



Product Data

STRATO Digital

Panoramic X-Ray System with CCD sensor

General Features

Movement technology:	Multi-motor with digital trajectory control
Patient positioning:	Face-to-face patient positioning
Patient alignment:	Three laser pointers that allow a dentist to locate the three reference planes: mid-sagittal, Frankfurt horizontal, canine

Standard Examination Programs

For each application the spinal column compensation is obtained by means of exposure parameter modulation, optimized in accordance with the selected anatomic program. Each application is available in adult or child settings.

- **Adult and Child Panoramic:** With trajectory optimization, exposure parameter reduction and reduced collimator in configuration ready for CEPH.
- **Adult and Child Hemi panoramic Right**
- **Adult and Child Hemi panoramic Left**
- **Adult and Child TMJ Open/Close Mouth:** 4 views are taken on the same image: left/right condyle, open/close mouth. Condyles are examined in lateral projection.
- **Adult and Child Bi-axial TMJ:** 4 views are taken on the same image: left/right condyle, longitudinal/oblique projection. One projection is parallel to condyle long axis; the other is angled at 40° with respect to the first.
- **Adult and Child Maxillary Sinus P-A:** One P-A projection, where both maxillary sinuses are shown. Possible to correct the position of the layer by +/- 7mm.
- **Maxillary sinus L-L:** L-L projection of right or left maxillary sinus. Possible to correct the position of the layer by +/- 3mm.
- **Improved Orthogonality Dentition:** Panoramic projection limited to the dentition obtained with X-ray beam constantly perpendicular to the arch. It allows to reduce superimposition of adjacent teeth and to improve visualization of possible interproximal caries.

Every examination is obtained implementing a stratigraphy method with high layer thickness. If selected patient type is "Child", layer position is additionally optimized.

Digital Cephalometric Examination

Strato 2000 is available in three configurations:

- Digital Panoramic only
- Digital Panoramic, Ceph-ready for 8" x 10" digital ceph arm

Ceph-ready models can be upgraded with the ceph arm at any time directly in field. The Ceph-ready versions have automatic alignment of the x-ray source directly on the cephalometric cassette.



Cephalometric collimator provides for 4 different image formats and projections according to the following table:

Application	Formats for 8"x10" Collimator
Skull Latero-Lateral	8" x 10" Vertical Asymmetric
Skull Anterior/Posterior or Posterior/Anterior	8" x 10" Vertical Symmetric
Skull Latero-Lateral, with full view of the nape	10" x 8" Horizontal Asymmetric
Mainly Latero-Lateral. Can also be used for AP/PA projections	12" x 10" Horizontal Symmetric

Anatomic Programs

- Patient type: 2 choices: adult, child
- Patient size: 3 choices: small, medium, large
- Arch shape: 3 choices: narrow, standard, wide

Image Magnification

- Panoramic 1.23 constant
- Open/close mouth TMJ 1.30 constant
- Bi-axial TMJ 1.30 average
- Sinus 1.23 constant
- Cephalometric 1.1

Note: the magnification factor is calculated in the center of the focal trough, which is based on a shape of the mouth-ascending ramus complex, as defined in international literature.

Generator

- High frequency generator, constant potential
- Ripple < 4%
- Inverter frequency: 30 kHz
- High voltage: 50 - 80kVp, step 2 kV
- Anodic current 4 - 12mA, step 1 mA for ceph
4 - 10mA, step 1 mA for other exams
- Exposure times:
 - Panoramic: 15 seconds adult, 13.5 seconds child
 - Hemipanoramic: 8 seconds adult, 7.5 seconds child
 - Open/Close Mouth and Bi-Axial TMJ: 4 x 2.65 seconds
 - Maxillary Sinus P-A: 10.4 seconds
 - Maxillary Sinus L-L: 5.2 seconds
 - Improved Orthogonal Dentition: 12 seconds
 - Cephalometric: 0.2 - 3 seconds

X-ray Tube

- Focal spot size: 0.5 (IEC336)
- Heat storage capacity: 30kJ (40kHU)
- Total filtration: 2.5mm Al eq.
- Duty cycle: 1 exposure every 4 minutes for panoramic; 1:16 for other examinations (for each second of exposure, 16 seconds of cooling time are needed).



Collimator

- Primary collimator
 - Fixed in basic configuration
 - Rotating in ready for Ceph configuration with automatic selection of the following diaphragms:
 - Adult Panoramic
 - Child Panoramic
 - 4 formats for Cephalometric
- Secondary collimator near the sensor to reduce scattered radiation.
- Soft tissue filter enhances profile of the soft tissues of the face on the lateral skull view. Motorized positioning of the filter can be adjusted to match the contour of any patient.

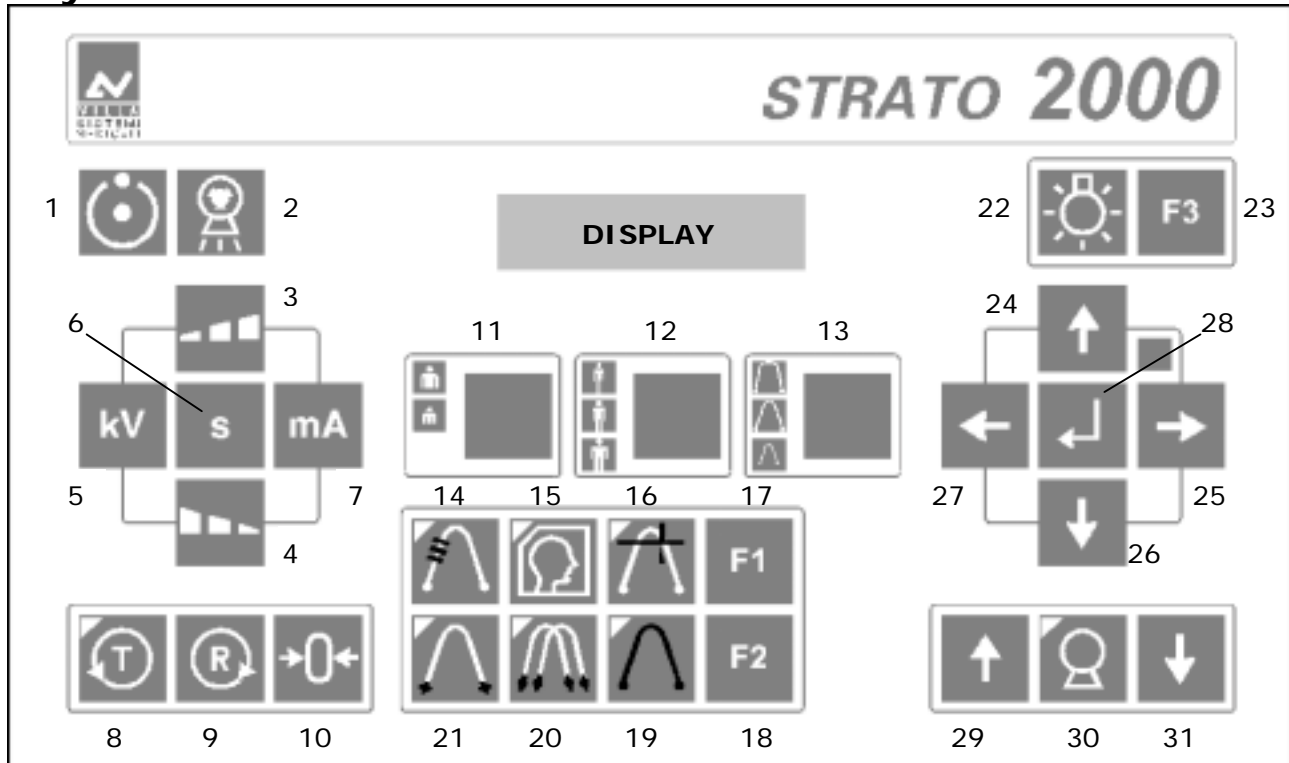
User Interface

- Console with flat and waterproof surface for easy cleaning and disinfection
- Back-lighted alphanumeric LCD display with 2 lines of 20 characters
- X-ray push button with extensible cable
- Each operation is guided by messages shown on the display

The user can choose one of five available languages:
English, Italian, French, Spanish, German.



Keyboard Functions



- | | |
|---|--|
| 1. Ready for exposure signal light | 17. Reserved for future expansions |
| 2. X-ray emission warning light | 18. Reserved for future expansions |
| 3. Manual increase of kV, sec or mA | 19. Panoramic programs selection |
| 4. Manual decrease of kV, sec or mA | 20. TMJ open/close mouth programs selection |
| 5. Select kV for manual regulation | 21. Bi-axial TMJ programs selection |
| 6. Select sec for manual regulation | 22. Centering laser lights |
| 7. Select mA for manual regulation | 23. Reserved for future expansions |
| 8. Execute exam in test mode without x-ray emission | 24. Cursor movement for parameters selection |
| 9. Reset | 25. Cursor movement for parameters selection |
| 10. Patient centering position | 26. Cursor movement for parameters selection |
| 11. Anatomic selection: adult/child | 27. Cursor movement for parameters selection |
| 12. Anatomic selection: patient size | 28. "Enter" key: operation confirmation |
| 13. Anatomic selection: arch shape | 29. Vertical movement: up |
| 14. Reserved for future expansions | 30. Safety key for vertical movement |
| 15. CEPH program selection | 31. Vertical movement: down |
| 16. SINUS program selection | |



Digital Acquisition System

CCD Sensor

- Technology: CCD sensor with Cesium Iodide (CsI) scintillator screen
- Pixel size: 48 μ (96 μ in binning modality)
- Image matrix: 1536 x 2805 pixels in binning modality (standard panoramic)
- Sensor resolution: 10.4 lp/mm maximum theoretical
5.2 lp/mm with CTF 60% real (in binning modality)
- Gray levels: 4096 (12 bits) in acquisition (A/D converter)
- Max useful image size: equivalent to a 15x30 cm film

Image Acquisition

Strato 2000 allows acquiring digital images in two different modalities:

1. **Direct acquisition through a USB 2.0 connection:**

The images and the exposure parameters are transferred from Strato 2000 to the PC via a high speed USB 2.0 connection (480 Mb/s). The images are seen forming on-screen in *real time* during the exposure.

2. **Acquisition on memory card "Compact Flash"® "**

Strato 2000 is equipped with a slot for memory cards "Compact Flash"® type I with 16MB to 1GB capacity, where the images and the exposure parameters can be stored also without a direct connection to a PC. The typical capacity of a 128MB memory card is 13 images. Images stored on the card can be transferred to any PC at any time after the acquisition using an appropriate card-reader by the QuickVision software.

Use of fast Compact Flash® cards is recommended. Images are stored on the cards in a proprietary format that must be read using the QuickVision software.

The system automatically recognizes where the image can be stored:

- On PC when Strato 2000 is connected to a PC via USB 2.0 connection
- On Compact Flash® when the card is in the slot and there is no USB connection
- On both PC and card when a card is in the slot and USB connection is available

The exposure is inhibited when there is no USB connection and no card in the slot.

ProImage Software

Strato 2000 digital is supplied with the ProImage software for image acquisition, storage and processing.

The ProImage software is available with the following functions:

Patient and Image Archive

Various archives are created including:

- Main patients data
- Exams for each patient
- Radiological parameters set for each exam (kV, mA, sec, anatomical program)

Virtual Keyboard

Thanks to a "Virtual keyboard" reproducing the Strato 2000 console on-screen, it is possible to set the exposure parameters directly from the PC.

Use of the virtual keyboard and of the on-board console is also possible at the same time.



For safety reasons, the virtual keyboard cannot activate X-ray emission, switch on the laser, or start any motorized movements.

Exam repetition

A dedicated function allows repetition of an exam using the exposure parameters of a previous session. The operator selects the exam he wants to repeat, and all the parameters are automatically transferred to Strato 2000.

Image processing

The ProImage software allows employing the following functions:

- Image contrast adjustment
- Image brightness adjustment
- Gamma factor adjustment
- Filter for edge enhancement, with possibility to adjust the filter level
- Gray scale equalization to improve the image definition
- Hi contrast
- Embossed view
- 3-D view
- Image rotation (90° and 180°)
- Image horizontal inversion
- Pseudo-colors
- Gray scale inversion (Negative/Positive)
- Magnification (up to X32)
- Distance measurement
- Drawing and annotation

Print

The system allows the user to print an image with the following parameters:

- Patient data
- Exposure parameters
- Examination date

Images can be printed on any Windows compatible printer, although image quality may differ according to the printer model.

Image Import/export

The software permits import/export of images in *jpeg* and *tiff* format.

Image Scan

The software also allows for the storage of images scanned with a compliant scanner.

Minimum Requirements for the PC Hardware

- CPU: Intel[®] Pentium[®] 4 with Intel[®] Chipset
- RAM: 512MB or more
- Operating system: Windows 2000, Windows XP[®]
- Video: 1024x768, 16 Million colors or more
- USB port: compatible with USB 2.0 specification
- Compact Flash[®] cards: Strato 2000 is compatible with Compact Flash[®] Type I cards from 16MB to 1GB.

NO dedicated PC board is required.



Standard Accessories

- One flat cassette 18x24 or 24x30cm with screens. Only for versions with ceph arm
- Bite Block support
- Chin support for edentulous patients
- 5 bite blocks with supports
- 2 temple clamps
- X-ray push button with extensible cable
- 2 sterilizable grips
- 4 accessory-trays

Mechanical Characteristics

- Source to image distance: 510 mm (20'') (panoramic, TMJ, Sinus, A.D.A.)
1650 mm (65'') (analog CEPH)
- Vertical column movement: 670 mm (26.4''), motorized
- Weight
Version without ceph arm: 135kg
Version with ceph arm: 150kg
- Total height max: 2320mm (91.3'')
- Length x Width
Versions without ceph arm: 1000x1250mm
Versions with ceph arm: 1770x1250mm
- Operating surface
Versions without ceph arm: 1300x1300mm
Versions with ceph arm: 1900x1300mm
- Type of installation: wall mount


Electrical Characteristics

- Power supply voltage: 220/230/240 V (±10%) single phase
- Frequency: 50 Hz
- Current rating: 8A
- Power rating: 2kVA

Environmental Characteristics

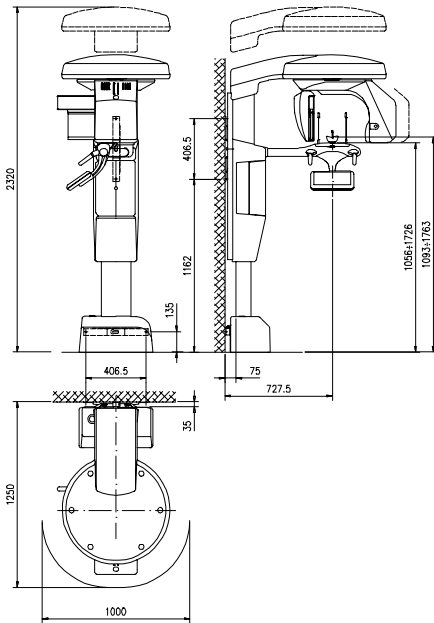
Operating temperature	+10°C ÷ +40°C
Operating relative humidity	30% ÷ 75%
Operating atmospheric pressure	700 – 1060 hpa
Transport and storage temperature	-20°C ÷ +70°C
Transport and storage relative humidity	<95 % non condensing
Transport and storage atmospheric pressure	500 – 1060 hpa

Standards and Regulations

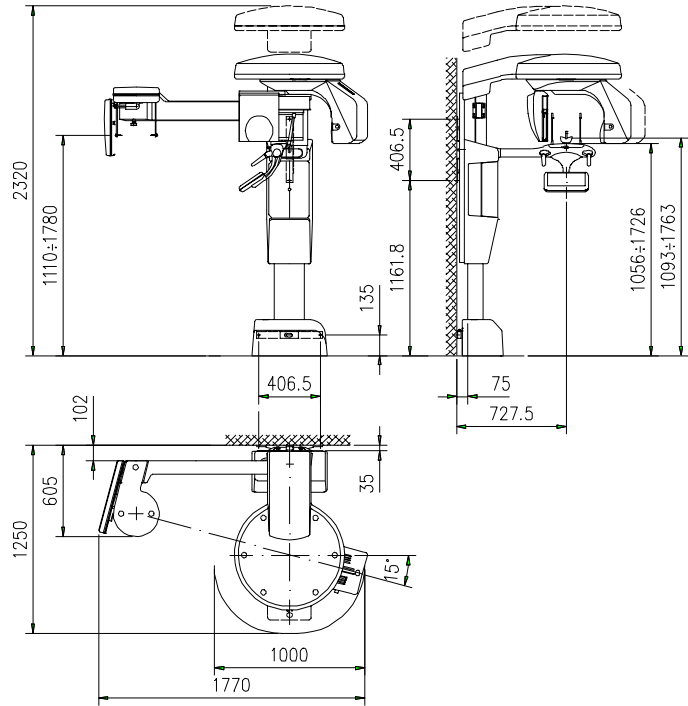
This product is designed and produced to meet the following standards:	
• EN 60601-1, EN 60601-1-1, EN 60601-1-2, EN 60601-1-3, EN 60601-2-7	
 0434	CE symbol grants the product compliance to the European Directive for Medical Devices 93/42 as a class IIB device.



Dimensions (indicated in mm)



Without ceph arm



With ceph arm

Note: Products are continuously under review in the light of technical advancement. The actual specification may therefore be subject to improvement or modification without notice.

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