



Planmeca ProMax[®]

2D S3

user's manual
2D tomography

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The manufacturer, assembler 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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1 INTRODUCTION

This manual describes how to take tomographic exposures. The manual applies to the following X-ray unit:

- Planmeca ProMax 2D S3



NOTE

This manual is valid for software version 3.5.0.0.r or later. This software version is compatible with Planmeca Romexis software version 3.8.1.r or later. To check the software version of your X-ray unit, select Settings > About > 4100 Component Information > ProMax SW version.

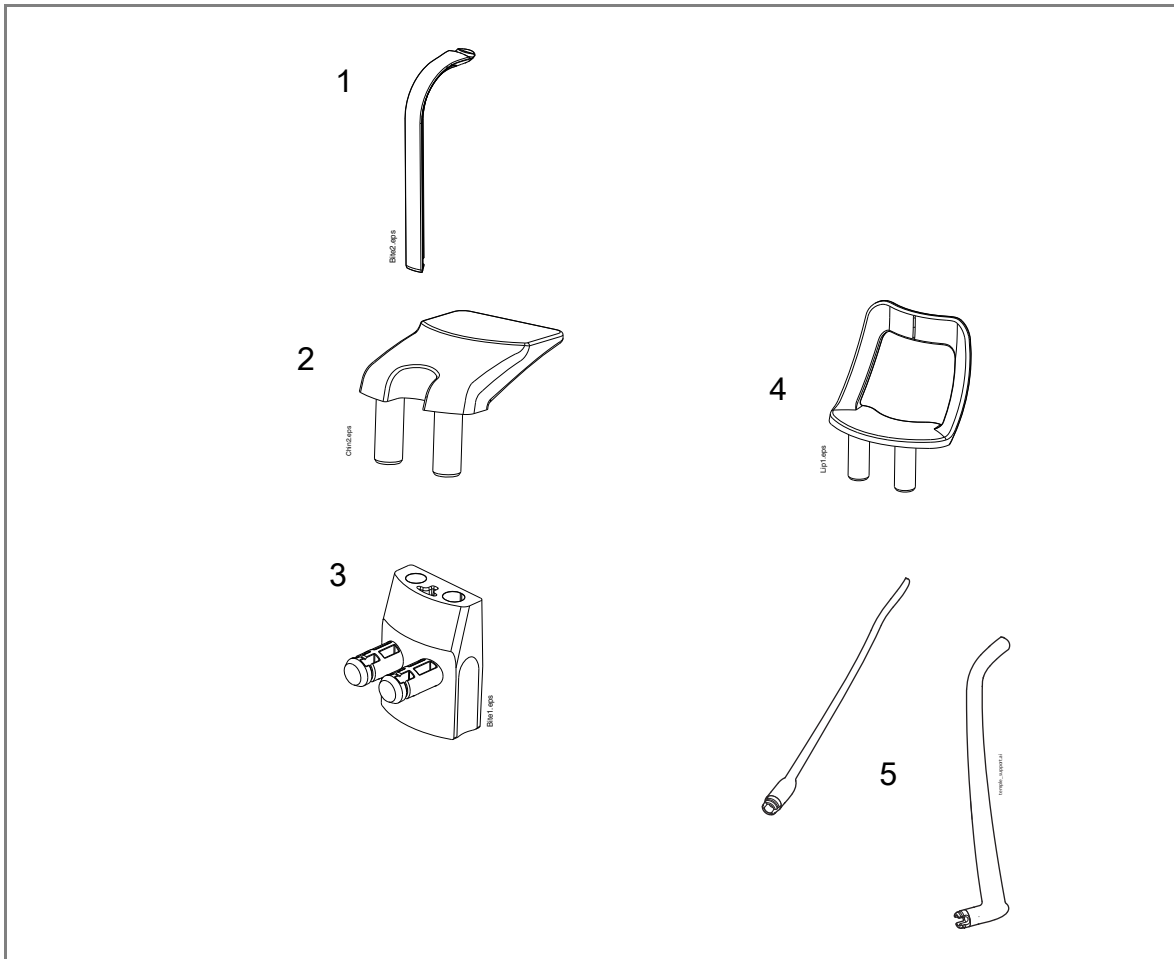
NOTE

Refer to the Planmeca ProMax 2D User's Manual for any general information about the X-ray unit.

The tomographic programs produce cross-sectional or longitudinal exposures from the jaws or temporomandibular joints (TMJs).

2 MAIN PARTS

2.1 Patient supports



- 1 Bite piece
- 2 Chin rest
- 3 Adapter
- 4 Chin support
- 5 Temple supports

2.2 Touch screen

NOTE

The options shown on the touch screen depend on the unit configuration. The X-ray unit can be upgraded with new programs and features, contact your dealer for further information. The views and values shown in this manual are only examples.

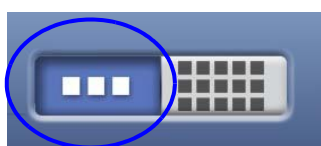
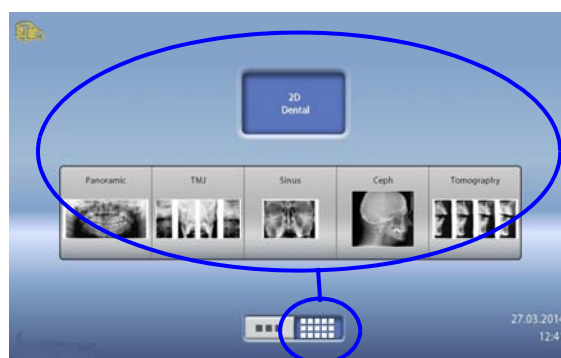
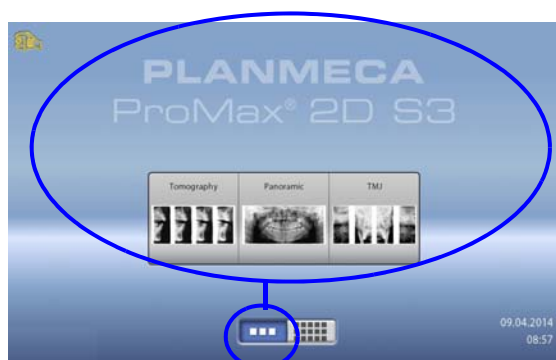
NOTE

The illustrations shown on the touch screen are based on approximate patient anatomy. The actual image position depends on the individual anatomy of the patient.

NOTE

Never allow patients to touch the screen when they are positioned in the X-ray unit. Touching the screen during exposure will stop the imaging process.

You can use the buttons at the bottom of the main screen to change the appearance of the main view.



- **Left button:**
To view the ProMax model and up to five most recently used programs, select the left button at the bottom of the main screen. The most recently used program is shown first. This is the default view of the main screen.

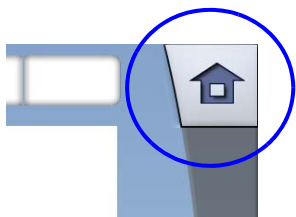


NOTE

If you wish to use fast forward buttons on this view, select **Settings > Program > 2200 Program Features > Fast Forward ON**. Using a fast forward button takes you directly to the last screen where you can take an exposure.



- **Right button:**
To view two program bars on top of each other, select the right button at the bottom of the main screen.



- **Home button:**
To return to the main view from another screen, select the home button at the top right corner of the screen.



- **Forward button:**
To accept a selection and to go to the next screen, touch the forward button.



- **Fast forward button:**
To accept a selection and to skip the next screen, touch the fast forward button.



- **Accept button:**
To accept a selection, touch the green check mark button.



- **Cancel button:**
To cancel a selection, touch the red cross button.



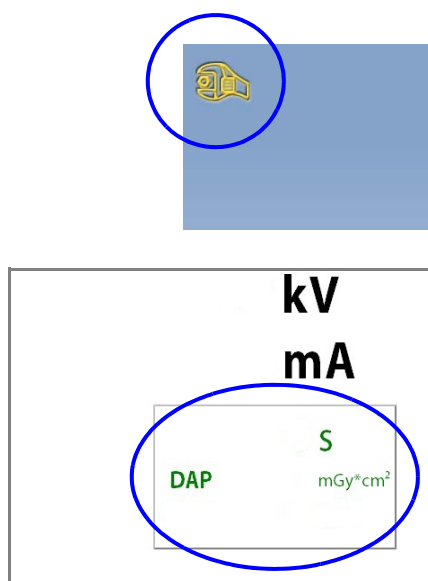
- **Pause button:**
To pause a function (instead of cancelling it), touch the pause button.



- **Making selections:**
To make a selection on the touch screen, simply touch a button or a field with your finger or a soft stylus. The selected option is highlighted. To deselect an option, touch the button or field again (or select another option if available).

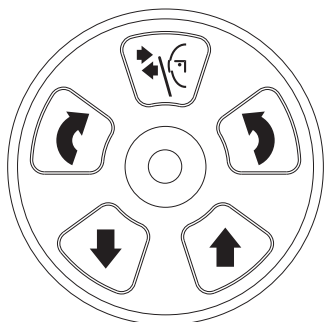
NOTE

Do not use sharp objects to operate the touch screen.



- **Scrolling lists:**
To scroll a list down or up, slide your finger on the screen.
- **Changing settings:**
To change a setting, select the settings icon at the top left corner of the main view. This takes you to the settings menu where you can adjust the settings of the X-ray unit.
- **Checking exposure time and DAP values:**
The estimated values for exposure time and DAP (Dose Area Product) are shown with black text on the touch screen before you take an exposure. The actual values are shown with green text after the exposure.
- **About stand-by mode:**
The screen will automatically switch to stand-by mode if you do not touch the screen or the exposure button for more than thirty minutes. In stand-by mode the green light on the exposure button indicates that the X-ray unit is switched on even though the screen is dark. The screen will switch on as soon as you touch it again.
- **Selecting demo mode:**
You can switch demo mode on if you wish to practice or demonstrate the functions of the X-ray unit without radiation (Settings > User > 1300 Operational settings > 1310 Use Mode > 1311 Set Demo Mode).

2.3 Patient positioning controls



NOTE

Never allow patients to press the positioning controls when they are positioned in the X-ray unit.

NOTE

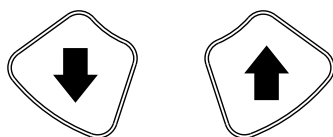
Pressing any of the positioning controls (button or joystick) will switch the patient positioning lights on. The lights will automatically switch off after two minutes. To switch them off earlier, press the positioning joystick.

Open / close temple supports



Press the button to open the temple supports. The temple supports can be closed by pressing the button again.

Up / down buttons



The buttons are used for adjusting the X-ray unit to suit the height of the patient.

The X-ray unit moves slowly at first, then faster.

NOTE

If for some reason either of the buttons gets stuck during operation, you can stop the up / down movement by pressing any of the other control buttons or the positioning joystick. This is a safety measure that guarantees that the up / down movement can be stopped in an emergency.

NOTE

Be careful that the X-ray unit does not hit the ceiling when you press the up button. The maximum height can be adjusted to suit offices with low ceiling, contact your service technician for help.

NOTE

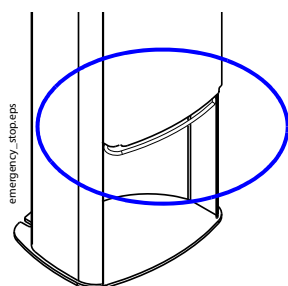
Make sure that there is no object under the telescopic column when you press the down button. If something is in danger of becoming trapped, release the button immediately to stop the movement.

NOTE

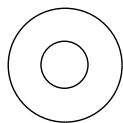
The column movement stops automatically if the emergency stop plate at the bottom is pressed upwards. Clear any obstruction before moving the column again.

NOTE

When positioning wheelchair patients always first move the X-ray unit down before you position the patient in the unit.

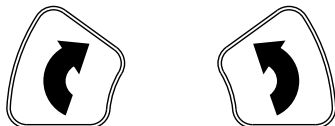


Positioning joystick



The positioning joystick is used for adjusting the image position as described in section 5.4 “Adjusting image position and angle” on page 23.

C-arm rotation buttons

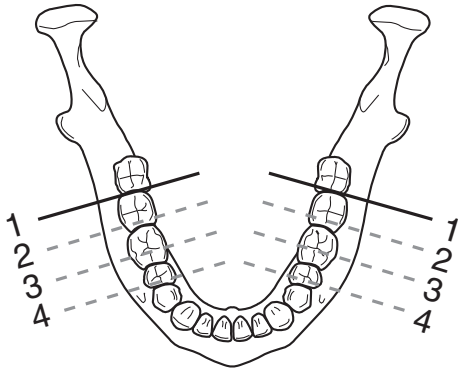


The buttons are used for adjusting the imaging angle as described in section 5.4.2 “Adjusting front light (X laser)” on page 25.

3 PROGRAMS

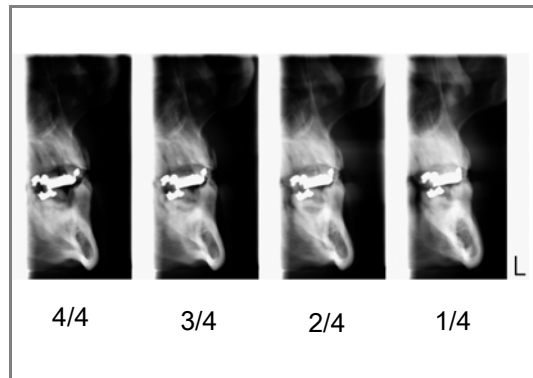
3.1 Cross-sectional programs

1-4 Cross-sectional



One to four cross-sectional exposures anywhere along the dental arch or TMJ area.

The movement step between slices is adjustable, and it can be 3, 6 or 9 mm.



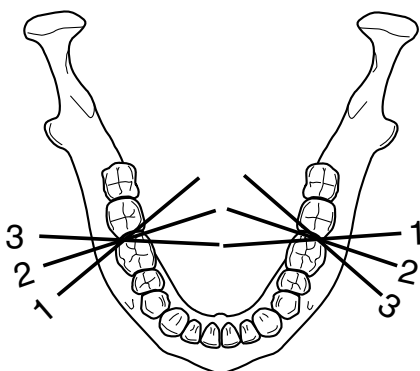
NOTE

The selected image position is in slice no. 1.

NOTE

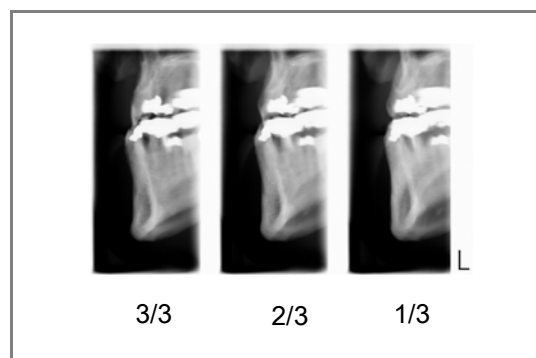
It is not always possible to take all four exposures in all areas.

3 Angles Cross-sectional



Three cross-sectional exposures with different angles anywhere along the dental arch or TMJ area.

The imaging angle is automatically changed between exposures. The angle of the first exposure is the selected angle +7° counterclockwise, and the angle of the third exposure is the selected angle +7° clockwise.

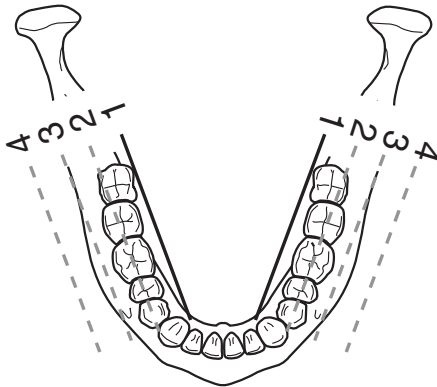


NOTE

The selected image position is in slice no. 2.

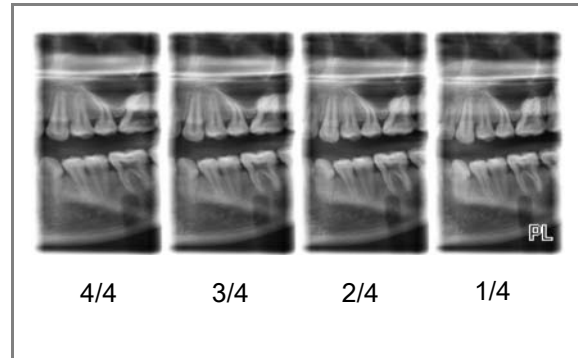
3.2 Longitudinal programs

1-4 Longitudinal



One to four longitudinal images anywhere along the dental arch or TMJ area.

The movement step between slices is adjustable, and it can be 3, 6 or 9 mm.



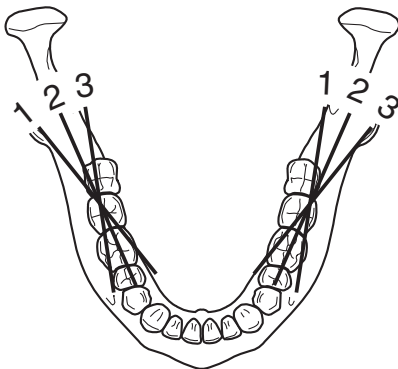
NOTE

The selected image position is in slice no. 1.

NOTE

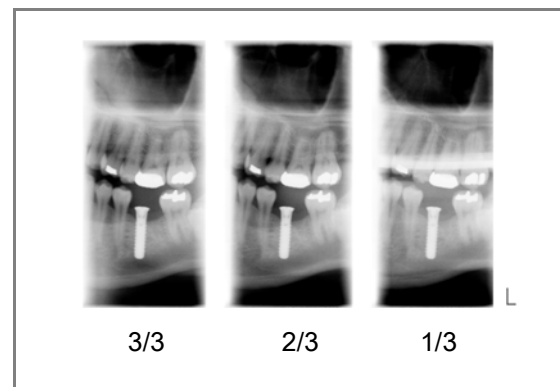
It is not always possible to take all four exposures in all areas.

3 Angles Longitudinal



Three longitudinal images with different angles anywhere along the dental arch.

The imaging angle is automatically changed between exposures. The angle of the first exposure is the selected angle $+7^\circ$ counterclockwise, and the angle of the third exposure is the selected angle $+7^\circ$ clockwise.

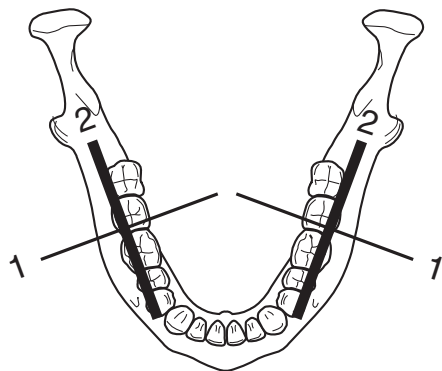


NOTE

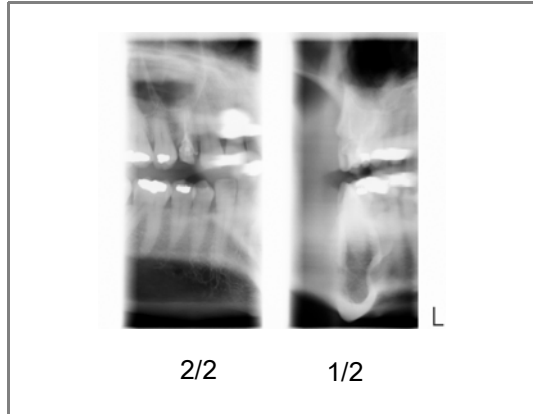
The selected image position is in slice no. 2.

3.3 Combined programs

1 Cross-sectional + 1 Longitudinal



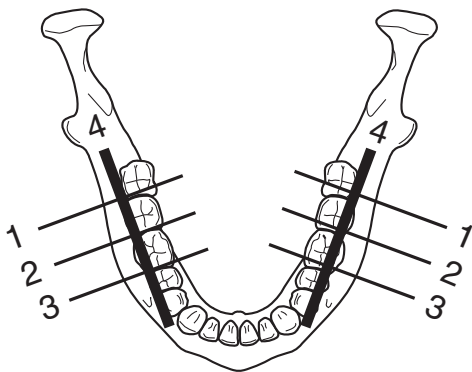
One cross-sectional exposure and one longitudinal exposure anywhere along the dental arch or TMJ area.



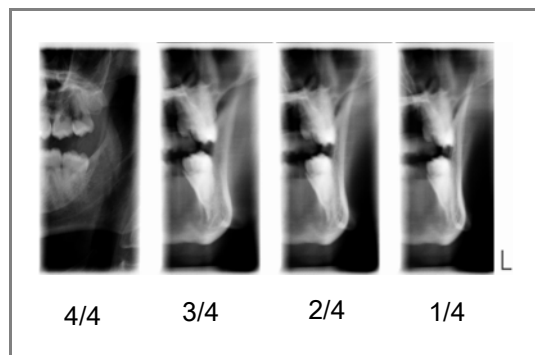
NOTE

The selected image position is in slice no. 1.

3 Cross-sectional + 1 Longitudinal



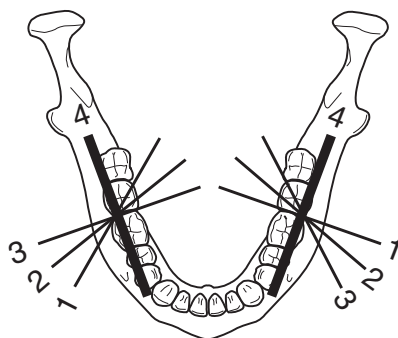
Three cross-sectional exposures and one longitudinal exposure anywhere along the dental arch or TMJ area. The movement step between cross-sectional slices is adjustable, and it can be 3, 6 or 9 mm.



NOTE

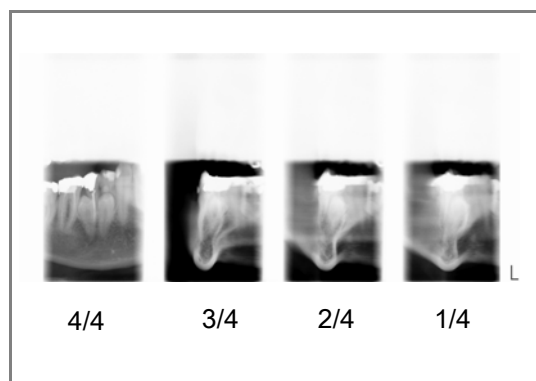
The selected image position is in slice no. 2.

3 Angles Cross-sectional + 1 Longitudinal



Three cross-sectional exposures with different angles and one longitudinal exposure anywhere along the dental arch or TMJ area.

The imaging angle is automatically changed between exposures. The angle of the first cross-sectional exposure is the selected angle +7° counterclockwise, and the angle of the third cross-sectional exposure is the selected angle +7° clockwise.



NOTE

The selected image position is in slice no. 2.

4 PREPARATIONS FOR EXPOSURE

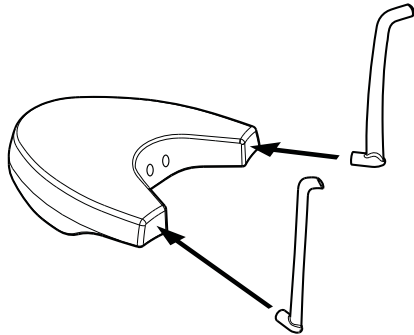
Make sure that:

- the sensor is attached to the C-arm
- you have selected the correct patient and exposure mode in the Planmeca Romexis program
- you have prepared the patient for the exposure.

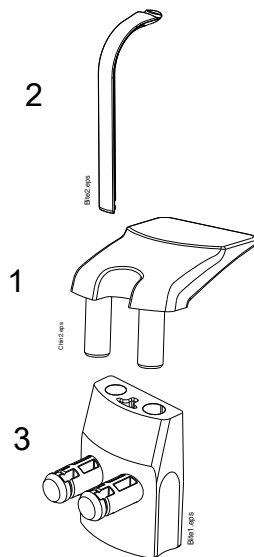
Refer to the Planmeca ProMax 2D User's Manual for details.

5 TOMOGRAPHIC EXPOSURE

5.1 Before exposure

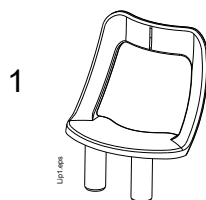


Insert the temple supports into the holes in the patient support table as shown.



For exposures in the teeth area, insert the chin rest (1) and a bite piece (2) into the adapter (3). Insert the adapter (3) into the holes in the patient support table.

For edentulous patients or for patients who are unable to use the bite piece you can use an impression plate or a bite piece with a vacuum formed stent.



For TMJ exposures, insert the chin support (1) into the adapter (3). Insert the adapter (3) into the holes in the patient support table.

5.2 Selecting exposure settings

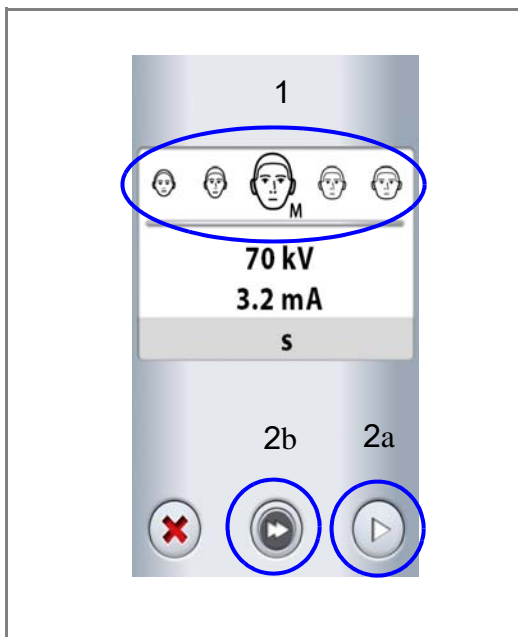
Refer to section 2.2 “Touch screen” on page 3 for general information on how to make or cancel selections on the touch screen.

5.2.1 Selecting program



Select the tomographic program.

5.2.2 Selecting patient size



1. Select the patient size:
 - XS = Child
 - S = Small adult
 - M = Medium-sized adult
 - L = Large adult
 - XL = Extra large adult
2. Select
 - a. the forward button or
 - b. the fast forward button if you want to skip the next screen.

NOTE

The exposure values will automatically change according to the selected patient size, program type and image position.

5.2.3 Adjusting exposure values for current exposure

The exposure values have been preset at the factory for each patient size, program type and image position. The preset exposure values are average values and they are only meant to guide the user.

NOTE

The preset exposure values are optimized for taking exposures at enhanced resolution (Romexis setting). You can use lower exposure values when taking exposures at normal resolution.

NOTE

Always try to minimize the radiation dose to the patient.

The preset exposure values are shown in the following tables.

Factory presets for cross-sectional exposures

PATIENT SIZE	Tooth No. 1 - 3		Tooth No. 4 - 8		TMJ (No. 9)	
	kV	mA	kV	mA	kV	mA
Child (XS)	60	1.25	66	2	64	2
Small adult (S)	62	1.6	68	2.5	66	2.5
Medium-sized adult (M)	64	2	70	3.2	68	3.2
Large adult (L)	66	2.5	72	4	70	4
Extra large adult (XL)	68	3.2	74	5	72	5

Factory presets for longitudinal exposures

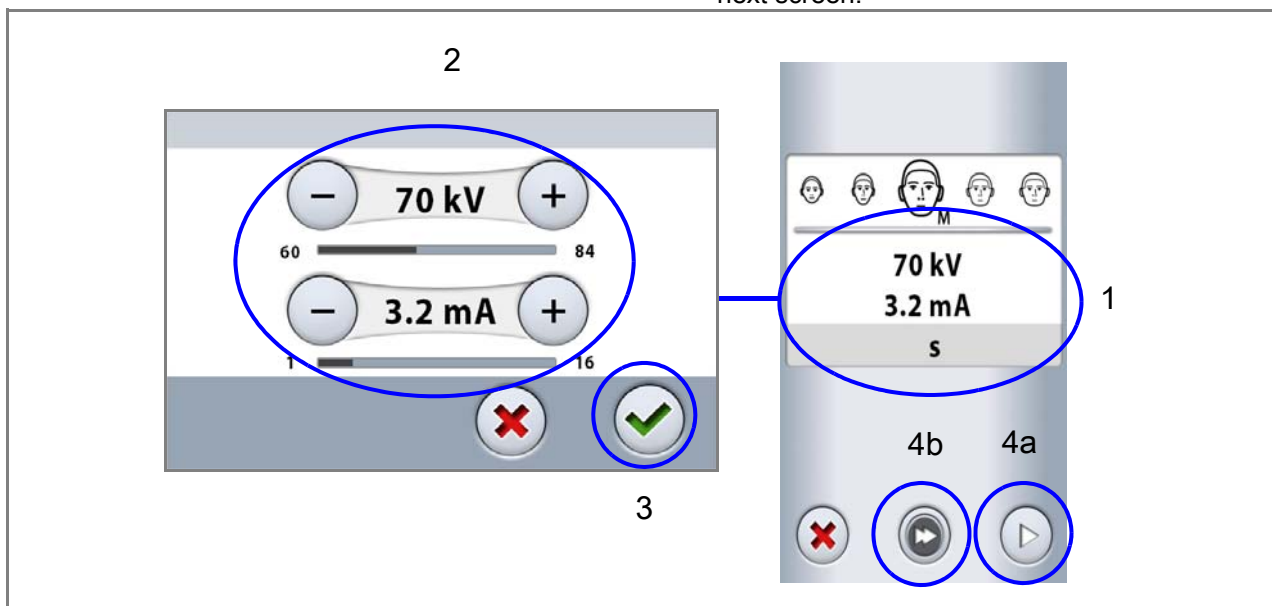
PATIENT SIZE	Tooth No. 1 - 3		Tooth No. 4 - 8		TMJ (No. 9)	
	kV	mA	kV	mA	kV	mA
Child (XS)	66	2.5	66	2	64	2
Small adult (S)	68	3.2	68	2.5	66	2.5
Medium-sized adult (M)	70	4	70	3.2	68	3.2
Large adult (L)	72	5	72	4	70	4
Extra large adult (XL)	74	6.3	74	5	72	5

NOTE

Refer to the corresponding cross-sectional / longitudinal exposure values for combined programs (cross-sectional + longitudinal).

If you need to adjust the preset exposure values for this exposure:

1. Select the kV / mA field.
2. Use the minus or plus buttons to set the exposure values you wish to use. To improve the image contrast, reduce the kV value. To reduce the radiation dose, reduce the mA value.
3. Select the green check mark button.
4. Select
 - a. the forward button or
 - b. the fast forward button if you want to skip the next screen.



NOTE

In combined programs (cross-sectional + longitudinal) only the cross-sectional exposure values can be adjusted.

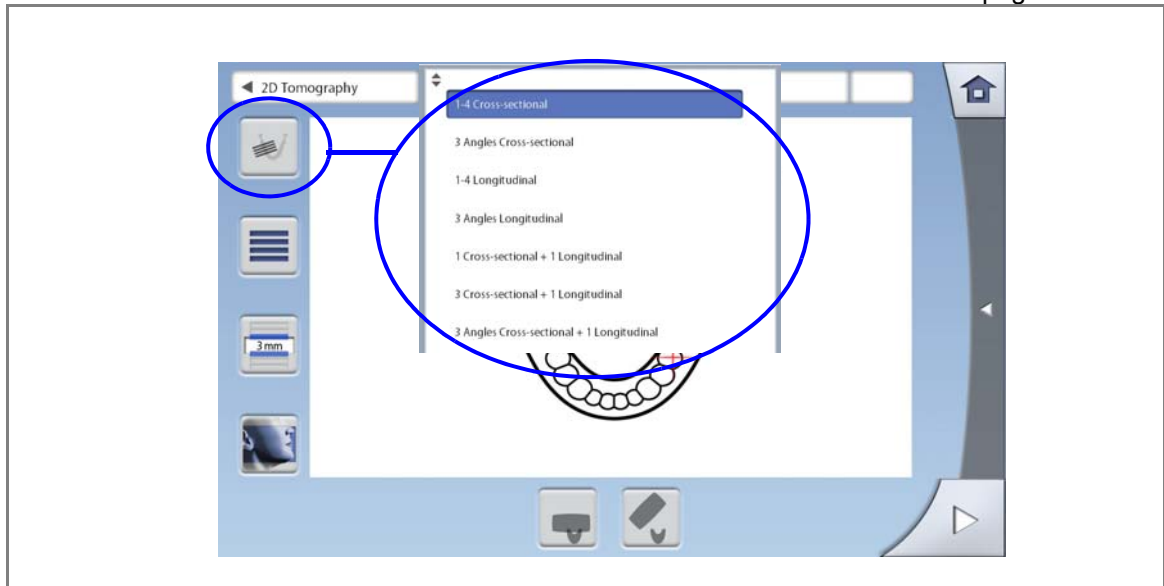
NOTE

To adjust the preset exposure values permanently, select Settings > Program > 2100 Programs. Refer to section "Program settings" in the Planmeca ProMax 2D User's Manual for details.

5.2.4 Selecting program type

Select the program type from the drop-down menu at the top. Alternatively, you can use the first button on the left of the screen to select the program type you wish to use.

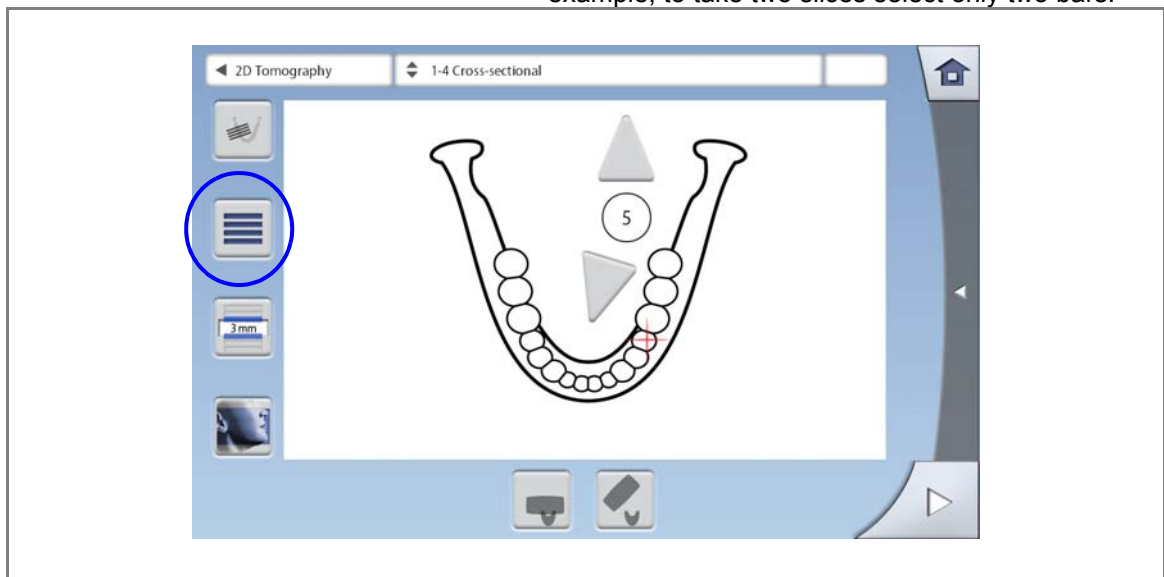
Refer to section 3 “PROGRAMS” on page 8 for details.



5.2.5 Selecting number of slices

Use the second button on the left of the screen to select the number of slices you wish to take.

The icon shows four bars each representing one slice. For example, to take two slices select only two bars.

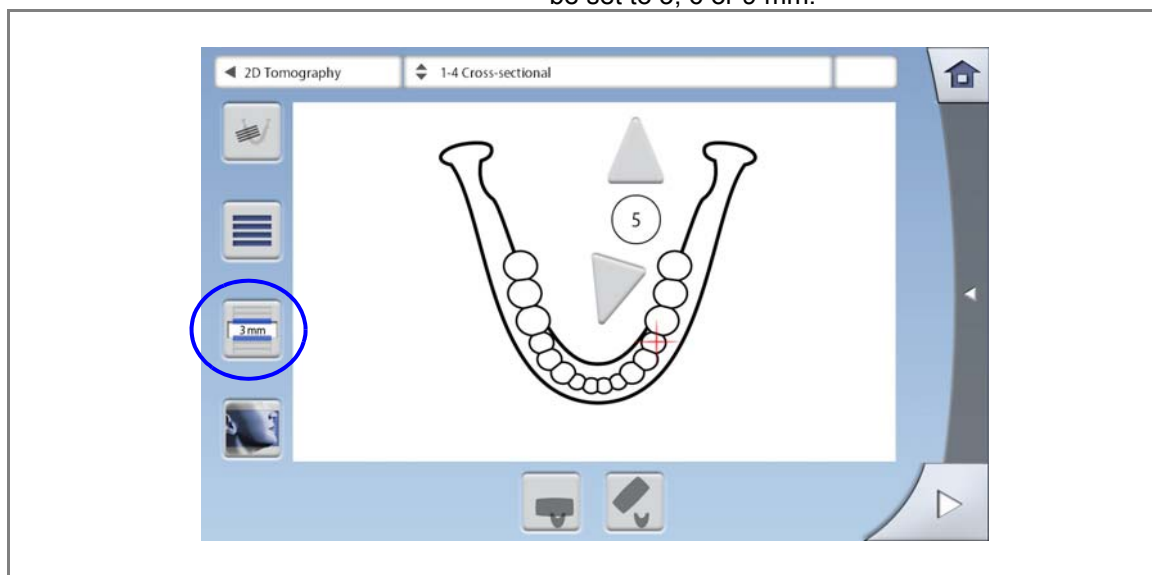


NOTE

This option is available for program types “1-4 Cross-sectional” and “1-4 Longitudinal”.

5.2.6 Selecting movement step

Use the third button on the left of the screen to select the movement step between slices. The movement step can be set to 3, 6 or 9 mm.



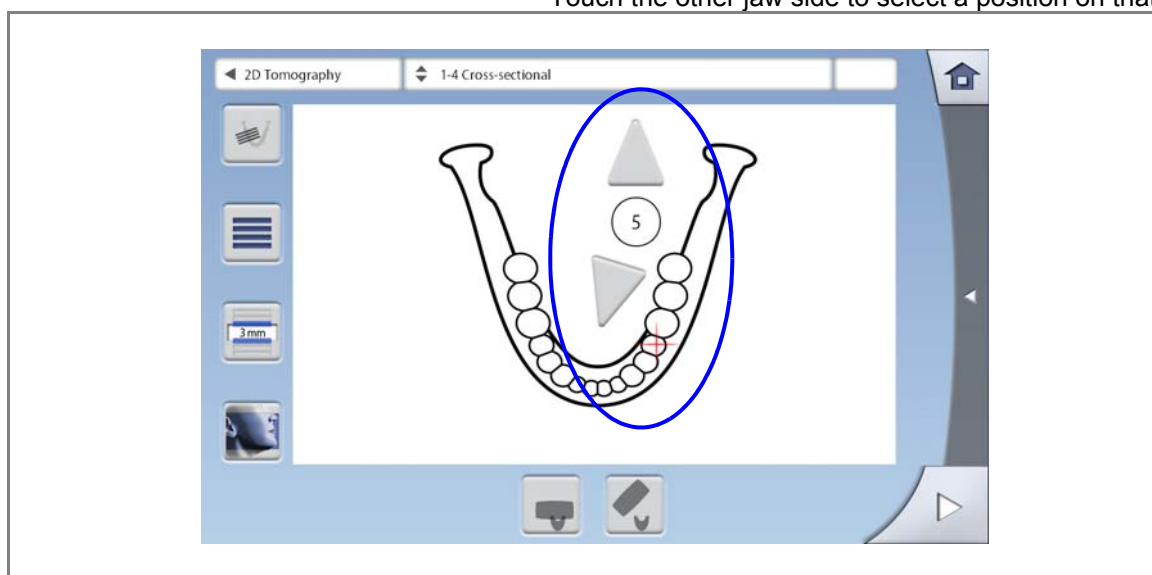
NOTE

This option is available for program types "1-4 Cross-sectional", "1-4 Longitudinal" and "3 Cross-sectional + 1 Longitudinal".

5.2.7 Selecting image position

Use the arrows in the middle of the screen to select the image position (tooth number 1 - 8 or number 9 for TMJ). Alternatively, you can touch the tooth or TMJ to select it.

Touch the other jaw side to select a position on that side.

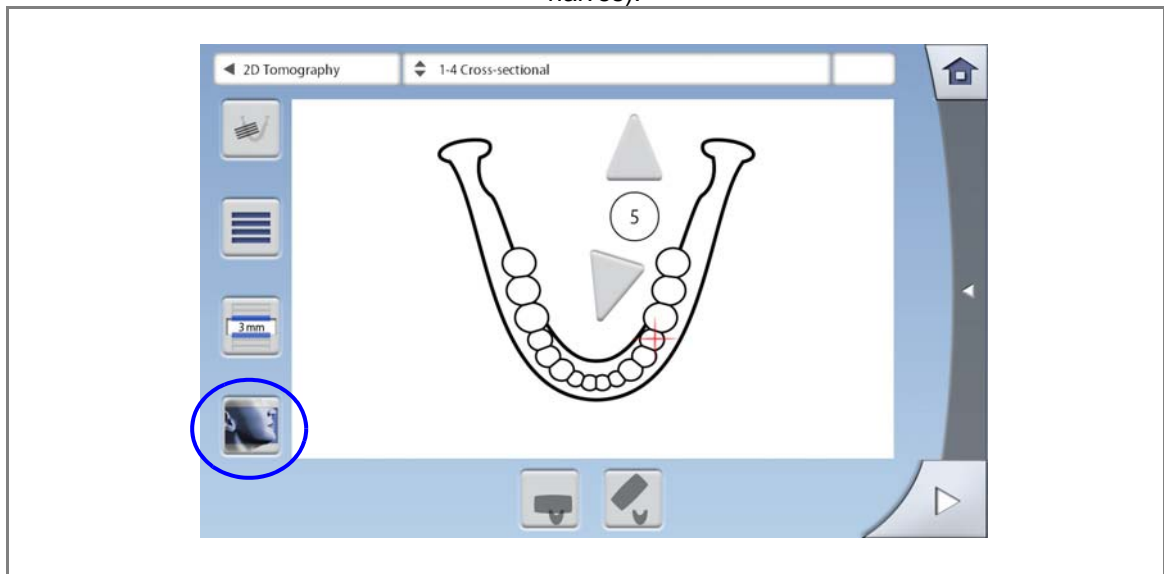


NOTE

The selected image position is in slice no. 1 or 2 depending on the program type in use. Refer to section 3 "PROGRAMS" on page 8 for details.

5.2.8 Selecting jaw half

Use the last button on the left of the screen to select the jaw half that you wish to expose (upper, lower or both halves).



NOTE

This option is not available for TMJ (position no. 9).

5.3 Patient positioning

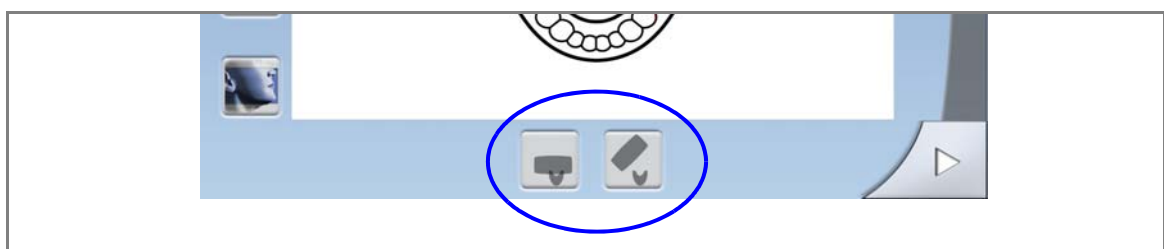
5.3.1 Selecting patient entry position

Use the buttons at the bottom of the screen to select the patient entry position.

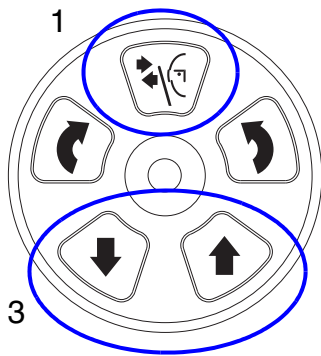
- Selecting the left button will position the C-arm around the patient support. This is the traditional closed patient entry position.
- Selecting the right button will move the C-arm to the back, away from the patient positioning area. This full view position allows you to monitor and adjust the patient's position freely from all directions.

NOTE

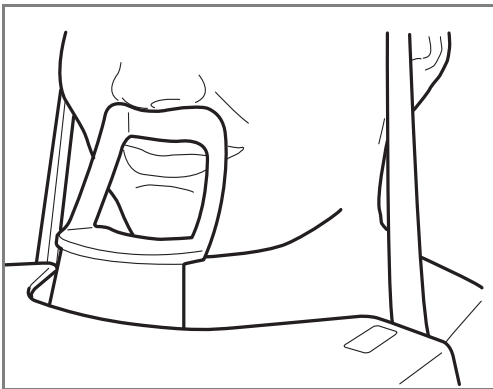
If needed, the full view position (right button) can be disabled (Settings > User > 1300 Operational settings > 1330 Patient positioning). This might be necessary if there is no space for the C-arm to move back.



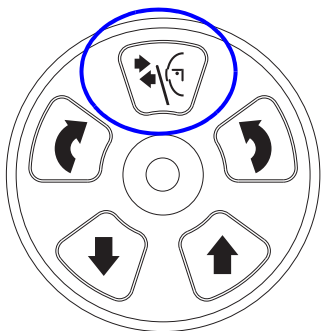
5.3.2 Positioning patient in X-ray unit



1. Press the temple support button to open the temple supports if they are not already open.
2. Guide the patient to the X-ray unit.
3. Adjust the X-ray unit to suit the height of the patient. To do this, press either of the height adjusting buttons until the chin rest is approximately level with the patient's lower jaw.
4. Ask the patient to step forward, grasp the patient handles and to stretch and straighten their back and neck.
5. Position the patient as follows:
 - For exposures in the teeth area, ask the patient to bite the bite piece. The upper and lower incisors must be in the groove in the bite piece.



- For TMJ exposures, ask the patient to press their lips against the chin support. The patient's nose must rest on top of the support and their mouth must be closed, and their teeth must be together.



6. Press the temple support button to close the temple supports.

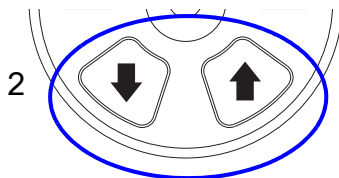
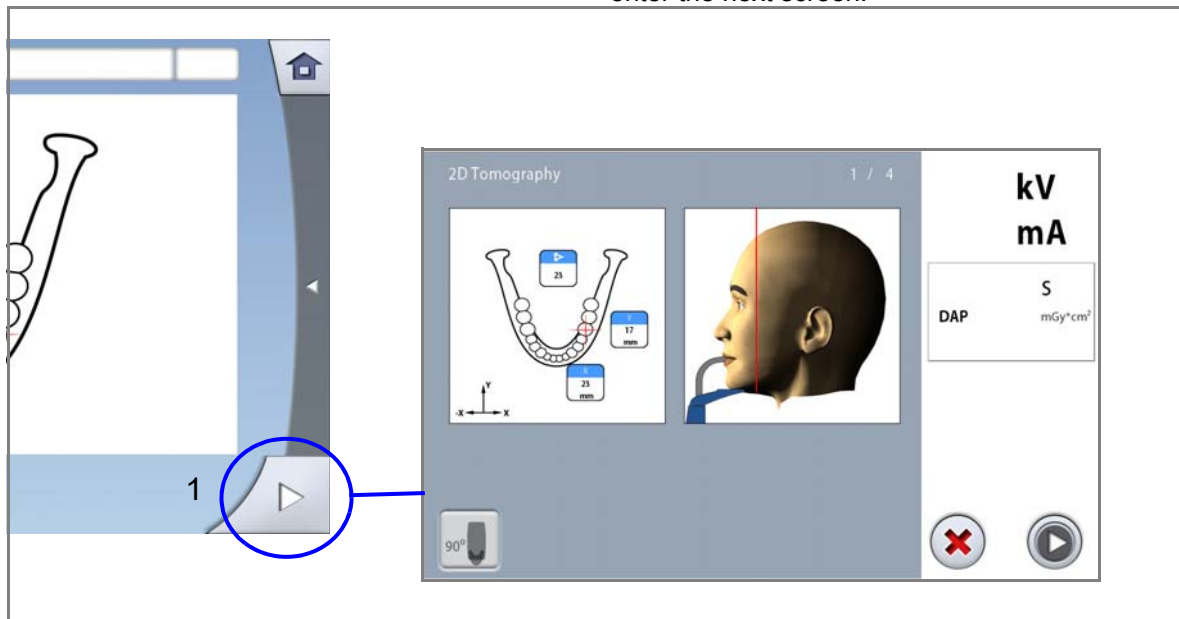
5.3.3 Adjusting patient's head position

The illustrations on the touch screen help you to position the patient's head correctly.

NOTE

The illustrations are for guidelines only.

1. Use the forward field at the bottom right corner to enter the next screen.

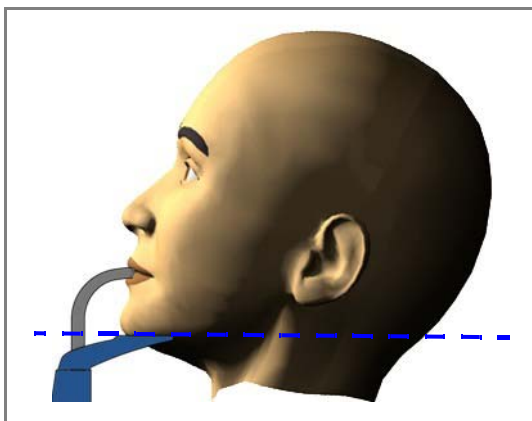


2. Press either of the height adjusting buttons to move the unit up or down so that the patient's head is tilted to the angle shown on the touch screen. Support the back of the patient's head with your other hand while you do this.

NOTE

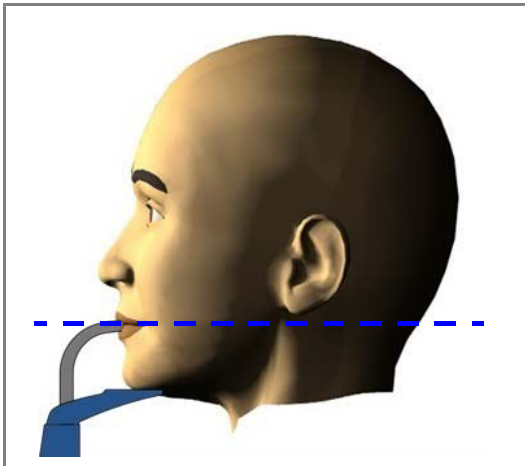
If you wish to use positioning lights as reference lines, select Settings > User > 1300 Operational settings > 1330 Patient positioning > Midsagittal and Frankfort lights in Tomo ON.

Exposure of lower jaw (teeth area)



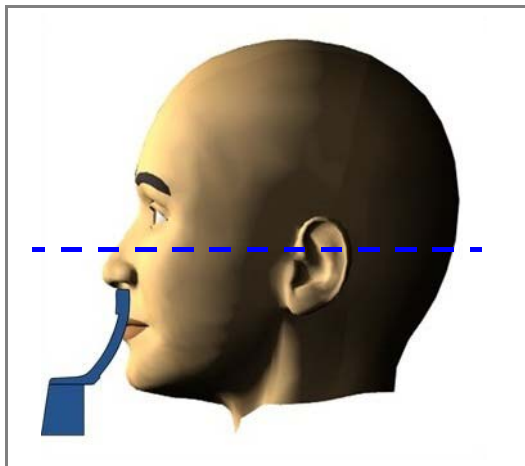
- To take exposures of the lower jaw, position the lower edge of the jaw so that it is horizontal at the image position.

Exposure of upper jaw or both jaws (teeth area)



- To take exposures of the upper jaw or both jaws, position the occlusal plane so that it is horizontal.

TMJ exposure



- To take exposures of the temporomandibular joints (TMJ = position number 9), position the Frankfort plane so that it is horizontal.

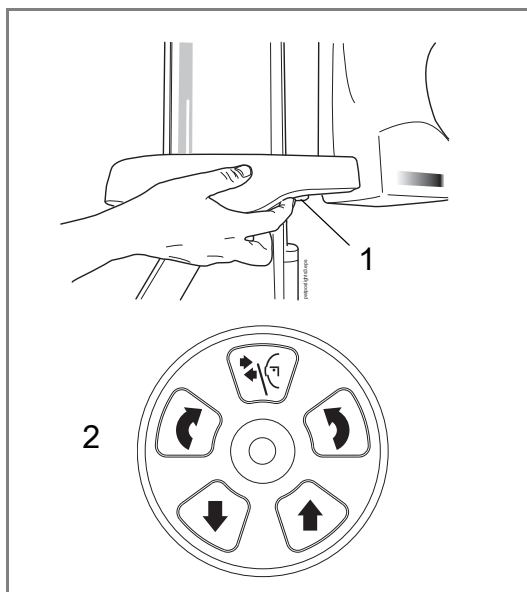
5.4 Adjusting image position and angle

The image position and angle are preset at the factory for a standard patient. However, as all patients and their anatomical structures are different you have to check that the preset position and angle are correct for this patient. If this is not the case, you have to adjust them according to the patient's anatomy.

The tomographic positioning lights and the illustrations on the touch screen help you to do this.

NOTE

The illustrations are for guidelines only. When you adjust the image position the tomographic positioning lights move on your patient's face. The positioning light on the illustration shows the preset image position and it does not move according to your adjustment.



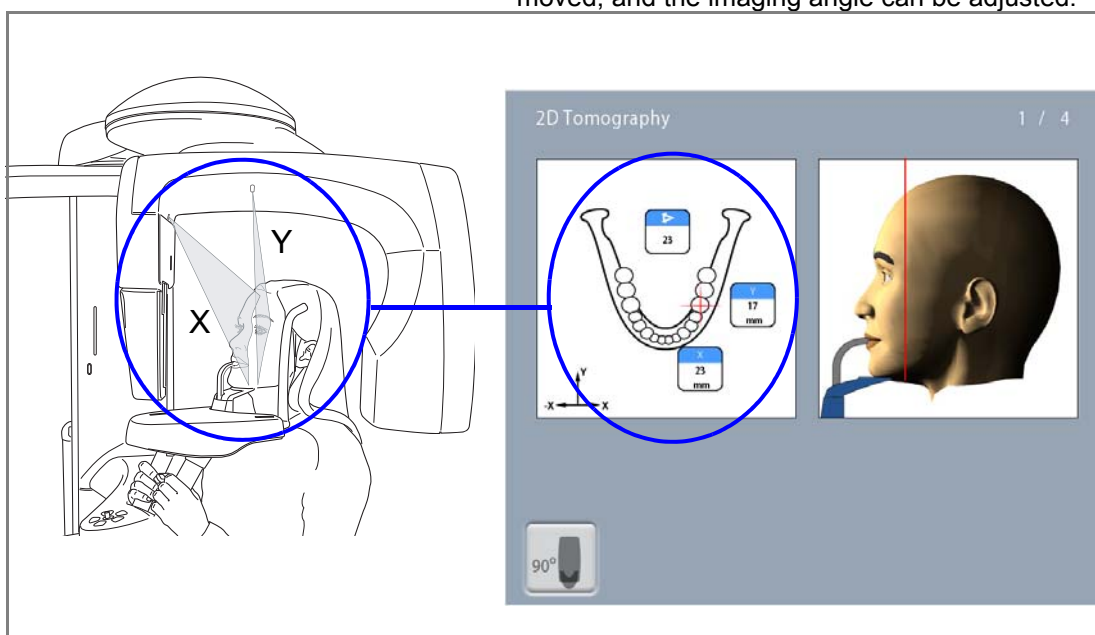
The positioning lights will automatically switch off after two minutes. To switch them off earlier, press the positioning joystick.

To switch them back on, do one of the following:

1. Press the thumb wheel on the underside of the patient support table.
2. Press any of the positioning controls (button or joystick).

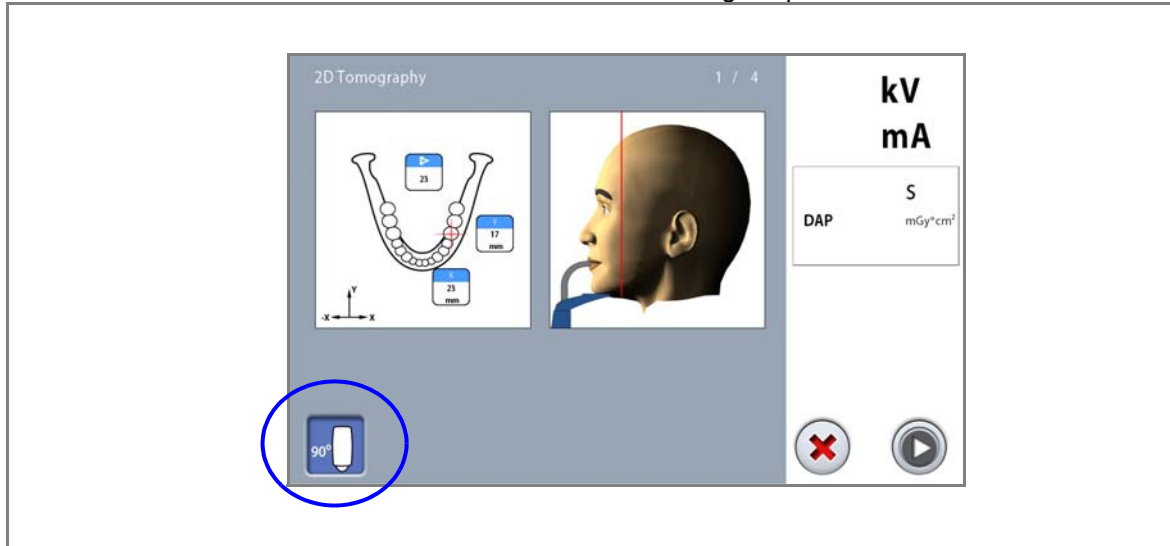
The tomographic positioning lights show on the front (X laser) and side (Y laser) of your patient's face. The light beams cross at the image position.

The X / Y coordinates and the imaging angle are shown on the left of the touch screen. The image position can be moved, and the imaging angle can be adjusted.



You can rotate the C-arm 90 degrees clockwise by selecting the 90° button at the bottom of the screen. This might give you a better view for checking the image position.

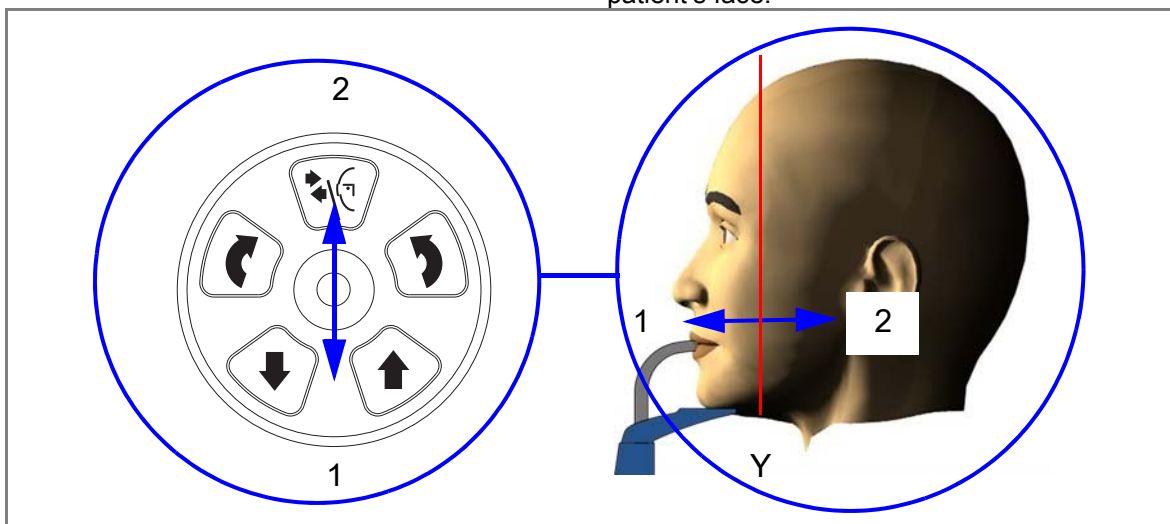
Select the button again if you wish to rotate the C-arm back to the original position.



5.4.1 Adjusting side light (Y laser)

If you need to move the image position to the front (1) or back (2):

- Move the positioning joystick towards you (1) or away from you (2). The side light (i.e. the image position as seen from the side) will move accordingly on your patient's face.



5.4.2 Adjusting front light (X laser)

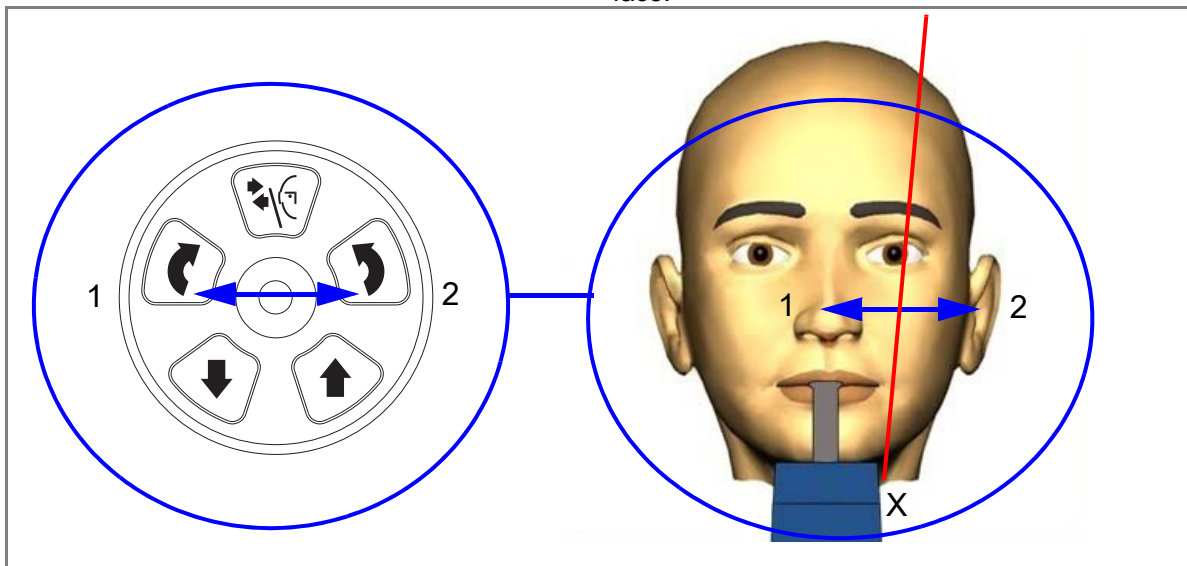
NOTE

The front light (X laser) is shown on your patient's face. It is not shown on the touch screen.

- Image position

If you need to move the image position to your left (1) or right (2):

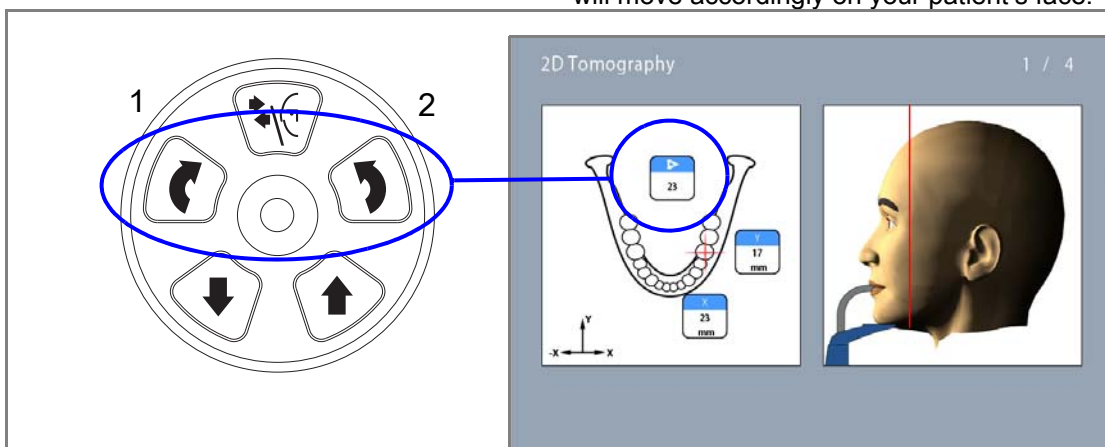
- Move the positioning joystick to your left (1) or right (2). The front light (i.e. the image position as seen from the front) will move accordingly on your patient's face.



- Imaging angle

If you need to adjust the imaging angle:

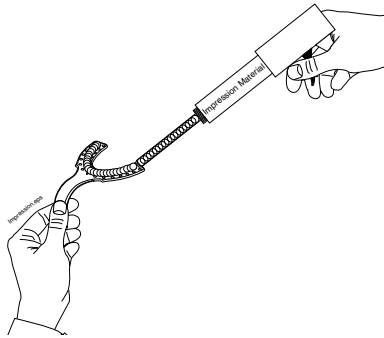
- Move the front light (X laser) so that it is parallel to the patient's dental arch at the image position. To do this, press a C-arm rotation button to rotate the C-arm clockwise (1) or counterclockwise (2). The front light will move accordingly on your patient's face.



NOTE

It is easier to adjust the imaging angle if the patient opens their mouth slightly when you adjust the front light.

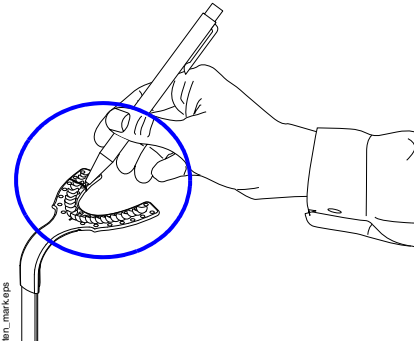
5.5 Patient positioning with impression plate



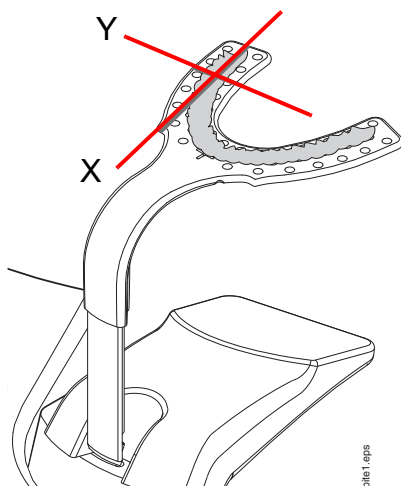
1. Apply bite registration material to the upper or lower side of an impression plate.



2. Ask the patient to bite the impression plate.

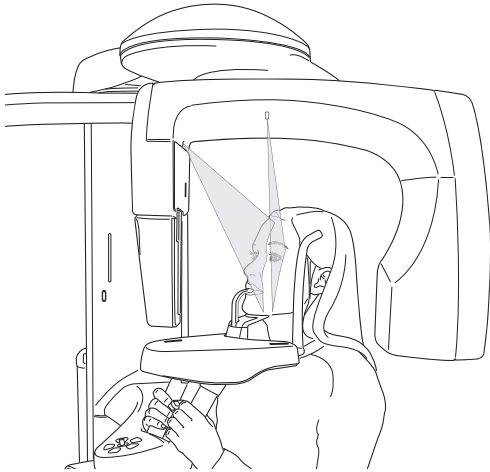


3. Mark the image position on the impression.



4. Place the impression plate in position.

5. Adjust the tomographic positioning lights so that they cross on top of your marking. Refer to sections 5.4.1 “Adjusting side light (Y laser)” on page 24 and 5.4.2 “Adjusting front light (X laser)” on page 25 for details.

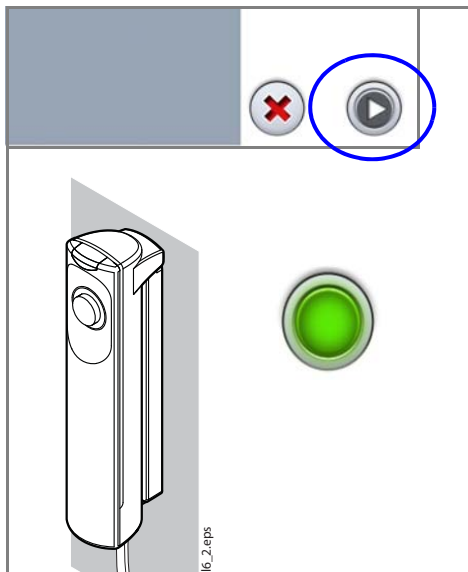


6. Ask the patient to bite the impression. Refer to section 5.3.2 “Positioning patient in X-ray unit” on page 20 for details.
7. Adjust the patient’s head position if necessary. Refer to section 5.3.3 “Adjusting patient’s head position” on page 21 for details.

5.6 Taking an exposure

NOTE

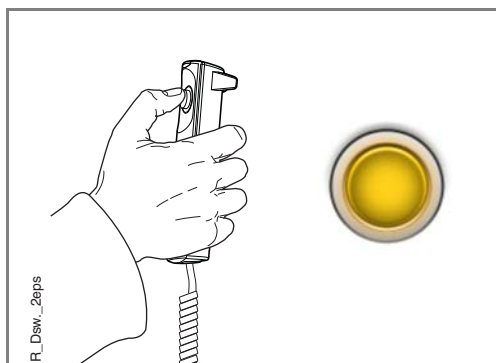
Make sure that you have selected the correct patient and exposure mode in the Planmeca Romexis program.



1. Select the forward button.
Green lights flash on the touch screen and exposure button when the X-ray system is getting ready for an exposure. The green lights stop flashing and stay on continuously when the X-ray system is ready for an exposure.

2. Ask the patient to stay as still as possible. Tell the patient how many exposures you will take so that they do not move before the end of the imaging process.

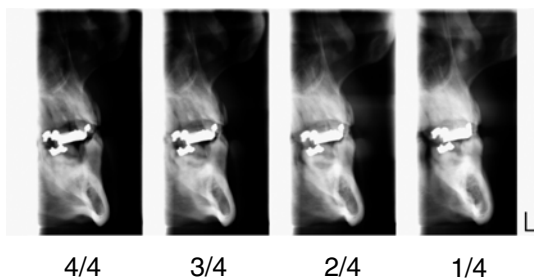
3. Move to a protected area.



4. Press and hold down the exposure button for the duration of the exposure(s).
The C-arm moves around the patient’s head. Yellow radiation warning lights illuminate on the exposure switch and on the touch screen, and you hear a radiation warning tone. Additionally, a radiation warning symbol is shown on the touch screen.

NOTE

Maintain audio and visual contact with the patient and X-ray unit during exposure. If the C-arm stops moving during exposure, or moves in an erratic way, release the exposure button immediately.



5. The image is shown on the computer screen.
 - Note that you must accept the image in the Planmeca Romexis program. Refer to the Romexis User's Manual.

6. Guide the patient away from the X-ray unit.

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