



**3D Accuitomo FPD – XYZ Slice View Tomograph.  
Super-High Resolution Images of Region of Interest**

 J.MORITA MFG.CORP

Thinking ahead. Focused on life.

  
**MORITA**



3D AccuTomo FPD

Thinking ahead.



Focused on life.



**The new era of user-friendly,  
3-dimensional digital radiography  
has just begun.**

The next generation digital X-ray sensor, equipped with a flat panel detector (FPD), offers you high quality radiographs at minimum effective dose.

With its excellent sensitivity, high resolution and wide dynamic range, as well as its expressive imaging tone, it creates brilliant images of both soft and hard tissue areas.

You can also freely select the radiographic area, either 40 x 40 mm or the wider 60 x 60 mm, and still enjoy a high resolution.

Positioning and exposure release is the same as a dental panoramic X-ray, and just as patient-friendly.

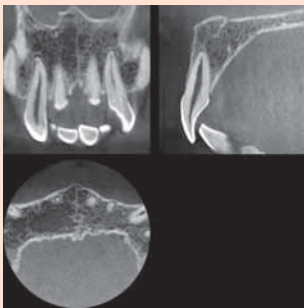
## The New Fully Digital System with Flat Panel Detector

# Super-High Resolution and Low Effective Dose with a Wide Radiographic Area

The superb sensitivity and resolution of the FPD provides superior image quality for hard as well as soft tissue. Both the larger imaging area (60 x 60 mm) and the regular area (40 x 40 mm) have the same, high level of resolution. The larger imaging area is particularly useful for examinations for implant therapy, apical lesions, TMJ, impactions, etc.

## Two Sizes of Imaging Areas

Ø 40 x 40 mm



The 40 x 40 mm area is suitable for 90% of all cases and has a lower X-ray dosage.

Ø 60 x 60 mm



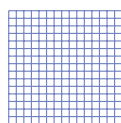
The 60 x 60 mm area offers images that show both the upper and lower teeth, implant planning, etc.

### Large Imaging Area with Same High Resolution

The radiographic area has been extended to 60 x 60 mm. It is now possible to achieve the same high resolution as previously available (2.0 Lp/mm), but without changing the voxel size of 0.125 mm.



Ø 40 x 40 mm



Ø 60 x 60 mm

### Super-High Resolution

The resolution of the 3D Accuitomo is greater than 2 line pairs per mm (MTF10%). The highly detailed images have a voxel size of 0.125 mm per side. The slice width and pitch can be set between 0.125 and 2 mm.

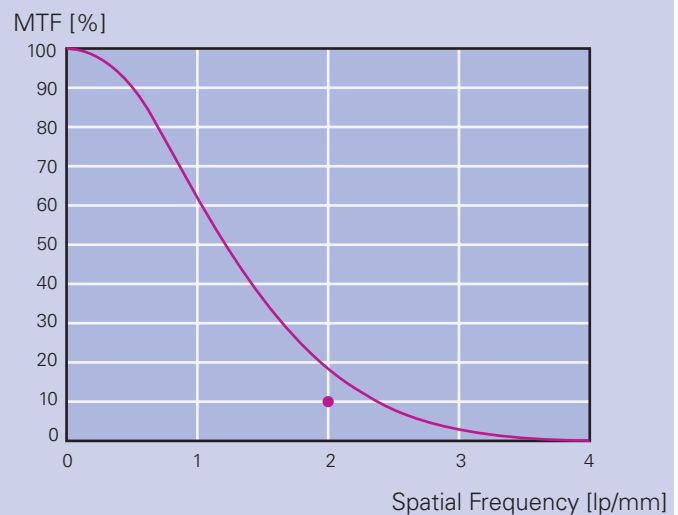
### Low Effective Dose

The exposure time is approximately 18 sec. and the effective dose\* is only about 1.8 times\*\* as high as that of the panoramic X-ray with film exposure.

### Compact

The 3D Accuitomo requires approx. only 1.6 times \*\* the space of a dental panoramic X-ray unit (1,620 x 1,200 mm).

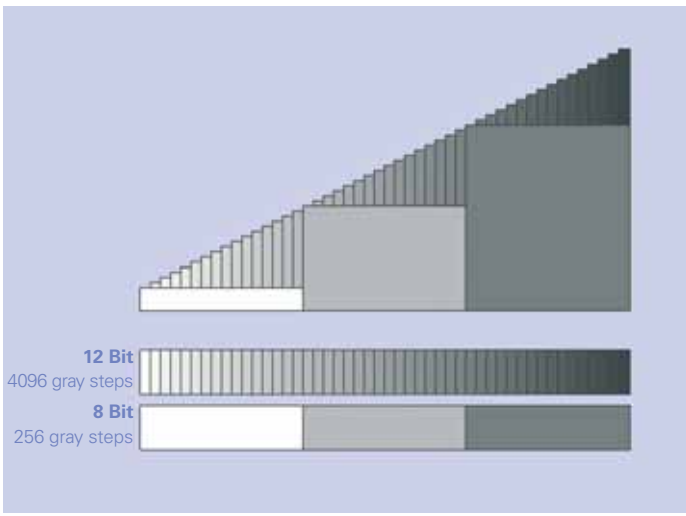
## Spatial Resolution MTF: Modulation Transfer Function



This function is obtained from typical products.

\* Effective dose: It is estimated according to ICRP Publication 60. We have actually measured them with the Rando phantom and the glass dosimeter.

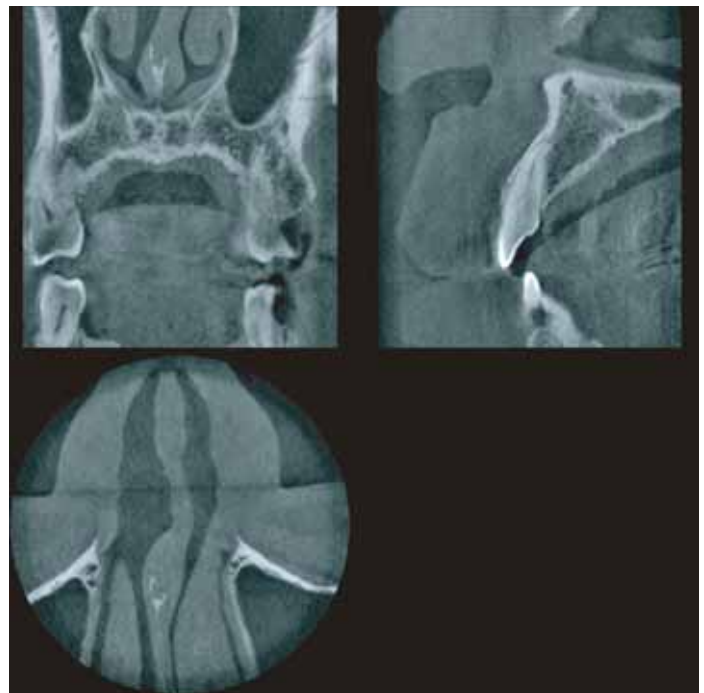
\*\* This comparison is made with the Veraviewepocs film-based system using the standard exposure mode and a radiographic area setting of 40 x 40 mm.



**Wide Dynamic Range \*\*\***

Wide dynamic range produces many gray steps and visualizes both hard and soft tissue areas. The FPD has 12 bit and 16 times as many gray steps as 8 bit technology and produces a subtle spread of contrast.

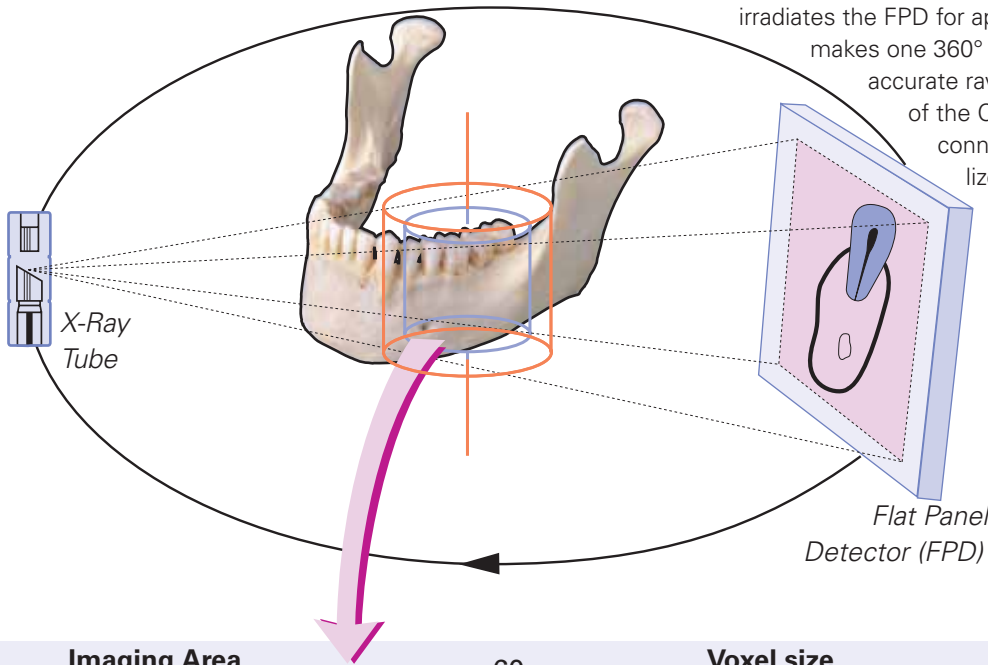
\*\*\* Dynamic range: Numerical values express the reproducibility of the signal and the ratio of the largest and smallest input values in dBs. The dynamic range of the digital signal is also sometimes expressed in bits. The highest signal level is taken to be the level remaining after subtracting the noise level. The value of the dynamic range indicates how weak a signal can be reproduced, or in other words, how high the resolution which can be used actually will be.



*Creates very high quality radiographs of soft tissue areas (such as mucous membrane of the maxillary sinus and skin, etc.) as well as hard tissue areas (such as enamel, dentin and alveolar bone).*

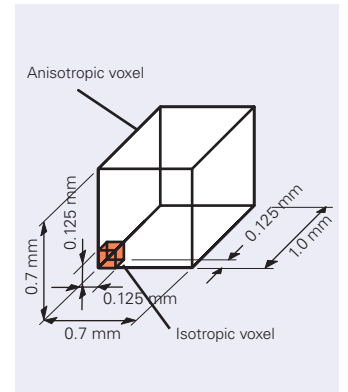
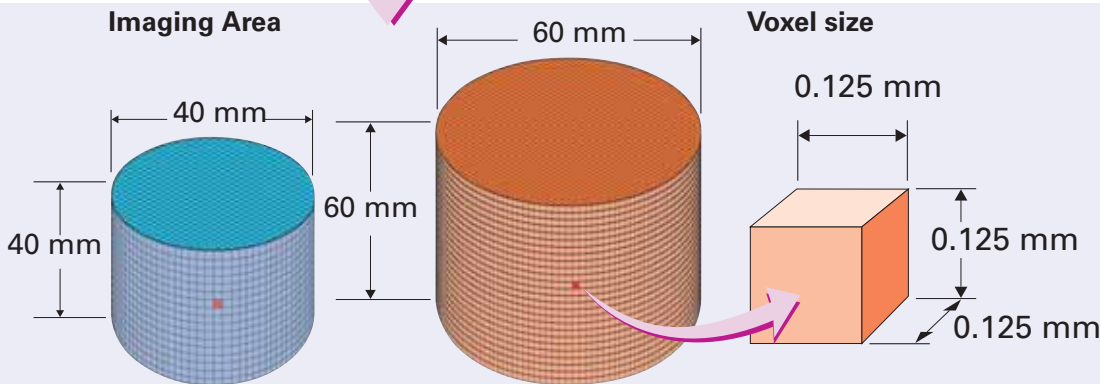
**Radiographic Procedure**

The regional imaging area, cylindrical in shape, is positioned relative to the region of interest by moving the patient chair laterally, longitudinally, and vertically. A small cone-shaped X-ray beam irradiates the FPD for approximately 18 seconds while the C-arm makes one 360° rotation around the region of interest. The accurate raw images, corresponding to the angle of the C-arm, are transferred to the computer connected to the 3D Accuitomo and digitalized. After post-processing, a reconstruction algorithm generates super-high resolution, 3-dimensional images displayed on the computer monitor.



**Isotropic Voxel**

The voxel is an isotropic cube that gives a highly detailed image without artifacts with the help of the slice pitch and helical pitch.

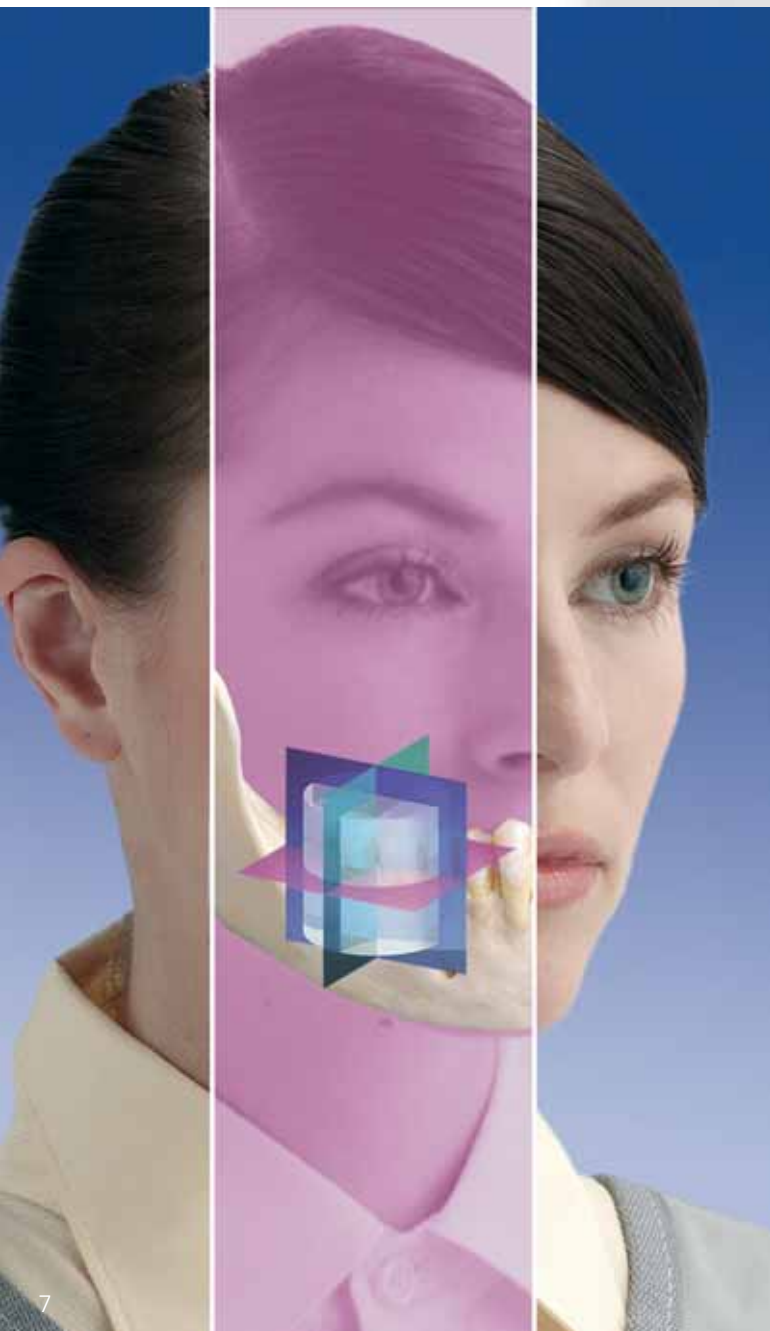


# New Flat Panel Detector Technology

## High Quality 3-dimensional Images

3D Accuitomo features a flat panel detector (FPD) which converts the pattern of strong and weak X-rays into a digital signal. This signal is then expressed in shades of black and white.

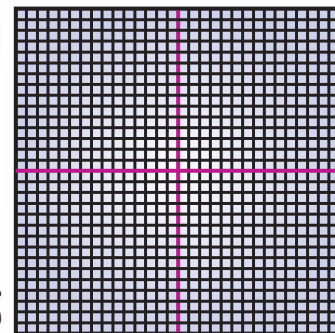
The FPD is thin and has long life span. In addition, it offers a wide dynamic range without image distortion or influence from electromagnetic fields. As a result, the FPD delivers high quality 3-dimensional images.



### No image Distortion

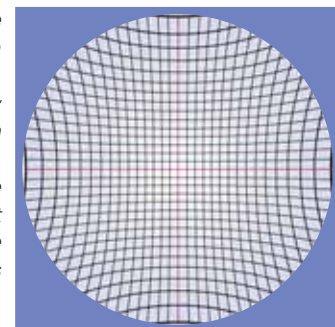
The image receptor is flat. X-ray projection occurs without image distortion. Post-processing of the projection images by software, as with analog systems, is not required.

*Projection image of a digital system (FPD)*



*Projection image as an analog system*

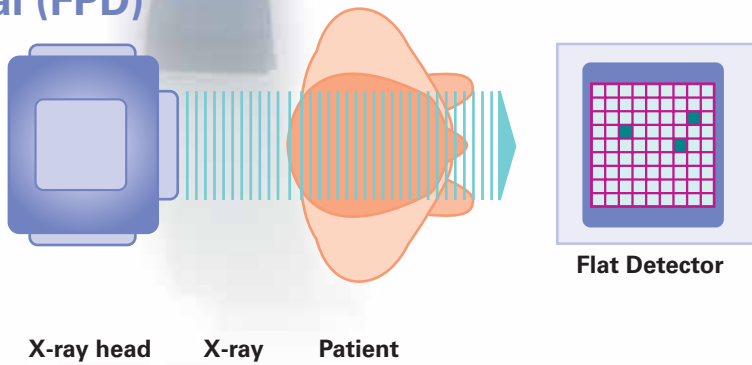
In analog radiographs, you may observe the distortion of grid when moving away from the center. With the digital FPD radiographs, no image distortion is observed, even at the most distant areas from the center. Software adjustment of such distortion, which is essential for analog radiographs, is not necessary.



X-rays are converted into visible light by the directly deposited CSI scintillator. Then, the light is converted into an electrical signal with a photo diode. The FPD is quite thin and has a long life-span.

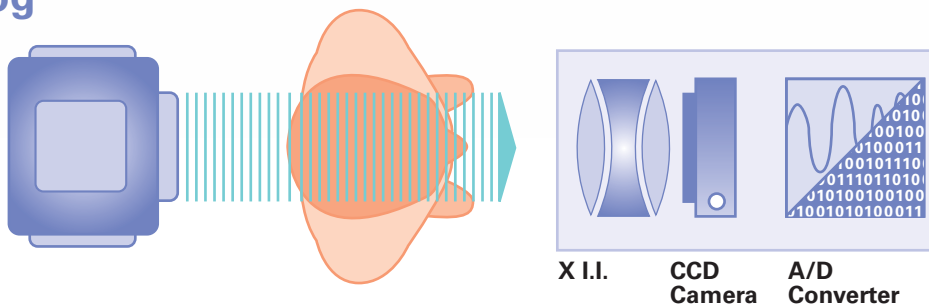


### Digital (FPD)



Flat Detector

### Analog



### Full Digital System

The flat panel detector receives a digital X-ray projection image and converts 3-dimensional data into an image reconstruction. Because the projection image is received directly by the flat panel detector, there are no noise artifacts associated with analog data conversion, and no distortions caused by electromagnetic fields.

- Two Sizes of Imaging Areas  
40 x 40 mm 60 x 60 mm
- Large Imaging Area with  
Same High Resolution
- Super-High resolution (2.0 lp/mm),  
Voxel size 0.125 mm
- Low effective dose
- Wide dynamic range and  
expresive tone create  
brilliant images of both soft  
and hard tissue areas
- Full digital system

**Generate highly details**  
3-dimensional images,  
with only X-ray exposure in  
approximately 18 seconds

**Uses dedicated i-Dixel**  
software to freely set slice  
angles

**Enables the most accurate**  
diagnosis for implants, apical  
lesions, temporomandibular  
joints, impactions, etc.

**Basis technology provided**  
by NUBIC (Nihon University  
Business, Research and  
Intellectual Property Center)

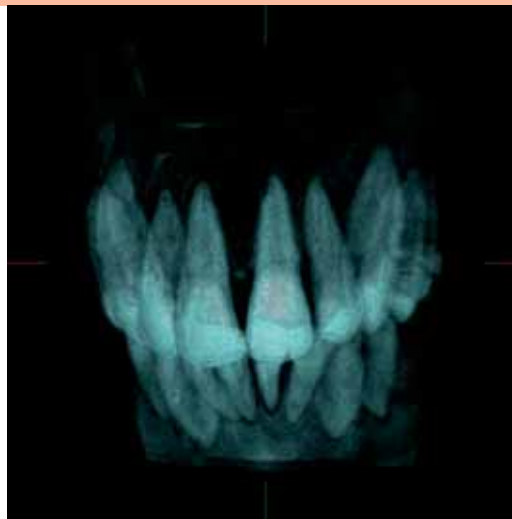
**Developed in collaboration**  
with Nihon University  
School of Dentistry  
and J.Morita Mfg. Corp.

**Offers You High Quality Images  
at Minimum Effective Dose**

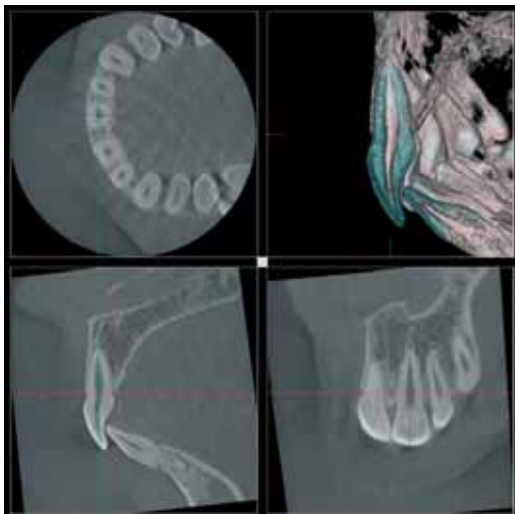
i-Dixel's volume rendering display will help you to inform your patients more effectively.



## i-Dixel Software — Intelligent Volume Rendering



*i-Dixel*



### **Volume rendering**

The volume rendering technology of 3D Accuitomo allows you to display images 3-dimensionally. Depending on your area of interest, you can adjust histograms and change settings to obtain high-definition 3-dimensional images of both soft, as well as hard tissue areas.

### **Real-Time Reslice**

Volume rendering images and slice images are linked in real time. Dragging on the volume or sliced images is all that is needed to obtain slice images, or to alter the observation angle.

# Easy Image Processing at Your Workplace

With various image processing functions, i-Dixel can easily display information, including 3-dimensional and 2-dimensional data. It is also seamlessly integrated into a network environment.

## XYZ Window

Move the cursor to display all three planes from any point.

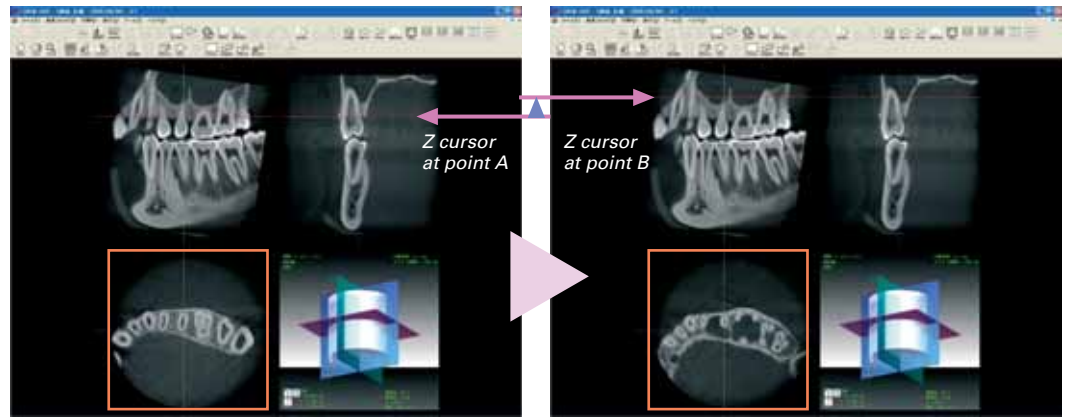
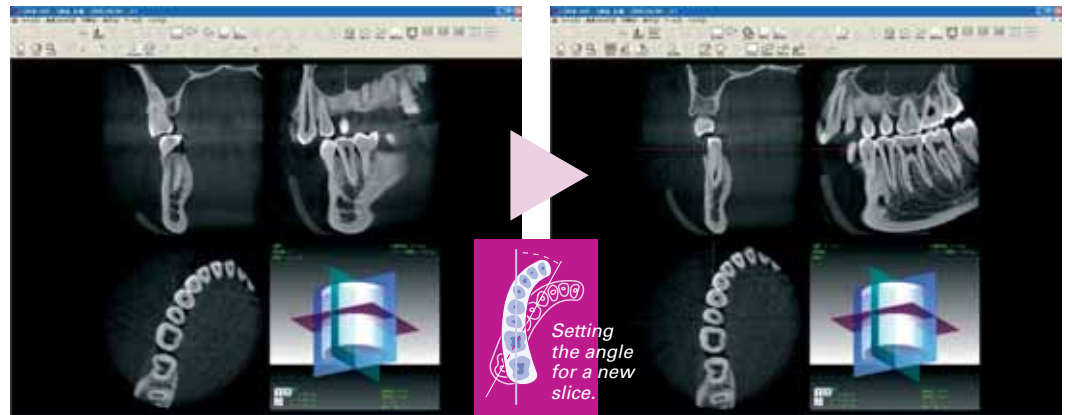


Image after moving Z cursor from point A to point B.

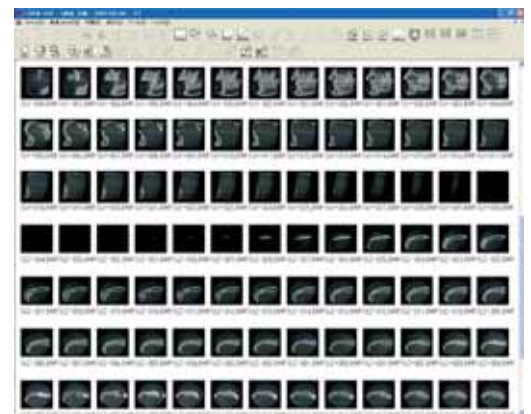


**Reslicing:** Set an angle to create new slices.

After reslicing

## Other Key Features

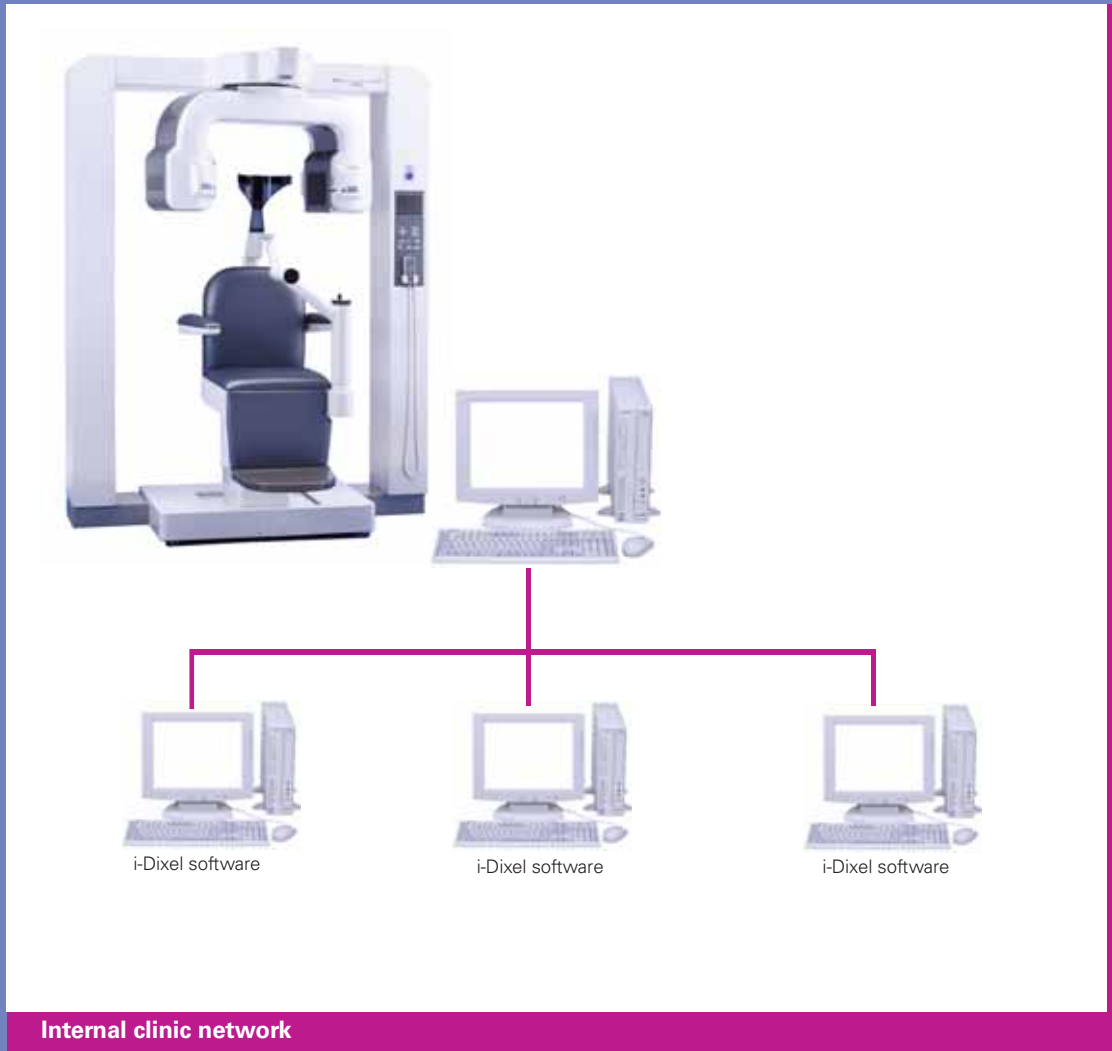
- Zoom
- Rotate
- Histogram
- Edge enhancement
- Distance and angle measurement
- Negative image
- Mirror image
- Slice distance measurement
- Surface Rendering
- DICOM 3.0 compatible
- Brightness conversion
- Space frequency filter
- Patient orientation display
- Density measurement
- Reconstruction, new reconstruction
- One Data Viewer export



**Slice Window:** Display a list of three-dimensional views – axial, coronal, and sagittal – with 1 mm pitch.

# Network Models

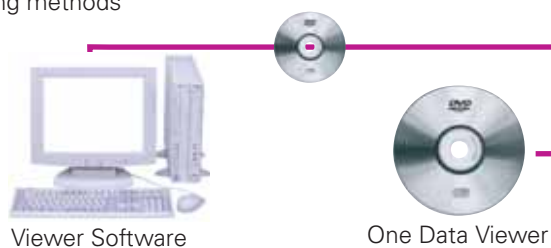
If you install i-Dixel on other computers of your clinic, you can display 3-dimensional images at each computer via your internal clinic network. With the One Data Viewer, you can even view 3D images on computers on which i-Dixel is not installed.

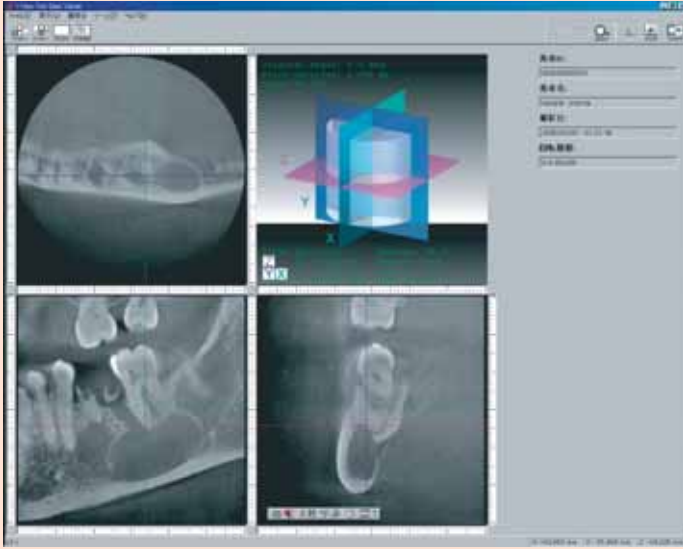


Patient data transfer  
via Internet or DVD/CD

## External clinic network

In external clinic networks without 3D Accutomo, 3D images can be viewed on a PC with both of the following methods





### One Data Viewer Software

One Data Viewer is a unique MORITA software feature which allows you to view 3D images on any computer without installing special software. One Data Viewer is made by exporting the data files with the execution file of One Data Viewer, from i-Dixel. Data files can be taken from anywhere and viewed on all computers within the clinic network, including 3-dimensional images and patient data. Functions to measure distances and angles, zoom, invert the gray scale, adjust brightness, contrast and gamma are also available options.

#### One Data Viewer EX

By moving of XYZ cursor, 3-dimensional slices can be seen.

#### One Data Viewer Plus

In addition to the One Data Viewer EX function, image adjustment and measurement functions are also possible.

### DICOM Support (Optional)

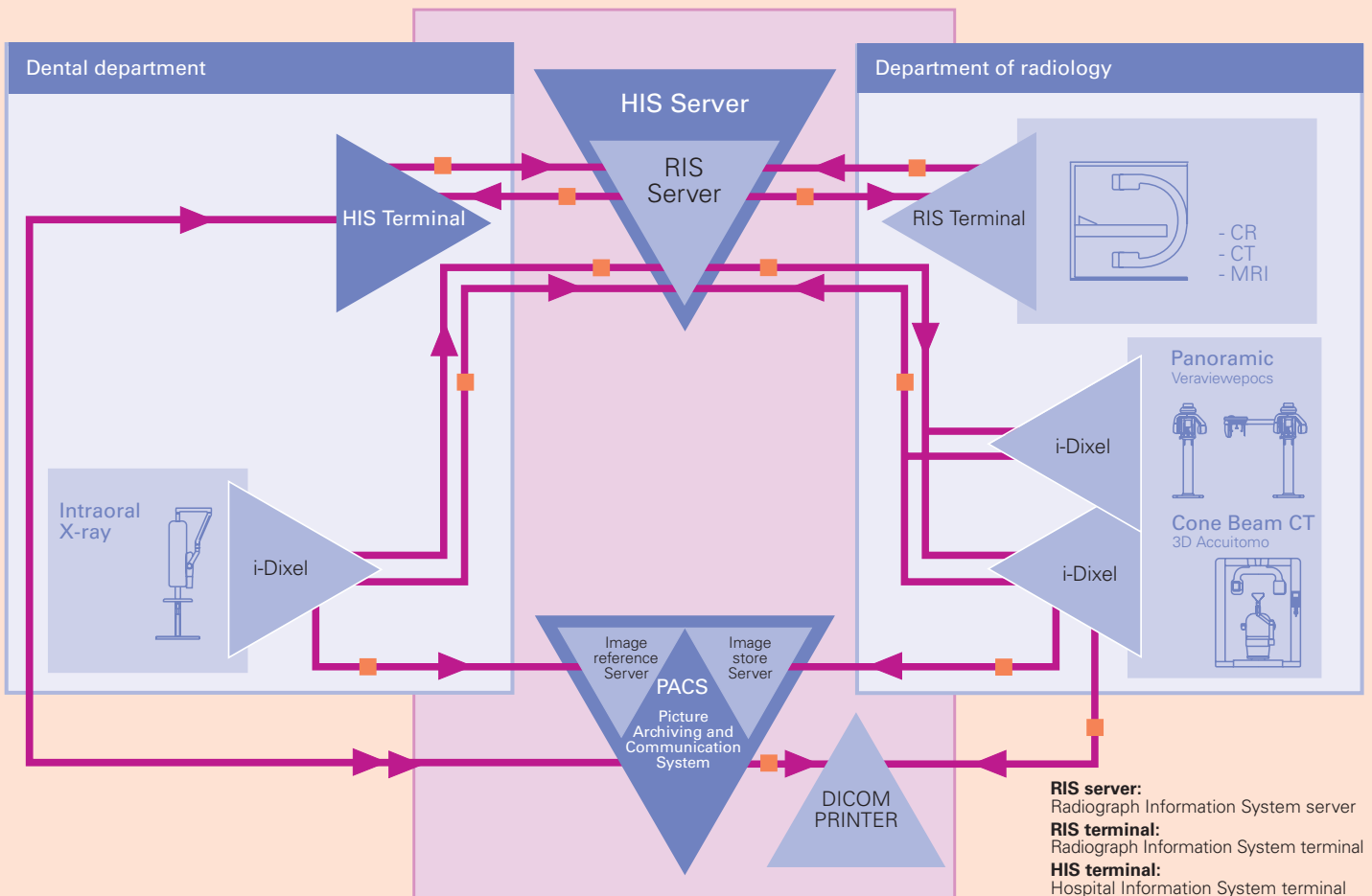
i-Dixel can be seamlessly integrated into a clinic network environment, and supports DICOM standards. DICOM, or Digital Imaging and Communications in Medicine, creates and maintains an international standard for image data communication and storage, to achieve compatibility between various information systems in health care environments. DICOM enables the exchange of diagnostic images, examination data and other relevant information regardless of the manufacturer or model of the medical imaging systems involved. It also supports the system architecture link to HIS/RIS.

### Viewer Software

By installing i-Dixel Viewer software on external clinic computers, all i-Dixel features can be utilized.

#### ■ i-Dixel Offers

1. Modality worklist management service class
2. Storage service class
3. Modality performed procedure step service class
4. Print management service class



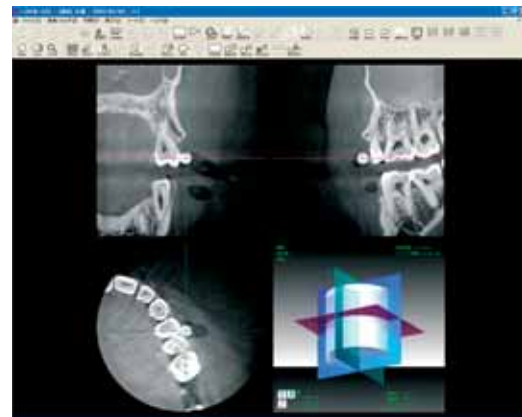
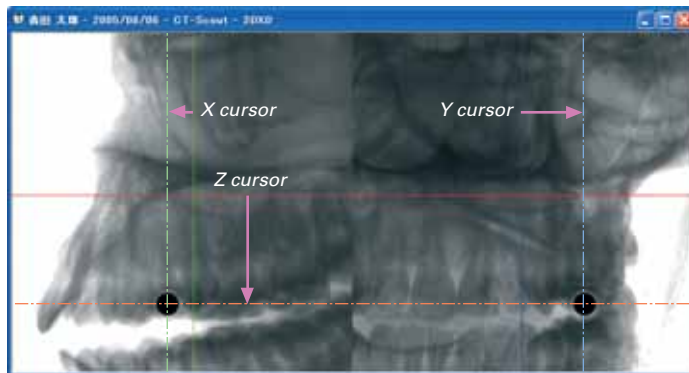
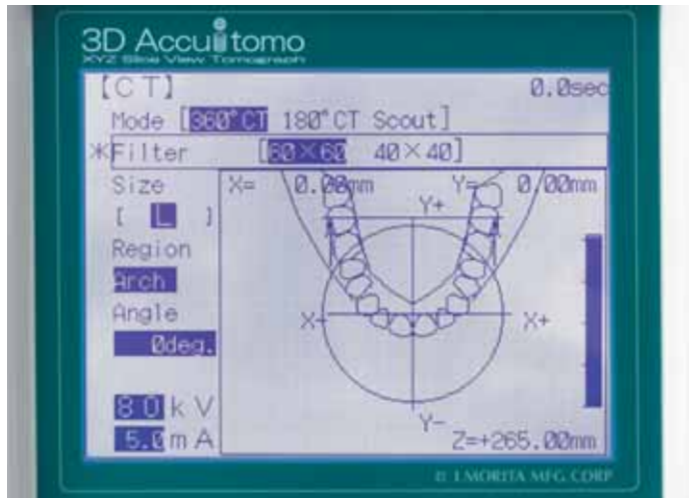
# Simple, Accurate Positioning

The three positioning laser beams and an LCD make positioning easy. The chinrest fixes the patient's head to avoid the movement. Scout images enable even more accurate positioning.

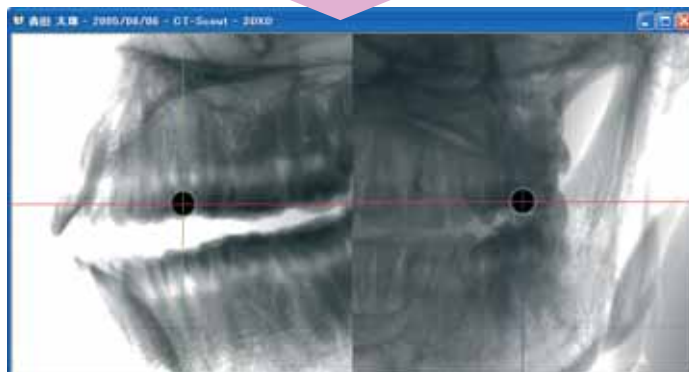
## Easy as One, Two, Three

First, the patient's initial position is set and recorded using the three positioning beams.

Then, the region of interest is aligned in the LCD. The chair automatically moves into the optimal position.



3-dimensional image with the region of interest located at the center.



## Scout Image

For even more accurate positioning, scout images can be created. After positioning, take two still X-ray images of coronal and sagittal views to confirm that the position is accurate. If it is not, adjust the image on the computer by placing the cursor at the center of the region of interest.

! The circles in the images are inserted for illustrative purposes to indicate the center of the region of interest. The actual images do not feature a circle.

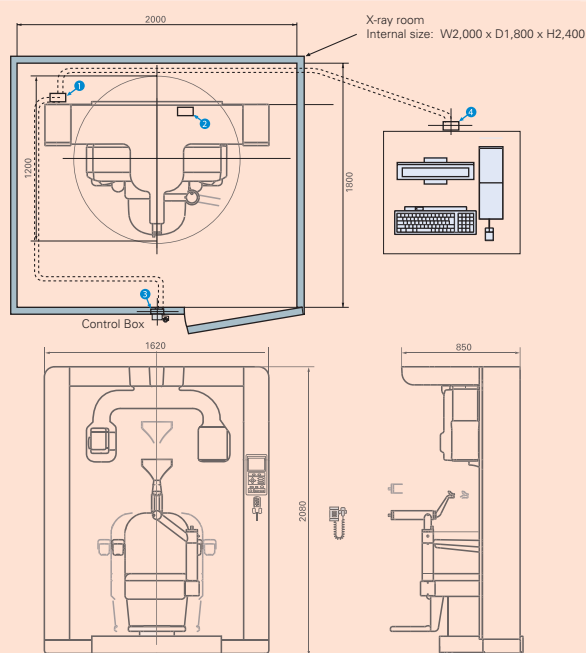
! Taking scout images increases X-radiation dosage by approximately 5–10%.



## Technical Data

### Dimensions

unit : mm

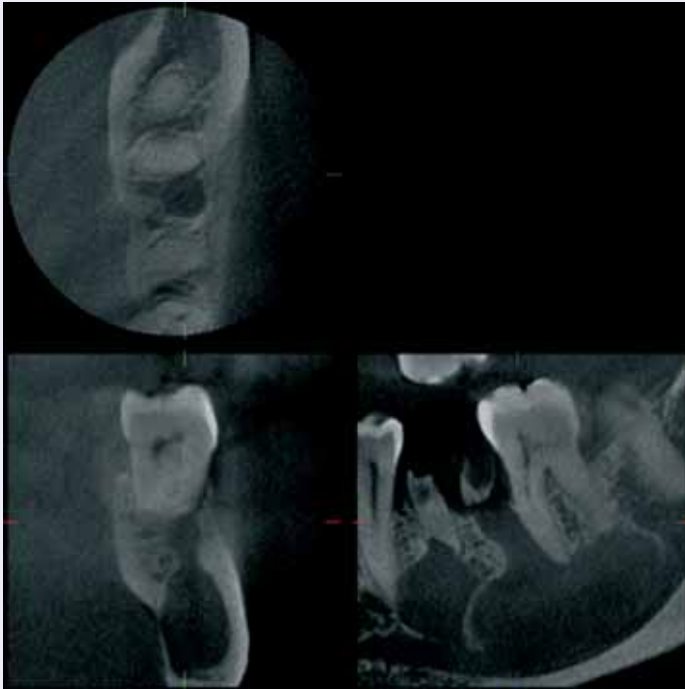


- ① Outlet of computer cable and operation cable
- ② Outlet of power supply
- ③ Outlet of operation cable
- ④ Outlet of computer cable

### Specifications

Trade Name	3D Accutomo XYZ Slice View Tomograph
Model	MCT-1
Type	EX F (EX-1F/EX-2F)
Input Voltage	100/110/120VAC(EX-1F) 220/230/240VAC(EX-2F)
Power Consumption	max. 2.0 KVA
X-ray Head	
Tube Voltage	60 - 80 kV
Tube Current	1 - 10 mA
Focal Spot Size	0.5 x 0.5 mm
Exposure Time	18 seconds or less
Size of Imaging Area	Diameter 40 x Height 40 mm Diameter 60 x Height 60 mm
Voxel Size	0.125 x 0.125 x 0.125 mm
Slice Width	0.125 mm to 2 mm
Recon. Time	Less than 5 min at PC with Pentium IV 3.8Hz or more Memory 4GB
Outer Dimensions	
Main Unit	Width 1,620 x Depth 1,200 x Height 2,080 mm
Control Box	Width 70 x Depth 40 x Height 115 mm
Weight	Approx. 400 kg

# Clinical Cases – 40 x 40 mm



**Mandibular Cysts**

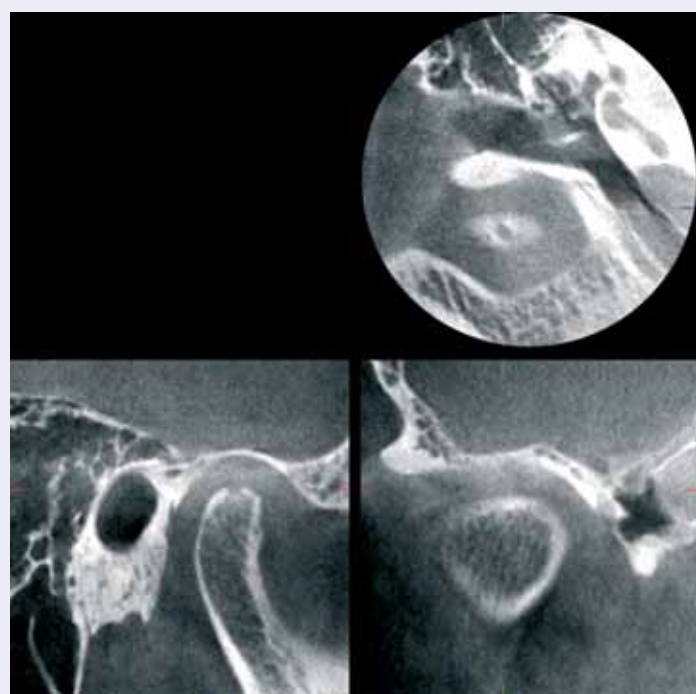


**Impacted Upper Canine**

The 40 x 40 mm area is suitable for 90% of all cases and has a lower effective dose.

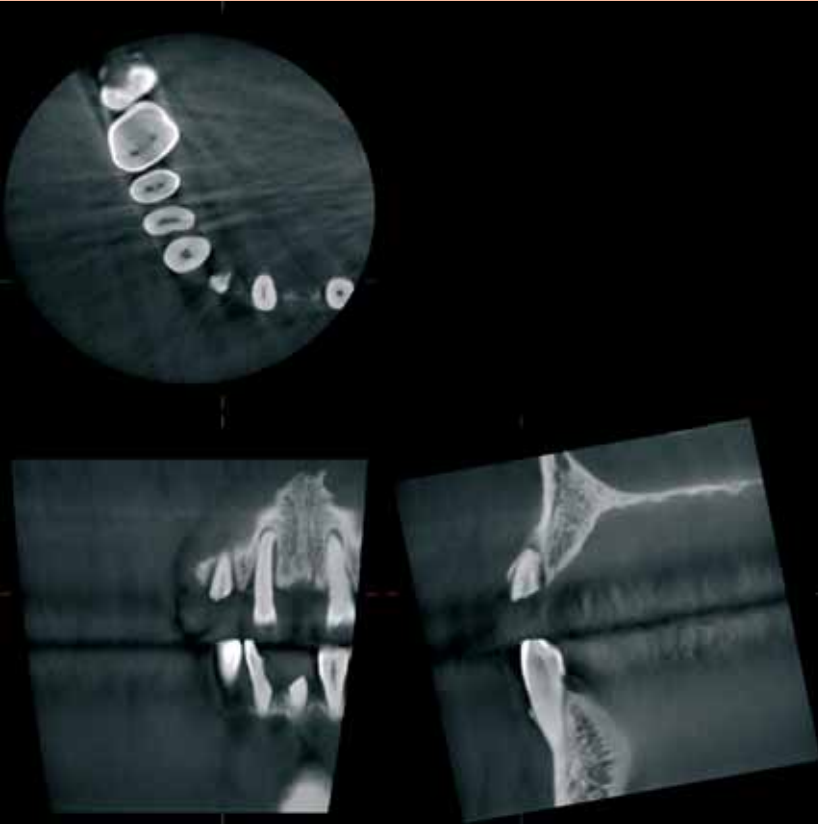


**Periodontal Disease  
(Bone absorption)**



**Temporomandibular Joint**

# Clinical Cases – 60 x 60 mm



**Root Fracture**



**Mandibular Apical Lesion**

The 60 x 60 mm area for images that show both the upper and lower teeth, implant planning, etc.

### Maxillary Implants



### Mandibular Implants



*Clinical images are provided by Kitasenju Radist Dental Clinic, i-View Imaging Center, Niimura Dental Clinic in Tachikawa, Tokyo, Japan and the department of dentomaxillofacial radiology at University of Leipzig, Germany.*

Thinking ahead. Focused on life.

In 1916, Junichi Morita started to import products of the leading dental equipment manufacturers into Japan, where demands for modern dentistry were growing. His venturesome attempts of supplying selected products for oral healthcare has grown steadily by receiving valuable support and guidance from the dental profession. His enterprising spirit lives through the decades, and all Morita Group Companies join in continuing to pursue marketing, distribution and services, as well as R&D and manufacturing, in collaboration with world leaders in healthcare products and research organizations.



**Auxiliaries**

**Educational and Training Systems**

**Laboratory Devices**

**Laser Equipment**

**Instruments**

**Treatment Units**

**Diagnostic/Imaging Equipment**

Distributed by

**J. MORITA CORPORATION**

33-18, 3-Chome, Tarumi-cho Suita City, Osaka 564-8650 Japan

Tel: +81-6-6380-2525, Fax: +81-6-6380-0585,

<http://www.asia.morita.com> <http://www.oceania.morita.com>

**J. MORITA USA, Inc.**

9 Mason Irvine, CA 92618 U.S.A.

Tel: +1-949-581-9600, Fax: +1-949-465-1095, <http://www.jmoritausa.com>

**J. MORITA EUROPE GMBH**

Justus-Von-Liebig-Strasse 27A, D-63128 Dietzenbach, Germany

Tel: +49-6074-836-0, Fax: +49-6074-836-299, <http://www.jmoritaeuropa.com>

**Siamdent Co., Ltd.**

71/10 Bangpakong Industrial Park I, Bangna-Trad KM. 52, Bangpakong,  
Chachuengsao 24130, Thailand

Tel: +66-38-57-3042, Fax: +66-38-57-3043

Developed and Manufactured by

**J. MORITA Mfg. Corp.**

680 Higashihama Minami-cho, Fushimi-ku, Kyoto, 612-8533 Japan

Tel: +81-75-611-2141, Fax: +81-75-622-4595, <http://www.jmorita-mfg.com>

