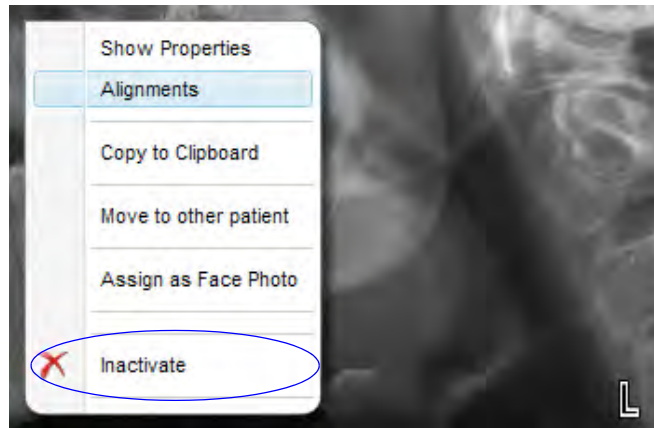
The photo will now show in *Files* module.



## 23.6 Inactivate

Check that the **Pan** tool is inactive.

Right-click on the image and select *Inactivate* from the pop-up menu.



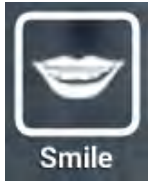
When the image is inactivated it will disappear from Romexis, but will remain in the image folder on the hard drive.

To permanently delete images see section "Reactivate and empty trash" in Planmeca Romexis technical manual (10037884).

# Chapter D: SMILE DESIGN MODULE

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## 1 INTRODUCTION



Planmeca Romexis Smile Design is a dedicated tool for digital smile design. A patient smile image and intelligent tooth silhouettes are used to design a new smile for the patient in a matter of minutes. A retractor image can be aligned with the smile image to aid e.g. in more detailed gum-line and tooth dimensions design. The finished design can be exported on top of CAD/CAM or Ortho software and sent to a dental lab using Planmeca Romexis Cloud service or printed out.

In addition to this manual you can watch Smile Design tutorial videos at: <http://www.planmeca.com/smiledesign/digital-smiledesign/videos/#TutorialVideos>



You can also access the videos directly by clicking this button at the top right corner of the screen.

## 2 CAPTURING IMAGES FOR SMILE DESIGN

To design a preview for a new smile only a frontal smile image is required. When planning the treatment in more detail e.g. for communicating with dental laboratory a retractor image can also be used.

For capturing the necessary images any camera can be used.

To ensure the proper alignment of the images the patient must be in the same position when capturing the smile image and the retractor image

The images should be saved in JPG, PNG, or BMP formats.

The images taken using Planmeca mRomexis will appear in the smile images list and in the 2D imaging module.

### 3 STARTING SMILE DESIGN MODULE



Move the cursor on the left border of the window and click the **Smile design** module button

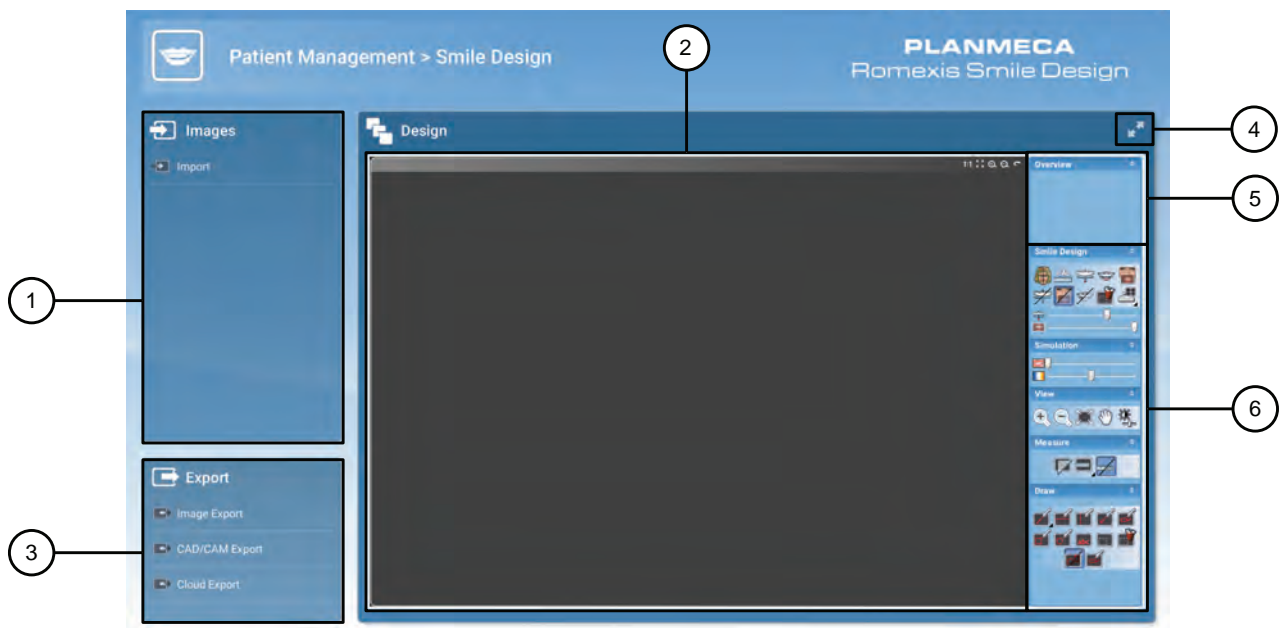
or

start from the *File* module by clicking the **Go to Smile Design** button from the *Next Steps* field.



### 4 USING THE INTERFACE

The view consists of the following elements.



- |   |                          |   |             |   |              |   |                        |   |                |   |  |
|---|--------------------------|---|-------------|---|--------------|---|------------------------|---|----------------|---|--|
| 1 | Image list and importing | 2 | Design area | 3 | Export tools | 4 | Maximize design window | 5 | Overview image | 6 | Smile design tools (Teeth shade, simulation, viewing, drawing & measurement tools) |
|---|--------------------------|---|-------------|---|--------------|---|------------------------|---|----------------|---|--|

## 4.1 Maximizing the design area



To maximize the design area press the arrow-buttons on the top right corner of the *Design* window.

## 4.2 Returning to Patient management view

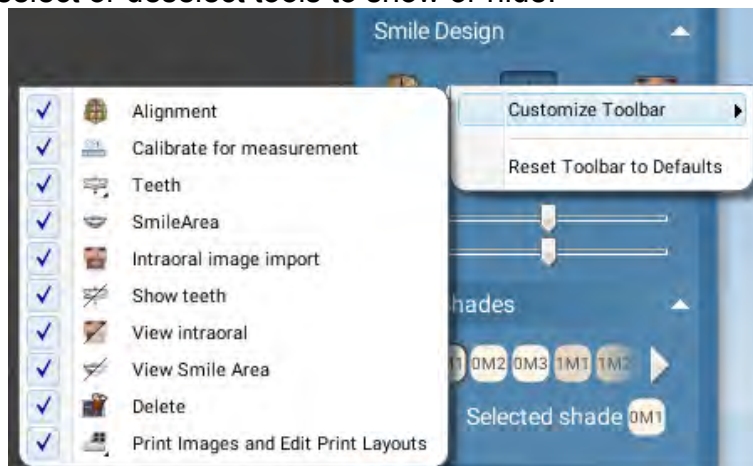
If necessary you can return to the Patient Management view by clicking this link on top of window.



## 4.3 Customizing toolbars

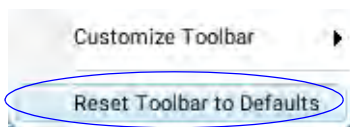
By customizing toolbars you can select which tools will be visible in the toolbars.

Right-click on any of the tool of the group you would like to customize and select or deselect tools to show or hide.



## 4.4 Resetting toolbars

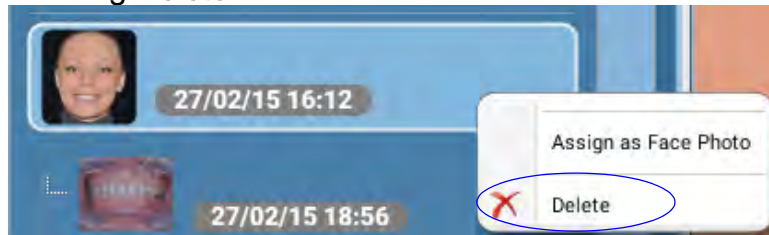
Right-click on any of the tool of the group you would like to reset and click this button.





## 4.5 Deleting images

If necessary images can be deleted by right-clicking on an image and selecting **Delete** from the menu.



## 4.6 Assigning as face photo

To define the patient identification photo shown in *Patient management* view right-click on an image and select **Assign as face photo** from the menu.



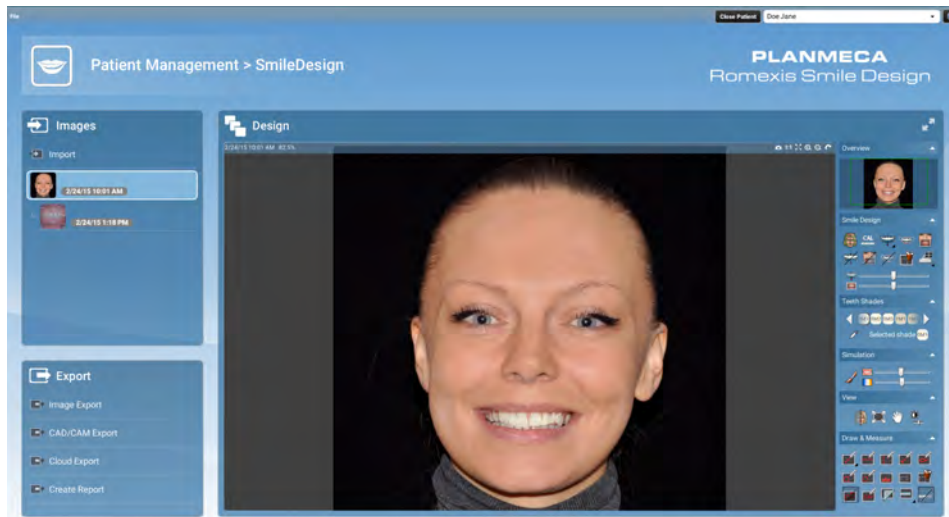
## 5 SMILE DESIGNING

### 5.1 Importing images



1. Click the **Import** button on the top left corner of the screen.
2. Select the desired image file and click **Open**.

The image is imported into the software.



If the case has been exported from another Planmeca Romexis Smile Design workstation, select the .zip-file when importing. The image is imported with an intraoral image (if included) and an editable tooth silhouette.

### 5.2 Viewing and opening patient images

The thumbnails of the current patient's images are shown in the *Images* field on the left of the screen. The import date is shown next to the image.

To add a comment to an image place the mouse cursor over the image thumbnail and click **Add comment**.

Open the image by double-clicking the thumbnail.

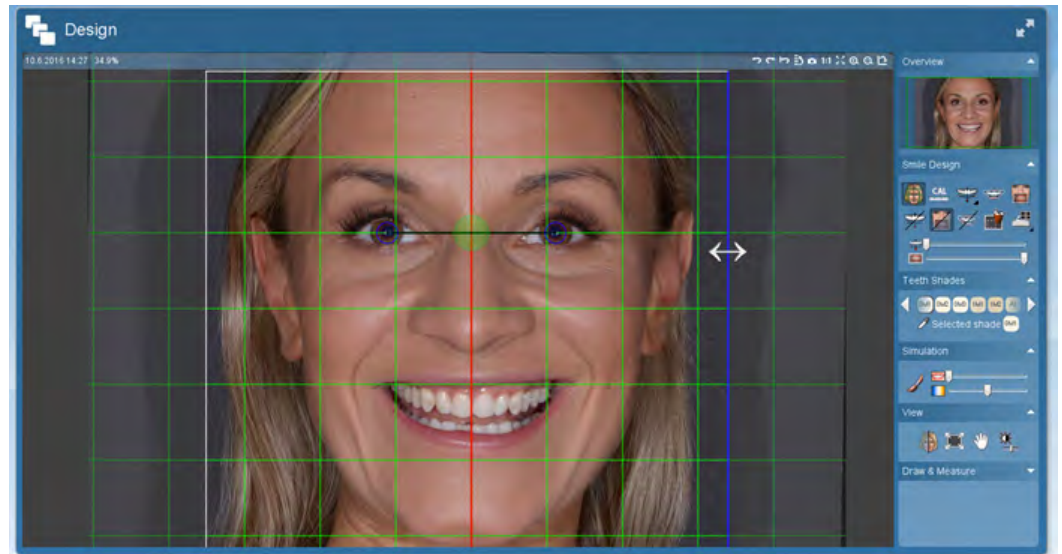


### 5.3 Aligning and cropping images

Align the smile image to horizontal using any two points in the image, e.g. pupils as follows:



1. Click the **Align and crop** button in the *Smile Design* tools.
2. Position the blue control points by dragging or double-clicking.
3. Double-click on the green control point in the middle to align.
4. Drag the borders of the image for cropping.
5. Double-right-click to crop.



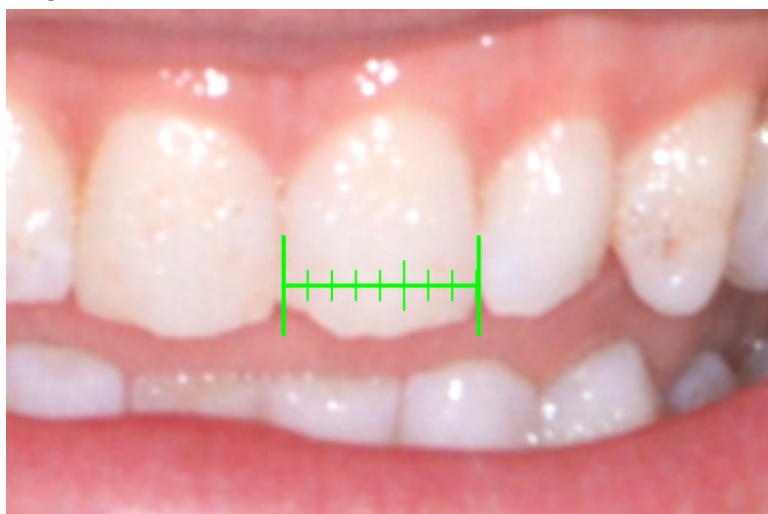
## 5.4 Image calibration

The image can be calibrated e.g. using the width or height of the object selected for calibration. The calibration affects the teeth dimensions visualized in the teeth silhouette and measurements made using the measuring tools.

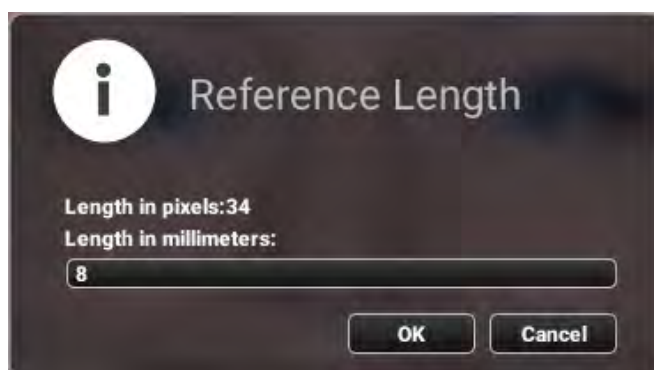
In the following instructions the calibration is done by measuring the incisor width.



1. Click the **Calibrate** button in the *Smile Design* group.
2. Place the mouse cursor on top of the incisor.
3. Draw a horizontal line by pressing and holding down the left mouse button while dragging the pointer e.g. from the left edge of the incisor to the right edge of the incisor.



4. In the following window enter the width of the physical incisor of the current patient in millimetres and click **OK**.

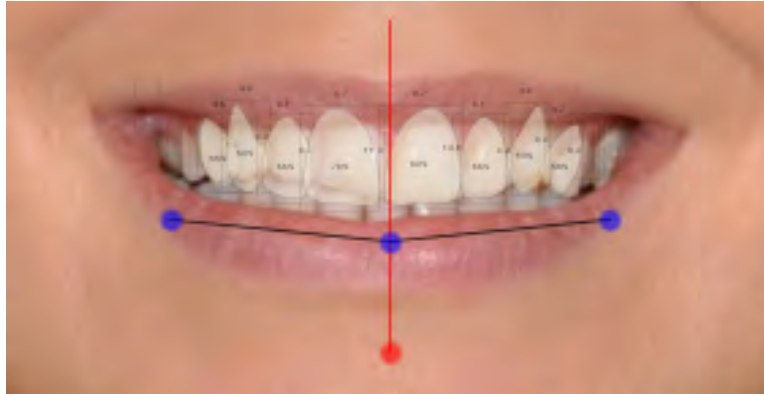


## 5.5 Adding a teeth design

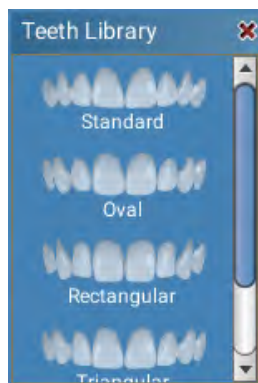


Click the **Teeth** button.

The latest used teeth design automatically appears on top of the smile image.



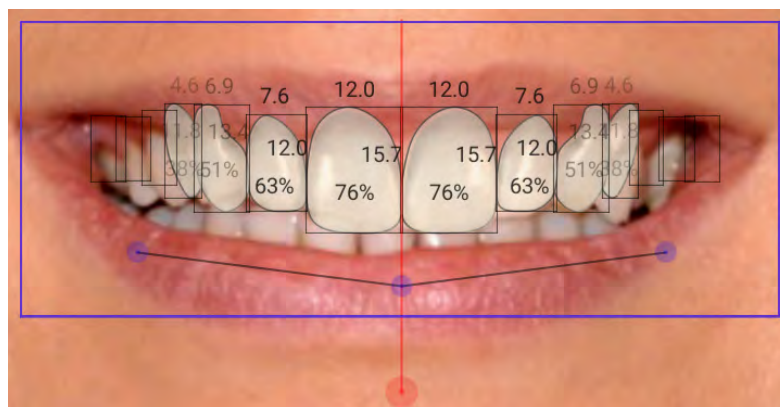
- To select a different design click on the black corner of the teeth button (or left-click and hold down the teeth button for a second) and select the desired template type on the list.



### 5.5.1 Resizing teeth

Move the mouse over the teeth design so that a blue rectangle appears around it.

To adjust the width or length of all teeth simultaneously place the mouse cursor on the blue rectangle and hold down the left mouse button while dragging.



## 5.5.2 Adjusting teeth design

- To translate drag the design from the blue control point at the centre.
- To rotate drag from the red control point at the bottom.
- To bend and scale drag from the lateral blue control points.

### Visualizing designs

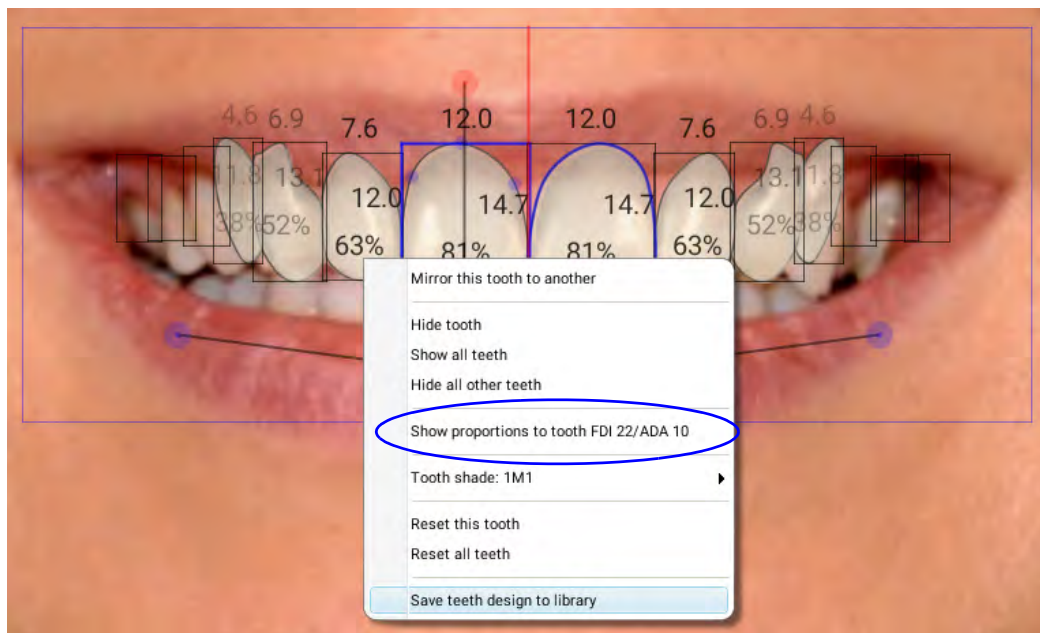
By right-clicking on an individual tooth you can:

- Mirror one tooth to opposite side
- Mirror all teeth on one side of the midline to the other side
- Hide the selected tooth
- Show all teeth
- Hide all other teeth
- Reset the selected tooth
- Reset all teeth

### Visualizing teeth proportions

You can also switch between showing individual teeth proportions (width / height) and showing width proportions compared to tooth 22 (FDI) / 10 (ADA).

To change the percentage ratio to proportions ratio right-click on the design and select *Show proportions to tooth...*

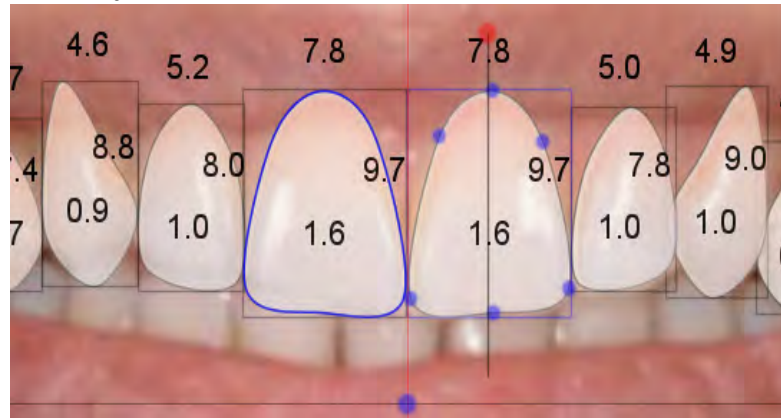




The percentage values change to proportions values.

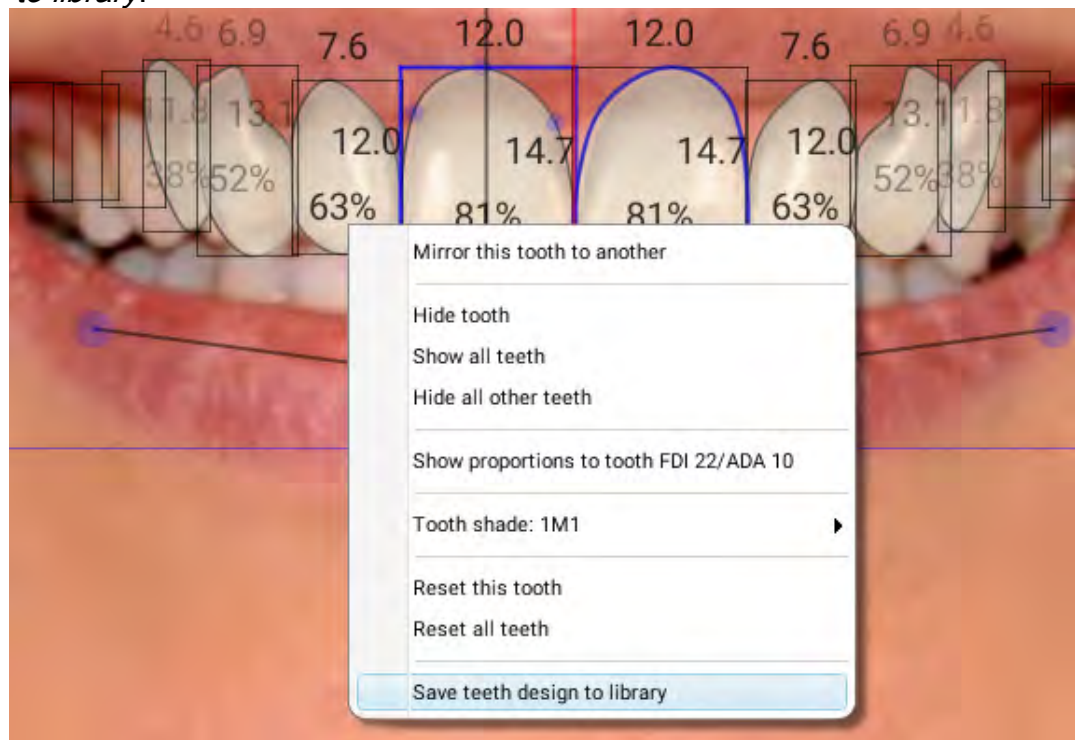
The golden proportions in relation to tooth FDI 22 (left 2nd incisor) are the following: 1st incisor = 1,6; 2nd incisor = 1 and canine = 0,6.

The proportion value shows the width of the each tooth in relation to the left maxillary lateral incisor.

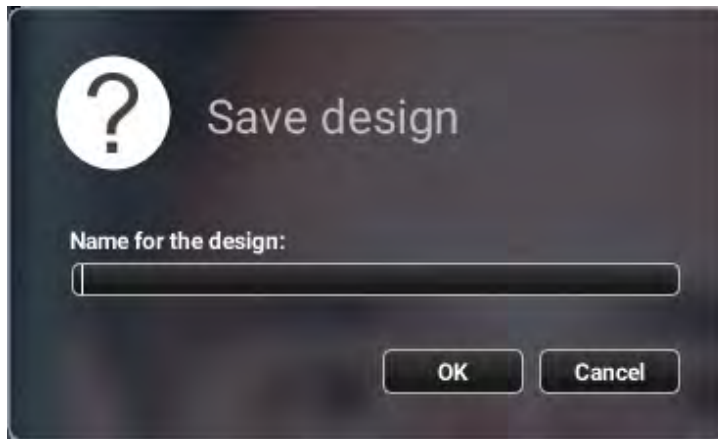


### 5.5.3 Saving own teeth designs to the teeth library

1. Right-click on top of the finished teeth design and select *Save teeth design to library*.



2. Enter a name for your design and click **OK**.



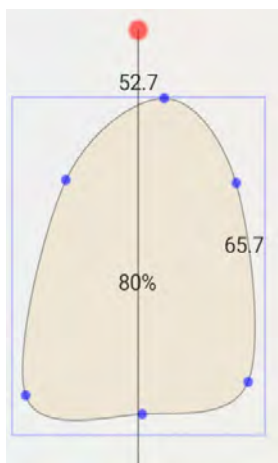
Your teeth design will appear in the list of teeth designs and can be used in the same way as the default designs.

To delete a design from the library right-click on it and confirm the deletion by clicking **Yes**.

#### 5.5.4 Adjusting individual tooth on the design

Start by activating the tooth you want to adjust.

- To lengthen the tooth drag from the bottom or top of the box that is around the tooth
- To widen the tooth drag from the sides of the box that is around the tooth
- To reshape drag from the blue control points on the tooth outline
- To add or remove control points double-click on the outline
- To rotate the tooth drag from the red control point above the tooth



#### NOTE

The design of the selected tooth shows as mirrored to the other side.



To hide the design press the show / hide design button.

To adjust the transparency of the design move the design transparency slider.



## 5.6 Defining smile area

The smile area needs to be defined so that the teeth can be hidden behind the lips.



1. Click the **Smile area** button.
2. Move the smile area as necessary by dragging from its edges using the left mouse button.
3. Adjust the area by dragging the line from the blue control points.



To add or remove control points double-click on them.

4. Hide the teeth under the lips by releasing the mouse button.



To show / hide the smile area press the **View smile area** button.

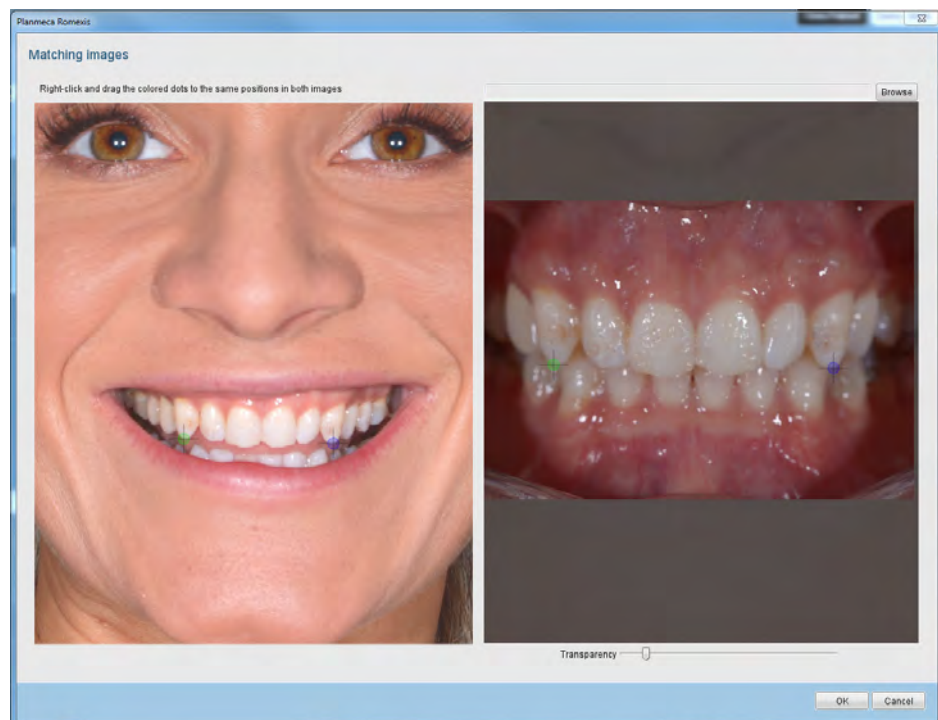
## 5.7 Aligning intraoral image with smile image

The alignment is done based on the tooth silhouettes that correspond to existing teeth. The alignment can be fine-tuned using intraoral image transparency.



1. Click the **Intraoral image import** button.
2. Select the suitable retractor image and press **Open**.
3. Align the intraoral image by right-clicking and dragging the coloured dots to the same position in both images.

The image can be moved by left-clicking and dragging.



- Use the transparency slider to view the matched images.



- Save the alignment by clicking **OK**.

To adjust the alignment or to change the intraoral image return to step 1 to import intraoral image.

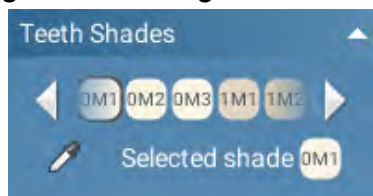
## 5.8 Selecting teeth shades

Teeth shades can be set for all teeth or for a single tooth at a time.

### 5.8.1 Selecting shade for all teeth

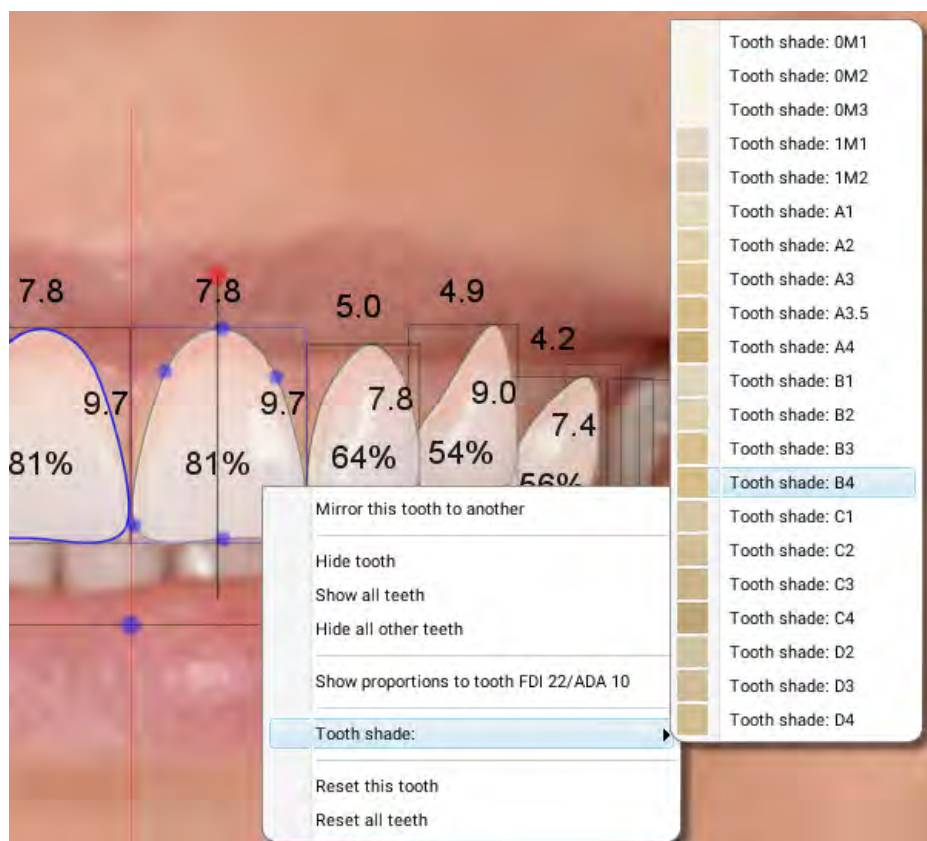
Select the desired shade from the Teeth shades menu in the vertical toolbar.

The available shades are as determined in the VITA Classical shades guide including bleached shade.



### 5.8.2 Selecting shade for single tooth

Right-click the tooth and select the appropriate shade from the menu.



### 5.8.3 Picking colour from existing tooth



Click the **Pick colour** button and then click on the tooth with wanted teeth colour. The design is automatically adjusted to that colour.

## 5.9 Using photo-realistic simulation tools

### 5.9.1 Adjusting transparency and shade

The photo-realistic look can be added to teeth design by using the transparency slider (the upper one) in the *Simulation* tools group.

To adjust the shade from cold to warm use the lower slider.



### 5.9.2 Using Clone brush

#### NOTE

For more information on how to use this tool see also the demonstration video on <https://vimeo.com/147091693>



The clone brush can be used to make photorealistic changes in the image for example for adjusting the gumline. Also minor adjustments elsewhere in the image can be made.

1. To clone an area place the mouse cursor over the area you want to clone.
2. Right-click on the area.

The area you are about to copy shows as a dashed circle in the image.



The mouse cursor automatically turns to a continuous light-blue circle.

3. Move the cursor over the area where you want to clone the selected area and clone the area by clicking once the mouse left button.

To clone a larger area from around the area you are about to copy hold down the left mouse button while dragging.



In the example case below the tooth has been made shorter by cloning.



Before cloning

After cloning

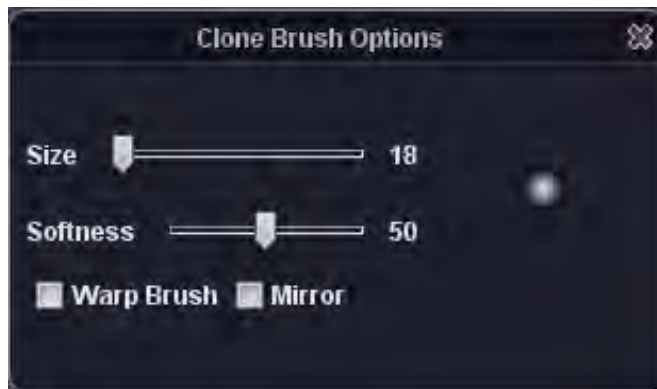
### Adjusting size and softness of the brush

To adjust the size of clone brush:

- Use the size slider in the dialog box in the upper right corner of the image.  
or
- Hold down the right mouse button while dragging to up-left and down-right over the image.

To adjust the transparency of the border of the cloned area, drag the *Soft* slider in the dialog box. The greater the softness value, the more transparent the cloned area. Minimizing softness produces a sharper cloning result.

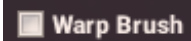
The size and softness adjustments apply also for warp brush, see below.





### Warp brush

The warp brush can be used for stretching or moving tissues and for straightening teeth.



To activate the tool check the *Warp brush* option. To stretch the image area inside the dashed line circle hold down the left mouse button while dragging.



Before warping

After warping

### Mirror

The mirror option can be used with Clone brush (not with Warp brush).



This option can be used to copy a mirror image of an area to another one for example for creating a symmetrical teeth and gumline on both sides of the teeth.



Before mirroring

After mirroring

### Undoing, redoing and reverting changes and adjusting view

Undo, Redo and Revert all work for clone and warp brush adjustments made during the same session even if the tool has been inactive for a while. All changes will be reverted even if the tool has been inactive for a while during the session. For re-opened images only Revert will work.

When the image is re-opened, you may still use Revert to cancel all the previously made cloning and warping adjustments.



1 2 3 4 5 6 7 8 9 10

1. **Undo** – undoes the latest change
2. **Redo** – redoes the latest change
3. **Revert** – erases all modifications made to the image
4. **Undo history** – shows a list of the changes made to the image and allows to select multiple changes to be undone or redone
5. **Snapshot to clipboard** - copies the current snapshot image to the clipboard, from where it can be pasted elsewhere.
6. Shows the image in its actual size
7. Zoom to fit – Fits the image to the viewing window
8. Zooms in the image
9. Zooms out the image
10. Rotates the image 90 degrees

## 5.10 Using viewing tools



Shows a comparison of the original imported image and of the current design.

To exit the comparison view click any key or mouse button.



Fits images to viewing window



Moves image on the screen

When enabled, holding down the right or middle mouse button allows brightness/contrast adjustment on top of the image.



Adjusts contrast and brightness.

When enabled, vertical movement affects contrast and horizontal movement brightness. Drag the sliders or move the mouse on the image while holding down the left mouse button.

## 5.11 Using drawing and measurement tools

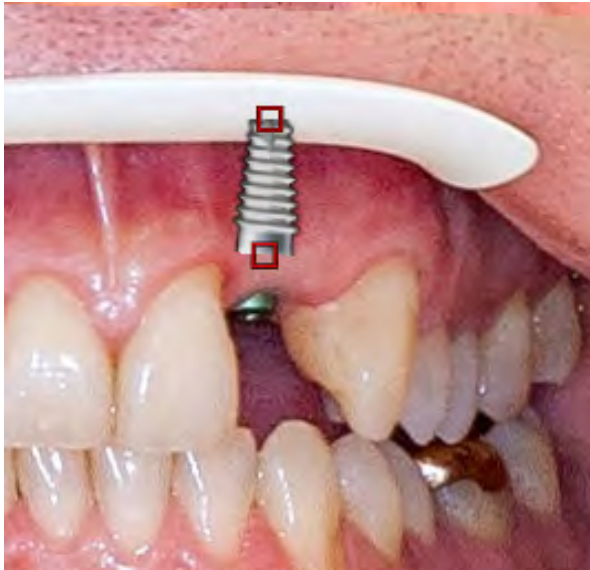
### Implant tool



To open an implant on top of the image click on this button.

You can move the implant by dragging with the left mouse button.

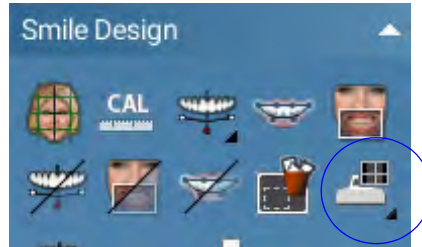
To rotate implant drag the implant from the squares on top and at the bottom of implant.



For detailed description on how to use the other measurement and drawing tools see sections 20.4 "Measurement tools" on page 117 and 20.5 "Drawing tools" on page 119.

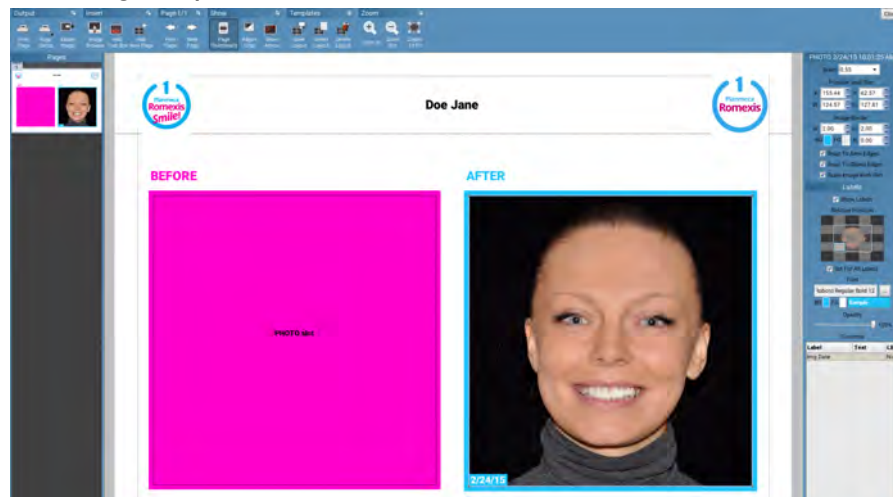
## 5.12 Printing smile design images

1. Open the image you wish to print. The image will be printed as it appears on the screen
2. Click the **Print editor** button in the *Smile design* group.

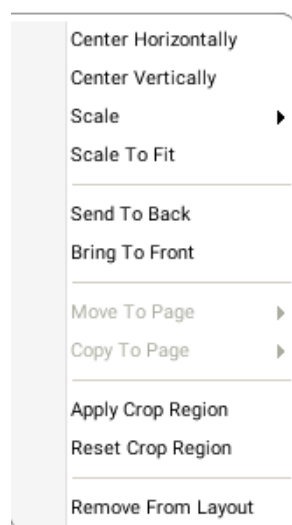


The image opens directly in the *Print editor*.

3. Select images to include in / delete from the printout.  
The images open in Print editor.



4. Adjust the layout of the pages by dragging and dropping the images as necessary.
  - To resize an image drag it from the corners.
  - To open a shortcut list for layout adjustments right-click the image.

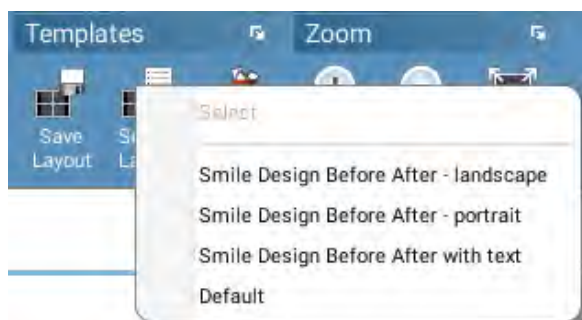


5. When finished with the adjustments click this button to start printing the pages.

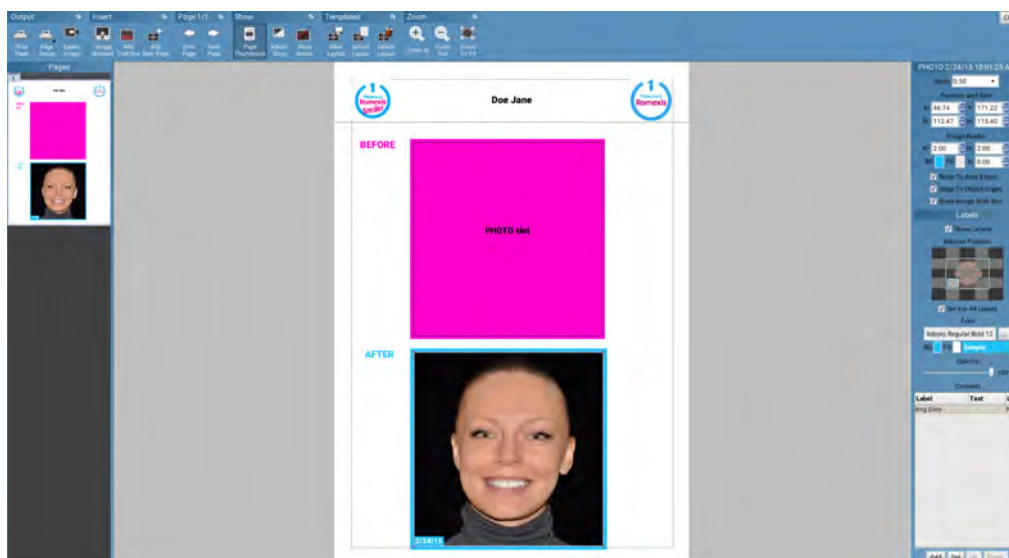
### 5.12.1 Selecting print layout



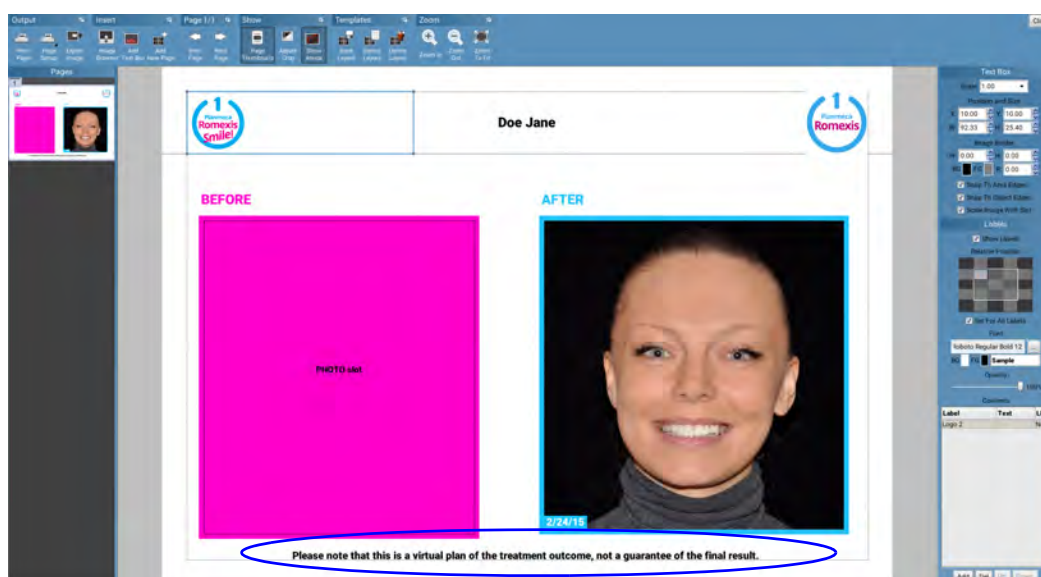
To select the print layout click the **Select layout** button.  
Select from three different ready-made print layouts:



- Before After - portrait



- Before After - landscape with or without text



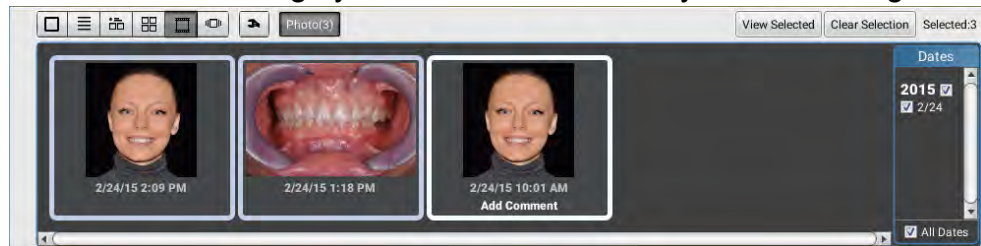
- Default



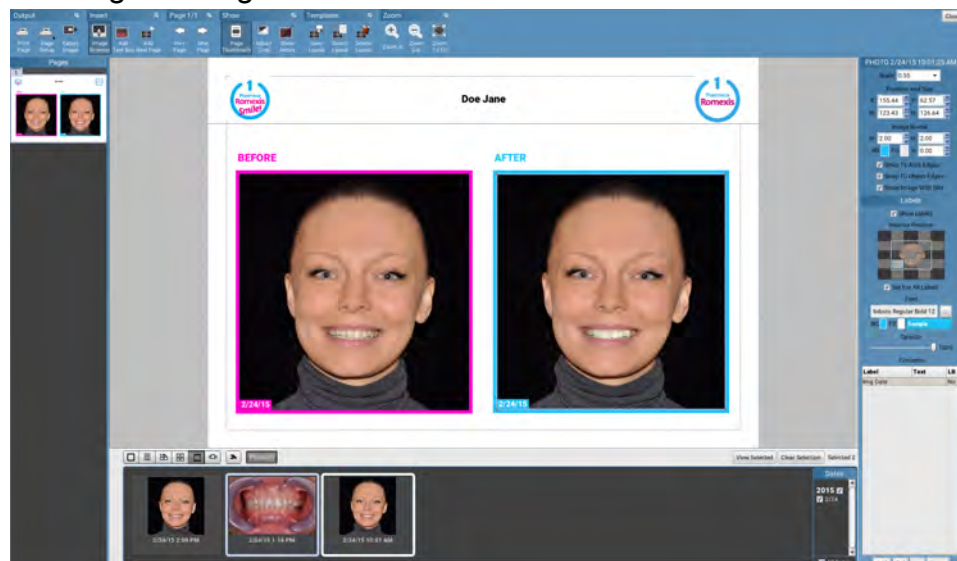


### Adding the before image to the layout

1. Open the image browser by clicking this icon on the top toolbar.
2. Double-click the image you want to add to the layout in the image browser.



The original image is added to the *Before* slot.



### 5.12.2 Using print editor tools

For detailed description see section 14.2 "Using print editor tools" on page 89.

### 5.13 Creating Smile design report

This section describes how to create a standard smile design case report in PDF format.

#### NOTE

To create custom reports see section 5.12 "Printing smile design images" on page 149.

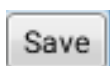
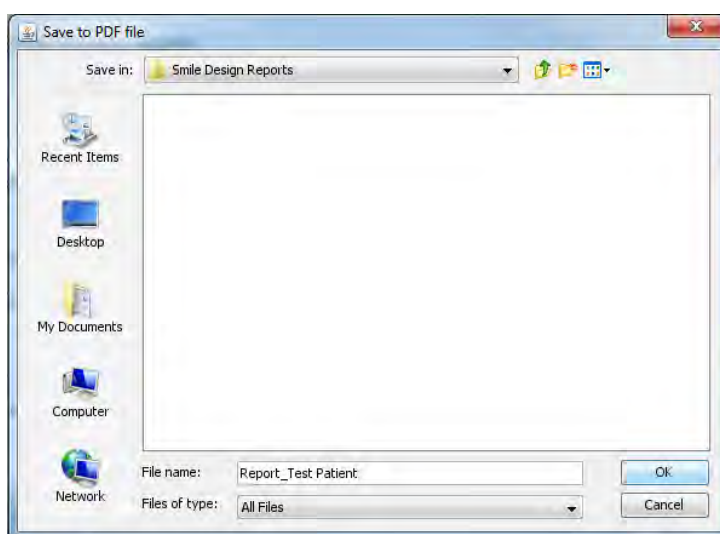
1. Click the **Create report** button.



2. Type the case information in the fields of the dialog box.
3. Click the **Browse** button.

4. Select the appropriate destination folder and enter the name for the new report file in the *File name* field.

Click **OK**.



5. Click **Save**.

The report is saved in the selected folder and will automatically open.

## Smile Design Report

26.11.2015 15:34



### PATIENT

Name Ana Smile  
ID 546547  
Age 31  
Gender F

### CLINIC

Name Smile Clinic  
Contact Name Dr. Smile  
Clinic Email smile@clinic.com

### COMMENTS

type here any comments

### BEFORE AND AFTER IMAGES



### TOOTH MEASUREMENTS

Tooth No.FDI	Length	Width	Ratio Width/Height	Shade
13	10,30 mm	5,81 mm	56 %	Picked Color
12	9,63 mm	5,66 mm	58 %	Picked Color
11	11,06 mm	8,09 mm	73 %	Picked Color
21	11,06 mm	8,09 mm	73 %	Picked Color
22	9,63 mm	5,66 mm	58 %	Picked Color
23	11,06 mm	5,89 mm	53 %	Picked Color

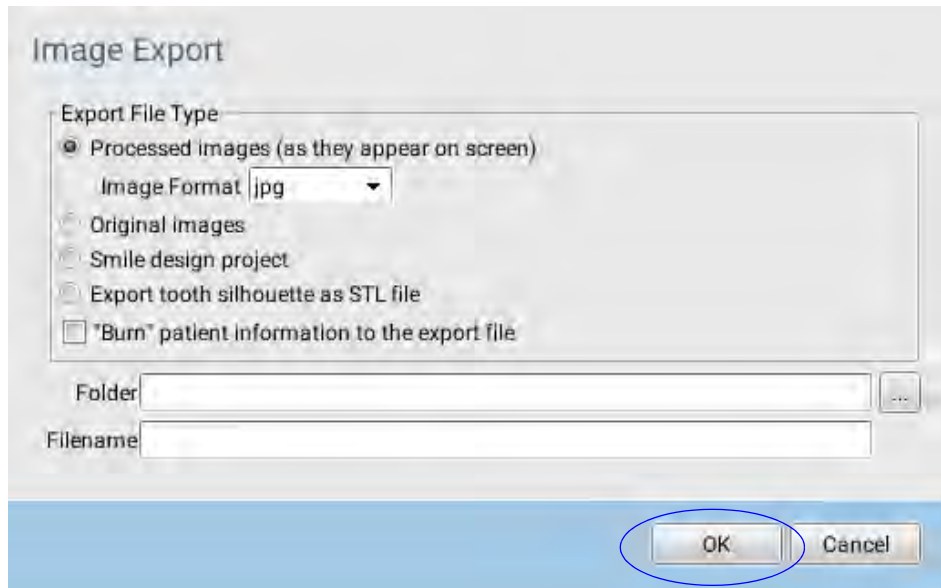
## 5.14 Exporting smile designs

### 5.14.1 Exporting current image

1. To export the currently shown image click the **Image export** button in the lower left corner of the screen.



2. Select from the options described in detail in the following and click **OK**.



### Export options

#### Export file type

- **Processed images**  
Export image(s) in 8 bit with all enhancements applied.  
Select the appropriate image format from the drop-down menu.
- **Original images**  
Export original image(s) (8 or 16 bits, depending on the original capturing mode).
- **Smile design project**  
Export smile and retractor images with teeth silhouette  
A zip-file, which can be imported to other Planmeca Romexis Smile Design workstation, will be created.
- **Export tooth silhouette as STL file**  
The teeth designs exported as STL file can be used in 3rd party software for further processing or imported back to Planmeca Romexis using the STL Import, see section 5.1 "Importing images" on page 134 for more information.
- **"Burn" patient information to the export file.**  
Attach the image information directly on the exported image.

### Send by email

To send the currently shown image in email, select *Send 2D images by email* option in the *File* menu.



### 5.14.2 CAD/CAM export

To export the designed teeth silhouette and overlay on top of any software click the **CAD/CAM Export** button.



The opening dialog contains the following tools:

- A button for locking the silhouette so that it cannot be scaled, translated, rotated or edited
- A transparency slider for adjusting transparency of the silhouette



To close the silhouette control dialog click the red close button on the top right corner of the window.

### 5.14.3 Cloud export



For detailed information see section 17 "CLOUD EXPORT" on page 97

# Chapter E: 3D MODULE

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The Planmeca Romexis *3D* Imaging module is designed for capturing, processing and storing images acquired with Planmeca ProMax 3D model X-ray units.

The three-dimensional data of the maxillofacial region is called an X-ray volume. The dimensions of the 3D volume varies depending on the source.

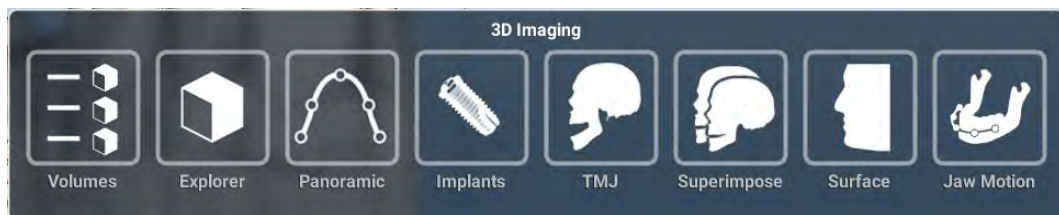
## NOTE

To access the 3D module a patient must be selected.

## 1 OVERVIEW

The 3D module is divided into following sub-modules:

- Volumes
- Explorer
- Panoramic (optional)
- Cross sections or Implants (optional) if implant license is installed
- TMJ (optional)
- Superimposition (optional)
- Surface (optional)
- Jaw Motion (optional)





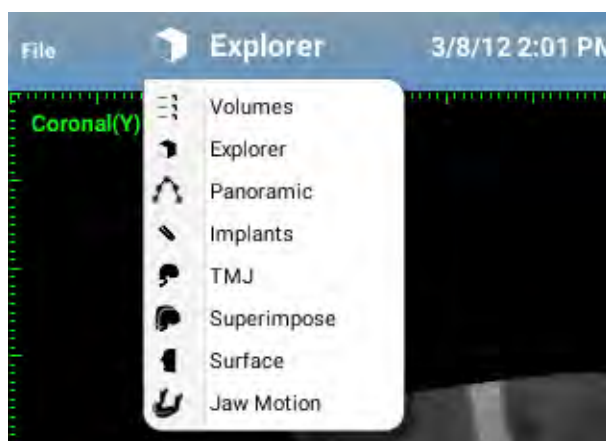
You can move from one sub-module to another by:

- Moving the mouse to the left border of the window and selecting the desired sub-module from the appearing menu



or by

- Selecting another sub-module from the drop-down menu in the upper left corner of the current sub-module.

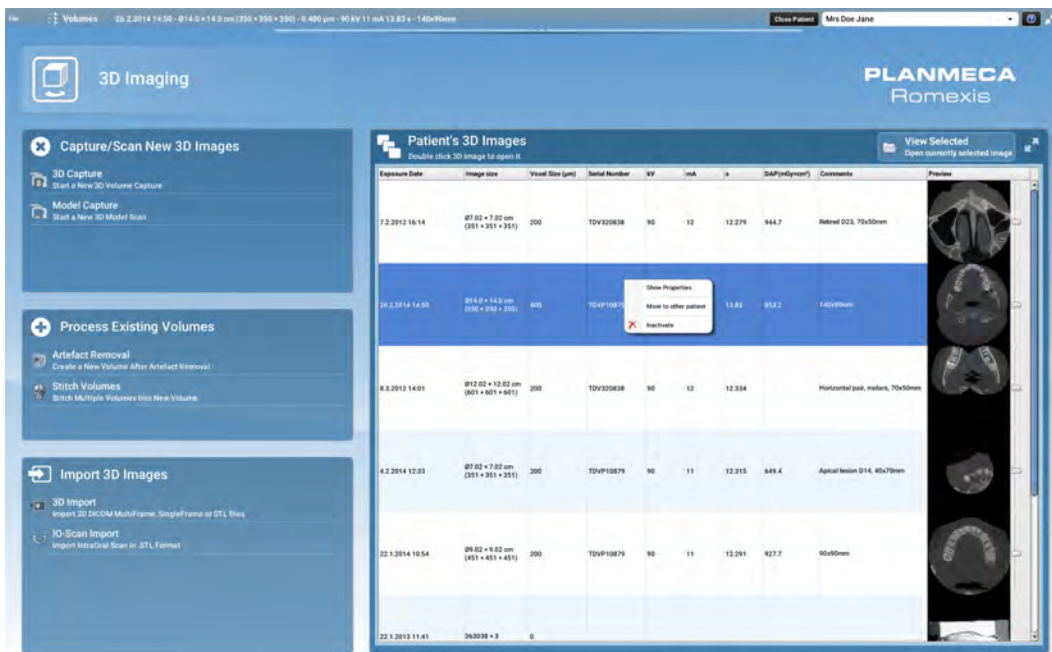


## 2 VOLUMES SUB-MODULE



In the *Volumes* sub-module the patient's 3D volumes are listed and axial-view thumbnail is displayed.

Thumbnail's axial slices can be scrolled with the slider or mouse wheel.

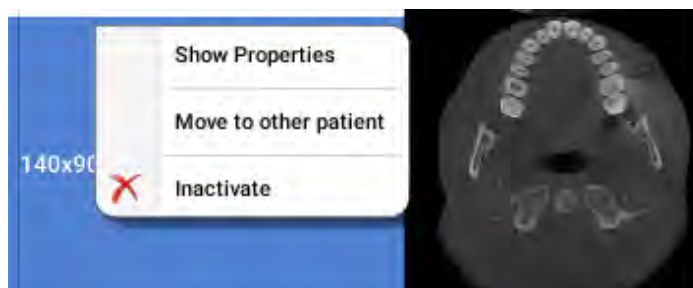


### 2.1 Opening 3D volumes

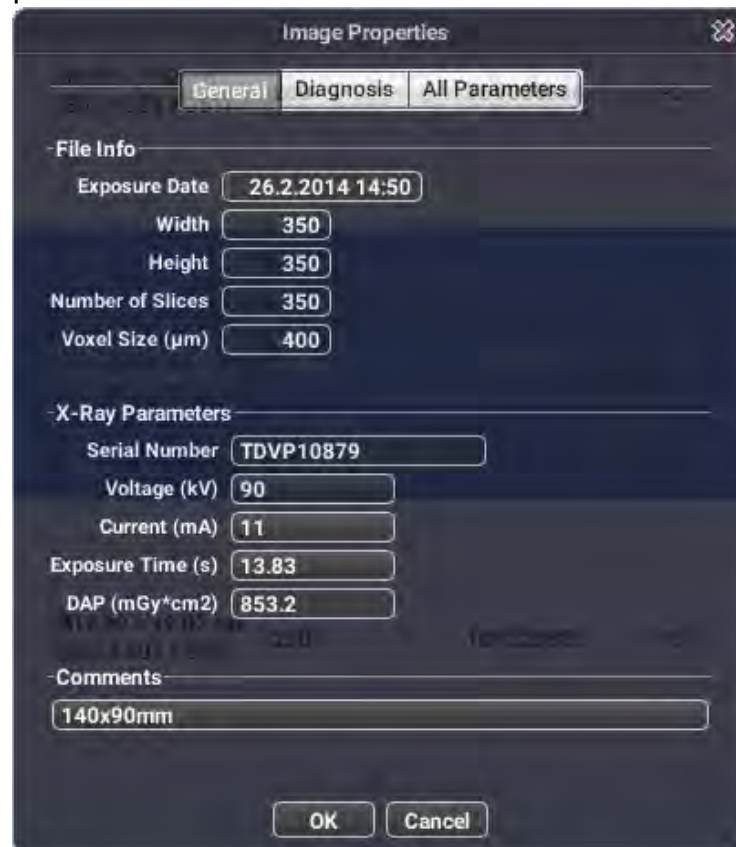
To open a 3D volume double-click the volume on the list. The volume opens in the *Explorer* sub-module, see section 3 "EXPLORER SUB-MODULE" on page 161.

### 2.2 Viewing volume properties

Right-click on the volume and select *Show properties*.

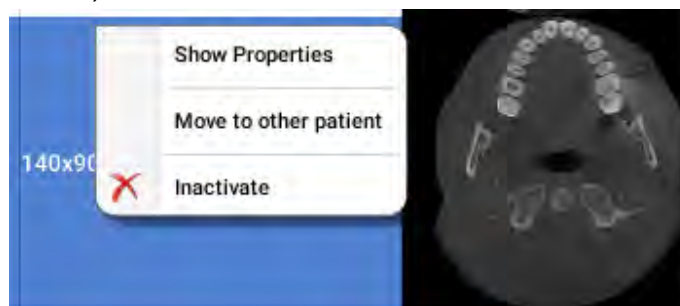


In the following window you can view image file information, x-ray parameters and added comments.

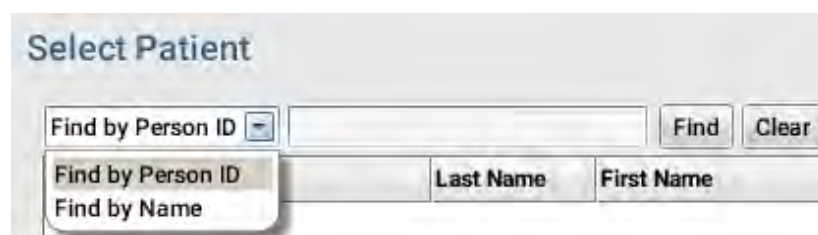


### 2.3 Moving volume to other patient

1. Right-click on a volume and select *Move to other patient* (see the image above).



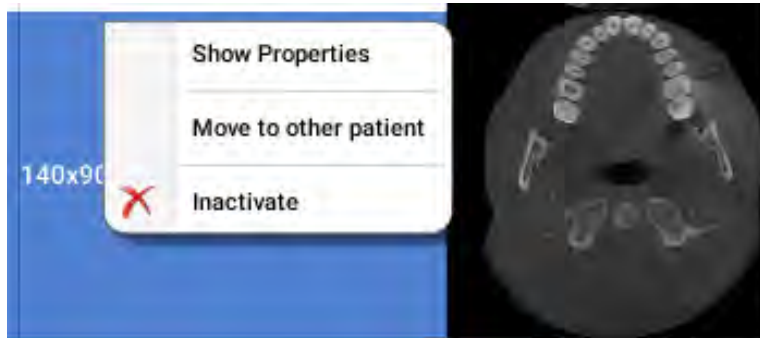
2. Select and enter the search criteria. Select the patient and click **OK**.



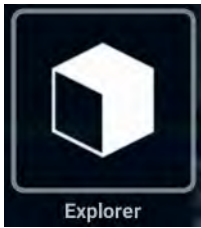
## 2.4 Inactivate

Right-click on a volume in the *Volumes* main view and select *Inactivate* (see the image above). The volume will be removed from the list.

The volume is moved to *Trash* folder from where it can be deleted permanently or returned to its original location, see section “Reactivate and empty trash” in the Planmeca Romexis technical manual (10037884) for more information.



## 3 EXPLORER SUB-MODULE

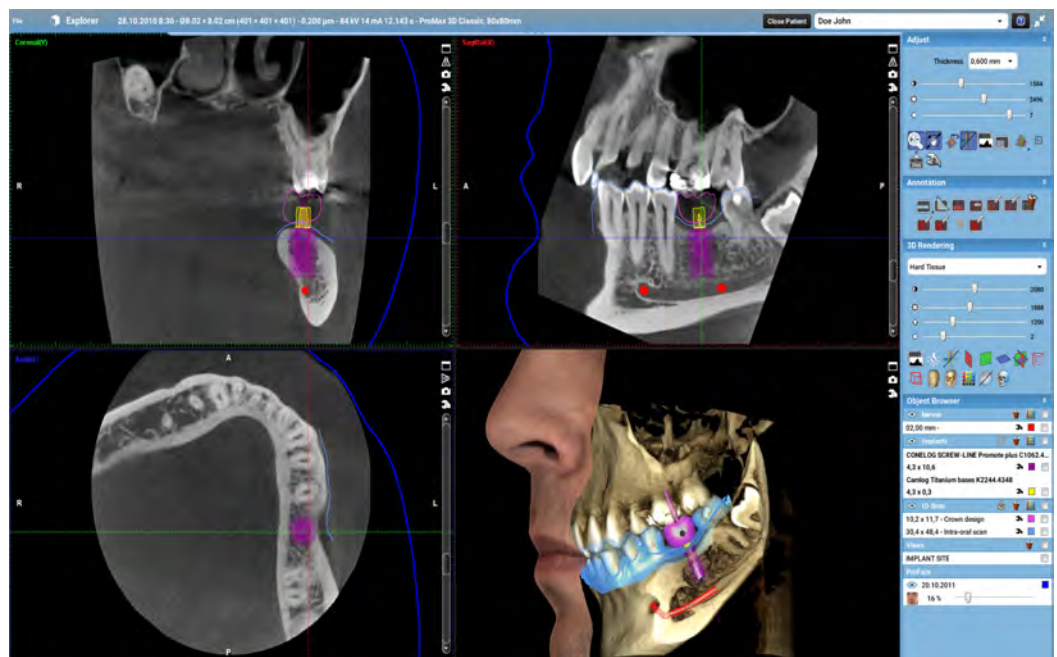


In the *Explorer* sub-module the 3D volumes are displayed simultaneously in three different multiplanar reconstruction (MPR) views and in a single rendered 3D view suited for general diagnosis and reprocessing. The reconstruction views include sagittal (red), coronal (green) and axial (blue) views.

### NOTE

The volume must be opened from the *Volumes* thumbnail for it to open in the *Explorer* sub-module.

In addition to axial, sagittal and coronal planes, any oblique plane can be reconstructed without loss of quality.



### 3.1 Multiplanar reconstruction slice views

#### 3.1.1 Orthogonal plane indicators

The orientation lines in each slice view indicate the relations between the orthogonal planes. This means that the position of the coronal plane is indicated with a green line in the sagittal view, axial view and with a green plane in the 3D volume rendering view. Likewise the sagittal and axial planes are indicated in their respective colors. It is possible to turn off the display of orthogonal plane indicators from the slice views as well as from the 3D volume rendering.



### 3.1.2 Navigating 3D volume data in MPR slice views



There are 2 modes for navigating 3D volumes described below. To toggle navigation mode see section 4.5.5 “Adjusting 3D volume rendered view” on page 211.

#### Volume navigation

You can move and rotate volumes so that the orthogonal planes remain at right angles while moving/rotating the volume. This way the volume can be positioned so that the point of interest shows in other MPR views.

- To move the volume use the left mouse button.
- To rotate the volume use the right mouse button.

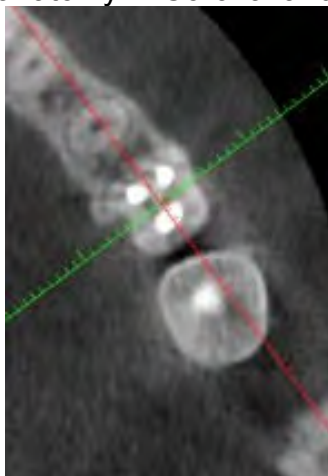
#### Plane navigation

With plane navigation the volume remains static while the orthogonal planes are moved and rotated inside the volume. This can be used for arbitrary oblique slicing without moving the actual anatomy.

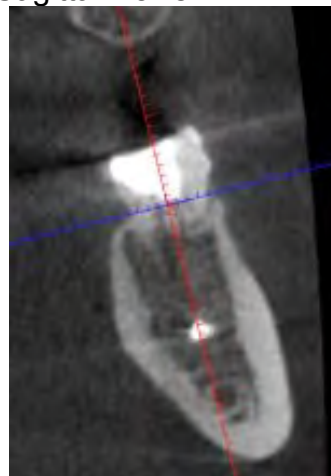
The orthogonal planes can be reoriented as follows:

- To move the intersection of planes click and drag on a MPR slice using the left mouse button. This way the intersection of the orthogonal planes can be positioned so that to the point of interest shows in the other MPR views.
- To rotate the 2 planes perpendicular to the current slice around their intersection click and drag the on a MPR slice using the right mouse button. (In the example below the 2 planes shown on the current slice.)

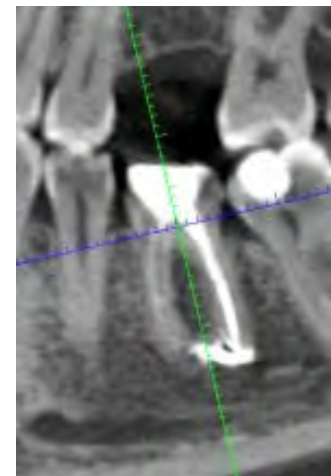
This tool can be used for placing the planar intersection along the axis of a tooth and to rotate the planes in the Axial view while observing the tooth's anatomy in Coronal and Sagittal views.



Axial



Coronal



Sagittal

### 3.1.3 Volume orientation indicators

When orientating the image, the anterior, posterior, left, and right anatomies are indicated by the *A/P/L/R* letters respectively on the edges of the views. These will automatically update to denote the nearest anatomy to the edge.



### 3.1.4 Hounsfield unit display

When moving the mouse cursor on top of the image, a Hounsfield Unit (HU) value will show at the bottom right of the current view. The value is an average of 3 x 3 pixel area under the mouse cursor.

### 3.1.5 Adjusting single MPR slice views

The tools specific to each MPR slice view are located vertically on their right edge (axial, sagittal, coronal).

#### Slice view position scroll bar

The position of a MPR slice view inside the 3D volume can be adjusted by using the vertical scroll bars located at the right edge of each view: axial, coronal, sagittal. For example using the scroll bar in the coronal view moves the coronal plane in anterior/posterior direction when the volume is in its default orientation.

The corresponding orientation lines in the two other views as well as the orthogonal plane in the 3D rendered view automatically move to the corresponding positions.

#### NOTE

To scroll through the image layers use the mouse wheel after deactivating the zoom mode see section 3.2.3 “Toggle zoom” on page 165.



#### Maximize slice view

To open the current view in full size click this button.



#### Snap shot

To create a 2D snapshot of MPR slice view click this button. The snapshot is automatically saved as a 2D CBCT image which can be opened in 2D imaging module.

For more information see section 12.12 “Save 2D view” on page 319.



#### Volume mirroring

Reorients volume in the view as follows:

Coronal: Anterior vs. Posterior

Sagittal: Lateral vs. Contra-lateral

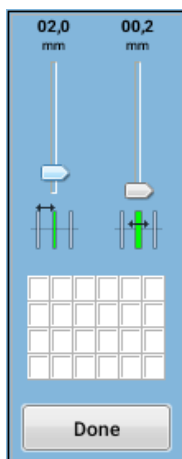
Axial Upper vs. Exterior

- Axial view: From above / below
- Coronal view: From front / back
- Sagittal view: From left / right



### Show view-port settings

To open the settings dialog click on this button on the top right corner of each 2D view. The number of images, layer thickness and distance between layers can be set separately for each view (coronal, sagittal, axial).



## 3.2 Using adjustment tools

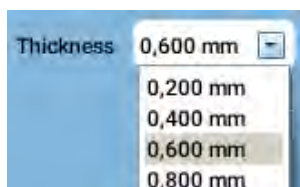
Adjust

These tools can be used in the coronal, sagittal and axial views for enhancement, annotations and measurements.

### 3.2.1 Thickness

Defines the displayed slice thickness of the slice views.

The re-sampling/thickness can be adjusted from the drop-down menu.



#### NOTE

This setting will override view specific layer thickness settings.

### 3.2.2 Contrast, brightness and sharpness

To adjust contrast, brightness and sharpness of the coronal, sagittal and axial view drag these sliders. The best results for contrast are achieved using thicker layer settings (2-5 mm).

The settings are automatically saved when the image is closed.



### 3.2.3 Toggle zoom



When the **Toggle zoom** button is activated the sliced views can be scaled up and down. Move the mouse pointer over the desired view and turn the mouse wheel into the appropriate direction (up to zoom in, down to zoom out).

#### NOTE

When the **Zoom Mode** button is deactivated, turning the mouse wheel over a view will scroll through the image layers as does the layer scroll bars next to the images.

#### NOTE

The rendered volume can be zoomed with and without the **Zoom Mode** button activated.

### 3.2.4 Moving and rotating volumes



Move / rotate volume toggles between the Volume navigation and Plane navigation modes. When enabled, Volume navigation mode is active.

#### NOTE

The annotations and measurements can only be selected and modified in the Plane navigation mode, e.g. when this button is inactive. For more information see section 3.1 “Multiplanar reconstruction slice views” on page 161.

### 3.2.5 Resetting orientation



Resets orientation of orthogonal planes to default without affecting other settings.

### 3.2.6 Show / hide annotation overlay



Shows/hides orientation lines and measurements in the coronal, sagittal and axial views.

### 3.2.7 Adjust levels (adjusting contrast and brightness manually)

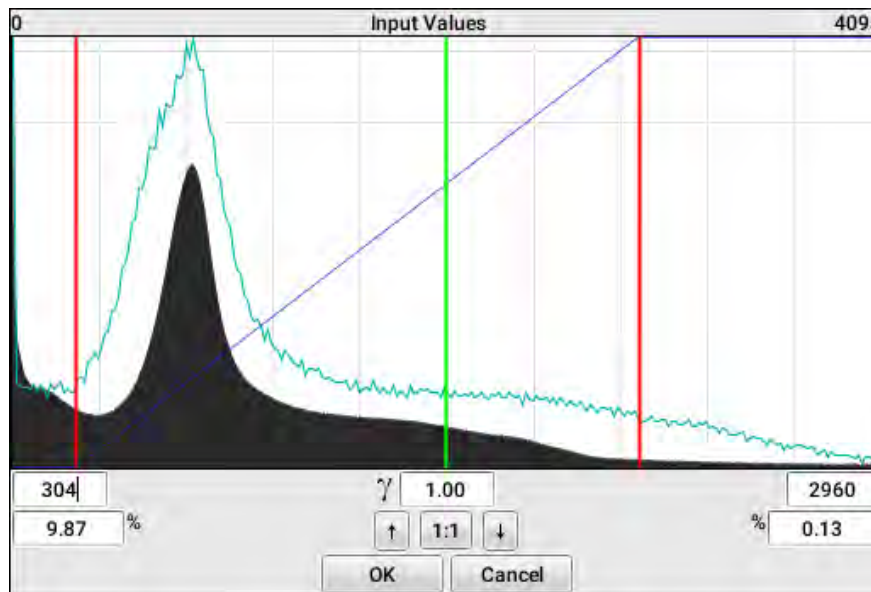
If the automatic adjustments are not satisfactory, the adjustments can be done manually as follows:



1. Click this button.
2. The *Input values* window opens and shows a graphic representation of the intensity distribution in the volume.

To adjust the gamma curve move the **green** line in the histogram. The value is displayed under the histogram in the middle field.

To adjust contrast and brightness cut the histogram from both ends by moving the **red** lines.



To scale histogram up and down to bring out the details click the arrows.



To restore the original scale of the histogram click the 1:1 button.

### 3.2.8 Cropping volumes for 3D rendering



The cropping applied over the sliced views but affects only the 3D rendered volume view.

Press the *Crop* button and move the mouse pointer over one of the sliced view. Press the left mouse button. A white framed rectangle appears.

By dragging the mouse on the view the cropped area can be defined. The rectangle also appears in the two other sliced views, as reference to define an exact area for cropping. If the volume has not been rotated a preview of the cropped volume is shown.

To finish cropping right-click with the mouse. The cropped rendering is automatically centred.

To adjust the cropping turn on the cropping and move the crop box or adjust the cropping limit by dragging its corner points.

### 3.2.9 Using volume reslicer

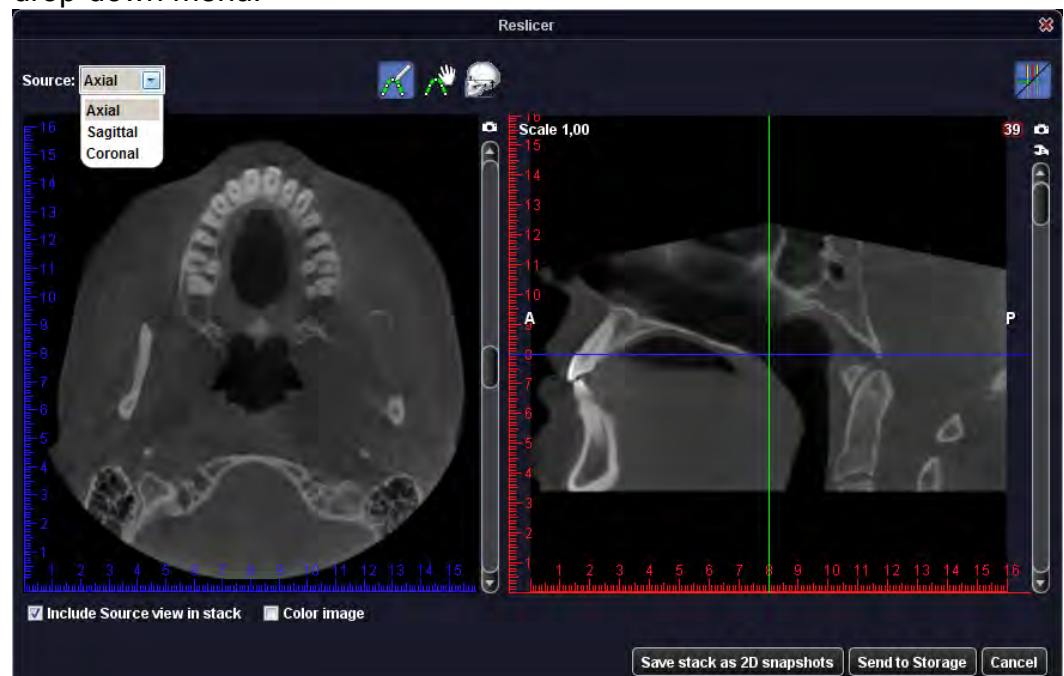
With the volume reslicer you can create a new set of projections and send them to DICOM storage as a 2D image stack. This way the volumes can be more conveniently viewed in some 3rd party DICOM viewers that do not allow free reorientation of the data in axial, sagittal and coronal views.

A stack of slices perpendicular to the mandible can be stored into PACS instead of a stack of axial slices for example.

Alternatively a stack created with re-slicer tool can be saved to 2D imaging module where the images will show as 2D stacks.



1. Open the 3D volume that you want to re-slice.
2. Click on the **Volume reslicer** button.
3. Select the projection to use as a basis for the new stack from the *Source* drop-down menu.



The new stack slices will be perpendicular to the source projection so that the Axial source allows generation of coronal and sagittal like slices.

To define a line or arc that is used as the direction of the re-sliced stack use the **Draw arc** and **Edit arc** tools.

The new slices will be perpendicular to this line and the source projection. The new stack of slices is generated immediately after the arc has been drawn and a preview is available on the right.

The preview allows adjusting the stack slice settings of distance, width and thickness, as well as mirroring of the slices.

To include the source view in final stack select the option **Include source view in stack**.

To send the result to DICOM Storage queue click the **Send to storage** button.

To save the stack to 2D imaging module click the **Save stack as 2D snapshots** button.



### 3.2.10 3D noise filter



This tool applies noise removal and sharpening filter on the 3D volume. To set the strength of the noise filter and to enable an additional sharpening filter:

1. Click the **3D noise filter** button.
2. In the opening preview window set the strength of filtering by moving the *Strength* slider and select the appropriate settings.
3. Apply sharpening filter by checking the *Sharpen* check box.

You can either filter the current volume without storing the results to the database or create a new filtered volume by checking the appropriate check box.

#### NOTE

Applying noise filtering and sharpening on an image may alter its diagnostic quality.



To remove the filtering close and reopen the volume in *Explorer* sub-module.



### 3.2.11 Exporting volume orientation to other views



To export the currently displayed volume orientation to *Panoramic* and *Cross Sections* views click this tool. The volume can then be processed in the other views as in the *Explorer* sub-module.

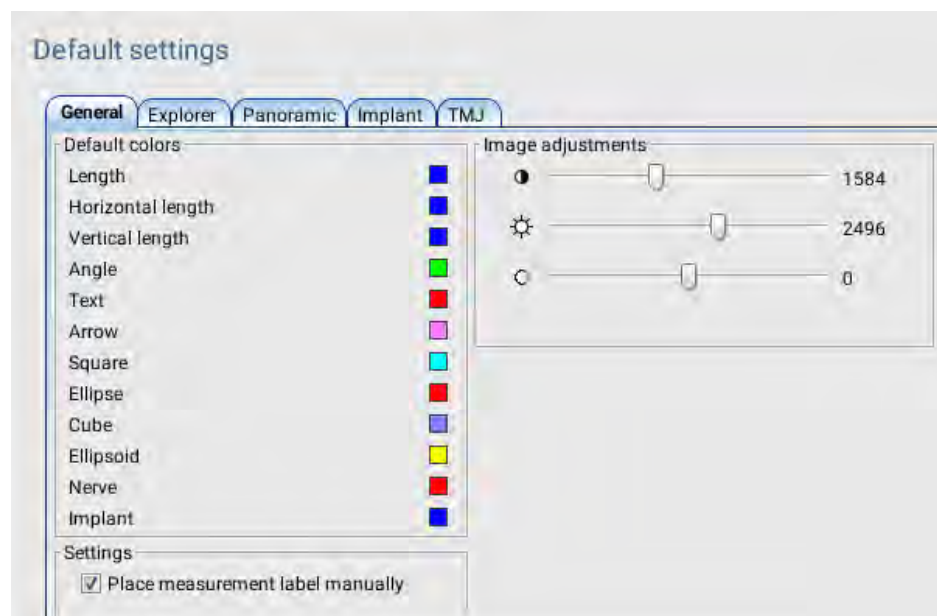
Use this tool for example to align the volume coronally before generating a panoramic view.

### 3.2.12 Default settings

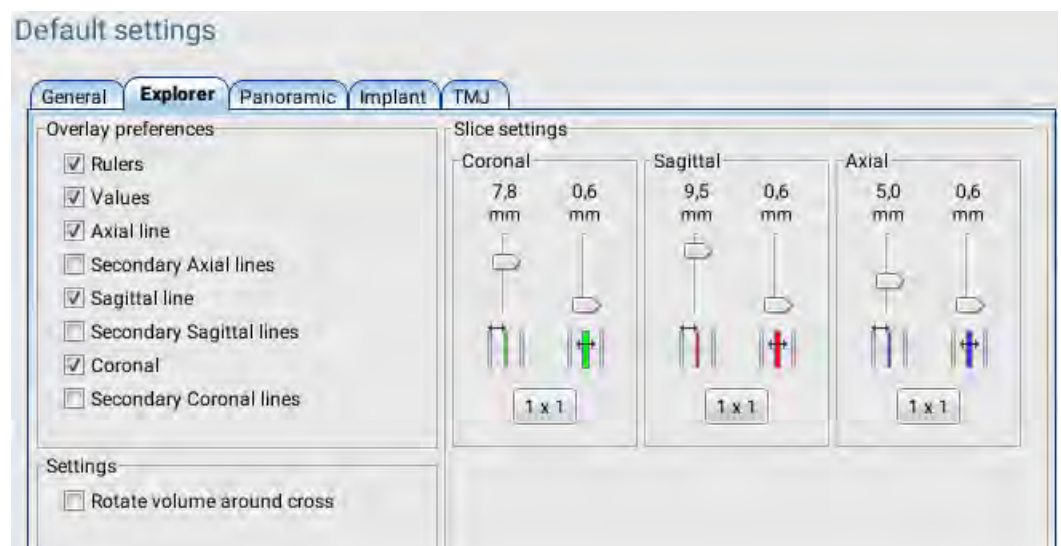


To set elements on the display visible/hidden and to adjust the local default values click this button.

In the *General* tab the default colours, contrast, brightness and sharpness can be adjusted. The colour settings apply for new annotations, nerves and cylinder implants but not for currently activated annotations. The contrast, brightness and sharpness settings apply for currently open and for new and reset images.



In the *Explorer* tab overlay preferences and slice settings can be adjusted.



### Overlay preferences

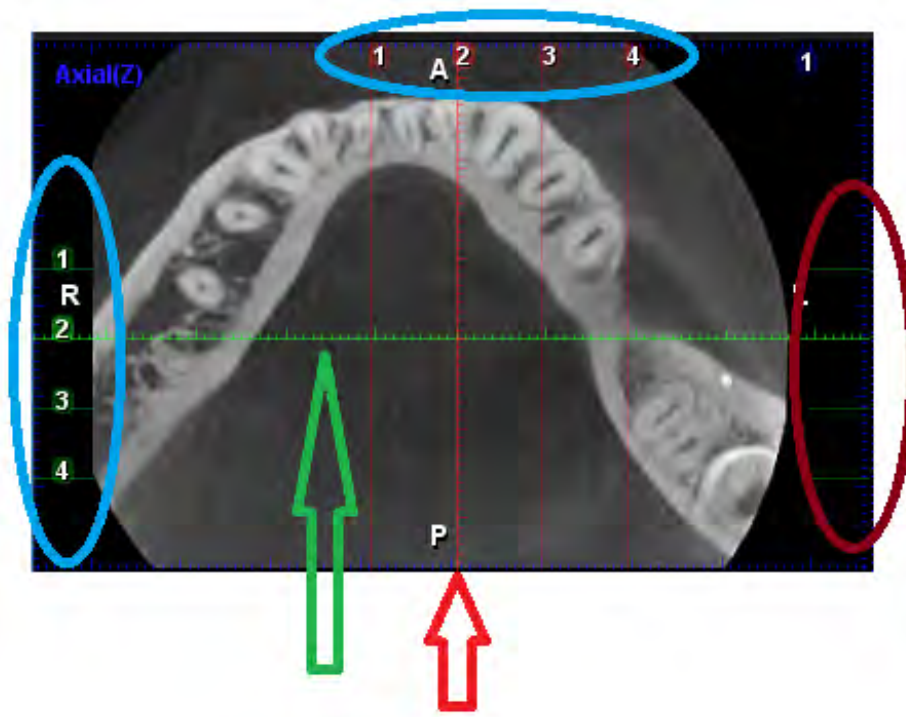
In this field the following elements can be set visible or hidden.

- Rulers (millimetre scale)
- Values - when view contains multiple images, they are balanced with values in other views.
- Axial Line - focus line
- Secondary axial lines
- Sagittal line - focus line
- Secondary sagittal lines
- Coronal line - focus line
- Secondary coronal lines

The secondary lines are reference lines of possible multiple images of other views.

In the axial view image below:

- The focus lines in the sagittal and coronal views are set visible (green and red arrow).
- Both sagittal and coronal views have four images each of which secondary lines of sagittal view is visible.
- As the secondary lines in the coronal view are hidden only the green sections of the line are visible (circled in brown).
- The image values are set to be shown (blue circles).



### Slice settings

In this field the thickness, distance and grid size for each view can be adjusted. These settings are applied for currently open, new and reset images.

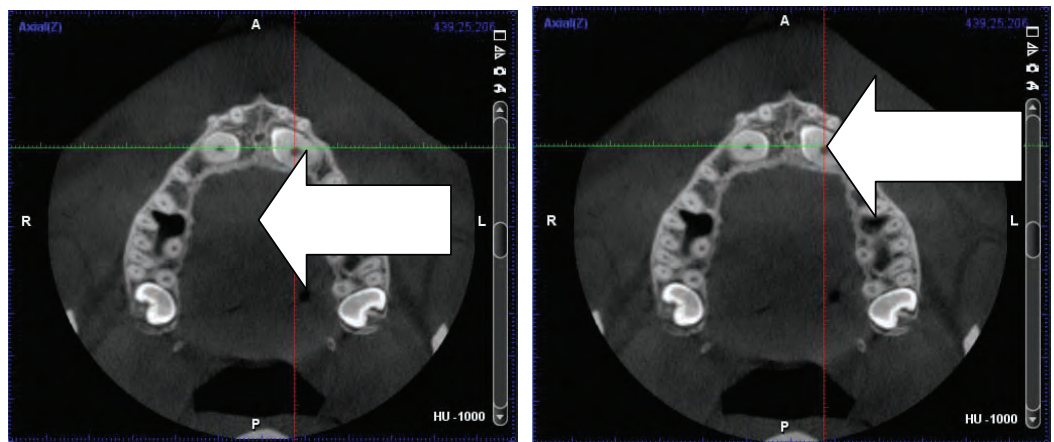
### Rotate volume around cross

To apply this option use plane navigation mode by enabling Move/Rotate volume button.

When this option is disabled the volume rotates around the centre of the slice view. (1)

When enabled, the volume rotates around the intersection of planes. (2)

The arrow points the centre of rotation.



(1)

(2)

### 3.2.13 Tooth segmentation tool (optional)



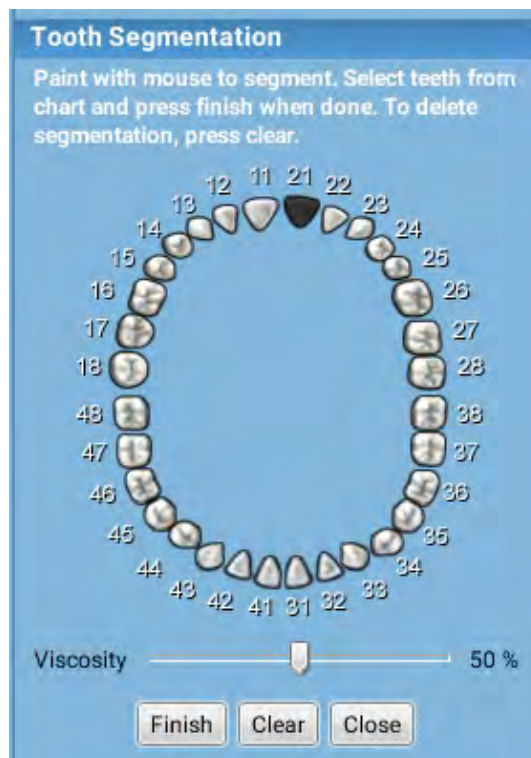
The tooth segmentation tool can be used to segment one tooth or several teeth from the CBCT volume. Each segmented tooth creates an STL file that can be moved on the volume. All segmented teeth are numbered and can be exported as STL files.

#### NOTE

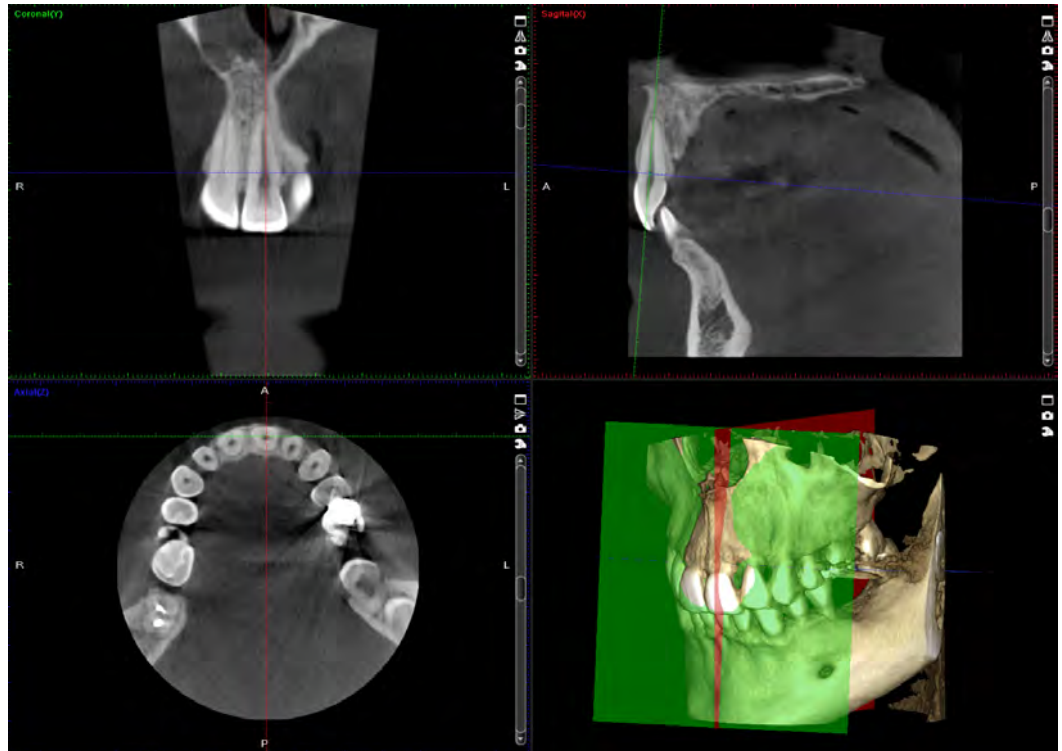
Tooth segmentation is currently best suited for volumes with voxel size between 150-200um.



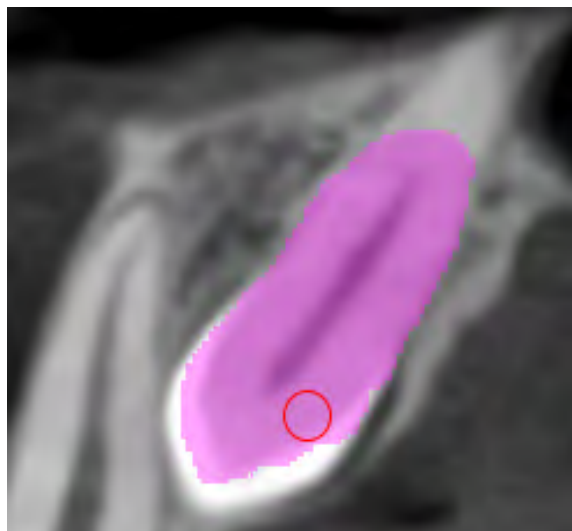
1. Start the segmentation by clicking the tooth segmentation tool and selecting the tooth from the chart.



2. Orientate the 2D planes parallel to the tooth axis. This is easiest done by holding down the **Ctrl** key and left clicking on the centre of the tooth on the 2D views. Rotating the planes parallel to the tooth axis is possible by holding down the **Ctrl** key and dragging with right mouse button in Sagittal and Coronal views.



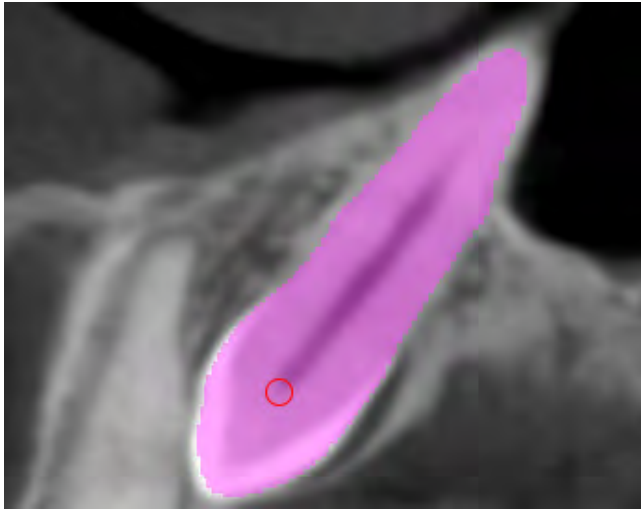
3. Start painting by dragging with the left mouse button e.g. first using the Sagittal view and then the Coronal view. Fine tune the painting by scrolling along the tooth axis using the Axial view.



To obtain the best possible fit multiple slice views can be used. Disabling the Zoom button allows scrolling through the slices using the mouse wheel.



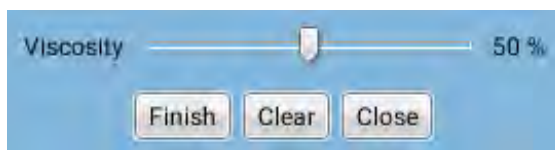
To decrease the size of the paint brush press the **Alt** key and the mouse wheel.



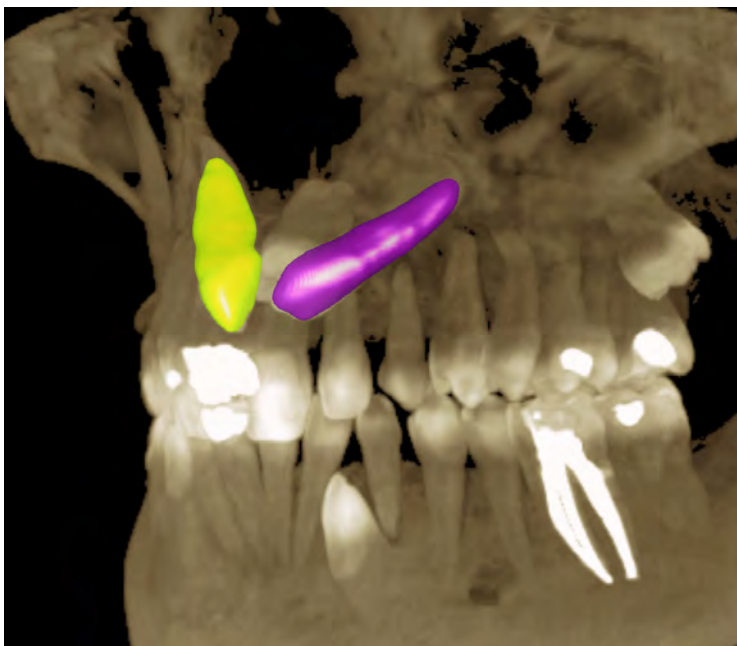
While the areas are being painted the colour flows outside the brush to fill the tooth.

The viscosity slider on the toolbar adjusts the way the paint flows and fills the tooth:

- With 0% viscosity only the area inside the brush is painted.
- With 100% viscosity a large area around the brush is painted as the colour flows.



To remove paint from unwanted areas use the right mouse button.







Finish

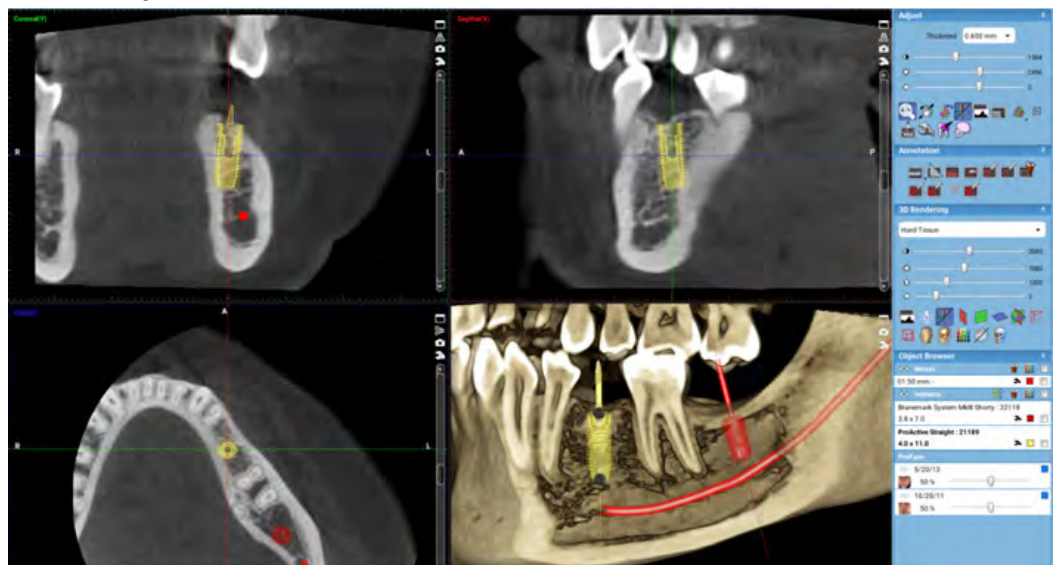
4. When finished click the **Finish** button in the Tooth Chart and centre the views on another tooth by repeating the process from step 2.

All segmented teeth appear in the *Object Browser* under *Segmented Tooth* group.



The segmented teeth are automatically divided into groups in Object Browser, indicating whether they belong to the upper or lower jaw.

In *Explorer* sub-module when clicking on implants or segmented teeth in 2D views or Object Browser, the 2D views are automatically focused on the clicked object.



To export segmented teeth select *Include segmented teeth* option from the *Export 3D* dialog, see section 12.8 "Exporting volumes" on page 309.

### 3.2.14 Jaw segmentation tool

The jaw segmentation tool creates surface models of the upper and lower jaws.

There are two jaw segmentation tools available, one related to 4D jaw motion procedure and another for segmenting the jaw otherwise.

#### NOTE

The availability of these functions depend on your license.



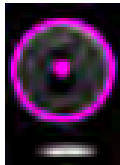
- For segmenting the jaw without following the 4D Jaw Motion procedure, click on the icon without 4D symbol and continue directly to section 3.2.15 "Painting mandibular condyle and coronoid process" on page 178.



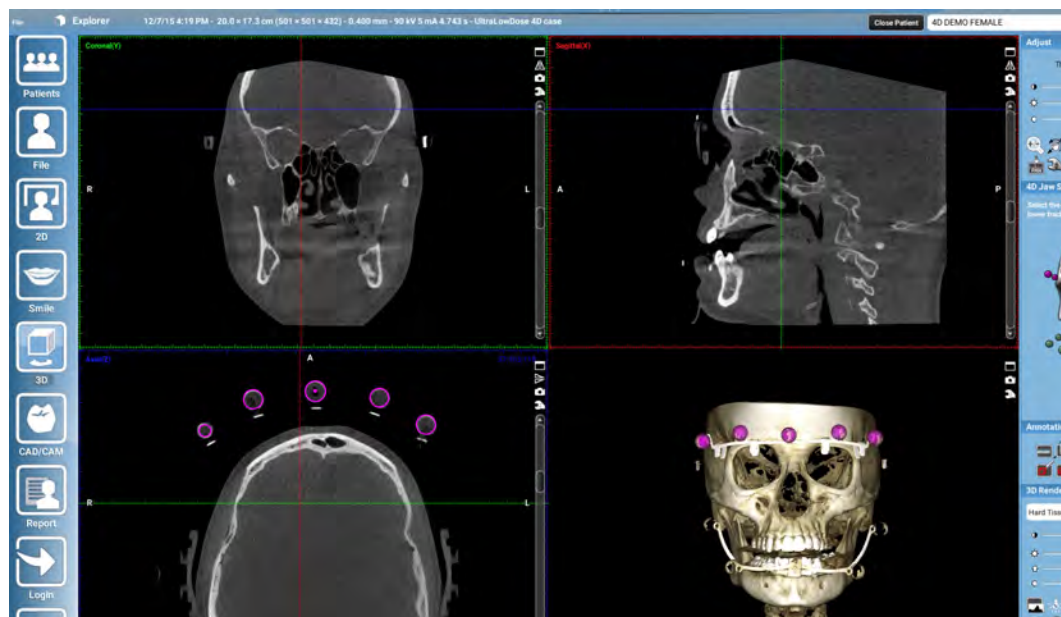
- For segmenting the jaw as part of 4D Jaw Motion procedure, click on the icon with 4D symbol and continue by painting the markers as instructed below.

- Click the **Jaw segmentation** button in the *Adjust* tools group.
- Scroll in the three slice views until the maxilla markers appear on the image.
- Click at the centre of any of the markers.

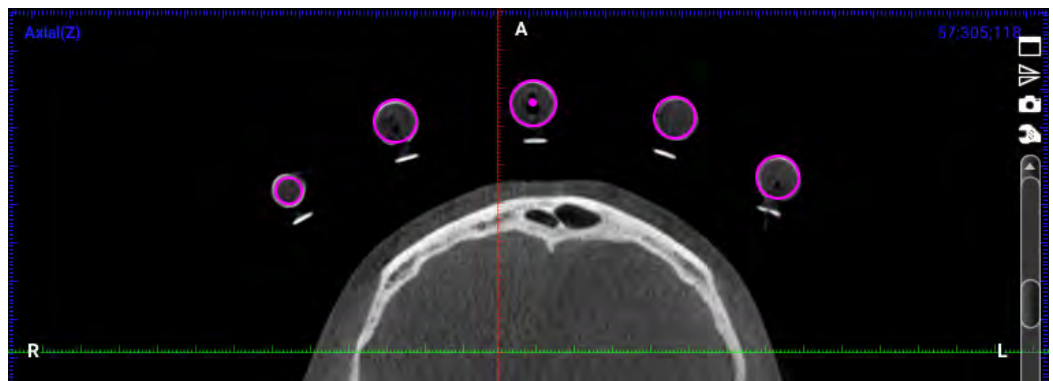
You have hit the centre of the marker when its outline is consistent with the pink outline of the marking tool.



- Click at the center points of the maxilla markers in one of the 2D slice views. The selected markers are painted in pink.



The axial view shows most markers simultaneously.

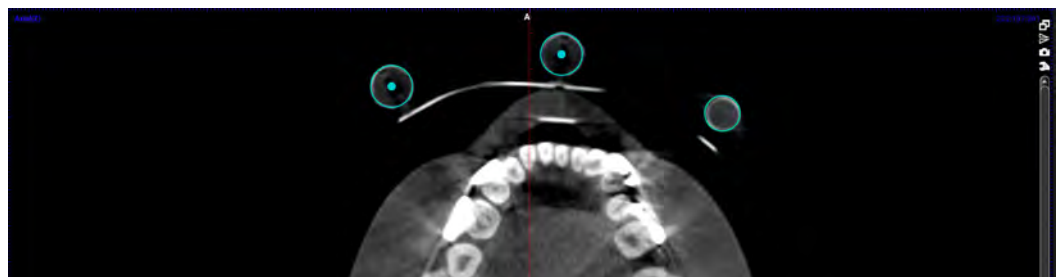


Use the scroll bars if you need to move up or down in the 2D slice views.

- If a marker cannot be selected, try to indicate the center point more accurately by clicking the same marker in one of the other 2D slice views.
  - If you still cannot select a marker, or if a marker is positioned partly outside the image or if you want to fine-tune the marker position, the marker can be selected by left-clicking the center point while holding down the **Alt** key.
5. Paint all 5 mandible markers in the slice views similarly as you did with the maxilla markers.
  6. The mandible markers are painted green.



The axial view shows most markers simultaneously.



7. Click **Next**.

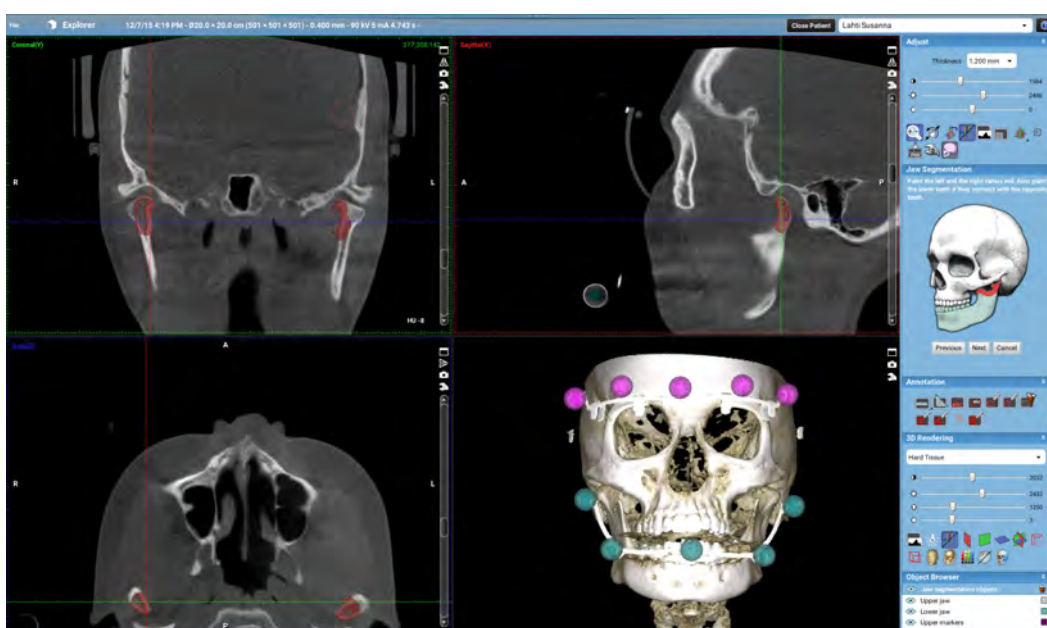
The mouse cursor turns to a red circle and you can continue to painting ramus.

### 3.2.15 Painting mandibular condyle and coronoid process

By painting the mandibular condyle and the coronoid process you will indicate to the system from where the highest part of the mandible starts. The mandibular condyle and coronoid process need to be painted on both sides of the jaw and all slice views can be used for painting.

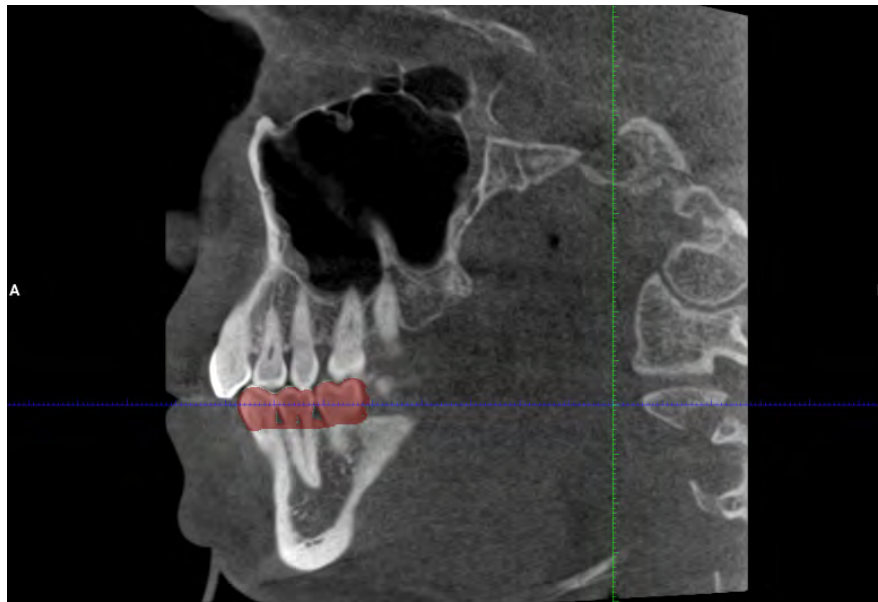
To adjust the size of the paint brush hold down the **Alt** key while scrolling the mouse wheel.

1. Paint both mandible condyles on the images. Use the scroll bar to move in the three slice views so that the entire condyle is painted. Then repeat for the other condyle.

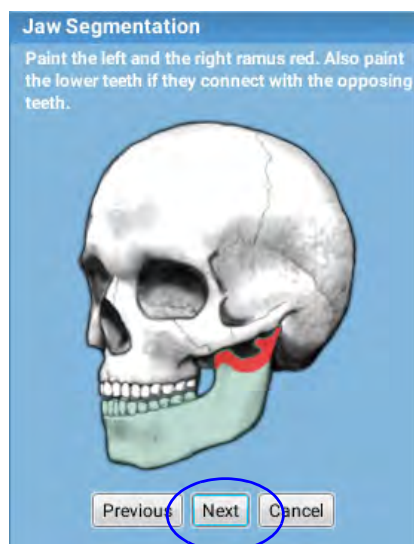




If the teeth are in contact with the opposing teeth paint also the lower teeth.



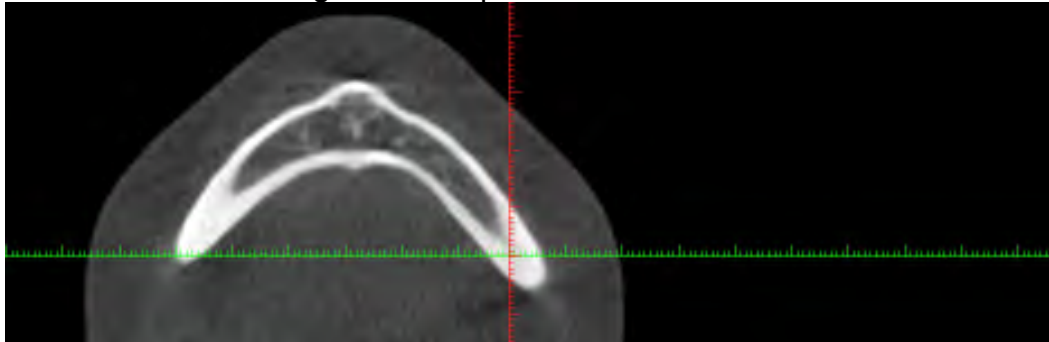
2. Click **Next**.



3. Continue to section 3.2.16 "Segmenting lower jaw from upper jaw" on page 180

### 3.2.16 Segmenting lower jaw from upper jaw

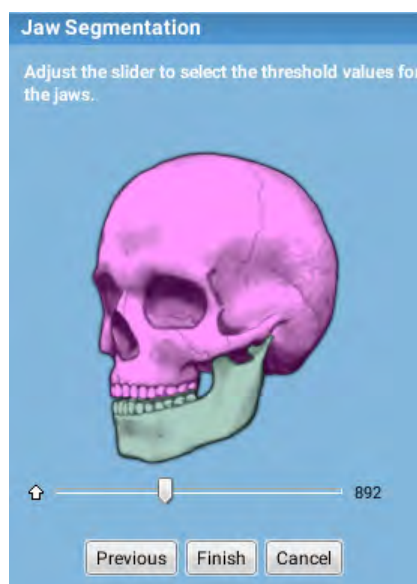
1. Click on a point of high bone density in the 2D views on the lower jaw to start the automatic segmentation process.



2. Click **Next**



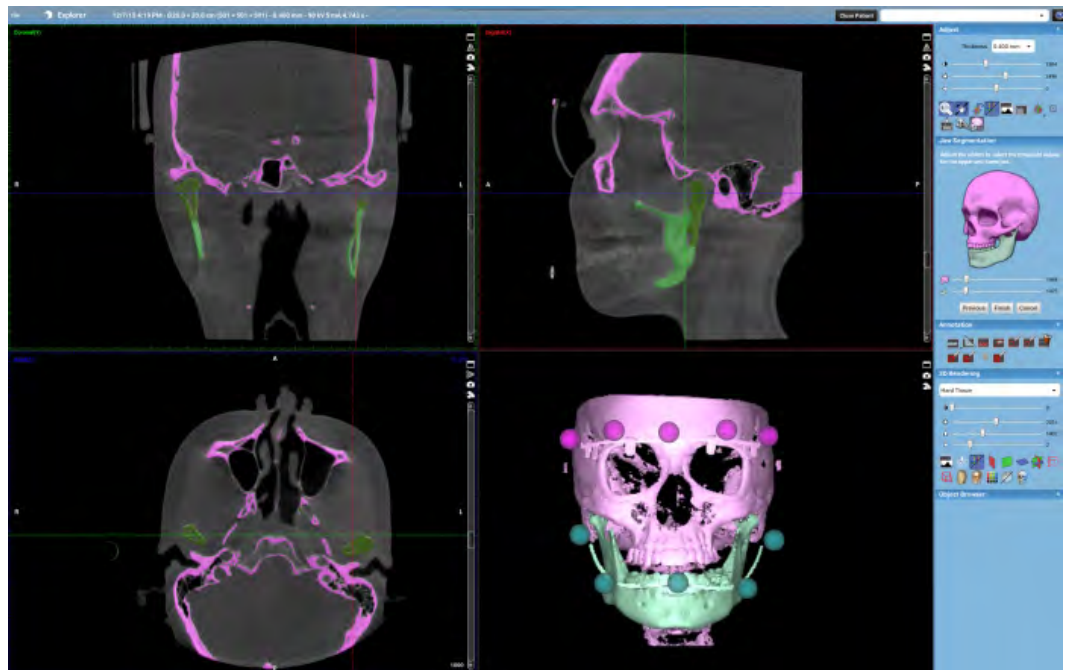
3. Use the slider to adjust the threshold value for the segmented bone surface. All the data above the selected threshold value will be included in the segmented surfaces. After adjusting the slider an automatic segmentation process starts. You can follow it in the 3D rendered view.





**NOTE**

If the threshold is set too low, the mandible segmentation can extend to maxilla.



4. Complete the segmentation by clicking **Finish**.

To continue to viewing, recording and analysing jaw movements and then exporting the files and creating reports see section 10 "JAW MOTION SUB-MODULE" on page 280.

### 3.3 Using annotation tools

#### Annotation

Annotations can be used to add text annotations and measurements on 3D slices. The location of text and point of interest can be moved after placement. All 3D annotations including region growing results are stored as saved views.

#### Measure length



Using the measurement tool you can measure length between two or multiple points.

To select between single measurement and polyline measurement hold down the left mouse button.

**Single measurement** – Hold down the left mouse button and drag to define measurement, release mouse button to finish.

The measurement label can be moved freely around a new single measurement (unless disabled in the default settings). The label can be fixed on a specific place by clicking.

**Polyline measurement** – Draw the line by pressing and holding down the left mouse button, release mouse button to finish.

#### NOTE

All measurements are automatically stored as saved views, use the [Open Saved View button](#) to open the saved views.

To select colour for measurements see section 3.3.1 “Setting the colour for annotations and measurements” on page 183.



#### Measure angle

Click this button to draw an angle into a slice view by pressing the left mouse button down. Drag to draw the first line and then click and drag to draw the second line.



#### Add text

1. Click the button and point with the mouse where you want to add the text.
2. Type the text to the opening window and click **OK**.

To edit the text later select the text with the **Select annotations** button and double-click the text. Edit the text and click **OK**.



#### Add arrow

1. Select Add arrow tool.
2. Click on a location to indicate point of interest,

3. Enter text and adjust the location of text label if necessary.



Use this tool to draw a rectangle.



Use this tool to draw an ellipse.



To delete the selected annotation click **Delete annotation** or **Delete** key on your keyboard.



Use this tool to measure a cubic area in the image. To draw a cube of same size in all views hold down the **Ctrl** key while drawing the cube.



Use this tool to draw and measure an elliptic area in the image. To draw an ellipsoid of same size in all views hold down the **Ctrl** key while drawing it.



Use this tool to measure an arbitrary anatomical region of uniform density (grey scale values). See section 3.3.2 "Region growing tool" on page 186.



Use this tool to measure a freely selectable region. See section 3.3.3 "Manual segmentation tool" on page 190.

### 3.3.1 Setting the colour for annotations and measurements

You can set a default colour for measurements and 3D annotations based on their orientation or type, for example the same colour for all ellipsoids or angle measurements. To set the default colours see the *General* tab settings in section 3.2.12 "Default settings" on page 169.

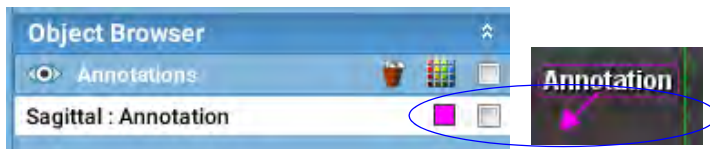
1. In the object browser click the colour icon of the annotation you would like to modify or to change the colour simultaneously to more annotations check the corresponding boxes of each annotation on their right side and use the colour chart on the *Annotations* header to change the colour.



2. Select the desired colour on the colour chart.

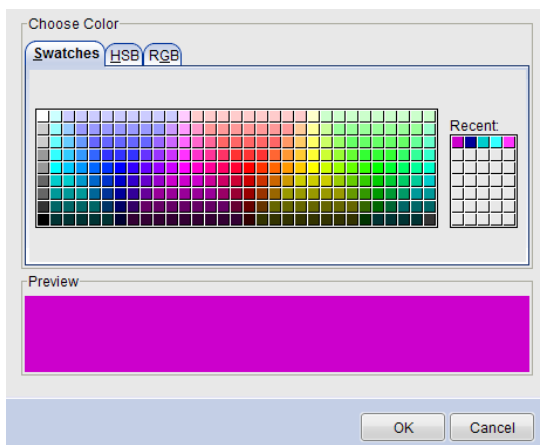


The annotation colour changes according to selection.

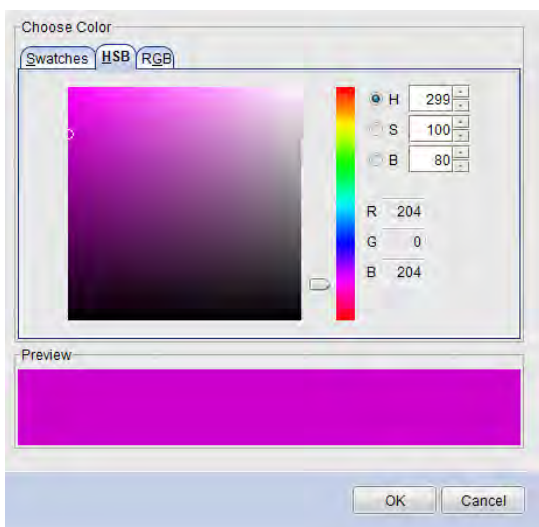


To select a different colour click on the **Other** button and select the colour in one of the following three different ways:

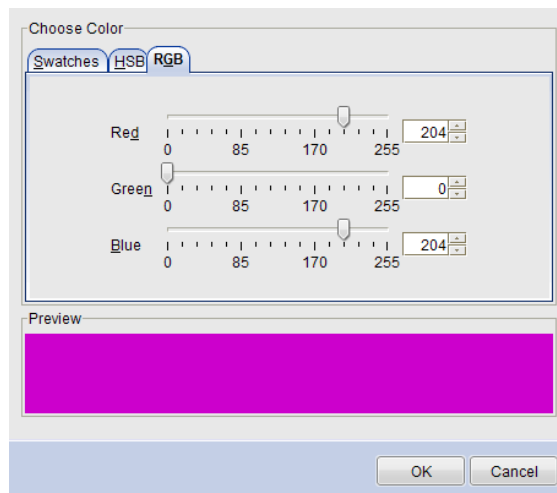
- From the *Swatches* tab by clicking on the desired colour.  
To select recently used colours click the colour on the *Recent* field.



- Entering values for hue (H), saturation (S) and brightness (B) in the *HSB* tab. The proportions of red (R), green (G) and blue (B) are shown below.



- Adjusting the proportions of red, green and blue in the RGB tab.



3. When finished click **OK**.

### 3.3.2 Region growing tool



The region growing tool can be used to approximate the area and volume of an arbitrary anatomical region of uniform density (grey scale values). It works best in areas where there is a distinct border in between the anatomies e.g. air and soft tissue or soft tissue and bone. It can be used e.g. to estimate volumes of sinus lifts or evaluate shape and volume of airways. The volume is calculated based on grey scale values in the image using the threshold value and the seed point specified by the user.

The measured region volume is displayed in cubic centimetres in a ROI info box. The area of region cross section is shown in each slice view in square millimetres.

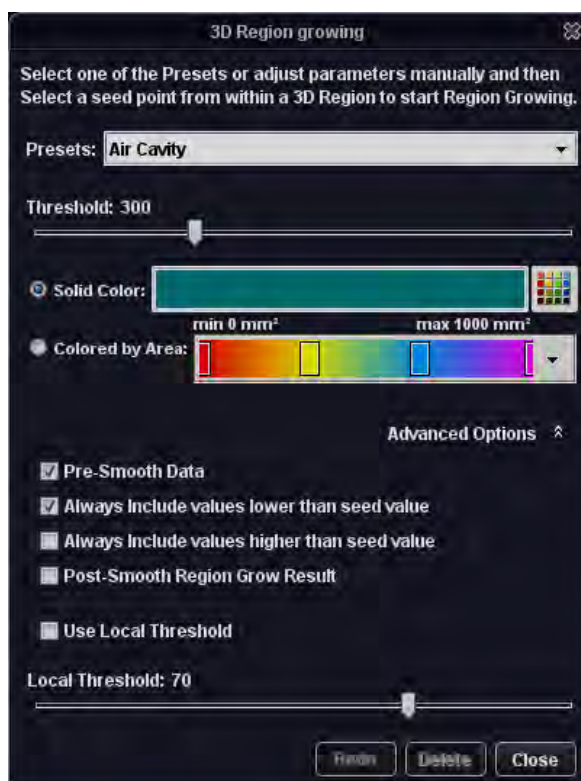
#### NOTE

The region growing result can only be modified when its bounding 3D measurement is parallel to a slice view. This is reached easiest by restoring the original REGION measurement view from the Select View list. If the bounding 3D measurement is displayed in dotted line it is not parallel and cannot be modified.

To toggle between minimised/maximized state of the ROI info box double-click on it.

#### Using the tool

1. Make a Cube or Ellipsoid 3D measurement.  
The measurement will act as the bounding volume for the measurement, limiting it inside the 3D shape.
2. Open the *3D region growing* dialog. You can change the settings as desired.





3. Click inside the 3D measurement you made in the first step on the density that you want to measure.
4. Check the result and adjust the Threshold value in the *Settings* dialog if necessary.
5. Click **Redo** to calculate new result.

To modify an existing region grow result, double-click on its bounding 3D measurement to open the *Settings* dialog and to change its size.

### 3D region growing settings

#### Presets

There are four presets for the region growing tool:

**Bone** for determining the amount of bone in the area in question

**Soft Tissue** for measuring the amount of soft tissue

**Air cavity** for measuring the dimensions in the air cavity

**Root cavity** for measuring the dimensions in the root cavity

#### Threshold

Voxels with values differing (either higher or lower) from the seed point less than the Threshold setting are included in the region.

#### Solid color

Choose the solid color that should be used to highlight the shape of the 3D region.

#### Coloured by area

Choose and adjust the colour range that should be used to highlight axial areas in the 3D region. This option can be used to colour an airway so that narrowest passages with smallest area will be highlighted in red for example. After the region grow has been executed the exact slice specific area measurement (in square mm) will be shown in each axial, sagittal and coronal slice respectively.

Additionally minimum and maximum axial areas will be shown above the color bar in the Region Grow dialog.

#### Advanced options

##### Pre-smooth data

Use this option to filter voxel data before region growing for less noisy result.

#### NOTE

This setting may cause very small features to be lost.

### Always include lower

Include voxels with values lower than the seed value in the region regardless of the threshold setting. Use this setting for segmenting air cavities.

### Always include higher

Include voxels with values higher than the seed value in the region regardless of the threshold setting. Use this setting for segmenting bone.

### Post-smooth region grow result

Use this tool to remove noisy voxels from the region grow result. This setting may cause very small features to be lost.

### NOTE

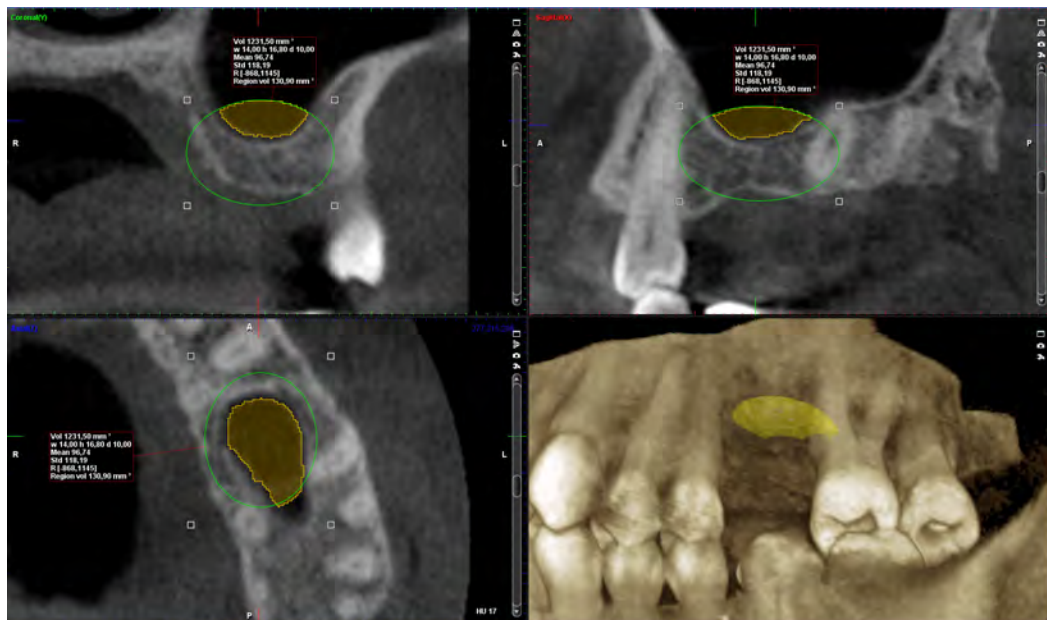
The settings *Always include lower / higher* should not be used together since this selection would always include whole volume in the result.

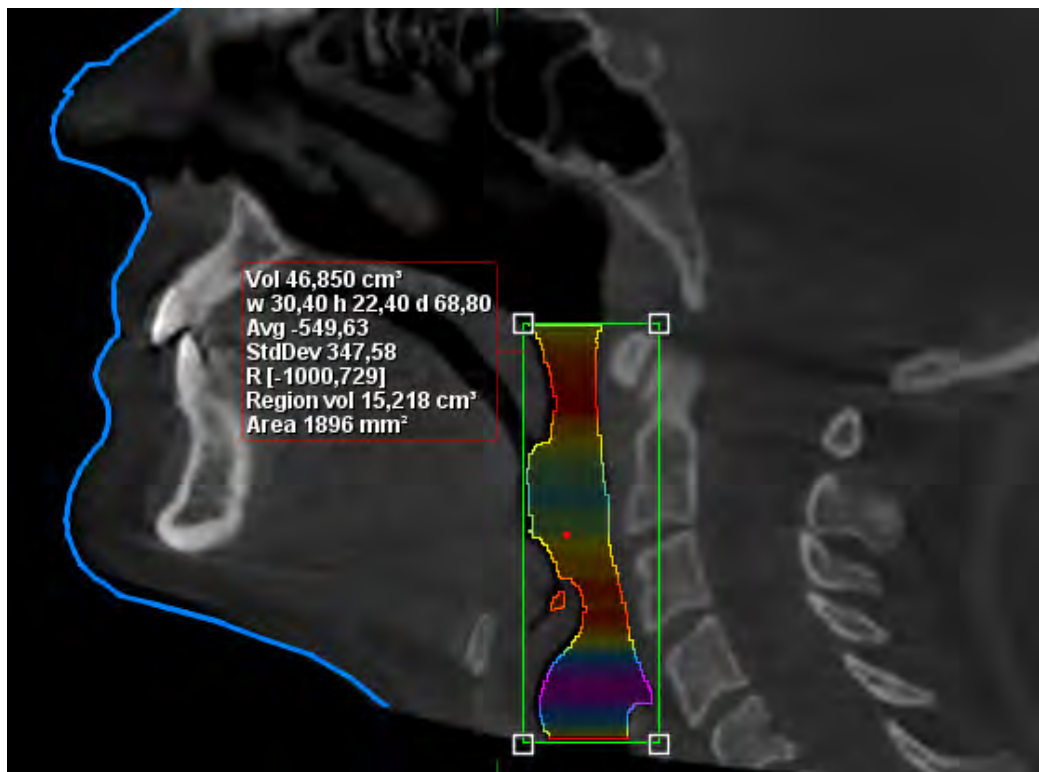
### Use local threshold / local threshold scroll bar

This setting is useful for segmenting areas with slow gradients, if the current voxel value is outside of the Threshold range but very similar to the previous neighbouring voxel included in the region (difference is less than the Local Threshold setting).

This setting prevents false contours in the segmentation result caused by slow gradients.

The following are examples of region growing results.





The following measurement are shown in the images:

- **Vol:** volume of the ellipsoid/cube
- **w,h,d :** width, height and depth of the ellipsoid/cube
- **Avg:** average HU value in cube/ellipsoid
- **StdDev:** standard deviation of HU values in cube/ellipsoid
- **R:** [minimum HU value in cube/ellipsoid, maximum HU value in cube/ellipsoid]
- **Region vol:** region volume
- **Area:** region area in the current slice

### 3.3.3 Manual segmentation tool

The manual segmentation tool can be used to approximate the area and volume of a freely selectable region. It can be used e.g. to evaluate shape and volume of areas that are visible but cannot be differentiated of their surrounding areas by the greyscale values.

The software calculates the volume based on the outlines defined by the user. The measured segmented volume is displayed in cubic centimetres in a ROI info box. The area of region cross section is shown in each slice view in square millimetres.

#### NOTE

The segmentation result cannot be modified after the region has been created.

To toggle between minimized/maximized state of the ROI info box double-click on it.

#### Using the tool



1. Open the manual segmentation tool dialog.
2. Choose one of the 2D views and start defining an area by left-clicking.
3. Finish drawing the area with right-click or double-click.
4. Move in the view's slices and draw at least another outline.

The outlines will act as the limits for the measurement. The area between different outlines is interpolated.

#### NOTE

The outlines for one segmented area can be drawn only to one view.

The outlines are listed in the manual segmentation tool dialog and each outline can be edited and deleted until the region is created. The number for each outline represents the slice number where the outline has been drawn.



5. Once you have finished with defining the outlines click **Create region**.

### 3.4 Using 3D rendering tools 3D Rendering ↑

The 3D rendering tools can be used to adjust the rendered volume.

To move the rendered volume press the mouse wheel *or* hold down the left and right mouse buttons while dragging the image.

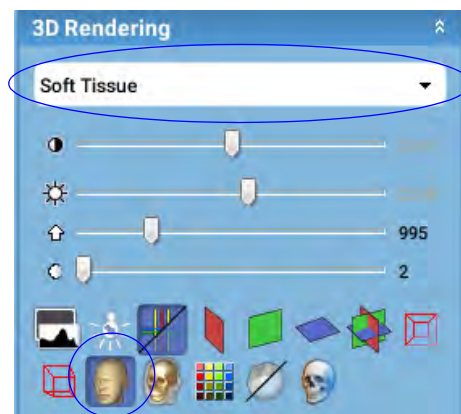
To re-centre the rendering right-click on the new centre point.

To slice or de-slice the volume hold down the right mouse button and drag the mouse up or down.

#### 3.4.1 Using soft tissue overlay

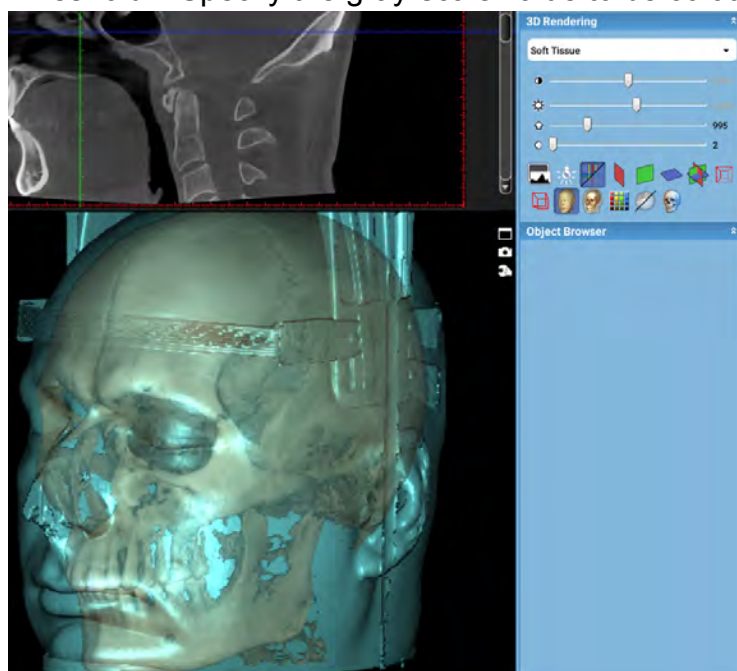
The soft tissue overlay can be used e.g. for colouring of soft tissue and airways to enhance the informative value of the 3D rendering.

Select soft tissue from the menu and click the **Show soft tissue** button.



Adjust transparency and threshold from the sliders as follows:

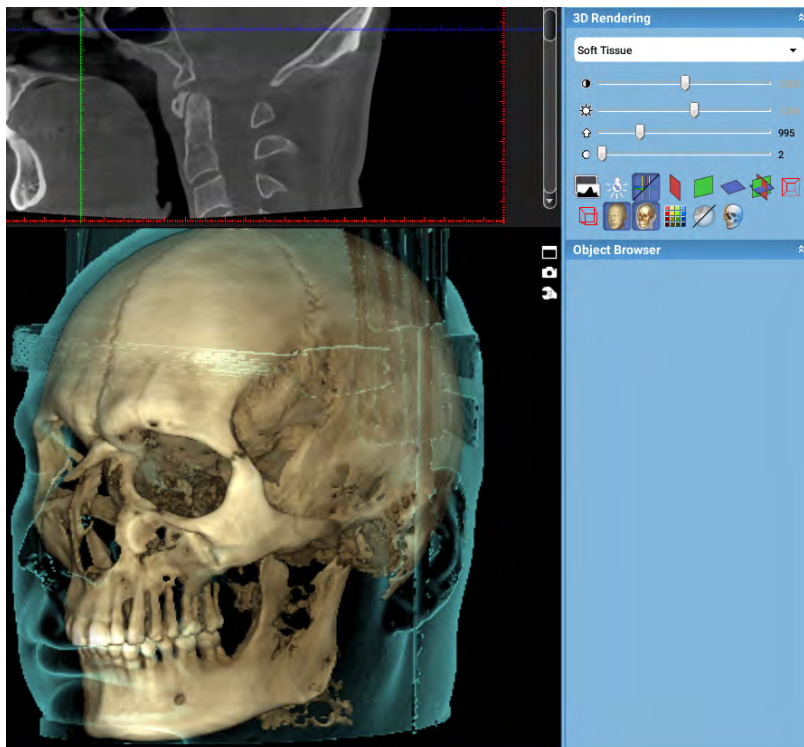
- Transparency – Specify the level of transparency of the overlay against the rendering.  
0% is for fully opaque and 100% for fully transparent.
- Threshold – Specify the gray-scale value to be colorized (0 - 4095).



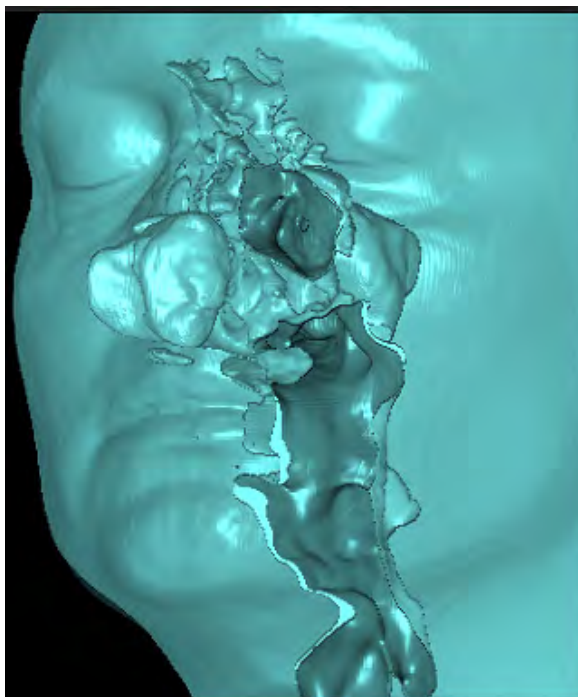




To view the outline of the soft-tissue and how the soft tissue is positioned in relation to bone click **Show soft tissue outline**.



In this image only the soft tissues are shown. The volume has been cut in order to show the intra-cranial air cavities.

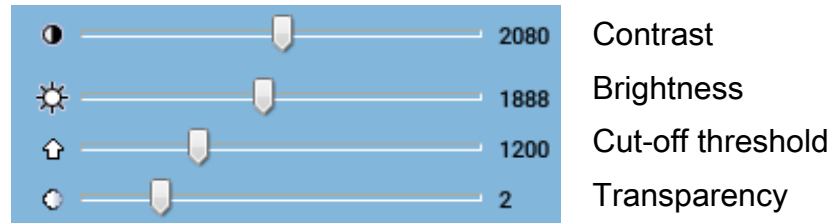


To select soft tissue colour click this button and select the colour from the appearing colour map, see instructions starting from step "To select a different colour click on the Other button and select the colour in one of the following three different ways:" on page 184 for more information.



### 3.4.2 Setting 3D rendering contrast, brightness, cut-off threshold and transparency

To adjust 3D rendering contrast, brightness, cut-off threshold and transparency move the 3D rendering sliders. Hard tissue must be selected from the drop-down menu to change the values for 3D rendering.



### 3.4.3 Adjust levels



If the automatic adjustment of the 3D volume rendering is not satisfactory, the adjustments can be done manually.

#### NOTE

The following settings are only applicable to 3D rendering. For the other levels adjustments see section 3.2.7 "Adjust levels (adjusting contrast and brightness manually)" on page 166.

#### Adjusting threshold

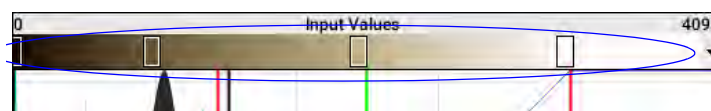
The black line increases or decreases the threshold and consequently has the same function than the slider *Set 3D rendering cut-off threshold*.

#### Adjusting pseudo colour

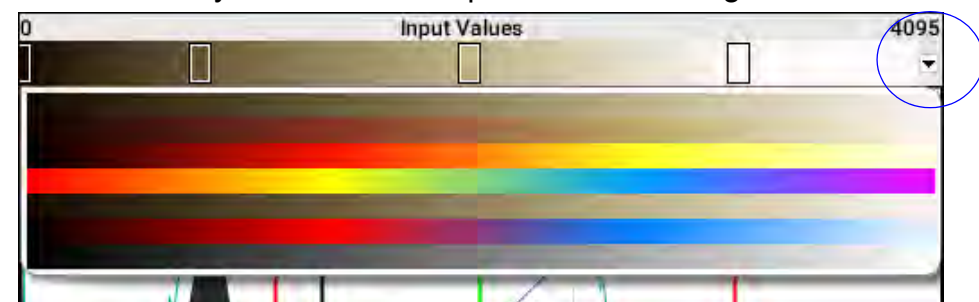
The gamma value buttons *F* and *R* modify the pseudo colours.

- The **F** button alters and allocates the colour for different tissues based on the curve of the histogram.
- The **R** button resets the pseudo colour settings.

To manually adjust the position and range of a specific pseudo colour drag the rectangles above the histogram to left or right.



To select ready made colour maps for 3D rendering click the arrow button.



### 3.4.4 Rotate light direction



Available only in *Surface style* rendering.

### 3.4.5 Rendering orientation tools

The rendered volume view has three coloured planes indicating the coronal, sagittal, and axial planes. These planes help you in orienting the three slice views in relation to the 3D rendering and actual anatomy. The planes can be shown/hidden by pressing the corresponding buttons at the right side of the rendered volume views as follows:



#### Show/hide annotation overlay

Shows/hides orientation lines and measurements in rendered view only.



#### Show sagittal plane (red)



#### Show coronal plane (green)



#### Show axial plane (blue)



#### Show/hide all planes



#### Show/hide volume boundaries:

3D volumes are by default surrounded by a volume boundary box that may in some cases help in orientating the 3D volume.



#### Show/hide perspective in 3D rendering

To turn on linear perspective that provides a more natural view of the anatomy click this button. By default the rendering is shown in an isometric style that has no perspective effect.

When in the default non perspective mode, hold down the right mouse button and move the mouse up and down to produce a slicing effect in which the anatomy is sliced out as you move the mouse up. This effect can be used to slice of thin layer of the anatomy or to clear obstructing anatomy from the view for example.



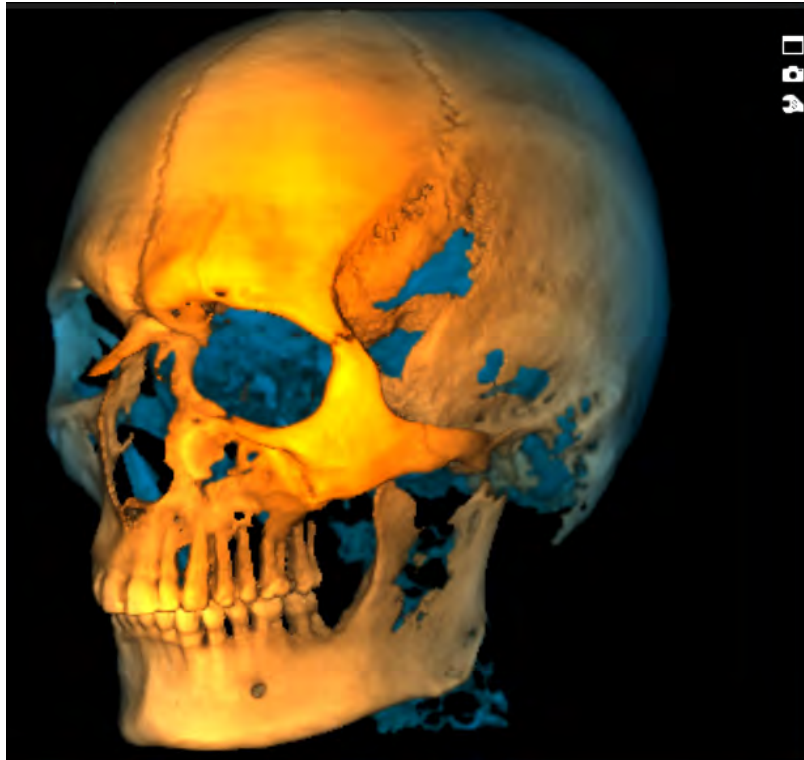
#### Smoothing

Applies a smoothing filter on the 3D rendering.



### Enhanced depth

Applies a depth perception enhancing filter on the 3D rendering view.



### 3.5 Using object browser

The object browser shows all elements added to the image including annotations, nerves, implants, fitted models, segmented teeth, views and ProFace.

The object browser can be scrolled up and down with mouse wheel or using the arrow buttons. All the subgroups can be collapsed by double-clicking the group title.

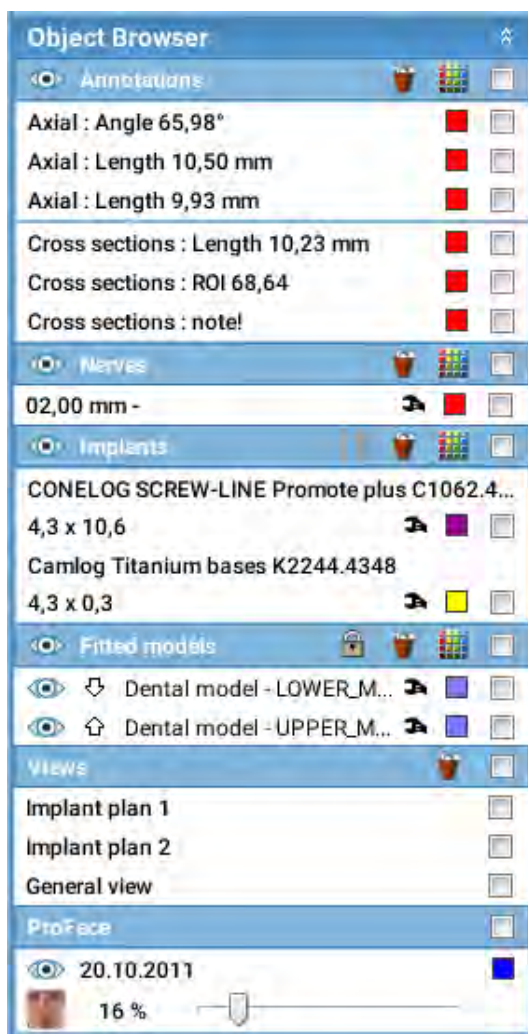
Annotations and views shown depend on the current module/view, other objects are the same for each module/view.

The elements in the object browser can be controlled separately by checking the box next to the desired element. To select all elements in the group (for example all annotations) check the box on the *Annotations* title row.

The element activated on the volume shows in bold in object browser.

Selecting an annotation, a nerve, implant or fitted model in object browser activates it in all the views as well.

When an annotation or view is selected from object browser the orientation of the volume is restored to the view where the annotation was added or the view saved. When an implant or segmented tooth is selected from object browser the 2D views are centred to that object.



### 3.5.1 Object browser tools



Shows or hides the items of the selected group on the images.



When the eye button is dimmed all elements in the current group are hidden. In the ProFace group elements can be shown or hidden separately.



Deletes selected items



Changes colour of selected items. To change colour of a single object click the colour box.



Check the box to select items



Opens properties dialog



Locks fitted models

By clicking this button the scans cannot be activated or moved in the image.



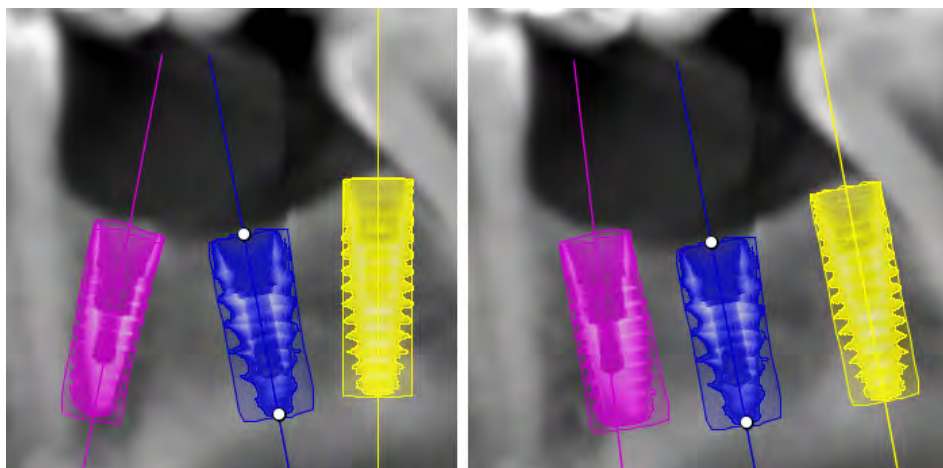
Aligns implants

#### Aligning implants

1. Select the master implant from the views or from Object Browser.  
The selected implant shows in bold in the Object Browser.
2. Select the implant(s) to be aligned from using the check boxes and click the alignment button.



In the image on the left the master implant has been selected and in the image on the right the alignment result is shown.



### 3.5.2 Object browser groups

#### Annotations

Shows length and angle measurements, added texts, arrows, 2D and 3D ROIs, regions and free regions of selected module sorted by the views. When an annotation line is clicked in the object browser the corresponding annotation is set visible by restoring the 2D slice views to the view where the annotation was created.



#### Segmented tooth

Shows segmented teeth added in Implants sub-module in all modules. The segmented teeth are automatically divided into Upper teeth or lower teeth groups in Object Browser



In *Explorer* sub-module when clicking on implants or segmented teeth in 2D views or Object Browser, the 2D views are automatically focused on the clicked object.



## Nerves

Shows nerves added in Implants sub-module in all modules. The value shown is the diameter of the nerve.



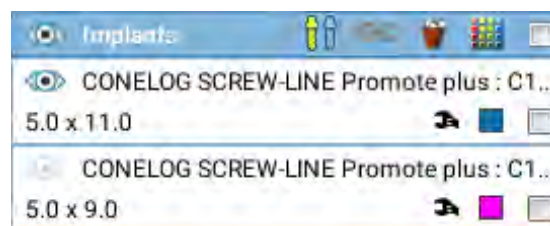
## Implants

Shows implants and crowns added in the Implants sub-module in all modules. The attached abutment is shown below implant. The values in the first row are *product line* and *model* and in the second row *catalog diameter*, *catalog length* and *comment*. If the implant library is not updated to version 4.0 the old diameter and length values are shown. When an element is clicked the corresponding implant/crown is activated.

In *Explorer* sub-module when clicking on implants or segmented teeth in 2D views or Object Browser, the 2D views are automatically focused on the clicked object.

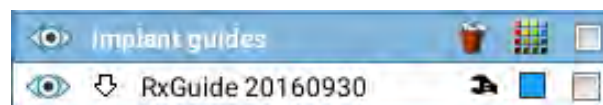
To group an implant with a generic crown, select both items in the Object Browser by checking the boxes, and click on the chain icon in the upper bar of the group. Grouped implant and crown can be moved together.

To hide a single implant click on the eye icon of the implant you want to hide.



## Implant guides

Shows implant guides added in the *Implants* sub-module in all modules.

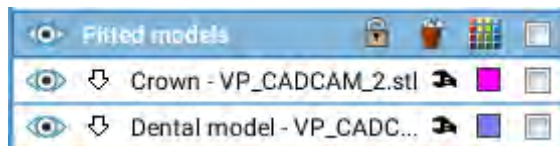


### Fitted models

Shows the imported crowns and dental models in all the modules.

When an element is clicked the corresponding fitted model is activated.

The arrow next to the scan file indicates whether the scan belongs to the upper or lower jaw. Click on the arrow to change the indication.



The crown/dental model division can be defined in the Fit model dialog see section 12.6.1 "Matching STL surface models to CBCT data" on page 304.

### Views

Shows the saved views. Clicking on a view element restores the 2D slice views to where the view was saved in.

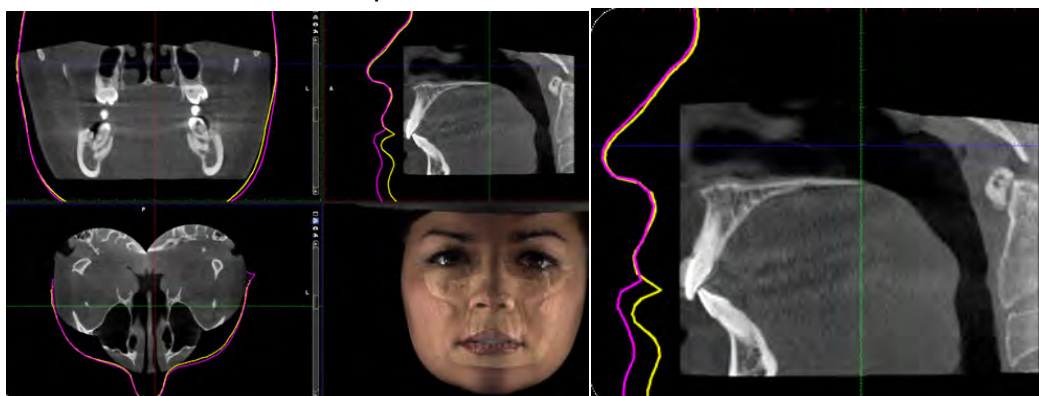


### ProFace

The ProFace overlays are shown in the Object browser's ProFace group. The overlays are listed according to date and a thumbnail of the ProFace image is shown.



Select colour for ProFace profile line in 2D Slice views.



### 3.5.3 Selecting 3D rendering style



To select 3D rendering style click this button on the right side of the rendering view.

The following styles are available.



- MIP (Maximum Intensity Projection)
- X-ray
- X-ray shaded (default)
- Shaded
- Shiny
- Surface
- Black & White X-ray
- Soft tissue

The currently selected style's thumbnail is circled in white.

To set the current rendering style as default setting click **Add** .

To delete the current custom preset click the **Del** button.

To set a new default rendering style, right-click on the desired style and select **Set as default preset**.

To change the background colour of the 3D rendered view, click on the coloured box at the bottom right corner of the window.

To change the resolution of the 3D rendering, click on the current resolution selection to reveal a drop-down list.

#### NOTE

For more information on 3D rendered texture quality, see section "Local settings" in the Planmeca Romexis technical manual (10037884).

## 4 PANORAMIC SUB-MODULE



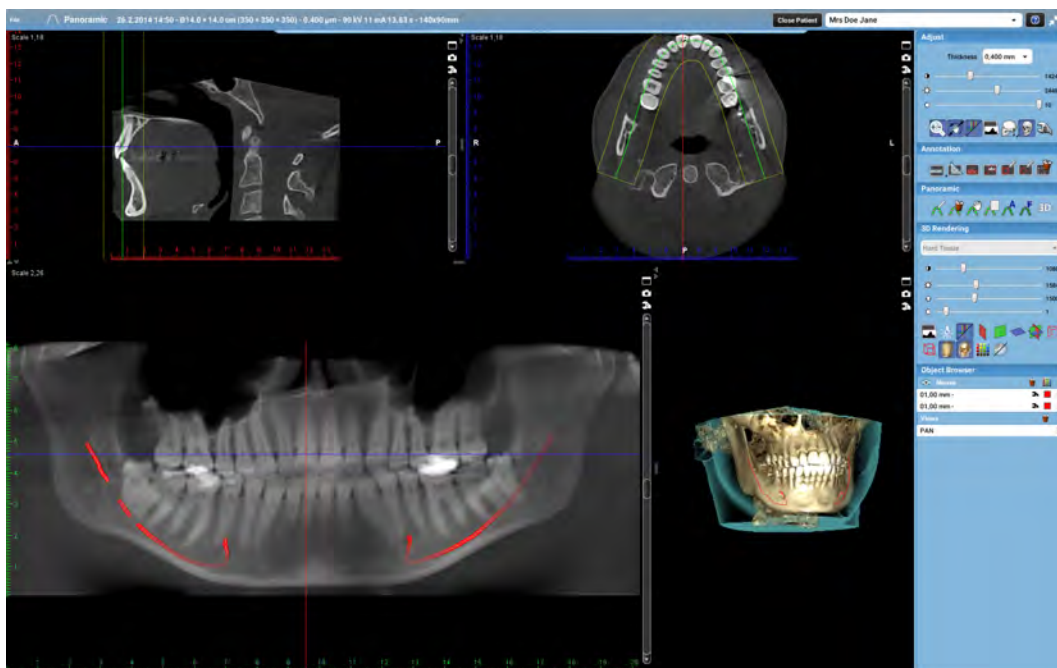
In the *Panoramic* sub-module panoramic images can be generated from the 3D volume data and adjusted and processed in multiple ways.

The image range, thickness and panoramic curve can be defined.

The displayed view can be exported, see section 12.12 “Save 2D view” on page 319. The images can also be printed.

The *Panoramic* sub-module displays four sub-views:

- In **Sagittal** view the volume can be rotated sagittally.
- In **Axial** view the volume can be rotated axially and the panoramic curve is created.
- In **Panoramic** view panoramic images (including 3D rendered views) are shown.
- **3D Rendered view**



### NOTE

To scroll through the image layers including panoramic, sagittal and axial using the mouse wheel deactivate the Zoom Mode, see section 3.2.3 “Toggle zoom” on page 165.

## 4.1 Adjusting the radius of the panoramic curve

Use the scroll bar on the right edge of a panoramic view. This adjustment shows in the axial view so that the panoramic curve moves on the dental arch inwards or outwards. The new layer is automatically updated to the panoramic view.

## 4.2 Adjusting panoramic layers

### NOTE

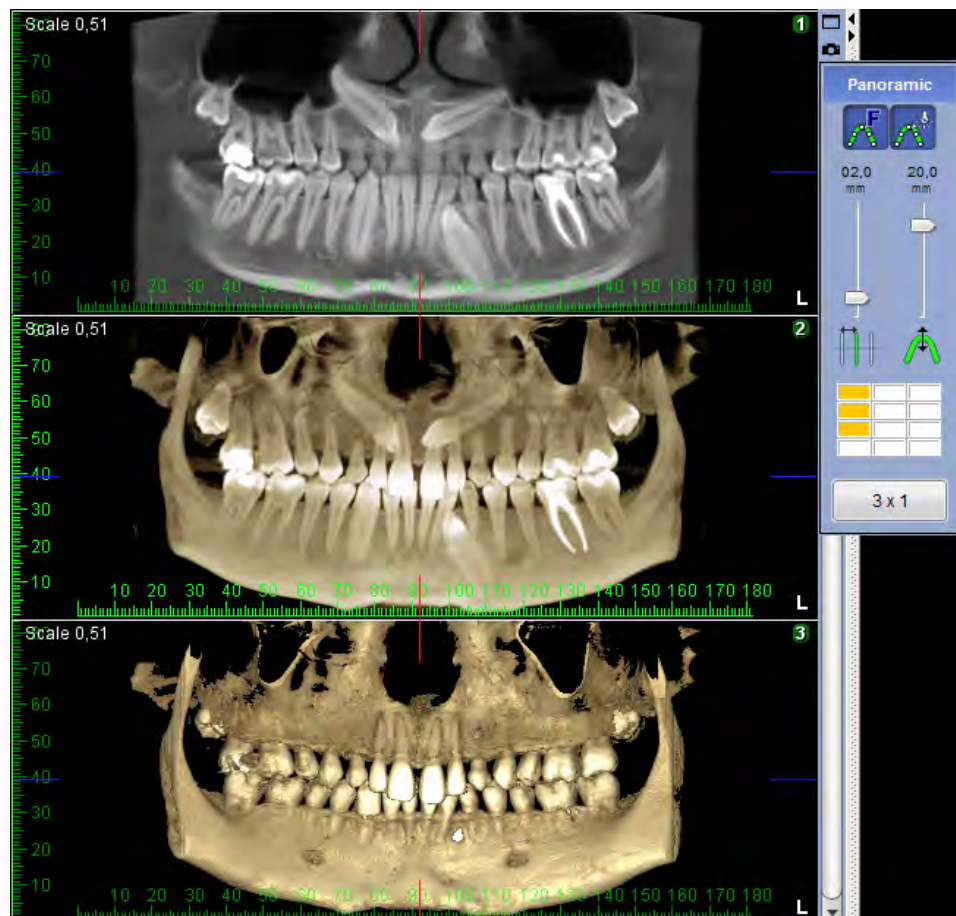
These settings apply to *all* panoramic layers and override all other settings.



Click this button on the top right corner of the panoramic image window. In the opening window the number of panoramic images, layer thickness and the distance between the layers can be adjusted.

### NOTE

Adjusting layer thickness here affects all currently displayed panoramic slices. To adjust a single slice see section 4.4 “Working with multiple panoramic slices” on page 208.

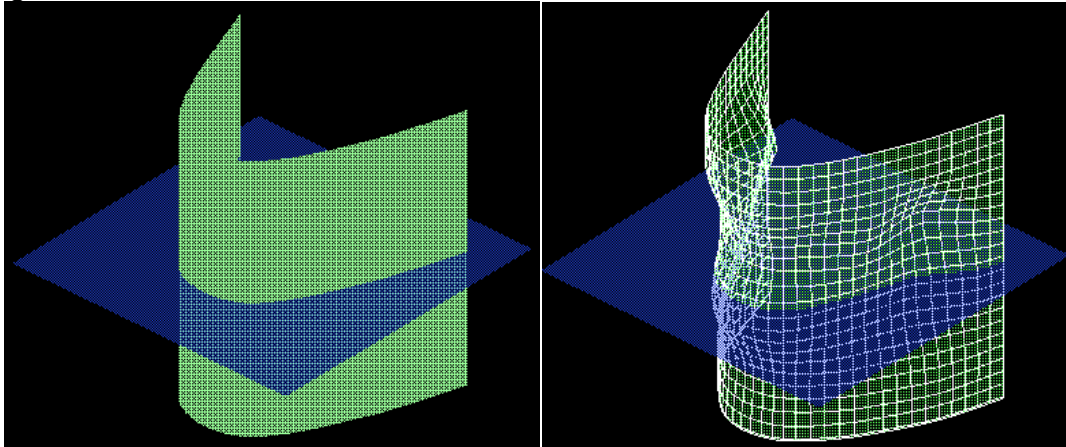




### 4.2.1 Panoramic autofocus tool



This tool automatically identifies anatomy in CBCT image and shapes the panoramic layer so that it follows anatomy in all three dimensions. This results in a clear overview of the whole denture. When used in combination with the Panoramic autofit tool, a detailed panoramic view can be generated.



Without autofocus

With autofocus

#### NOTE

When using panoramic autofocus tool the neighboring panoramic slices may seem identical.

### 4.2.2 Panoramic auto adjust tool



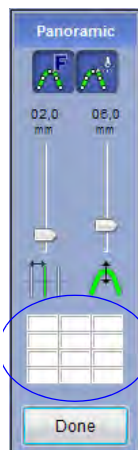
This tool automatically enhances the contrast and sharpness of the generated panoramic layers resulting in an image with more resemblance to a standard panoramic image.

#### NOTE

The rendered panoramic slices are always generated from the same middle panoramic layer.

### 4.2.3 Setting the slice layout

To set the layout for all open panoramic slices click the squares on the grid.





### 4.3 Using Panoramic tools Panoramic ^

With the *Panoramic* tools, the panoramic view can be defined and adjusted by drawing a curve to the axial view and choosing a range to be displayed.

#### 4.3.1 Setting the panoramic rendering mode

To set the same rendering mode for all currently displayed panoramic slices use this panoramic rendering mode drop-down menu.



To set the rendering mode for a single slice when multiple slices are displayed, see section 4.4 “Working with multiple panoramic slices” on page 208.

#### NOTE

The rendered panoramic slices are always generated from the same middle panoramic layer.

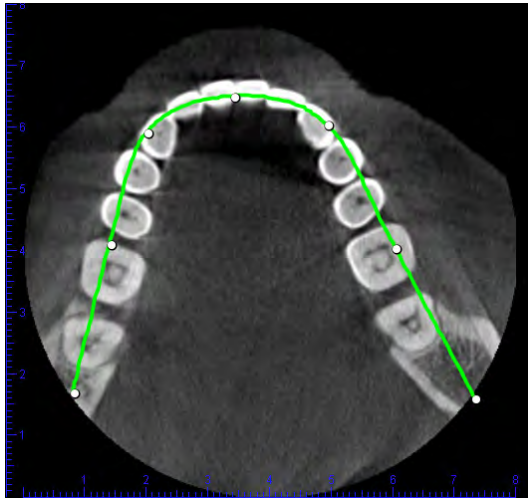
#### 4.3.2 Drawing panoramic curve manually



1. Click this button.
  - The panoramic curve appears on top of the image.
2. Place the curve points on the axial view by using the left mouse button.
  - To add a new control point between two points click between them.
  - To remove a control point, press and hold down the **Ctrl** and click on any existing control point. The cursor will turn into a pen with a minus sign.
  - To move a control point, press and hold down the **Shift** key while dragging it.
3. Click the right mouse button to finish.

**NOTE**

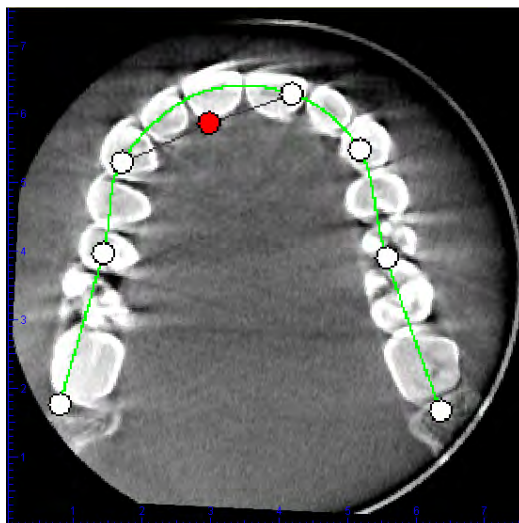
All created panoramic curves will be saved and listed in the Select panoramic curve option.

**4.3.3 Deleting current panoramic curve**

Click this button to delete the currently displayed panoramic curve. The standard curves are not deleted.

**4.3.4 Editing panoramic curve**

1. Click the this button.
  - To move single points on the curve drag the points using the mouse.
  - To move the whole curve drag the curve from the green curve line.
  - To add a new control point, hold down the **Ctrl** key while clicking between existing control points or beyond the ends of the curve.
  - To delete a control point, hold down the **Ctrl** key while clicking on any existing control point. The cursor turns into a pen with a minus sign to indicate removal.
2. When finished with editing click the **Edit curve** button again.



### 4.3.5 Selecting panoramic curve from the saved curves list



1. To show a list of all panoramic curves click this button.  
All curves are saved and named with the date and time they were created.
2. Select curve from the list.



3. To show the curve on image click the **Edit curve** button.

### 4.3.6 Panoramic autofit tool



1. Click on the **Panoramic Autofit** button.

A panoramic curve (focal layer) is automatically placed on the volume.

The occlusal level is automatically identified and the panoramic curve (focal layer) is placed on the dental arch. This tool works best with volumes where dental arch is present.

The Panoramic Autofit tool also adjusts the maxillary and mandibular ranges of the panoramic view so that they resemble typical panoramic image dimensions. (For manual adjustment see section 4.5.2 "Define data range" on page 209).

### 4.3.7 Panoramic autofocus tool



For a detailed description see section 4.2.1 "Panoramic autofocus tool" on page 204.

## 4.4 Working with multiple panoramic slices

To display and select layout for multiple panoramic slices see section 4.2.3 “Setting the slice layout” on page 204.

### Changing the rendering mode and layer thickness of a single slice

1. Right-click on top of the slice you want to adjust.
2. In the opening menu adjust the slice thickness by moving the slider and select the desired rendering mode from the drop-down menu.

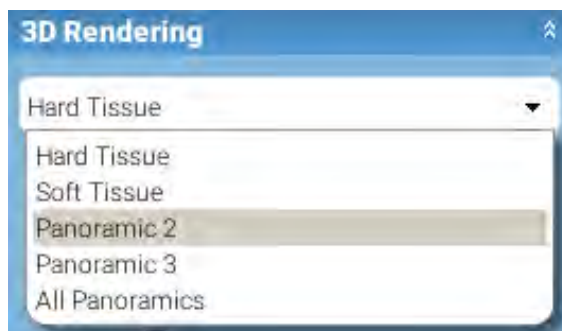


### Rendering settings

1. In the *3D rendering* menu select the panoramic slice of which settings you want to adjust.
2. Use the rendering adjustment sliders to adjust the appearance of the selected slice.

### NOTE

Only the rendered slices are shown on the list.



## 4.5 Using panoramic adjustment tools

Adjust 

### 4.5.1 Moving and rotating volumes



To **move** 3D volume select the *Move/rotate* and hold down the **left** mouse button while dragging the Axial or Sagittal view.

To **rotate** 3D volume click the *Move/rotate volume* and hold down the **right** mouse button while dragging the Axial or Sagittal view.

Refreshing the views may take a moment.

To edit annotations disable this button.

On how to rotate the volume coronally, for example to straighten the occlusal plane, see section 3.2.11 “Exporting volume orientation to other views” on page 169.

### 4.5.2 Define data range



By clicking the **Define Data Range** button the area of interest for the panoramic image can be defined. You can select from which part, lower or upper jaw, the panoramic image is created. In the appearing window move the sliders up or down. The left slider restricts the upper jaw and the right slider the lower jaw.



### 4.5.3 Show/hide renderer



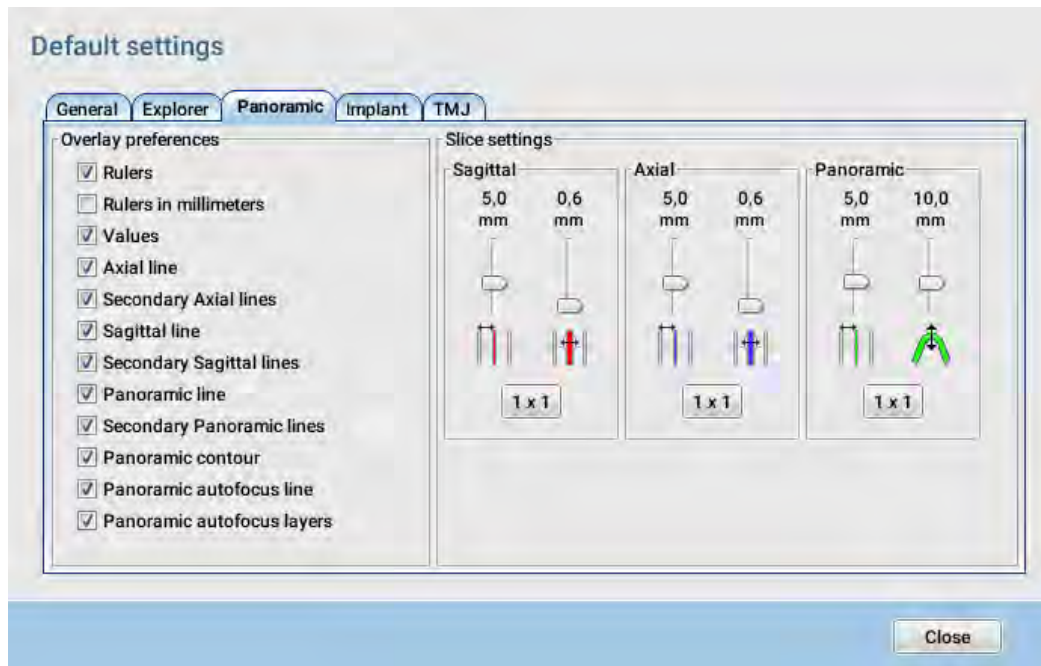
Allows showing and hiding of the 3D rendered view.

#### 4.5.4 Viewing and adjusting default settings



To set elements on the display visible/hidden click this button.

In the opening window select the overlays to be shown and click **Close**.



#### Overlay preferences

In this field the following elements can be set visible or hidden.

- Rulers (centimetre scale)
- Rulers in millimetres. When selected, rulers are shown in millimeters.
- Values. When view contains multiple images, they are separated with labels in other views.
- Axial Line - Focus line
- Secondary axial lines.
- Sagittal Line - Focus line
- Secondary Sagittal lines
- Panoramic Line - Focus line
- Secondary Panoramic lines
- Panoramic contour
- Panoramic autofocus line
- Panoramic autofocus layers

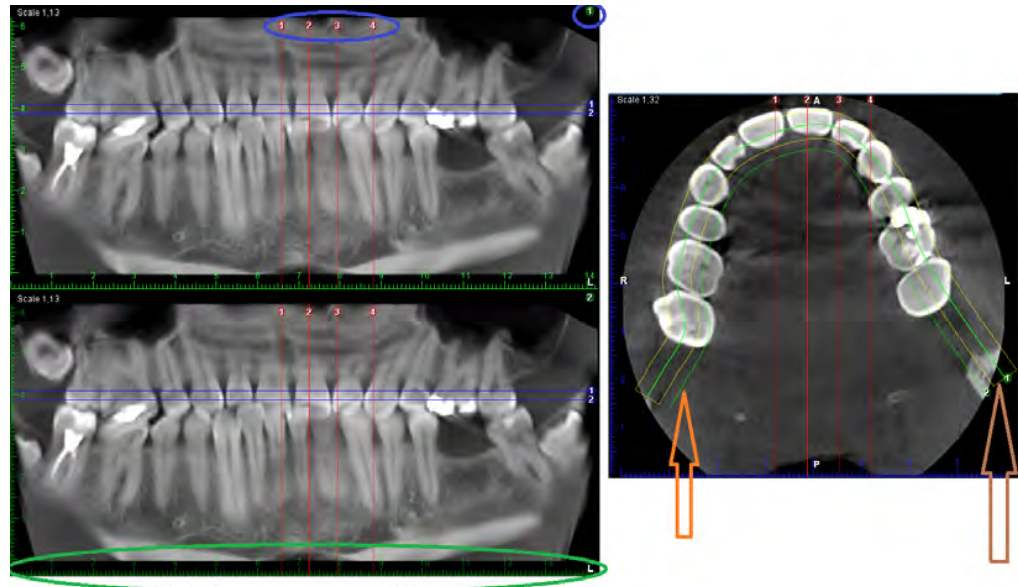
The secondary lines are reference lines of possible multiple images of other views.



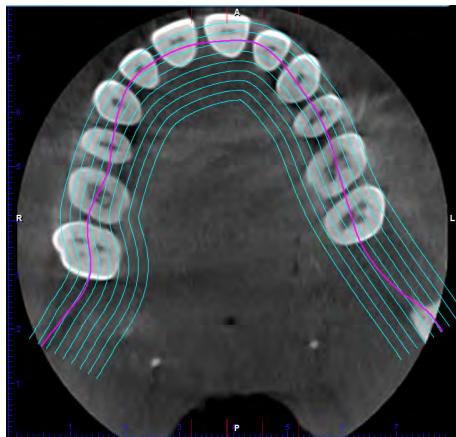
In the following picture of panoramic and axial view some adjustable settings are indicated.

The ruler (circled in green), values (blue circles), panoramic lines (orange arrow) and panoramic contour (brown arrow) are set to be shown.

The thicker of the red lines (number 2) is the focus line for the sagittal view and the thinner red lines are secondary sagittal lines.



In the picture below the panoramic autofocus line is shown in magenta and the autofocus layers are shown in cyan.



### Slice settings

In this field the thickness, distance and grid size for each view can be adjusted. These settings are applied for currently open, new and reset images.

#### 4.5.5 Adjusting 3D volume rendered view

For more information on 3D rendered texture quality, see section “Local settings” in the Planmeca Romexis technical manual (10037884).

## 5 CROSS SECTIONS SUB-MODULE

### NOTE

A volume must be opened from the *Volumes* sub-module before it can be viewed in *Cross sections*.

### NOTE

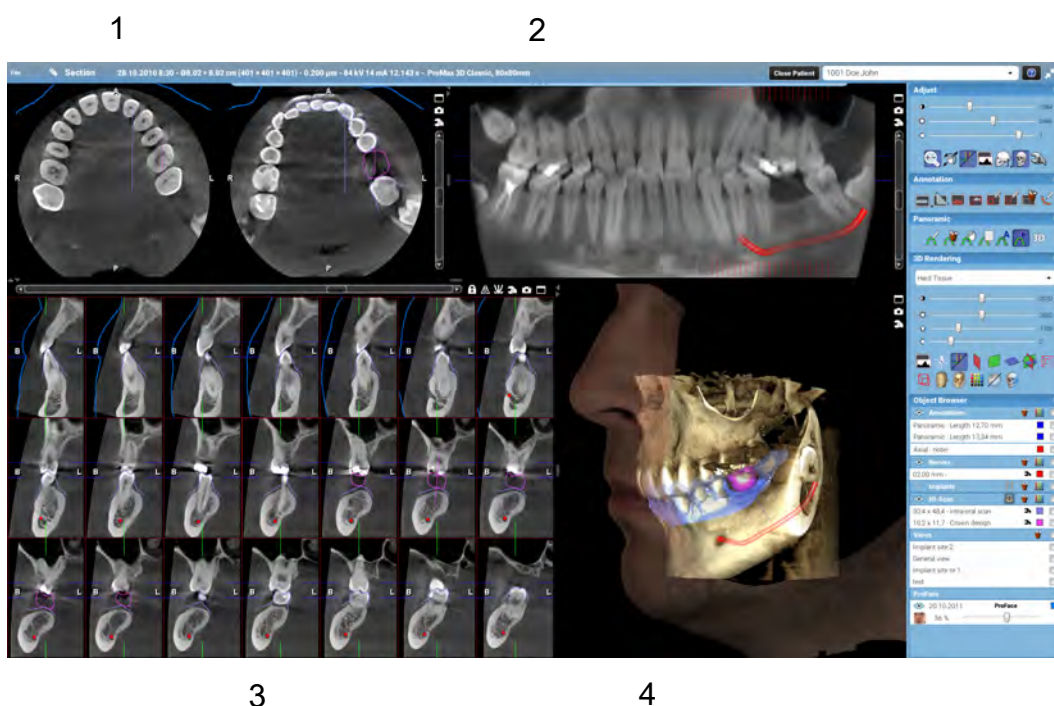
Depending on the acquired license *Cross Sections* sub-module can be replaced by *Implants* sub-module. All functions described in this section are available also in *Implants* sub-module see section 6 “IMPLANTS SUB-MODULE” on page 217.

In the 3D *Cross Sections* view cross sectional slices, axial slices and panoramic images can be created from 3D data.

The Cross Sections sub-module consists of four views:

- Axial view (1)
- Panoramic view (2)
- Cross sectional slices view (3)
- 3D rendered view (4)

The views can be expanded by clicking the small dual arrows in the end of the view dividers or maximized by clicking the *Maximize* button.



## 5.1 Cross section scroll bar



To move the visible slices to right or left with the use the scroll bar. The panoramic curve moves with the slices.

If the option *Cross section lines* is enabled in user preferences (see section 3.2.9 “Using volume reslicer” on page 167) the cross sections will also show in the axial and panoramic views. The middle section is indicated by a red line and a red ruler in the cross sections view.

- To move cross sections voxel by voxel click on the end arrows.
- To move the cross sections freely around drag the scroll box.
- To move cross sections in increments of the distance between the slices click between the scroll box and end arrows

### NOTE

*Full Arc mode will modify the behaviour of the cross sectional scroll bar.*

## 5.2 Full arc mode



In the full arc mode the entire dental arch can be specified by the panoramic curve to be processed as single cross sections. It can be used to create a printout of cross sections covering the entire jaw.

The differences in editing between the normal and full arc mode are listed in the following table.

	Normal mode	Full arc mode
<b>Moving cross sections</b>	Free	Limited to intra slice increments
<b>Printing and 2D snapshots</b>	Maximum number of cross section reference lines shown in Axial and Panoramic view is what is currently shown in the Cross Section browser.	All cross sections reference lines can be shown. Maximum number is defined by length of panoramic curve and distance between slices.
<b>Cross section numbering</b>	Previous setting is remembered	Ordinal numbering is used by default
<b>Typical use case</b>	3D image diagnostics done in Planmeca Romexis only	Complex printouts where measurements must be available on all or most cross sections.

### 5.2.1 Typical work-flow

#### **In normal mode**

1. Browse and rotate volume freely to detect findings.
2. Use views and measurements to indicate findings.
3. Use saved views to return to findings and measurements when necessary.

#### **In full arc mode**

1. Align volume optimally for best compromise between Panoramic coverage and Cross Sectional alignment. No volume re-alignment should be done after this point to prevent existing measurements from not being shown on Cross Sections.
2. Turn on full arc mode to limit cross sections movement. This ensures cross section measurements remain visible.
3. Use the Save View to restore the selected volume alignment in case volume needs to be re-aligned between measurements.
4. All cross sections are processed and measurements added on them where required.
5. When finished, print them out in multi-page printout.

### 5.3 Adjusting slices in cross sections views

#### NOTE

Adjustment in Cross sections view will also affect the settings in Panoramic and vice versa and sagittal or axial rotation of the volume in the *Panoramic* view shows in the *Cross sections* view.



To mirror the cross sections click this button.



To mirror the cross-sections at the apex of the panoramic curve click this button.

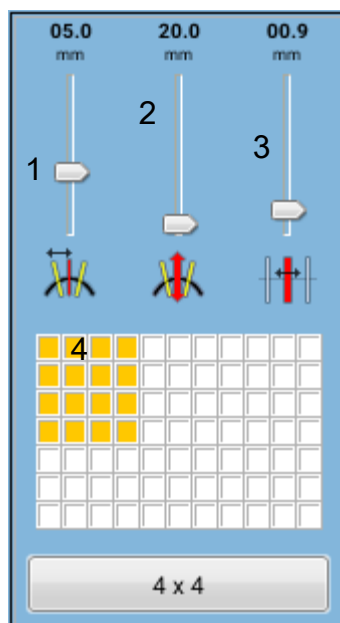
#### 5.3.1 Adjusting spacing, width, thickness and number of slices



Click this button on top of cross section slices.

To adjust the spacing (1), width (2) and thickness (3) of the slices move the slider up or down.

To define the number of slices move the mouse cursor over the slices to select the number of slices (4).



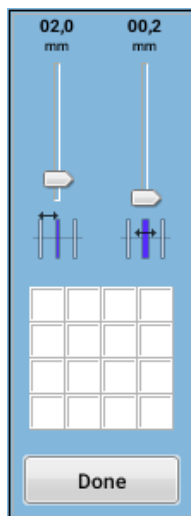
- 1 Spacing
- 2 Width
- 3 Thickness
- 4 Number of slices

If the section lines are activated (see section 3.2.9 “Using volume reslicer” on page 167) the adjustment shows in yellow lines in the axial view. The cross sectional view is automatically updated.

## 5.4 Adjusting axial / panoramic slices



Click this button on the upper right corner of the axial / panoramic view. In the opening dialog the number and thickness of the slices and the distance between them can be adjusted.



## 5.5 Using nerve tools



### Draw nerve

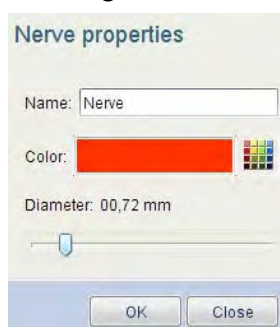
To draw a new nerve channel click the **Draw nerve** button. Use the left mouse button to place points either on the panoramic or on the cross sectional view for a curve depicting the nerve channel of the patient. When finished click the right mouse button. The nerve channel will be displayed as a coloured line in the panoramic view and as dots of the same colour in the cross sectional views.

### Nerve properties

By clicking the adjustment button in the Object browser's *Nerves* group the properties of a nerve channel can be adjusted.



The nerve can be named and the colour and diameter can be modified. To change its properties a nerve needs to be selected. To select an existing nerve channel, press the left mouse button on the nerve.

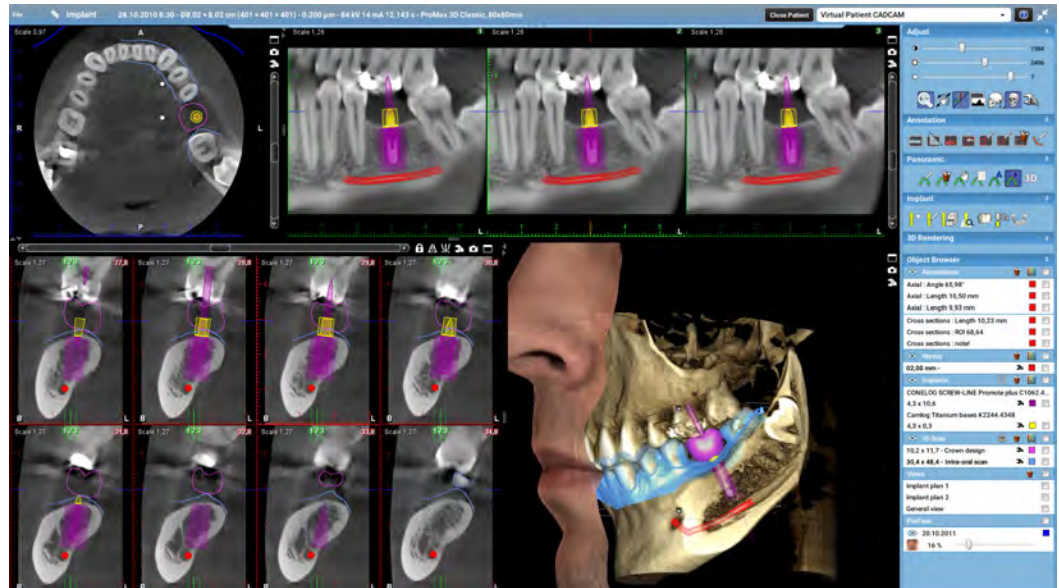




## 6 IMPLANTS SUB-MODULE



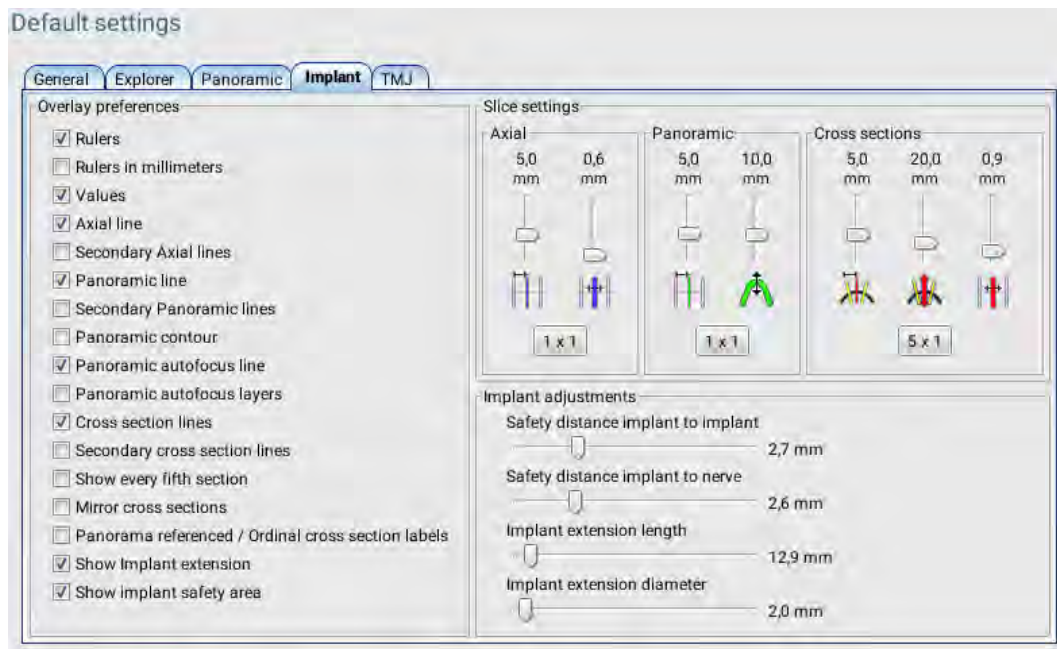
The *Implants* sub-module provides tools for planning and placing an implant into a 3D volume. The Implants sub-module extends the Cross sections sub-module and shares all its features. For more information on the tools (such as cross sections, panoramic, and nerve adjustments) in the Cross sections sub-module, see section 5 “CROSS SECTIONS SUB-MODULE” on page 212.



A volume must be opened from the *3D imaging* main view for it to show in *Implants* sub-module.

Selected implants are available in accurate silhouettes in 2D slices allowing more accurate planning of implant sites.

## 6.1 Viewing and adjusting default settings



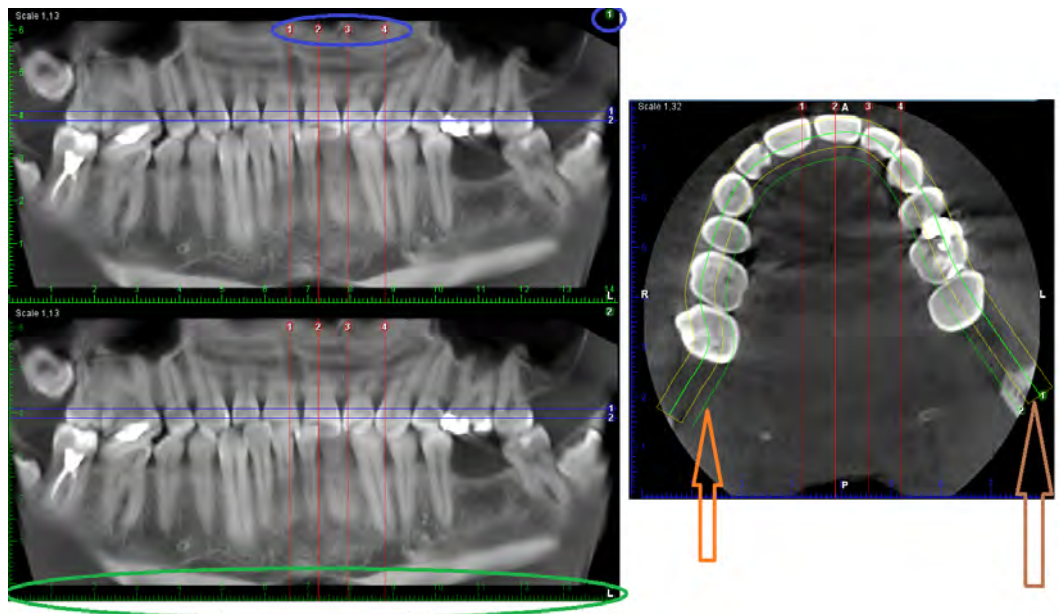
### Overlay preferences

- Rulers (centimeter scale)
- Rulers in millimeters
- Values - when view contains multiple images, they are separated with labels in other views.
- Axial Line - focus line
- Secondary axial lines
- Panoramic line - focus line
- Secondary panoramic lines
- Panoramic contour
- Cross section lines (all cross section lines)
- Secondary Cross section lines
- Show every fifth section – when selected only every fifth layer line is shown in full length on top of the views. The lines for the rest of the layers are shown in half-length lines in axial view and in short lines in panoramic view.
- Panorama referenced / Ordinal cross section labels. When selected, cross section label represents the distance of cross section from the start of the panorama curve in millimetres.
- Show implant extension
- Show implant safety area

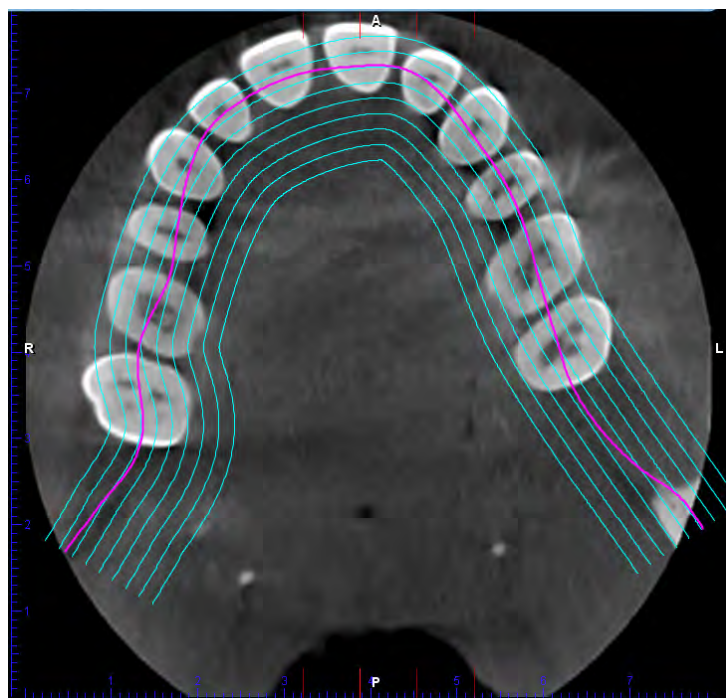
The secondary lines are reference lines of possible multiple images of other views.

In the following picture of panoramic and axial view some adjustable settings are indicated.

The ruler (circled in green), values (blue circles), panoramic lines (orange arrow) and panoramic contour (brown arrow) are set to be shown. The thicker of the red lines (number 2) is the focus line for the sagittal view and the thinner ones are secondary sagittal lines.



In the picture below the panoramic autofocus line is shown in magenta and the autofocus layers are shown in cyan.



### Slice settings

In this field the thickness, distance and grid size for each view can be adjusted. These settings are applied for currently open, new and reset images.

## Implant adjustments

### NOTE

If implant license is missing the *Implant adjustments* field is hidden and the *Implants sub-module name changes to Cross sections*. The implant related visibility settings are also hidden.

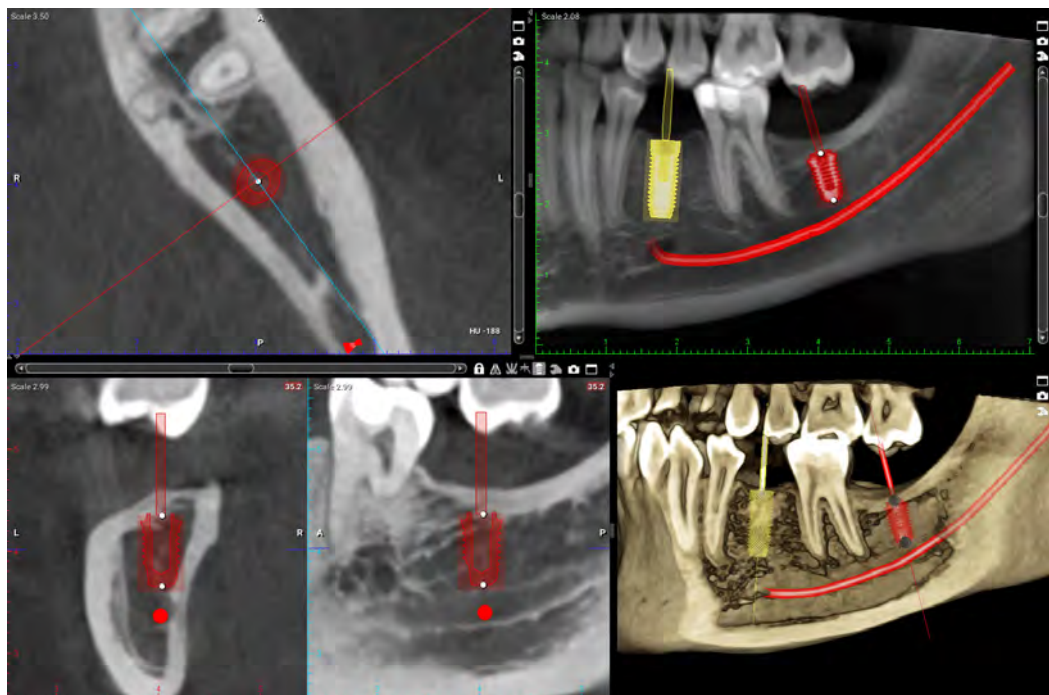
- The default settings for safety distance between implants and between implant and nerve can be adjusted.
  - The default length and diameter of implant extension can also be adjusted.
- For more information on implant safety distances and implant extension bar see sections 6.3.1 "Implant safety area" on page 224 and 6.3.2 "Implant extension bar" on page 225

## 6.2 Adjusting slices in implant centric view



To activate implant centric view click this button.

Implant centric view automatically creates two perpendicular slices of the implant (or segmented tooth) instead of the normal cross sections view.

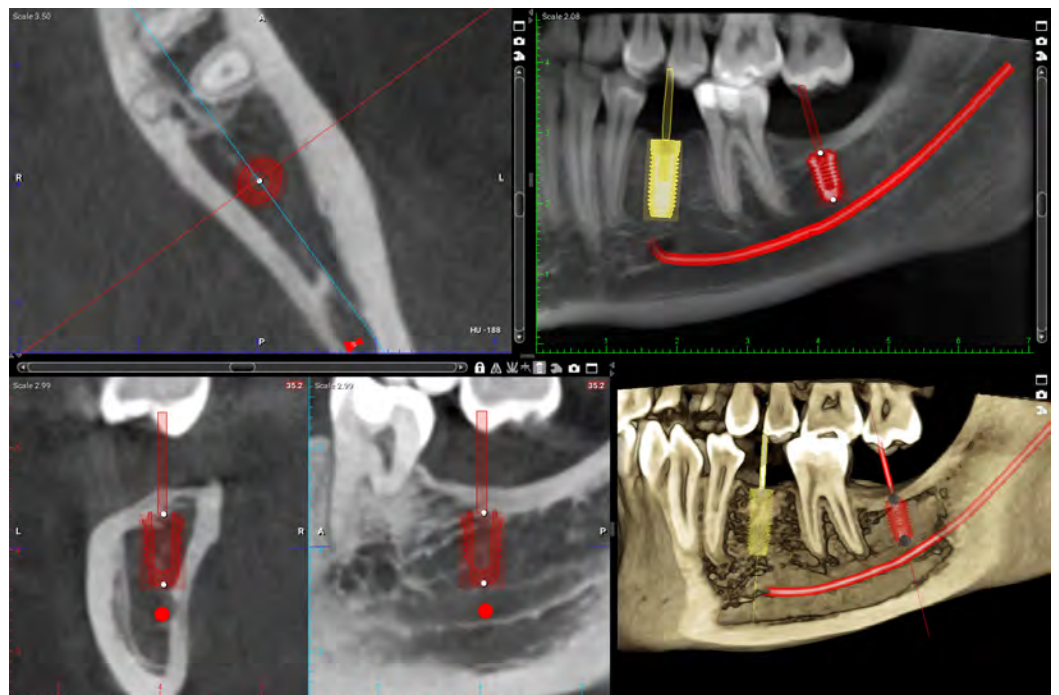




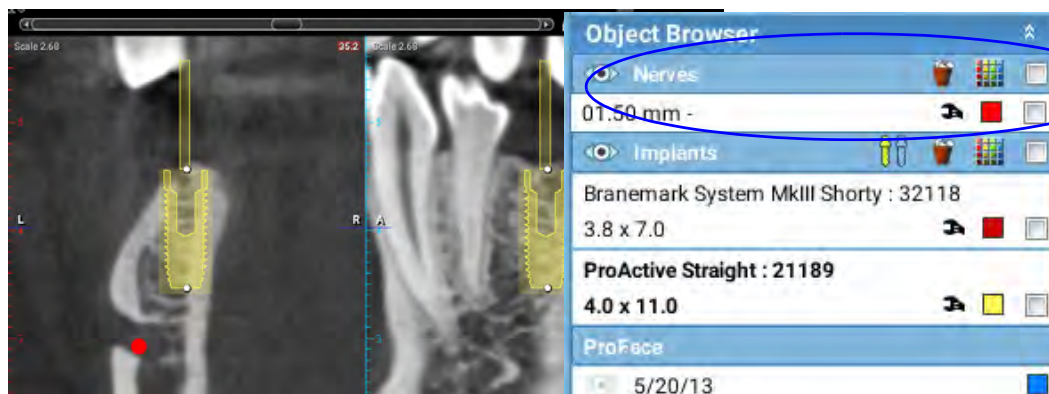
The slice on the left side is perpendicular to the panoramic curve (if defined) and the right side is parallel to the panoramic curve (if defined).



To view the areas around the implant rotate the views with the slider. When moving an implant in any of the slices the implant centric view adjusts automatically to the new position.



To use implant centric view for another implant or segmented tooth added to the image click on the implant or tooth in 2D views or in the *Object Browser*.



To rotate the slices use the slider on top of them.



### 6.3 Using implant tools



#### Add implant

Use *Add default implant* tool to place a pre-selected default implant into the plan. The default implant can be defined in the *Implant library*.



#### Draw implant

Use this tool to draw an approximation of the implant's width and height, using the patient's anatomy as a reference for sizing. Then use *Implant Library* to search and select the nearest matching real implants from your library. With this method you will get the correct length and diameter without first having to guess which size would provide the best fit.



#### Implant library

Use this tool to place implants to the plan directly from the Implant Library. This allows you to first browse your selection of available implants and decide on the type before placing an implant into the plan. After selecting the implant type, press the **Add** button to add the selected implant into the plan. You can then align the implant to match the patient's anatomy. You can also use the *Implant Library* to add new implants into the library and modify existing designs. See below for more information on the *Implant Library*.





### Implant verification

Opens the implant verification tool, see section 6.7 “Verifying placement of implant and segmented tooth” on page 232.



### Crown library

Opens the crown library where you can select and edit crowns for specific implant, see section 6.6 “Using the crown library” on page 231.



### Abutment editor

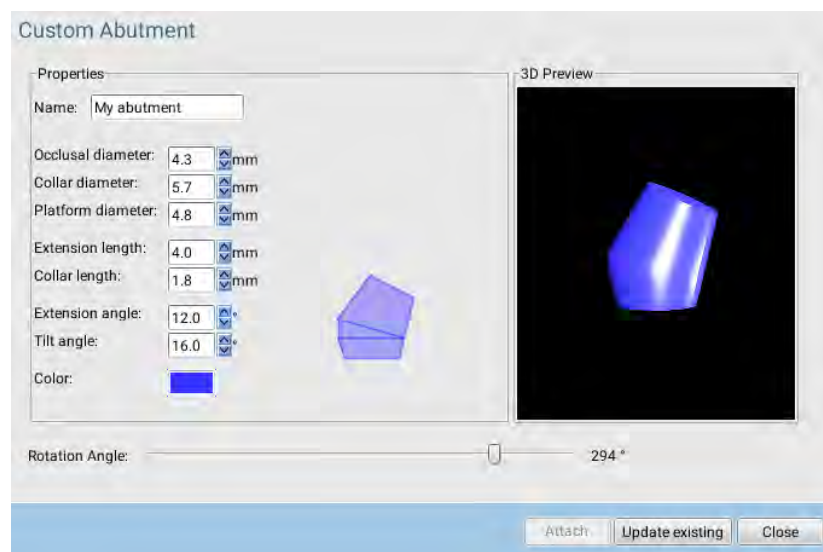
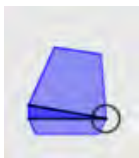
The abutment editor is intended for creating a custom abutment to implant plan. To open the abutment editor an implant (with or without abutment) must be selected. Previously created custom abutments can be opened and modified.

The property values can be changed by scrolling the mouse wheel, clicking the up and down arrows or by entering a new value.

The 2D and 3D previews are automatically updated according to the entered values.

The position of attached abutment is relative to the parenting implant.

The 2D preview guides the user with the measures: when hovering the mouse over a value field the corresponding measure is shown in the preview, a tilt angle for example.



### Implant guide

For detailed description See section 6.8 "Designing implant guides" on page 234.

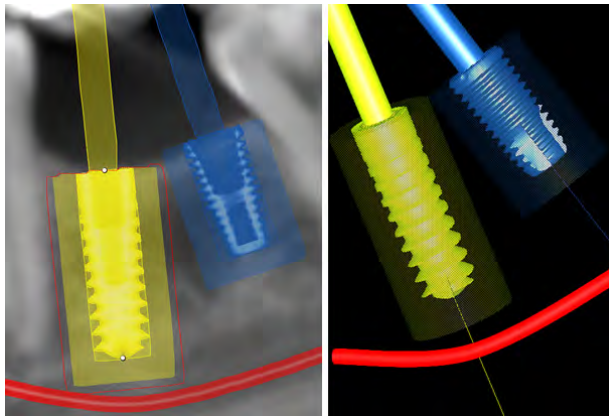
### 6.3.1 Implant safety area

The implant safety area indicates when implants are too close to each other or to a nerve.

The safety distance between implants or implant and nerve can be defined. When implants and nerves are placed in a way that their distance is less than defined, a collision is detected, a warning dialog pops up and the background of the corresponding elements in the object browser turns red. Only the part of the implant that is placed inside bone is included in safety calculations.

The safety area between implants is shown as a transparent cylinder in 2D projections and in the 3D rendered image. Between implant and nerve the safety limit is not shown unless collision is detected in which case it is shown as a dashed line around cylinder in 2D projections.

In the images below safety areas between the two implants is visible. In the image on the left the red line around the safety area indicates that the implant is too close to the nerve.



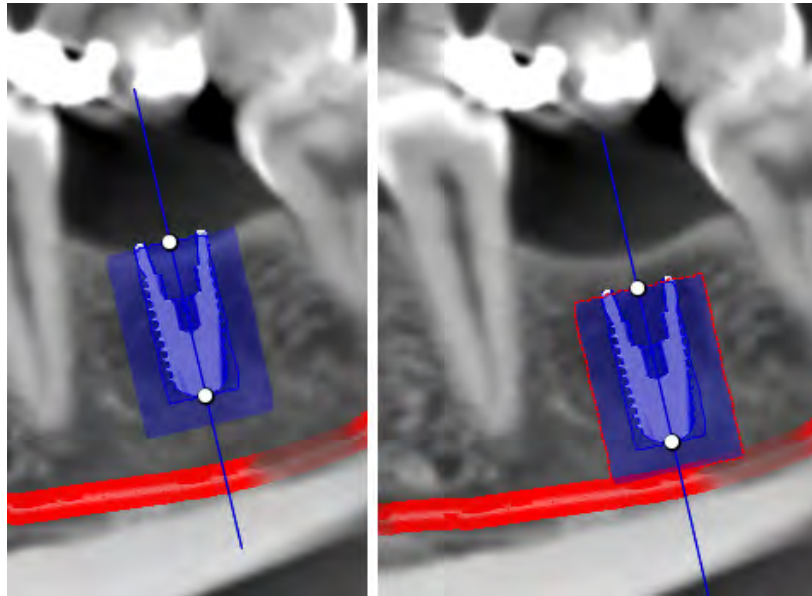
The safety distance and its visibility between implants and between implant and nerve can be separately adjusted from the Default settings dialog, see section 6.1 "Viewing and adjusting default settings" on page 218.



#### NOTE

The diameter of implant and assumed implant surface is equal to intra-osseous diameter given by the manufacturer. If given intra-osseous diameter is less than the realistic diameter of the implant model then the real distance between implant and implant or nerve is less.

In the image on the left the safety area is shown around the implant but no collision is detected. In the image on the right a detected collision indicated by a dashed red line surrounding the safety area.

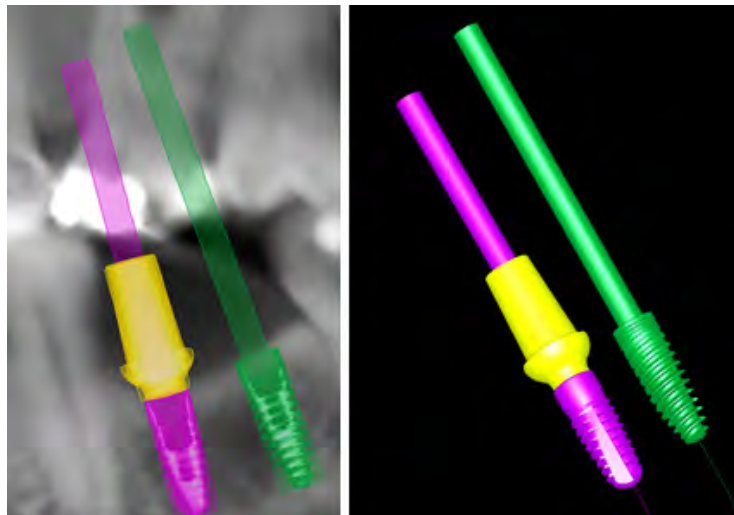


### 6.3.2 Implant extension bar

The implant extension bar can be adjusted in the *User setting* dialog, see section 6.1 "Viewing and adjusting default settings" on page 218

The implant extension is an implant-centred and orientated rod that can be used for example to indicate the orientation and position of implant in teeth level. The visibility, diameter and length of implant extension can be adjusted. The default length is 25 mm and the diameter 2 mm.

The implant extension is illustrated in the images below.



## 6.4 Placing implants

1. Add implant to the plan by using a default choice, drawing to size, or a specific model from library.
2. Place the implant to the correct location and use control handles to orientate it to match the patient's anatomy. You can use all available views (panoramic, axial, cross-sections and rendering) for placement and orienting.

To reorient the implant in the rendered view hold down the **Ctrl+Shift** or **Alt+Shift** keys while dragging the implant from its control points.

You can change the size of the implant model from the *Properties* window, or in the Implant Library.

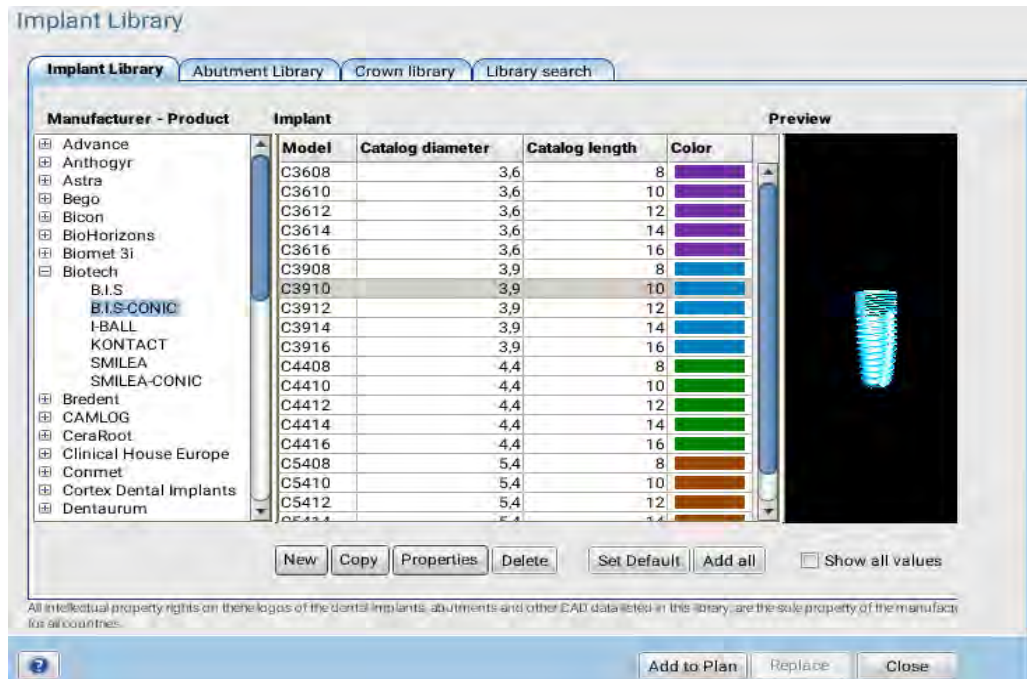
3. Verify margins and orientation by using the Implant Verification tool and place next implant. For more information on how to use the tool, see section 6.7 "Verifying placement of implant and segmented tooth" on page 232.

## 6.5 Managing implants using implant library

Implant library can be used to create new implants, modify, add and replace implants in the plan, and search for implants. Implants that are commonly used can be freely added and will be automatically grouped by manufacturer and product lines. If available a realistic preview of the currently selected implant model will be shown on the screen.

The implants that have been placed into the plan are not affected by any changes made in the library. To modify implants that are already placed, modify the properties of a single implant with the **Properties** button, use the Replace function, or the implant list.

### 6.5.1 Implant library tab



#### Creating new implant

Create a new implant by clicking the **New** button and specifying the required information. Use the drop-down menus to select existing manufacturers or product lines.

Use the length and diameter field to enter new measurements for the implant.

To modify the colour of an implant click the colour chart in the right hand side of the Color field.

When entering numerous implant models, the *Copy* function explained below can be used.

**Create new implant**

Manufacturer:

Product:

Model:

Color:

Length:

Diameter:

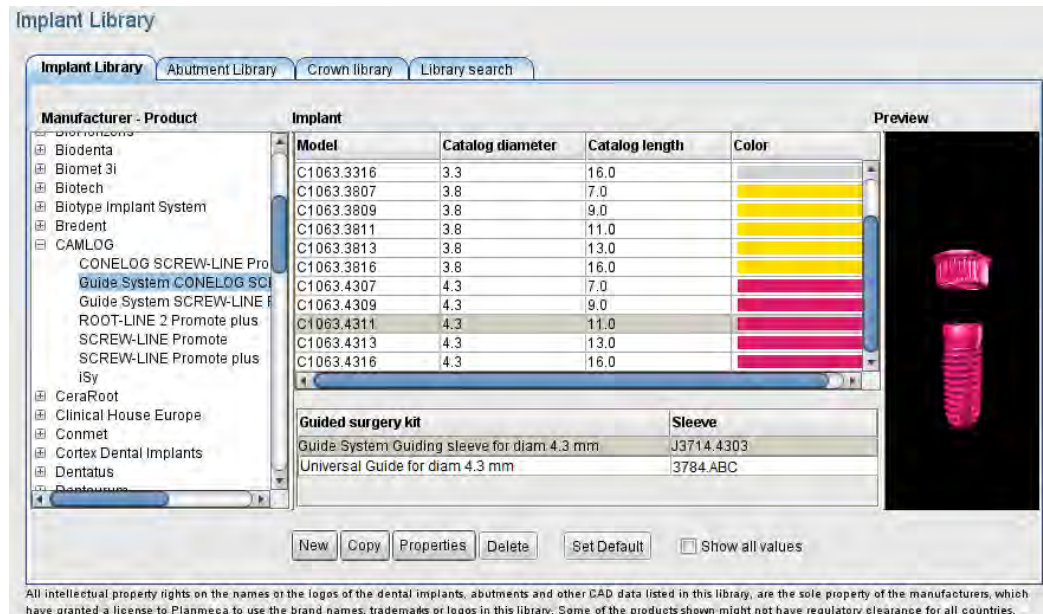


## Implant with sleeves

### NOTE

This feature requires implant guide license.

Implant library also shows the surgical kits and sleeves that can be used with the selected implant. These may be selected for creating the implant guide to the correct position with correct type of sleeve hole.



## Copy implants

To create groups of implants that with some common properties copy the selected implant to a new one and modify the properties an necessary.

## Implant properties

Modify the properties of the selected implant.

### NOTE

Changing the properties in the library does not affect implants that have already been placed into the plan.

## Delete

Deletes the selected model from the library.

### NOTE

Deleting an implant from the library does not affect implants that have already been placed into the plan.

## Set default

Set the selected model as the default implant. This default selection is used by the *Add default implant* feature.



### Add to plan

Use *Add to Plan* to add the selected implant into the current plan and automatically close the *Implant Library* dialog. When you add implants from the library, you cannot adjust their size with the *Properties* dialog. To change the size, use the **Implant Library** and the **Replace selected** button.

### Replace selected

Use **Replace selected** to replace the selected implant with implant an implant selected from the Implant Library. The dialog will automatically close. When you replace an implant with another from the library, the dimensions of the placed implant can no longer be adjusted with the *Properties* dialog. To change the size, use the **Implant Library** and the **Replace selected** button again.

## 6.5.2 Abutment library tab

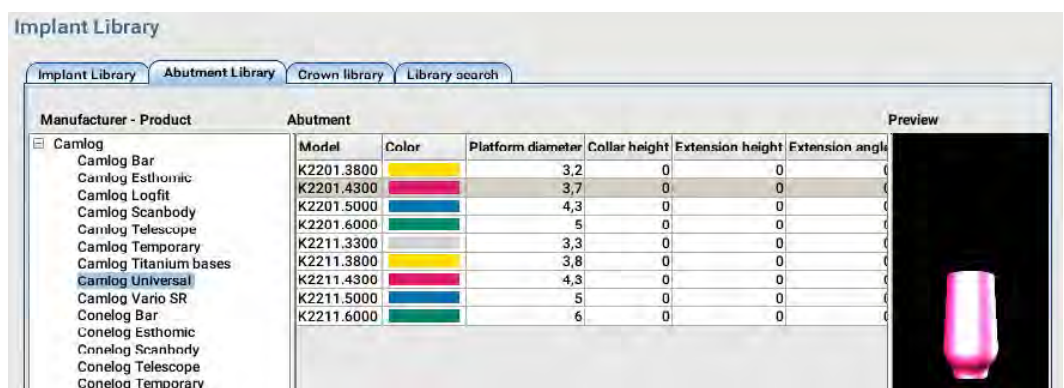
When you have added the implant(s) in the plan select the corresponding abutment and attach it to the selected implant as follows:

1. Select the implant in the plan.
2. Select the abutment from the library.
3. Click **Attach**.

The implant and the abutment can now be moved simultaneously as a single object.

### Replacing an abutment in the plan

1. Select the abutment in the plan.
2. Select the appropriate abutment in the library.



3. Click **Replace**.

The abutments now shows in the image.

To change the properties of the implant and abutment double click the object. The properties of the implant and the abutment can be seen and adjusted on separate tabs in the opening *Properties* dialog window.

### 6.5.3 Crown library tab

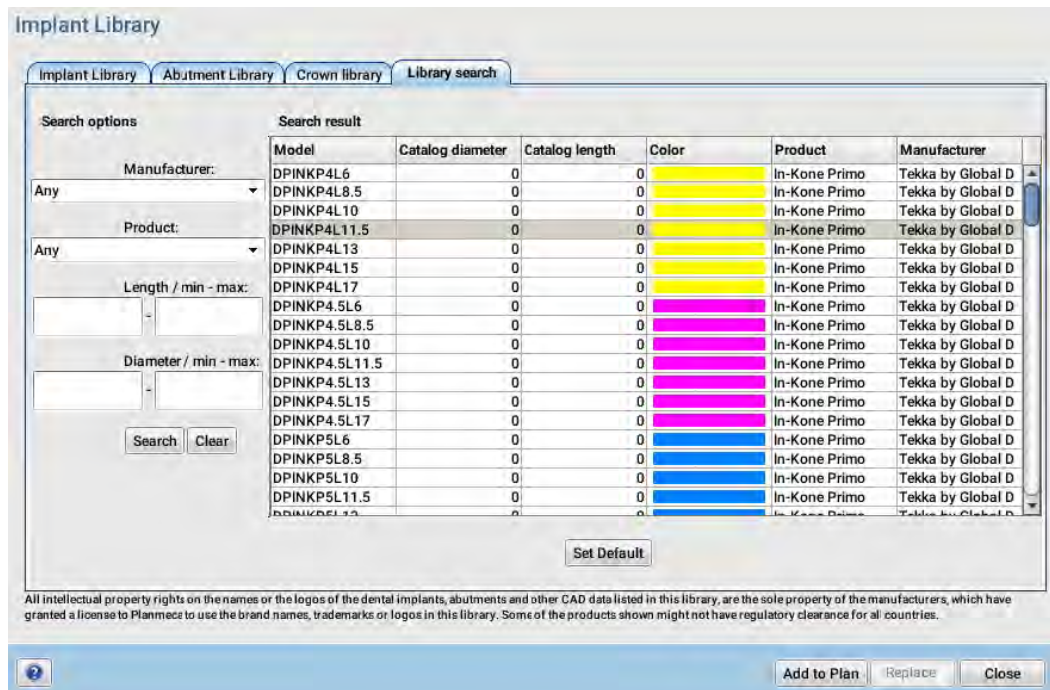
See section 6.6 “Using the crown library” on page 231.

### 6.5.4 Library search tab

To search implants by manufacturer or product line select the search criteria from the corresponding drop-down menu.

To search implants with specific measurements enter the length and diameter.

Start the search by clicking the **Search** button. To clear the results click **Clear**.



## 6.6 Using the crown library



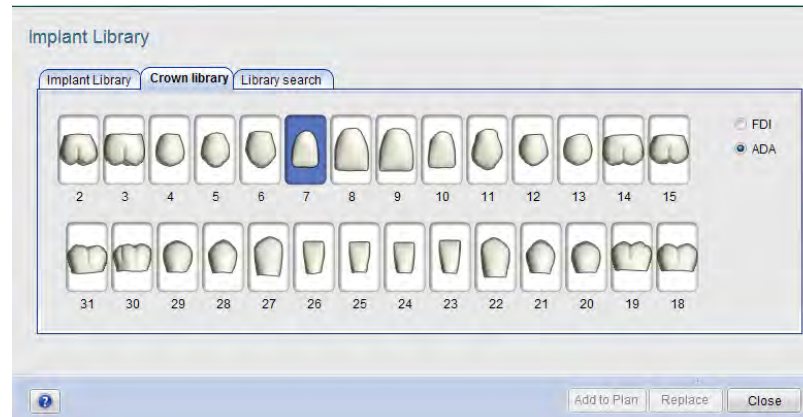
To open the crown library click this button.

On the right select the tooth numbering system you would like to use:

- FDI (World dental federation)
- ADA (American Dental Association)

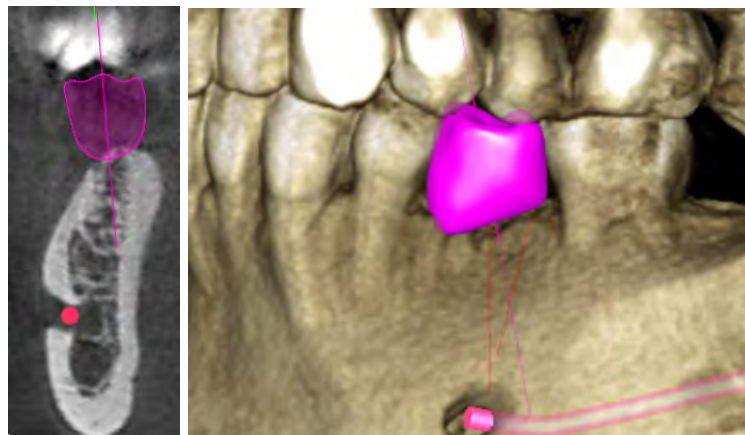
To **add** a crown to the plan click the suitable crown in the chart and select **Add to plan**.

To **replace** an existing crown first select the crown in the plan, select suitable crown in the chart and click **Replace**.



To **rotate** the crown in the plan, hold down the right-mouse button on top of the crown and drag the mouse until the crown is in the desired orientation.

To **adjust the width and height** of the crown press and hold down the **Shift + Ctrl** or **Alt + Shift** keys while dragging the crown with the mouse.



The precise angle can be adjusted in the *Implant properties* dialog.



To **exit** the Crown library click **Close**.

### 6.6.1 Importing crowns to the plan

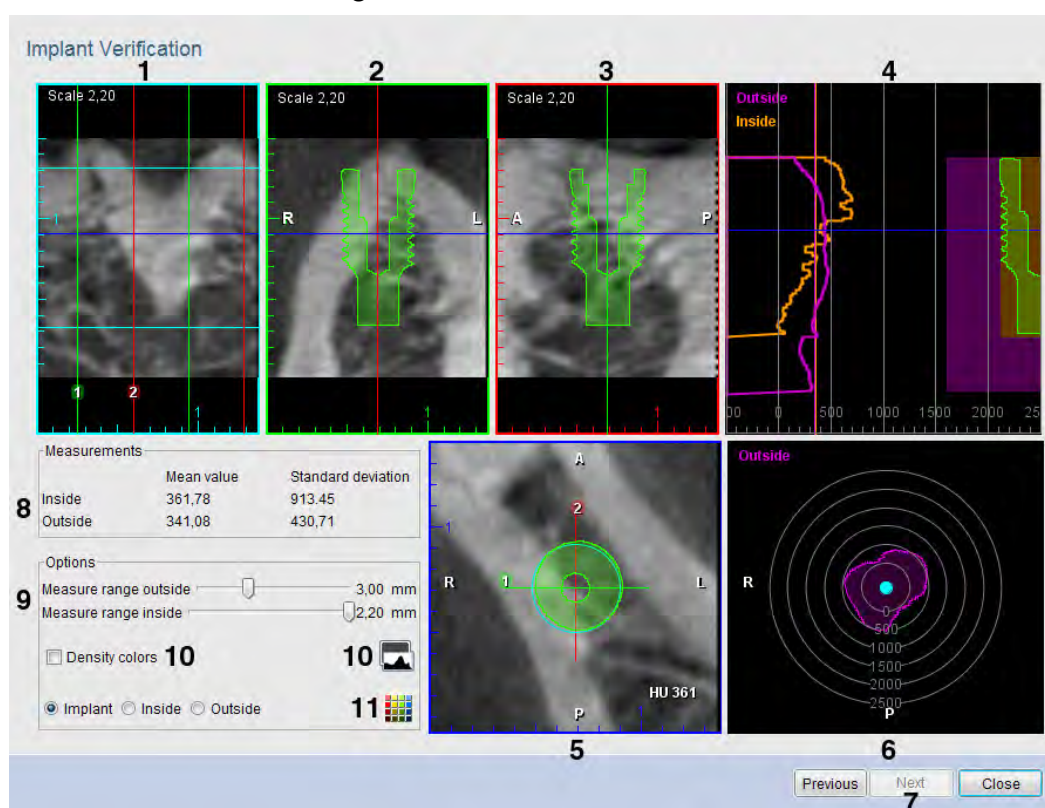
To import a specific crown see section 12.6 "Importing fitted models" on page 304.

## 6.7 Verifying placement of implant and segmented tooth

The verification tool can be used to evaluate the placement of implants and segmented teeth. To estimate the fit between the implant/tooth and anatomy at the site the slice views and average HU-values in the proximity of an implant/tooth can be used.

Unlike other 3D views the verification views are always centred on the current implant/tooth whereas the 3D volume revolves around the vertical axis of the implant. This makes it easy to focus on the implant/tooth and it's relation to the surrounding anatomy.

When the Verification dialog is opened the currently selected implant/tooth is automatically shown. The implant/tooth can be selected and reoriented in *Implants* sub-module while the *Verification* dialog is open. The slice orientations and measurement margins can be easily adjusted as described in the following illustration.



1. Around implant slice
2. Green cross section
3. Red cross section
4. HU mean values outside and inside the implant
5. Axial slice
6. HU mean values around implant
7. Select previous or next implant
8. Total mean value and standard deviation inside and outside implant
9. Adjust thickness of measured layer both inside and outside implant
10. Colours corresponding to HU values and adjustment dialog
11. Adjust implant colour or HU measurement layers

## Visual implant site evaluation

### Axial, cross section and envelope slice views

To rotate the cross section views around the implant's vertical axis by clicking and dragging with mouse in the axial slice. This allows you to inspect the anatomy by viewing the green and red cross sections (lines 1 and 2 respectively in the axial view) and compare them with the overview on the implant Envelope view.

The implant envelope ring and the anatomical orientation of the data (anterior, posterior, left, right) are also shown on the Axial slice.

To move the axial slice plane (blue line) up and down on the vertical axis of the implant use the mouse wheel. This allows you to view the axial slice at any level on the implant's height.

### Cross section views

The green and red cross sections (number 1. and 2. on the axial slice) are slices perpendicular to each other and parallel to the axis of the implant. They can be used to verify the anatomy around the implant when rotated using the axial view. The cross sections also show the silhouette of the implant, axial slice position and orientation (A, P, L, R).

To zoom in and out use mouse wheel on the cross section and envelope slice views.

### Implant envelope view

The Implant Envelope view is a flattened cylinder view of the anatomy on the implant's outer perimeter. It allows you to see if any of the implant's outer wall would fall on a weaker bone for example instead of having to do with 360 degree rotation of the cross section views. Also the implant apex and insertion depths (cyan lines) and intersections with the green and red cross section slices are shown.

### Density colours

To enable pseudo-colouring of the data to differentiate different anatomy densities use this option. With pseudo-colours each gray scale value is mapped to different colour making the subtle differences between different values easier to perceive. The colours and their distribution over the gray scale histogram can be adjusted in the histogram.

### Statistical implant site evaluation

The HU mean values display the mean value of voxels inside or outside of the implant in the margin. The margin is specified using the Options - Measure range outside / inside sliders. The values are shown in a line graph from top of the implant towards the apex with implant silhouette and margin thickness references on the right and HU value scale reference at the bottom.



Under *Measurements* are shown the mean value totals corresponding to the vertical lines as well as the corresponding standard deviation values. By default the outside values are marked in violet and the inside values in orange. To adjust the colours use the colour chart icon at the bottom of the *Options* section.

The bulls-eye chart at the bottom right indicates the distribution of mean HU values in the outside margin around the implant in the posterior/anterior and left/right directions.

## 6.8 Designing implant guides

### NOTE

CE and FDA approval for this functionality are pending.

### NOTE

Implant guide design functionality is available under license.

### CAUTION

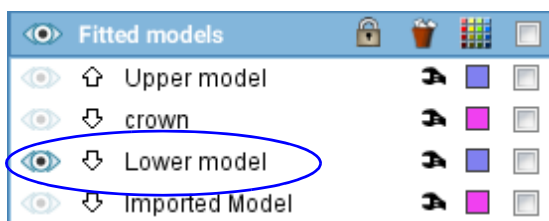
Only qualified dentists or dental technicians must design and manufacture guides using implant guide design functionality. Its user is fully responsible for suitability and application of the designed guide. The user must also be familiar with the implant manufacturer specific drilling protocols to use them successfully with the designed guide.

### CAUTION

The dental model must be of high quality and represent the exact current situation in the mouth. Check the fitting of the dental model to ensure the guide is positioned correctly.

### NOTE

Before starting to use the implant guide functionality, hide all other fitted models by clicking the eye buttons in the Object browser. Only the model on top of which the guide shall be designed should be visible.



Start the guide design by clicking the **Implant guide** button in the *Implant* tools.





## 1. Set Insertion Direction:

Rotate model to optimum insertion position considering the under cuts and click **Set Manually** button

OR

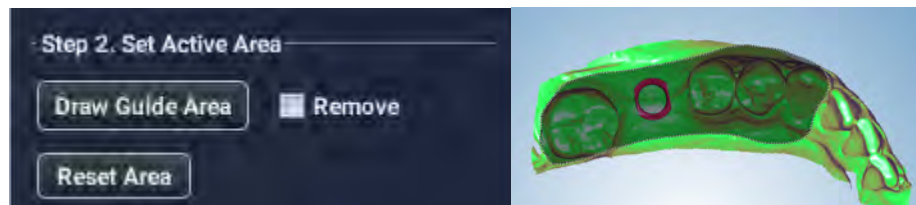
click **Set Automatically** to use the default position (the position Romexis proposes when starting implant guide design).

The red areas in the model indicate undercuts, and the guide will not be created there.



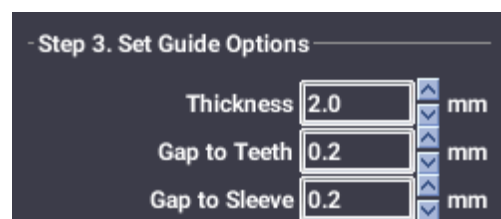
## 2. Set Active Area:

- Click **Draw Guide Area** button and draw active guide area by holding down the left mouse button.
- To remove area draw by holding down the right mouse button.
- To rotate model hold down the **Alt** key while dragging with the mouse.
- To start defining the guide area from the beginning click **Reset Area**.



## 3. Set Guide Options

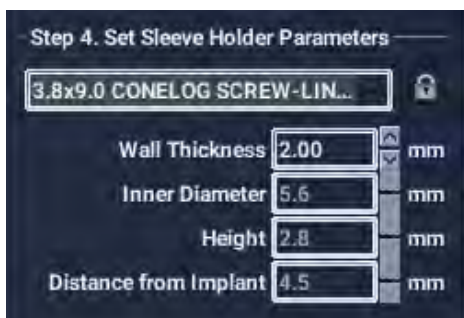
- Define guide thickness and gap to teeth and sleeve depending on the printer and material specifications.



#### 4. Set Sleeve Holder Parameters (optional)

In case sleeve information is NOT selected during implant planning you can define sleeve parameters here. These parameters define the sleeve holder position and size. These parameters are defined by the implant system in use.

Wall thickness can be defined by the user as it doesn't affect the fit of the sleeve. A thickness of 2 mm is recommended.

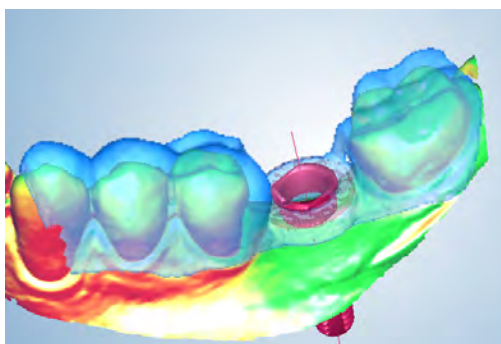
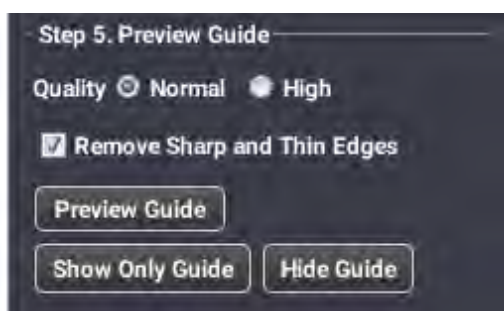


#### 5. Preview Guide

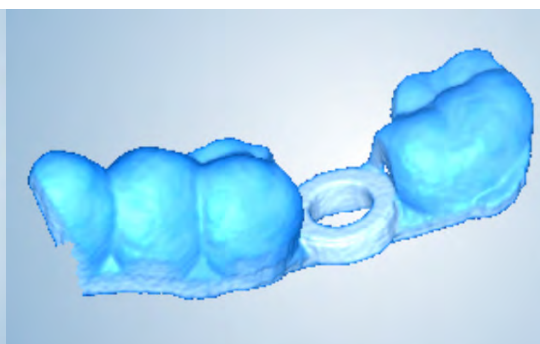
Select the desired quality and trimming settings and click on the **Preview Guide** button to open a preview of the guide.

To view the guide alone click on the **Show only Guide** button.

To hide the guide click on the **Hide guide** button.



Preview guide

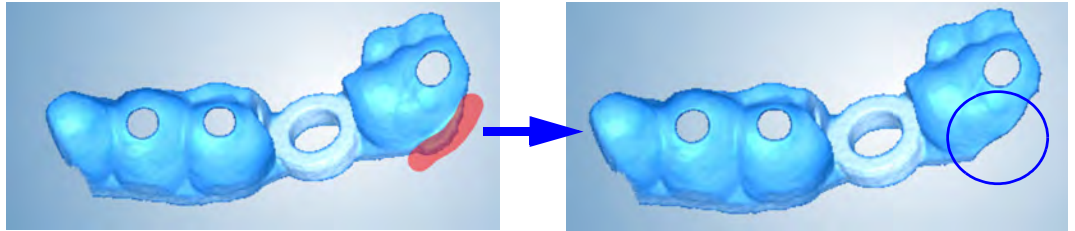


Show only guide

## 6. Modify Guide

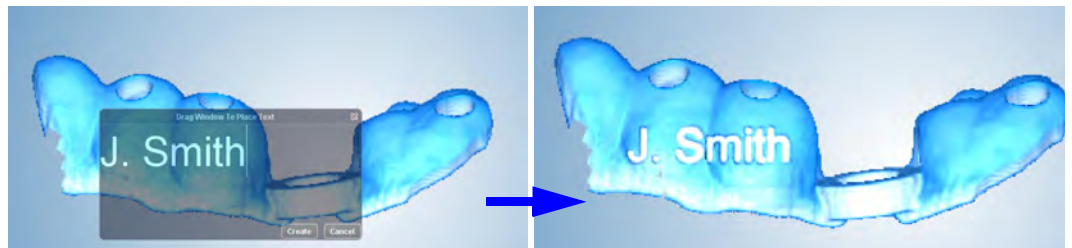


To remove material from guide, click **Remove Material** button and paint with mouse.

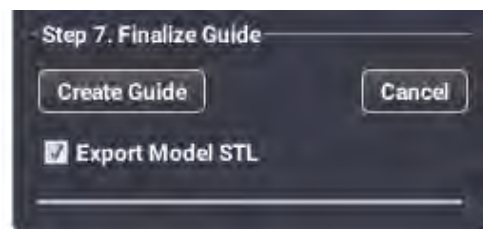


To resize the paint brush hold down the right mouse button while dragging. To rotate the guide hold down the **Alt** key while dragging with mouse. To rotate the model axially hold down the **Ctrl** key while dragging with the right mouse button.

You can add text e.g patient name to the guide by typing the text to dialog and overlaying the dialog onto model. The font size can be adjusted by zooming +/- the model.



## 7. Finalize Guide



To create the final stl model of the guide click the **Create guide** button. You can also Export the guide as an .stl file at the same time.

The guide will then be saved to Romexis and it will be visible on the volume and in the Object Browser's *Implant guides* category.



To exit the design mode click this button on the guide design window or click **Cancel**. Note that by clicking the Cancel button the guide design is not saved.

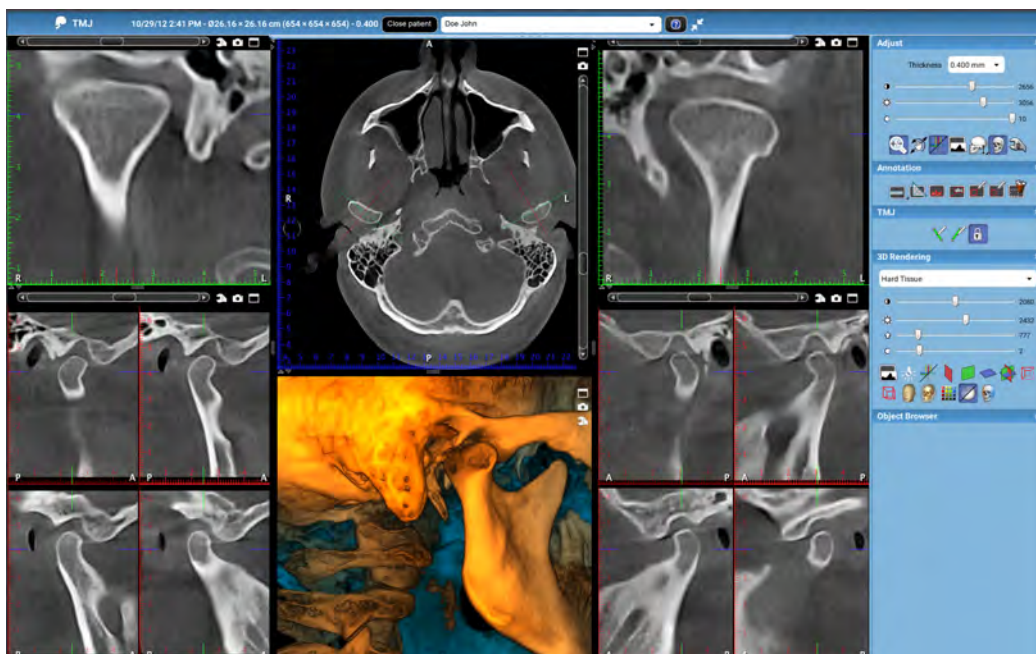
## 7 TMJ SUB-MODULE



The *TMJ* sub-module is intended for viewing and diagnosis of the temporo-mandibular joint regions.

### NOTE

A volume must be opened from the *Volumes* sub-module before it can be viewed in TMJ sub-module.



### 7.1 TMJ tools



#### Draw right PA line

Use to draw and define the posterior-anterior PA line for the right side slices.



#### Draw left PA line

Use to draw and define the posterior-anterior PA line for the left side slices.



#### Synchronise sides

Enables / disables synchronisation of left PA line with right PA line. When enabled the drawing of PA line length will be automatically constrained to match the length of the existing lines. The length can still be adjusted using the view settings dialog affecting both PA lines simultaneously. When disabled each PA line can be defined separately.



### 7.1.1 Using TMJ tools

After drawing posterior anterior line (PA line) for each side of the anatomy, multiple dedicated lateral slices and PA slices are provided. These views correspond to a double lateral-PA exposure but can be easily aligned, rotated and adjusted to give a better understanding of the anatomy in the region. Multiple studies with single exposure can be generated.

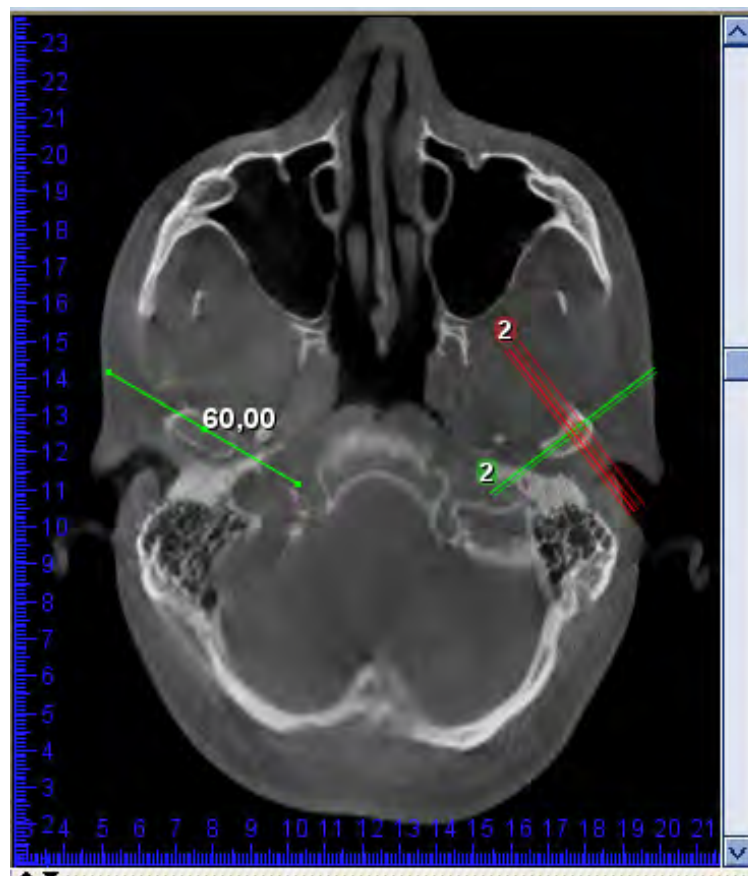
1. Open the volume to be studied in the *Explorer* sub-module.  
The volume can be a full head exposure, a single TMJ or a stitched volume of both TMJs. Note that the TMJ region must be visible in the volume.
2. Orientate the volume in anterior-posterior line so that the mandible is aligned correctly (TMJ slices perpendicular to the axial plane).
3. Orientate the left-right line so that both condyles (if visible) are on the same axial plane.
4. Go to *TMJ* sub-module.
5. Verify the alignment using the Axial view.
6. Use the slider on the volume's right edge to show condyles.



7. Click this button.
8. Define the length and direction of the PA line by clicking on the middle of the condyle and holding down the left mouse button while dragging.

The opposite half of the line is automatically introduced and round its total length to nearest millimetre.

9. Finish the line by releasing the mouse. The slice views automatically appear.





10. Draw left PA line using this tool. Repeat the process described in step 5.



By default the *Synchronise Sides* tool is enabled so that the left PA line length is constrained to match that of the right PA line. In this case only the direction of the left PA line needs to be defined. To specify a left PA line of different length, disable the *Synchronise Sides* tool.

11. Use the view settings dialogs to adjust the number, width and spacing of the PA and lateral slices similar to other 3D modules.

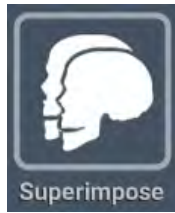


12. To adjust the position of the PA lines verify that the *Move/rotate volume* tool is disabled and then use left mouse button to move a PA line or right mouse button to rotate.

13. To adjust the width of the slices (length of the PA line) either use the slice specific settings menu or redraw the line.



## 8 SUPERIMPOSITION SUB-MODULE (OPTIONAL)

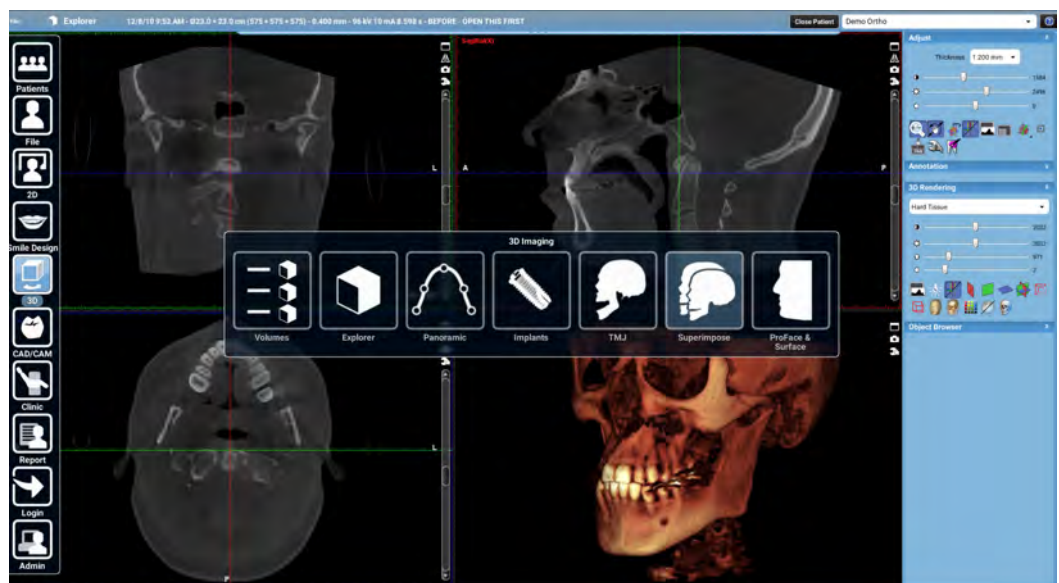


In the 3D Superimposition sub-module two CBCT before / after volumes can be fitted for visualization and measurement of anatomical changes during different stages of treatment.

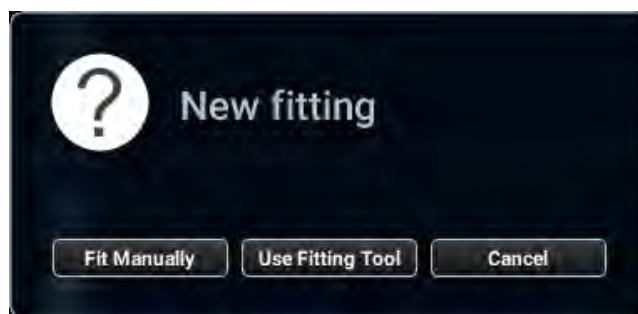
Fitting can be done automatically by defining three common points in both volumes or by manually moving the after volume. The volumes can then be compared in overlay or synchronized side-by-side view.

### 8.1 Fitting volumes for superimposition

1. Open the before volume in 3D Explorer module.
2. Click the **3D** module button and select the *Superimposition* sub-module.



3. Select whether to fit the models manually or by using the fitting tool.



Superimposition can be cancelled at this time and continued later using the Add Volume button.

#### NOTE

Annotation and saved view tools cannot be used before two volumes have been fitted.

### 8.1.1 Manual fitting



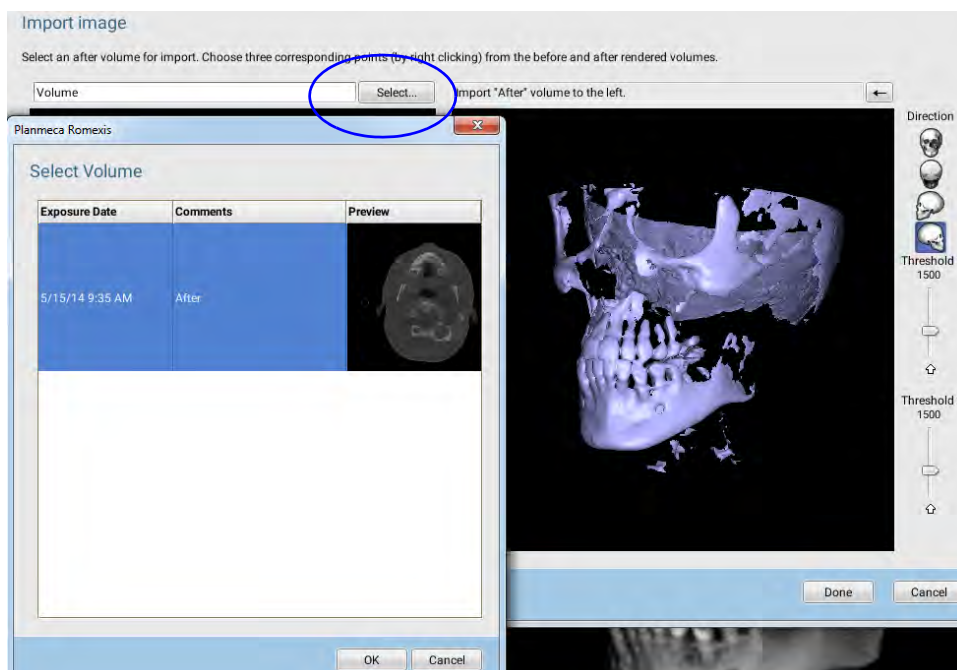
Volumes can be manually fitted by adjusting the position and rotation of the after volume using the Move / Rotate Volume 2 tool.

### 8.1.2 Using the fitting tool

For automatic fitting three common points must be defined.

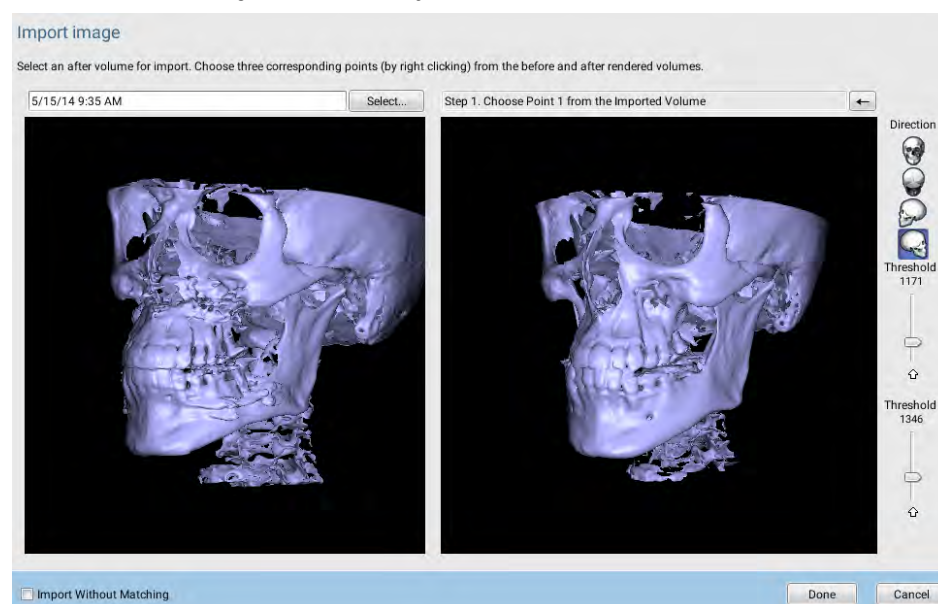
When the dialog is first opened, the before volume is shown on the right.

1. Select the after volume by using the **Select** button above the left view.

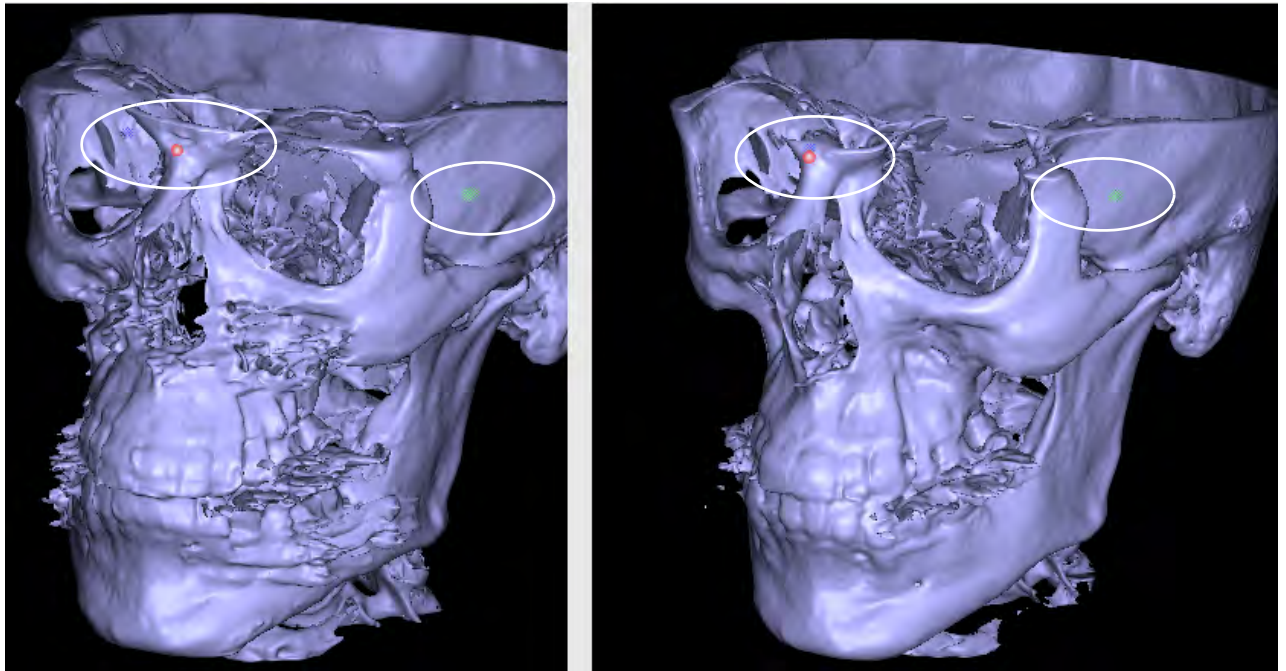


2. Adjust the *Threshold 1* and *Threshold 2* sliders so that the bone surface is displayed equally in both volumes.

As the points placed on visible bone surface will be used to fit the volumes the threshold adjustment may affect the end result.



3. Add 3 common points (marked in red, green and blue on the image below) on the surfaces in both volumes by clicking with the right mouse button. Suitable points vary depending on the treatment and the bone growth during treatment.



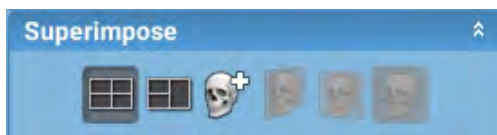
4. When finished click **Done**.

The after volume will appear in the *Object Browser*. The superimposition can be removed from the after volume in the Object browser (the image is not removed from the patient's volumes list).

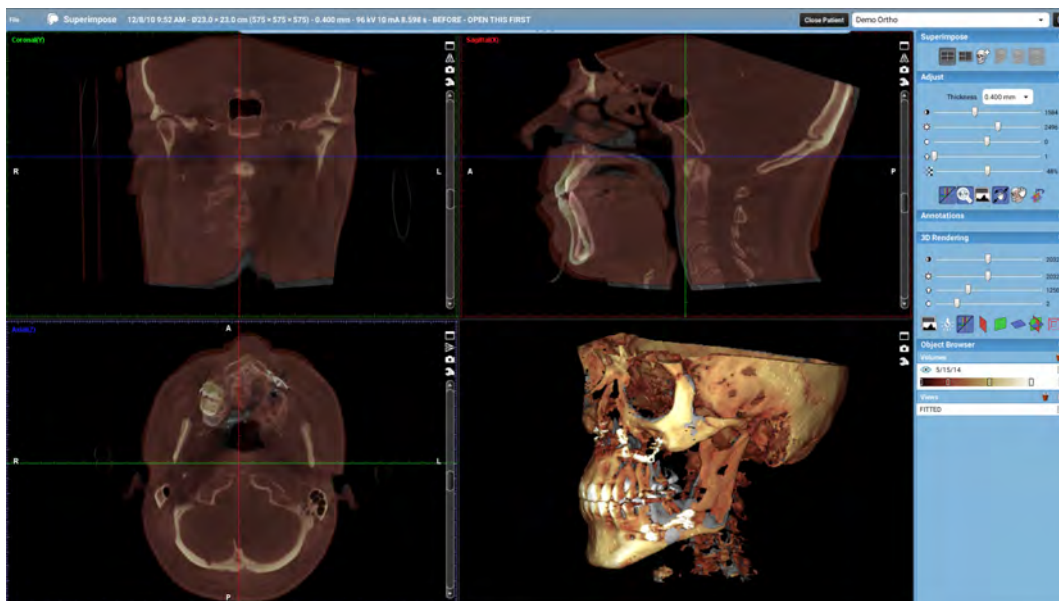
#### NOTE

All measurements and saved views are specific to the fitted volume pair and Superimposition module. If superimposition is removed, all measurements and saved views will be lost.

## 8.2 Overlay view



In the *Overlay* view the differences of two superimposed volumes can be visualized by overlaying the after volume with the before volume. This view is similar to the 3D Explorer view except that the after volume is painted transparently using pseudo colours on top of the before volume (marked in grey). If both the before and after volume are visible the HU value is not shown. In the 3D rendering view the volumes are painted in corresponding pseudo colours except for the Surface rendering mode.



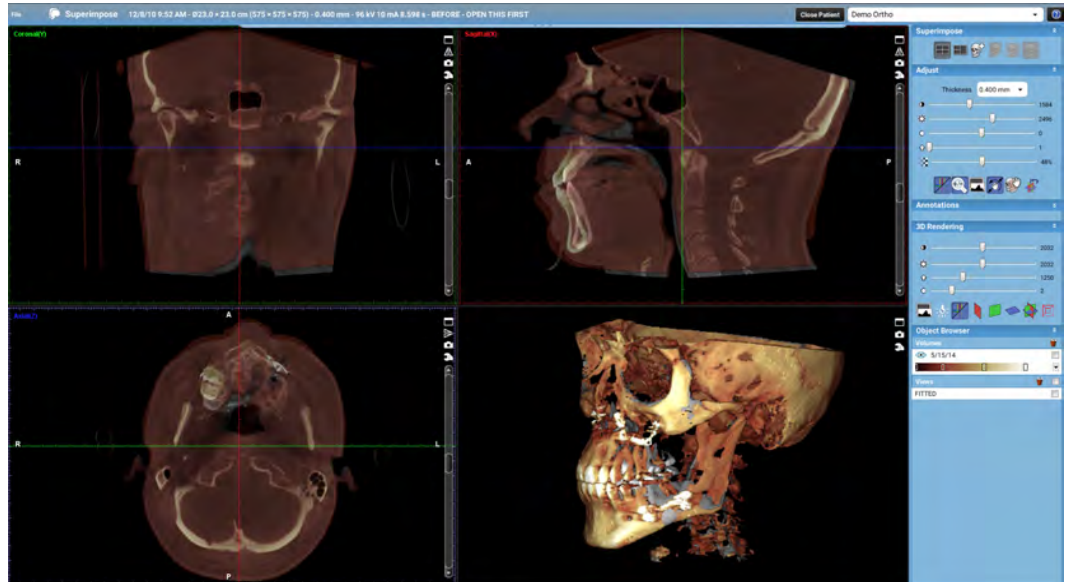


### 8.2.1 Adjusting superimposed after volume

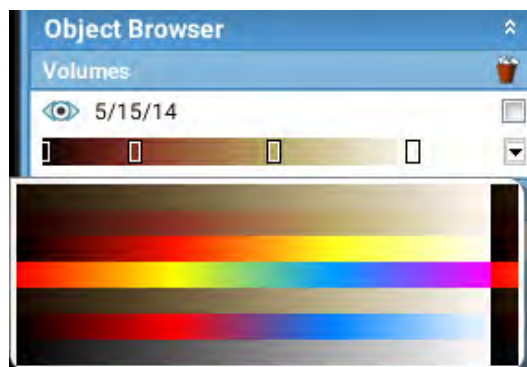
The appearance of the superimposed after volume can be altered by adjusting its pseudo colouring, threshold and transparency. The volume can also be hidden or removed in the Object browser.

#### Adjusting after volume pseudo colours

Select or define the pseudo colours to be applied to the after volume in the

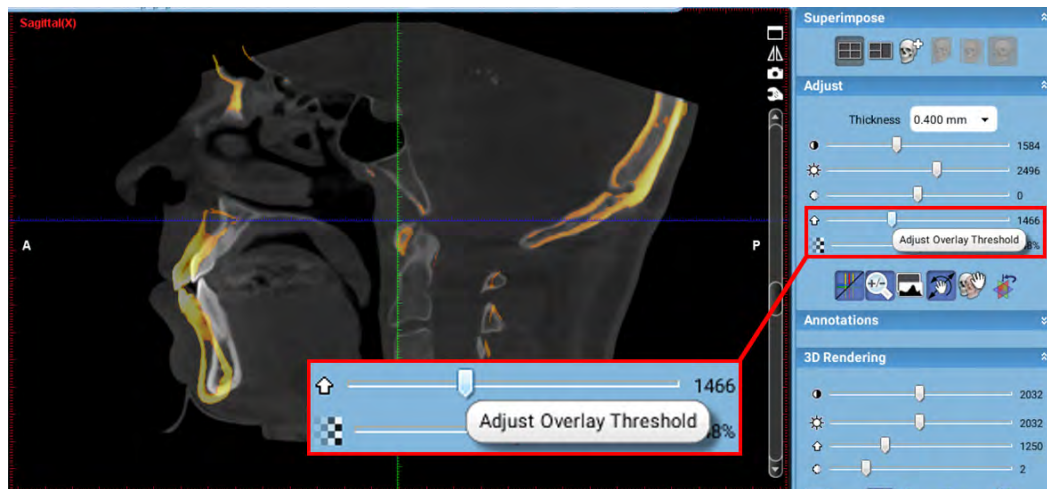


#### Volumes tool group



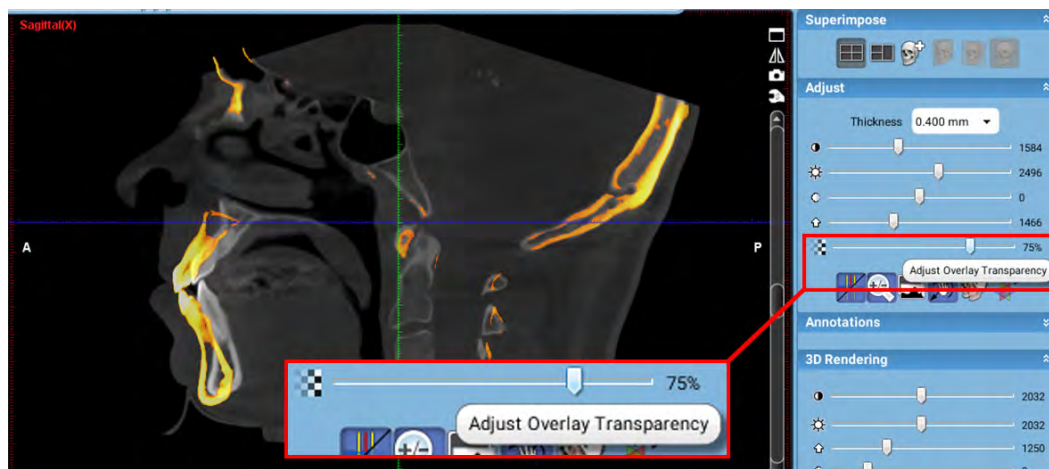
### Adjusting after volume threshold

To set the threshold for the after volume use the *Adjust overlay threshold* slider in the *Adjust* tool group. By adjusting the overlay threshold for example the changes in bone tissue only are better visualized.



### Adjusting transparency

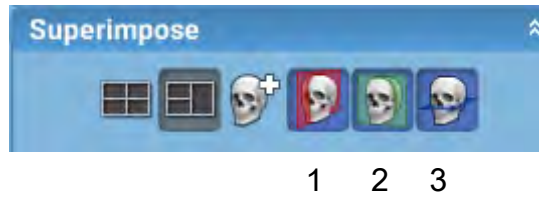
To adjust the transparency of the after volume use the *Adjust overlay transparency* slider in the *Adjust* tool group to emphasize the after volume in the Overlay view.





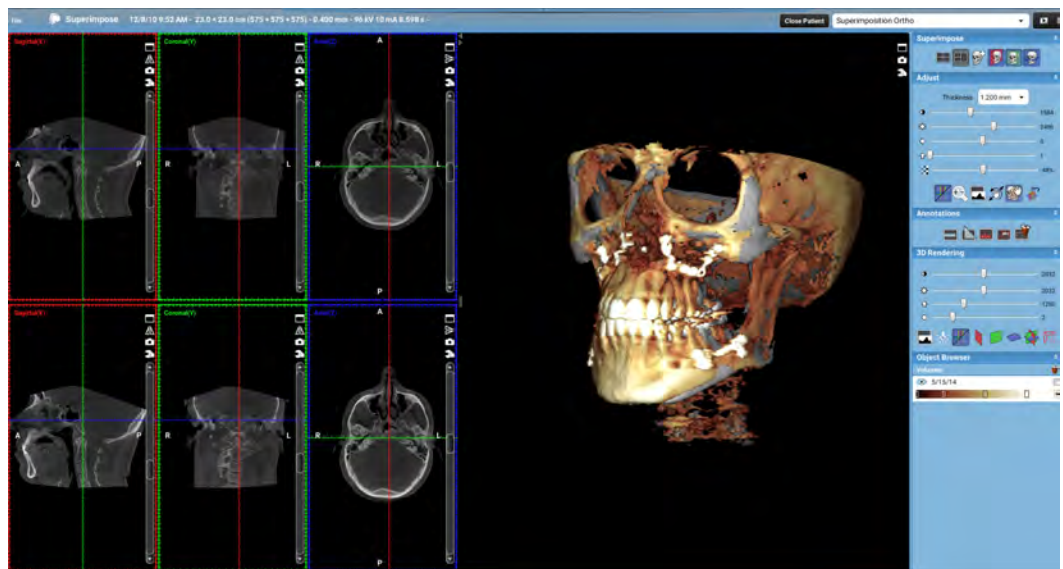
### 8.3 Side-by-side synchronized view

In the *Side-by-side* view the axial, sagittal and coronal projections can be sliced so that the anatomy can be evaluated in the same position with an unobstructed view.



1 Sagittal 2 Coronal 3 Axial

By clicking the slice view buttons you can select which views to show or hide.



When axial, coronal and sagittal views have been hidden the rendering view is maximized and restored again when a view has been selected. The same slice position of the before and after volume is shown in the upper and lower left panels respectively. The slice can be changed using either of the scrollbars while both views will update simultaneously. The 3D rendering view is the same as the *Overlay* view.

## 9 SURFACE SUB-MODULE



### NOTE

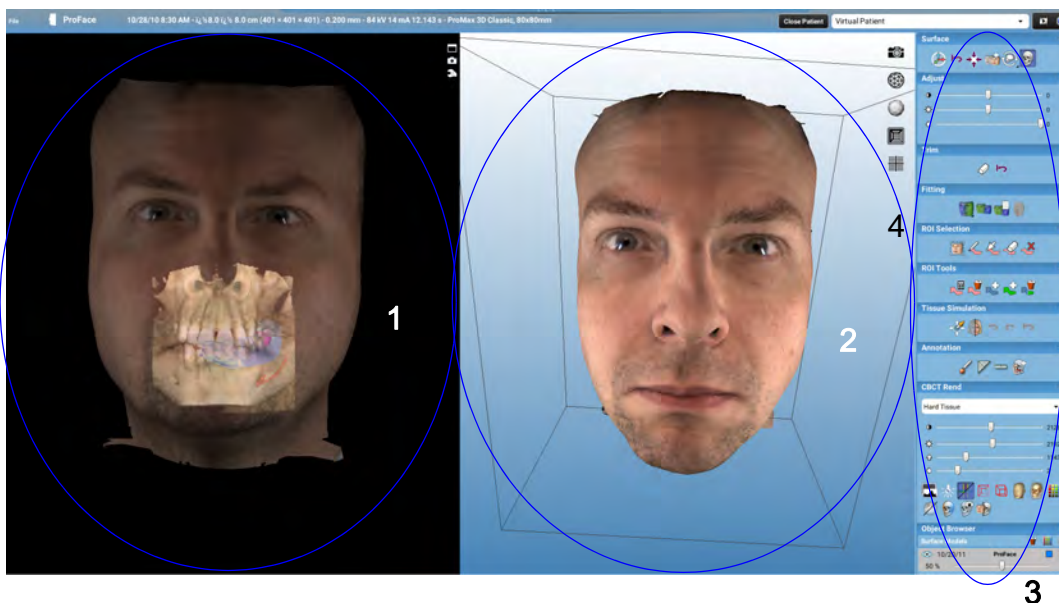
The volume must be opened from the Volumes sub-module before it can be viewed in *Surface* sub-module.

### NOTE

For more information on Planmeca ProFace image acquisition and processing see your Planmeca ProMax X-ray unit User's manual.

The *Surface* sub-module is divided in 3 sections:

- CBCT volume rendering view (1)
- Surface Rendering view (2)
- Planmeca Surface image adjustment tools (3)



3

### 9.1 Planmeca Surface rendering view

#### 9.1.1 Manipulating view

The Planmeca Surface rendering view displays texturized range images captured by Planmeca ProFace sensor.

To **rotate** an image click and drag it with the left mouse button.

To **zoom** in/out in the image click the image you want to zoom and scroll the mouse wheel.

To **set COI** (center of interest around which the virtual camera rotates) right-click in a desired point on an image.

### 9.1.2 Adjusting view



#### Snapshot

Takes a snapshot of the Surface rendering view. The snapshot will be saved in 2D imaging module.



#### Wireframe

Wireframe rendering can be used to analyse the triangulation in scanned images. To set wireframe rendering style for all images click this button.



#### Surface

Surface rendering can be used to analyse the topography of a measured surface. To set surface (i.e. no texture) rendering style for all images click this button.



#### Parallel projection

Use this mode to turn on and off linear perspective that provides a more natural view of the face.



#### Show grid

To show a symmetric grid on top of ProFace image click this button. By selecting parallel projection also measurement values are shown in the grid.

## 9.2 3D overlays

See section "ProFace" on page 200 for detailed description on how to use 3D overlays.

### 9.3 CBCT volume rendering view

The CBCT volume rendering view is identical with the 3D module's *Explorer* view.

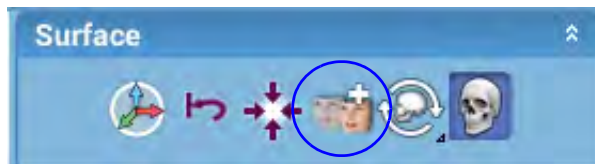
In case Planmeca ProFace image was captured simultaneously with CBCT image the CBCT data will be displayed in the CBCT rendering view.

#### 9.3.1 Setting a ProFace image as an overlay for the CBCT data

##### NOTE

Before starting make sure that both the CBCT data and ProFace image are added to the Volumes list of the patient.

1. Open the CBCT volume.
2. Go to *Surface* sub-module.
3. Add the ProFace image by clicking the **Add Surface Image** button in the *Surface* tools in the upper right corner.



Both the CBCT volume and ProFace rendering views are now visible in the ProFace module, and the CBCT data will get an ProFace overlay in other 3D sub-module views.

### 9.4 Using Planmeca ProFace image adjustment tools

This tool bar contains the main tools for adjusting and measuring Planmeca ProFace images.

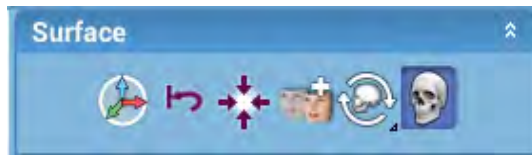
Based on their functions, the tools are divided in the following groups:

- **Surface** – for managing the data and their orientation
- **Adjust** – for adjusting the qualities of the ProFace image
- **Trim** – for removing areas
- **Fitting** – for fitting models or images together
- **ROI Selection** – for selecting regions of interest in the models
- **ROI Tools** – for working on the selected ROIs
- **Tissue Simulation** – for modifying ProFace surfaces
- **Annotation** – for making measurements
- **CBCT Rend** – for adjusting the CBCT rendering view (only visible when CBCT rendering is visible)
- **Object Browser** – for managing the properties and visibility of the objects in the views

##### NOTE

For detailed description of these functions see the following sections.

### 9.4.1 Surface tools



#### Set move mode

By clicking this button the image can be moved, rotated and zoomed in and out.

To drag the image on the screen to the **left** or **right**, click the **blue arrow** with the left mouse button and hold it down while dragging the image to the desired direction.

To drag the image on the screen **up** or **down**, click the **red arrow** with the left mouse button and hold it down while dragging the image to the desired direction.

To **rotate** the image **horizontally** (around its Y-axis) click the **green arc** using the left mouse button and hold it down while rotating the image to the desired direction.

When the move mode is switched on, the other modes are switched off. For example, if the Measurement Mode was active before switching on the move mode the measurements are no longer displayed once the move mode is activated.

To rotate and pan the rendered view press and hold down the **Alt** key on your keyboard while moving the image.



#### Reset offset

To reset all images to the state in which they were after import click this button. This tool can be used to detect variations in patient positioning.



#### Centre all

To centre models click this button



#### Add Planmeca ProFace image

To select and open another image from the same patient click this button.

The added image will be saved and opened the next time the original image is opened from the *Volumes* sub-module. The position and orientation of added images will also be saved.

The added images can be used for measurements and image comparisons.

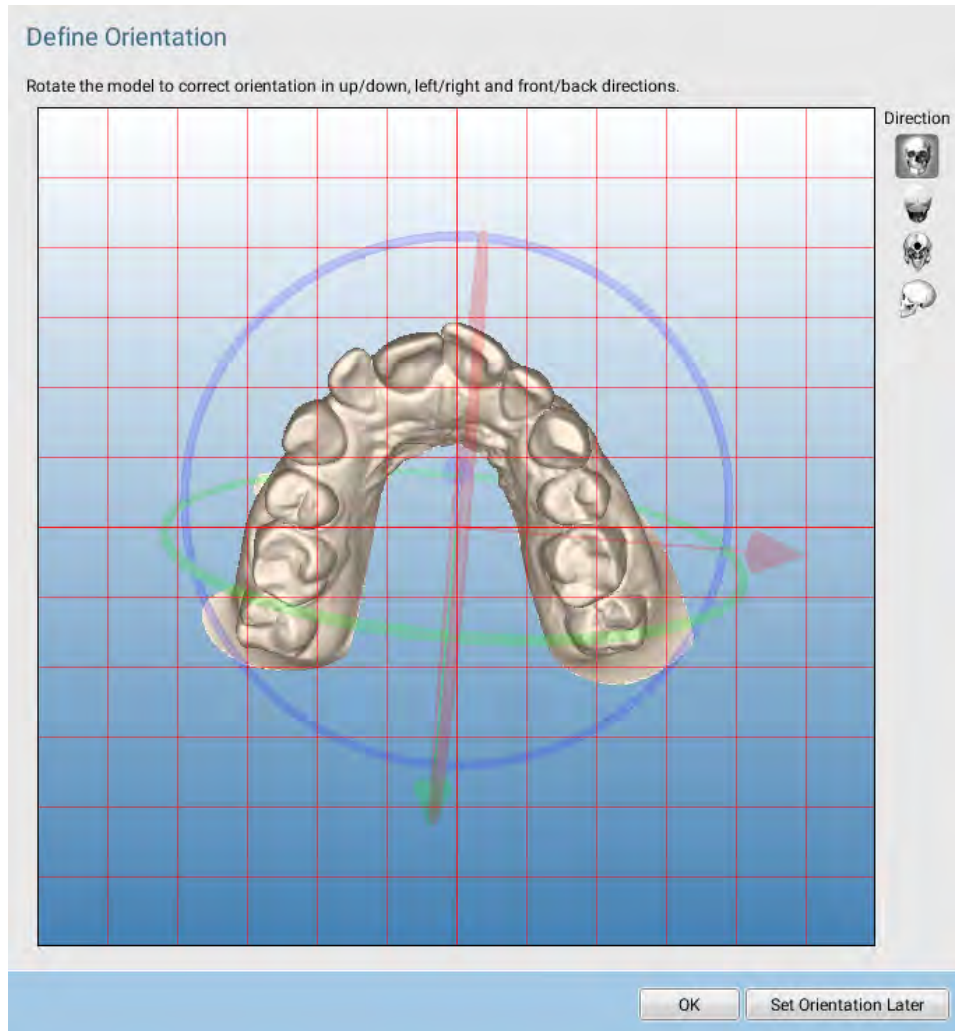


### Define orientation

#### NOTE

Works only for dental models.

To define the orientation use an orientation widget and a grid. Verify by examining the position from different directions.



When a new surface model is imported the orientation tool opens automatically.

The orientation can also be defined later by clicking the tool.



### Show/hide renderer

Shows or hides the CBCT rendering view in the image area.



### 9.4.2 Adjustment tools

#### NOTE

These adjustment affect only the ProFace images selected in the object browser.

By dragging the sliders contrast, brightness and softness of the ProFace images (before, after, CBCT rendering view) can be adjusted.

When the image is closed the settings are saved automatically.



### 9.4.3 Trimming tools



#### Paint ROI to trim

To remove any unwanted areas from the selected surface paint the areas using this tool. The surface behind the painted area(s) will be automatically removed.

To increase/decrease the size of the paint tool press and hold down the **Alt** key while scrolling the mouse wheel.

To rotate the image while the tool is selected press and hold down the **Alt** key while pressing the left mouse button.



#### NOTE

With this tool it is recommended to use [Wireframe rendering mode](#).



#### Reset trim

This tool restores all trimmed areas of the original surface. The effect of reset will be stored within image data.

### 9.4.4 Fitting tools

The *Fitting* tools can be used to analyse differences between scanned surfaces.



The *BEFORE* group marks the scan taken earlier of the two scans and *AFTER* group the latest scan image.

#### NOTE

For the matching process to work the registered images need to have common surface (anatomy).



#### Launch fitting wizard

The fitting wizard allows easy fitting of 3D models that have common anatomy. It can mainly be used to

- Fit together ProFace 3D photos of before and after treatment
- Fit ProFace 3D after treatment photos to CBCT data using an earlier ProFace 3D photo, which is already correctly positioned (offset) over CBCT data.
- Fitting two upper/lower jaw dental models together
- Fit dental models to correct bite using a bite piece model.

See the following sections for detailed information on different fitting methods.



#### Fit after to before

Using the *Fit After To Before* tool the anatomical regions can be matched together using the *Before* and *After* groups.

Fitting is successful when the fit result is 1 or less. If the fit result is not acceptable try to readjust the point sets or to re-align the images.

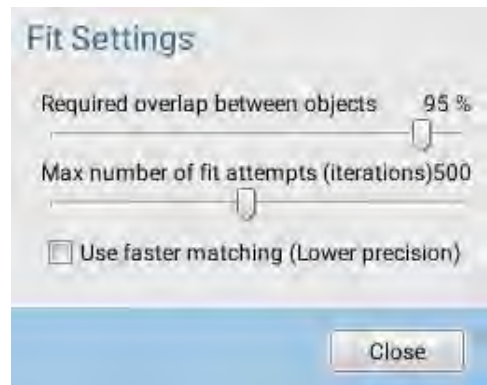
In the fitting the latest scan (*After* or green group) will be fitted to the blue *Before* group.

Before starting the fitting the models must be manually fitted to their initial position.



### Fitting settings dialog

Use the overlap parameter to improve point selection and noise in measurements. Ideally the point sets fully overlap and contain very little noise.



### Show deviation

Given that *Before* and *After* groups have been properly defined the Show deviation tool will calculate the distance between *After* and *Before* surfaces.

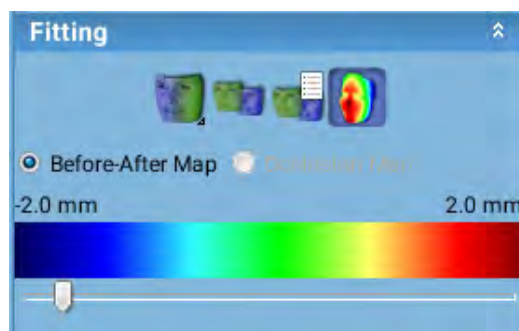
Warm colours indicate the *After* group surface is over the *Before* surface and the cool colours indicate the *After* group surface is below *Before* surface.

The deviation legend indicates the distance each colour represents.

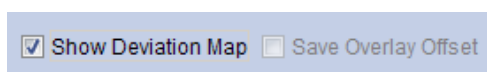
To adjust the deviation range use the deviation legend slider. The default range is from -5mm to +5mm.

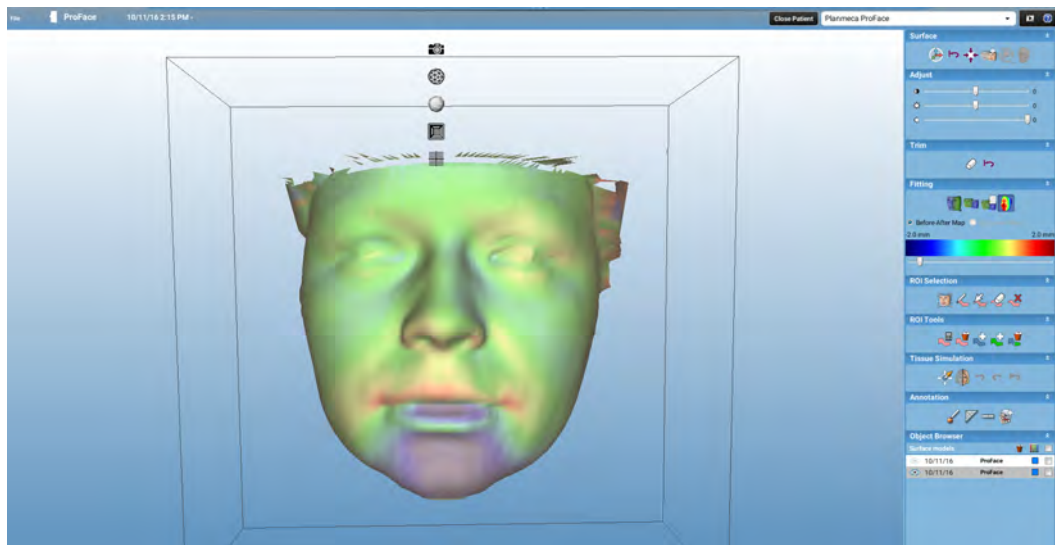
Moving mouse over the deviation map indicates the distance between surfaces in the current position.

Right-clicking on the deviation map will leave a distance indicator in the current position. Note that by moving the ProFace image or by making a new fitting the measurements will be erased.



To show the deviation map automatically after fitting check the *Show deviation Map* option in the fitting wizard.





### 9.4.5 ROI selection tools



#### Add model to ROI

Adds the whole surface model to the ROI.



#### Paint ROI

Use this tool to paint the areas you want to add to ROI by dragging holding down the left mouse button.

To increase/decrease the size of the tool press and hold down the **Alt** key while scrolling the mouse wheel.

To rotate the image while the tool is selected press and hold down the **Alt** key while clicking the left mouse button.



#### Draw ROI

Use this tool to draw a new ROI (Region of Interest) in the image. The ROI can also be used for trimming parts of scans and marking regions.

The ROI is essentially a closed polyline shape.

To add vertex points to a ROI using the left mouse button, click the **Draw ROI** button.

To finish and close a polyline double-click in the area in the image where you want to end the polyline. Alternatively you may single-click the right mouse button.

#### NOTE

The rendering view can be rotated and panned by holding down ALT-key while drawing the ROI.



### Modify ROI

Click this button to paint the areas to be removed from the selected ROI.



### Clear ROI

To clear any existing ROI object click this button.

To clear the previous ROI before drawing a new one click the “Clear ROI” button.

## 9.4.6 ROI tools



### NOTE

For the ROI tools to work you need the image must be selected in the screen.



### Calculate area

Use this tool to calculate the area of a ROI.



### Remove ROI area

This tool can be used to remove areas from a surface given that a region is selected using the ROI tool. Information about trimmed regions is stored with image data. The trimmings are stored to all images.

The trim tools can also be used with STL files.

### NOTE

Trim the main image before any processing or measuring.



### Add ROI to BEFORE group

Click this button to add the ROI area of selected image to the Before group. All previous assignments to the Before group will be reset. The selected area shows in blue.



### Add ROI to AFTER group

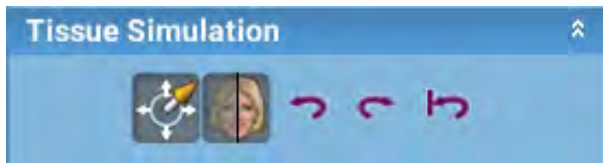
Click this button to add the ROI area of selected image to the *After* group. All previous assignments to the *After* group will be reset. The selected area shows in green.



### Remove all groupings

Click this button to remove the *Before* or *After* group from all images in the active session.

### 9.4.7 Using tissue simulation



Tissue simulation tools can be used to manipulate ProFace image surface in two ways:

- pull/push the surface along a direction perpendicular to the surface  
or
- slide the surface along the current viewing plane.

The shaping tool has a spherical radius of effect (for example, 3 cm). This means the effect of modification is strongest at the centre of the sphere and falls off to zero towards the edges of the sphere.

#### Using shaping tool

1. Open the ProFace image to work on.
2. Click on the **Shaping tool** button.
3. Specify the area you want to modify by clicking anywhere on the ProFace surface.



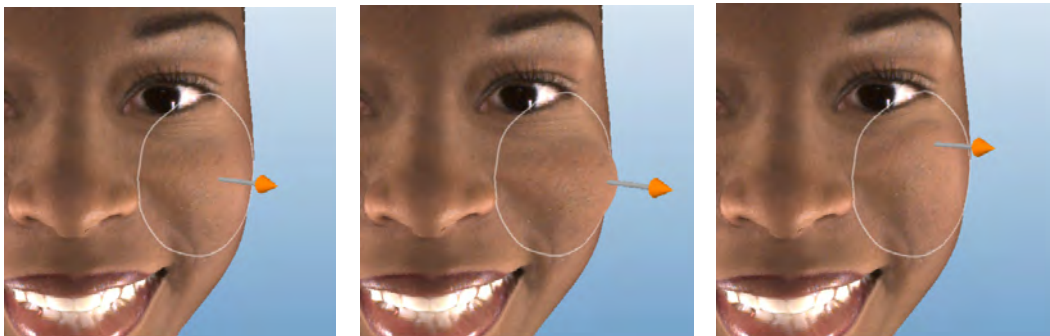
An indicator displays the range, centre point and the surface normal at the centre point.

You can adjust the effective area of the shaping tool by holding down the **Alt** key while scrolling the mouse wheel.

To specify a radius for the tool, scroll the mouse wheel to increase or decrease it. The range is drawn with a thin white line.

4. Drag the surface area you want to modify using the mouse.
  - To pull/push the surface at a given position, drag the arrow in or out with the mouse (2).
  - To slide the surface along the viewing plane, drag any point inside the tool area. When sliding the surface, it moves perpendicular to the viewing direction (3).

The following images show the original (1), pulled (2) and slid (3) surface.



1 Original surface

2 Pulled surface

3 Slid surface



- To specify a new centre point inside the selected area, hold down the **Ctrl** key while clicking on the new point with the mouse. If you don't hold down **Ctrl** key and click inside the tool's area, it is interpreted as a slide operation.
- To remove the tool indicator, hold down the **Ctrl** while clicking with the mouse anywhere outside the surface.
- To zoom the surface in/out while the tool is active, hold down the **Ctrl** while scrolling the mouse wheel.
- To rotate the model while the tool is active, drag outside the model surface. Otherwise you will end up selecting a new centre point for the tool.
- To zoom in/out the model scroll the mouse wheel.

### Before/after tool



To compare the modified ProFace surface image to the original one click the **Before / After** button. The tool can be used whether or not the Shaping tool is activated.k

### Undo / Redo

All surface modifications are stored so that the original surface is left untouched. The modifications of the current editing session are stored into undo history.



To undo/redo modifications use the **Undo / Redo** buttons. The modifications are stored into the database when the patient is closed.

Note that when opening a modified patient file you can only undo modifications of the latest editing session.

### Revert to original



To discard and remove all modifications and to go back to the original surface click the **Revert to original tool**.

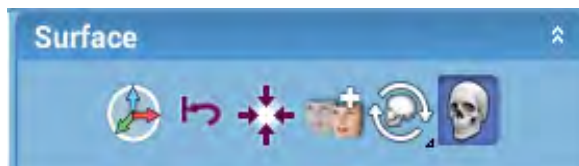


As long as no new modifications are made and patient is not closed. The reverted modifications can still be restored by clicking the **Redo** button.

### Viewing modified ProFace surface overlaid with CBCT volume



Open both the CBCT and ProFace image and click the **Show / Hide** renderer button in the *Surface* tools.



To toggle between modified and original surface click the **Before / After** button in *Tissue Simulation* tools. If you use the shaping tool in CBCT image the modifications also show in the rendering view.

### 9.4.8 Annotation tools



#### Point of interest

You can add a point of interest on the surface and use it as a facial soft tissue landmark for analysing the symmetry of the face.

The names of the points added can be changed in the Object Browser.



#### Angle measurement

Use this tool to measure angles on a surface model or between two surface models.



#### Polyline measurement

The measurements are poly lines that display the distance of every line segment and the overall length of the measurement.

To make a new measurement select the this tool.

Using the left mouse button click on the image where you want to start the measurement. Next click on the image where you want the measurement to finish.

To save the measurement double-left-click in the area where you want the measurement to end or single click with the right mouse button.

#### NOTE

The rendering view can be rotated and panned by holding down ALT-key while adding measurements.



#### Two surface measurement

When the two-surface measurement mode is activated new measurements can be added to measure distances between two surfaces. These measurements contain only two points, both on separate surfaces.

By left-clicking the first measurement point on a surface, the image containing this point is toggled invisible until the second measurement point is left-clicked on another surface.

After the second measurement point is added, the first surface is toggled visible once the measurement is finished.

### 9.4.9 CBCT rendering tools

For detailed description of the other rendering tools see section 3.4 "Using 3D rendering tools" on page 191.

In this section only the ProFace specific tools, the rendering snapshot and the save overlay offset, is described.

#### NOTE

The CBCT rendering tools are hidden if no CBCT images are open .



#### NOTE

The rendering snapshot and save overlay offset tools are active only if ProFace image has been added.



#### Rendering snapshot

To create a snapshot position the CBCT rendering object so that the features of interest are visible in the image. Features that are not visible in the CBCT rendering will not be available in the snapshot surface.

If CBCT image is not open during the session no snapshot can be created and an error message will appear.

When a Planmeca ProFace image is set as an overlay for CBCT data, all rendering snapshots created from the CBCT data inherit the (inverse) offset from the overlay. This means that when Planmeca ProFace images are captured together with CBCT data, the user can create rendering snapshots from CBCT data and start doing measurements immediately between soft-tissue and bone surfaces.



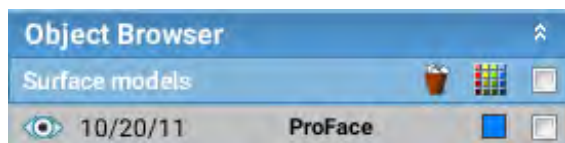
#### Save overlay offset

The tool can be used to save the fitted position between the CBCT image and Planmeca ProFace image in the rendering in case Planmeca ProFace and CBCT image have been taken in different occasions and therefore not automatically fitted. The Planmeca ProFace image will be fitted correctly in the rendering in relation to the CBCT image.

To use this tool the images need to be designated to *Before* and *After* groups. To save the definition click the *Save overlay offset* tool. The face image will be shown in the saved position in the *Rendering* view with CBCT volume data.

### 9.4.10 Object browser

For detailed description see section 3.5 "Using object browser" on page 196.



## 9.5 Comparing Planmeca ProFace images before and after treatment

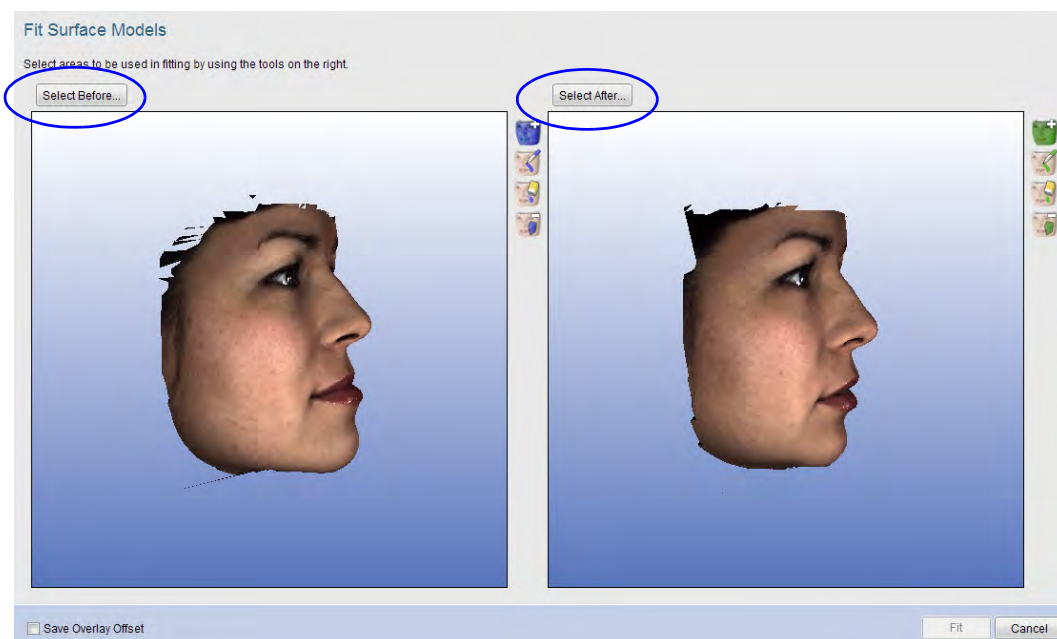
Planmeca ProFace can be used for comparing the anatomy of the patient before and after treatment. Planmeca Romexis software automatically superimposes the images and shows the anatomical differences between the images acquired before and after treatment.



1. Click this button to launch the Fitting wizard.
2. Open the before and after ProFace images using the **Select Before** and **Select After** buttons.

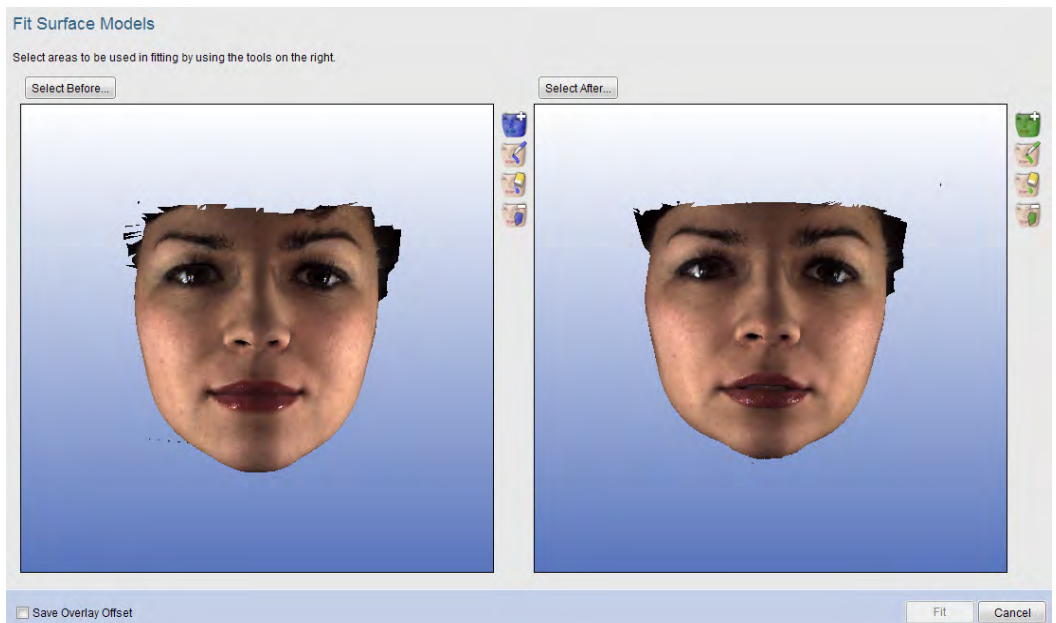
### NOTE

The images must show in the *Volumes* sub-module to be used in the wizard.



3. To add the image into the Before / After group use these buttons.  
All previous assignments to that group will be reset. The image selected for before group shows in blue and the one selected for after group in green.

4. Turn the models so that you can select common anatomy in them.
  - To turn the model hold down left mouse button.
  - To move the model around hold down both mouse buttons.
  - To zoom in/out scroll the mouse wheel.
5. Select common anatomy on both models by using the tools next to the models.



#### NOTE

To maximize the accuracy of the fitting process select anatomy that has NOT been affected by treatment.

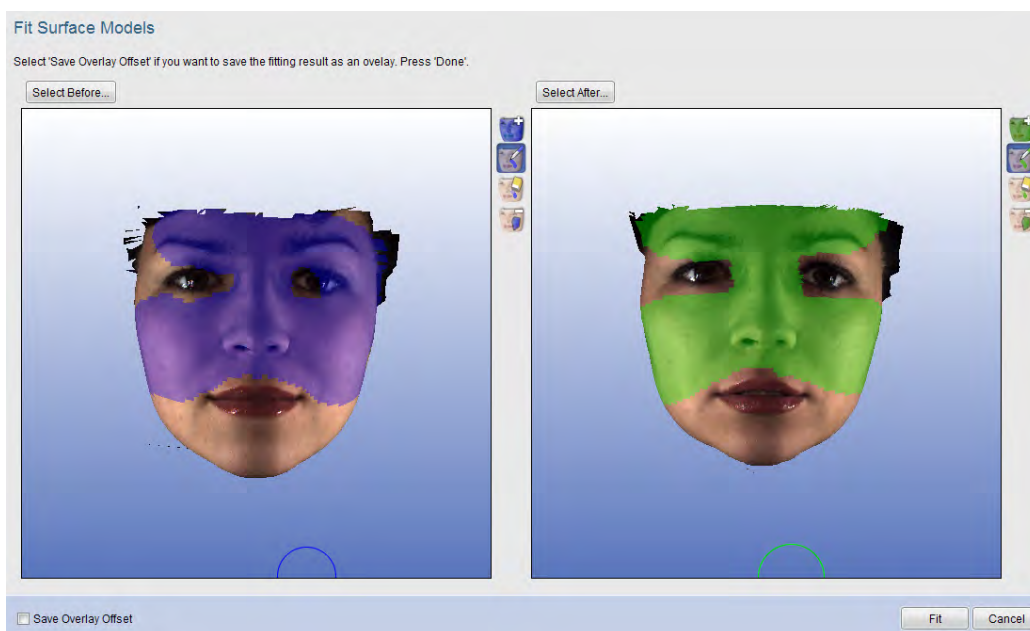
- To adjust the tool size press and hold down the **Alt** key while scrolling the mouse wheel.
- To turn the models while the paint tools are active press and hold down the **Alt** key.
- To move the model press and hold down the **Alt** key and both mouse buttons.

#### NOTE

If the before status is already mapped to a CBCT image and you want to use the same offset mapping for the after image enable the *Save Overlay Offset* option. This will make the after image appear in the correct position over the CBCT image.



If necessary you can use the ROI removal tool to remove unnecessary areas from the selection.

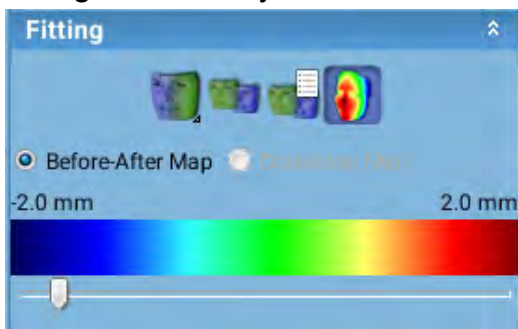


6. When finished click the **Fit** button.

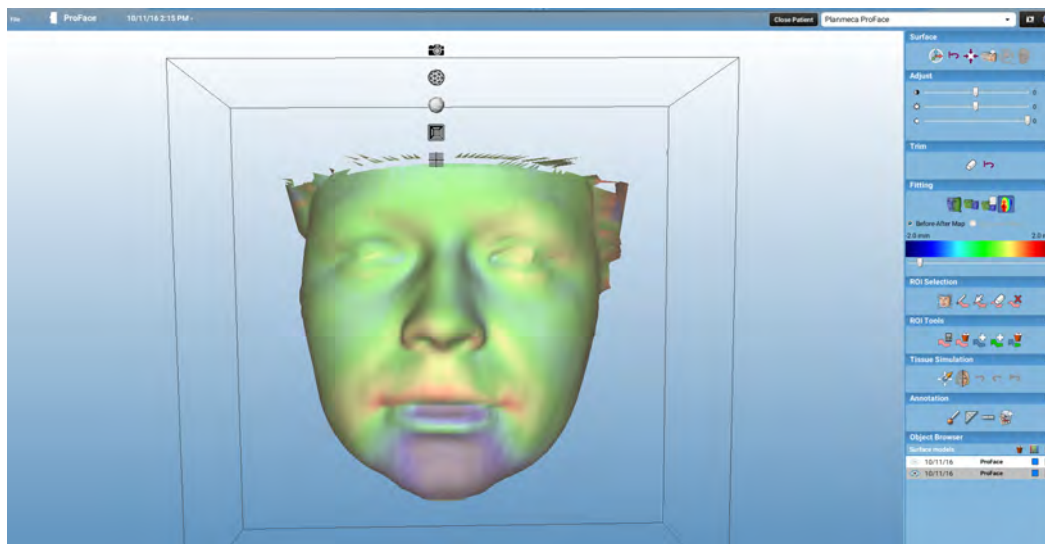
The images are automatically fitted together and appear in correct position.



7. To study the differences in coloured topology based on the amount of change in anatomy click the **Deviation Map** button in the Fitting group.



Blue colour indicates retraction of anatomy and red indicated protrusion.

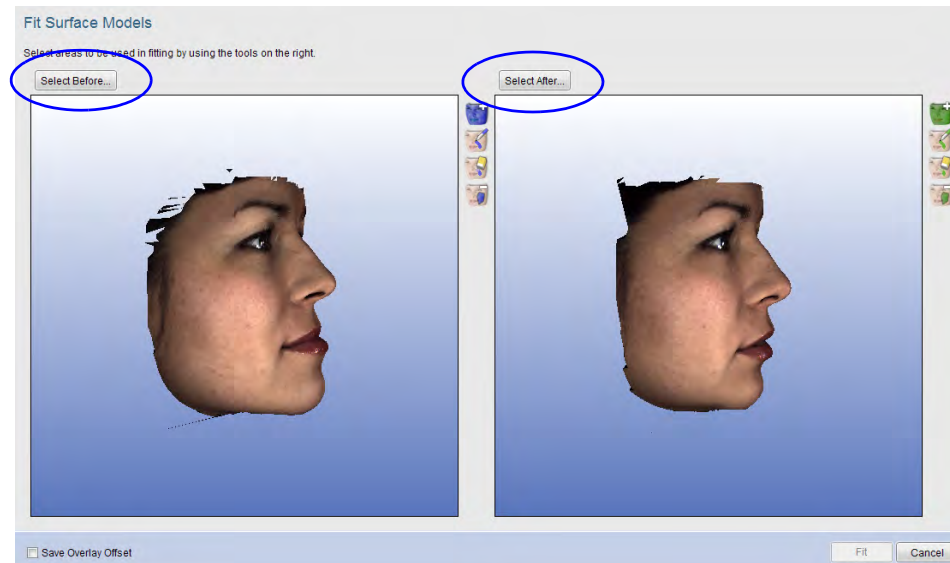




### 9.5.1 Automatic fitting using a previous ProFace image

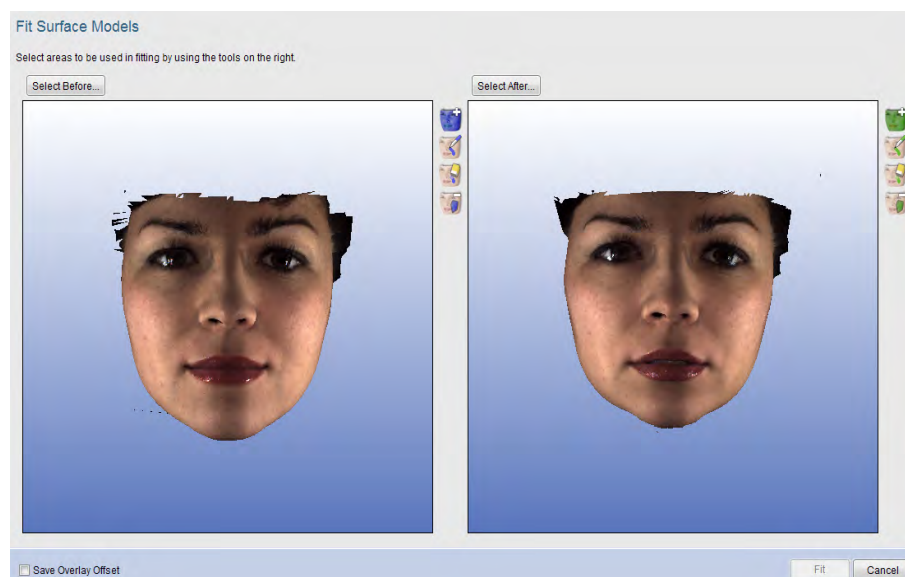
If the patient has an earlier ProFace image mapped to a CBCT image, its offset can be used to map new ProFace images to the same CBCT as follows.

1. Open the CBCT image to which the earlier ProFace image is mapped to.
2. Go to *Surface* sub-module.
3. Launch the fitting wizard by clicking this button.
4. Open the before (already mapped to CBCT) and after ProFace images using the **Select Before** and **Select After** buttons.



The images must be present in the *Volumes* sub-module for them to be used in the wizard.

5. Position the models so that you can select common anatomy in them:
  - To turn the model press and hold down the left mouse button.
  - To zoom in/out use the mouse wheel.





6. Paint common anatomy on both models by using the **Paint** and **Draw ROI** tools.

#### NOTE

For maximum accuracy of the fitting process select anatomy that has not been affected by treatment.

- To adjust the tool size use **Alt** + mouse wheel.
  - To turn the models while the paint tools are active press and hold down the **Alt** key.
  - To move the model press and hold down the **Alt** key and both mouse buttons.
7. Enable the **Save overlay offset** option. This will make the *After* ProFace image appear in the correct position over the CBCT exposure.




8. If necessary remove areas from the selection by using the **ROI** removal tool.
9. Click the **Fit** button.
10. Planmeca Romexis fits the images together and they appear in correct position over the CBCT image.

### 9.5.2 Alternative method for comparing images before and after treatment

This section describes an alternative method for comparing ProFace or other surface models as described in section 9.5 “Comparing Planmeca ProFace images before and after treatment” on page 262.

1. Open the CBCT volume (or earlier Planmeca ProFace image if no CBCT is available) by double-clicking it from *Patient's 3D images*.

Patient's 3D Images									
Double click 3D Image to open it									
Exposure Date	Image size	Voxel Size (µm)	Serial Number	kV	mA	s	DAP(mGy*cm²)	Comments	Preview
15.9.2014 11:03	100 x 100	0						BEFORE	

The image opens in the *Surface* sub-module.



2. To add both Planmeca ProFace images to the study click the **Add Surface Model** button in the *Surface* tools.



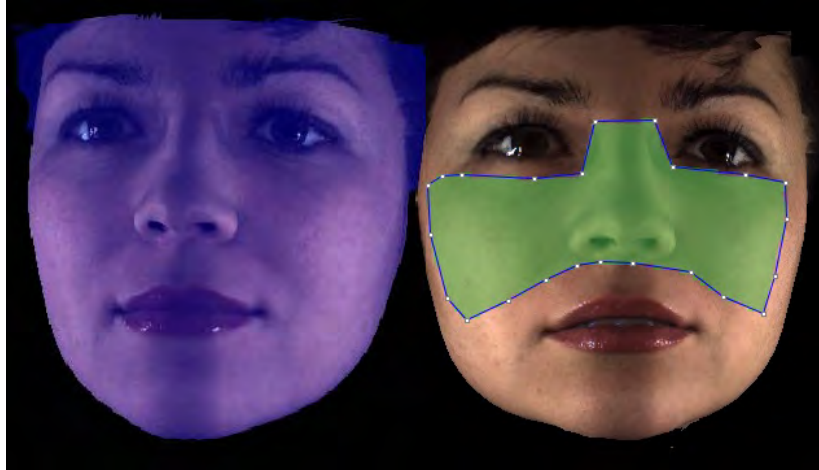


3. Select the image acquired before treatment and click the **Add to Before** button. The image is added to the *Before* group and shows in blue.

4. Select the image acquired after treatment.

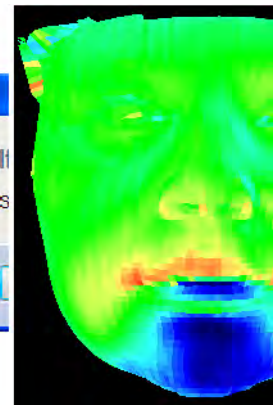
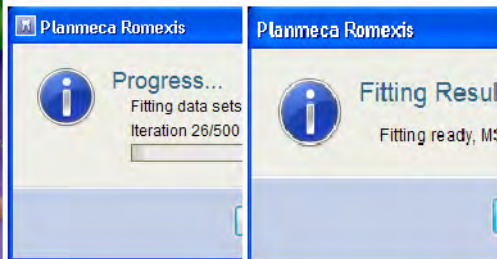


5. Use the **Draw ROI** button to mark an area that is identical in both images (not affected by the treatment).



6. Click the **Add ROI to After Group** button. The marked area turns green.

7. Drag one image on top of another so that their anatomy roughly matches.



8. Click the **Fit After to Before** button. Planmeca Romexis now fits the surfaces precisely.




9. To evaluate the changes in anatomy click the **Show Deviation Map** button and uncheck the before ProFace image from the in the Object Browser list. Blue colour indicates receded anatomy, green colour shows unchanged areas and red areas indicate the areas that have protruded after treatment.

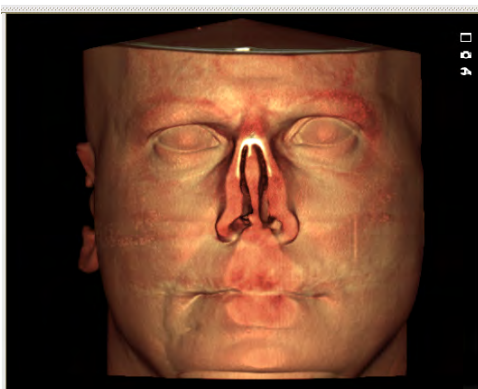
## 9.6 Fitting Planmeca ProFace image to CBCT volume

Planmeca ProFace image is normally automatically fitted to the CBCT data during the exposure. However, manual fitting is necessary for example in case the images were acquired at different times.

Manual fitting is easiest on 3D volumes that include skin surface as the surface can be used as a fitting reference.

On how to fit a new ProFace image to a CBCT volume using an earlier ProFace image see section 9.5.1 “Automatic fitting using a previous ProFace image” on page 265.

1. Check that the CBCT volume and its related Planmeca ProFace image are listed in the *Volumes* sub-module.
2. Open the CBCT volume and click the *Surface* sub-module.
-  3. Add ProFace image to the study by clicking this button.
4. Adjust 3D rendering so that skin surface is visible using *Soft Tissue 3D rendering* preset.



5. Click **Rendering snapshot** button to make a surface model of the 3D rendering.

The snapshot is added to the Object browser where the two items can be activated and modified.



6. Select the 3D rendering snapshot and click the **Draw ROI** button to mark an area that is unmodified in both images.

### NOTE

The cheeks and forehead are suited for selecting common anatomy. The chin can be used if chin support was not used for exposure and nose when included in the volume.





7. Click the **Add to before group** button. The selected area turns blue.



8. Select the Planmeca ProFace image and click the **Draw ROI** button to define a common area with the 3D rendering snapshot.



9. Click the **Add ROI to after group** button. The marked ROI turns green.



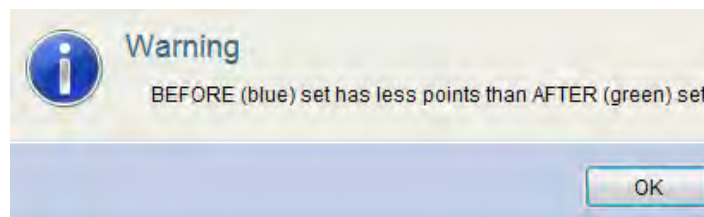
10. Move the surfaces on top of each other so that the anatomy roughly matches.



11. Click the **Fit after to before** button to have Planmeca Romexis fit the surfaces precisely.

#### NOTE

If the following warning appears when using the **Fit after to before** tool, you need to change the groupings so that the blue (before) group is larger than the green (after) group. To evaluate the size of the trimmed area in each group turn on the **Wireframe** mode. Generally the trimmed areas in the 3D rendering snapshots are much larger than in the Planmeca ProFace scans.



12. To evaluate the fitting result click the **Show deviation map** button and deactivate the 3D rendering snapshot in the Object browser.

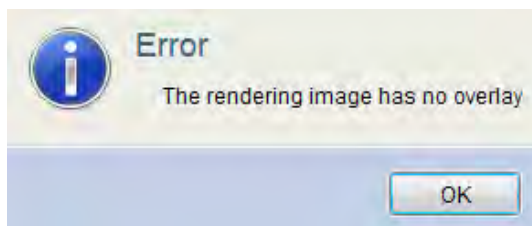
The fitting is successful when most of the face shows in bright green, see step 7.



13. To save the Planmeca ProFace offset select the Planmeca ProFace image and click on the **Save overlay offset** button.

The **Save overlay offset** tool ensures that the Planmeca ProFace surface is correctly positioned in relation to the CBCT volume when shown in the 3D rendering as an overlay

14. In case the following error about missing rendering overlay appears, click the **3D overlay menu** to attach the Planmeca ProFace image to the CBCT volume.



#### NOTE

In case there is no soft tissue surface suitable for fitting in the CBCT volume, accurate overlay fitting cannot be done. For manual overlay calibration, the rendering snapshot should be taken using bone surface in the rendering.

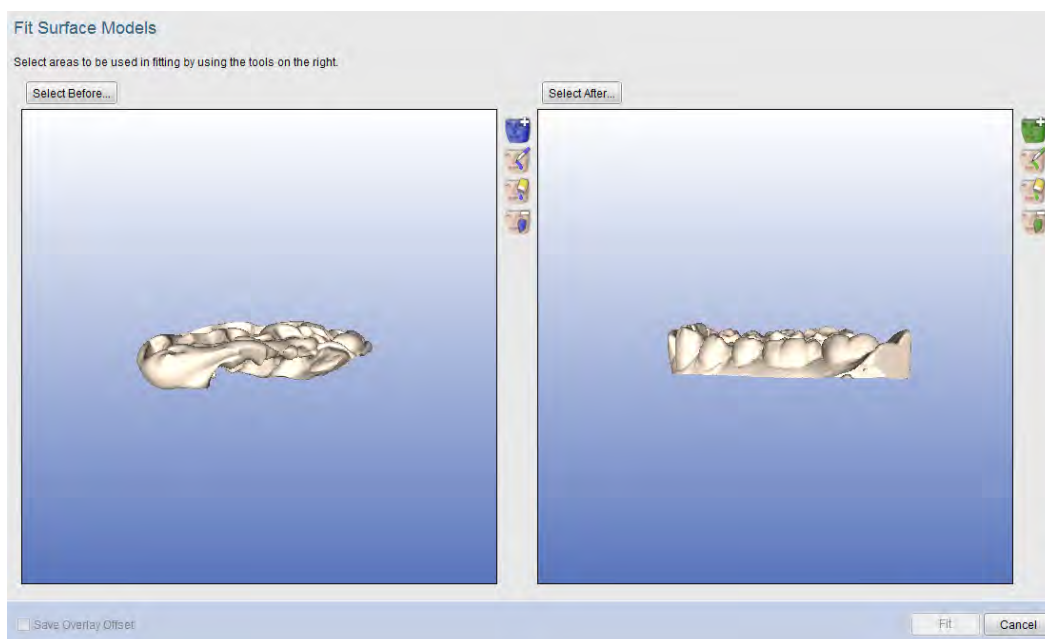
## 9.7 Fitting surface models

### 9.7.1 Fitting two 3D models using bite piece

The Fitting Wizard can be used to fit two dental models into correct bite using a bite piece model. In order to fit STL models they need to be listed in the *Volumes* sub-module. To fit the models into correct bite follow these steps.

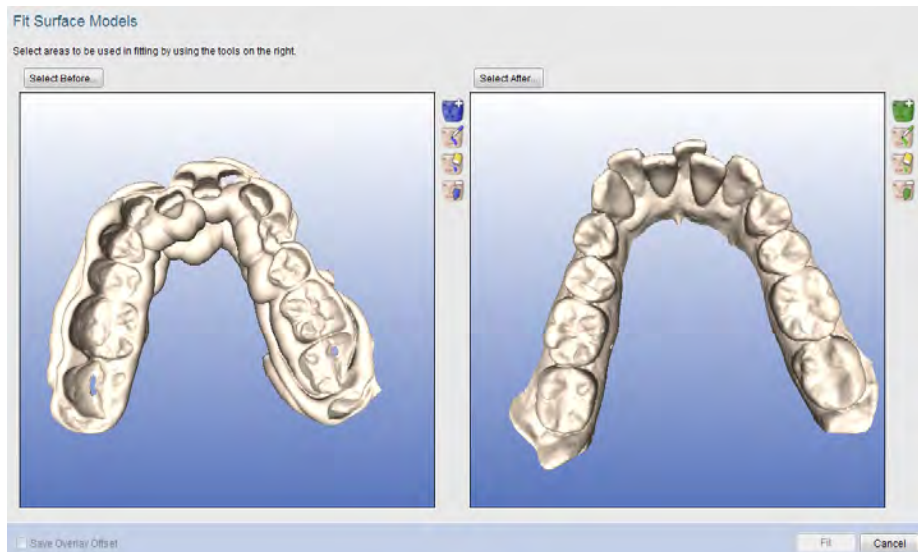
The general work-flow is always as follows:

- Run the fitting wizard and set the bite piece as the *Before* model and the upper model as *After* model.
  - Run the fitting wizard again and select the bite piece again as the *Before* model and the lower model as the *After* model.
1. Launch the Fitting Wizard by clicking this button.





## 2. Position the models so that occlusal surfaces are clearly visible.



- To turn the model hold down the left mouse button while dragging.
- To move the model around hold down both mouse buttons while dragging.
- To zoom in/out use the mouse wheel.

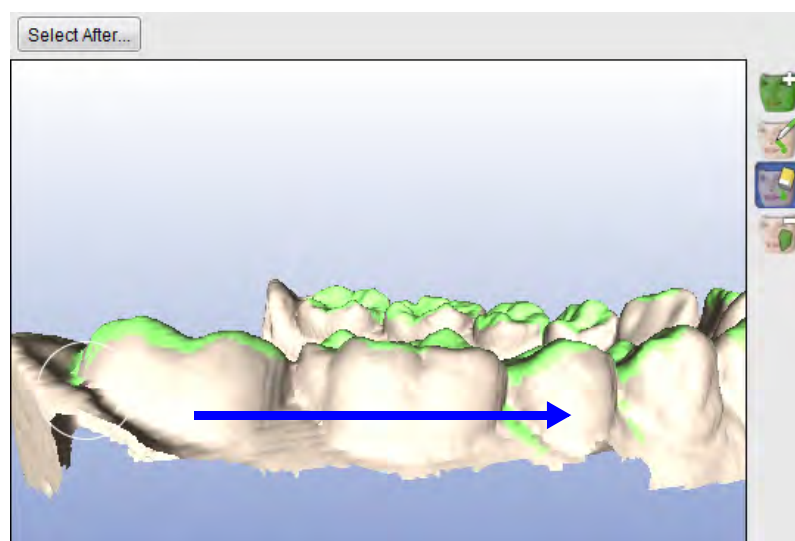


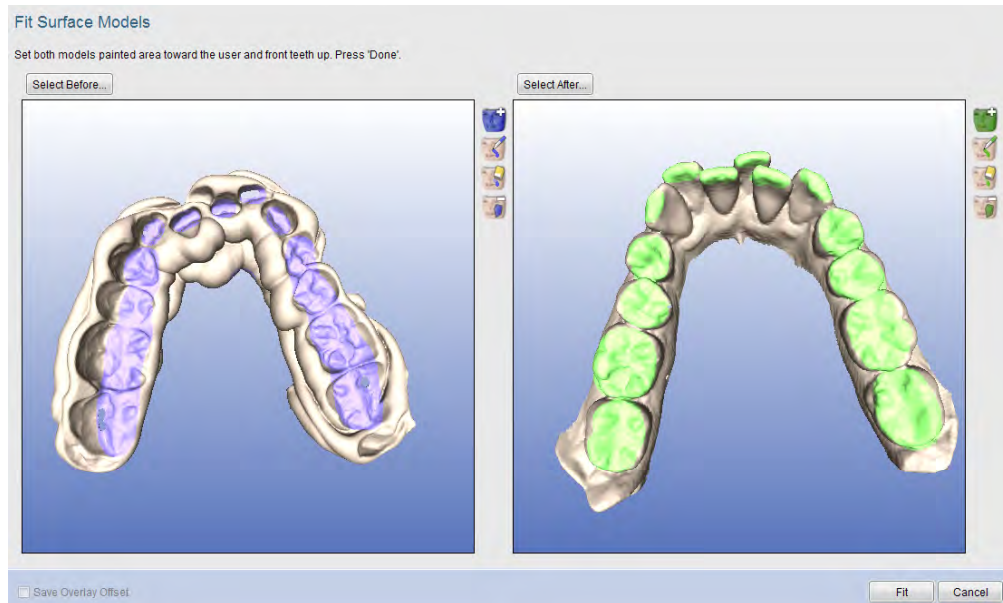
## 3. Paint occlusal surfaces on both models by using the ROI paint tools.

- To adjust the tool size use the **Alt** key and the mouse wheel. In general all the occlusal surfaces can be painted with one stroke using a wide brush.
- To turn the models while the paint tools are active press and hold down the **Alt** key.
- To move the model hold down the **Alt** key and both mouse buttons.

For improved fitting result use the ROI removal tool to in the After model (lower / upper bite) to clean any extra selections from the non-occlusal surfaces (MDBL).

A few wide swipes across the sides of the dental arch is usually sufficient for good results.





4. Click the **Fit** button.
5. The models are automatically fitted.
6. Repeat the steps from 1 to 4 for the remaining opposite bite.

### 9.7.2 Fitting two 3D models without bite piece

The Fitting Wizard can be used to fit two dental models without using bite piece. For example models of the upper arch taken at different times of the treatment can be fitted together. It is recommended to select the first model (the model taken of the initial situation) as the before model for the fitting. The STL models to be fitted need to be listed in the *Volumes* sub-module.

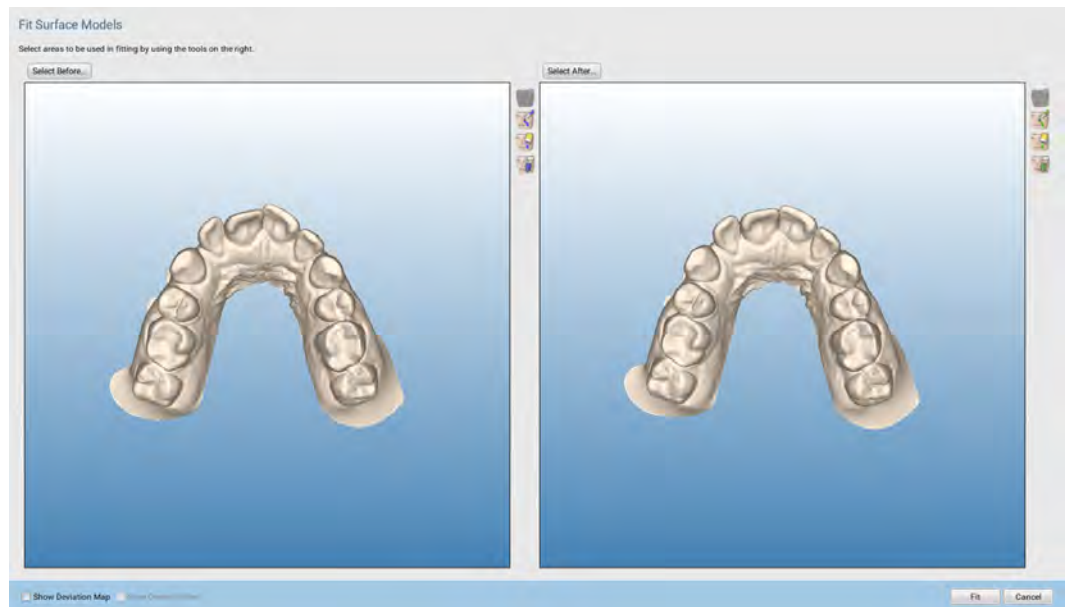
#### Fitting models

Before starting:

- Run the fitting wizard and set the bite piece as the *Before* model and the upper model as *After* model.
- Run the fitting wizard again and select the bite piece again as the *Before* model and the lower model as the *After* model.



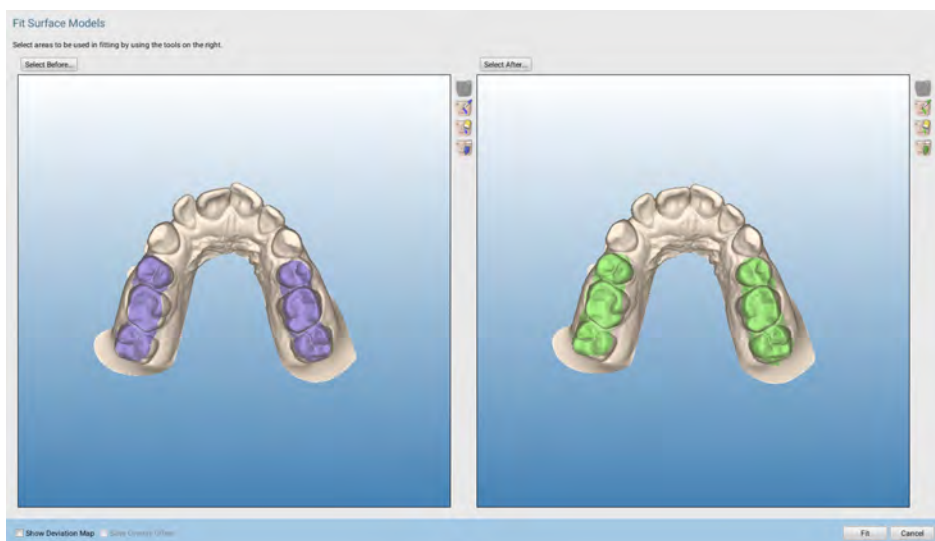
1. Launch the Fitting Wizard by clicking this button.
2. Position the models so that the occlusal surfaces are clearly visible.



- To turn the model hold down the left mouse button while dragging.
- To move the model around hold down both mouse buttons while dragging.
- To zoom in/out use the mouse wheel.



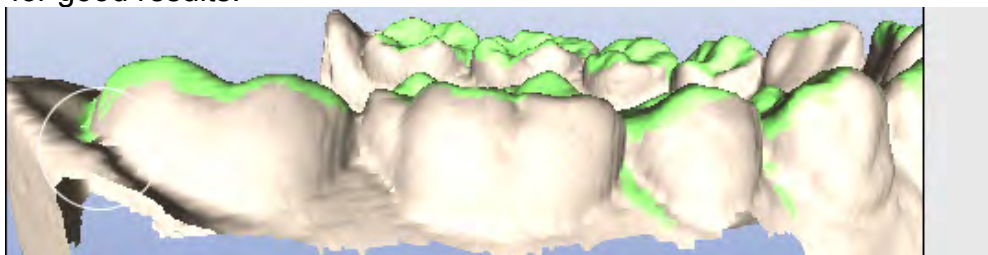
3. Paint the areas that have not been changed during treatment, e.g. the molar occlusal surfaces by using the ROI paint tools.



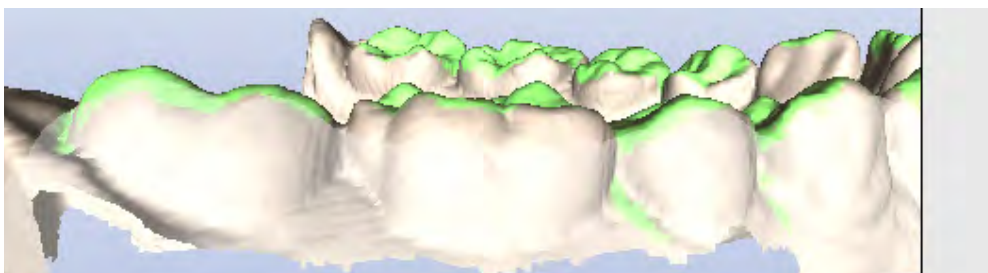
- To adjust the tool size use the **Alt** key and the mouse wheel. In general molar occlusal surfaces can be painted with one stroke using a wide brush.
- To turn the models while the paint tools are active hold down the **Alt** key while dragging.
- To move the model hold down the **Alt** key and both mouse buttons.

For improved fitting result use the ROI removal tool to in the After model (lower / upper bite) to clean any extra selections from the non-occlusal surfaces (MDBL).

A few wide swipes across the sides of the dental arch is usually sufficient for good results.



Before swiping

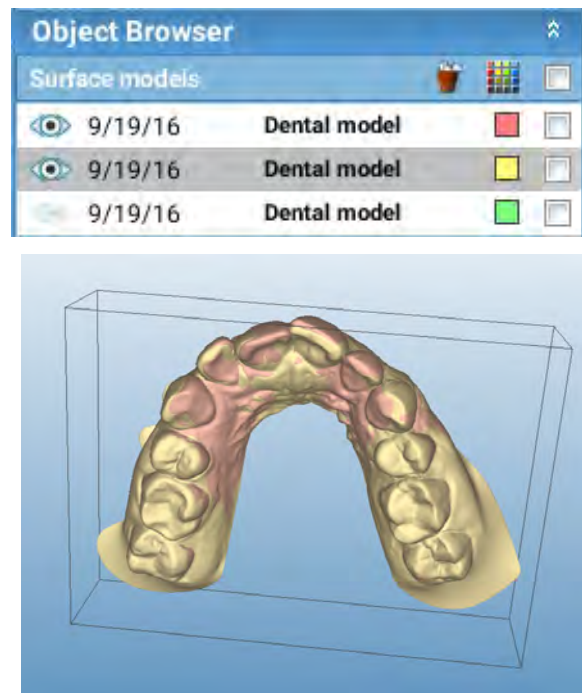


After swiping

4. Click the **Fit** button.

The models are automatically fitted.

To distinguish the differences between the fitted the models you can set a different colour for each model.



## 9.8 Adjusting ProFace rendering overlay offset manually

If it is not possible to use automatic fitting of the Planmeca ProFace image to CBCT volume due to missing soft tissue surface or other issues, the images can be manually positioned and attached.

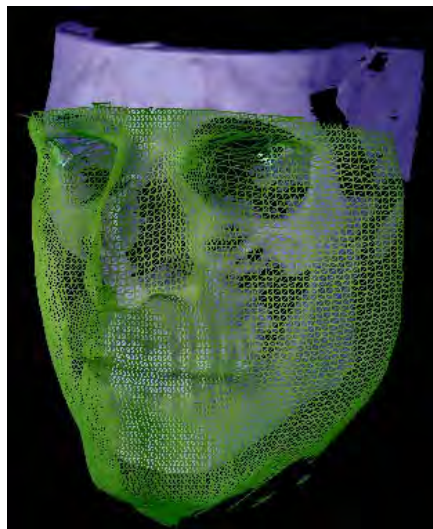
1. Manually position the volumes as accurately as possible.



2. Select the rendering snapshot and click the **Add to before group** button. The snapshot turns blue.



3. Select the Planmeca ProFace image and click the **Add to after group** button. The snapshot turns green.







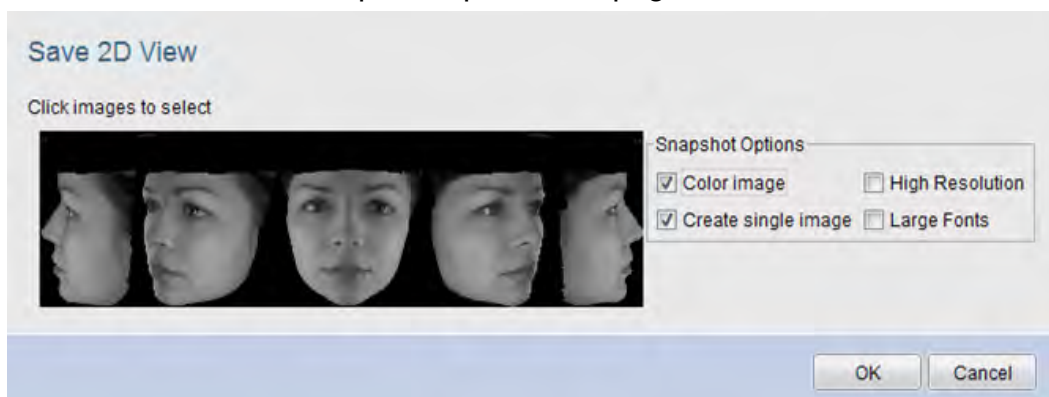
4. Attach the Planmeca ProFace image to the CBCT volume using the **Save Overlay Offset** button.



### 9.9 Creating a set of Planmeca ProFace 2D snapshots



1. Click the **Save 2D view** or **Print editor** button.
2. In the following window click on the images you would like to appear in the snapshot set.
3. Select the suitable snapshot options. For detailed description of options see section 12.12.2 “Snapshot options” on page 321.



4. Click **OK**.

The set of Planmeca ProFace snapshots appears in Planmeca Romexis.





## 9.10 Taking Planmeca ProFace quickshots

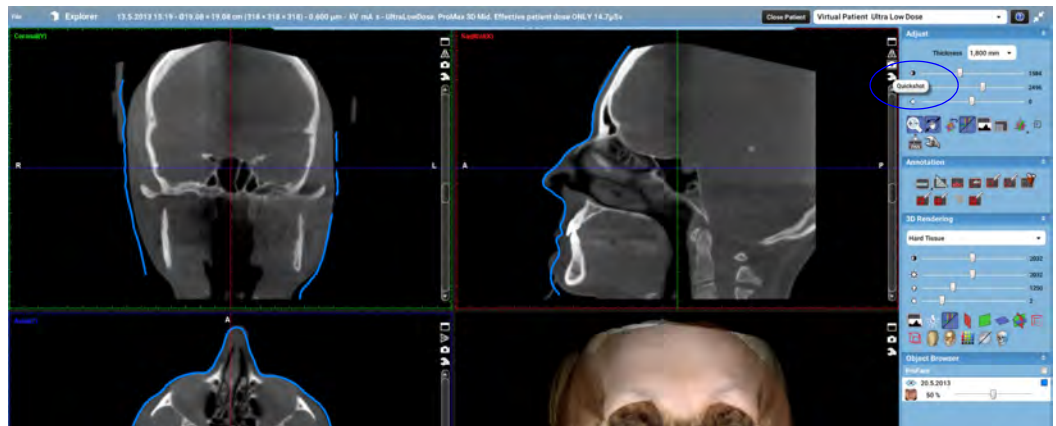
With the quick shot tool a 2D snapshot of CBCT volume with Planmeca ProFace data (blue line) can be created out of a CBCT volume's single view. A quick shot can be created in every view of the 3D module.



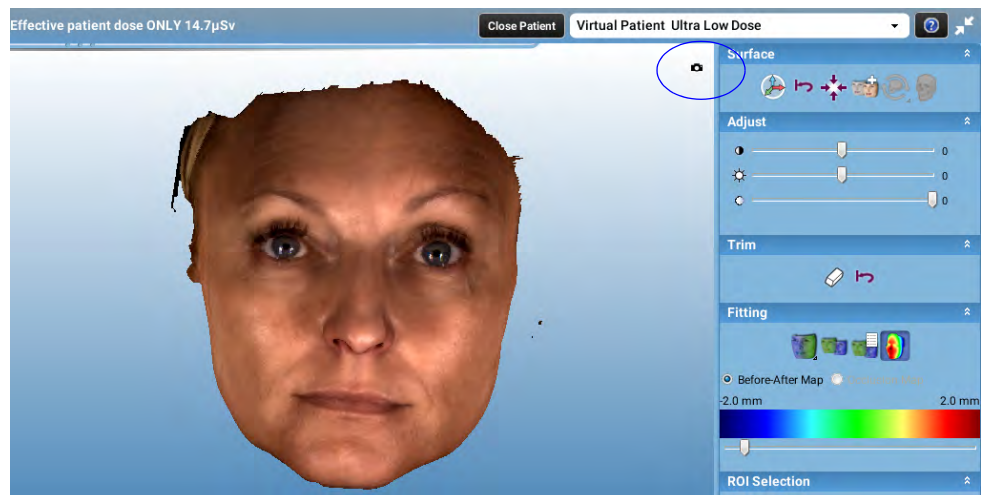
### NOTE

Face data is visible only when *Show/hide overlay* is enabled. When the eye button is dimmed all elements in the current group are hidden. In the ProFace group elements can be shown or hidden separately.

- Quick shot from combined 3D and face data can be created e.g. in *Explorer* sub-module.



- Quick shot from face photo can be created only in *Surface* sub-module



To view the quick shots go to 2D imaging module. The quick shots are saved as 2D images.



## 9.11 Importing Planmeca ProFace images



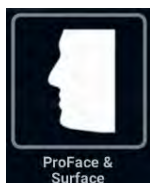
1. Go to the *3D* module by clicking the **3D** module button and select *Surface* sub-module.



2. Click **3D import** from the 3D main tool bar.
3. In the opening window select the image to be imported.  
The imported image opens in *Surface* sub-module.



## 9.12 Exporting Planmeca ProFace images



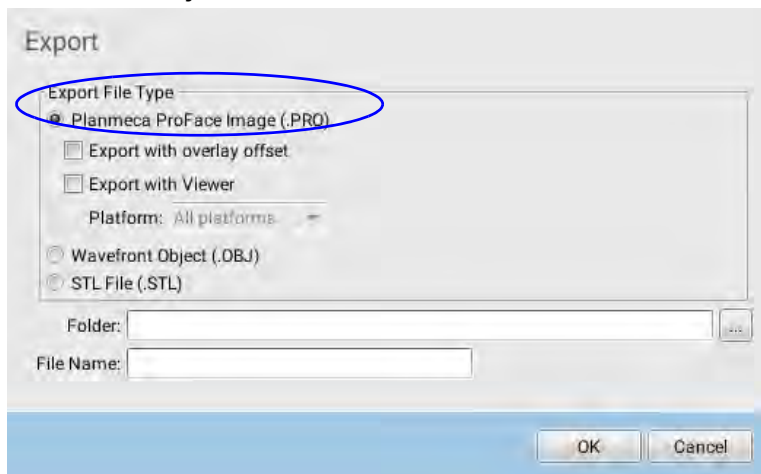
1. In 3D module select the *Surface* sub-module.



2. From the top tool bar click the **Export volume** button.

Planmeca ProFace image can be exported with overlay offset and with viewer. You can also select the optimized platform (32-bit / 64-bit Windows or MacOS) for the viewer according to your system.

The extension of the exported Planmeca ProFace image is \*.PRO. For wavefront object the extension is .OBJ and .STL for stl file.

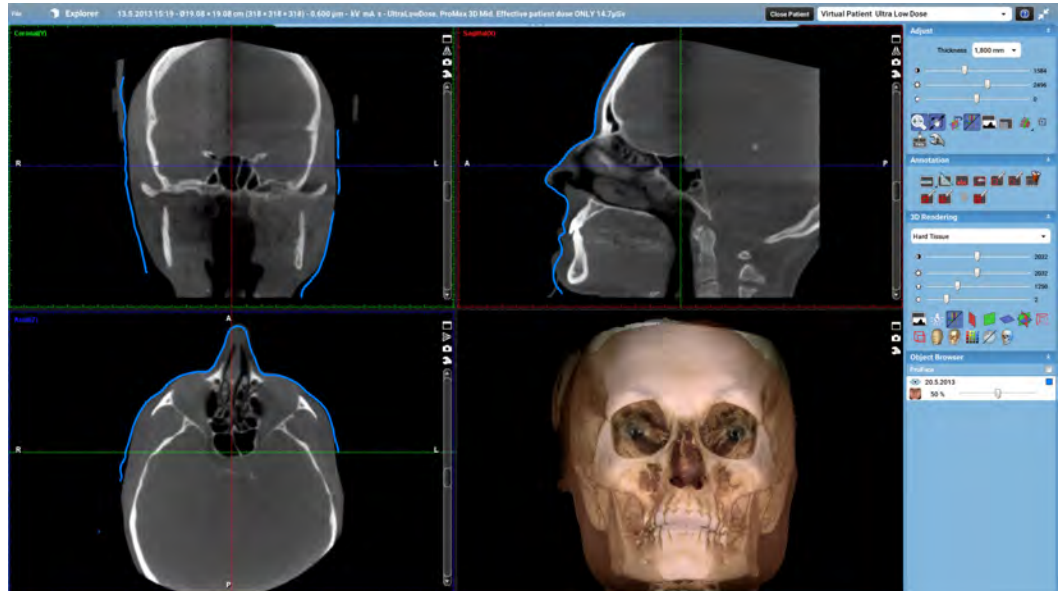


### 9.12.1 Exporting CBCT volumes with Planmeca ProFace images

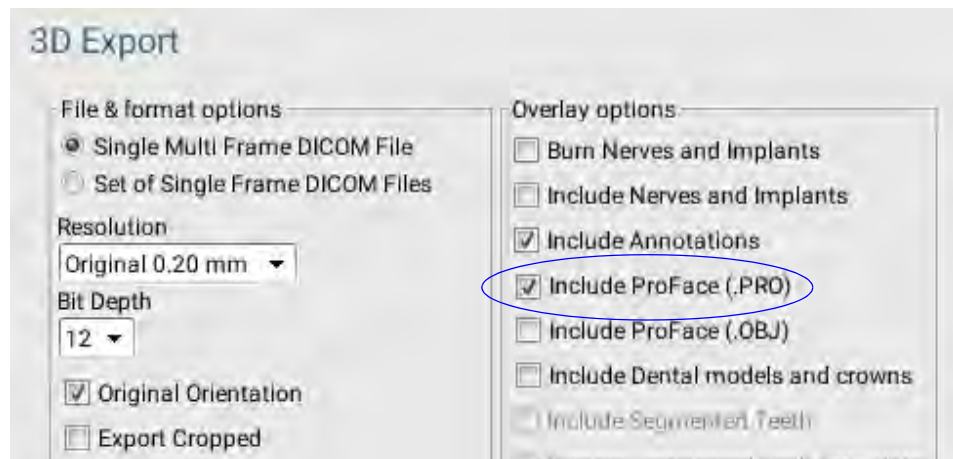
The combination of CBCT volume, ProFace image and STL file can be exported with matching coordinates. This means that as the receiver opens the exported images they will open as aligned by the sender. The files can also be imported to 3rd party software.

For external software use the *.OBJ* format for ProFace images.

1. Open CBCT volume with ProFace overlay and go to *Explorer* sub-module.



2. From the main tool bar select **Export volume**.
3. Select the option *Include ProFace*.



#### NOTE

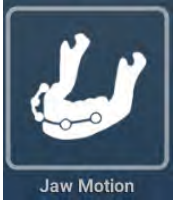
CBCT volume and Planmeca ProFace image are exported as separate files. The extension for the exported Planmeca ProFace-image is *\*.pro* and *\*.dcm* for the CBCT volume.

#### NOTE

If you select the option *Include ProFace* make sure that the setting in 3D Rend / Overlay Properties / Type is set to *3D Photo*.

## 10 JAW MOTION SUB-MODULE

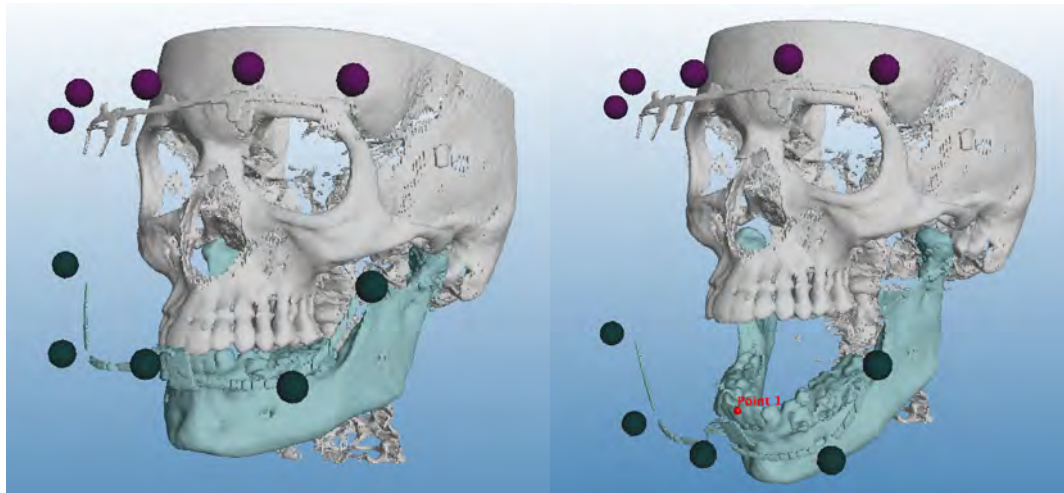
### 10.1 Viewing and recording jaw motions



1. Open the Jaw Motion sub-module.

When the system is in ready-state, the movements of the patient can be seen live in Planmeca Romexis. The movements are not saved unless they are recorded. To record the movements for later analysis, please see section 10.1.1 "Recording jaw movements" on page 280.

2. Ask the patient to perform the needed movements.



Jaw closed

Jaw open

#### 10.1.1 Recording jaw movements

1. To enable recording click on the **START CONNECTION** button.




2. Record the movements showing on the screen by clicking on the **Record** button. The movements are now been saved as a video.





The ongoing recording shows in the object browser.



-  To stop recording re-click on the **Recording** button.  
In the opening window enter a name for the recording and click **OK**.



The recording now shows in the Object Browser.



### 10.1.2 Viewing recordings

#### NOTE

The recordings cannot be viewed when the tracking connection is enabled. Before starting to view recordings check that the connection is disabled.



1. Select the recording you want to view in the *Recordings* list and click the **Play** button.



2. The recording will start.



To stop the recording click the **Stop** button.



To go backwards in the recording click the **Backwards** button.



## 10.2 Analysing recorded jaw movements

Use the annotation tools to add annotations, length and angular measurements.

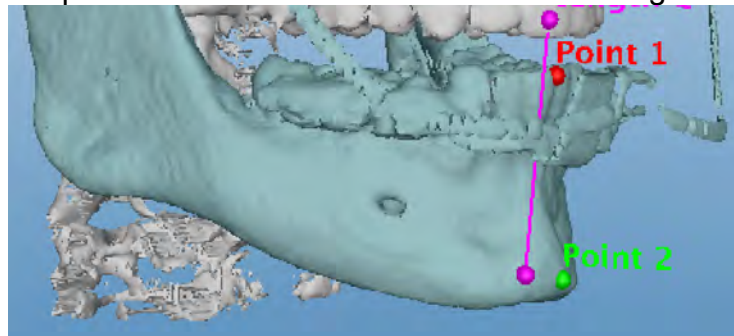


### 10.2.1 Adding point measurements



To add a point measurement click this button and then click on the mandible/maxilla surface.

The point shows as a coloured ball on the image.



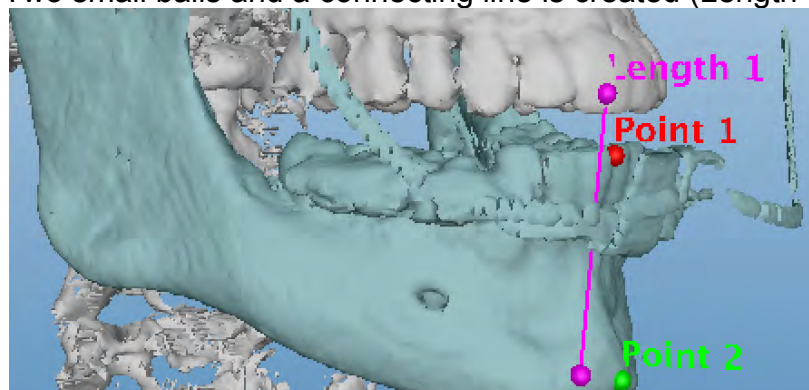
As patient moves the lower jaw the point location can be seen as a 2D-plot of two axes, such as XY-axis or YZ-axis. Alternatively the location of the point can be visualized as a function of time (see section 10.2.5 "Chart views" on page 285).

### 10.2.2 Adding line measurements



Insert two points by clicking on the desired areas.

Two small balls and a connecting line is created (Length 1 in the image).



- If both points are placed on the mandible or on the maxilla a simple distance measurement is created. This measurement will not change value during tracking.
- If one of the points is inserted on the maxilla and the other on the mandible the length of the measurement will change as the patients move their jaw. This shows as a function of time (see section 10.2.5 "Chart views" on page 285).

### 10.2.3 Adding angular measurements

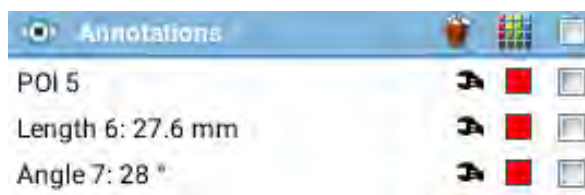


Click on the model to insert the middle point, then click to add two line segments.

An angle between the two line segments is created.

- If all the points are added on the maxilla or on the mandible a simple angle measurement is created and it will not change as patients move their jaw.
- If one of the points is located on the mandible and the other two on the maxilla (or vice versa) the angle will change as the patients move their jaw. The angle will show as a function of time on the 2D plot (see section 10.2.5 "Chart views" on page 285).

### 10.2.4 Annotation properties



All added measurements are shown in the Object browser under *Annotations*.

The default colour for all annotations is red.

To change the colour of a single measurement click the colour box next to the measurement.

To change the colour of multiple measurements check the measurements in the *Annotations* toolbar. The colour selected for the measurement is used also in the 3D view and in the charts.

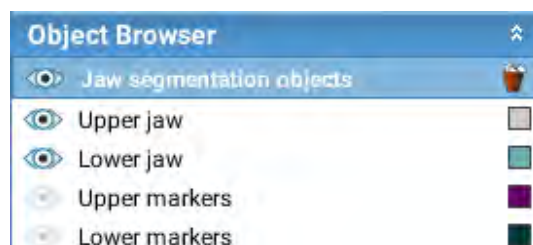
The default text for a new annotation is *POI N*, *Length NX* or *Angle NX* where N is a consecutive measurement number and the X is the value. The value changes as the patient moves during tracking.



The text field can be modified by using the wrench tool. The same text is shown in the 3D view and in the charts.



The visibility of the measurements in the 3D view is controlled using the **Eye** button. When the button shows in white the objects are hidden and when in blue the objects are shown.



To remove measurements check the ones you want to remove and click the **Delete selected** button. Note that removing a measurement removes it from the Object browser, from the 3D view and from the charts.

### 10.2.5 Chart views

The values of the measurements can also be visualized in the chart views. The row selected measurements are shown in the charts. The measurement with the grey background is selected (default value), white is deselected.

Three chart options are available:



#### POI Projection:

Shows a 2D-plot of two axes in all three directions (Sagittal, Coronal, Axial) for a point measurement. Each measurement's change from its starting position is shown.



- **POI versus Time:**



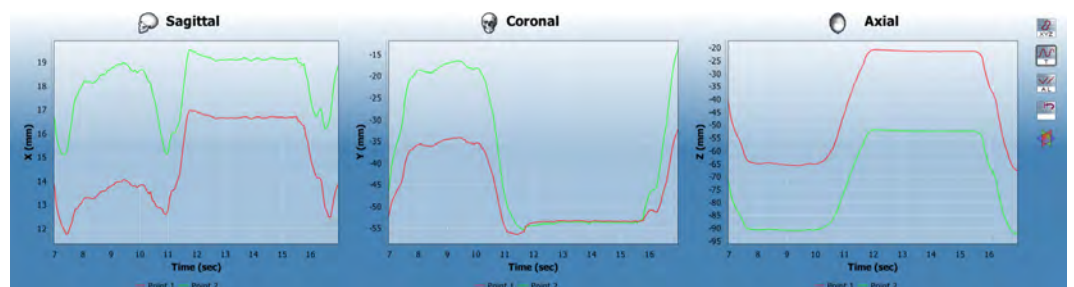
Shows X, Y and Z-coordinates as a function of time for a point measurement.



- **Distance/Angle versus Time:**



Values of the distance and angle measurements as a function of time. The scale of the charts is adjusted automatically.



### 10.2.6 Resetting charts



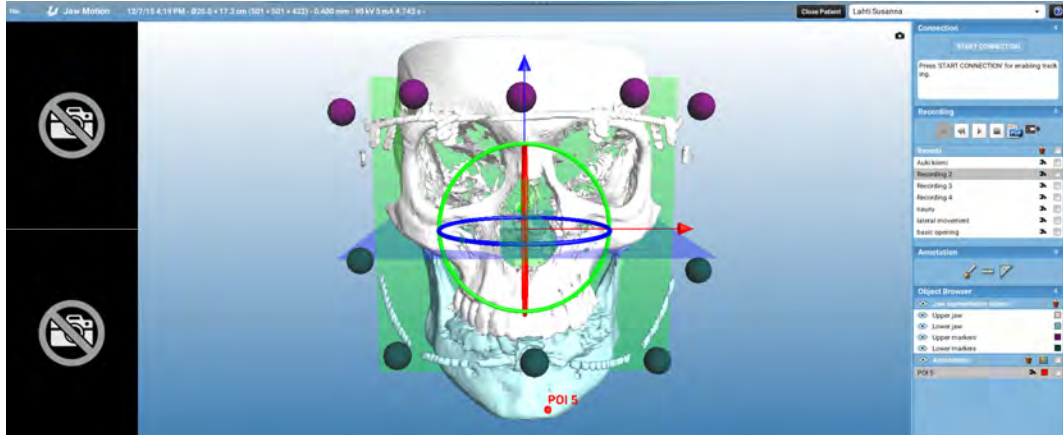
To reset all charts and timer click the **Reset charts** button.

### 10.2.7 Viewing reference coordinates



To view the coordinate system in which the added point measurements are shown in the POI charts click on this button.

To modify the reference coordinate system use the control gimbal by dragging with the left mouse button while holding down the **Alt** key.



### 10.3 Exporting jaw motion files



1. Click the **Export** button.
2. Select the export destination folder and click **Save**.

## 10.4 Creating and saving reports



1. Click the **PDF** button.
2. Enter the necessary clinic and patient information.

Clinic		Patient	
Name	<input type="text" value="Name"/>	Name	<input type="text" value="Lahti"/>
Contact email	<input type="text" value="example@email.com"/>	ID	<input type="text" value="25621626"/>
Contact name	<input type="text" value="Name"/>	Age	<input type="text"/>
		Gender	<input type="text" value=""/>

3. Select the recordings and annotations you want to include in the report.

Select one or more recordings to be included in the report

Auki kiinni
Recording 2
Recording 3
Recording 4
nauru

Select one or more annotations to be included in the report

POI 5
Length 6
Angle 7
Length 4

4. Click **Browse** to select the folder where you want to save the report.

Save Jaw Tracking Report to file	
<input type="text" value="C:\Users\Desktop\Report.PDF"/>	<input type="button" value="Browse"/>

**Save**5. Click **Save**.

Create Jaw Tracking Report

<b>Clinic</b>	<b>Patient</b>
Name <input type="text" value="Name"/>	Name <input type="text" value="Susanna"/>
Contact email <input type="text" value="example@email.com"/>	ID <input type="text" value="25621626"/>
Contact name <input type="text" value="Name"/>	Age <input type="text"/>
	Gender <input type="text" value=""/>

Select one or more recordings to be included in the report

- Auki kiinni
- Recording 2**
- Recording 3**
- Recording 4**
- nauru

Select one or more annotations to be included in the report

- POI 5**
- Length 6**
- Angle 7**
- Length 4

Comments

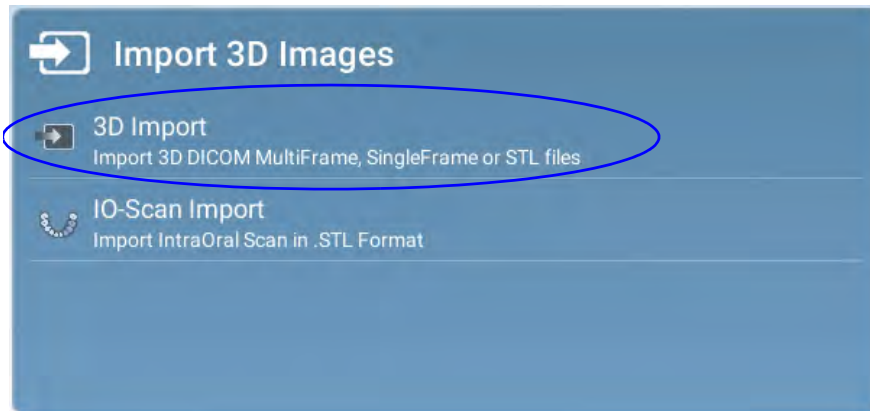
Save Jaw Tracking Report to file



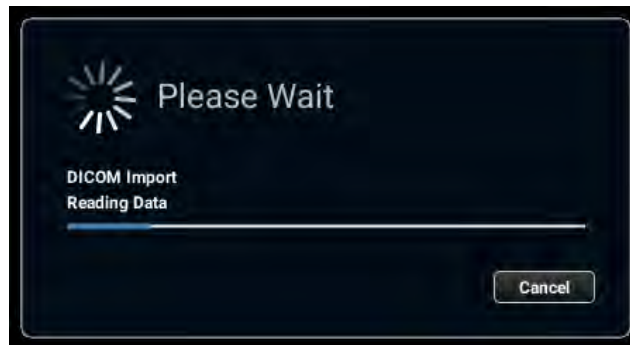
## 10.5 Importing Jaw tracking cases



1. Click the **3D import** button on the 3D top toolbar or select the **3D import** from the *Volumes* sub-module.



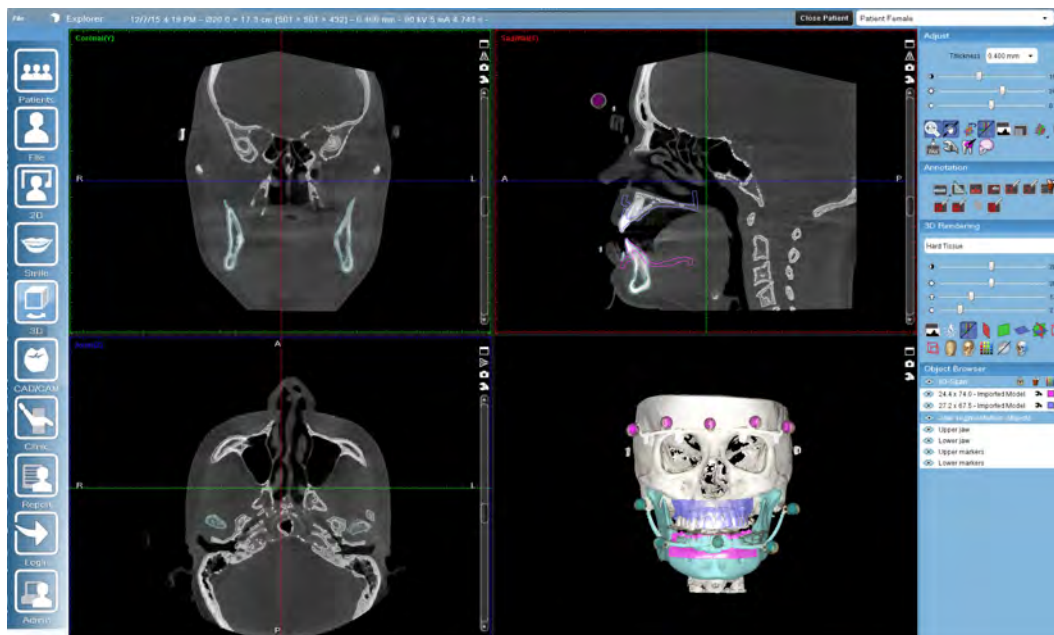
The import starts.



2. Click **OK**.



The jaw tracking case opens in the Explorer sub-module.



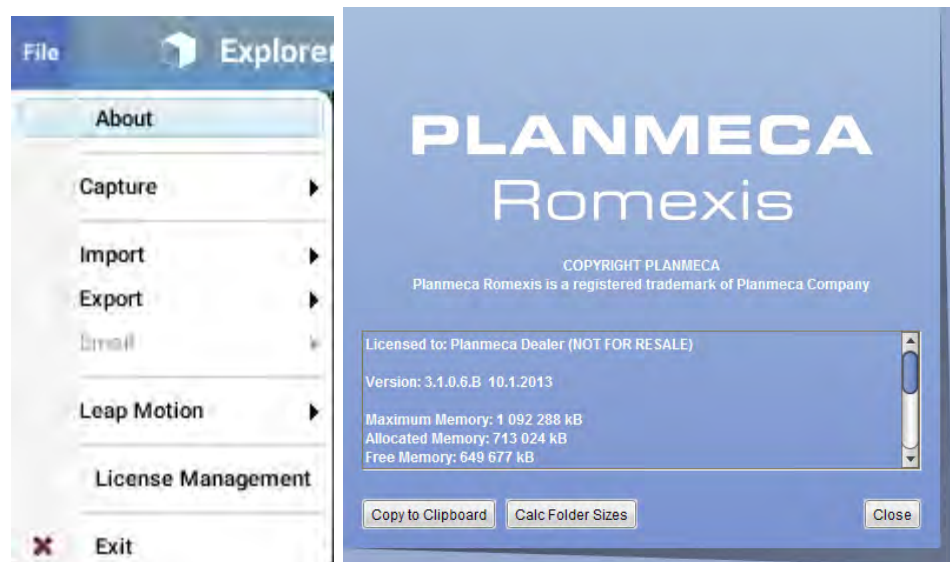
Change to the *Jaw Motion* sub-module to view the jaw motion recordings.

# 11 FILE MENU

## 11.1 About

From the *About* menu you can check license data, current software versions, memory settings, currently logged in user and open patient, name of the workstation and number of active images in the system.

To view all information scroll down the bar.



## 11.2 ROI reconstructions

When using Planmeca ProMax 3D units it is possible to generate higher resolution partial reconstructions of original volumes using selected exposure modes. The following exposure modes can be used to generate Partial Reconstructions:

Planmeca ProMax 3D Max Full Skull 400 $\mu$ m (Normal)

The voxel size of the ROI reconstruction will be half of the original (double the resolution) so that original volume of 400 $\mu$ m will produce a ROI reconstruction of 200  $\mu$ m with approximately half of the physical dimensions of the original.

To generate ROI Reconstruction in Planmeca Romexis:

1. In 3D Explorer sub-module move the intersection of axial, sagittal and coronal slice reference lines in the middle of the region of interest using your mouse. The intersection of the reference lines will be the center of the new high-resolution volume.

- From the *File* menu select *Capture > ROI Reconstruction*.



The Reconstruction PC will indicate if it is possible to generate a ROI reconstruction of the selected volume.

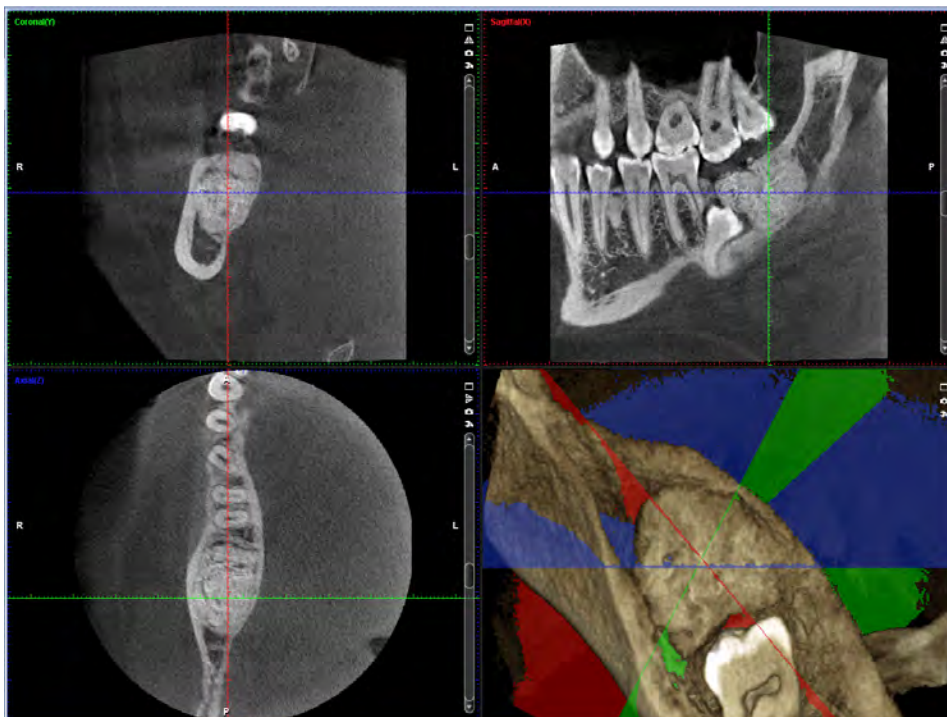
#### NOTE

ROI reconstruction is possible only if the original raw data is available on the reconstruction PC. Therefore ROI reconstructions should be generated as soon as possible after the exposure is taken.

- The ROI reconstruction will be generated and opened for viewing automatically in Explorer sub-module.

#### NOTE

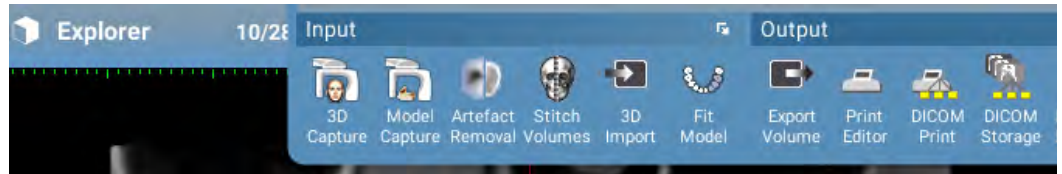
When generating a new ROI reconstruction from stitched volumes only the volume in which the ROI is closest to the center will be included in the new volume.



## 12 3D MODULE TOP TOOLBAR

The 3D module's top toolbar contains tools common to all main views of the 3D module. In the following their functions are explained in brief and references to sections providing more information are listed.

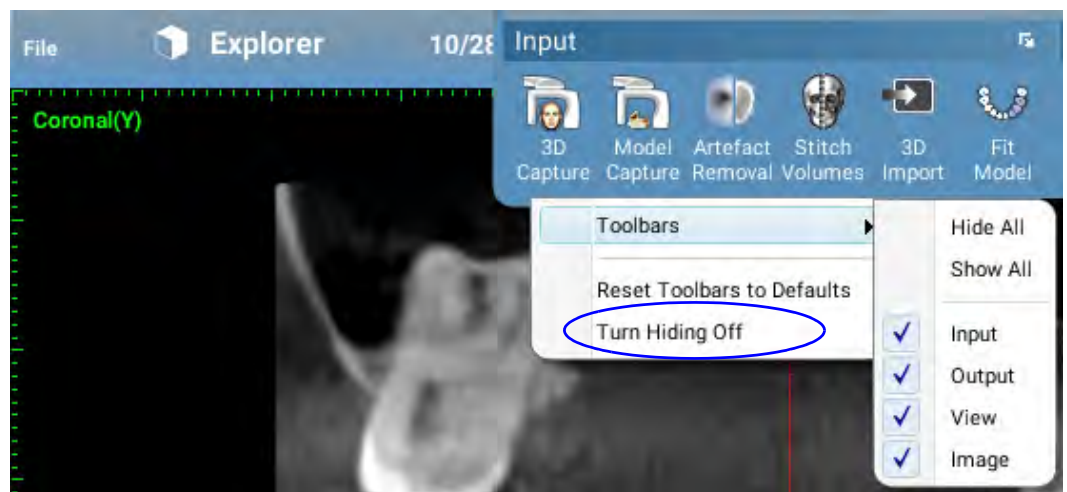
The toolbar appears when moving the mouse on top of the screen.



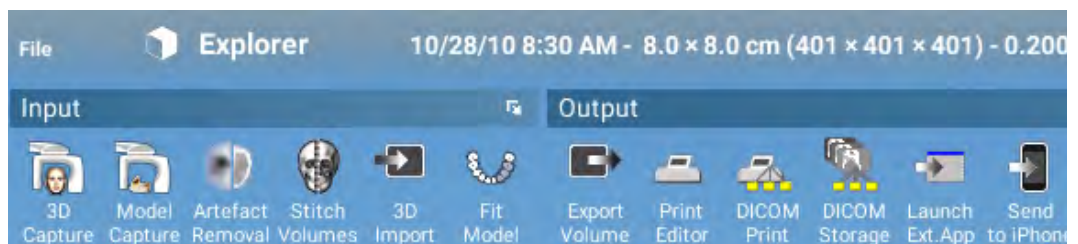
### NOTE

To activate all tools in the toolbar a volume must be opened.

If you want the toolbar to remain visible on top of the screen right-click on the toolbar and select **Turn Hiding Off**.



The toolbar now remains visible on top the screen.





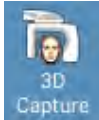
## 12.1 3D capture

### NOTE

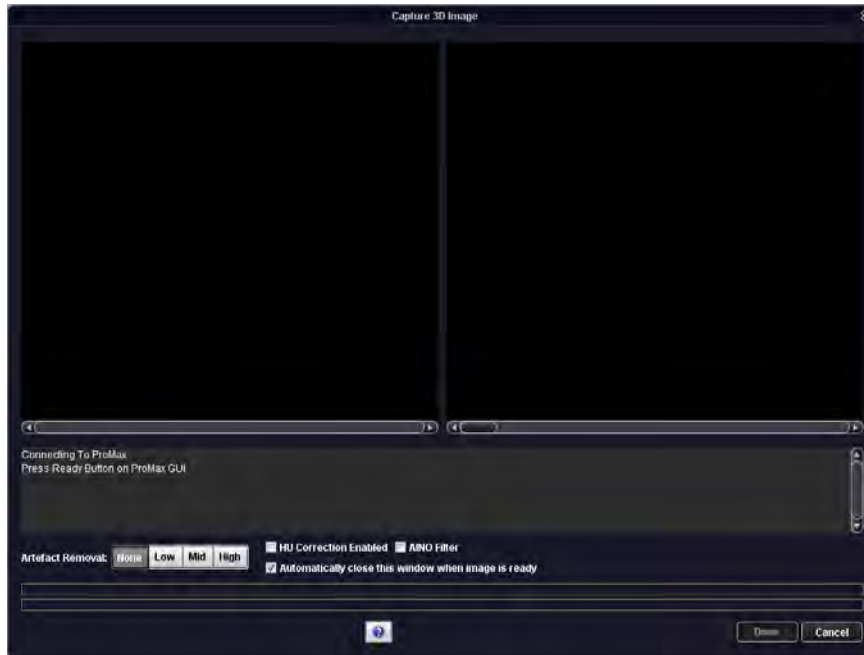
See also [Planmeca ProMax 3D/Dimax3 user's manual](#).

### NOTE

Do not use the software for other tasks during exposure.



- To start exposure click this button.  
The image acquisition window appears.



Optionally you can take 2 scout images or 2D Views before the actual 3D volume exposure. These options can be selected on Planmeca ProMax 3D GUI.

On how to activate/deactivate the scout / 2D View exposure, see Planmeca ProMax 3D user's manual.

With this function two images, one coronal and one sagittal image, in an angle of 90° to each other will be captured. This means that patient positioning can be verified before the final exposure, and additional radiation caused by a possible retake can be avoided.

- Select the appropriate level of artefact removal (None / Low / Med / High) that is applied to the image.

Use the higher settings with patients who have more high density materials in the exposed area such as amalgam fillings.

If the result is not satisfactory the artefact removal can be re-applied with different settings as explained in section 12.3 "Artefact removal" on page 298.

When all exposures have been taken and the reconstruction calculation is completed, the 3D study is automatically saved into the database under the patient file and displayed on the screen.



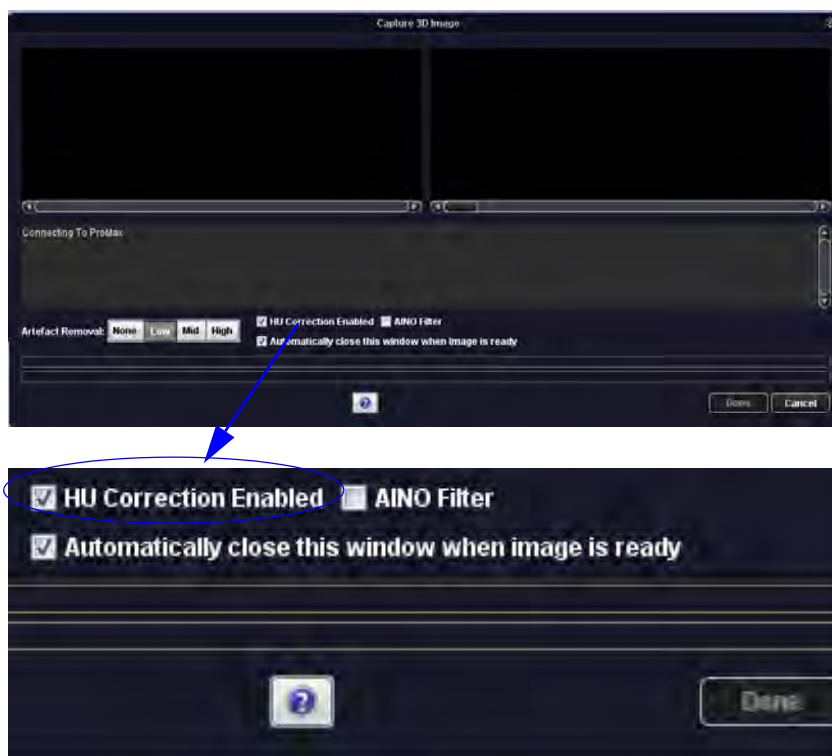
If ProMax 3D stitching mode is used, the stitching window is automatically presented in Planmeca Romexis. For more information see section 12.4 “Aligning volumes” on page 300.

### HU correction enabled

When enabled provides more uniform HU-values on the edges of the volume.

#### NOTE

When using Reco PC software revision 3.6.0.R or later HU correction must be enabled for patient imaging. Only for calibration phantom exposure or when exposing some other non-living object it must be disabled.

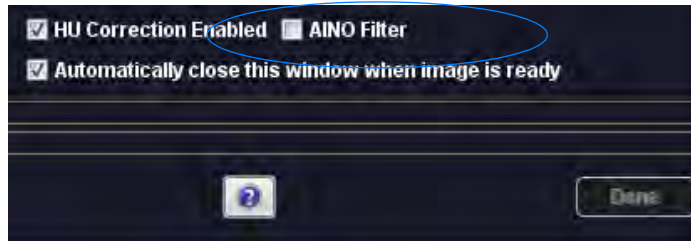


### AINO Filter

#### NOTE

Applying the AINO filter will increase the reconstruction time of the image.

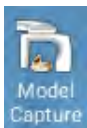
AINO (Adaptive Intelligent Noise Optimiser) is a 3D noise filter that reduces noise in CBCT images with minimal loss of detail. The filter analyses exposure data during reconstruction and adaptively differentiates noise and fine details. It is most useful with images that have very small voxel size or very low radiation dose. The AINO Filter is available only on supported hardware combinations. For more information on availability contact your local sales representative.



The original image is stored in the reconstruction PC (100 exposure buffer) and can be recalled using **Redo 3D reconstruction** from the *File > Capture* menu.



## 12.2 3D model capture



The 3D Model Capture is intended to be used with Planmeca ProMax 3D unit's model scan program. The program automatically generates 3D surface dental models. The models show in the *Volumes* sub-module once the exposure is completed.

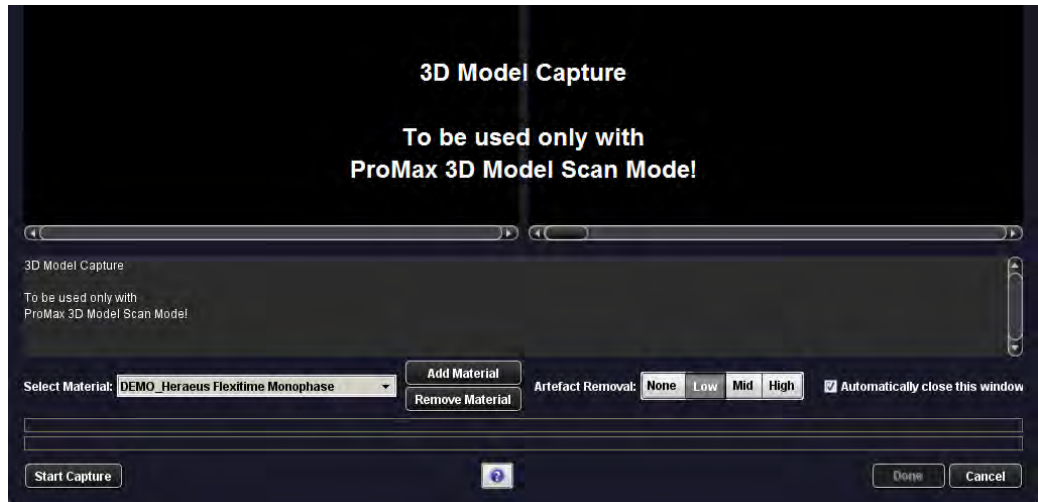
### NOTE

**Only the surface model is stored into Planmeca Romexis image archive, the CBCT volume is discarded.**

The surface models can be viewed and processed in the *Surface* sub-module and exported to other software using the *Export Volume* tool, for more information see section 12.9 "Exporting surface models in Surface sub-module" on page 313.

For step-by-step instructions on how to take exposures on dental models, see your Planmeca X-ray unit user's manual.

The digital casts can be used for electronic archiving of the impressions or they can be turned into STL surface models for further use in Planmeca Romexis or other treatment planning software. See also sections 12.6 “Importing fitted models” on page 304 and 3.2.10 “3D noise filter” on page 168.



### 12.2.1 Selecting, adding and removing material

#### Select material

Use this drop-down menu to select calibrated material that was used to produce the dental impression to be scanned.

#### NOTE

Each material needs to be calibrated before accurate model scans can be produced.

#### Add material

After crafting a calibration target for Planmeca ProMax, use this button to start a calibration scan and to name the calibrated material for later use. Calibration exposure values are automatically predefined to the material name. The Model Capture should always be done using exposure values identical to those of the calibration scan.

#### Remove material

Click this button to remove material from the calibrated materials list.

#### Artefact removal

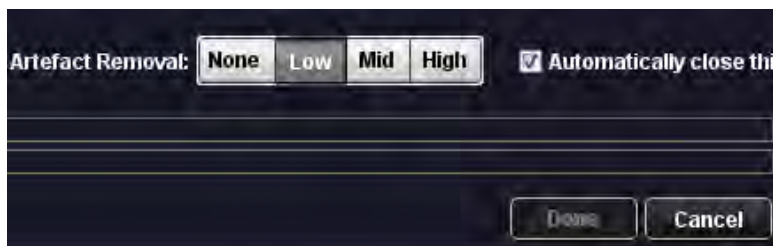
Select the level of artefact removal applied to the scan.

#### CAUTION

The 3D model capture can only be used to scan dental models or plaster casts. It must never be used to scan patients.

Automatic artefact removal can be applied to all new exposures. This eliminates the need to remove artefacts separately from each volume. The following preset artefact removal options are available:

- None – no artefact removal is applied
- Low – low threshold level to reduce some artifacts with minimum effect on anatomic information.
- Mid – medium threshold level to compromise between artifact reduction and effect on anatomic information.
- High – high threshold level to maximize artifact reduction but with the risk of hard tissue anatomic information of being affected.

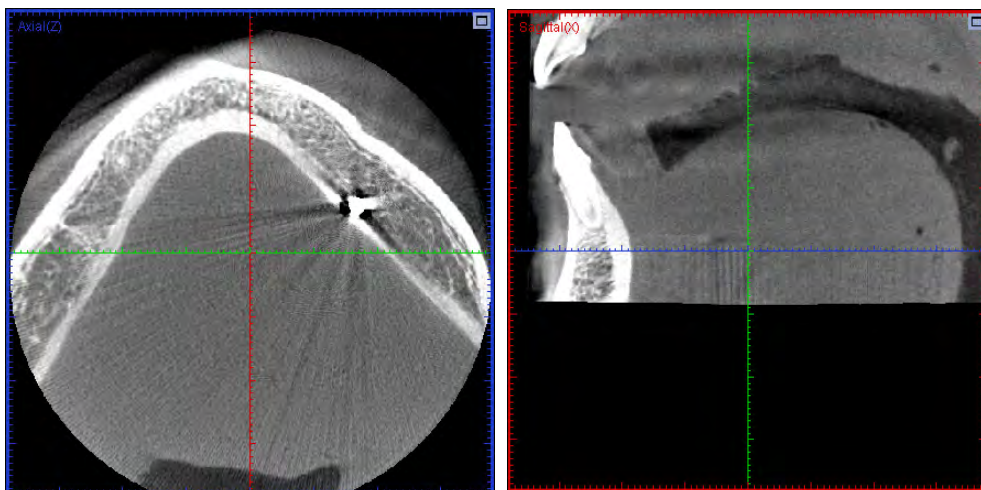


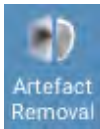
The default level for automatic artefact removal can be configured in the Configuration application, see section "Default artefact removal" in the Planmeca Romexis technical manual (10037884). The default level setting can be overridden per exposure using the buttons as described above.

### 12.3 Artefact removal

Objects of high density, such as amalgam or other metallic bodies, can cause artefacts on X-ray images as the radiation cannot penetrate them. Artefact removal is not automatically applied when the volume is reconstructed, but if disturbing artefacts are present after a successful capture recalculate the volume using the *Artefact Removal*.

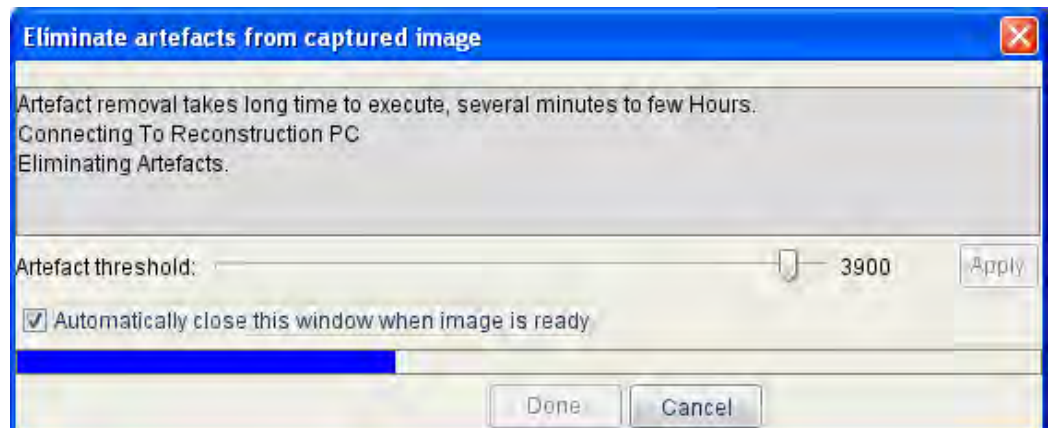
1. Use the sagittal (or coronal) view to align the axial view so that the whole teeth arch can be seen and the maximum amount of amalgam shows in axial view.





2. Click the **Artefact removal** button.
3. In the opening window set the *Artefact threshold* by moving the slider.

The threshold can be set between 0 for pure black and 4096 for pure white (amalgam, for example, ranges near 4000). By decreasing the threshold more potential artefacts (darker shades of grey) whereas by increasing less will be removed. This means that a decrease in threshold value makes suspect areas more likely to be considered for removal. Therefore, a decrease in value may also increase the processing time as more areas need to be processed.



4. When adjusting the slider from right to left, pay attention to the axial view aligned in step 1.

The areas of amalgam, which are normally bright white, turn red.

#### NOTE

Adjust the threshold only until amalgam or other metallic bodies appear red, not more. Too aggressive settings may affect dentin.

5. Move the slider to the left until all presumed areas of amalgam have barely turned red and the dentin remains white or light grey.

#### NOTE

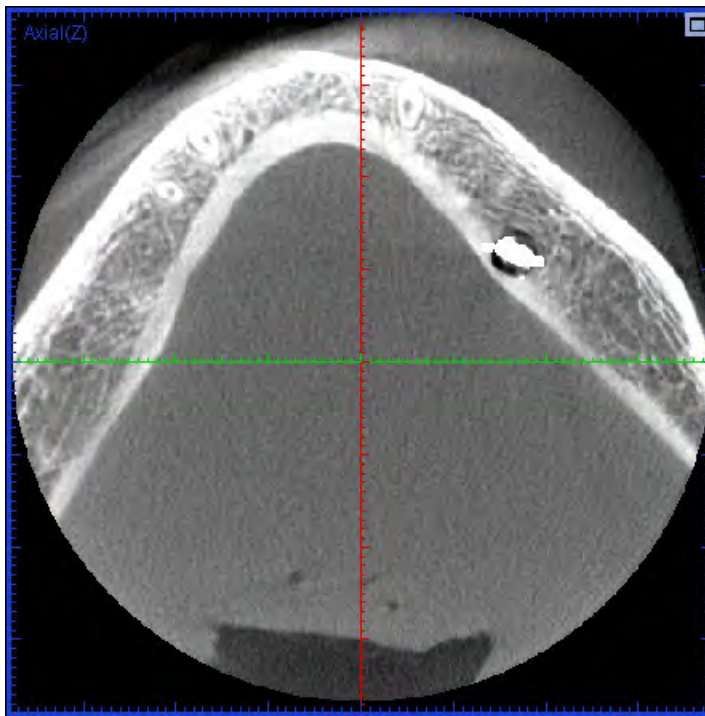
Too many red areas can extend the recalculation time and produce unwanted results. Adjust threshold separately for each volume.

6. Start artefact removal by clicking **Apply**.

The reconstruction PC will start a recalculation of the 3D volume, ignoring all areas (voxels) above a certain grey level, which have been flagged as undesired in step 3 by colouring them red. Leaving the problematic areas out of the calculation will remove artefacts caused by amalgam or other metallic bodies from the recalculated volume. The bodies that caused artefacts will, however, still be visible.



7. Click *Done* to finish.



#### NOTE

If the volume was taken with Planmeca Romexis version 1.4 or older you the right frameset ID must be manually selected. Planmeca Romexis requests the original frame sets from the reconstruction PC. If the correct frame sets are not on the PC anymore the artefacts cannot be removed.

## 12.4 Aligning volumes

By joining together two or more volumes of neighbouring anatomy larger volumes than the maximum size of 8 x 8 cm of Planmeca ProMax 3D can be created.

#### NOTE

For vertical stitching the volumes must be manually pre-aligned in Planmeca Romexis using the *Auto with tilt* stitching mode.

Volumes can also be re-stitched and the volumes captured in some other imaging mode can be manually aligned.

#### NOTE

With stitching all volumes are converted into the size of 300  $\mu\text{m}$  resolution corresponding to the resolution achieved using ProMax 3D low dose mode.

#### NOTE

Before starting make sure the patient has at least two volumes suitable for stitching.





1. Click this button.
2. Select the volume to be used for stitching from the drop-down menu.
3. Click **Add**.

The volume opens in the window.



4. Add the other volumes for stitching.
  - In this image all three volumes are correctly aligned.

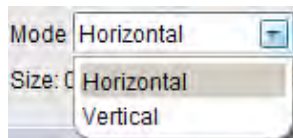


- In this image the volumes are incorrectly aligned.



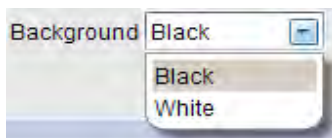
If necessary the volumes can be further adjusted as follows:

1. Align the volumes as accurately as possible.
2. Select *Horizontal* to align volumes side by side or *Vertical* to align them on top of one another.



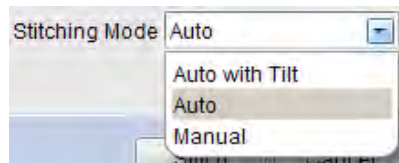
3. Select *Black* or *White* background colour.

In some cases it is more convenient to use the white background, but the colour of the background does not affect the alignment result.



4. Select one of the following alignment modes:
  - *Auto* – creates best horizontal alignment after the volumes have been roughly aligned. This mode is most suited for horizontal stitching and is the default setting for horizontal stitching in Planmeca X-ray units.
  - *Auto with Tilt* – as *Auto* mode but considers also different rotations for the volumes in case the patient's head has tilted between exposures. Most suited for vertical stitching and as a default setting in vertical stitching imaging mode in Planmeca X-ray units.

- *Manual* – can be used if neither of the automatic modes does not produce an adequate result.



If the volumes do not share anatomy in the same slice, the sliders can be used to adjust the slices to view a common anatomy in all volumes. This is necessary in vertical stitching, as the anatomy shown by the default centre slice (125) of the top and bottom volume will be 2-4 cm apart.

Check/uncheck the boxes next to the sliders on the left to show/hide volumes.



5. Click **Stitch**.

The volumes are automatically stitched and fine-tuned and stiched image is saved.

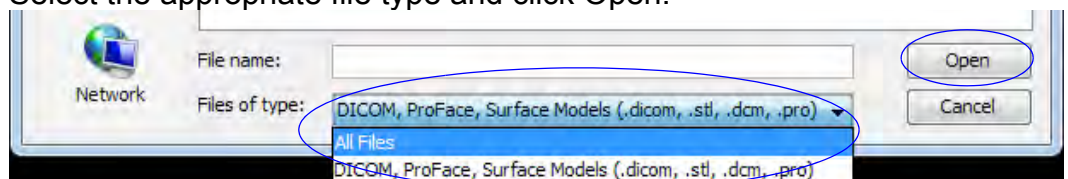
## 12.5 Importing 3D images



3D import can be used to import DICOM MF, DICOM SF and ProFace files.

1. Click the **3D Import** button.

Select the appropriate file type and click Open.



To import single DICOM MultiFrame image select a single DICOM file .

To import files as single DICOM SingleFrame image select multiple DICOM files.

To import Planmeca ProFace 3D photo select single PRO file.

To import it as surface model select single STL file.

Multiple file selection is only accepted for DICOM SF images, otherwise it is ignored.

## 12.6 Importing fitted models

### NOTE

Surface model import requires 3D Implant Planning License. The surface models can be separately processed in the *Surface* sub-module.

3D surface models can be acquired and added to the *Volumes* list by using the 3D Model Capture (see section 12.2 “3D model capture” on page 296) or by using the 3D Import (see section 12.5 “Importing 3D images” on page 303).

The models can be matched with CBCT volumes using the Fit model tool. Once matched with a CBCT volume the properties of the matched surface model can be adjusted (delete, change colour) in the Object browser’s *Fitted model* group.

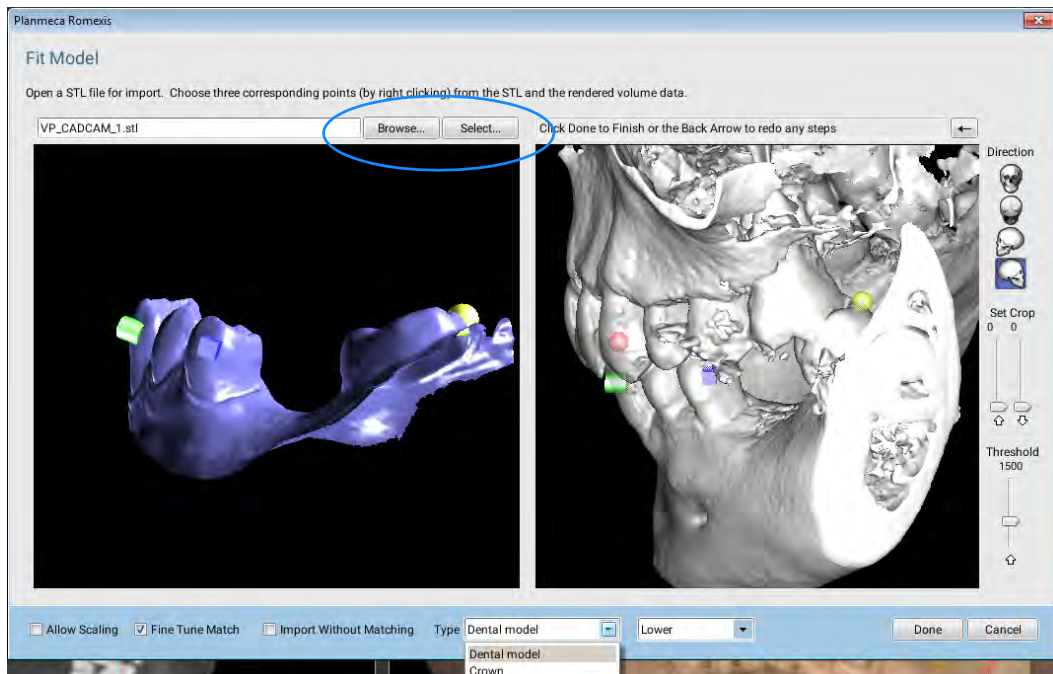
For instructions on how to modify the intra-oral scans see section 12.6.2 “Adjusting positioning of matched STL surface models” on page 308.

### 12.6.1 Matching STL surface models to CBCT data

1. Open the 3D volume you want to match with the surface model.
2. Start matching by clicking the **Fit model** button.



- To match a *new* surface file select *Browse*
- To match an *existing* surface model from the patient’s Volumes list use *Select*.



3. Orientate CBCT volume and surface model to comparable positions:
  - To **rotate** the image, press and hold down the left mouse button while dragging the image
  - To **pan/move** surface model and crop CBCT, press and hold down the right mouse button, while dragging the image.
  - To **pan/move** CBCT volume press and hold down the middle mouse button while dragging the image.
  - To **zoom in/out** the image use the mouse wheel.
4. Right-click on (3-10) common landmark points in the surface model and CBCT rendering.

The minimum amount of common points required for matching is three, but the more points you select, the more accurate the matching will be.
5. To get the best possible fit, select the dots as far from each other as possible. Place the dots to places that are clearly visible on both images, ideally on tooth cusps that have texture, but be aware of teeth that have artefacts on the CBCT image.

Do not place the dots on soft tissue or gingival areas, because they do not show clearly on CBCT images.
6. Start by selecting a landmark in the surface model and then in the CBCT and so forth.

Note that by rotating the models you can select landmarks on any side of the anatomy.

To undo and repeat the previous step click the **Back / Repeat** button.

Ideally the landmarks should be placed on corners of occlusal and buccal or distal and mesial or distal surfaces.

The first three landmarks are indicated as follows:

  - 1st landmark: sphere

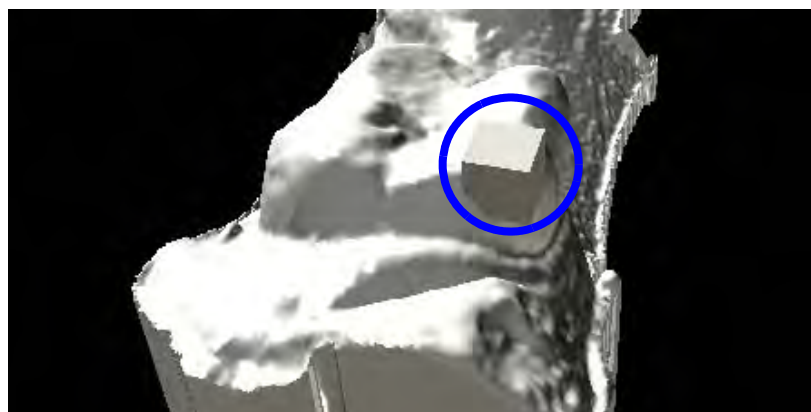




- 2nd landmark: cylinder



- 3rd landmark: cube



7. To finish the positioning click **Done**.

The surface model is automatically matched to the CBCT volume.

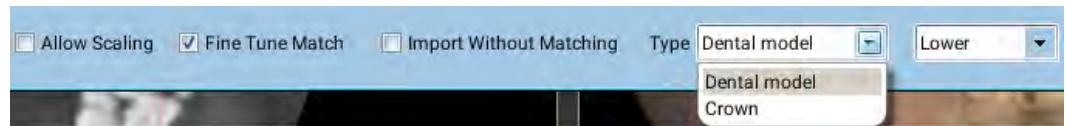
The following options are available:

- Direction buttons to orientate the CBCT rendering to default positions
- Set Crop to limit the anatomy that is used for matching the surface model to the CBCT
- Threshold to adjust the CBCT rendering bone surface

The imported surface models can be found in the Implant list where there colour can be modified.



Additionally the following options can be selected:



### Allow Scaling

When enabled, Planmeca Romexis will stretch the surface model to achieve better fit with the CBCT volume. Note that this may alter proportions of the surface model.

### Fine Tune Match

When enabled, Planmeca Romexis will analyze the anatomy around each control point and uses the actual anatomy for best possible fit.

When disabled, Planmeca Romexis will minimise the deviation between the three control points in each data to get the closest fit with no additional analysis.

### Import without matching

When enabled the model are imported but not matched.

### Type

Select whether to import dental model or crown. This choice will separate the two model types in object browser under *Fitted models* group.

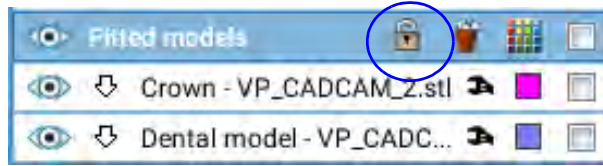
The crown will be automatically placed into the exact same area where it was placed in the crown planning software if the proposed option *Use existing match* is selected.

### Lower/upper jaw

Select whether to import the model for lower or upper jaw or leave unspecified.

## 12.6.2 Adjusting positioning of matched STL surface models

When the lock button is not activated in the Object Browser *Fitted models* group, the matched models can be adjusted.



### Moving models with mouse

#### In sliced views



- Check that the move/rotate tool is inactive and drag with the left mouse button.

#### In rendered view

- Drag with the left mouse button while holding down the **Ctrl + Shift** keys

### Rotating models with mouse

#### In sliced views



- Check that the move/rotate tool is inactive and drag with the right mouse button.

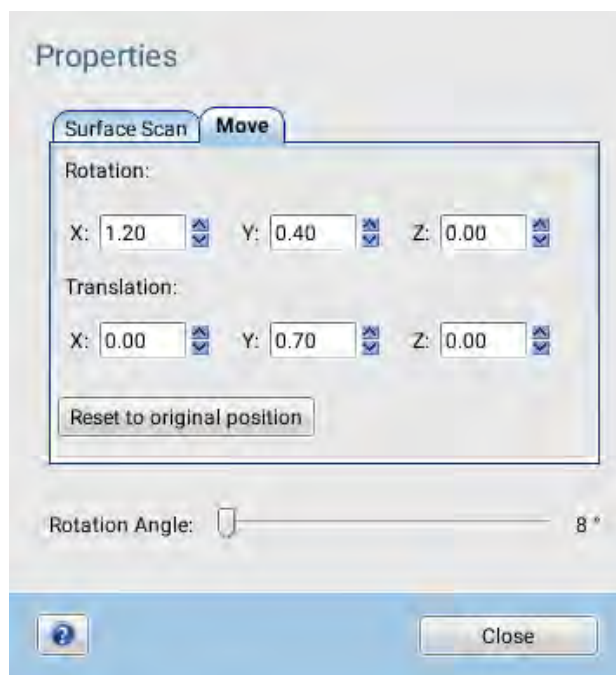
#### In rendered view

- Drag with the right mouse button while holding down the **Ctrl + Shift** keys

### Adjusting positioning of models in Properties dialog



The positioning of fitted models can also be adjusted in their properties by clicking on the wrench button on the row and then on the *Move* tab in the dialog that opens.



To adjust the rotation (in degrees) or the translation of the fitted model in all three dimensions enter the value into the field or click the arrow buttons.

You can also change the rotation angle using the slider.

The models are moved in millimetres (between -100 and +100) in relation to the coordinates of the models. If the dialog is reopened after having made these changes all values are reset to zero.

The model rotates around its x- y- and z axis between -180 and + 180 degrees.

If the dialog is reopened after having made these changes all values are reset to zero.

To reset the fitted model to the position in which it was matched click **Reset to original position**.

## 12.7 Scanning with Planmeca PlanScan scanner

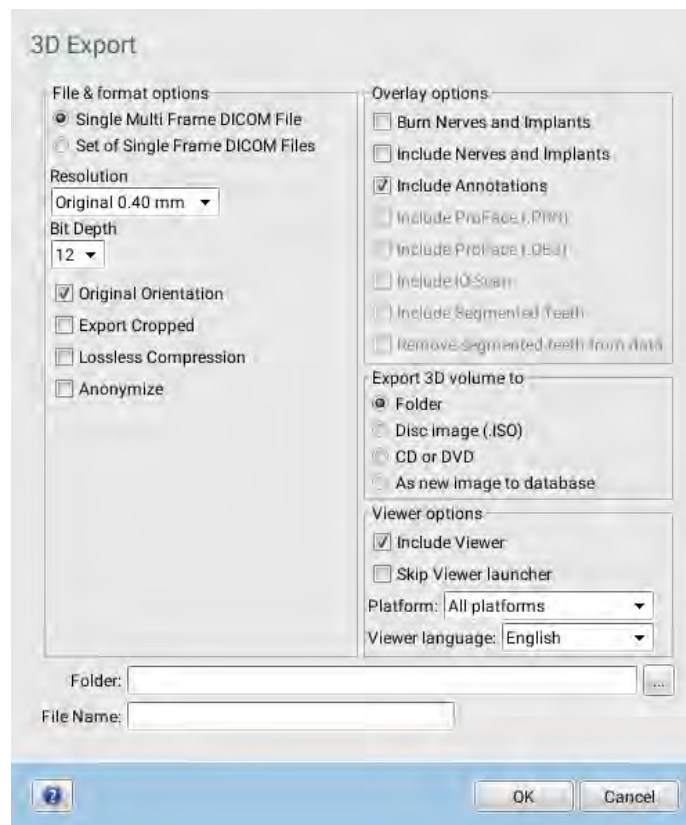
The Planmeca PlanScan is an optical impression system for CAD/CAM of dental restorations. For detailed description on how to use the scanner see Planmeca PlanScan User's manual (publication number 10033946).

## 12.8 Exporting volumes



1. Click this button.

For detailed descriptions of the export options see the following sections.



### 12.8.1 File & format options

Planmeca Romexis can export 3D volumes in different formats:

#### Single multi frame DICOM file

A single DICOM standard file that contains the 3D image data in a set of frames.

#### Set of single frame DICOM files

A set of multiple DICOM standard files each of which contains a single Frame of the 3D Image data.

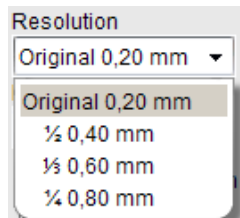
If images are to be exported as they were originally captured, tick the *Export Original (not rotated)* selection. All rotations and translations done to the image afterwards will not be exported with this function.

Insert a blank writeable CD and click OK to start the CD creation.



#### Resolution

Select the desired resolution for exporting DICOM files from the *Resolution* drop-down menu.



#### Bit depth

Select the volume bit depth, 12 or 15 bits.

#### Original orientation

Check this option to export images as shown right after exposure

#### Export cropped

Check this option to export cropped volume when cropping has been applied.

#### Lossless compression

Compresses volume approximately to the size of 1/3 of the original.

#### Anonymize

Remove personal identification information from the export DICOM file.

## 12.8.2 Overlay options

### **Burn nerves and implants**

Select this option to export voxel representation of nerves and implants present in the study.

Nerves and implants are burned to the image and thus cannot be edited after export. Implants and nerves are burned to the image as they are seen in 3D module.

### **Include nerves and implants**

Select this option to export nerves and implants as editable Planmeca Romexis objects. For the implants to appear as realistic implant models the Romexis Implant Library must be locally installed. Otherwise the implants will appear as cylinders.

### **Include annotations**

Includes annotations (such as measurements, labels and arrows) as editable Planmeca Romexis objects.

### **Include ProFace (.PRO)**

Includes Planmeca ProFace images in the export.

### **Include ProFace (.OBJ)**

Includes Planmeca ProFace images in the export.

### **Include fitted model**

Includes intraoral scan in the export.

### **Include segmented teeth**

Includes segmented teeth in the export.

### **NOTE**

All surface models (ProFace & STL) currently visible in the 3D module will be included in the export. To add or remove surface models from the export use the 3D Overlays menu. This allows exporting, for example, a full combination of CBCT, ProFace and intraoral scans in correct coordinates. The images can then be imported into another Planmeca Romexis or viewed in Planmeca Romexis Viewer.

### **Remove segmented teeth from data**

Removes segmented teeth from the volume to be exported.

### 12.8.3 Export 3D volume to

#### Folder

Data is exported to a folder

#### Disc image (.ISO)

Data is exported to a CD/DVD disc image that can be written to a media using 3rd party CD/DVD writer software.

#### CD or DVD

Data is written directly to a CD/DVD if a CD/DVD writer is installed.

#### As a new image to the database

By selecting this option a new volume is created to the *Volumes* sub-module. The cropping, rotations, annotations etc. will be included in the new volume if selected as export options from the *3D Export* window.

This option can be used for example for cropping one volume of only upper jaw and another volume of lower jaw.

To distinguish the volume from the original volume a comment for the new volume can be entered in the *File name* field. In the *Volumes* sub-module the comment will show in front of the original volume comment.

### 12.8.4 Viewer options

#### Include Viewer

Select to includes the Planmeca Romexis Viewer software in the export.

#### Skip Viewer launcher

When exporting single image select this option for the Planmeca Romexis Viewer to open without displaying the patient selection dialog in the launcher.

#### Viewer platform

If you know on which platform the Viewer will be used, select the specific platform from the drop-down menu to optimize Viewer size.

#### Viewer language

Set the default language for the exported Planmeca Romexis Viewer software.



## 12.9 Exporting surface models in Surface sub-module

When *Surface* sub-module is active you can export currently open surface model as follows:

### Planmeca ProFace image with .PRO extension

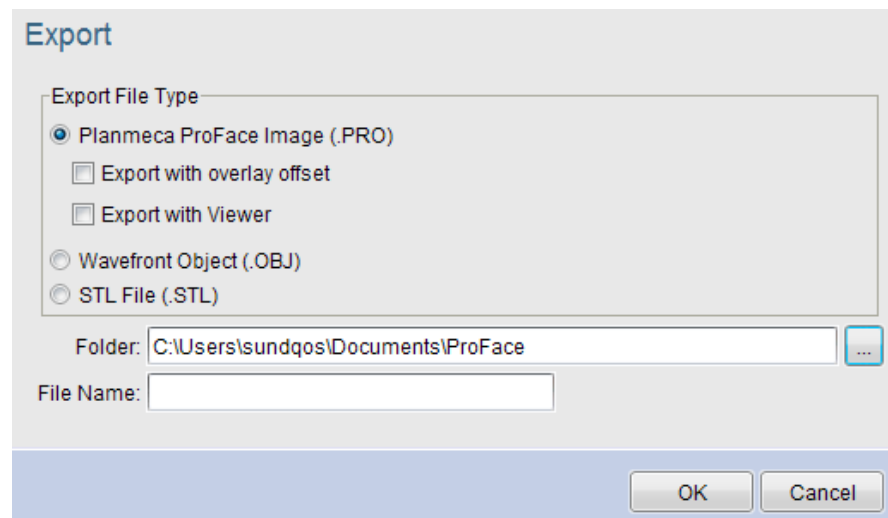
- *Export with overlay offset* (optional): apply overlay offset so that the ProFace surface can later be positioned in relation to the patient's CBCT volume. It is possible to export 3D CBCT with ProFace image attached to the volume.
- *Export Romexis Viewer* (optional): can be used to view ProFace image.

### Wavefront object format

Not supported

### STL file format

Only surface shape is included (skin texture is discarded).



## 12.10 Exporting CBCT volumes in STL (surface model) format

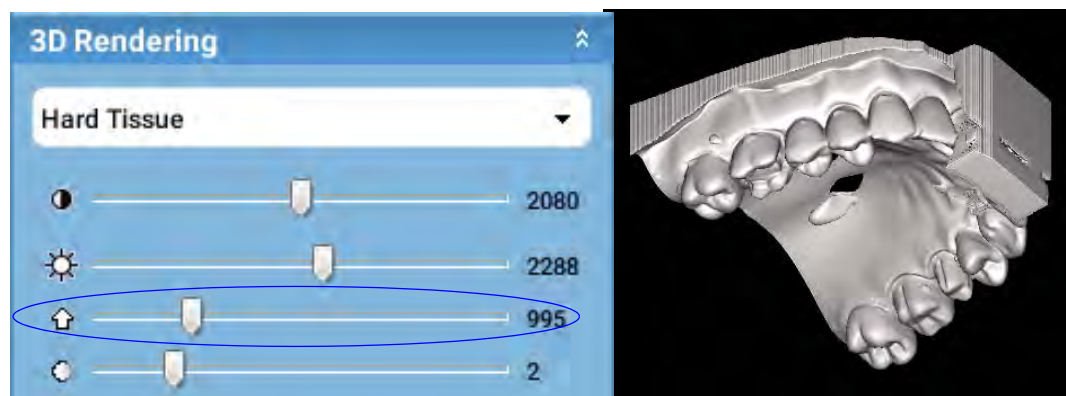
The CBCT volumes created of dental impressions can be converted to STL surface model format (.STL) and exported to desired location.

The STL surface models can then be re-used in any 3rd party software supporting the STL standard format.

For more information on dental impressions and digital cast conversion see section 3.2.10 “3D noise filter” on page 168.

### 12.10.1 Exporting volume in STL format

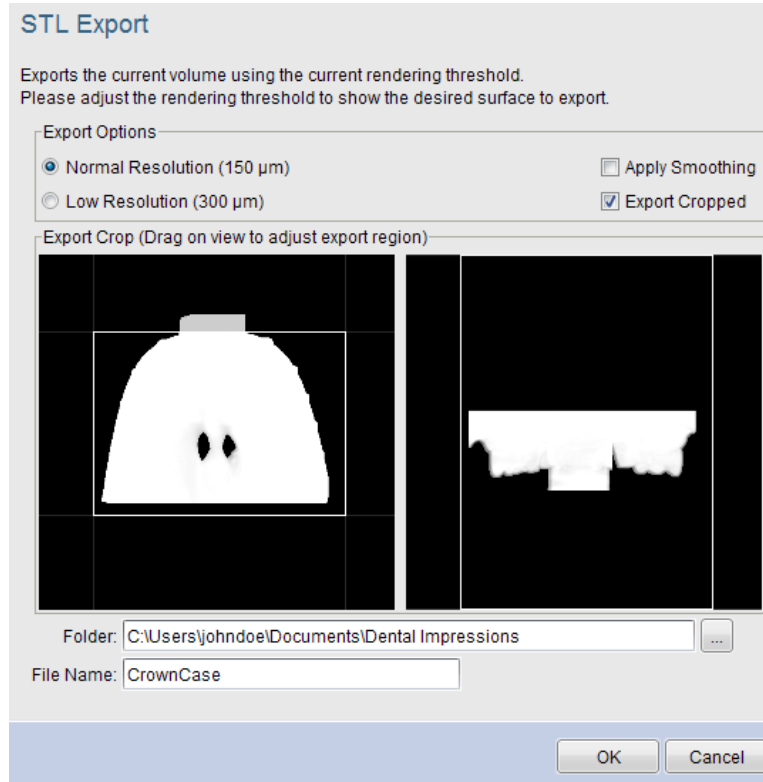
1. Open the CBCT volume that you want to export.
2. Adjust the 3D Rendering threshold value so that the surface that you want to export shows cleanly.



3. From the *File* menu select *Export > Export Volume as STL*



4. In the opening window the following settings can be adjusted:



### Normal or low resolution

The selected resolution affects the amount of detail in the exported STL file. Using Normal resolution also results in a larger file size

### Apply smoothing

The exported STL is smoothed but with possible loss of detail.

### Export cropped

Select this option to export the STL of the selected crop region only. You can adjust the crop region by drawing a box around the area that you want to export.

### NOTE

You can preview the crop result in real-time in the 3D Rendering view where it can also be rotated while the *STL Export* dialog is open.



Crop result preview in 3D rendering

**Folder**

Select the folder where to export.

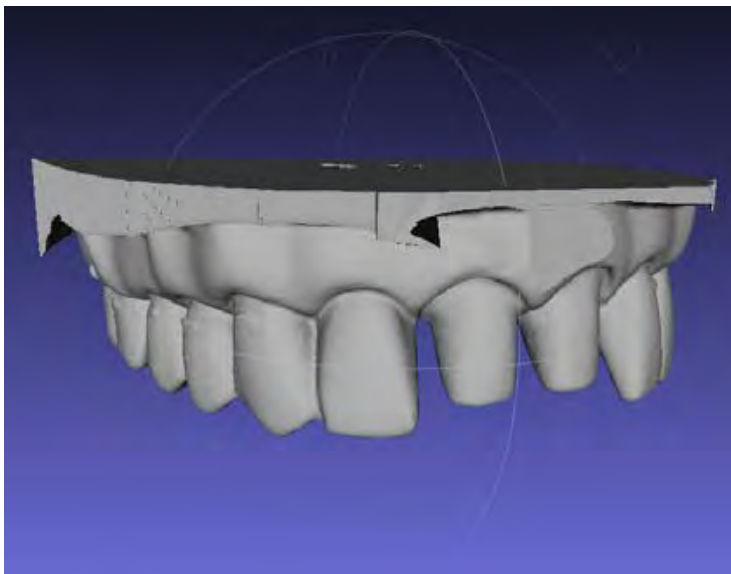
**File name**

Name the file to be exported

5. When finished with adjusting click **OK**.

The STL file is exported.

The STL file can now be used in 3rd party software for further processing or imported back to Planmeca Romexis using the STL Import, see section 12.6 "Importing fitted models" on page 304 for more information.



Sample view of post-processing the STL model in 3rd party software

## 12.11 Digital cast conversion

Digital cast conversion is intended for converting dental impressions into actual dentures.

### NOTE

For automatic capture and conversion of dental impressions and plaster casts see section 12.2 “3D model capture” on page 296.

With Digital Cast conversion tool the dental impressions generated in Planmeca ProMax 3D Standard Mode can be converted into digital models representing an actual denture. The tool can be used to replace plaster casts (in certain cases).

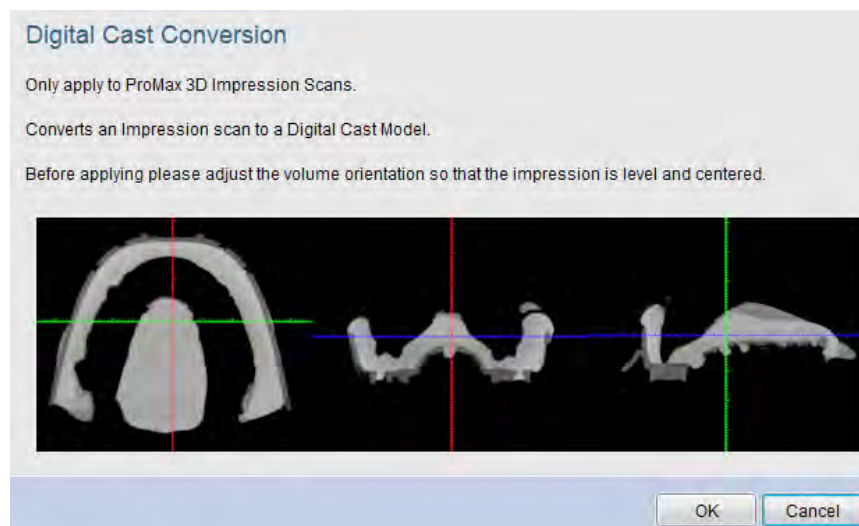
For more information on how to work with surface models see section 12.10 “Exporting CBCT volumes in STL (surface model) format” on page 314 and 12.6 “Importing fitted models” on page 304.

### 12.11.1 Producing digital casts

1. Acquire a CBCT scan of dental impression using Planmeca ProMax 3D Standard mode.
2. Make sure the scan is approximately centred as indicated in the digital cast dialog.
3. From the *File* menu select *Export > Digital cast conversion*.



The positioning of the volume can be adjusted while the dialog is open.

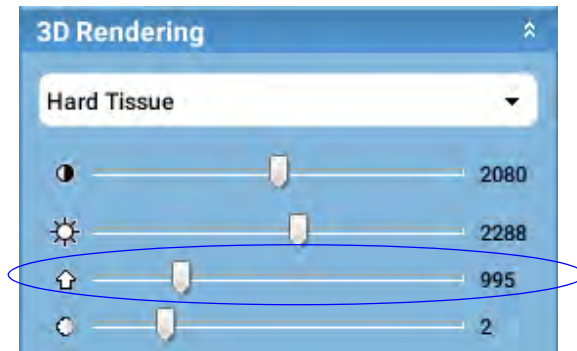


4. When finished click **OK**.

Planmeca Romexis now produces a Digital Cast CBCT model. Please wait while the data is being processed. This may take a few minutes.

5. The Digital Cast (positive) model opens in the 3D Explorer.

If the model doesn't show correctly in the rendered view, adjust threshold.



#### NOTE

Due to large file size digital casts are not automatically saved. To store the Digital Cast model for later use, export the model into a small STL surface model. For more information see section 12.10 "Exporting CBCT volumes in STL (surface model) format" on page 314.

#### NOTE

The Digital Cast operation requires a lot of memory. If you receive a low memory warning during Digital Cast operation increase your Planmeca Romexis memory reservation. For more information see section "Java VM parameters" Planmeca Romexis technical manual (10037884).



## 12.12 Save 2D view

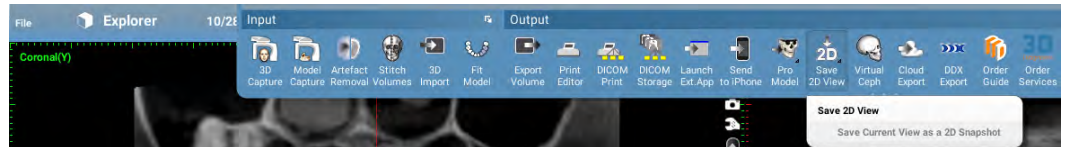
This tool can be used to generate 2D snapshots of 3D volumes.

The snapshots will appear in the 2D imaging module in *CBCT* group where they can be measured and processed using the tools described in Chapter C: "2D IMAGING MODULE".

By default the snapshots are generated as they appear on the screen but the appearance and number of snapshots can be adjusted in the *Save 2D View* window.



1. Click the **Save 2D view** button on the top toolbar.



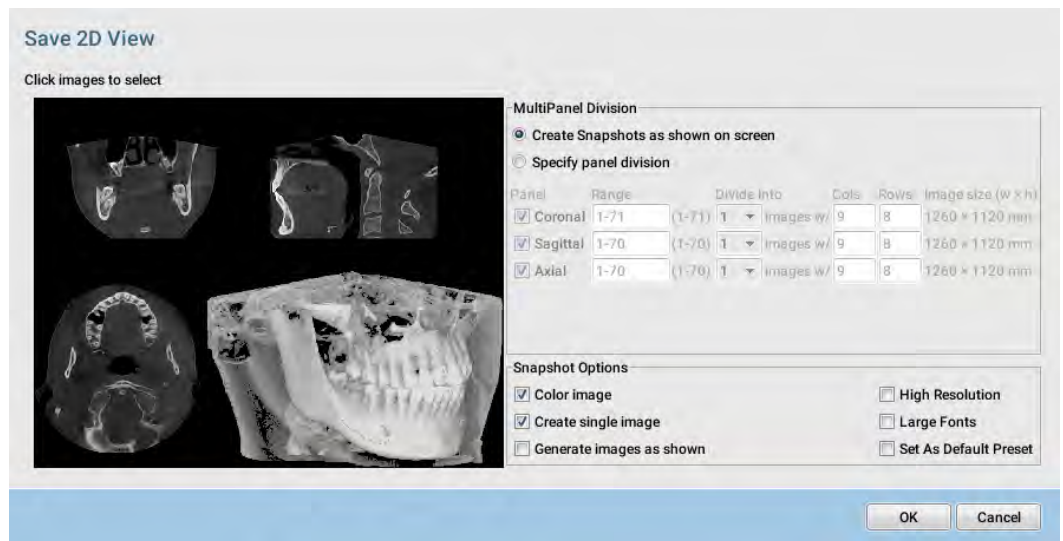
2. In the appearing dialog specify the image(s) or ranges of images to be included in the snapshots.

To exclude a view:

Click on it in the preview image

or

After having enabled the **Specify panel division** option deselect it in the *Panel* list.



### NOTE

To include only one image in the snapshot, eg. Cross Sections, maximize the image in Planmeca Romexis before opening the 2D Snapshot dialog. You may also use the snapshot button next to each 3D view.

### NOTE

The 2D Snapshot dialog is a shared feature with 3D printing and the following applies to defining views for printing as well.

### 12.12.1 MultiPanel division

In this field you can define the exact layout for generated 2D snapshots. It is particularly useful when a large number of slices (usually over 30) is processed and the slices would not fit in one reasonably sized image. For example for multi-page printouts a large number of slices is needed. For better visualization and navigation of large number of cross sectional slices see section 5.2 “Full arc mode” on page 213.

#### Create snapshots as shown on the screen

When enabled, the snapshots are created as they appear in the preview. The snapshot options can be used to further adjust the appearance of the images. This option is used by default.

#### Specify panel division

This option can be used to create slice snapshots in freely configurable numbers and layouts from all available projections in the underlying 3D module. It can for example be used to generate multiple images that include cross-sectional slices from the full dental arch with 1mm spacing. The slice distance, thickness and width should be defined in 3D module.

To create slice snapshots:

1. Select the *Specify panel division* option.
2. Select the panels that you want to configure by ticking the check box next to its label.

If you do not select a panel the default snapshot as shown in the preview will still be generated unless you also deselect that by clicking on the preview.

3. Specify the range of slices that you want to generate for each selected panel.

The range maximum depends on the slice settings in the underlying module

For example:

- *Axial and Panoramic*: The size of the volume divided by the distance between slices. For example for 80 mm high volume with 1mm axial slice distance a maximum of 80 axial slices can be generated.
  - *Cross Sectional*: The length of the panoramic curve divided by the distance between cross sectional slices. For a full jaw panoramic curve totalling 180 mm in length and with 1 mm cross section distance a maximum of 180 cross sectional slices can be generated.
4. To create a desired number of images of each panel use the *Divide Into* drop-down menu.
  5. To set the distribution of slices on the final image(s) use the fields under *Cols* and *Rows*.

The Image Size shows an estimate snapshot dimensions and fit on portrait or landscape setup.

6. Click **OK** to generate snapshots as specified.

### 12.12.2 Snapshot options

There are 6 options for generating 2D snapshots:

#### **Color image**

If selected an 8 bit color image will be created. If unselected a 12 bit gray scale image is created.

#### **NOTE**

If you intend to further process the images in the 2D imaging module (brightness, contrast, gamma) it is preferable to select 12 bit grayscale images)

#### **Create single image**

If selected, a single image is created. If unselected, single images from different views will be created.

#### **High resolution**

Doubles the resolution of the image. Useful for low resolution images in which the labels may appear grainy.

#### **Large fonts**

Larger label font improves readability.

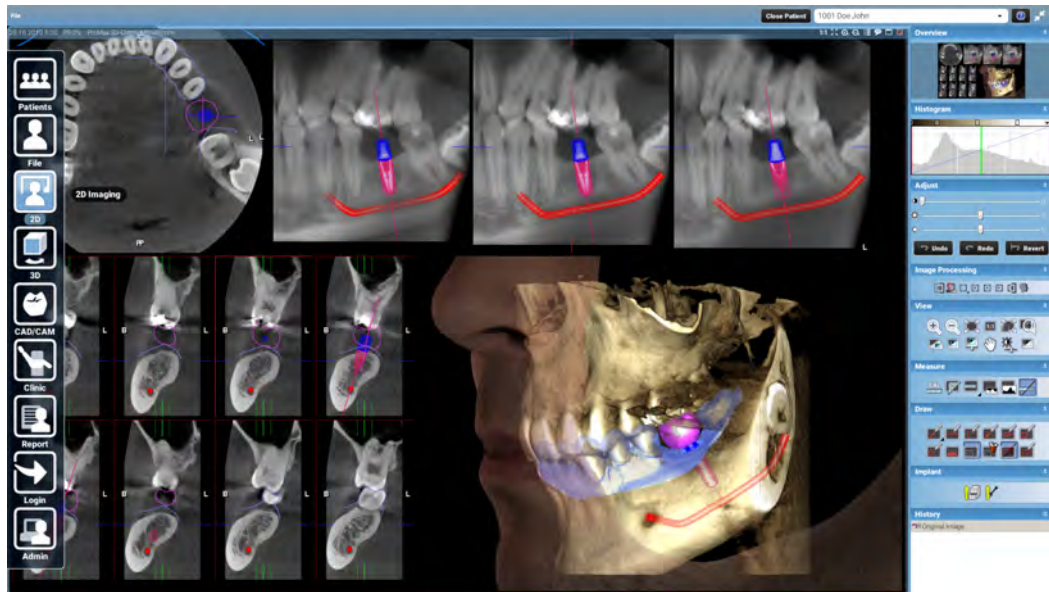
#### **Generate images as shown**

If selected a snapshot with the same zoom level that is applied in the underlying module is generated.

#### **Set as default preset**

Sets the current values as defaults for the 2D snapshot dialog.

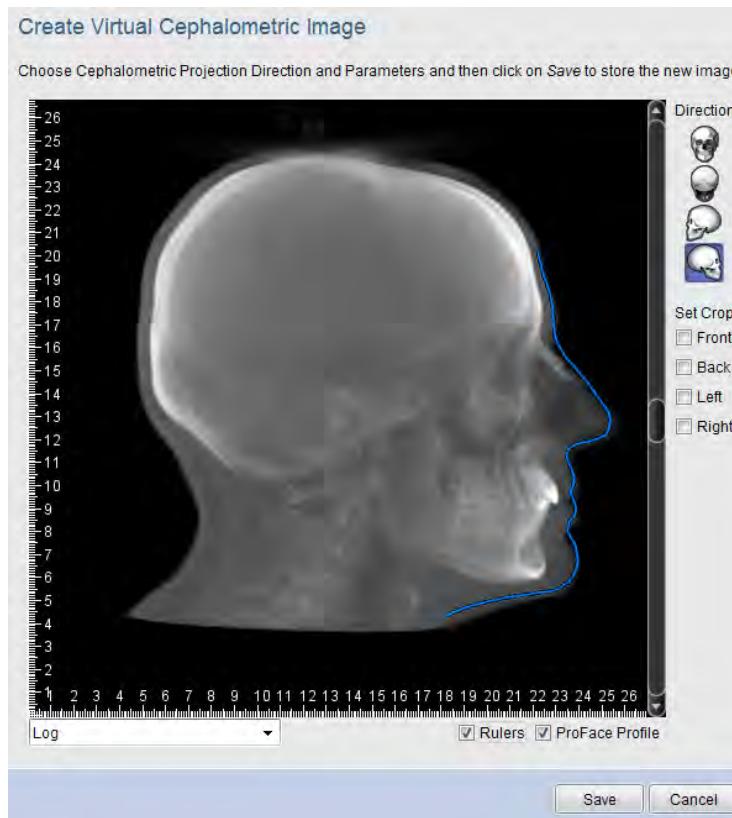
The view is saved as a 2D image and opened in the 2D imaging module.



### 12.13 Virtual ceph



Virtual Cephalometric can be used to generate 2D cephalometric images from 3D volumes and save them to patient's 2D images.



- To **rotate** and **align** the volume use left mouse button. Note that the projection is perspective free so the close and far anatomy can be aligned perfectly.
- To **rotate** the volume **sagittally** (nodding) use the **Ctrl + right** mouse button.

- To adjust **contrast** and **brightness** use **Ctrl** + left mouse button.  
Use the direction buttons to set the direction of which the cephalometric image should be generated. These can be used together with crop options so that the far side of anatomy is removed from the cephalometric image creating an image where duplicate anatomy does not need to be considered.  
The following options can be selected from the drop-down menu:
- *Default*. Produces the most film like quality in the image.
- *Flat*. Flattens the image by reducing differences in contrast between areas.
- *Log*. Adds contrast

To show/hide ruler check/uncheck the *Rulers* check box.

To turn on/off the ProFace profile overlay check/uncheck the ProFace profile check box.

Use the scroll bar to adjust the left/right positioning of the ProFace profile line.

## 12.14 Printing images with Print editor

For more information see section 14 "PRINTING IMAGES WITH PRINT EDITOR" on page 87.

## 12.15 DICOM print

For more information see section 14.4 "Printing images with DICOM compatible printers (optional)" on page 95.

### NOTE

On how to configure DICOM printer see section "DICOM configuration" in the Planmeca Romexis technical manual (10037884).

## 12.16 DICOM storage

In case a full DICOM license is purchased, images can be sent to a remote DICOM application, i.e. DICOM image archive (PACS).

### NOTE

DICOM Storage service needs to be configured in the *Admin* module before it can be used, see section "DICOM storage setup" in the Planmeca Romexis technical manual (10037884).

1. Open the image you want to store.
2. Click this button.



### NOTE

Images can also be automatically stored to the DICOM archive after capturing, see section "DICOM configuration" in the Planmeca Romexis technical manual (10037884).

## 12.16.1 Settings

**DICOM Storage**

AE Title JDSTORAGE

Calling AE Title RXCLIENT1

Crop Empty Space from Volume      Advanced Options ▲

**Axial Slices**

Send Axial Slices

Send Full Resolution Range (401 slices)

Specify D-V Range in mm (401 slices)

Start 0.00   Stop 80.20   Distance 0.20   Thickness 0.20

**Coronal Slices**

Send Coronal Slices

Send Full Resolution Range (401 slices)

Specify R-L Range in mm (401 slices)

Start 0.00   Stop 80.20   Distance 0.20   Thickness 0.20

**Sagittal Slices**

Send Sagittal Slices

Send Full Resolution Range (401 slices)

Specify A-P Range in mm (401 slices)

Start 0.00   Stop 80.20   Distance 0.20   Thickness 0.20

OK   Cancel

### AE title

Specifies the AE title of the PACS server where the image is to be stored.

### Calling AE title

Shows the AE title of the current Planmeca Romexis workstation.

### Crop empty space from volume

Empty space from around the volume (from the top, bottom, left, right, anterior or posterior) is removed before sending. a volume smaller in size is sent compared to original volume.

### Advanced options

- Send axial, coronal, sagittal slices  
By default only axial slices are sent. Additionally or instead coronal or sagittal slices can be sent.
- Send Full Resolution / Specify Range  
By default full range of thinnest possible slices (smaller range if *Crop Empty Space* is selected) are sent. The range can be specified with the starting and end points, distance between slices and slice thickness all in millimetres. If start and end points are outside of the volume after applying *Crop Empty Space* settings they are adjusted to new volume limits.



## 12.17 Cloud export



See section 17 "CLOUD EXPORT" on page 97.

## 12.18 Transferring images to external applications



See section 16 "TRANSFERRING IMAGES TO EXTERNAL APPLICATIONS" on page 96.

## 12.19 Send to iPhone



Sends images currently open to specified iPhone. Enter the IP address of the Planmeca iRomexis device where you want to send the image to.

A dialog box titled "Send to iPhone" with a light gray background. It contains the text "Enter the iOS device IP address below to send the currently opened images to iRomexis". Below this is a text input field labeled "Host Name" containing the value "192.168.1.145". At the bottom are two buttons: "OK" and "Cancel".

Send to iPhone

Enter the iOS device IP address below  
to send the currently opened images to iRomexis

Host Name

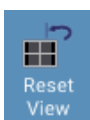
OK Cancel

## 12.20 Save view



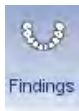
Saves the currently displayed view. Enter a name to the opening dialog.

## 12.21 Reset view



Restores the original orientation and settings of the views.

## 12.22 Using radiological findings module

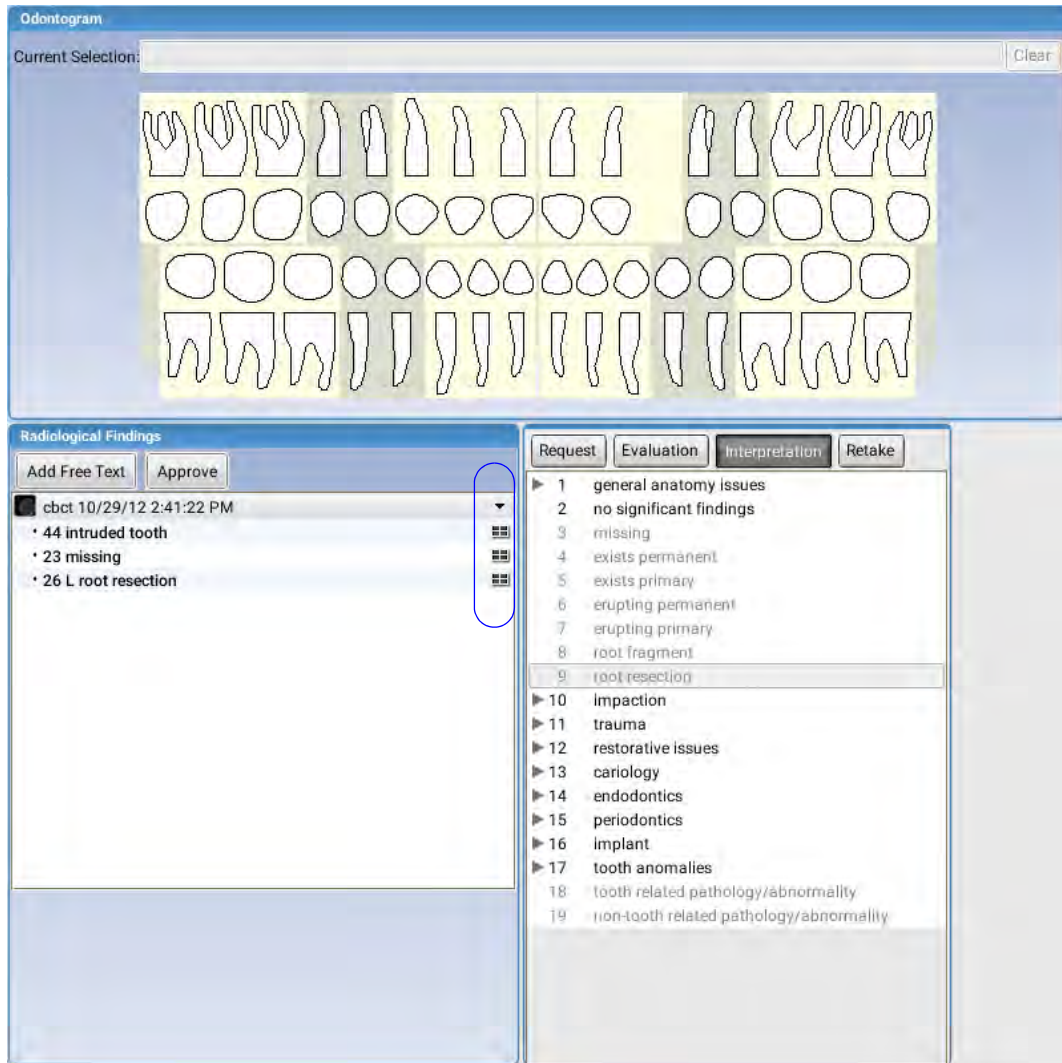


Click the **Findings** button on the top toolbar.

The orientation of the volume (axial, sagittal; cross-sectional) can be modified in the 3D module at any time without closing the dialog.

When a finding is added in the 3D module the orientation is saved with the finding.

To return to the orientation in which the finding was registered click the orientation link on the finding.



Orientation links

### NOTE

For detailed information on how to use the findings tool see section 8.9 “Entering and viewing radiological findings” on page 71.

## 12.23 Image properties

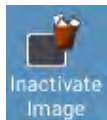


1. Click the **Image Properties** button to view *Image properties* or add an image comment.



2. When finished click **OK**.

## 12.24 Inactivate image



To inactivate an image click the **Inactivate Image** button.

The image is moved to *Trash* folder from where it can be deleted permanently or returned to its original location, see section “Reactivate and empty trash” in the Planmeca Romexis technical manual (10037884).

### NOTE

[Inactivating can be restricted with user rights, see section “Groups” in the Planmeca Romexis technical manual \(10037884\).](#)

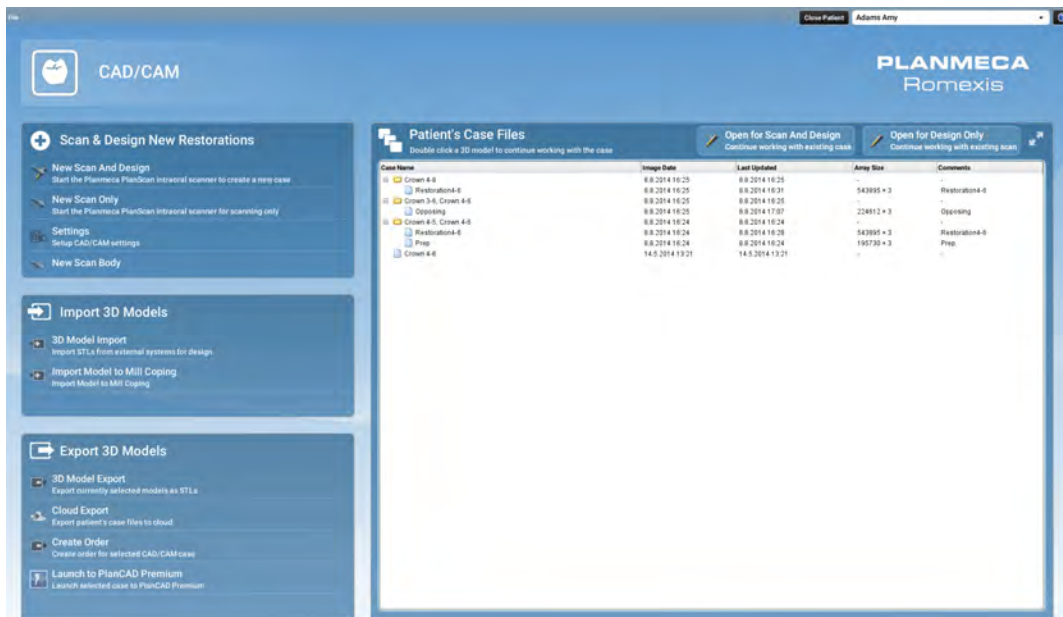
# Chapter F: CAD/CAM MODULE

## 1 INTRODUCTION



Planmeca Romexis CAD/CAM module is intended for working with digital impressions and restorations. Digital impressions can be acquired with Planmeca PlanScan scanner connected to Planmeca Chairside CAD/CAM solution.

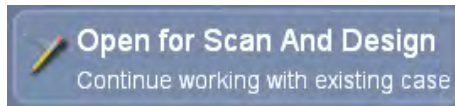
The digital impressions can also be used for designing restorations in the software. The digital impressions and designed restorations can then be paired with CBCT volume in Implants sub-module for implant simulation. All data are automatically stored into Planmeca Romexis database and organized into cases to be exported to another system or sent to a certified laboratory for design and milling using Planmeca Romexis Cloud service (see section 17 “CLOUD EXPORT” on page 97 for more information).



## 2 SCANNING AND DESIGNING RESTORATIONS

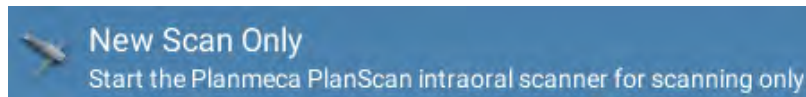
### 2.1 New scan and design

To start a new scan and create a new case for design select this option. For detailed description on how to proceed with scanning and design see Planmeca Chairside CAD/CAM solution User's manual.



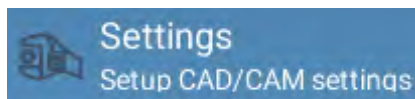
### 2.2 New scan only

Select this option for scanning only. For detailed description on how to proceed with scanning see Planmeca Chairside CAD/CAM solution User's manual.



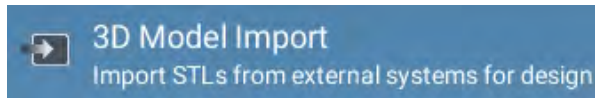
### 2.3 Settings

To adjust the CAD/CAM settings click this button. The *Settings* window opens. For detailed description, see Planmeca Chairside CAD/CAM solution User's manual.

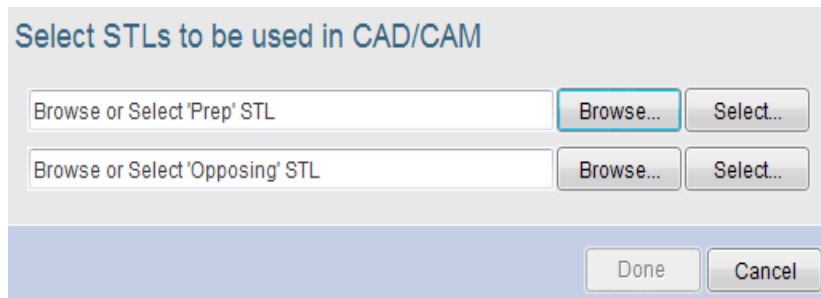


## 3 IMPORTING 3D MODELS

Click **3D model import**.



The following window opens.



You can import models either from an external source (A) or from Planmeca Romexis 3D module's *Volumes* sub-module (B):

- **To import models from an external source (A):**
  1. Click **Browse**.
  2. Go to the folder from where you want to import the models.
  3. Select the files and click **Open**.

### NOTE

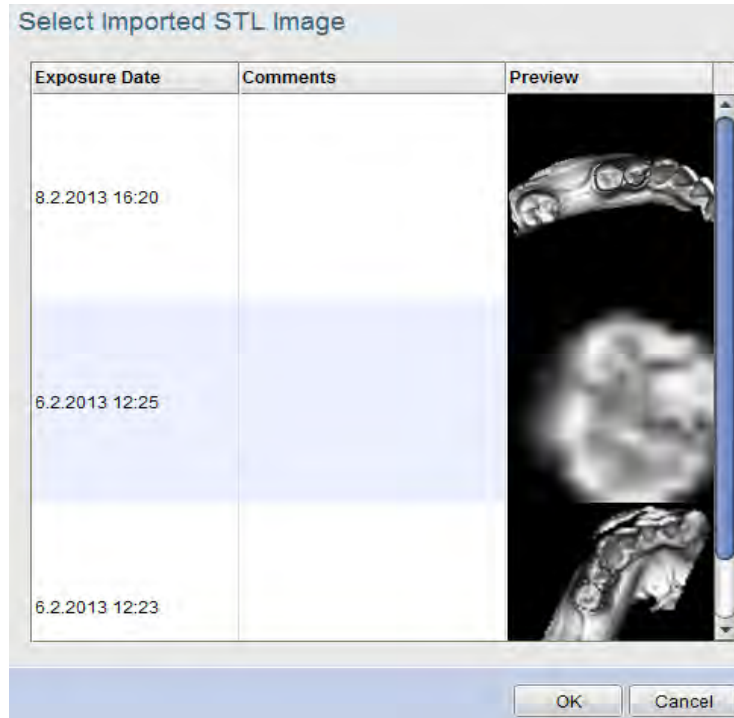
**Both prep and opposing models must be imported.**

4. When both models have been imported click **Done**.  
The imported files will appear in the *Setup* view of the Planmeca Chairside CAD/CAM window.



To import models from the Planmeca Romexis 3D module's *Volumes* list (B):

1. Click **Select**.
2. In the following window select the file to import and click **OK**.



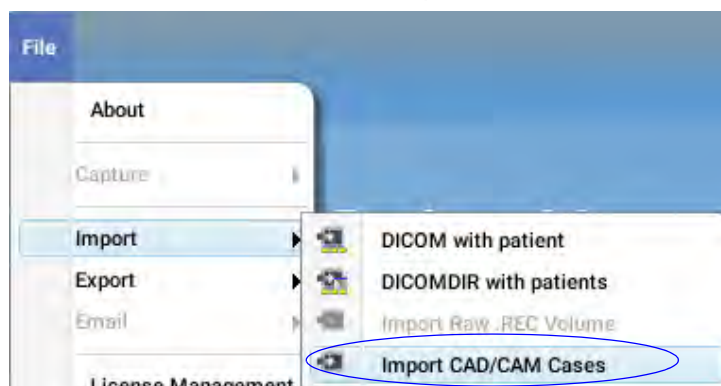
The imported files will open in the *Setup* view of the Planmeca Chairside CAD/CAM window.

### 3.1 Importing CAD/CAM cases

#### NOTE

The cases imported via *File* menu are E4D compatible.

1. From the *File* menu select **Import CAD/CAM cases**.



2. In the following window select whether you want to import
  - a single case
  - or
  - one or several patients.

3. Select Import single CAD/CAM Case and click **Next**.

**Import CAD/CAM Case or Patients**

Import single CAD/CAM Case

Import one or more CAD/CAM Patients

Select one or more existing CAD/CAM patient folder(s)

Patient folders with cases found:

Prompt for each patient

Auto generate each patient info

4. Select the folder from where to import the case by clicking **Browse**.

**Import CAD/CAM Case**

Select the ["CASE ID"] folder from an existing CAD/CAM case folder

Select or create patient for importing

Import to current patient

Test Patient

Create new patient

First Name Last Name External id

Select an existing patient

5. Double-click on the case you want to import or select the case and click **Open**.
6. If a patient is open, the case will be imported to that patient. If no patient is open select *Create new patient* or *Select an existing patient*.

**Import CAD/CAM Case**

Select the ["CASE ID"] folder from an existing CAD/CAM case folder

L:\Personal\Siirto2\CADCAM[2-6-2014 11.25.30 AM]

Select or create patient for importing

Import to current patient

Test Patient

Create new patient

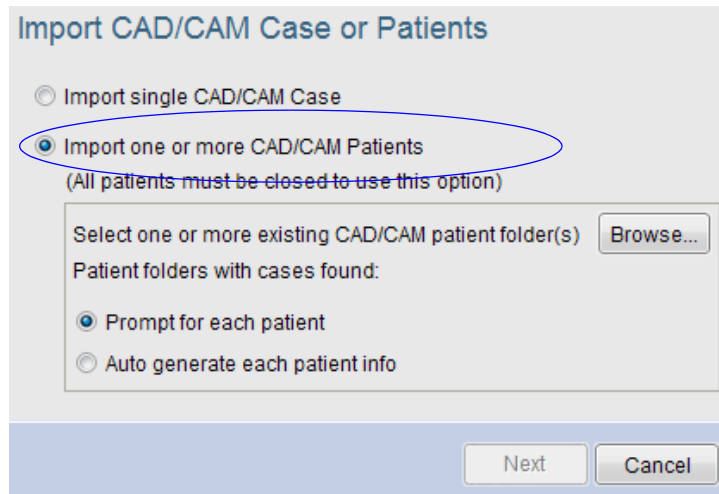
First Name Last Name External id

Select an existing patient

7. Click **Import**.

## 3.2 Importing CAD/CAM patients

1. To import one or several patients select this option.



### NOTE

This option is possible only when no patient is open.

After patient folder(s) have been selected by clicking the **Browse** button, select from the following options:

- *Prompt for each patient*: the patient information for each folder must be confirmed. The suggested information can be accepted and modified and a new patient created based on that information or alternatively an existing patient from the patient list can be selected.
- *Auto generate each patient info*: a new patient for each imported folder is automatically created.

2. Click **Next**.

If prompt for each patient was selected, the following dialog appears.

3. Select either *Create new patient* or *Select an existing patient*.

If new patient is created the first name, last name and external ID can be modified in the dialog before clicking **Add patient**.

4. Click **Import**.

Import CAD/CAM Case

Select the ["CASE ID"] folder from an existing CAD/CAM case folder

I:\Saila\CADCAM\Wkbk Ex - 3D Movement\restorations\7-29-2013 9.31.01 AM] Browse...

Select or create patient for importing

Import to current patient

Create new patient

First Name Last Name External id

Movement Wkbk Ex 06\_112644

Add Patient

Select an existing patient

Select

Import Cancel

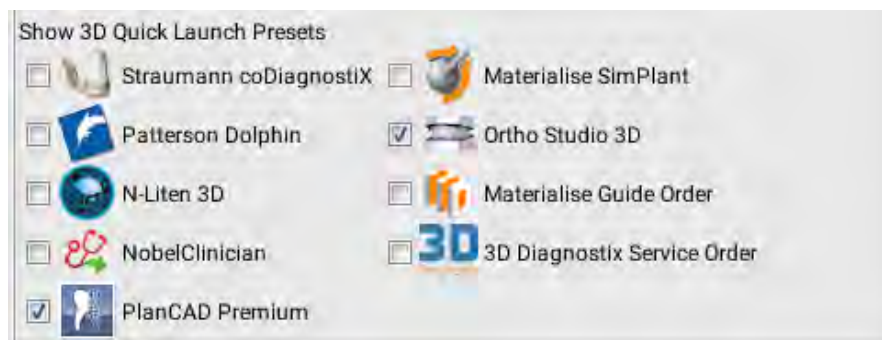
5. Click **OK**.

The imported patients will now show in the *Volumes* list.

## 4 EXPORTING 3D MODELS



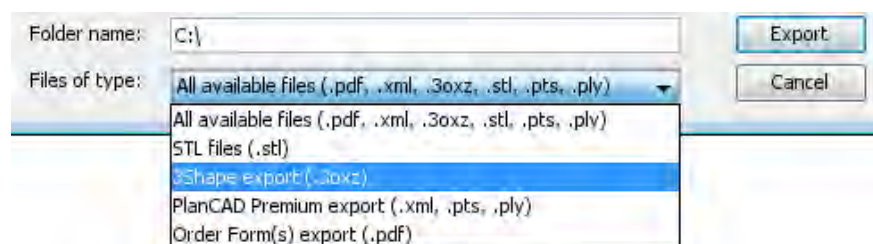
For some of the export options to show in this section they must be selected in the Admin module's *Local settings* tab, see Planmeca Romexis Technical manual for more information.



### 4.1 3D model export

When using the 3D model export option the following formats can be used:

- All available files (.pdf, .xml, .3oxz, .stl, .pts, .ply)
- STL files (only .stl files)
- PlanCAD Premium Export (.xml, .pts, .ply)
- 3Shape export (3.oxz)
- Order Form(s) export (.pdf)



#### NOTE

CAD/CAM export to 3Shape Dental System™ 2015 in .3oxz format is compatible with 3Shape Dental System 2015 software revision 15.5.0. The models must be ditched in Planmeca PlanCAD® Easy before export.

## 4.2 Cloud export



To export case files to Planmeca Romexis Cloud select them from the list and click **Cloud export**. For more information on how to use the Cloud service, see section 17 “CLOUD EXPORT” on page 97.



## 4.3 Creating and exporting lab orders

A lab order can be created for a selected CAD/CAM case in PDF format to be sent over to a lab.



To describe the needed restoration a lab order form can be used.

The form contains basic information on the receiving lab, the patient, and the referring clinic. Restorations can be added to the order manually

1. Click this button to open a lab order form.
2. Enter the necessary information.

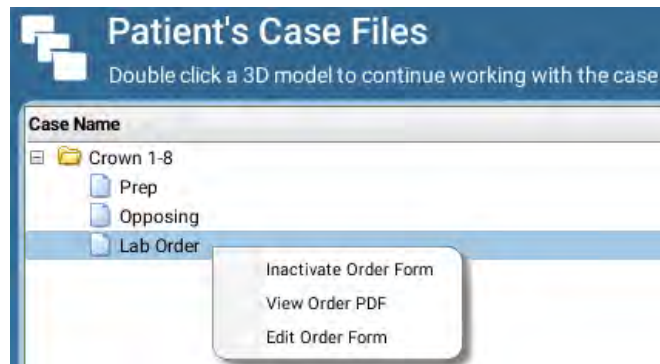
Lab Order Form

<b>Receiving Laboratory Information</b> Name: <input type="text" value="Dental Lab"/>	<b>Patient Information</b> Name: <input type="text" value="Jane Doe"/> ID: <input type="text" value="20150513"/> Age: <input type="text" value="35"/> Gender: <input type="text" value="Female"/>
<b>Referring Clinic Information</b> Name: <input type="text" value="SmileClinic"/> Contact email: <input type="text" value="smileclinic@dental.com"/> Contact name: <input type="text" value="Mary Smith"/>	
<b>Order Information</b> Order date: <input type="text" value="Jun 18, 2015"/> Due date: <input type="text" value="Jun 30, 2015"/>	Comments: <input type="text" value="Free text comments can be added here."/>

**Restorations**  
No restorations defined



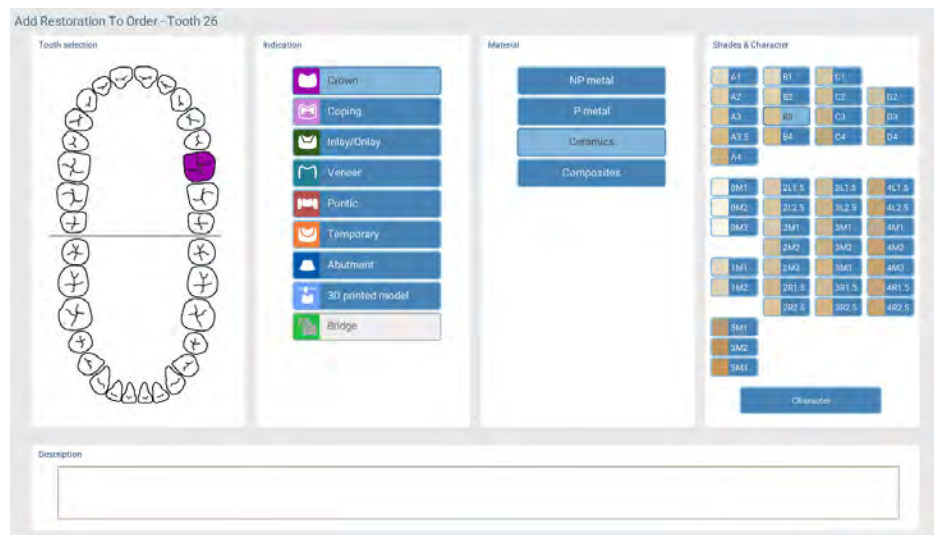
Once a lab order has been created it can be inactivated, viewed as PDF or edited by right-clicking.



#### 4.3.1 Adding restorations to the order



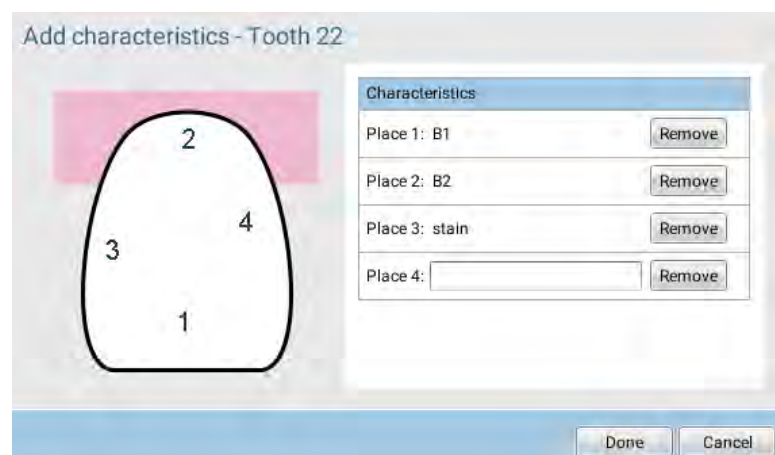
1. Click the **Add restoration** button on the lab order form.
2. From the opening dialog select the tooth in question from the tooth selection field map, the indication, material and finally the shade.



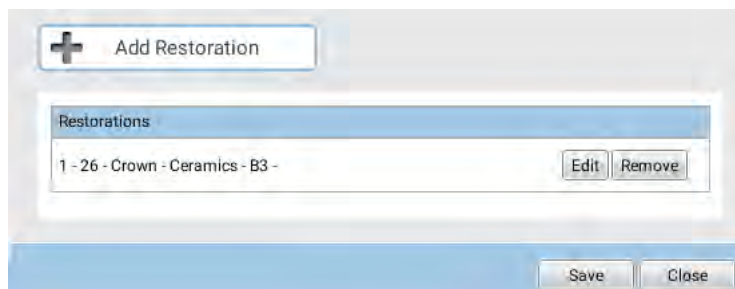
Character

To add characteristics click the **Character** button.

Click on an area on the tooth picture. The area will be automatically numbered and a free text can be added to the area.



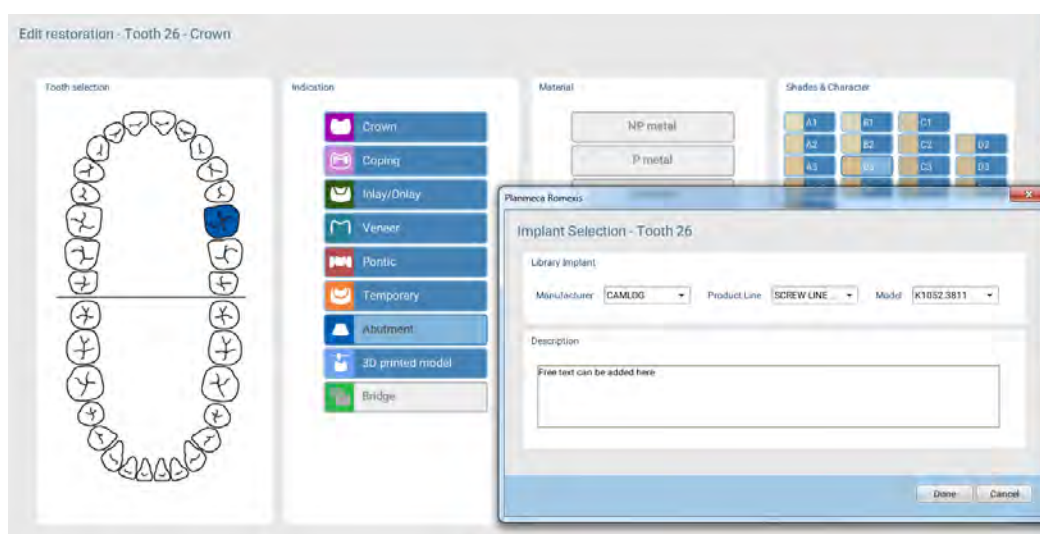
The added restoration will now show on the *Restorations* list.



Any added restoration can be edited or removed by clicking the **Edit** and **Remove** buttons.

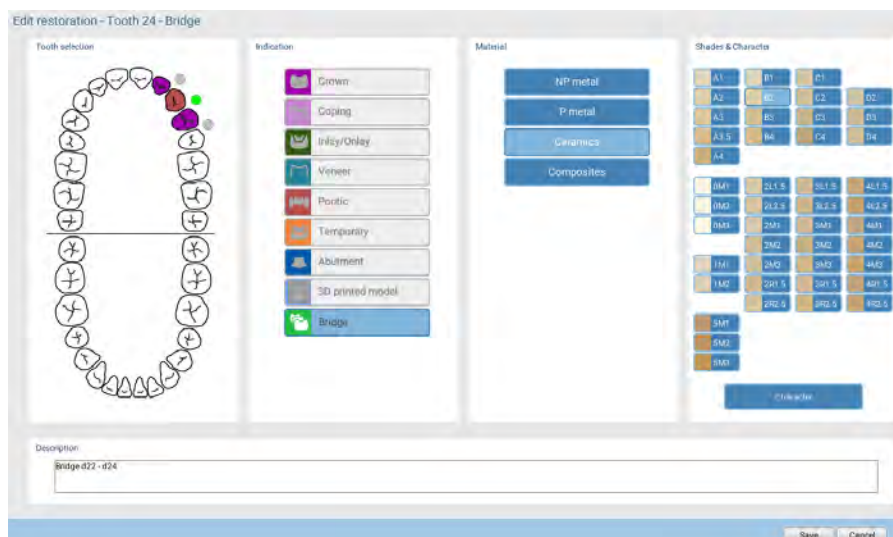
## Defining implants

To define the underlying implant select **Abutment** in the indication field.

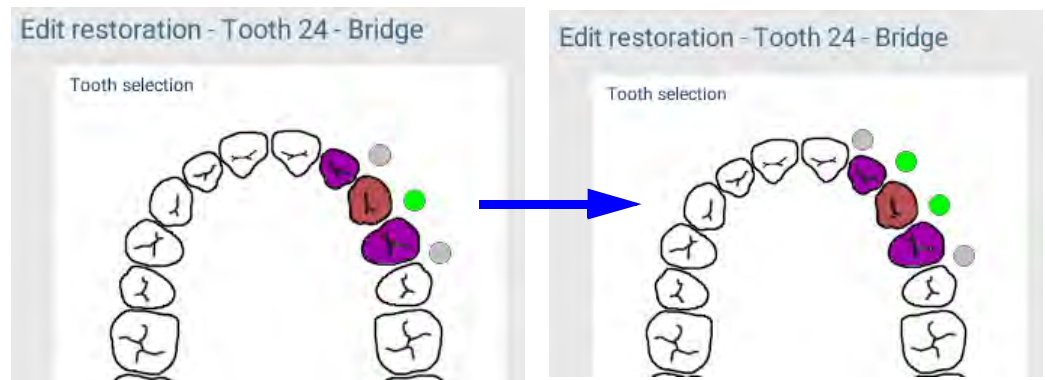


## Creating bridges

1. Add first the necessary restorations.
2. Select one tooth to be included in the bridge in the *Tooth selection* field.
3. Select **Bridge** as indication.



4. Create the bridge structure by clicking on the grey dots, which will turn into green dots where bridge applies.



#### 4.3.2 Sending order form

The order can be sent to the lab either over Cloud Export with all the STL files included or as for viewing only via 3D model export.

#### 4.4 Launching PlanCAD Premium



To launch a case in Planmeca PlanCAD Premium application click this button. For detailed description on how to use the PlanCAD Premium software see the Planmeca PlanCAD Premium User's manual (publication number 10037107).

#### 4.5 Launching Planmeca Romexis OrthoStudio



To launch a case in Planmeca Romexis OrthoStudio application click this button. For a detailed description on how to use the Planmeca Romexis OrthoStudio software see the Planmeca Romexis OrthoStudio User's manual (publication number 10033024).

#### 4.6 Sending to Planmeca iRomexis



To send models to iOS select the files from the list and click **Send to iRomexis**. For more information on how to use the Planmeca iRomexis see Appendix C: "MOBILE APPLICATIONS" on page 398.

#### 4.7 DDX export

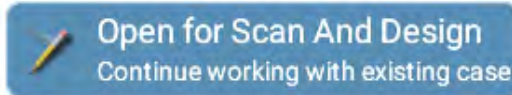


To export cases using DDX export select the cases from the list and click **DDX export**. For more information on how to use DDX Export see Appendix D: "DDX CLOUD" on page 404.

## 5 WORKING WITH EXISTING CAD/CAM CASES

### 5.1 Open for scan and design

To continue scanning and design with an existing case select the case from the list and double-click on it or click **Open for Scan and Design**.



The case opens in Planmeca Chairside CAD/CAM solution's *Scan* view. For detailed description on how to proceed with scanning and design see Planmeca Chairside CAD/CAM solution User's manual.

#### NOTE

Both scan and design licenses are required.

### 5.2 Open for design only

To continue design with an existing scan select the case from the list and click **Open for Design Only**.



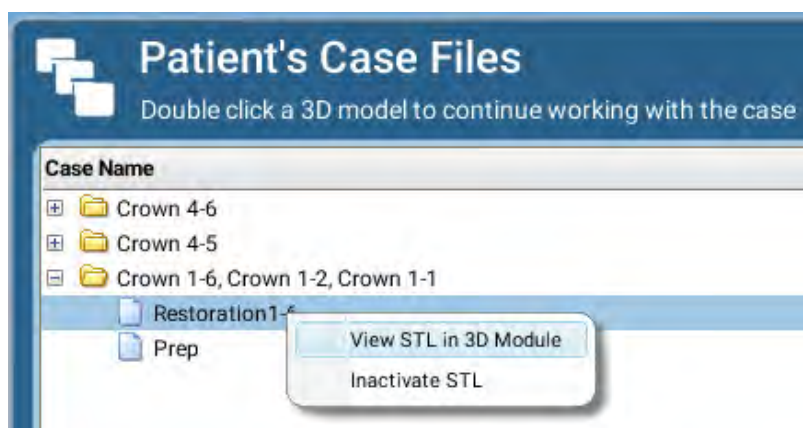
The scan opens in Planmeca Chairside CAD/CAM solution's *Design* tab. For detailed description on how to proceed with design see Planmeca Chairside CAD/CAM solution User's manual.

#### NOTE

A design license is required.

### 5.3 Opening STL file in 3D module

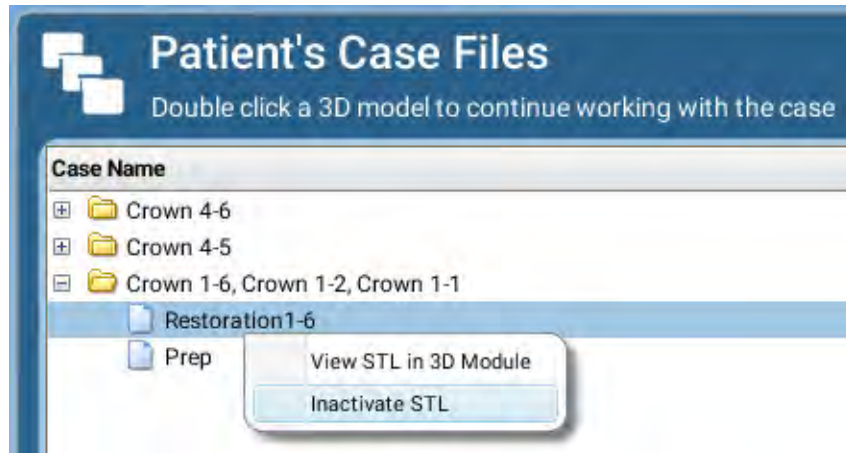
Right-click on the case and select **View STL in 3D module**.



By clicking this button on the top right corner of the *Patient's Case Files* window you can expand / reduce the window size.

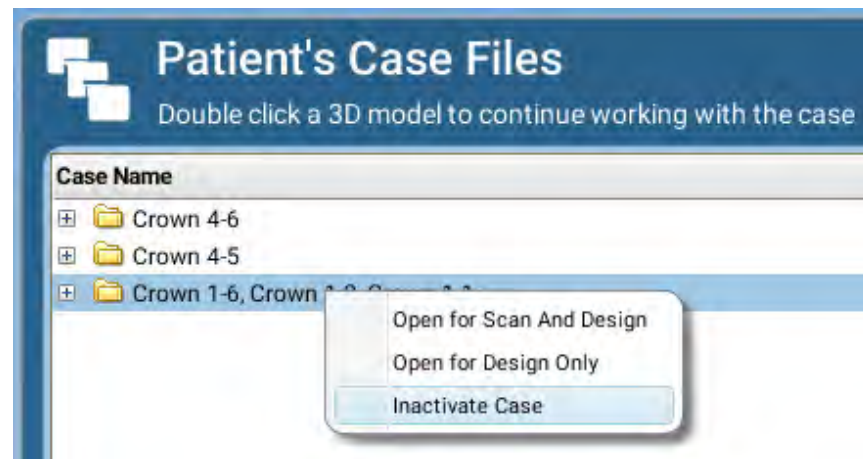
### Inactivating STL files (scans)

To inactivate (remove) an stl fil) (scan) from the patient's case files right-click on the file and select **Inactivate STL**.



### Inactivating restorations (cases)

To inactivate (remove) a case right-click on the case and select **Inactivate restoration**.

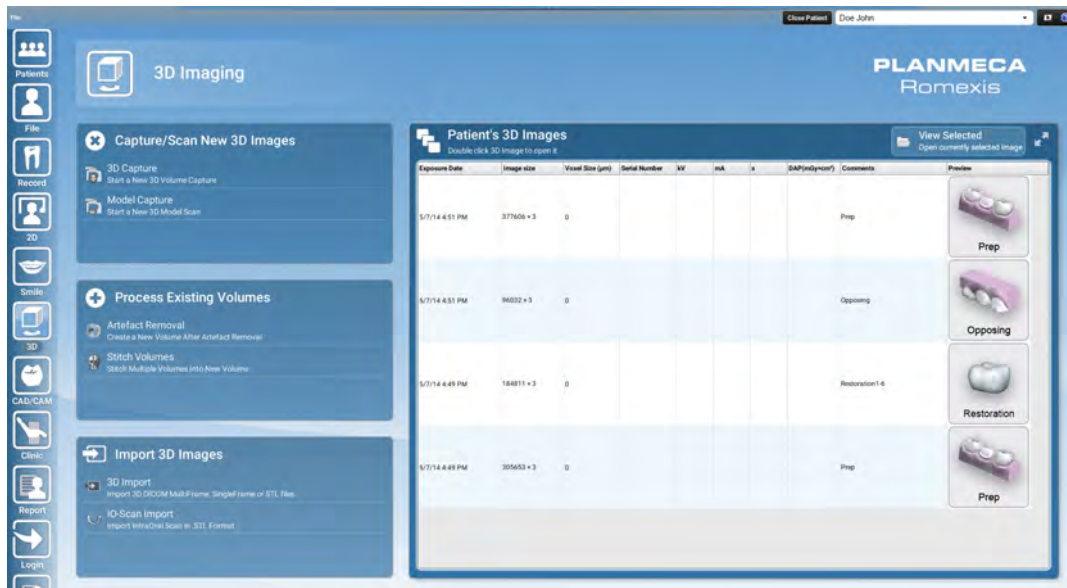


To reactivate or permanently delete a case from the database see section "Reactivate and empty trash" in the Planmeca Romexis technical manual (10037884).



## 5.4 Scans and restorations in 3D module

All scans and designed restorations will automatically appear in the 3D module's *Volumes* sub-module.



To open a scan/restoration for viewing and further processing double-click it.

To view the properties of a scan/restoration, see section 2.2 “Viewing volume properties” on page 158.

To move a scan/restoration to another patient, see section 2.3 “Moving volume to other patient” on page 159.

To inactivate a scan/restoration, see section 2.4 “Inactivate” on page 160.



# Chapter G: CLINIC MANAGEMENT MODULE

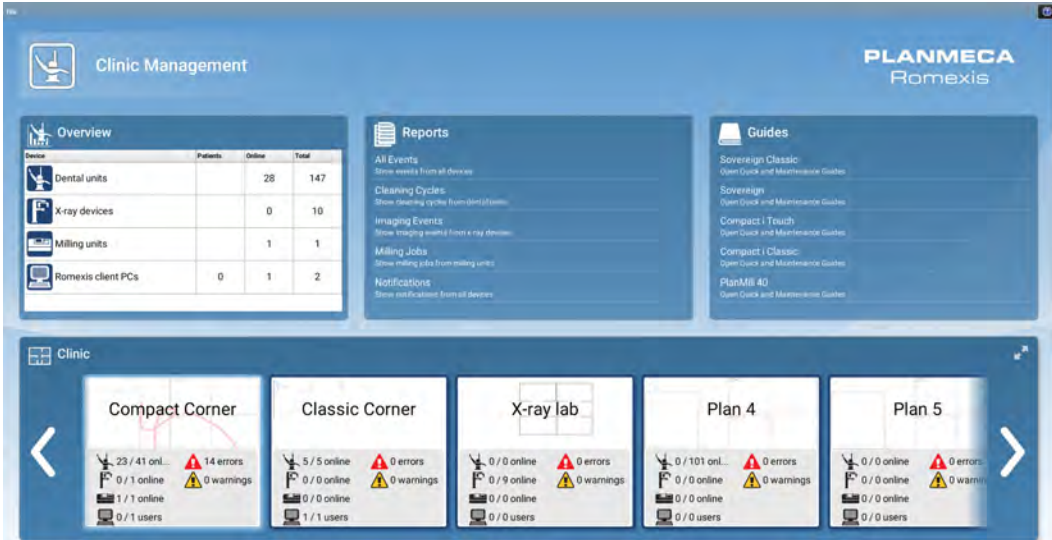
## 1 INTRODUCTION



Planmeca Romexis **Clinic management** module allows time stamped recording and real-time monitoring and control of most activities performed using Planmeca Compact i, Planmeca Compact i Touch, Planmeca Sovereign and Planmeca Sovereign Classic dental units, Planmeca ProMax and Planmeca ProOne X-ray units and Planmeca PlanMill 40 milling units. The features and the gathered data can be used for remote assistance, service and maintenance, as well as preventive maintenance planning.

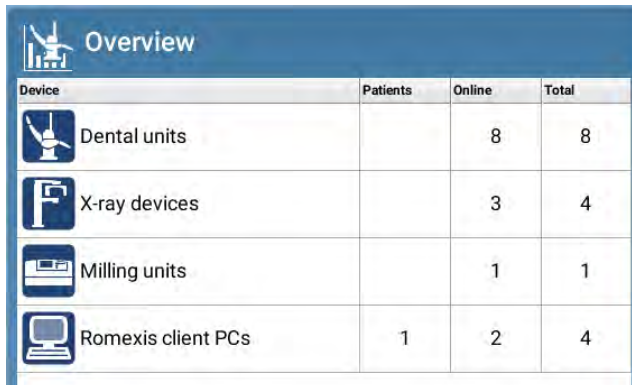
### NOTE

Depending on the device configuration the views presented in this manual may appear different from the views on your computer screen.



### 1.1 Overview

The Overview field shows the devices currently connected to Planmeca Romexis.



Device	Patients	Online	Total
Dental units		8	8
X-ray devices		3	4
Milling units		1	1
Romexis client PCs	1	2	4

### 1.2 Reports

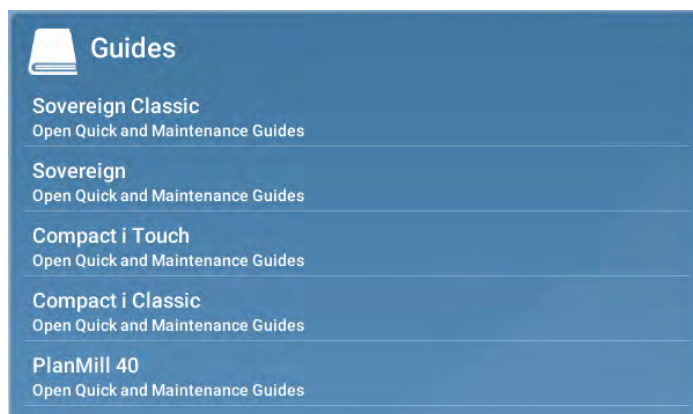
Clicking the buttons in the Reports field opens the list of activities of selected devices in Clinic view. For detailed description on how to use the reports see section 2.4 "Logs" on page 363.



- All Events**  
Show events from all devices
- Cleaning Cycles**  
Show cleaning cycles from dental units
- Imaging Events**  
Show imaging events from x-ray devices
- Milling Jobs**  
Show milling jobs from milling units
- Notifications**  
Show notifications from all devices

### 1.3 Guides

Click the buttons in the Guides field to open the Quick and maintenance guides for the selected device. For detailed description on how to use the guides see section 2.6 "Guides" on page 374



- Sovereign Classic**  
Open Quick and Maintenance Guides
- Sovereign**  
Open Quick and Maintenance Guides
- Compact i Touch**  
Open Quick and Maintenance Guides
- Compact i Classic**  
Open Quick and Maintenance Guides
- PlanMill 40**  
Open Quick and Maintenance Guides

## 1.4 Clinic

In the Clinic field the number of connected devices, error and warning messages are displayed.

To open the detailed view of the clinic click the clinic plan image.

For detailed description on how to use the guides see section 2 "CLINIC VIEW" on page 346.



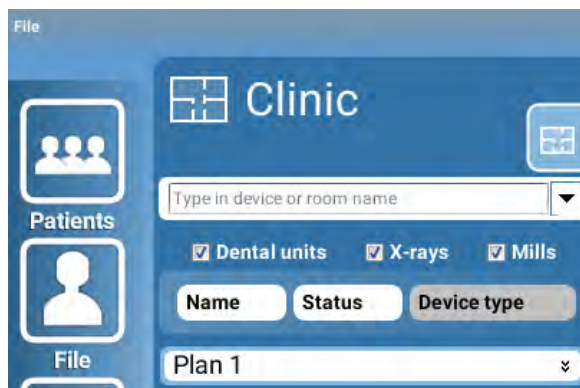
## 2 CLINIC VIEW

### 2.1 Searching units or treatment rooms

Start entering the name of the unit or treatment room in the search field. The software automatically returns units or rooms corresponding to the entered search term.

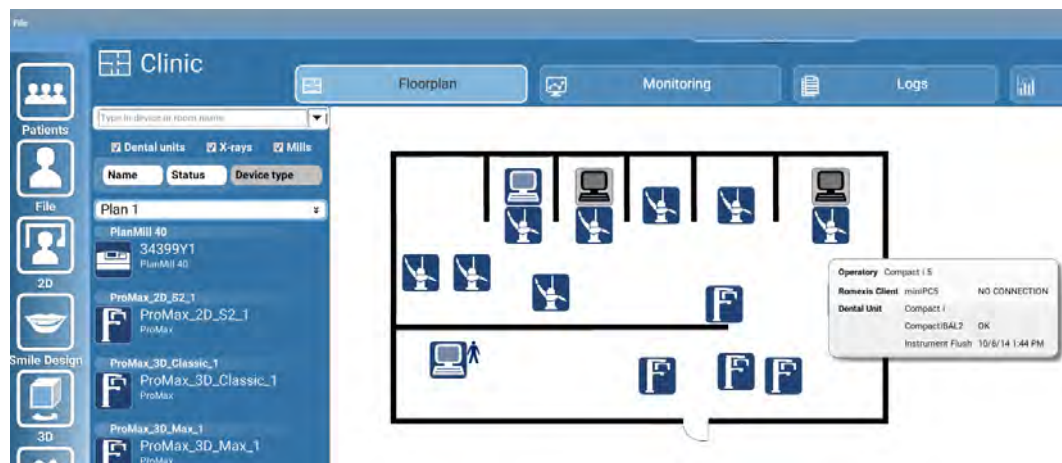
You can select the type of units to search for (dental, X-ray and milling units) by checking the appropriate check-boxes.

The units and rooms can also be sorted by name, status or device type by clicking on the corresponding button.

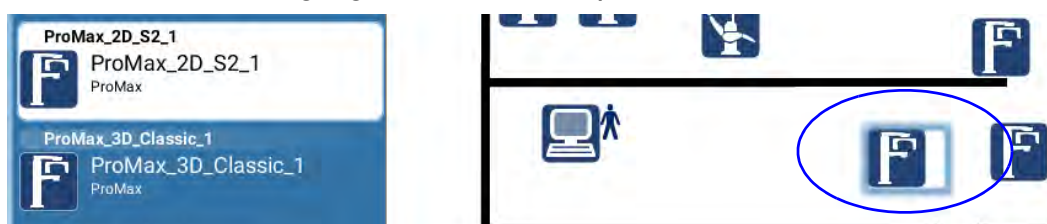


### 2.2 Floorplan

The clinic layout can be configured for up to 10 floors. For more information on how to configure the layout see Planmeca Romexis technical manual (10037884).



By placing the mouse cursor on a unit listed on the left side of the window the selected unit is highlighted on the floorplan.



### 2.2.1 Floorplan icons

The floorplan icons are colour-coded according to the current status and connectivity of the unit as follows.

	X-ray unit	Dental unit	Milling unit
Connected to Romexis			
No connection to Romexis			
Connected to Romexis, attention required			
Connected to Romexis, immediate attention required			
Unit is being serviced			
Software is being updated			
Cleaning ongoing			
Patient on chair			
Patient selected on PC			
Imaging ongoing			
Milling ongoing			
Milling completed, attention required			

**Client PC (Romexis)**

User logged in to Planmeca Romexis



User logged in and patient selected



No users logged in



Software is being updated





## 2.3 Monitoring

In the *Monitoring* view the usage of the selected unit can be monitored in real time.

### 2.3.1 Using Planmeca Romexis Virtual Clinic simulation tool

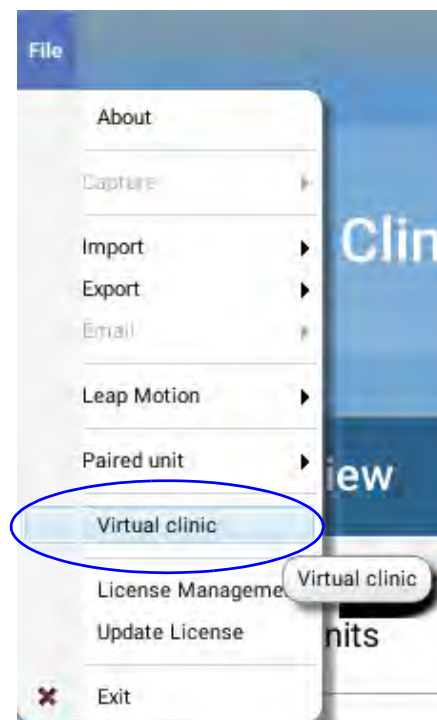
In case the devices cannot be connected to Planmeca Romexis and you want to demonstrate how the different unit actions can be monitored and registered in Planmeca Romexis you can use the Planmeca Romexis Virtual Clinic tool.

#### Before first use

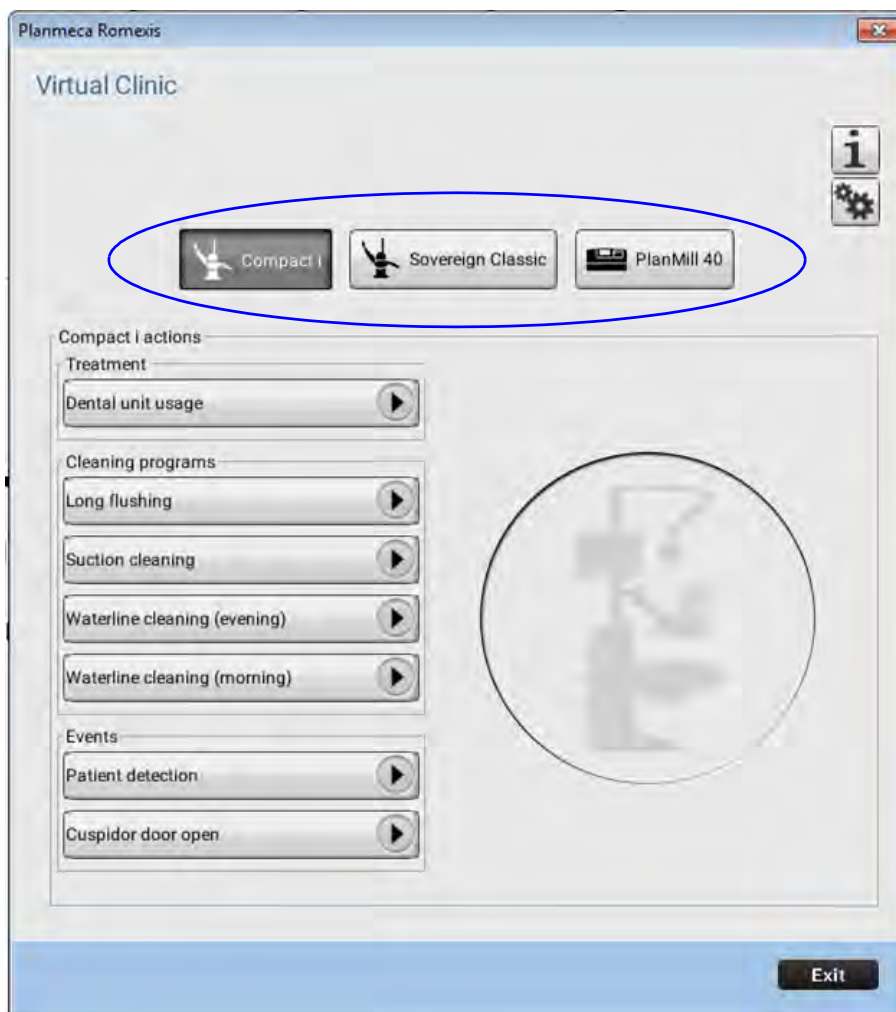
When using the tool for the first time you need to add unit(s) to the floorplan as follows:



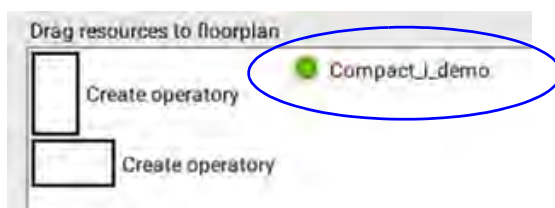
1. On the top toolbar move the mouse cursor to the top of the screen and select **Configure layout**.
2. From the *File* menu select **Virtual clinic**.



3. Click on the desired virtual unit in the *Virtual Clinic* window.



4. Wait until the unit appears at the bottom of the screen.



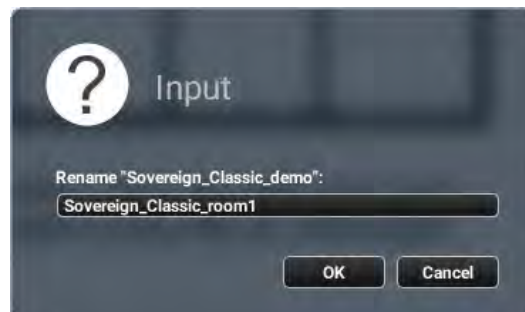
5. Drag and drop the unit to the floorplan.



If needed you can rename the operator by right-clicking on the unit and selecting **Rename operator**.



Enter a new name for the operator in the *Input* field



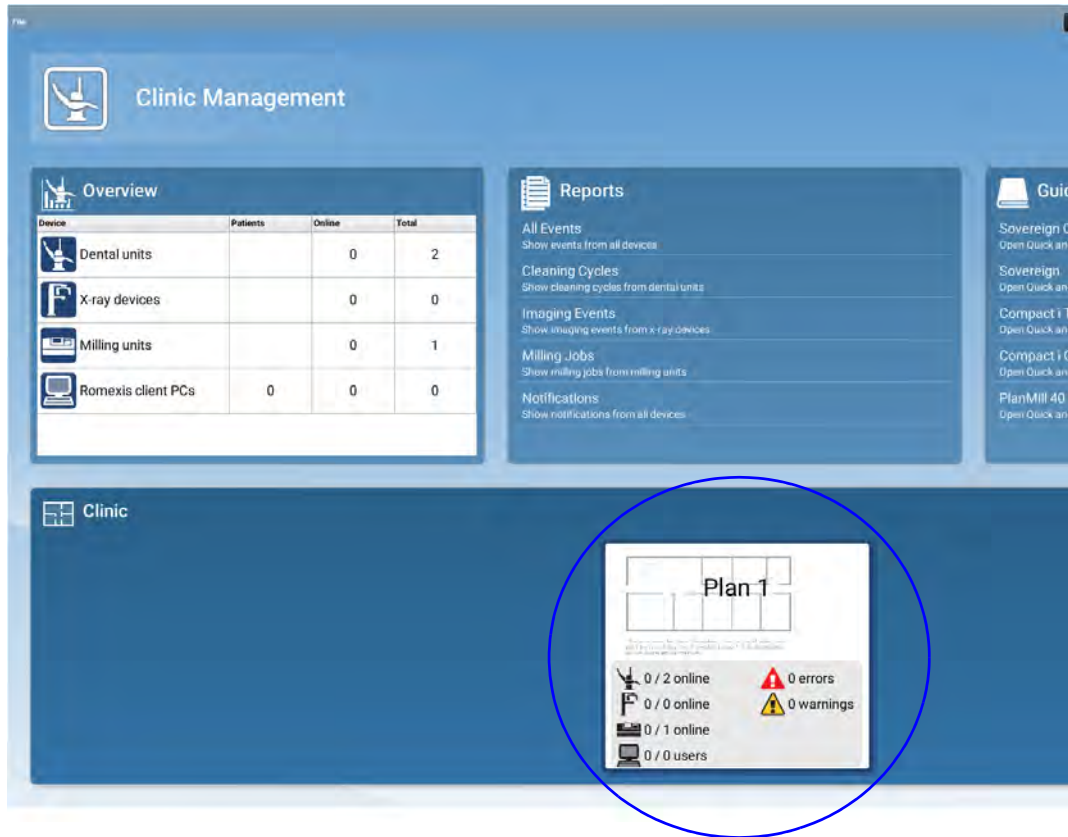
6. Exit layout mode by re-clicking the **Configure layout** button.

#### NOTE

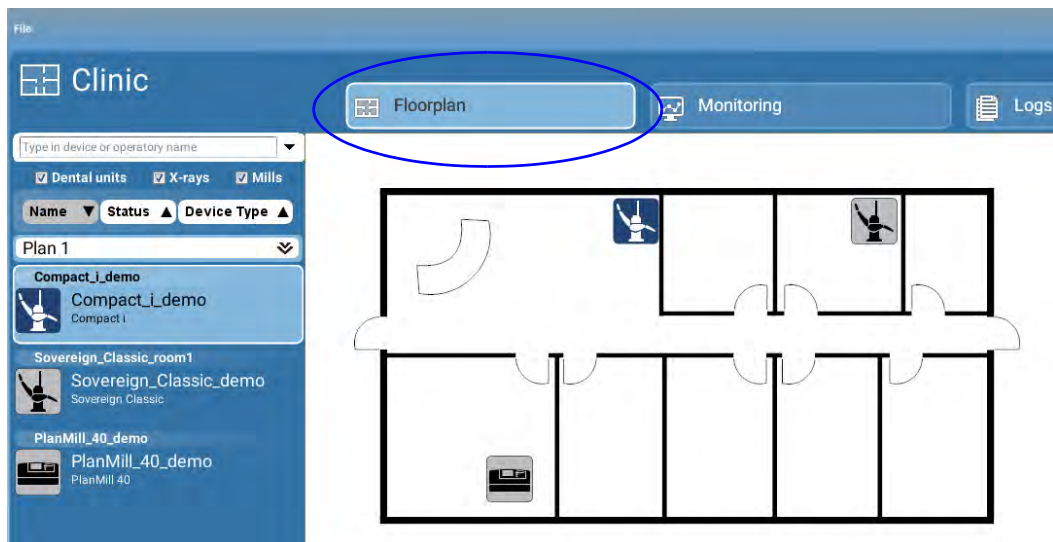
For detailed instructions on how to configure floorplan see [Planmeca Romexis technical manual](#).

### Using simulation tool

1. In the *Clinic* view click on **Plan1**.



2. On top of the window select Floorplan (Plan 1).



- Start the simulation by clicking on the desired device action see section "Description of device actions" on page 354.



The simulation opens in *Monitoring* view.



- To view the usage times, click on *Summary*.

- To view the event log, click on *Logs*.

## Description of device actions

### Dental unit actions

- Treatment  
Normal dental unit functions including chair movement, instrument, operating light and suction usage
- Cleaning programs  
Automated cleaning programs for instruments and suction system
- Events:  
Other dental unit usage related events



### Planmeca PlanMill® 40 actions

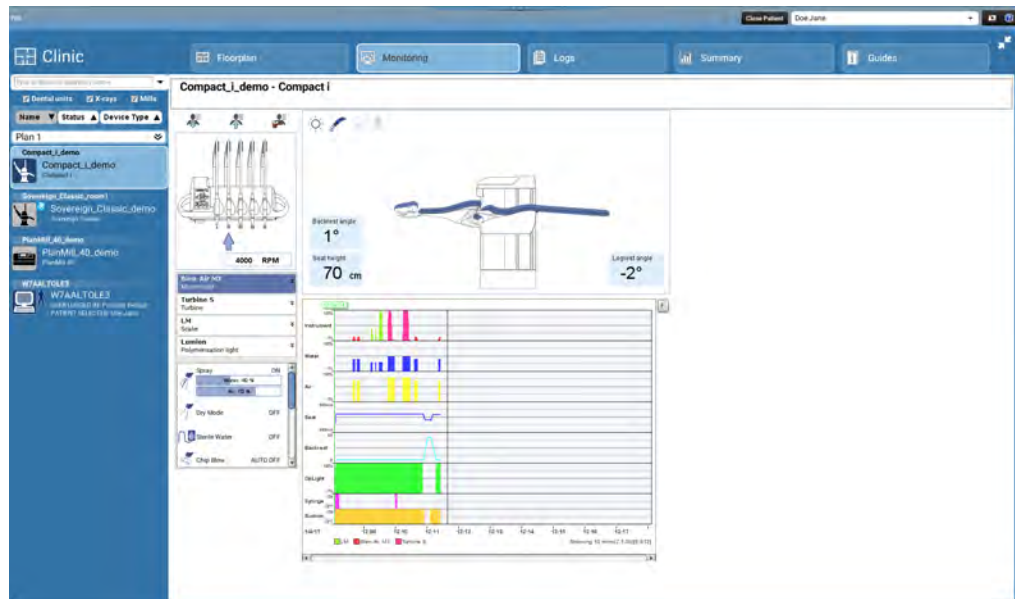
- Milling jobs:  
Milling different types of job (veneer, crown, bridge, onlay, inlay)
- Events:  
Tool state, air pressure and water level status notifications





### 2.3.2 Dental unit monitoring

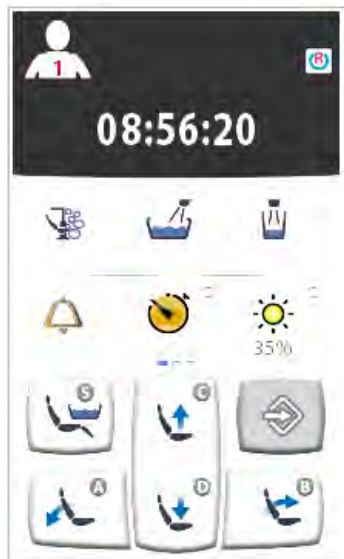
The unit usage in each section of the clinic can be monitored allowing to spot users requiring assistance as well as review, store and restore the unit's settings.



#### Dental unit control panel

The dental unit control panel corresponds to the control panel of the unit that is currently in use.

- For Planmeca Compact i the control panel is fully functional.



- For Planmeca Sovereign the control panel is displayed but cannot be used to control the unit.
- For Planmeca Sovereign Classic no control panel is displayed.

See your dental unit's user's manual for detailed description of the control panel functions.

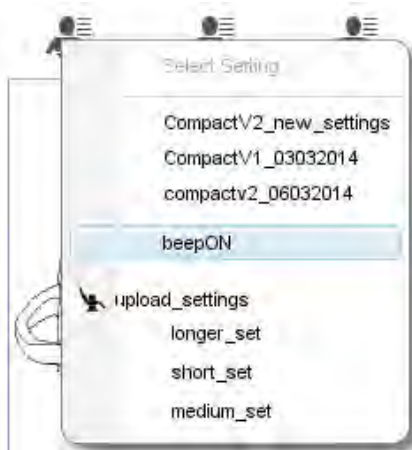
## Storing and restoring unit settings

### A. Planmeca Compact i units

The unit settings can be adjusted according to user's preferences. On how to adjust the settings see your unit's user's manual.

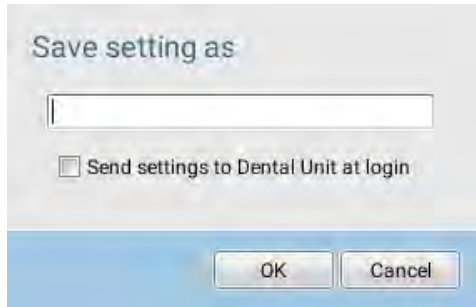


To select settings or upload settings from the current user profile to the unit click on this button and select the appropriate settings from the list.



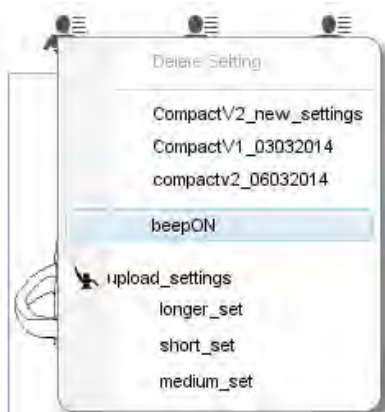
To save your settings to the current user profile in Planmeca Romexis click this button.

Enter the name for the settings.



Delete saved settings.

The settings are recorded for Planmeca Romexis user and are automatically activated at login or can be selected from the settings list.



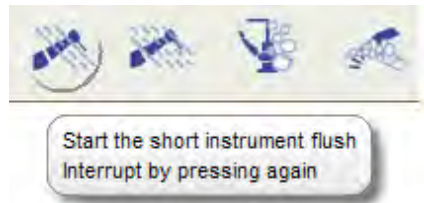
## B. Planmeca Sovereign Classic units

The personal settings for Planmeca Sovereign Classic units can be stored to Planmeca Romexis using the Planmeca Sovereign Classic control panel. For more information see Planmeca Sovereign Classic User's manual section "Managing users and personal settings".

### Short cuts

The short cuts allow quick access to routine unit activities.

By placing the cursor on top of the button a tool tip explanation appears.



The following short cuts are available:



Service mode

#### NOTE

**Before entering the service mode on a unit remotely, make sure that the unit is not currently in use.**



BienAir micromotor reverse operation mode



BienAir micromotor torque operation mode



Start short instrument flushing



Start long instrument flushing



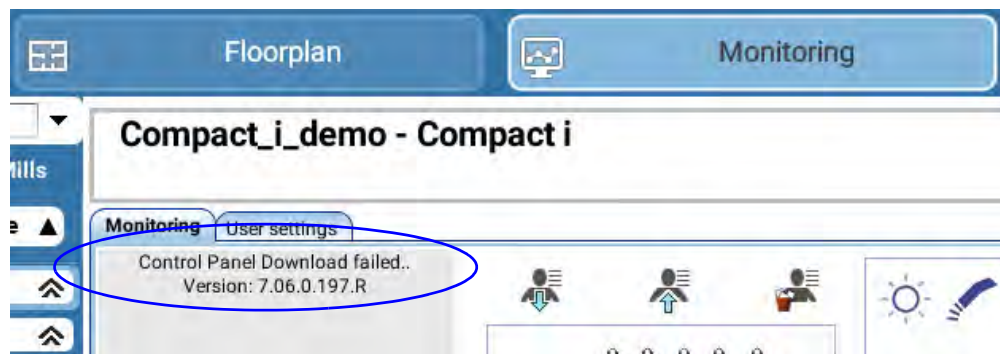
Start Waterline Cleaning System cycle



Start Suction Tube Cleaning System cycle

## Error messages

This section displays eventual error messages.



## Instrument console

The instrument that is currently in use is indicated by the arrow on the console and it is coloured in blue in the panel.

The instrument speed/power is shown in percentage points or in rpm as selected in unit settings. On how to adjust the settings see your unit's User's manual for more information.



## Chair position

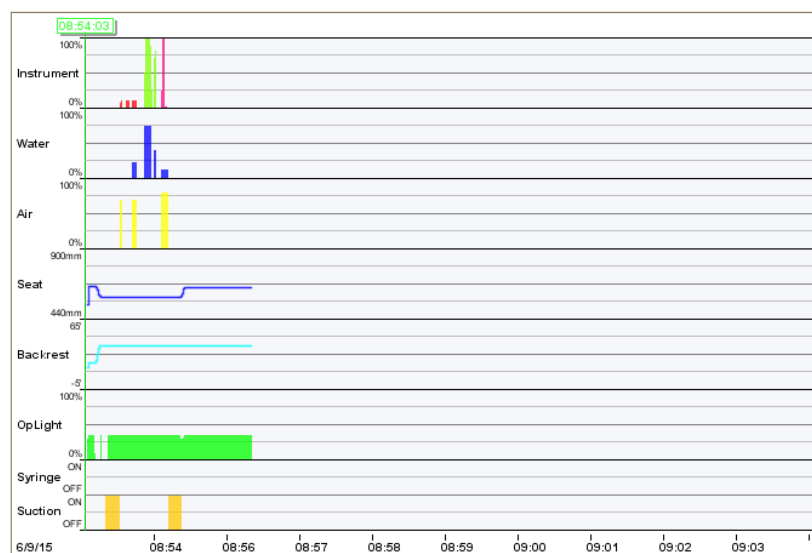
In this field you can monitor the backrest and legrest angle, seat height, swivel angle (for Planmeca Sovereign and Sovereign Classic) as well as motorised headrest length, height, and angle.



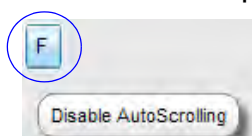
## Graphic display

The following unit activities can be monitored in the graphic display:

- Active instrument and power level
- Water usage
- Air usage
- Seat height
- Backrest angle
- Operating light level
- Syringe on/off
- Suction on/off



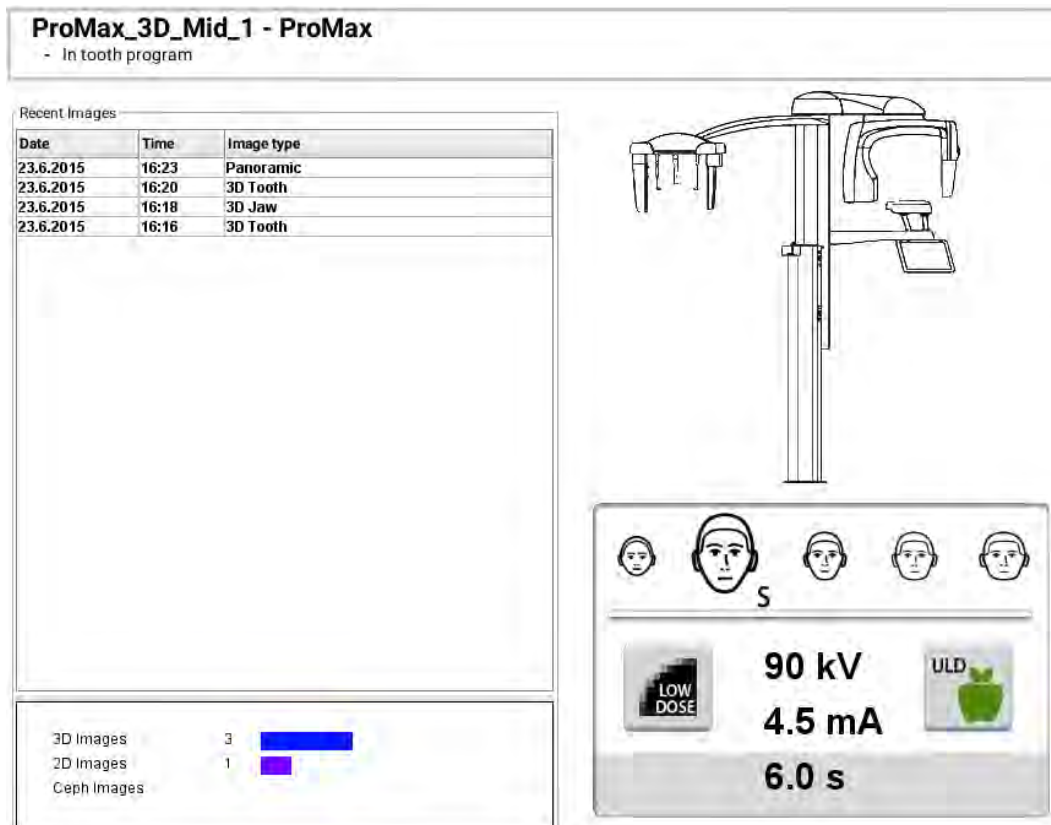
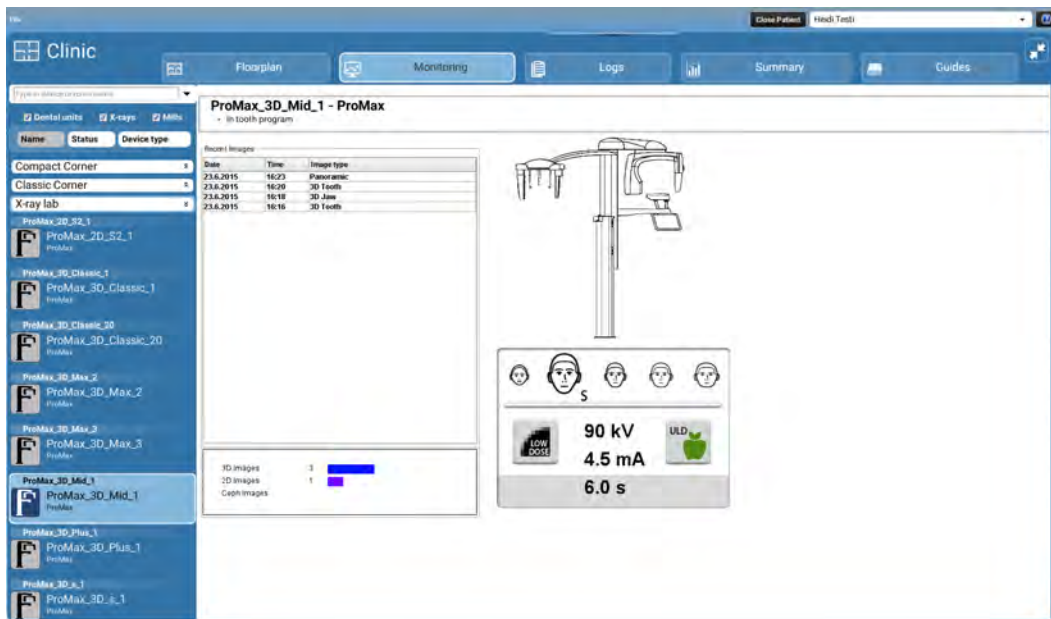
The graphics are automatically displayed. To hide the graphics click this button on the top right corner of the graphics window



### 2.3.3 Planmeca ProMax monitoring

For Planmeca ProMax X-ray units the following information is shown:

- Currently selected imaging program
- Exposure times
- Number of acquired images
- Type of acquired images
- Current exposure values





### 2.3.4 Planmeca ProOne monitoring

For Planmeca ProOne X-ray units the following information is shown:

- Currently selected imaging program
- Exposure times
- Type of acquired images

The screenshot displays the 'Clinic' management interface. The top navigation bar includes 'Floorplan', 'Monitoring', 'Logs', 'Summary', and 'Guides'. The 'Monitoring' tab is active, showing details for 'ProOne\_1 - ProOne'. The left sidebar lists various devices, including 'Compact Corner', 'Classic Corner', 'X-ray lab', and several 'ProOne' and 'ProMax' units. The main area shows a table of 'Recent Images' for the selected unit, with a diagram of the X-ray unit to the right.

Date	Time	Image type
15.3.2016	9:56	Panoramic interproximal
15.3.2016	9:54	TMJ double lateral
15.3.2016	9:52	Panoramic bitewing
15.3.2016	9:50	Panoramic bitewing
15.3.2016	9:48	Panoramic standard
15.3.2016	9:44	Panoramic standard
15.3.2016	9:40	Panoramic standard

This view provides a detailed look at the monitoring interface for 'ProOne\_1 - ProOne'. It features a title bar, a subtitle indicating the program, and a table of recent images. A diagram of the X-ray unit is positioned to the right of the table.

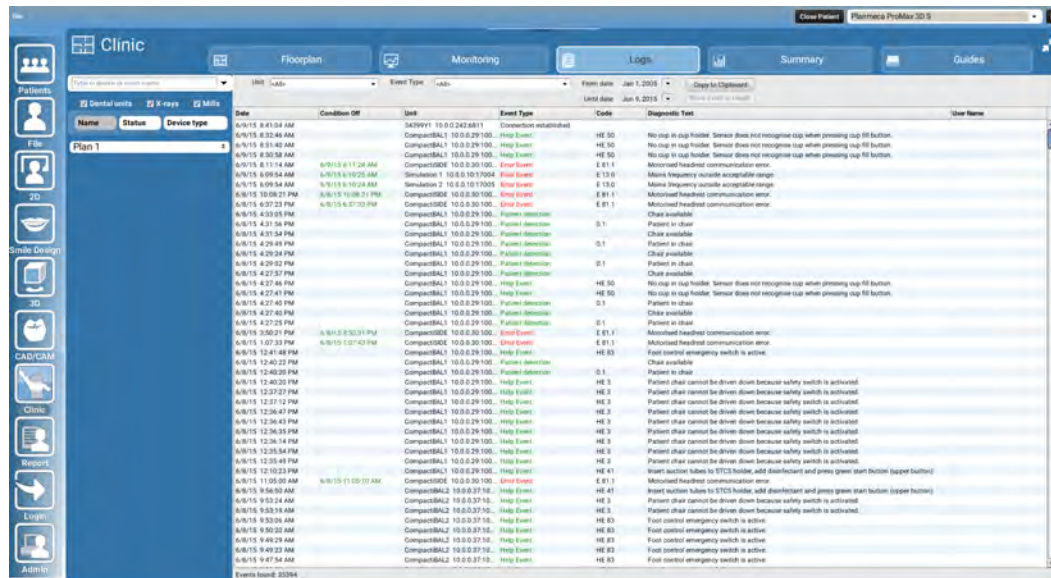
Date	Time	Image type
15.3.2016	9:56	Panoramic interproximal
15.3.2016	9:54	TMJ double lateral
15.3.2016	9:52	Panoramic bitewing
15.3.2016	9:50	Panoramic bitewing
15.3.2016	9:48	Panoramic standard
15.3.2016	9:44	Panoramic standard
15.3.2016	9:40	Panoramic standard



## 2.4 Logs

The *Log* records and displays the unit status and events with detailed error and help descriptions and codes. The log can be used to monitor and diagnose unit events. The event history can also be reviewed.

Monitoring can be done remotely off-site or on-site when applicable.

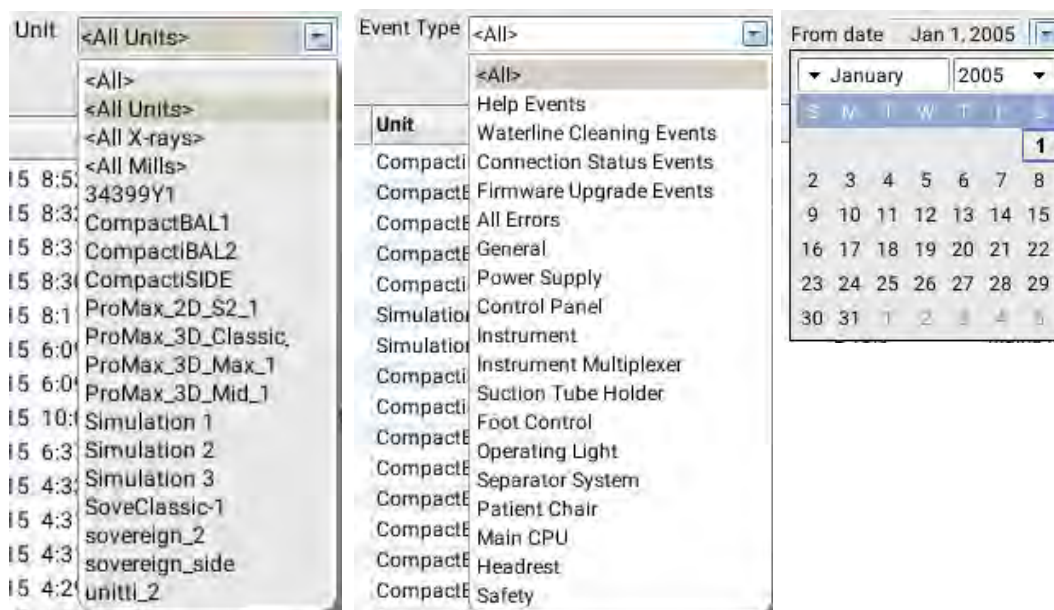


### 2.4.1 Reviewing unit events

The events can be viewed by unit, type of events, or according to a certain time period.

Click on the appropriate drop-down menu and select the desired criterion.

To display all unit events in real time select **<All>** with current date.



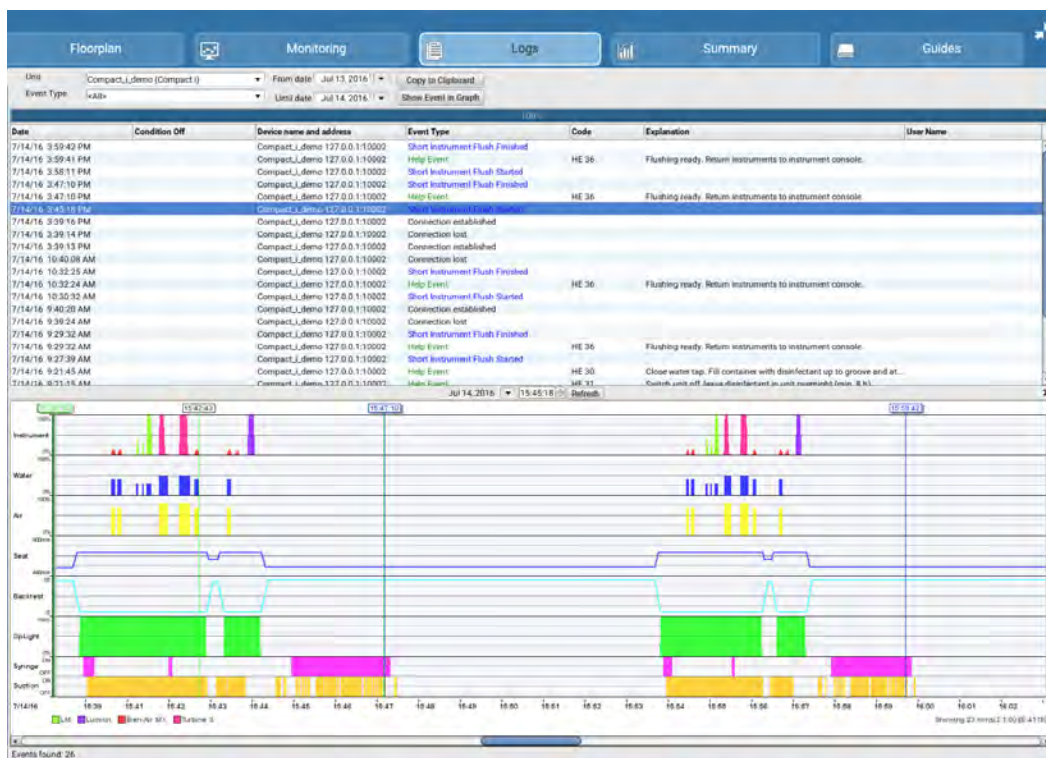
To forward warning messages via e-mail see section *E-mail notification* in the Planmeca Romexis technical manual (10037884).

To copy and send a report forward click the **Copy to clipboard** button. You can now send the report by e-mail for example.



To view an error in its context of use, select an event and click the **Show event in graph** button.

In front of the selected event a history graph of the unit is shown which can be used for troubleshooting. The history graph shows the context of use at the time the error occurred.



## 2.4.2 Viewing imaging parameters

Double-click on the imaging event of which imaging parameters you want to view.

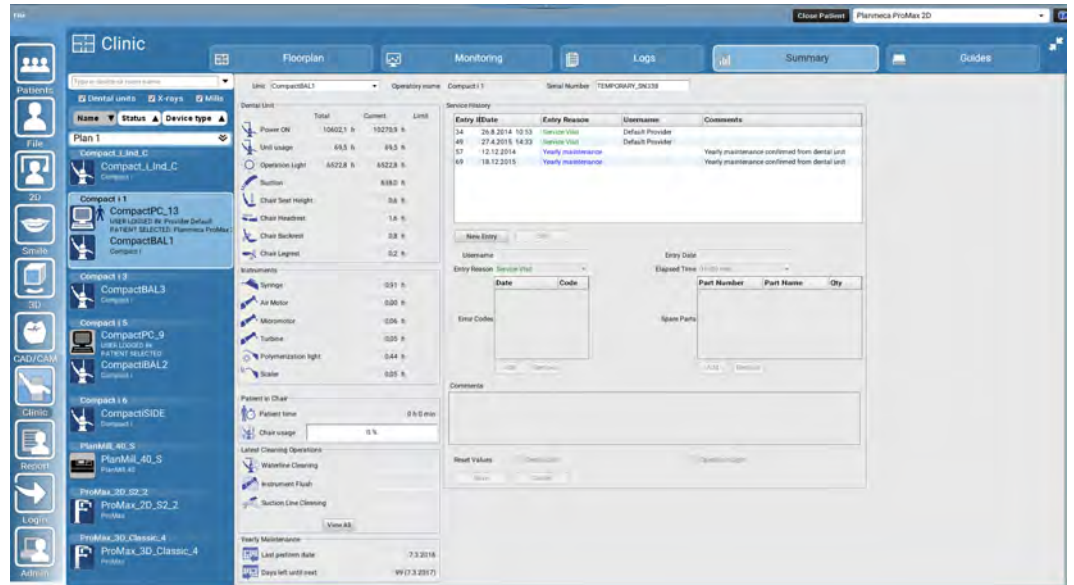
9/1/16 4:59:47 PM	ProMax_3D_Max_1 10.0.1.254:12345	Imaging Event	3D tooth image taken.
9/1/16 4:57:38 PM	ProMax_3D_Max_1 10.0.1.254:12345	Imaging Event	Panoramic image taken.
9/1/16 4:54:20 PM	ProMax_3D_Max_1 10.0.1.254:12345	Imaging Event	Panoramic image taken.
9/1/16 4:49:20 PM	ProMax_3D_Classic_1 10.0.1.214:12...	Imaging Event	3D teeth image taken.
9/1/16 4:46:50 PM	ProMax_3D_Classic_1 10.0.1.214:12...	Imaging Event	3D double scan image taken.
9/1/16 4:43:51 PM	ProMax_3D_Classic_1 10.0.1.214:12...	Imaging Event	3D teeth image taken.

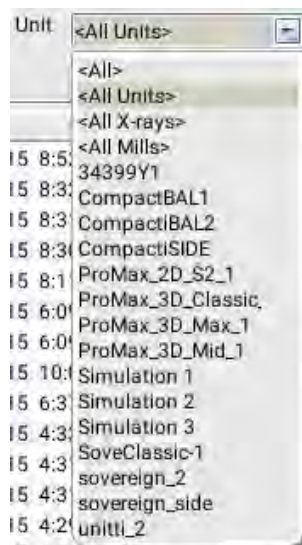
Imaging parameters	
Imaging type	Panoramic
Target/Program	standard
kV	84.0
mA	11.0
Patient size	XL
DAP (mGy*cm <sup>2</sup> )	71.9
Jaw shape	Square
Jaw size	L

## 2.5 Summary

The *Summary* view provides information on the unit's usage and maintenance.



To view the summary select the unit for which you want to view the summary for.



## 2.5.1 Dental units

### Dental unit







- The *Total* column indicates the total usage time.
- The *Current* column indicates the number of usage hours after the last reset (usually annual maintenance or lamp change). Usage time is shown for:
  - Power on
  - Unit usage
  - Operating light
  - Suction
  - Chair seat height
  - Chair headrest (or Motorised headrest)
  - Chair Backrest
  - Chair Legrest
- The *Limit* column shows the time until the preset alert limit. The limit can be set in the Admin module, see Planmeca Romexis technical manual (10037884) for more information.

Dental Unit		Total	Current	Limit
	Power ON	10602,1 h	10270,9 h	
	Unit usage	69,5 h	69,5 h	
	Operation Light	6522,8 h	6522,8 h	
	Suction		638,0 h	
	Chair Seat Height		0,6 h	
	Chair Headrest		1,6 h	
	Chair Backrest		0,8 h	
	Chair Legrest		0,2 h	



## Instruments

The instruments section shows the total usage hours for different dental unit instruments.

Instruments	
 Syringe	0,91 h
 Air Motor	0,00 h
 Micromotor	0,06 h
 Turbine	0,05 h
 Polymerization light	0,44 h
 Scaler	0,05 h

## Patient in chair

This section shows the total time spent with patient and chair usage. The chair usage is the time spent for the actual treatment of the total patient time.


Patient in Chair	
 Patient time	39 h 4 min
 Chair usage	32 %

## Latest cleaning procedures

Based on real-time data collected on unit usage, a full history of the unit's cleaning procedures is recorded and can be reviewed. Entries of the latest cleaning procedures are shown for:

- Planmeca Waterline Cleaning System (disinfection)
- Instrument flushing (water)
- Suction line cleaning

To display the full history of the cleaning procedures listed in the *Logs* click **View All**.

Latest Cleaning Operations	
 Waterline Cleaning	3/5/15 3:20 PM
 Instrument Flush	6/22/15 3:12 PM
 Suction Line Cleaning	3/5/15 3:19 PM

[View All](#)

## Yearly maintenance

The date of the yearly maintenance confirmed on the dental unit as well as the number of days left to the next yearly maintenance is shown in this field.

The screenshot shows a window titled "Yearly Maintenance" with two input fields. The first field, "Last perform date", contains the text "6/2/15 11:12 AM". The second field, "Days left until next", contains the number "215".

## Service history

The *Service history* shows a list of recent maintenance procedures and a form for entering new maintenance records or for reviewing the previous records.

The screenshot shows a window titled "Service History" containing a table of entries and a form for adding new entries.

Entry ID	Date	Entry Reason	Username	Comments
34	8/26/14 10:53 AM	Service Visit	Default Provider	
49	4/27/15 2:33 PM	Service Visit	Default Provider	
57	12/12/14	Yearly maintenance		Yearly maintenance confirmed from dental unit

Below the table are buttons for "New Entry" and "Edit". The form includes fields for "Username", "Entry Date", "Entry Reason" (set to "Service Visit"), "Elapsed Time" (0 h:00 min), "Error Codes" (with "Date" and "Code" sub-fields), and "Spare Parts" (with "Part Number", "Part Name", and "Qty" sub-fields). There are "Add" and "Remove" buttons for both Error Codes and Spare Parts. A "Comments" text area is also present. At the bottom, there are "Reset Values", "Dental Unit", and "Operation Light" checkboxes, and "Save" and "Cancel" buttons.

The following information is recorded from a service visit:

- Entry ID (for quick reference)
- Date
- Entry reason (the reason for visit)

*Service visit* - a scheduled visit such as annual maintenance.

*Unscheduled service visit* - A non-scheduled visit that may have caused unscheduled downtime. Possibly caused by an unexpected lamp failure or similar.

*User guidance visit* - a visit is required to instruct the user in proper use or maintenance of the unit.

*Remote service* - recorded when a technical problem can be solved without visiting the clinic, for example by adjusting service modes remotely.

*Remote user guidance* - used for example when the user can be remotely instructed on the phone on the proper use of the unit by referring to the recorded history information.

- User name

The name of the person who provided the service (automatically records the currently logged in user)

- Comments

To provide more details and to assist in later maintenance visits.

To view the existing entries select them from the *Service History* list, which automatically updates the recorded values onto the form.

To record a new entry, click on **New entry**.

To edit an existing record, click the **Edit** button.

- Error codes

Error events that the service entry negates can be selected from the list of all errors. Click the **Add** and **Remove** buttons to modify the list. Once negated the errors no longer show in *Diagnostic Log*.

Date	Code
12.11.2007 16:20	36.2
12.11.2007 16:20	36.2

- Elapsed time

For recording the time consumed on the service operation.

- Spare parts

A list of components used. Part number, part name and quantity can be recorded as listed in Planmeca's spare part manuals, for example.

- Comments

For explaining, for example, the steps taken during the maintenance.

- Reset Values

Set a service point to reset the unit's summary counter values. Use these options after servicing a part or the unit. The options can be changed at a later point in case an erroneous recording was made. These settings only affect the display of summary values and they do not affect the data stored into the database, which remains fully available for reporting.

Unit - resets the unit counter when, for example, annual maintenance is done.

Operating light - resets the operating light counter when the lamp is changed.

## 2.5.2 Planmeca ProMax x-ray units

### ProMax configuration

To view configuration for specific unit select the unit from the drop-down menu.

Unit	ProMax_3D_Classic_1
ProMax Configuration	
ProMax Type	3D Classic
ProMax Software	3.7.0.59.b
ProTouch Software	3.7.0.59.b
Sensor Type	V2 ProFace
Cephalostat	Scanning
Panoramic	Available

### Imagings done

Shows the totals of different types of imagings.

Imagings done	
Panoramic	1558
Cephalostat	118
Tomographic	2
3D	709

### Calibration dates

Shows the latest calibration dates.

Calibration dates	
3D Beam Check	16.6.2015 15:56
3D Flat Field	16.6.2015 16:00
3D Geometry	17.6.2015 10:15
3D QA	5.6.2015 10:43
Panoramic Beam Check	16.6.2015 15:37
Panoramic Flat Field	16.6.2015 15:42
ProFace	16.6.2015 16:32

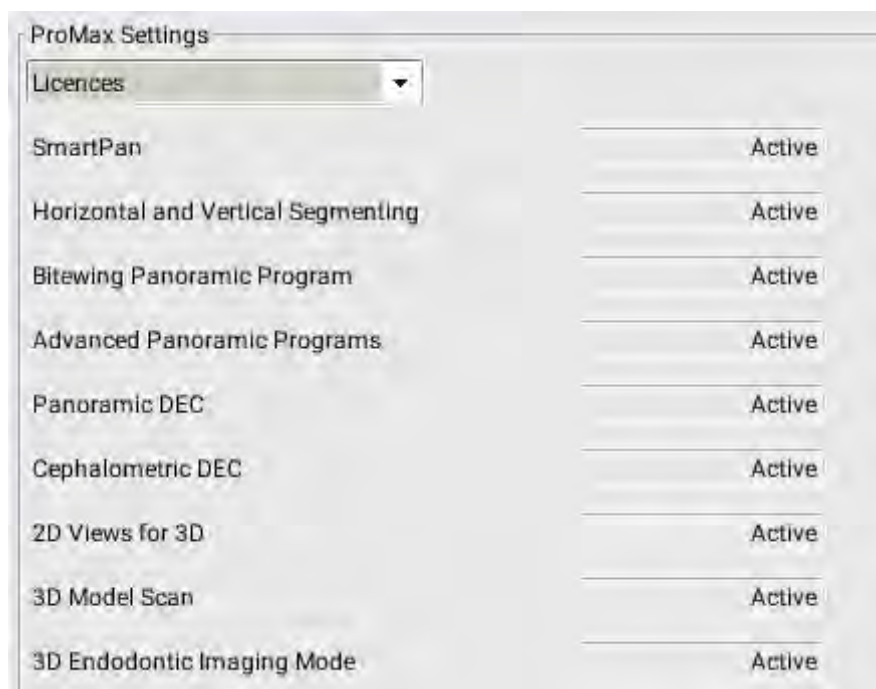
## Program features

Shows the currently selected program features.



## Licences

Shows the active and inactive licenses.



### 2.5.3 Planmeca ProOne x-ray units

#### ProOne configuration

To view configuration for specific unit select the unit from the drop-down menu.

ProOne configuration	
SW version	1.9.0.24.b
Sensor type	Dimax 4
PCB versions (CPU,PSU)	10,B7

#### Imagings done

Shows the totals of different types of imaging.

Imagings done	
Panoramic	338
TMJ	47
Sinus	21
Cross sections	31

#### Calibration dates

Shows the latest calibration dates.

Calibration dates	
Panoramic Beam Check	04/03/16 11:47
Panoramic Flat Field	21/01/16 08:38

#### Licences

Shows the active and inactive licences.

Device settings	
Licences	
Horizontal and Vertical Segmenting	Active
Advanced programs	Active
DEC	Active
Bitewing Panoramic Program	Inactive



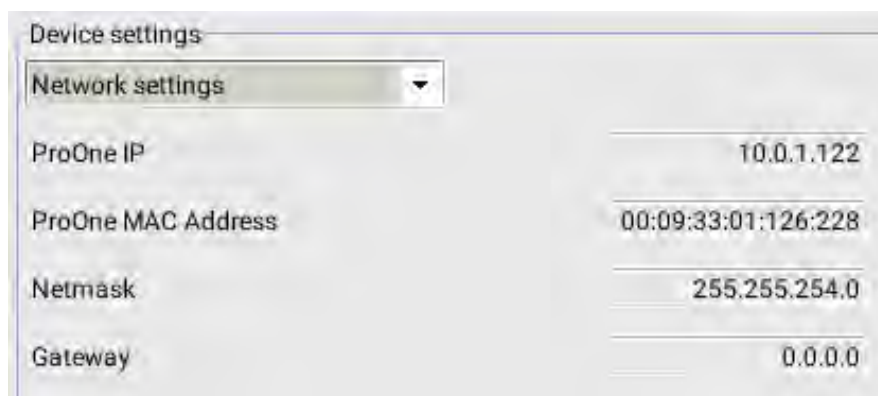
### Program presets

Shows the currently selected program features.



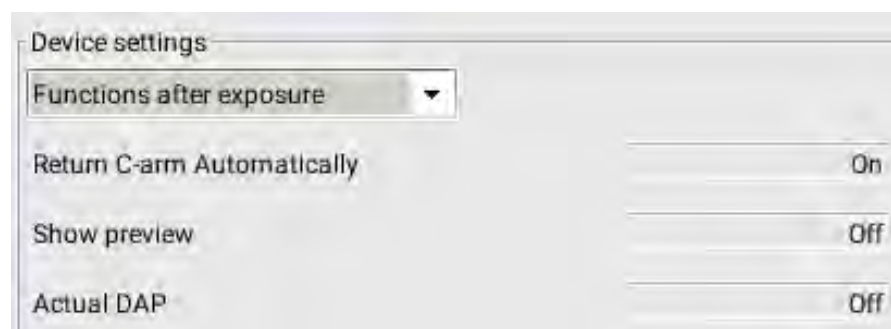
### Network settings

Shows the currently selected network settings.



### Functions after exposure

Shows which activities occurring after exposure are on/off.



## 2.5.4 Planmeca PlanMill 40 milling units

### PlanMill finished jobs

The number of finished milling jobs grouped according to the type of the job is shown.

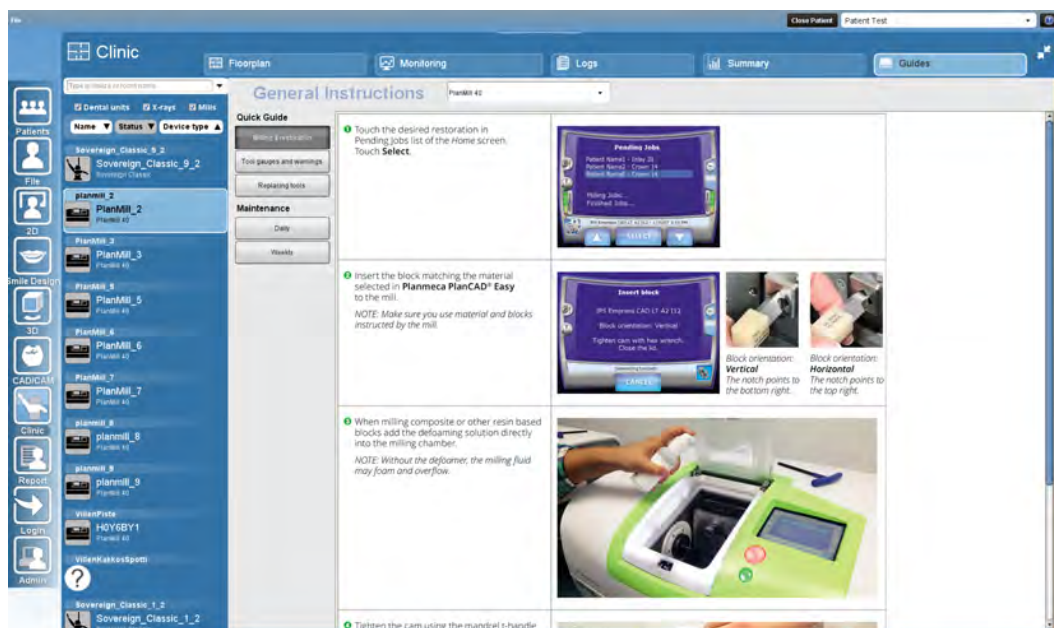
PlanMill Finished Jobs	
Crown	520 jobs
Inlay	85 jobs
Onlay	0 jobs
Veneer	7623 jobs
Bridges	0 jobs

### Service history

See section "Service history" on page 368 for detailed description.

## 2.6 Guides

The *Guides* tab provides instructions for general use and maintenance procedures.

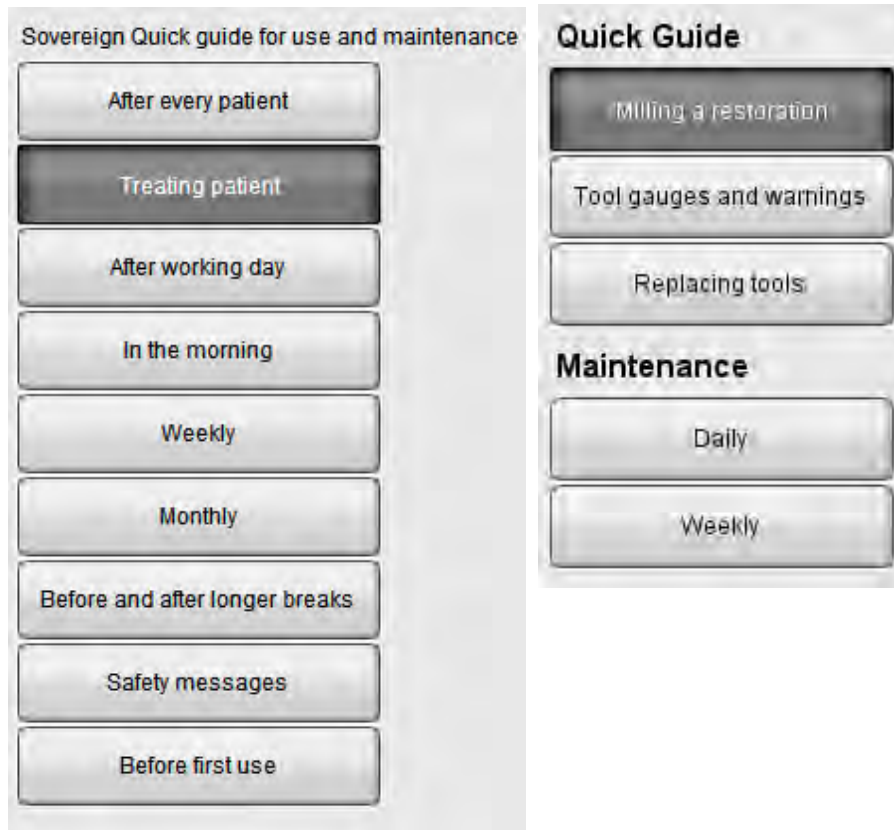


To display instructions on specific functions proceed as follows:

1. Select the unit from the drop-down menu.



2. From the list on the left select the instructions you want to view.

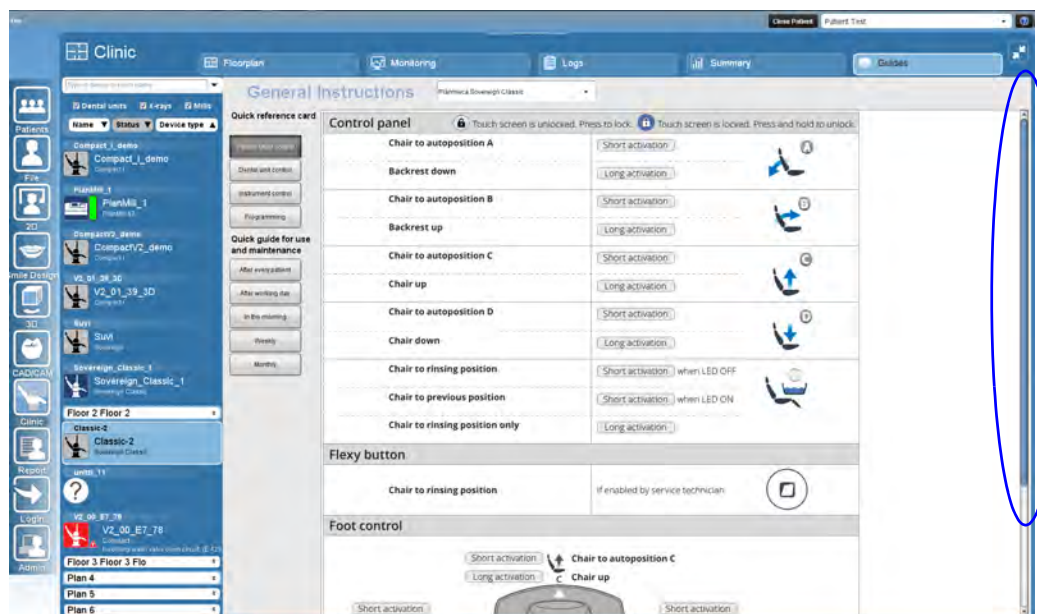


Instructions for dental units

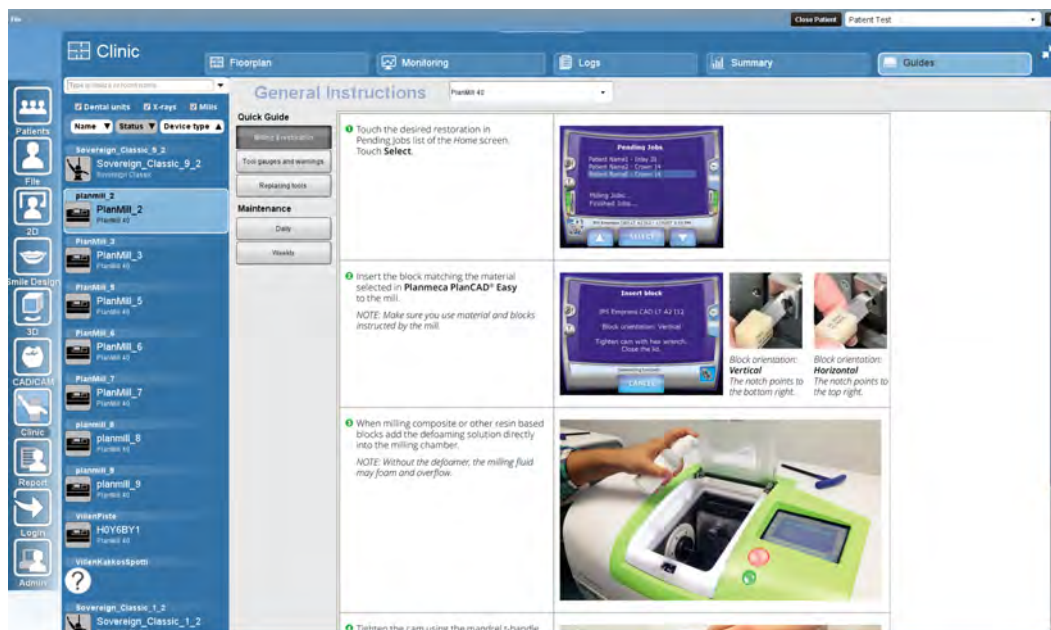
Instructions for milling unit

3. Scroll down the screen to read all of the instructions.

The quick guides for use and maintenance are currently available for Planmeca Compact i, Planmeca Compact i Touch, Planmeca Sovereign and Planmeca Sovereign Classic dental units:



and for Planmeca PlanMill 40 milling unit:

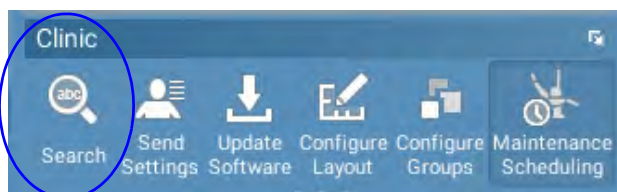


## 2.7 Searching users, patients, operatories and units

To search for a specific unit, operatory or user at the clinic you can use the **Search** feature on the *Clinic* toolbar.

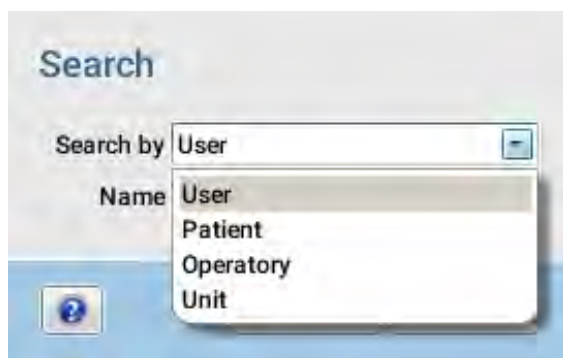
To access the toolbar move the mouse cursor to the top edge of the screen. The *Clinic* toolbar appears.

Click the **Search** button on the *Clinic* toolbar.



In the opening window select the appropriate search criterion (user, patient, operatory or unit) from the *Search by* drop-down menu.

Click **OK**.





To search by name type the name in the *Name* field or select **Provider default** from the drop-down menu.  
Click **OK**.



## 2.8 Viewing timed dental unit maintenance schedules

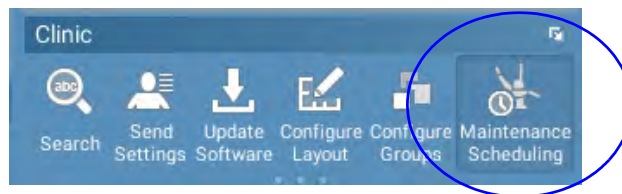
### NOTE

This feature is available for Planmeca Sovereign Classic dental units using software revision 1.7.0 or later.

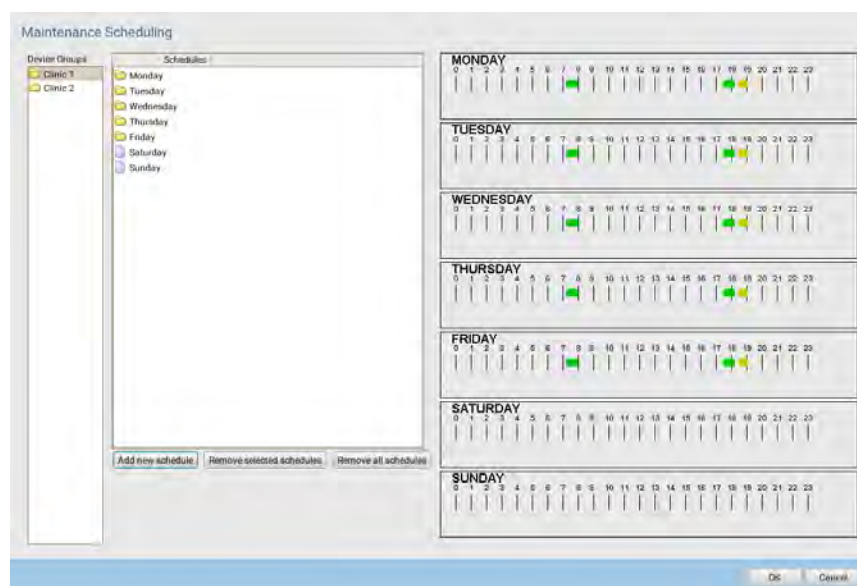
### NOTE

For instructions on how to edit the schedules see Planmeca Romexis technical manual (publication number 10037884).

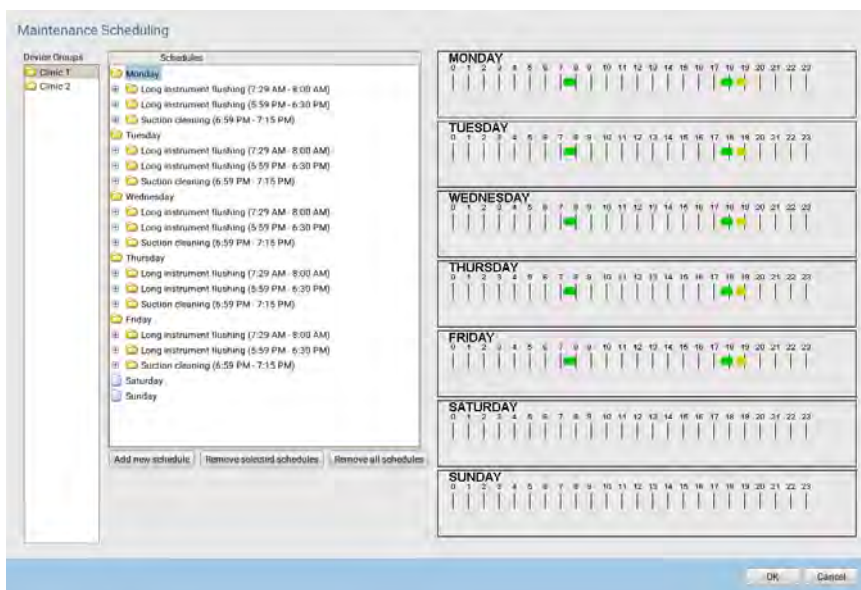
To check the current schedules for timed flushing and cleaning programs select **Maintenance Scheduling** from the *Clinic* toolbar on top of the screen



The programmed flushing and cleaning program schedules appear in weekly table.



To view more detailed information for each day double-click on the folders on the left.

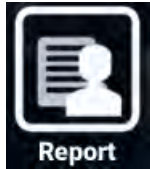


For more detailed information on Clinic toolbar functions (sending settings, updating software, configuring layout and groups and maintenance scheduling) see Planmeca Romexis Technical manual (10037884).



# Chapter H: REPORT MODULE

## 1 INTRODUCTION



The Report module enables to list several processes of Planmeca Romexis as a report. These reports contain direct links to images and patients as well as the possibility to print the report.

Image Link	Patient	ID	Age	Source	Taken By	kV	mA	s	mGy*cm2	Tooth Sites
Surface 20.10.2011 8:38	Doe John	53	39	ProFace						0
CBVT2D 28.10.2010 8:30	Doe John	53	39	DICOM	Provider Default	84	14	12.143		0
Photo 4.11.2014 17:55	Doe John	53	39	Imported	Provider Default					0
Surface 4.12.2014 13:11	Doe John	53	39	ProFace	Provider Default					0
Surface 4.12.2014 13:12	Doe John	53	39	ProFace	Provider Default					0
Photo 4.12.2014 13:25	Doe John	53	39	<invalid>						0
Photo 4.12.2014 13:26	Doe John	53	39	<invalid>						0
CBVT3D 28.10.2010 8:30	Doe John	53	39	DICOM	Provider Default	84	14	12.143		0
CBVT2D 7.2.2012 16:14	Dupont Laurianne	45	37	DICOM	Provider Default	90	12	12.279		0
Photo 4.12.2014 13:02	Dupont Laurianne	45	37	Imported	Provider Default					0
CBVT3D 19.9.2013 14:01	Johansson Pia	42	35	DICOM	Provider Default	96	1	5.838		0
CBVT2D 28.11.2012 13:43	Johansson Pia	42	35	DICOM	Provider Default	96	10	12.326		0
CBVT2D 28.11.2012 13:43	Johansson Pia	42	35	DICOM	Provider Default	96	10	12.326		0
CBVT3D 28.11.2012 13:43	Johansson Pia	42	35	DICOM	Provider Default	96	10	12.326		0
CBVT3D 9.1.2013 8:58	Johansson Pia	42	35	DICOM	Provider Default	96	10	15.417		0
CBVT3D 23.1.2013 10:38	Johansson Pia	42	35	DICOM	Provider Default	96	10	15.402		0
CBVT2D 26.7.2010 12:07	Johansson Pia	42	35	DICOM	Provider Default	96	11	8.635		0
CBVT3D 1.12.2010 10:53	Johansson Pia	42	35	DICOM	Provider Default	96	8	11.909		0
CBVT2D 29.10.2012 14:41	Johansson Pia	42	35	DICOM	Provider Default	96	11	12.437		0
Photo 4.12.2014 13:02	Johansson Pia	42	35	Imported	Provider Default					0
CBVT3D 29.10.2012 14:41	Johansson Pia	42	35	DICOM	Provider Default	96	11	12.437		0
Pan 19.12.2013 13:05	Moore Amanda	41	24	DICOM	Provider Default	65	8	18.879		0
Pan 19.12.2013 13:05	Moore Amanda	41	24	DICOM	Provider Default	65	8	18.879		0
Pan 19.12.2013 13:05	Moore Amanda	41	24	DICOM	Provider Default	65	8	18.879		0
Intra 19.10.2010 16:27	Moore Amanda	41	24	DICOM	Provider Default					4
CBVT2D 11.3.2010 13:27	Moore Amanda	41	24	DICOM	Provider Default	84	14	12.157		0
CBVT2D 11.3.2010 13:27	Moore Amanda	41	24	DICOM	Provider Default	84	14	12.157		0
CBVT2D 11.3.2010 13:27	Moore Amanda	41	24	DICOM	Provider Default	84	14	12.157		0
Ceph 22.5.2012 15:50	Moore Amanda	41	24	Imported	Provider Default					0
Photo 4.12.2014 13:02	Moore Amanda	41	24	Imported	Provider Default					0

Report Summary

Image Link Count									mGy*cm2 S
240									0,00

The following reports can be created:

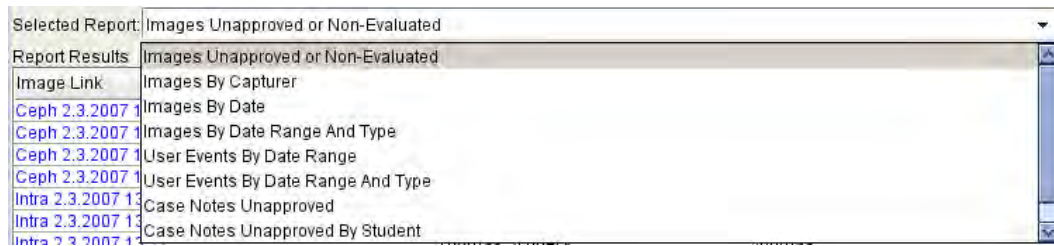
1. Images by capturer
2. Images by date range and type
3. User events by date range and type
4. X-ray log book sorted by patient
5. X-ray log book with original exposures
6. DICOM status report
7. ProScanner images by plate serial number



## 2 GENERATING REPORTS

**Generate**

Select one report mode from the drop down menu and press the **Generate** button.



Perform your selection and click *OK*. The selected report mode will be displayed.

### 2.1 Image link

**Open Link(s)**

To view one of the listed images, double-click on the blue image name in the left column (Image Link) or select the image or several images by holding down control, and press the **Open Link(s)** button. The Image View tab opens and the selected image(s) is shown.

Image Link	Provider	Username	Patient Name	Patient Ext ID
<a href="#">Ceph 2.3.2007 15:13</a>	Thomas Schneck	thomas	Frisch Max	7636
<a href="#">Ceph 2.3.2007 15:21</a>	Thomas Schneck	thomas	Frisch Max	7636
<a href="#">Ceph 2.3.2007 16:13</a>	Thomas Schneck	thomas	Frisch Max	7636
<a href="#">Ceph 2.3.2007 16:20</a>	Thomas Schneck	thomas	Frisch Max	7636

### 2.2 Patient link

By double-clicking on a red patient name, a patient file can be opened directly for further processing.

Patient Name
Frisch Max
Frisch Max
Frisch Max
Frisch Max
...

### 2.3 Refresh

**Refresh**

The Refresh button updates the current report on the screen.

### 2.4 Print

**Print**

Reports can be printed with the button. Open the report you want to print and click the *Print* button. The preview window appears and the report is printed according to the layout on the screen.

### 3 IMAGE VIEW



The *Image View* tab displays images opened from the report in the *Report Generation* tab. Each open image has its own horizontal toolbar above the image. These viewing and processing tools affect only that respective image. As images are viewed *Read Only*, no changes will be saved.



Prev Image

#### Prev Image

Opens the previous image in the report list.

Next Image

#### Next image

Opens the next image in the report list.

Open Copy

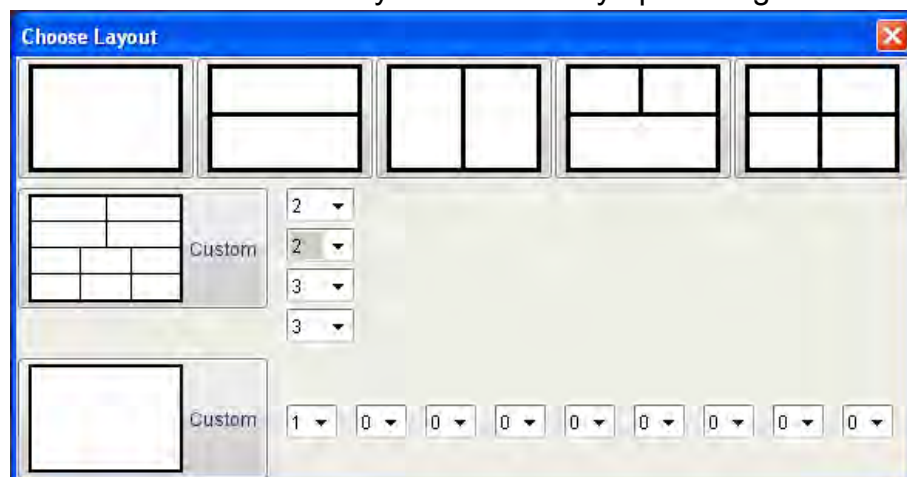
#### Open copy

Opens an exact copy of the current image for further processing.

Set Layout

#### Set layout

Allows to choose a new layout for currently open images.

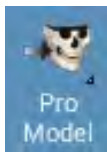


# Appendix A: ORDER SERVICES

---

## A.1 PLANMECA PROMODEL

Planmeca ProModel is a patient specific physical model to be used as an assisting tool for preoperative planning of dental and maxillo-facial procedures. It is designed to be used with the original 3D volume acquired with ProMax 3D. The model should not be used as the only tool for planning procedures. In no circumstances ProModel can be used in vivo. Planmeca ProModel order button is enabled by default.



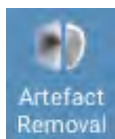
### NOTE

User must have administrator rights in Planmeca Romexis to disable (or enable) Planmeca ProModel ordering, see section "LOCAL SETTINGS" in the Planmeca Romexis technical manual (10037884).

### A.1.1 Placing an order

### NOTE

In case of artifacts caused by high-density objects, such as amalgam or other metallic bodies use the artifact removal tool before placing Planmeca ProModel order.



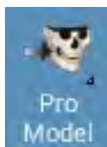
### NOTE

Planmeca ProModel is not autoclavable and it is not recommended to use liquid disinfectants.

### NOTE

In case you need separate models for mandible and maxilla take 3D exposure with a mouthpiece on.

1. Open the volume of which you would like to create the model from the *Explorer* sub-module.
2. Click the **ProModel** button.



The Planmecca ProModel order form opens.

**PLANMECA**  
ProModel

Order Form

Order Planmecca ProModel from the current volume  
 Send current volume to Planmecca for troubleshooting ONLY

Title

**First Name**  **Last Name**

**Company**

**Address**

**Postcode**  **City**

State

**Country** CANADA

**Email**

Tele  Fax

**ProModel ID** 258369

Comments

**Reference**

Price Information   Invoiced through your local Planmecca Dealer  
 UPS Cash On Delivery/Exchange Collect

Same Address for Delivery and Billing   
 Different Address for Delivery and Billing

Include Nerves and Implants  
 By selecting this box, I agree to these [Terms And Conditions](#)

3. Enter the necessary information.

The obligatory fields are marked in bold.

The order confirmation will be sent to the user by e-mail, please give a valid email address.

- ProModel ID

The ID will be printed on the ProModel. The software automatically uses the Person ID of the patient. The default ID automatically generated by Planmecca Romexis can be in text, number or special character format and can be freely modified.

- Reference

Used for order processing.

The optional fields and buttons include:

- Comments

You can use the Comments field is for special requests, e.g. if you would like to order the model in other than the default (white) colour. If you would like to have the ROI marked in the model or give a notice to Planmeca concerning the volume you can write it down in the comments.

- Reference

Used for order processing.

- Price list

By clicking this button a ProModel price list opens in your default web browser. If your computer is not online clicking the button gives the URL of the price list in your default web browser. The prices in the list are recommended prices. For further information contact your local Planmeca dealer.

- Include nerves and Implants check box.

Select this option if you have drawn mandibular nerve or placed implants in the patient's data in Romexis. The colored nerve can be printed on the ProModel and the implants will be included as cylinder representations.

#### NOTE

For the nerves to show in the ready ProModel, the order must be placed from the 3D module's *Implants* sub-module.

- **Add billing address** button

If you have selected the option *Different Address for Delivery* instead of *Same address for Delivery and Billing* this button will be enabled.

To enter a different address for billing click the **Add billing address** button.



The screenshot shows a dialog box titled "PLANMECA ProModel Billing Address". It contains several input fields: "Address" (two lines), "Postcode" and "City" (two separate fields), "State", "Country" (a dropdown menu currently showing "CANADA"), and "Reference". At the bottom left is a help icon (question mark in a circle), and at the bottom right are "Accept" and "Cancel" buttons.



- **Add dealer information button**

Enter the local Planmeca dealer information. The information is required for billing purposes. This information is filled by your local Planmeca dealer and it needs to be given once.

The screenshot shows a web form titled "PLANMECA ProModel Dealer Contact Info". The form contains the following fields:
 

- Company: [Text input]
- Contact Person: [Text input]
- Address: [Text input]
- Postcode: [Text input]
- City: [Text input]
- State: [Text input]
- Country: [Dropdown menu showing CANADA]
- Reference: [Text input]

 At the bottom right of the form, there are two buttons: "Accept" and "Cancel".

- By selecting this box, I agree to these Terms and Conditions check box  
To read the terms and conditions click the respective hyper link. This box must be checked before placing the order.
  - **Save this order form as a template button.**  
By selecting this option saving you do not need to refill all the required fields every time when placing an order.
4. After you have entered all necessary information click the **Continue** button.
  5. Select the appropriate ordering option.

### NOTE

**In all ordering options all personal information of the patient is removed from the 3D volume.**

The options include:

- **Send online**  
The image and order form are sent to Planmeca's FTP server. The computer needs to be online and possible firewall needs to be set to allow outgoing FTP-connections. Order confirmation and courier package tracking number will be sent to customer's email account
- **Burn to CD/DVD**  
The image and order are burned to CD or DVD which can be sent by mail to Planmeca.
- **Export to My Documents**

A zip-folder including the image and order form to user's My Documents folder (OS WinXP).



6. Click **Accept**.

## A.2 SURGIGUIDE® DRILL GUIDE ORDERING

After having finished the implant plan in Planmeca Romexis you can order a Surgiguide with



Planmeca Romexis ordering wizard.

1. To launch the order wizard click the **Order guide** button.
2. The following window opens

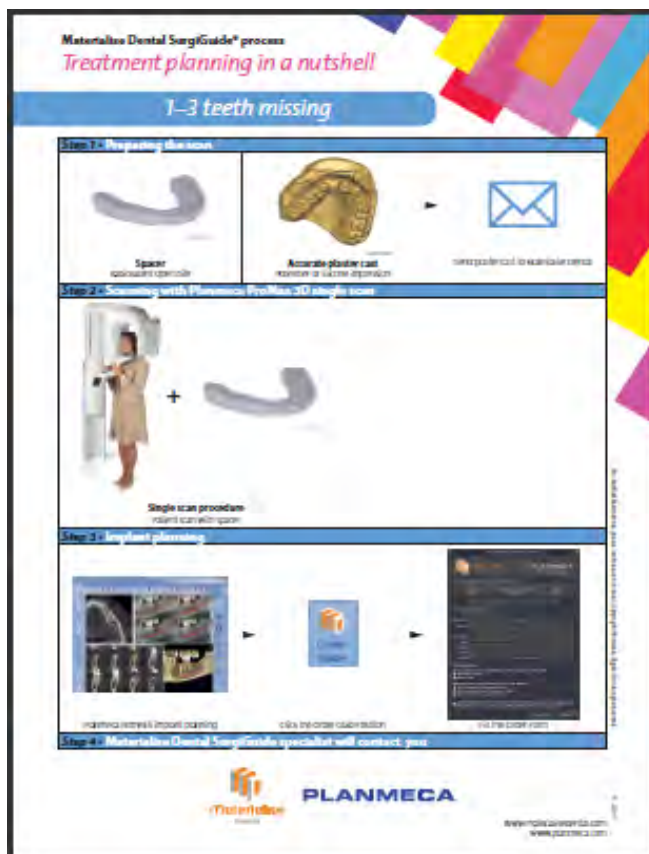
3. Fill in the order form.  
If necessary you can send plaster model with the order by selecting the correct ordering option.
4. When the order is completed click **Place order** button.
5. You will soon receive an automatic confirmation e-mail.
6. To complete the order send the e-mail to Materialise Dental Support Service.

**NOTE**

If a suitable internet connection is not available, the order can be saved to file and sent to Materialise Dental manually. In this case no automatic e-mail will be sent

Materialise Dental SurgiGuide® specialist will contact the customer to implement the guide design and discuss it with the customer.

After production the customer receives the SurgiGuide® ready for use in surgery via their Materialise Dental distributor.



## A.3 3D DIAGNOSTIX ORDER SERVICES

Planmeca Romexis users can send their CBCT data, implant planning and Planmeca ProMax 3D scanned impression in STL format to 3D Diagnostix for ordering surgical guides. In addition CBCT volumes can be sent for radiological interpretation. The volumes are read by 3D Diagnostix's board certified radiologists for a variety of diagnostic objectives such as pathology findings, implant planning, existing implant evaluation, sinus evaluation and TMJ analysis.

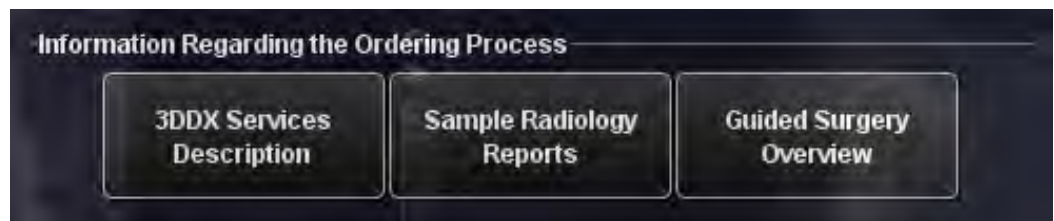
The 3D Diagnostix order Services button can be enabled in the **Admin** module, see section "LOCAL SETTINGS" in the Planmeca Romexis technical manual (10037884).

### A.3.1 Radiology report order

1. Open the CBCT volume to which you want to order the radiology report.
2. Start the 3D DX Order Services by clicking this button.



To view examples of ordering processes click these buttons.



3. Enter your contact information and select the necessary options from the list of order options:
  - Rule out pathology
  - Implant planned
  - Evaluate existing implant
  - Sinus evaluation
  - TMJ evaluation

If necessary you can enter comments or additional information.

4. After entering all necessary information click the **Place order** button.

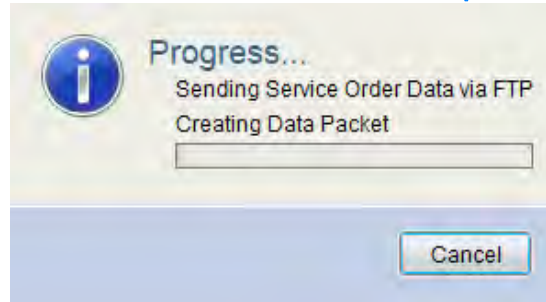
The following window opens.



5. When ordering TMJ evaluation make sure that you include both open and closed TMJ images in the order. Add second volume to the order by clicking the **Add additional datasets to order** button.
6. Select whether to send your order online or save the order in a file.
7. Place the order by clicking **Accept**.  
The order will now be sent to 3D Diagnostix FTP site.

**NOTE**

**Do not close Romexis until the upload has completed.**

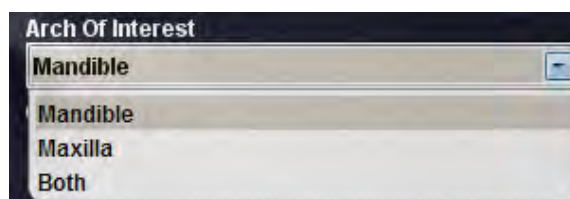
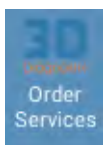
**NOTE**

**If internet connection is not available, the order can be saved to file and sent to 3D Diagnostix manually.**

8. Once the order is ready 3D Diagnostix will send you an email with directions on how to download the ready report in PDF.
9. To download the report, log on to 3D Diagnostix's online management system and update your billing information.

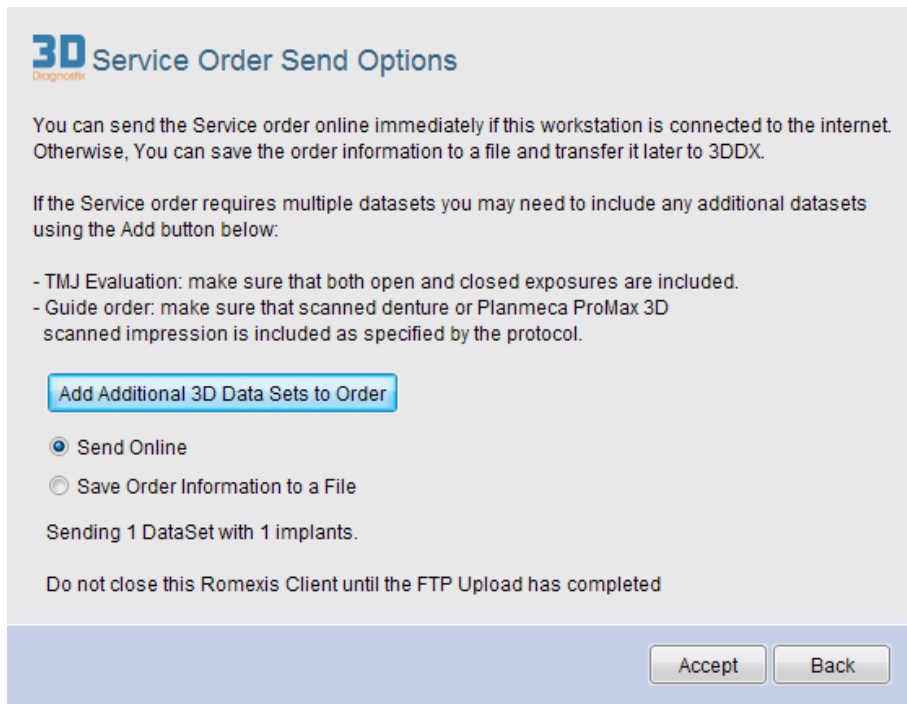
### A.3.2 Treatment plan and guide order

1. When required, create scan denture, bite registration etc. For more information on the required actions, Guided surgery overview and Service description can be found in Romexis.
2. Scan with Planmeca ProMax 3D unit, dual or single scan.
3. When required, send traditional plaster cast to 3D Diagnostix. Alternatively you can scan the impression with Planmeca ProMax 3D Model Scan program and add it to the order in step 9.
4. Create implant plan
5. Start the 3D Diagnostix Order Services by clicking this button.
6. Fill in the order form.
7. Select the arch(es) of interest from the respective drop-down menu.



8. Click **Place Order** button.

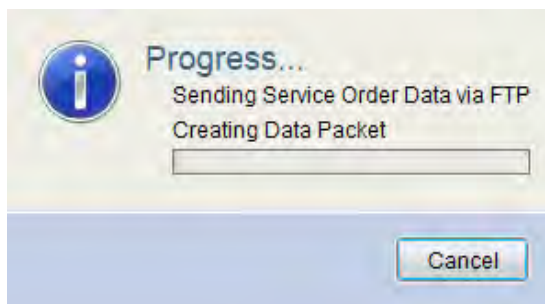
9. If required, attach the scanned denture or the 3D scanned impression to the order by clicking **Add additional 3D data sets to the order**.
10. Place the order by clicking **Accept**.



The order will now be sent to 3D Diagnostix FTP site.

#### NOTE

Do not close Romexis until the upload has completed.



#### NOTE

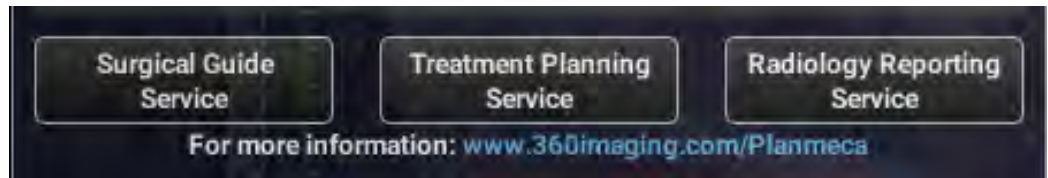
If internet connection is not available, the order can be saved to file and sent to 3D Diagnostix manually.

The specialist from 3D Diagnostix will contact you for an online case review to fine-tune and approve the optimized plan. Once you have accepted the plan you will receive the guide ready for surgery.

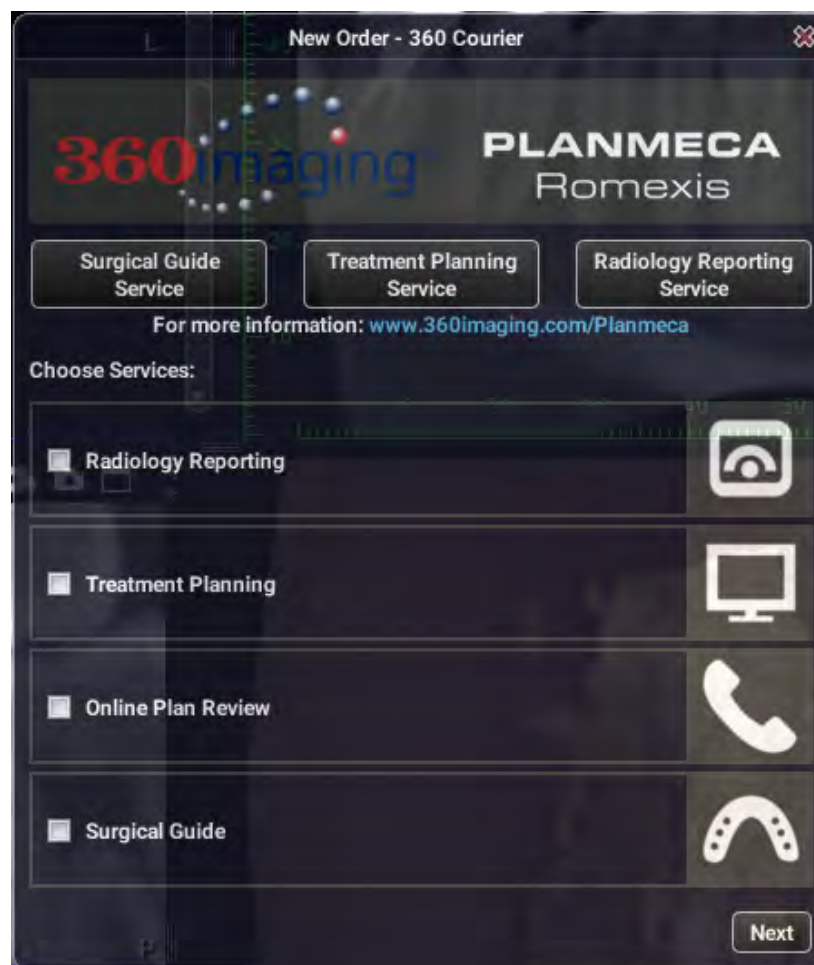
## A.4 360 IMAGING ORDER SERVICES



1. Click on this button.
2. In the following dialog select the appropriate services  
To view examples of ordering processes click these buttons.



3. Select the desired services and click **Next**.



4. Select the appropriate sending options and click **Accept**.



# Appendix B: PLANMECA ROMEXIS VIEWER

The Planmeca Romexis Viewer can be distributed freely with images taken using Planmeca equipment. It can be used for sending images for referral in case the user does not have the full Planmeca Romexis license.

The Viewer can be used to measure images while taking new exposures, however saving changes or measurements is not possible. Also printing is more basic compared to the full software. The 2D files in DICOM format, 3D files in DICOM MultiFrame and DICOMDir filesets can be opened in Planmeca Romexis Viewer.

The features in Planmeca Romexis Viewer are limited compared to the full version. For example if the Planmeca Romexis has been used to export the viewer with *implants view* enabled, the view will also be available in the Viewer except for saving.

Patient	Date	Type
✓ Doe John	28.10.2010	3D CBCT
✓ Doe John	22.02.2013	Intraoral
✓ Doe John	22.02.2013	Panoramic
✓ Doe John	16.05.2016	Photo
✓ Doe John	13.09.2016	Photo

Drop image file or directory here or click

Add images

Install Start Viewer

www.planmeca.com

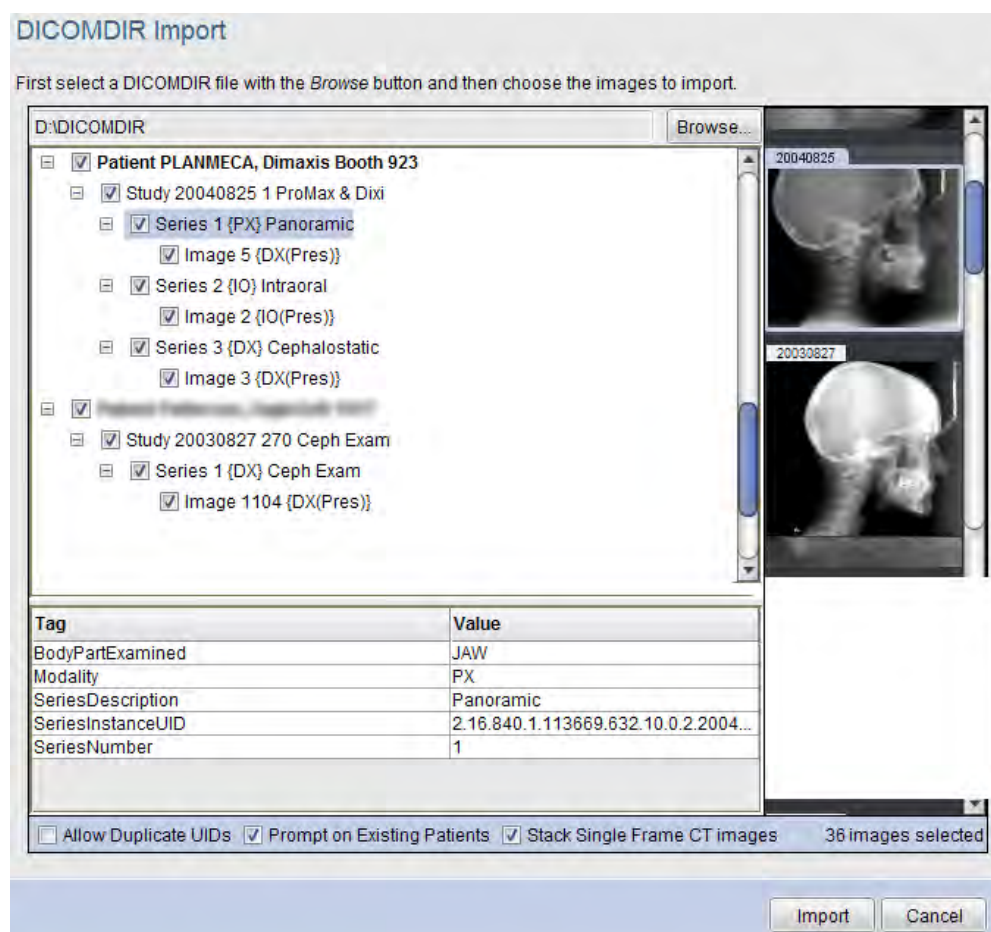
## B.1 OPENING IMAGES

Planmeca Romexis Viewer is most commonly exported from Planmeca Romexis accompanied with a DICOMDir fileset of patient's images. In this case the DICOMDir files are stored to the same folder with Planmeca Romexis Viewer. The images are automatically presented to the user when the Viewer is started and they can be selected for viewing. For 3D images no preview is available.

After selecting images and clicking *Import* the images will open in the image browser. To view 3D images go to the 3D module.

For more information on how to view and enhance 2D images see Chapter C: "2D IMAGING MODULE" on page 29.

Some features such as exposure, export, and DICOM are not available in Planmeca Romexis Viewer.



Planmeca Romexis Viewer can also be used to open single DICOM images or to open DICOMDir filesets outside the default Viewer folder.

To open a single DICOM image click the **DICOM import** button on the toolbar.

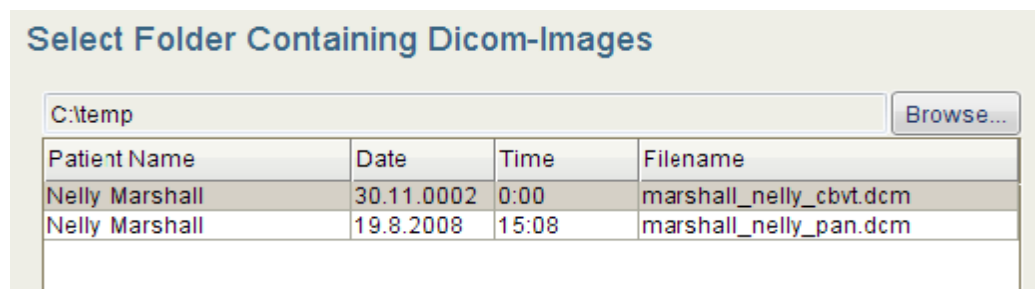


Alternatively *Open DICOM file* can be selected from the *File* menu.

Select the DICOM file to open in Planmeca Romexis.



Select the images you want to open from the list.



Please note that when a single DICOM image is opened any previously opened images will be closed.

To open a DICOMDir file click this button on the toolbar.

Alternatively you can select *Open DICOMDir* from the *File* menu.

Browse to the DICOMDir you wish to open and proceed with opening the DICOMDir as when starting the Planmeca Romexis Viewer.



## B.2 VIEWING 3D IMAGES



1. Click **3D** module button.
2. Click the *Volumes* sub-module.
3. Select the image you want to view.
4. Double-click the image or click **View**



You can switch between *Explorer*, *Panoramic* and *Cross Section / Implant* main views (when available).

For more information on how to view and enhance 3D images please see section Chapter E: “3D MODULE” on page 156.

### NOTE

Some features such as exposure, export, and DICOM are *not* available in Planmeca Romexis Viewer.

# Appendix C: MOBILE APPLICATIONS

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## C.1 PLANMECA mROMEXIS

The Planmeca mRomexis is a software intended for displaying and visualizing dental and medical 2D and 3D images from imaging devices, such as radiographs, CBCT images and photographs.

Planmeca mRomexis is compatible with iOs and Android tablets and web browsers.

### NOTE

Planmeca mRomexis software is not intended for diagnostic purposes.

To access the Planmeca mRomexis user's manual online go to <http://publications.planmeca.com/manuals/Digital/mRomexis/um/en/10037441.pdf>.

## C.2 PLANMECA iROMEXIS

### C.2.1 Introduction

Planmeca iRomexis is designed to work with Planmeca Romexis desktop software and it has an integrated 2D and 3D image viewer with 3D surface rendering. Images acquired using Planmeca Romexis desktop software can be accessed on the local network.

Planmeca iRomexis is compatible with Planmeca Romexis version 2.6.R or later. Planmeca iRomexis is available as a free download at Apple iTunes App Store.



Planmeca iRomexis is compatible with iOS7 on iPad.

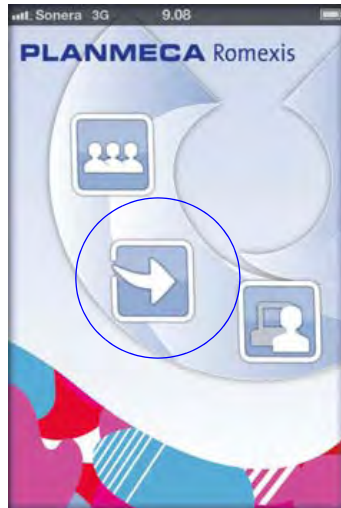
### NOTE

Please note that as a generic viewing application Planmeca iRomexis mobile application is not suited for diagnostic purposes. It is, however, an excellent tool for communicating a diagnosis made at Planmeca Romexis desktop workstation.

## C.2.2 Connecting Planmeca iRomexis to server

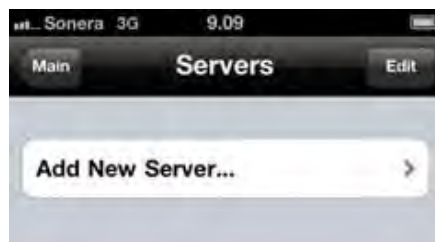
To search patients and view images on the local Planmeca Romexis server, a wifi connection to the server must be established. To establish a connection proceed as follows:

To access the Server configuration touch the Arrow button in the Planmeca iRomexis main menu.



### Adding a new server connection

1. Click on the **Add New Server** field.



2. In the *Add New Server* dialog enter the following information:
  - Server Name for Planmeca Romexis server connection
  - Planmeca Romexis Server IP Address
  - Login Name
  - Login Password



If you have multiple servers configured, you can set the respective Planmeca Romexis server as default.

It is possible to add multiple Planmeca Romexis server connections to the server list.

3. To test the server connection click on the **Test server connection** button\*.



#### NOTE

Make sure Fire wall does not block the connection to the port 8083 which is used for the communication to Planmeca Romexis server.

#### NOTE

Make sure Mobile server is enabled in the Planmeca Romexis Server. On how to enable the class server see section "Mobile server" in the Planmeca Romexis technical manual (10037884).

### C.2.3 Adjusting user interface and database settings



1. Click on the **Settings** button in the Planmeca iRomexis main window. The following settings can be configured:



- Show / Hide Image Dates
- Show / Hide image comments in the image list
- Store patients locally in the iRomexis
- Store images locally in the iRomexis
- Use black image background instead of grey one

**Delete all local data** (patient and image information in the Planmeca iRomexis).



## C.2.4 Viewing and browsing images



To view patients and images click on the *Patients* field in the Planmeca iRomexis main window.

### Viewing Images stored in the Planmeca iRomexis



In the Patients view, click on the *Local* tab to see the patients stored in Planmeca iRomexis database.

### Viewing images stored in the local Planmeca Romexis server

Click on the *Server* tab to see all patients on the connected Planmeca Romexis server.

In order to view patient's images, select a patient by clicking on the patient list => Patient data is transferred to iRomexis.

### Browsing images

After selecting a patient browse the image list by sliding the screen up and down with your finger.

### Opening images

To open an image click on the image thumbnail.

### Viewing images

Rotate the image by moving two fingers on a circular orbit on the screen.  
Zoom in / out by moving two fingers towards / away from each other on the screen.

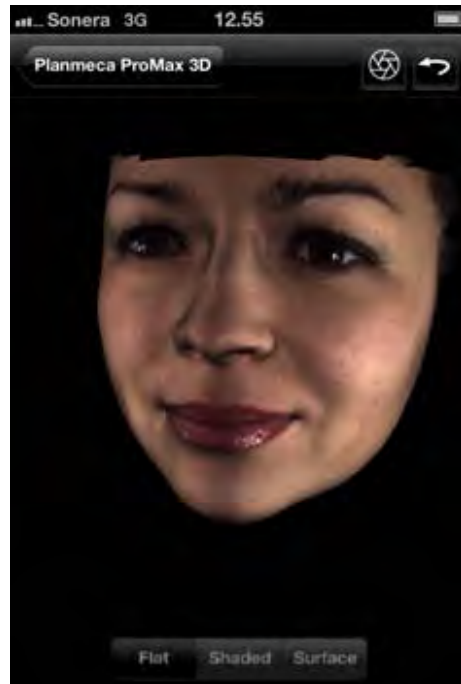


Browse through a 3D image stack by using the slider on the right side of the screen.





Change the rendering type for face images between **Flat**, **Shaded** and **Surface** at the bottom of the screen.



### C.2.5 Image processing tools



To store a snapshot of the current image to the camera roll [of the iPhone/iPad] click on the camera button.



To reset the image to its original state click on the Reset View button.



To make distance measurement on the image click on the Measure button. Touch the screen with two fingers at the same time and drag them to the end points of the desired measurement.

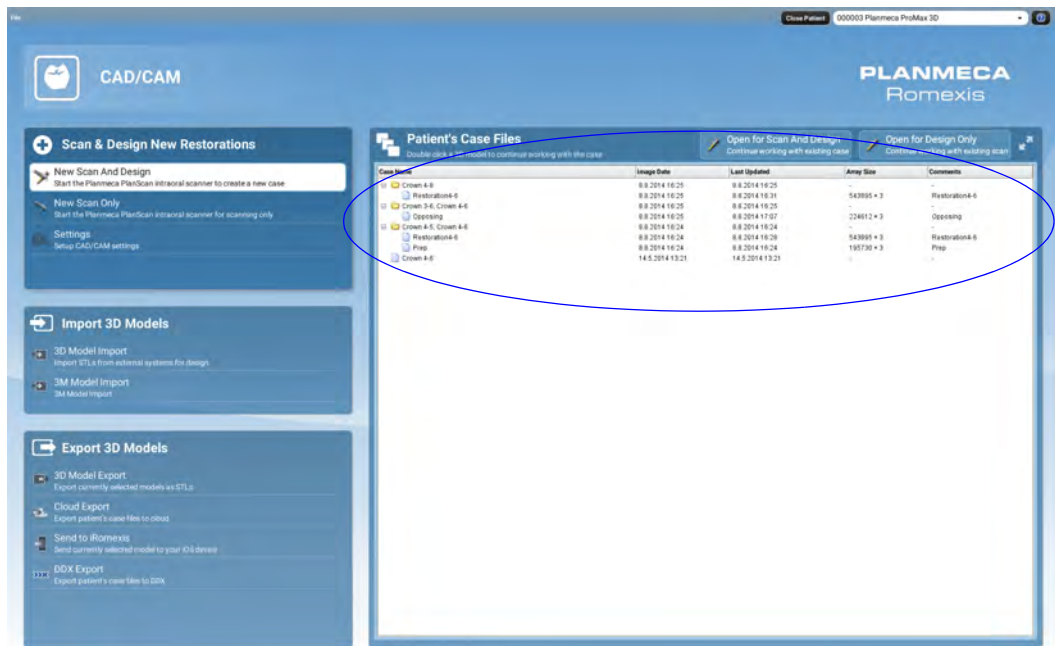


Click this button and move your finger up and down on the screen to adjust brightness and left and right to adjust contrast.

# Appendix D: DDX CLOUD

## D.1 Exporting to DDX Cloud

1. In the CAD/CAM module select the case to be exported to DDX cloud.

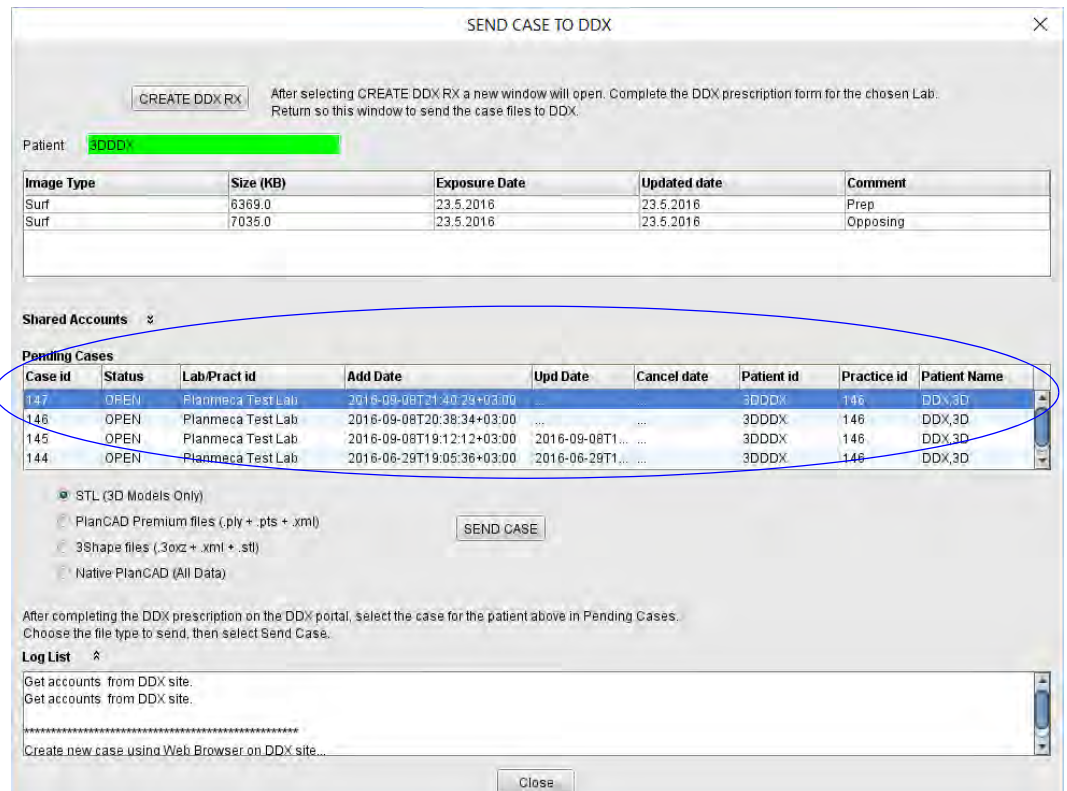


2. Click **DDX Export**.



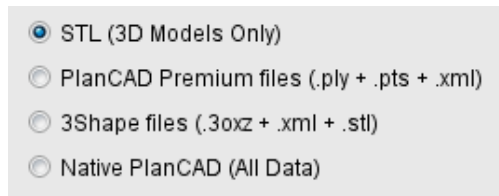
## D.1.1 Exporting existing cases

1. Select an existing case on the *Pending Cases* list.



The case automatically appears on the top of the pending cases list.

2. Select an appropriate export option.

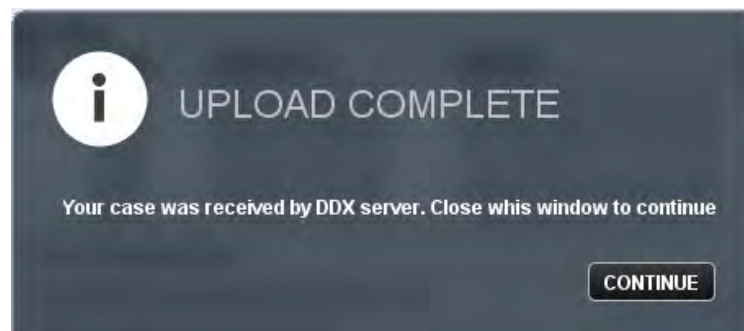


SEND CASE

3. Click the **Send case** button.

When the case has been successfully sent to DDX cloud the following notification appears.

4. Click **Continue**.



## D.1.2 Creating and exporting new cases

1. Create a new case by clicking the **CREATE DDX RX** button.

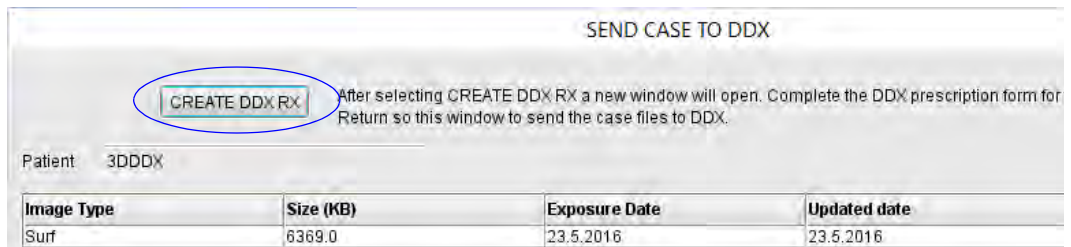
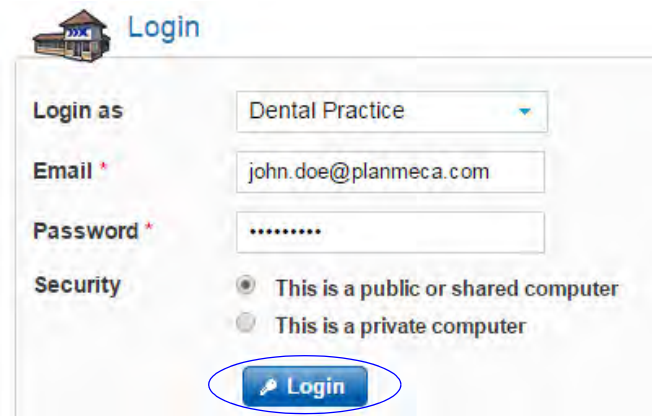
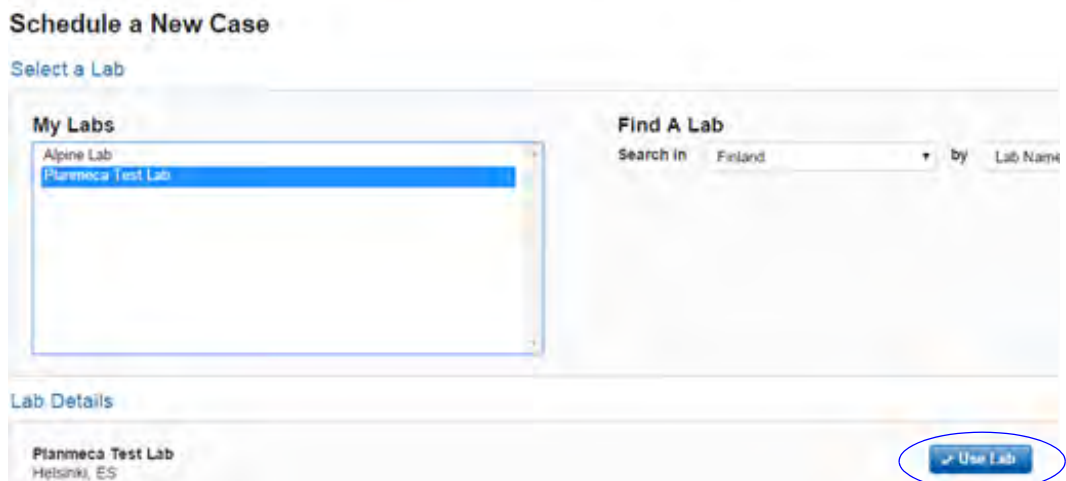


Image Type	Size (KB)	Exposure Date	Updated date
Surf	6369.0	23.5.2016	23.5.2016

2. In the following window click **Login**.



3. Select a lab from the list and click **Use Lab**.



4. Verify and if needed enter the necessary information.

5. Select **Submit the case**.

**Schedule a New Case**

**Patient Details**

First Name	<input type="text" value="3D Movement"/>	Gender	<input type="text"/>
Last Name *	<input type="text" value="Wkbk Ex"/>	Patient Chart	<input type="text" value="20140506_104017"/>
		Birth Date	<input type="text"/> <input type="button" value="M"/>

**Work Requested**

Send Date *	<input type="text" value="Oct 28, 2014"/> <input type="button" value="M"/>
Procedure *	<input type="text" value="Select Procedure"/> <input type="button" value="M"/>
<input type="button" value="+ Add Another Procedure"/>	

**Notes**

Try-in  Emerg.  Files

Tags

The case is now being uploaded to DDX Cloud.

**Case #87**

**New case received. Please print work authorization for this case and include it with your case materials.**

<b>Return Date:</b> Nov 10, 2014 <input type="button" value="M"/>	<b>Patient:</b> <a href="#">3D Movement Wkbk Ex</a> <input type="button" value="M"/>
<b>Send Date:</b> Oct 28, 2014	<b>Patient Appointment:</b> Not Entered
<b>Case Monitoring:</b> Not Following <input type="button" value="M"/>	<b>Status:</b> DDX Case in Progress



## D.2 Importing case from DDX Cloud

1. Log in to DDX Cloud as recipient and download the case

**Case #87**

**New case received. Please print work authorization for this case and include it with your case materials.**

**Return Date:**  
Nov 10, 2014

**Send Date:**  
Oct 28, 2014

**Case Monitoring:**  
Not Following

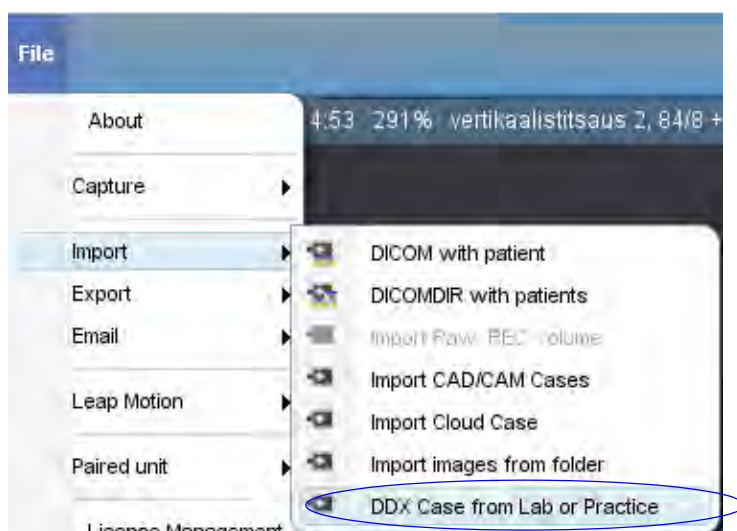
**Patient:**  
[3D Movement Wbkb Ex](#)

**Patient Appointment:**  
Not Entered

**Status:**  
DDX Case in Progress

The file is saved to your default download folder.

2. From the *File* menu select *Import > DDX Case from Lab or Practice*.



3. Select the case to be uploaded from the *OPEN Cases* list.

Import DDX Case

Registered Application Accounts									
id	Role	Reg Name	Name	Address	Zipcode	City	State	Country	Email
800064	LAB	Planmeca labr 1	Planmeca Test Lab	Asentajankatu 8	00880	Helsinki	ES	FI	...
146	PRACTICE	Planmeca Romexi...	Planmeca Software ...	Asentajankatu 8	00880	Helsinki	ES	FI	...
188	PRACTICE	Planmeca Romexis	Planmeca Testing	Asentajankatu 6	00620	Helsinki	ES	FI	...

OPEN Cases						
Case id	Patient Name	Appointment	Add Date	Upd Date	Lab/Pract Name	Lab/Pract id
100	Release Tests Romexis 4.0		2015-01-22T16:32:46...	2015-04-16T22:06:34...	Planmeca Software Developm...	146
101	Release Tests Romexis 4.0		2015-01-22T16:41:11...	2015-04-16T22:06:34...	Planmeca Software Developm...	146
102	RC TESTS ROMEXIS 4.0		2015-02-11T17:06:31...	2015-04-16T22:06:34...	Planmeca Software Developm...	146
103	Test Patient		2015-04-13T17:21:02...	2015-04-16T22:06:34...	Planmeca Software Developm...	146
104	Test Patient		2015-04-13T17:28:43...	2015-04-16T22:06:34...	Planmeca Software Developm...	146
107	Yksi Potilas		2015-05-12T22:32:51...	2015-06-12T18:30:05...	Planmeca Software Developm...	146
108	Sorting Test		2015-05-13T19:14:50...	2015-06-13T18:30:04...	Planmeca Software Developm...	146
110	Test Test32BIT		2015-06-15T19:59:08...	2015-07-16T18:30:04...	Planmeca Software Developm...	146
113	CAD5 CAM5		2015-06-15T23:26:52...	2015-07-16T18:30:05...	Planmeca Software Developm...	146
114	Sama Potilas		2015-06-17T19:05:53...		Planmeca Software Developm...	146

Download

Import Cancel

Download

4. Click on the **Download** button.

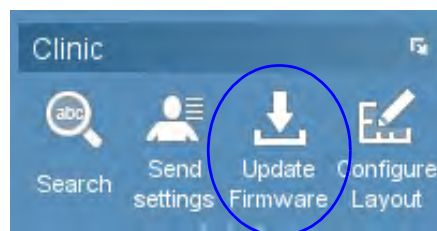


# Appendix E: CENTRALIZED UPDATE OF PLANMECA DENTAL UNIT SOFTWARE

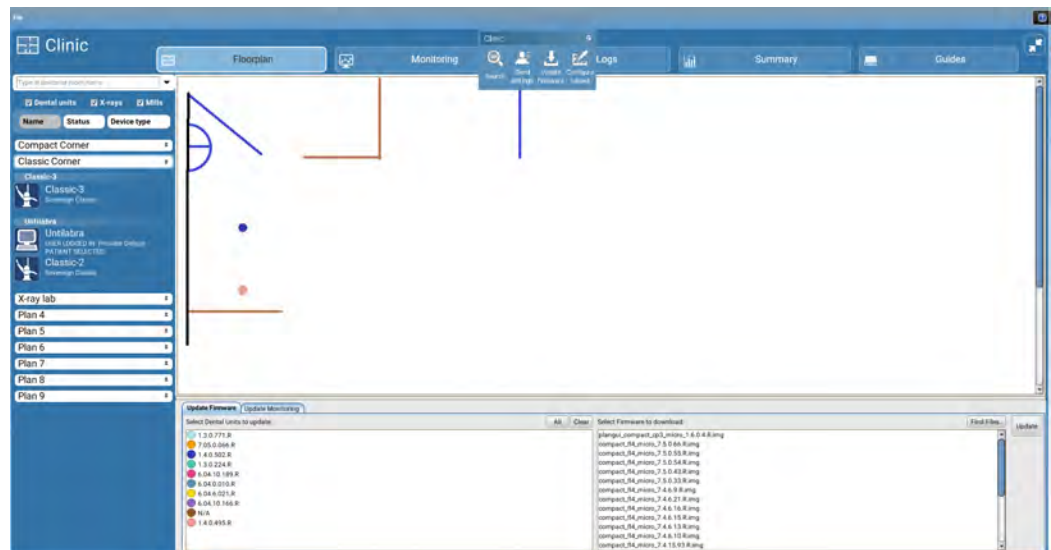
## NOTE

To update firmware administrator rights are required.

The *Update Firmware* can be used to check the current version of dental unit software as well as to upload new firmware to selected units.



A list of all connected dental units and their software version is shown at the bottom of the screen.



To select multiple units for update press and hold down the *Ctrl* key while selecting units.

To choose software for specific dental units click **Find files**.

Browse to the *\*.MOT* file that contains the new software. Update the units by clicking **Update selected units**.





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