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PLANMECA



Planmeca ProMax®

2D & 3D s & 3D Classic

EN

user's manual

2D imaging

10033256

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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 2D panoramic exposures. The manual applies to the following X-ray units:

- Planmeca ProMax 2D S2
- Planmeca ProMax 2D S3
- Planmeca ProMax 3D s
- Planmeca ProMax 3D Classic

NOTE

This manual is valid for Planmeca ProMax software version 3.9.5 or later. This software version is compatible with Planmeca Romexis software version 5.1.1.r or later. To check the software version of your X-ray unit, select Settings > About > 4100 Component Information > ProMax SW version.

The X-ray unit uses panoramic techniques to produce two-dimensional (2D) X-ray images for the examination of dentomaxillofacial anatomy.

You need a PC with the Planmeca Romexis program in order to save, view and modify the images.

Make sure that you are fully acquainted with the appropriate radiation protection measures and these instructions before you use the X-ray unit. Note that your X-ray unit may not feature all the options described in these instructions. Refer to section "Licences (2300)" on page 95 for a list of available licences.

These instructions include options that may not be available in all countries.

NOTE

The X-ray unit may be used by health care professionals only.

NOTE

You can register your X-ray unit online as described in section "Product Registration (4300)" on page 98.

1.1 Associated documentation

The X-ray unit is supplied with the following manuals:

- User's Manual(s)
- Installation Quick Guide
- Installation Manual
- Technical Manual
- Planmeca Device Tool Manual

These manuals are intended to be used in conjunction with the documentation for the Planmeca Romexis program. The Romexis package contains the following manuals:

- User's Manual
- Technical Manual

The original language of the manuals is English.

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NOTE

The User's Manuals are available on Planmeca's website.

- For X-ray units, select Material bank > Manuals > Imaging.
- For software products, select Material bank > Manuals > Software.

1.2 Symbols on product labels



Fulfils the requirements of Directive 93/42/EEC.



SGS listing marking according to US and Canadian standards (ANSI/AAMI ES60601-1 and CAN/CSA C22.2 No. 60601- 1).



Date of manufacture (Standard ISO 7000).



Type B applied part (Standard IEC 60417).



Separate collection for electrical and electronic equipment according to Directive 2002/96/EC (WEEE).



Refer to instruction manual/booklet (Standard ISO 7010).



Emergency stop (Standard IEC 60417)



Warning: Electricity (Standard ISO 7010).

To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.



Electrostatic sensitive device (Standard IEC 60417)



Warning, hot surface (Standard ISO 7010).

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General warning (Standard ISO 7010).

1.3 Safety precautions



WARNING

The following safety precautions must be observed in order to avoid the risk of personal injury or damage to the X-ray unit.

CAUTION

FOR US USERS:

Federal law restricts this device to sale by or on the order of a health care professional.

CAUTION

This X-ray unit may be dangerous to both patient and operator unless safe exposure values are used and correct operating procedures are observed.

CAUTION

It is very important that the place where the X-ray unit is to be used and the position from which the user is to operate the X-ray unit are correctly shielded.

CAUTION

Since radiation safety requirements vary from country to country and state to state it is the responsibility of the user to ensure that all local safety requirements are met.

CAUTION

The patient positioning lights are laser lights. Do not stare into the laser beam.

CAUTION

Do not drop the sensor. Planmeca limited warranty does not cover damage which is due to misuse, e.g. dropping the sensor, neglect, or any cause other than ordinary use.

If you have any reason to believe that the sensor might be faulty, take a test exposure before taking a patient exposure.

CAUTION

If an exposure is interrupted (e.g. exposure button is released or emergency stop button activated), the patient must be guided away from the X-ray unit before the C-arm is moved.

CAUTION

Do not connect items which are not specified as part of the system.

CAUTION

Do not touch an electrical connector and the patient at the same time.

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CAUTION

If the X-ray unit shows any signs of oil leakage, switch the X-ray unit off and contact your service technician for help.

CAUTION

Do not use the X-ray unit in an oxygen rich environment or in the presence of flammable anesthetics.

CAUTION

Never use a defective or damaged X-ray system. Contact your service technician for help.

CAUTION

Do not modify the X-ray unit. The X-ray unit must be serviced by qualified personnel only.

NOTE

Cone beam imaging should not be used for routine (or screening) examinations. The imaging examinations must be justified for each patient to demonstrate that the benefits outweigh the risks.

NOTE

When it is likely that evaluation of soft tissues will be required as part of the patient's radiological assessment, conventional CT or MR medical imaging should be used rather than CBCT.

NOTE

Before taking an exposure, ask any female patient of childbearing age whether she might be pregnant. The X- ray unit is not intended for use on pregnant women.

NOTE

FOR CANADIAN USERS:

All patients must be provided with a shielded apron for gonad protection and a thyroid shield. The use of a thyroid shield is especially important in children. The shielded apron and thyroid shield should have a lead equivalence of at least 0.25 mm on both sides (front and back of the patient).

NOTE

If the X-ray unit has been stored at temperatures under +10°C for more than a few hours, time must be allowed for the unit to reach room temperature before turning it on.

NOTE

Ensure efficient air conditioning in the X-ray room. It is recommended to keep the room temperature between +20°C and +25°C at all times.

NOTE

If exposures are taken in rapid succession, the X-ray tube may overheat and a cooling time will flash on the touch screen. The cooling time indicates the delay before the next exposure can be taken.

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NOTE

If the X-ray system is not connected to an Uninterruptible Power Supply (UPS), switch the X-ray unit off and disconnect the PCs from the mains during lightning storms.

NOTE

FOR US & CANADIAN USERS:
The laser lights are class II laser products (21 CFR § 1040.10).

NOTE

FOR EUROPEAN USERS:
The laser lights are class 1 laser products (Standard IEC / EN 60825-1: 2007).

NOTE

EMC requirements have to be considered, and the equipment must be installed and put into service according to the specific EMC information provided in the accompanying documents.

NOTE

Portable and mobile RF communications equipment can affect the X-ray unit.

NOTE

External equipment intended for connection to signal input, signal output or other connectors, shall comply with relevant IEC standard (e.g. IEC 60950 for IT equipment and the IEC 60601 series for medical electrical equipment). In addition, all such combinations - systems - shall comply with the standard IEC 60601-1, Safety requirements for medical electrical systems. Equipment not complying to IEC 60601 shall be kept outside the patient area (more than 2m (79 in.) from the X-ray unit). Any person who connects external equipment to signal input, signal output or other connectors has formed a system and is therefore responsible for the system to comply with the requirements of IEC 60601-1. If in doubt, contact your service technician or local representative for help.

NOTE

Contact your service technician if you notice a decrease in image quality.

NOTE

If you take an exposure but the image does not appear in the Planmeca Romexis program, you can import the image manually into Romexis. Refer to the Planmeca Romexis User's Manual for details.

NOTE

Do not handle liquids near or on the X-ray unit.

NOTE

Never place or hang any objects on any part of the X-ray unit.

NOTE

Make sure that neither you nor your patient can get caught or hooked up on any part of the X-ray unit. Keep loose items of clothing, hair and jewellery tucked away safely.

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NOTE

If you have any reason to believe that the C-arm might hit the patient during exposure (e.g. patients with wide shoulders), take a test exposure without radiation first. To turn radiation off, select Settings > User > 1300 Operational settings > 1310 Use Mode > 1311 Set Demo Mode.

NOTE

Do not touch the arm structures when the X-ray unit is moving.

NOTE

Patients are not allowed to hang on the patient handles.

NOTE

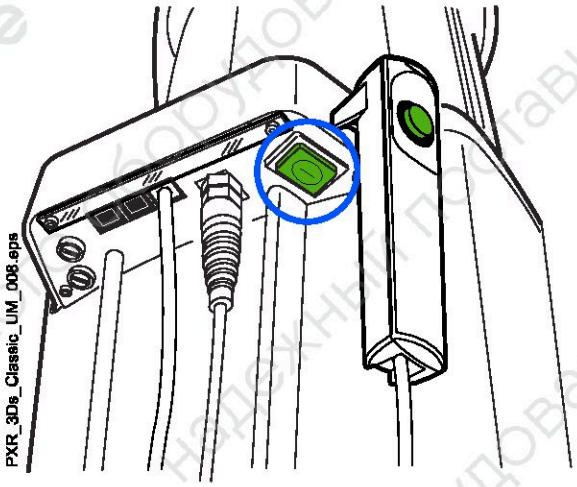
FOR PROFACE SENSOR:
Do not touch the glass windows. Fingerprints or other stains on the glass surface destroy image quality.

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2 Switching X-ray unit on

The on / off switch is located on the underside of the column top.



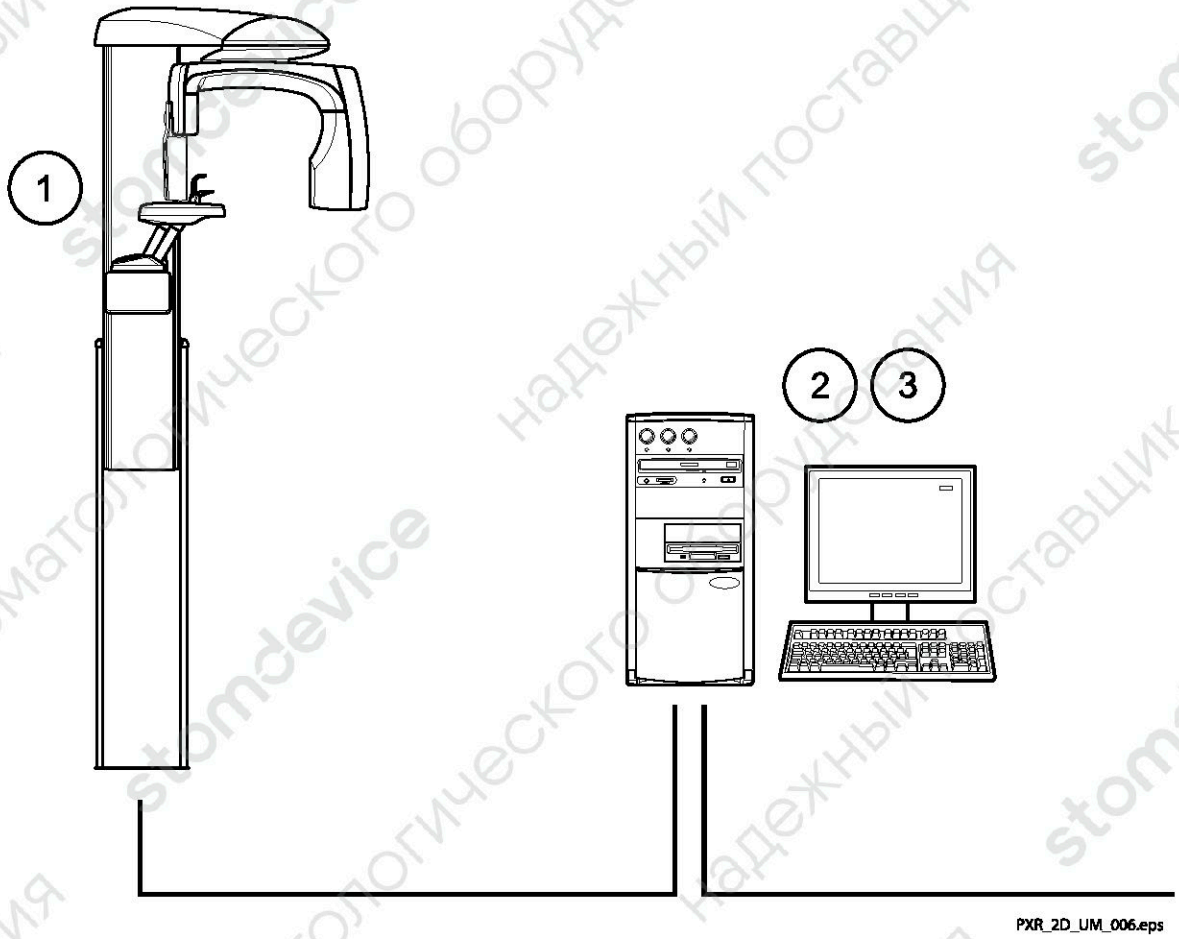
NOTE

To prolong the lifetime of your X-ray unit, always switch the X-ray unit off when it is not in active use.

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3 Main parts

3.1 General view of 2D X-ray system

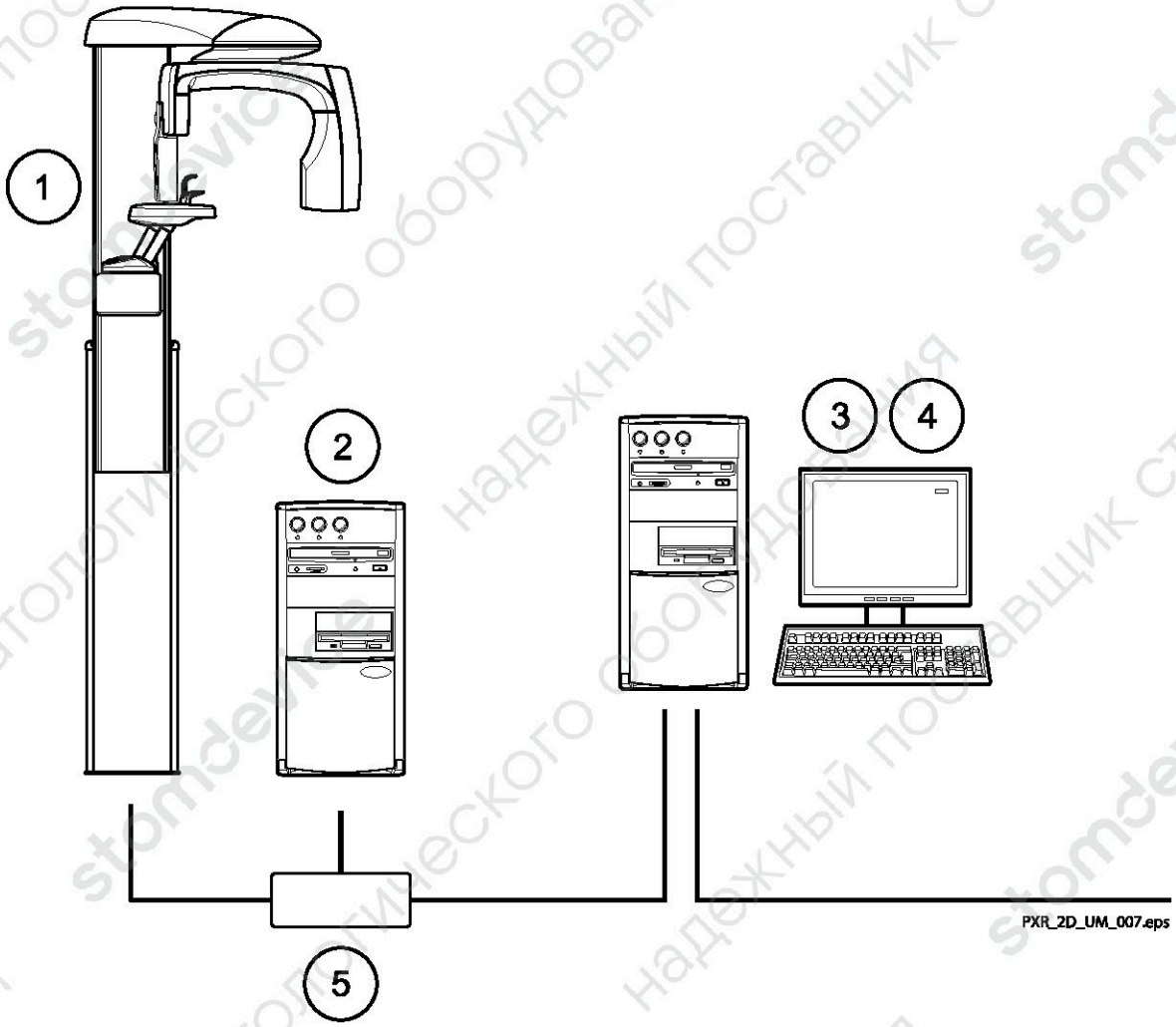


1. X-ray unit
2. Planmeca Romexis program
3. ProTouch desktop application
   (optional, see section "ProTouch desktop application" on page 17)

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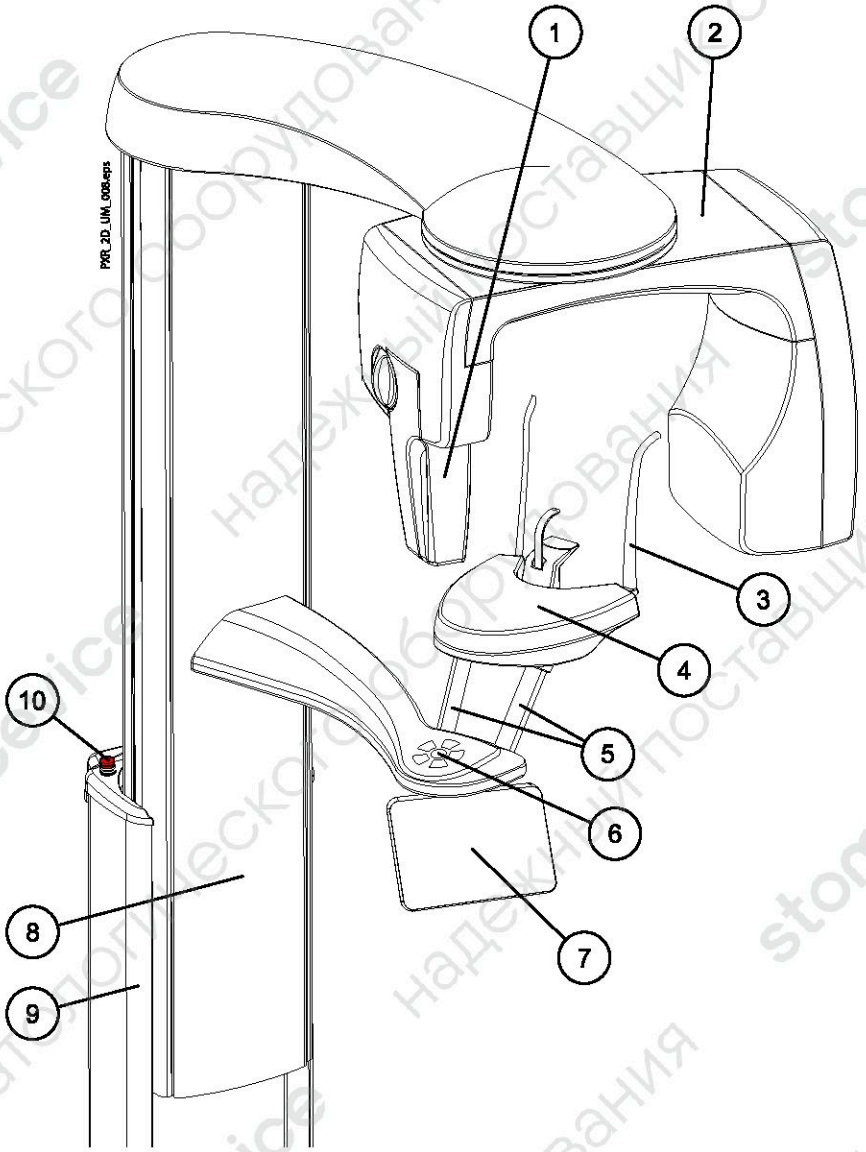
3.2 General view of 3D X-ray system



1. X-ray unit
2. 3D reconstruction PC
3. Planmeca Romexis program
4. ProTouch desktop application
   (optional, see section "ProTouch desktop application" on page 17)
5. Ethernet switch

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3.3 General view of X-ray unit

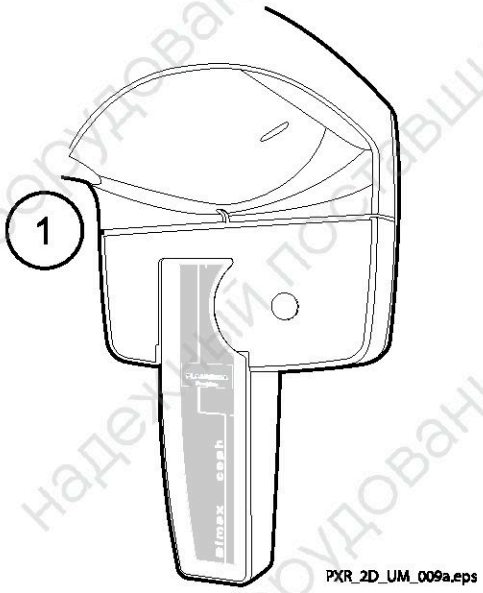


1. Sensor (see section "Sensor" on page 11)
2. C-arm
3. Patient supports (see section "Patient supports" on page 12)
4. Patient support table
5. Patient handles
6. Patient positioning controls (see section "Patient positioning controls" on page 19)
7. Touch screen (see section "Touch screen" on page 14)
8. Telescopic column (see section "Telescopic column" on page 12)
9. Stationary column
10. Emergency stop button (see section "Emergency stop button" on page 13)

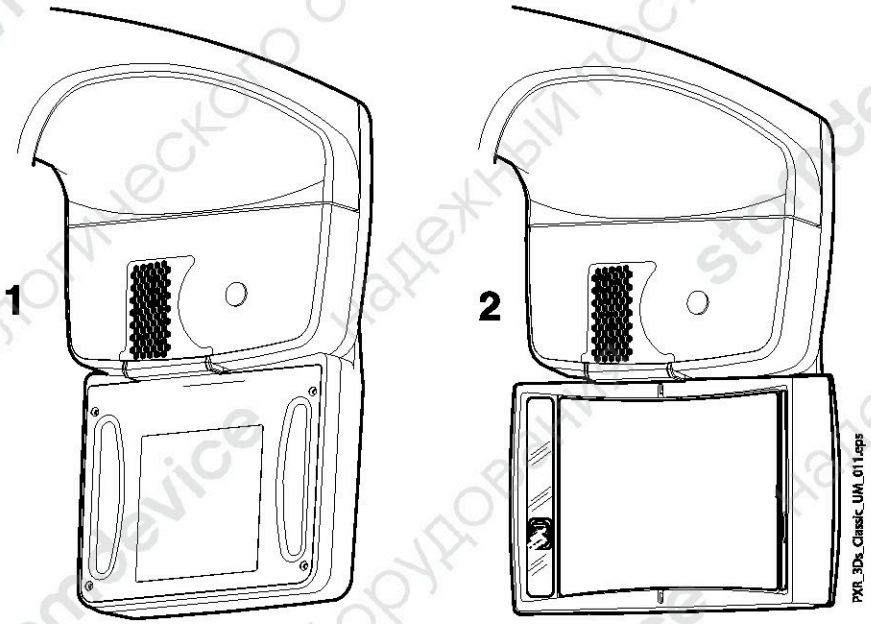
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3.4 Sensor



1. Dimax sensor

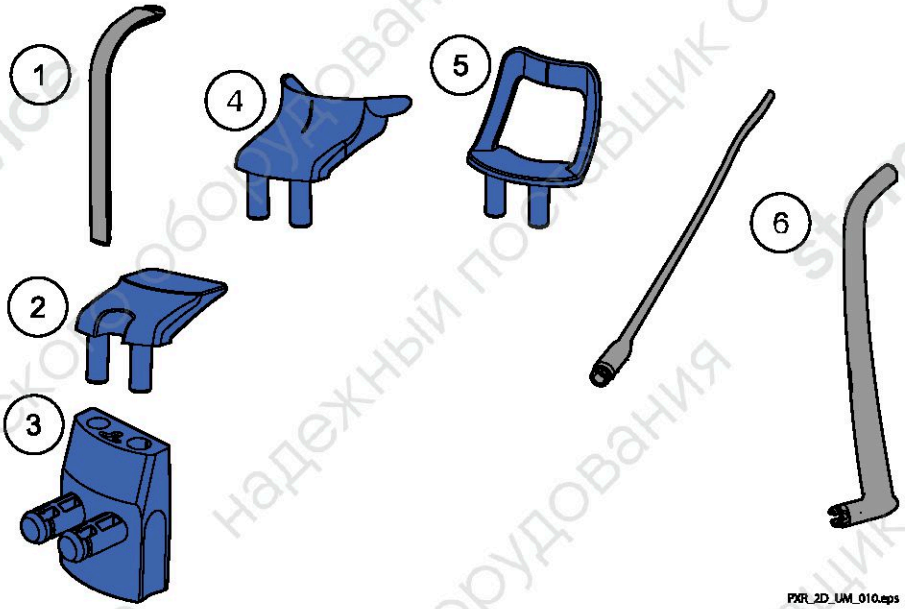


1 3D sensor for Planmeca ProMax 3D s and Planmeca ProMax 3D Classic

2 ProFace sensor for Planmeca ProMax 3D s and Planmeca ProMax 3D Classic

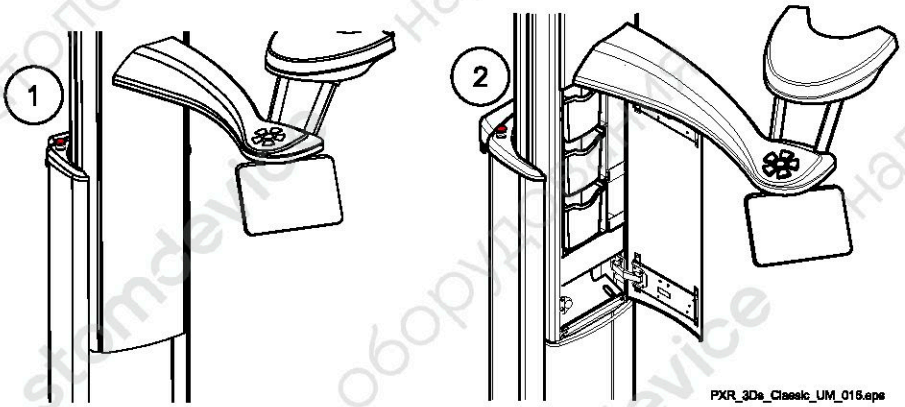
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3.5 Patient supports



1. Bite piece
2. Chin rest
3. Adapter
4. Chin cup
5. Chin support
6. Temple supports

3.6 Telescopic column



1. Telescopic column without accessory cabinet
2. Telescopic column with accessory cabinet (three accessory boxes)

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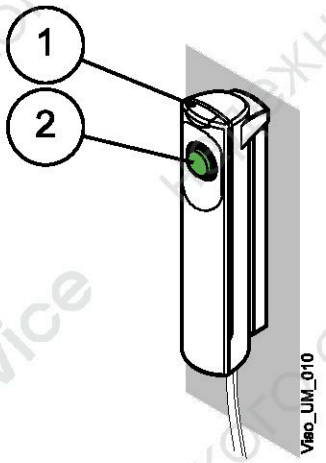
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3.7 Exposure switch

The exposure switch can be mounted on the wall, or it can be hung from the hook provided on the stationary column top if a protected area is within reach.

Green lights flash on the exposure button and on the touch screen 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.

During exposure yellow radiation warning lights illuminate on the exposure switch and on the touch screen. They indicate that the X-ray unit is generating radiation.



1 Exposure switch
2 Exposure button

3.8 Emergency stop button

The emergency stop button is located on the top of the stationary column. Press the button to stop the X-ray unit operating in an emergency. When the emergency stop button is pressed down, all movements of the X-ray unit are blocked and the unit will not generate radiation. The up / down movement will stop within a distance of 10 mm (0.4 in.).

A help message will appear on the touch screen. Guide the patient away from the X-ray unit. Then release the emergency stop button. The X-ray unit will automatically restart.



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3.9 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 exposure area 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.

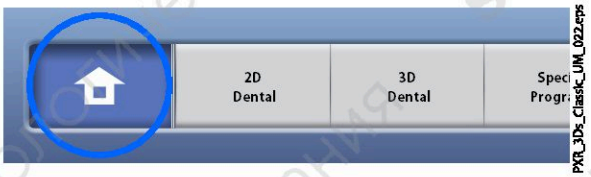
Main screen

The main screen shows the name and the imaging programs of the X-ray unit. You can use the buttons at the bottom of the main screen to change the appearance of the main view.



Home button

To view up to five most recently used programs, select the home button. The most recently used program is shown first. This is the default view of the main screen.



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ProMax_UM_014

NOTE

If you wish to use fast forward buttons on this view, select Settings > Program > 2200 Program Features > 2240 General > Fast Forward ON. Using a fast forward button takes you directly to the screen where you can take an exposure.

Program group button(s)



To view all the programs that are available for a program group, select the **2D Dental** program group 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).

You hear an audible signal when you make a selection. If you wish to adjust the volume of the signal, select Settings > User > 1300 Operational Settings > 1320 Audio Settings > Touch Volume.

NOTE

Do not use sharp objects to operate the touch screen.

Accept button



To accept a selection, select the green check mark button.

Cancel button



To cancel a selection and close the screen, select the red cross button.

Pause button



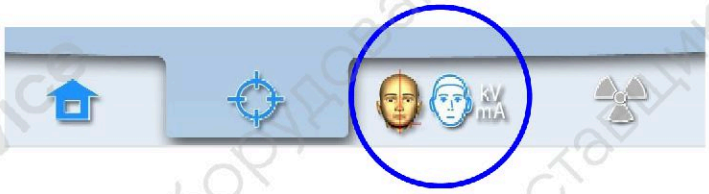
To pause a function (instead of cancelling it), select the pause button.

Moving forward



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To go to the next screen, select either the forward button, or the **next** symbol at the bottom of the screen.



Moving backward

To go back to a previous screen, select a previous symbol at the bottom of the screen.

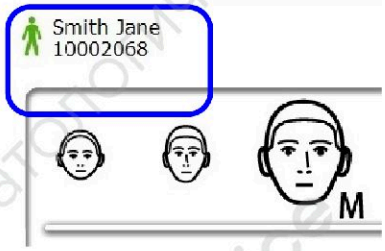


Scrolling lists

To scroll a list down or up, slide your finger on the touch screen.

Checking patient's name and ID number

The patient's name and ID number are shown in the top right corner of the touch screen. The patient and exposure mode have to be selected in Planmeca Romexis.



Checking DAP and CTDI values

The estimated values for DAP (Dose Area Product) and CTDI (Computed Tomography Dose Index) 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.

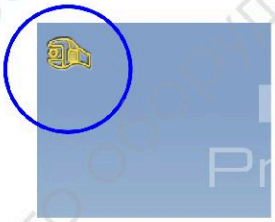


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Changing settings

To change a setting, select the settings symbol on the main screen. This takes you to the settings menu where you can adjust the settings of the X-ray unit. Refer to section "Settings" on page 85 for details.



About stand-by mode

The touch 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 on / off switch 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 and PC connection. To do this, select Settings > User > 1300 Operational settings > 1310 Use Mode > 1311 Set Demo Mode. The selection is shown in the bottom left corner of the touch screen.



3.10 ProTouch desktop application

If the ProTouch desktop application is installed on your computer, you can use a virtual control panel on your computer screen.

The application is identical to the touch screen that is integrated to the X-ray unit. The two control panels are synchronised, and you can use either or both of them.



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NOTE

You need a licence if you wish to use the application for moving to the ready status. Contact your dealer for help.

To use the virtual control panel, double-click the ProTouch icon on your computer screen. Then click your mouse on the function that you wish to use.



NOTE

A help message appears if you used the settings menu before you opened the application. The application will automatically close when you accept the help message. You can reopen the application by double-clicking the icon again.

The small icon in the bottom left corner of the screen indicates when the application is connected to the X-ray unit.

- A green icon indicates that the connection is working:

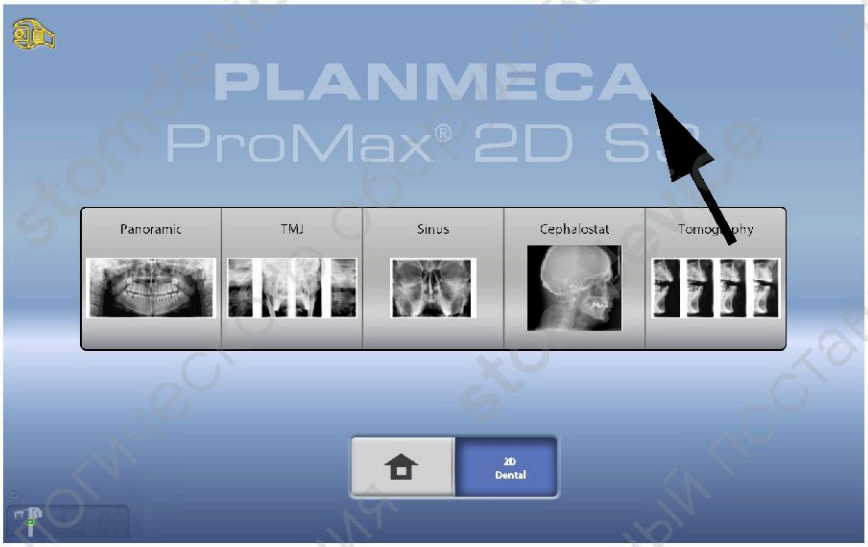


- A red icon indicates that the connection is not working:



  Restart the X-ray unit if the icon is red.

To move the control panel screen, drag it with your mouse.



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To close the application, click on the small red cross in the top right corner of the screen.



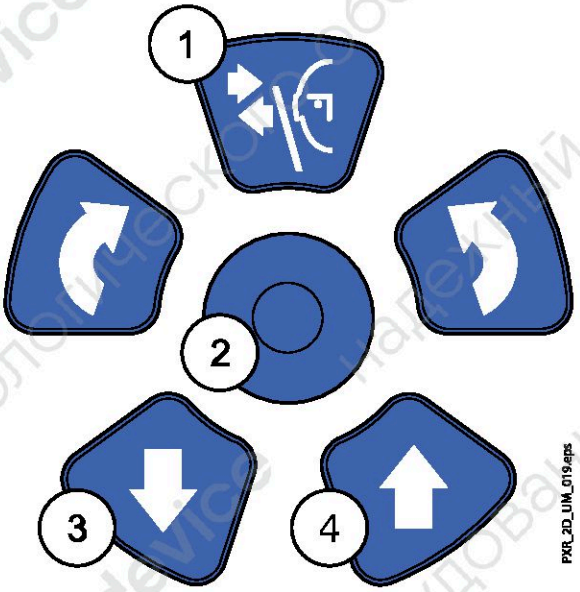
3.11 Patient positioning controls

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.

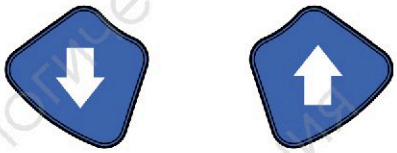


1. Open / close temple supports (2D imaging)	2. Positioning joystick
3. Move X-ray unit down	4. Move X-ray unit up

3.11.1 X-ray unit up / down

The X-ray unit up and down buttons are used to adjust the X-ray unit to suit the height of the patient.

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



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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

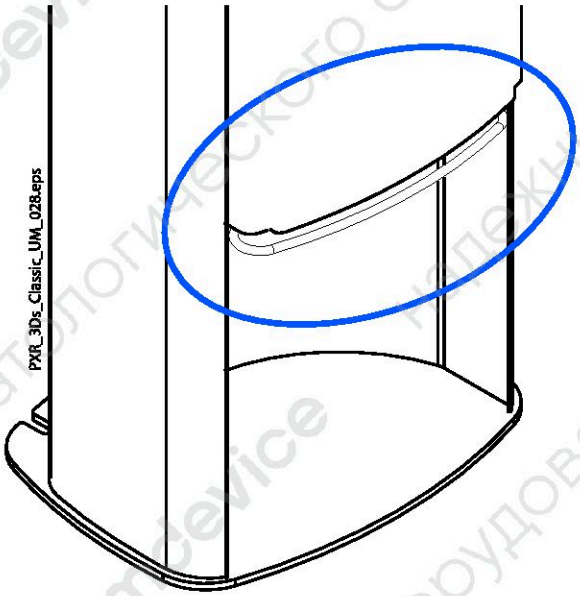
Be careful that the X-ray unit does not hit the ceiling when you press the up button. The maximum height can be adjusted to suit offices with a low ceiling, contact your service technician for help.

NOTE

Make sure that there is no object under the X-ray unit when you press the down button. If something is in danger of becoming trapped, release the button immediately to stop the movement. Clear any obstruction before pressing the button again.

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.

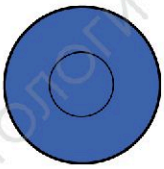


NOTE

When positioning seated patients (e.g. in a wheelchair) always first move the X-ray unit down before you position the patient in the unit.

3.11.2 Positioning joystick

The positioning joystick is used for adjusting the positioning lights. It is used when the patient is positioned in the X-ray unit.



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3.11.3 Open / close temple supports

Press the temple support button to open the temple supports in 2D imaging. The temple supports can be closed by pressing the temple support button again.



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4 Programs

The X-ray unit uses SCARA (Selectively Compliant Articulated Robot Arm) technology for arm movements.

Planmeca ProMax 2D S3 and Planmeca ProMax 3D X-ray units have three joints (S3 = SCARA 3) and allow limitless imaging possibilities. Planmeca ProMax 2D S2 X-ray units have two joints (S2 = SCARA 2) and offer a more limited selection of imaging programs.

NOTE

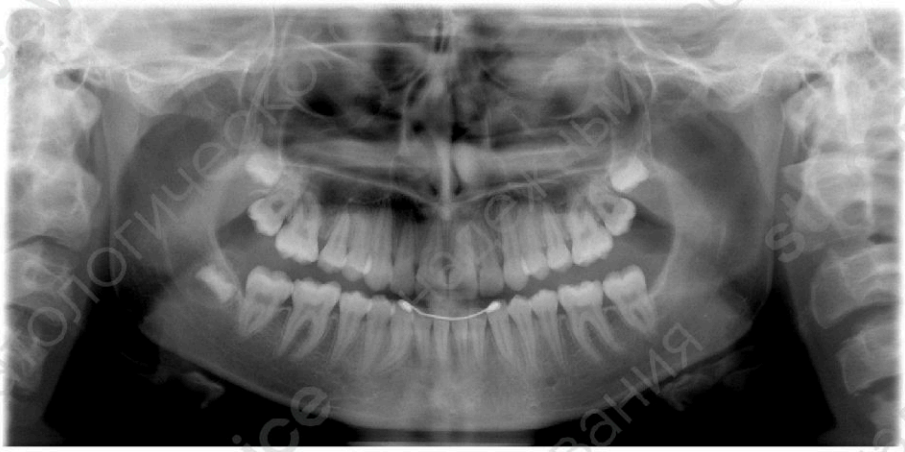
The image width and height depend on the X-ray unit model and sensor. The images shown here are only examples.

4.1 Panoramic programs

4.1.1 Standard



The standard panoramic program has a traditional path and angles of the beam.



4.1.2 Bitewing



This program produces bitewing images from premolar and molar areas including parts of maxilla, mandible and rami. The bottom of the maxillary sinus as well as the mandibular canal and the mental foramen are also visible.

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NOTE

This program is optimised for interproximal imaging and a shadow of the opposite side teeth may therefore be visible in the image.

4.1.3 Interproximal



The basic imaging geometry is the same as in the standard panoramic program but the X-ray beam is more parallel to the interproximal contacts of the teeth.



NOTE

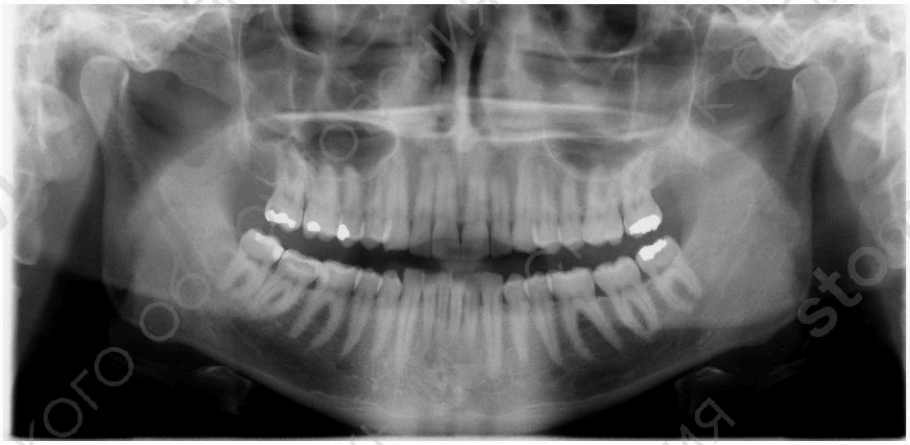
This program is optimised for interproximal imaging and a shadow of the opposite side teeth may therefore be visible in the image.

4.1.4 Orthogonal



The basic imaging geometry is the same as in the standard panoramic program but the X-ray beam is perpendicular to the jaw.

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NOTE

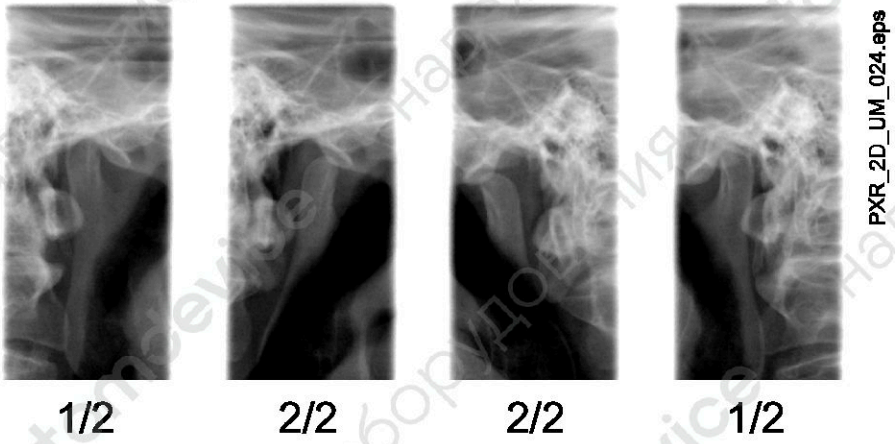
This program is optimised for orthogonal imaging and a shadow of the opposite side teeth may therefore be visible in the image.

4.2 Temporomandibular joint (TMJ) programs

4.2.1 Double lateral



Lateral exposures of closed (1/2) and open (2/2) temporomandibular joints.



- **Planmeca ProMax 2D S3 & Planmeca ProMax 3D:**

  The imaging position and angle can be adjusted. The default imaging angle is 0°.

- **Planmeca ProMax 2D S2:**

  The imaging position can be adjusted.

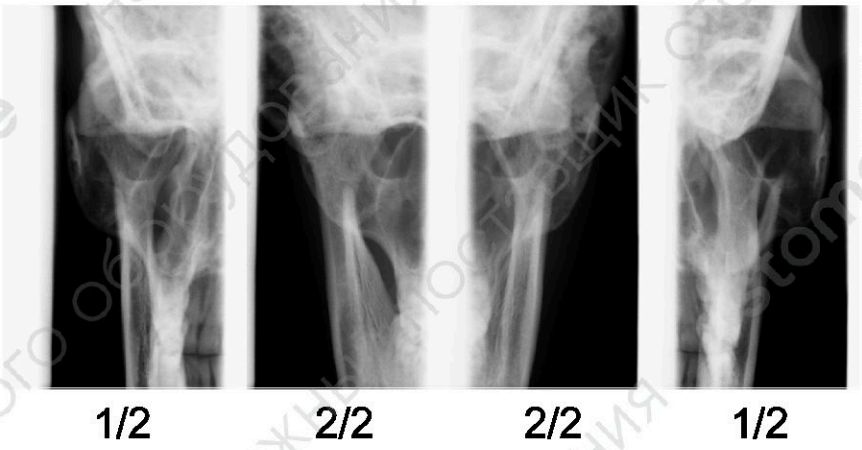
4.2.2 Double posteroanterior



Posteroanterior exposures of closed (1/2) and open (2/2) temporomandibular joints.

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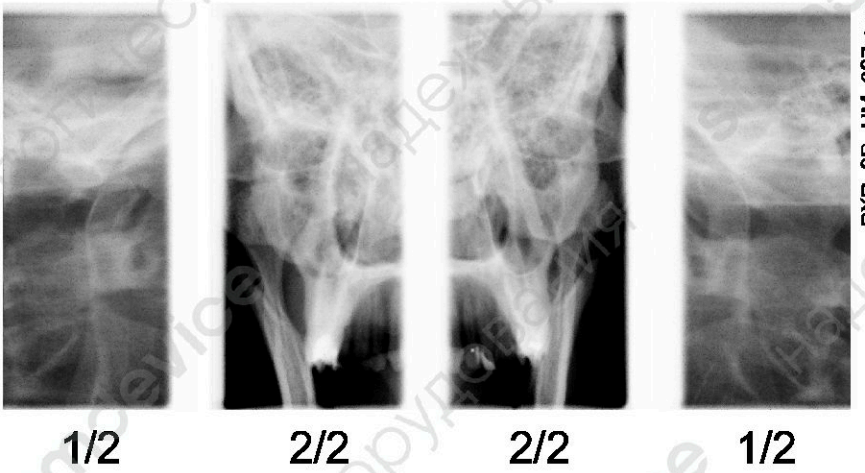
- **Planmeca ProMax 2D S3 & Planmeca ProMax 3D:**

  The imaging position and angle can be adjusted. The default imaging angle is 0°.

4.2.3 Double lateral-posteroanterior



Lateral (1/2) and posteroanterior (2/2) exposures of closed or open temporomandibular joints. The imaging angles (lateral and PA) are adjustable (default angle: 0°).



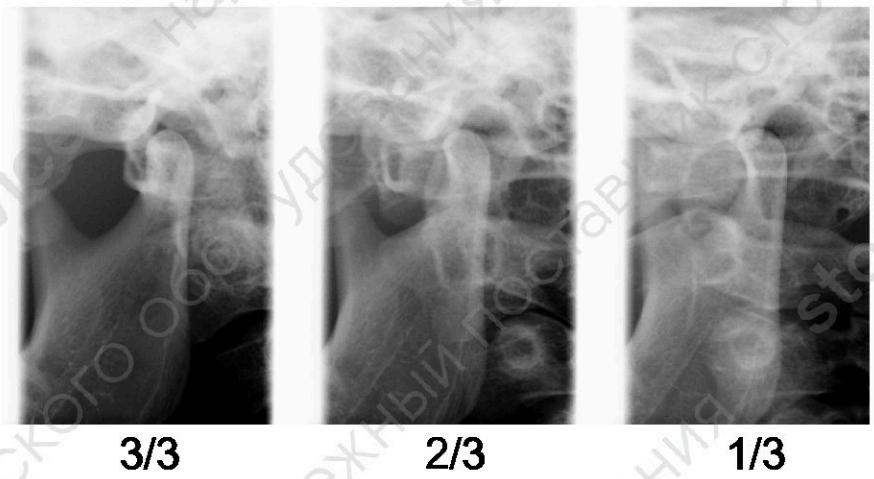
4.2.4 Three angles lateral



Three lateral multi-angle TMJ exposures (left or right).

The imaging angle for image no. 2 is adjustable (three imaging angles: 0° ± 7° by default). The selected imaging angle is in image no. 2.

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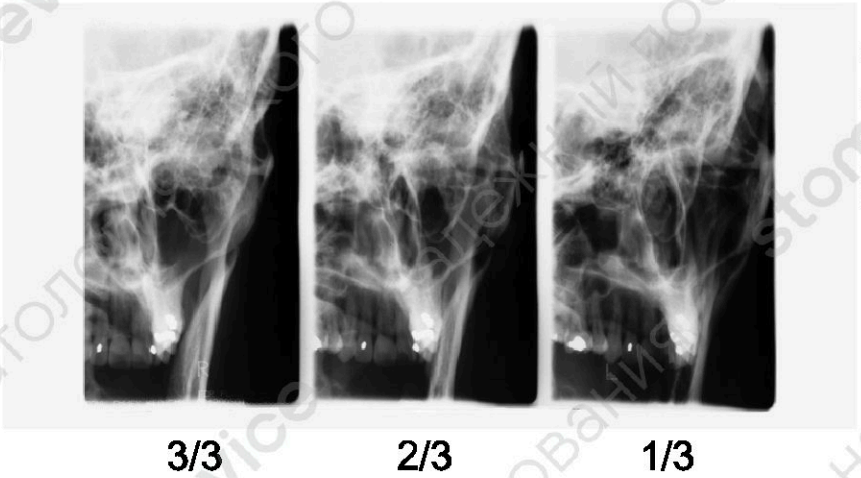


4.2.5 Three angles posteroanterior



Three posteroanterior multi-angle TMJ exposures (left or right).

The imaging angle for image no. 2 is adjustable (three imaging angles: 0° ± 7° by default). The selected imaging angle is in image no. 2.



4.3 Sinus programs

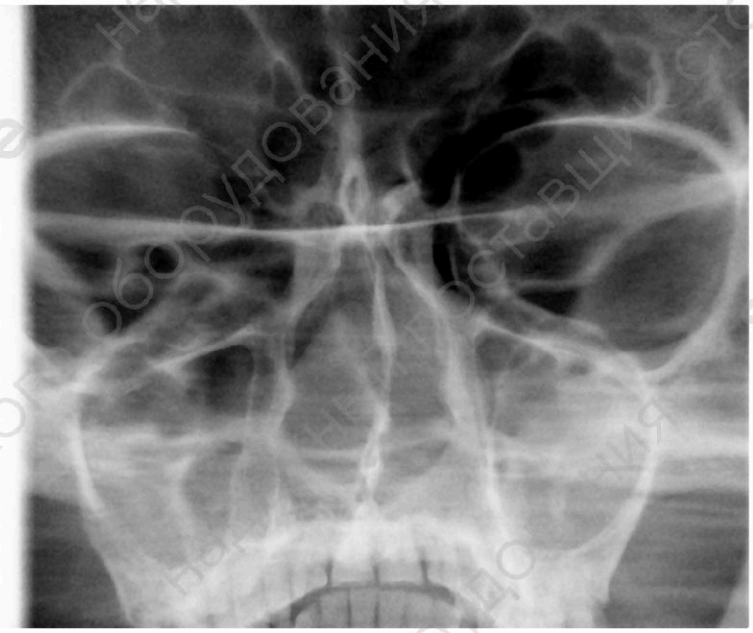
4.3.1 Posteroanterior



Posteroanterior sinus exposure.

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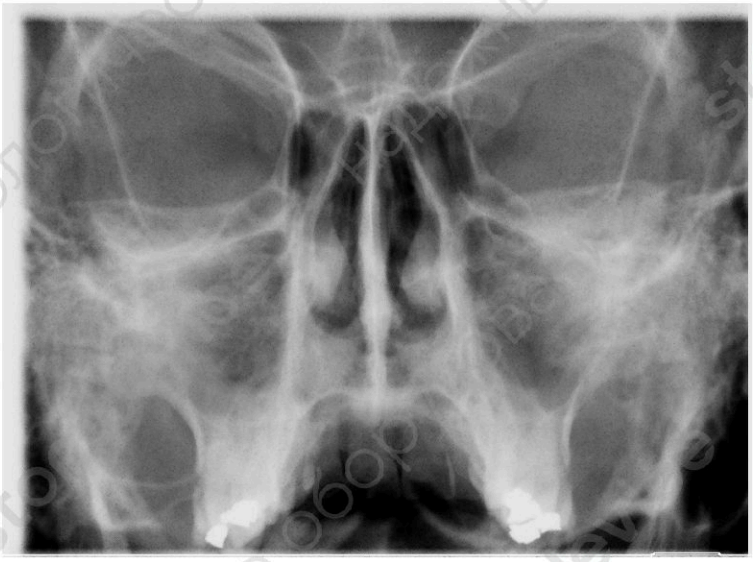
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4.3.2 Posteroanterior linear



Posteroanterior linear sinus exposure.



4.3.3 Lateral



Lateral exposure of the left or right sinus area.

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5 Preparations for exposure

5.1 Attaching and removing sensor

NOTE

The available sensors are shown in section "Sensor" on page 11.

NOTE

FOR PLANMECA PROMAX 2D X-RAY UNITS:

If the sensor is attached to the cephalostat (optional), the sensor must be moved to the C-arm as described below.

NOTE

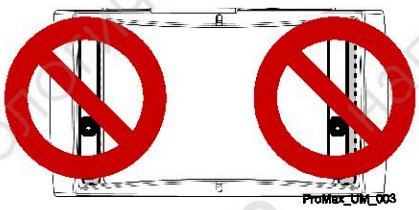
FOR PLANMECA PROMAX 3D X-RAY UNITS:

If you wish to use a Dimax sensor, select Settings > User > 1300 Operational Settings > 1340 Exposure Settings > Panoramic System Dimax and change the sensor as described below.

NOTE

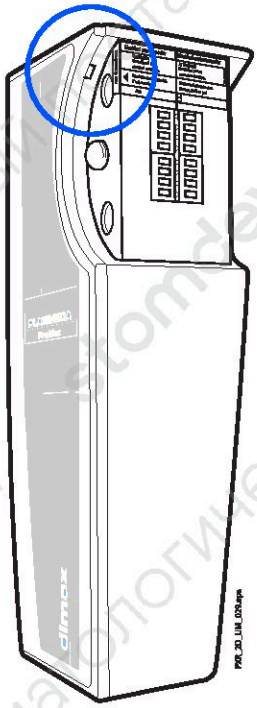
FOR PROFACE SENSOR:

Do not touch the glass windows. Fingerprints or other stains on the glass surface destroy image quality.



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CAUTION

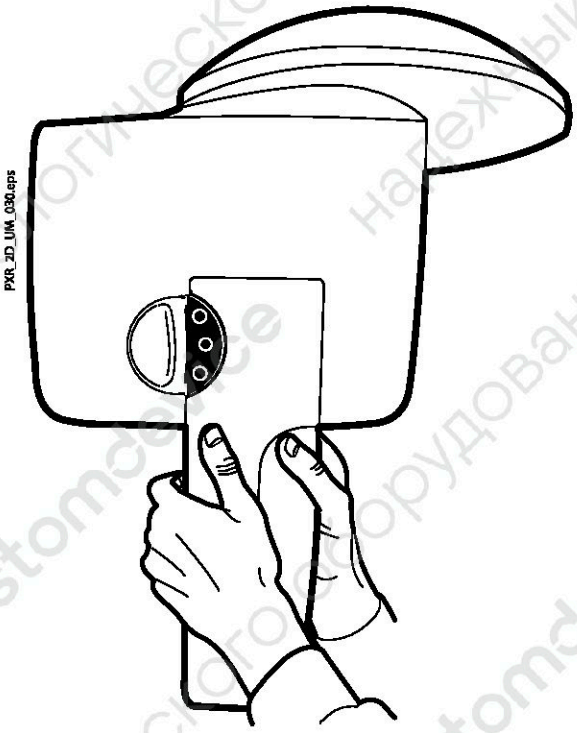
Do not drop the sensor. Planmeca limited warranty does not cover damage which is due to misuse, e.g. dropping the sensor, neglect, or any cause other than ordinary use.

Do not use the sensor if the shock indicator (1) is red - contact your service technician for help.

If you have any reason to believe that the sensor might be faulty, take a test exposure before taking a patient exposure.

5.2 Attaching sensor to C-arm

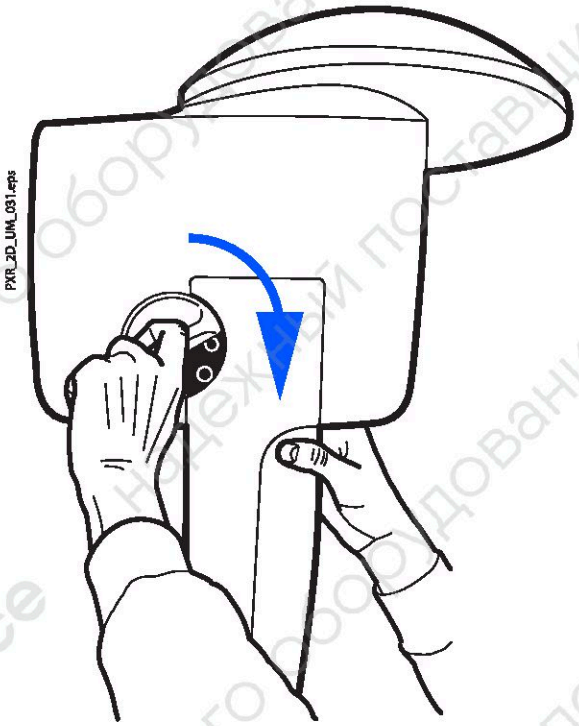
1. Push the sensor onto the connector on the C-arm.



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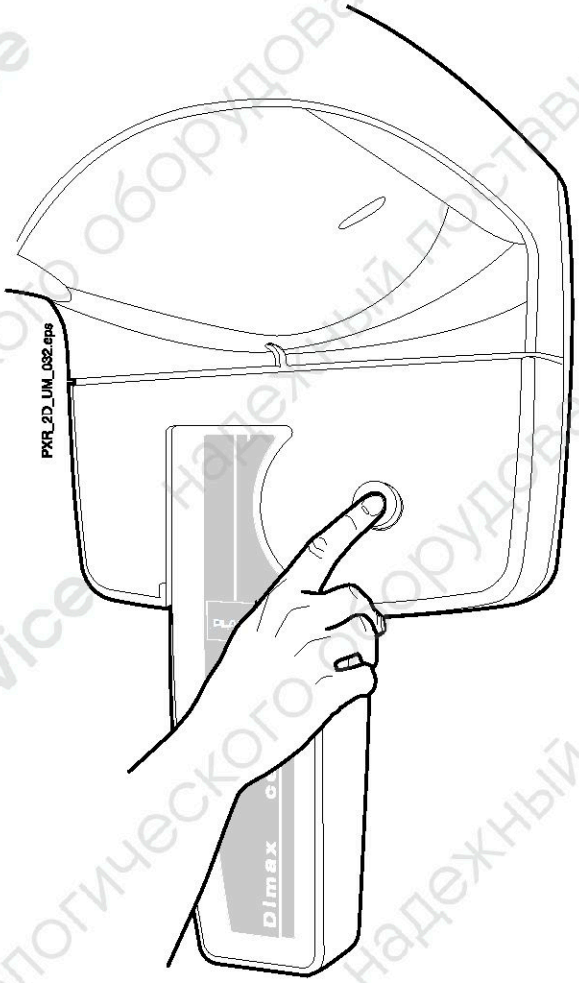
2. Turn the locking knob over the fastening mechanism. This will secure the sensor in position.



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3. Push in the C-arm electrical connector button on the other side. This will make the electrical connection between the sensor and C-arm.



5.3 Detaching sensor from C-arm

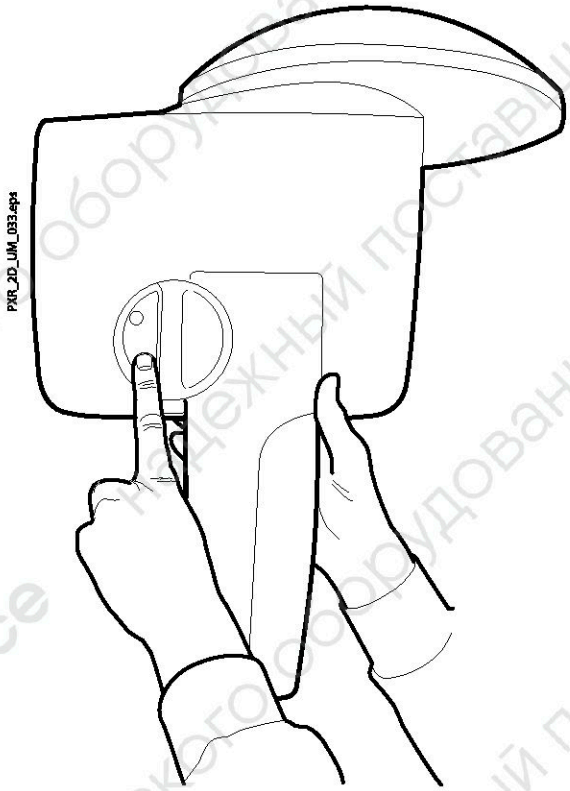
NOTE

Do not remove the sensor during imaging process.

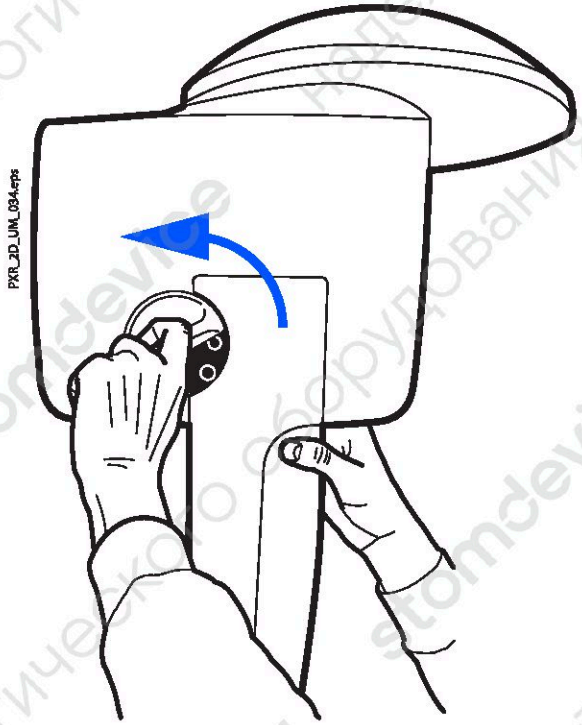
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1. Push in the C-arm electrical connector. This will disconnect the electrical connection between the sensor and C-arm.

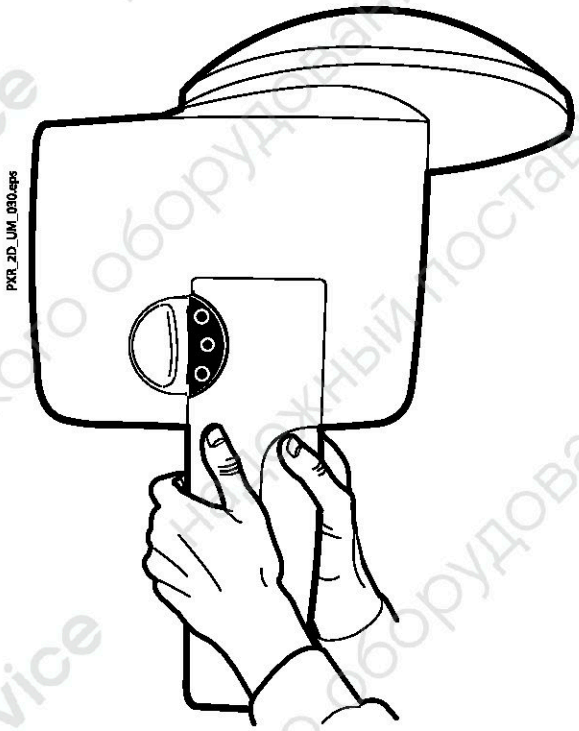


2. Turn the locking knob 180 degrees. This will release the locking mechanism.



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3. Carefully pull the sensor out.

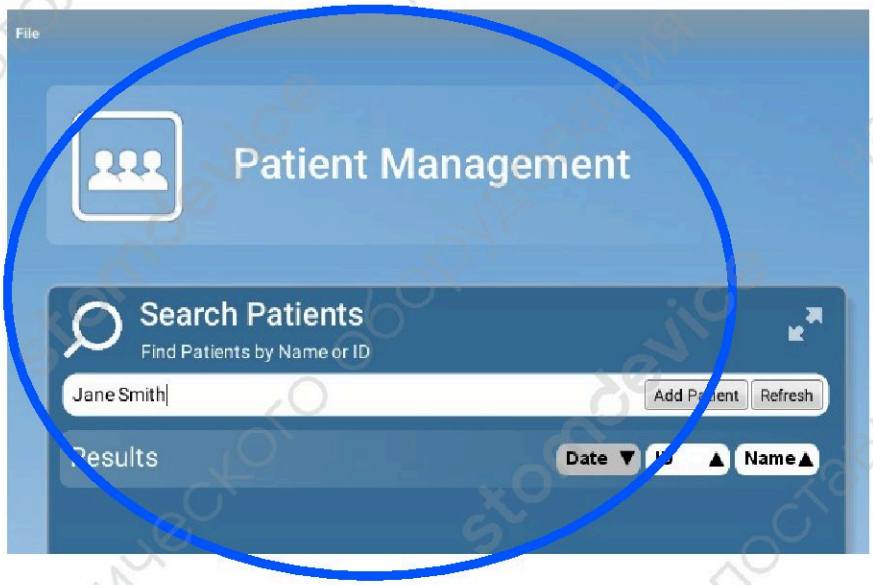


NOTE

For safety reasons, wait for at least ten seconds before you attach a sensor again. The blue indicator light under the locking knob has to switch off first.

5.4 Preparing Planmeca Romexis

- Select the patient



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- Select the panoramic exposure



Refer to the Planmeca Romexis User's Manual for details on Romexis functions.

5.5 Preparing patient

Ask the patient to remove any spectacles, hearing aids, dentures, hairpins, and personal jewellery such as earrings, necklaces and piercings as these can produce shadows or reflections in the image. The patient should also remove any loose items of clothing (e.g. scarf, tie) that might get caught in the arm structures of the X-ray unit.

NOTE

High contrast objects, such as gold teeth or amalgam, may cause artefacts in the image.

Place a protective lead apron over the patient's back if required.

NOTE

We recommend that you image patients with poor health in a sitting position.

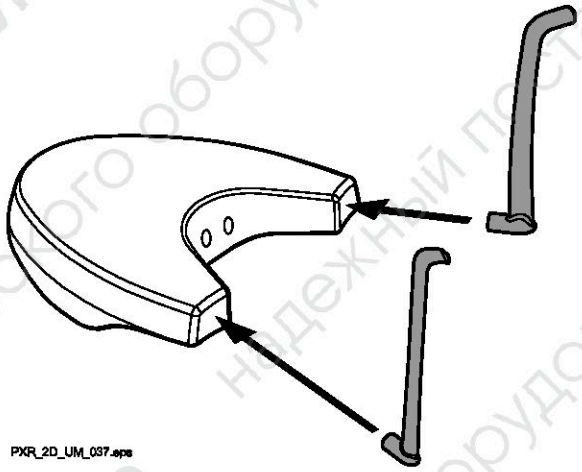
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6 Panoramic exposure

6.1 Before exposure

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

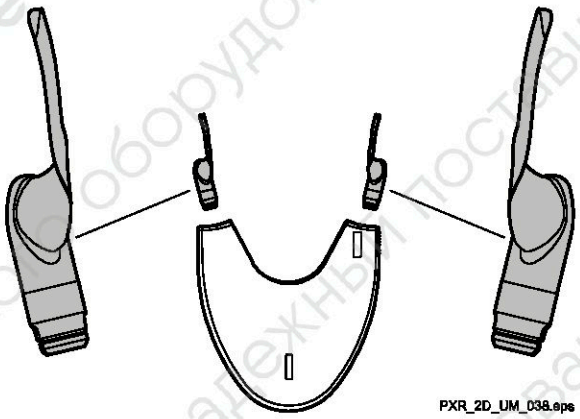


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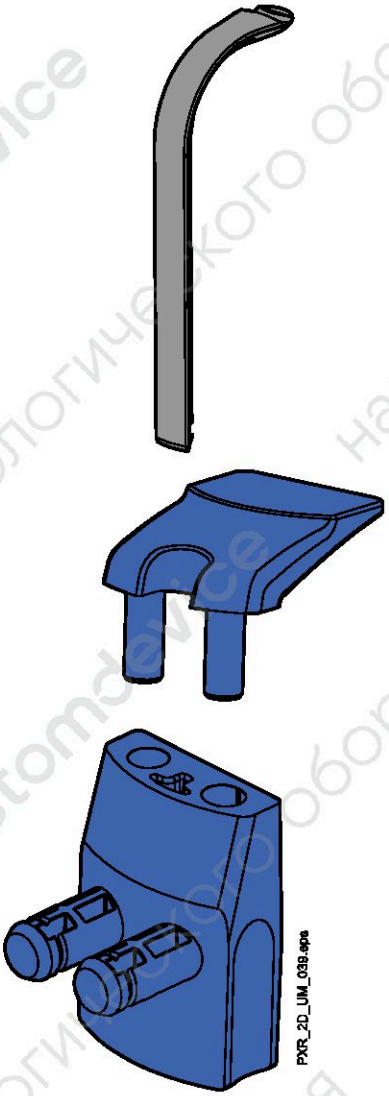
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NOTE

Ensure that you insert the temple supports the right way round (i.e. with the convex side facing outward as shown).



- Use these patient supports.



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NOTE

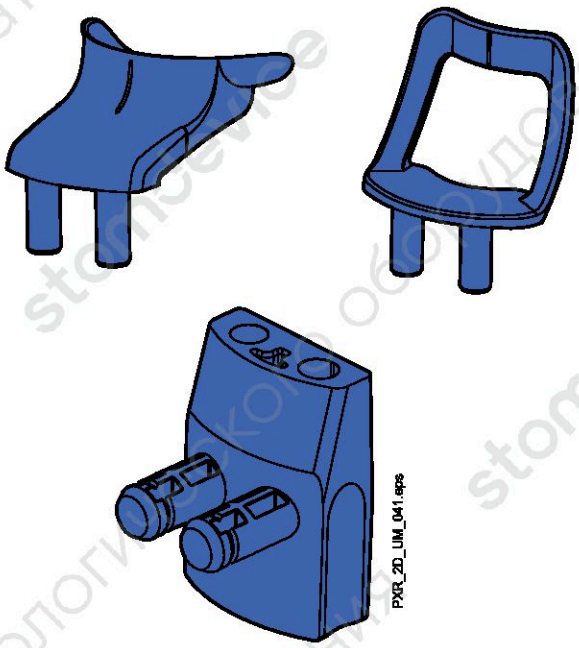
FOR BITEWING EXPOSURES:

You can use these patient supports if the patient has a very large jaw.



NOTE

You can use these patient supports for edentulous patients or for patients who are unable to bite.



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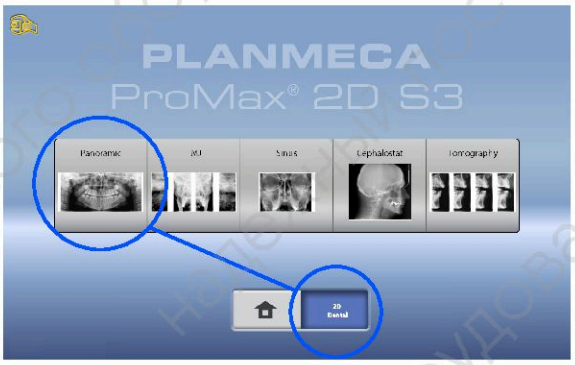
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6.2 Selecting exposure settings

Refer to section "Touch screen" on page 14 for general information on how to make or cancel selections on the touch screen.

6.3 Selecting program

Select the panoramic program (2D Dental > Panoramic).



6.3.1 Selecting program type

Select the program type from:

- The drop-down menu at the top

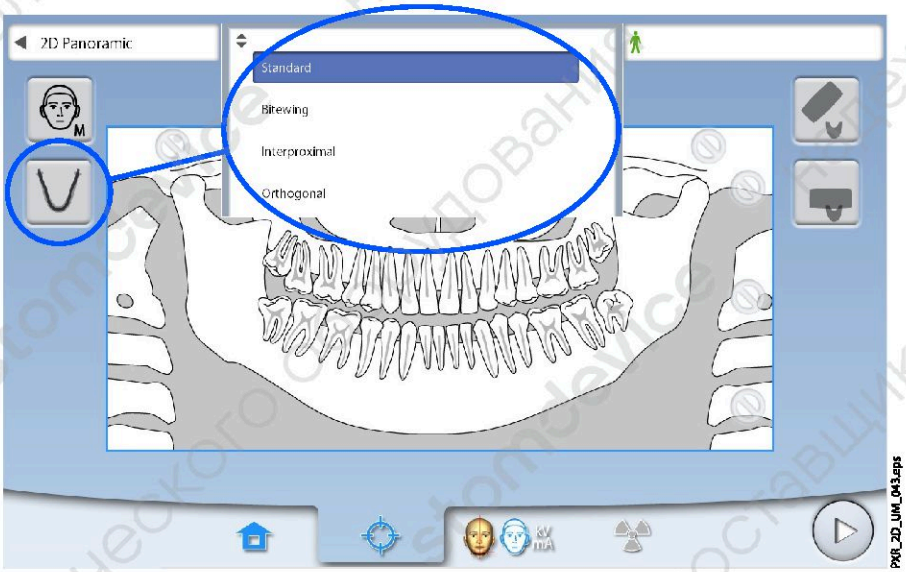
  OR

- The left of the screen

Refer to section "Panoramic programs" on page 22 for details.

NOTE

The available options depend on the X-ray unit model.



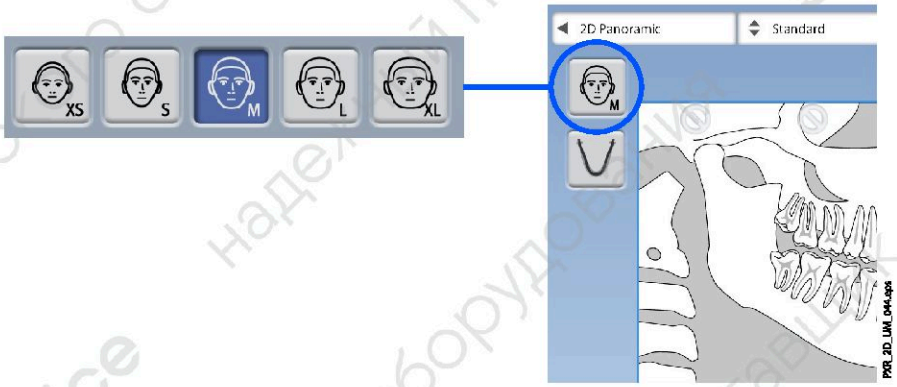
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6.3.2 Selecting patient size

Use this button to select the patient size:

- XS = Child
- S = Small adult
- M = Medium-sized adult
- L = Large adult
- XL = Extra large adult



NOTE

Selecting child patient (XS) will automatically reduce the exposure area and patient dose.

NOTE

The exposure values will automatically change according to the selected patient size.

NOTE

The patient size can also be selected on the next screen.

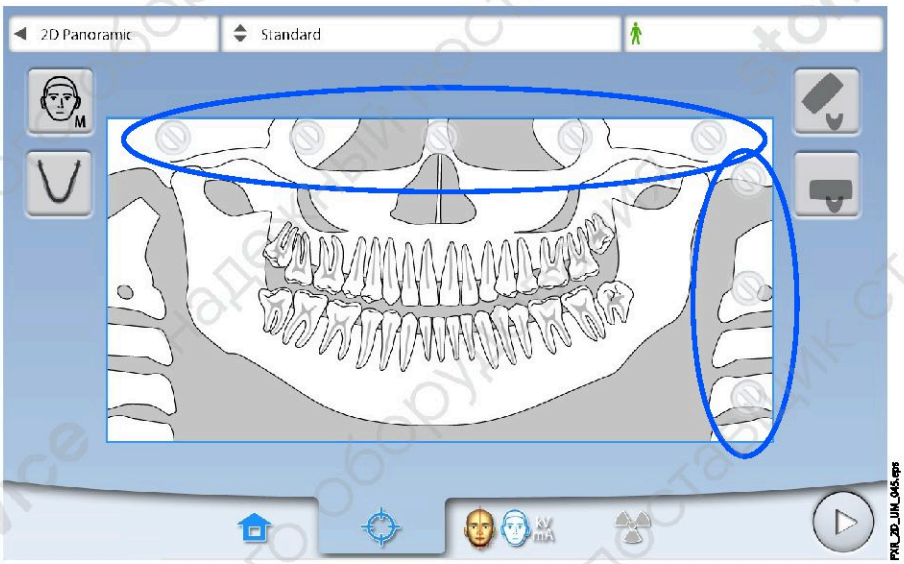
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6.3.3 Selecting segmentation

The function allows you to take exposures of different jaw segments. This will reduce the radiation dose of the patient.

The illustration on the screen is divided into three horizontal segments and five vertical segments. Select the segments that should NOT be exposed. The prohibition signs of these segments turn red.



NOTE

It is not possible to expose two separate horizontal segments.

NOTE

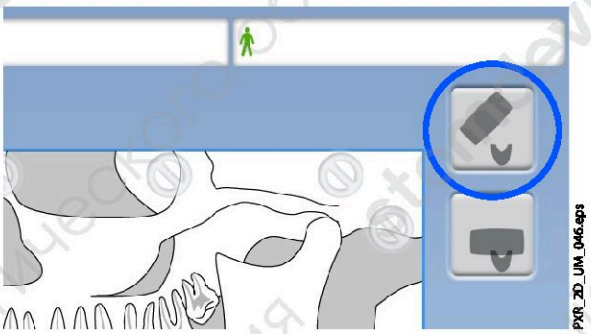
The illustration on the screen is only an example. The actual size of the exposed area depends on the patient's individual anatomy.

6.4 Patient positioning

6.4.1 Selecting patient entry position

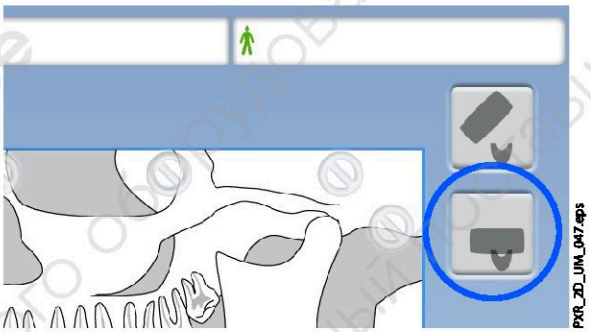
Use the buttons on the right of the screen to select the patient entry position.

- Select this button to 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.



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- Select this button to position the C-arm around the patient support table. This is the traditional closed patient entry position.



NOTE

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

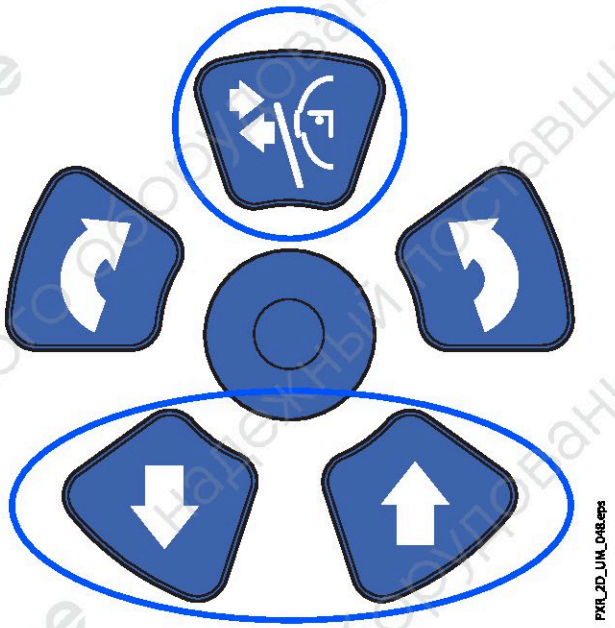
NOTE

Planmeca ProMax 2D S2 X-ray units offer only one patient entry position. This entry position is the closed patient entry position where the C-arm is positioned around the temple supports.

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6.4.2 Positioning patient's head



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, stretch and straighten their back and neck, and bite the bite piece. The upper and lower incisors must be in the groove in the bite piece.



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NOTE

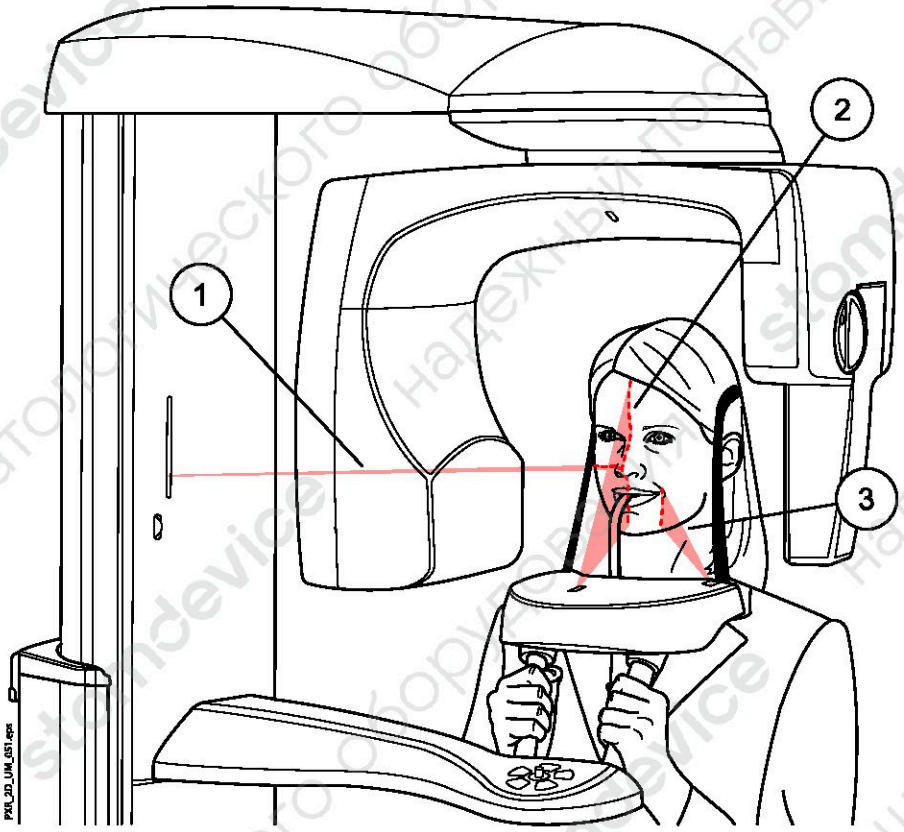
If you use the chin support, position the patient so that the chin touches the top bar as shown.

NOTE

If you use the chin support or the chin cup, use for example a cotton roll to ensure that the patient's upper and lower incisors do not overlap.



The positioning lights show on the patient's face.



1. Frankfort plane light	2. Midsagittal plane light	3. Layer light

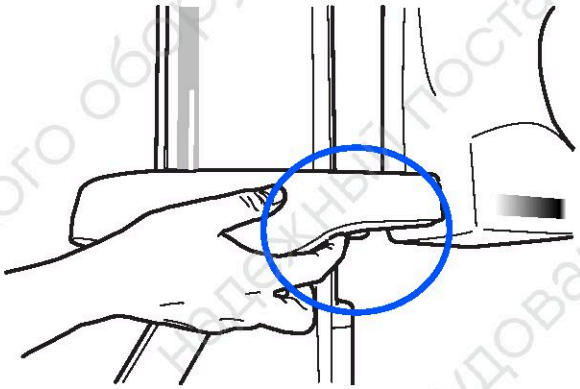
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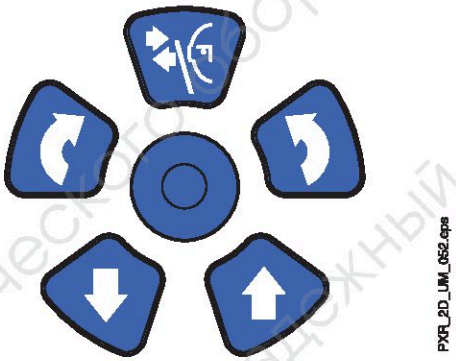
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The positioning lights will automatically switch off after two minutes. To switch them off earlier, press the positioning joystick.

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).





6.4.3 Adjusting patient's head position

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

NOTE

The illustrations are for guidelines only.

1. To go to the next screen, select
   - This symbol:



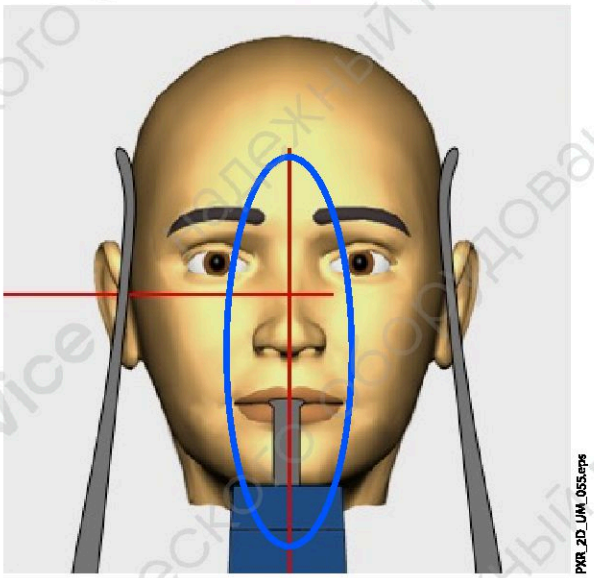
OR

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- The forward button:

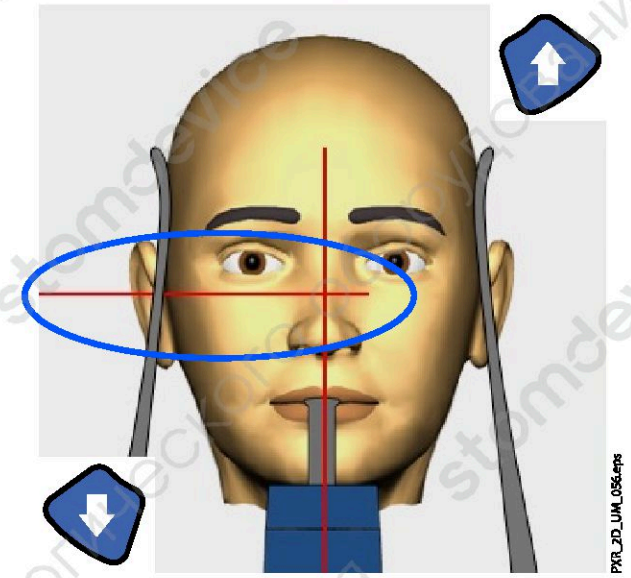


2. Position the patient's midsagittal plane so that it coincides with the midsagittal plane light.



3. Position the patient's Frankfort plane so that it coincides with the Frankfort plane light.

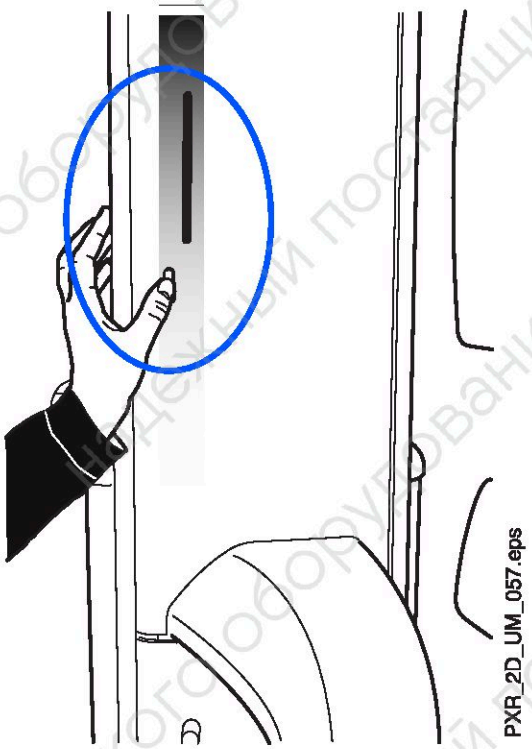
   To do this, adjust the tilt of the patient's head by raising or lowering the X-ray unit with the height adjusting buttons. The patient's back and neck must be straight.



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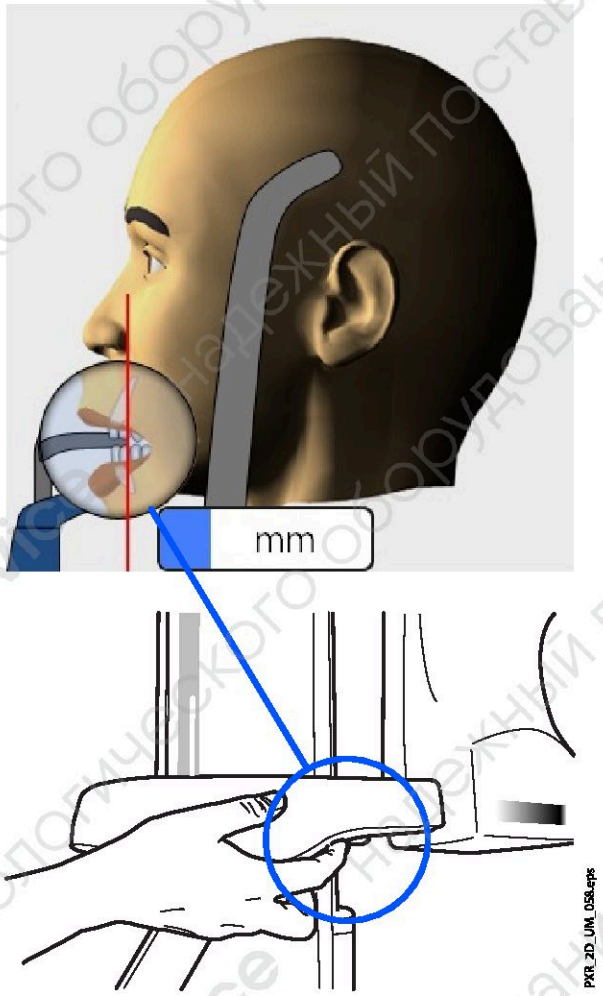
- The Frankfort plane light is located inside the column. The light's position can be adjusted if needed. This is done by rotating the thumb wheel below the light slot.



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4. Position the apices of the patient's upper central incisors within the image layer of the X-ray unit.

   To do this, rotate the thumb wheel on the underside of the patient support table to move the layer light until it falls between the second incisor and the canine.



NOTE

The layer light is switched off when Autofocus is selected. Refer to section "Taking an exposure with Autofocus (Planmeca ProMax 2D S3 and Planmeca ProMax 3D X-ray units)" on page 55 for details.

5. Check that the midsagittal plane light and the Frankfort plane light are still correctly positioned. Reposition them if necessary.

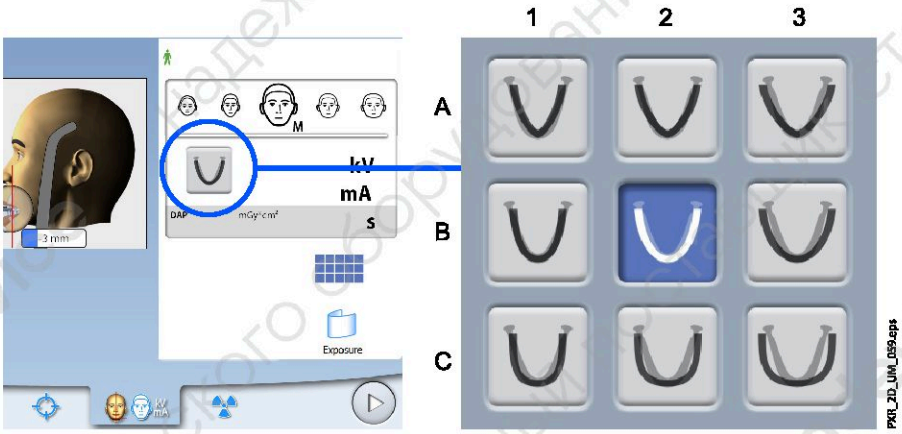
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6.5 Selecting jaw size and shape

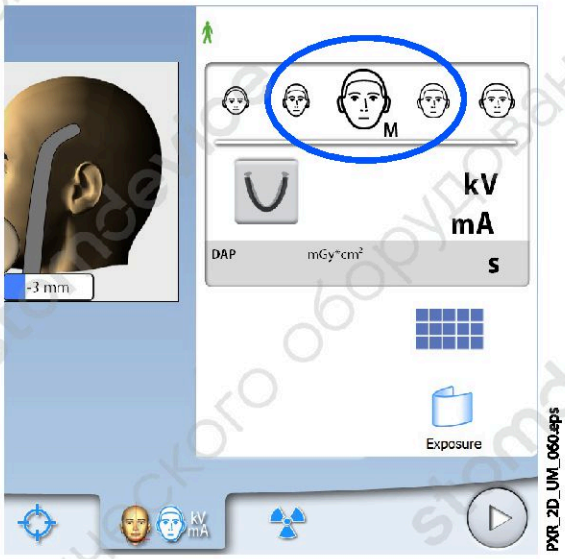
Use this button to select the following:

- Jaw size of the patient (columns):
  1. Small
  2. Medium
  3. Large
- Jaw shape of the patient (rows):
  1. V-shaped
  2. Standard
  3. U-shaped



NOTE

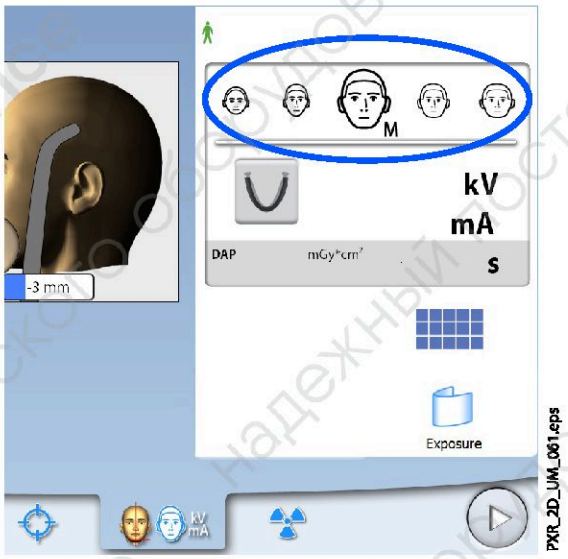
The jaw size will automatically change according to the selected patient size (XS = 1, S & M & L = 2, XL = 3).



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NOTE

If needed, you can change the patient size on this screen.

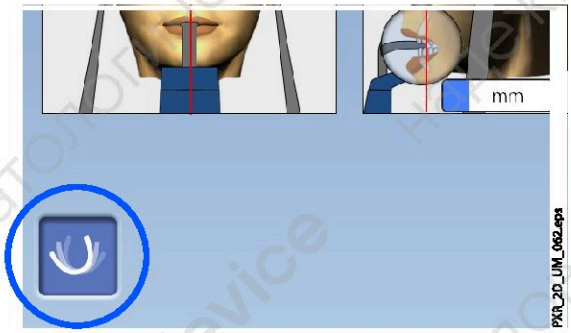


6.6 Selecting MultiView (Planmeca ProMax 3D X-ray units)

NOTE

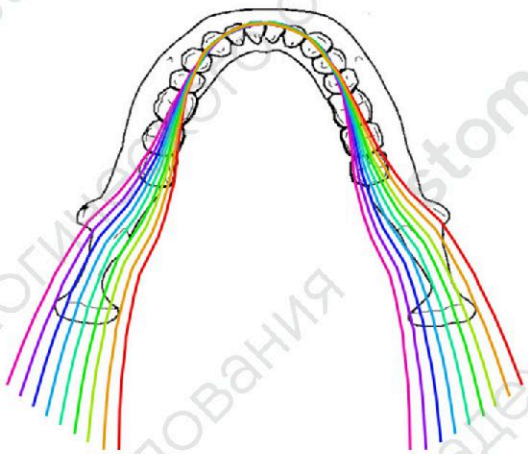
MultiView is an optional feature for Planmeca ProMax 3D X-ray units.

Use this button to select the MultiView imaging mode.



This function allows you to adjust the viewing angle in the Planmeca Romexis program.

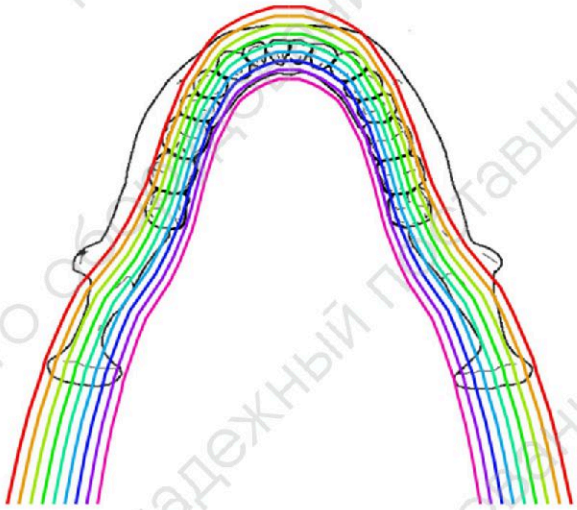
- Panoramic layers with MultiView (button selected)



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- Panoramic layers without MultiView (button not selected)



NOTE

The exposure values will automatically change according to the selected patient size and imaging mode.

6.7 Adjusting exposure values for current exposure

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

NOTE

FOR X-RAY UNITS WITH DIMAX SENSOR:

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

NOTE

Always try to minimise the radiation dose to the patient.

The preset exposure values are shown in the following table.

Factory presets for panoramic exposures

PATIENT SIZE	kV VALUE	mA VALUE
X-ray units with Dimax sensor		
Child (XS)	62	5
Small adult (S)	64	6.3
Medium-sized adult (M)	66	8
Large adult (L)	68	10
Extra large adult (XL)	70	12.5
		X-ray units with 3D sensor
SmartPan		
Child (XS)	62	5.6

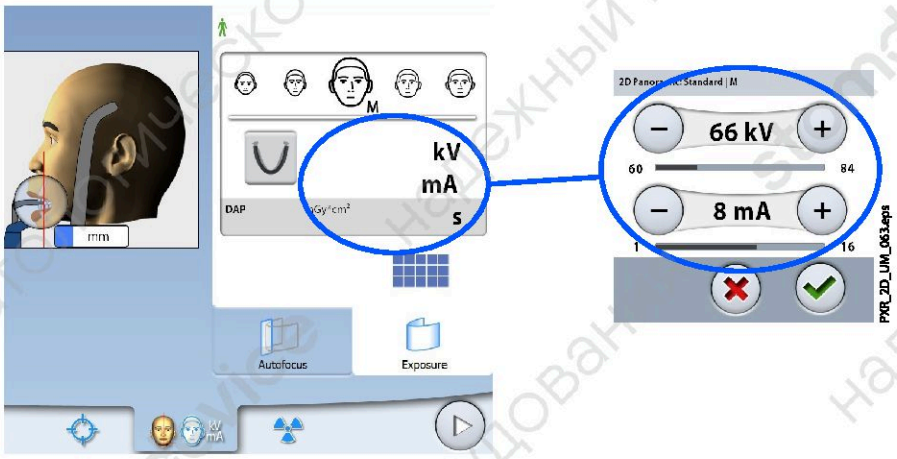
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Factory presets for panoramic exposures

PATIENT SIZE	kV VALUE	mA VALUE
Small adult (S)	64	7.1
Medium-sized adult (M)	66	9
Large adult (L)	68	11
Extra large adult (XL)	70	14
MultiView SmartPan		
Child (XS)	62	10
Small adult (S)	64	11
Medium-sized adult (M)	66	12.5
Large adult (L)	68	14
Extra large adult (XL)	70	16

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.



NOTE

You can adjust the preset exposure values permanently as described in section "Programs" on page 22.

6.8 Selecting Dynamic Exposure Control (DEC) (Planmeca ProMax 2D X-ray units)

NOTE

Dynamic Exposure Control (DEC) is an optional feature for Planmeca ProMax 2D X-ray units.

NOTE

DEC and vertical segmenting can be used simultaneously. However, the right-most vertical segment cannot be deselected.

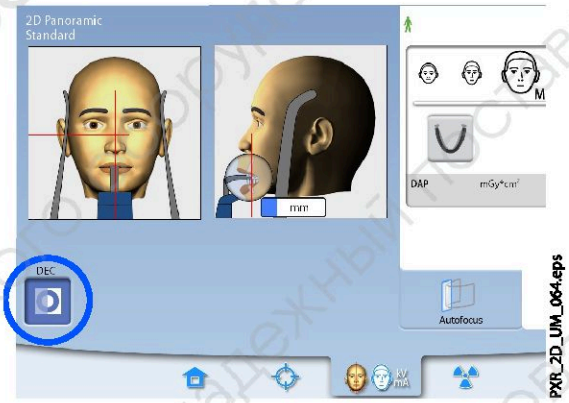
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NOTE

DEC and horizontal segmenting cannot be used simultaneously.

Select the DEC button.



Dynamic Exposure Control (DEC) automatically provides optimal exposure values for each patient during exposure. The function adjusts the exposure values individually for each patient based on their anatomic structure and bone density. Switching DEC on improves the image quality as the function produces images of more consistent brightness and contrast.

When DEC is switched on the exposure values are automatically adjusted during exposure. The kV value is adjusted by max ±4 kV and the mA value is adjusted by max +4 / -3 mA within the available scale.

6.8.1 Adjusting DEC density

If the images appear to be too bright or too dark, DEC density can be adjusted. Select Settings > Program > 2200 Program Features > 2210 2D Panoramic > Pan DEC Density and use the minus or plus sign to adjust the setting.

The setting can be adjusted between 20% (lower exposure values -> brighter image) and 200% (higher exposure values -> darker image). The recommended setting is 100% (default setting).

6.9 Taking an exposure

NOTE

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

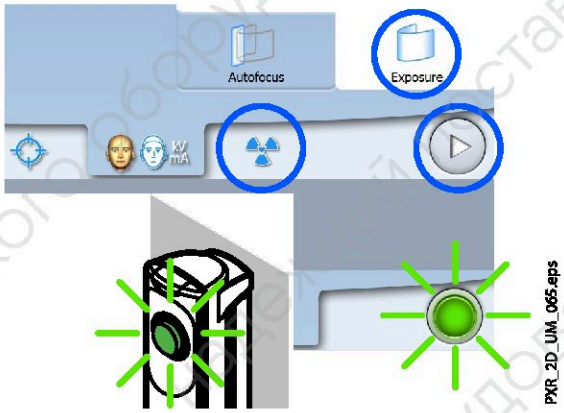
1. Make sure that the **Exposure** tab is selected.

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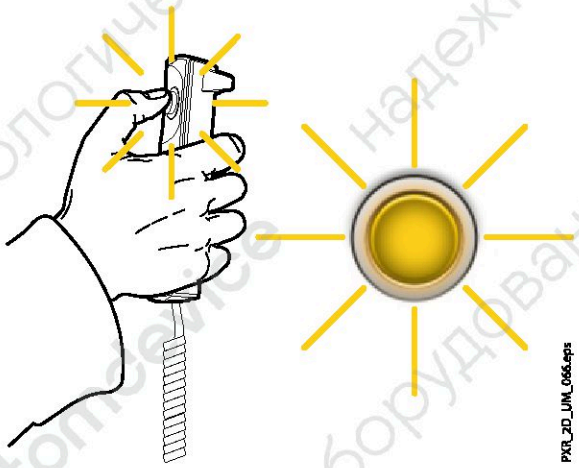
2. Select the radiation symbol or the forward button.

   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.



3. Ask the patient to swallow, place their tongue flat against the roof of the mouth and stay as still as possible.
4. Move to a protected area.
5. Press and hold down the exposure button for the duration of the exposure.

   The C-arm moves around the patient's head. During the exposure 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.

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6. The image is shown on the computer screen.



Note that you must accept the image in the Planmeca Romexis program.

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

6.10 Taking an exposure with Autofocus (Planmeca ProMax 2D S3 and Planmeca ProMax 3D X-ray units)

NOTE

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

NOTE

Autofocus is available for standard, interproximal and orthogonal panoramic programs. To turn Autofocus on, select Settings > Program > 2200 Program Features > 2210 2D Panoramic > Autofocus ON.

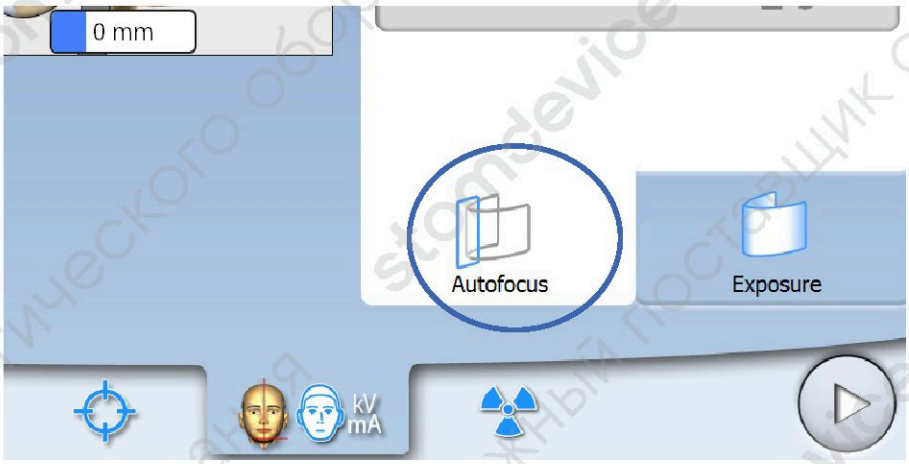
NOTE

FOR PLANMECA PROMAX 2D S3 X-RAY UNITS:

If Autofocus is selected, DEC is automatically switched off for the first exposure (scout image).

1. Select the Autofocus tab. This switches the layer light off.

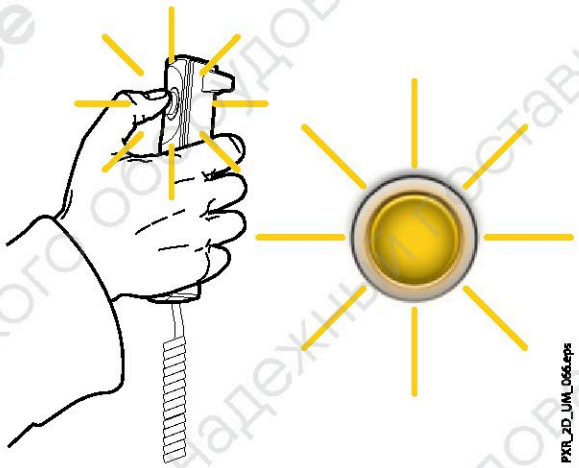
   Autofocus adjusts the layer position automatically. The function positions the image layer individually for each patient based on the position and angle of the apices of the upper central incisors.



The exposure is taken in two stages and the C-arm moves twice.

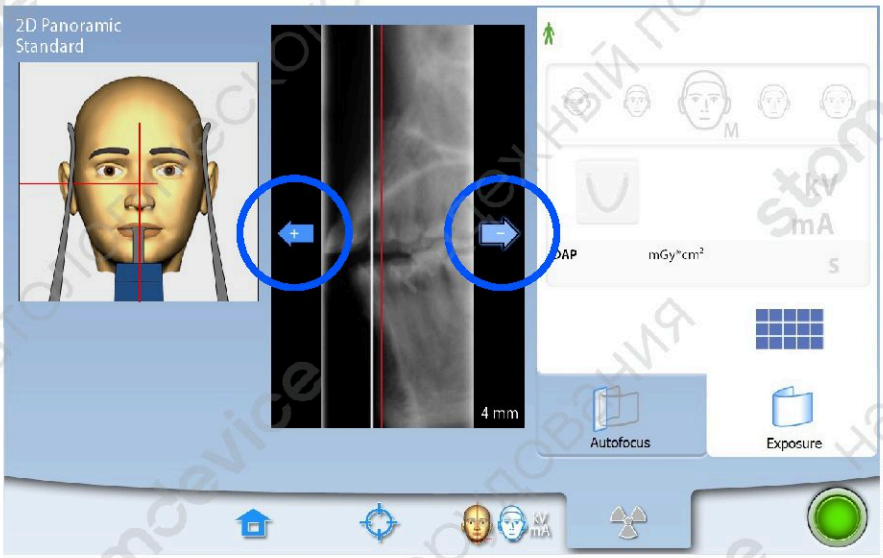
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2. Take the first exposure as described in section "Taking an exposure" on page 53. The first exposure is a short, low-dose exposure during which the optimal position for the image layer is calculated.



3. The image appears on the touch screen and on the computer screen. The calculated layer position is shown with a white line on the image.

   If needed, you can adjust the layer position manually by using the plus or minus sign on the touch screen. The new position is shown with a red line on the image.



NOTE

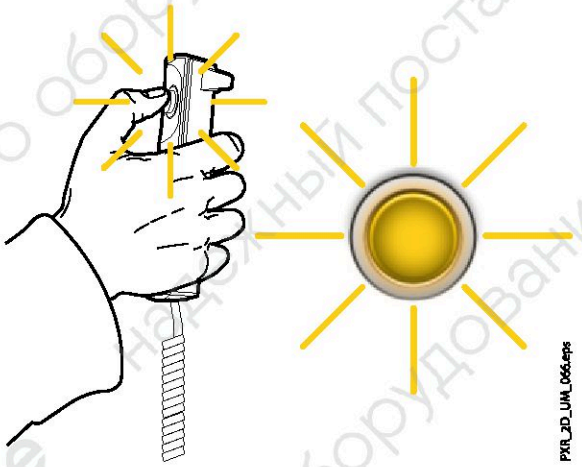
Make sure that the patient does not move between exposures.

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4. Press and hold down the exposure button again to take the second exposure. The second exposure will produce the actual image and the C-arm will now move through one complete exposure cycle.

   During exposure yellow radiation warning lights illuminate on the exposure switch and on the touch screen, and you hear a radiation warning tone.

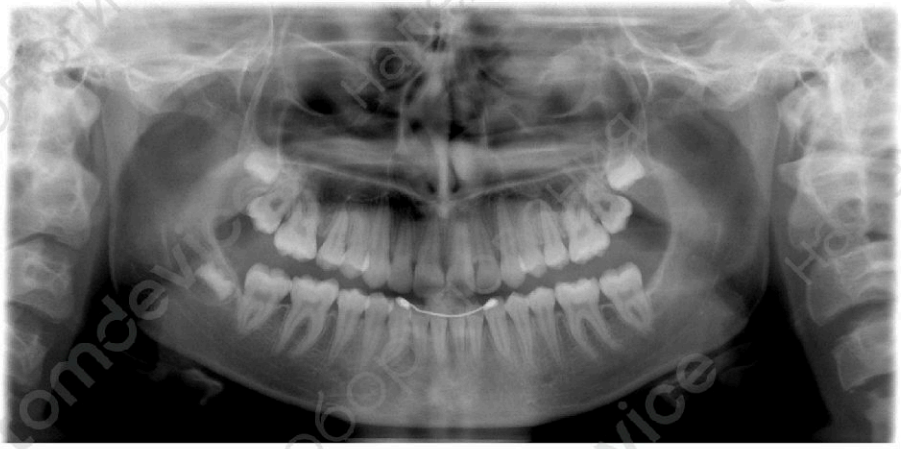


   Additionally, a radiation warning symbol is shown on the touch screen.

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.

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

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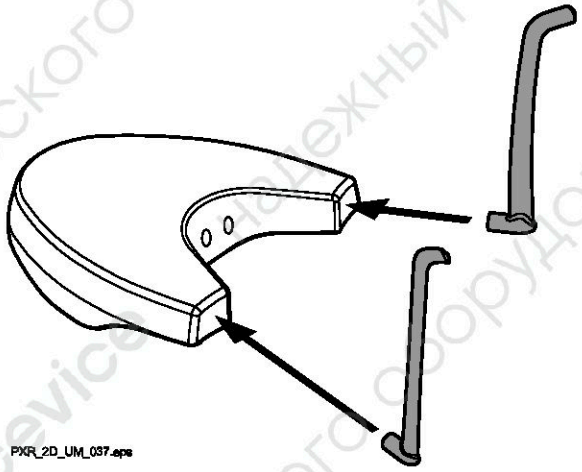
7 Temporomandibular joint (TMJ) exposure

Double TMJ programs produce closed and open views of the left and right temporomandibular joints.

Three angle TMJ programs produce three exposures with different angles from the left or right temporomandibular joint.

7.1 Before exposure

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

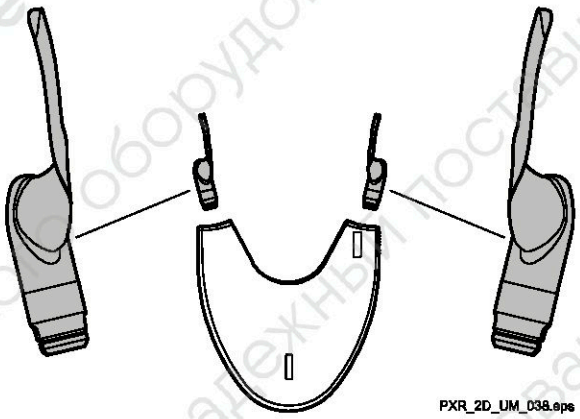


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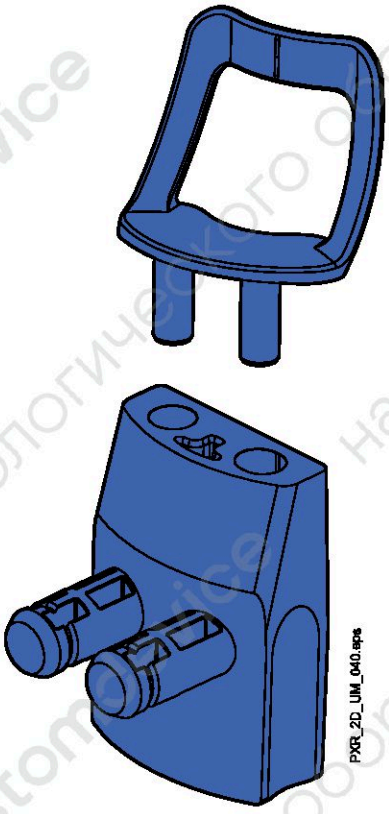
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NOTE

Ensure that you insert the temple supports the right way round (i.e. with the convex side facing outward as shown).



- Use these patient supports.



7.2 Selecting exposure settings

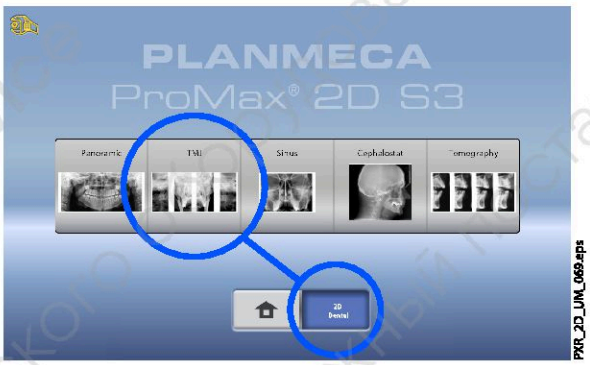
Refer to section "Touch screen" on page 14 for general information on how to make or cancel selections on the touch screen.

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7.2.1 Selecting program

Select the TMJ program (2D Dental > TMJ).



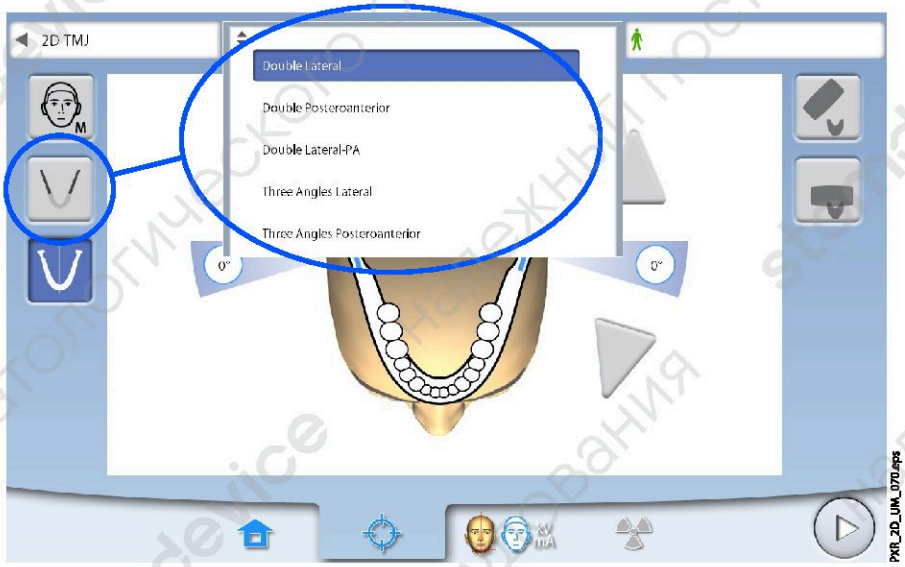
7.2.2 Selecting program type

Select the program type from:

- The drop-down menu at the top

  OR

- The left of the screen



Refer to section "Temporomandibular joint (TMJ) programs" on page 24 for details.

NOTE

The available options depend on the X-ray unit model.

7.2.3 Selecting patient size

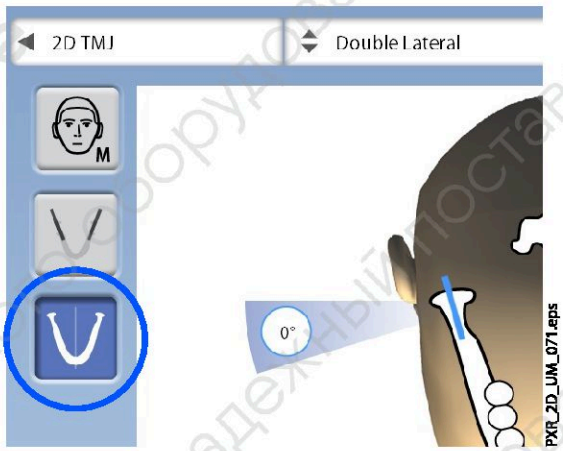
Select the patient size as described in section "Selecting patient size" on page 77.

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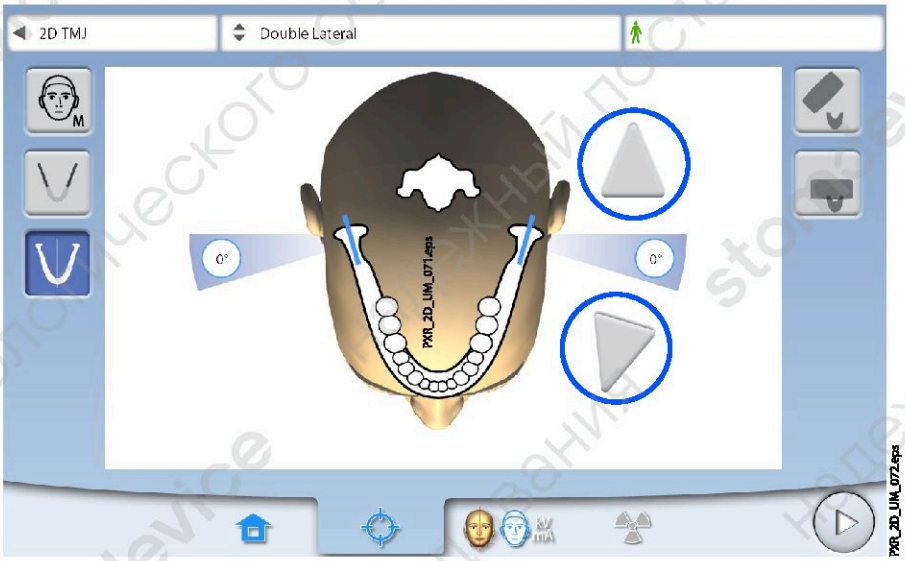
7.2.4 Selecting jaw side(s)

Use this button to select the right, left or both jaw sides.



7.2.5 Selecting imaging angle (Planmeca ProMax 2D S3 and Planmeca ProMax 3D X-ray units)

Use the arrow buttons to select the imaging angle for this exposure.



NOTE

To change the default angle (0 degrees), select Settings > Program > 2200 Program Features > 2220 2D TMJ > Lateral TMJ Default Angle or PA TMJ Default Angle and adjust the setting with the plus or minus sign.

7.3 Patient positioning

7.3.1 Selecting patient entry position

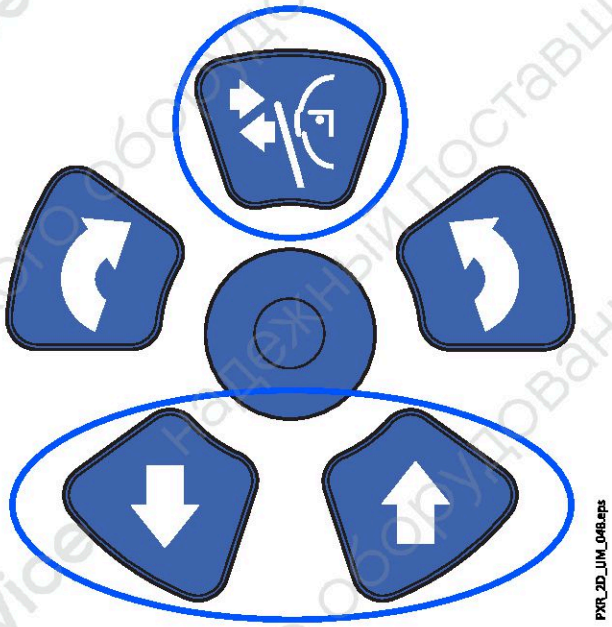
Select the patient entry position as described in section "Selecting patient entry position" on page 41.

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7.3.2 Positioning patient's head

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 opening in the chin support is approximately level with the patient's mouth.
4. Ask the patient to step forward, grasp the patient handles, stretch and straighten their back and neck, and 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.



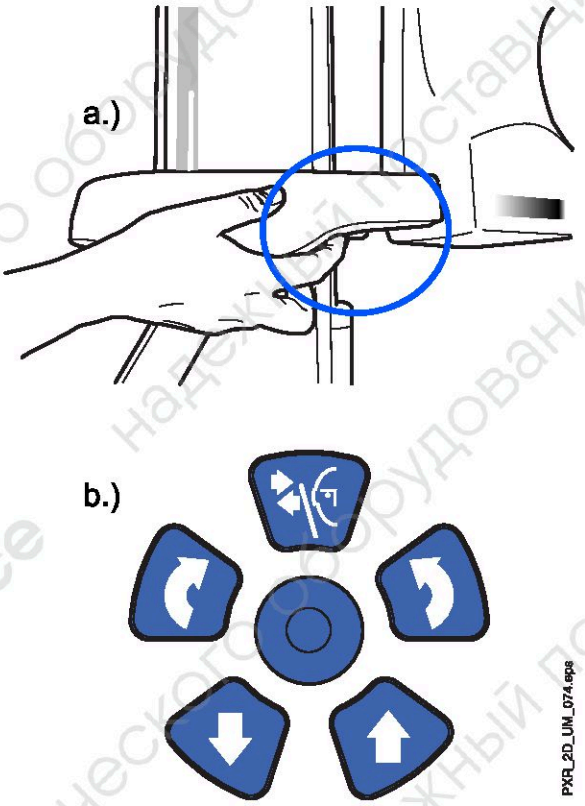
The positioning lights for the midsagittal plane, Frankfort plane (and TMJ position, depending on unit configuration) show on the patient's face. The lights will automatically switch off after two minutes. To switch them off earlier, press the positioning joystick.

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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).



7.3.3 Adjusting patient's head position (Planmeca ProMax 2D S2 X-ray units)

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

NOTE

The illustrations are for guidelines only.

1. To go to the next screen, select:
   - This symbol:

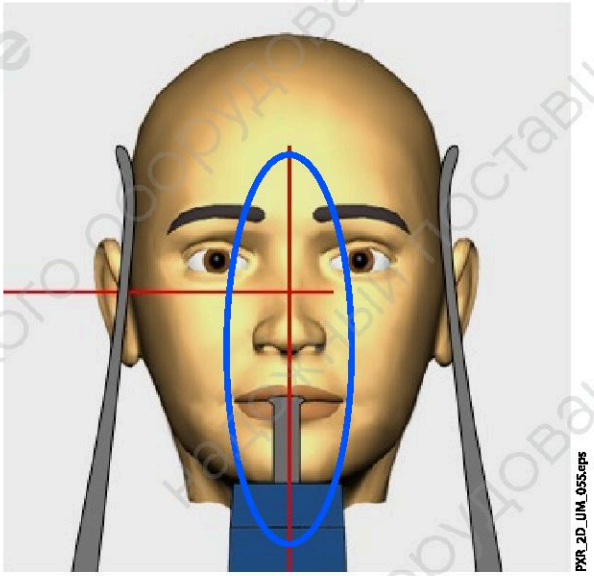


   OR
   - The forward button:



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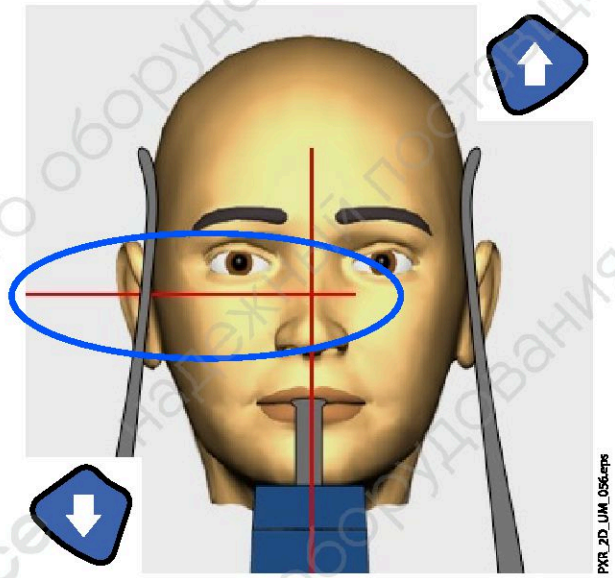
2. Position the patient's midsagittal plane so that it coincides with the midsagittal plane light.



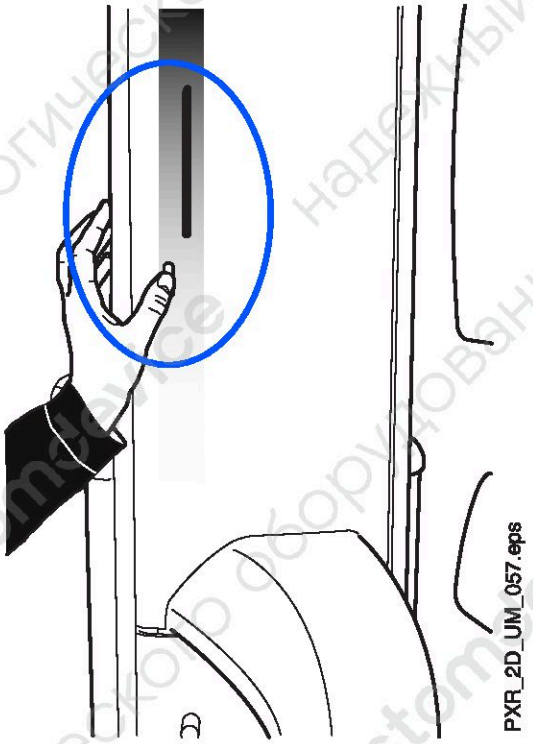
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3. Position the patient's Frankfort plane so that it coincides with the Frankfort plane light. To do this, adjust the tilt of the patient's head by raising or lowering the X-ray unit with the height adjusting buttons. The patient's back and neck must be straight.



The Frankfort plane light is located inside the column. The light's position can be adjusted if needed. This is done by rotating the thumb wheel below the light slot.

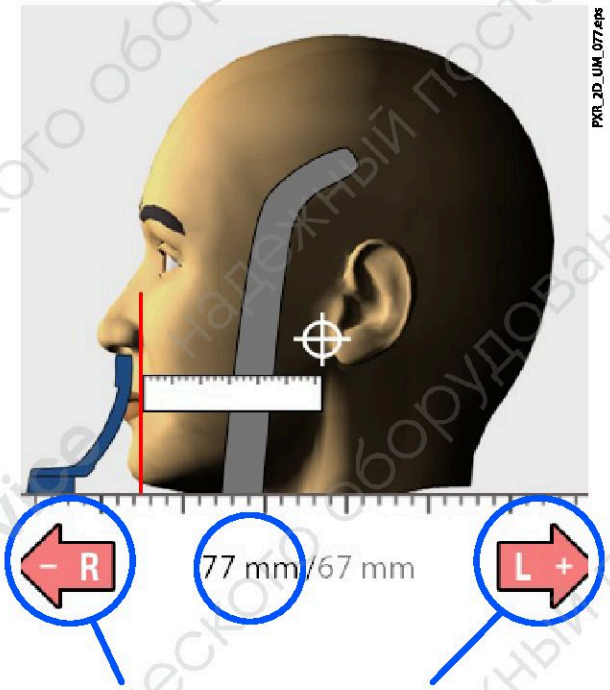


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NOTE

FOR LATERAL EXPOSURES:

Use a ruler to measure the distance between the layer light and the patient's temporomandibular joint so that you can determine the imaging position. Adjust the imaging position with the minus or plus sign according to your measurement.



NOTE

FOR DOUBLE TMJ EXPOSURES:

You can set the X-ray unit so that the imaging position is automatically moved forward for the open jaw exposure (2/2). To do this, select Settings > Program > 2200 Program Features > 2220 2D TMJ > TMJ 2/2 Shift and adjust the setting with the minus or plus sign (e.g. 10 mm). The result is shown on the ruler (e.g. 1/2 = 77 mm and 2/2 = 67 mm).

4. Check that the midsagittal plane light and the Frankfort plane light are still correctly positioned. Reposition them if necessary.

NOTE

FOR POSTEROANTERIOR EXPOSURES:

It is not possible to adjust the imaging position.

7.3.4 Adjusting patient's head position (Planmeca ProMax 2D S3 and Planmeca ProMax 3D X-ray units)

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

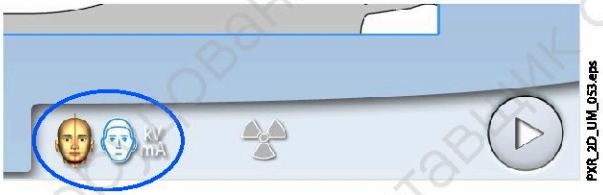
NOTE

The illustrations are for guidelines only.

1. To go to the next screen, select

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- This symbol:

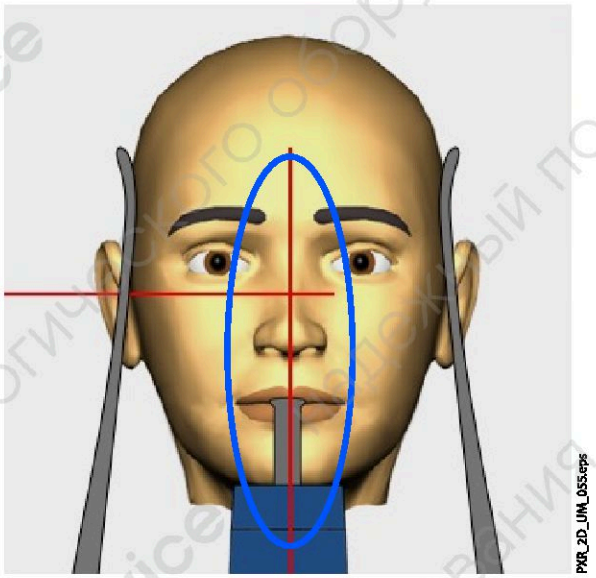


OR

- The forward button:



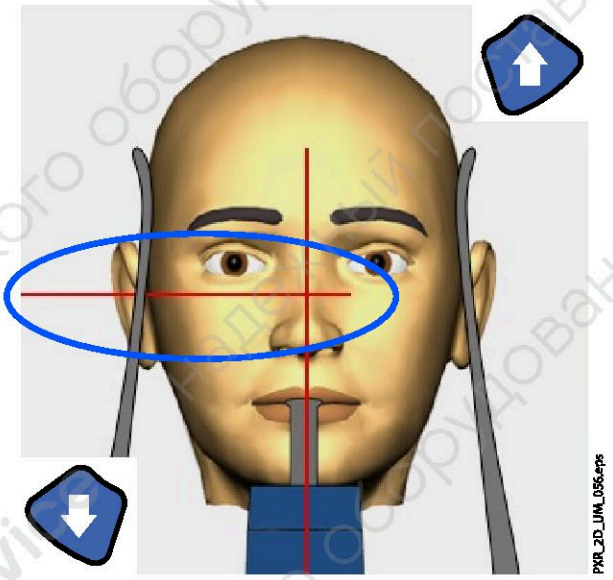
2. Position the patient's midsagittal plane so that it coincides with the midsagittal plane light.



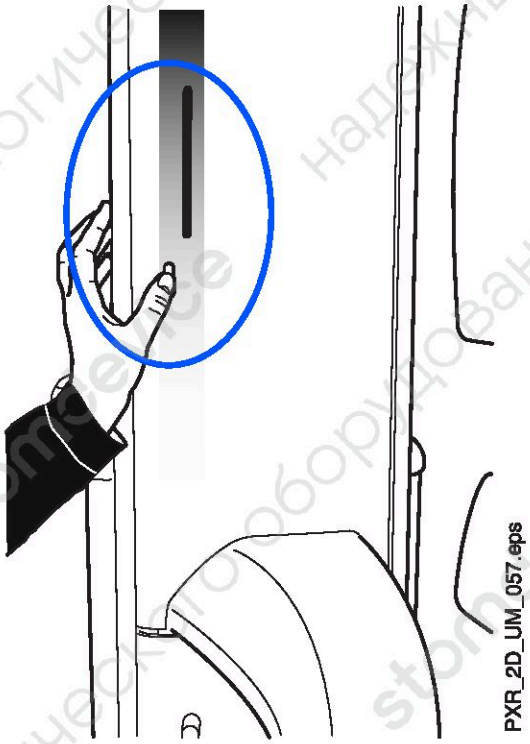
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3. Position the patient's Frankfort plane so that it coincides with the Frankfort plane light.

   To do this, adjust the tilt of the patient's head by raising or lowering the X-ray unit with the height adjusting buttons. The patient's back and neck must be straight.



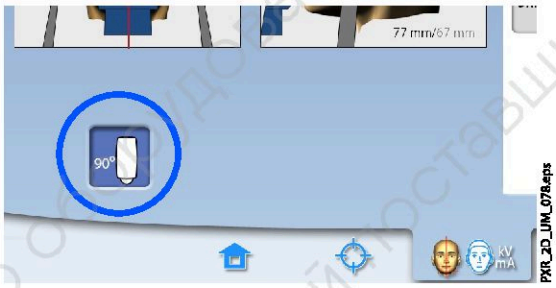
- The Frankfort plane light is located inside the column. The light's position can be adjusted if needed. This is done by rotating the thumb wheel below the light slot.



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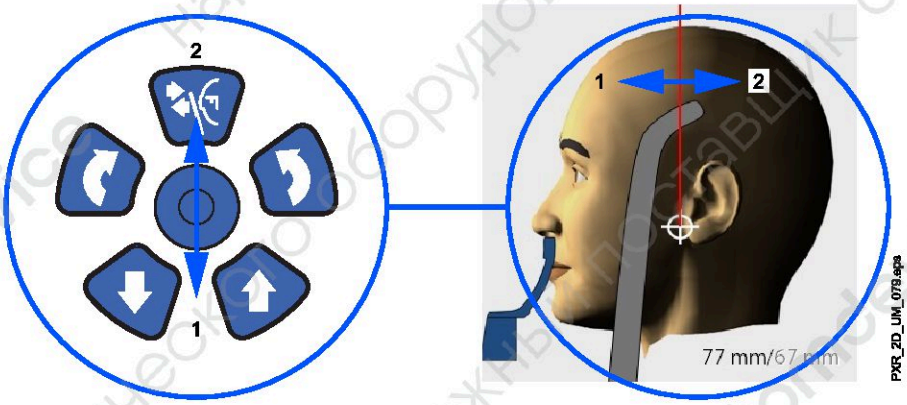
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4. Rotate the C-arm 90 degrees clockwise by selecting the 90° button. This will give you a better view for checking the TMJ light position.



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

5. Use the positioning joystick to adjust the TMJ light. The TMJ light has to coincide with the patient's temporomandibular joint.



NOTE

FOR DOUBLE TMJ EXPOSURES:

You can set the X-ray unit so that the imaging position is automatically moved forward for the open jaw exposure (2/ 2). To do this, select Settings > Program > 2200 Program Features > 2220 2D TMJ > TMJ 2/2 Shift and adjust the setting with the minus or plus sign (e.g. 10 mm). The result is shown on the touch screen (e.g. 1/2 = 77 mm and 2/2 = 67 mm).

6. Check that the midsagittal plane light and the Frankfort plane light are still correctly positioned. Reposition them if necessary.

7.4 Adjusting exposure values for current exposure

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

NOTE

Always try to minimise the radiation dose to the patient.

The following tables show the preset exposure values.

Factory presets for lateral and lateral-PA TMJ exposures

PATIENT SIZE	kV VALUE	mA VALUE
Child (XS)	62	4

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Factory presets for lateral and lateral-PA TMJ exposures

PATIENT SIZE	kV VALUE	mA VALUE
Small adult (S)	64	5
Medium-sized adult (M)	66	6.3
Large adult (L)	68	8
Extra large adult (XL)	70	10

Factory presets for posteroanterior TMJ exposures

PATIENT SIZE	kV VALUE	mA VALUE
Child (XS)	64	4
Small adult (S)	66	5
Medium-sized adult (M)	68	6.3
Large adult (L)	70	8
Extra large adult (XL)	72	10

You can adjust the preset exposure values (kV and mA) as described in section "Adjusting exposure values for current exposure" on page 82.

7.5 Taking an exposure in double TMJ programs

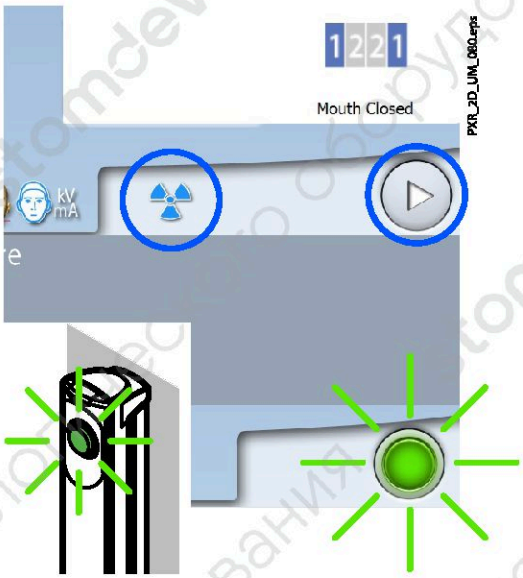
NOTE

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

7.5.1 First exposure - jaw closed (1/2)

1. Select the radiation symbol or the forward button.

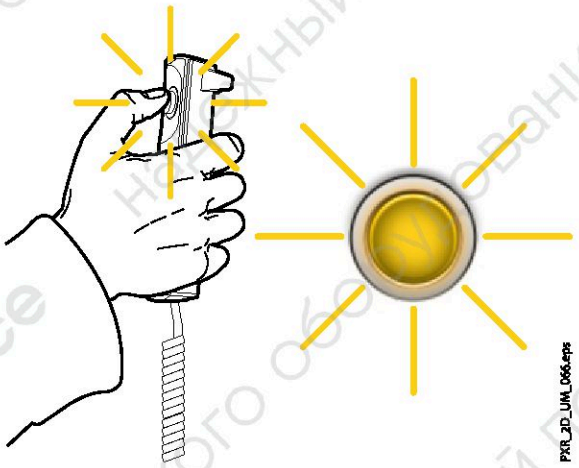
   Green lights flash on the touch screen and exposure button when the X-ray system is getting ready for an exposure. The green lights stop flashing and stay on continuously when the X-ray system is ready for an exposure.



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2. Ask the patient to stay as still as possible. Explain to the patient that this is a double exposure and that the C-arm will move twice around the patient's head.
3. Move to a protected area.
4. Press and hold down the exposure button for the duration of the first exposure.

   The C-arm moves around the patient's head. During exposure 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.

NOTE

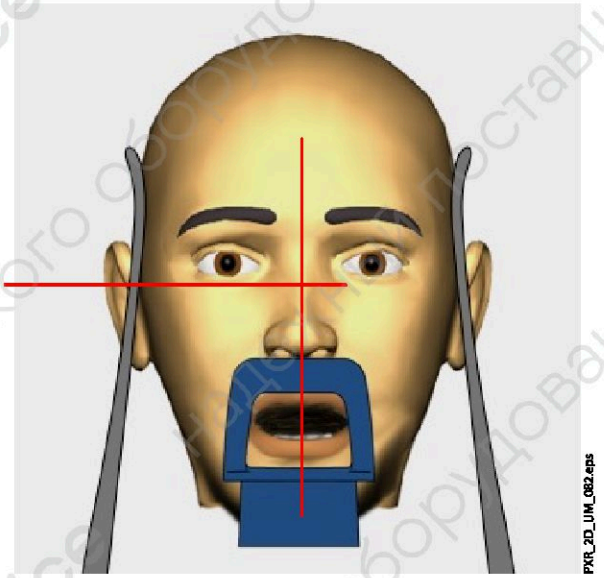
If needed, you can stop the imaging process by touching the red cross button after you have taken the first exposure.



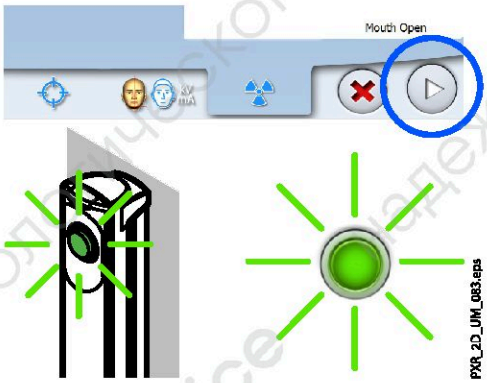
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7.5.2 Second exposure - jaw open (2/2)

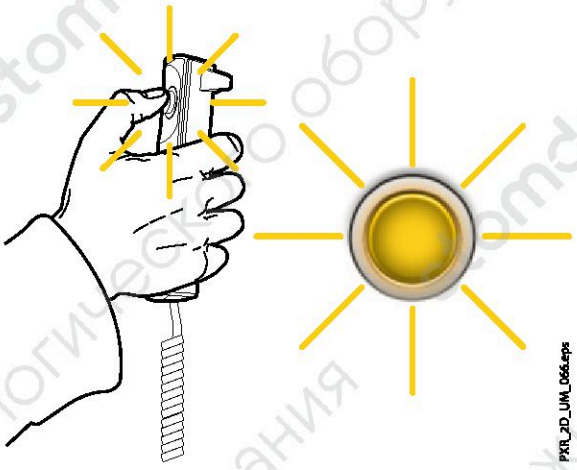
1. Ask the patient to open their mouth as wide as possible. Make sure that the patient's upper lip is still touching the chin support.



2. Select the forward button. Wait until the X-ray system is ready, i.e. until the green lights stop flashing.



3. Press and hold down the exposure button for the duration of the second exposure. The C-arm moves around the patient's head and the exposure is taken in the same way as the first exposure.



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4. The image is shown on the computer screen.



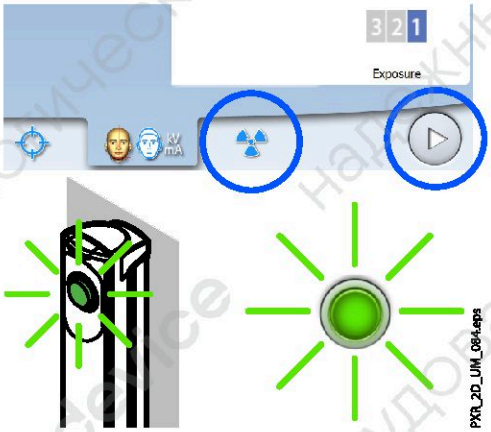
   - Note that you must accept the image in the Planmeca Romexis program.
5. Guide the patient away from the X-ray unit.

7.6 Taking an exposure in three angle TMJ programs

NOTE

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

1. Select the radiation symbol or the forward button.



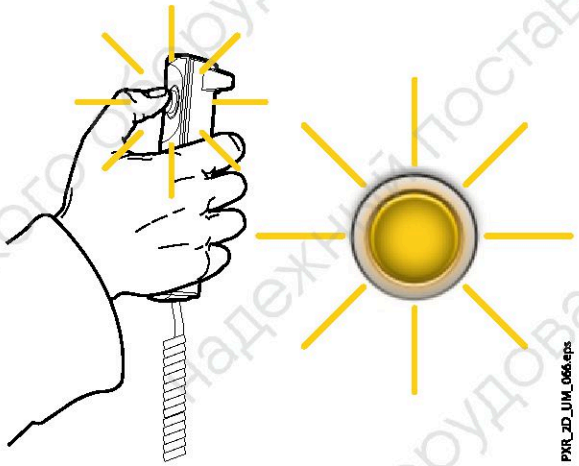
   Green lights flash on the touch screen and exposure button when the X-ray system is getting ready for an exposure. The green lights stop flashing and stay on continuously when the X-ray system is ready for an exposure.
2. Ask the patient to stay as still as possible. Explain to the patient that this is a multiple exposure and that the C-arm will move through three exposure cycles.
3. Move to a protected area.

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4. Press and hold down the exposure button for the duration of the exposure.

   During exposure 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.

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

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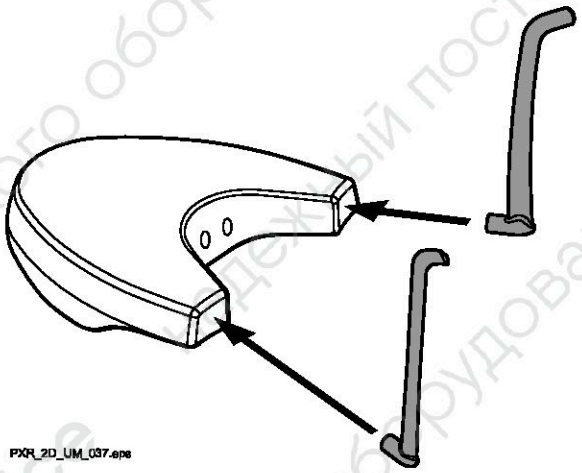
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8 Sinus exposure

This procedure will produce an exposure of the maxillary sinuses.

8.1 Before exposure

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

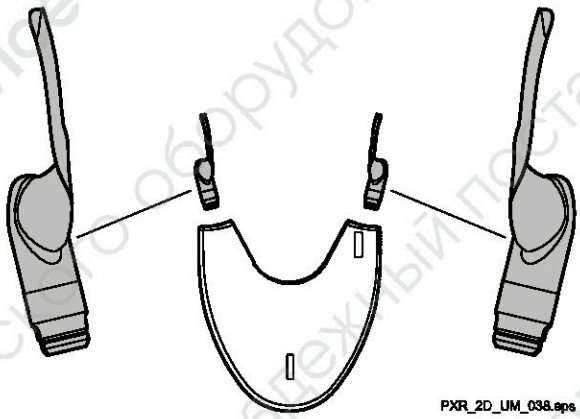


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NOTE

Ensure that you insert the temple supports the right way round (i.e. with the convex side facing outward as shown).



- Use these patient supports.



8.2 Selecting exposure settings

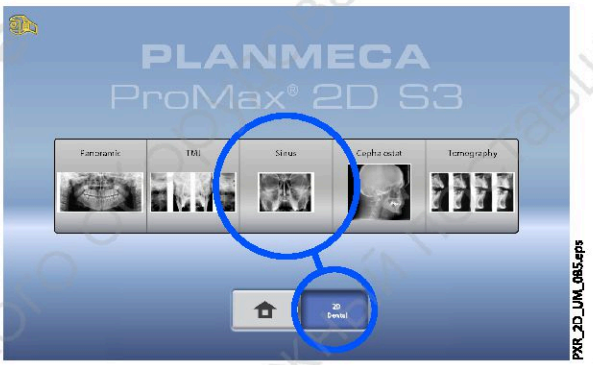
Refer to section "Touch screen" on page 14 for general information on how to make or cancel selections on the touch screen.

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8.2.1 Selecting program

Select the sinus program (2D Dental > Sinus).



8.2.2 Selecting program type

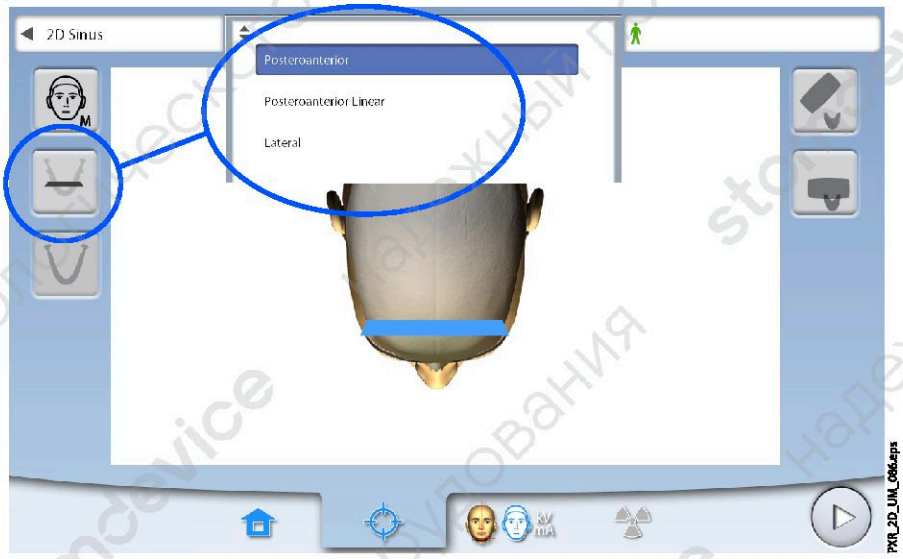
Select the program type from:

- The drop-down menu at the top

  OR

- The left of the screen

Refer to section "Sinus programs" on page 26 for details.



NOTE

The available options depend on the X-ray unit model.

8.3 Selecting patient size

Select the patient size as described in section "Selecting patient entry position" on page 78.

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8.4 Selecting jaw side for lateral exposures (Planmeca ProMax 2D S3 and Planmeca ProMax 3D X-ray units)

Use this button to select the right or left jaw side.



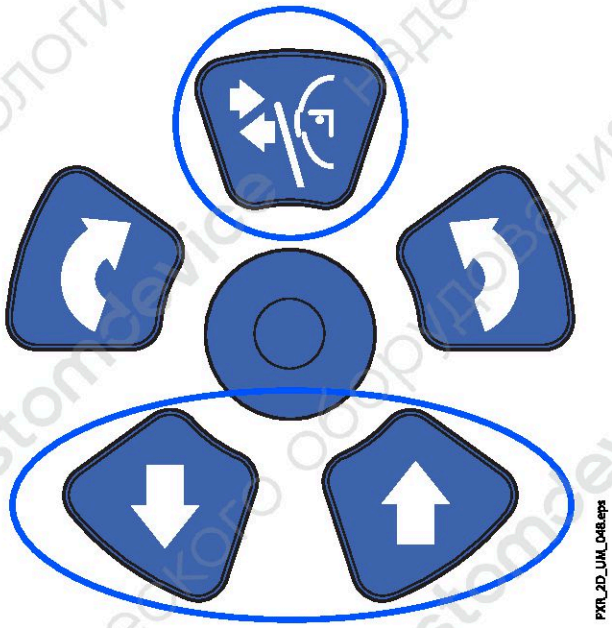
8.5 Patient positioning

8.5.1 Selecting patient entry position

Select the patient entry position as described in section "Selecting patient entry position" on page 41.

8.5.2 Positioning patient's head

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 opening in the chin support is approximately level with the patient's mouth.

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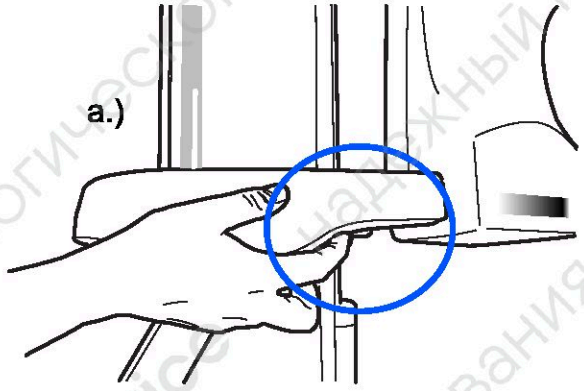
4. Ask the patient to step forward, grasp the patient handles, stretch and straighten their back and neck, and press their lips against the chin support. The patient's nose must rest on top of the support and their mouth must be closed.

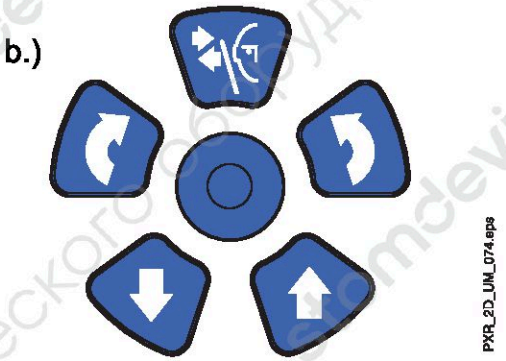


The positioning lights for the midsagittal and Frankfort plane show on the patient's face. The lights will automatically switch off after two minutes. To switch them off earlier, press the positioning joystick.

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).





8.5.3 Adjusting patient's head position

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

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NOTE

The illustrations are for guidelines only.

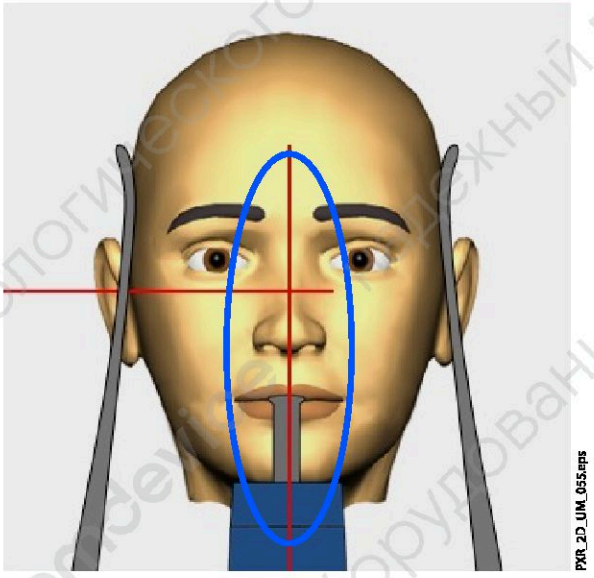
1. To go to the next screen, select
   - This symbol:



   OR
   - The forward button:



2. Position the patient's midsagittal plane so that it coincides with the midsagittal plane light.



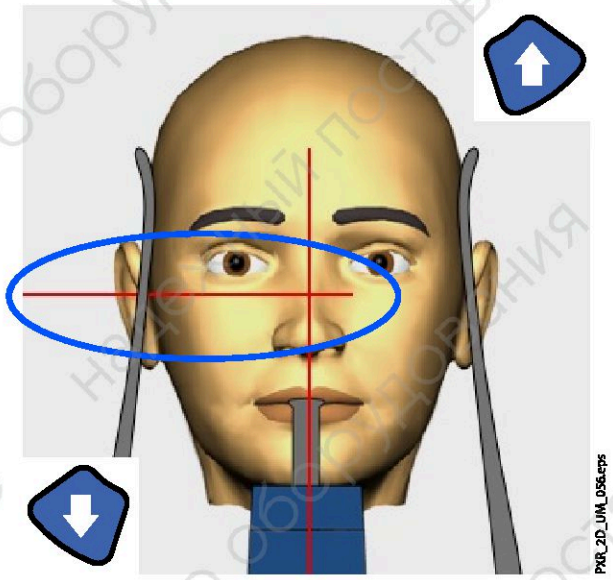
3. Position the patient's Frankfort plane as follows.

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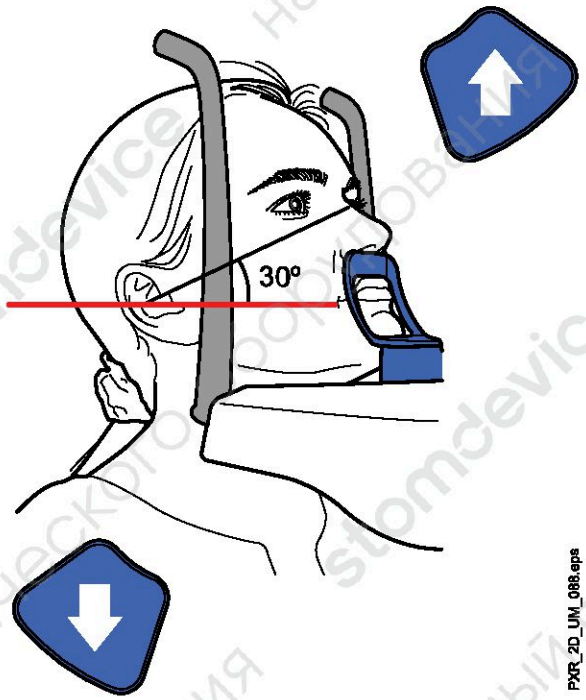
- FOR POSTEROANTERIOR AND LATERAL PROGRAMS:

  Position the patient's Frankfort plane so that it coincides with the Frankfort plane light. To do this, adjust the tilt of the patient's head by raising or lowering the X-ray unit with the height adjusting buttons. The patient's back and neck must be straight.



- FOR POSTEROANTERIOR LINEAR PROGRAM:

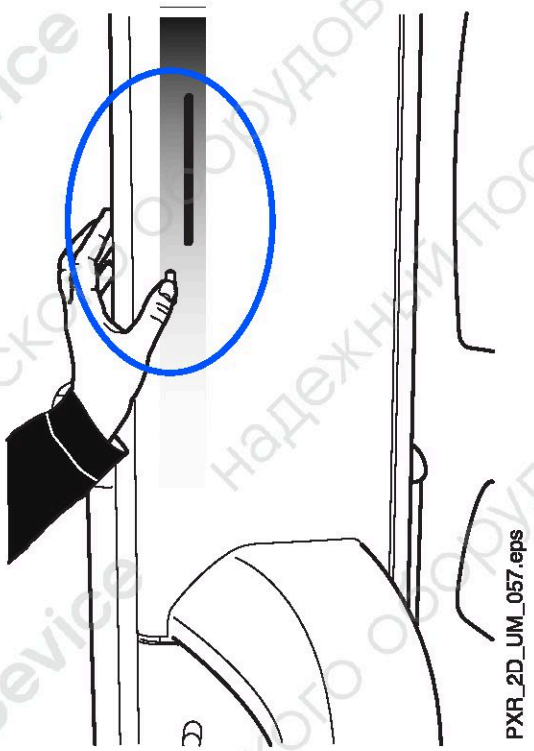
  Position the patient's head so that the Frankfort plane is tilted up about 30 degrees. To do this, support the back of the patient's head with your hand and, using the Frankfort plane light as a reference line, adjust the tilt of the patient's head by raising or lowering the X-ray unit with the height adjusting buttons. The patient's back and neck must be straight.



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The Frankfort plane light is located inside the column. The light's position can be adjusted if needed. This is done by rotating the thumb wheel below the light slot.



8.6 Adjusting exposure values for current exposure

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

NOTE

Always try to minimise the radiation dose to the patient.

The preset exposure values are shown in the following tables.

Factory presets for posteroanterior sinus exposures

PATIENT SIZE	kV VALUE	mA VALUE
Child (XS)	72	4
Small adult (S)	74	5

Factory presets for posteroanterior sinus exposures

PATIENT SIZE	kV VALUE	mA VALUE
Medium-sized adult (M)	76	6.3
Large adult (L)	78	8
Extra large adult (XL)	80	10

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Factory presets for lateral sinus exposures

PATIENT SIZE	kV VALUE	mA VALUE
Child (XS)	60	4
Small adult (S)	62	4
Medium-sized adult (M)	64	4.5
Large adult (L)	66	5
Extra large adult (XL)	68	5

You can adjust the preset exposure values (kV and mA) as described in section "Adjusting exposure values for current exposure" on page 51.

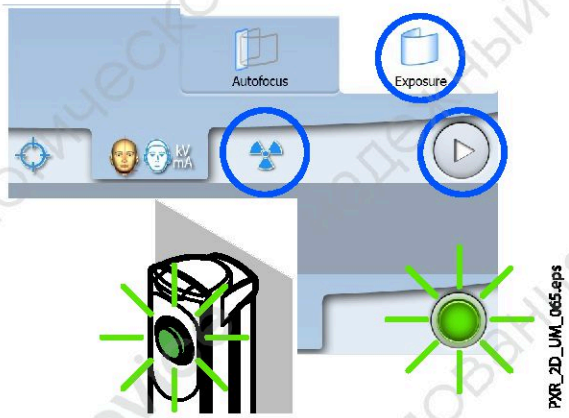
8.7 Taking an exposure

NOTE

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

1. Select the radiation symbol or 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.

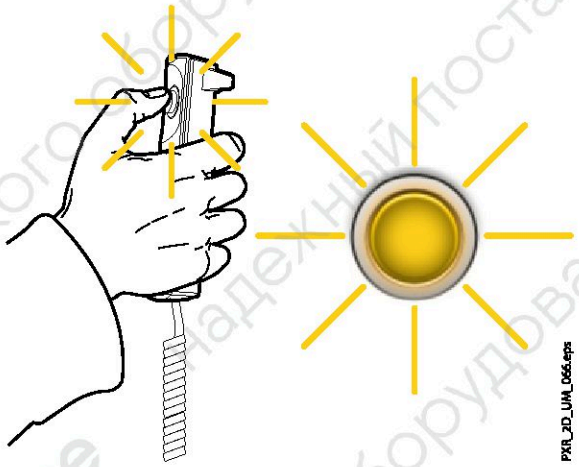


2. Ask the patient to stay as still as possible.
3. Move to a protected area.

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4. Press and hold down the exposure button for the duration of the exposure.

   The C-arm moves around the patient's head. During exposure 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.

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

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9 Settings

NOTE

Some of the settings can be used to alter the operation of the X-ray unit. Never use functions that you are not familiar with.

NOTE

The contents of the displays depend on the unit configuration. The displays shown here are only examples.



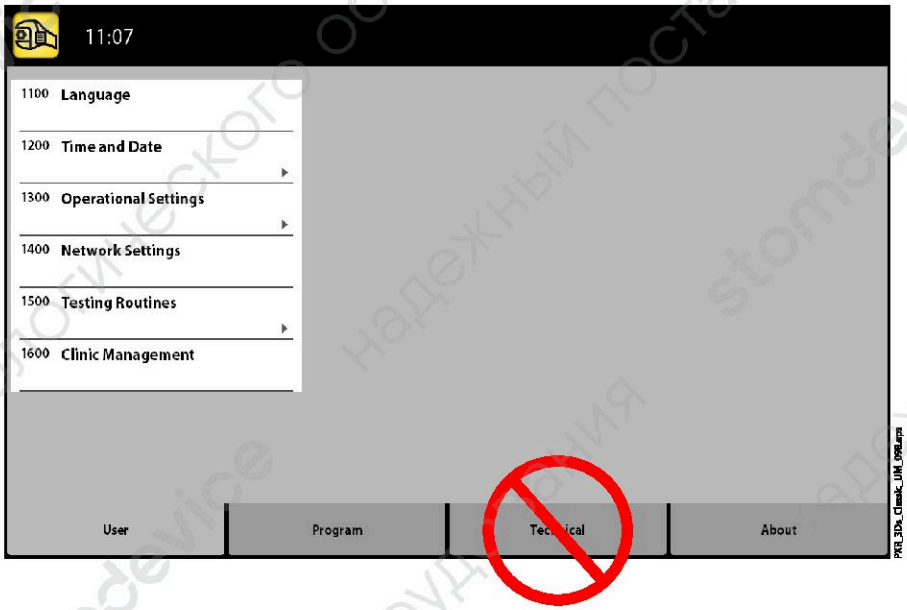
Select the settings symbol on the main screen to enter the settings menu.

Settings that can be entered by the user:

- User
- Program
- About

Settings that can be entered by service personnel only (password required):

- Technical



To return to the main screen, select the settings symbol at the top left corner.

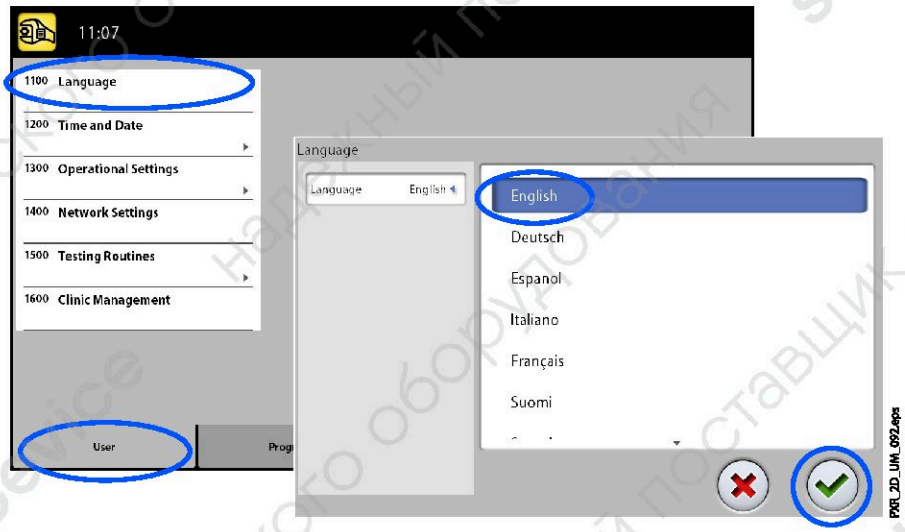
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9.1 User settings

9.1.1 Language (1100)

To change language:

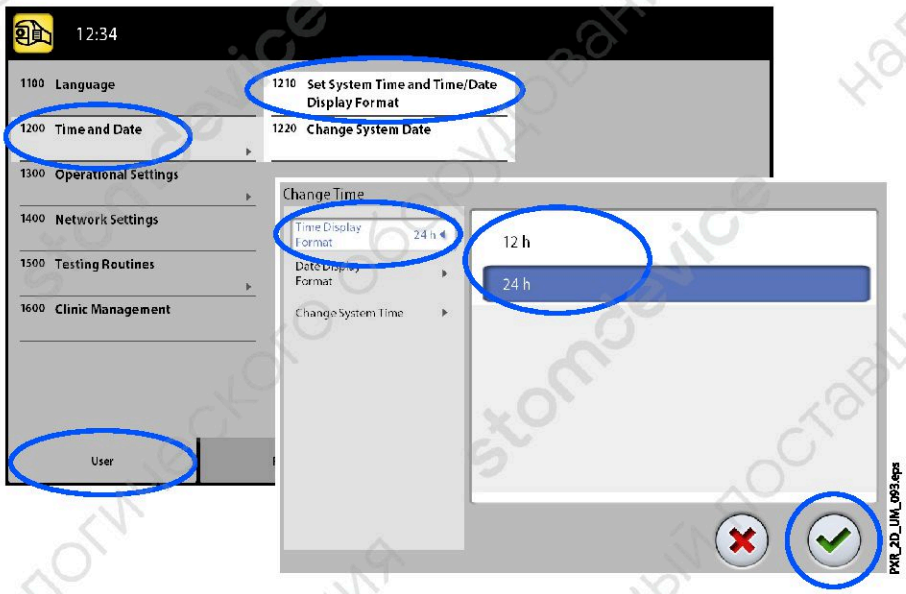
1. Select User > 1100 Language.
2. Select the language you wish to use.
3. Select the green check mark button.



9.1.2 Time and Date (1200)

To set time display format:

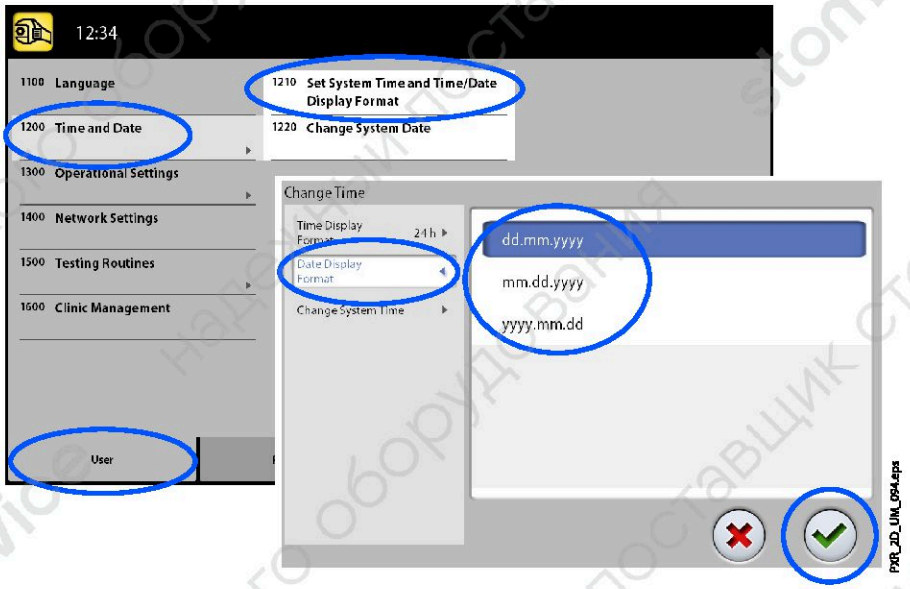
1. Select User > 1200 Time and Date > 1210 Set System Time and Time / Date Display Format > Time Display Format.
2. Select the display format you wish to use.
3. Select the green check mark button.



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To set date display format:

1. Select User > 1200 Time and Date > 1210 Set System Time and Time / Date Display Format > Date Display Format.
2. Select the display format you wish to use.
3. Select the green check mark button.

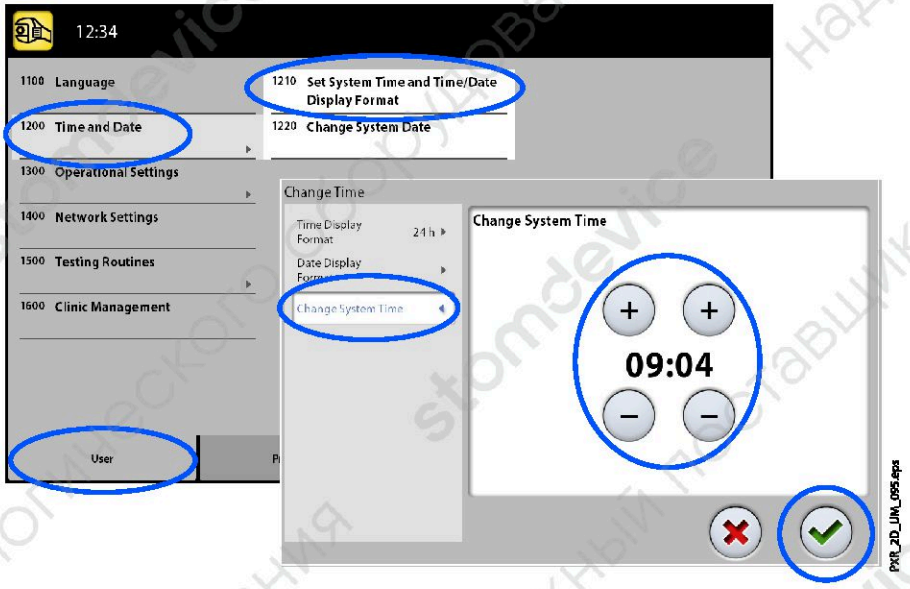


To set time:

1. Select User > 1200 Time and Date > 1210 Set System Time and Time / Date Display Format > Change System Time.
2. Use the plus and minus buttons to change the time.
3. Select the green check mark button.

NOTE

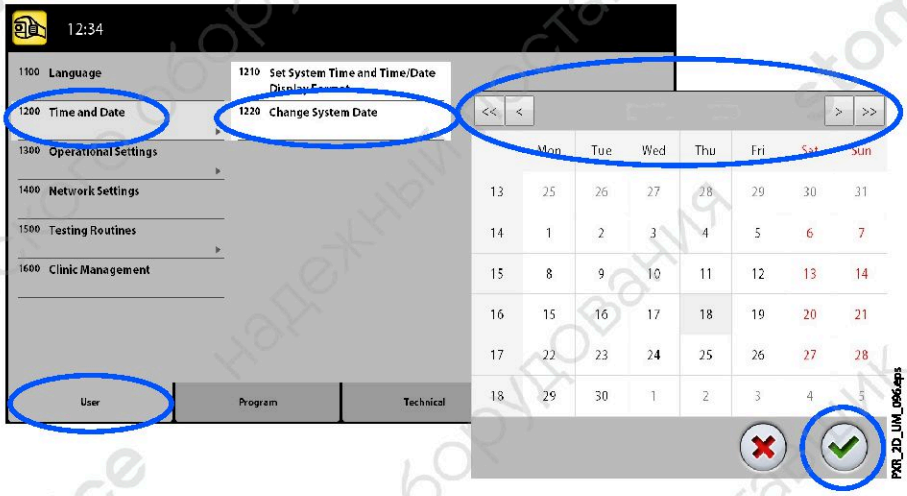
The time is set to the local time at the factory. Change the time setting to show the correct time before you start using the X-ray unit.



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To set date:

1. Select User > 1200 Time and Date > 1220 Change System Date.
2. Select the day or use the arrow buttons to change the month (single arrow) or year (double arrow).
3. Select the green check mark button.

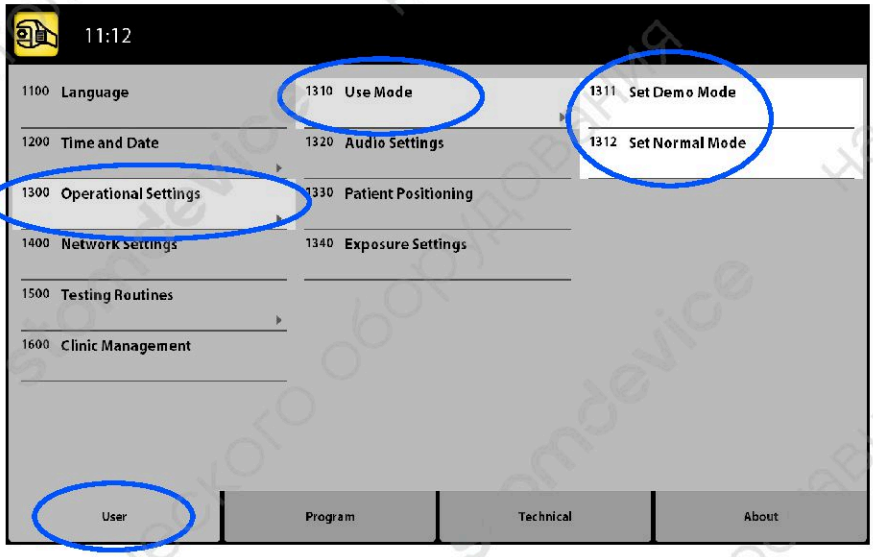


9.1.3 Operational Settings (1300)

To select mode:

1. Select User > 1300 Operational Settings > 1310 Use Mode.
2. Select the mode you wish to use.

   In demo mode you can practice or demonstrate the functions of the X-ray unit without radiation and PC connection.
3. Select the green check mark button.



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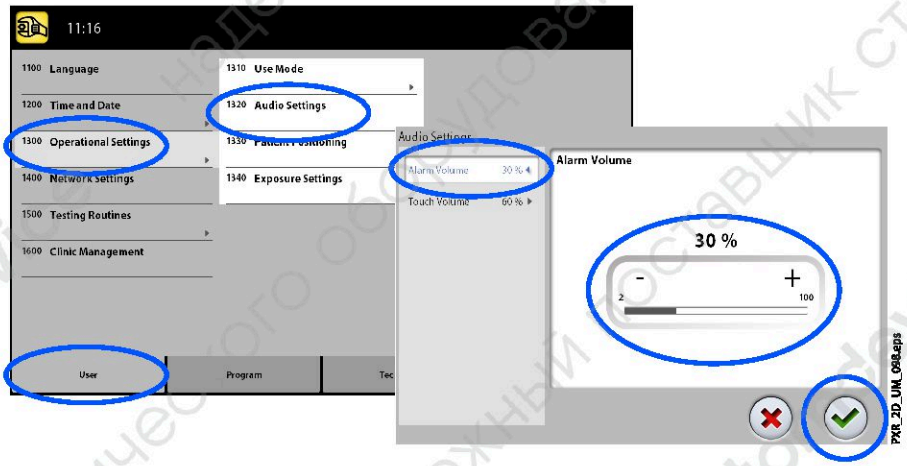
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To control audio settings:

1. Select User > 1300 Operational Settings > 1320 Audio Settings.
2. Select:
   - Alarm Volume

     This setting adjusts the volume of the radiation warning tone. Use the minus or plus button to reduce or increase the volume.
   - Touch Volume

     This setting adjusts the volume of the audible signal that you hear when you make a selection on the touch screen. Use the minus or plus button to reduce or increase the volume. Set the volume level to 0% if you do not wish to use this function.
3. Select the green check mark button.



To manage settings for patient positioning:

1. Select User > 1300 Operational Settings > 1330 Patient Positioning.
2. Turn an option(s) ON or OFF:
   - Side Entry

     Turn this option OFF if you do not wish to use the open (full view) patient entry position. This might be necessary if there is no space for the C-arm to move back.



NOTE

Planmeca ProMax 2D S2 X-ray units offer only one patient entry position. This entry position is the closed patient entry position where the C-arm is positioned around the temple supports.

   - Midsagittal and Frankfort Lights in Tomo

     Turn this option ON if you wish to use the midsagittal and Frankfort plane lights when you take 2D tomographic or 3D exposures.
   - Temple Supports

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Turn this option OFF if you do not wish to use the temple supports.

- Return C-arm Automatically

  Turn this option ON if you wish to set the X-ray unit so that the C-arm will automatically return to the starting position at the end of an exposure cycle. Note, however, that the automatic function works only if the exposure button is pressed and held down for the entire duration of the exposure.

3. Select the green check mark button.



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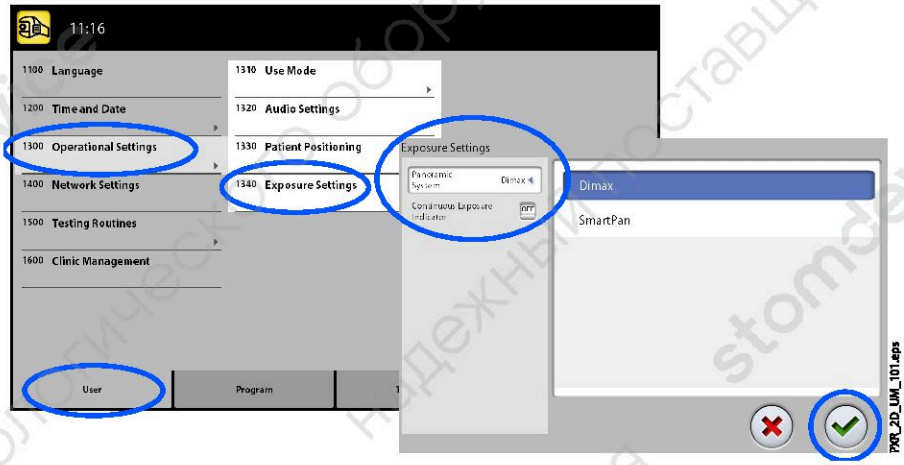
To control exposure settings:

1. Select User > 1300 Operational Settings > 1340 Exposure Settings.
2. Select:
   - Panoramic System

     On 3D X-ray units you can use either the Dimax sensor or the 3D sensor for taking 2D exposures. Select the Dimax or SmartPan (3D sensor) system and change the sensor as described in section "Attaching and removing sensor" on page 29.
   - Continuous Exposure Indicator

     Turn this option ON if you wish to set the X-ray unit so that the yellow radiation warning light stays on continuously (instead of flashing) when you take an exposure.

     Note that the setting affects all indicator lights that are connected to your X-ray system (indicator light on the hand-held exposure switch, wall exposure switch(es) and remote exposure lamp).
3. Select the green check mark button.

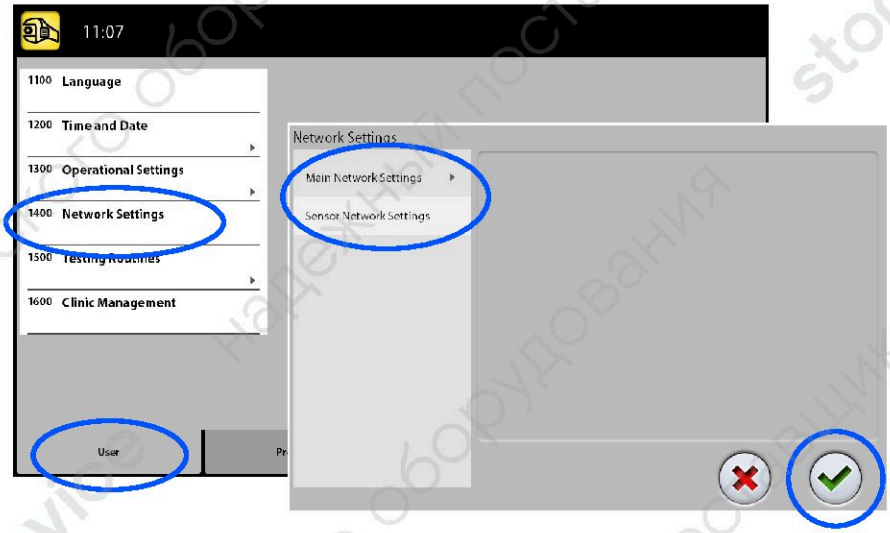


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9.1.4 Network Settings (1400)

To view network settings:

1. Select User > 1400 Network Settings.
2. Select the network settings you wish to view.
3. Select the green check mark button.



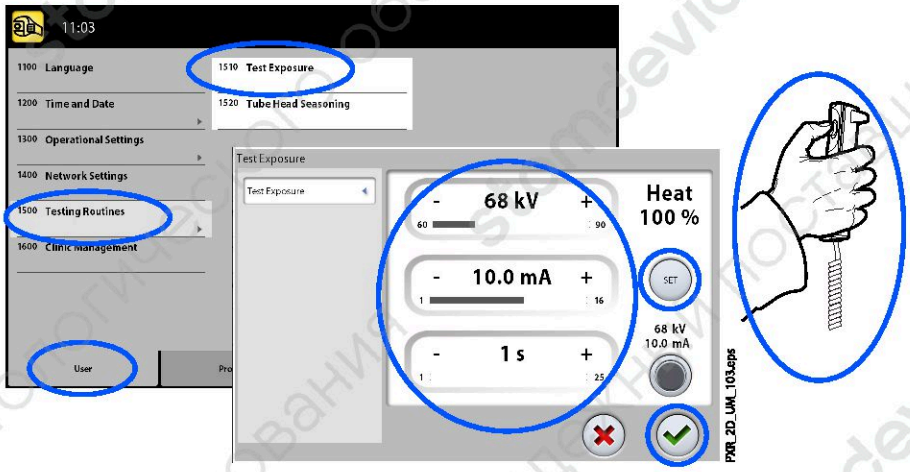
NOTE

Only a service technician or local administrator may change the network settings.

9.1.5 Testing Routines (1500)

To take a test exposure:

1. Select User > 1500 Testing Routines > 1510 Test Exposure.
2. Use the minus or plus buttons to set the exposure values you wish to use.
3. Select the SET button.
4. Move to a protected area.
5. Press and hold down the exposure button for the duration of the exposure. The C-arm will not move when you take a test exposure.
6. Select the green check mark button.



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To perform tube head seasoning:

1. Select User > 1500 Testing Routines > 1520 Tube Head Seasoning.

   This option allows you to warm up the X-ray tube, i.e. run a tube head seasoning process. This is necessary if the X-ray unit has not been used for a week or more and / or if you receive error message E332 (Severe arcing across X-ray tube).

2. Select the Start button.
3. Move to a protected area.
4. Press the exposure button when the word Ready appears.

   You can press and hold down the exposure button for the whole duration of the process or remove your thumb from the exposure button when the word Wait appears. Note that the seasoning process will take several minutes. After a successful process the message OK is shown.

5. Select the green check mark button.



NOTE

Contact your service technician for help if error message E332 (Severe arcing across X-ray tube) reappears after a successful seasoning process.

9.1.6 Clinic Management (1600)

Select User > 1600 Clinic Management to view the network settings for the Planmeca Romexis Clinic Management module.

NOTE

Only a service technician or local administrator may change the settings.

9.2 Program settings

9.2.1 Programs (2100)

To turn a program(s) ON or OFF:

1. Select Program > 2100 Programs.
2. Select a program group (e.g. 2D Panoramic).
3. Turn a program type(s) (e.g. Interproximal) ON or OFF.
4. Select the green check mark button.

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NOTE

The function is available for programs that have been activated in menu 2300 Licences.

To permanently adjust preset exposure values:

1. Select Program > 2100 Programs.
2. Select a program group (e.g. 2110 2D Panoramic).
3. Select a program type (e.g. Interproximal).
4. Select the exposure values you wish to adjust (e.g. 66 kV / 9 mA for patient size M).
   - For 2D tomographic programs:

     In combined programs (cross-sectional + longitudinal) only the cross-sectional exposure values can be adjusted.
   - For 3D X-ray units:

     If you use both sensors (Dimax and 3D) for taking 2D exposures, make sure that the panoramic system in menu 1340 is set to the option (Dimax or SmartPan) you wish to adjust.
   - For 3D X-ray units:

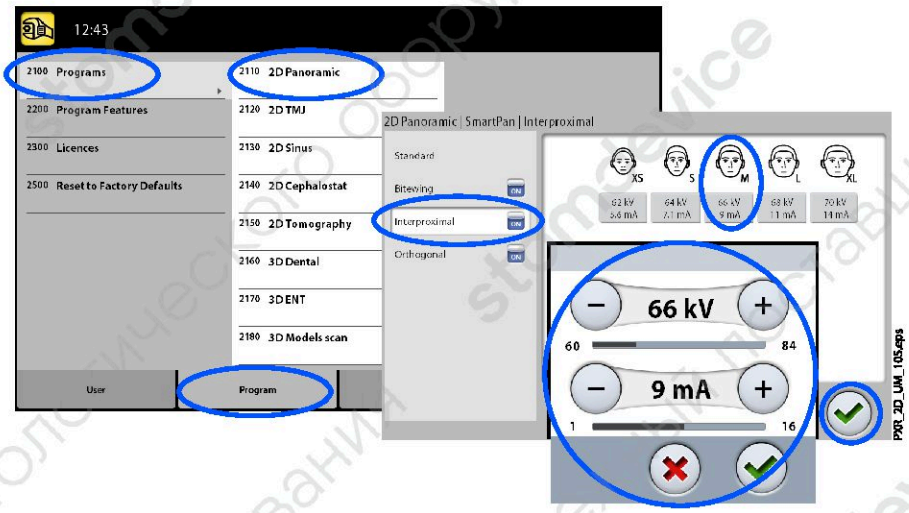
     In 2D panoramic programs with a 3D sensor (2D Panoramic / SmartPan /) select also the MultiView button if you wish to adjust the presets for the MultiView imaging mode.





   - For 3D X-ray units:

     In 3D programs the exposure values are given separately for each image resolution. The image resolutions that are not available are shown with faded buttons. Select also the ULD (Ultra Low Dose) button if you wish to adjust the presets for the ULD function.
5. Use the minus or plus buttons to set the exposure values you wish to use.
6. Select the green check mark button.
7. Repeat for another program type, patient size or image resolution (3D) if needed.
8. Select the green check mark button.



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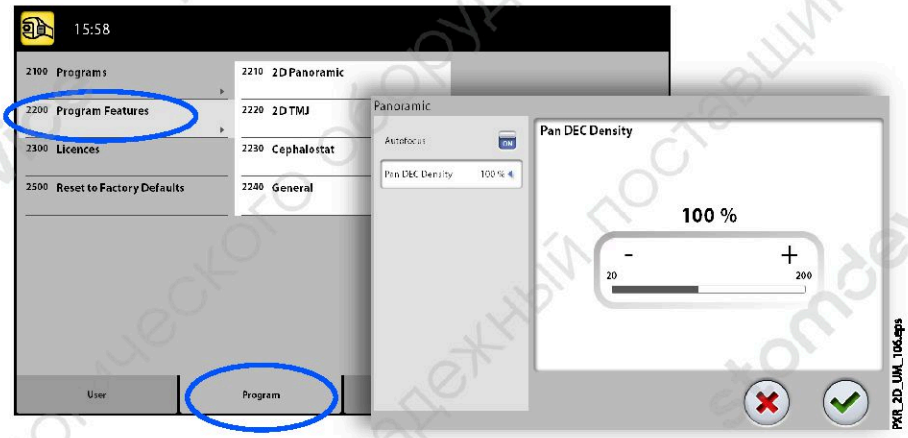
NOTE
Always try to minimise the radiation dose to the patient.

NOTE
You can restore the exposure values that have been preset at the factory (i.e. overrule your own settings) by selecting Program > 2500 Reset to Factory Defaults.

NOTE
You can adjust the preset exposure values temporarily as described in section "Adjusting exposure values for current exposure" on page 51.

9.2.2 Program Features (2200)

Select Program > 2200 Program Features to manage program settings. For details on a specific setting, refer to the manual section that contains the corresponding function.



9.2.3 Licences (2300)

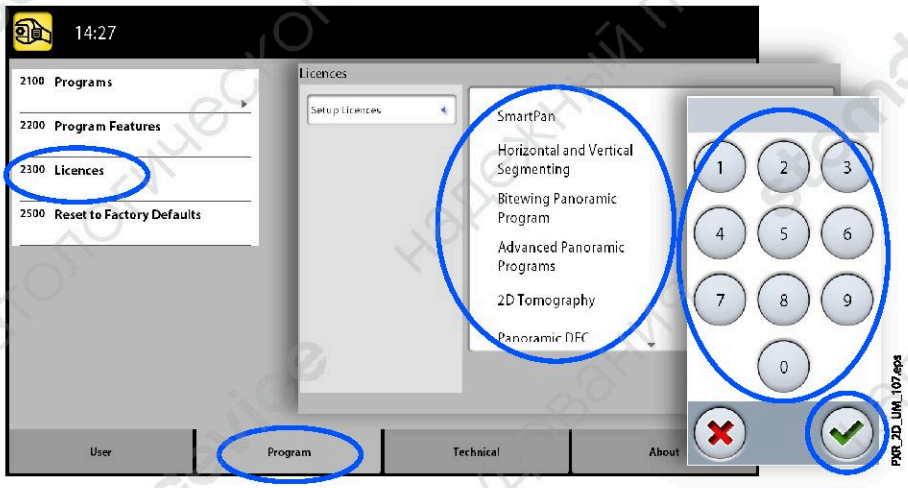
To activate a program licence:

1. Select Program > 2300 Licences.
2. Select the licence you wish to activate:
   - SmartPan (Basic 2D panoramic, TMJ and sinus programs with 3D sensor)
   - Horizontal and Vertical Segmenting (Reduced exposure area for 2D panoramic programs)
   - Bitewing Panoramic Program (True extraoral bitewing program)
   - Advanced Panoramic Programs (Additional 2D panoramic, TMJ and sinus programs)
   - 2D Tomography (2D tomographic programs, for Planmeca ProMax 2D only)
   - Panoramic DEC (Dynamic Exposure Control for 2D panoramic programs with Dimax sensor)
   - Cephalometric DEC (Dynamic Exposure Control for 2D cephalometric programs with Dimax sensor)
   - 2D Views for 3D (LAT, PA and LAT-PA views for 3D programs)
   - 3D Model Scan (3D Impression and 3D Plaster Cast programs)

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- 3D Endodontic Imaging Mode (Endodontic image resolution for small 3D image volumes)
- Braces Protocol (3D Braces program, for Planmeca ProMax 3D Classic only)
- 3D Classic Extended Volume (Extended 3D image volume for 3D Teeth program, for Planmeca ProMax 3D Classic only)
- ProTouch Desktop (Virtual control panel that allows you to take exposures)
- CALM (Patient movement correction for 3D programs)
- ULD (Ultra Low Dose for 3D programs, licence available for Planmeca ProMax 3D Classic only)
- Autofocus (Autofocus for 2D panoramic programs, licence available for Planmeca ProMax 3D Classic only)
- 3D Advanced FOVs (Additional 3D programs and volume heights, licence available for Planmeca ProMax 3D Classic only)

3. Enter the licence code that you have received for this licence on this X-ray unit.
4. Select the green check mark button.
5. Repeat for another program licence if needed.
6. Select the green check mark button.



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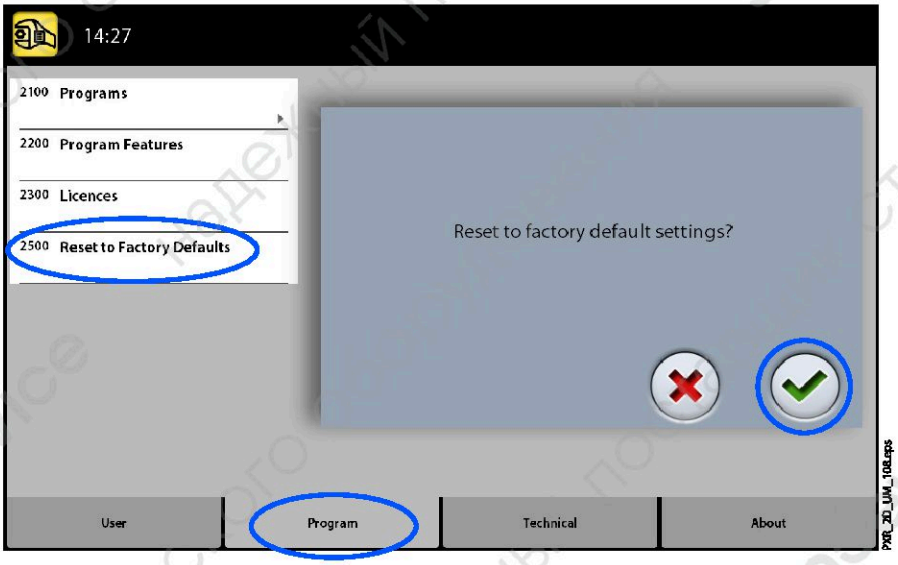
9.2.4 Reset to Factory Defaults (2500)

To reset to factory defaults:

1. Select Program > 2500 Reset to Factory Defaults. The function will restore the exposure values that have been preset at the factory (i.e. overrule your own settings in menu Programs (2100)).

   The preset exposure values are shown in sections “Adjusting exposure values for current exposure”.

2. Select the green check mark button.



9.3 About tab

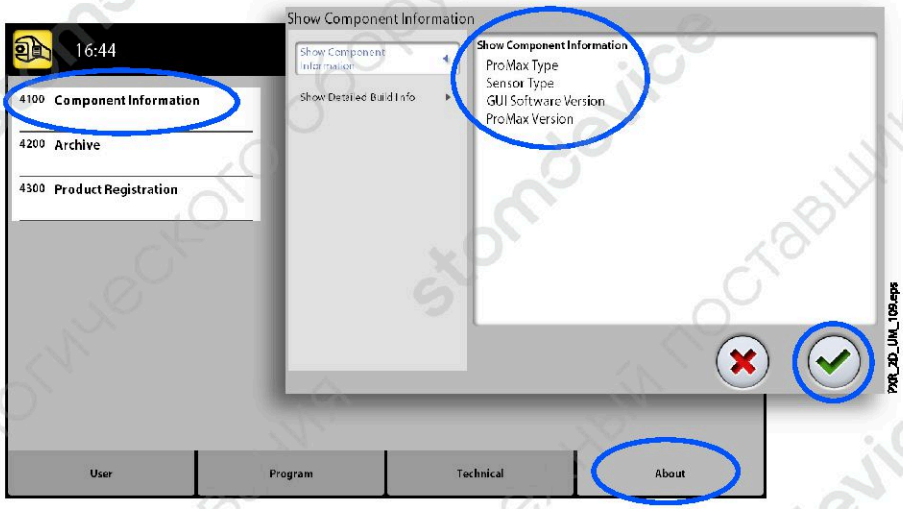
9.3.1 Component Information (4100)

To view component information:

Select About > 4100 Component Information > Show Component Information to view the set-up or current software versions of the X-ray unit.

To view software build information:

Select About > 4100 Component Information > Show Detailed Build Info to view details about the software build.



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9.3.2 Archive (4200)

To view error history:

Select About > 4200 Archive > Error History to view a list of the error messages that have been generated by the X- ray unit. The errors are shown in chronological order with the latest error message on top.

To view exposure statistics:

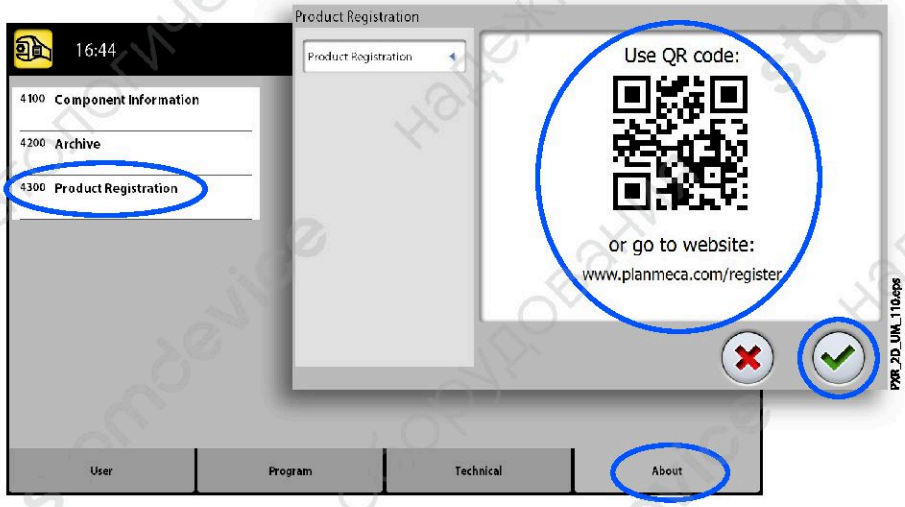
Select About > 4200 Archive > Exposure Statistics to view statistical data about the X-ray unit.

9.3.3 Product Registration (4300)

To register the X-ray unit on Planmeca's website:

1. Select About > 4300 Product Registration.
2. Do one of the following:
    1. A QR (Quick Response) code is shown on the screen. If you have a QR code reader installed on your mobile device (e.g. smartphone), hold the device steady over the QR code. You will be directed to Planmeca's product registration page.
    2. Go to Planmeca's product registration page at http://www.planmeca.com/register.
3. Follow the instructions on the registration page.

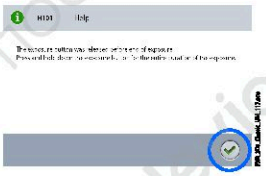
    Note that when you enter the X-ray unit serial number, you have to include any letters shown at the beginning of the number.
4. Select the green check mark button.



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10 Help messages



The X-ray unit incorporates a self-checking feature that monitors the operation of the unit. If the system detects an operating error, a help message (e.g. H101) appears on the touch screen.

The X-ray unit will not accept any commands from the user until the help message is cleared from the touch screen. Clear the message by touching the green check mark.

The following list shows, in numerical order, all the help messages that can appear.

Code	Explanation		Comments
H101	**Exposure switch**	The exposure button was released before end of exposure.	Guide the patient away from the X-ray unit before moving the C-arm. Press and hold down the exposure button for the entire duration of the exposure.
H102		The exposure button is stuck or the cable is short circuited.	Release the exposure button. If necessary, contact your service technician to replace the exposure switch.
H103	**ProTouch desktop application**	The ProTouch desktop application needs to be closed.	Restart the application.
H105	**Emergency stop button**	The emergency stop button has been activated.	All movements of the X-ray unit are blocked, no radiation is generated. Guide the patient away from the X-ray unit. Then release the emergency stop button to resume normal operation.
H112	**Collimator**	Check panoramic X-collimator position setting.	Check the collimator settings.
H113		Check panoramic X-collimator width setting.	Check the collimator settings.
H114	**DEC**	DEC calibration initialization failed.	Check the sensor connection.
H115		DEC is receiving too much radiation.	Change the exposure values.
H116		DEC is receiving too little radiation.	Change the exposure values.
H127		Cephalometric DEC exposure too long.	
H130	**Patient safety area**	Patient safety area violation detected.	Check the scan and layer settings.
H131	**Tomography**	Patient safety area violation in tomo slice 1.	Check the slice count and / or step between slices.
H132		Patient safety area violation in tomo slice 2.	Check the slice count and / or step between slices.

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Code	Explanation		Comments
H133		Patient safety area violation in tomo slice 3.	Check the slice count and / or step between slices.
H134		Patient safety area violation in tomo slice 4.	Check the slice count and / or step between slices.
H142	**Height movement**	Height movement is not possible because the stop plate at the bottom of the column was activated.	Clear any obstruction before moving the column again.
H144		Height movement is not possible because one (or more) of the positioning control buttons or the positioning joystick is stuck.	Release the button / joystick.
H151	**Line voltage**	The line voltage was too low during exposure.	Exposure was interrupted. Contact your service technician for help.
H152		The line voltage is too low.	Exposure is not possible. Contact your service technician for help.
H161	**Temperature**	The temperature of the tube head is too high.	Wait for a few minutes for the tube head to cool down.
H162		The temperature of the lift motor is too high.	Wait for a few minutes for the lift motor to cool down.
H165		The temperature of the tube head is too high for the selected exposure values.	Wait for a few minutes for the tube head to cool down.
H166		The maximum tube head energy level was exceeded.	Wait for a few minutes for the tube head to cool down or use lower exposure values.
H170	**User related messages**	Wrong licence code.	Check the licence code.
H171		The sensor is not attached properly to the C-arm.	Attach and / or lock the sensor in position.
H172		The sensor is not attached properly to the cephalostat.	Attach and / or lock the sensor in position.
H175		PC program selection is in conflict with the selected X-ray unit program.	Select another exposure mode in Planmeca Romexis.
H180		DEC is not available.	
H181		The imaging process was cancelled in Planmeca Romexis.	
H182		Timeout in image data transmission.	Exposure was interrupted. Contact your service technician for help.
H183		The attached sensor is not suitable for the selected program.	Change the sensor.
H184		Remove the 3D sensor.	
H185		The 3D sensor is not attached properly.	Attach and / or lock the sensor in position.

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Code	Explanation	Comments
H186	No IP address defined for 3D sensor.	
H187	Problem during image data transmission.	Exposure was interrupted. Contact your service technician for help.
H189	The screen was touched during exposure.	Exposure was interrupted.
H190	Error in communication protocol UID.	Retry or contact your service technician for help.
H191	Error in communication protocol state.	Retry or contact your service technician for help.
H192	Command queue full.	Retry or contact your service technician for help.
H193	Invalid scan settings.	Retry or contact your service technician for help.
H194	The control panel (touch screen or ProTouch desktop application) is not connected to the ProMax main software.	Operating in standalone mode.
H195	Request timed out while waiting for ProMax to respond.	Retry or contact your service technician for help.
H196	Version mismatch in communication interfaces.	Update ProMax software.
H197	Eeprom reading failed.	Retry or contact your service technician for help.
H199	The 3D reconstruction PC does not support the CALM algorithm.	Upgrade the 3D reconstruction PC or deactivate the CALM licence. Contact your service technician for help.

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11 Error messages



NOTE

Contact your service technician for help if you receive an error message.

The X-ray unit incorporates a self-checking feature that monitors the operation of the unit. If the system detects a technical fault, an error message (e.g. E201) appears on the touch screen.

An error message indicates that the X-ray unit has a problem that needs to be solved before further exposures can be taken. The X-ray unit will not accept any commands from the user until the error message is cleared from the touch screen. Guide the patient away from the X-ray unit. Then clear the message by touching the green check mark.

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12 Cleaning and disinfection

NOTE
Switch the X-ray unit off before cleaning or disinfection.

NOTE
Use a Planmeca approved cleaning agent and surface disinfectant. The products are categorised here as cleaning agents and / or disinfectants according to the information provided by the manufacturers.

NOTE
Follow the instructions provided by the manufacturer of the cleaning agent, disinfectant and autoclave.

NOTE
FOR SPRAYS, LIQUIDS AND FOAMS:
Do not apply sprays, liquids or foams directly on the surfaces. Apply sparingly to a clean soft cloth and wipe the surface with the cloth.
Contact your service technician for help if sprays, liquids or foams enter the system.

NOTE
FOR PLANMECA PROMAX 3D X-RAY UNITS:
Refer to the User's Manual for 3D imaging.

Planmeca approved cleaning agents

Manufacturer	Brand name
Alpro Medical	CleanWipes
Alpro Medical	IC-100
Alpro Medical	MinutenSpray-classic
Clinell	Clinell Universal Wipes
Clinitex	R515 Detergent Multi-Surface Wipes
Ecolab	Actichlor Plus
SciCan	Optim Blue Wipes

Planmeca approved surface disinfectants

Manufacturer	Brand name
Alpro Medical	MinutenSpray-classic
Antibac	Antibac 75%
CCS HealthCare	Dax Extra
CCS HealthCare	Dax 70+
Chemi-Pharm AS / Plandent	Orbis Surface Disinfectant
Clinell	Clinell Universal Wipes
Dürr	FD 312
Ecolab	Actichlor Plus

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Planmeca approved surface disinfectants

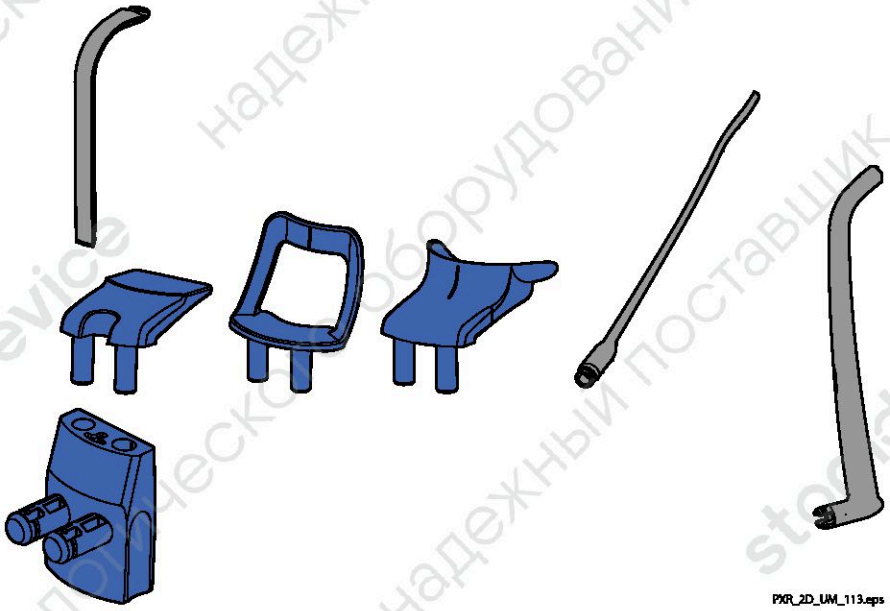
Manufacturer	Brand name
SciCan	Optim Blue Wipes

12.1 Patient supports, patient handles and touch screen

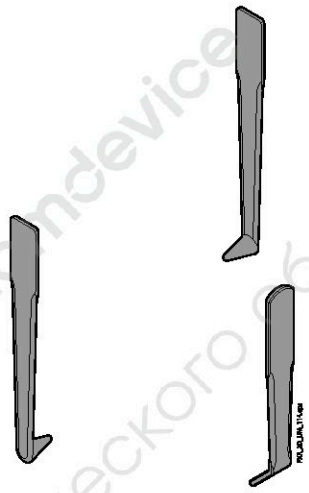
Wipe these parts after each patient using a Planmeca approved surface disinfectant.

Use a Planmeca approved cleaning agent for cleaning stains and dirt if needed.

- Panoramic patient supports

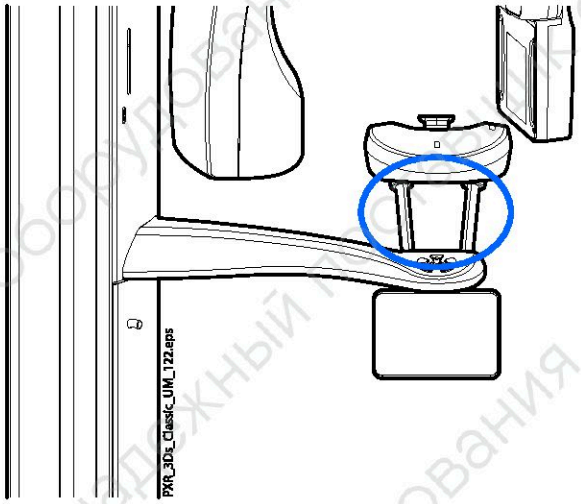


- Cephalometric patient supports

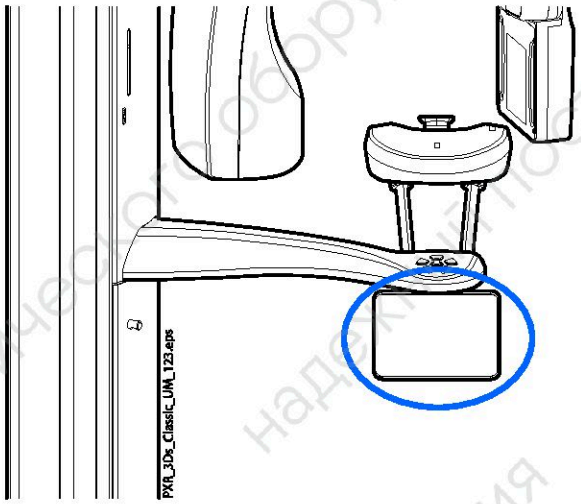


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- Patient handles



- Touch screen



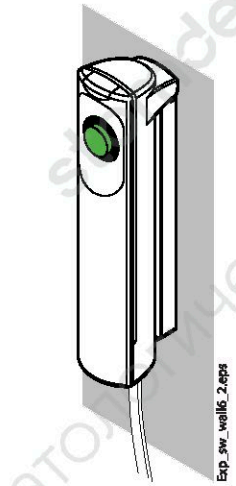
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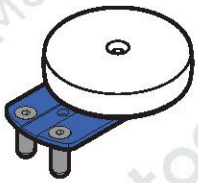
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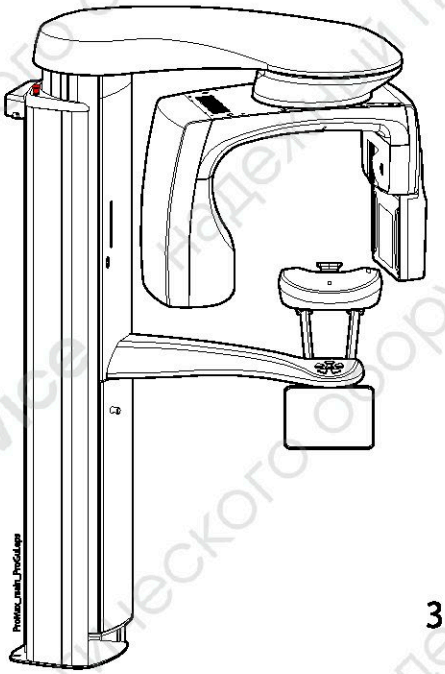
12.2 Other surfaces

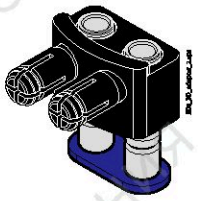
Wipe the other surfaces regularly using a Planmeca approved surface disinfectant.

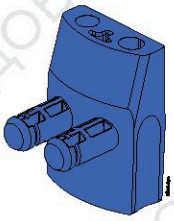
Use a Planmeca approved cleaning agent for cleaning stains and dirt if needed.

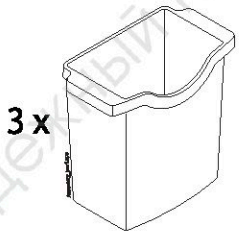


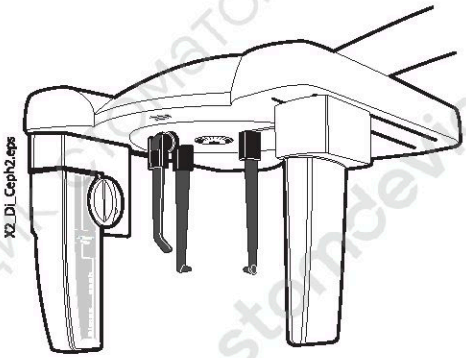


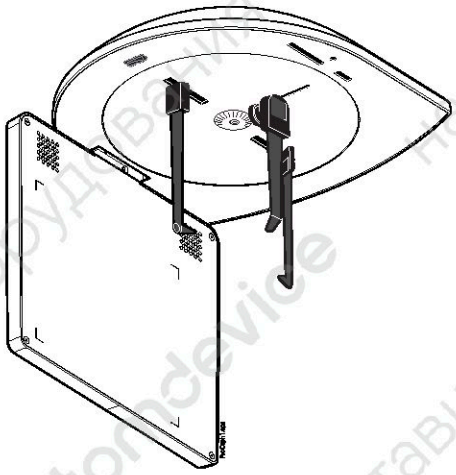


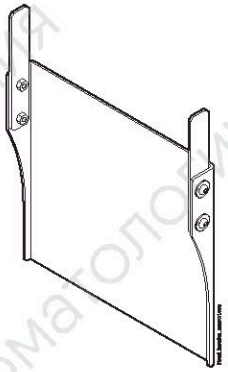








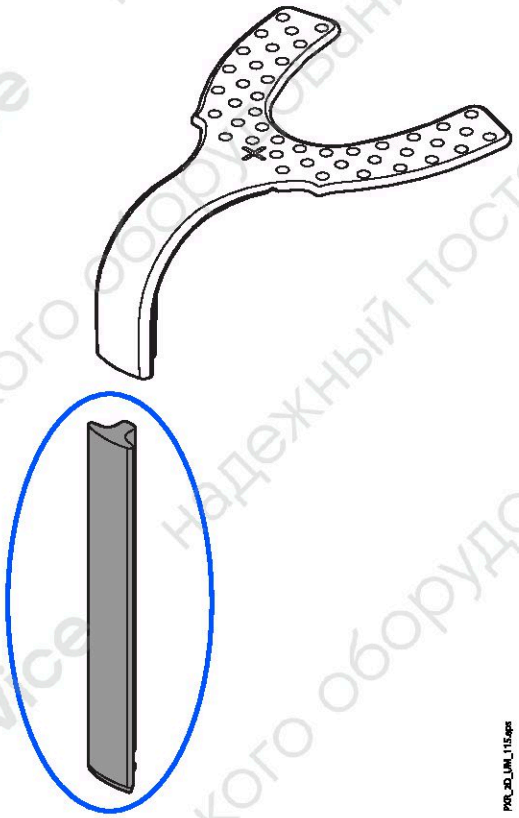




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- Impression plate holder

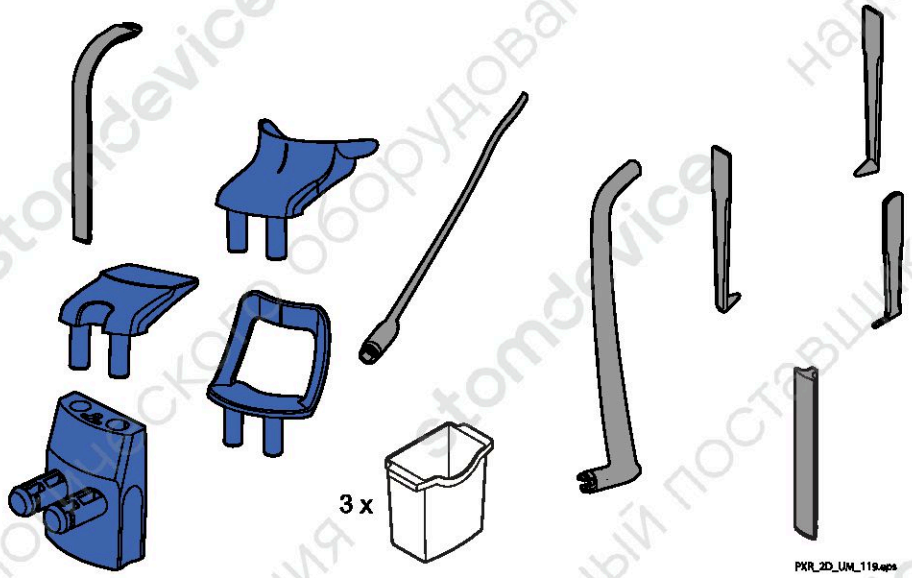


NOTE

The impression plate (the upper component in the figure above) is a single-use item. Do not reuse it for another patient.

NOTE

The parts in the figure below can be autoclaved at 134°C (273°F). The parts can be autoclaved up to 100 times.



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13 Service

The X-ray unit must be checked by a qualified Planmeca service technician once a year or after every 10 000 exposures (if this is sooner). This will guarantee patient and user safety and ensure consistent image quality.

The annual maintenance service includes inspection of the following:

- Exposure switch
- Exposure indicator lights and warning signals
- Emergency stop button
- X-ray unit adjustments and quality control checks
- Data security updates
- Column motor nut
- Labels

NOTE

Refer to the Technical Manual for details.

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14 Disposal

In order to reduce the environmental load over the product's entire lifecycle, Planmeca's products are designed to be as safe as possible to manufacture, use and dispose of.

Parts which can be recycled should always be taken to the appropriate processing centers, after hazardous waste has been removed. Disposal of obsolete units is the responsibility of the waste possessor.

All parts and components containing hazardous materials, as well as batteries, must be disposed of in accordance with waste legislation and instructions issued by the environmental authorities. Batteries must be disposed of in compliance with the requirements of Directive 2006 / 66 / EEC.

The risks involved and the necessary precautions must be taken into account when handling waste products.

Part	Main materials for disposal	Recyclable material (X) = if available	Waste disposal site	Hazardous waste (separate collection)
Frame, covers & patient supports: metal	Aluminium	X		
	Galvanised steel	X		
	Lead			X
Frame, covers & patient supports: plastic	PUR		X	
	Other plastic	X		
Motors		(X)		
Component boards		(X)		
Cables, transformers	Copper	X		
	Steel	X		
	Transformer oil			X
X-ray tube				
Packing	Wood	X		
	Cardboard	X		
	Paper	X		
	Polystyrene	X		
Sensor	Return sensor to Planmeca.			
Other parts			X	

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15 Technical data for Planmeca ProMax product family

Classification	
Medical Device Directive	93/42/EEC (Class IIb)
RoHS	2011/65/EU
IEC 60601-1	Class I, type B
CISPR 11	Class B
IP Classification	IP20
Applied parts (according to IEC 60601-1: 2012)	
Patient supports	As shown in section Patient supports in User Manuals
Patient handles	
Generator (according to IEC 60601-2-7: 1998)	
	Resonant-mode, DSP-controlled, 80 - 160 kHz
X-ray tube	
2D / 3D s / 3D Classic / 3D Plus	D-054SB
3D Mid	D-054SB, D-059SBR or SXR 130-10-0.5 SC
3D Max	D-067SB, D-059SBR or SXR 130-10-0.5 SC
Focal spot size (according to IEC 60336: 2005)	
2D / 3D s / 3D Classic / 3D Plus / 3D Mid or 3D Max with X-ray tube D-059SBR or SXR 130-10-0.5 SC	0.5 x 0.5 mm
3D Max with X-ray tube D-067SB	0.6 x 0.6 mm
Filtration	
Pan / ceph	Total 2.5 mm Al
3D	Total 2.5 mm Al + 0.5 mm Cu
SmartPan	• 3D s / 3D Classic / 3D Plus / 3D Mid: total 2.5 mm Al • 3D Max: total 2.5 mm Al + 0.5 mm Cu
Tube housing front cover quality equivalent filtration (not included in the specified total filtration)	0.3 mm Al @ 70 kV / HVL 2.6 mm Al
Anode voltage	
Pan / SmartPan	60 - 84 kV ±5%
Ceph	60 - 84 kV ±5%
3D s / 3D Classic / 3D Plus or 3D Mid with X-ray tube D-054SB	60 - 90 kV ±5%
3D Max with X-ray tube D-067SB	60 - 96 kV ±5%
3D Mid / 3D Max with X-ray tube D-059SBR or SXR 130-10-0.5 SC	60 - 120 kV ±5%
Anode current	
Pan	1 - 16 mA ±10%
Ceph	1 - 16 mA ±10%

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3D s / 3D Classic / 3D Plus or 3D Mid with X-ray tube D-054SB or 3D Max with X-ray tube D-067SB	
	3D: 1 - 14 mA ±10%
	Pan / SmartPan: 1 - 16 mA ±10%
	Scanning ceph: 1 - 16 mA ±10%
	Planmeca ProCeph: 16 mA ±10%
3D Mid / 3D Max with X-ray tube D-059SBR	
	3D: 1 - 14 mA ±10%
	Pan / SmartPan: 1 - 14 mA ±10%
	Scanning ceph: 1 - 14 mA ±10%
	Planmeca ProCeph: 11 mA ±10%
3D Mid / 3D Max with X-ray tube SXR 130-10-0.5 SC	
	3D: 1 - 14 mA ±10%
	Pan / SmartPan: 1 - 16 mA ±10%
	Scanning ceph: 1 - 16 mA ±10%
	Planmeca ProCeph: 11 mA ±10%
mAs range	
	min. / max. as indicated ±(10% + 0.2 mAs)
mGy range	
	min. / max. as indicated ±40%
Linearity of radiation output	
	< 0.1
DEC accuracy	
	±10%
Cooling period	
	Automatically controlled
Exposure time	
Pan	2.7 - 16 s as indicated ±10%
SmartPan	2.5 - 15.6 s as indicated ±10%
Scanning ceph	6.7 - 10.5 s as indicated ±10%
Planmeca ProCeph	0.1 - 0.8 s as indicated ±10%
3D	Pulsed, effective 3 - 36 s as indicated ±10%
SID	
Pan	• 2D / 3D s / 3D Classic: 501 mm (19.7 in.) • 3D Plus / 3D Mid: 574 mm (22.6 in.)
Ceph	1700 mm (66.9 in.)

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3D / SmartPan	• 3D s / 3D Classic: 528 mm (20.7 in.) • 3D Plus or 3D Mid with X-ray tube D-054SB / 3D Max with X-ray tube D-067SB: 600 mm (23.6 in.) • 3D Mid / 3D Max with X-ray tube D-059SBR or SXR 130-10-0.5 SC: 632 mm (23.8 in.)
Magnification	
Pan	• 2D / 3D s / 3D Classic: 1.2-1.5 • 2D tomography: 1.5 • 3D Plus / 3D Mid: 1.4
SmartPan	• 3D s / 3D Classic: 1.27 • 3D Plus / 3D Mid / 3D Max: 1.4
Ceph	1.13
3D	• 3D s / 3D Classic: 1.58 • 3D Plus / 3D Mid / 3D Max: 1.38, 1.40, 1.42, 1.43 or 1.8
Duty cycle for height adjustment	
	25 s ON / 400 s OFF
Line voltage	
	100 - 220 V~ / 50 - 60 Hz
	230 - 240 V~ / 50 Hz
Line current	
	8 - 17 A
Line harmonics	
	Cos better than 0.9
Max. permissible apparent impedance of supply mains	
	0.5 Ω (100 VAC)
Max. continuous heat dissipation	
	250 W
Internal fuse(s)	
User replaceable	100 - 220 V~ / 16A FF H 500 V 230 - 240 V~ / 8A FF H 500 V
Type	195100 ELU
External fuse(s)	
	100 - 220 V ~ / 16A min. - 20A max. T 250 V 230 - 240 V ~ / 10A min. - 20A max. T 250 V
Battery	
	Lithium battery: CR2032, Varta / Panasonic
Max. weight	
2D / 3D s / 3D Classic	119 kg (262 lb)
3D Plus / 3D Mid	141 kg (311 lb)
3D Max	139 kg (306 lb)

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Scanning ceph	26 kg (57 lb)
Planmeca ProCeph	20 kg (44 lb)
Environmental requirements	
Transport:	
Temperature	-20°C - +60°C (-4°F - +140°F)
Relative humidity	10 - 90% RH (non-condensing)
Air pressure	700 - 1060 hPa
Storage:	
Temperature	-10°C - +50°C (+14°F - +122°F)
Relative humidity	10 - 90% RH (non-condensing)
Air pressure	700 - 1060 hPa
Operating:	
Temperature	• Pan / scanning ceph: +10°C - +40°C (+50°F - +104°F) • 3D / ProCeph: +10°C - +35°C (+50°F - +96°F)
Relative humidity	10 - 90% RH (non-condensing)
Air pressure	800 - 1060 hPa
Max. altitude	2000 m (1.25 miles)
Image properties	
Pan / ceph CCD:	
Pixel size	48 µm
Pan active surface	6 x 146 mm (0.24 x 5.74 in.)
Ceph active surface	6 x 292 mm (0.24 x 11.15 in.)
Planmeca ProCeph:	
Flat panel pixel size	139 µm
Flat panel active surface	302 x 249 mm (11.89 x 9.80 in.)
3D:	
Flat panel pixel size	127 µm
Flat panel active surface	• 3D s / 3D Classic: 130 x 130 mm (5.12 x 5.12 in.) • 3D Plus / 3D Mid: 146 x 146 mm (5.74 x 5.74 in.) • 3D Max: 193 x 242 mm (7.6 x 9.5 in.)
SmartPan:	
Flat panel pixel size	127 µm
Flat panel active surface	• 3D s / 3D Classic: 8 - 25 x 130 mm (0.31 - 0.98 x 5.12 in.) • 3D Plus / 3D Mid: 8 - 25 x 146 mm (0.31 - 0.98 x 5.74 in.) • 3D Max: 13 - 25 x 162 mm (0.51 - 0.98 x 6.38 in.)
Operating conditions for X-ray units with ProFace sensor	

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Optimum colour temperature	Approx. 6500 Kelvin
Frequency for fluorescent lamps	100 Hz
Even and uniform lighting	
No natural light	

Original manufacturer

Planmeca Oy, Asentajankatu 6, FIN-00880, Helsinki, Finland
Phone: +358 20 7795 500, Fax: +358 20 7795 555, www.planmeca.com

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