



# PLANMECA ProOne

## user's manual



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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 authorized 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

The Planmeca ProOne X-ray unit produces digital X-ray images for the diagnosis of dentomaxillofacial anatomy. The unit is allowed to be used only under supervision of a dental/health care professional.

This manual describes how to operate the Planmeca ProOne X-ray unit. Please read these instructions thoroughly before using the unit.

You need a PC with the Planmeca Romexis/Dimaxis imaging software to save, view and modify the radiographs. The Romexis/Dimaxis software has a separate manual which should be used in conjunction with this manual.



Planmeca ProOne X-ray unit fulfils the requirements of Directive 93/42/EEC (Class IIb).

**CAUTION FOR US USERS:**

***Federal law restricts this device to sale by or on the order of a dentist.***

**NOTE** The X-ray unit's software version is shown briefly on the control panel when the X-ray unit is switched on. This manual is valid for software version 1.6.0.0.r or later. This software version is compatible with Romexis software version 2.4.0.R or later and Dimaxis software version 4.5.0.0.r or later.

The display values shown in this manual are only examples and should not be interpreted as recommended values unless otherwise stated.

The Planmeca ProOne X-ray unit features preset exposure values for all imaging programs. The exposure values have been preset at the factory to automatically correspond with the selected patient size. However, the exposure values required to produce good X-ray images vary considerably according to the build and age of the patient. The preset exposure values are average values and they are only meant to guide the user. Users are encouraged to develop their own radiographic techniques based on these values.

Make sure that you are fully acquainted with the appropriate radiation protection measures and these instructions before using the X-ray unit.

## 2 SYMBOLS ON PRODUCT LABELS



Type B applied part (Standard IEC 60601-1)



Attention, consult accompanying documents  
(Standard IEC 60601-1)



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



Alternating current (Standard IEC 60417)



Warning: dangerous voltage  
(Standard IEC 60417)



Electrostatic sensitive device (Standard IEC 60417)

## 3 ASSOCIATED DOCUMENTATION

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

- User's Manual
- Installation Manual
- Technical Manual

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

- User's Manual
- Installation Manual

## 4 WARNINGS AND PRECAUTIONS

**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** *Modification of the X-ray unit is strictly prohibited.*

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

**CAUTION** *Do not connect a multiple portable socket outlet (MPSO) or extension cord to the system.*

**CAUTION** *If the X-ray unit shows any signs of oil leakage, disconnect the unit from mains and contact your service technician for help.*

**CAUTION** *The X-ray unit is not suitable for use in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide.*

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

**NOTE** 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 unit are correctly shielded. 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.

**NOTE** If the X-ray unit has been stored at temperatures below +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.

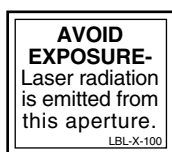
**NOTE** If the X-ray unit is not connected to an Uninterruptible Power Supply (UPS), disconnect the unit from mains during lightning storms.

**NOTE FOR US USERS:**  
The patient positioning lights are class II laser products (21 CFR § 1040.10).

**NOTE FOR EUROPEAN USERS:**  
Class 1 laser product (Standard EN 60825-1: 1994).  
The patient positioning lights are class 1, inherently safe laser lights.

**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 Planmeca ProOne 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 60601-1-1, 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 60601-1-1. 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** 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.

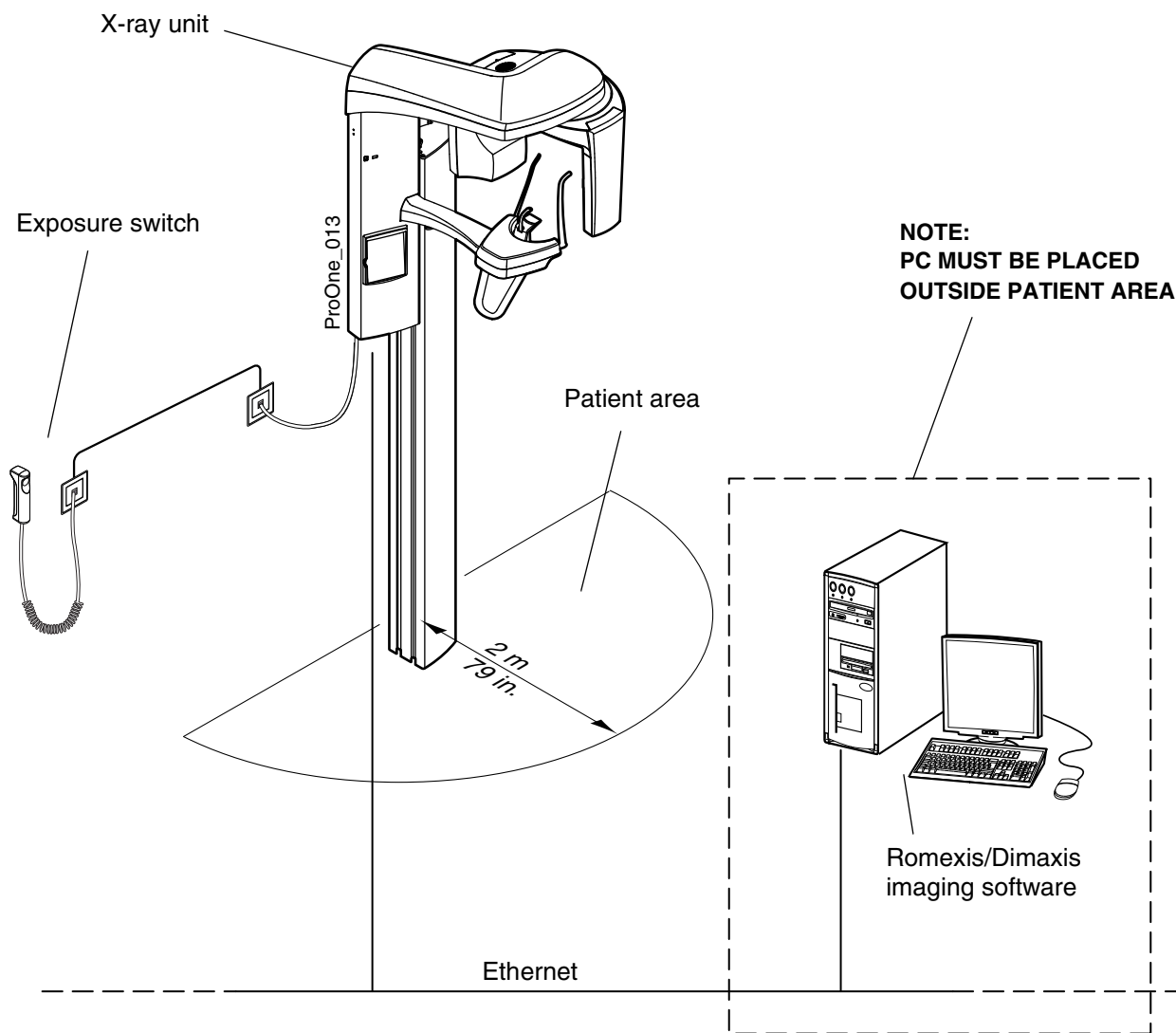
**NOTE** Do not attempt to remove any covers from the X-ray unit. X-ray unit covers may be removed by service personnel only.

**NOTE** Do not touch the arm structures (C-arm, upper arm) when the X-ray unit is moving.

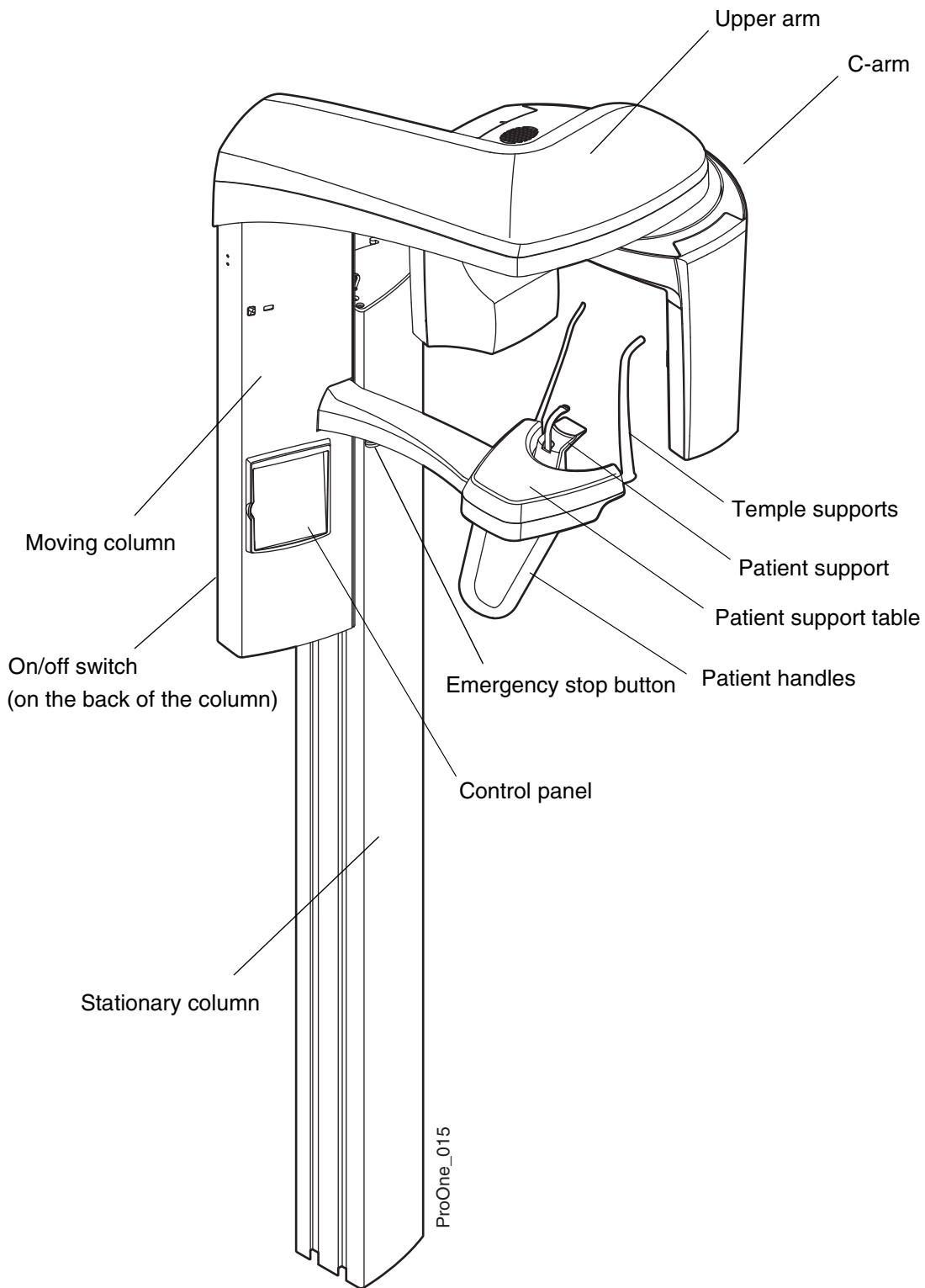


## 5 MAIN PARTS

### 5.1 General view of the system

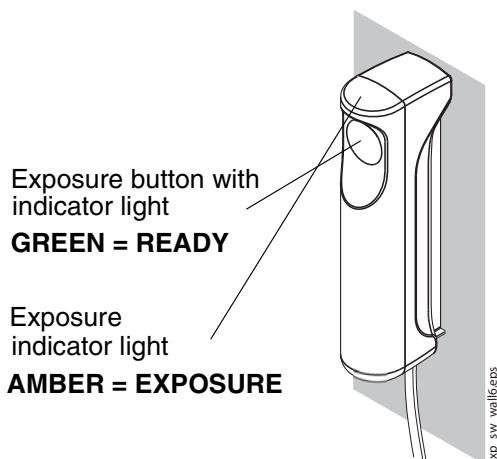


5.2 General view of the X-ray unit

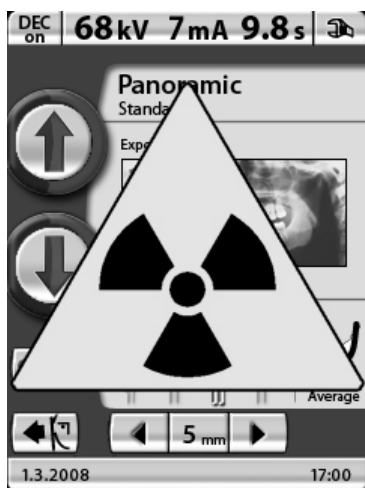


### 5.3 Exposure switch

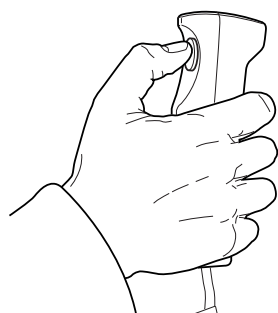
The exposure switch can be mounted on the wall, or it can be hung from the hook located on the back of the moving column if a protected area is within reach.



When the X-ray unit is ready to take an exposure a green indicator light will come on on the exposure button. Additionally, the status bar at the bottom of the control panel display will turn green.

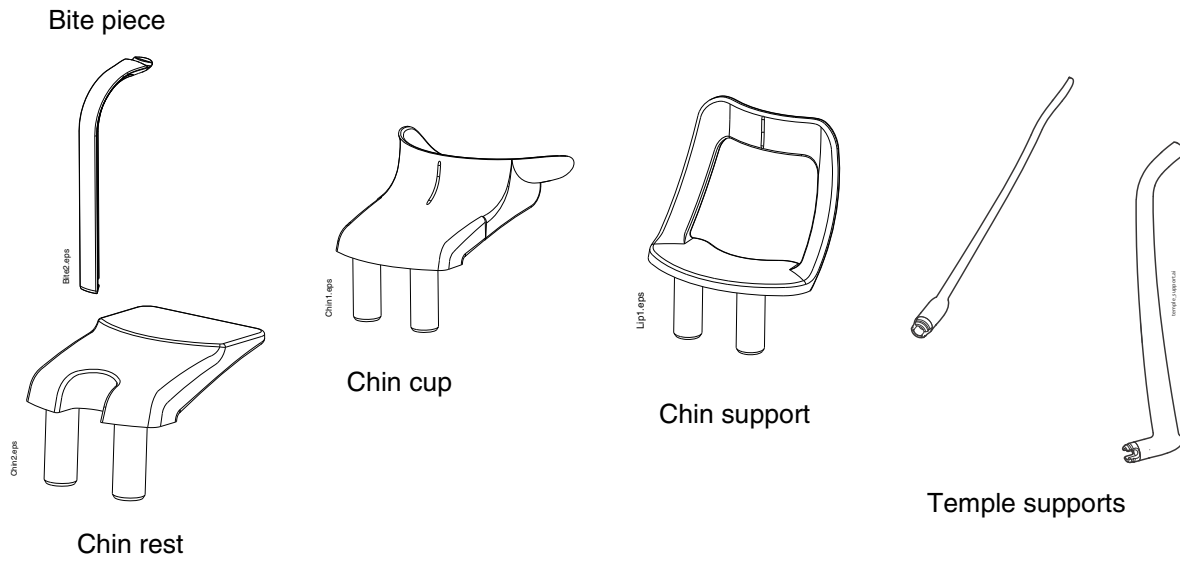


When you take an exposure an amber indicator light will come on on the exposure switch. It indicates that the X-ray unit is generating radiation. Additionally, a radiation warning symbol will be shown on the control panel display and you will hear a radiation warning signal.

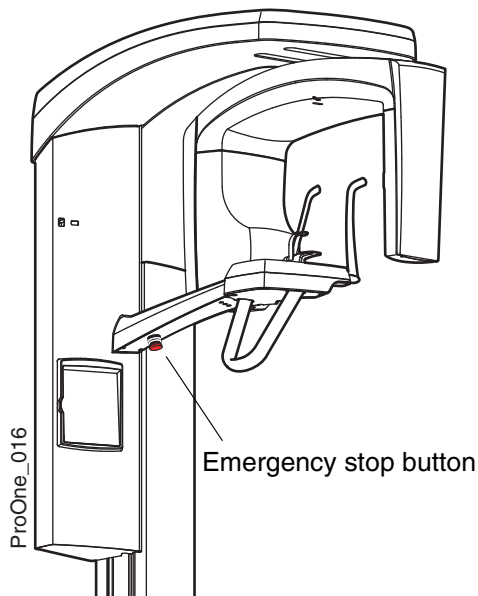


When you take an exposure you must press and **hold down** the exposure button for the whole duration of the exposure. If you remove your finger from the exposure button before the exposure cycle is completed radiation is interrupted, the C-arm will stop moving and a help message will appear on the control panel. The help message must be cleared before the X-ray unit can be used again.

## 5.4 Patient supports



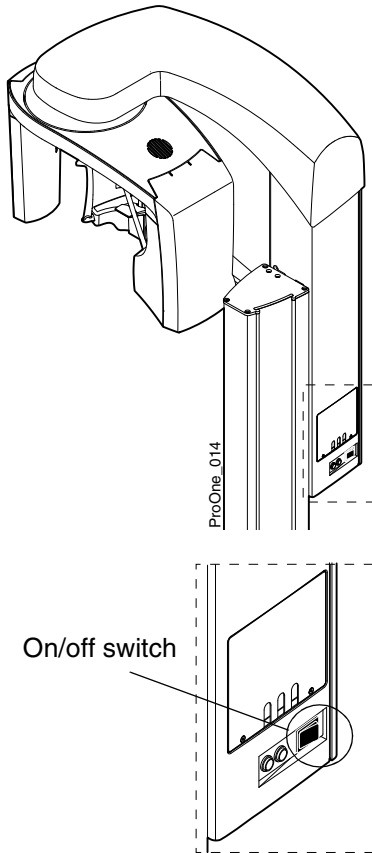
## 5.5 Emergency stop button



The emergency stop button is located on the underside of the patient support table arm. 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.

A help message will appear on the control panel display. Release the stop button to resume normal operation.

## 6 SWITCHING THE X-RAY UNIT ON



The on/off switch is located on the back of the moving column. When you switch the X-ray unit on the main display will be shown on the control panel and a blue light will come on on the left side of the display. Additionally, the X-ray unit will carry out a self-test which will last a few seconds.

The X-ray unit is then ready for use.

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

## 7 PROGRAM PACKAGES

The Planmeca ProOne X-ray unit offers a wide selection of exposure programs for various diagnostic purposes. The basic program package is included as standard and the other program packages are available as options.

The basic program package includes basic panoramic, double TMJ and sinus programs for general maxillofacial diagnostics. The advanced program package consists of special panoramic, TMJ, sinus and cross sections programs for specific diagnostic needs. The panoramic bitewing program can be purchased as part of the advanced program package or separately.

Each exposure program has a child setting which reduces the image size and patient dose.

In the table the programs are divided according to the sales packages. In the following chapters the programs will be presented according to the program type.

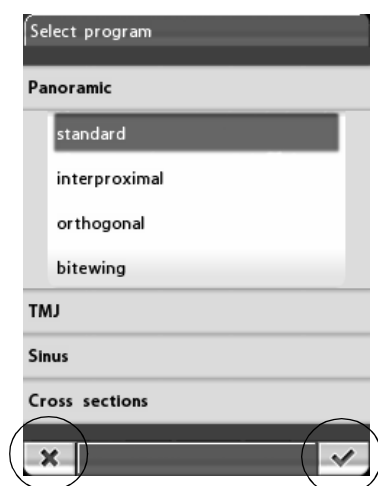
Program package	Contents
Basic programs (standard)	<ul style="list-style-type: none"> <li>• Standard panoramic program</li> <li>• Double lateral TMJ program</li> <li>• Double PA TMJ program</li> <li>• PA rotational sinus program</li> </ul>
Advanced programs (optional)	<ul style="list-style-type: none"> <li>• Interproximal panoramic program</li> <li>• Orthogonal panoramic program</li> <li>• Panoramic bitewing program</li> <li>• Double lateral-PA TMJ program</li> <li>• 3 angles lateral TMJ program (left or right)</li> <li>• Lateral non-rotational sinus program (left or right)</li> <li>• Midsagittal non-rotational sinus program (left or right)</li> <li>• Cross sections manual</li> <li>• Cross sections automatic</li> </ul>
Panoramic bitewing (optional)	<ul style="list-style-type: none"> <li>• Panoramic bitewing program</li> </ul>
Segmenting (optional)	<ul style="list-style-type: none"> <li>• Horizontal and vertical segmenting for panoramic programs</li> </ul>
DEC (optional)	<ul style="list-style-type: none"> <li>• Dynamic Exposure Control for panoramic programs</li> </ul>

## 8 CONTROL PANEL

### 8.1 General about control panel

**NOTE** Never allow patients to touch the display while positioning them in the X-ray unit or carrying out the exposure. Touching the display during exposure will interrupt radiation, stop the C-arm movement, and cause a help message to appear on the control panel. The help message must be cleared before the X-ray unit can be used again.

**NOTE** The contents of the displays depend on the configuration of the X-ray unit. The displays shown here are from an X-ray unit that features all currently available imaging programs and functions.



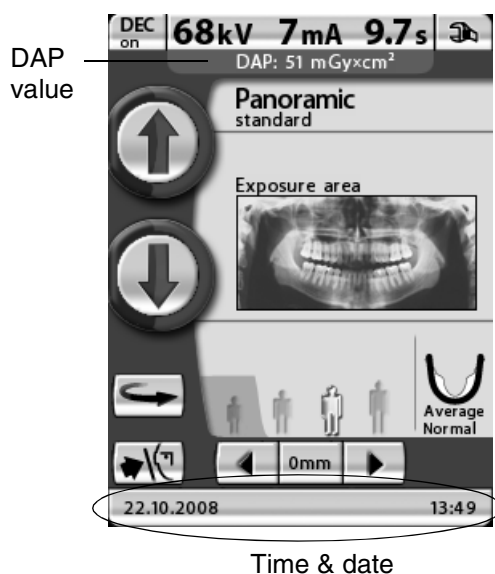
Cross = Cancel      Check mark = Accept

**NOTE** Do not use sharp objects to operate the control panel.

Only the text fields and icons on the display are touch-sensitive, and touching areas outside them will not activate an action.

To accept a selection, touch the green check mark button in the bottom right corner of the display. To cancel a selection, touch the red cross button in the bottom left corner of the display.

The display will automatically switch to stand-by mode if you do not touch the display or the exposure button for more than 30 minutes. A blue power light on the left side of the display indicates that the X-ray unit is switched on even though the display is dark. The display will switch on as soon as you touch it again.



You can set the X-ray unit so that the current time and/or date will be shown at the bottom of the display. You can choose in which format (e.g. 22.10.2008 for date and 13:49 for time) they will be shown. Refer to section “Setting time and date (U1100)” on page 37 for more information.

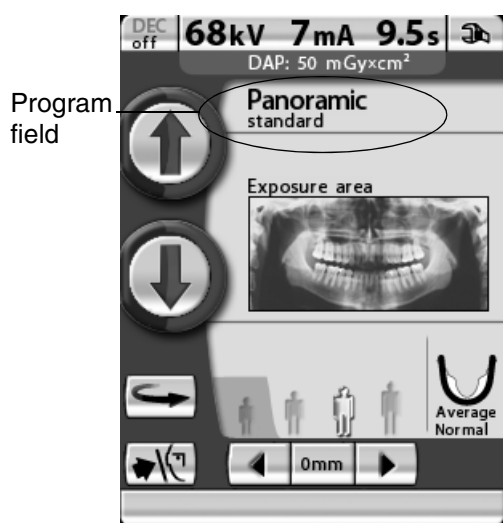
You can set the X-ray unit so that the estimated DAP (Dose Area Product) value will be shown on the main display for the exposure you are going to take. The DAP value indicates the highest radiation dose the patient will be exposed to during the exposure. Refer to section “Program presets (P2200)” on page 46 for more information.

You can set the X-ray unit so that a preview of the image will be shown on the control panel after exposure. This option allows you to evaluate the image immediately after you have taken it. Refer to section “Functions after exposure (P2300)” on page 48 for more information.

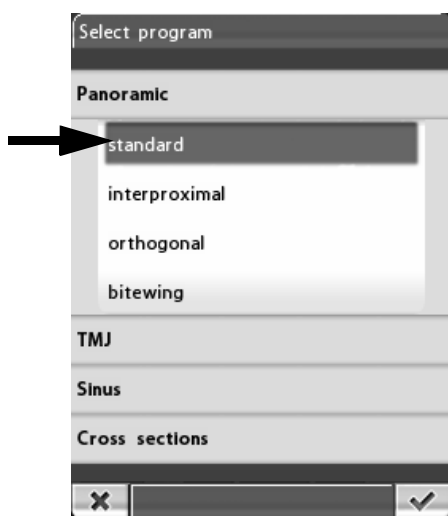
**NOTE** The control panel can be adjusted to respond to your individual finger touch. Refer to section “Operational settings (U1300)” on page 39 for more information.

**NOTE** You can switch practice mode on, if you wish to practice or demonstrate the functions of the X-ray unit without radiation. Refer to section “Operational settings (U1300)” on page 39 for more information.

## 8.2 Selecting panoramic exposure program



To select a panoramic exposure program touch the program field on the main display. The main display is the display that is shown when the X-ray unit is switched on.



The *Select program* display appears. Select the required panoramic exposure program by touching the appropriate field on the display. The selected program will be highlighted.

**NOTE** The patient positioning lights will be automatically switched on when you select the exposure program.

There are four panoramic exposure programs: Standard, Interproximal, Orthogonal and Bitewing.

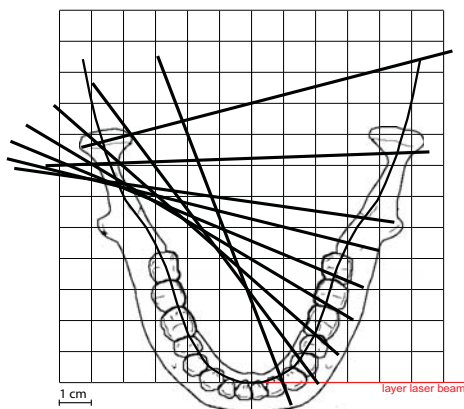
**NOTE** The panoramic program “Standard” is included in the basic program package. Other panoramic programs are optional.

**NOTE** When the child setting (smallest patient size) is selected, the image size and patient dose are automatically reduced.



**Standard panoramic program**

Direction of beam



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

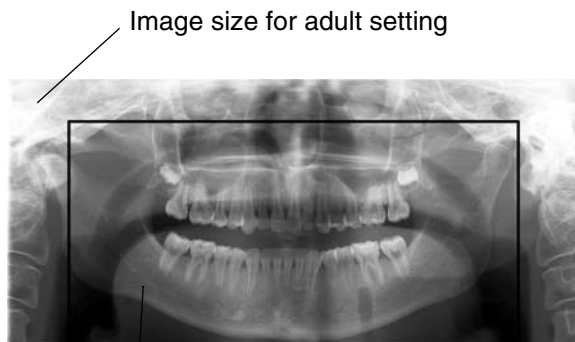
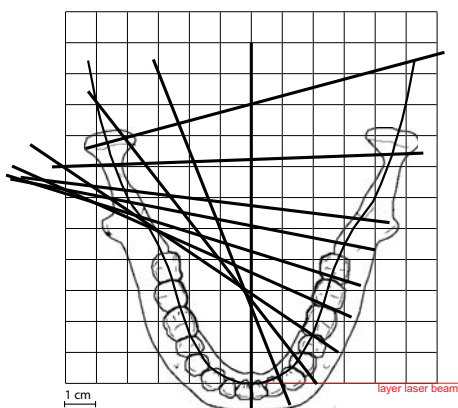


Image size for child setting

**Interproximal panoramic program**

Direction of beam



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

This program is used for caries detection.

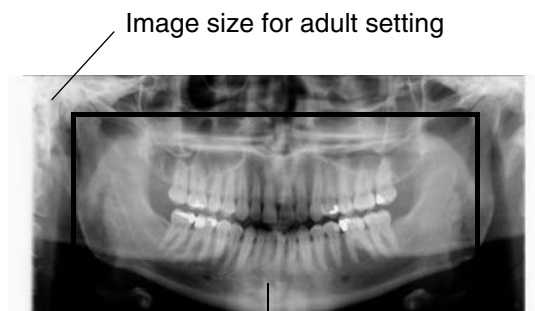
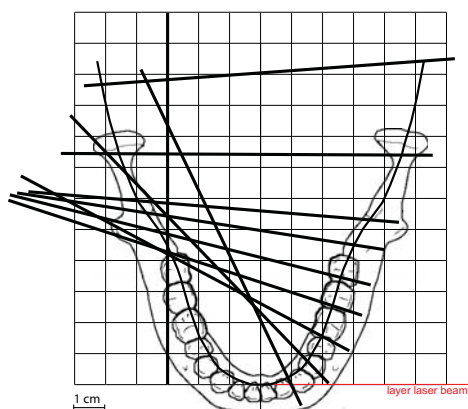


Image size for child setting

**Orthogonal panoramic program**

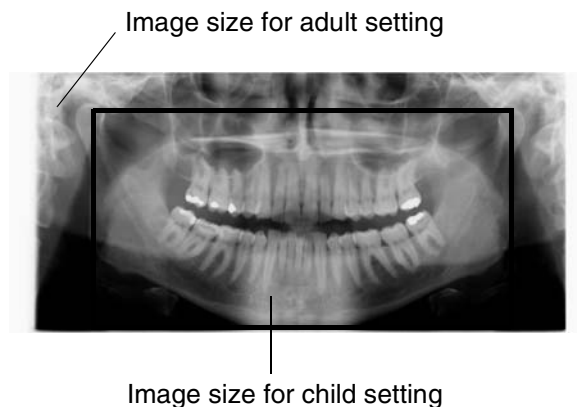
Direction of beam



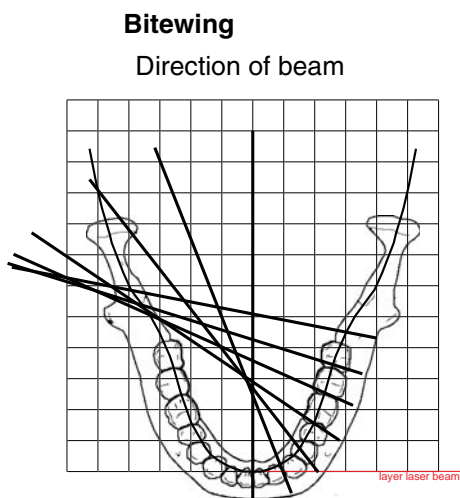
**NOTE** This program is optimized for interproximal imaging and a shadow of the opposite side teeth may therefore be visible in the radiograph.

In the **Orthogonal** program the basic imaging geometry is the same as in the standard panoramic program but the angle of the X-ray beam is more perpendicular to the jaw.

This program is useful for periodontal studies.

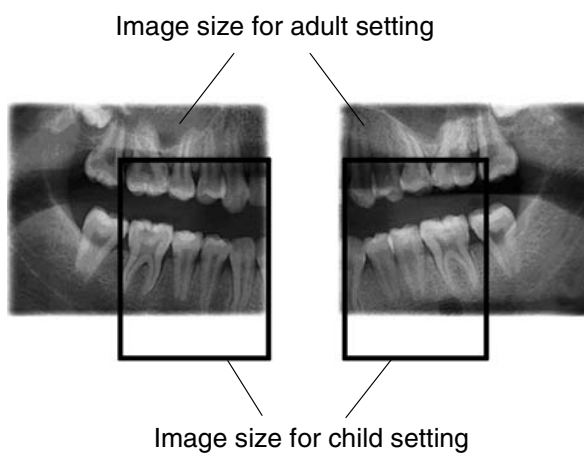


**NOTE** This program is optimized for orthogonal imaging and a shadow of the opposite side teeth may therefore be visible in the radiograph.

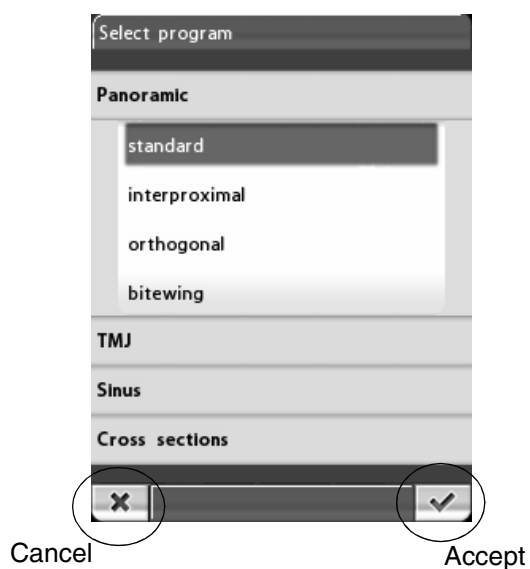


The **Bitewing** program produces bitewing-like images from premolar and molar areas including parts of maxilla, mandible and rami. The bottom of the maxillary sinus as well as the mandibular canal and the mental foramen are also visible.

The bitewing program uses improved interproximal angulation projection geometry.



**NOTE** This program is optimized for interproximal imaging and a shadow of the opposite side teeth may therefore be visible in the radiograph.



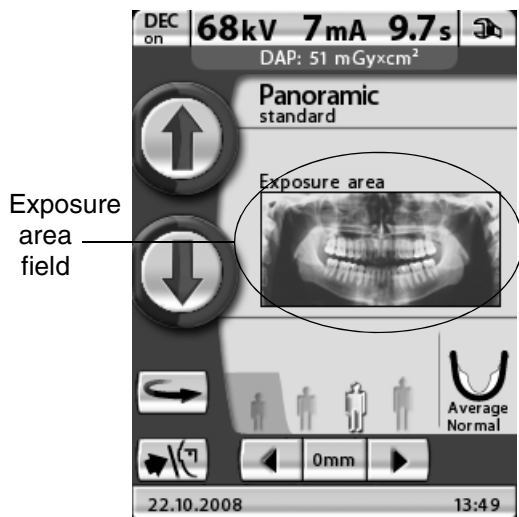
Accept the selection and return to the main display by touching the green check mark button in the bottom right corner of the display.

Image sizes in panoramic programs

Program	Patient size	Real image size (WxH) mm	Image size on receptor (WxH) mm	Magnification
<b>Standard panoramic</b>	Adult	226 x 103	288 x 134	1.27
	Child	176 x 88	223 x 112	1.27
<b>Interproximal panoramic</b>				
<b>Orthogonal panoramic</b>				
<b>Panoramic bitewing</b>	Adult	115 x 48	146 x 60	1.27
	Child	74 x 40	93 x 50	1.27

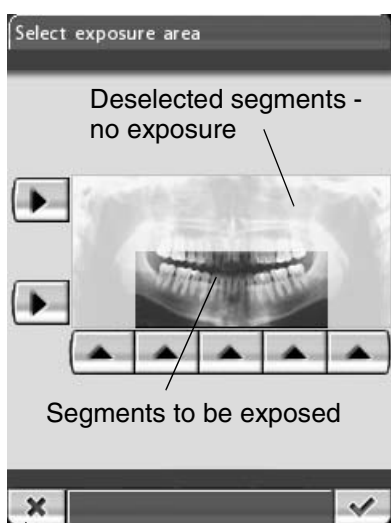
### 8.2.1 Selecting exposure area for panoramic exposures (optional)

**NOTE** Segmenting is an optional feature. Refer to section “Program licences (P2100)” on page 44 for more information.



This optional segmenting function allows you to take panoramic exposures of different jaw segments. It will reduce the radiation dose as only diagnostically interesting areas need to be X-rayed.

Touch the exposure area field on the main display.



**NOTE** The image shown on the display is only an example. The exposed image will not equal the example image.

The *Select exposure area* display appears. The display shows an image which is divided into two horizontal and five vertical segments.

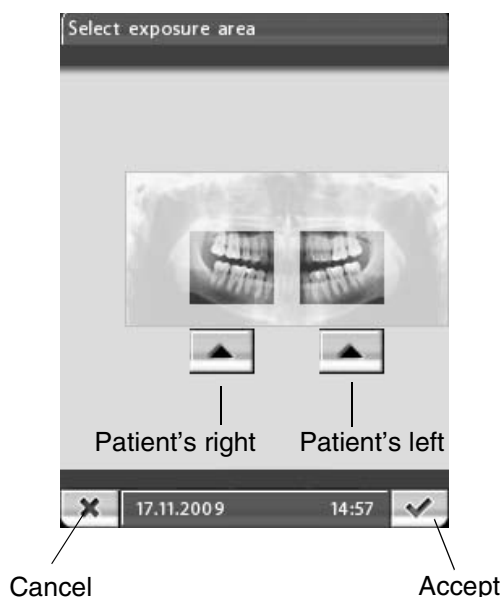
Touch the corresponding arrow button(s) to **deselect** the segment(s) that should not be exposed. The segments which will **not** be exposed are shown faded. The segments which will be exposed are shown in full colour.

Touching the arrow of a deselected segment again will change the colour of the segment back to normal.

Cancel

Accept

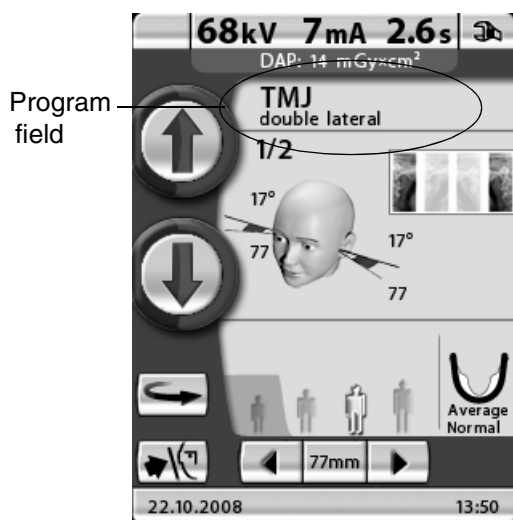
Accept the selections you have made, and return to the main display by touching the green check mark button in the bottom right corner of the display.



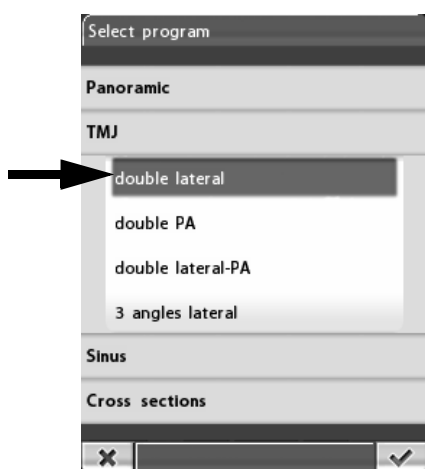
With the optional **Panoramic bitewing** program you can deselect right or left side by touching the corresponding arrow button on the control panel.

Accept your selection and return to the main display by touching the green check mark button in the bottom right corner of the display.

### 8.3 Selecting temporomandibular joint (TMJ) exposure program



To select a temporomandibular joint (TMJ) exposure program touch the program field on the main display. The main display is the display that is shown when the X-ray unit is switched on.



The *Select program* display appears. Select the required TMJ exposure program by touching the appropriate field on the display. The selected program will be highlighted.

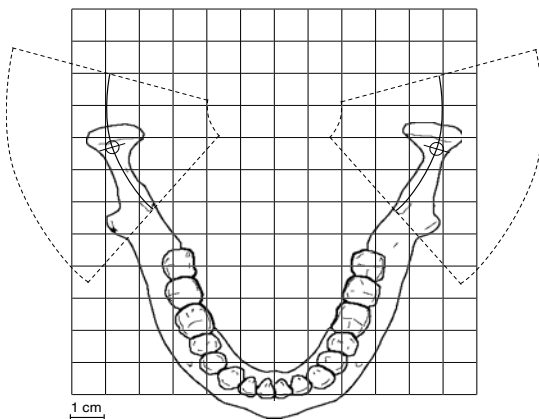
**NOTE** The patient positioning lights will be automatically switched on when you select the exposure program.

There are four TMJ exposure programs: Double lateral, Double PA, Double lateral-PA and 3 angles lateral.

**NOTE** The temporomandibular programs “Double lateral” and “Double PA” are included in the basic program package and enabled by default. However, the “Double PA” program could have been disabled by the service personnel. The “Double lateral-PA” and “3 angles lateral” programs are optional.

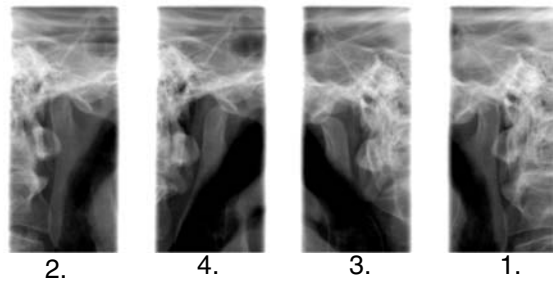
**NOTE** When the child setting (smallest patient size) is selected, the image size and patient dose are automatically reduced.

## Double lateral

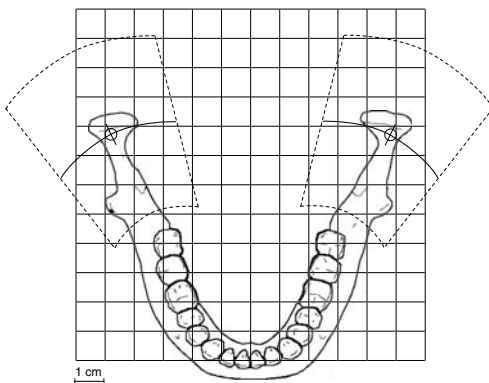


## Double lateral:

Lateral TMJ exposures of open and closed temporomandibular joints. The imaging angle is adjustable (factory default angle: 17°).

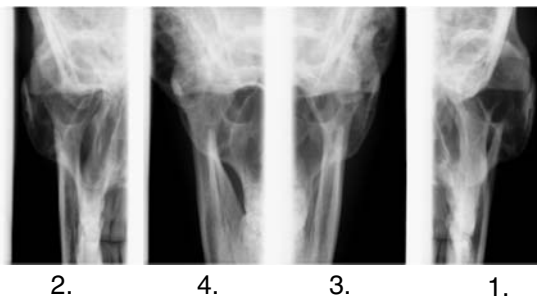


## Double PA

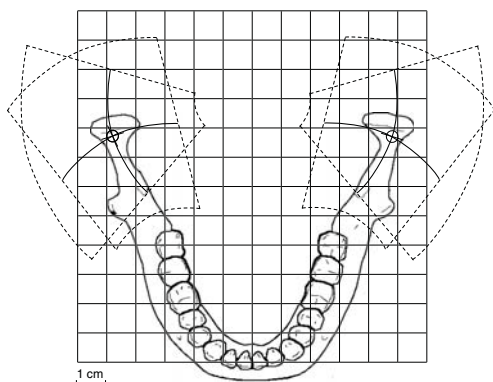


## Double PA:

Posteroanterior TMJ exposures of open and closed temporomandibular joints. The imaging angle is 60° and it is not adjustable.



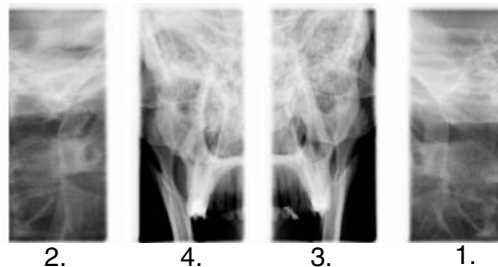
**Double lateral-PA**



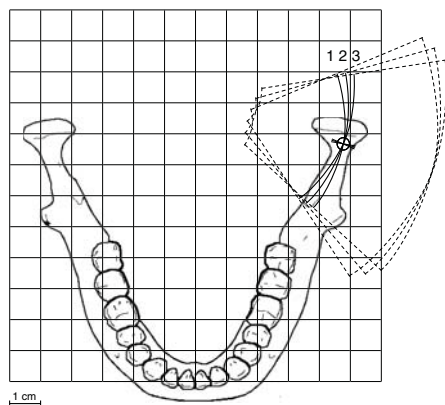
**Double lateral-PA:**

Lateral and posteroanterior TMJ exposures of open or closed temporomandibular joints.

The imaging angle for the lateral exposure is adjustable (factory default angle: 17°). The imaging angle for the postero-anterior exposure is 60° and it is not adjustable.



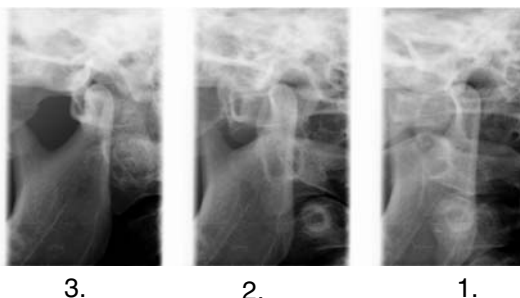
**3 angles lateral, left**



**3 angles lateral:**

Three lateral multi-angle left-hand or right-hand side TMJ exposures.

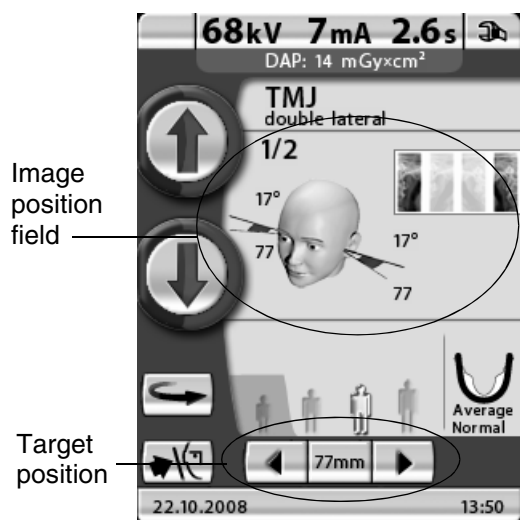
The imaging angle for image no. 2 is adjustable (three imaging angles: factory default angle 17° ±7°). The selected imaging angle is in image no. 2



- First exposure = Selected angle - 7°
- Second exposure = Angle selected by user (factory default angle: 17°)
- Third exposure = Selected angle + 7°

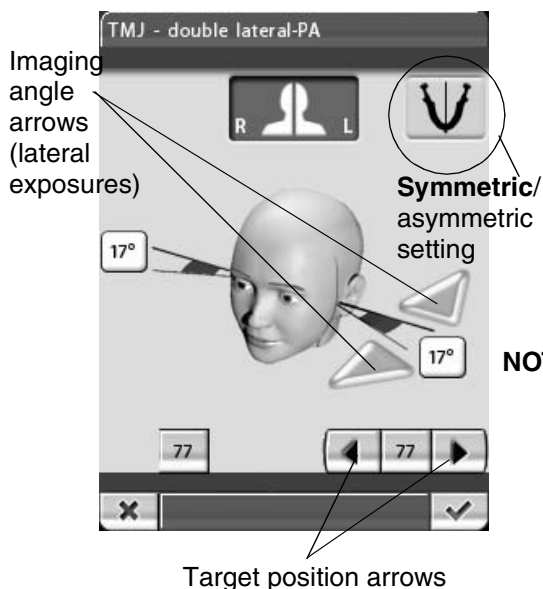
Accept the selection and return to the main display by touching the green check mark button in the bottom right corner of the display.

### 8.3.1 Selecting imaging position for temporomandibular joint (TMJ) exposures



Touch the image position field in the middle of the display to select the imaging position.

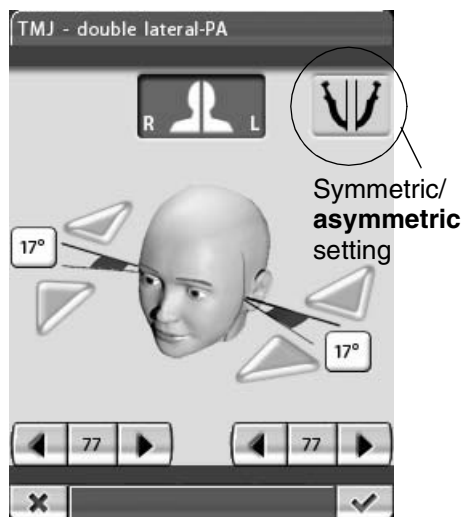
The X-ray image in the top right corner of the field shows in which order the images will appear on the radiograph. The active exposure is shown in full colour. The number in the top left corner indicates the number of the active exposure.



On the display that appears you can adjust the imaging position by touching the target position arrows in the bottom right corner. The arrow pointing to the left will move the target position forwards and the arrow pointing to the right will move the target position backwards. The target position on the other jaw side will move accordingly if the icon for symmetric/asymmetric setting shows an undivided jaw (one line in the middle). The number that is shown on the display demonstrates the position of the layer light and serves as a reference for later retakes.

**NOTE** The imaging position can also be adjusted by touching the target position arrows on the main TMJ display.

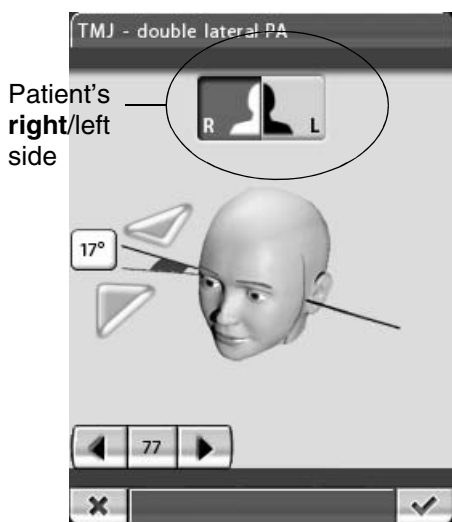
The imaging angle can be adjusted for lateral TMJ exposures. The default imaging angle for lateral exposures can be defined by user in the *Program presets* menu, option **Lateral TMJ default angle**, see Section “Program presets (P2200)” starting from page 46. To adjust the imaging angle for the exposure you are going to take touch the imaging angle arrows next to the degree marking. Touching the upwards pointing arrow will decrease the angle and touching the downwards pointing arrow will increase the angle. The imaging angle on the other jaw side will change accordingly if the icon for symmetric/asymmetric setting shows an undivided jaw (one line in the middle).



If the patient’s right and left side are asymmetric you will need to set the target position and imaging angle (lateral views) separately on the other side. To do this, touch the icon for symmetric/asymmetric setting to select the asymmetric setting and adjust the other side as required. In the asymmetric setting the icon shows a divided jaw (two lines in the middle).



**NOTE** In the asymmetric setting, touching the target position arrows on the main TMJ display will adjust the imaging position only on the patient's left side.

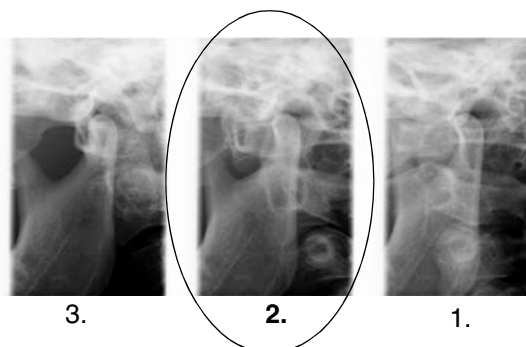
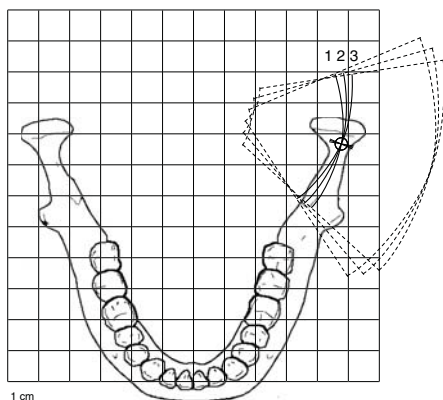


Patient's right/left side

The right/left buttons at the top of the display allow you to select on which side the exposures will be taken. You can set the unit to take TMJ exposures on one side or on both sides. The button(s) of the selected side(s) will be highlighted. Note that the buttons refer to the patient's (not your) right and left side.

**NOTE** In multi-angle exposures the selected imaging angle is in image no. 2.

3 angles lateral, left



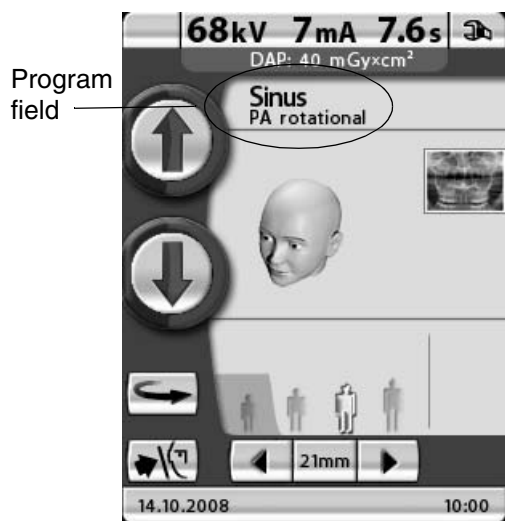
3. 2. 1.  
Imaging angle selected by the user

- First exposure = Selected angle - 7°
- Second exposure = Angle selected by the user (factory default angle: 17°)
- Third exposure = Selected angle + 7°

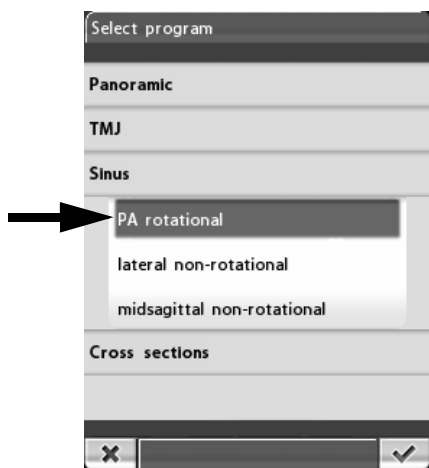


Accept the selection and return to the main display by touching the green check mark button in the bottom right corner of the display.

## 8.4 Selecting sinus exposure program



To select a sinus exposure program touch the program field on the main display. The main display is the display that is shown when the X-ray unit is switched on.



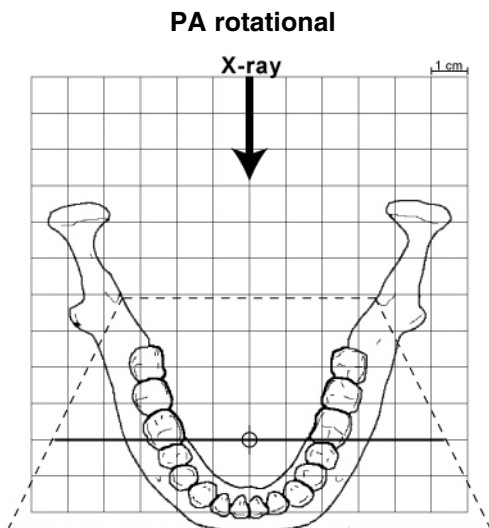
The *Select program* display appears. Select the required sinus exposure program by touching the appropriate field on the display. The selected program will be highlighted.

**NOTE** The patient positioning lights will be automatically switched on when you select the exposure program.

There are three sinus exposure programs: PA rotational, Lateral non-rotational and Midsagittal non-rotational.

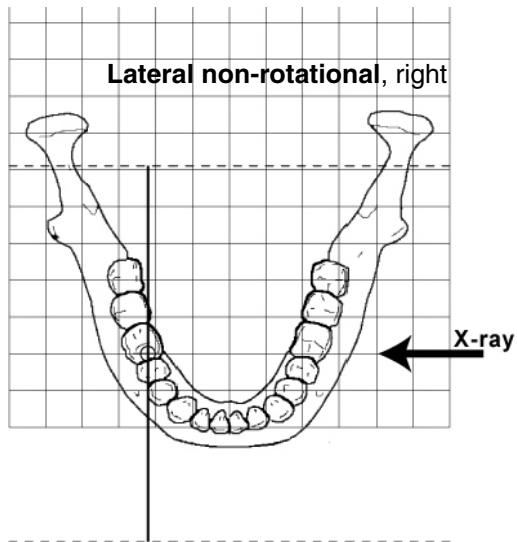
**NOTE** The sinus program “PA rotational” is included in the basic program package. Other sinus programs are optional.

**NOTE** When the child setting (smallest patient size) is selected, the image size and patient dose are automatically reduced.

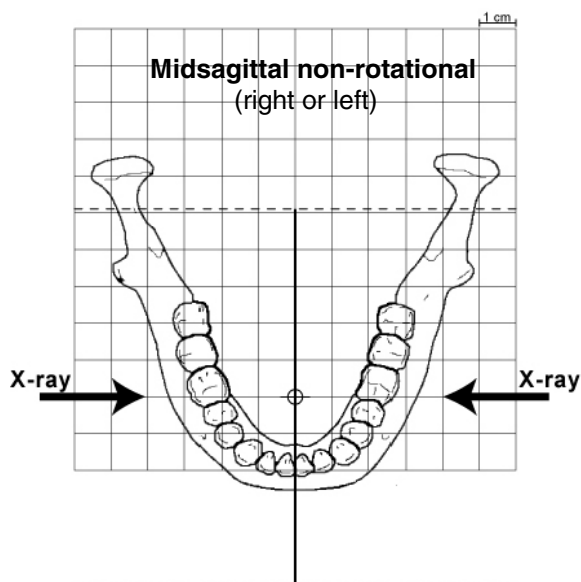


The **PA rotational** program produces a posterior-anterior rotational sinus exposure.

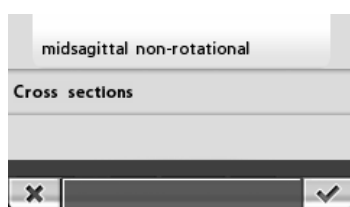




The **Lateral non-rotational** program produces lateral non-rotational exposures of the left or right sinus area.

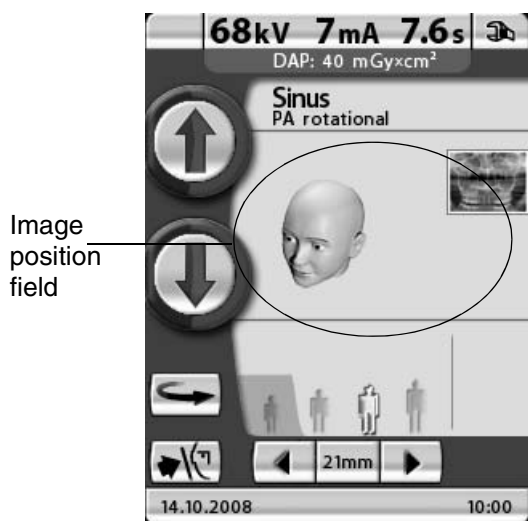


The **Midsagittal non-rotational** program produces lateral non-rotational sinus exposures in the middle of the jaw. The exposures can be taken from the left or right jaw side.



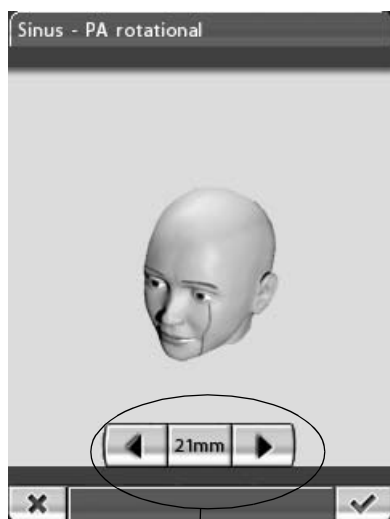
Accept the selection and return to the main display by touching the green check mark button in the bottom right corner of the display.

### 8.4.1 Selecting imaging position for sinus exposures



Touch the image position field in the middle of the display to select the imaging position for PA exposures, or to select the imaging side for lateral or midsagittal exposures.

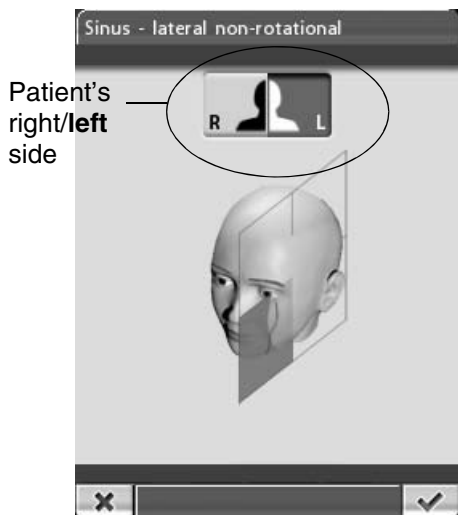
The X-ray image in the top right corner of the field shows where the exposed image will appear on the radiograph.



To select the **imaging position for PA exposures**, touch the target position arrows at the bottom of the display. The arrow pointing to the left will move the target position forwards and the arrow pointing to the right will move the target position backwards. The marking on the patient's face demonstrates the imaging position.

**NOTE** The imaging position can also be adjusted by touching the target position arrows on the main sinus display for PA exposures.

Target position arrows

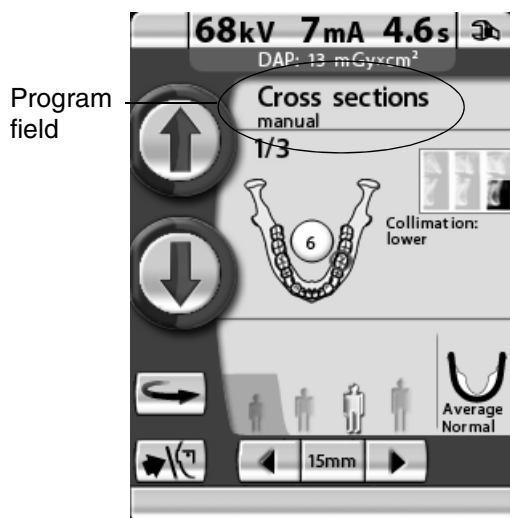


To select the **imaging side for lateral or midsagittal exposures**, touch the right or left side button at the top of the display. The button of the selected side will be highlighted. Note that the buttons refer to the patient's (not your) right and left side.

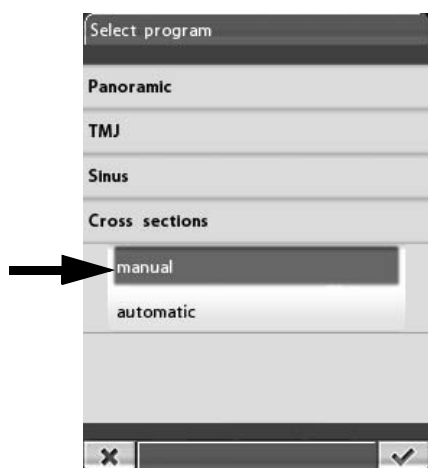
Accept the selection and return to the main display by touching the green check mark button in the bottom right corner of the display.

## 8.5 Selecting Cross sections exposure program (optional)

**NOTE** Cross sections programs are not included in the basic program package. Both cross sections programs are optional.



To select a cross sections exposure program touch the program field on the main display. The main display is the display that is shown when the X-ray unit is switched on.



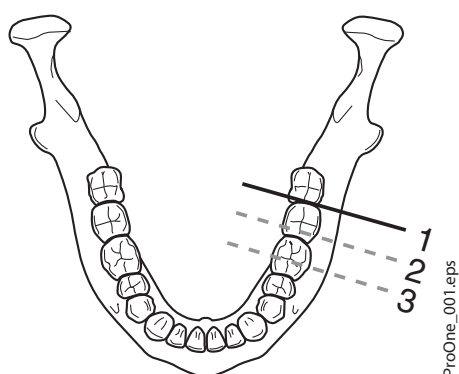
The *Select program* display appears. Select the required cross sections exposure program by touching the appropriate field on the display. The selected program will be highlighted.

**NOTE** The patient positioning lights will be automatically switched on when you select the exposure program.

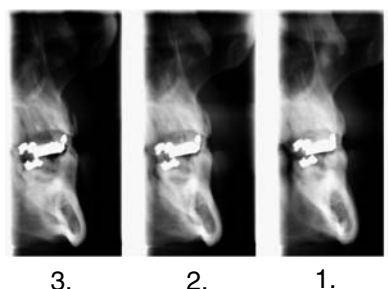
There are two cross sections exposure programs: Cross sections manual and Cross sections automatic.

**NOTE** When the child setting (smallest patient size) is selected, the image size and patient dose are automatically reduced.

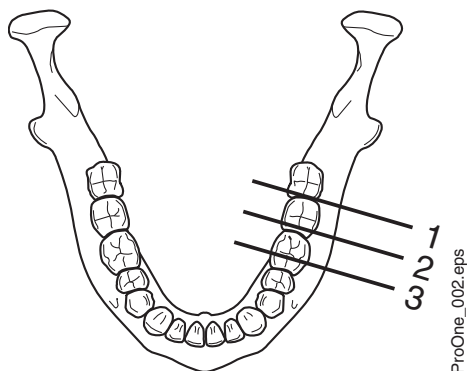
**Cross sections manual**



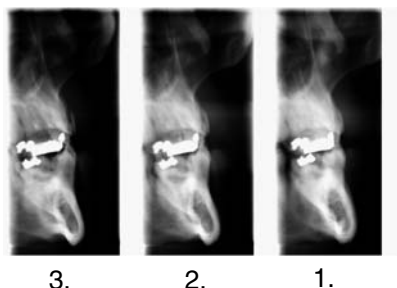
The **manual cross sections** program produces 1-3 cross sections images on the left or right side of the upper or lower jaw from premolar, molar or TMJ areas. The imaging position is set manually between exposures.



**Cross sections automatic**

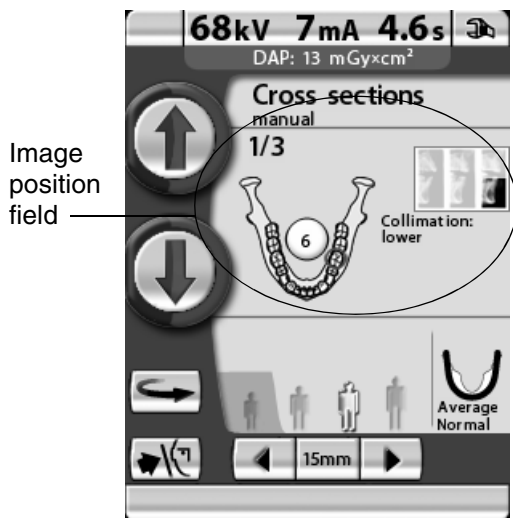


The **automatic cross sections** program produces three cross sections images on the left or right side of the upper or lower jaw from premolar, molar or TMJ areas. The imaging position will be automatically moved between exposures. The movement step (distance from middle to middle) is adjustable, and it can be 1-10 mm.



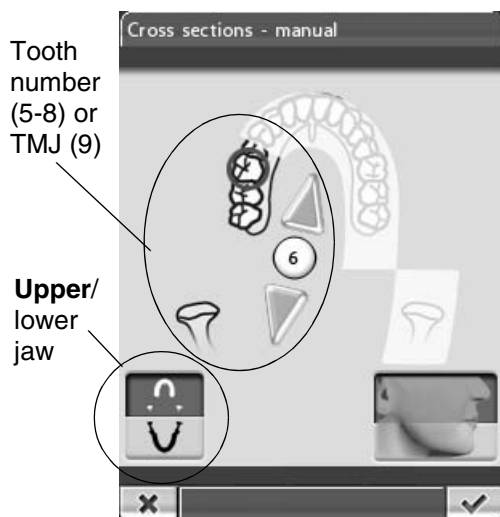
Accept the selection and return to the main display by touching the green check mark button in the bottom right corner of the display.

**8.5.1 Selecting imaging position for cross section exposures**



Touch the image position field in the middle of the display to select the imaging position.

The X-ray image in the top right corner of the field shows in which order the images will appear on the radiograph. The active exposure is shown in full colour. The number in the top left corner indicates the number of the active exposure.



On the display that appears you can select the imaging position.

Select the upper or lower jaw by touching the corresponding jaw half in the bottom left corner. The icon of the selected jaw half will be highlighted.

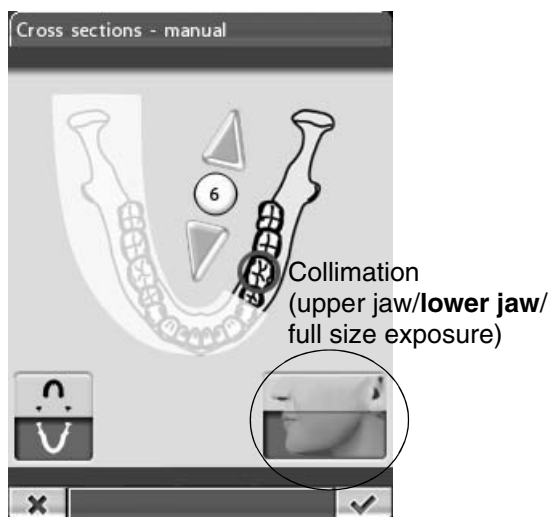
Select the left or right jaw side by touching the corresponding jaw side in the middle of the display. The selected jaw side will be shown in full colour.

Select the target position (tooth number 5-8 or temporomandibular joint 9) by either touching the corresponding position on the jaw icon or by tapping the small arrows next to the tooth number. The upwards pointing arrow moves the target position forwards on the dental arch and the downwards pointing arrow moves the target position backwards on the dental arch. The selected target position will be marked with a red circle.

Each preprogrammed target position has a fixed magnification:

Tooth No.*)	Magnification
5	1.48
6	1.51
7	1.56
8	1.61
TMJ (9)	1.89

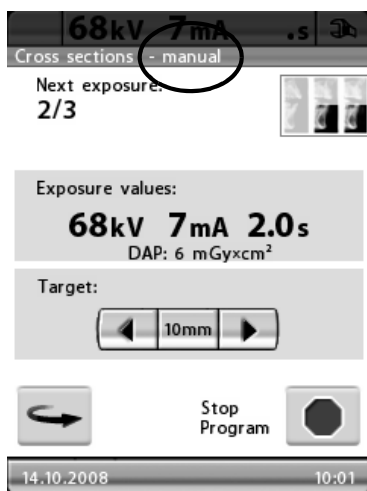
\*) Planmeca tooth numbering



Touch the collimation field in the bottom right corner of the display to select the exposure area. You can set the collimation field so that only one jaw half (upper/lower jaw) or both jaw halves (full size exposure) will be exposed. Turning collimation on will reduce the radiation dose as the exposed area is smaller.

The area that will be exposed is highlighted. Touch the collimation field again to turn collimation off.

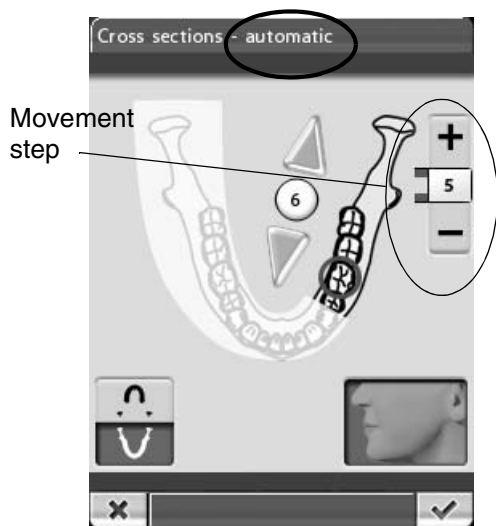
## CONTROL PANEL



In the **manual** exposure program you can decide how many exposures you wish to have in one image. The minimum is one and the maximum is three.

Between exposures a display is shown where you can change the exposure values (kV and mA) and move the target position.

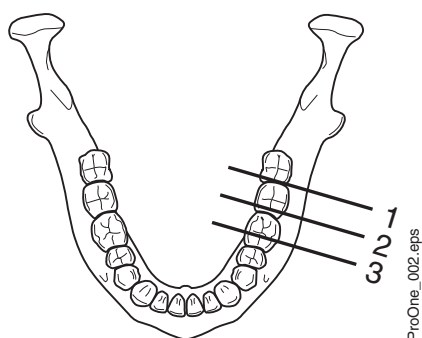
If you take only one or two exposures you will have to stop the exposure procedure by touching the stop button at the bottom of the display.



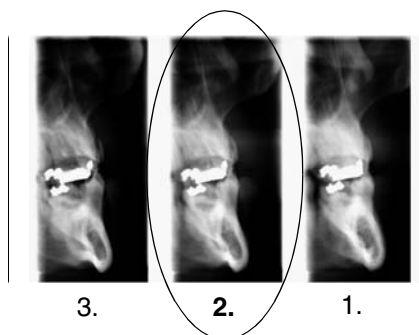
In the **automatic** program the target position will be automatically moved between exposures. The movement step is adjustable between 1-10 mm. Select the movement step by touching the plus or minus button next to the step value.

**NOTE** In the automatic program the selected target position is in cross-section no. 2.

### Cross-sections automatic



- First exposure = Cross-section no. 1
- Second exposure = Cross-section no. 2
- Third exposure = Cross-section no. 3



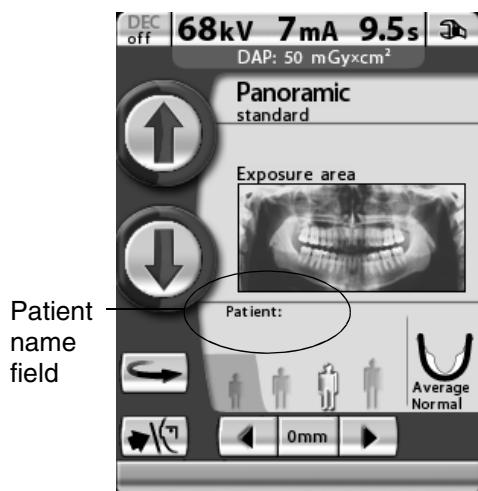
Position selected by the user

Accept the selections and return to the main display by touching the green check mark button in the bottom right corner of the display.



## 8.6 Entering patient name

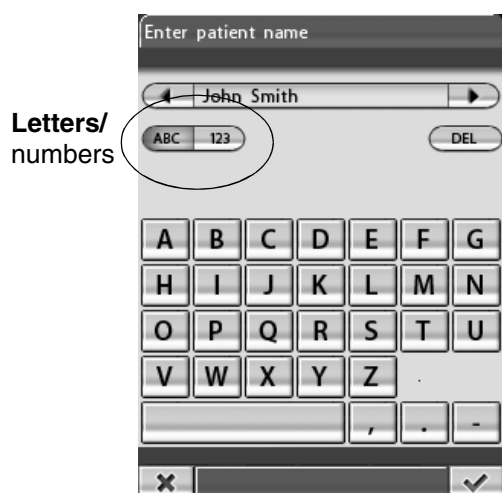
**NOTE** This function is available only if a USB memory stick is connected to the X-ray unit and the *Save images on USB memory stick* function is switched on. Refer to section “Imaging without PC (P2600)” on page 58 for more information.



Patient name field

To enter a patient name, touch the patient name field.

**NOTE** We recommend that you always enter the patient name before you take an exposure. This will ensure that images of different patients cannot be mixed up.

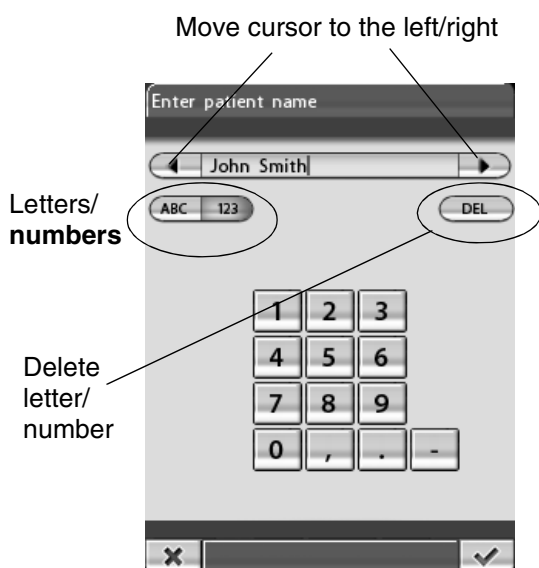


Letters/numbers

The *Enter patient name* display appears. The display will show letters or numbers depending on which side of the ABC/123 button is selected. The selected option will be shown highlighted.

When the display shows letters, touching the ABC button again will toggle between upper case and lower case letters.

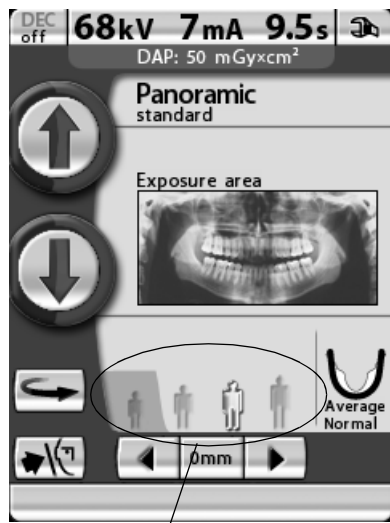
Enter the patient name/number by touching the letters/numbers on the display. The first letter of a word will always be capitalized.



To move the cursor to the left or right, touch the arrow button on the left or right side of the patient name/number.

To delete a letter or a number, touch the *DEL* button. Characters will be deleted one at a time and in reverse order of entry.

## 8.7 Selecting patient size



Patient size field:

- Child on darker background (shadow)
- Adult sizes on lighter background

Select the patient size by touching the corresponding size symbol in the patient size field on the main display. The selected patient size will be highlighted.

**NOTE** The exposure values will automatically change to correspond with the selected patient size.

Select the smallest patient size symbol for a child. Selecting the smallest patient size will automatically change the jaw size setting to “Small”.

**NOTE** When the smallest patient size (child setting) is selected, the image size and patient dose are automatically reduced.

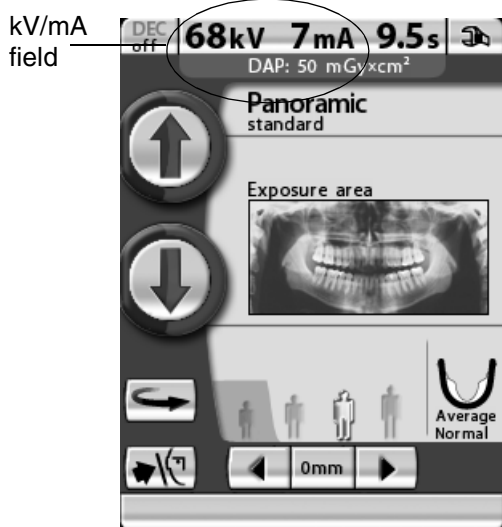
Select the second patient size symbol for a small adult. Select the third patient size symbol for an average-sized adult. Selecting either of the patient sizes in the middle will automatically change the jaw size setting to “Average”.

Select the biggest patient size symbol for a large adult. Selecting the biggest patient size symbol will automatically change the jaw size setting to “Large”.

**NOTE** Jaw size and shape selection is not possible in sinus programs.

**NOTE** Manual selections (exposure values or jaw size) will override any automatic settings.

## 8.8 Selecting kilovolt and milliampere values



**NOTE** The exposure values will automatically change to correspond with the selected patient size.

The exposure values have been preset at the factory to automatically correspond with the selected patient size. The preset exposure values are average values and they are only meant to guide the user.

To change the preset exposure values, touch the kV/mA field on the main display.



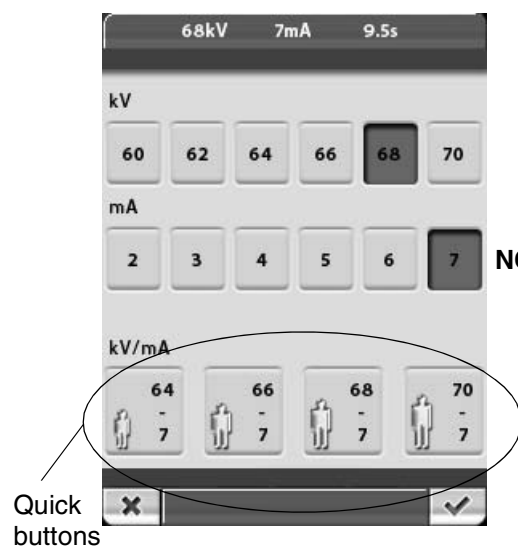
The exposure parameter display appears. Select the required exposure values by touching the appropriate kV and mA values. The selected values will be highlighted.

The preset exposure values for each patient size are shown in the quick buttons at the bottom of the display.

**NOTE** Selecting kV and mA values manually will override the automatic quick button setting.

Accept the selections and return to the main display by touching the green check mark button in the bottom right corner of the display.

### 8.8.1 Changing exposure values for quick buttons



The quick button exposure values have been preset at the factory. If needed, the preset values can be changed by the user.

To change the preset values, first select the required kV and mA values by touching the corresponding fields on the parameter display and then touch and hold the desired quick button until you hear a signal tone. The quick button will now show the new exposure values.

**NOTE** To view the preset exposure values, refer to the tables in sections 9 “PANORAMIC EXPOSURE” on page 61, 10 “TEMPOROMANDIBULAR JOINT EXPOSURE” on page 70, 11 “SINUS EXPOSURE” on page 82 and 12 “CROSS-SECTIONAL EXPOSURE (OPTIONAL)” on page 87.

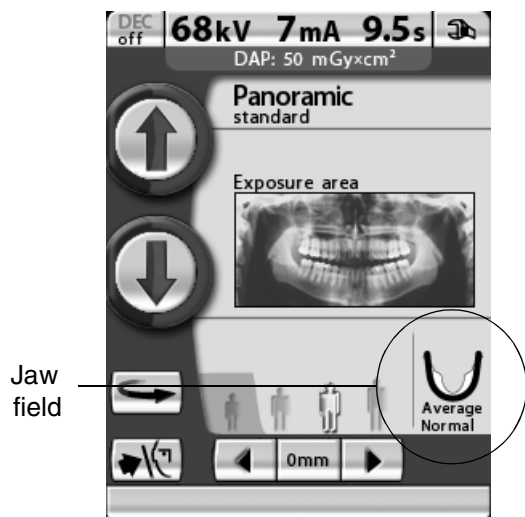
Accept the selections and return to the main display by touching the green check mark button in the bottom right corner of the display.

## 8.9 Selecting jaw size and shape

This function adjusts the form of the focal trough to accommodate patients with different jaw sizes and shapes.

**NOTE** The jaw size setting will automatically change to correspond with the selected patient size.

**NOTE** Jaw size and shape selection is not possible in sinus programs.

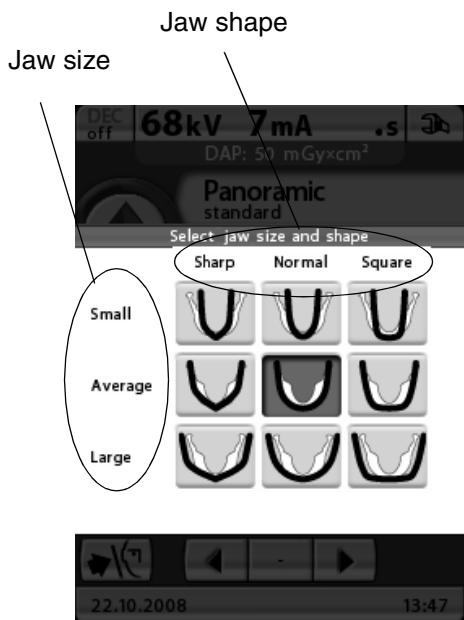


Changing the patient size will automatically change the setting for jaw size:

Selecting the smallest patient size will automatically change the jaw size setting to “Small”. Additionally, the image size and patient dose will be reduced.

Selecting either of the patient sizes in the middle will automatically change the jaw size setting to “Average”.

Selecting the largest patient size will automatically change the jaw size setting to “Large”.

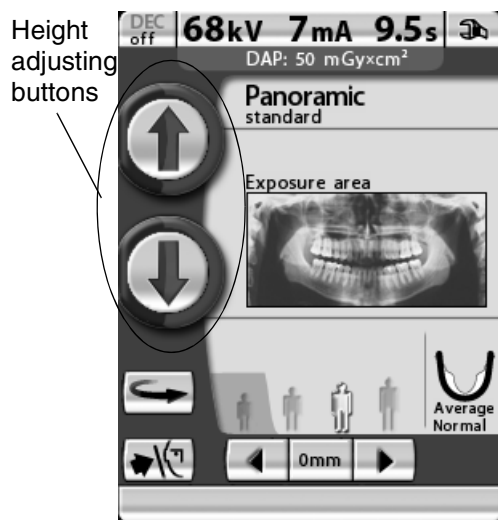


To select jaw shape, or to change the automatic jaw size setting, touch the jaw field on the main display. A display showing different jaw sizes and shapes appears. The marking on the jaw icon demonstrates the focal layer. Select the required jaw shape (or size) by tapping the corresponding icon on the display. The selected jaw icon will be highlighted.

**NOTE** Selecting jaw size manually will override the automatic setting.

**NOTE** Jaw shape selection (sharp, normal or square) is possible in panoramic programs only.

## 8.10 Adjusting unit height

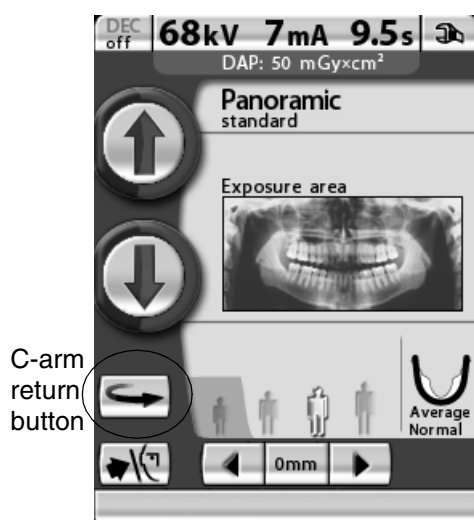


Touch and hold either of the height adjusting buttons to move the C-arm up or down so that the X-ray unit can be adjusted to suit the height of the patient. The movement will stop when you release the button.

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

**NOTE** When positioning seated patients (e.g. in a wheelchair) always first move the C-arm down until the patient support is approximately level with the patient's mouth before you position the patient in the X-ray unit.

## 8.11 Returning C-arm to patient entry position

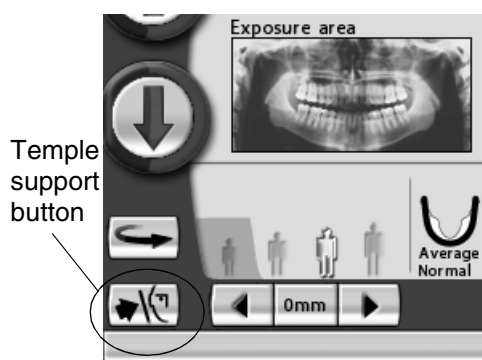


Touch the C-arm return button to move the C-arm to the patient entry position. Alternatively, you can touch either of the target position arrows to move the C-arm to the patient entry position.

**NOTE** The C-arm will automatically move to the patient entry position when you select an exposure program.

**NOTE** You can set the X-ray unit so that the C-arm will automatically return to the patient entry position at the end of an exposure cycle. Refer to section "Functions after exposure (P2300)" on page 48 for more information.

## 8.12 Opening/closing temple supports

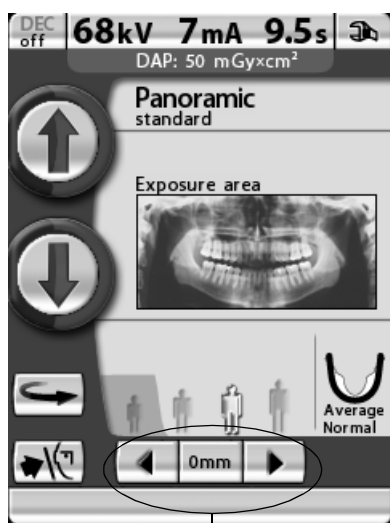


Touch the temple support button to open or close the temple supports.

The arrow shown on the temple support button points to the right when the temple supports are open. The arrow points to the left when the temple supports are closed.

**NOTE** The temple supports will automatically open when you select an exposure program. They will also open at the end of an exposure cycle.

### 8.13 Adjusting layer light position



Target position field

Touch and hold either of the arrows in the target position field to adjust the position of the layer light. The arrow pointing to the left moves the C-arm forwards and the arrow pointing to the right moves the C-arm backwards. The C-arm movement will stop when you release the button.

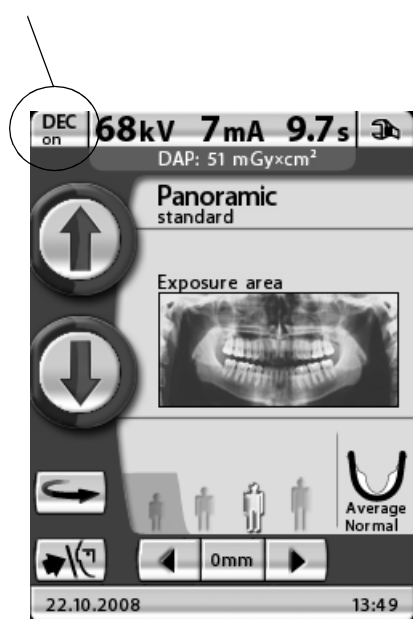
The number in the target position field indicates the position of the layer light and serves as a reference for later retakes.

**NOTE** Touching either of the target position arrows will move the C-arm to the patient entry position, if it is not already there.

**NOTE** Touching either of the target position arrows will switch on the patient positioning lights, if they are not already on.

### 8.14 Switching DEC on/off (optional)

DEC button



**NOTE** Dynamic Exposure Control (DEC) is an optional feature. Refer to section “Program licences (P2100)” on page 44 for more information.

**NOTE** Dynamic Exposure Control (DEC) is available for Standard, Interproximal and Orthogonal panoramic programs. However, DEC cannot be used if only the lower horizontal jaw segment is imaged (partial exposure).

Touch the DEC button to switch Dynamic Exposure Control (DEC) on or off for the exposure you are going to take.

Dynamic Exposure Control (DEC) automatically provides optimal exposure values for each patient during exposure. This 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.

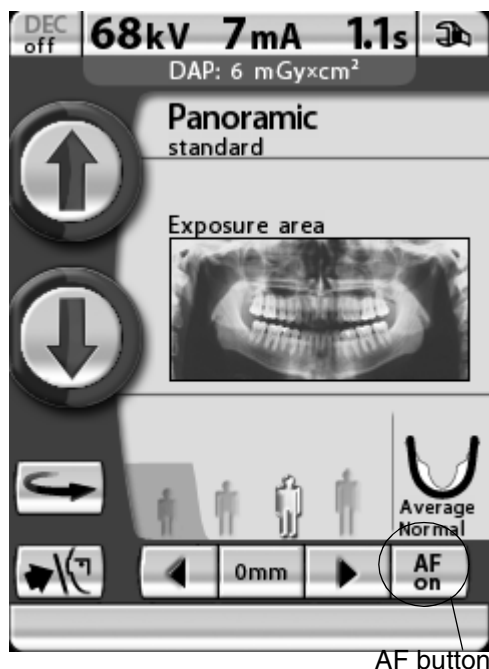
When DEC is switched on the kV value will be adjusted by max ±4 kV. However, if the starting value is e.g. 68 kV the value will be increased by only 2 kV (available kV scale: 60-70). The mA value will be adjusted by max +4/-3 mA. However, if the starting value is e.g. 7 mA the value will not be further increased (available mA scale: 2-7).

**NOTE** DEC target value can be adjusted if the images appear to be too bright or too dark. Refer to section “Program presets (P2200)” on page 46 for more information.

## 8.15 Switching Autofocus on/off

**NOTE** Autofocus is available for standard, interproximal and orthogonal panoramic programs.

**NOTE** Autofocus must be activated by the service personnel.



Touch the AF button to switch Autofocus (AF) on or off for the exposure you are going to take.

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.

Refer to section 9.4 “Taking an exposure with Autofocus” on page 67 for information on how to take an exposure with Autofocus (AF ON).

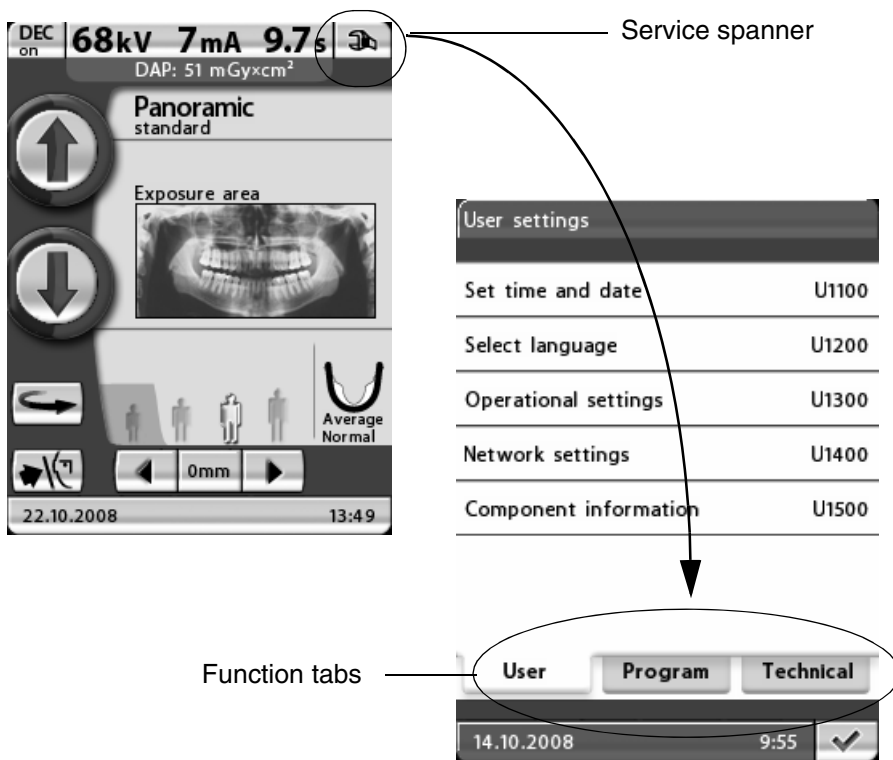
## 8.16 Settings

**CAUTION** *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.*

The Planmeca ProOne X-ray unit has a number of additional functions for special requirements. The additional functions can be entered by touching the service spanner icon on the main display.

The functions are divided into three groups: User settings (*User* tab), Program settings (*Program* tab) and Technical settings (*Technical* tab). The *User* and *Program* tabs can be entered without a password.

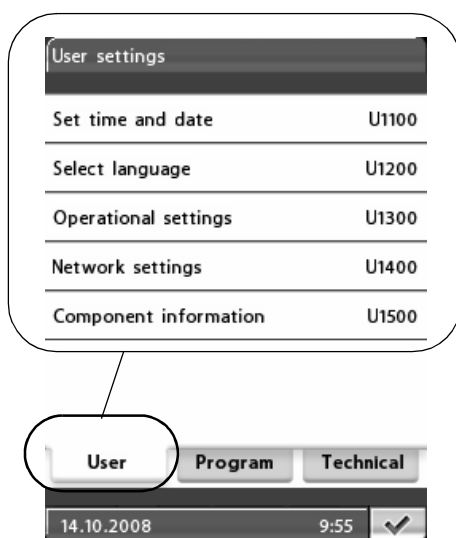
The information and functions behind the *Technical* tab are intended for service personnel only and access to these settings requires a password.



To return to the main display, touch the green check mark button in the bottom right corner of the display.



### 8.16.1 User settings



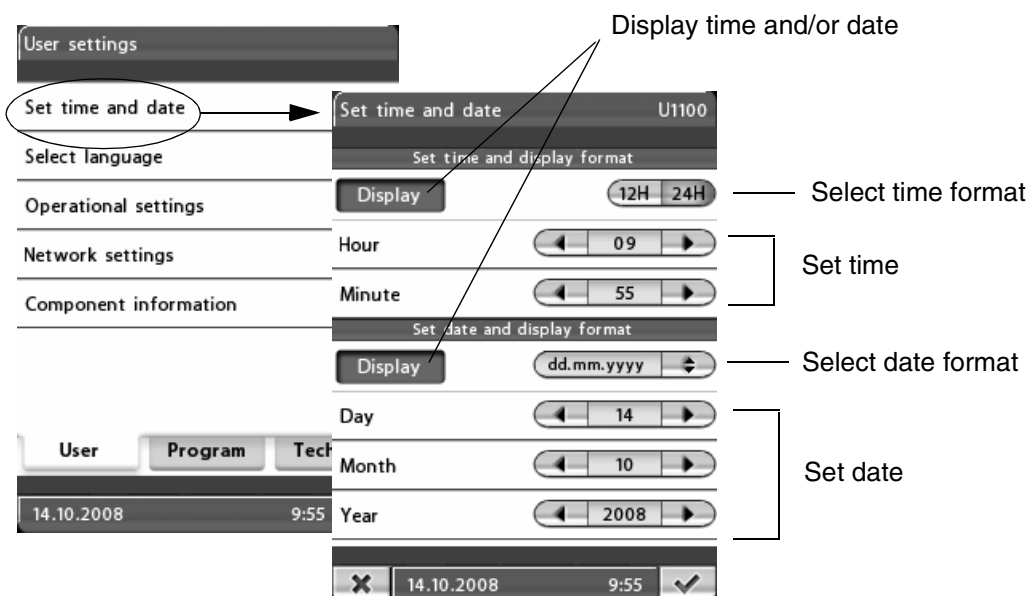
On the *User settings* display you can set time & date, select the language for the control panel displays and adjust or view operational and network settings. The component information needed for service and maintenance purposes is also available here.

The available options are described in detail on the following pages.

Exit the *User settings* display by touching the green check mark button in the bottom right corner of the display.

#### Setting time and date (U1100)

To set the X-ray unit so that the current time and/or date will be shown at the bottom of the control panel display, first select the **Set time and date (U1100)** option on the *User settings* display. The *Set time and date (U1100)* display will appear.



- **Set time and display format**

First touch the *Display* button to set the X-ray unit so that the current time will be shown at the bottom of the control panel display. The *Display* button will be highlighted.

You can choose between 12 and 24 hour system for the time display. Touch the *12H* or *24H* button to select the format you wish to use. The selected format will be highlighted.

Then set the time by touching the arrow buttons in the *Hour* and *Minute* fields.

- **Set date and display format**

First touch the *Display* button to set the X-ray unit so that the current date will be shown at the bottom of the control panel display. The *Display* button will be highlighted.

The date can be displayed in following formats: dd.mm.yyyy, mm.dd.yyyy or yyyy.mm.dd. When you touch the date format button a display will appear where you can select the format you wish to use.

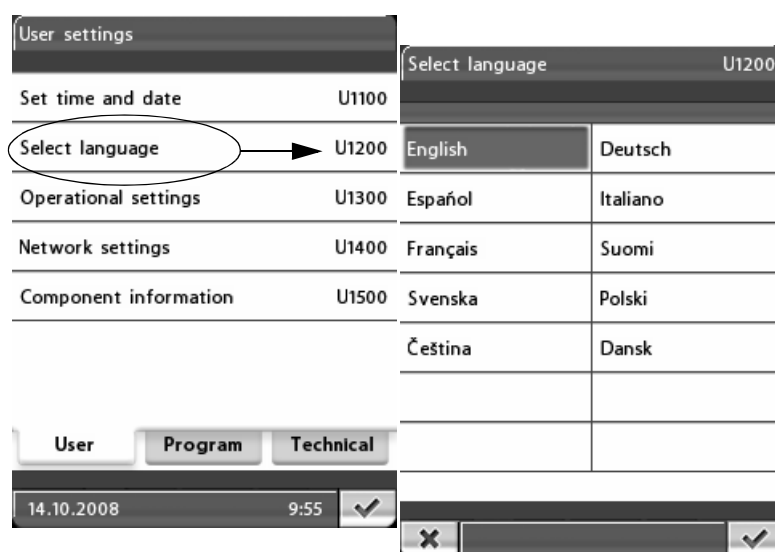
Then set the date by touching the arrow buttons in the *Day*, *Month* and *Year* fields.

Accept the new date and time by touching the green check mark button in the bottom right corner of the display. To exit the display without saving the changes, touch the red cross button in the bottom left corner of the display.

## Select language (U1200)

To change the language of the control panel displays, first select the option **Select language (U1200)** on the *User settings* display. The *Select language (U1200)* display will appear.

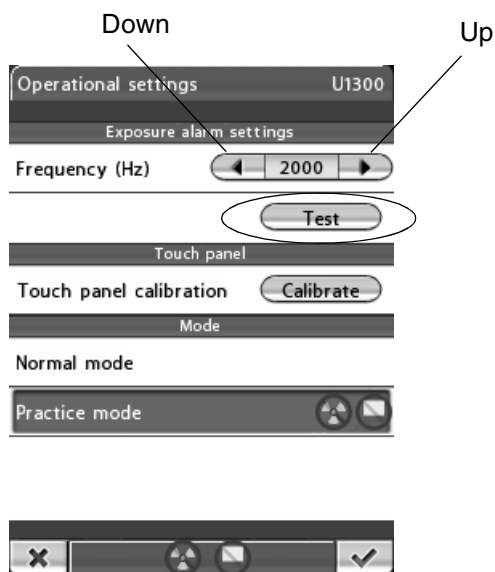
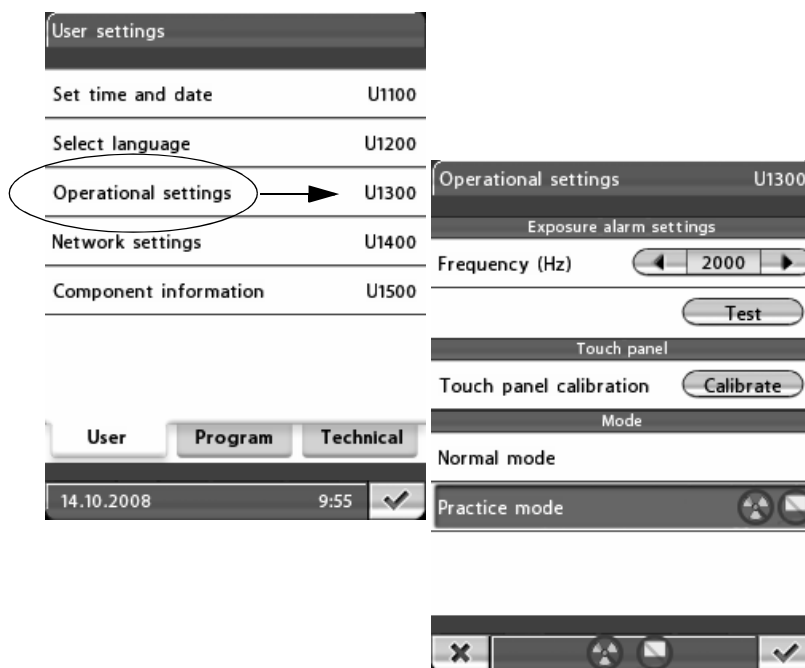
Select the language of your choice. The selected language will be shown highlighted.



Accept your selection by touching the green check mark button in the bottom right corner of the display. To exit the display without saving the changes, touch the red cross button in the bottom left corner of the display.

### Operational settings (U1300)

To adjust the exposure warning signal, to calibrate the touch panel or to enter the practice mode, first select **Operational settings (U1300)** on the *User settings* display. The *Operational settings (U1300)* display will appear.



- **Exposure alarm settings**

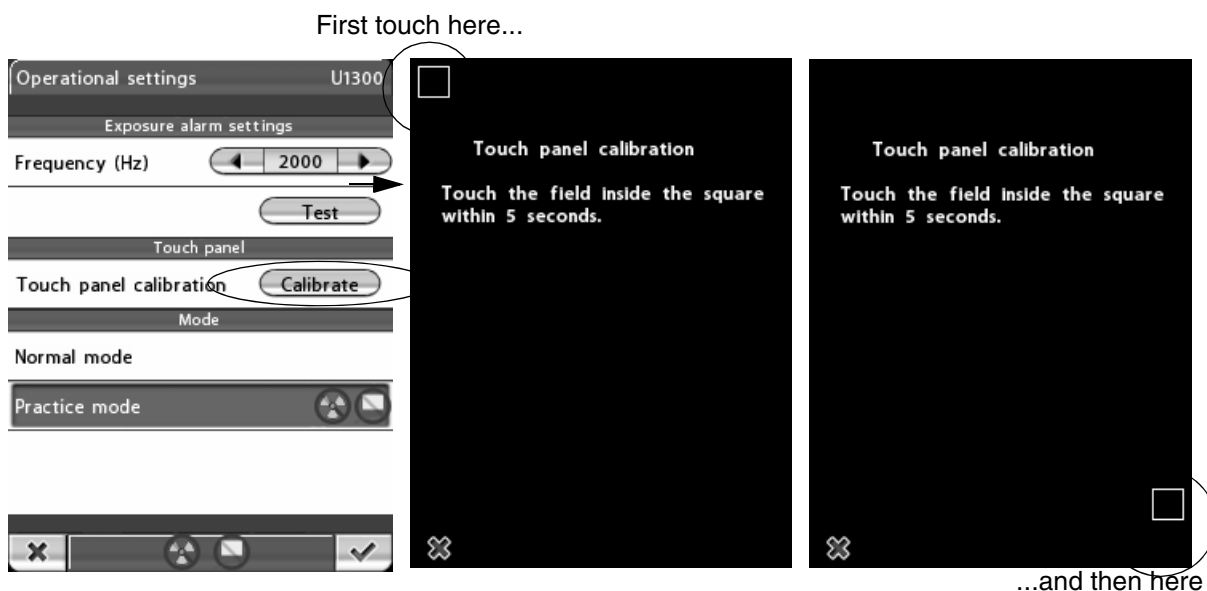
You can adjust the *Frequency* of the exposure warning signal as follows: touch and hold the *Test* button on the display, and you will hear the current warning signal. Adjust the frequency by touching the arrow buttons and then test the frequency again. Repeat the procedure until the frequency is appropriate. The minimum value is 500 Hz and maximum 2000 Hz.

- **Touch panel**

Touch the *Calibrate* button to calibrate the touch panel. Touch panel calibration adjusts the panel to respond to the pressure level of your finger touch.

A black calibration display with a white square in the top left corner will appear. Touch the square to “teach” the panel the pressure of your individual finger touch and to make it react rapidly to this pressure level. Another black calibration display with a white square in the bottom right corner will appear. Again touch the square. Note that you have to touch the square within five seconds as the calibration procedure will be cancelled once this time limit has expired.

To cancel the calibration procedure, touch the red cross button in the bottom left corner of the display.



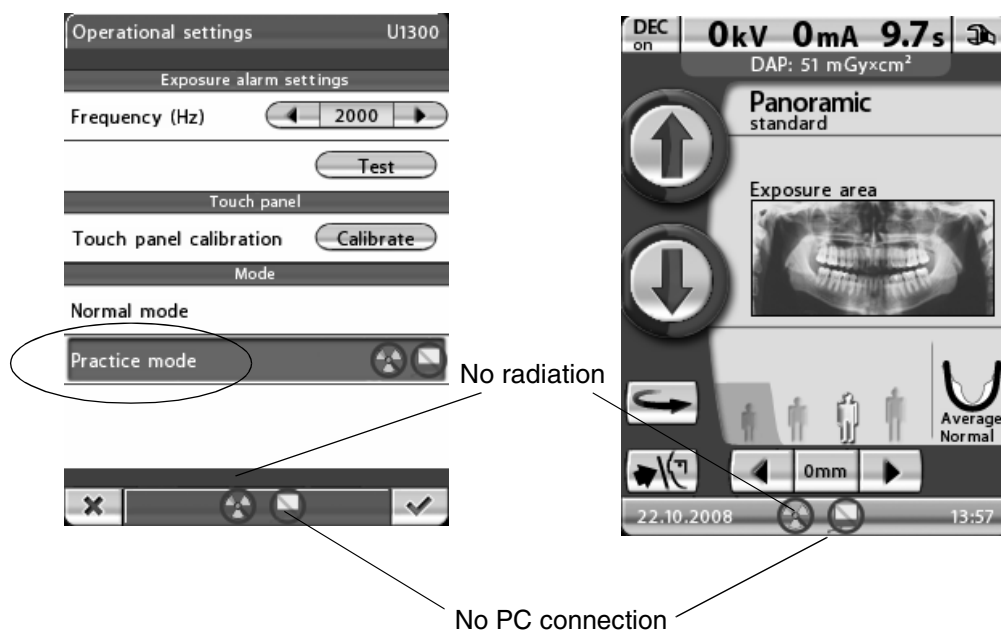
• **Mode**

**Normal mode:** Touch the *Normal mode* field to switch normal operating mode on. When normal mode is in use the *Normal mode* field is shown highlighted.

**Practice mode:** Practice mode enables you to practice/demonstrate program functions available on your X-ray unit. In practice mode no radiation is generated when you press the exposure button and there is no connection to a computer. The C-arm will move normally but no radiation will be generated and no radiation warning signals will be given, i.e. this is a “dummy run” function for training and demonstration purposes. For example, you might want to demonstrate the C-arm movements before taking exposures of children or nervous patients.

Touch the *Practice mode* field to switch practice mode on. When practice mode is in use the *Practice mode* field is shown highlighted and symbols indicating that radiation and PC connection are disabled will appear in the status bar on all displays.

To switch practice mode off, touch the *Normal mode* field.

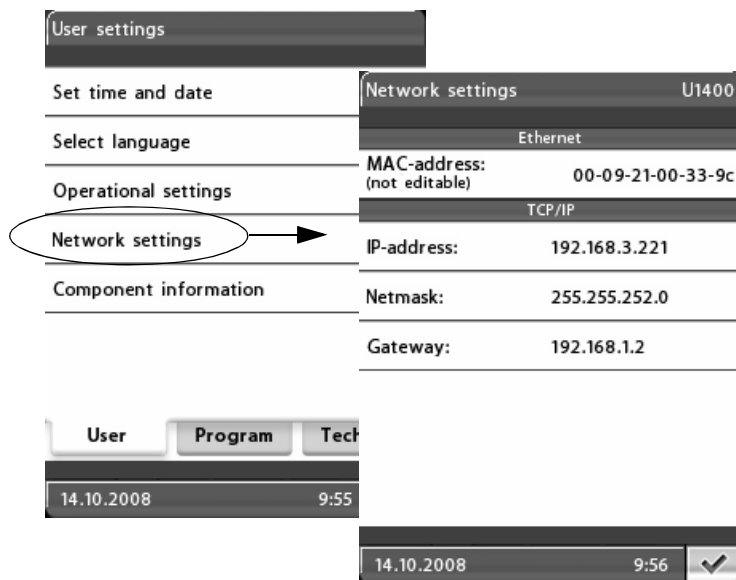


Accept your selection by touching the green check mark button in the bottom right corner of the display. To exit the display without saving the changes, touch the red cross button in the bottom left corner of the display.

## Network settings (U1400)

**NOTE** Only a service technician/local administrator may change the network settings.

To view the settings for Ethernet or TCP/IP connection, first select the option **Network settings (U1400)** on the *User settings* display. The *Network settings (U1400)* display will appear.



The Planmeca ProOne X-ray unit communicates through an Ethernet link. To enable the communication it is necessary to configure the link settings for the X-ray unit and the PC which is connected to the X-ray unit. This is done by a service technician/local administrator when the digital system is installed.

- **Ethernet**

**MAC address:** MAC (Media Access Control) address is unit specific and it cannot be changed.

- **TCP/IP**

**IP address:** This field shows the Ethernet interface IP (Internet Protocol) address. The IP address is a unique number assigned to a specific X-ray unit and the address may be changed by a service technician/local administrator only.

**Netmask:** This field shows the subnet mask. The value may be changed by a service technician/local administrator only.

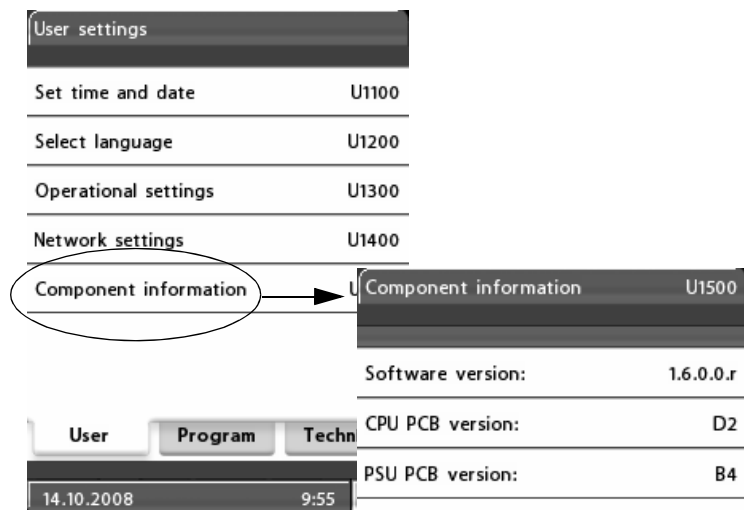
**Gateway:** This field shows the gateway IP (Internet Protocol) address. The value may be changed by a service technician/local administrator only.

Exit the *Network settings (U1400)* display by touching the green check mark button in the bottom right corner of the display.

## Component information (U1500)

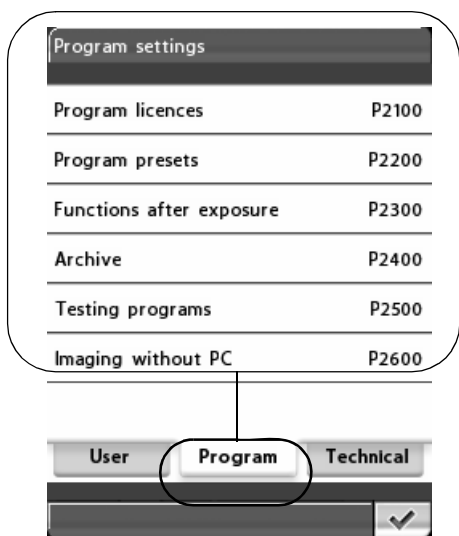
To view information about specified components of the X-ray unit, first select the option **Component information (U1500)** on the *User settings* display. The *Component information (U1500)* display will appear.

The *Component information (U1500)* display shows the current software version of the X-ray unit and specifies which PCB (printed circuit board) versions have been installed. The information is needed for service and maintenance purposes.



Exit the display by touching the green check mark button in the bottom right corner of the display.

### 8.16.2 Program settings



**NOTE**

On the *Program settings* display you can activate new program features and adjust default settings for exposure programs. Here you can also specify how the X-ray unit will function after an exposure has been taken.

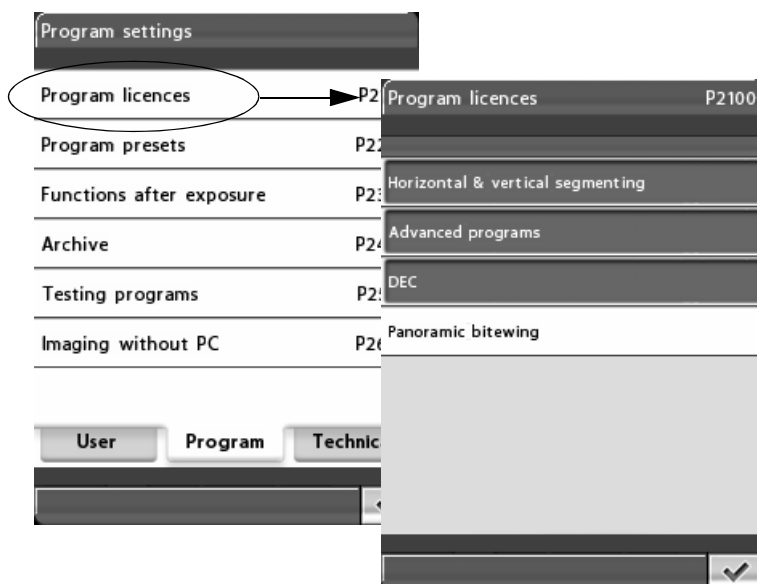
**The option *Imaging without PC* will be shown on the display only if a USB memory stick is connected to the X-ray unit.**

The available options are described in detail on the following pages.

Exit the *Program settings* display by touching the green check mark button in the bottom right corner of the display.

#### Program licences (P2100)

To activate program features, first select the option **Program licences (P2100)** on the *Program settings* display. The *Program licences (P2100)* display will appear.



Touch the program feature you wish to activate:

- **Horizontal & vertical segmenting**

The segmenting function makes it possible to take panoramic exposures of different jaw segments. Segmenting reduces the radiation dose as only diagnostically interesting areas need to be x-rayed.



- **Advanced programs**

The advanced program package contains following exposure programs:

- Interproximal, orthogonal and bitewing panoramic programs
- Double lateral-PA and 3 angles lateral TMJ programs
- Lateral and midsagittal non-rotational sinus programs
- Manual and automatic cross sections programs

- **DEC**

Dynamic Exposure Control (DEC) adjusts the exposure values individually for each patient during exposure. Once activated, the DEC function can be switched on/off independently for each exposure.

Note that DEC target value can be adjusted, see section "Program presets (P2200)" on page 46 for details.

**NOTE DEC must be calibrated by a qualified service technician before the function can be used. Contact your service technician for help.**

- **Panoramic bitewing**

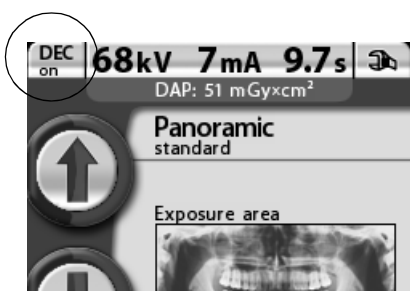


A licence code will be requested next. Enter the licence code (6 digits) for the selected program feature.

Save the licence code by touching the green check mark button, or exit the number display by touching the red cross button.

**NOTE Each licence code is unit and feature specific, i.e. it can only be used on the specified X-ray unit and for the specified program feature.**

DEC button



The program features that have been enabled and are in use are shown highlighted on the *Program licences (P2100)* display.

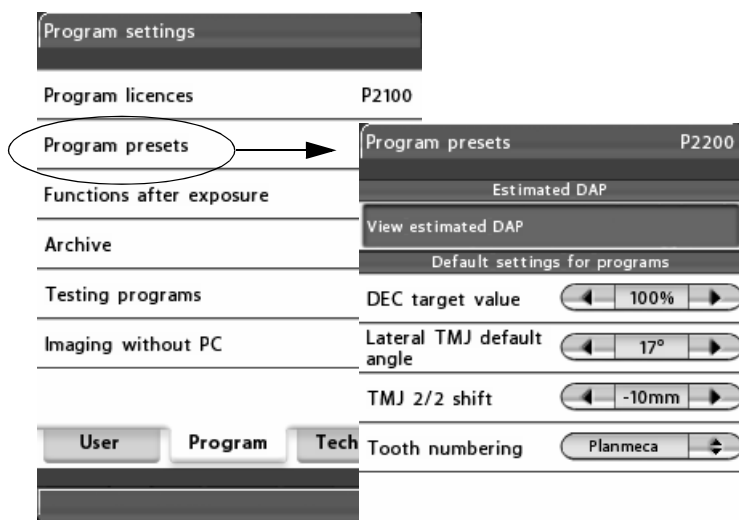
Additionally, when the program licence for DEC has been activated a *DEC on/off* button will appear in the top left corner of the main display.

Exit the *Program licences (P2100)* display by touching the green check mark button in the bottom right corner of the display.

**NOTE** If required, program features can be deactivated by selecting a highlighted feature on the *Program licences (P2100)* display and entering its licence code as described above.

### Program presets (P2200)

To adjust program default settings, first select the option **Program presets (P2200)** on the *Program settings* display. The *Program presets (P2200)* display will appear.



- **Estimated DAP**

Touch the *View estimated DAP* field to set the X-ray unit so that the estimated Dose Area Product (DAP) value will be shown on the main display. The DAP value indicates the highest radiation dose the patient will be exposed to during the exposure.

The *View estimated DAP* field is highlighted when the function is switched on. To switch off the function, touch the *View estimated DAP* field again.

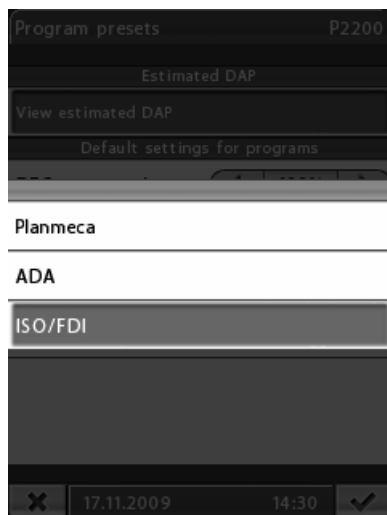
- **Default settings for programs**

**DEC target value:** Touch the arrow buttons in the *DEC target value* field to adjust the setting for DEC (Dynamic Exposure Control) target value. DEC target value is expressed in percentage in comparison to DEC calibration value. The setting can be adjusted between 50% (lower exposure values -> brighter image) and 200% (higher exposure values -> darker image). The recommended setting is 100% (default value).

**NOTE** DEC target value will be shown on the *Program presets (P2200)* display only if DEC has been activated on the *Program licences (P2100)* display.

**Lateral TMJ default angle:** Touch the arrow buttons in the *Lateral TMJ default angle* field to adjust the setting for the lateral TMJ default angle. The factory default imaging angle for lateral exposures is 17 degrees. If necessary, adjust the imaging angle as described in section 8.3.1 “Selecting imaging position for temporomandibular joint (TMJ) exposures” on page 20.

**TMJ 2/2 shift:** Touch the arrow buttons in the *TMJ 2/2 shift* field to adjust the setting for the TMJ 2/2 shift. This setting defines the automatic position shift between the first (jaw closed) and the second (jaw open) exposure. The setting can be adjusted between -15 mm and 0 mm. This setting affects the Double lateral and Double PA TMJ imaging. The factory default value is -10 mm.



**Tooth numbering:** Touch the arrow buttons to select the tooth numbering system you want to use in the Cross sections program. The options are:

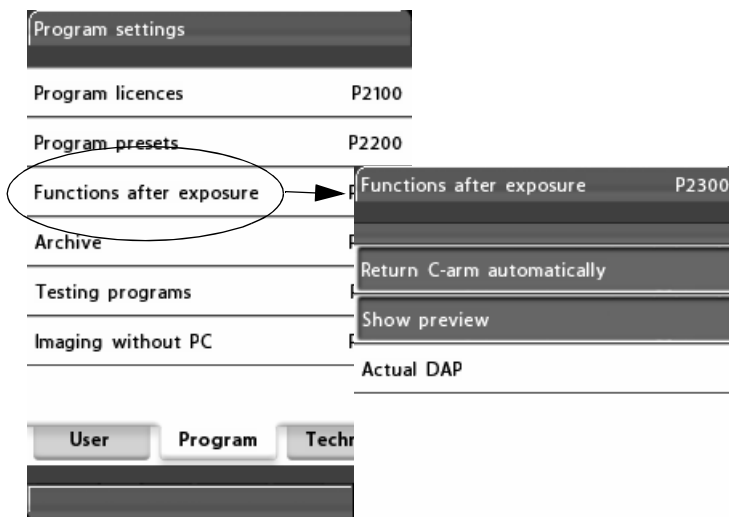
- Planmeca 0-8, TMJ (left/right),
- ADA: TMJ-Right, 1-8, 32-25, 0, 9-16, 17-24, TMJ-Left,
- FDI/ISO: TMJ-Right, 18-11, 48-41, 0, 21-28, 31-38, TMJ-Left.

**NOTE** Tooth numbering will be shown on the *Program presets (P2200)* display only if “Cross sections” have been activated on the *Advanced programs (P2100)* display.

Accept your selection by touching the green check mark button in the bottom right corner of the display. To exit the display without saving the changes, touch the red cross button in the bottom left corner of the display.

## Functions after exposure (P2300)

On the *Program settings* display, select option **Functions after exposure (P2300)**. The *Functions after exposure (P2300)* display will appear. Here you can specify how the X-ray unit will function after an exposure has been taken.



- **Return C-arm automatically**

Touch the *Return C-arm automatically* field to set the X-ray unit so that the C-arm will automatically return to the patient entry 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.

The *Return C-arm automatically* field is highlighted when the function is switched on. To switch off the function, touch the field again.

- **Show preview**

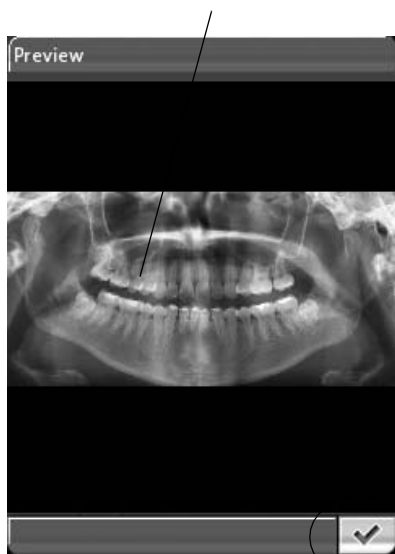
Touch the *Show preview* field to set the X-ray unit so that a preview of the image is shown on the control panel after exposure. This option allows you to evaluate the image immediately after you have taken it.

The *Show preview* field is highlighted when the function is switched on. To switch off the function, touch the field again.

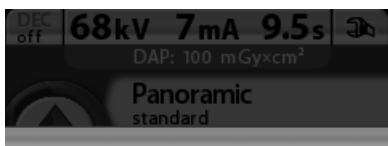
The preview image can be zoomed in and out to resize it, or dragged to move the image on the display. Touching the image will zoom in and show you the image in more detail at the point that was touched. Touching the image again will zoom out and bring you back to the original size. Dragging the zoomed image with your finger will move the image in the desired direction on the display.

Touch the green check mark button in the bottom right corner of the *Preview* display to return to the main display.

Touch = Zoom in  
 Touch again = Zoom out  
 Drag = Move zoomed image along display



Back to main display



DAP: 50 mGy\*cm<sup>2</sup>

Back to main display



• **Actual DAP**

Touch the *Actual DAP* field to view the actual Dose Area Product value after each exposure. The actual DAP value indicates the actual radiation dose the patient has been exposed to during the exposure.

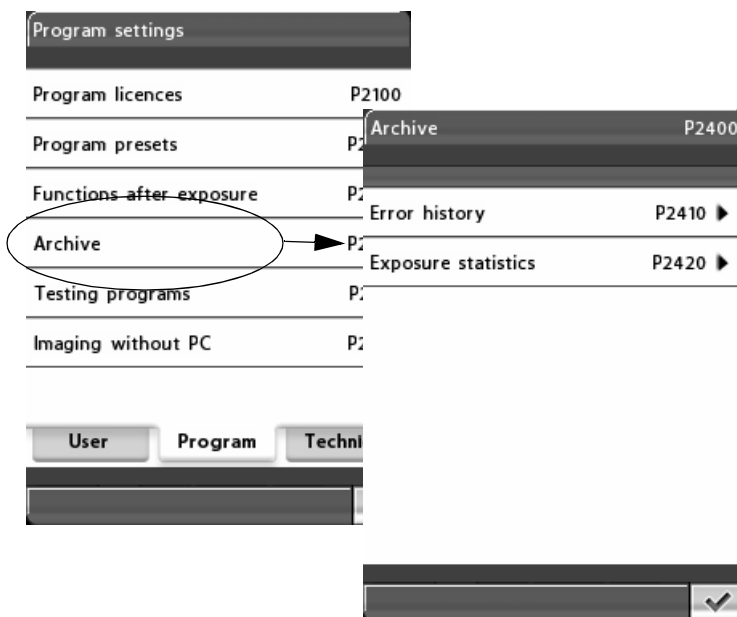
The *Actual DAP* field is highlighted when the function is switched on. To switch off the function, touch the *Actual DAP* field again.

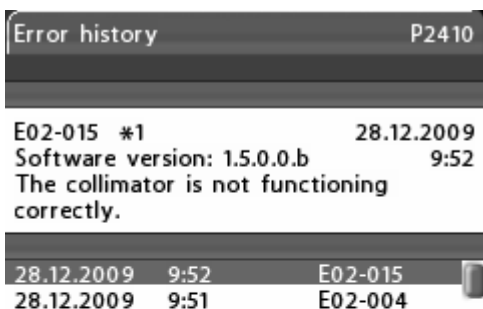
The value will be shown as in the figure beside. To return back to the main display, touch the green check mark in the bottom right corner of the display.

On the *Functions after exposure (P2300)* display, accept your selection by touching the green check mark button in the bottom right corner of the display. To exit the display without saving the changes, touch the red cross button in the bottom left corner of the display.

**Archive (P2400)**

On the *Program settings* display, select the option **Archive (P2400)**. The *Archive (P2400)* display will appear. Here you can view the error history and exposure statistics.





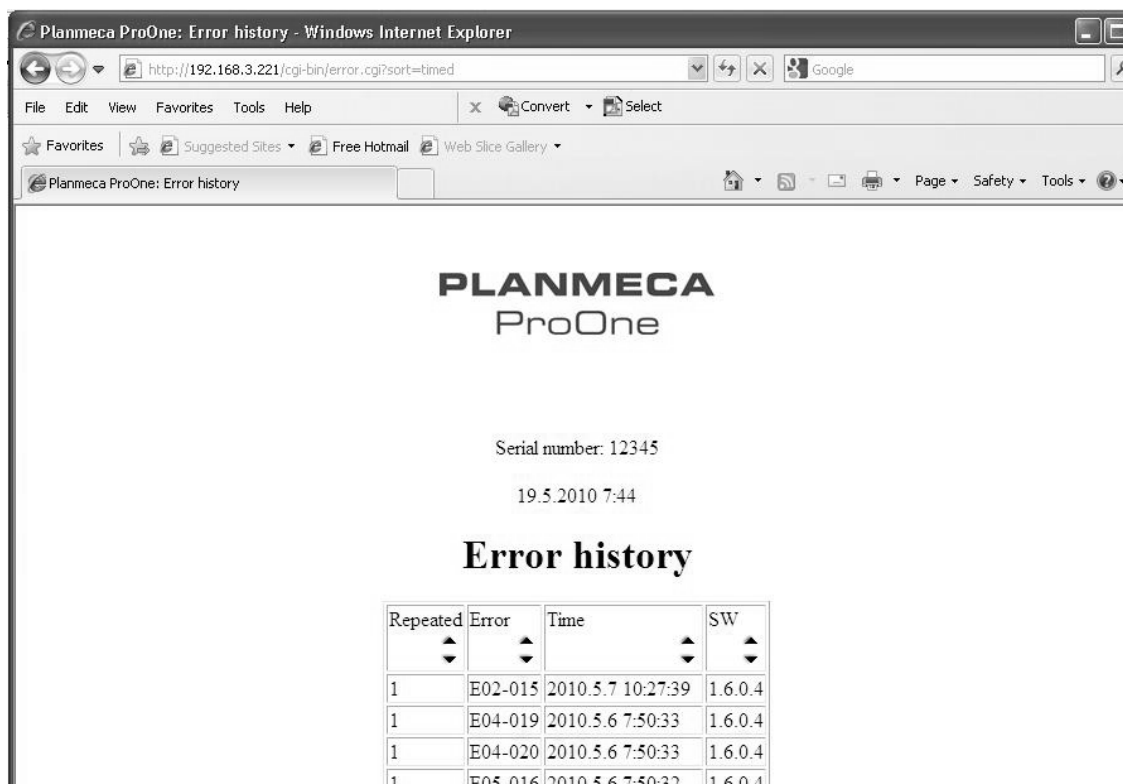
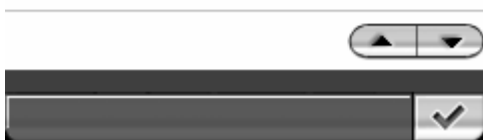
• **Error history**

Touch the *Error history* field to view the error history. All error situations occurred in this X-ray unit are listed here, including the error code, description of the error, as well as the date and time of its occurrence. If the same error has occurred several times in a row, the list indicates how many times the respective error has occurred.

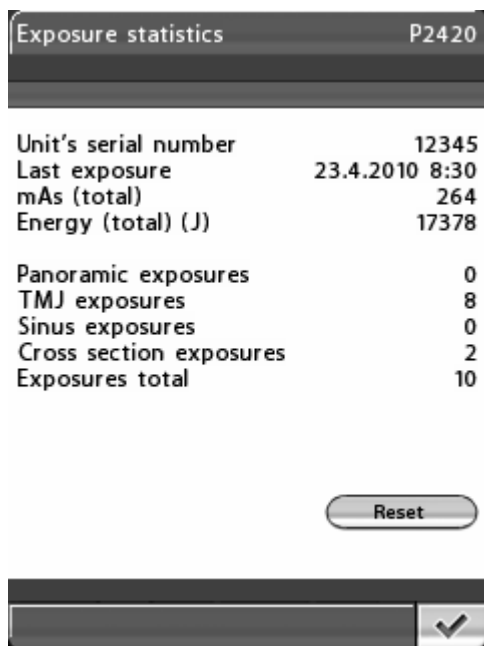
**ProOne Error history web page**

The error history can also be viewed with a web browser (e.g. Internet Explorer) of the computer connected to your ProOne X-ray unit.

Open the web browser and enter the IP address of your ProOne X-ray unit into the address bar. You can find the IP address on the ProOne control panel display *Network settings (1400)* (Spanner icon>User tab>Network settings>IP address). On the ProOne main page select *Error history*. The following screen opens.



The error history page contains a table listing the error codes reported by the X-ray unit, the frequency, date and time of their occurrence, and the software version with which the error occurred. The table can be arranged by the desired parameter either into ascending or descending order by clicking the arrow buttons.



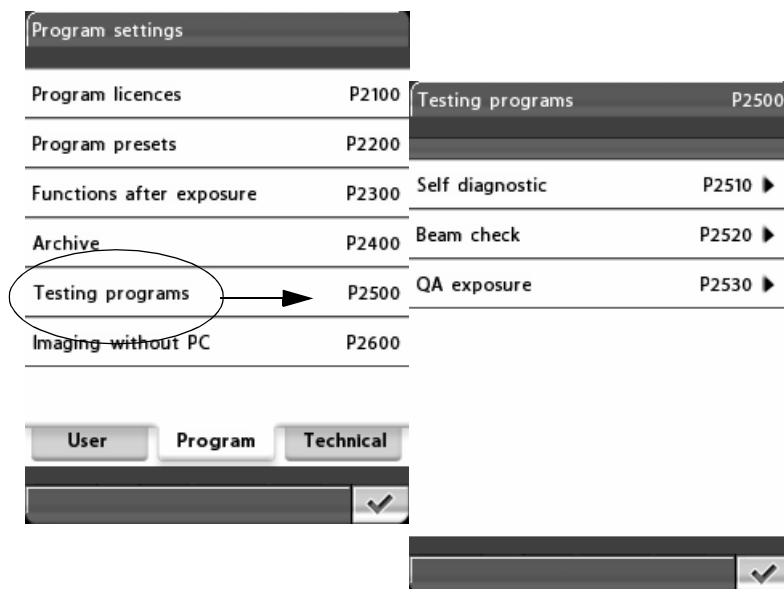
• **Exposure statistics**

Touch the *Exposure statistics* field to view the following information: Unit's serial number / Last exposure (date and time) / mAs (total) / Energy (total) (J); number of panoramic exposures / TMJ exposures / Sinus exposures / Cross section exposures / Exposures total.

You can reset the exposure data by touching the *Reset* field in the bottom right corner of the *Exposure statistics* menu.

**Testing programs (P2500)**

To perform self diagnostics, a beam check or to take a QA exposure, first select the option **Testing programs (P2500)** on the *Program settings* display. The *Testing programs (P2500)* display will appear.

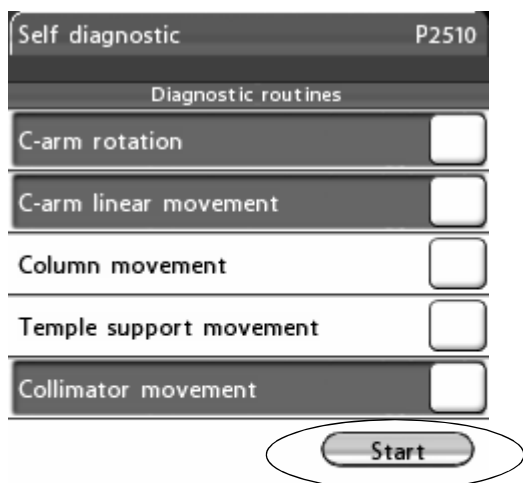


• **Self diagnostics (P2510)**

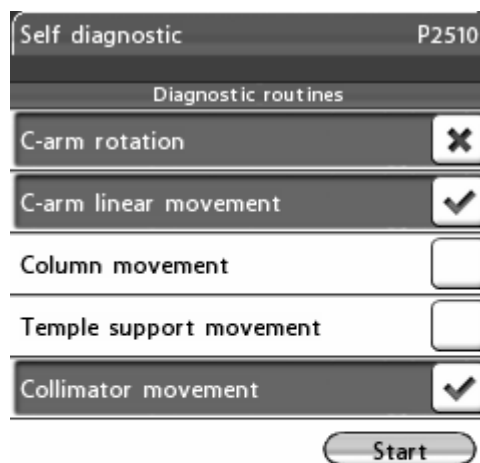
If required, you can perform self diagnostics on the actuating devices of the X-ray unit (movements and limit sensors). On the *Testing programs* display, select *Self diagnostics (P2510)*. The *Self diagnostics* display (P2510) will be shown. From the options available select one, several or all functions to be tested; C-arm rotation / C-arm linear movements / Column movement / Temple support movement / Collimator movement.

The selected functions will be highlighted. Then click *Start*. The self diagnostics starts to run, while the feature being tested at any one time will be displayed at the bottom of the display. After the self diagnostics test is completed the results will be displayed as follows: green check mark = pass, red cross mark = fail.

**NOTE** The C-arm will move during the self diagnostics sequence.



Self diagnostic display - functions to be tested chosen



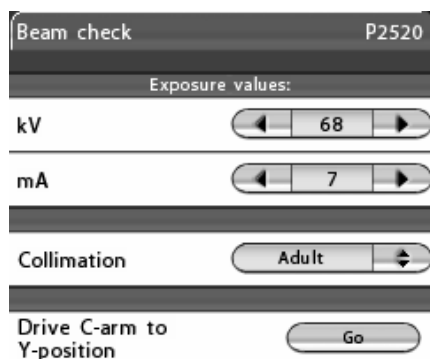
Self diagnostic display - results



- **Beam check (P2520)**

If required, you can perform a beam check to check the position of the X-ray beam on the sensor.

**NOTE** The X-ray beam must be aligned and the sensor must be calibrated by a qualified service technician before a beam check is started.



On the *Testing programs (P2500)* display, select the option *Beam check*. The *Beam check (P2520)* display will be shown.

The default exposure values (68 kV/7mA) for a beam check exposure will be shown on the *Beam check* display. If you wish to improve image contrast, you can select a higher kV value (70 kV) by touching the corresponding arrow in the kV field. The mA value cannot be further increased.

The beam position can be checked for both adult and child collimation. When you touch the button in the *Collimation* field a display will appear where you can select *Adult* or *Child*. Select *Adult* for the first beam check exposure.

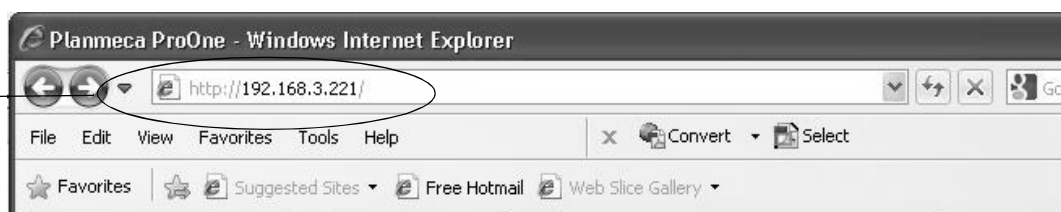


The beam check image will be shown on the web browser screen (e.g. Internet Explorer) of the computer that is connected to your ProOne X-ray unit.

Open the web browser. Enter your X-ray unit's IP address in the address bar.

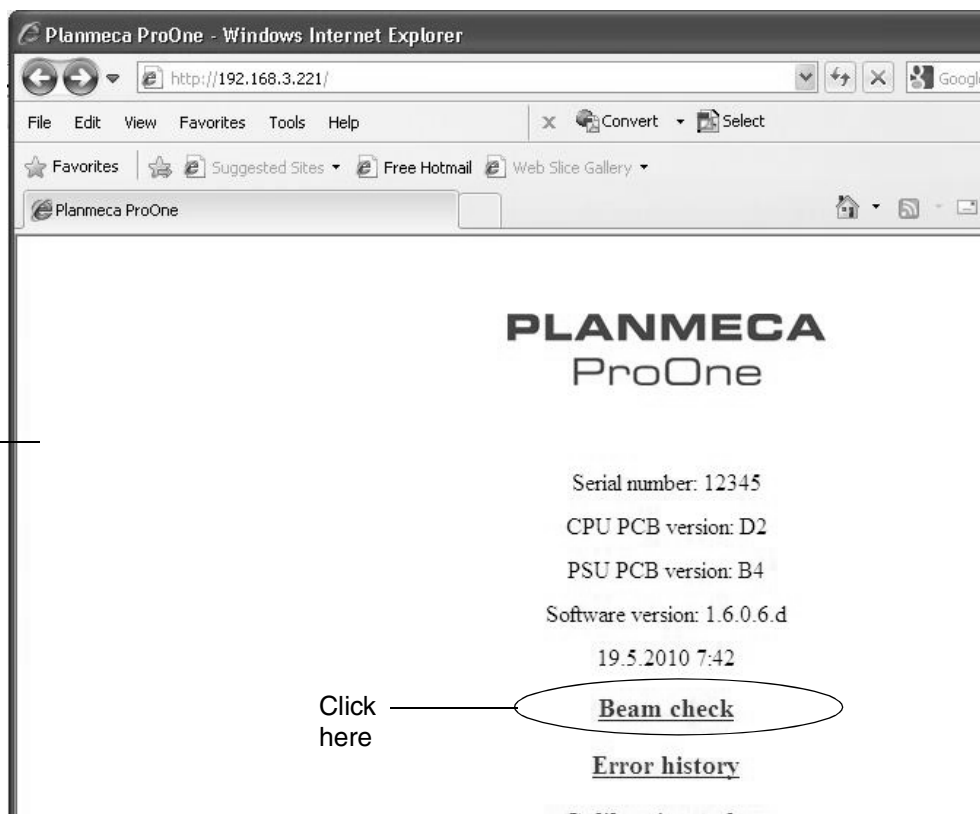
**NOTE** You can find the IP address on the ProOne control panel *Network settings (U1400)* display (Spanner icon>*User* tab>*Network settings*>*IP address*).

Enter ProOne IP address here

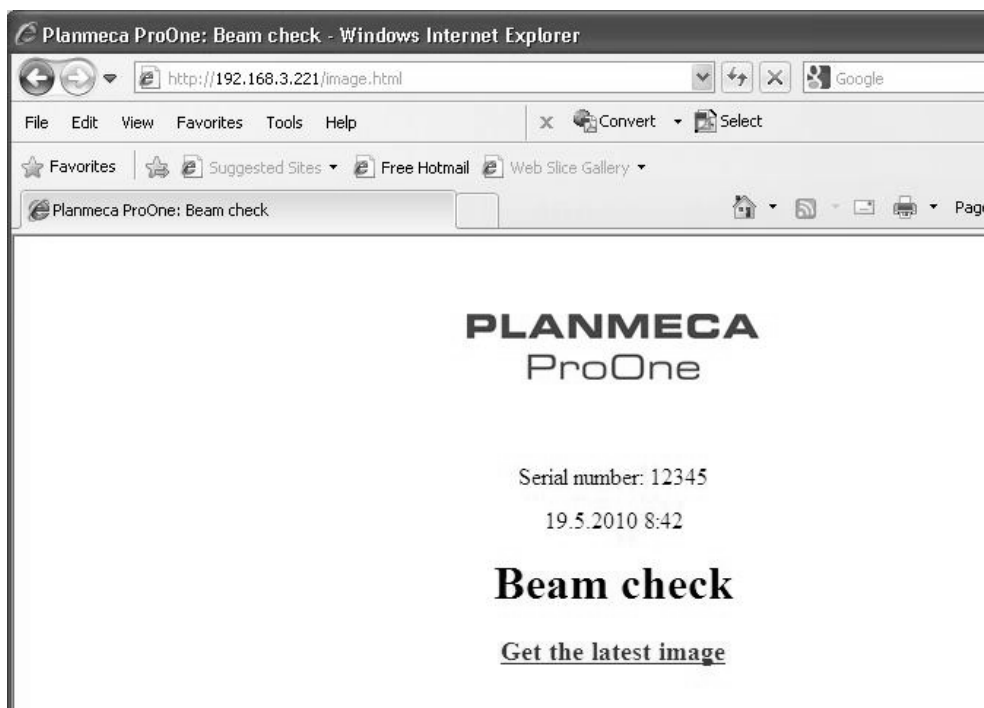


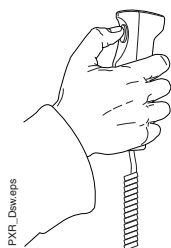
ProOne main page opens.

ProOne  
main page



Click the Beam check link on the ProOne main page.  
The Beam check page opens.



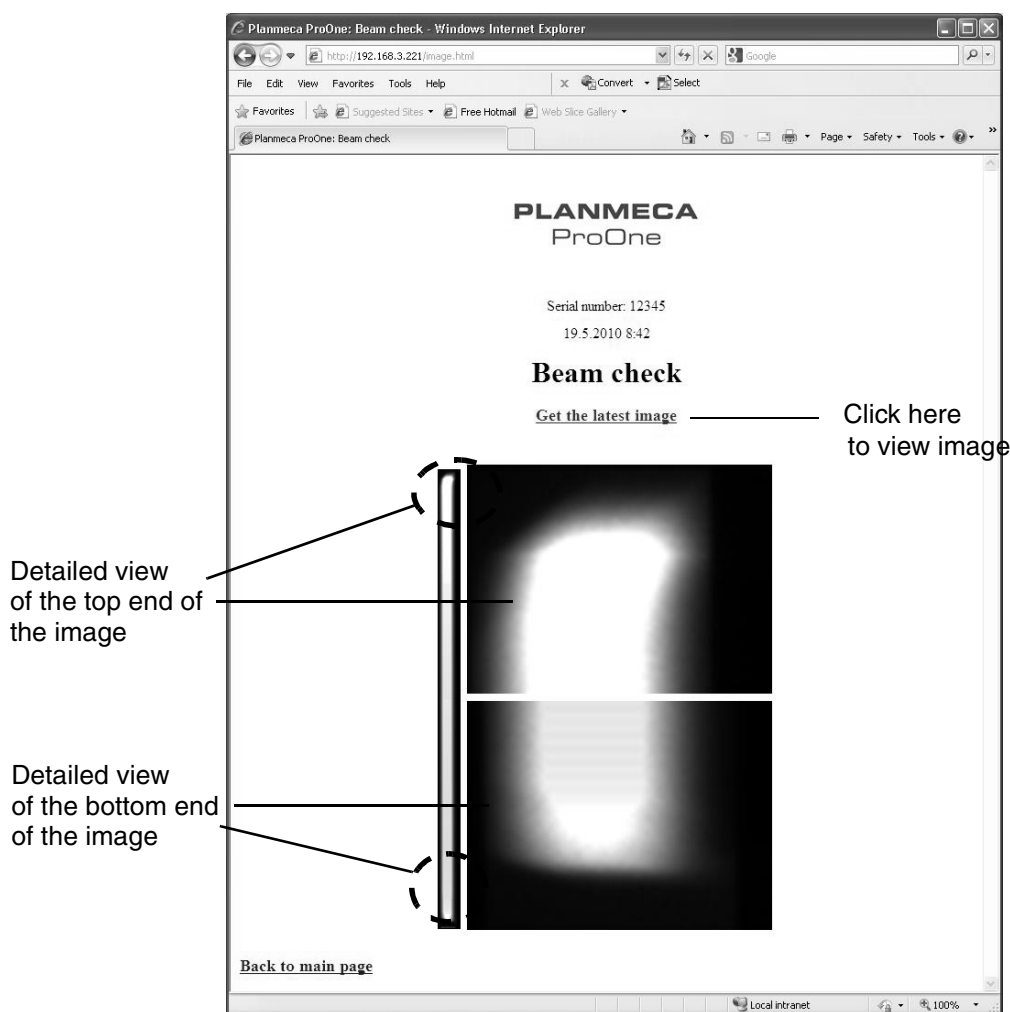


Take an exposure. Press and hold down the exposure button for the duration of the exposure.

**CAUTION** *Radiation is generated when the exposure button is pressed. Protect yourself from radiation.*

Click the [Get the latest image](#) link on the screen to view the beam check image.

The beam check image for adult collimation will be shown on the web browser screen.

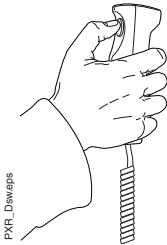


The radiation beam (white area in the image) must be positioned **inside the active area** of the sensor (black area in the image), i.e. the white radiation beam must be surrounded by black borders on all four sides. In an ideal case the white radiation beam is positioned exactly in the middle of the black area (both vertically and horizontally).

**NOTE** *If any part of the radiation beam extends outside the active sensor area, the X-ray beam must be readjusted and the sensor must be recalibrated by a qualified service technician. Contact your service technician for help.*



Now take a beam check image with child collimation. On the *Beam check (P2520)* display, touch the button in the *Collimation* field and select *Child* on the display that appears.

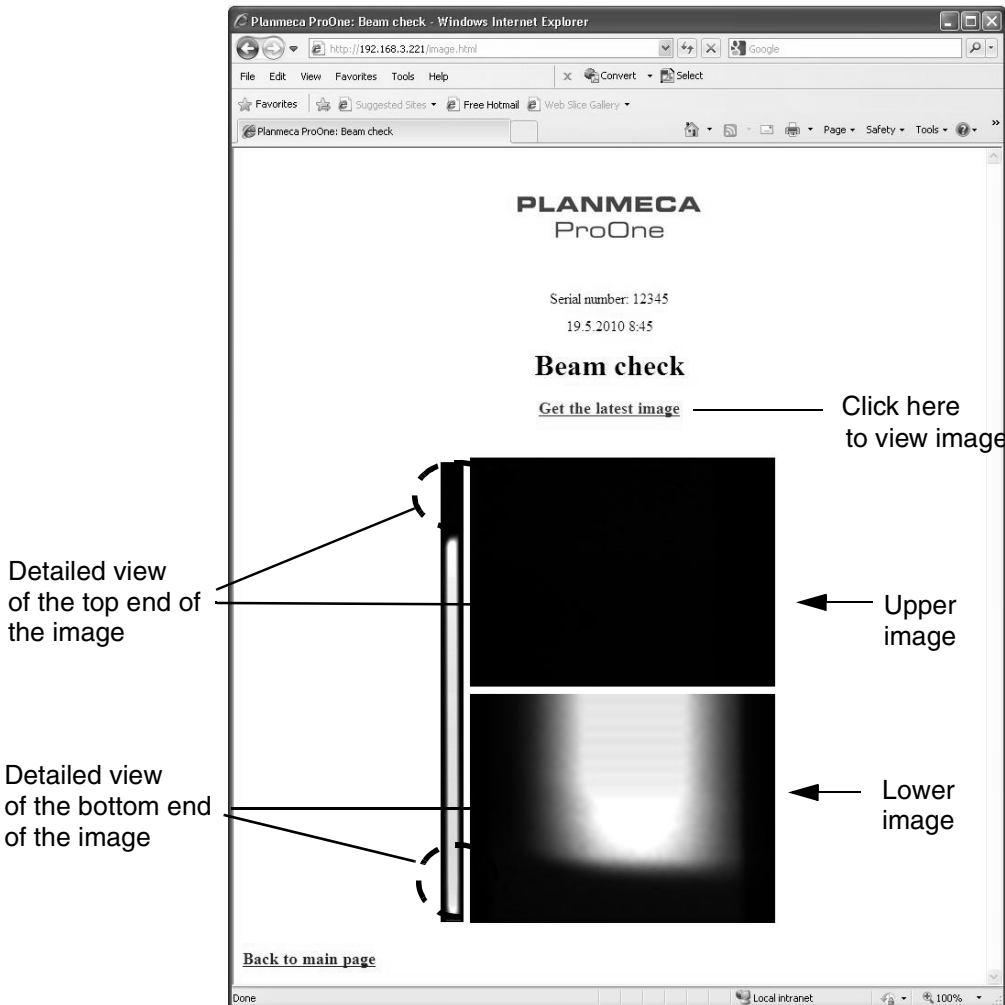


Take an exposure. Press and hold down the exposure button for the duration of the exposure.

**CAUTION** *Radiation is generated when the exposure button is pressed. Protect yourself from radiation.*

Click the Get the latest image link on the screen to view the beam check image.

The beam check image for child collimation will be shown on the web browser screen.

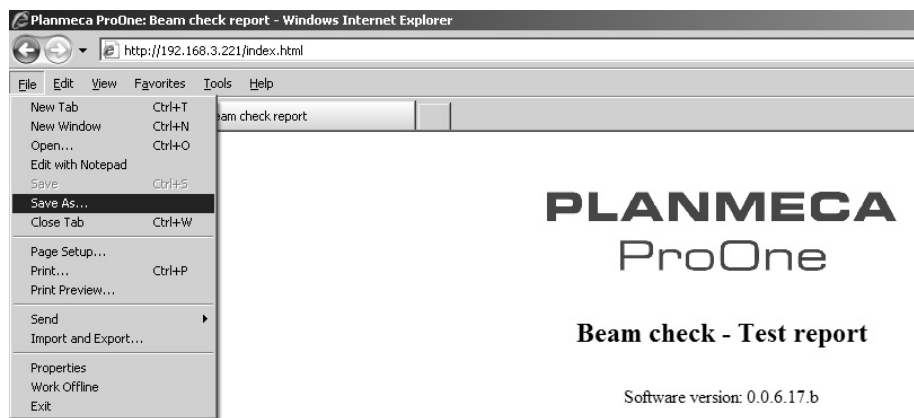


The bottom end of the radiation beam (white area in the lower image) must be positioned **inside the active area** of the sensor (black area in the lower image). The **upper image** must be **black** (no radiation). In the narrow image

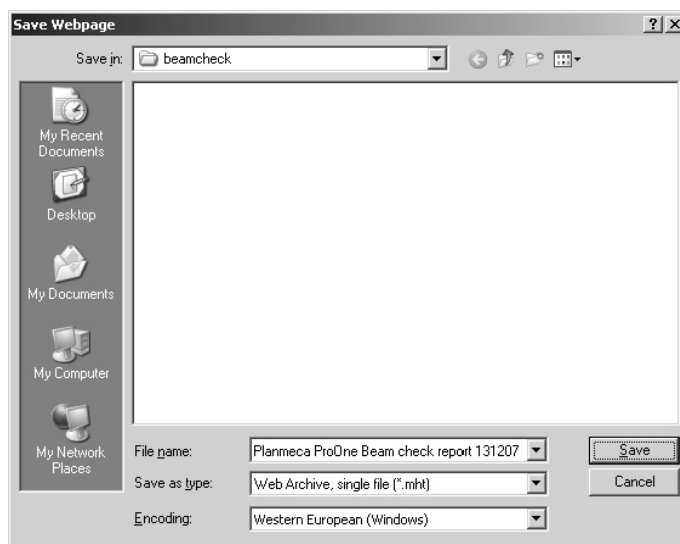
on the left, the **white radiation beam** must be **surrounded by black borders** on all four sides.

**NOTE** If any part of the radiation beam extends outside the active sensor area or if the upper image is not black, the X-ray beam must be readjusted and the sensor must be recalibrated by a qualified service technician. Contact your service technician for help.

The beam check images can be saved (or printed) using the *Save As* (or *Print*) command of the web browser.



The beam check images can be saved in any folder on the computer or network as a single file web page (.mht file).



Exit the *Beam check (P2520)* display by touching the green check mark button in the bottom right corner.

- **QA exposure (P2530)**

If required, you can take a QA exposure to check the image quality of the X-ray unit.

Refer to Planmeca Publication Number 10016248 (Image Quality Monitoring Instructions for Planmeca Digital X-ray

Units) for a detailed description on how to take a QA exposure.

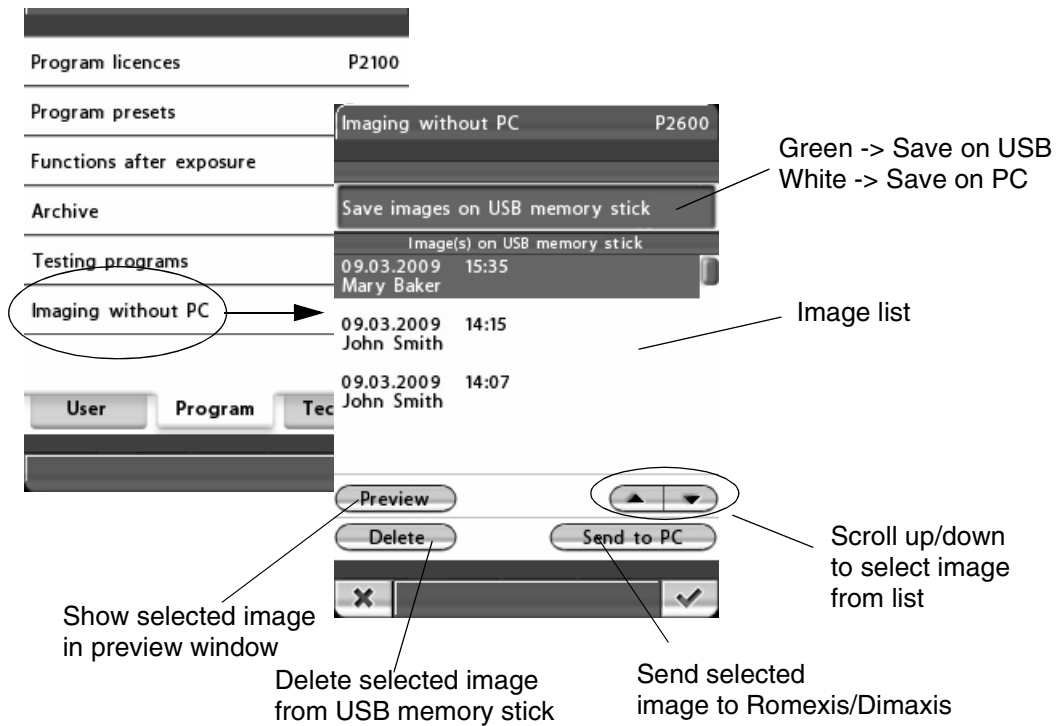
Exit the *Testing programs (P2500)* display by touching the green check mark button in the bottom right corner.

### Imaging without PC (P2600)

**NOTE** This option will be shown on the display only if a USB memory stick is connected to the X-ray unit. When a USB memory stick is plugged in, images can be saved on the memory stick or on the computer.

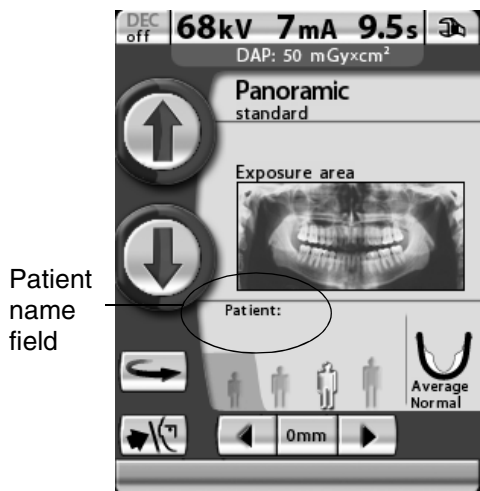
**NOTE** A USB memory stick must be plugged into the USB port by a service technician only. Contact your service technician for help if you need to use a USB memory stick.

Select the option **Imaging without PC (P2600)** on the *Program settings* display. The *Imaging without PC (P2600)* display will appear.



Touch the *Save images on USB memory stick* field to switch the function on. To switch the function off, touch the field again. The field will be shown highlighted (green) when the function is switched on.

Accept your selection by touching the green check mark button in the bottom right corner of the display. To exit the display without saving the changes, touch the red cross button in the bottom left corner of the display.

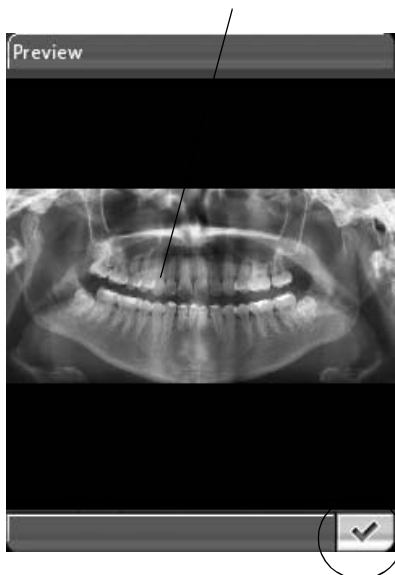


**NOTE** We recommend that you always enter the patient name before you take an exposure. This will ensure that images of different patients cannot be mixed up.

When you take an exposure the image will be saved on the USB memory stick and not on the computer. Note, however, that the saving process will now take a few seconds longer and you should not switch the X-ray unit off immediately after you have taken an exposure. When using a USB memory stick, wait for approx. 15 seconds before you switch the X-ray unit off after exposure.

When you have taken an exposure the image information (date, time, patient name if used) will be shown in the image list on the *Imaging without PC (P2600)* display. Use the up or down arrow to select an image from the list. The selected image will be shown highlighted. You can then use the function buttons at the bottom of the display:

- Touch = Zoom in
- Touch again = Zoom out
- Drag = Move zoomed image along display



Exit preview

• **Preview**

Touch the Preview button to see a preview of the selected image on the control panel display.

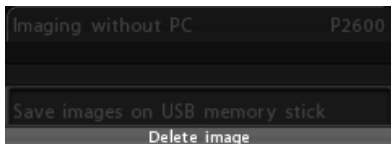
The preview image can be zoomed in and out to resize it, or dragged to move the image on the display. Touching the image will zoom in and show you the image in more detail at the point that was touched. Touching the image again will zoom out and bring you back to the original size. Dragging the zoomed image with your finger will move the image in the desired direction on the display.

Touch the green check mark button in the bottom right corner of the *Preview* display to return to the *Imaging without PC (P2600)* display.

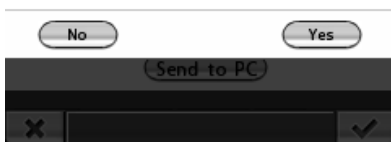
• **Send to PC**

**NOTE** Make sure that you have selected the right patient and the panoramic exposure mode in the Romexis/Dimaxis software program before you send an image. Refer to the Romexis/Dimaxis User's Manual.

Touch the *Send to PC* button to send the selected image to the Romexis/Dimaxis software program. A message confirming that the image was sent will appear on the



**Do you really want to delete the selected image?**



display. Remember to accept the image in the Romexis/Dimaxis software program.

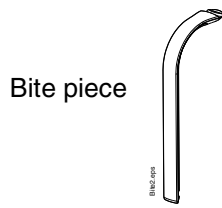
- **Delete**

Touch the *Delete* button if you want to delete the selected image from the USB memory stick. A message asking you to confirm the action will pop up. Touch the *No* button to cancel the action, or select *Yes* to delete the image.

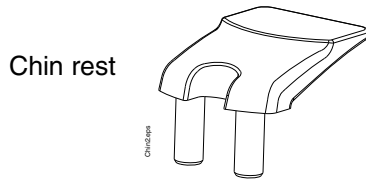
**NOTE** Ensure that you have sent the image to the PC before you delete it. Deleted images cannot be recovered.



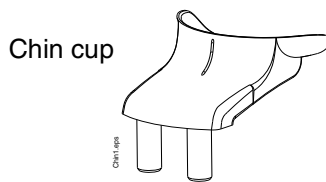
## 9 PANORAMIC EXPOSURE



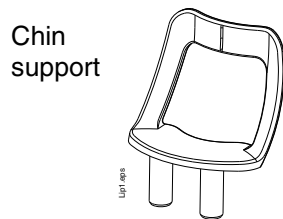
**NOTE** If the optional segmenting function is activated on your X-ray unit, you can take a partial exposure by selecting only certain vertical or horizontal segments of the jaw, refer to section 8.2.1 “Selecting exposure area for panoramic exposures (optional)” on page 16.



Use a bite piece for this procedure. Insert the chin rest and a bite piece into the adapter on the patient support table.



For edentulous patients or for patients who are unable to use the bite piece you can use the chin cup or the chin support. You may have to place a roll of gauze or cotton between the patient’s jaws to raise the upper ridge to the correct position.



**NOTE** We recommend that you use the chin support when taking bitewing exposures.

**NOTE** We recommend that you use the bite piece when taking Autofocus exposures.

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 unit’s arm structures.

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

Select the panoramic program you require, refer to section 8.2 “Selecting panoramic exposure program” on page 12. Select the patient size as described in section 8.7 “Selecting patient size” on page 30.

The exposure values will automatically change to correspond with the selected patient size and exposure program. The preset exposure values are shown in the following tables. The preset exposure values are average values and they are only meant to guide the user. If needed, you can change the preset values as described in section 8.8 “Selecting kilovolt and milliamperere values” on page 30.

**NOTE** Always try to minimize the radiation dose to the patient.

## EXPOSURE VALUES FOR STANDARD, INTERPROXIMAL AND ORTHOGONAL PANORAMIC PROGRAMS

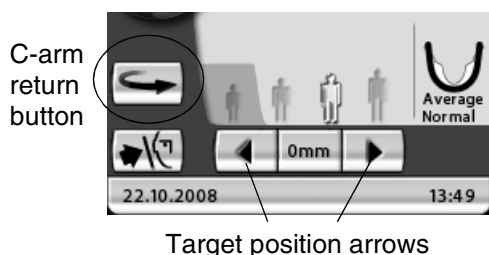
PATIENT SIZE	kV VALUE	mA VALUE
Child	64	7
Small adult	66	7
Average-sized adult	68	7
Large adult	70	7

**NOTE** If the optional DEC (Dynamic Exposure Control) function is activated on your X-ray unit, you can switch it on as described in section 8.14 “Switching DEC on/off (optional)” on page 34. DEC adjusts the exposure values individually for each patient during exposure.

## EXPOSURE VALUES FOR PANORAMIC BITEWING PROGRAM

PATIENT SIZE	kV VALUE	mA VALUE
Child	70	4
Small adult	70	5
Average-sized adult	70	6
Large adult	70	7

### 9.1 Patient positioning

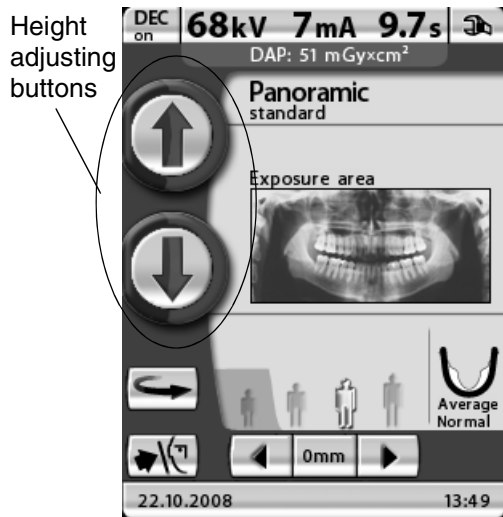


Touch the C-arm return button to move the C-arm to the patient entry position if it is not already there. Alternatively, you can touch either of the target position arrows to move the C-arm to the patient entry position.

**NOTE** You can set the X-ray unit so that the C-arm will automatically return to the patient entry position at the end of an exposure cycle. Refer to section “Functions after exposure (P2300)” on page 48 for more information.



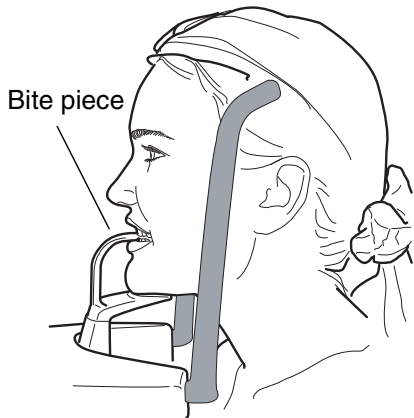
Touch the temple support button to open the temple supports if they are not already open.



Guide the patient to the unit so that they are facing the chin rest.

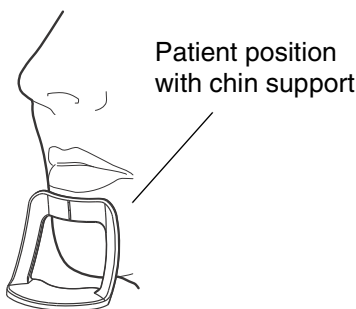
To adjust the height of the unit, press either of the height adjusting buttons on the display until the chin rest is at the level of the patient's chin. Stretch and straighten the patient's neck.

The unit moves slowly at first, then faster.



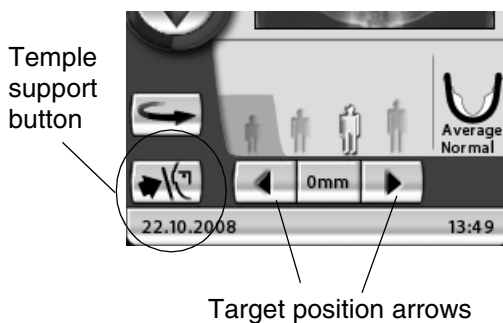
Ask the patient to step forward, grasp the patient handles, stretch up and bite the bite piece. The incisal edges of the maxillary and mandibular teeth must be in the groove in the bite piece.

**NOTE** Patients are not allowed to hang on the patient handles. The pull-down force applied to the patient handles may not exceed 15 kg (33 lb).



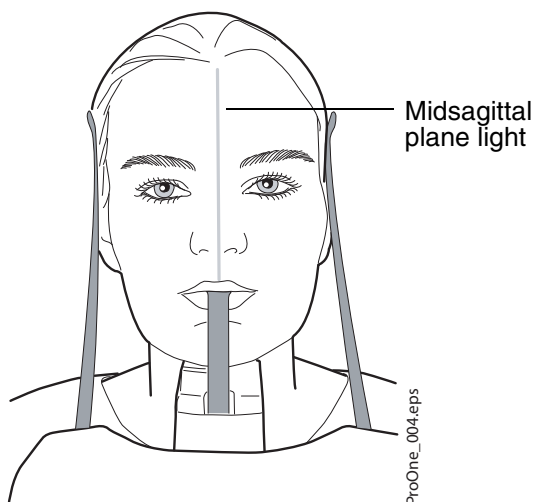
**NOTE** If you are using the chin support position the patient so that the chin, just below the lower lip, touches the top bar.

**NOTE** If you are using the chin support or the chin cup use for example a roll of gauze to ensure that the patient's teeth are together.



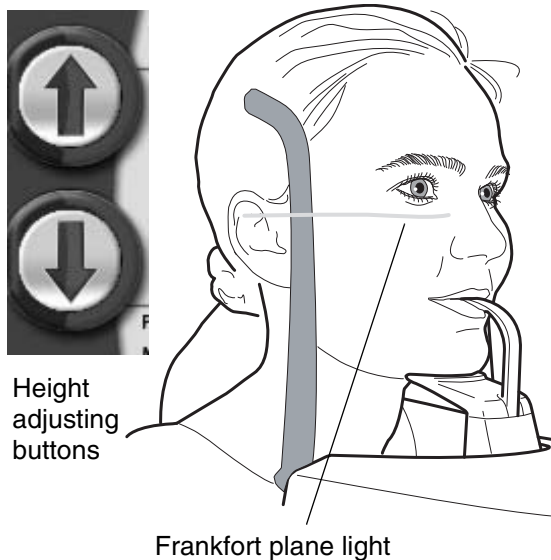
Close the temple supports by touching the temple support button.

The three patient positioning lights will automatically switch on when you select the exposure program. They will switch off after two minutes. If the lights go out before you have positioned the patient you can touch either of the target position arrows to switch the lights back on.



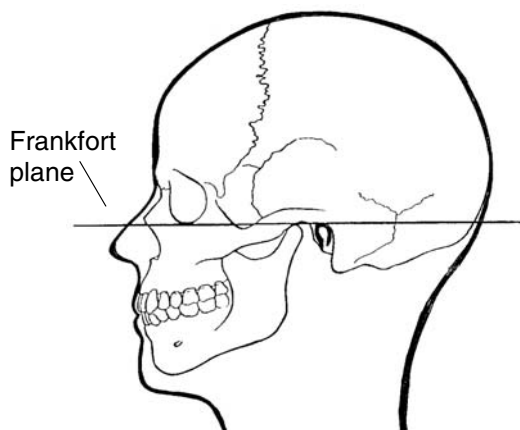
Stand behind the patient and make sure that the patient's shoulders are level and the neck muscles relaxed.

Position the patient's head so that the midsagittal plane coincides with the midsagittal plane light beam. Make sure that the patient is looking straight ahead as the light may appear to be correctly positioned but the patient's head could be turned slightly to one side.

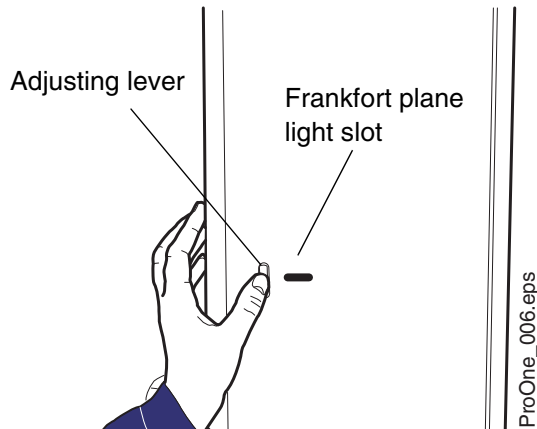


Position the patient's head so that the Frankfort plane coincides with the Frankfort plane light beam.

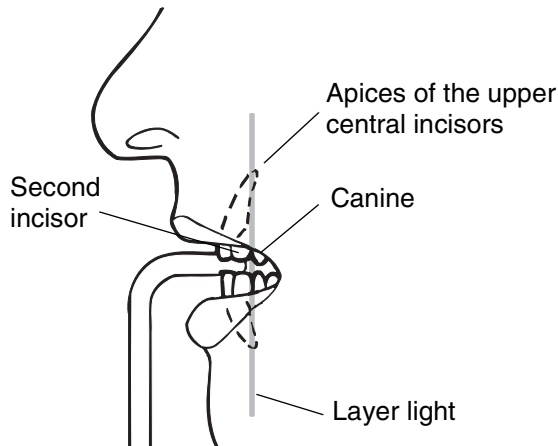
To do this support the back of the patient's head with your hand and then adjust the tilt of the patient's head by raising or lowering the unit with the height adjusting buttons. The patient's back should be straight. If necessary, stretch and straighten the patient's neck by moving the unit up slightly.



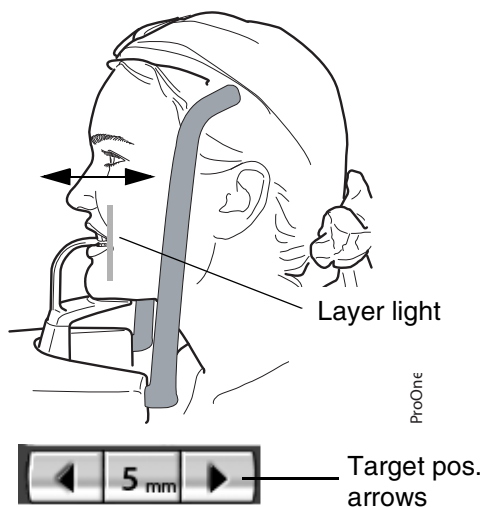
The Frankfort plane is an imaginary line which joins the infra-orbital point to the superior border of the external auditory meatus.



Note that the Frankfort plane light, located on the side of the column, can be moved up or down to accommodate different head sizes. This is done by moving the adjusting lever that is located next to the light slot.



Position the apices of the patient's upper central incisors within the image layer (focal trough) of the unit.



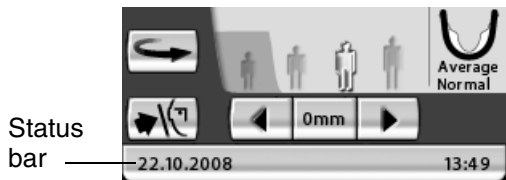
To do this, touch and hold either of the target position arrows to move the layer light - which indicates the centre of the focal trough - until it falls between the second incisor and the canine. For an average patient, this procedure will place the apices of the upper central incisors within the focal trough.

The arrow pointing to the left moves the C-arm forwards and the arrow pointing to the right moves the C-arm backwards. The number in the target position field indicates the position of the layer light and serves as a reference for later retakes.

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

## 9.2 Taking an exposure

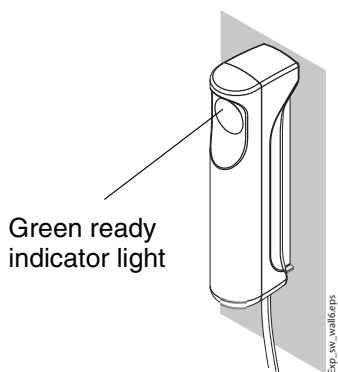
**NOTE** Make sure that you have selected the right patient and the panoramic exposure mode in the Romexis/Dimaxis software program before you take an exposure. Refer to the Romexis/Dimaxis User's Manual.



Status bar

**Green = Ready for exposure**  
 Grey = Not ready for exposure

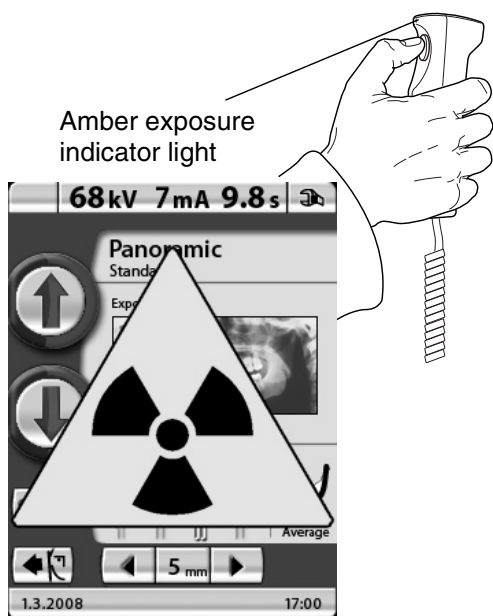
The status bar at the bottom of the display will turn green when the unit is ready to take an exposure.



On the exposure button a green indicator light will come on. The Romexis/Dimaxis program will show the *Waiting for Exposure* message on the computer screen.

Ask the patient to close their lips on the bite piece, swallow, place their tongue flat against the roof of the mouth, breathe normally, and stand as still as possible.

Move to a protected area.



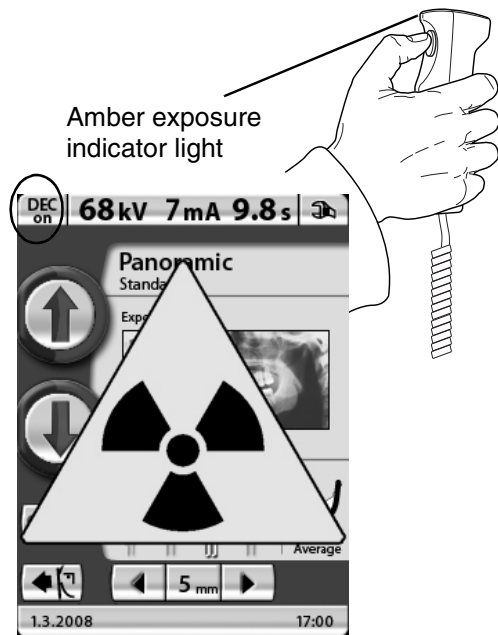
Amber exposure indicator light

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

**NOTE** If exposures are taken in rapid succession the X-ray tube will overheat and a cooling time will be shown on the display (e.g. Cooling: 21 s). The cooling time indicates the delay before the next exposure can be taken.

When you have taken the exposure the image will be shown on the computer screen. **Note that you must accept the image in the Romexis/Dimaxis imaging program - only accepted images will be stored in the database.** Refer to the Romexis/Dimaxis User's Manual for further information.

### 9.3 Taking an exposure with DEC



If the optional DEC (Dynamic Exposure Control) function is switched on, the exposure will be taken in two stages and the C-arm will move twice. The exposure values (kV and mA) will be adjusted during the first (short) exposure. The second exposure will produce the actual image and the C-arm will now move through one complete exposure cycle.

Press and hold down the exposure button for the duration of both exposures.

**NOTE** Do not release the exposure button before the end of the second exposure.

### 9.4 Taking an exposure with Autofocus

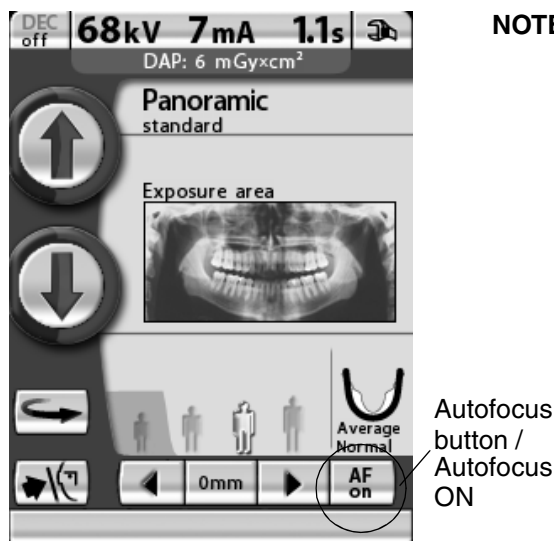
**NOTE** Autofocus is available for standard, interproximal and orthogonal panoramic programs.

**NOTE** When Autofocus is switched on, the target position will be automatically set at 0 mm and the C-arm will move to the corresponding position. The layer cannot be adjusted manually.

**NOTE** Always switch Autofocus on or off BEFORE starting the imaging process in the Romexis / Dimaxis program. After starting these programs you can no longer switch Autofocus on or off without cancelling the imaging process first from the Romexis/Dimaxis program.

**NOTE** In case of automatic layer adjustment images can only be saved on the computer.

Touch the Autofocus button on the main display to switch the Autofocus function on (AF on) or off (AF off) for the exposure you are going to take.

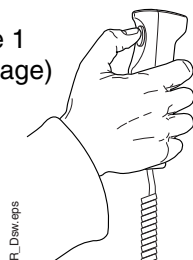


Autofocus adjusts the layer position automatically. The function positions the image layer individually for each patient based on the position and angle of the apices of the upper central incisors.

The exposure will be taken in two stages and the C-arm will move twice. The first exposure is a short, low-dose exposure during which the optimal position for the image layer will be calculated, The second exposure is the actual exposure to acquire the final image.

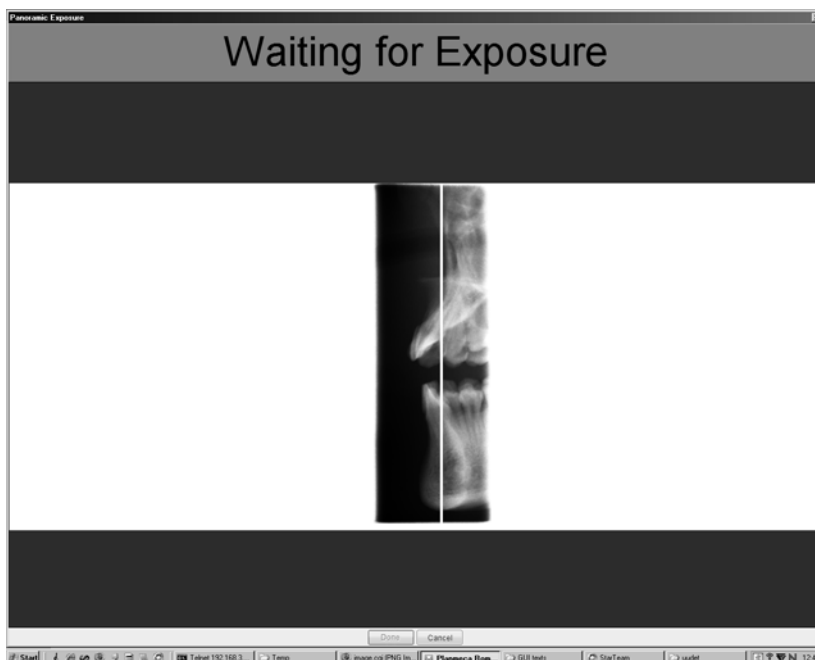
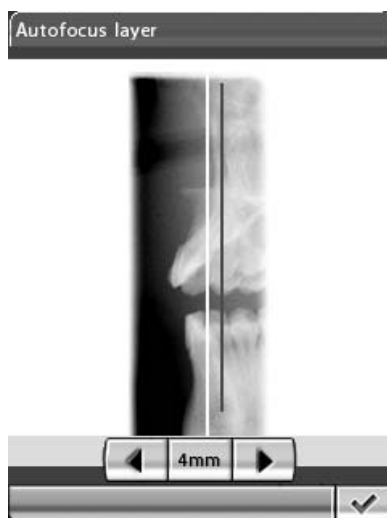
## PANORAMIC EXPOSURE

Exposure 1  
(scout image)



Position the patient as described in section 9.1 “Patient positioning” on page 62. Take the first exposure as described in section 9.2 “Taking an exposure” on page 66.

The following displays will appear on the control panel and computer screen.



The calculated layer position is shown with a white line on the image.

If necessary, you can adjust the layer position by touching the arrow buttons on the control panel display. The new position will be shown with a red line on the control panel display. The movement range is from +15 mm to -15 mm.



The selected layer position will be shown at the bottom of the display (e.g. 2 mm).

**NOTE** Make sure the patient does not move between the two exposures.

Exposure 2  
(final image)



R\_Daw.epgs

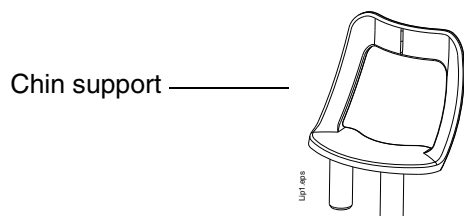
Press the exposure button again to take the second exposure. The second exposure will produce the actual image and the C-arm will now move through one complete exposure cycle.

## 10 TEMPOROMANDIBULAR JOINT EXPOSURE

### 10.1 Double TMJ exposure (lateral, PA or lateral-PA)

This procedure will produce open and closed views of the left and right temporomandibular joints.

Note that this is a double exposure and the C-arm will travel through two exposure cycles.



Use the chin support for this exposure. Insert the chin support into the adapter on the patient support table.

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 unit's arm structures.

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

#### 10.1.1 First exposure - jaw closed

Select the double TMJ exposure program you require, refer to section 8.3 "Selecting temporomandibular joint (TMJ) exposure program" on page 17. Select the patient size as described in section 8.7 "Selecting patient size" on page 30.

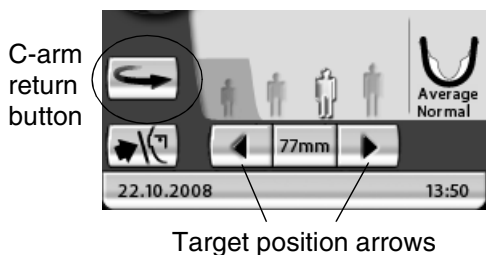
Select the image position parameters (target position, imaging angle, symmetric/asymmetric setting and left/right side exposure) as described in section 8.3.1 "Selecting imaging position for temporomandibular joint (TMJ) exposures" on page 20.

The exposure values will automatically change to correspond with the selected patient size. The preset exposure values are shown in the following table. The preset exposure values are average values and they are only meant to guide the user. If needed, you can change the preset values as described in section 8.8 "Selecting kilovolt and milliamperage values" on page 30.

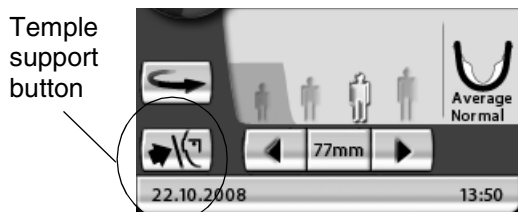
**NOTE** Always try to minimize the radiation dose to the patient.

EXPOSURE VALUES FOR DOUBLE TMJ PROGRAMS

PATIENT	kV VALUE	mA VALUE
<i>Child</i>	<i>64</i>	<i>7</i>
<i>Small adult</i>	<i>66</i>	<i>7</i>
<i>Average-sized adult</i>	<i>68</i>	<i>7</i>
<i>Large adult</i>	<i>70</i>	<i>7</i>

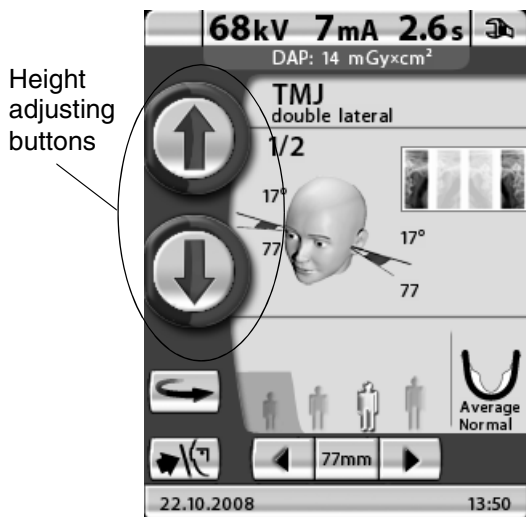


**NOTE** You can set the X-ray unit so that the C-arm will automatically return to the patient entry position at the end of an exposure cycle. Refer to section “Functions after exposure (P2300)” on page 48 for more information.



Touch the temple support button to open the temple supports if they are not already open.

Guide the patient to the unit so that they are facing the chin support. Explain to the patient that you will take a double exposure and that the unit will rotate twice.



To adjust the height of the unit, press either of the height adjusting buttons on the display until the opening in the chin support is approximately level with the patient’s mouth.

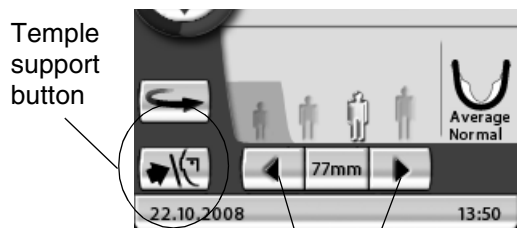
The unit moves slowly at first, then faster.

## TEMPOROMANDIBULAR JOINT EXPOSURE



Ask the patient to step forward, grasp the patient handles 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, their teeth together.

**NOTE** Patients are not allowed to hang on the patient handles. The pull-down force applied to the patient handles may not exceed 15 kg (33 lb).



Temple support button

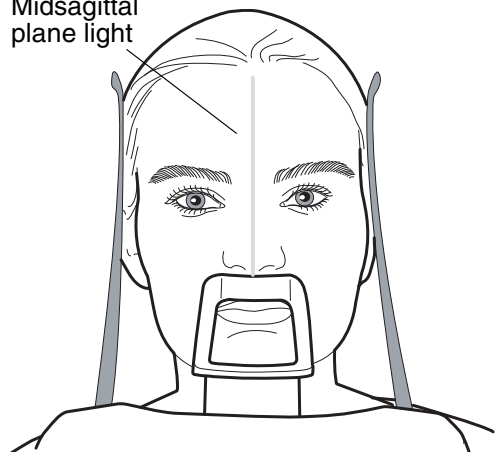
Close the temple supports by touching the temple support button.

Target position arrows

Stand behind the patient and check that the patient's shoulders are level and the neck muscles relaxed.

The three patient positioning lights will automatically switch on when you select the exposure program. They will switch off after two minutes. If the lights go out before you have positioned the patient you can touch either of the target position arrows to switch the lights back on.

Midsagittal plane light

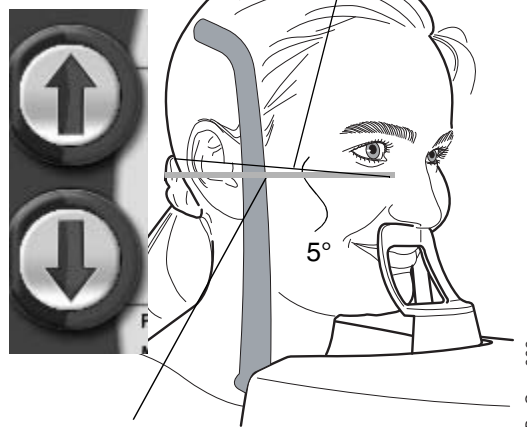


ProOne\_008.eps

Position the patient's head so that the midsagittal plane coincides with the midsagittal plane light beam. Make sure that the patient is looking straight ahead as the light may appear to be correctly positioned but the patient's head could be turned slightly to one side.

Height adjusting buttons

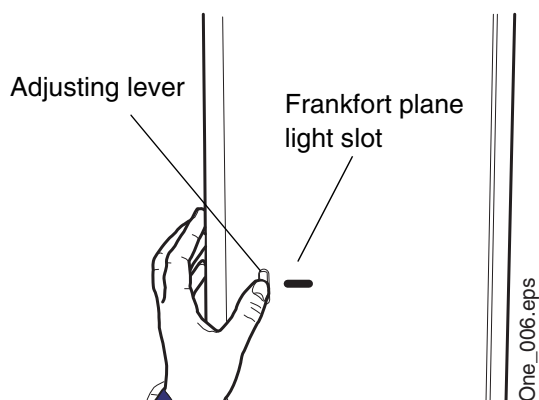
Frankfort plane



Frankfort plane light

ProOne\_009.eps

Position the patient's head so that the Frankfort plane is tilted down five 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 position of the patient's head by raising or lowering the unit with the height adjusting buttons. Make sure the patient's back is straight.



Note that the Frankfort plane light, located on the side of the column, can be moved up or down to accommodate different head sizes. This is done by moving the adjusting lever that is located next to the light slot.

Temporomandibular joint



Layer light

The layer light will be automatically positioned at the back, in the area of the patient's temporomandibular joint. To fine-adjust the position of the layer light manually, touch and hold either of the target position arrows until the layer light is positioned at the patient's temporomandibular joint.

The arrow pointing to the left moves the C-arm forwards and the arrow pointing to the right moves the C-arm backwards. The number in the target position field indicates the position of the layer light and serves as a reference for later retakes. The target position on the other jaw side will change accordingly if the icon for symmetric/asymmetric setting on the display shows an undivided jaw (one line in the middle).



Target position arrows

The imaging angle can be adjusted for lateral TMJ exposures. The factory default imaging angle for lateral exposures is 17 degrees. The default imaging angle for lateral exposures can be defined by user through the *Program presets* menu, option **Lateral TMJ default angle**, see Section "Program presets (P2200)" starting from page 46. If necessary, adjust the imaging angle for the exposure you are going to make as described in section 8.3.1 "Selecting imaging position for temporomandibular joint (TMJ) exposures" on page 20.

**NOTE** For lateral-PA double exposures the imaging angle will be automatically changed between exposures.

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

**NOTE** Make sure that you have selected the right patient and the panoramic exposure mode in the Romexis/Dimaxis software program before you take an exposure. Refer to the Romexis/Dimaxis User's Manual.

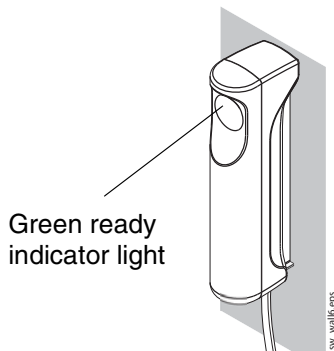
**NOTE** Images can be saved on a USB memory stick instead of the computer. Refer to section “Imaging without PC (P2600)” on page 58 for more information.



Status bar

**Green = Ready for exposure**  
 Grey = Not ready for exposure

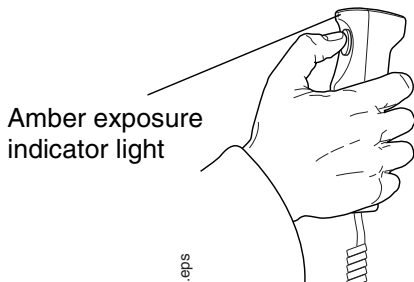
The status bar at the bottom of the display will turn green when the unit is ready to take an exposure.



Green ready indicator light

On the exposure button a green indicator light will come on. The Romexis/Dimaxis program will show the *Waiting for Exposure* message on the computer screen.

Ask the patient to stand as still as possible.

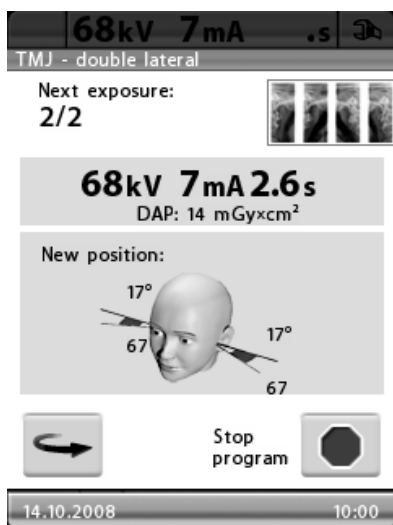


Amber exposure indicator light

Move to a protected area.

Press and hold down the exposure button for the duration of the exposure. The C-arm will move through one complete exposure cycle and then automatically return to the ready position. The temple supports will remain closed and hold the patient in position for the second exposure. During the exposure cycle the radiation warning light on the exposure switch and on the display will come on and you will hear a radiation warning tone.

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



Between exposures a display is shown where you can change the exposure values (kV and mA) and view the imaging position for the second exposure.

To change the exposure values, touch the exposure value field in the middle of the display and select new values on the display that appears.

The X-ray image in the top right corner of the display shows in which order the images will appear on the radiograph. The active exposure is shown in full colour. The number in the top left corner (2/2) indicates the number of the active exposure.

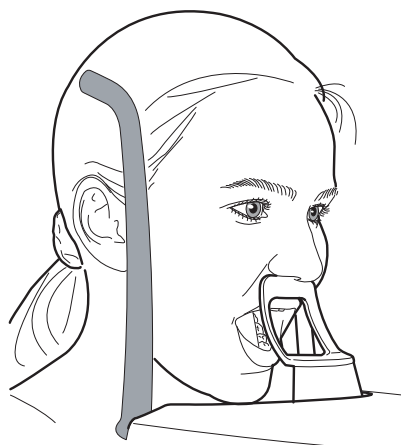
You can move the C-arm to the starting position, if it is not already there, by touching the C-arm return button in the bottom left corner.

If necessary, you can stop the exposure procedure by touching the stop button in the bottom right corner.

**NOTE** For lateral and PA double exposures the target position will be automatically moved forwards for the second exposure by a value in mm selected in the *Program preset* menu, field *TMJ 2/2 shift*, see page 47.

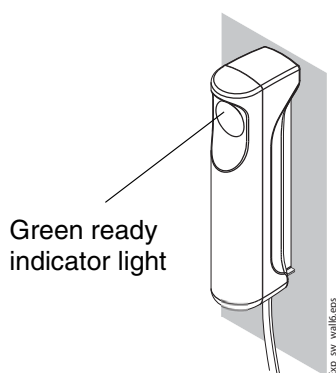
**NOTE** For lateral-PA double exposures the imaging angle will be automatically changed between exposures.

### 10.1.2 Second exposure - jaw open



ProOne\_011

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

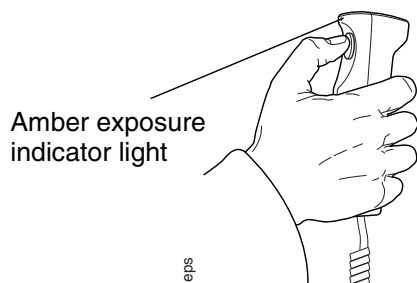


Green ready indicator light

Exp\_sw\_walk.eps

On the exposure button a green indicator light will come on. The Romexis/Dimaxis program will show the *Waiting for Exposure* message on the computer screen.

Ask the patient to stand as still as possible.



Amber exposure indicator light

eps

Move to a protected area.

Press and hold down the exposure button for the duration of the second exposure. During the exposure cycle the radiation warning light on the exposure switch and on the display will come on and you will hear a radiation warning tone. When the C-arm has completed the second exposure cycle the temple supports will automatically open. You can now guide the patient from the unit.

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

**NOTE** If exposures are taken in rapid succession the X-ray tube will overheat and a cooling time will be shown on the display (e.g. Cooling: 21 s). The cooling time indicates the delay before the next exposure can be taken.

When you have taken the exposure the image will be shown on the computer screen. **Note that you must accept the image in the Romexis/Dimaxis imaging program - only accepted images will be stored in the database.** Refer to the Romexis/Dimaxis User's Manual for further information.

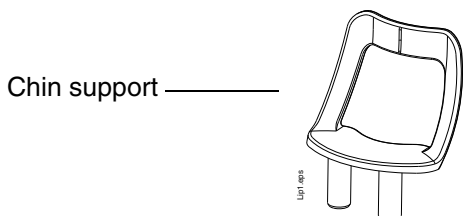


## 10.2 Multi-angle TMJ exposure (3 angles lateral)

This procedure will produce three lateral exposures with different angles from the patient's left or right temporomandibular joint.

Note that the C-arm will move three times during the exposure cycle.

Use the chin support for this exposure. Insert the chin support into the adapter on the patient support table.



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 unit's arm structures.

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

Select the TMJ exposure program "3 angles lateral" as described in section 8.3 "Selecting temporomandibular joint (TMJ) exposure program" on page 17. Select the patient size as described in section 8.7 "Selecting patient size" on page 30.

Select the image position parameters (target position, imaging angle and left/right side exposure) as described in section 8.3.1 "Selecting imaging position for temporomandibular joint (TMJ) exposures" on page 20.

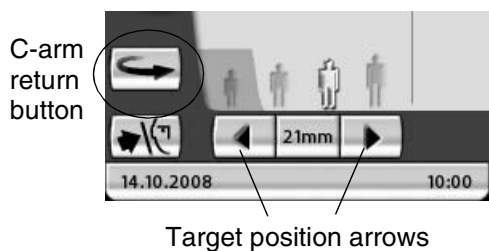
The exposure values will automatically change to correspond with the selected patient size. The preset exposure values are shown in the following table. The preset exposure values are average values and they are only meant to guide the user. If needed, you can change the preset values as described in section 8.8 "Selecting kilovolt and milliamperage values" on page 30.

**NOTE** Always try to minimize the radiation dose to the patient.

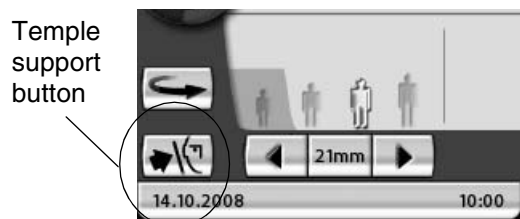
**EXPOSURE VALUES FOR MULTI-ANGLE TMJ PROGRAM**

PATIENT	kV VALUE	mA VALUE
<i>Child</i>	<b>64</b>	<b>7</b>
<i>Small adult</i>	<b>66</b>	<b>7</b>
<i>Average-sized adult</i>	<b>68</b>	<b>7</b>
<i>Large adult</i>	<b>70</b>	<b>7</b>

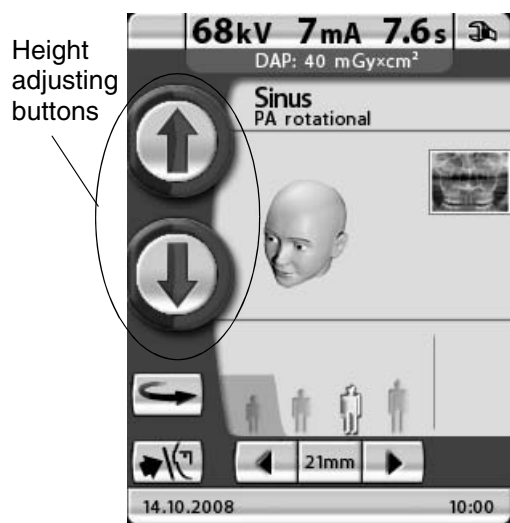
## 10.2.1 Patient positioning



**NOTE** You can set the X-ray unit so that the C-arm will automatically return to the patient entry position at the end of an exposure cycle. Refer to section “Functions after exposure (P2300)” on page 48 for more information.



Touch the temple support button to open the temple supports if they are not already open.



Guide the patient to the unit so that they are facing the chin support. Explain to the patient that you will take a multi-angle exposure and that the C-arm will move three times during the exposure cycle.

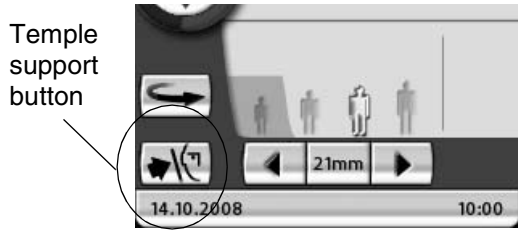
To adjust the height of the unit, press either of the height adjusting buttons on the display until the opening in the chin support is approximately level with the patient's mouth.

The unit moves slowly at first, then faster.



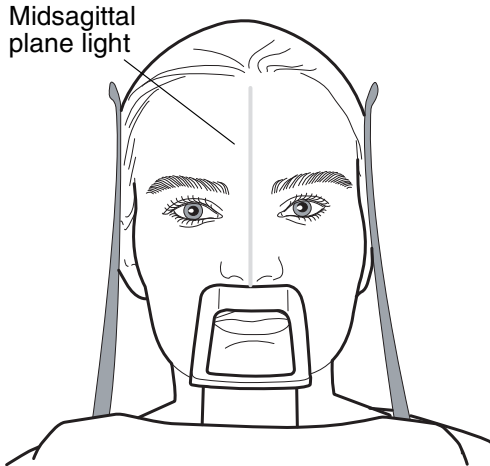
Ask the patient to step forward, grasp the patient handles and press their lips against the chin support. The patient's nose must rest on top of the support and their mouth must be closed, their teeth together.

**NOTE** Patients are not allowed to hang on the patient handles. The pull-down force applied to the patient handles may not exceed 15 kg (33 lb).



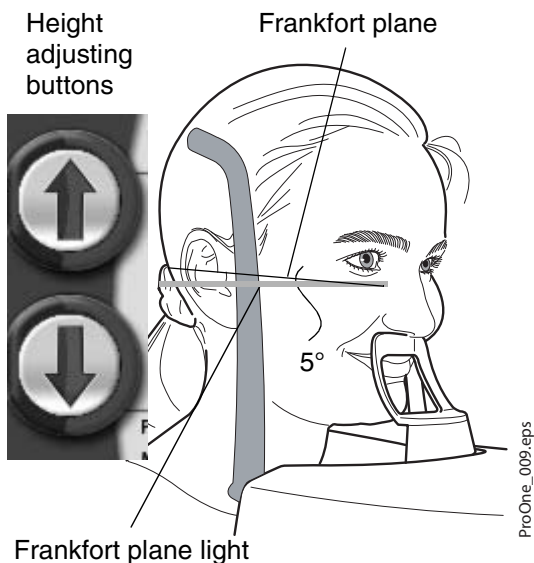
Close the temple supports by touching the temple support button.

Stand behind the patient and check that the patient's shoulders are level and the neck muscles relaxed.

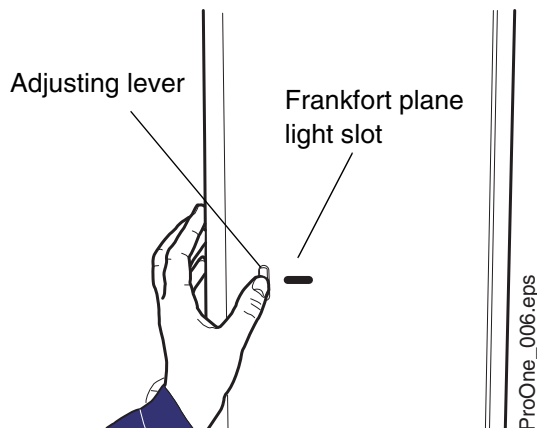


The three patient positioning lights will automatically switch on when you select the exposure program. They will switch off after two minutes. If the lights go out before you have positioned the patient you can touch either of the target position arrows to switch the lights back on.

Position the patient's head so that the midsagittal plane coincides with the midsagittal plane light beam. Make sure that the patient is looking straight ahead as the light may appear to be correctly positioned but the patient's head could be turned slightly to one side.

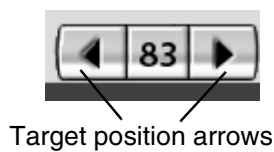
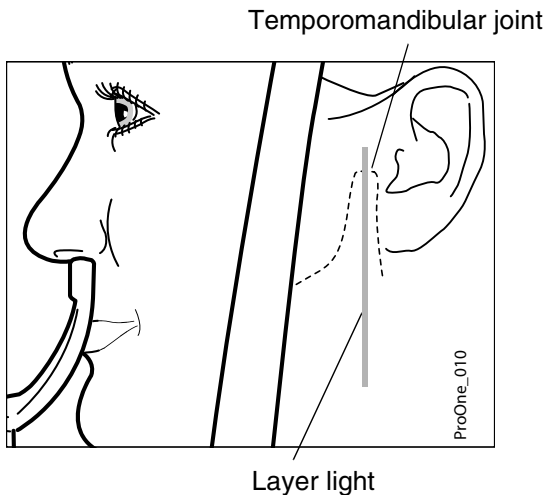


Position the patient's head so that the Frankfort plane is tilted down five degrees. To do this support the back of the patient's head with your hand and, using the Frankfort plane light as a reference line, adjust the position of the patient's head by raising or lowering the unit with the height adjusting buttons. Make sure the patient's back is straight.



Note that the Frankfort plane light, located on the side of the column, can be moved up or down to accommodate different head sizes. This is done by moving the adjusting lever that is located next to the light slot.

## TEMPOROMANDIBULAR JOINT EXPOSURE

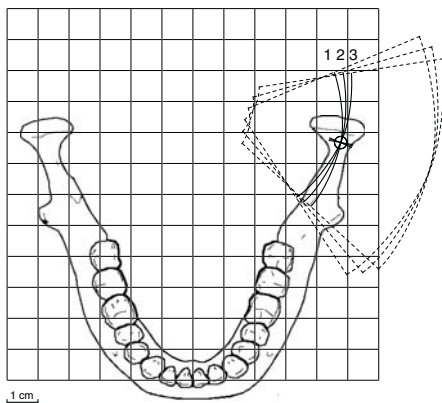


The layer light will be automatically positioned at the back, in the area of the patient's temporomandibular joint. To fine-adjust the position of the layer light manually, touch and hold either of the target position arrows until the layer light is positioned at the patient's temporomandibular joint.

The arrow pointing to the left moves the C-arm forwards and the arrow pointing to the right moves the C-arm backwards. The number in the target position field indicates the position of the layer light and serves as a reference for later retakes.

**The layer light is always positioned on the patient's left side, even when taking multi-angle exposures of the patient's right temporomandibular joint.**

### 3 angles lateral, left



First exposure = Selected angle - 7°

Second exposure = Angle selected by the user  
(factory default angle: 17°)

Third exposure = Selected angle + 7°

The factory default imaging angle for the second exposure is 17 degrees. The default imaging angle for lateral exposures can be defined by user in the *Program presets* menu, option **Lateral TMJ default angle**, see Section "Program presets (P2200)" starting from page 46.

If necessary, you can adjust the imaging angle for the exposure you are going to take as described in section 8.3.1 "Selecting imaging position for temporomandibular joint (TMJ) exposures" on page 20.

The imaging angle for the first exposure is the selected angle minus seven degrees, and the imaging angle for the third exposure is the selected angle plus seven degrees. The imaging angle will be automatically changed between exposures.

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

10.2.2 Taking an exposure

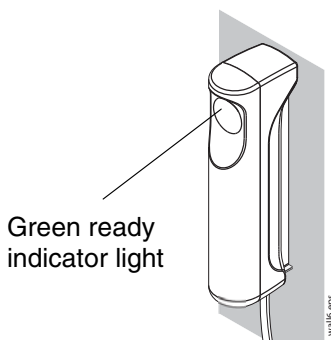
**NOTE** Make sure that you have selected the right patient and the panoramic exposure mode in the Romexis/Dimaxis software program before you take an exposure. Refer to the Romexis/Dimaxis User's Manual.

**NOTE** Images can be saved on a USB memory stick instead of the computer. Refer to section "Imaging without PC (P2600)" on page 58 for more information.



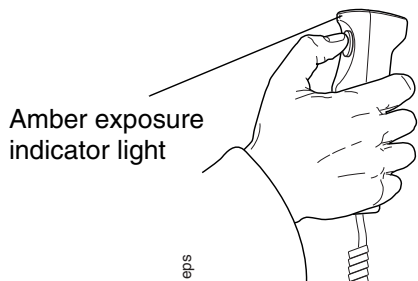
**Green = Ready for exposure**  
 Grey = Not ready for exposure

The status bar at the bottom of the display will turn green when the unit is ready to take an exposure.



On the exposure button a green indicator light will come on. The Romexis/Dimaxis program will show the *Waiting for Exposure* message on the computer screen.

Ask the patient to stand as still as possible.



Move to a protected area.

Press and hold down the exposure button for the duration of the exposure. The C-arm will move three times during the exposure cycle. The radiation warning light on the exposure switch and on the display will come on and you will hear a radiation warning tone. When the C-arm has completed the third exposure cycle the temple supports will automatically open. You can now guide the patient from the unit.

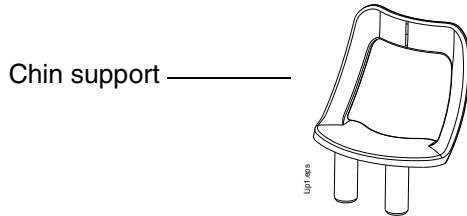
**NOTE** Maintain audio and visual contact with the patient and unit during exposure. If the C-arm stops moving during exposure, or moves in an erratic way, release the exposure button immediately.

**NOTE** If exposures are taken in rapid succession the X-ray tube will overheat and a cooling time will be shown on the display (e.g. Cooling: 21 s). The cooling time indicates the delay before the next exposure can be taken.

When you have taken the exposure the image will be shown on the computer screen. **Note that you must accept the image in the Romexis/Dimaxis imaging program - only accepted images will be stored in the database.** Refer to the Romexis/Dimaxis User's Manual for further information.

# 11 SINUS EXPOSURE

This procedure will produce an exposure of the maxillary sinus along the selected plane.



Use the chin support for this exposure. Insert the chin support into the adapter on the patient support table.

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 unit's arm structures.

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

Select the sinus program you require, refer to section 8.4 "Selecting sinus exposure program" on page 22. Select the patient size as described in section 8.7 "Selecting patient size" on page 30.

Select the imaging position or side as described in section 8.4.1 "Selecting imaging position for sinus exposures" on page 24.

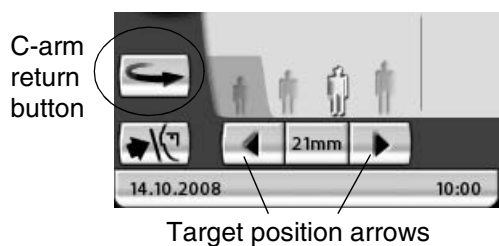
The exposure values will automatically change to correspond with the selected patient size. The preset exposure values are shown in the following table. The preset exposure values are average values and they are only meant to guide the user. If needed, you can change the preset values as described in section 8.8 "Selecting kilovolt and milliampere values" on page 30.

**NOTE** Always try to minimize the radiation dose to the patient.

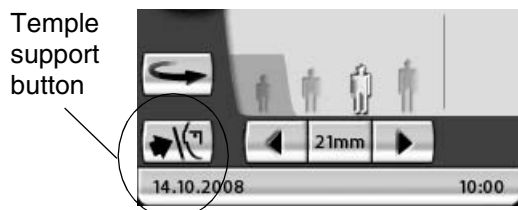
**EXPOSURE VALUES FOR SINUS PROGRAMS**

PATIENT	kV VALUE	mA VALUE
<i>Child</i>	<b>64</b>	<b>7</b>
<i>Small adult</i>	<b>66</b>	<b>7</b>
<i>Average-sized adult</i>	<b>68</b>	<b>7</b>
<i>Large adult</i>	<b>70</b>	<b>7</b>

## 11.1 Patient positioning

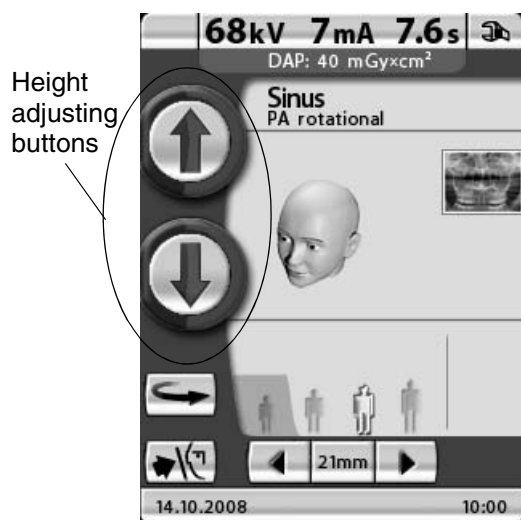


**NOTE** You can set the X-ray unit so that the C-arm will automatically return to the patient entry position at the end of an exposure cycle. Refer to section “Functions after exposure (P2300)” on page 48 for more information.



Touch the temple support button to open the temple supports if they are not already open.

Guide the patient to the unit so that they are facing the chin support.



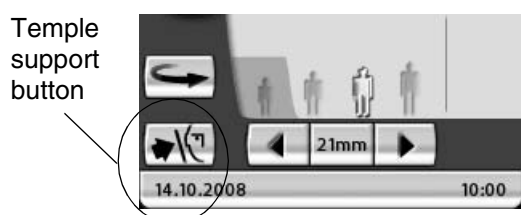
To adjust the height of the unit, press either of the height adjusting buttons on the display until the opening in the chin support is approximately level with the patient's mouth.

The unit moves slowly at first, then faster.



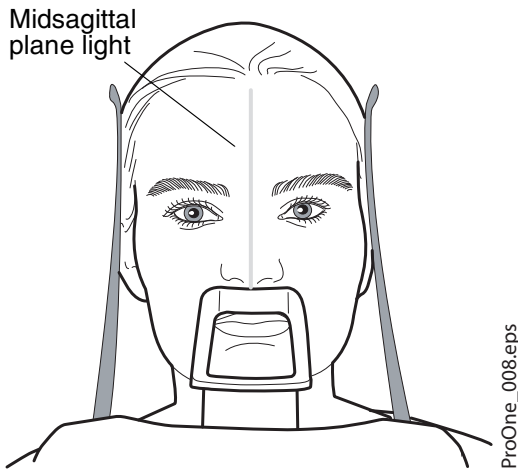
Ask the patient to step forward, grasp the patient handles and press their lips against the chin support. The patient's mouth must be closed.

**NOTE** Patients are not allowed to hang on the patient handles. The pull-down force applied to the patient handles may not exceed 15 kg (33 lb).



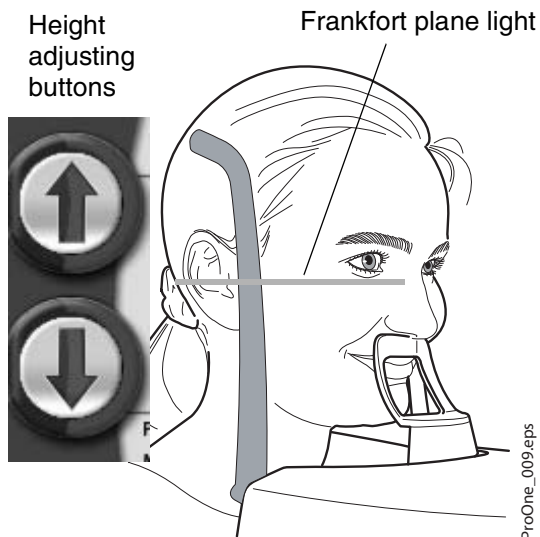
Close the temple supports by touching the temple support button.

Stand behind the patient and check that the patient's shoulders are level and the neck muscles relaxed.



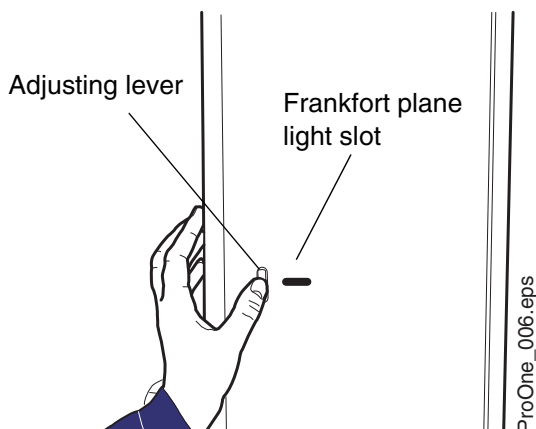
The three patient positioning lights will automatically switch on when you select the exposure program. They will switch off after two minutes. If the lights go out before you have positioned the patient you can touch either of the target position arrows to switch the lights back on.

Position the patient's head so that the midsagittal plane coincides with the midsagittal plane light beam. Make sure that the patient is looking straight ahead as the light may appear to be correctly positioned but the patient's head could be turned slightly to one side.



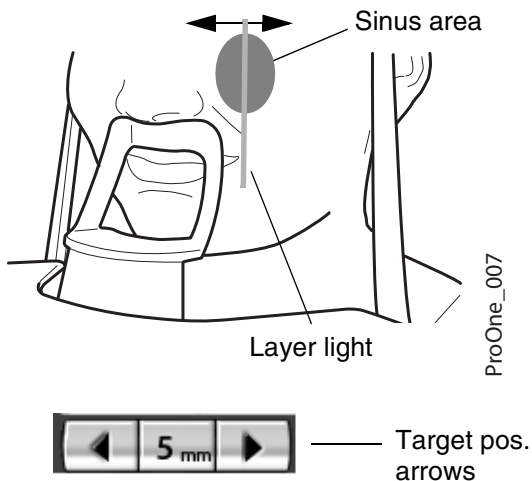
Position the patient's head so that the Frankfort plane coincides with the Frankfort plane light beam.

To do this support the back of the patient's head with your hand and then adjust the tilt of the patient's head by raising or lowering the unit with the height adjusting buttons. The patient's back should be straight. If necessary, stretch and straighten the patient's neck by moving the unit up slightly.



Note that the Frankfort plane light, located on the side of the column, can be moved up or down to accommodate different head sizes. This is done by moving the adjusting lever that is located next to the light slot.





The layer light will be automatically positioned in the region of the maxillary sinus.

For PA exposures you can fine-adjust the position of the layer light manually. To do this, touch and hold either of the target position arrows until the layer light is in the correct position for the exposure you wish to take.

The arrow pointing to the left moves the C-arm forwards and the arrow pointing to the right moves the C-arm backwards. The number in the target position field indicates the position of the layer light and serves as a reference for later retakes.

**NOTE** The layer light is always positioned on the patient's left side, even when taking exposures of the patient's right maxillary sinus.

**NOTE** The layer light position cannot be adjusted for lateral or midsagittal exposures.

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

## 11.2 Taking an exposure

**NOTE** Make sure that you have selected the right patient and the panoramic exposure mode in the Romexis/Dimaxis software program before you take an exposure. Refer to the Romexis/Dimaxis User's Manual.

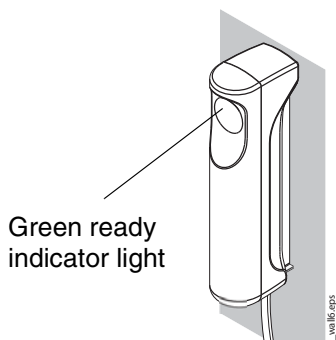
**NOTE** Images can be saved on a USB memory stick instead of the computer. Refer to section "Imaging without PC (P2600)" on page 58 for more information.



The status bar at the bottom of the display will turn green when the unit is ready to take an exposure.

**Green = Ready for exposure**

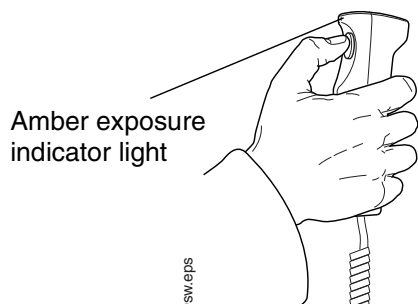
**Grey = Not ready for exposure**



On the exposure button a green indicator light will come on. The Romexis/Dimaxis program will show the *Waiting for Exposure* message on the computer screen.

Ask the patient to stand as still as possible.

Move to a protected area.



Press and hold down the exposure button for the duration of the exposure. The C-arm will move through one complete exposure cycle. During the exposure cycle the radiation warning light on the exposure switch and on the display will come on and you will hear a radiation warning tone. When the C-arm has completed the exposure cycle the temple supports will automatically open. You can now guide the patient from the unit.

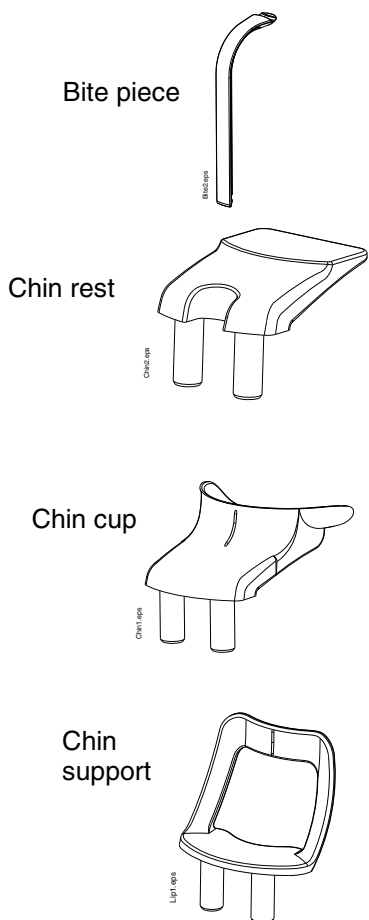
**NOTE** Maintain audio and visual contact with the patient and unit during exposure. If the C-arm stops moving during exposure, or moves in an erratic way, release the exposure button immediately.

**NOTE** If exposures are taken in rapid succession the X-ray tube will overheat and a cooling time will be shown on the display (e.g. Cooling: 21 s). The cooling time indicates the delay before the next exposure can be taken.

When you have taken the exposure the image will be shown on the computer screen. **Note that you must accept the image in the Romexis/Dimaxis imaging program - only accepted images will be stored in the database.** Refer to the Romexis/Dimaxis User's Manual for further information.

## 12 CROSS-SECTIONAL EXPOSURE (OPTIONAL)

This procedure will produce cross section images on the left or right side of the upper or lower jaw.



Use a bite piece for cross section exposures. Insert the chin rest and a bite piece into the adapter on the patient support table.

For edentulous patients or for patients who are unable to use the bite piece you can use the chin cup or the chin support. You may have to place a roll of gauze or cotton between the patient's jaws to raise the upper ridge to the correct position.

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 unit's arm structures.

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

Select the Cross sections program you require, refer to section 8.5 "Selecting Cross sections exposure program (optional)" on page 25. Select the patient size as described in section 8.7 "Selecting patient size" on page 30.

Select the image position parameters (jaw half, jaw side, tooth number/TMJ, collimation, and movement step in the automatic program) as described in section 8.5.1 "Selecting imaging position for cross section exposures" on page 26.

## CROSS-SECTIONAL EXPOSURE (OPTIONAL)

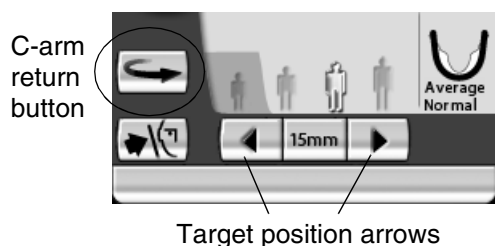
The exposure values will automatically change to correspond with the selected patient size. The preset exposure values are shown in the following table. The preset exposure values are average values and they are only meant to guide the user. If needed, you can change the preset values as described in section 8.8 “Selecting kilovolt and milliamperage values” on page 30.

**NOTE** Always try to minimize the radiation dose to the patient.

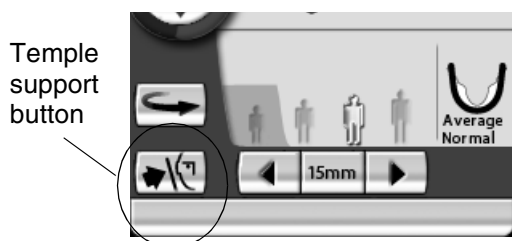
**EXPOSURE VALUES FOR CROSS SECTIONS PROGRAMS**

PATIENT	kV VALUE	mA VALUE
<i>Child</i>	<i>64</i>	<i>7</i>
<i>Small adult</i>	<i>66</i>	<i>7</i>
<i>Average-sized adult</i>	<i>68</i>	<i>7</i>
<i>Large adult</i>	<i>70</i>	<i>7</i>

### 12.1 Patient positioning



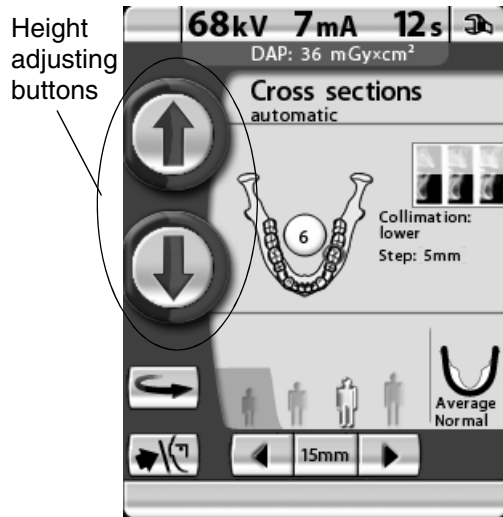
**NOTE** You can set the X-ray unit so that the C-arm will automatically return to the patient entry position at the end of an exposure cycle. Refer to section “Functions after exposure (P2300)” on page 48 for more information.



Touch the temple support button to open the temple supports if they are not already open.

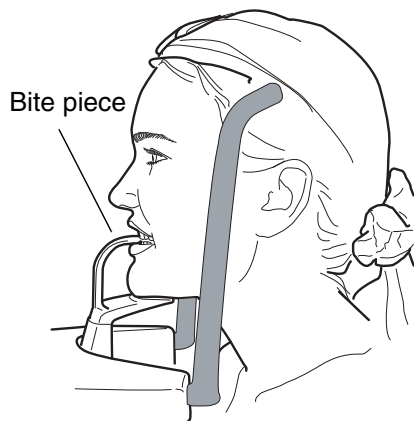
Guide the patient to the unit so that they are facing the chin rest.

## CROSS-SECTIONAL EXPOSURE (OPTIONAL)



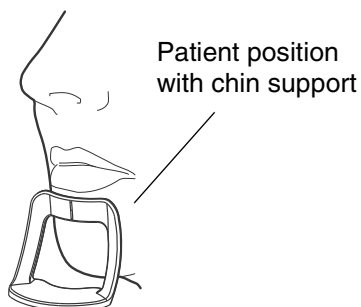
To adjust the height of the unit, press either of the height adjusting buttons on the display until the chin rest is at the level of the patient's chin. Stretch and straighten the patient's neck.

The unit moves slowly at first, then faster.



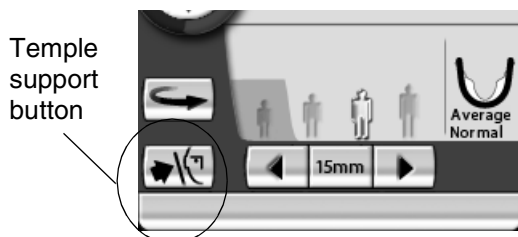
Ask the patient to step forward, grasp the patient handles, stretch up and bite the bite piece. The incisal edges of the maxillary and mandibular teeth must be in the groove in the bite piece.

**NOTE** Patients are not allowed to hang on the patient handles. The pull-down force applied to the patient handles may not exceed 15 kg (33 lb).



**NOTE** If you are using the chin support position the patient so that the chin, just below the lower lip, touches the top bar.

**NOTE** If you are using the chin support or the chin cup use for example a roll of gauze to ensure that the patient's teeth are together.



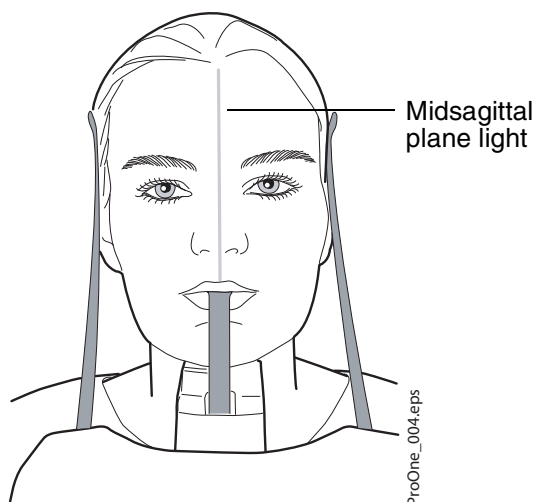
Close the temple supports by touching the temple support button.

The three patient positioning lights will automatically switch on when you select the exposure program. They will switch off after two minutes. If the lights go out before

## CROSS-SECTIONAL EXPOSURE (OPTIONAL)

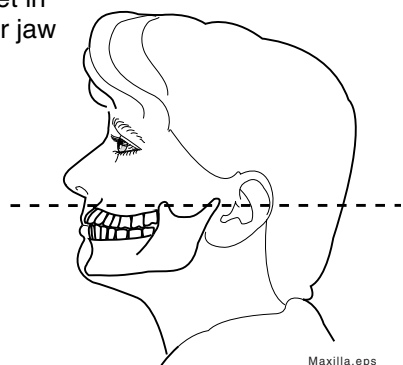
you have positioned the patient you can touch either of the target position arrows to switch the lights back on.

Stand behind the patient and make sure that the patient's shoulders are level and the neck muscles relaxed.



Position the patient's head so that the midsagittal plane coincides with the midsagittal plane light beam. Make sure that the patient is looking straight ahead as the light may appear to be correctly positioned but the patient's head could be turned slightly to one side.

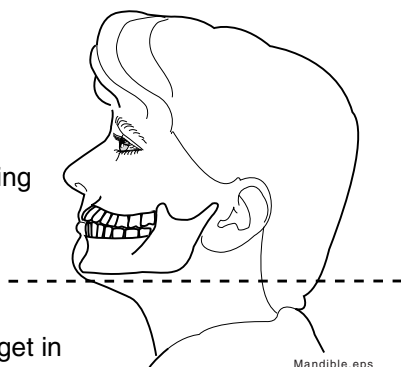
Target in upper jaw



To take exposures of the upper jaw, position the maxillary alveolar ridge so that it is horizontal. To take exposures of the lower jaw, position the lower edge of the mandible so that it is horizontal.

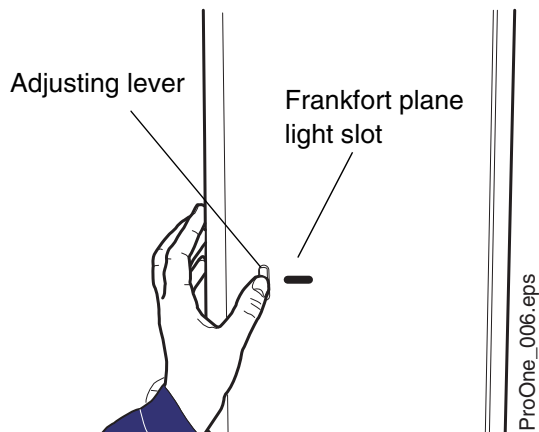
To do this support the back of the patient's head with your hand and then adjust the tilt of the patient's head by raising or lowering the unit with the height adjusting buttons. The patient's back should be straight. If necessary, stretch and straighten the patient's neck by moving the unit up slightly.

Height adjusting buttons

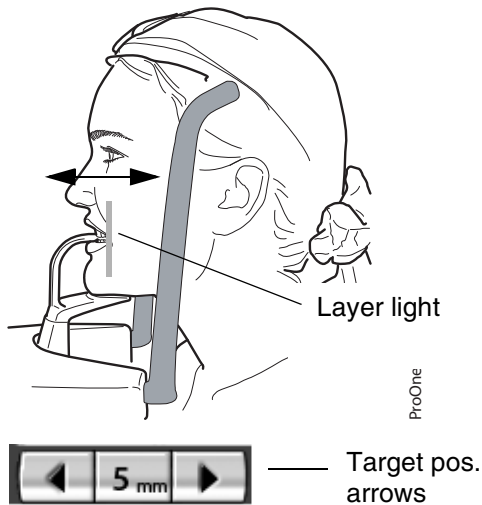


Target in lower jaw

## CROSS-SECTIONAL EXPOSURE (OPTIONAL)



Note that the Frankfort plane light, located on the side of the column, can be moved up or down to accommodate different head sizes. This is done by moving the adjusting lever that is located next to the light slot.



The layer light will be automatically positioned at the selected target position. To fine-adjust the position of the layer light manually, touch and hold either of the target position arrows until the layer light is positioned at the tooth (or TMJ) that you wish to expose.

The arrow pointing to the left moves the C-arm forwards and the arrow pointing to the right moves the C-arm backwards. The number in the target position field indicates the position of the layer light and serves as a reference for later retakes.

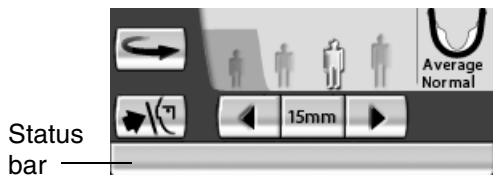
**NOTE** The layer light is always positioned on the patient's left side, even when the target position is on the other jaw side.

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

## 12.2 Taking an exposure

**NOTE** Make sure that you have selected the right patient and the panoramic exposure mode in the Romexis/Dimaxis software program before you take an exposure. Refer to the Romexis/Dimaxis User's Manual.

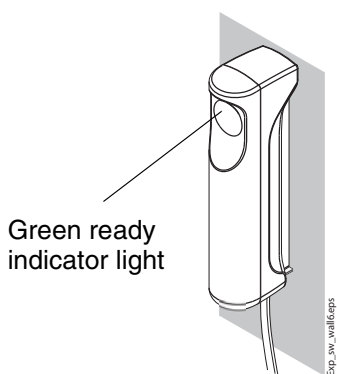
**NOTE** Images can be saved on a USB memory stick instead of the computer. Refer to section "Imaging without PC (P2600)" on page 58 for more information.



**Green = Ready for exposure**

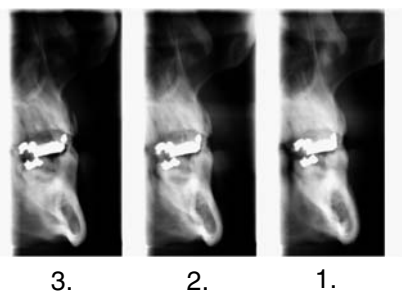
**Grey = Not ready for exposure**

The status bar at the bottom of the display will turn green when the unit is ready to take an exposure.



On the exposure button a green indicator light will come on. The Romexis/Dimaxis program will show the *Waiting for Exposure* message on the computer screen.

### Manual exposure

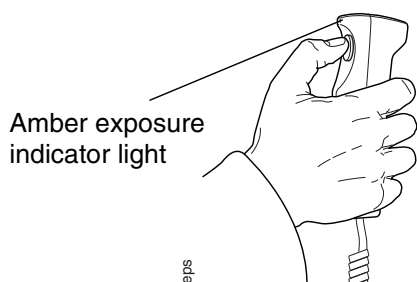


In the manual exposure program you can take 1-3 exposures in one image.

Between exposures you can manually:

- change the exposure values (kV and mA)
- change the target position
- change the position of the patient.

Ask the patient to close their lips on the bite piece, swallow, and remain as still as possible. Tell the patient how many exposures you will take so that they do not move before the end of the exposure cycle.



Move to a protected area.

Press and hold down the exposure button for the duration of the exposure. The C-arm will move through one complete exposure cycle. During the exposure cycle the radiation warning light on the exposure switch and on the display will come on and you will hear a radiation warning tone. The C-arm will then stop and wait for you to take the next exposure.

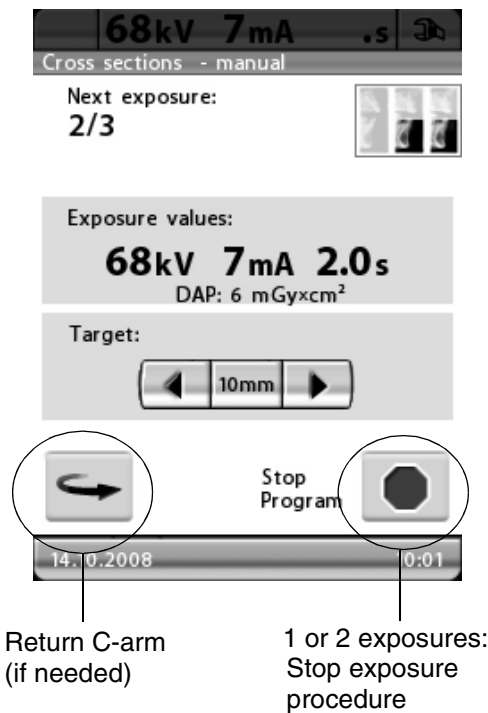


**NOTE** Maintain audio and visual contact with the patient and unit during exposure. If the C-arm stops moving during exposure, or moves in an erratic way, release the exposure button immediately.

Between exposures a display is shown where you can change the exposure values (kV and mA) and move the target position.

To change the exposure values, touch the exposure value field in the middle of the display and select new values on the display that appears.

To move the target position, touch and hold either of the target position arrows until the layer light is positioned at the tooth (or TMJ) that you wish to expose.



The X-ray image in the top right corner shows in which order the images will appear on the radiograph. The active exposure is shown in full colour. The number in the top left corner (2/3 or 3/3) indicates the number of the active exposure.

Take the next exposure in the same way as described above.

You can move the C-arm to the starting position, if it is not already there, by touching the C-arm return button in the bottom left corner.

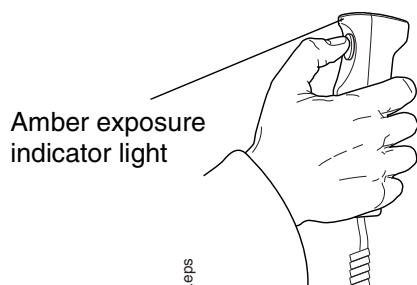
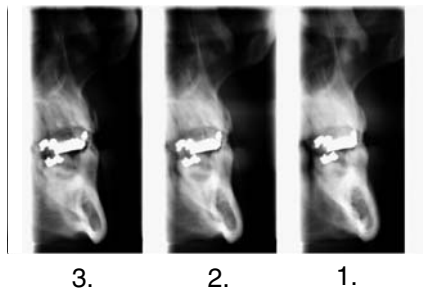
If you take only one or two exposures you will have to stop the exposure procedure by touching the stop button in the bottom right corner.

When you have taken the number of exposures that you require the temple supports will automatically open and you can guide the patient from the unit.

**NOTE** If exposures are taken in rapid succession the X-ray tube will overheat and a cooling time will be shown on the display (e.g. Cooling: 21 s). The cooling time indicates the delay before the next exposure can be taken.

The image will be shown on the computer screen. **Note that you must accept the image in the Romexis/Dimaxis imaging program - only accepted images will be stored in the database.** Refer to the Romexis/Dimaxis User's Manual for further information.

### Automatic exposure



In the automatic exposure program you will get three exposures in one image.

Ask the patient to close their lips on the bite piece, swallow, and remain as still as possible. Tell the patient that the C-arm will rotate backwards and forwards three times so that they do not move before the end of the exposure cycle.

Move to a protected area.

Press and hold down the exposure button for the duration of the exposure. The C-arm will rotate backwards and forwards three times. During the exposure cycle the radiation warning light on the exposure switch and on the display will come on and you will hear a radiation warning tone.

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

At the end of the exposure cycle the temple supports will automatically open. You can now guide the patient from the unit.

**NOTE** If exposures are taken in rapid succession the X-ray tube will overheat and a cooling time will be shown on the display (e.g. Cooling: 21 s). The cooling time indicates the delay before the next exposure can be taken.

The image will be shown on the computer screen. **Note that you must accept the image in the Romexis/Dimaxis imaging program - only accepted images will be stored in the database.** Refer to the Romexis/Dimaxis User's Manual for further information.

## 13 CLEANING

**NOTE** When disinfecting unit surfaces always disconnect the X-ray unit from mains.

All removable patient support parts (bite pieces, chin rest, chin support, chin cup and temple supports) can be autoclaved up to 135°C or cleaned with alcohol-based solutions.

The patient support handles can be cleaned with alcohol-based solutions.

Other unit surfaces, including the control panel display, can be cleaned with a soft cloth damped in a mild cleaning solution.

**NOTE** Do not use cleaning agents in aerosol or spray form directly on unit surfaces.

## 14 SERVICE

To guarantee user and patient safety and to ensure image quality the unit must be checked and recalibrated by a qualified Planmeca service technician once a year or after every 10 000 exposures if this is sooner. Refer to the **Planmeca ProOne Technical Manual** for complete servicing information.

## 15 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 centres, 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.

### Disposal of Planmeca ProOne X-ray unit

X = action, (X) = action in cases where processing is available

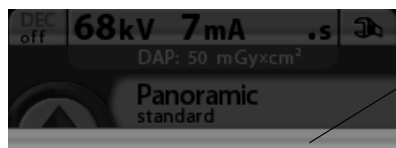
Part	Main materials for disposal	Recyclable material	Waste disposal site	Hazardous waste (separate collection)
<i>Frame covers</i> <i>- metal</i>	<i>Aluminium,</i> <i>galvanized steel,</i> <i>lead</i>	<i>X</i> <i>X</i>		<i>X</i>
<i>- plastic</i>	<i>PUR,</i> <i>other plastics</i>	<i>X</i>	<i>X</i>	
<i>Motors</i>		<i>(X)</i>		
<i>Component boards</i>		<i>(X)</i>		
<i>Cables, transformers</i>	<i>Copper,</i> <i>steel,</i> <i>transformer oil</i>	<i>X</i> <i>X</i>		<i>X</i>
<i>X-ray tube</i>				<i>X</i>
<i>Packing</i>	<i>Wood,</i> <i>cardboard,</i> <i>paper,</i> <i>polystyrene</i>	<i>X</i> <i>X</i> <i>X</i> <i>X</i>		
<i>Sensor head</i>	<i>Return sensor head to Planmeca.</i>			

**Disposal of Planmeca ProOne X-ray unit**

X = action, (X) = action in cases where processing is available

<b>Part</b>	<b>Main materials for disposal</b>	<b>Recyclable material</b>	<b>Waste disposal site</b>	<b>Hazardous waste (separate collection)</b>
<i>Other parts</i>			X	

# 16 HELP MESSAGES



Blue line

### H03-001

The exposure button was released before end of exposure.

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

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. H03-001, blue line at top) will appear on the control panel.

The X-ray unit will not accept any commands from the user until the help message is cleared from the display. Touch the green check mark button to clear the message.



Accept

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

Code	Explanation	Comments
H02-001	Lift motor	Upper limit The X-ray unit cannot be moved any higher. Use the height adjusting buttons (down arrow) to move the unit down.
H02-002		Lower limit The X-ray unit cannot be moved any lower. Use the height adjusting buttons (up arrow) to move the unit up.
H02-003		Temperature The lift motor power supply temperature has reached the upper limit or there is a short circuit. Wait for a few minutes for the lift motor power supply to cool down.
H02-014		Duty cycle The lift motor is overheated. Wait for a few minutes for the lift motor to cool down.
H03-001	Exposure switch	Button released too early The exposure button was released before end of exposure. Press and hold down the exposure button for the entire duration of the exposure.
H03-014	Control panel	Control panel touched The control panel was touched during operation. Operation was interrupted.

Code	Explanation		Comments
H04-001	USB	Communication	The system cannot recognize the connected USB device. Only a USB memory stick can be plugged into the USB port.
H04-003	Ethernet		No network connection. Check the connection and cabling.
H04-021	Imaging program	Status	The imaging program is not ready. Select panoramic exposure in the imaging program (Romexis/Dimaxis).
H04-022	USB	Software update	The software on the USB memory stick is not suitable. Check the software file.
H04-023	USB	Memory stick full	The USB memory stick is full and no more images can be saved to it. Use an empty USB memory stick or, to create free memory space, delete images from the USB memory stick after you have sent the images to a PC.
H05-020	USB	Power supply	The USB power supply current is too high. Only a USB memory stick can be plugged into the USB port. Check that the memory stick is not defective or damaged.
H05-021	Frankfort positioning light		The Frankfort laser power supply current is too high. To replace the Frankfort laser light, contact your service technician.
H05-022	Midsagittal positioning light		The midsagittal laser power supply current is too high. To replace the midsagittal laser light, contact your service technician.
H05-023	Layer light		The layer laser power supply current is too high. To replace the layer laser light, contact your service technician.
H06-001	Emergency stop button	Button activated	The emergency stop button has been activated. All movements of the X-ray unit are blocked, no radiation is generated. Release the emergency stop button to resume normal operation.

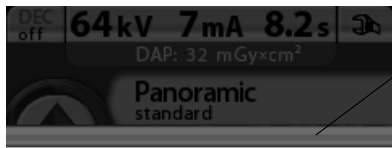
## HELP MESSAGES

Code	Explanation		Comments
H06-003	Dimax sensor	Radiation level	The radiation level on Dimax sensor is below average or factory settings. If necessary, contact your service technician to improve image quality.
H06-004		Beam	The X-ray beam is not symmetrical. If necessary, contact your service technician to improve image quality. The collimator needs to be readjusted.
H06-008		Status	The Dimax sensor is not ready for exposure. Wait for a moment.
H06-009	X-ray tube	Heat capacity	The X-ray tube will overheat with the selected exposure values (kV/mA). Use lower exposure values or wait for the X-ray tube to cool down.
H06-010	Tube head	Temperature	The temperature of the tube head is too high. Wait for a few minutes for the tube head to cool down.
H06-014	DEC	Segmenting	The lower horizontal jaw segment (partial exposure) cannot be selected if DEC (Dynamic Exposure Control) is used.
H06-015	DEC	DEC not available	DEC (Dynamic Exposure Control) cannot be used if only the lower horizontal jaw segment is selected (partial exposure).
H07-002	Licences	Code	The entered licence code was wrong. Check that you have got the correct licence code for the desired feature on this X-ray unit.
H07-003	DEC	Calibration	DEC (Dynamic Exposure Control) is not available. Contact your service technician for help. DEC has not been calibrated.
H07-004		Target value	DEC (Dynamic Exposure Control) calibration value is out of limits. Target value has to fall between 200 and 2000.



# 17 ERROR MESSAGES

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



Red line

## E02-011

Timeout at collimator motor.

Check that the mechanism is not stuck. Then check the collimator motor limit sensor and cable. If necessary, then replace the PSU assembly and perform the preheat calibration again.



Accept



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. E02-011, red line at top) will appear on the control panel.

An error message indicates that the X-ray unit has a problem that needs to be solved before further exposures can be taken. The error message gives instructions to the service technician on what actions to take.

The X-ray unit will not accept any commands from the user until the error message is cleared from the display. Touch the green check mark button to clear the message.

## 18 TECHNICAL SPECIFICATIONS

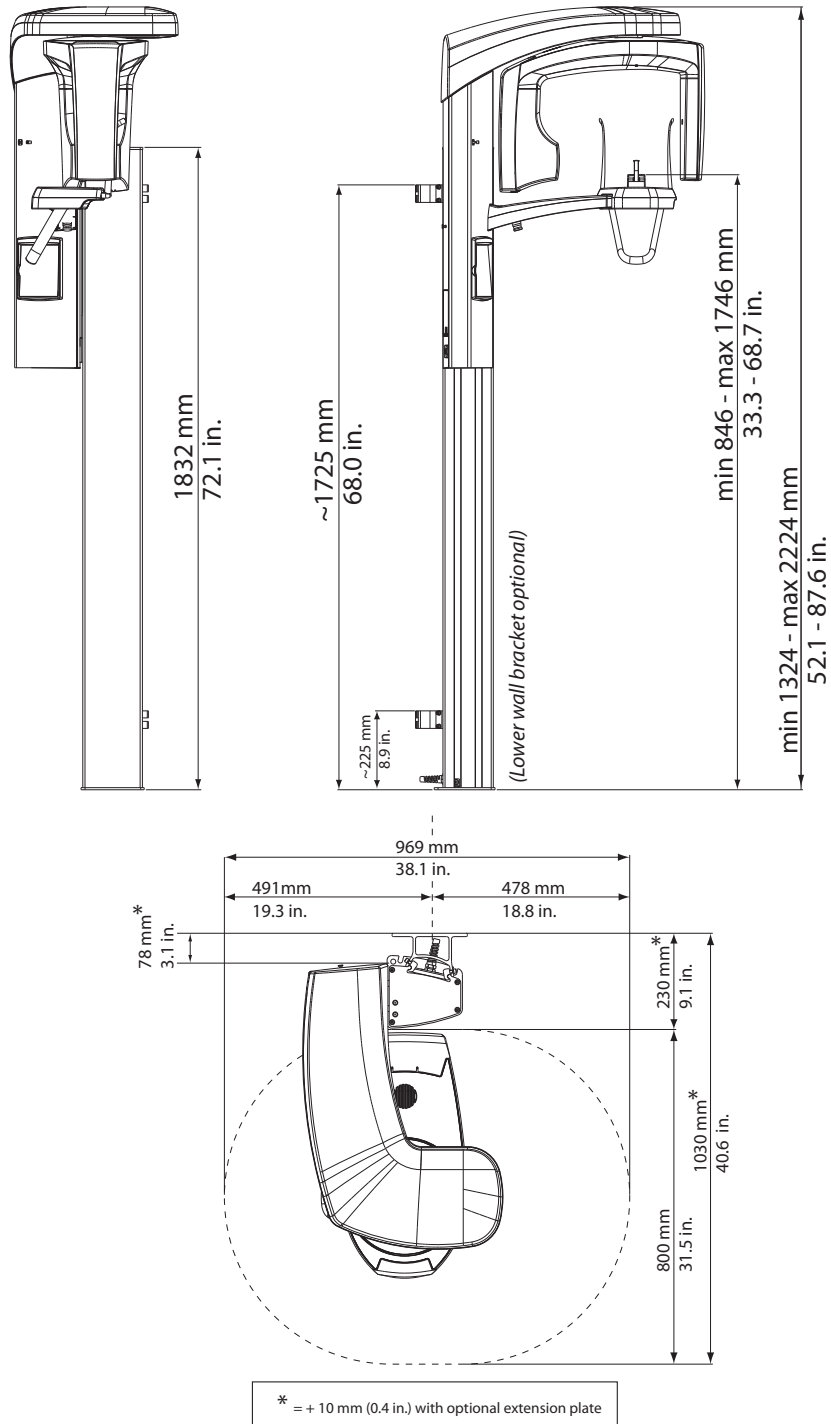
**NOTE** Refer to the Planmeca ProOne Technical Manual for User's Statement.

Generator	Constant potential, resonance mode high frequency 60 - 80 kHz according to IEC 60601-2-7: 1998
X-ray tube	Toshiba D-058SB
Nominal focal spot value	0.5 according to IEC 60336 Ed. 4
Total filtration	min. 2.5 mm Al
Anode voltage	60 - 70 kV $\pm$ 5%
Anode current	2 - 7 mA $\pm$ 10%
Exposure time	1 - 10 s as indicated $\pm$ 10%
Duty cycle for height adjustment	1:10 or 2 min continuous use followed by 18 min not in use
Maximum heat capacity	10 000 kJ
Essential performance (heating/cooling period)	Two consecutive panoramic images using maximum exposure values (70 kV/7 mA)
Cooling period	Automatically controlled
SID	480 mm (19 in.)
Magnification	1.22 - 1.29 (panoramic exposures)
CCD pixel size	33 $\mu$ m
Image pixel size	132 $\mu$ m
CCD active surface	9 x 136 mm (0.35 x 5.35 in.)
Line voltage	100 - 240 V~ / 50 - 60 Hz
Power input	Continuous operation with intermittent loading 845 W intermittent: 1:20 (70 kV, 7 mA, 10 s exposure) 35 W continuous
Line harmonics	According to IEC 61000-3-2 class A
Max. permissible apparent impedance of supply mains	0.5 $\Omega$ (100VAC)
Electrical classification	Class I, type B applied part
Fuses	2 user replaceable fuses F 8A H 250V
Weight	67 kg (148 lb)
Colour	White, RAL 9016
Ambient temperature	Operating +10°C to +40°C storage $\pm$ 0°C to +50°C transport $\pm$ 0°C to +50°C
Humidity	15% - 85%

Original manufacturer

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

18.1 Dimensions



Minimum operational space requirements

	Width	Depth	Height
<b>Planmeca ProOne X-ray unit</b>	<b>1300 mm 51 in.</b>	<b>1300 mm 51 in.</b>	<b>2250 mm 89 in.</b>





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