

# SmartPad

## User & Installation Manual





Copyright

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# 1 Introduction

## 1.1 INTRODUCTION

Instrumentarium Dental Orthopantomograph® OP200 D and Orthoceph® OC200 D are software controlled diagnostic dental x-ray equipments for producing high quality digital images of dentition, TM-joints and skull. An embedded PC with SmartPad touch screen display is connected to the OP200 D/OC200 D unit for image capturing. No additional computer is required.

SmartPad is a full color high resolution LCD display with touch screen interface. The SmartPad produces an easy to read and follow menu with simple and intuitive navigation through the operations.

SmartPad can be used only with Orthopantomograph® OP200 D and Orthoceph® OC200 D digital units. SmartPad can be installed either to the OP200 D / OC200 D unit or to a wall.

SmartNav software provides easy selection of imaging programs, arch sections, lateral scanning start position, and more. SmartNav is used together with OP200 D control panel. The exposure button can be found on the OP200 D control panel. The following operations can be performed with SmartNav, assuming that all the other equipment are ready for use:

- Selection of imaging programs
- Selection of arch sections
- Selection of lateral scanning start position
- Selection of user programs
- Setting of user parameters
- Selection of the patient positioning animation to be showed on SmartPad touch screen to support correct clinical use of OP200 D/OC200 D
- Selection of exposure values
- Preview of exposed x-ray images
- Instant Dynamic help for imaging program purposes
- Complete User Manuals in pdf-format

This user & installation manual covers the usage and installation of SmartPad. Refer to your SmartPad manuals before installing or using the SmartPad and SmartNav software. See your Windows manuals for further information about the Windows environment.

SmartNav works with Windows® XP Professional operating system.



### NOTE!

SmartPad must be installed according to the SmartPad installation manual by a qualified technician. Only trained personnel should be allowed to operate SmartPad.



## 1.2 MARKINGS, GRAPHICS SYMBOLS AND ABBREVIATIONS

The following markings are used in this manual:



### NOTE!

Contains useful information for the reader about the unit and its use.

---



### CAUTION!

Contains important instructions. If these instructions are not observed, malfunction of the unit or damage to the unit or other property may occur.

---



### WARNING!

Contains warnings and instructions about the safety of the unit. If these warnings are not respected, serious risks and injury may be caused to the patient and operator.

---

The following symbols are used in the OP200 D.



Radiographic control



Protective earth (ground)



AC, Alternating current



Attention, consult accompanying documents



If the unit has CE-marking it is CE-marked according to the Medical Device Directive 93/42/EEC.



If the unit has UL-marking, it is UL-marked according to UL60601-1 and CAN/CSA C22.2 No.601.1



This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.



PC	Personal computer
HDD	Hard disk drive
Hz	Hertz; cycles per second
MHz	Millions of hertz
CPU	Central processing unit (computer)
RAM	Random access memory
MB	Mega bytes
GB	Giga bytes
CD-R	Compact disc (read)
CD-RW	Compact disc (read and write)
DVD-RW	Digital Versatile Disc (read and write)
PCI	Peripheral Component Interconnect
LAN	Local Area Network

### 1.3 MAIN LABEL

The type and version of the SmartPad is defined in the main label of the unit located on the bottom of the embedded PC next to the power cord socket. The unit is class I and with IP-20 protection.



Fig 1.1. Location of main label and CE mark

MODEL:

Ser.No:

Date of manufacture:

4A/100-240 V~ 50/60 Hz

IEC 60601-1 IP-20



0537

This product complies with DHHS regulations 21 CFR Subchapter J at the date of manufacture.



MEDICAL EQUIPMENT WITH RESPECT TO ELECTRIC SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL 60601-1, CAN/CSA C22.2 NO.601.1 32ZX

Manufactured by  
Instrumentarium Dental  
Nahkelantie 160  
FI-04300 TUUSULA, Finland

200166



Main label

## 1.4 ACCESSORIES AND PREVENTIVE MAINTENANCE

If SmartPad is installed to a wall, optional 10 m optical cable (part no. 69061) is needed. For ethernet connection use unshielded CAT5/CAT6 LAN cable. These accessories are suitable for use with in the patient environment.



### WARNING!

The LAN cable should be unshielded CAT5/CAT6, so that the chassises will not be connected! Ethernet HUB to which the PC is connected to, should have appropriate safety approvals (e.g. EN 60950, IEC 60950, UL 60950). Check after installation that the IEC 60601-1 leakage current levels are not exceeded.



### NOTE!

In order to maintain safe and correct functioning of OP200 D and SmartPad, only the approved accessories may be used.

It is not allowed to use in the patient environment any other detachable accessories (mouse, keyboard, USB memory stick etc.) during normal operation. During maintenance PS/2 mouse, PS/2 keyboard and all USB accessories, which are approved by Microsoft, are allowed. Driver installation is not allowed.

**WARNING!**

Both SmartPad and OP200 D/OC200 D comply with IEC601-1-1 medical safety standard but in order to the system incorporating also other equipment to comply the standard, EITHER the equipment has to be a medical grade or it has to be located 2 meters apart from the OP200 D/OC200 D unit. The installer and the user of the system shall confirm that at least one of the above requirements is fulfilled. The equipment is medical grade if it complies IEC 601-1 standard and that is indicated in the accompanying documents.

---

## 1.5 MANUFACTURER'S LIABILITY

As a manufacturer we can only assume liability of safe and reliable operation of this unit when

- SmartPad installation was performed according to the SmartPad Installation Manual and
- SmartPad is used according to the SmartPad User Manual
- Maintenance and repairs are performed by a qualified Orthopantomograph® Dealer and
- Original or authorized spare parts are used
- The SmartNav software is installed and used according to the User Manual.

The safe and reliable usage of the product requires that the user has read and followed the instructions and restrictions given in the manual. We recommend qualified serviceman to check the unit to be in its original condition regarding electrical, radiation and mechanical safety according to our maintenance program described in more details in chapter *maintenance*. For more information please contact your local dealer.

If service on the unit is performed, a work order describing the type and extent of repair must be provided by the service technician. This must contain information of changes of nominal data or work range performed. The work order must furthermore indicate the date of repair, the name of the company concerned and a valid signature. User should keep this work order for future references.

**NOTE!**

For PC system: Instrumentarium Dental can guarantee OP200 D PCI board and CliniView software compatibility with other PC hardware and software only if that configuration has been tested by Instrumentarium. Any later changes to the hardware or software may void this test.

---

**WARNING!**

The openings on the enclosures are for air convection. Protect the equipment from overheating. Do not cover the openings!

---



### **WARNING!**

Never insert anything metallic into the openings. Doing so may create a danger of electric shock.

---

## **1.6 DISPOSAL**

Follow all local regulations on disposal of waste parts. At least electronic circuits of SmartPad should be regarded as non-environmental friendly waste products.

## **1.7 MANUAL**

All SmartNav functions can be selected from the graphical symbols on the windows and dialogs. This manual describes the procedure by using graphical symbols. Graphical symbols used stand beside the text.



### **NOTE!**

Touching the screen means pressing the screen with finger once. Clicking means pressing the left mouse button once.

---

## **1.8 GENERAL INSTRUCTIONS**

In order to obtain full advantage of SmartNav, you have to be familiar with the functionality of the operating system.

It is important to use full color high resolution touch screen SmartPad. The SmartPad should be operated in subdued light and strong direct light should not reach the screen.

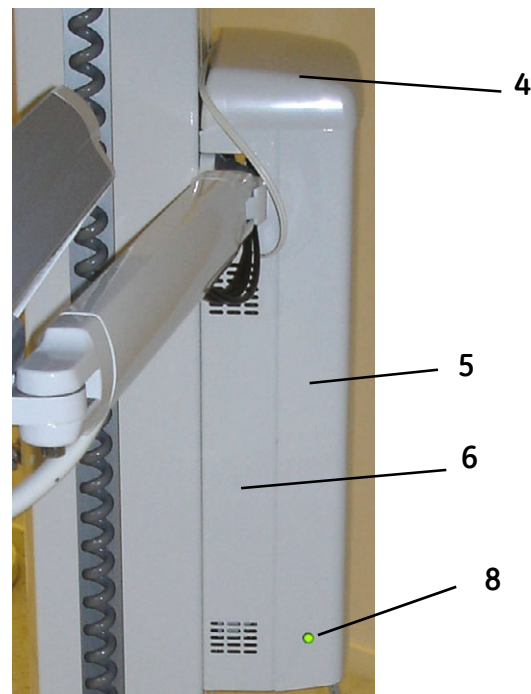
If the equipment is not used for a long time, disconnect it from the mains to avoid damage by transient overvoltage.

## 2 SmartPad main parts



- 1 Embedded PC of the SmartPad (SPC200)
- 2 Supporting arm of the monitor
- 3 SmartPad, touch screen monitor (STP200)

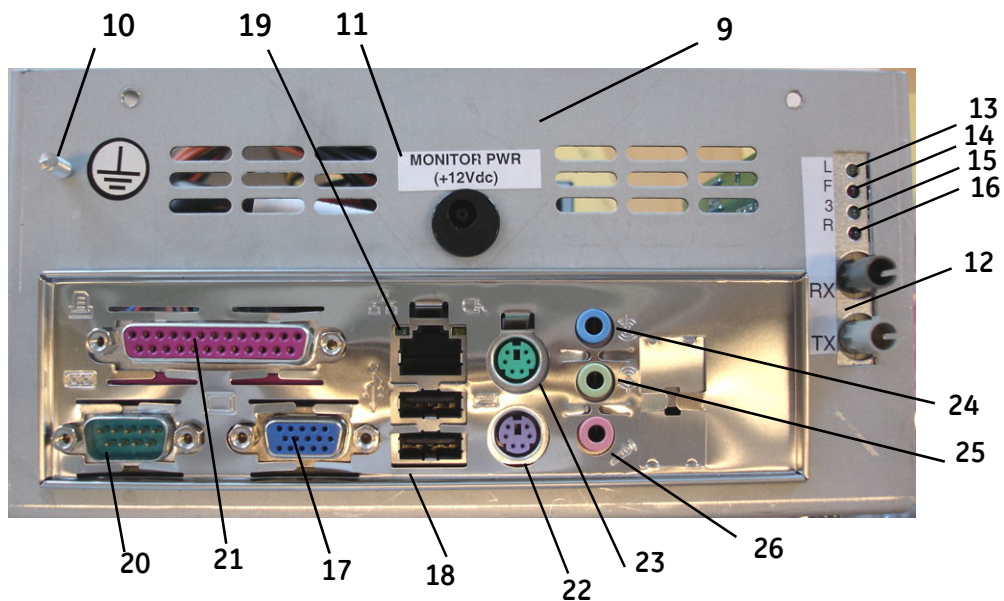
### 2.1 EMBEDDED PC (SPC200)





- 4 Top cover
- 5 Cover plate
- 6 Base plate
- 7 Inner case
- 8 ON/OFF-indicator

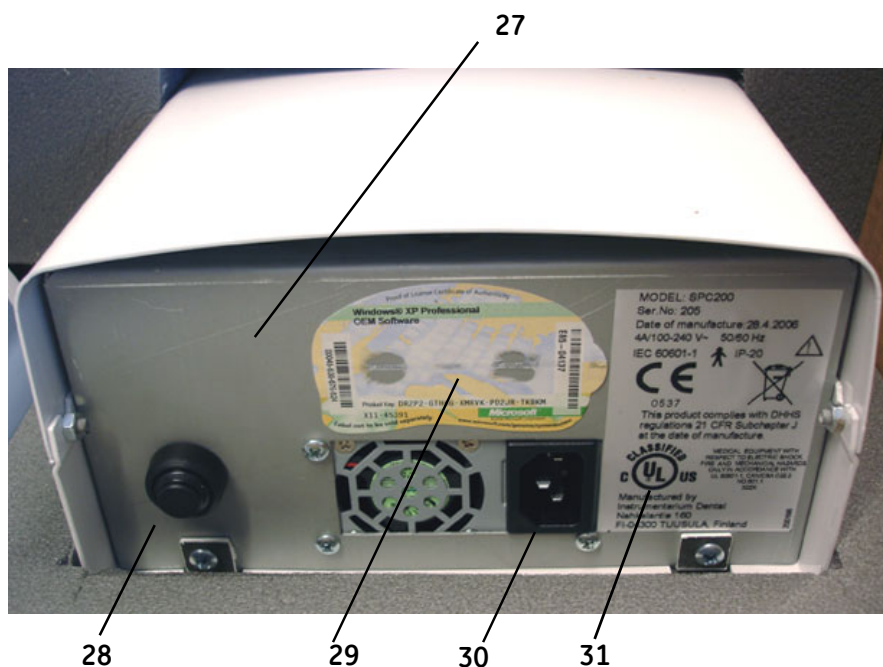
## 2.2 SPC200 FRONT PANEL



- 9 Front panel
- 10 Earth Ground connector (for wall mounting)

- 11 Monitor power connector
- 12 Optical cable connectors (RX and TX)
- 13 Link OK LED
- 14 EEPROM failure LED
- 15 Supply voltages OK LED
- 16 Local reset LED
- 17 VGA connector
- 18 Two USB connectors
- 19 1GB Ethernet connector
- 20 COM1 connector
- 21 LPT connector
- 22 Keyboard connector
- 23 Mouse connector
- 24 Audio in
- 25 Audio out
- 26 Microphone

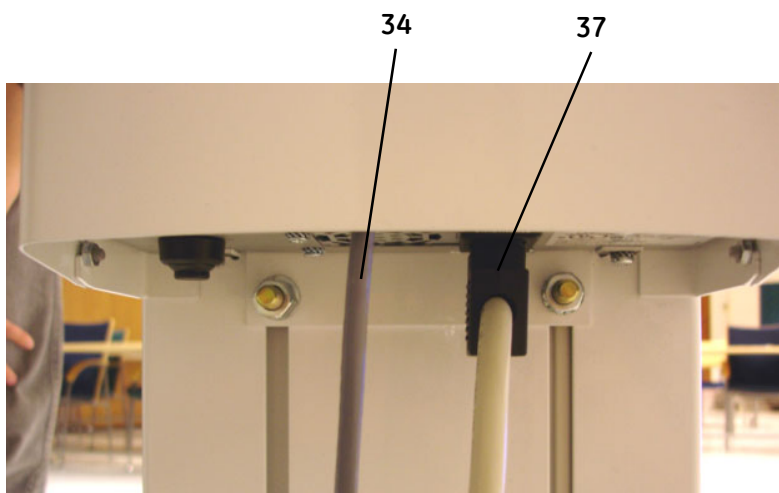
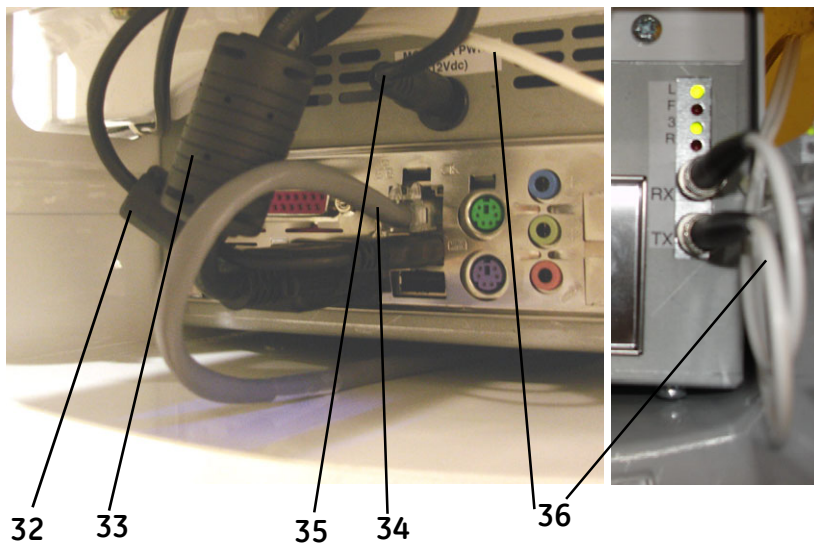
## 2.3 SPC200 REARPANEL



- 27 Rear panel
- 28 ON/OFF-switch
- 29 Microsoft® Windows XP authenticity label
- 30 AC inlet
- 31 Main label



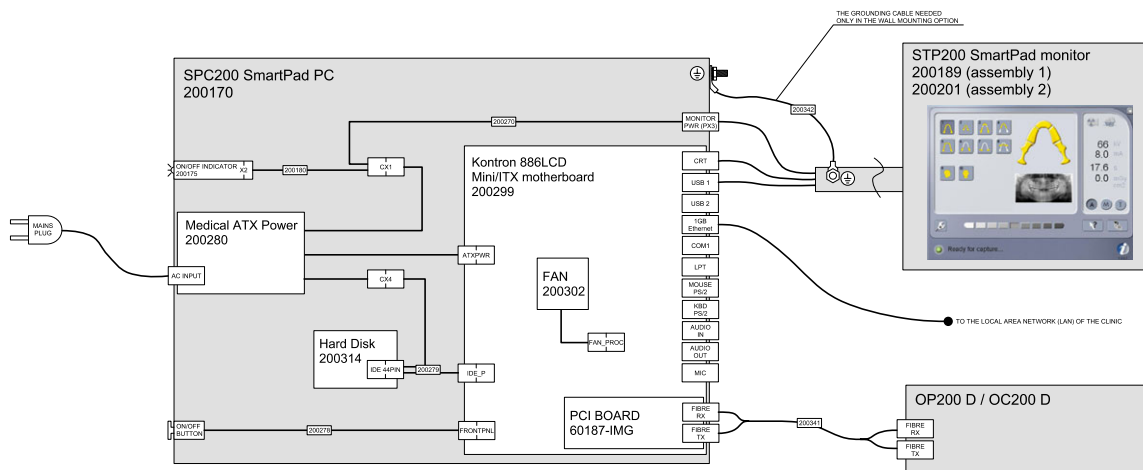
## 2.4 SPC200 CABLING



- 32 STP200 USB cable
- 33 STP200 VGA cable
- 34 Unshielded CAT5/CAT6 Ethernet Cable for LAN connection
- 35 STP200 Power cable
- 36 Optical cable to OP200 D
- 37 Mains cable



## 2.5 WIRING DIAGRAM





## 3 SmartPad installation

### 3.1 GENERAL



#### **WARNING!**

SERVICING AND INSTALLING THIS UNIT WITHOUT ADEQUATE EXPERTISE IS EXTREMELY DANGEROUS. Instrumentarium Dental recommends that all service operations are performed by Instrumentarium Dental authorized service personnel!



#### **WARNING!**

Prevent unauthorized access to unit during the unit installation process. Some internal parts of the unit contain dangerous voltage, which can be reached during the installation, when the unit covers have been removed.

This chapter covers the installation of SmartPad with embedded PC system. As the manufacturer we strongly recommend that you read this manual before installation. For information about how to use the SmartPad, OP200 D unit and CliniView software please refer to the appropriate manuals.

These manuals and future updates will be available on request from Instrumentarium Dental.

As the manufacturer we strongly recommend to read, understand and follow the SmartPad and OP200 D manuals before using this system.

Use only approved cables and plugs.

Mains connector types:

- NEMA 5-15P or similar Hospital grade (US/110 V)

Power supply cord:

- For UL-countries: SJT, 3 x AWG 16/18
- H05VV-F 10-16A 250V (CE)

### 3.2 PREPARATIONS

Switch the power off and remove the back panel.

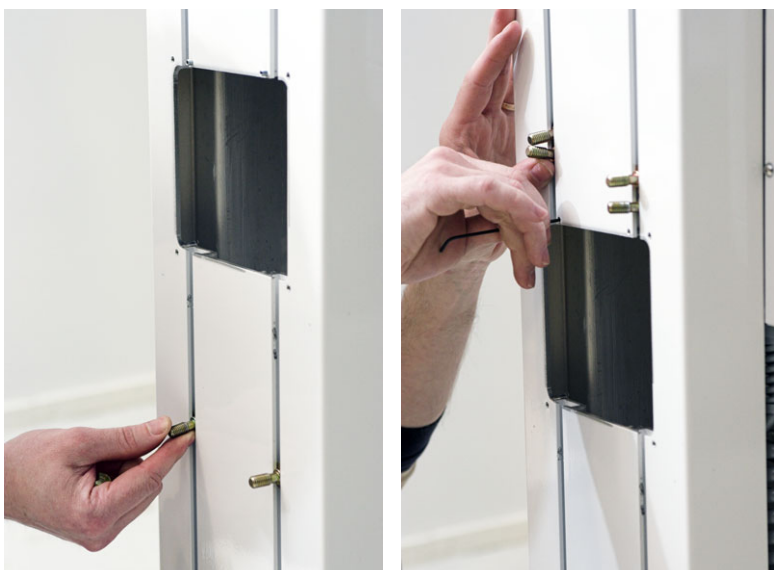
- 1 Switch the OP200 D power off.
- 2 Locate and remove the panel on the back side of the OP200 D column and detach it.
- 3 Unscrew the safety pins from the upper end of the now uncovered opening.



### 3.3 INSTALLATION HEIGHT

Install the bolts for the PC-box, mark and measure the installation height of 960 mm.

- 1 Pass two short M8 bolts (found from the package of the SmartPad unit) into the slots below the opening, one in each.
- 2 Slide four M8 bolts into the grooves above the opening, two in each.
- 3 After installing bolts into the grooves you can re-tighten the safety pins to the slots above the opening, thus preventing the bolts from falling off.
- 4 Measure and mark 960 mm from the base of the OP200 D column (be careful to measure the length from the inside of the support of the column).

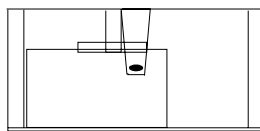




### 3.4 INSTALLATION OF THE SMARTPAD SUPPORT

Attach the SmartPad with support.

- 1 Remove the SmartPad and hinge from the package.
- 2 Decide onto which side of the OP200 D unit you want to have the SmartPad.
- 3 Have the hinge pointing to the decided side and place it on the two middle M8 bolts that were installed in step 2 (the bolts right above the opening).
- 4 Slide the hinge with the bolts to the 960 mm mark (match the hinge's upper edge with the mark).
- 5 Fasten the hinge to the column. Before securing and tightening the hinge, use a bubble level to ensure that the hinge is horizontal. Do not overtighten!



#### **WARNING!**

Maximum torque for the wall bracket mounting nuts of the column (a) is 20 nm/15 ft. lbs. Do not overtight!

- 6 Attach the SmartPad support to the hinge and make sure that the SmartPad is oriented correctly (the wiring should be attached to the bottom part of the display back panel).



### 3.5 INSTALLATION OF EMBEDDED PC

Attach the PC-box.

- 1 Take the PC-box from the package and remove the top cover on it.
- 2 Unscrew the four nuts, located at the both ends inside the box, securing the PC-box cover.
- 3 Lift the PC-box cover off.
- 4 Pass the bolts in the grooves below the opening trough the bolt holes at the lower end of the PC-box.
- 5 Slide the PC-box upwards and pass the SmartPad cables trough the large opening on the top of the PC-box.
- 6 Run the bolts above the SmartPad hinge trough the bolt holes on the upper end of the PC-box. The SmartPad hinge should be inside the opening of the PC-box.
- 7 Secure the PC-box to the column, starting from the bolt at top right corner of the PC-box.



### 3.6 CABLING OF THE EMBEDDED PC

Attach the cables to the PC-box.

- 1 Connect the SmartPad power cable, VGA cable and USB cable to the PC connectors.
- 2 Bring in the optical cables trough the larger opening on the PC-box, from the side that the optical connectors are located.
- 3 Connect the optical cables and secure them trough the catch that is located on the PC-box's side just below the opening.
- 4 If the ethernet connection is needed, plug the LAN cable to the PC socket before putting the PC-box cover on, so the LAN cable can run inside the cover.

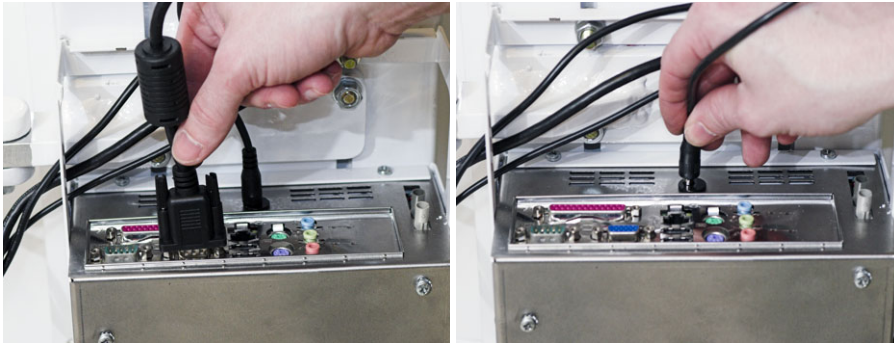


#### **WARNING!**

The LAN cable should be unshielded CAT5/CAT6, so that the chassises will not be connected! Ethernet HUB to which the PC is connected to, should have appropriate safety approvals (e.g. EN 60950, IEC 60950, UL 60950). Check after installation that the IEC 60601-1 leakage current levels are not exceeded.

---

- 5 Place the PC-box cover on and secure it with nuts.



#### **WARNING!**

Never use your LCD if the power cord has been damaged.

---

## **3.7 FINALIZING THE INSTALLATION**

Switch the power on and attach the optical cables to the OP200 D.

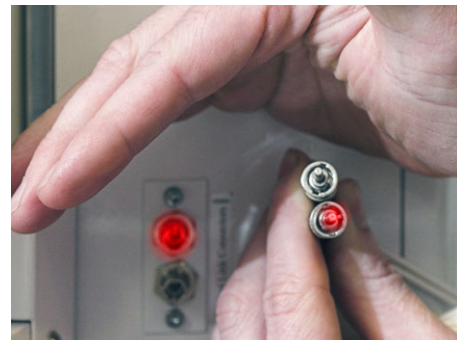
- 1 Attach the power cord to the mains connector located on the bottom of the PC-box.
- 2 Switch the PC on by pressing the button located next to the mains connector on the bottom of the PC-box.
- 3 Now the PC should be on: the SmartPad starts and a green led should be lit on the side of the PC-box.
- 4 Switch on the OP200 D.

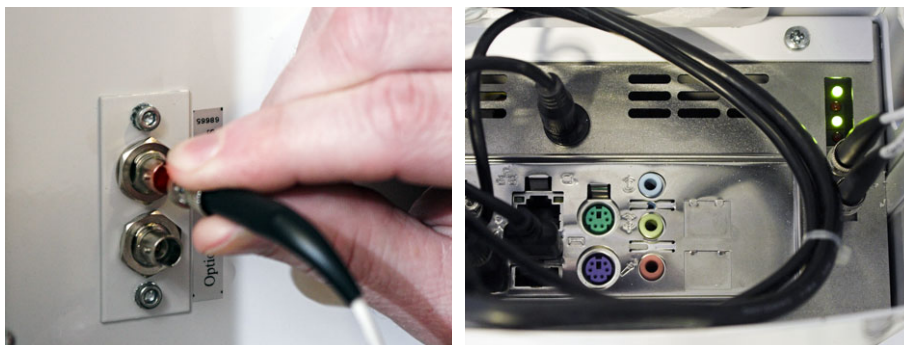


- 5 Check the optical cable jacks and optical cable connectors behind the OP200 D unit. There should be dim red light on one of the connectors on OP200 D and on one of the optical cable jacks.
- 6 Connect the optical cable with the red light to the lightless connector and the lightless cable to the connector with the red light on the OP200 D.
- 7 Second green led should light up on the PCI-card of the PC.
- 8 Put the top cover on the PC-box.
- 9 The SmartPad hardware is now installed.

**NOTE!**



Optical cable is very sensitive for mechanical damages. Route the optics cable properly so that all possible damages shall be avoided. Pay attention to that enough free cable is left for the unit up and down movement.





### 3.8 WALL MOUNTING

SmartPad with embedded PC can also be mounted on a wall. Prior to mounting, locate the supporting material of the wall or a mounting surface and choose the mounting system according to the following examples. Mount the unit so that the upper edge of the supporting arm's bracket is approximately 40 inches (1000 mm) from the floor.

Wall type		Anchor	Thread	Screw	Washer
1	K25 Concrete wall	HSA expansion anchor 	M8		
2	K30 Concrete wall	HKD-S flush anchor 	M8	DIN 912 M8x30	DIN 125-B 8,7
3	Wood frame wall			DIN 571 8x90	DIN 125-B 8,7
4	Steel frame	Installing SmartPad directly to steel framing is not allowed.			

- 1 Wall: The wall and mounting hardware must sustain a pull of 350 lbs./1500N, from each wall bracket bolt.
- 2 Specify the sight of the unit and drill suitable holes according to mounting hardware. Insert plugs if necessary.
- 3 Fasten the mounting bracket loosely to the wall. Level and tighten the wall mounting bracket.
- 4 Repeat the previous steps when installing the PC-box.
- 5 The PC-box and the supporting arm has to be connected with a grounding wire.

**WARNING!**

Connect the grounding wire between the earth ground connector on the front panel of the PC (see chapter *SPC200 FrontPanel*) and a bolt, which is used for mounting the supporting arm.

**NOTE!**

We recommend that when mounting the PC to a wall, the PC is installed so that the ON/OFF indicator is visible.



## 4 Equipment care

### 4.1 CARE INSTRUCTIONS

X-ray imaging systems are sophisticated electronic products including advanced technologies. As such, they have to be handled with a high degree of care. This document gives the care instructions applicable to the SmartPad.



#### NOTE!

It is strictly mandatory to follow these Care Instructions in order to not void the warranty of the product.

---



#### CAUTION!

As a standard recommendation, clean the unit regularly using non-aggressive, mild, commercially available cleaning agents.

---

### 4.2 CLEANING RECOMMENDATIONS

Items and surfaces can be cleaned with soft cloth moistured with disinfective after every usage.



#### WARNING!

Always disconnect SmartPad and OP200 D from mains prior to cleaning or disinfecting the unit.

---



#### CAUTION!

Do not allow water or other cleaning liquids to enter the unit interior since these may cause short-circuits or corrosion.

---

#### 4.2.1 Cleaning

The purpose of cleaning and rinsing is to remove all adherent visible soil (eg. blood, protein substances and other debris), to reduce the number of particulate and micro-organisms, and to reduce the amount of pyrogenic and antigenic material.

Use a cloth moistened in cool-to-lukewarm, soapy water to clean the unit, and prevent coagulation and thus facilitate the removal of protein substances. Then wipe with a cloth moistened in clear water. Mild detergent solution can be used. Use cleaners or solvents, which are listed as allowed cleaning agents below. If you are uncertain of the nature of cleaning agent, do not use it.

Examples of cleaning agents that are allowed or prohibited when cleaning the unit panels:

Allowed: Methanol (metyl alcohol), Soap, Isopropyl alcohol, distilled water.

Not allowed: Bentzene, Chlorine bentzene, Acetone, Acetic ether, agents containing phenol, paracetic acid, peroxide and other oxygen-cleaving agents, sodium hypochlorite and iodine-cleaving agents.

Never use corrosive or solvent disinfectants. All items and surfaces should be dried before next usage.



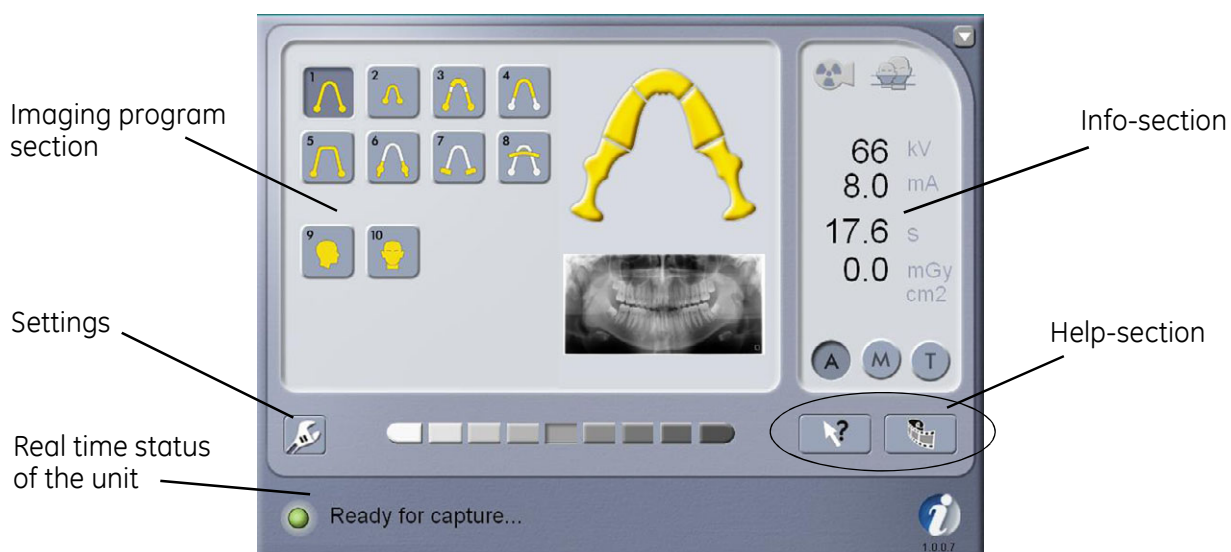
#### **WARNING!**

Do not use any cleaning sprays since the vapor could ignite causing injury.

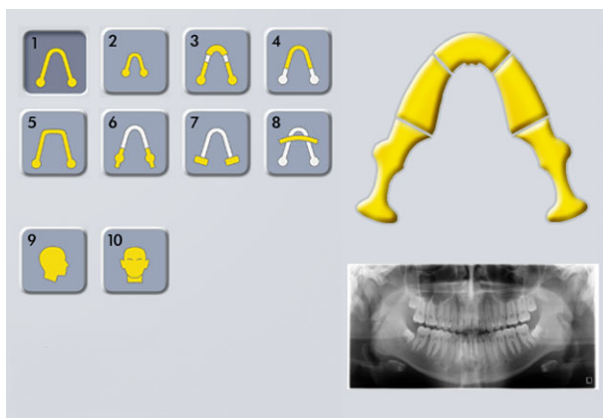
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## 5 SmartNav software

### 5.1 MAIN WINDOW



### 5.2 IMAGING PROGRAM SECTION



In panoramic imaging programs the dental arch and image model are program specific.

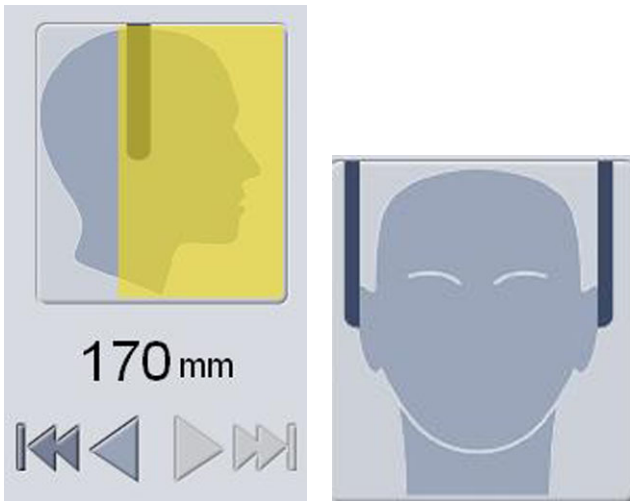


Fig 5.1. Model heads for imaging programs P9 and P10

In cephalometric imaging programs the model head and setting buttons are program specific.

## IMAGING PROGRAMS



Standard Panoramic (P1)



Pediatric Panoramic (P2)



Ortho Zone enhanced Panoramic (P3)



Orthogonal Panoramic (P4)



Wide arch Panoramic (P5)



TMJ lateral projection (P6) or Ortho TMJ, axial corrected lateral projection (optional) (P6)



TMJ, posterior-anterior projection (P7)



Maxillary Sinus View (P8)



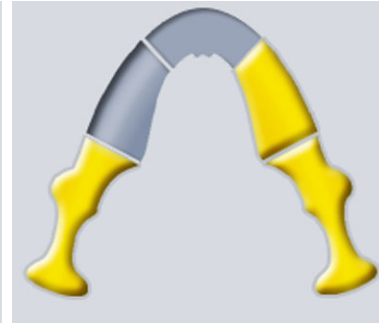
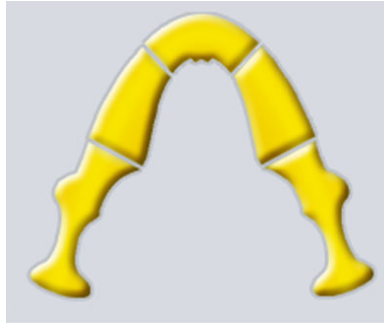


Cephalo lateral projection (P9)



Cephalo PA projection (P10)

## DENTAL ARCH

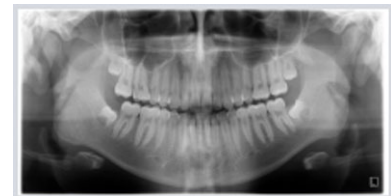


Enabled arch sections in P1.

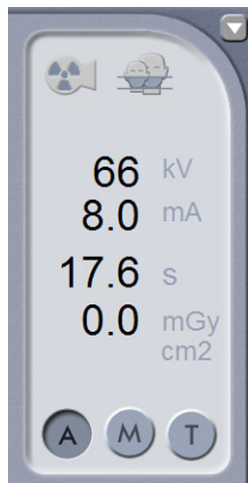
Two sections disabled.

## IMAGE MODEL

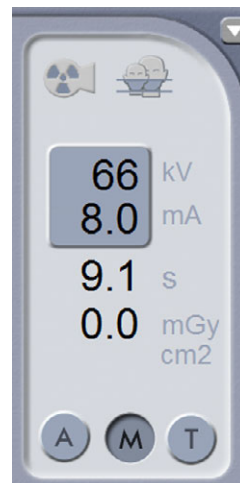
X-ray image model shows the enabled and disabled arch sections from the result point of view.



## 5.3 INFO SECTION



AEC-mode



Manual-mode

## EXPOSURE INDICATORS

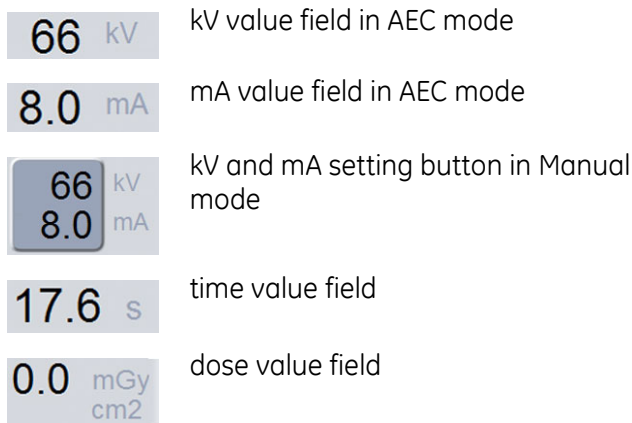


Exposure Indicator symbol

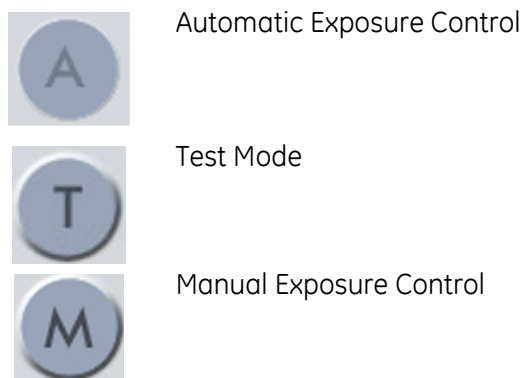


Pediatric Adapter symbol

## EXPOSURE VALUES



EXPOSURE MODES



## 5.4 OTHERS

### GENERAL SETTING



User programs and pdf-format manuals are in the general setting button.

### DENSITY SETTING



9 dose control steps. Default setting is seen in the figure. Dose is decreased when the lighter button is selected. Dose is increased when the darker button is selected.


### ICONS FOR PRE-PROGRAMMED TECHNIQUE FACTORS

Child - Juvenile - Small adult - Adult - Large adult



Dose is decreased when the smaller size icon is selected. Dose is increased when the larger size icon is selected.

## 5.5 REAL TIME STATUS OF THE UNIT

 Ready for capture...

Status field shows when the unit is ready for capturing or any trouble occurs. Green, yellow and blue colour indicates the nature of the status. See chapter *General settings* for more detailed information.

## 5.6 HELP BUTTONS

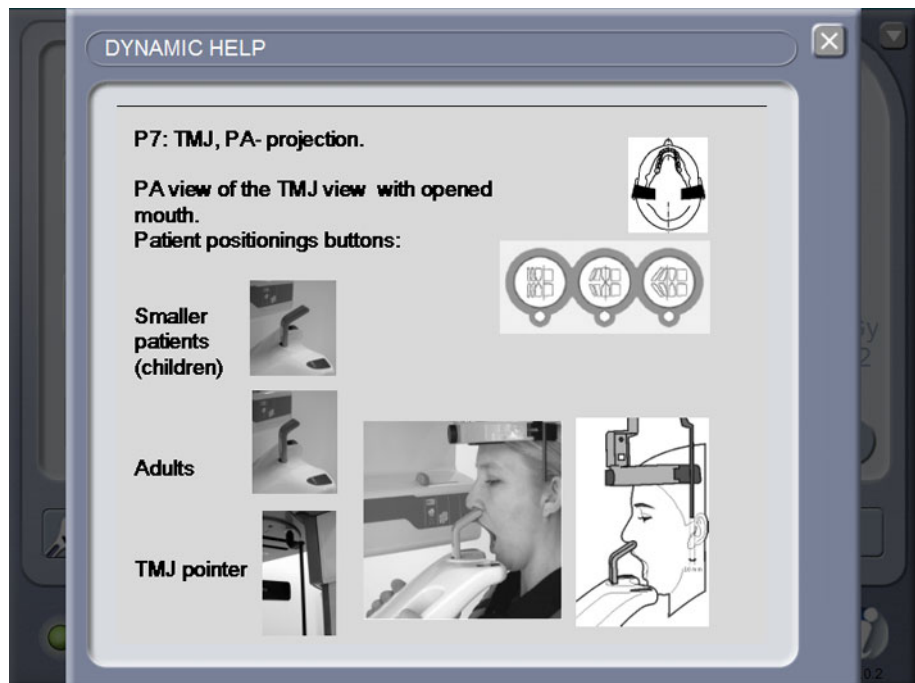


Instant Dynamic Help button



Patient positioning animation button

### INSTANT DYNAMIC HELP



Press the dynamic help button once and then press the imaging program button. The dynamic help dialog is shown on the screen for the selected imaging program.

## PATIENT POSITIONING ANIMATION WINDOW



Selected imaging program can be changed in patient positioning animation window. One patient positioning procedure for one imaging program is composed of several scenes. One patient positioning step can be played by pressing one scene button.



Progress bar shows which animation scene is running on the screen.

## ANIMATION CONTROLS



Half speed button



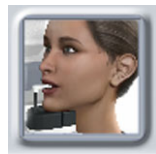
Full speed button



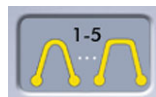
Start of the imaging program animation



Start of the animation scene /  
Step back for one animation scene



Scene button. Pressing the button during playing pauses the animation scene. Re-pressing the button continues the scene.



Button for patient positioning animation of imaging programs P1-P5



# 6 Capturing images



## 6.1 STARTING SMARTNAV

To start the SmartNav Software, click the “i” logo in the floating SmartNav dialog or the SmartNav icon on the desktop, or open the software from Start menu *Programs* ⇒ *SmartNav*.

The keyboard button opens the floating keyboard on the screen.

## 6.2 GENERAL INSTRUCTIONS



### CAUTION!

Do not run other programs while taking x-ray images. The imaging system uses all the resources of the workstation.

- 1 Launch or activate CliniView or other DICC image capturing software. The SmartNav software minimizes itself automatically.
- 2 Select **patient** from CliniView.
- 3 Press the **Start image capturing** button (e.g. in CliniView) or enable the image capturing otherwise.
- 4 SmartNav maximizes itself automatically on the top of the screen. Select the needed imaging program and other settings (e.g. exposure values, modes and density or patient size).
- 5 Position the patient. Use the SmartNav patient positioning animation guide if needed.
- 6 Unit real time status field at the bottom of the screen indicates if the system is warming up and when the system is ready for image acquisition. Message “Ready for capture...” is displayed when system is ready.

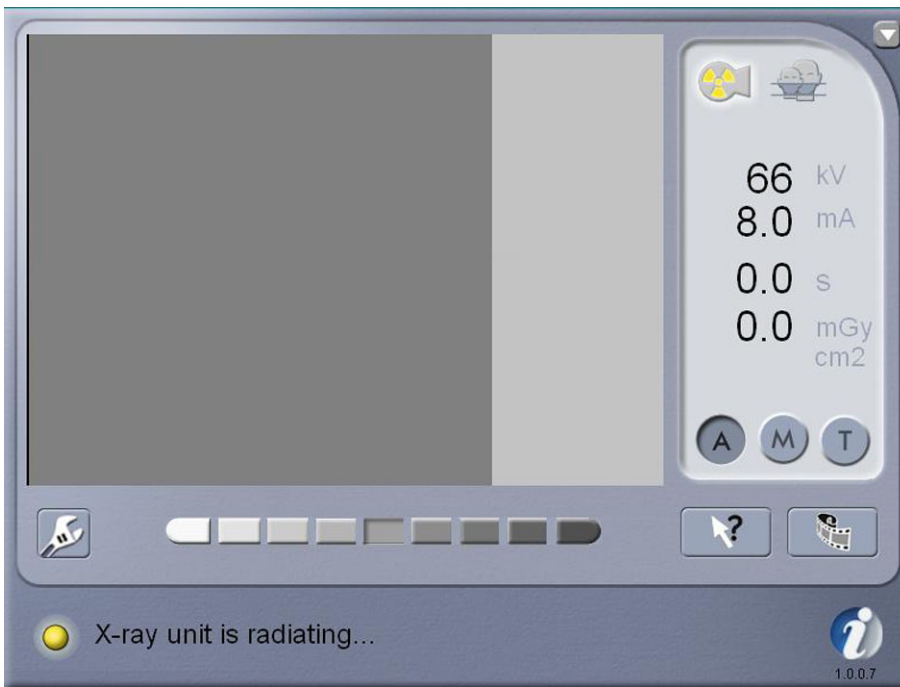


### WARNING!

Turning off the x-ray unit or the workstation during the exposure may cause the image to be lost.



- 7 Press the **exposure** button when the system is in a Ready state. The exposure must be made within the time-out (1...10 min.); otherwise, the image capture time expires. The exposure indicator is lit when exposing. SmartNav status shows “x-ray unit is radiating...”



- 8 SmartNav shows the image preview when exposing and after 2-3 seconds CliniView maximizes itself on the top of the screen showing the final image.

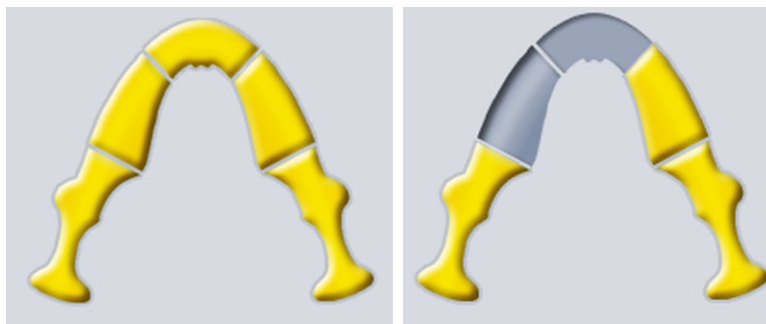
### 6.3 PATIENT POSITIONING ANIMATION

- 1 Select the needed imaging program.
- 2 Press the **patient positioning animation** button.
- 3 The first animation frame of the selected imaging program is the default starting point.
- 4 In the patient positioning animation dialog it is possible to select another imaging program. The first animation frame of the selected imaging program is the default starting point.





## 6.4 TAKING PANORAMIC EXPOSURES



Enabled arch sections in P1. Two sections disabled.

Every imaging program, requires at least one section to be selected. In P8 no sections can be disabled.

Imaging program P6 can be changed from TMJ lateral projection to Ortho TMJ, axial corrected lateral projection (and vice versa) through the service program settings in the control panel.

Auto mode (A) is selected in the imaging programs P1-P5.

Manual mode (M) is selected in the imaging programs P6-P10 and the exposure values can be changed manually.

## 6.5 TAKING CEPHALOMETRIC EXPOSURES

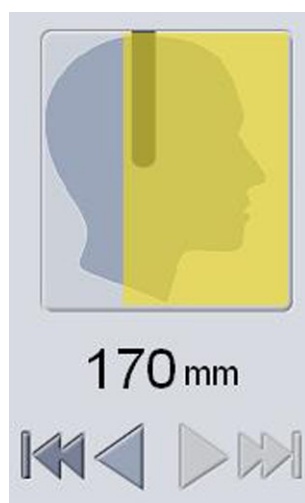


Fig 6.1. Yellow area is the exposure area, which can be adjusted with the arrow buttons.

- 1 The exposure area in cephalometric lateral projection, can be limited with the two large arrow button under the head figure. The exposure area is adjusted 10 mm with one arrow button pressure. The impact of the pressure takes approx. three seconds from SmartNav to the OP200 unit. After a few seconds the the arrow buttons return to enable state.
- 2 Minimum area is 170 mm, which position is 10 mm from behind of the ear rod toward the back of the head.



Maximum area 270 mm



Minimum area 170 mm

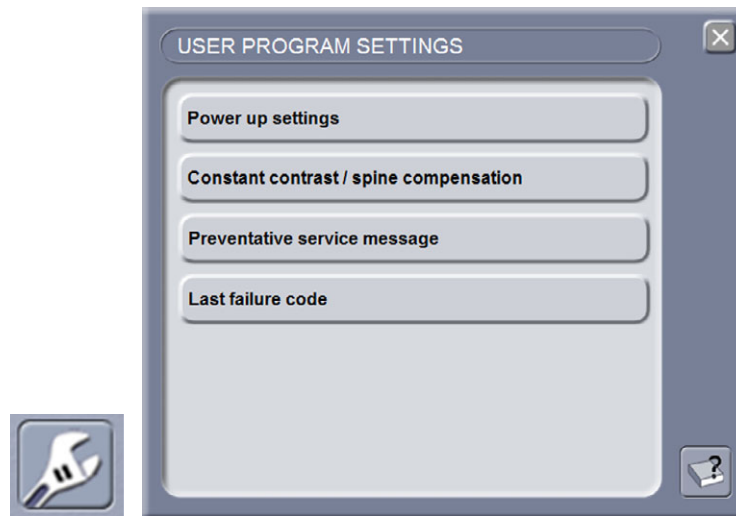
# 7 General settings

## 7.1 USER PROGRAMS

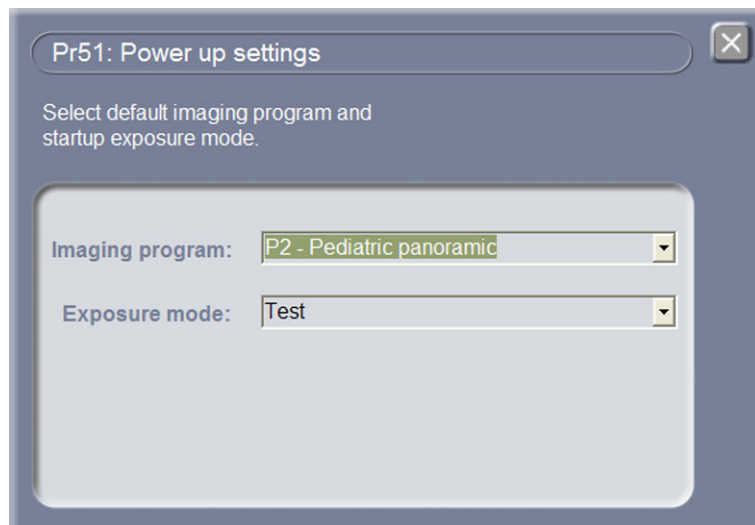


### NOTE!

The user program setting takes effect as soon as the user program settings -dialog is closed.



### POWER UP SETTINGS



Select the imaging program and the exposure mode, which are on when the OP200 D is turned on.

## CONSTANT CONTRAST / SPINE COMPENSATION

Pr52 and Pr58

General dose reference value for all imaging programs: 5.0

	Default kV	Offset	Spine compensation mode
P1	66	0	ASC
P2	66	0	ASC
P3	66	0	ASC
P4	70	0	ASC
P5	66	0	ASC
P6	66	0	
P7	66	1.0	
P8	70	0	
P9	77	0	
P10	77	0	

General dose reference value for all imaging programs is 5.0 as default. Select the Default kV and Offset mode in every imaging program if needed. Spine compensation can be set to P1 - P5 (OFF, LO, HI, ASC).

**"OFF"** disables the spine compensation. It can be selected with pediatric patients. When disabled, the same kV value is used during the exposure cycle.

**"LO"** compensates the spine shadow by one mA-step (Lo = 1). It is selected with most of the patients.

**"HI"** compensates the spine shadow by two mA-steps (Hi = 2). It can be selected with large patients.

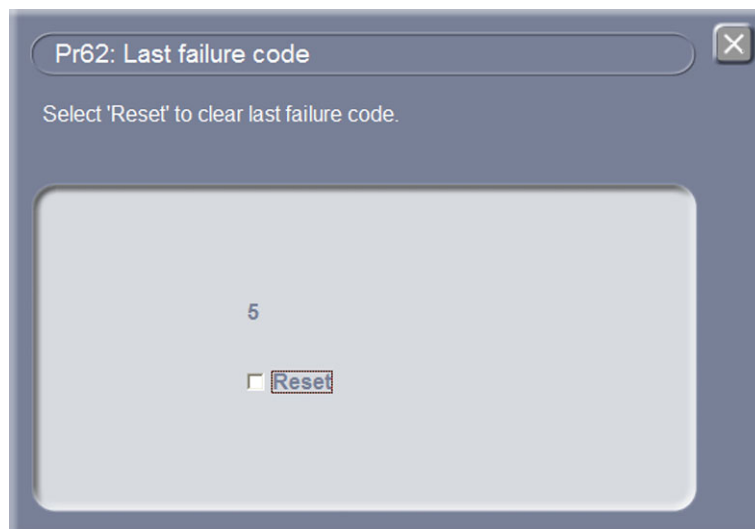
Select **"ASC"** for Automatic Spine Compensation ( $0 < ASC < 2$ ). MA compensation will be determined automatically.

## PREVENTIVE SERVICE MESSAGE



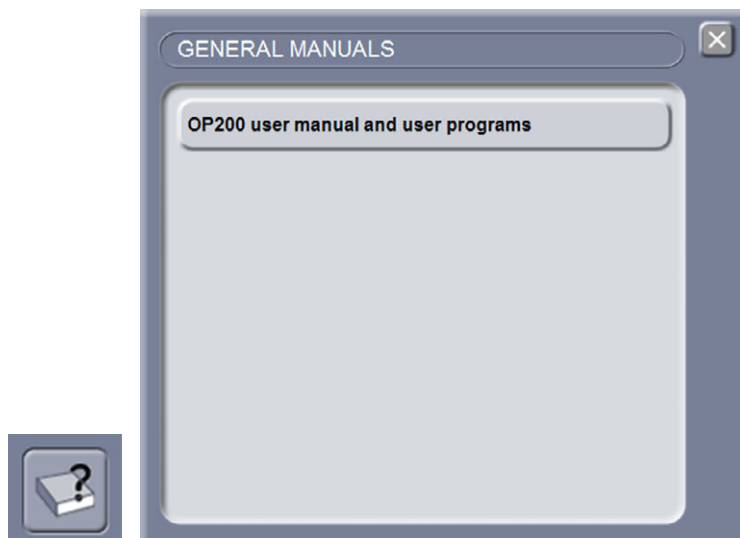
Preventative maintenance reminder can be set ON or OFF as wanted. To reset current counter value to 0, select "Reset maintenance".

## LAST FAILURE CODE



The last failure code can be seen in this dialog. Reset takes effect as soon as the Last failure code -dialog is closed.


## 7.2 GENERAL MANUALS



Manual button opens the general manuals dialog, where it is possible to select one of the provided user manuals. The selected manual is opened in the Adobe Acrobat software, which can be loaded from the Adobe www-site. When using SmartNav, the pdf-manual is staying on the screen behind the SmartNav software, unless the Adobe Acrobat is not separately closed.


## 7.3 MESSAGES

### INFO (GREEN MESSAGES)

 Ready for capture...


- "Ready for capture..."
- "Rotating unit is moving..."
- "X-ray unit is in sequence..."

### RADIATING (YELLOW MESSAGES)

 X-ray unit is radiating...

- "X-ray unit is radiating..."

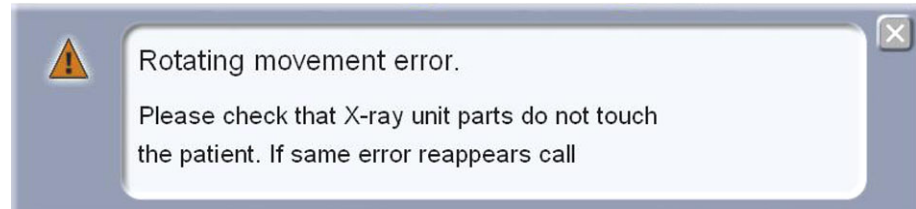
### CHECKS (BLUE MESSAGES)

 Panorama camera not connected or imaging capture not enabled.

- "Panorama camera not connected or imaging capture not enabled."
- "Cephalostat camera not connected or imaging capture not enabled."
- "Please, select correct collimator."
- "Mains line voltage is out of limits."
- "Please, press patient positioning button before taking exposure."
- "Maintenance recommended."
- "Exposure allowed only from remote exposure button."

- "Communication to the workstation failed."
- "Please check cephalostat earholder position."
- "Exposure values out of range."
- "Calculation of dose not possible. Dose will not be displayed."
- "Please check biteplate orientation or remove biteplate."
- "Please wait ## seconds before next exposure."

### WARNINGS (ORANGE MESSAGES)

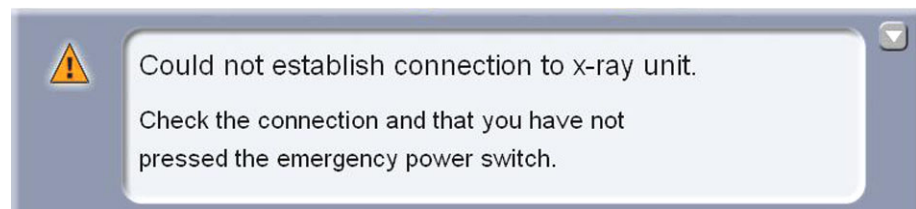


### NOTE!

Message can be closed by clicking CLOSE-button.

- "Tubehead too hot. Cooling time maybe 1 hour or more."
- "Tubehead or generator error during the exposure cycle."
- "Try again. If same problem reappears, call service."
- "Exposure button was released before the end of exposure."
- "Inverter error during exposure."
- "Filament error during exposure."
- "AEC signal missing."
- "EEPROM write failed."
- "Rotating movement error."
- "Please check that X-ray unit parts do not touch the patient. If same error reappears call service."
- "Linear movement error"
- "Carriage up/down movement error."
- "If same error reappears call service."
- "Cephalostat movement error."
- "Cephalostat beam alignment error."
- "Call service to check beam alignment."
- "Please check camera connection."
- "If same error reappears call service."

### ERRORS (LIGHT ORANGE MESSAGES)



### NOTE!

Message cannot be closed, but it can be minimized.

- "CPU processing error. Call service."
- "CPU RAM check error. Call service."
- "CPU ROM check error. Call service."

- "Line voltage error. Call service."
- "Filament board or connection error. Call service."
- "Input error. Please make sure no buttons are pressed during startup. If same error reappears call service."
- "Lease or test exposure limit has been reached. Call service."
- "Could not establish connection to x-ray unit."
- "Check the connection and that you have not pressed the emergency power switch."
- "Could not execute OP -server process. Restart system."



## 8 Trouble shooting

### 8.1 DIAGNOSING IMAGE QUALITY PROBLEMS

PROBLEM	POSSIBLE CAUSE	REMEDY
Images are too light	<ol style="list-style-type: none"> <li>1 Exposure factors used are too low.</li> <li>2 Image adjustments have not been performed.</li> </ol>	<ol style="list-style-type: none"> <li>1 Increase exposure factors</li> <li>2 Adjust the image brightness, contrast and gamma using CliniView software</li> </ol>
Images are too dark	<ol style="list-style-type: none"> <li>1 Exposure factors used are too high.</li> <li>2 Image adjustments have not been performed.</li> </ol>	<ol style="list-style-type: none"> <li>1 Decrease exposure factors.</li> <li>2 Adjust the image brightness, contrast and gamma using CliniView software.</li> </ol>
Lack of image contrast	<ol style="list-style-type: none"> <li>1 kV used is too high.</li> <li>2 Image adjustments have not been performed.</li> </ol>	<ol style="list-style-type: none"> <li>1 Lower the kV value (if possible).</li> <li>2 Adjust the image contrast using CliniView software.</li> </ol>
Images are blurred	<ol style="list-style-type: none"> <li>1 The patient moved</li> <li>2 The X-ray source moved</li> <li>3 Incorrect integration time</li> </ol>	<ol style="list-style-type: none"> <li>1 Prevent patient movement.</li> <li>2 Prevent X-ray unit movement or have the unit serviced.</li> <li>3 Set the integration time in CliniView to be longer than the exposure time.</li> </ol>
Images are bloomed/ burned out	<ol style="list-style-type: none"> <li>1 Excessive exposure time</li> </ol>	<ol style="list-style-type: none"> <li>1 Set shorter exposure time</li> <li>2 Change to a long cone on the X-ray unit.</li> </ol>

### 8.2 DIAGNOSING EQUIPMENT SPECIFIC PROBLEMS

PROBLEM	POSSIBLE CAUSE	REMEDY
OP200 D goes down	<ol style="list-style-type: none"> <li>1 Power failure</li> </ol>	<ol style="list-style-type: none"> <li>1 Turn the OP200 D unit on</li> </ol>
SmartNav goes down	<ol style="list-style-type: none"> <li>1 Power failure</li> </ol>	<ol style="list-style-type: none"> <li>1 Re-start the SmartNav</li> </ol>

PROBLEM	POSSIBLE CAUSE	REMEDY
Power failure	1 Emergency stop switch is used	1 Release the emergency stop switch and turn the unit back on
Image capturing not enabled	1 DICC client (CliniView) is not started	1 Start DICC client and enable image capturing
Unit is not reacting when buttons are pressed	1 SmartNav is in undefined state	1 Re-start the SmartNav 2 Re-start the OP200 D computer and SmartNav
Could not establish connection to x-ray unit	1 Emergency stop switch is used 2 OP200 D power off 3 SmartNav has lost the OP200 D connection	1 Release the emergency stop switch and turn the unit back on 2 Turn the OP200 D unit on 3 Re-start the OP200 D computer
Preview image does not appear on the screen	1 DICC and SmartNav communication failure	1 Capture new image 2 Re-start the SmartNav 1 Re-start DICC client (CliniView)
Image capturing does not get enabled	1 DICC and SmartNav communication failure	1 Capture new image 2 Re-start the SmartNav 1 Re-start DICC client (CliniView)
User program settings do not get updated	1 OP200 D and SmartNav communication problem failure	1 Re-try to do the user program settings 2 Use the OP200 D control panel to do the user program settings

PROBLEM	POSSIBLE CAUSE	REMEDY
Different function is selected than the user pressed on the screen	1 Display calibration incorrect	1 Calibrate the touch screen by using the USB-HID Calibration Tool. 2 Use a stylus for the most accurate calibration.

PCI board LED:s

L:	Link OK
F:	EEPROM failure (red)
3:	Supply voltages OK
R:	Local reset (red)

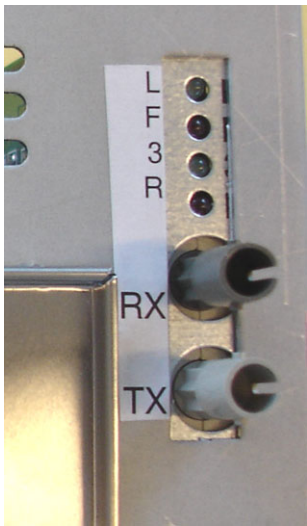


Fig 8.1. PCI board LED:s

## 9 Technical specifications

Manufacturer:	Instrumentarium Dental P.O. Box 20, FIN-04301 Tuusula, FINLAND
Quality system:	In accordance with ISO 9001 standard
Environmental management system:	In accordance with ISO 14001 standard
Electrical & mechanical safety:	According to IEC 601-1, UL and C-UL (File E301913) CE models marked according to the Medical Device Directive 93/42/EEC

Product name:	SmartPad
Model:	SPC200
Product type:	SmartPad Option for OP200 D/OC200 D

Unit data	
Class:	I
Protection:	IP-20
Operation:	Continuous operation
Power supply:	Mains plug connection
First software version:	Release 1.0 dated 1.6.2006 by Instrumentarium Dental
Applied part:	N/A

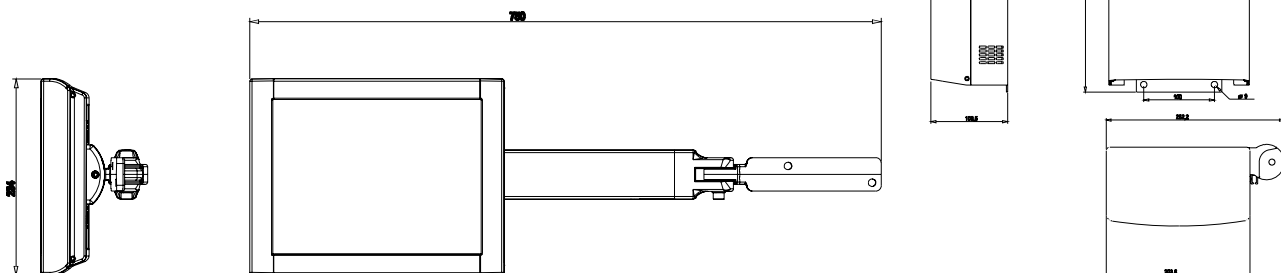
Standards this unit complies with:	IEC 60601-1 UL 60601-1 MDD (93/42/EEC) (if the unit contains CE mark) UL/CSA (file Exxxxxx, if the unit contains UL/CSA mark)
------------------------------------	--

Electrical connections	
Nominal mains voltage:	100-240 VAC full range
Input power frequency:	50 / 60 Hz
Nominal current:	2A @ 230 VAC, 4A @ 110 VAC

Electrical connections	
Fuses:	Inside the power supply
Maximum impedance of main:	1,0 $\Omega$

User interface	
Program and technique factors selection:	SmartNav
Connection to OP200 D:	Optical link
Connection cable (OP200 D - PC):	Optical fibre 1.7 m

SmartPad physical measures:	
Installation:	OP200 D column or wall mount
Height x Width x Depth (mm):	PC: 466 x 204 x 111 mm Monitor with supporting arm: 234 x 750 x 126 mm
Weight:	PC: 5 kg Monitor with supporting arm: 4 kg



Environmental Requirements:	
Operation Temperature range:	+10°...+40°C
Transportation and storage temperature range:	-10°...+50°C
Operating humidity:	Max. 95% RH, non-condensing
Transportation and storage humidity:	Max. 95% RH, non-condensing

<b>Embedded PC system:</b>	
Platform:	Intel Pentium-M / Intel Celeron-M, Mini-ITX
Processor:	Celeron-M 1.3GHz
Chipset:	Intel 855GME and Intel 6300ESB Embedded Chipset
Hard disk:	40GB HDD minimum
CD-ROM:	N/A, use CD-ROM with USB connection
Operating system:	Windows <sup>®</sup> XP
Main memory (RAM):	512 MB
PCI board connection:	PCI slot
Power Supply:	FSP180-50MP, medical ATX
Ethernet:	10/100/1000 Mbps, Realtek

<b>Touch screen monitor:</b>	
Screen size:	12.1"
Technology:	active matrix TFT LCD & resistive touch screen
Resolution:	800 x 600

<b>Minimum requirements for SmartNav:</b>	
Processor:	Pentium 1.3GHz
Hard disk:	20GB HDD
CD-ROM:	Yes
Keyboard:	Yes
Mouse:	Yes
Network card:	10/100 Mbps
Operating system:	Windows <sup>®</sup> XP
Main memory (RAM):	512 MB
PCI board connection:	PCI slot

Orthopantomograph® OP200 D with SmartPad accessory is suitable for use in the specified electromagnetic environment. The purchaser or user should assure that it is used in an electromagnetic environment as described below:		
Emissions Test	Compliance	Electromagnetic Environment
Radio-Frequency Emissions CISPR11	Group 1	Orthopantomograph® OP200 D with SmartPad accessory uses RF energy only for its internal function. Therefore, the RF emission is very low and not likely to cause any interference in nearby electronic equipment.
Radio-Frequency Emissions CISPR11	Class B	Orthopantomograph® OP200 D with SmartPad accessory is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions  IEC 61000-3-2	IEC 61000-3-2 Class D	Orthopantomograph® OP200 D with SmartPad accessory is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Voltage fluctuations/ flicker emissions  IEC 61000-3-3	Complies	Orthopantomograph® OP200 D with SmartPad accessory is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.

Table 9.1 Electromagnetic emissions IEC 60601-1-2 Ed2

Orthopantomograph® OP200 D with SmartPad accessory is suitable for use in the specified electromagnetic environment. The purchaser or user should assure that it is used in an electromagnetic environment as described below:			
Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment
Electrostatic discharge (ESD) IEC 61000-4-2	$\pm 2, 4, 6$ kV for contact discharge $\pm 2, 4, 8$ kV for air discharge	$\pm 2, 4, 6$ kV for contact discharge $\pm 2, 4, 8$ kV for air discharge	Floors are wood, concrete, or ceramic tile, or floors are covered with synthetic material and the relative humidity is at least 30 percent.
Electrical fast transient/burst IEC 61000-4-4	$\pm 2$ kV for power supply lines  $\pm 1$ kV for input/output lines	$\pm 2$ kV for power supply lines  $\pm 1$ kV for input/output lines	Mains power quality is that of a typical commercial and/or hospital environment
Surge IEC 61000-4-5	$\pm 1$ kV differential mode $\pm 2$ kV common mode	$\pm 1$ kV differential mode $\pm 2$ kV common mode	Mains power quality is that of a typical commercial and/or hospital environment.

Table 9.2 Electromagnetic immunity IEC 60601-1-2 Ed2




Orthopantomograph® OP200 D with SmartPad accessory is suitable for use in the specified electromagnetic environment. The purchaser or user should assure that it is used in an electromagnetic environment as described below:

Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5 % $U_T$ (> 95 % dip in $U_T$ ) for 0,5 cycle 40 % $U_T$ (60 % dip in $U_T$ ) for 5 cycles 70 % $U_T$ (30 % dip in $U_T$ ) for 25 cycles < 5 % $U_T$ (> 95 % dip in $U_T$ )	< 5 % $U_T$ (> 95 % dip in $U_T$ ) for 0,5 cycle 40 % $U_T$ (60 % dip in $U_T$ ) for 5 cycles 70 % $U_T$ (30 % dip in $U_T$ ) for 25 cycles < 5 % $U_T$ (> 95 % dip in $U_T$ )	Mains power quality is that of a typical commercial and/or hospital environment. If the user of Orthopantomograph® OP200 D requires continued operation during power mains interruptions, it is recommended that Orthopantomograph® OP200 D with SmartPad accessory is powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields are at levels characteristic of a typical location in a typical commercial and/or hospital environment.
NOTE: $U_T$ is the a.c. mains voltage prior to application of the test level.			

Table 9.2 Electromagnetic immunity IEC 60601-1-2 Ed2

Orthopantomograph® OP200 D with SmartPad accessory is suitable for use in the specified electromagnetic environment. The purchaser or user of the Orthopantomograph® OP200 D with SmartPad accessory should assure that it is used in an electromagnetic environment as described below:

Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment
<p>Conducted RF IEC 61000-4-6</p> <p>Radiated RF IEC 61000-4-3</p>	<p>3 V150 kHz to 80 MHz</p> <p>3 V/m 80 MHz to 2,5 GHz</p>	<p>[ V<sub>1</sub> ] 3 V</p> <p>[ E<sub>1</sub> ] 3 V/m</p>	<p>Portable and mobile RF communications equipment are used no closer to any part of Orthopantomograph® OP200 D with SmartPad accessory, including cables, than the recommended separation distance calculated from the equation appropriate for the frequency of the transmitter.</p> <p><b>Recommended Separation Distance:</b></p> $d = \left[ \frac{3,5}{V_1} \right] \sqrt{P}$ $d = \left[ \frac{3,5}{E_1} \right] \sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$ $d = \left[ \frac{7}{E_1} \right] \sqrt{P} \quad 800 \text{ MHz to } 2,5 \text{ GHz}$ <p>Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,* are less than the compliance level in each frequency range.** Interference may occur in the vicinity of equipment marked with the following symbol:</p> 

\*Field strengths from fixed transmitters, such as base stations for cellular telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast cannot be estimated accurately. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be performed. If the measured field strength exceeds the RF compliance level above, observe Orthopantomograph® OP200 D with SmartPad accessory to verify normal operation in each use location. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating of the system.

\*\*Over the frequency range 150 kHz to 80 MHz, field strengths are less than [V<sub>1</sub>] V/m.

**The Recommended Separation Distances are listed in the next table.**

**Note:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

Table 9.3 RF immunity of non-life-support equipment or system IEC 60601-1-2

**NOTE!**

This equipment generates, uses and can radiate radio frequency energy. If not installed and used in accordance with this manual, it may cause harmful interference to radio communications. Portable and mobile RF communications equipment can also affect the performance of OP200 D and SmartPad.

<b>Recommended Separation Distances for Portable and Mobile RF Communications Equipment IEC 60601-1-2</b>			
Frequency of Transmitter	150KHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2,5 GHz
Equation	$d = [\frac{3,5}{V_1}] \sqrt{P}$	$d = [\frac{3,5}{E_1}] \sqrt{P}$	$d = [\frac{7}{E_1}] \sqrt{P}$
Rated Maximum Output Power of Transmitter (watts)	Separation Distance (meters)	Separation Distance (meters)	Separation Distance (meters)
0,01	0,12	0,12	0,23
0,1	0,37	0,37	0,74
1	1,17	1,17	2,34
10	3,69	3,69	7,38
100	11,67	11,67	23,34

Fig 9.1. Table 4

**USE LIMITATION:***External components*

The use of accessories, transducers, and cables other than those specified may result in degraded ELECTROMAGNETIC COMPATIBILITY of the EQUIPMENT and/or SYSTEM

**INSTALLATIONS REQUIREMENTS & ENVIRONMENT CONTROL :**

*In order to minimize interference risks, the following requirements shall apply.*

*Cables shielding & grounding*

All interconnect cables to peripheral devices must be shielded and properly grounded. Use of cables not properly shielded and grounded may result in the equipment causing radio frequency interference.

### *Stacked components & equipment*

*The Orthopantomograph® OP200 D with SmartPad accessory should not be used adjacent to or stacked with other equipment; if adjacent or stacked use is necessary, the Orthopantomograph® OP200 D with SmartPad accessory should be observed to verify normal operation in the configuration in which it will be used.*

### *Electrostatic discharges environment & recommendations*

In order to reduce electrostatic discharges interferences, the floor material shall be a dissipative material, versus the electrostatic charge stacking. The relative humidity shall be at least 30 percent. The dissipative material shall be connected to the system ground reference.

# 10 Maintenance

Orthopantomograph® OP200 D with SmartPad accessory is designed to provide reliable performance and many years of customer satisfaction. In order to assure safe performance of this X-ray system, a preventative maintenance program must be established. It is the owner's responsibility to supply or arrange for this service. Consult your Orthopantomograph® dealer to arrange for this service.

## 10.1 MAINTENANCE SCHEDULE

Maintenance service for SmartPad is suggested at installation and at the same time with OP200 D maintenance. This periodic maintenance is outlined in *OP200 D Maintenance Manual*.

These maintenance procedures require the services of a qualified technician. In addition to periodic maintenance any deviation from normal performance should be immediately reported to your dealer and the equipment should be unplugged. These include:

- The power cord or plug is damaged
- The equipment has been exposed to moisture
- Liquid has penetrated into the system
- The equipment doesn't work correctly
- The equipment has been dropped
- The equipment has signs of breakage
- If there are any unusual sounds or smells coming from the equipment



### **WARNING!**

SERVICING THIS SYSTEM WITHOUT ADEQUATE EXPERTISE IS EXTREMELY DANGEROUS. Instrumentarium Dental recommends that all service operations are performed by Instrumentarium Dental authorized service personnel!

## 10.2 MONTHLY INSPECTION BY USER

The user must perform monthly the following inspections:

- Visually check that all visible labels are intact and legible
- Visually check that the exposure indicator is lit for the duration of exposure
- Check that exposure terminates and an error code is displayed on screen when prematurely releasing the exposure button
- Check all the functions of the SmartNav

## 10.3 PREVENTIVE MAINTENANCE PROGRAM

- Open the PC chassis and clean off all dust
- Check that both the power supply fan and the CPU cooler fan are working properly
- Check that all screws are tightened and all cables are visually in order
- Check that the unit is well fixed to the column / wall

- Check the grounding from the LCD panel to the PC mains inlet and the OP200 D chassis. Resistance must be less than 0.2 Ohms
- Verify that the OP vertical carriage is not able to hit the display supporting arm
- Check that appropriate operating system update is installed and virus definitions are up to date
- Do a complete system backup
- Calibrate the touch screen with a stylus by using the HID Calibration Tool

## 10.4 TOUCH SCREEN CALIBRATION AND OSD

Run the program; Figure 10.1. shows the first menu. Click the calibrate button to start the screen coordinates configuration.

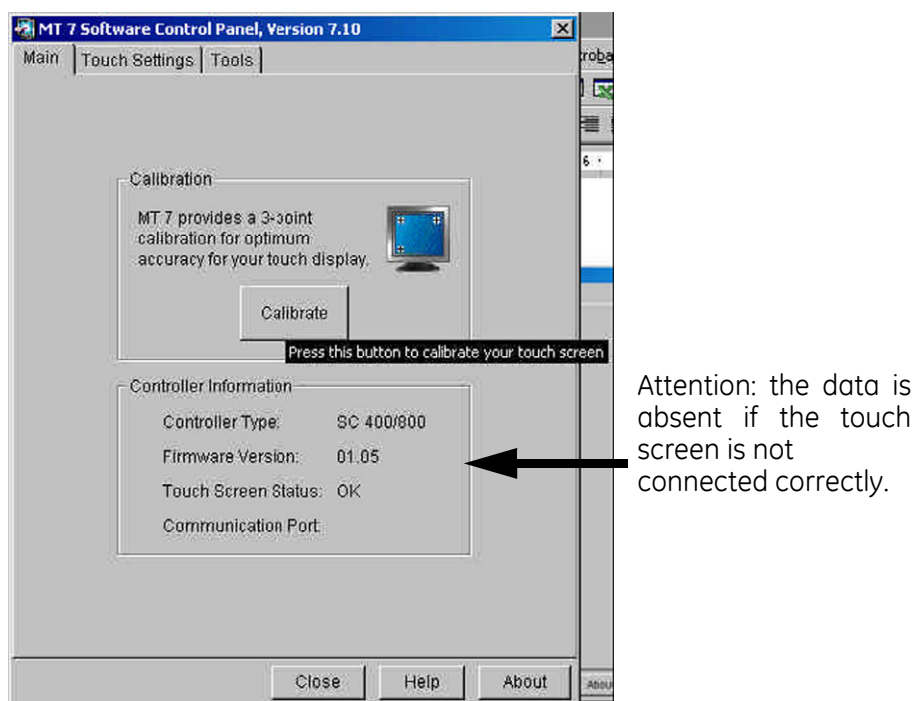


Fig 10.1. Initial menu

The calibration procedure starts by pressing with a finger or a stylus on the green point on the screen. If the pressing is correct, the point becomes red.

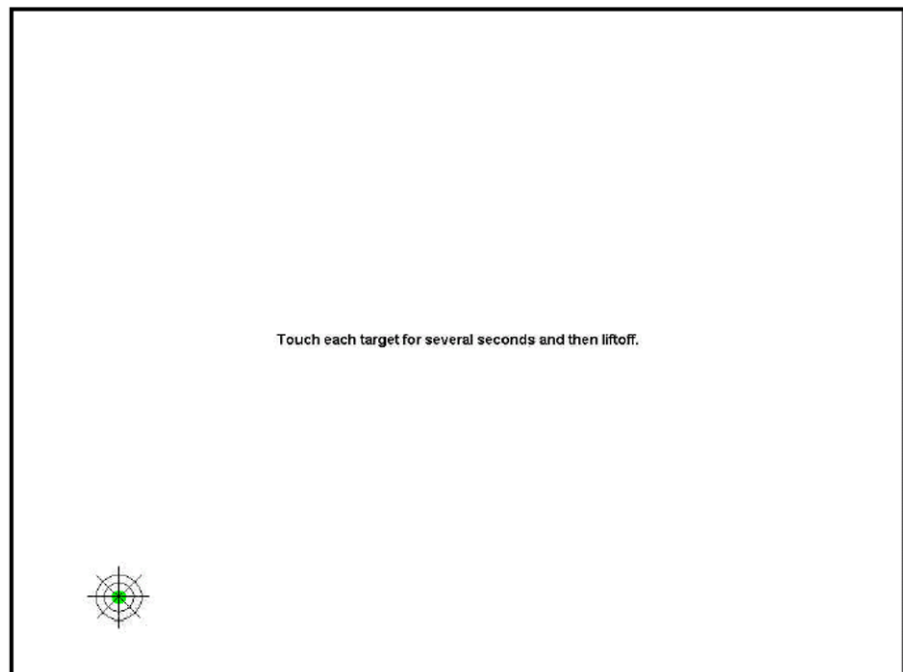


Fig 10.2. Step 1

Press on the second point and proceed as in the first step, as shown in the fig. 10.3. Repeat the same procedure for position three.



Fig 10.3. OK



Fig 10.4. Step 2

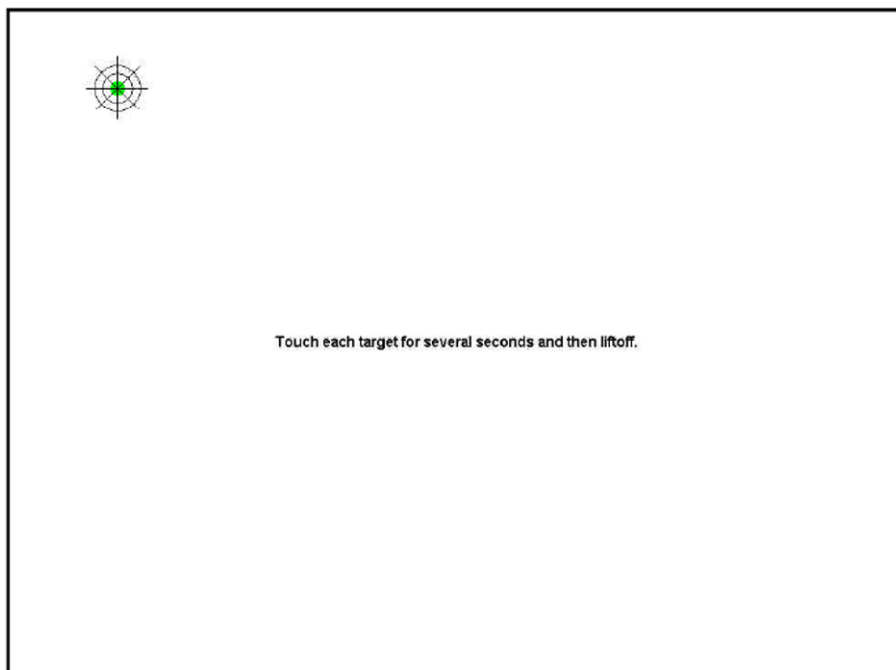


Fig 10.5. Step 3

At this point if the calibration has gone well, the following window will appear on the screen. During the calibration phase if something goes wrong, the program returns to the main window. Choose "Yes" to verify the accuracy of the touch screen; "No" to exit.

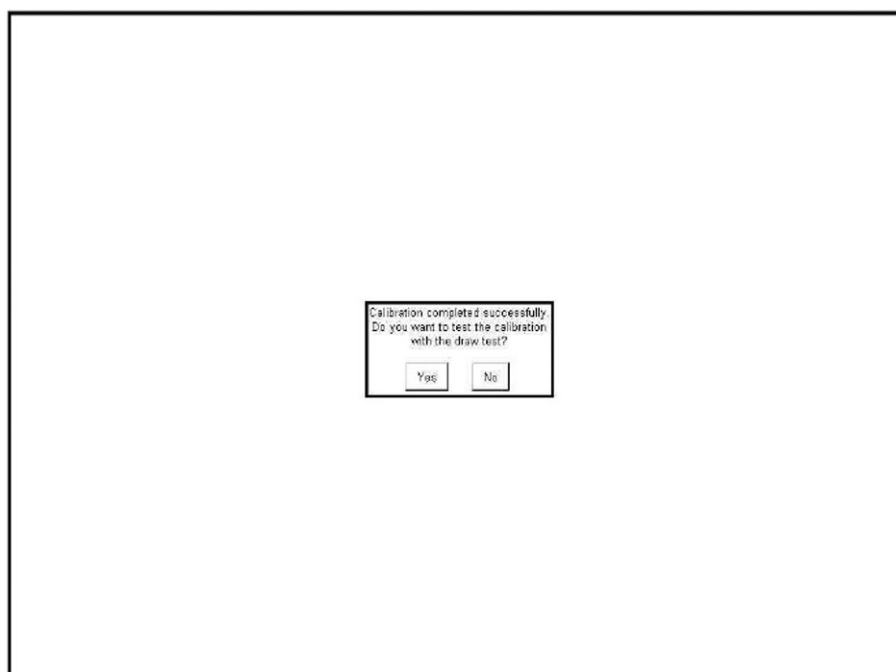


Fig 10.6. Step 4

Once the calibration is acceptable press ESC to exit the program.



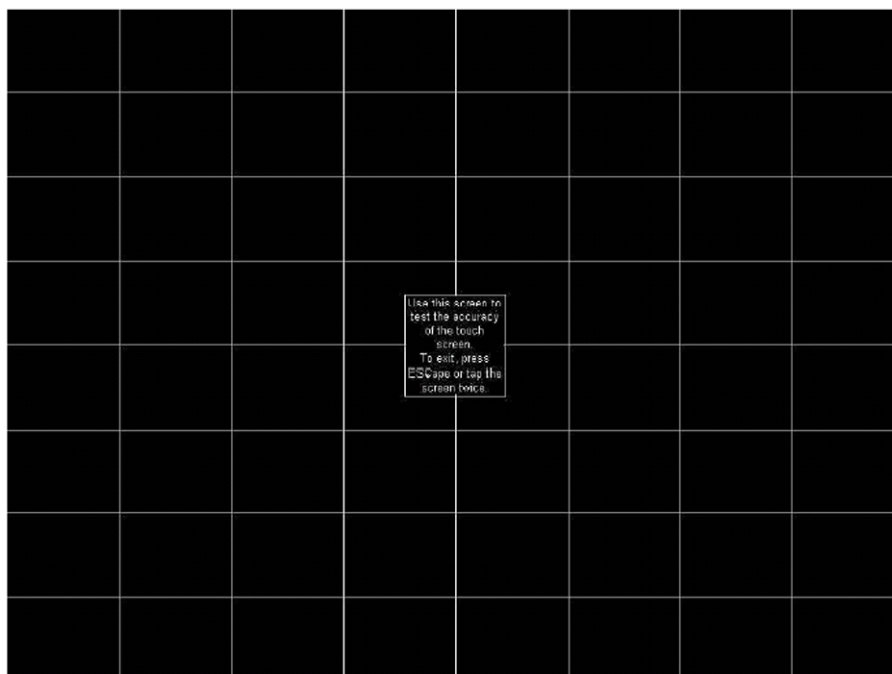


Fig 10.7. Step 5

Press "Yes" on the last menu in order to terminate the program. At this point the touch screen is calibrated and the monitor can be fully used.

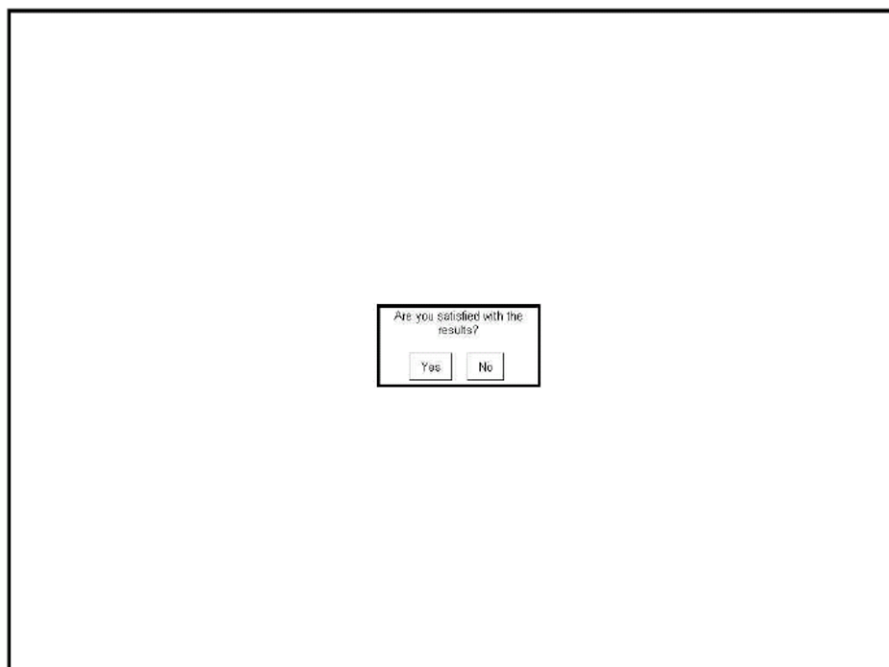


Fig 10.8. Step 6

### OSD:

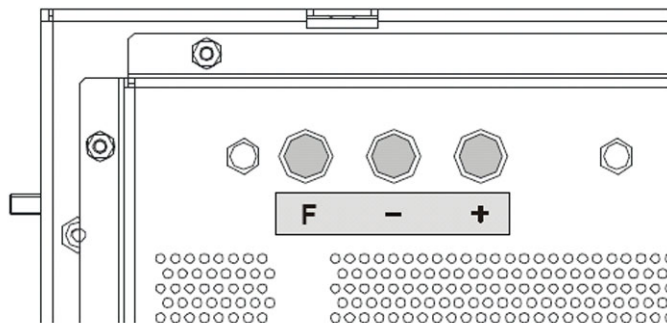
This chapter describes the On Screen Display (OSD) program used to make the logical adjustments on the monitor (contrast, brightness, position of picture, clarity of picture and colour temperature of picture).

The OSD program can be accessed whenever the computer is on; when it is off or in energy saving mode, the OSD program is not accessible.

OSD provides a quick and easy way to make the logical adjustments on the monitor. To access the OSD main menu, press the "F" button at the rear panel of the monitor. To scroll through the menu items and to increase or decrease the value displayed, use the other buttons on the rear of the monitor; to activate a menu item, after selected it, press the "F" button again. For more information read the "keyboard" section.

### Keyboard:

In the back of the monitor there is a keyboard. For every type of monitor the keyboard is placed in different position, but the sequence and the function of the keys is the same. In this paragraph there is the description of the keys functionalities (the image in this page is only an example of the keyboard to help the user).



**Key "F"** - To display the principal menu and the other sub-menu.

To select the interested regulation and, after, save it.

**Key "-"** - To scroll down the menu and to adjust the level of the control.

**Key "+"** - To scroll up the menu and to adjust the level of the control.

After having optimized the regulations, the memorization of the formulations happens automatically. You can leave to disappear the OSD menu (10 seconds ones of inactivity, it's possible to set the OSD timeout by the OSD regulations) or to exit from the menu with EXIT.

The items of the main menu and submenus are listed together with the description of the function in the following table:

OSD STRUCTURE		FUNCTION DESCRIPTION
Setup functions	Setup video	Provides access to the setup submenu
	Setup geometry	Adjust the setup video
	Autosetup options	Adjust the setup geometry
	Autosetup on mode set	Access to the Auto setup options submenu
Brightness	Enable autoclock	Provides access to the setup submenu
	Exit	Allows to turn-on or turn-off the autoclock
		Exit from the auto setup options
		Regulates the overall brightness of the picture
Contrast		Regulates the contrast of the picture
Image Adjust		Provides access to the image adjust submenu
	Geometry	Access to the geometry submenu
	Horizontal position	Allows to adjust the horizontal position of the image
		Allows to adjust the vertical position of the image
	Vertical position	
	Scale/center	
	Full screen	Select the picture size
	Maintain aspect ratio	
	Center	
	Advanced	Provides access to the corresponding submenu
	Phase adjust	
	Clock adjust	
	Exit	Exit from the advanced submenu
		Exit from the advanced submenu
		Access to the video submenu
	Video	
	Image enhancement	
	Context sensible	Access to the submenu to select the picture clarity
	Text (sharp)	
	Video (smooth)	
	Color	Provides access to the color submenu
		Adjusts the intensity of primary colours (R, G, B)
		Selects three colour temperatures for the picture
	RGB adjust	Used to adjust the black level of the picture
		Exit from the color submenu
		Access to the OSD setting submenu
	Color temp	
	Black level adjust	
	Exit	
	OSD setting	
	OSD position	Adjusts the vert. and hor. position of the OSD menu
	Horizontal position	
	Vertical position	
	OSD size	Used to adjust the size of the OSD menu
	Normal	
	Double	
	OSD transparency	Used to adjust the transparency of the OSD menu
	OSD timeout	Sets the duration of the OSD menu
	Languages	Used to select the language of the OSD menu
	Information	Used to view the version of the monitor firmware
		Exit from the OSD setting submenu
		Used to restore the setting made by the manufacturer
Exit	Restore factory presets	Exit from the image adjust submenu
	Exit	Exit from the OSD menu





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