

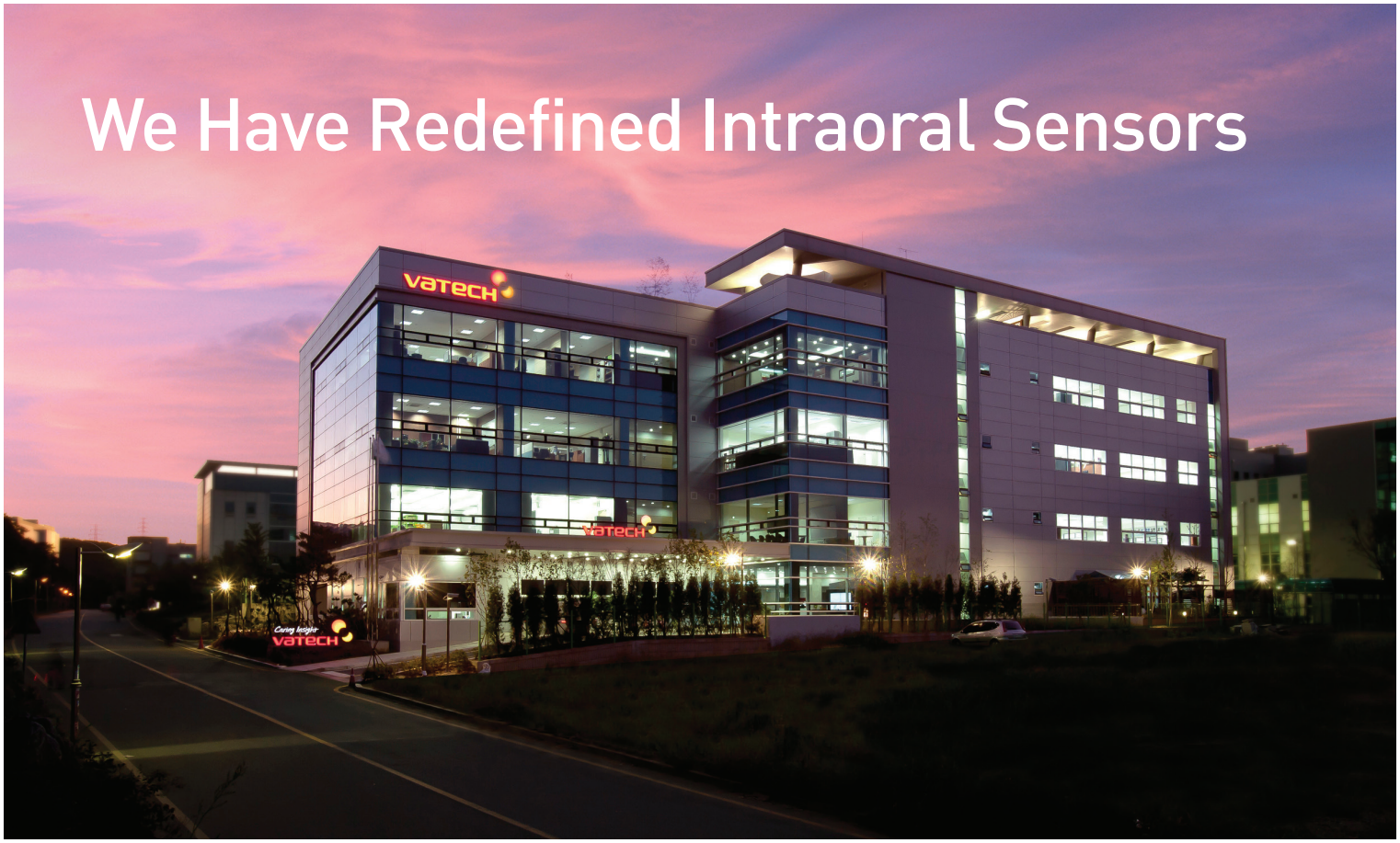
Better is not enough,

Be different

Dental Pioneer
VATECH
VATECH Global

www.vatechglobal.com

We Have Redefined Intraoral Sensors



- Why do doctors prefer to use Intraoral Sensor than Films?
- Would you still consider using IPS?
- Why have we created a SLIM sensor?
- Learn more about the EzSensor Classic / HD

Dental Pioneer
VATECH
VATECH Global

Every 3 minutes, 1 Intraoral Sensor is sold worldwide. What makes dentists choose Intraoral Sensors?



Dentists have been using film X-ray in dentistry since 1930. The Intraoral sensor was invented in 1982 and was developed to enhance the patient's comfort and accuracy in diagnosis. There are six advantages of working with intraoral sensor vs. film:

1. Work Flow Efficiency



Film

Total 16 min.



Image Acquisition



Intraoral Sensor

Total 20 sec.



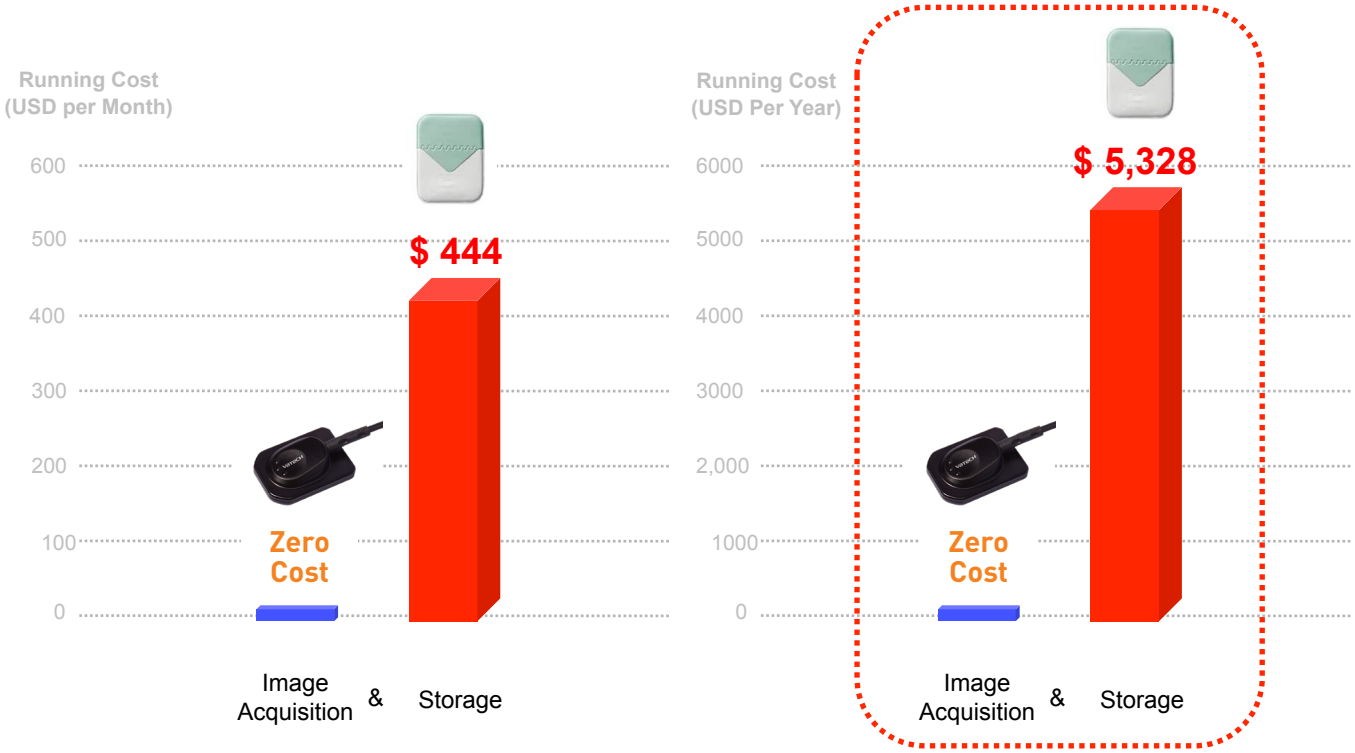
Image Acquisition

15 min.
Time Saving

Efficiency in capturing X-rays also translates to time saved. Less time spent developing film X-rays and taking patients through their treatment plans means more time actually treating patients. Over weeks and months, the minutes wasted developing film turn to hours.
It is estimated that by eliminating the time spent waiting for film radiographs to develop, it is possible to see one more patient for every two or three that you treat. [1]

Which one is more cost-effective Film or an Intraoral Sensor?

2. Cost Efficiency



According to the study of ADA (American Dental Association), they estimated that it costs $1.11 on average to capture an X-ray film image. This cost includes material cost of film, storage and chemicals for developing and fixing. Suppose you capture 400 film X-rays per month, it would cost $444 per month, and $5,328 per year.

You can save $5,328 every year just by switching over to intraoral sensors.



Have you ever misdiagnosed a patient due to low image quality?

3. High Image Quality

[Endodontic Treatment]



Film



Intraoral Sensor

[Implant]



Film



Intraoral Sensor

Doctors require detailed high image quality especially for accurate implant work and endodontic diagnosis.
In the case of implants, doctors have to capture the R.O.I. several times during surgery to make sure the fixture is placed properly or not.

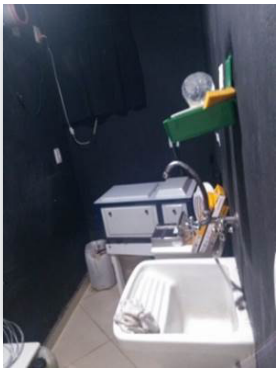
Intraoral sensors are great tools when planning for implant surgeries because of their high image quality.



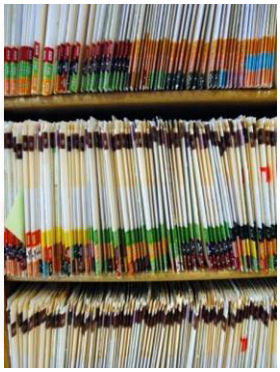
Who wouldn't want a clean, modern and spacious clinic?

4. Space Efficiency

[Film]



Dark Room



File Storage Room

[Intraoral Sensor]



No need for the Physical Space

Film users need to have physical space for film storage and a dark room for chemically processing X-ray film images. However, in the case of intraoral sensors, doctors only need a small space for the PC and monitor to view the images.

Clinicians can transform the dark room and file storage room into a patient's waiting room or a reception space.

Are you aware of the toxic effects when developing film?



5. Toxic Chemical Free

The silver thiosulfate complex in radiographic fixers is the form of environmental concern.



Another common waste product in a dental office is unused film. It contains unreacted silver that can be toxic to the environment. The majority of silver concentration that is released into the environment remains in the soil or the waste water sludge at the waste water emission site.

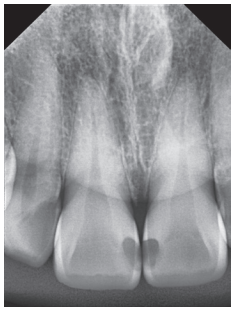
Digital imaging is the standard means of acquiring dental radiographs and one of its key advantages are the absence of chemicals. [2]



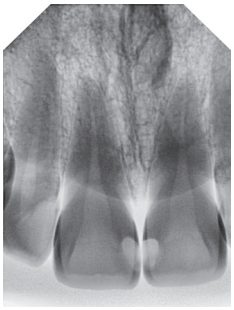
How about making your own image to suit your diagnostic needs?



6. Image Adjustment for your Diagnosis



Original



Inverted



Original



Contrast & Brightness Adjusted

You can correct, to some extent,
overexposed or underexposed images and **optimize contrast and brightness** for specific diagnostic procedures such as **caries detection and bone level assessment.**

Additionally, **images can be rotated, enlarged, and magnified to enhance details for diagnosis and patient education.**



73%

of respondents in a recent survey claimed digital radiography to be more diagnostic than film. (Acceptance Rate of Diagnosis). [3]

It has been my observation that most people get ahead during the time that others waste.

- Henry Ford -

Process Time Difference : Intraoral Sensor VS. IPS

The primary disadvantage of IPS is the need for additional time (max. 147 sec.) for handling and scanning (scanner processing) prior to the final viewing of the radiographic image.

IPS	
Steps	**Time**
Erase Each Plate	20
Insert Each Plate into a Barrier	5
Position	10
Expose	1
Take to Scanner	20
Clean up Hands and Plates	20
Open Barriers	10
Insert Plates into Scanner	5
Scan	17
Arrange Images in Order	25
Retrieve Used Plates	10
Return to Patient	20
View	4
Over 2 minutes per image	**167**

Intraoral Sensor	
Steps	Time
Insert Sensor into Barrier	5
Position	10
Expose	1
View	4
Total Time in Seconds	**20**

※ Time can vary slightly depending on clinic's environment

An intraoral sensor will save you 147 sec.

• IPS: Imaging Plate System

Don't be distracted by long processing times, Focus on your "patients"

Instant viewing is a must in various situations

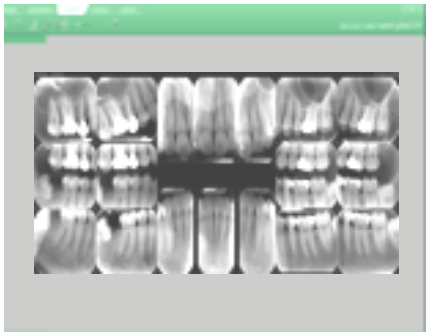
Implant Surgery

Intraoral sensor helps you take images on the operating table instantly without having to move.
The instant view is remarkably important in order to prevent unexpected incidents while you are conducting implant surgeries.

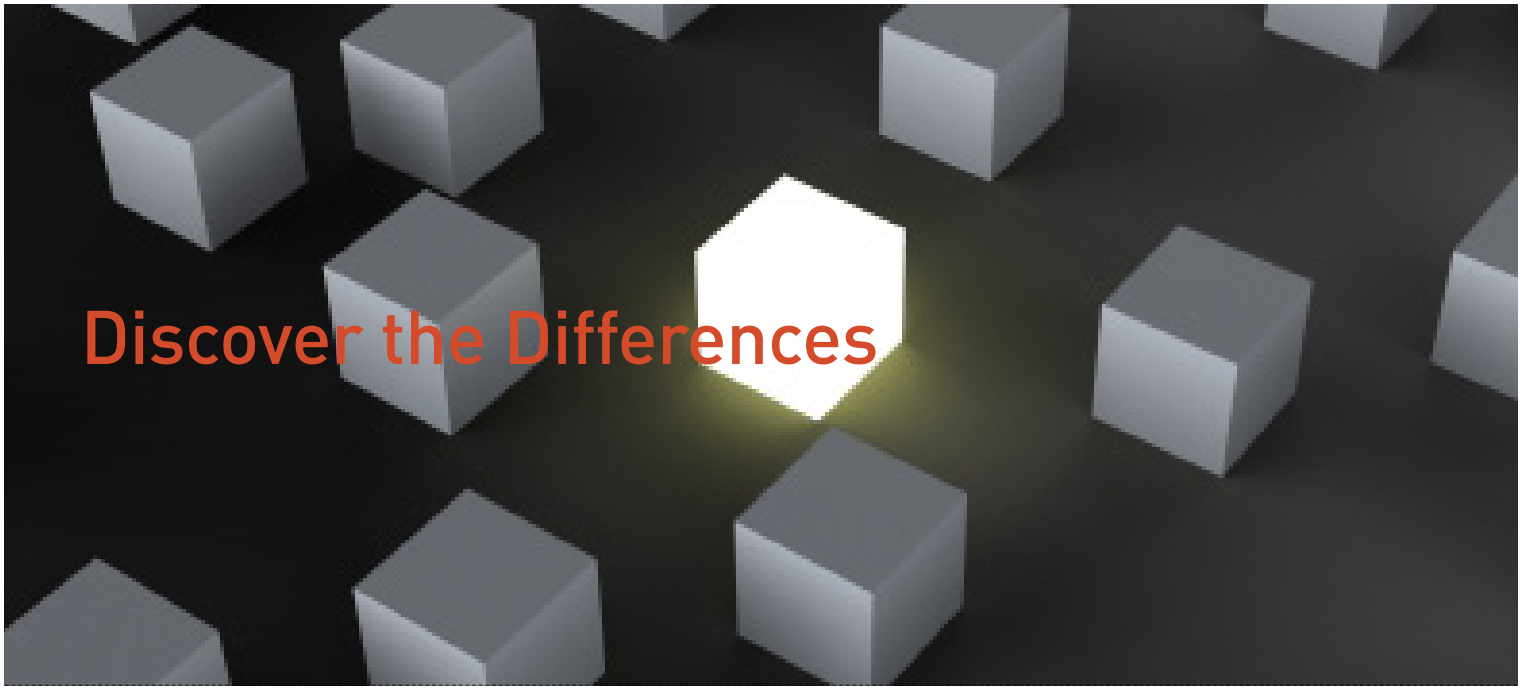


FMX (Full Mouth Series of X-ray)

Whenever you take images through IPS, plates have to be exchanged and be scanned respectively. So the FMX process takes about 4 times more than that of Intraoral Sensor based on the process chart before.
Furthermore, the gap widens as staff sometimes repeat the steps to acquire retakes. With Intraoral Sensor's instant view, waiting time is minimized.



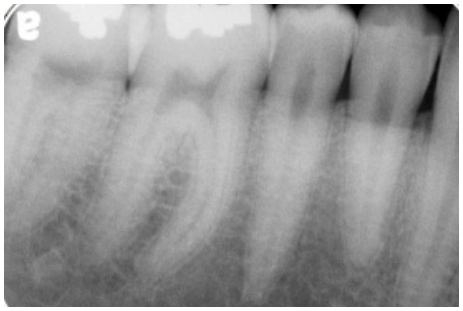
Intraoral Sensor provides you with fast and efficient workflow in various situations.



Discover the Differences

Image Quality Difference : IPS VS. Intraoral Sensor

Technically, IPS has a lower spatial resolution than an intraoral sensor. Emulsion scratches and plate scanning delays have a significant effect on pixel intensity degradation and the ability to detect occlusal caries.



[IPS Image]

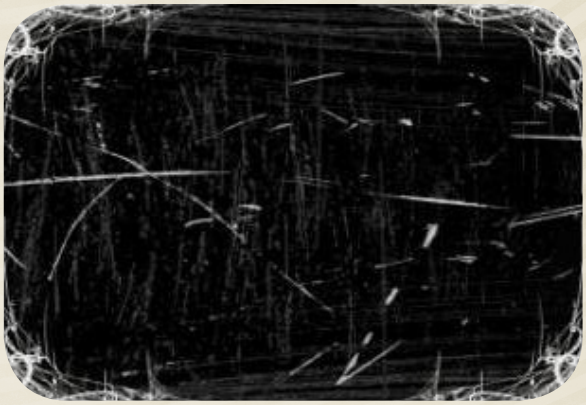


[Intraoral Sensor Image]

	IPS		Intraoral Sensor	
Company	A	B	C	D
Pixel Size	30 µm (High) 60 µm (Low)	23 µm (High) 30 µm (Low)	18.5 µm	14.8 µm

※ Pixel is the basic unit of a digital image. Since the physical size of a pixel determines image resolution - the smaller the size of the pixel, the higher the resolution which results in a clearer image.

Why should we have to deal with lower quality images?



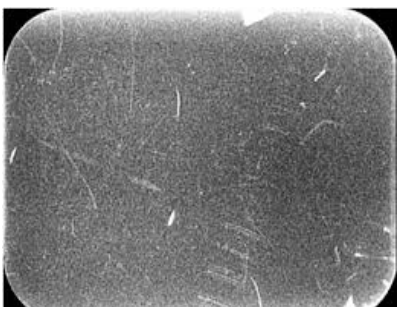
Scratches shorten an imaging plate's life expectancy

Imaging plates which have been over-used seem to demonstrate a lower quality due to the appearance of scratches.

These scratches can sometimes render the resulting image completely useless for diagnosis and may lead to a retake of the radiograph.

The plates are first placed into protective plastic barriers, then into the film holder of the positioning devices, next into the patient's mouth, and lastly, mounted onto the drum of the IPS before going through the scanner.

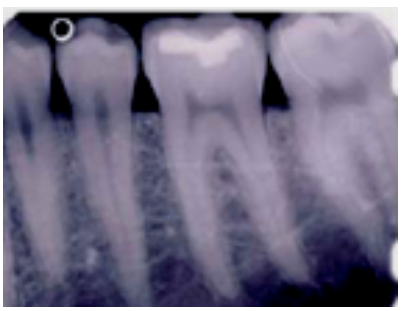
During the steps mentioned above, the imaging plate is most commonly damaged by the operator's fingernails when handling the plate and the patients teeth when placed into position. [4]



[Blank image with scratches]



[Plate with scratches]



[Image with scratches]

Why should we have to deal with lower quality images?

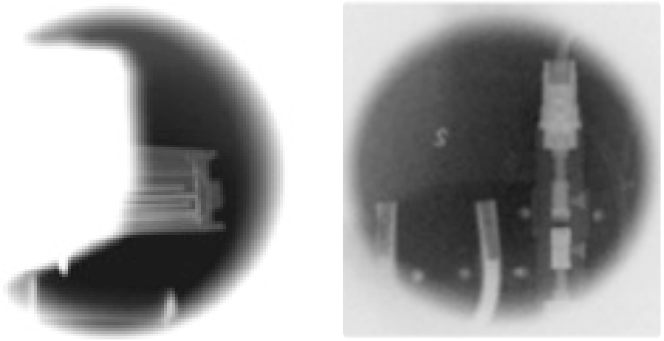


Observation of Ghost Images

Imaging plates have a linear response to high radiation dose. When it gets exposed to a high dose of neutrons or X-rays in practice, it results in highly saturated radiographs.

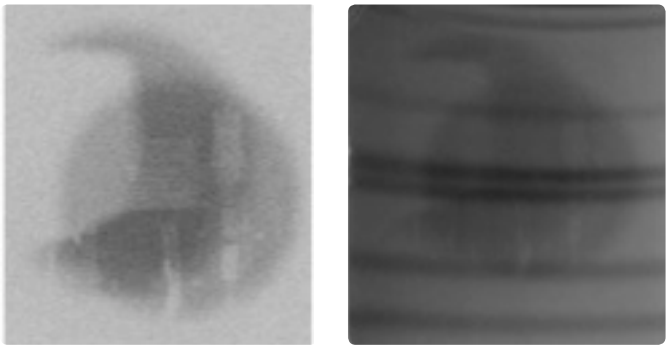
Under such circumstances the residual latent image on plate does not get completely erased when exposed to visible light resulting in some unexpected effects such as formation of ghost images. These then reappear in the background of subsequent image taken.

It is unquestionable that the ghost images may cause serious practical problems that lead to incorrect quantification of Photo-Stimulated Luminescence (PSL) intensities and severe damage to the plates. [5]



(1) (2)

These two radiographs were the source for ghost image. 5)



(a) (b)

(a) Ghost image as combination of two radiographs shown above. (b) Ghost image appearing in the background of neutron diffraction pattern. 5)

Why are you still using IPS?



I. Longer Steps

There is a huge difference in processing times between IPS and an intraoral sensor. That gap is about 82 seconds, which can further increase if you ever need to re-take an image with IPS. Moreover, this long process allows for increased chances of errors and a decreased attention to patients.



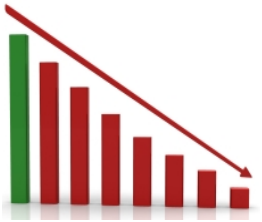
II. Lower Image Quality Compared to the Intraoral Sensor

IPS images technically have lower image quality because of their larger pixel sizes. With every use of the plate, the quality of the image decreases because of the wear and tear of the plate.
After years of usage, one cannot expect their IPS to keep the same image quality compared to how it looked on the first day they used it.



III. Scratches Shorten an Imaging Plate's Life Expectancy

Plates are too weak to be protected against various scratches, which can render the resulting image completely non diagnostic and may lead to a retake of the radiograph. In addition, there will be costs every time you need to replace a worn out plate.



Hello, Slim

We have developed new slim sensor models, the EzSensor Classic / HD, with high resolution to minimize the daily inconveniences for you and your practice.

Current sensors in the market give discomfort to patients and cause problems such as retakes. However the EzSensor Classic / HD provide the best comfort, great visibility, easy treatment, and time efficiency in order to help you concentrate and spend more valuable time on your diagnosis.

Slim design for easier positioning

Leading expert in image quality

Innovation in durability

Mobility in practice

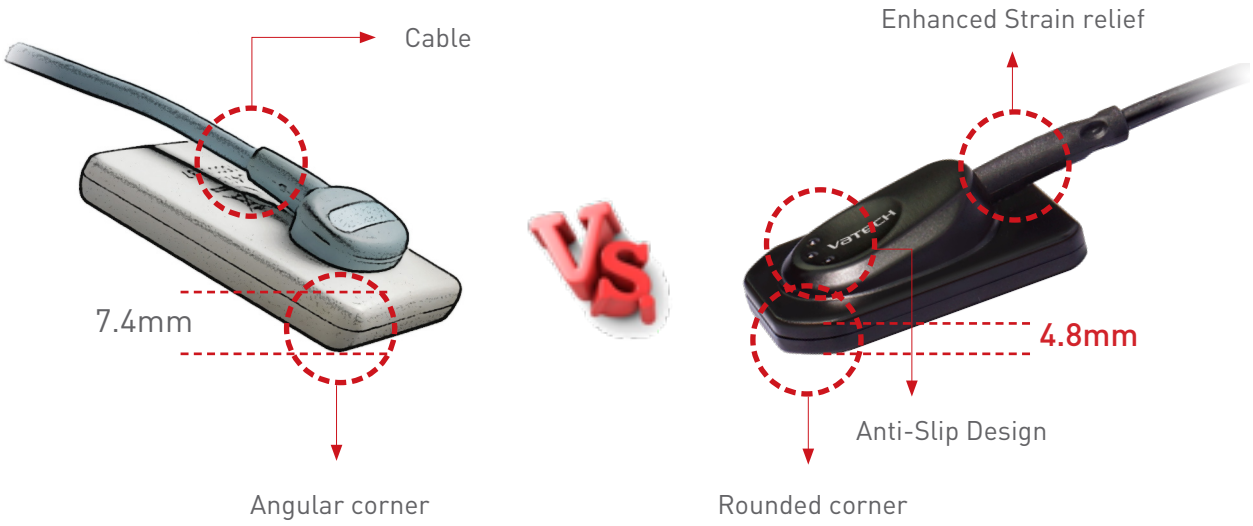


EzSensor *Classic*
EzSensor *HD*

Slim Design for Easier Positioning

Thickness of 4.8mm and rounded design allows for maximum comfortable placement against soft tissue.

Slim and rounded edges ensure that patients feel as comfortable as possible while taking X-ray images.



[Normal Sensor]

[EzSensor Classic/HD]

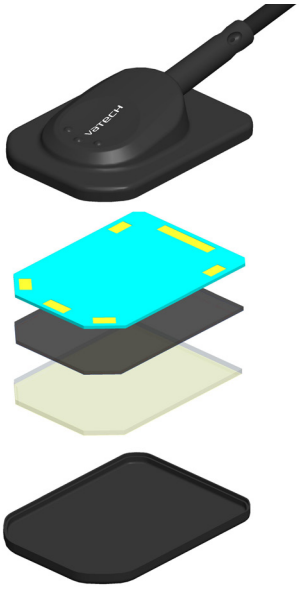
The design results in not only patient's comfort but better quality images with reduced risks of retakes associated with patient movement. Patients will feel more at ease and avoid any distress that comes with using a thick and angular corner sensor can be eluded.

Slim Design for Easier Positioning

Thickness of 4.8mm and rounded design allows for maximum comfortable placement against soft tissue.

Patients will experience an 'optimized touch' from the thinnest sensor.





EzSensor Classic / HD have a thickness of 4.8mm which is the thinnest size among CMOS sensor.

VATECH R&D Center ran simulations and came to a conclusion that the optimized thickness of 4.8mm which minimizes the pain.

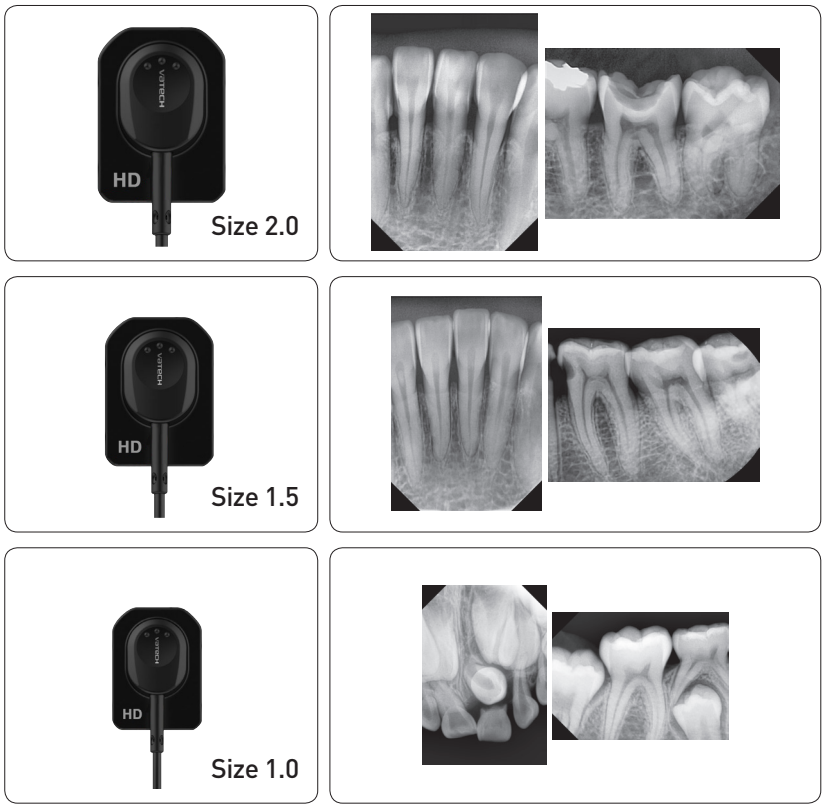
This feature makes the process more comfortable. The sensor can be easily positioning thereby causing less stress to the patient.

Slim Design for Easier Positioning

Thickness of 4.8mm and rounded design allows for maximum comfortable placement against soft tissue.

Ergonomically designed in 3 different sizes.

EzSensor Classic / HD are ergonomically designed in 3 different sizes to meet the needs of various cases. The rounded & cut edges provide the best possible comfort for patients. Even more, Vatech's unique size 1.5 fits almost all patients.



→ 2.0 for for adults and big oral cavities

→ 1.5 for children and adults

→ 1.0 for children

Leading expert in Image Quality

Experience high image quality

EzSensor Classic / HD will upgrade the existing intraoral sensor standards.

Both sensors provide you and your staff the images you need for accurate, easy and quick diagnosis.





How did we create such a high quality sensor?

- New image processing algorithm applied
- Well balanced imaging factors – resolution, sensitivity, and noise
- In-house manufacturing components (from CMOS design to viewer software)

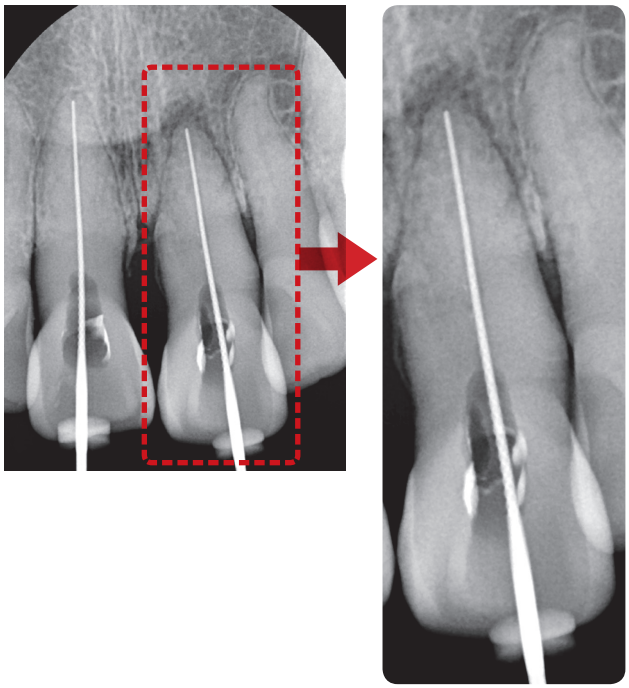


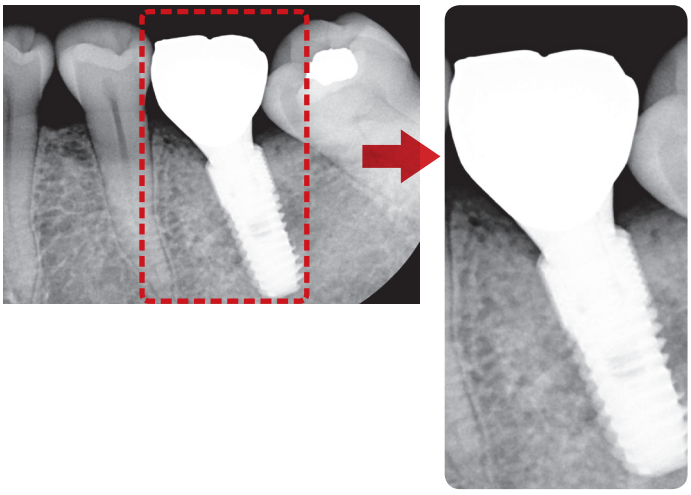
Leading expert in Image Quality

Experience high image quality

EzSensor HD especially provides expert images for endodontists and implantologists when you choose the 'high resolution mode'.

There is no image degradation caused by magnification, as seen in the sample images below. This greatly benefits you, when you check ROI which requires accurate diagnosis.





Leading expert in Image Quality

Experience high image quality

How are the EzSensor Classic / HD different?

They have the same features and appearances, but the EzSensor HD has a "High Resolution Mode" for acquiring expert image quality.

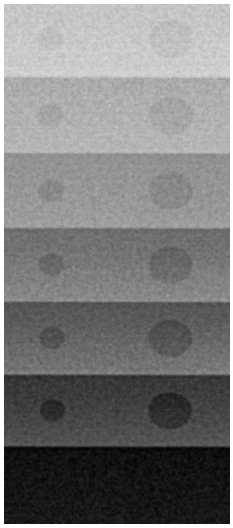
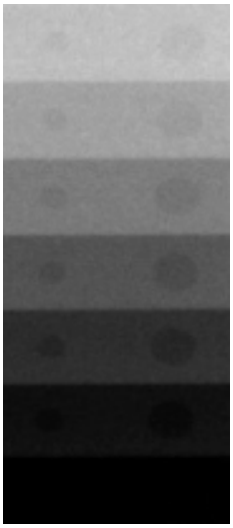
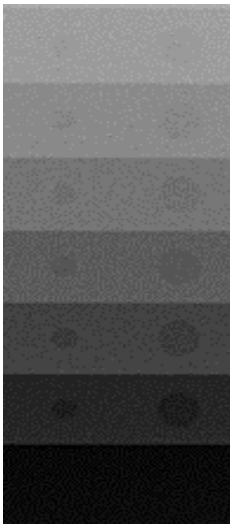
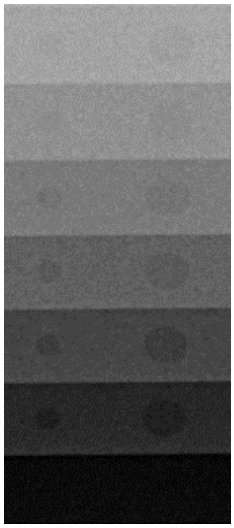
Resolution	EzSensor Classic	EzSensor HD
Pixel size (µm/mm)	29.6 µm / 0.0296 mm	High Resolution : 14.8 µm / 0.0148 mm Normal Resolution : 29.6 µm / 0.0296 mm
Theoretical resolution (LP/mm)	16.89 (lp/ mm)	High Resolution : 33.78 (LP/mm) Normal Resolution :16.89 (LP/mm)
	*Actual(or ideal) resolution may not reflect same numbers as mentioned above depending on circumstances.	

※ Pixel is the basic unit of a digital image. Since the physical size of a pixel determines image resolution - the smaller the size of the pixel, the higher the resolution which results in a clearer image.

Leading expert in Image Quality

Experience high image quality

How many lines and dots you can see is a more important factor than the actual resolution number.

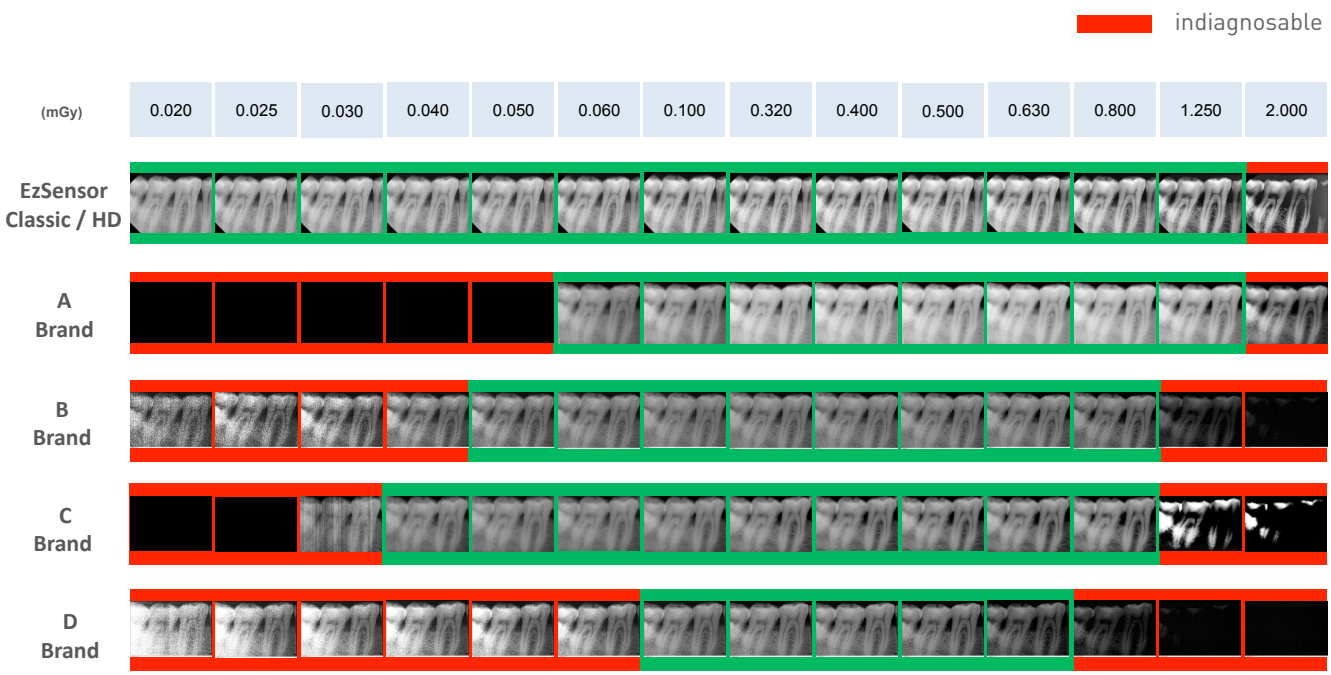
Skull Phantom Image				
Step Wedge* Image **Test condition: 100μGy**				
Sensor Brand	EzSensor Classic/HD	A	B	C

- Step wedges are used for evaluation of contrast on radiolographic image.
- The images were acquired using the same exposure conditions [time, kVp, mA]

Leading expert in Image Quality

Experience high image quality

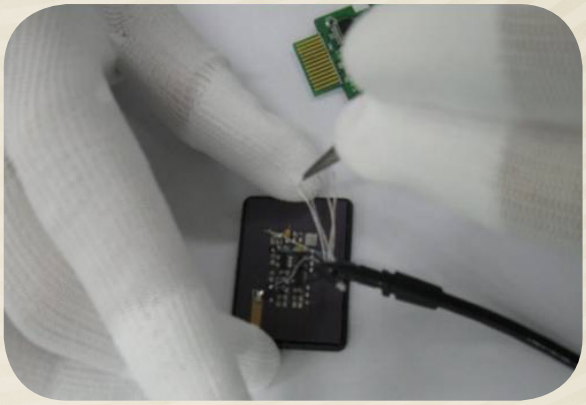
The EzSensor Classic/HD provides you stable quality through high sensitivity sensor technology. Under a wide range of exposure settings even including old X-ray sources, you can capture diagnosable and consistent images.



Test conditions:
X-ray Exposure: 65 kVp, 6 mA, 28 cm, SID

Innovation in Durability

Upgrade Usability and Raise Value



Enhanced Durability Through Cable Strain Relief

The EzSensor Classic / HD are designed with a durable close-coupled wired body to prevent any kind of damages in its everyday use. Based on actual usage, our durability test includes bending up, down, left, right side and bending up to four times.

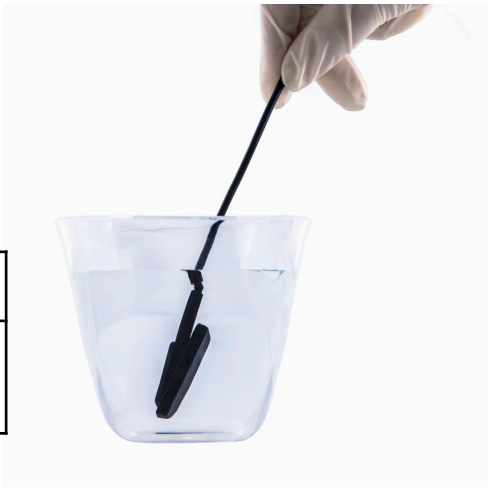


- Cable bending test has been carried out by 120,000 times (condition: +/- 180 degree & 200g).

Complete Protection Against Dust and Water

The EzSensor Classic / HD rated at IP68, the highest level of the Ingress Protection [IP].

IP	6	8
Ingress Protection	Complete Protection Against Contact	Suitable For Continuous Immersion



Mobility in Practice

How many intraoral sensors do you need for your clinic?

The common assumption is that each operatory of your practice should have an intraoral sensor installed.
Why do our customers need to purchase more than one sensor?
Why can't they just have only one sensor, even if there are multiple operatories?

Here is a solution, Mobility

- Better use of a single sensor in Multi Rooms
- Image acquisition within a few seconds
- Easy consultation with patients

EasyDent M

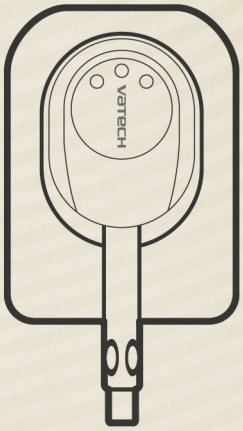


Our mobile solution will enable you to use one sensor in multiple rooms, which will free you from cable messes and volume purchase burdens.

Chair-side consultation through Mobile Viewer is possible with a tablet capturing, viewing and manipulating images instantly.

EzSensor Classic
EzSensor HD

Faster workflow with Direct USB Connection.

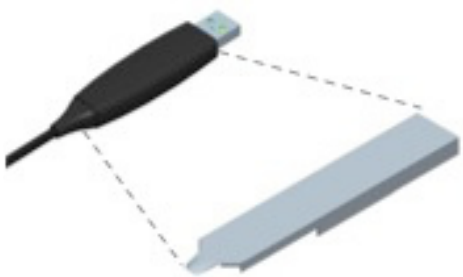


Directly connect the EzSensor Clsssic/HD USB to the USB port on the PC.



USB Cable Length

Total Length of cable between sensor and PC is 2.7M



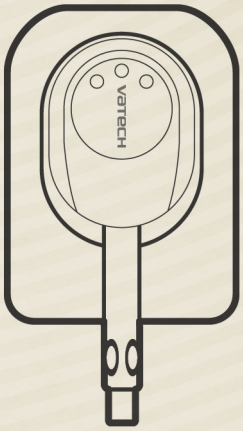
Metal Cover

Metal inner case protects the USB
(Shock protection up to 9N)

EzSensor Classic
EzSensor HD

Experience the most user friendly S/W.

Diagnose and consult simultaneously, with our powerful consultation tool.







VIDEO



SIMULATION



X-RAY



CASE

- EzDent-i included
- EzCodi included

EzDent-i

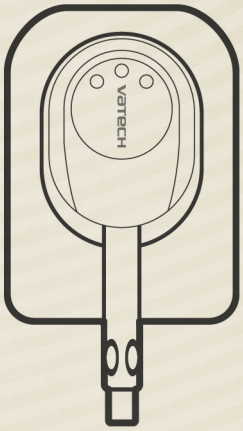
EzCodi, a package of 50 animations of dental treatments, which will help your patients to understand better and your consultations more powerful.

EzSensor Calssic / HD & EzDent-i will change the way you consult and will increase patient satisfaction.

EzSensor Classic
EzSensor HD

Accessories

The EzSensor Classic/HD meet the needs of every requirement.



Basic

In Box (Full Pack)	Remark
Sensor Module	2.7m USB Cable
Wrap (Hygienic Sleeves)	1 pc
Holder for Sensor	1 pc
S/W & Driver Installation CD (or USB) Manual	EzDent-i USB Device Driver Document

Optional



Exclusive Holder

· 5 Arms & Rings : 1 Ant, 2 Post, 1BW, 1 Endo
· 10 Bite blocks – 2 Each : Ant, Post, HBW, VBW, Endo



Mobile Solution

Technical Specification

EzSensor Classic EzSensor HD

General Specifications	
Installation	Wall or Lamp (Pipe) mounted
Gray Scale	4096 gray levels
PC Connection	USB 2.0 Compatible *In the case of further extension, the use of an active USB hub is recommended.
PC Requirement	▪ CPU: Intel Pentium Ⅳ 3.0 GHz ▪ Main Memory: 1GB of RAM (DDR2) ▪ Graphic Card : 64MB or Higher ▪ HDD: 80 GB (or higher) ▪ Display: 1024x768 (Min)

Size Specification	Sensor Size 2.0	Sensor Size 1.5	Sensor Size 1.0
Sensor Dimensions (L x W x D mm)	42.9 x 31.3 x 4.8 mm 1.69 x 1.28 x 0.19 inch	39.5 x 29.2 x 4.8 mm 1.55 x 1.15 x 0.19 inch	36.8 x 25.4 x 4.8 mm 1.44 x 1.00 x 0.19 inch
Active Sensor Area (L x W mm)	35.99 x 25.99 mm	33.00 x 23.98 mm	30.01 x 20.01 mm

Resolution	EzSensor Classic	EzSensor HD
Pixel size (μm/mm)	29.6 μm / 0.0296 mm	High Resolution : 14.8 μm / 0.0148 mm Normal Resolution : 29.6 μm / 0.0296 mm
Theoretical resolution (LP/mm)	16.89 (lp/ mm)	High Resolution : 33.78 (LP/mm) Normal Resolution :16.89 (LP/mm)
	*Actual(or ideal) resolution may not reflect same numbers as mentioned above depending on circumstances.	

Better is not enough,
Be different

We have redefined the intraoral sensor.



EzSensor Classic
EzSensor HD

Dental Pioneer
VATECH
VATECH Global



| References |

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