



## See beyond sight

# Sales Kit of Medical Display

December. 2019

**Clinical Review Monitor** | 27HJ712C, 27HJ713C, 19HK312C

**Diagnostic Monitor** | 32HL512D, 21HK512D

**Surgical Monitor** | 32HL710S, 27HJ710S, 27HK510S

**Digital X-ray Detector** | 17HK700G-W, 17HK701G-W, 14HK701G-W



## Things you **MUST KNOW** before starting

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- If you use images for commercial use, it can be accompanied with legal issues.
- Some product features and images included in this document may vary or differ depending on country as each country runs different specifications.
- Some product features are also available with specific models. Therefore, consumers should check the detailed specifications of the model they are looking for.

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32HL710S | 27HJ710S | 27HK510S

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# LG Electronics, Global Network

LG's 75,150 employees continuously supports customers worldwide while advancing the boundaries of what technology can do to enhance the lives and business environment.

\* Including all companies of LG Electronics Inc.



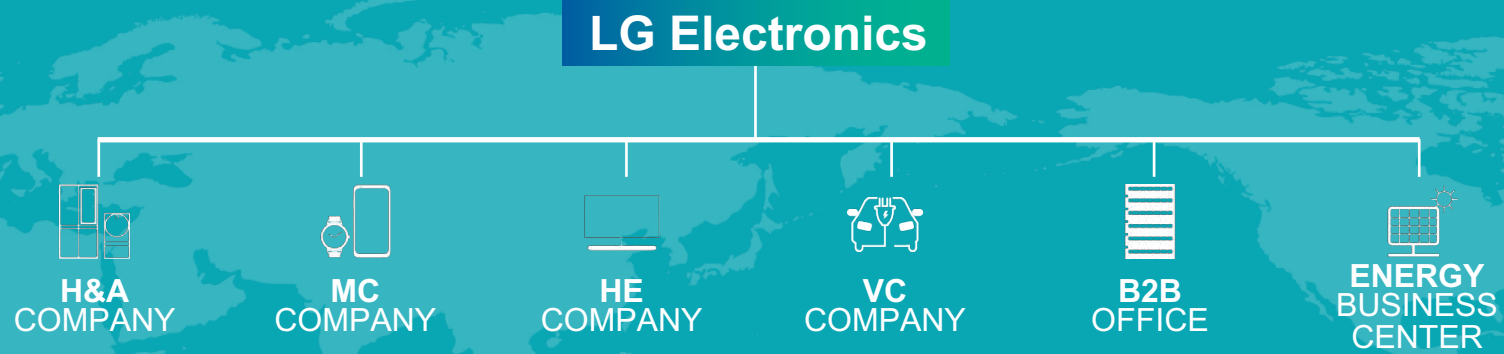
Global Operation **118** / Design Centers **6** / Workforce **75,150**



## Introduction

# LG Electronics, Leader of the Industry

LG Electronics is a leading electronics company with 6 divisions including LG Home Entertainment Company, and HE's product portfolio spans a well-diversified range of home entertainment products and B2B products, from TVs, AV, IT and digital signage categories. Above all, B2B products designed to support and enhance businesses across numerous verticals.



Monitor



PC



Projector



Signage  
Open-frame OLED Signage



Commercial TV/ Hospitality



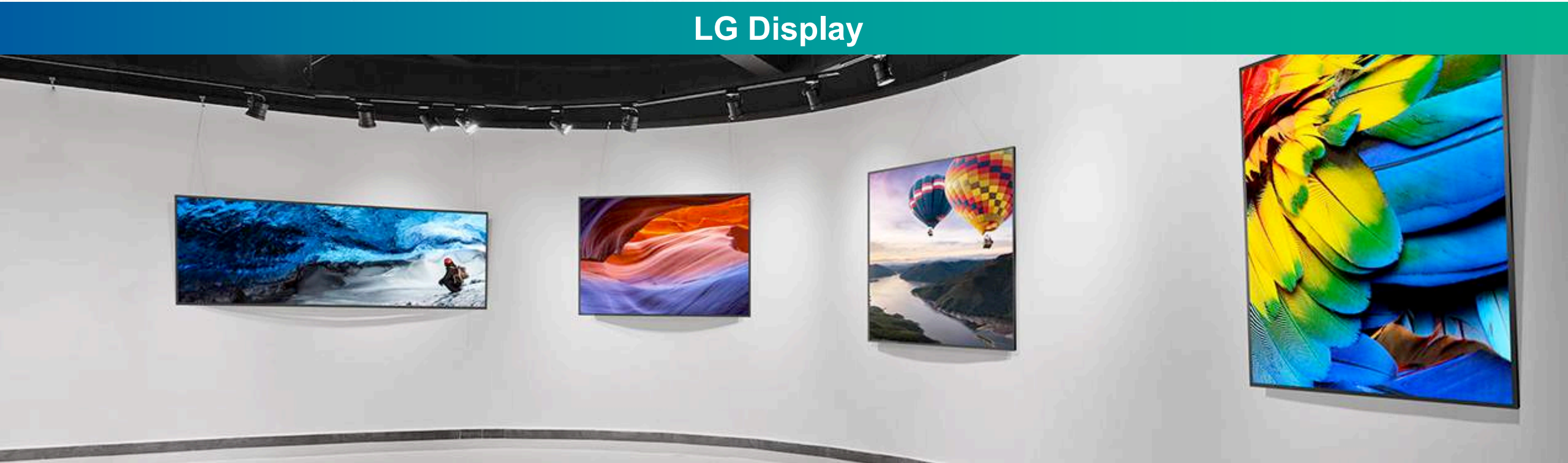
In-glass Wallpaper  
OLED Signage

## Introduction

# LG Display Technology Adding Value to LGE Products

Innovative technologies from LG Display, the world's No.1 leader in the display market, have brought value to consumers together with the synergy between the various latest products from LG Electronics. This has helped LG build strong reliability for a wide range of clients within the B2B marketplace.

## LG Display



TV Display

Commercial Display

IT Display

Mobile Display

Auto Display

OLED Light

IPS

in-TOUCH

M+

## Introduction

# LG IT Division Business Unit

Leveraging years of experience in advanced flat-panel display technology, LG offers a product lineup formulated and optimized specifically for medical environments. LG Electronics has developed a wide range of advanced technologies that assist with major advancements in the field of specialized care, an industry that relies on high-tech integration.



### Monitor

- UltraWide™
- UHD 4K Monitor
- UltraGear™
- TV Monitor
- LED & IPS Monitor



### Projector

- Laser
- LED



### PC

- Laptop



### Cloud Device

- Thin Client
- Zero Client



### Medical Display

- Clinical Review Monitor
- Diagnostic Monitor
- Surgical Monitor
- Digital X-ray Detector (DXD)



## Introduction

# A Diverse Range of Medical Display Solutions

In November 2016, LG Electronics officially debuted its line of medical monitors to the healthcare market at RSNA 2016, the industry's largest annual meeting in Chicago, demonstrating the new products, including monitors for clinical review, surgery and diagnoses. At MEDICA 2017, the world's largest medical trade fair held in Düsseldorf, LG is showcasing its expanded and completed lineup of medical display with a variety of scenarios, including a consultation room, a surgical operating room, a radiographer's room, and a diagnostic reviewing room. Especially, LG products are not only optimized for actual medical environments, but also developed with the latest technology based on the actual performance needs of field clinicians.

### Clinical Review Monitor

- 8MP Clinical Review Monitor
- 1.3MP Clinical Review Monitor

### Diagnostic Monitor

- 8MP Diagnostic Monitor
- 3MP Diagnostic Monitor

## LG Medical Display

### Surgical Monitor

- 4K Surgical Monitor
- FHD Surgical Monitor

### Digital X-ray Detector(DXD)

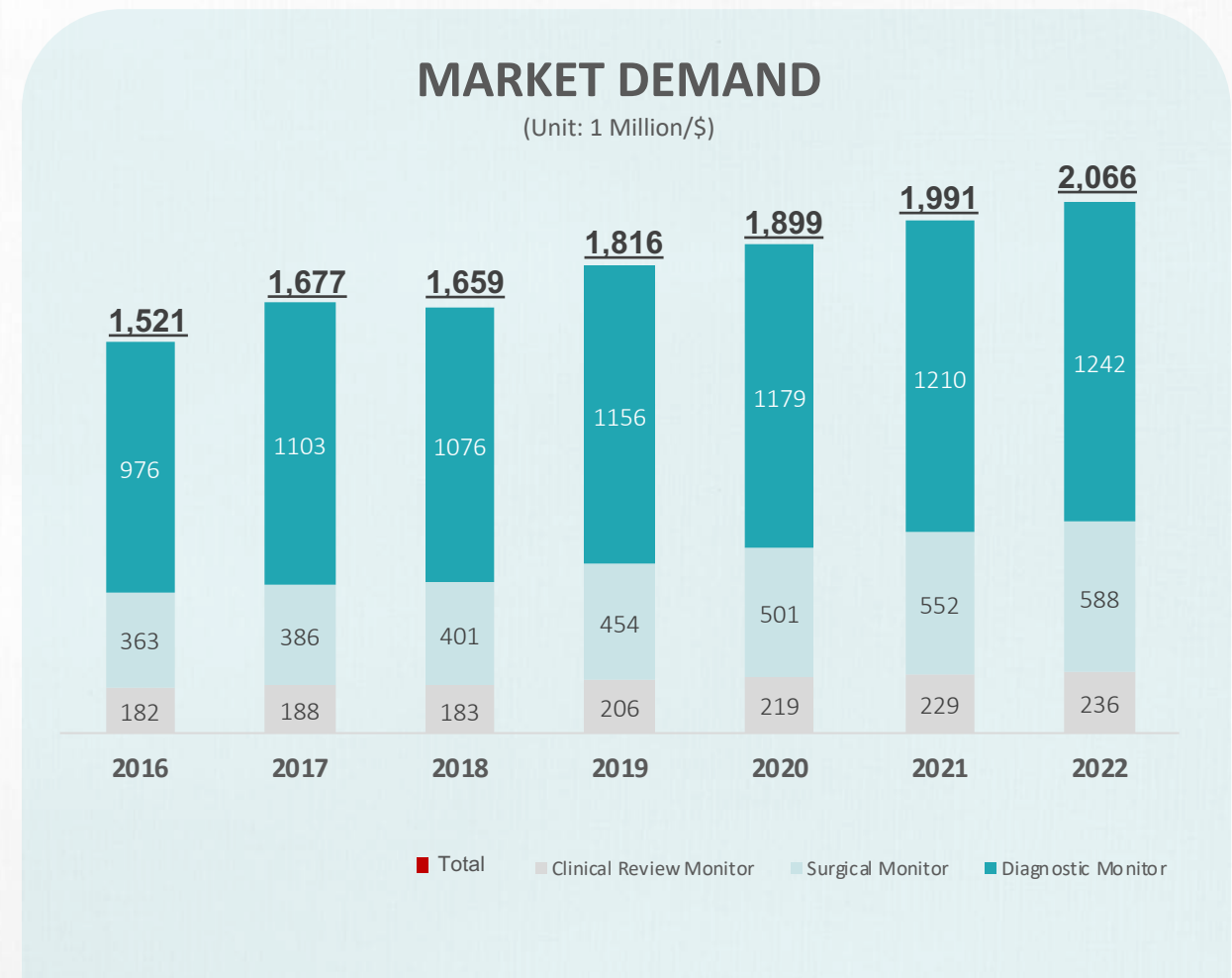
- 17-inch Wired DXD
- 17-inch Wired/ Wireless DXD
- 14-inch Wired/ Wireless DXD

## Understanding Market Potential

# Medical Display, The Field LG Can Do Better

Supposed to develop a brand-new business category where our company can afford while considering the market growth and profits, it is a key issue to access medical displaying market.

Also medical regulation strengthening from USA and Germany, it supposed entering medical display will spurred the growth in the field of monitor display on us.





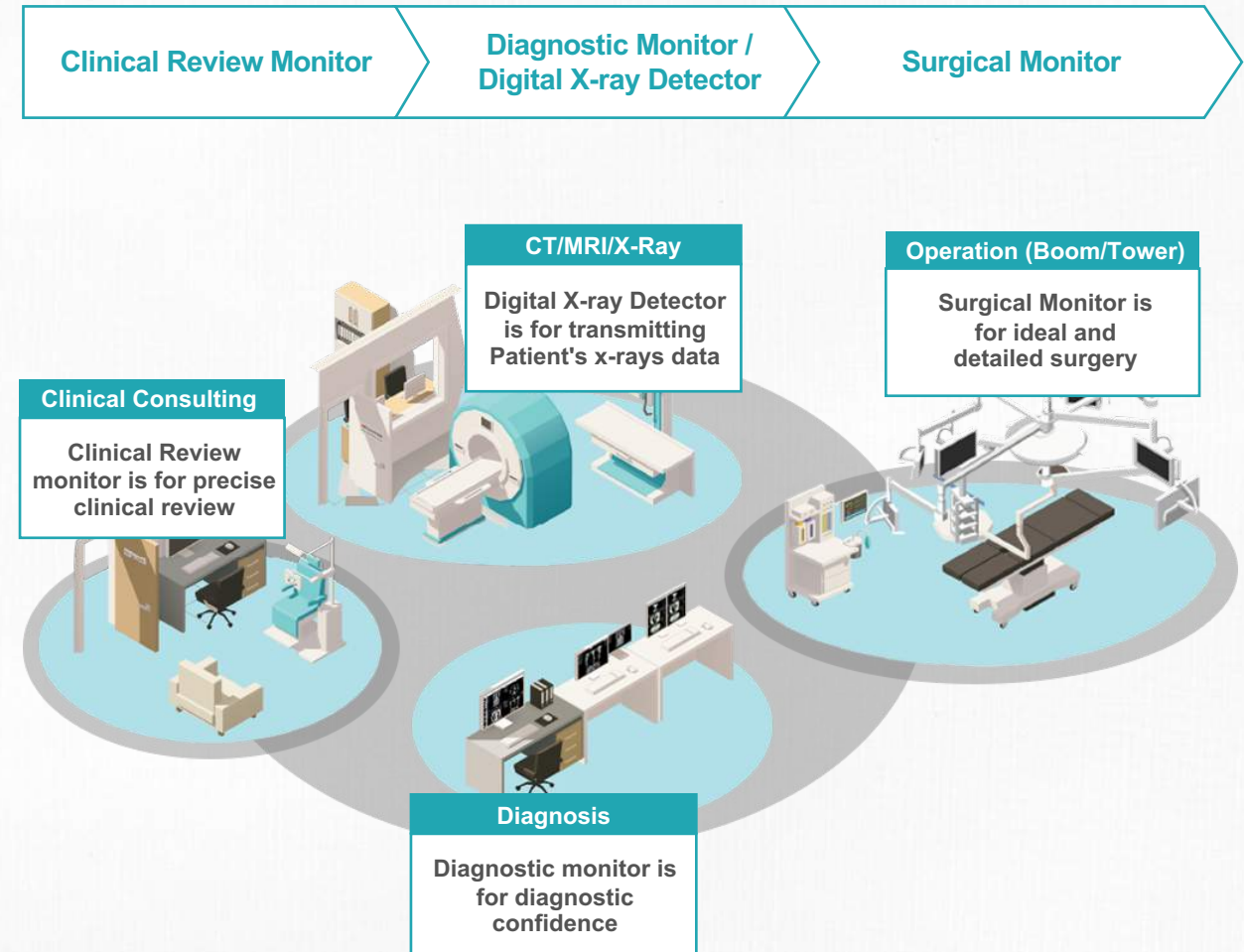
## Understanding Market Potential

# Types of Medical Display

Medical Grade Monitor Should Have...

ITEM	Normal	Clinical Review	Diagnostic	Surgical
Medical grade Certification	No	FDA Class I CE MDD Class I IEC60601-1	FDA Class II CE MDD Class I IEC60601-1	FDA Class I CE MDD Class I IEC60601-1
Compliance of DICOM Part14	No	Yes	Yes	Yes
Brightness Stabilization	No	Yes	Yes	Yes
Waterproof	No	No	No	Yes
High Brightness	No	No	Yes	Yes
Monochrome only	No	No	Yes	No
Front Sensor	No	No	Yes	No

[Link to : 'Front Sensor' in Medical Monitor](#)



# LG Medical Display Line-up

## Clinical Review Monitor



27HJ712C



27HJ713C



19HK312C

## Diagnostic Monitor



32HL512D



21HK512D

## Surgical Monitor



32HL710S



27HJ710S



27HK510S

## Digital X-ray Detector



17HK700G-W/17HK701G-W



14HK701G-W

Product Line-up

# 19Y LG Medical Display

Clinical Review Monitor

Diagnostic Monitor/Digital X-ray Detector

Surgical Monitor

Clinical Review Monitor

27HJ712C  
27HJ713C  
19HK312C

Digital X-ray Detector

17HK700G-W  
17HK701G-W  
14HK701G-W

Surgical Monitor

32HL710S  
27HJ710S  
27HK510S

Diagnostic Monitor

32HL512D  
21HK512D

# LG Medical Display Solution

LG Medical Displays are used all over the world. They are found across 118 hospitals and clinics, in many consultation rooms, surgical operating rooms, radiology reading rooms, and rooms for clinical review.





# LG Medical Display Solution : North America & LATAM

LG Medical Display Devices are used in hospitals worldwide.

## UNIVERSITY OF SOUTHERN CALIFORNIA



- Country : USA
- Bed Capacity : 600 Beds
- Hospital Type : Private
- Department / Usage : General purpose
- Product Information : 27HJ712C Clinical review monitor
- Installation date : September, 2018

## UNIVERSITY OF MICHIGAN



- Country : USA
- Bed Capacity : 1,006 Beds
- Hospital Type : Private
- Department / Usage : General purpose
- Product Information: 27HJ712C Clinical review monitor
- Installation date : December, 2018

## HOSPITAL SANTO TOMAS



- Country : Panama
- Bed Capacity : 632 Beds
- Hospital Type : Public
- Department / Usage : Operation Room/Auxiliary Monitor
- Product Information: 27HK510S Surgical monitor
- Installation date : April, 2018

## FUNDACAO DOUTOR AMARAL CARVALHO



- Country : Brazil
- Bed Capacity : 300 Beds
- Hospital Type : Private / Public
- Department / Usage : Radiology / Imaging Analysis
- Product Information: 27HJ712C Clinical review monitor
- Installation date : April, 2019





## LG's Reference

# LG Medical Display Solution : Europe

LG Medical Display Devices are used in hospitals worldwide.

### La Zarzuela UNIVALSITY HOSPITAL



- Country : Spain
- Bed Capacity : 205 Beds
- Hospital Type : Private
- Department / Usage : Operation Room / Laparoscopy
- Product Information: 27HJ710S Surgical monitor
- Installation date : January, 2018

### PULA HOSPITAL



- Country : Croatia
- Bed Capacity : 600 Beds
- Hospital Type : Public
- Department / Usage : Radiology
- Product Information: 27HJ712C Clinical review monitor
- Installation date : March, 2019

### IASO



- Country : Greece
- Bed Capacity : 486 Beds
- Hospital Type : Private
- Department / Usage : Obstetrics and Gynecology
- Product Information: 27HJ712C Clinical review monitor
- Installation date : February, 2018

### CENTER HOSPITALIER DE BANGNOLS SUR CEZE



- Country : France
- Bed Capacity : 448 Beds
- Hospital Type : Public
- Department / Usage : Operation Room
- Product Information: 27HK510S Surgical monitor
- Installation date : 2019

### CUF HOSPITAL in LISBONE



- Country : Portugal
- Bed Capacity : 578 Beds
- Hospital Type : Private
- Department / Usage : Radiology
- Product Information: 27HJ712C Clinical review monitor
- Installation date : 2019



# LG Medical Display Solution : Europe & India

LG Medical Display Devices are used in hospitals worldwide.

## SALFORD ROYAL HOSPITAL NHS FOUNDATION TRUST



- Country : UK
- Bed Capacity : 728 Beds
- Hospital Type : Public
- Department / Usage : Radiology / PACS, Clinical review
- Product Information: 27HJ712C Clinical review monitor
- Installation date : April, 2019

## MAX HEALTHCARE



- Country : India
- Bed Capacity : 2,849 Beds, 14 branch
- Hospital Type : Private
- Department / Usage : Radiology / Imaging Analysis
- Product Information: 27HJ712C Clinical review monitor
- Installation date : July, 2018

## HOSPITAL SANT JOAN DE DEU BARCELONA



- Country : Spain
- Bed Capacity : 362 Beds
- Hospital Type : Private / Public
- Department / Usage : Operation Room
- Product Information: 27HJ710S Surgical monitor
- Installation date : September, 2019

## TATA MEMORIAL HOSPITAL



- Country : India
- Bed Capacity : 629 Beds
- Hospital Type : Public
- Department / Usage : Radiology / Clinical review
- Product Information: 27HJ712C Clinical review monitor
- Installation date : August, 2019

## MOOLCHAND HOSPITAL



- Country : India
- Bed Capacity : 50 Beds
- Hospital Type : Private
- Department / Usage : Operation Room / Surgery
- Product Information: 27HJ710S Surgical monitor
- Installation date : November, 2018





# 1

## Clinical Review Monitor

- 27HJ712C (8MP)
- 27HJ713C (8MP)
- 19HK312C (1.3MP)



Understanding the Product Concept

# What is Clinical Review Monitor?

## A Display compliant to DICOM Part 14 for Clinical Review Applications

Most general monitors are used as hospital monitors for clinical review. However, high-end monitors are preferred by professors of radiology for precise diagnoses. Because it is costly for hospitals to install high-end monitors throughout the entire hospital, monitors for general purposes have been also used for clinical purposes.

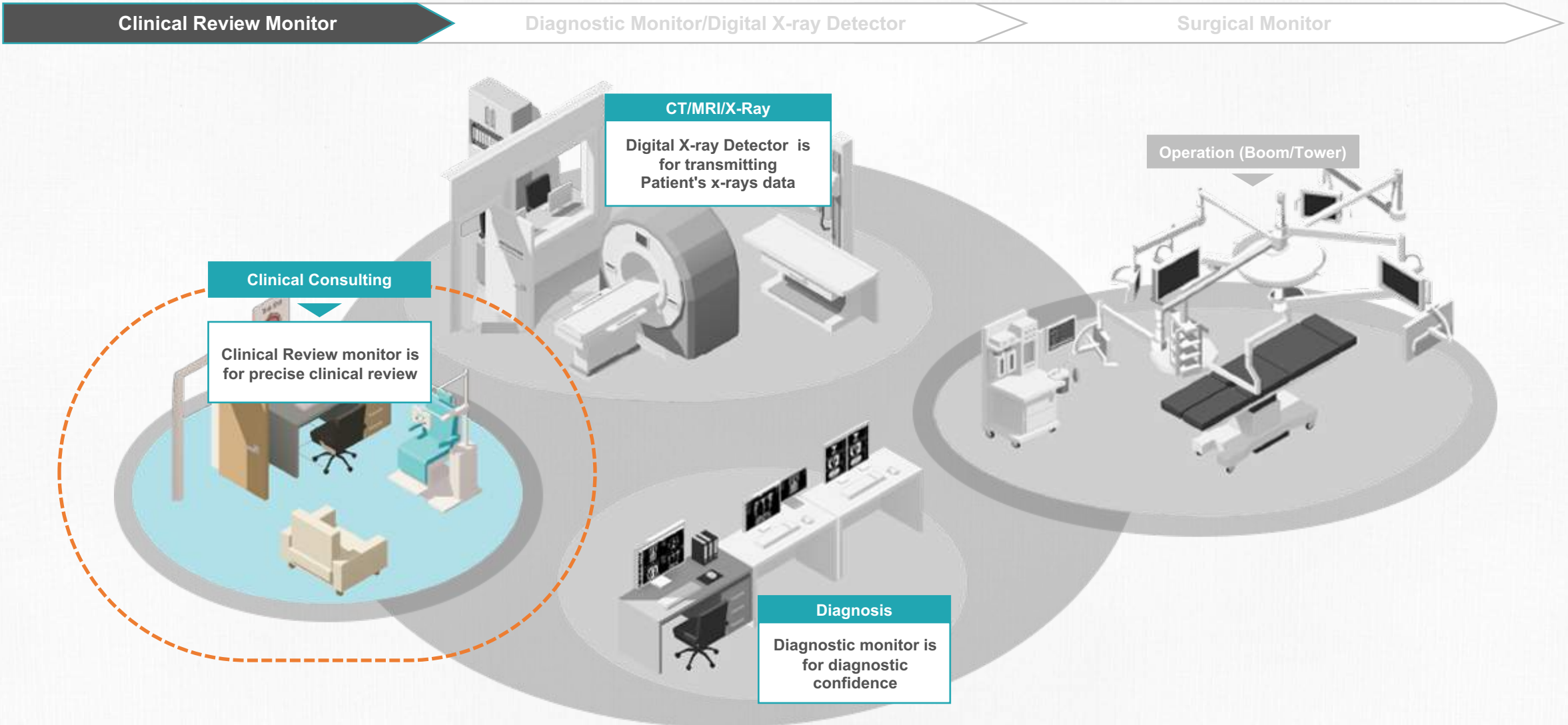
But there is a trend toward medical monitors compliant to DICOM Part 14 that can offer consistent grayscale among monitors so that doctors can double-check data based on accurate medical images.

Clinical review monitors are typically used for checking medical images, referral or other activities supporting diagnosis.





# Where is the Clinical Review Monitor...?





# Factors that Affect Purchase Decisions

Clinical Review Monitor

## Priority

### ✓ Superior Imaging Quality

The main purpose of clinical review monitors is cross-checking and analyzing. Compared to other equipment, different decoders can result even from the same test depending on the monitor's image quality, color expression and contrast. This could lead to faulty reviews or treatment, so a clinical review monitor needs to provide a high quality image comparable to a high-end monitor.

### ✓ Image Consistency Over Time

When conducting a clinical review, all judgement should be done under same conditions to prevent an incorrect review. All monitors should be set based on the DICOM preset, which is the industry standard, to maintain sharpness and consistency over time. Backlight sense is also an important element for making an accurate clinical review.

### ✓ Dynamic Sync Mode

For a more precise, more accurate clinical review, low input lag should be a basic criterion.

### ✓ Reduce Eye Strain

Considering that lengthy reviews cause eye fatigue for doctors, minimizing the flicker level ensures visual comfort.

## Usability Test Report

# Usability Test Result from SNUH UTC

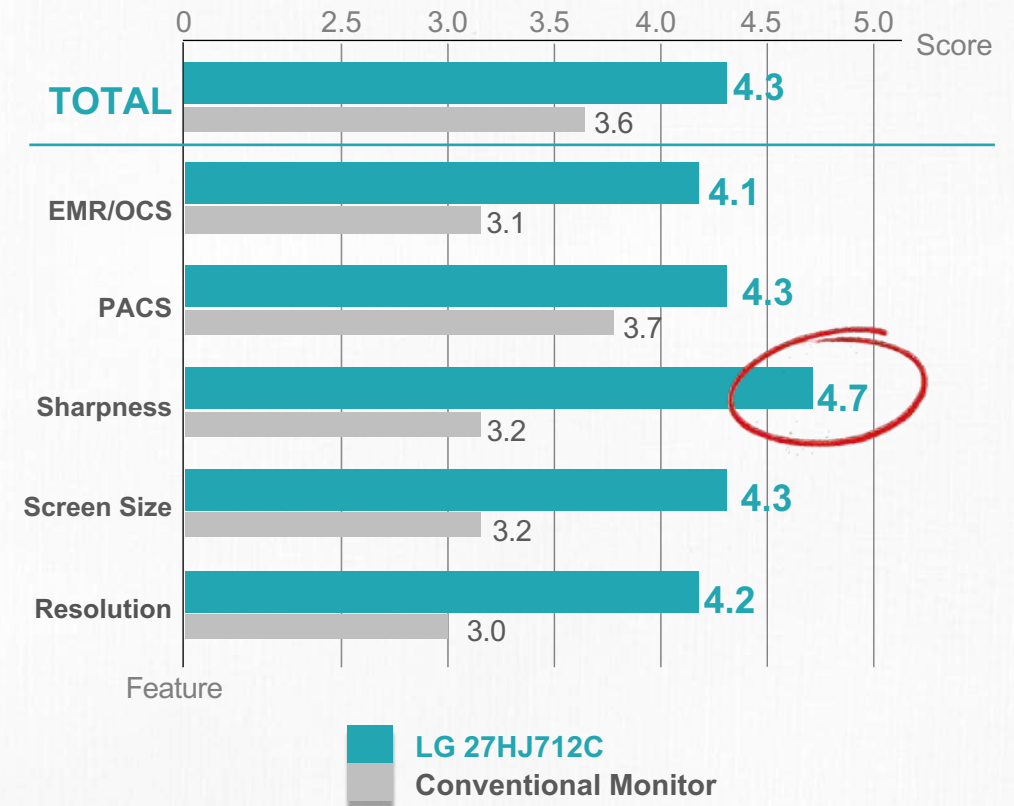
## Clinical Review Monitor

### Summary Statement

- 1 **83%** participants gave **higher score** on LG 8MP Clinical Review Monitor than the conventional monitor  
(5 participants out of 6 gave higher score on 27HJ712C and the last participant gave an equal score with Conventional monitor)
- 2 Got average score **4.3 out of 5.0** for all the test  
(Conventional monitor: 3.6/5.0)
- 3 Achieved **perfect score (5.0/5.0)** from **2 participants** out of 6
- 4 **4 participants out of 6** are **willing to purchase** to LG 27HJ712C
- 5 **Biggest Difference in "Sharpness(4.7/5.0)"** of all the test  
(Conventional monitor: 3.2/5.0)

\* The score ranges on 1-5 scale points.

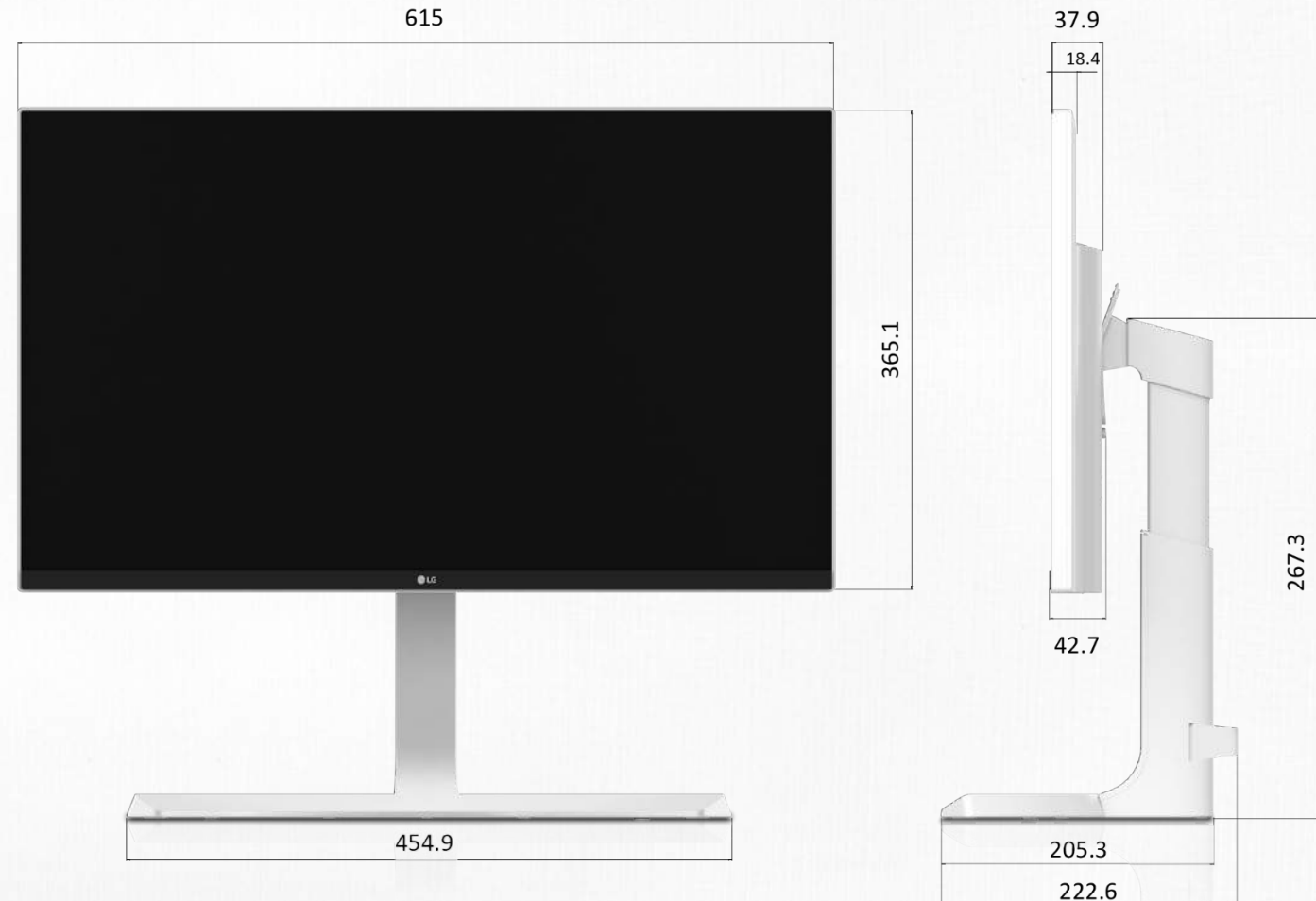
\*\* It is a usability report provided by 6 specialists from Seoul National University Hospital.  
LG monitors were evaluated by comparing them to the existing ones during medical consultant.



## Product Brief

# 8MP Clinical Review Monitor | 27HJ712C

- 27" IPS 8MP UHD (3840X2160)
- Over 99%(Coverage), 350nits(Typ.)
- 14ms(Off- setting), 5ms (Faster- setting) R/T
- 178° Wide Viewing Angle
- Factory Calibration / HW Calibration / Color Calibrated
- True Color Pro / Dual Controller
- DICOM part 14 / Dynamic Action Sync
- Brightness Stabilization / Uniformity Compensation
- Flicker Safe / Reader Mode
- Height / Pivot / Tilt Adjustable Stand
- HDMI x2, DisplayPort x1, USB 1up 2dn, H/P out
- IEC (IEC 60601-1 / IEC 60601-1-2), EN (EN 60601-1 / EN 60601-1-2), cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 No. 60601-1), FCC (FCC part 15 Class A), FDA(Registration (Class I)), CE (MDD 93/42/EEC, 2007/47/EC), RoHS, REACH, WEEE, MFDS



## Product Brief

# 8MP Clinical Review Monitor | 27HJ713C

- 27" IPS 8MP UHD (3840X2160)
- Over 99%(Coverage), 350nits(Typ.)
- 14ms(Off- setting), 5ms (Faster- setting) R/T
- 178° Wide Viewing Angle
- Factory Calibration / HW Calibration / Color Calibrated
- True Color Pro / Dual Controller
- DICOM part 14 / Dynamic Action Sync
- DICOM calibrated(250nits) to ACR-AAPM-SIIM  
secondary review brightness guidelines
- Brightness Stabilization / Uniformity Compensation
- Flicker Safe / Reader Mode
- Height / Pivot / Tilt / Swivel Adjustable Stand
- HDMI x2, DP x1, USB 1up 2dn, H/P out
- IEC (IEC 60601-1 / IEC 60601-1-2), EN (EN 60601-1 / EN 60601-1-2),  
cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 No. 60601-1),  
FCC (FCC part 15 Class A), FDA(Registration (Class I)),  
CE (MDD 93/42/EEC, 2007/47/EC), RoHS, REACH, WEEE, MFDS



# 3 Key Sales Points

## 1. Accurate Image Quality to Maintain Precision

### 27" 8MP (3840x2160) & IPS | 350nits (Typ.) & sRGB 99%

The 27-inch 8MP display with IPS technology offers an outstanding picture quality along with perfect 178° wide viewing angles. Images can be viewed simultaneously by several people with the highest quality reproduction and minimal color shift. Furthermore, with its sRGB 99% of the color space, 10-bit color accuracy, and 350nits(Typ.) brightness could deliver superior image reproduction for precise clinical review.

## 2. Guaranteed to Provide Consistent Medical Images

### Brightness Stabilization | DICOM Part 14

To ensure the most accurate and consistent shading possible, LG measures and sets every grayscale tone on the production line to produce a monitor compliant with DICOM Part 14. Moreover, the Brightness Stabilization's fully automated stability function makes use of an internal backlight sensor to quickly stabilize the luminance at startup and over the passage of time. Therefore, the luminance level is remains constant.

## 3. Optimum Eye Comfort

### Flicker Safe | Reader Mode

Doctors often have to look at a monitor for long time, which can lead to eye fatigue. For this reason, the LG clinical review monitor includes flicker safe and reader mode. LG's Flicker-Safe technology protects user's eye from fatigue by reducing flickering to almost zero. Further, Reader Mode allows the reduction of blue light emissions that can be harmful to the eyes, so doctors can comfortably view the clinical review monitor.



## Product Brief

# 1.3MP Clinical Review Monitor | 19HK312C

- 19" IPS 1.3MP (1280X1024, 5:4)
- NTSC 72%, 330nits(Typ.)
- 14ms(Off- setting), 5ms (Faster- setting) R/T
- 178° Wide Viewing Angle
- Factory Calibration / HW Calibration / Color Calibrated
- True Color Pro / Dual Controller
- DICOM Part 14 / Dynamic Action Sync
- Brightness Stabilization / Uniformity Compensation
- Flicker Safe / Reader Mode
- Height / Pivot / Tilt / Swivel Adjustable Stand
- VESA mount compatibility
- D-sub x 1, DVI-D x 1, HDMI x 1, DisplayPort x 1, USB 1up 2dn
- IEC (IEC 60601-1 / IEC 60601-1-2), EN (EN 60601-1 / EN 60601-1-2), cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 No. 60601-1), FCC (FCC part 15 Class A), FDA(Registration (Class I)), CE (MDD 93/42/EEC, 2007/47/EC), RoHS, REACH, WEEE, MFDS
- Anti-Microbial Properties built in the Plastic Housing  
(complied with the ISO22196 standard)



\*The antimicrobial properties do not protect users or others against bacteria, viruses, germs, or other disease organisms.

\*\*External plastic housing except the front LCD panel

### 3 Key Sales Points - 1.3MP Clinical Review Monitor

# 3 Key Sales Points

## 1. Stable, Optimized Image Quality

### 19" 1.3MP(1280X1024) Display & IPS | 330nits(Typ.) & NTSC 72%

The 19-inch 1.3MP display with IPS offers outstanding picture quality along with a full 178-degree wide viewing angle. Also, the LG 1.3MP clinical review monitor with NTSC 72% is a suitable for X-ray image which has a 3:4 ratio by pivoting. The Images can be viewed simultaneously by several people with the highest quality reproduction and minimal color shift. Plus, it's 330nits(Typ.) brightness can deliver the best image reproduction for precise clinical review.

## 2. Guaranteed for Reliable Clinical Reviewing

### DICOM Part 14 | Brightness Stabilization

To ensure the most accurate and consistent shading possible, LG measures and sets every grayscale tone on the production line to produce a monitor compliant with DICOM Part 14. Moreover, the fully automated Brightness Stabilization uses an internal backlight sensor to quickly stabilize the luminance at startup and over the passage of time ensuring that the luminance level remains constant.

## 3. Enhanced Viewing Comfort

### Anti-Microbial Properties\* built in the Plastic Housing\*\* | Flicker Safe | Reader Mode | Ergonomic Stand | Multi-ports

The antimicrobial properties are applied to the housing of the 19HK312C monitor. It complied with the ISO22196 standard, which is the measurement of antimicrobial which is built in to inhibit the growth of bacteria that may affect the housing of this product. LG's Flicker-Safe technology prevents visual fatigue by reducing flickering to almost zero, while Reader Mode reduces blue light emissions that can be harmful to the eyes, so doctors can comfortably view the clinical review monitor. Furthermore, with bi-directional pivot, the lower cover between two monitors does not interfere with on-screen contents by pivoting in different directions. In addition, with multiple input ports, it can be configured according to user needs alongside other medical devices.

\*The antimicrobial properties do not protect users or others against bacteria, viruses, germs, or other disease organisms.

\*\*External plastic housing except the front LCD panel

Key Feature #1 (Only for 8MP Clinical Review Monitor)

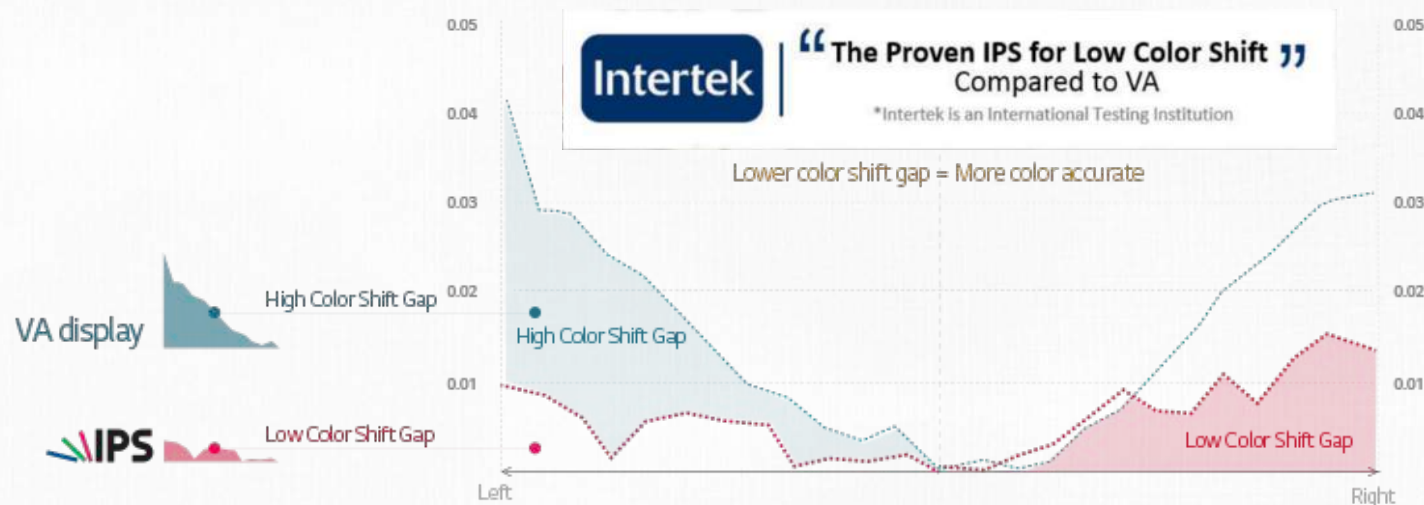
## 27" 8MP Display & IPS

### Enhance Clinical Review Efficiency

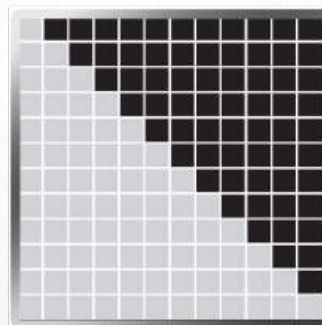
The LG clinical review monitor has 8MP(4K) on a 27-inch; however, it has better picture quality than a normal 8MP monitor that has only a resolution advantage.

As the LG clinical review monitor is based on IPS, which has perfect 178 wide viewing angles, images can be viewed simultaneously by several people with the highest quality reproduction and minimal color shift. Also, vivid color expression without any color shift has been certified by Intertek, ensuring a more accurate clinical review.

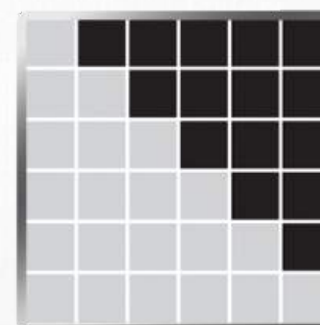
#### IPS's Wide Viewing Angle



#### Pixel Pitch : 8MP



8MP



2MP

\*2MP(Mega Pixel) : FHD, 1920X1080  
\*8MP(Mega Pixel) : 4K, 3840x2160



# LG IPS, *The Definition of Picture Quality!*

LG IPS is recognized and proven by global authorities with its clear images and vivid colors from any angle.



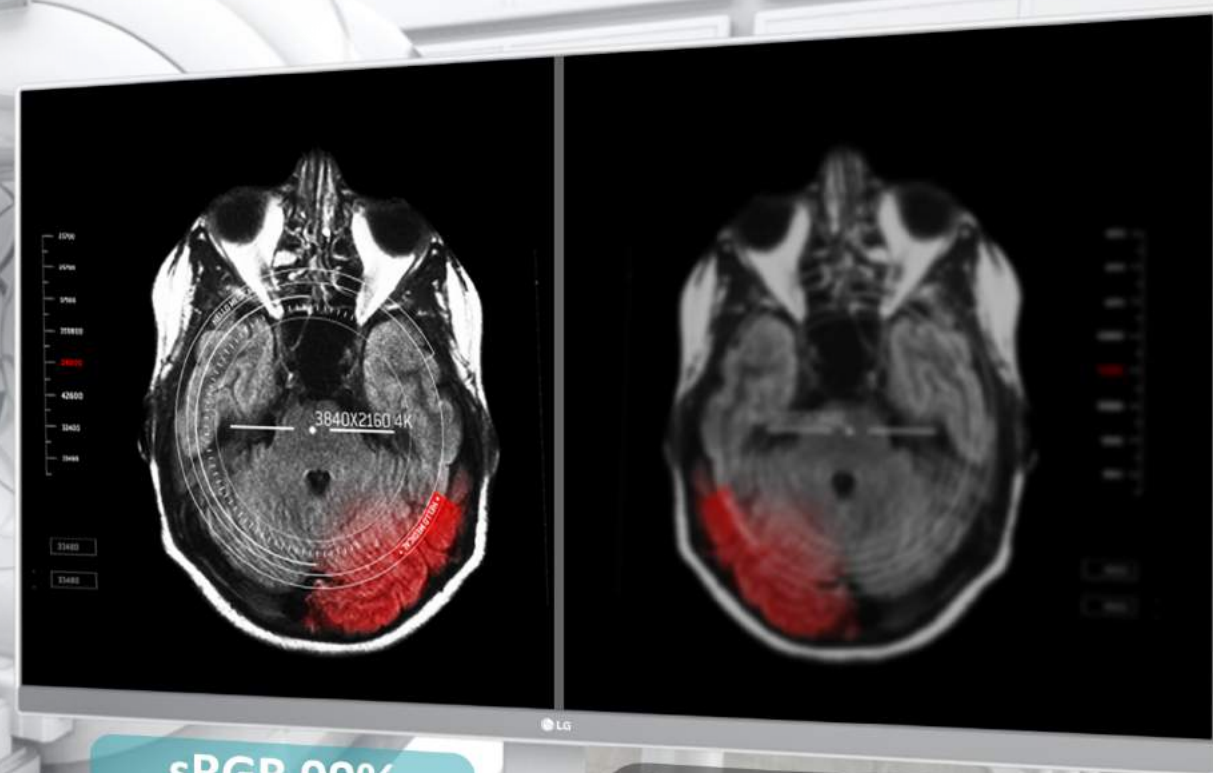
Key Feature #2-1 (Only for 8MP Clinical Review Monitor)

## 350nits(Typ.) & sRGB 99%

### Clinical Review Efficiency Enhanced by High Quality Images

Clinical progress is based on various test results. While some results are expressed in colors, for others, contrast is considered to be important. Competitors such as NEC or EIZO offer models with 300-340nits. However, the LG clinical review monitor offers 350nits(Typ.), making it brighter than the others.

A wide range of colors represented by sRGB over 99% of the color space guarantee brighter and more precise resolution.



Key Feature #2-2 (Only for 1.3MP Clinical Review Monitor)

## 330nits(Typ.) & NTSC 72%

### Precise Resolution with Optimal Picture Quality

Clinical progress is based on various test results. While some results are expressed in color, for others, contrast is more important. Competitors such as NEC or EIZO offer 1.3MP models with 300nits; however, the LG clinical review 1.3MP monitor offers 330nits(Typ.), making it brighter. An optimal range of colors for 1.3MP HD resolution medical images represented by NTSC 72% of the color space guarantee both more precise picture quality and optimal grayscale.

An optimal range of colors for 1.3MP HD resolution medical images represented by NTSC 72% of the color space guarantee more precise both picture quality and optimal grayscale.





### Key Feature #3

# DICOM Part 14

## Specialized 'Gamma' Preset for Clinical Review

Standard monitors for office use have grayscale tone characteristics that may vary even between two monitors of the same model. In the medical field, monitors must display medical images accurately and consistently.

DICOM Part 14, published by the National Electrical Manufacturers Association (NEMA) and the American College of Radiology (ACR), provides strict guidelines for how grayscale display function calibration and quality assurance tests should be performed on displays used in medical imaging applications.



\*DICOM Part 14: Standard to adjust the grayscale tone characteristics of monitors used in the medical field.

#### Key Feature #4

## Brightness Stabilization

### Built-in Features Ensure Consistently Accurate Display

A sensor measures the backlight brightness stability and automatically compensates for brightness fluctuations caused by aging for a consistently stable display during the usage period.



Brightness Stabilization

VS



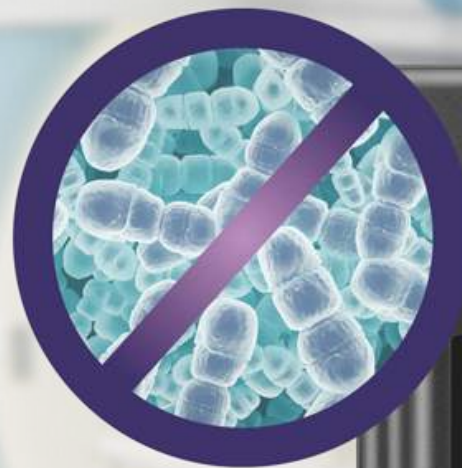
Conventional

Key Feature #5 (Only for 1.3MP Clinical Review Monitor)

## Anti-Microbial Properties\* built in the Plastic Housing\*\*

### For Optimized Medical Environment

The antimicrobial properties are applied to the housing of the 19HK312C monitor. It complied with the ISO22196 standard, which is the measurement of antimicrobial which is built in to inhibit the growth of bacteria that may affect the housing of this product.



\*The antimicrobial properties do not protect users or others against bacteria, viruses, germs, or other disease organisms.

\*\*External plastic housing except the front LCD panel



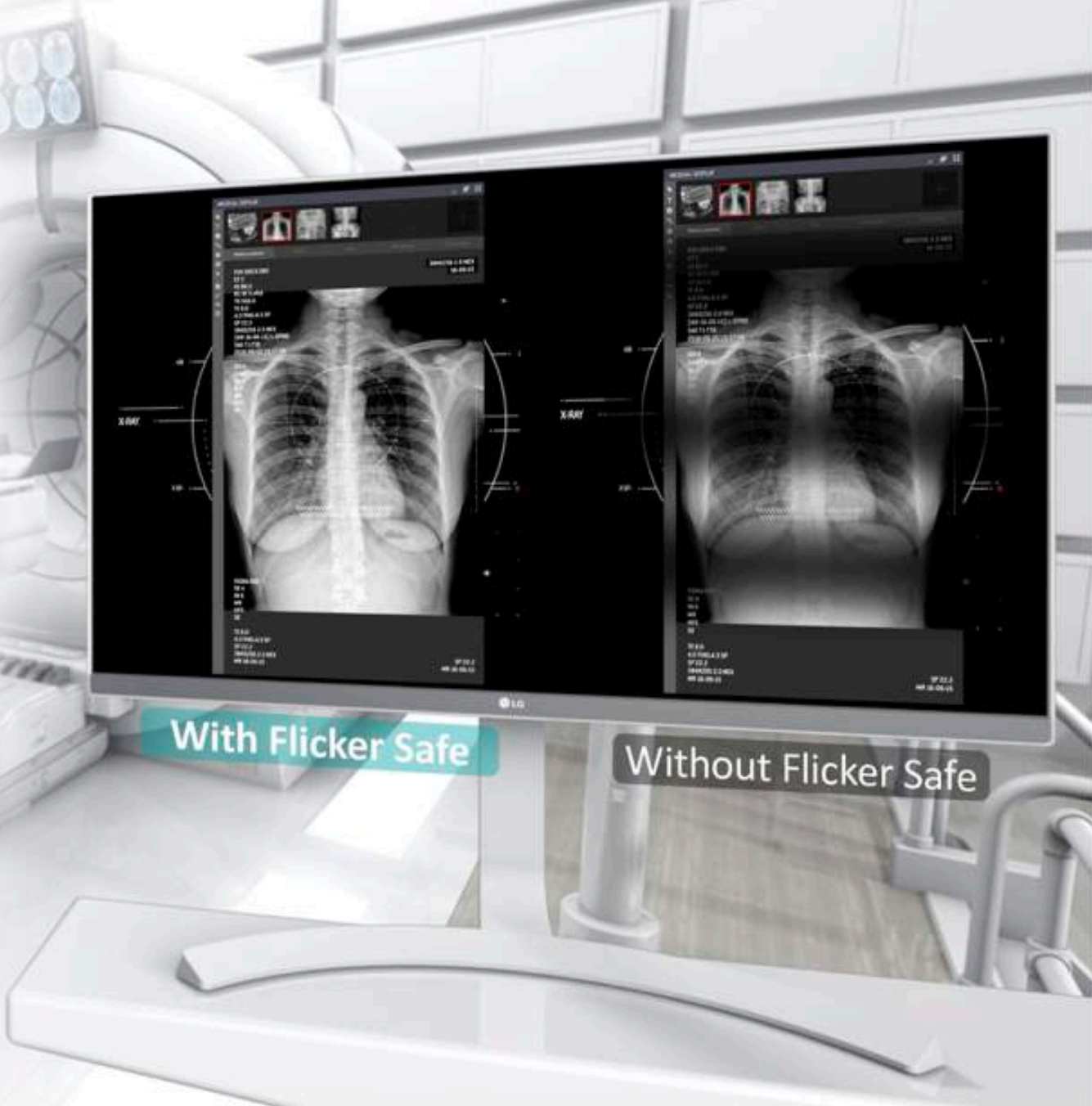
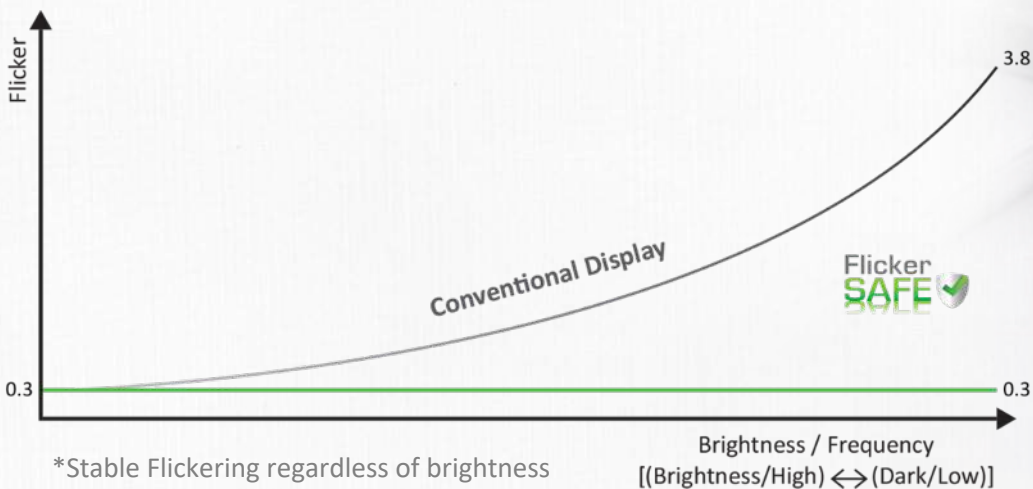
Key Feature #6

# Flicker Safe

## Long-lasting Eye-Comfort

As long as doctors are spending long time on clinical reviewing, LG's Flicker-Safe technology protects doctor's eye from fatigue by reducing flickering to almost zero.

Reducing the flicker lever to almost zero, Flicker-Safe helps doctors protect their eyes from exhausting flickers.



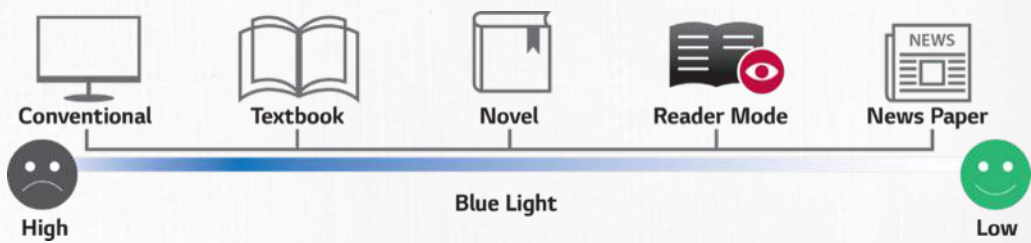
Key Feature #7

# Reader Mode

## Mode Selection for Optimum Viewing

While spending a lot of time looking at the monitor, LG's Reader Mode technology protects doctor's eyes from fatigue by reducing blue light.

Reader Mode provides optimal conditions for clinical use. You can comfortably read on the monitor even for long periods of time.



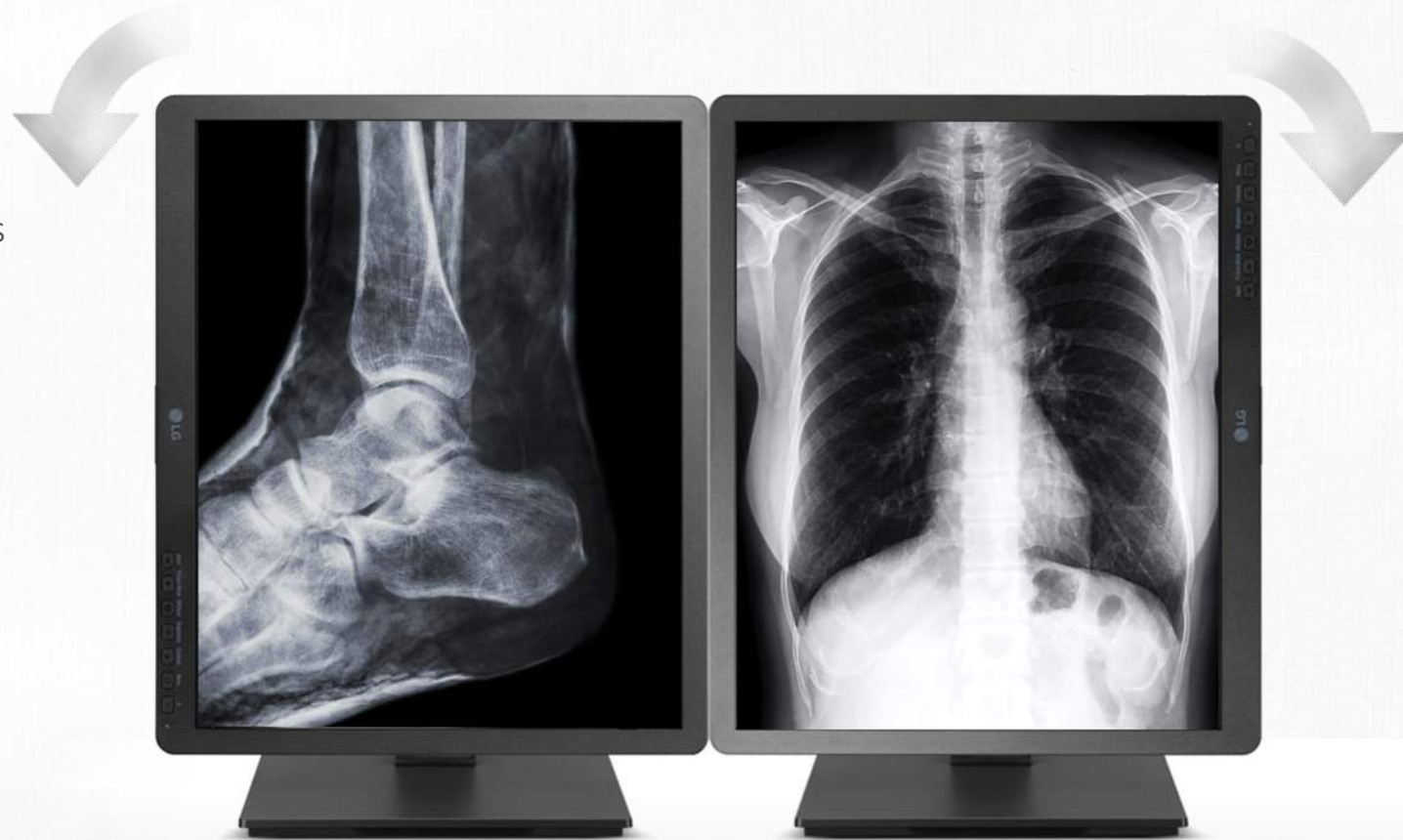
## Key Feature #8

# Ergonomic Stand and Multiple Interface

### Two-Way Pivot and Multi-ports

Bi-directional pivot provides a customizable multi-monitor configuration according to the user interface of diagnostic software, and the lower cover between two monitors does not interfere with on-screen contents as it pivots in different directions.

In addition, with multiple input ports, it can be configured according to user needs alongside other medical devices.









8MP Clinical Review Monitor

Specification Comparison

Manufacturer & Product		LG	Eizo	NEC
		27HJ712C, 27HJ713C	MX270W	MDview 272
Product Image				
LCD	Module	27” IPS	27” IPS	27” IPS
	Resolution	 3840 x 2160	2560 x 1440	2560 x 1440
	PPI	163.18	108.79	108.79
	Brightness	 350 cd/m² (Typ.)	300 cd/m² (Typ.)	340 cd/m² (Typ.)
	Contrast	1000	1000	1000
	Color Space	sRGB 99%		AdobeRGB 99%
	Color Depth	10bit (1.07B color)	10bit (1.07B color)	10bit (1.07B color)
	Response Time	14ms	12ms	20ms
HW	Input Interface	HDMI X 2	-	HDMI 1.3 X 1
		DP X 1	DP 1.2 X 1	DP 1.2 X 1
		-	-	Mini DP X 1
		-	DVI-D X 1	DVI-D X 1
		USB 1up 2down (hub)	USB 1up 2down (hub)	USB 2up 3down (hub)
Feature		Brightness Stabilization	Brightness Stabilization	Auto Brightness
		Uniformity Compensation	Uniformity Compensation	Uniformity Compensation
		Factory Calibration / HW Calibration / Color Calibrated	HW Calibration (Internal Sensor)	HW Calibration
		DICOM Part 14	DICOM Part 14	DICOM Part 14
		PBP	PIP / PBP	PIP / PBP
Medical Standard		IEC/EN (IEC/EN 60601-1 & IEC/EN 60601-1-2), FCC (FCC part 15 Class A), cUL (ANSI/AAMI ES60601-1 & CAN/CSA-C22.2 NO. 60601-1), RoHS, REACH, WEEE, CISPR, CE MDD (Class I)	FDA 510K / CE MDD CSA UL60601-1 / IEC60601-1	Unknown

## 1.3MP Clinical Review Monitor

# Specification Comparison

Manufacturer & Product		LG	Eizo	Eizo	Barco
		19HK312C	MX191	SCD19120	MDRC-1219
Product Image					
LCD	Module	19" IPS	19" VA	19" IPS	19" VA
	Resolution	1280 x 1024, 5:4	1.3MP(1280 x 1024, 5:4)	1.3MP (1280 x 1024, 5:4)	1.3MP(1280 x 1024, 5:4)
	Brightness	▲ 330 cd/m² (Typ.)	300 cd/m² (Typ.)	330 cd/m² (Typ.)	330 cd/m² (Typ.)
	Contrast	900	2000	900	1000
	Color Space	NTSC 72%	Unknown	Unknown	Unknown
	Color Depth	8bit (16.7M color)	8bit (16.7M color)	8bit (16.7 million color)	8bit (16.7M color)
	Response Time	14ms (GTG), 18ms (On/Off)	20ms (On/Off)	18ms (On/Off)	30ms (On/Off)
HW	Input Interface	▲ HDMI X 1	-	Composite X 1	-
		DisplayPort X 1	-	S-Video X 1	DP X 1
		DVI-D X 1	DVI-D X 1	DVI-D X 1	DVI-D X 1
		D-sub X 1	D-sub X 1	D-sub X 1	-
		USB 1up 2down (hub)	USB 1up	-	USB 1up 2down (hub)
		Brightness Stabilization	Brightness Stabilization	Backlight Stabilization	Brightness Stabilization
Feature	Uniformity Compensation	-	-	-	
	Factory Calibration / HW Calibration / Color Calibrated	HW Calibration	-	HW Calibration	
	DICOM Part 14	DICOM Part 14	-	DICOM Part 14	
	Anti-Microbial Properties built in the Plastic Housing (complied with the ISO22196 standard)	-	-	-	
	Medical Standard	IEC/EN (IEC/EN 60601-1 & IEC/EN 60601-1-2), FCC (FCC part 15 Class A), cUL (ANSI/AAMI ES60601-1 & CAN/CSA-C22.2 NO. 60601-1), RoHS, REACH, WEEE, CISPR, CE MDD (Class I)	CE MDD, EN60601-1, ANSI/AAMI ES60601-1, CSA C22.2 No. 601-1, IEC60601-1, EN60601-1	CE MDD, EN60601-1, UL60601-1, CSA C22.2 No. 601-1, IEC60601-1, EN60601-1	CE MDD, ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 NO. 60601-1, IEC60601-1, IEC60601-1-2, EN60601-1, EN60601-1-2

# 2

## Diagnostic Monitor

- 32HL512D (8MP)
- 21HK512D (3MP)





Understanding the Product Concept

# What is Diagnostic Monitor?

**A display providing accurate picture quality for professional diagnosis and decisions**

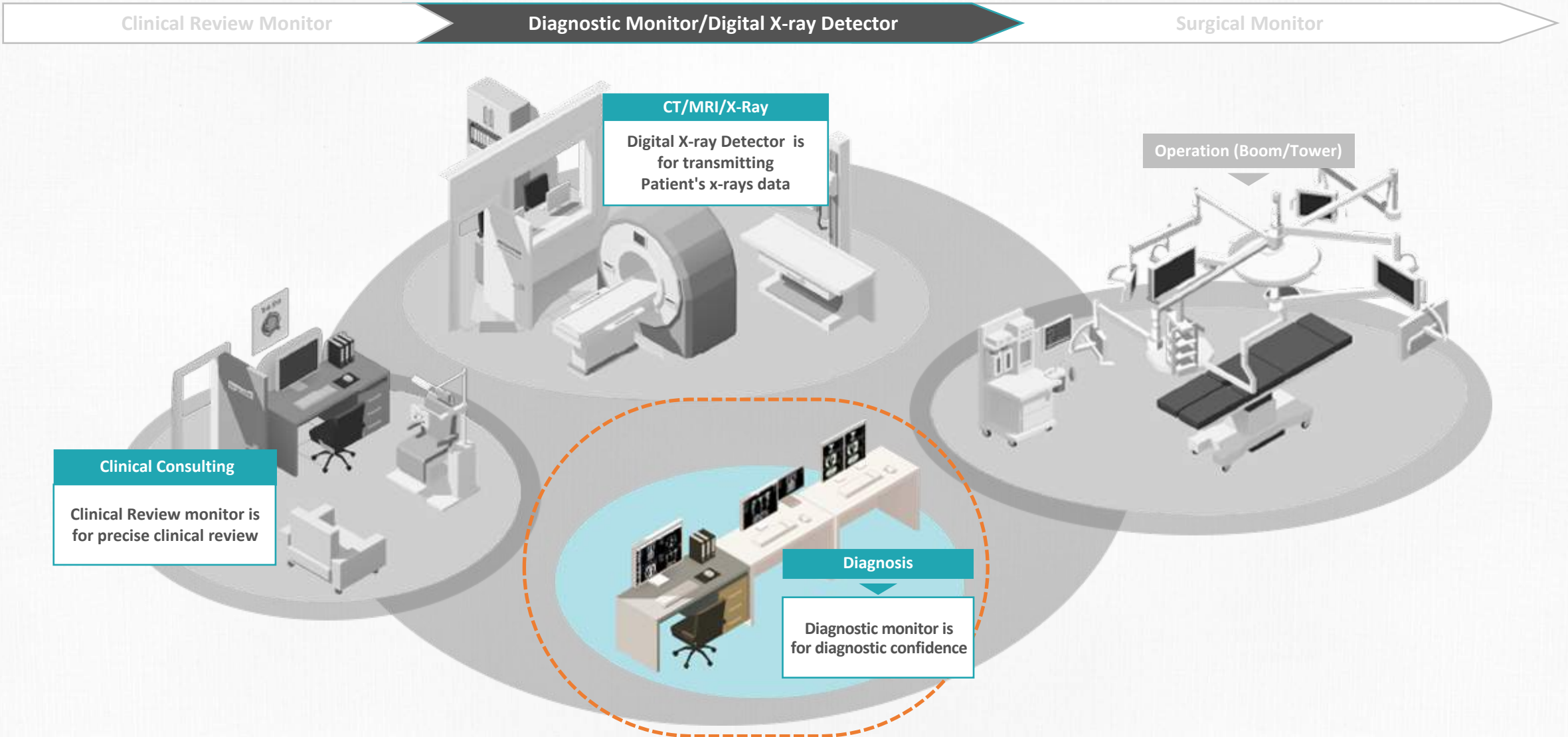
Hospitals require medical monitors for various specialized uses. Diagnostic monitors in particular offer high resolution image quality for precise diagnosis. Also they need to guarantee the utmost brightness to help doctors discern even the finest detail on patients' medical images.

Furthermore an internal calibration sensor automatically provides the medical images with stable image quality. Remote & Self calibration delivers consistent medical images without the need for adjustments.

All of these elements support more professional decision making, enhancing diagnostic confidence and workflow.



# Where is the Diagnostic Monitor...?



# What to Consider as a Buyer?

## Diagnostic Monitor

### Priority

#### ✓Superior Image Quality

A diagnostic monitor is more specialized for professional diagnosis and decisions compared to a clinical review monitor. And there is a trend toward a segmented Mega Pixel series of diagnostic monitors that can offer accurate picture quality through suitable high-resolution according to medical images such as CT etc. This can ensure a more precise diagnosis with better detail for specific medical decisions.

#### ✓DICOM Part 14 and Stable Brightness

All medical decision making should be done under the same conditions to prevent errors. All diagnostic monitors should be set based on DICOM Part 14, which is the standard for ensuring the level of detail and maintaining the consistency of medical images over a long period of time.

#### ✓Remote & Self Calibration & Ergonomic Stand

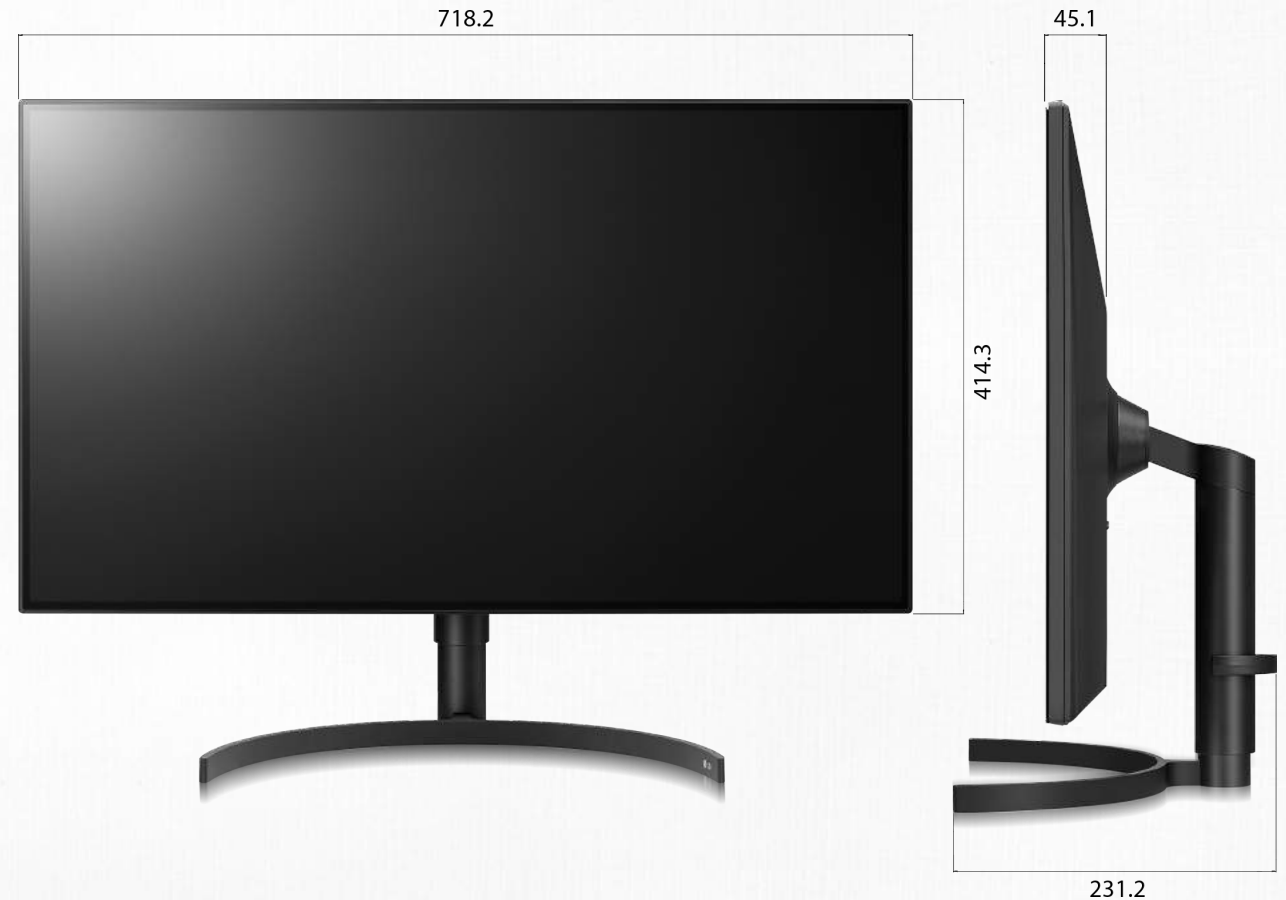
To increase productivity and efficiency in the diagnostic workflow, built-in Remote & Self Calibration automatically produce more contingent medical images based on the setting without the need for adjustments, which would increase operating costs and manpower. In addition, one-way pivot allows for a flexible diagnostic workspace.



## Product Brief

# 8MP Diagnostic Monitor | 32HL512D

- 31.5" IPS 8MP (3840x2160, 16:9)
- Multi-Resolution Option (8/6/4MP)
- DCI-P3 98%, 450nits (Typ.)
- 14ms(Off- setting), 5ms (Faster- setting) R/T
- 178° Wide Viewing Angle
- Factory Calibration / HW Calibration / Auto Luminance Calibration
- DICOM Part 14
- Uniformity Compensation
- Brightness Stabilization (Auto Luminance Sensor)
- Pathology Mode
- Height / Pivot (Bi-Direction) / Tilt Adjustable Stand
- VESA mount compatibility
- DisplayPort x 2, USB 1up 2dn
- IEC (IEC 60601-1 / IEC 60601-1-2), EN (EN 60601-1 / EN 60601-1-2), cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 NO. 60601-1), FCC (FCC part 15 Class A), FDA (510(k) Class II), CE, RoHS, REACH, WEEE





### 3 Key Sales Points – 8MP Diagnostic Monitor

# 3 Key Sales Points

## 1. Exceptional Image Quality for Precise Diagnosis

### 31.5" 8MP (3840x2160) IPS Display | 178° Wide Viewing Angle | Multi Resolution Options (8/6/4MP)

The large 31.5-inch 8MP IPS display allows medical professionals to easily distinguish even delicate details of medical images such as CT and angiography. With its wide viewing angle, the IPS panel can provide clear images from all angles with minimal distortion. Also, 8MP, 6MP, and 4MP resolution options are available to provide optimized image quality for various modalities.

## 2. Efficient Diagnostic Data Management

### 2PBP | Dual Controller | 4-side Virtually Borderless Design

The diagnostic monitor allows medical professionals to view images from multiple devices at once with support for up to 2PBP. With Dual Controller, easily view and review images from multiple devices connected conveniently to one single screen, keyboard, and mouse. You can review patient information and clinical info simultaneously, maximizing work efficiency. And the 4-side Virtually Borderless design provides a seamless workstation for a multi-monitor diagnostic setup.

## 3. Stable Review with Diagnostic Optimized Feature

### Pathology Mode | Auto Luminance Calibration | Ergonomic Stand

The diagnostic monitor can display more accurate color reproduction with the Pathology Mode setting. It also maintains the quality of medical images through the built-in Auto Luminance Calibration. Auto Luminance Calibration increase productivity and efficiency without the need for additional operating costs or manpower. Remote software allows calibration to be managed remotely and automatically. It maintains the consistency of medical images by maintaining accurate values. The ergonomic stand offers, tilt, two-way pivot and height adjustment, allowing you to use the monitor with greater comfort.

## Product Brief

# 3MP Diagnostic Monitor | 21HK512D

- 21.3" IPS 3MP (1536x2048, 3:4)
- NTSC 72%, 1000nits (Typ.)
- 14ms(Off- setting), 5ms (Faster- setting) R/T
- 178° Wide Viewing Angle
- Factory Calibration / HW Calibration
- DICOM Part 14
- Brightness Stabilization (Auto Luminance Sensor)
- Uniformity Compensation
- Remote & Auto Calibration
- Ambient Sensor / Presence Sensor
- Height / Pivot / Tilt / Swivel Adjustable Stand
- VESA mount compatibility
- DVI x 1, DisplayPort x 1, USB 1up 2dn
- IEC (IEC 60601-1 / IEC 60601-1-2), EN (EN 60601-1 / EN 60601-1-2), cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 NO. 60601-1), FCC (FCC part 15 Class A), FDA (510(k) Class II), CE, RoHS, REACH, WEEE



### 3 Key Sales Points – 3MP Diagnostic Monitor

# 3 Key Sales Points

## 1. Optimized Image Quality for Diagnostic Review

### 21.3" 3MP (1536x2048) IPS Display | 1000nits (Typ.) | 178° Wide Viewing Angle

The 21.3-inch 3MP IPS display with 1000nits (Typ.) brightness facilitates precise diagnoses of medical images from CT and Angiography, as it allows medical professionals to easily distinguish even delicate details. Plus, it enhances the visibility of text and illuminates obscure abnormal findings through high brightness with drastic contrast.

## 2. Reliable Image for Diagnosis

### DICOM Part 14 | Auto Luminance Sensor

A display compliant with DICOM Part 14 delivers grayscale images that are rendered accurately and are consistent with their appearance on other imaging devices. Plus, Auto Luminance Sensor automatically adjusts the screen brightness to changing ambient light conditions for a more stable and optimized view in the diagnostic process.

## 3. Productive, Efficient Workflow

### Remote & Auto Calibration | Ergonomic Stand with Pivot

The diagnostic monitor effectively manages medical images by maintaining image quality through built-in Remote & Auto Calibration. Remote & Auto calibration helps to increase productivity and efficiency without the need for additional operating costs or manpower. Remote software allows calibration to be managed remotely and automatically. It improves image consistency in which medical images are displayed by maintaining accurate values. The ergonomic stand with one-way pivot provides a customizable multi-monitor configuration according to the user's needs based on diagnostic software.

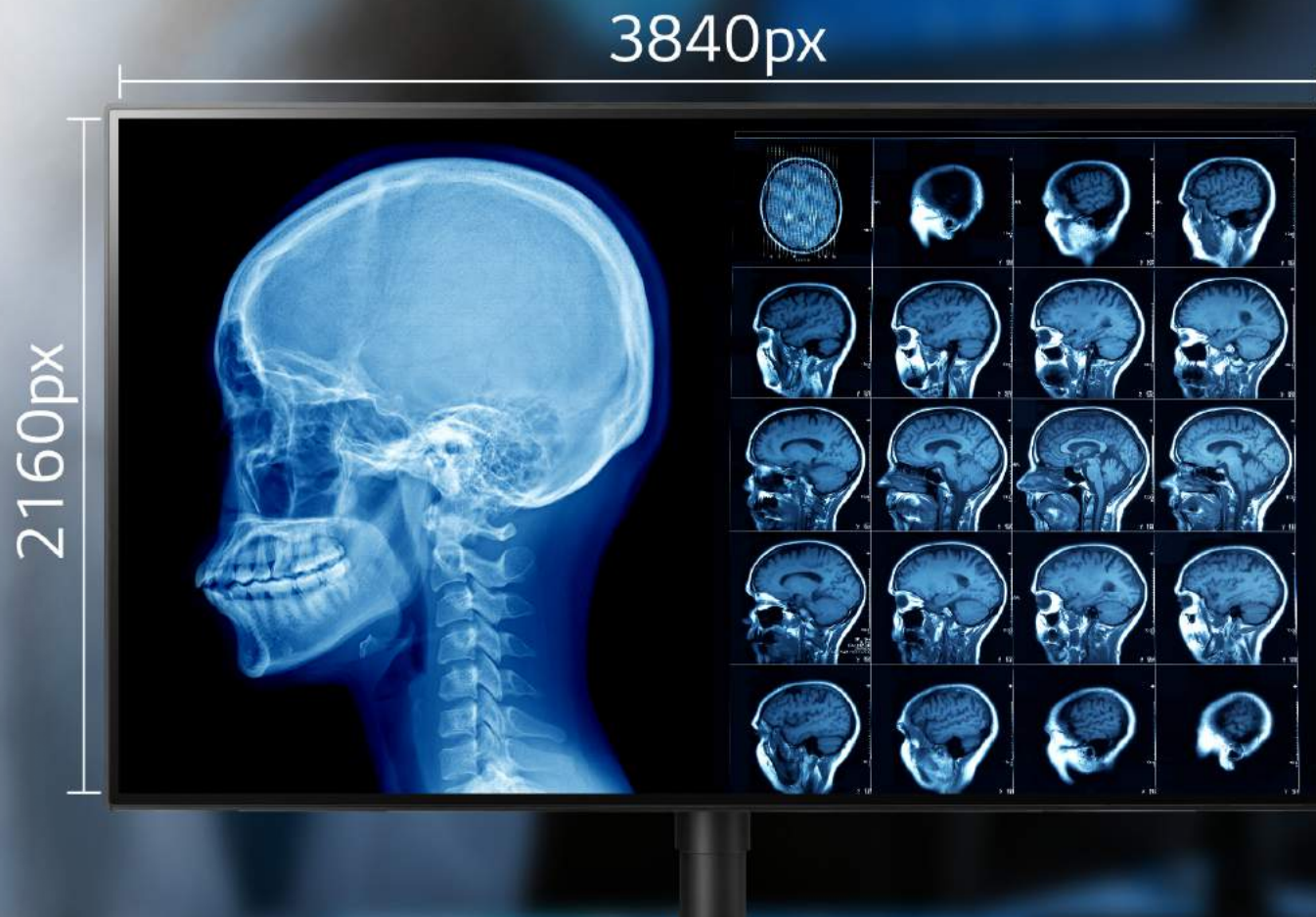


## Key Feature #1

# Finest Details with Larger Screen

**31.5" 8MP (3840x2160) IPS Display**  
**178° Wide Viewing Angle**

The resolution of the monitor is vital to distinguishing details of the medical image. In addition, diagnostic monitors often set up multiple monitors to check the results of the various medical image at once. That's why the wide viewing angle is also important. The 32HL512D offers the highest resolution, displaying 8MP (3840x2160) of information. The large 32-inch screen makes it easier for medical professionals to identify abnormalities in medical images such as CT and MRI scans, with room to review multiple medical images at once in a tiled format.





## Key Feature #2

# Exceptional Image Quality

## 1000nits (Typ.) Brightness

For precise diagnosis, the brightness of the monitor is vital to distinguish details from medical images. The 21HK512D has a brightness of 1000nits, enabling healthcare professionals with the ability to easily distinguish even the finest details to detect anomalies, which can lead to accurate diagnoses with CT and angiography images.

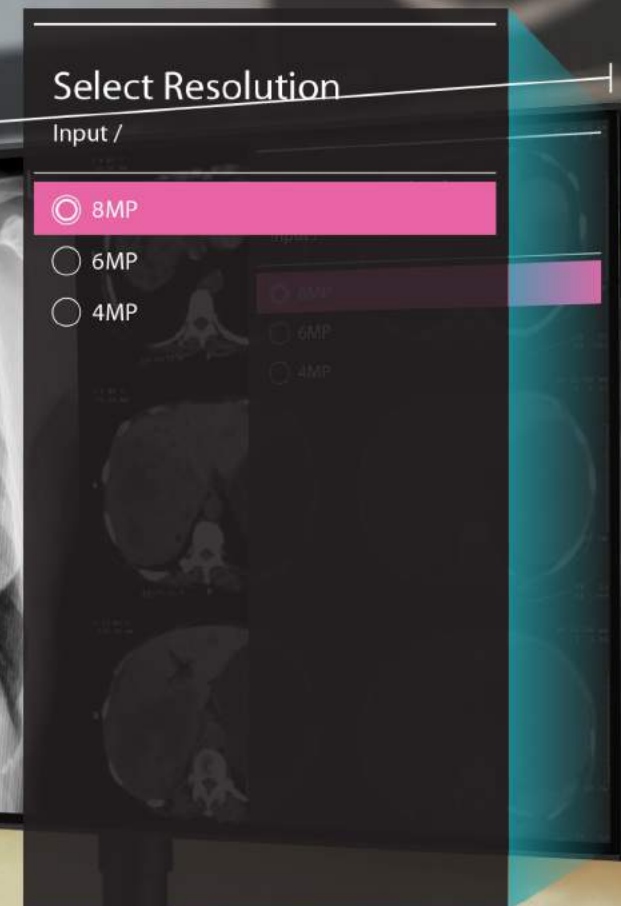
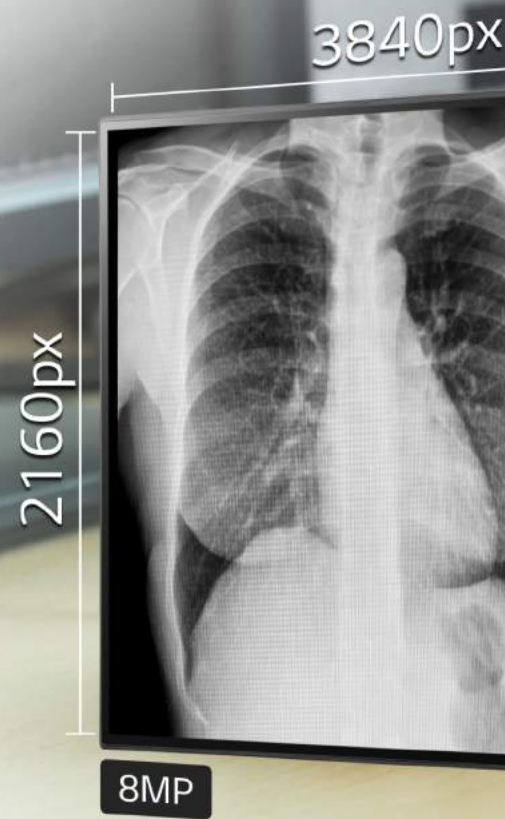


### Key Feature #3

## Improved Connectivity for Various Modalities

### Multi Resolution Options (8/6/4MP)

The 32HL512D offers 8MP, 6MP and 4MP resolution options to provide optimized image quality for various modalities. Convenient access to resolution settings for different forms such as CR, CT, and endoscopy make it easy to select the optimal image viewing conditions.



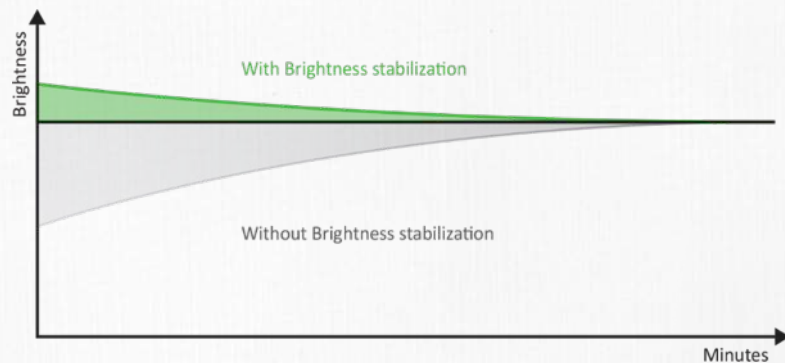


## Key Feature #4

# Stable Grayscale Images

## DICOM Part 14 and Auto Luminance Sensor

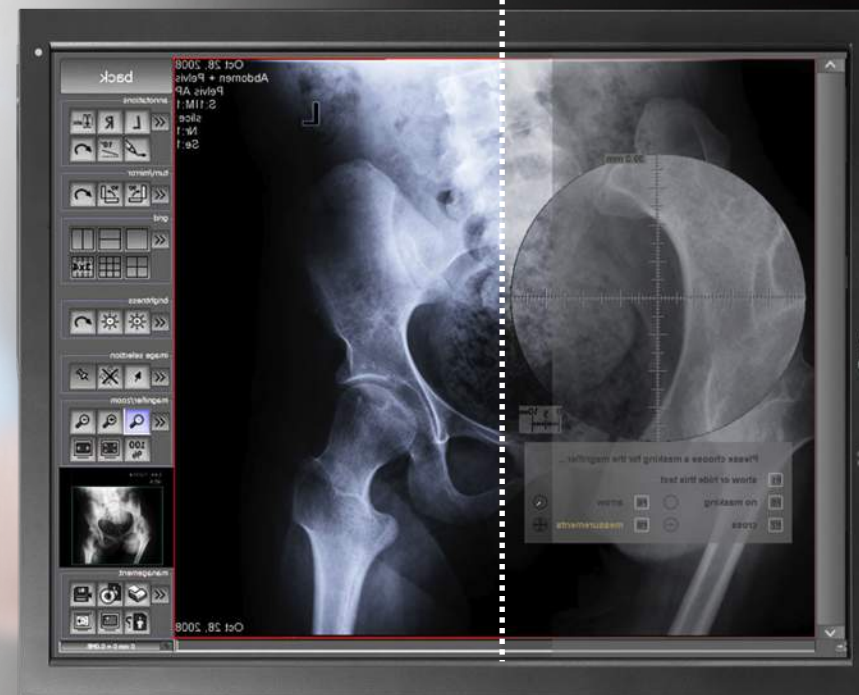
The standard DICOM Part 14 Gamma allows for accurate diagnostics as it adjusts the grayscale levels of medical images received from different types of image capturing devices. The 21HK512D also has an Auto Luminance Sensor that automatically adjusts the screen brightness to changing ambient light conditions for a more stable and optimized view which can help reduce even minor errors in the diagnostic process.



\*Brightness is consistently stable

DICOM Part 14

Conventional



\*DICOM(Digital Imaging and Communications in Medicine) : Standard to adjust the grayscale tone characteristics of monitors used in the medical field.

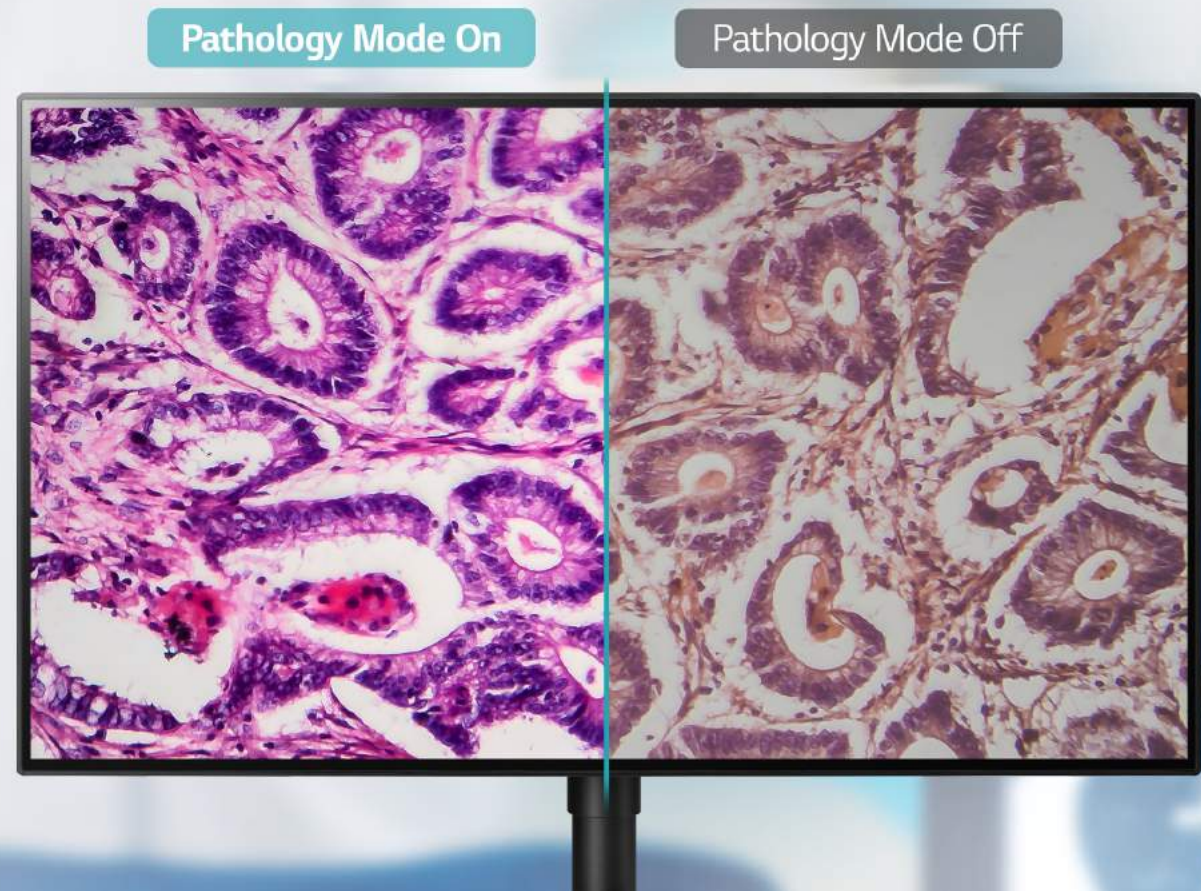
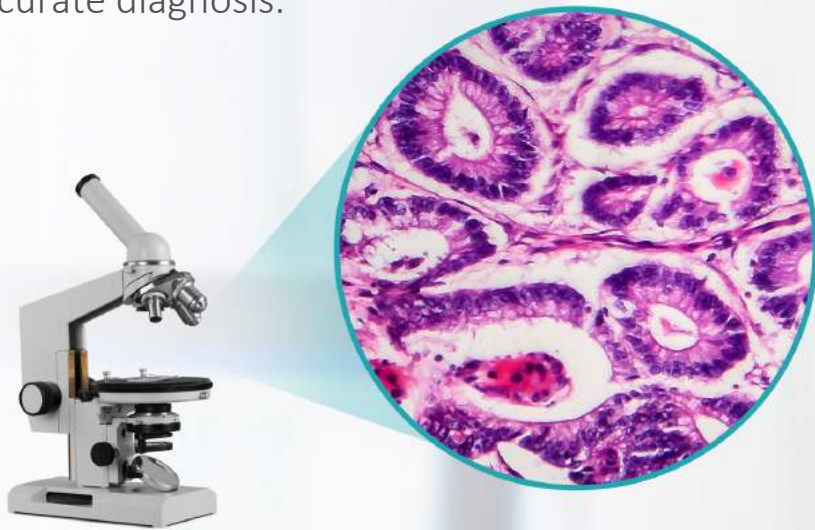


## Key Feature #5

# True-to-Life Color Reproduction

## Pathology Mode

The diagnostic monitor can visualize optimized color variations using the pathology mode. This allows you to view laboratory test results of blood and other bodily fluids and tissues and conduct microscopic evaluations of individual cells in detail, to help make an accurate diagnosis.

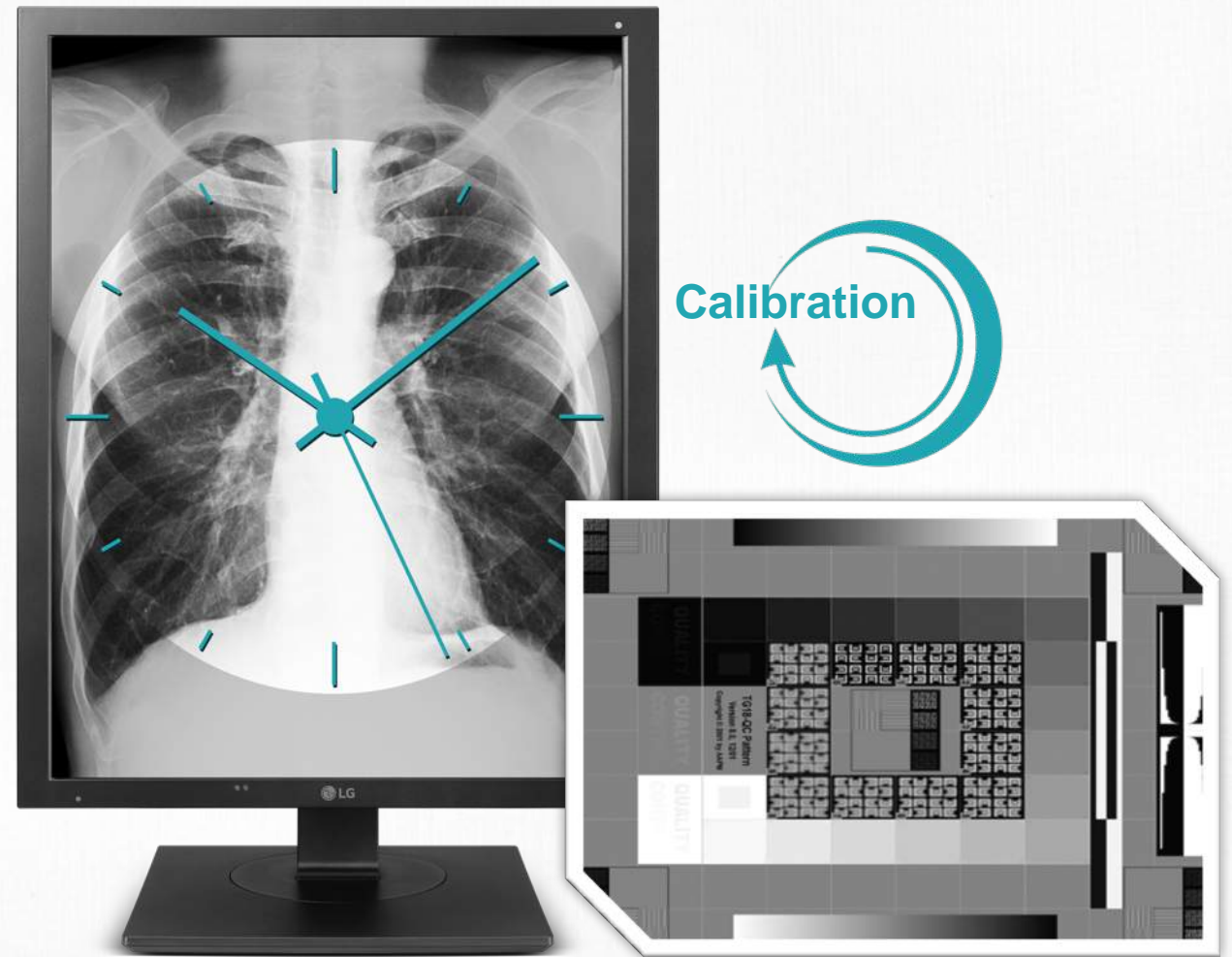


## Key Feature #6

# Improved Productivity

## Auto Luminance Calibration Remote & Auto Calibration

Remote & Auto calibration increases productivity and efficiency without the need for additional operating costs or manpower. Remote software allows calibration to be managed remotely and automatically. It improves the quality and consistency of medical images that are displayed by maintaining accurate values. For this reason, it automatically keeps clear and consistent medical images for exact diagnosis.



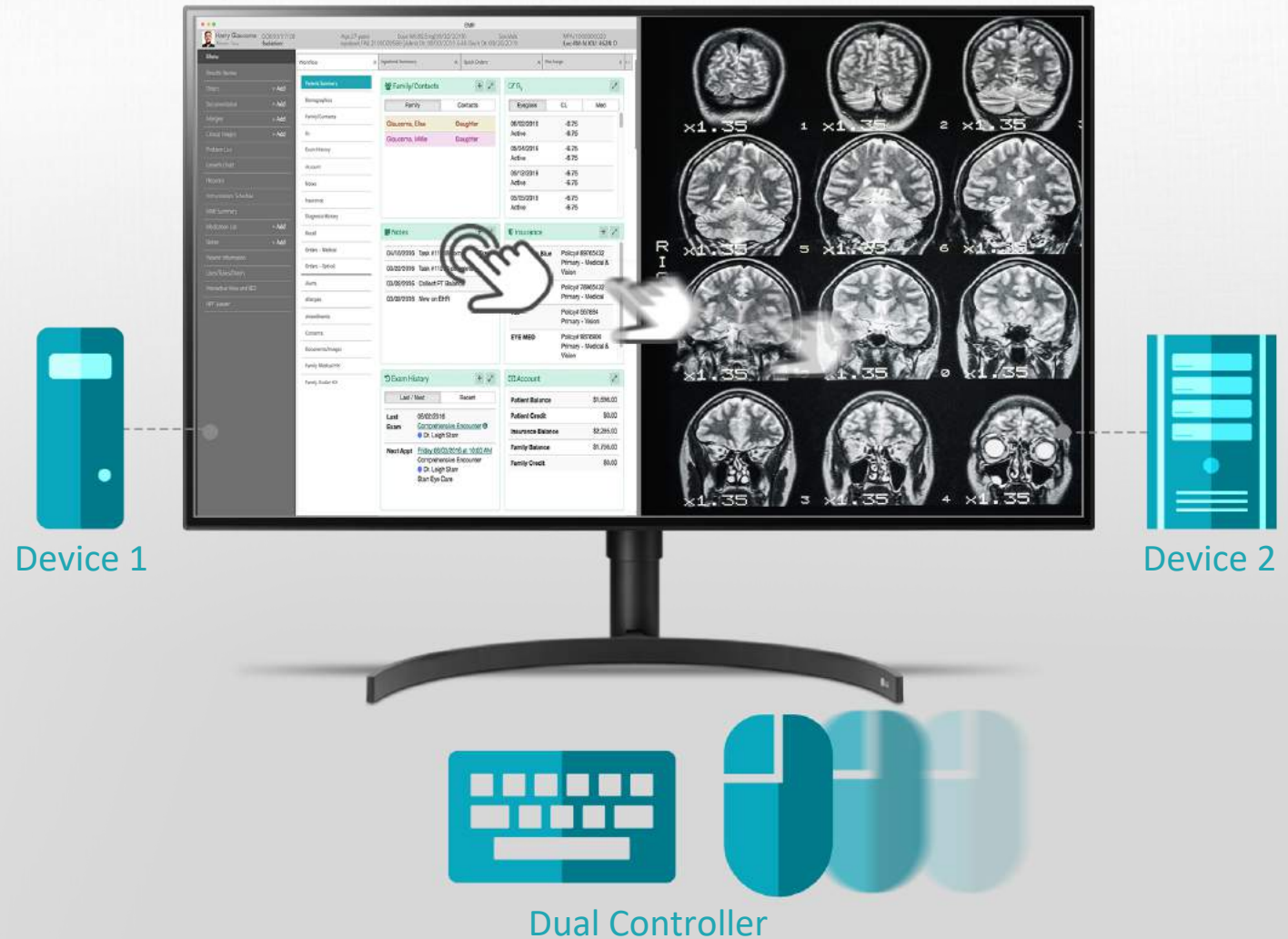


## Key Feature #7

# See More Signals Easily

## 2PBP | Dual Controller

The 32HL512D, which supports up to 2PBP, allows medical professionals to view multiple signals at once, improving review convenience. By connecting multiple modalities, you can view two screens simultaneously, maximizing work efficiency. View various combinations of clinical information including X-ray, CT, MRI, and ultrasound images, as well as electronic patient charts. With Dual Controller, easily view and review images from multiple devices connected conveniently to one single screen, keyboard, and mouse.



## Key Feature #8

# Seamless Multi Monitor Setup

## 4-side Virtually Borderless Design

In medical environments, a multi-monitor setup is very common because a variety of different information must be used to make a diagnosis. The 4-side virtually borderless design allows you to create a seamless workstation even if you use multiple monitors.





## Key Feature #9

# Ergonomic Design

## Two-way Pivot and Adjustable Height Stand




The LG Diagnostic Monitor's ergonomic design stand offers, tilt, pivot and height adjustment, allowing you to use the monitor with greater comfort.

The Pivot provides a customizable multi-monitor configuration most convenient for the user or diagnostic software. The 32HL512D supports the Two-way Pivot, allowing you to configure the monitor freely by rotating left or right, regardless of orientation. In addition, with adjustable height, it can be configured as needed alongside other MP monitors.






8MP Diagnostic Monitor

Specification Comparison

Manufacturer & Product		LG	Eizo	Barco
		32HL512D	MX315W	MDCC-6430
Product Image				
LCD	Module	31.5” IPS	31.1” IPS	30.4” IPS
	Resolution	▶ 8MP (3840 x 2160, 16:9)	8MP (4096x2160, 17:9)	6MP (3280x2048, 16:10)
	Brightness	450 cd/m²(Typ.)	450cd/m²(Typ.)	
	Contrast	1300	1300	1500
	Color Gamut (Typ.)	▶ DCI-P3 98% (CIE1976)	-	-
	Response Time	▶ 14ms (Off- setting), 5ms (Faster- setting)	20ms (Typ.)	18ms
HW	Input Interface	HDMI x1	-	-
		DisplayPort x2	DP : In x2, Out x1	DP x2
		-	DVI-D x1	DVI-D x2
		USB 1up, 2down	USB 2up, 3down	USB 1up, 3down
Feature		-	Brightness Stabilization	Brightness Stabilization
		Uniformity Compensation	-	-
		▶ HW Calibration (Auto Luminance Calibration) - Pathology Mode	HW Calibration (Internal Sensor)	HW Calibration (Internal Sensor)
		2PBP	2PBP	-
		DICOM Part 14	DICOM Part 14	-
		Tilt / Pivot (Bi-Direction), Height	Tilt, Swivel, Height	Tilt, Swivel
Medical Standard		IEC (IEC 60601-1 / IEC 60601-1-2), EN (EN 60601-1 / EN 60601-1-2), cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 NO. 60601-1), FCC (FCC part 15 Class A), FDA (510(k) Class II), CE, RoHS, REACH, WEEE	TBD	TBD

3MP Diagnostic Monitor

Specification Comparison

Manufacturer & Product		LG	Eizo	Barco
		21HK512D	RX350	MDNC-3421
Product Image				
LCD	Module	21.3”	21.3” IPS	21.3” IPS
	Resolution	3MP (1536 x 2048, 3:4)	3MP (1536 x 2048, 3:4)	3MP (1536 x 2048, 3:4)
	Brightness	▶ 1000 cd/m²(Typ.), 800 cd/m²(Min.)	1000 cd/m²	900 cd/m²
	Contrast	1400	1500	1400
	Color Gamut (Typ.)	NTSC 72%	-	-
	Response Time	30ms (Typ.)	20ms	20 ms
HW	Input Interface	DisplayPort x1	DP 1.2 X 1	DP x 1
		DVI x1	DVI-D X 1	DVI-D x 1
		USB 1up, 2down	USB 1up 2down (hub)	USB 1 up 3 down
Feature		▶ Brightness Stabilization (Auto Luminance Sensor)	Brightness Stabilization	Brightness Stabilization
		Uniformity Compensation	Uniformity Compensation	Uniformity Compensation
		▶ HW Calibration (Remote & Auto Cablibration) - Presence Sensor, Ambient Sensor	HW Calibration (Internal Sensor)	HW Calibration (Internal Sensor)
		DICOM Part 14	DICOM Part 14	DICOM Park 14
		Pivot (-90 / 0 / +90)	Pivot (0 /+90)	Pivot (90)
Medical Standard		IEC (IEC 60601-1 / IEC 60601-1-2), EN (EN 60601-1 / EN 60601-1-2), cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 NO. 60601-1), FCC (FCC part 15 Class A), FDA (510(k) Class II), CE, RoHS, REACH, WEEE	-	FDA 510(K)



# 3

## Surgical Monitor

- 32HL710S (4K)
- 27HJ710S (4K)
- 27HK510S (FHD)





Understanding the Product Concept

# What is Surgical Monitor?

## Ideal Display for Detailed Surgery

In the surgical operating room, there is a move toward minimally invasive surgery, at least in certain routine procedures. Surgeons want to know that procedures can be completed accurately.

And that's where technology can help. 4K/FHD displays, while becoming more commonplace in the home and cinema, are now coming to the operating room.



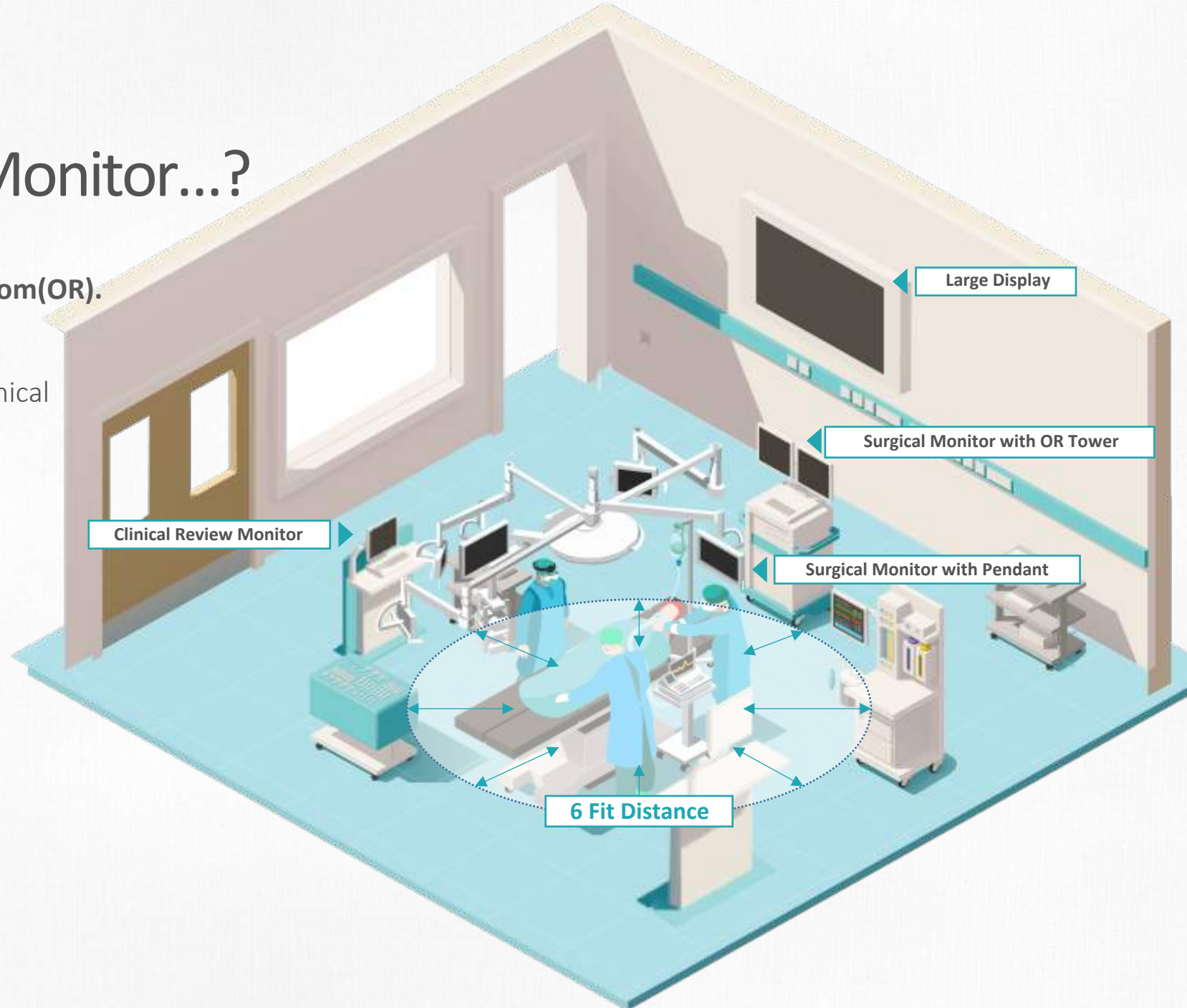
## Understanding the Product Concept

# Where is the Surgical Monitor...?

**This is a typical environment of Operating Room(OR).**

In the OR, you may find several kind of displays including not only Surgical Monitor but also Clinical Review Monitor and large-sized displays.

Surgeons are normally concentrating on the surgical monitor while operating, and Surgical Monitors can be installed either on pendant (medical arm) or on the OR Tower at that time. Only surgical monitors can be placed within a 6-fit radius of the patient.





# What to Consider as a Buyer?

## Surgical Monitor

### Priority

#### ✓ **Accurate Images with sRGB 115%(Deep Red)**

when you choose a surgical monitor, accurate color expression, especially in the red spectrum on the display is very important.

#### ✓ **Dustproof and Water Resistance (IP35/IP32)**

During surgery, nobody can foresee what could happen in seconds. Therefore, it is essential that surgical monitors are durable and protected against unexpected contact with substances such as blood, bodily fluids and powdered medication.

#### ✓ **Quick Response time**

A display with a slow response time will show blurring behind moving objects, which can be visually distracting.

#### ✓ **Anti-reflection & Optical Bonding Glass**

During an operation, it is important that monitors do not cause a reflection to provide accurate images.

#### ✓ **Eye-Comfort**

It is possible that a surgeon may be watching a monitor for five hours or more during an operation. Considering the long time of surgery causing eye strain and discomfort for doctors, minimize the flicker level ensures comfort.

## Test Report

# Usability Test Result from SNUH UTC

## Surgical Monitor

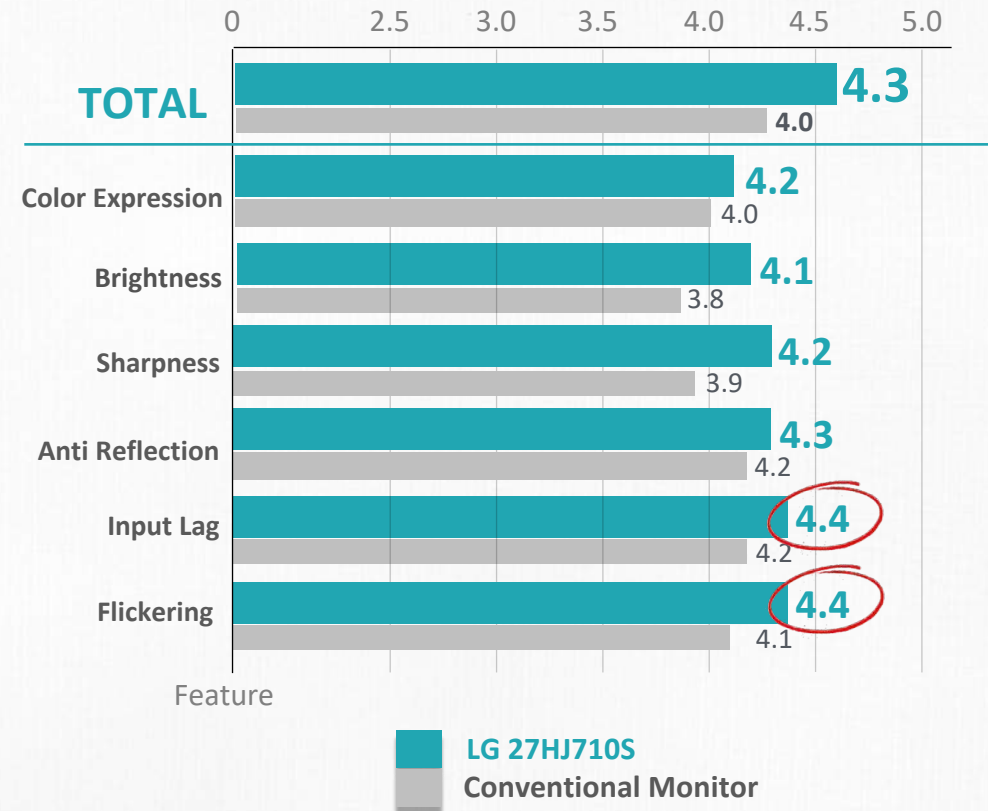
### Summary Statement

- 1 Got average score **4.3 out of 5.0** for all the test  
(Conventional monitor: 4.0/5.0)
- 2 Clinical surgery of **30 sessions**, total **20 medical staffs** including specialists and assistants participated in the test
- 3 Specialists with **over 15 years of experience** performed real clinical surgery test
- 4 **4 Departments** out of 5 satisfied and gave **higher score** on 27HJ710S  
(4 Departments include Urology, Obstetrics & Gynecology, Surgery, and Colorectal surgery, and the Thoracic Surgery was the only department had opposite result.)
- 5 All about the **RESOLUTION!**  
(Got excellent score on all items of Sharpness, Brightness, Afterimage Level)
- 6 **Input Lag & Flickering satisfaction test** scored **highest score (4.4/5.0)**  
(Conventional monitor scored 4.2 and 4.1 on Input Lag and Flickering item respectively.)

\*The score is based on 1-5 scale system.

\*\* This is the average score evaluated by specialists and physician assistants.

\*\*\* It is a usability report provided by 6 specialists and 14 physician assistants from Seoul National University Hospital. LG monitors were evaluated by comparing them to the existing ones during surgery.



🔗 About Seoul National University Hospital (SNUH) and SNUH UTC

🔗 Evaluating Environment

## Product Brief

# 4K Surgical Monitor | 32HL710S

- IPS 31.5" 4K (3840x2160)
- sRGB 115% (Area) / Over 99% (Coverage), 800nits (Typ.)
- 14ms(Off- setting), 5ms (Faster- setting) R/T
- 178° Wide Viewing Angle
- Factory Calibration / HW Calibration
- True Color Pro
- DICOM Part 14
- Uniformity Compensation
- Flicker Safe
- Input : HDMI x 1, DisplayPort x 1, 3G-SDI x 1, DVI x 1
- Output : DisplayPort x 1, 3G-SDI x 1, DVI x 1
- Resistance Rating : IP35 (Front) / IP32 (Except for Front), IK06
- IEC (IEC60601-1 / IEC60601-1-2), EN (EN 60601-1 / EN 60601-1-2), cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 NO.60601-1), FCC (FCC part 15 Class A), FDA(Registration (Class I)), CE (MDD 93/42/EED, 2007/47/EC), RoHS, REACH, WEEE



\*The monitor stand is not included with the surgical monitor.



### 3 Key Sales Points – 4K Surgical Monitor

# 3 Key Sales Points

## 1. Superior Picture Quality Even with HDR Contents

**32" IPS 4K (3840x2160) | 178° Wide Viewing Angle | HDR 10**

The larger 32HL710S, 31.5-inch 4K display with IPS, helps surgeons easily identify details, presenting accurate, realistic images during a procedure. In addition, when multiple doctors take part in the surgery, the wide viewing angle of the IPS panel allows each doctor to view content on the monitor from different angles with minimal color shift. It also allows accurate reproduction of HDR contents from devices such as surgical cameras that support HDR. This ensures image from HDR-supported endoscope cameras are displayed in a way that closely resembles how it would appear to actual visual observation.

## 2. Improvement Safety to the Surgical Environment

**Mirror Mode & Rotation Mode | IP35 (Front), IP32 (Except for Front), IK06**

The 32HL710S allows you to adjust the flip and rotation to fit your surgery. Depending on your needs, you can use Mirror Mode to share the same surgical scene or Rotation Mode to adjust it to an easy-to-view direction regardless of the rotation of the surgical camera. Also, surgical monitors must be protected from unexpected events that may occur during surgery. It is ideal for surgical environments, highly reliable with a IP35 rating in the front and IP32 on the back, protecting it from all directions. It is also highly durable, protecting the glass from external mechanical impact with a IK06 rating.

## 3. Enhanced Connectivity for Multi Modalities

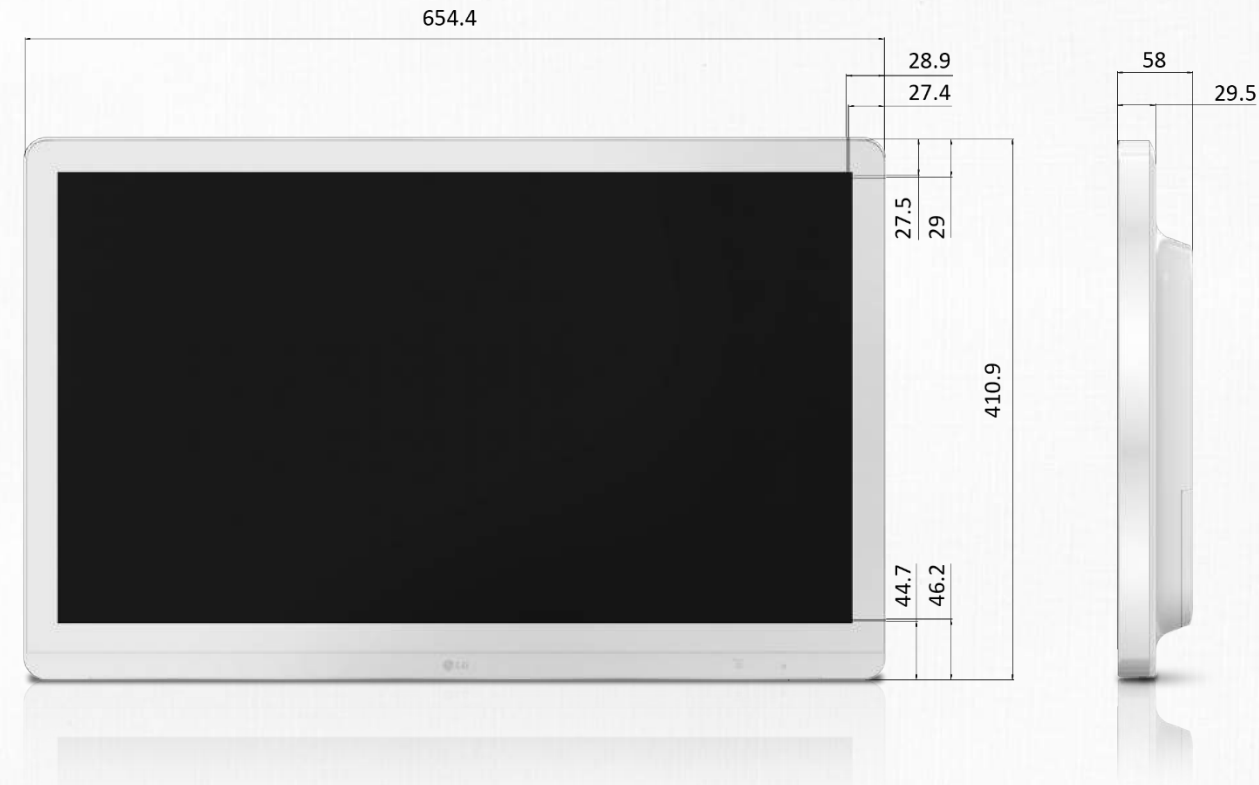
**PBP (Up to 4PBP) | PIP | Multi-Modality Connectivity**

Using the 32-inch 4K Surgical Monitor, medical professionals can view a combination of endoscopic and fluoroscopic images while monitoring vital signs. It can be connected to various modalities, and it is highly usable because the screen can be configured with four different inputs. In other words, the 32HL710S is compatible with a variety of analog and digital modalities, such as 3G-SDI, DVI-D, DP, HDMI video interfaces.

## Product Brief

# 4K Surgical Monitor | 27HJ710S

- IPS 27" 4K (3840x2160)
- sRGB 115% (Area) / Over 99% (Coverage), 800nits (Typ.)
- 14ms(Off- setting), 5ms (Faster- setting) R/T
- 178° Wide Viewing Angle
- Factory Calibration / HW Calibration
- True Color Pro
- DICOM Part 14
- Uniformity Compensation
- Flicker Safe
- Input : HDMI x 1, DisplayPort x 1, 3G-SDI x 1, DVI x 1
- Output : DisplayPort x 1, 3G-SDI x 1
- Resistance Rating : IP35 (Front) / IP32 (Except for Front), IK06
- IEC (IEC60601-1 / IEC60601-1-2), EN (EN 60601-1 / EN 60601-1-2), cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 NO.60601-1), FCC (FCC part 15 Class A), FDA(Registration (Class I)), CE (MDD 93/42/EED, 2007/47/EC), RoHS, REACH, WEEE



\*The monitor stand is not included with the surgical monitor.

### 3 Key Sales Points – 4K Surgical Monitor

# 3 Key Sales Points

## 1. Exceptional Picture Quality that All Surgeon Wanted

**27" IPS 4K (3840x2160) | 800nits (Typ.) & sRGB 115% (Area) | DICOM Part 14 & Brightness Stabilization**

While performing surgery using a monitor, it can be difficult to identify details due to the movement of blood or the complex structure of the human body. The superior image quality with the wide view angle IPS panel of LG's surgical monitors helps the surgeon view contents on the monitor from any angle with minimal distortion. Furthermore, the LG surgical monitor not only supports high brightness up to 800 nits, but also covers 115 % of the sRGB spectrum, for over 99% coverage and accurate color reproduction, especially the red spectrum. The LG surgical monitor carefully measures and sets every grayscale tone as well to create a monitor compliant with DICOM Part 14 and ensure the most accurate outcome. And its stabilized brightness settings quickly adapt to the surgical procedure or local lighting conditions.

## 2. Ideally Suited to the Surgical Environment

**IP35 (Front), IP32 (Except for Front), IK06 | Anti-reflection & Optical Bonding Glass**

The 27HJ710S is ideal for surgical environments, highly reliable with a IP35 rating in the front and IP32 on the back, protecting it from all directions. With a IK06 rating, it is also highly durable against external mechanical impact with IK06 protection rating. The LG surgical monitor also features anti-reflection & optical bonding glass, delivering brighter, sharper, highest quality images.

## 3. Comfort Eyes in a Long-Time Surgical Operation

**Dynamic Sync Mode | Quick Response Time | Flicker Safe**

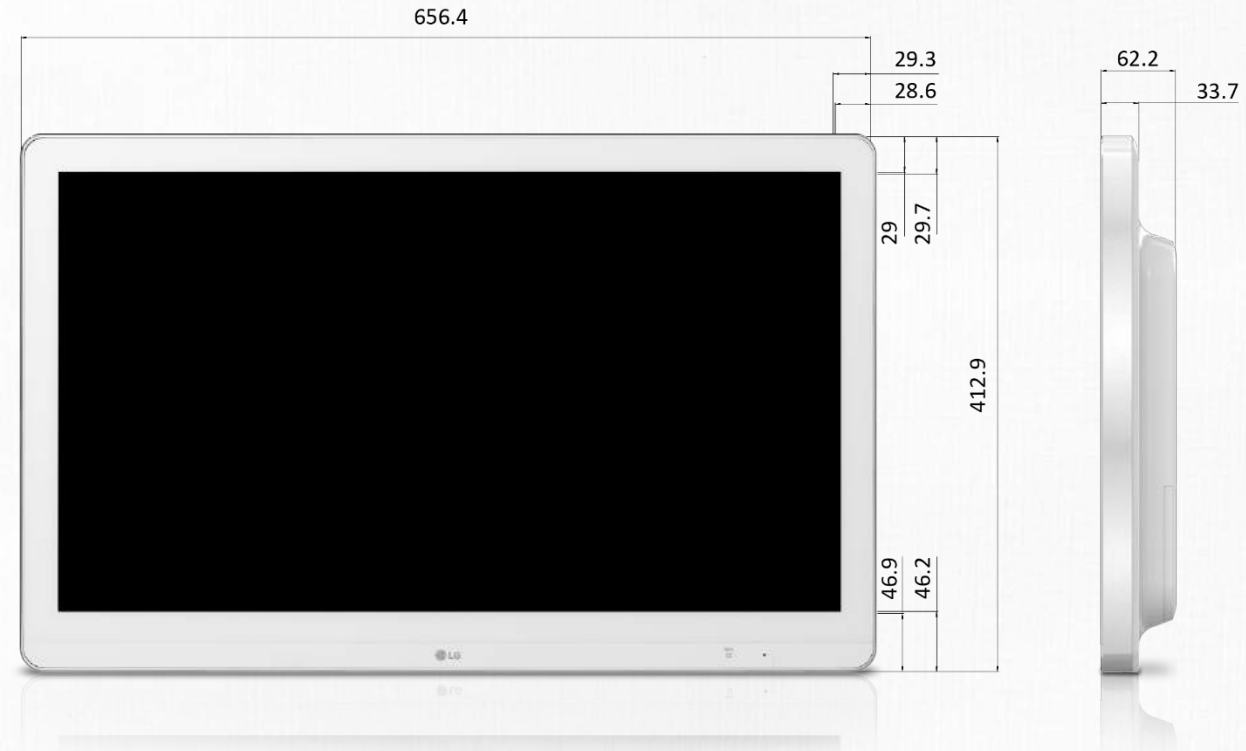
The low input lag of a display indicates how quickly it can deliver an image from input device to monitor. And by supporting a quick response time, the monitor provide a clear display without distortion thanks to a faster signal transportation. Furthermore, another special feature, Flicker Safe, helps protect doctors' eyes from a flickering screen by reducing flickering to almost zero.



## Product Brief

# Full HD Surgical Monitor | 27HK510S

- IPS 27" Full HD (1920x1080)
- sRGB 115% (Area) / Over 99% (Coverage), 1000nits (Typ.)
- 14ms(Off- setting), 5ms (Faster- setting) R/T
- 178° Wide Viewing Angle
- Factory Calibration / HW Calibration
- DICOM Part 14
- True Color Pro
- Uniformity Compensation
- Flicker Safe
- Input : HDMI x 1, S-Video x 1, Composite x 1, 3G-SDI x 1, DVI-I x 1 (Compatible with Component via adapter)
- Output : 3G-SDI x 1, DVI-I x 1
- Resistance Rating : IP35 (Front) / IP32 (Except for Front), IK06
- IEC (IEC 60601-1 / IEC 60601-1-2), EN (EN 60601-1 / EN 60601-1-2), cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 No. 60601-1) FCC (FCC part 15 Class A), FDA(Registration (Class I)), CE (MDD 93/42/EEC, 2007/47/EC), RoHS, REACH, WEEE, MFDS



\*The monitor stand is not included with the surgical monitor.

### 3 Key Sales Points – FHD Surgical Monitor

# 3 Key Sales Points

## 1. Optimal Picture Quality and High Compatibility with Surgical Devices

**27" IPS Full HD | 1000nits (Typ.) & sRGB 115% (Area) | DICOM Part 14 & Brightness Stabilization**

Thanks to the 27-inch Full HD display, brightness of 1000 nits (Typ.), 115% area of the sRGB spectrum, for over 99% coverage and accurate color reproduction, the 27HK510S is a perfect match for Full HD surgical devices. It presents surgeons with accurate, realistic images while performing surgery. In particular, the enhanced red spectrum and IPS helps surgeons ascertain the details from any angle and without any distortion despite the difficulty presented by the movement of blood or the complex structure of human body. Especially, 27HK510S's deep red expression allows to easily distinguish the vessels to complete the delicate surgery. And, its stabilized brightness settings quickly adapt to the surgical procedure or local lighting conditions.

## 2. Suitable for the Surgical Environment

**IP35 (Front), IP32 (Except for Front), IK06 | Anti-reflection & Protection Bonding Glass**

To protect it from contact with substances such as blood or bodily fluids, the LG surgical monitors offers a cleanable, reliable medical monitor with ratings of IP35 on its front and IP32 on the back, securing it from any direction. And with a IK06 rating, it is also highly durable against external mechanical impact. The 27HK510S also has an anti-reflection & protection bonding glass for easier maintenance and cleaning, while protecting it from water and bodily fluids.

## 3. Reducing Eye Fatigue During Long Surgery Times

**Dynamic Sync Mode | Quick Response Time | Flicker Safe**

By supporting quick response time, the surgical monitor provides clear images without distortion thanks to faster signal transmission during surgery. In addition, Flicker Safe helps protect doctors' eyes by reducing onscreen flickering to almost zero during long surgeries.

## Key Feature #1

# The Larger Sized 31.5-inch 4K Display

### 31.5-inch 4K (3840x2160)

LG Surgical Monitor has a full lineup with more options to better meet needs - 32-inch and 27-inch screen sizes and 4K and Full HD resolutions. Therefore, you can choose the best screen size most suitable for dimensions of your operating room and modality in use.

With the introduction of the new 32-inch model, the 32HL710S offers a wider option for looking closely at details under the same resolution of the 27-inch model. The larger screen allows surgeons to quickly and clearly pick up on the details during surgical procedures with accurate and realistic images.



32HL710S



27HK710S



## Key Feature #2

# 4K / Full HD IPS Display

## More Detailed and Precise Surgery is Possible

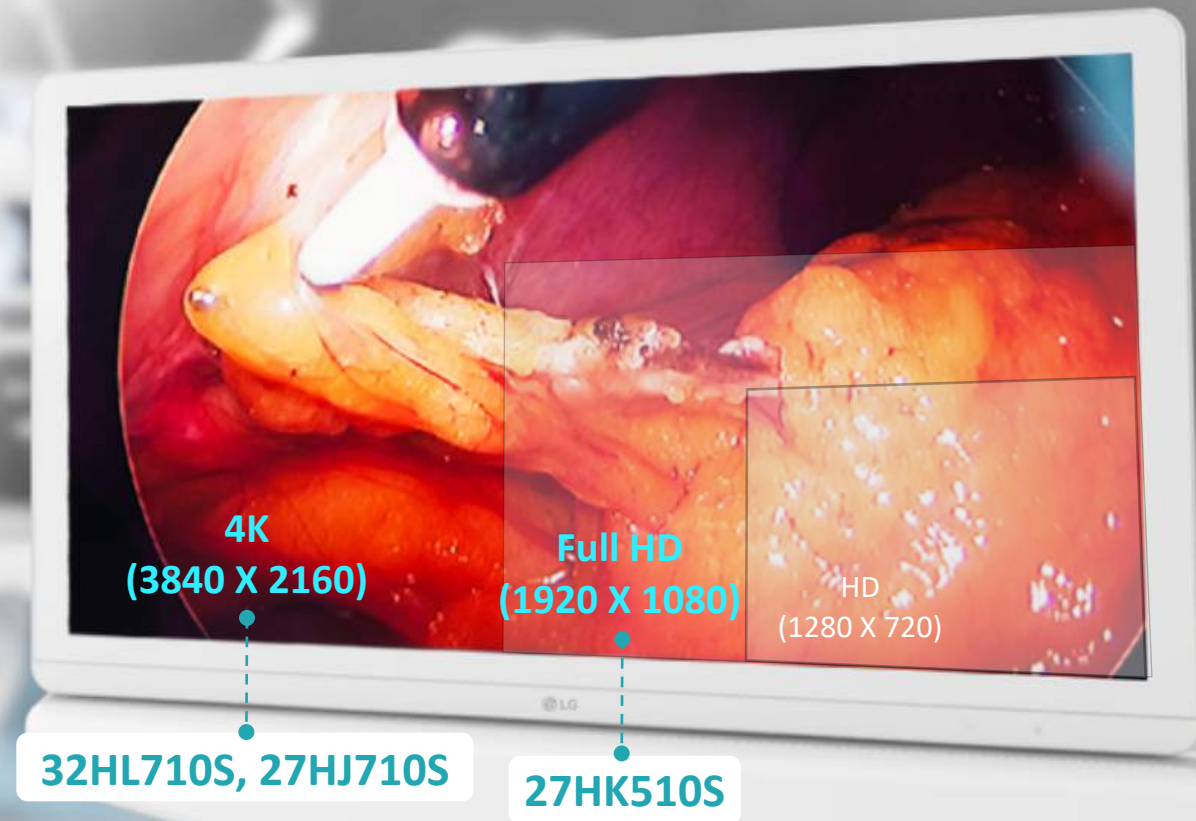
The LG monitor includes an 4K panel to achieve an image with four times the resolution of Full HD and also offers a Full HD display to maximize compatibility and fit with other Full HD surgical devices. The different types of surgical monitors improve work efficiency by not only enabling detailed observation but also clearly displaying multiple images.

In addition, when multiple doctors take part in the surgery, the wide view angle of the IPS panel allows each doctor to view content on the monitor from different angles with minimal color shift. This allows the entire crew in the surgery room to view the screen more comfortably, resulting in a more efficient operating environment.



“The Proven IPS for Low Color Shift”  
Compared to VA

\*Intertek is an International Testing Institution



### Key Feature #3

# Optimization of HDR Contents

## HDR 10

HDR (High Dynamic Range) approximates the human perception of color and light as content is shown on a display device. The 32HL710S, which supports HDR, allows accurate reproduction of HDR contents from devices such as surgical cameras. This ensures images from HDR-supported endoscope cameras are displayed in a way that closely resembles how it would appear to actual visual observation.



32HL710S



Conventional

115% of sRGB(Area) & 1000nits(Typ.)\*

Most operating rooms require a brighter monitor with more accurate color expression compared to other usage environments. The LG surgical monitor not only supports high brightness up to 1000nits(Typ.) for the 27HK510S and 800nits(Typ.) for the 27HJ710S, compared to other surgical monitors at approximately 600-650nits, but also covers sRGB 115%(Deep Red) which ensures more accurate color reproduction. Moreover, by adding the deep red color spectrum, LG surgical monitors ensure true color expression of red tones.

\*Applied to 27HK510S





## Key Feature #5

# DICOM Part 14 & Brightness Stabilization

## Built-In Features Ensure Consistently Accurate Display

The LG monitor's drift correction function quickly stabilizes the brightness level of the monitor upon startup, quickly providing the most accurate images. In addition, a sensor measures the backlight brightness and automatically compensates for brightness fluctuations caused by ambient temperature and aging for a consistently stable display.

Even more, DICOM (Digital Imaging and Communications in Medicine) Part 14, published by the National Electrical Manufacturers Association (NEMA) and the American College of Radiology (ACR), provides strict guidelines for how grayscale display function calibration and quality assurance tests should be performed on displays used in medical imaging applications. DICOM is used as a standard to adjust the grayscale tone characteristics of monitors used in the medical field.

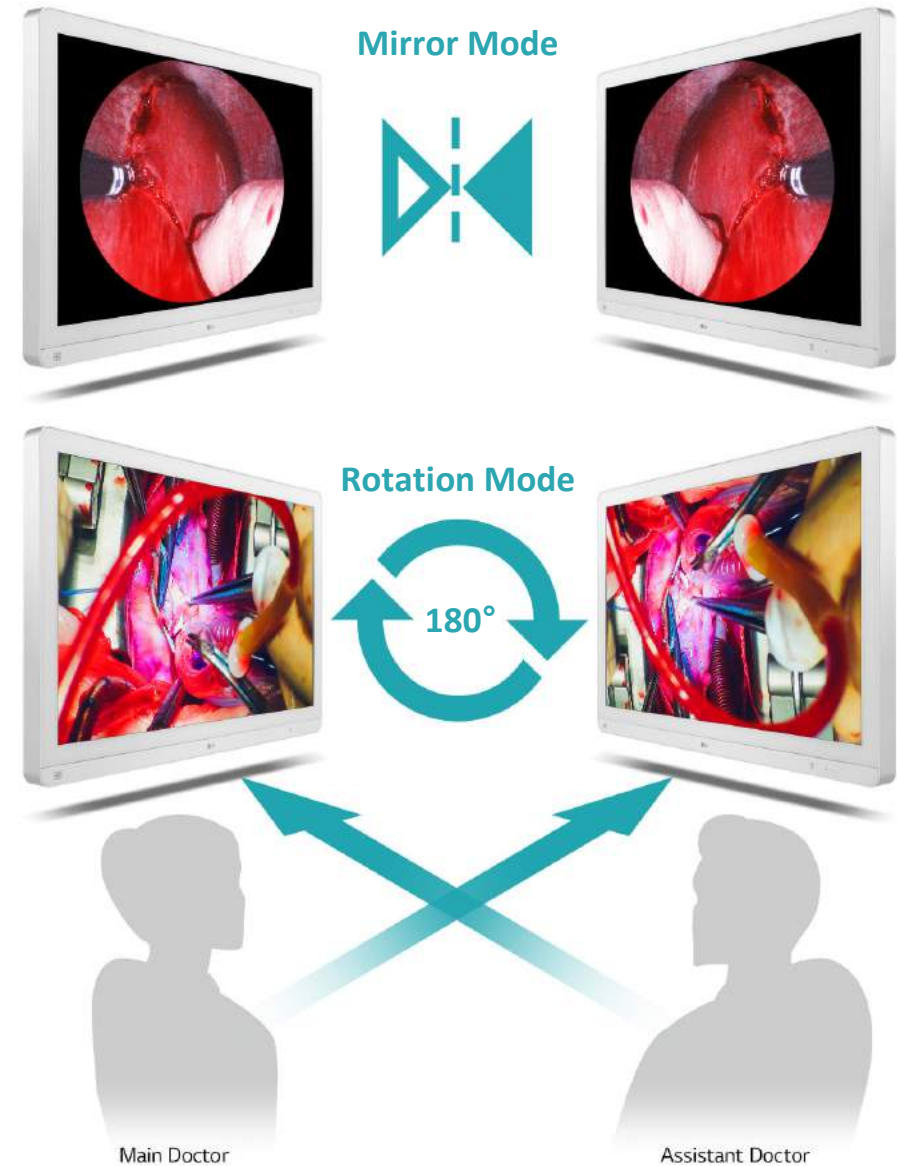


## Key Feature #6

# Customized Surgery Monitoring

## Mirror & Rotation Mode

The 32HL710S allows you to adjust the flip and rotation to fit your surgery. Mirror Mode allows you to see the screen in the same direction even from the opposite side of the operating table, so all medical staff in the operating room can see the scene accurately. In addition, Rotation Mode allows you to rotate and display the screen in a direction that is easy to view, regardless of the orientation of the surgical camera.

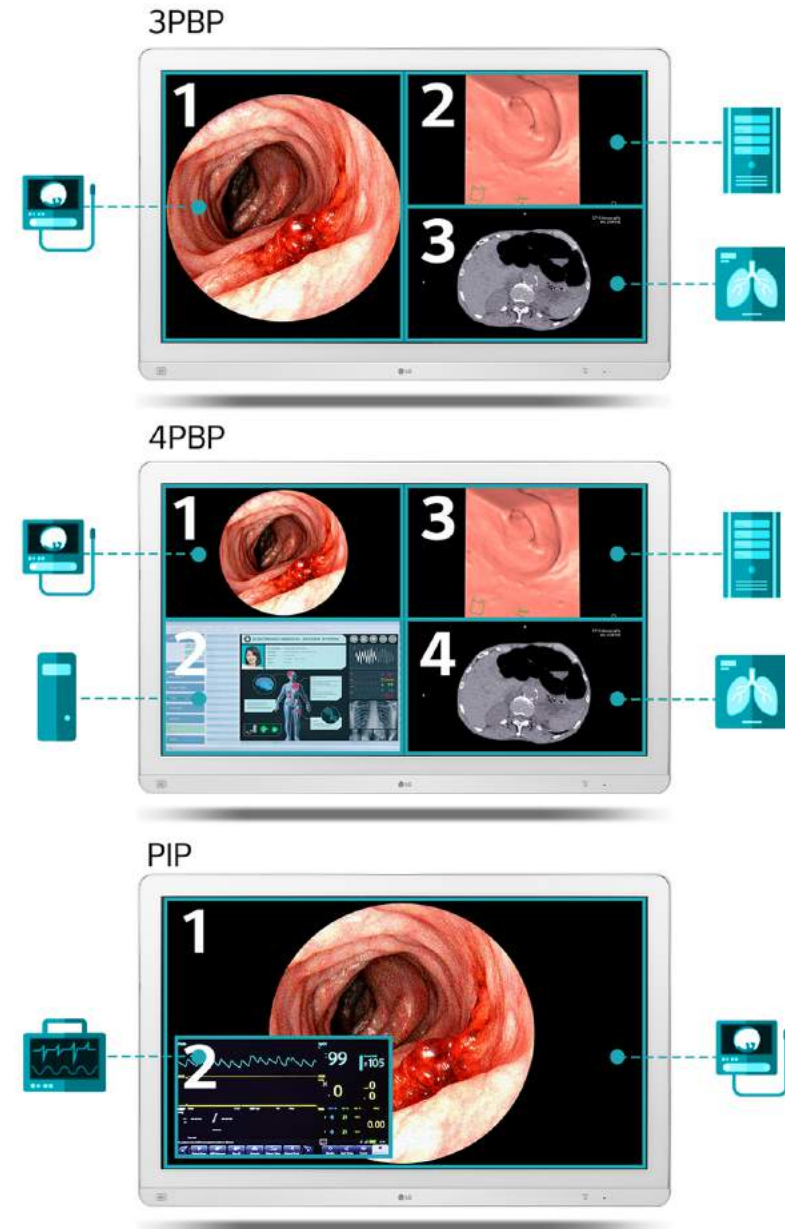


## Key Feature #7

# Multiple Signals at Once

### PBP(Up to 4PBP) | PIP

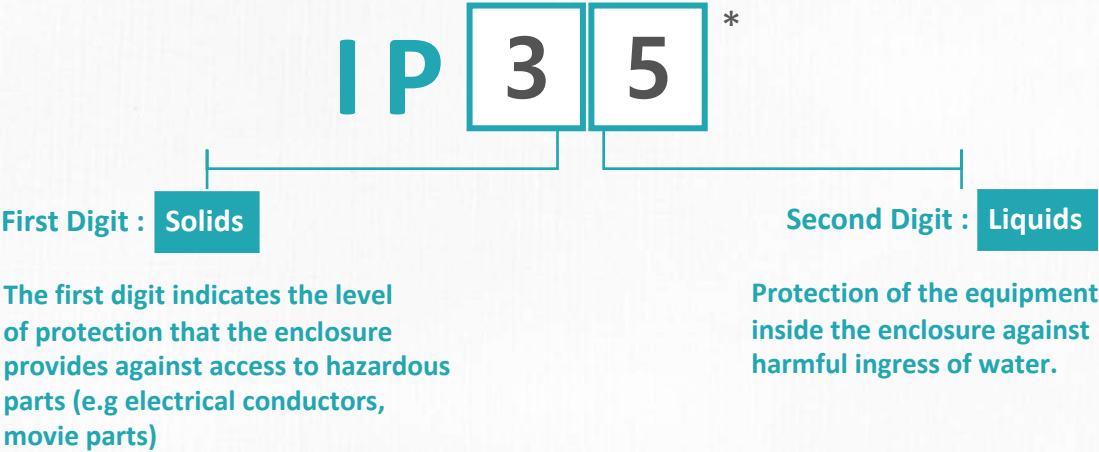
The 32-inch 4K surgical monitor allows you to use 2PBP, 3PBP, and even 4 PBP. Supporting up to 4PBP and allowing medical professionals to see multiple signals at once is an ideal option for surgical monitors. Using the 32-inch 4K Surgical Monitor, a surgeon or a member of the medical staff can view a combination of endoscopic and fluoroscopic images while monitoring vital signs. In other words, different input signals, through 3G-SDI, DIV-D, DP and HDMI, can be viewed on up to four video signal simultaneously.

















Key Feature #8-1

# IP Grade



LG offers a cleanable and reliable medical monitor with rating of IP35, which reduce potential risk in demanding environment. Required hygiene standard in medical environment gets stricter in the worry of infection. Medical monitors touched by doctors, patients and contact with unexpected body fluid. Medical equipment should not be compromised by dust, bodily fluids, sprayed water for washing-down and sterilized. With IP35, infection control gets easier and also reduces asset management risk.

\*IP35 is applied to LG Surgical Monitor’s front and IP32 is on the back.

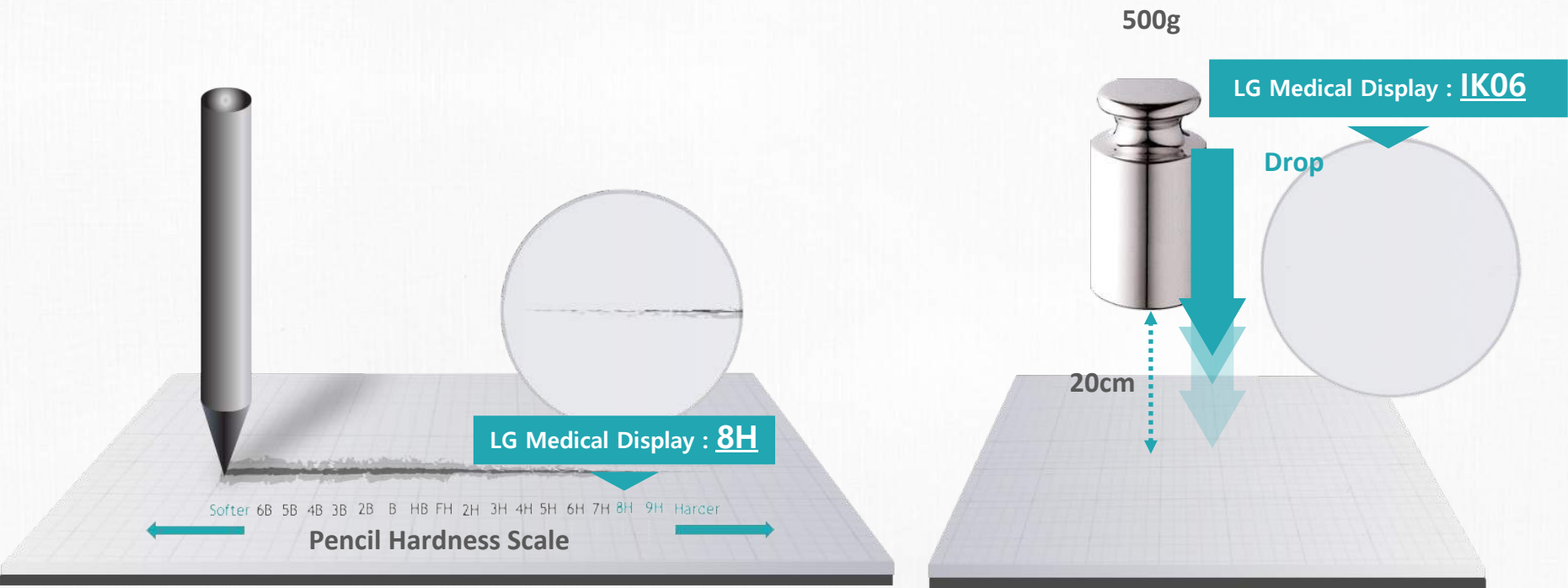
Dustproof	Waterproof
	
 <div>IP 3 : 2.5mm, Tools thick wires etc.</div>	
	
	<div>IP 5 : Water projected by a nozzle (6.3mm) against enclosure from any direction shall have no harmful effects</div> 
	
	

Key Feature #8-2

# Hardness Cover Glass & IK Grade

## Pencil Hardness Test and IK Grade

LG Surgical Monitor offers a cleanable and reliable medical monitor with rating of 8H IK06 grade, which reduce potential risk in demanding surgical environment.



**Vandalproof**

The Vandalproof test sequence shows a monitor being hit by a hammer. The sequence includes a monitor being hit by a hammer, a monitor being hit by a hammer, a monitor being hit by a hammer, a monitor being hit by a hammer, a monitor being hit by a hammer, and a monitor being hit by a hammer. A label indicates 'IK06 : Protected against a 500g object dropped from 20cm in height'.

## Key Feature #9

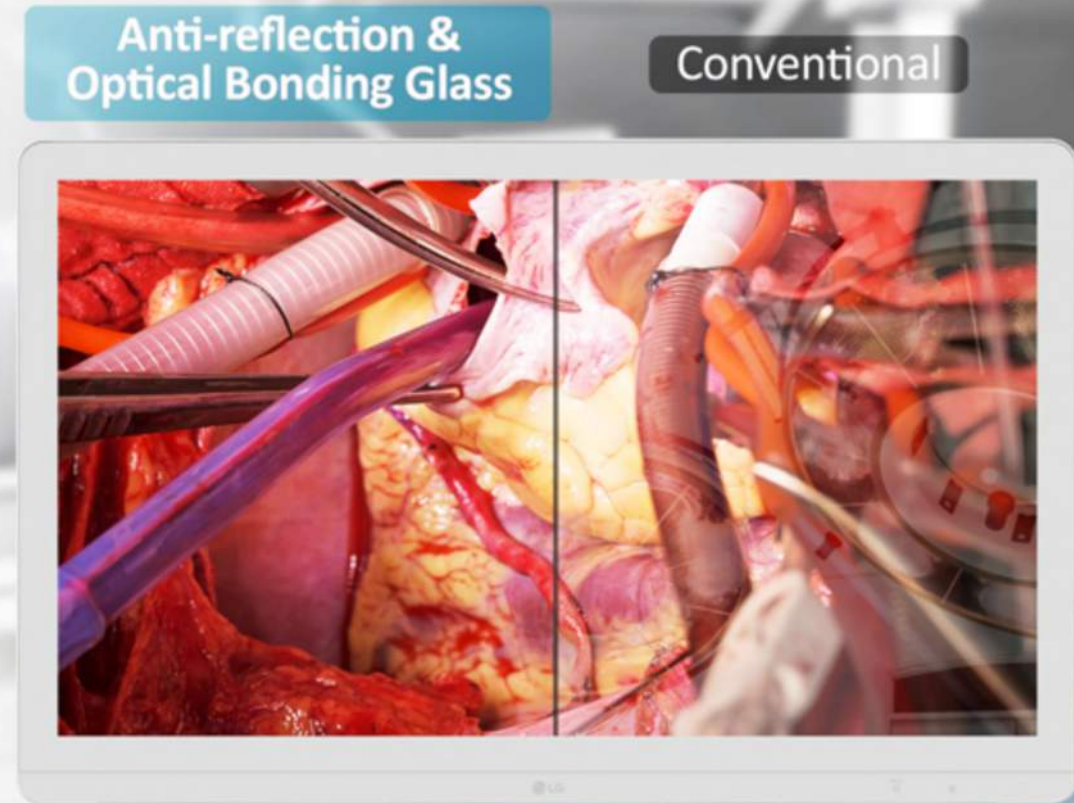
# Anti-reflection & Optical Bonding Glass

### **Reduce glare from external light sources & Maximum durability against bodily fluids**

During an operation, high legibility and definition are essential to making accurate judgements. However, when light from an external source passes through the panel and the gap, refraction can cause it to be reflected back, creating glare on the screen.

For this reason, the 27HJ710S with optical bonding significantly reduces glare from external light sources and improves its anti-reflection ability. It provides a clearer image without dark or bright spots. In addition, the 27HK510S with protection bonding provides a more durable display by protecting the monitor from water and bodily fluids and making it easier to clean for its front glass.

In addition, an anti-reflective coating on the display glass further reduces surface reflection. The AR (Anti Reflection) minimizes internal reflections, and the AF (Anti Finger) prevents fingerprints on display.





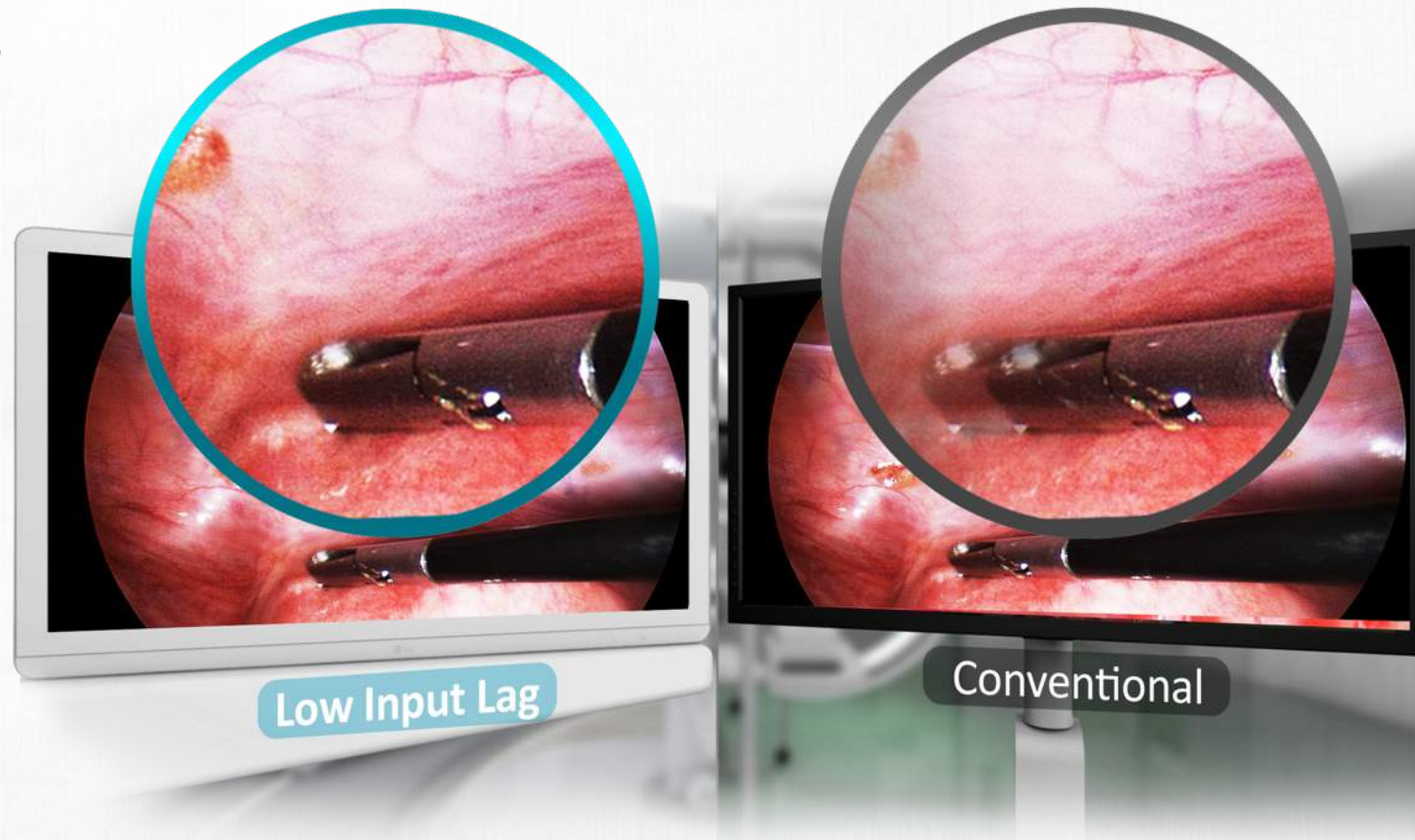
## Key Feature #10

# Dynamic Sync Mode

### Manage a Lot of Information without Any Delays

The input lag of a display indicates how quickly it can deliver an image from input device to monitor. Since during an operation, a display takes a lot of heavy information from many other devices those tracking the real-time condition of the patient, input lag takes time and therefore visual distracting caused.

The LG surgical monitor minimizes those risks by supporting low input lag in the OR.



\*Input lag level will be updated based on internal test later

\*Dynamic Sync Mode is only available to contents at 60Hz input source.

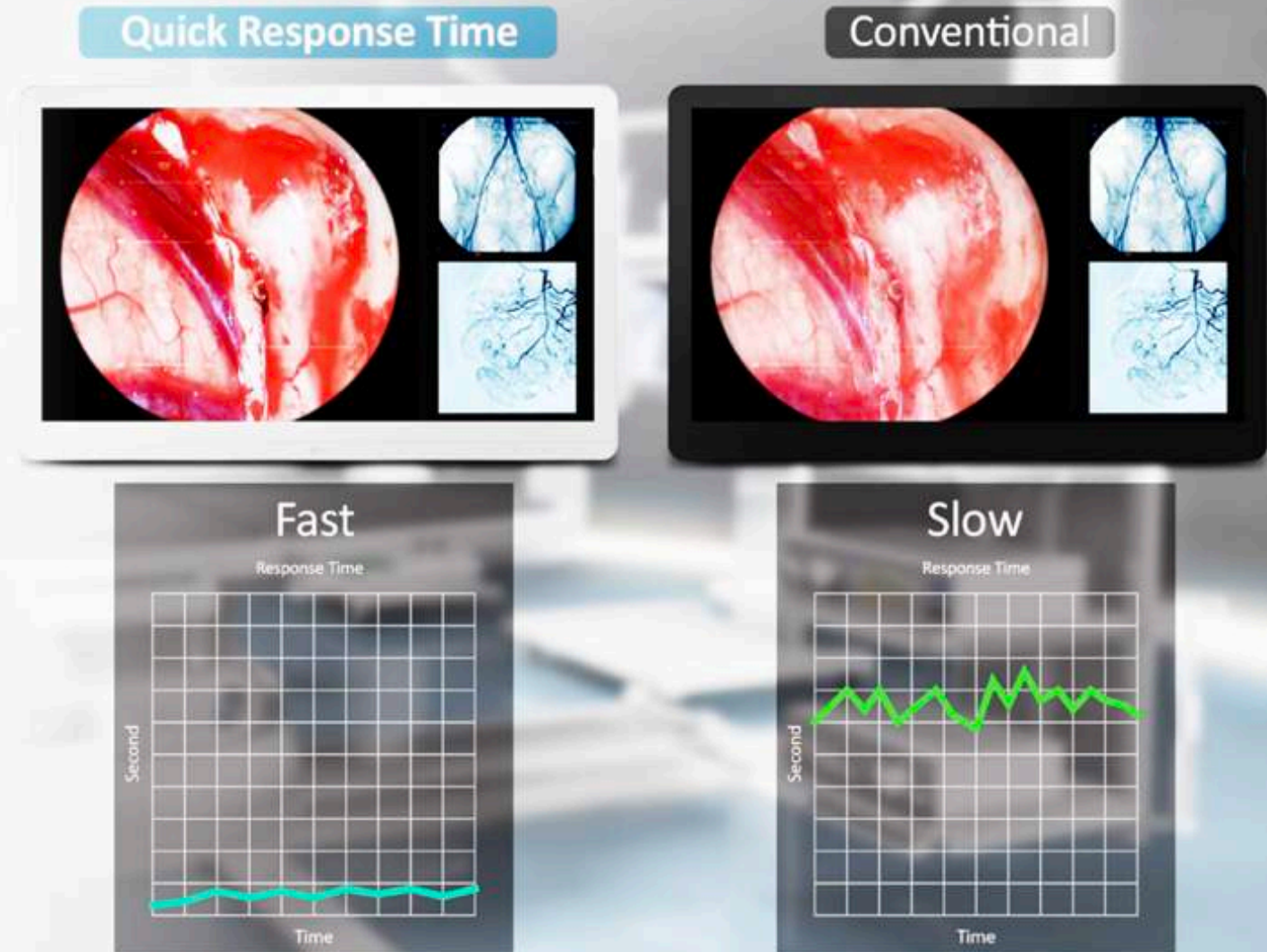
## Key Feature #11

# Quick Response Time

## Transporting Heavy Information with Fast Signal Process

The response time of a display is typically related to how much ghosting a display has. Ghosting is the blur that you see on your display trailing objects when there are fast scenes being displayed, such a real-time information.

Since LG surgical monitor supports quick response time, it makes monitor to display all real-time information clearly without show blurring behind moving objects as they are move.



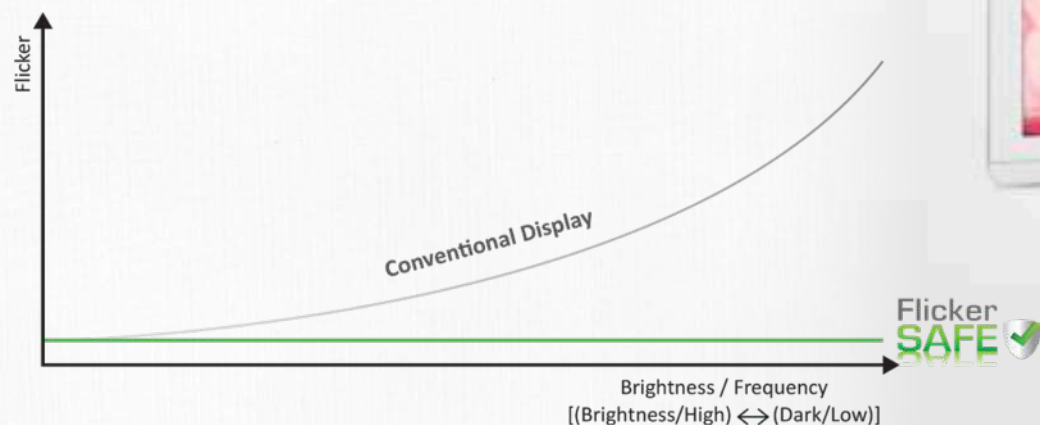


## Key Feature #12

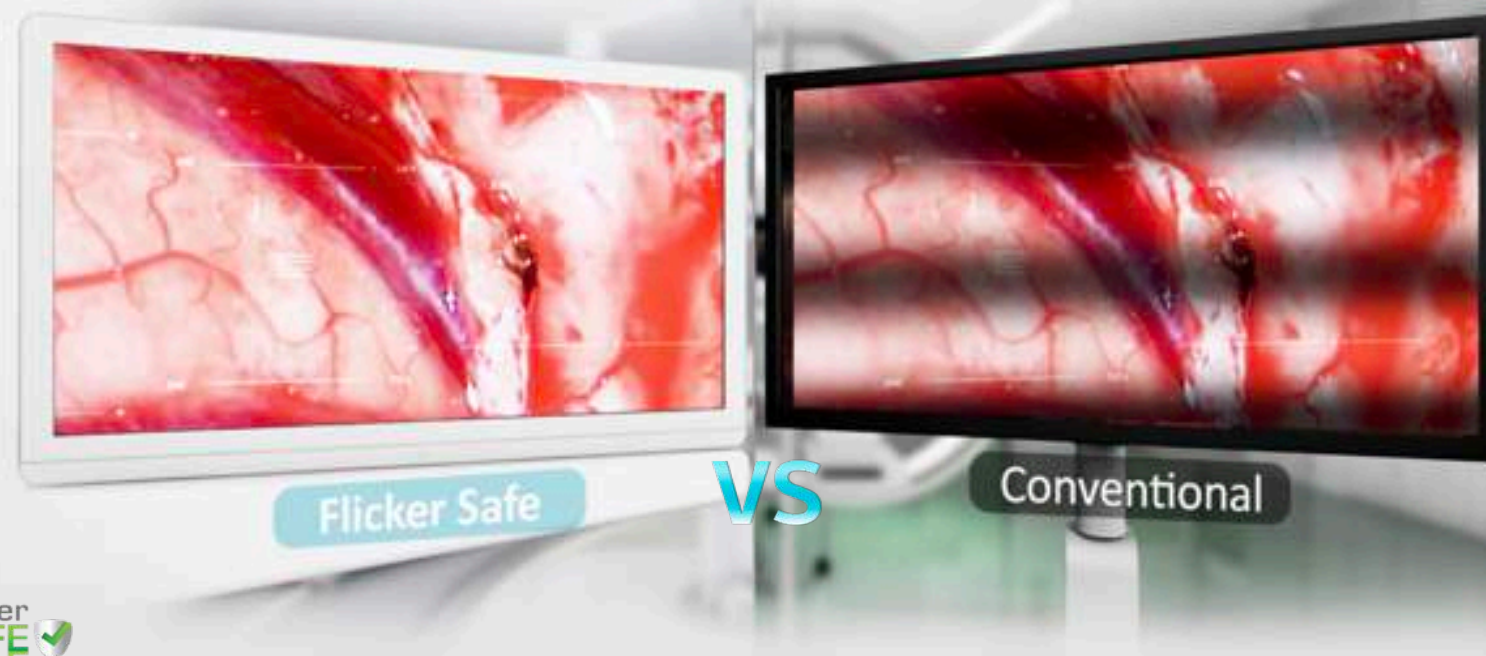
# Flicker Safe

## Long-lasting Eye-Comfort

As long as doctors are spending long time for clinic, LG's Flicker-Safe technology protects doctor's eye from fatigue by reducing flickering to almost zero. Reducing the flicker level to almost zero, Flicker-Safe helps doctors protect their eyes from exhausting flickers.






\*Stable Flickering regardless of brightness









# Specification Comparison

Manufacturer & Product		LG 32HL710S	Barco MDSC-8231	FSN FS-P3102D
Product Image				
LCD	Module	31.5" IPS	31.1" IPS	31.5" IPS
	Resolution	3840 x 2160	4096 x 2160	4096 x 2160
	Brightness	▲ 800 cd/m <sup>2</sup> (Typ.)	550 cd/m <sup>2</sup> (Typ.)	350 cd/m <sup>2</sup>
	Contrast	1000	1400	1500
	Color Space	sRGB 115% (Area), Over 99% (Coverage)	Native: 96% DCI-P3 / 105% Adobe	-
	Response Time	▲ 14ms (Off- setting), 5ms (Faster- setting)	20ms (Typ.)	11ms (Typical rise time)
HW	Interface	3G-SDI : In X1 / Out X1	3G-SDI : In X1	3G-SDI : In X4 / Out X4
		DVI : In X1 / Out X 1	DVI : In X1	DVI : In X1 / Out X 1
		HDMI In X 1	HDMI 2.0 In X 2	HDMI 2.0 In X 1
		DisplayPort : In X 1 / Out X1	DP : 1.1 X 2 / 1.2 X1	DP(1.2) : In X1 / Out X 1
	Power	100-240Vac, 50/60Hz	-	AC 100~240V, DC 24V 6.6A
Resistance Rating		IP35 (Front) / IP32 (Except for Front), IK06	IP45 / IP20 (Front / Back)	-
Medical Standard		IEC (IEC60601-1 / IEC60601-1-2), EN (EN 60601-1 / EN 60601-1-2), cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 NO.60601-1), FCC (FCC part 15 Class A), FDA(Registration (Class I)), CE (MDD 93/42/EED, 2007/47/EC), RoHS, REACH, WEEE	TBD	TBD
Feature		PIP/PBP(2/3/4PBP) Screen Flip (Mirror Mode & Rotation Mode) H/W Calibration Uniformity Compensation True Color Pro / Flicker Safe		

# Specification Comparison

Manufacturer & Product		LG 27HJ710S	Barco MDSC-8427	FSN FM-B2702D
Product Image				
LCD	Module	27" IPS	27" IPS + Glass	27" IPS + Glass
	Resolution	▲ 3840 x 2160	3840 x 2160	3840 x 2160
	PPI	163		
	Brightness	▲ 800 cd/m² (Typ.)	750 cd/m² (Typ.) 550 cd/m² stabilized	800 cd/m² (Typ.)
	Contrast	1000	1400	1400
	Color Space	▲ sRGB 115% (Area), Over 99% (Coverage)	Adobe 92%	
	Response Time	▲ 14ms (Off- setting), 5ms (Faster- setting)	20ms	11ms
HW	Interface	3G-SDI : In x1 / Out x1	3G SDI : In X 1 / Out X 1	3G SDI : In X 4(FM-B2702DS) / Out X 4(FM-B2702DS)
		DVI x1	DVI : In X 1 / Out X 1	DVI : In X 1 / Out X 1
		HDMI x1	HDMI 2.0 in X 2	HDMI 2.0 : In X 1
		DisplayPort : In X 1 / Out X1	DP : In X 2	DP 1.2 : In X 2 / Out X 1
	Power	100-240Vac, 50/60Hz	25V (100W)	24V /6.6A(85W)
	Resistance Rating	IP35 (Front) / IP32 (Except for Front), IK06	IP45 / IP21 (Front / Back)	IP33
Medical Standard		IEC (IEC60601-1 / IEC60601-1-2), EN (EN 60601-1 / EN 60601-1-2), cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2 NO.60601-1), FCC (FCC part 15 Class A), FDA(Registration (Class I)), CE (MDD 93/42/EED, 2007/47/EC), RoHS, REACH, WEEE	CE MDD Class 1 UL60601-1 / IEC60601-1	CE MDD Class 1 UL60601-1 / IEC60601-1
Feature		Brightness Stabilization PIP/PBP(2PBP) H/W Calibration Uniformity Compensation ▲ User Preset / <b>Flicker Safe</b>		

# Specification Comparison

Manufacturer & Product		LG 27HK510S	Sony LMD-2765MD	Barco MDSC-2326	NDS 27 Radiance Ultra
Product Image					
LCD	Module	27" IPS	27" IPS + Glass	26" IPS + Glass	27" IPS + Glass
	Resolution	1920 x 1080	1920 x 1080	1920 x 1080	1920 x 1080
	Brightness	▲ 1000 cd/m <sup>2</sup> (Typ.)	1000 cd/m <sup>2</sup> (Typ.)	900 cd/m <sup>2</sup> (Typ.)	900 cd/m <sup>2</sup> (Typ.)
	Contrast	1000 : 1	1000 : 1	1400 : 1	1000:1
	Color Space	▲ sRGB 115% (Area), Over 99% (Coverage)	NTSC 72%	BT.709 100%	BT.709 or SMPTE-C
	Response Time	▲ 14ms (Off- setting), 5ms (Faster- setting)	14ms	18ms	14ms
HW	Interface	3G SDI : In X1 / Out X1	3G SDI : In X2 / Out X1	3G SDI : In X2 / Out X2	3G SDI : In X1 / Out X1
		DVI-I : In X1 / Out X 1	DVI : In X2 / Out X 1	DVI in X 2 / Out X 1	DVI : In X1 / Out X 1
		▲ HDMI In X 1	-	DisplayPort	-
		S-Video In X 1	S-Video in X 1	S-Video in X 1 / Out X 1	S-Video in X 1
		Component In X 1 (Share DVI-I port)	Component in X 1 (Share D-sub port using 5-BNC to 15-pin D-sub Adapter )	Component in X 1	Component in X 1 (Share D-sub port using 5-BNC to 15-pin D-sub Adapter )
		Composite In X 1	Composite in X 1	Composite in X 1 / Out X 1	Composite in X 1
		-	D-sub In X 1	D-sub In X 1 (Share DVI port using DVI to VGA adapter)	D-sub In X 1
	Power	100-240Vac, 50/60Hz	24V / 6.25A	-	24V / 6.25A
	Resistance Rating	IP35 (Front) / IP32 (Except for Front), IK06	IPX5 / IPX2 (Front / Back)	IPX5 / IP21 (Front / Back)	IPX6
Feature		Brightness Stabilization PIP/PBP (2PBP) H/W Calibration Uniformity Compensation User Preset / Flicker safe	Brightness Stabilization PIP/PBP AIME (Advanced Image) User Preset	Brightness Stabilization PIP/PBP Uniformity Compensation	Brightness Stabilization PIP/PBP H/W Calibration Gorilla® Glass Embedded ZeroWire® Receiver



# 4

## Digital X-Ray Detector

- 17HK700G-W (17" Wired)
- 17HK701G-W (17" Wired/ Wireless)
- 14HK701G-W (14" Wired/ Wireless)



## Understanding the Product Concept

# What is Digital X-ray Detector ?

### A Digitalized X-Ray Detector for Radiography

X-ray detectors are devices used to measure the flux, spatial distribution, spectrum, and/or other properties of X-rays.

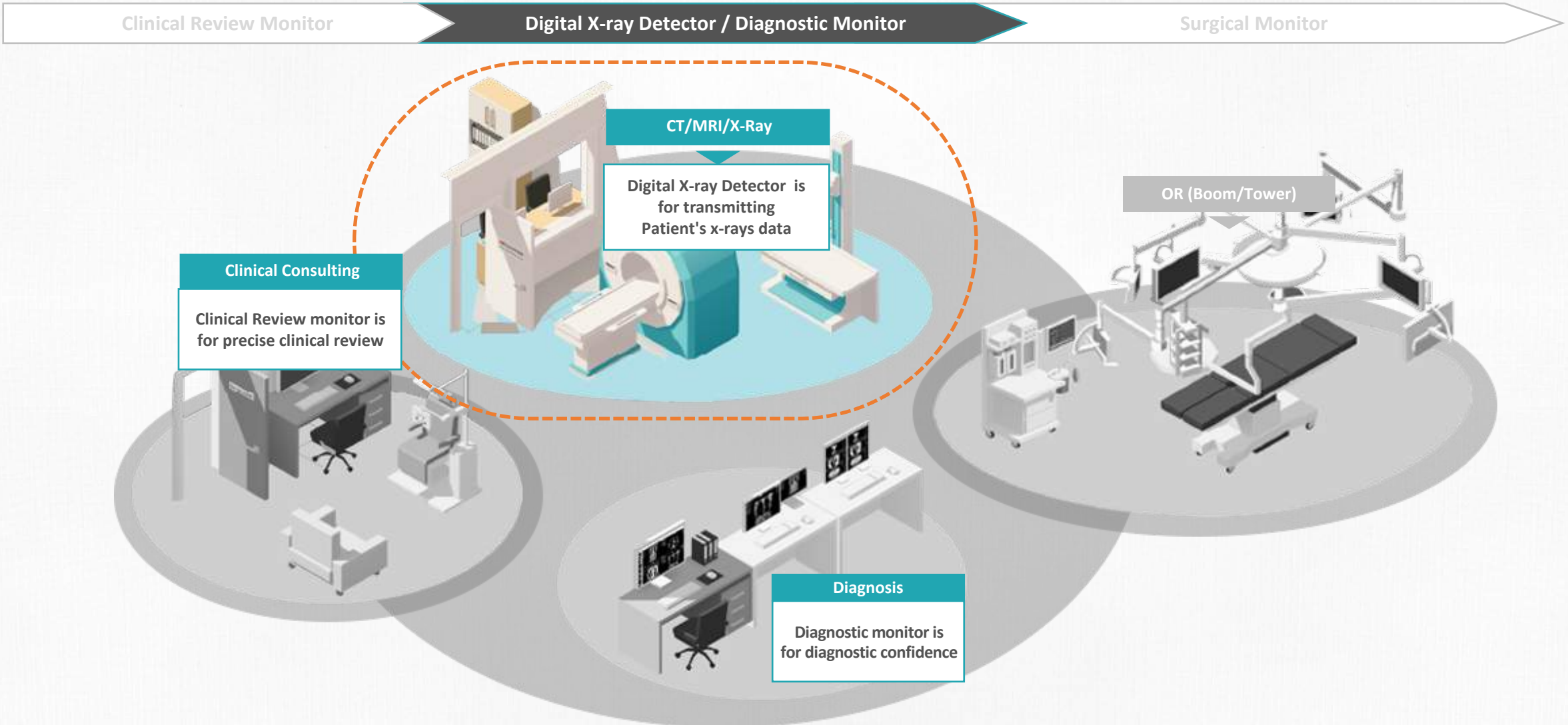
Imaging detectors for radiography were originally Photographic plates and X-ray film (photographic film). However, replacing the photographic plates and X-ray film into Digital X-ray Detector is a major trend in radiography because Digital X-ray Detector saves money and time for the following reasons.

- ① Costs less and eco-friendly without any needs to print out
- ② Requires lower data storage because all the images are digitalized
- ③ Offers excellent image quality within a few seconds



\*Fits into existing analog X-ray tray

# Where is Digital X-ray Detector ...?





## Factors that Affect Purchase Decisions

# What to Consider as a Buyer?

17"x17" & 14"x17" Digital X-ray Detector

### Priority

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#### ✓ Superior Image Quality

Digital X-ray Detector is highly required to have superior diagnostic imaging capabilities, especially in high grey scale range, since it distinguishes bones, soft tissue, overlapping areas or contours of objects for diagnosis only in black and white.

#### ✓ Durability & Mobility

Waterproof or dustproof is an essential element of Digital X-ray Detector as well as lightweight as doctors are always facing dynamic emergency situations regardless of indoor or outdoor and need to respond such urgent accidents at anytime and anywhere.

#### ✓ High Speed Processing

In medical environments, "high speed processing" is very important to hospital management in terms of cost-efficiency. For that, the X-ray scanning time will be an important consideration point for purchase, as hospitals can deal with more patients within limited time, resulting in more profits.

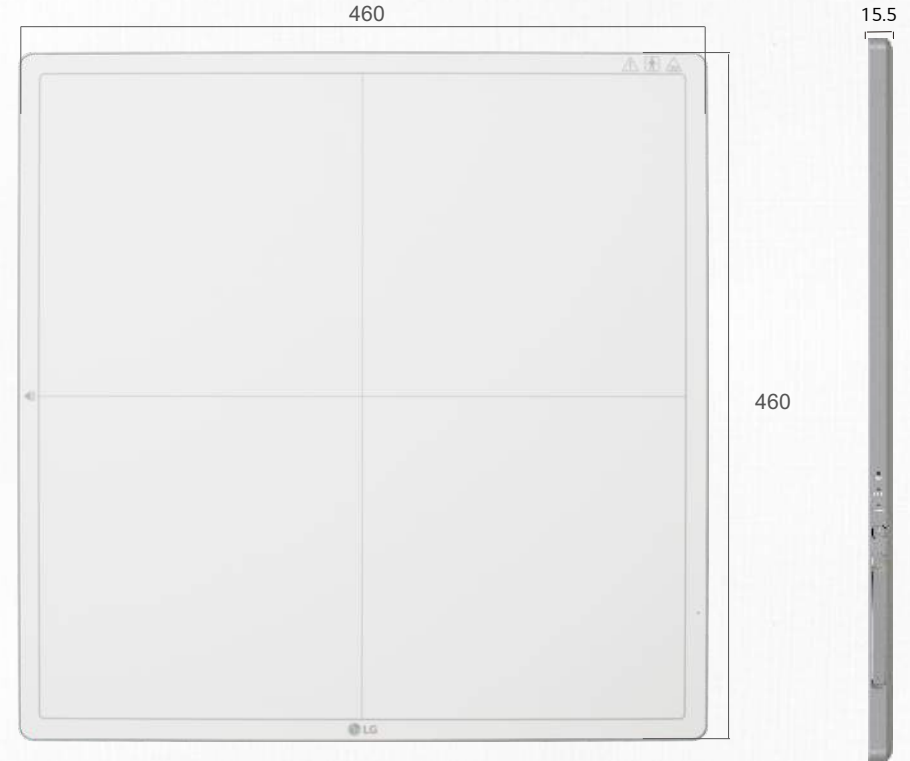
## Product Brief

# Digital X-ray Detector (17"x17") | 17HK700G-W

- TFT: Amorphous silicon Thin Film Transistor (a-Si TFT)
- Scintillator: CsI
- AD Conversion / Output : 16 bit
- Pixel Pitch: 140 $\mu$ m
- Full Image Transfer: 3 sec(Tethered)
- Sizes: 460mm x 460mm x 15.5mm
- Weight: 3.2kg
- Maximum Load Weight : 150kg
- Waterproof : IP41



Control Box



Panel

## Product Brief

# Digital X-ray Detector (17"x17") | 17HK701G-W

- TFT: Amorphous silicon Thin Film Transistor (a-Si TFT)
- Scintillator: CsI
- AD Conversion / Output : 16 bit
- Pixel Pitch: 140 $\mu$ m
- Full Image Transfer: 3 sec(Tethered) / 6 sec(Wireless)
- Sizes: 460mm x 460mm x 15.5mm
- Weight: 3.4kg
- Maximum Load Weight : 150kg
- Waterproof : IP41





## Product Brief

# Digital X-ray Detector (14"x17") | 14HK701G-W

- TFT: Amorphous silicon Thin Film Transistor (a-Si TFT)
- Scintillator: CsI
- AD Conversion / Output : 16 bit
- Pixel Pitch: 140 $\mu$ m
- Full Image Transfer: 3 sec(Tethered) / 6 sec(Wireless)
- Sizes: 384mm x 460mm x 15.2mm
- Weight: 2.95kg
- Maximum Load Weight : 150kg
- Waterproof : IP41



# 3 Key Sales Points

## 1. Exceptional Image Quality

### 16bit Image Processing | Pixel Pitch/Matrix

This is one of the most important reason why LG Electronics can proudly introduce the Digital X-ray Detector in the market. Digital X-ray Detector is a device to convert X-ray energy passing through the human body to digital imaging on a monitor. a-Si TFT(Amorphous Silicon Thin Film Transistor) included in Digital X-ray Detector offers accurate images from this process. Plus, LGE also provides 16bit image processing, offering excellent image contrast, and supports ideal pixel pitches of 140 $\mu$ m for high resolution images.

## 2. Outstanding Durability and Portability

### IP41 | Magnesium & Carbon-fiber Body

LG Digital X-ray Detector is rated IP41 which protects contact of liquid in its vertical position or fine dust of approximately 1mm such as powdered medication. In addition, as the device is made of carbon-fiber materials, so it weighs only 3.2kg for 17"x17"(Tethered) model, 3.4kg for 460mm x 460mm x 15.5mm (Tethered/Wireless) and 2.95kg for 384mm x 460mm x 15.2mm (Tethered/Wireless) model. Despite of the lightness, its excellent robustness ensures that it can stand up to 150kg for full load weight and 100kg for local load weight. Moreover, it meets military standards that are stricter than the ordinary medical standards regarding durability and precision, and it guarantees safe and convenient transport under conditions of vibration as well.

## 3. Best Productivity from Faster Imaging

### Only 3sec. (Tethered) & 6sec. (Wireless) for Getting Full image

As spending less time for getting examination results, hospitals can diagnose more patients within the same time frame, which is directly related to sales. So, it is important for hospital to have a fast-processing Digital X-ray Detector to enhance productivity and efficiency.

The LG Digital X-ray Detector takes only 3 seconds for tethered version or 6 seconds for wireless one to produces the final image, reducing the time to serve patients as well as saving costs.

## Key Feature #1

# Exceptional Image Quality

## Ensure Diagnostic Accuracy without Image Distortion

Digital X-ray Detector is a device to convert X-ray energy passing through the human body to digital imaging on a monitor. a-Si TFT play a huge role in displaying accurate images from this process. They accumulate and store the energy of the electrons and convert it to a digital image.





## Key Feature #2

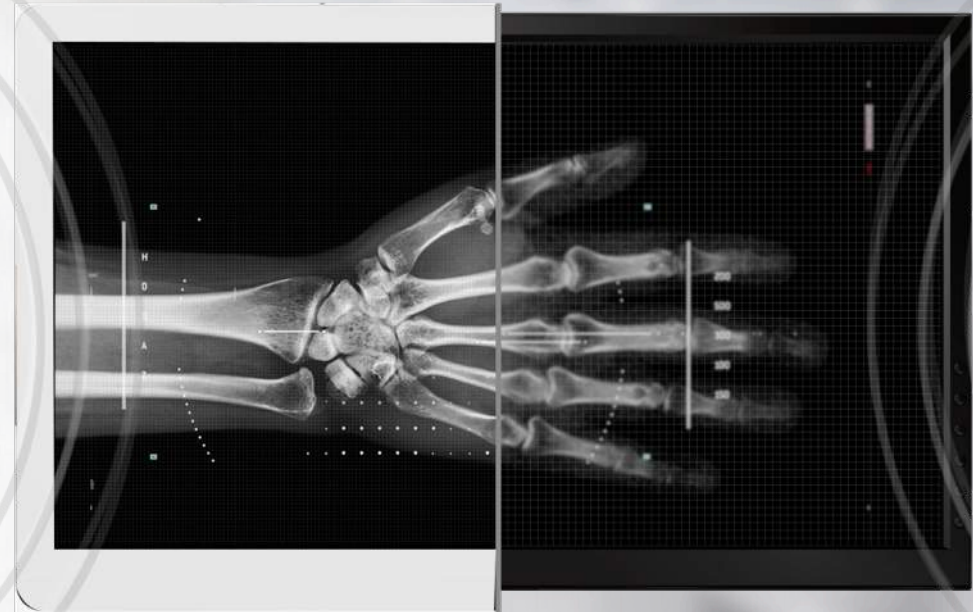
# 16 bit Image Processing

### Superior Image Quality for Diagnostic Accuracy

The detector configuration makes positioning a challenge for non-standard imaging protocols.

By featuring the 16bit image processing, LG Digital X-ray Detector achieves instant and clear displays of even thick and thin areas, including the overlapping areas or contours.

All the details are right before users with the richer and wider range that enables accurate, detailed, and natural-looking images. Also, with smoother transition in gradients, the more shades in between that let doctors work with images in more detail.



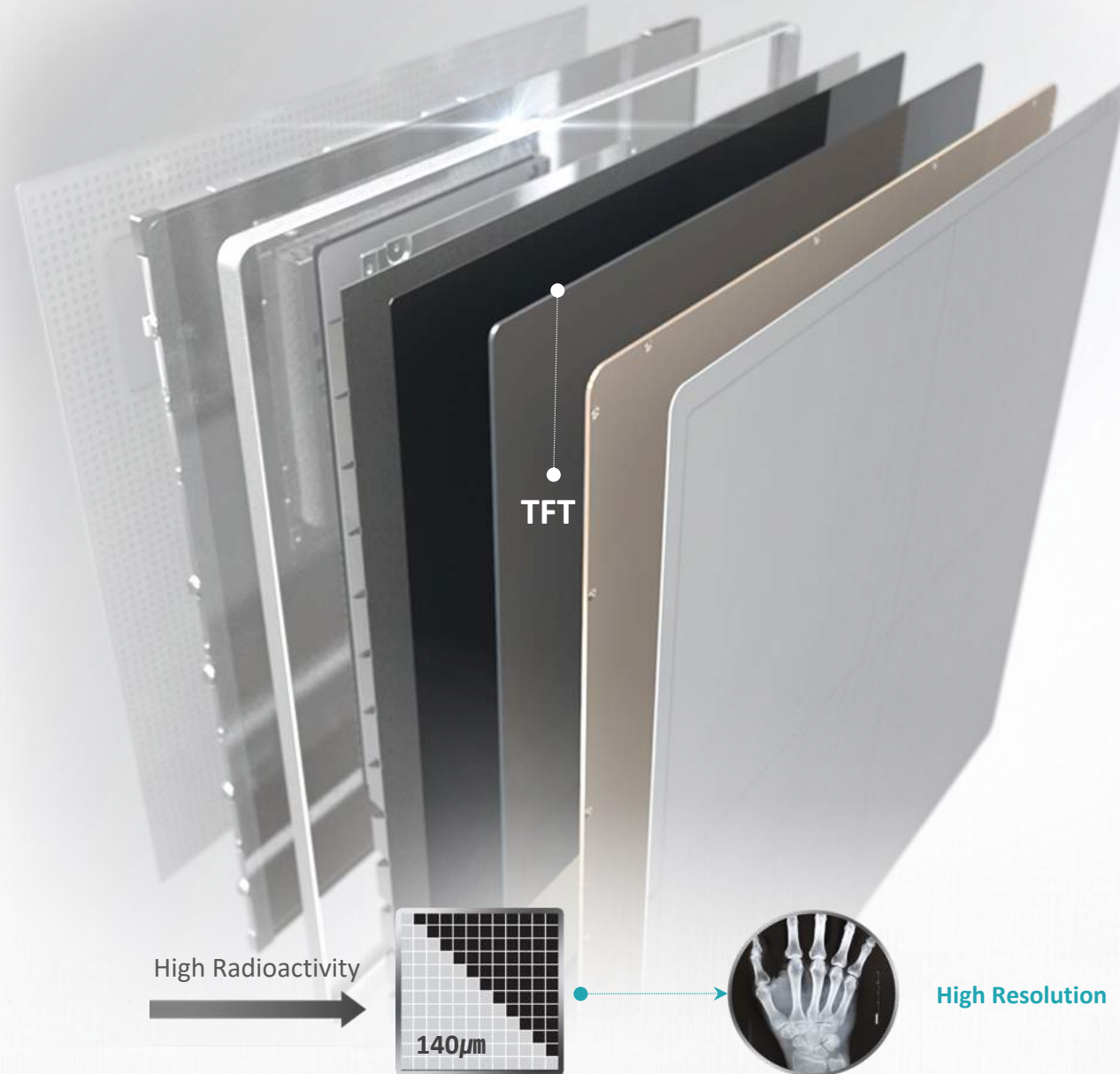
### Key Feature #3

# A 140 $\mu$ m Pixel Pitch for High Resolution

## Superior Image Quality for Diagnostic Accuracy

Pixel pitch refers to an area of a pixel. Lower pixel pitch means higher resolution images but it also leads to increased exposure to radiation.

Thus, LG Digital X-ray Detector supplies the highest 140 $\mu$ m pixel pitch among competitors for high resolution images.



Key Feature #4

# IP41: Water Resistance & Dustproof

## Protection from Liquid Sprays and Dust in All Direction

IP41 rating ensures that the device will be protected from vertical contact with liquids from any direction and fine dust of 1mm or bigger. It means LG Digital X-ray Detector is protected from any unexpected contact with substances such as blood, bodily fluids and powdered medication.



### First Digit : Solids

The first digit indicates the level of protection that the enclosure provides against access to hazardous parts (e.g. electrical conductors, moving parts) and the ingress of solid foreign objects.

Level	Object Size Protected Against	Effective Against
0	-	No protection against contact and ingress of objects.
1	>50mm	Any large surface of the body, such as the back of the hand, but no protection against deliberate contact with a body part.
2	>12.5mm	Fingers or similar objects.
3	>2.5mm	Tools thick wires etc.
4	>1mm	Most wire, screws, etc.
5	Dust Protected	Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment; complete protection against contact.
6	Dust Tight	No ingress of dust; complete protection against contact.

IP\* 41

### Second Digit : Liquids

Protection of the equipment inside the enclosure against harmful ingress of water.



Level	Protected Against	Effective Against
0	Not protected	-
1	Dripping water	Dripping water (vertically falling drops) shall have no harmful effect.
2	Dripping water when tilted up to 15°	Vertically dripping water shall have no harmful effect when the enclosure is tilted at an angle up to 15° from its normal position.
3	Spraying water	Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect.
4	Splashing water	Water splashing against the enclosure from any direction shall have no harmful effect.
5	Water jets	Water projected by a nozzle (6.3mm) against enclosure from any direction shall have no harmful effects.
6	Powerful water jets	Water projected in powerful jets (12.5mm nozzle) against the enclosure from any direction shall have no harmful effects.
7	Immersion up to 1 m	Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time (up to 1 m of submersion).
8	Immersion beyond 1 m	The equipment is suitable for continuous immersion in water under conditions which shall be specified by the manufacturer. Normally, this will mean that the equipment is hermetically sealed. However, with certain types of equipment, it can mean that water can enter but only in such a manner that it produces no harmful effects.

\*IP: Ingress protection



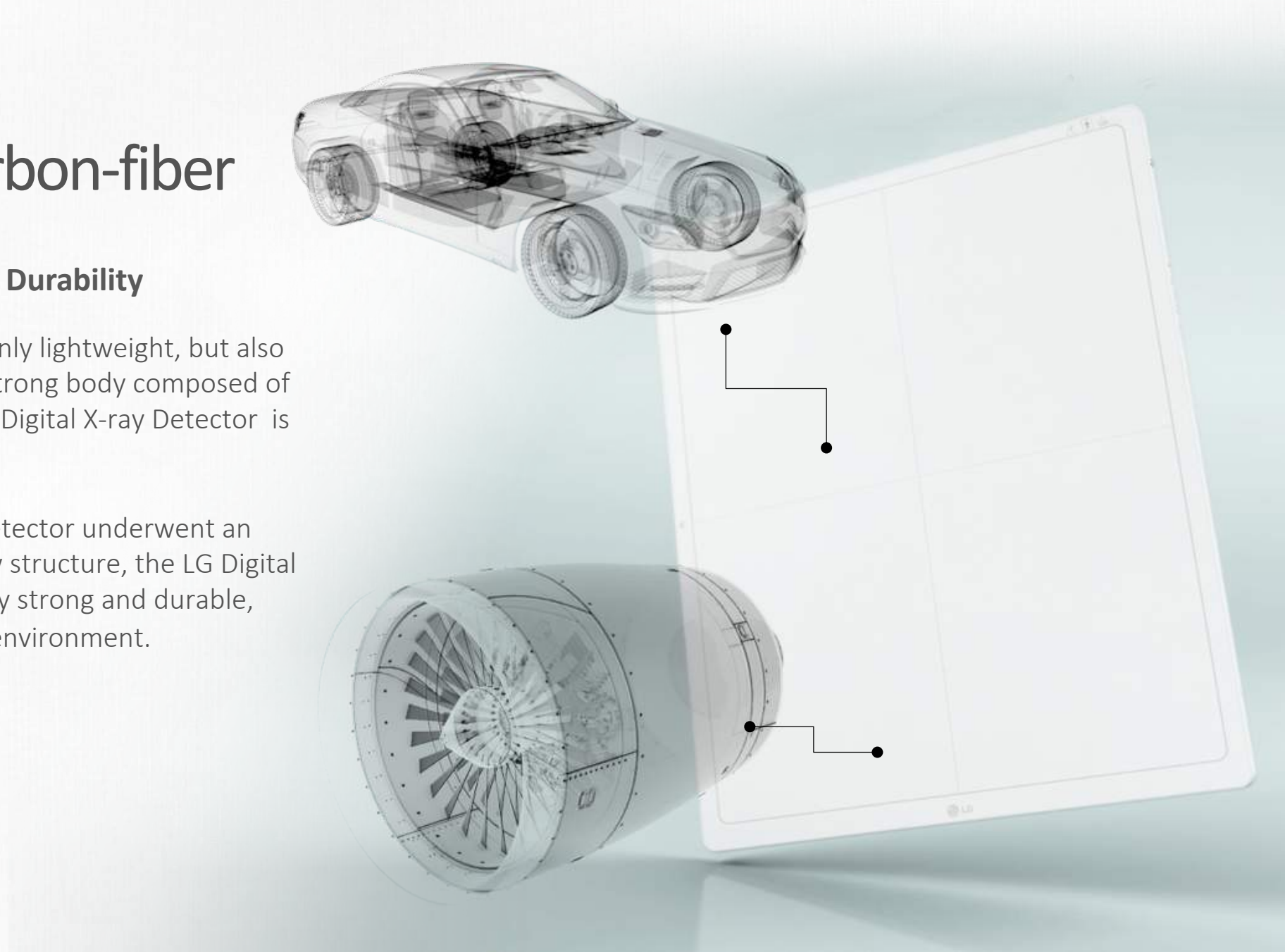
## Key Feature #5

# Magnesium & Carbon-fiber

### Light yet Strong for Outstanding Durability

The LG Digital X-ray Detector is not only lightweight, but also exceptionally strong. With a super-strong body composed of carbon fiber, the durability of the LG Digital X-ray Detector is increased.

To certify this, the LG Digital X-ray Detector underwent an internal durability test. With this new structure, the LG Digital X-ray Detector is lighter yet extremely strong and durable, the ideal combination for a medical environment.



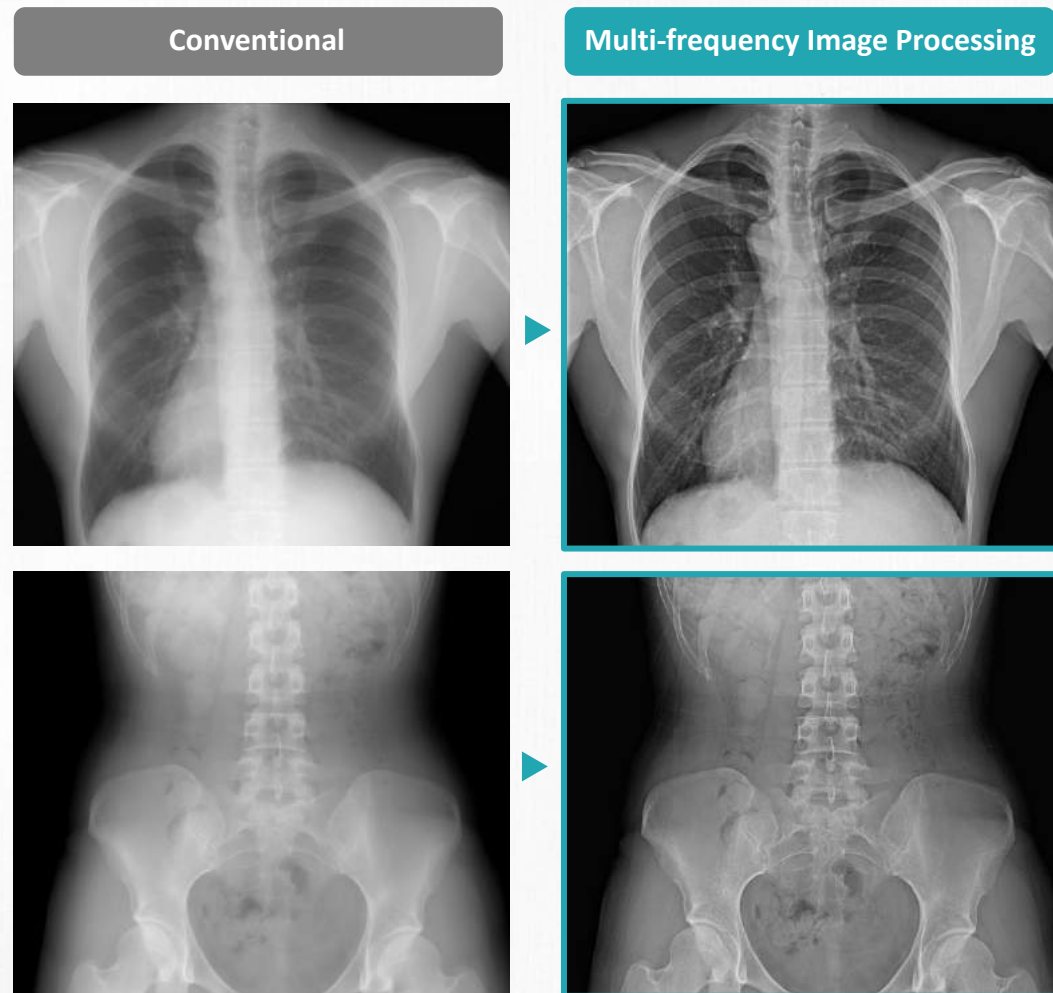
## Key Feature #6

# Acquisition Workstation Software (AWS)

## The most appropriate AWS for LG Digital X-ray Detector

Multi-frequency image processing embedded in Acquisition Workstation Software provides well-balanced visualization at each frequency level. Its contrast enhancement processing functions such as detail contrast, sharpen and de-noise improve tissue visibility within an image.

Also, its user-friendly interface helps to enhance work efficiency. With this software, you can create your own presets consisting of series of markers, annotations and other tools.



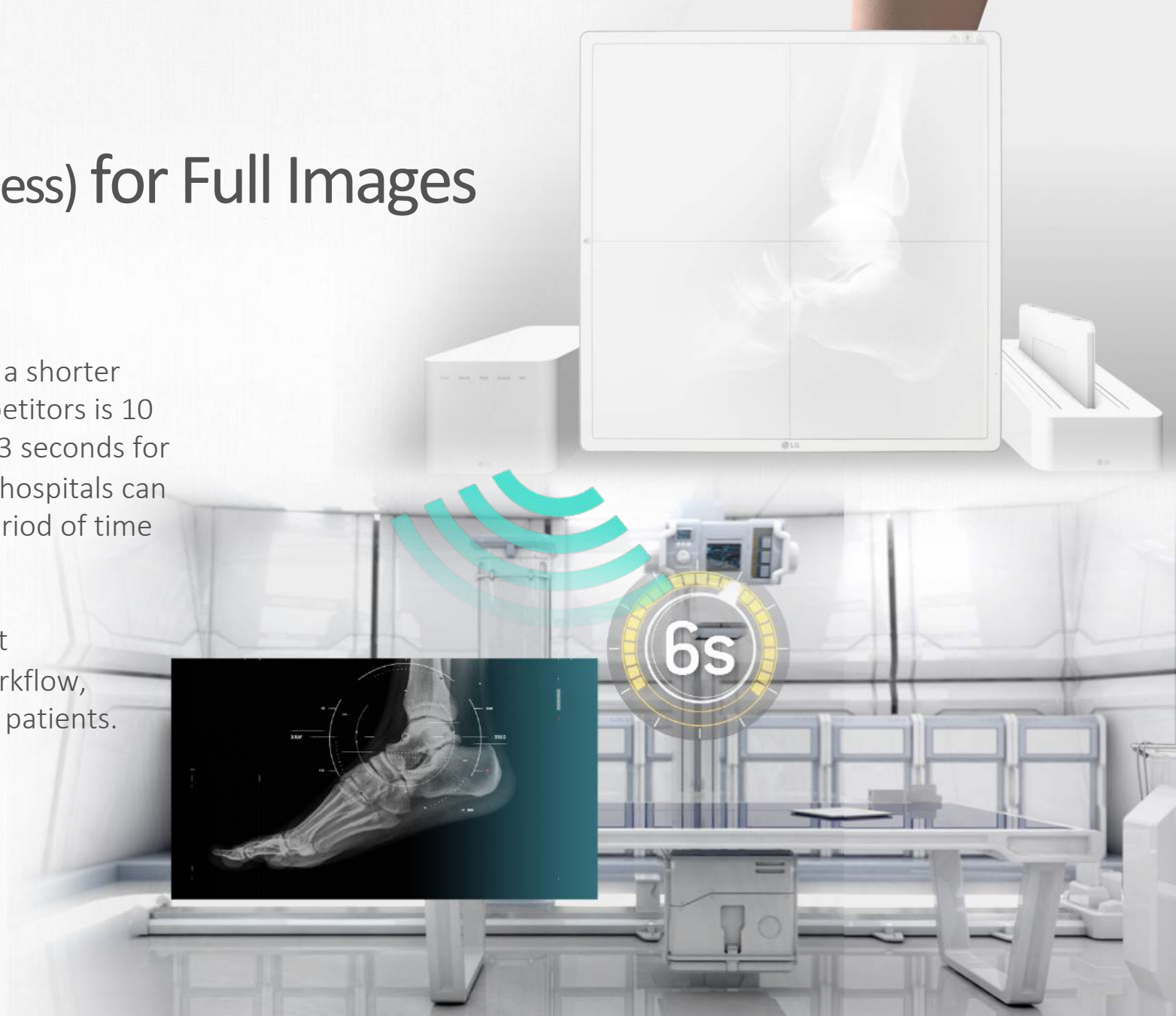
## Key Feature #7

# 3sec.(Tethered) & 6sec.(Wireless) for Full Images

## Make More Efficient Workflow

LG Digital X-ray Detector increases productivity with a shorter preview time. Average waiting time offered by competitors is 10 seconds but LG Digital X-ray Detector requires only 3 seconds for tethered version and 6 seconds for wireless one. So hospitals can serve a greater number of patients within a given period of time and expect increasing productivity.

6 seconds may not mean something to single patient but reduced time leads to increased efficiency in workflow, thus resulting in reduced waiting time for a series of patients.





Digital X-ray Detector

# Specification Comparison

Manufacturer & Product		LG			Varian	Vieworks
		17HK700G-W (Wired)	17HK701G-W (Wired/Wireless)	14HK701G-W (Wired/Wireless)	Paxscan 4343R	VIVIX 1717VA
Sensor	Scintillator	CsI	CsI	CsI	CsI	CsI
	Pixel Pitch / Pixel Matrix	140μm / 3072x3072	140μm / 3072x3072	140μm / 2500x3052	139μm / 3072x3072	140μm / 3072X3072
	AED (Auto Exposure Detection)	Yes	Yes	Yes	No	Yes
Imaging Performance	Full Image (Raw image) display	3 seconds	3 seconds (Tethered), 6 seconds (Wireless)	3 seconds (Tethered), 6 seconds (Wireless)	5 seconds	2 seconds
	AD conversion / Output	16bit	16bit	16bit	16bit	16bit
	DQE @ 0lp/mm	72%	72%	72%	70% ± 5%	Unknown *Previous model : 60% (0.5lp/mm)
Interface	Communication	Tethered	Tethered / Wireless	Tethered / Wireless	Tethered	Tethered
Battery	Bundle battery	-	-	Yes (2EA)	-	-
	Charger	-	Yes	Yes	-	-
	Battery Charging Time	-	-	3 hours	-	-
Mechanical characteristics	Product Weight	3.2kg	3.4kg	2.95kg	7.5kg	4.5kg
	Maximum Load Weight	150kg	150kg	150kg	150kg	150kg
	Waterproof	IP41	IP41	IP41	IP41	IPX0

# Appendix

For your information

# Moments-of-Truth (MoT) at Hospitals

“Moment of Truth” is the moment when users interact with a brand, product or services to form or change an impression about that particular brand, product or service.

In hospitals, there are many different moments of truth as below and LG Medical Display tries to offer the best solutions and meets the needs on each step at the hospitals.



Reception Desk

Consulting Room

X-ray / MRI / CT

Operating Room

ICU\* / Hospital Room

\* Diagnostic monitor can be required at this stage.

\* ICU : Intensive Care Unit



Clinical Review Monitor/Diagnostic Monitor/Digital X-ray Detector

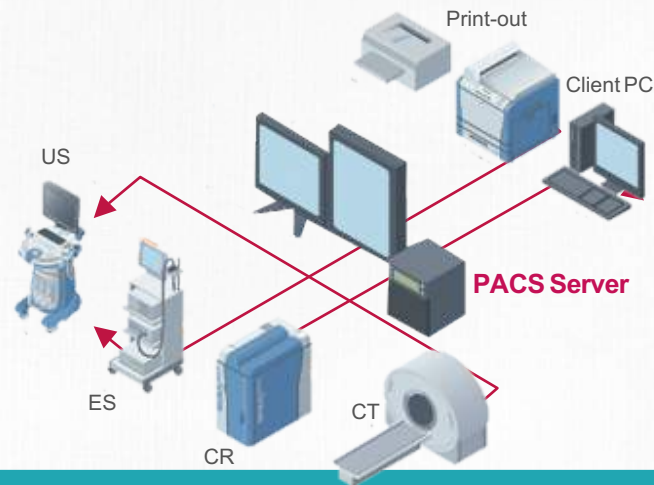
Surgical Monitor /  
Clinical Review Monitor

Clinical Review Monitor



For your information

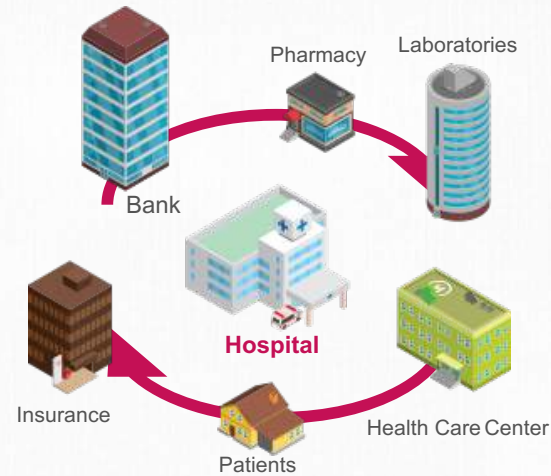
# Types of Medical System (1)



**PACS**

## Picture Archiving Communication System

A Picture Archiving and Communication System (PACS) is a medical imaging technology that provides economical storage and convenient access to images from multiple modalities.



**HIS**

## Hospital Information System

A hospital information system (HIS) is an element of health informatics that focuses mainly on the administrative needs of hospitals.



**RIS**

## Radiology Information System

The major functions of the RIS can include patient scheduling, resource management, examination performance tracking, examination interpretation, results distribution, and procedure billing.

For your information

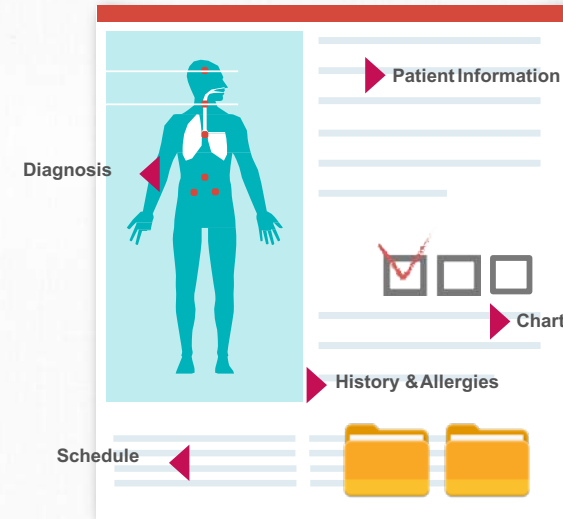
## Types of Medical System (2)



### OCS

#### Order Communication System

OCS is a system that is designed to eliminate the inconvenience that a patient's prescription should be handled by the patient and transfer it to each medical support department, to improve patient care services such as prevention of loss of prescription, Automatic delivery system.



### EMR

#### Electronic Medical Record

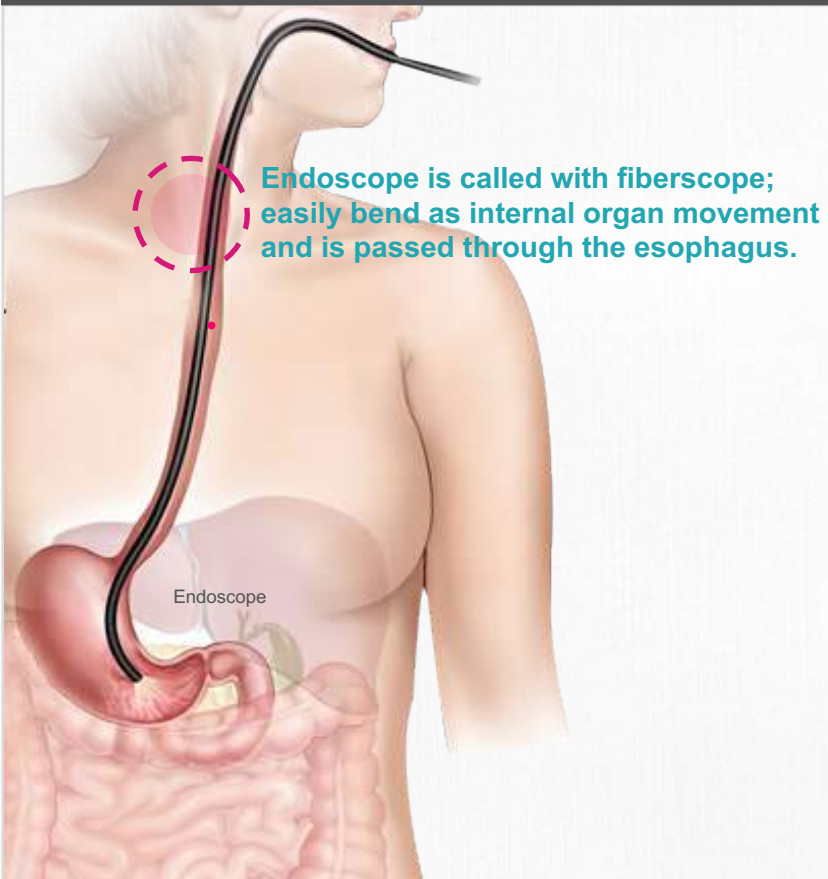
An Electronic Health Record (EHR), or Electronic Medical Record (EMR), refers to the systematic collection of patient and population health information electronically stored in a digital format.

For your information

# Medical Definition of Endoscopy & Laparoscopy

Endoscopy is normally only for examine without incision, while laparoscopy is a surgical method with small incision.

Endoscopy



Laparoscopy

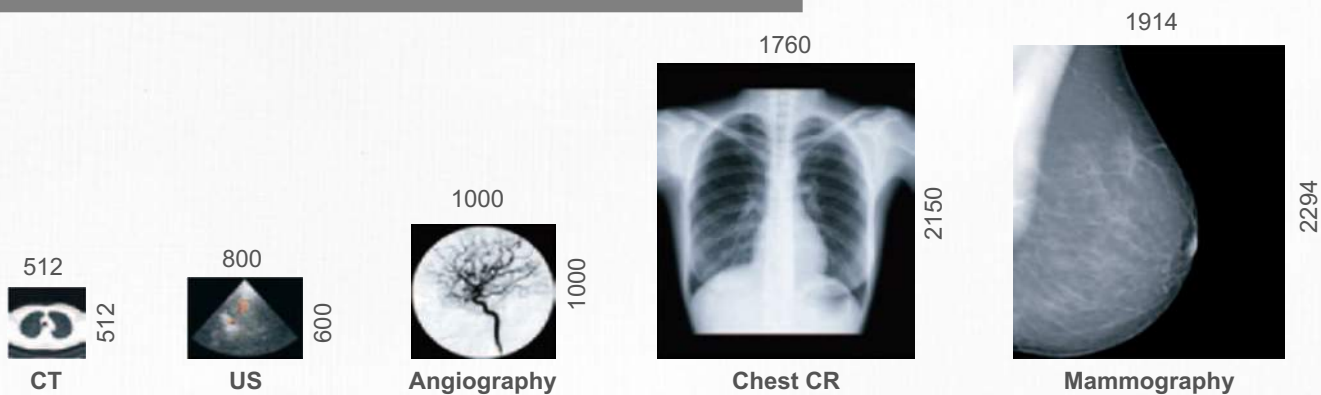




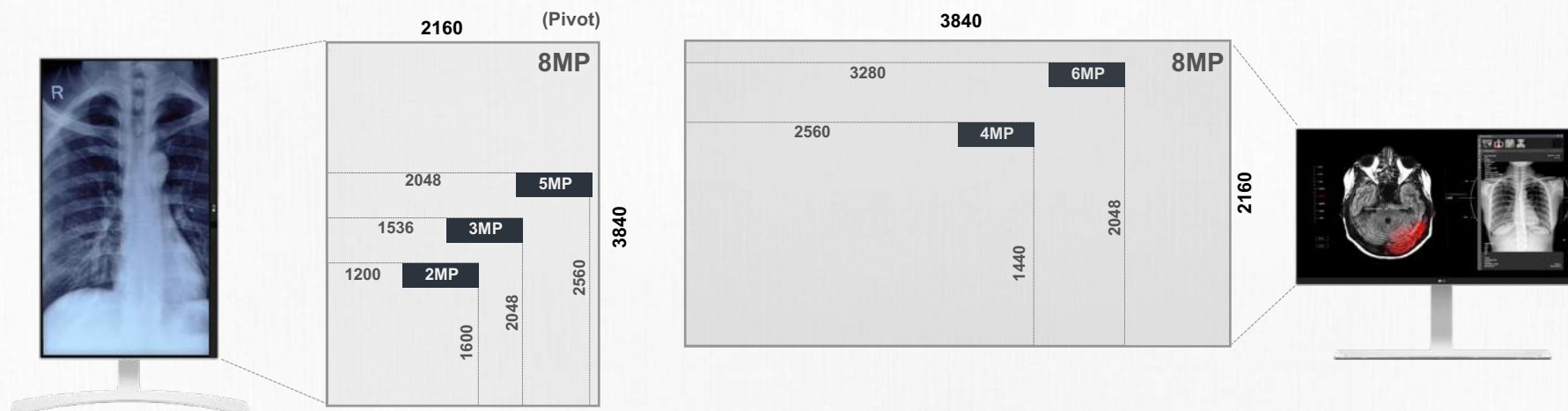
For your information

# Monitor Resolution of Medical Images

## Original Resolution of Medical Images



## Monitor Resolution



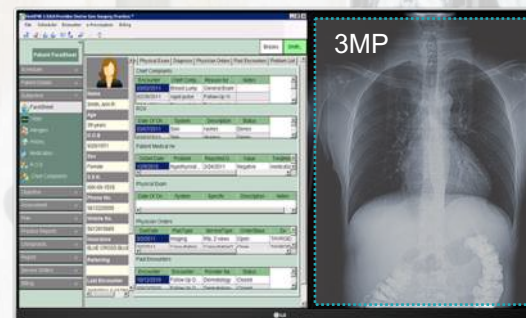
## For your information 27" 4K Display

### Enhance Efficiency of Clinical Review

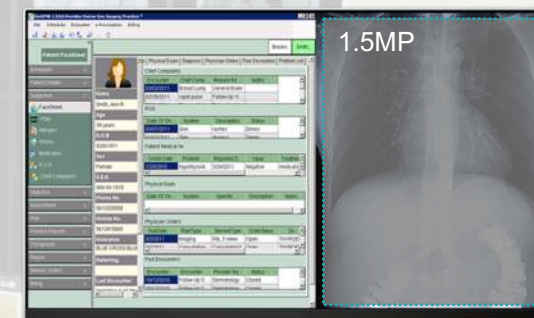
The LG monitor adopts a 8MP panel to achieve an image with four times the resolution of FHD to improve the work efficiency not only enabling detailed observation of previously hard-to-see region but also displaying multiple imaging applications.

As the LG clinical review monitor is based on 8MP, clinical review system and PACS images can be viewed simultaneously by large display with high resolution with distortion.

LG 27" 8MP Clinical Review Monitor



27" 4MP Clinical Review Monitor

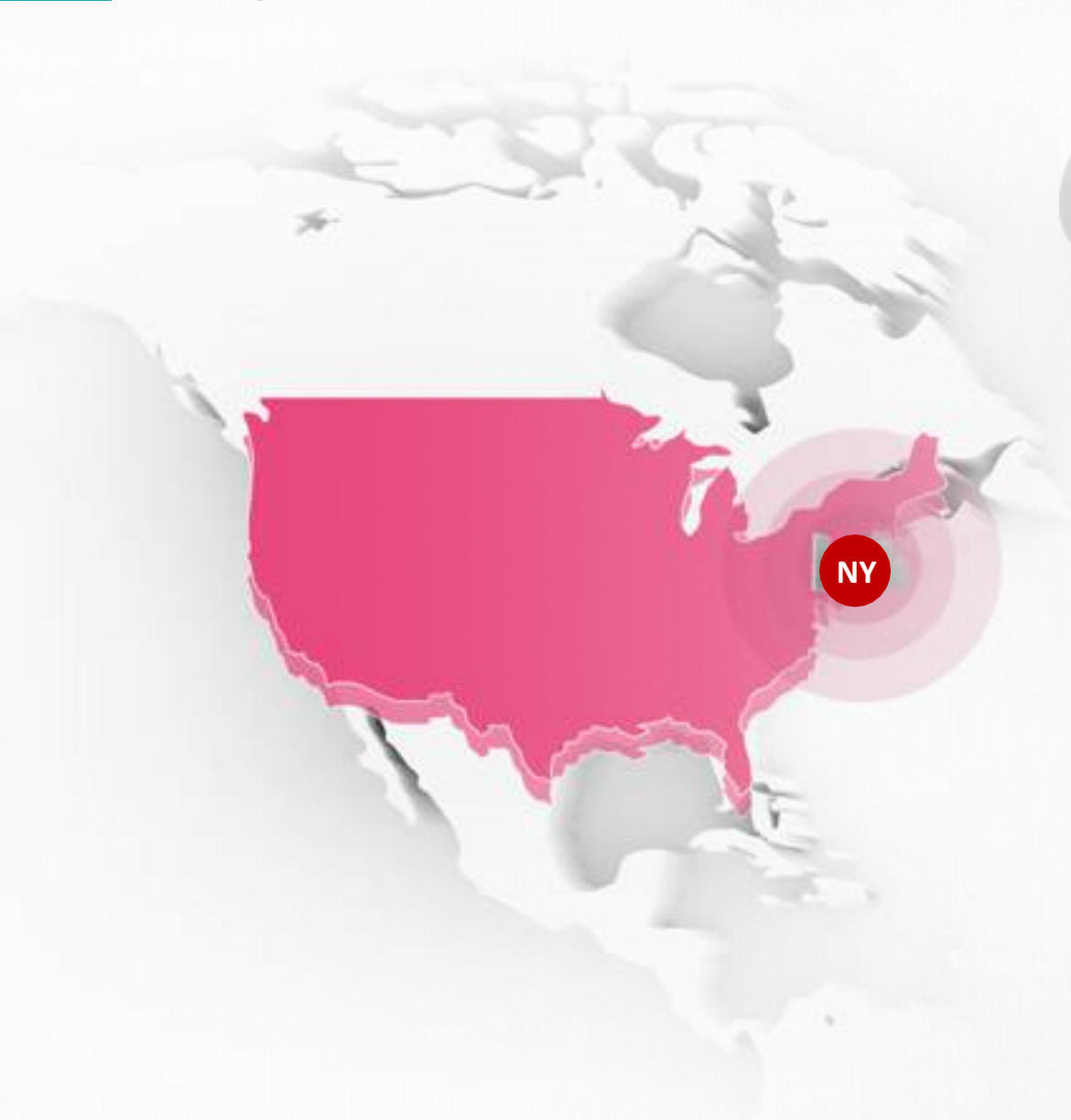


### Medical Image Flow



For your information

# Regulation Trend of Medical Devices : USA



“

So, one thing that you can look at right now it's just New York, although what happens in New York, New Jersey follows. And, then, maybe, just maybe Connecticut.

”

- IDI 5 / Eizo

2015, State of NY, Clinical review monitors have to meet the same product specification as diagnostic monitors.

With such a new trend of adopting clinical review monitor, surrounding states such as NJ and CT and other Northeast states are expected to apply the same regulation.



For your information

# Regulation Trend of Medical Devices : GERMANY



“By 2025, all practices can use existing medical monitors that do not follow DIN standard, but for new purchase, They have to equip monitors with ones that observe **DIN standard**.”

- IDI 9 Medical Monitor Distributor

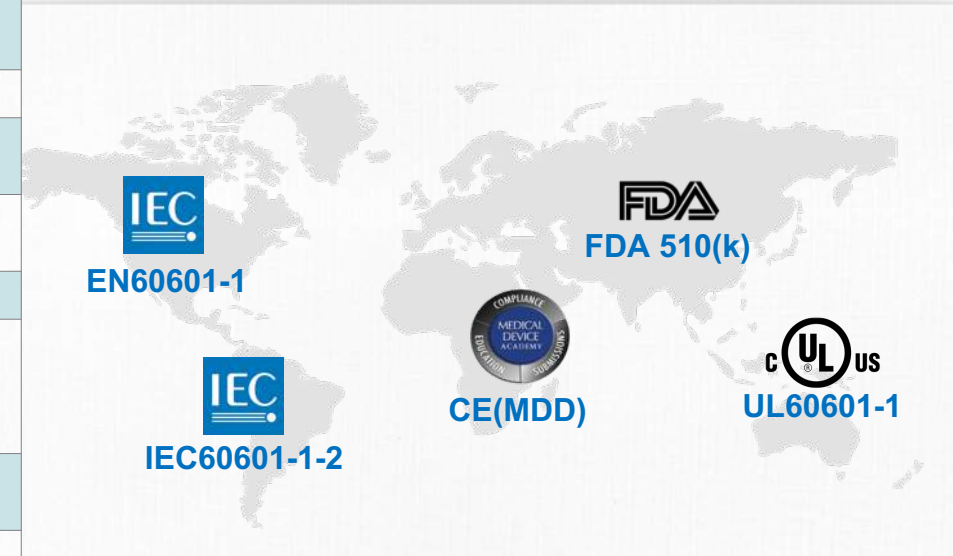
The new DIN 6868-157 standard requires use of the correct medical display for the appropriate purpose, such as review, and it will be regulated by the Medical Product Law(MPG).

It should be mandatorily applied from May 2015 as a replacement of the previous standard DIN 6868-57.

For your information

# Medical Grade Certification

Continent & Nation		NA		Korea	EU	SEA
		US	Canada	Korea	EU	Australia
Certification	Medical Certification	Mandatory	Mandatory	TBD	Mandatory	Mandatory
	FDA (US)	FDA Class1	-	-	-	-
		FDA Class2 (TBD)	-	-	-	-
	MFDS (Korea)	-	-	Item Approval (1 <sup>st</sup> Grade)	-	-
	CE MDD (EU)	-	-	-	-	-
	CE (EU)	-	-	-	CE MDD Class1 CE MDD Class 2	-
	CMDR (Canada)	-	Class1 (TBD)	-	EN60601-1 / EN60601-1-2	-
	TGA (Australia)	-	-	-	-	Class1 (TBD)
	RCM (Australia)	-	-	-	-	Class1 (TBD)



For your information

# PBP/PIP Matrix

8MP Clinical Review Monitor (27HJ712C) & 4K Surgical Monitor (27HJ710S)

27HJ710S					
PBP Map		Sub Display			
		SDI	DVI	HDMI	DisplayPort
Main Display	SDI	-	Yes	Yes	Yes
	DVI	Yes	-	Yes	Yes
	HDMI	Yes	Yes	-	Yes
	DisplayPort	Yes	Yes	Yes	-

27HJ712C				
PIP/PBP Map		Sub Display		
		HDMI 1	HDMI 2	DisplayPort
Main Display	HDMI 1	-	No	Yes
	HDMI 2	No	-	Yes
	DisplayPort	Yes	Yes	-



For your information

# Recommended Hardware Options for Medical Monitors

## Graphic Card Requirement

Win OS	27HJ712C 27HJ710S	Graphic Card		Interface	
	Resolution (3840x2160)	Intel	HD4600 or higher	DisplayPort	HDMI
		AMD	HD7000 or higher R7 or higher	3840x2160 @ 60Hz	3840x2160 @ 60Hz
		NVIDIA	FirePro W600 or higher		
			GeForce GT640 or higher Quadro K500 or higher	3840x2160 @ 60Hz	3840x2160 @ 30Hz
			GeForce GTX950 or higher	3840x2160 @ 60Hz	3840x2160 @ 60Hz
	21HK512D	Graphic Card		interface	
	Resolution (2048x1536)			DisplayPort	HDMI
		NVDIA	Quadro K2000 / Quadro K2200 Quadro M4000 / Quadro P1000		
		AMD	FirePro W4100 / FirePro W9000		

- ❖ CAUTION : If UHD resolution is not listed as an option on a supported graphic card, please updated to the latest graphic card driver from the manufacturer.  
(NVIDIA : [www.nvidia.com](http://www.nvidia.com), AMD : [www.amd.com](http://www.amd.com), Intel : [www.intel.com](http://www.intel.com))
- ❖ Performance and results may vary depending on the Intel Graphic Card PC manufacturer.
- ❖ When connecting to a Windows product, please use the HDMI to HDMI cable or DP to DP cable that is included in the package.

Mac OS	27HJ712C 27HJ710S	Product Name	Interface	
			DisplayPort	HDMI
	Resolution (3840x2160)	MacBook Pro (Retina, 13-inch, Early 2015) MacBook Pro (Retina, 15-inch, Mid 2014 and later) Mac Pro (Late 2013) iMac (Retina 4K, 21.5-inch, Late 2015) iMac (Retina 5K, 27-inch, Late 2014 and later) MacBook Air (Early 2015)	3840x2160 @ 60Hz	3840x2160 @ 30Hz (Depending on model)

- ❖ Mac OS 10.10 and later version are supported.
- ❖ When connecting to a Mac product, please use the HDMI to HDMI cable or DP to DP cable that is included in the package.
- ❖ For more information about the latest Mac device supported list, refer to Apple website at ([www.apple.com](http://www.apple.com)).

# Usability Evaluation Report



## Seoul National University Hospital is a world-recognized medical institution

- Established in 1885
- Beds : 1,786 (General 1,604 / Special Care 36 / ICU 106 / NICU 40)
- Employees : 5,989 (Doctor 1,372 / Nurse 1,982 / Others 2,695)
- Surgery and Examination Cases
  - Surgery 40,644 / Radiology 1,682,785 / Radiation Therapy 81,870

## Ranked 1st in the world in number of clinical trials registered (US National Institute of Health's database `13)

- Published 2,500 science citation index-grade research papers per year
- Opened LA office in the USA (2008)
- Opened Sheikh Khalifa Specialty Hospital (SKSH) in UAE, under the operation and management of SNUH



# Usability Evaluation Report

## SNUH UTC MEDICAL DEVICE USABILITY TESTING CENTER



Monitoring Center



Testing Room



Operating Room



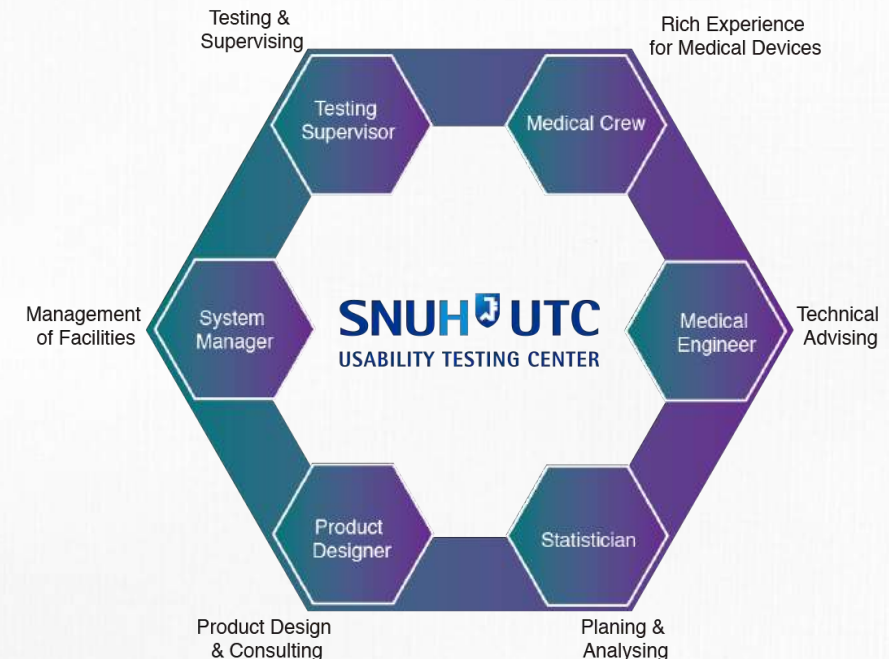
Testing Room A



Testing Room B

## The First Medical Device Usability Test Center in Korea

Usability Testing Center, Medical Device Innovation Center of the Seoul National University Hospital is the first usability testing center in Korea. It has an abundant experience about the usability tests and well equipped with experts of various departments and the environment similar to operating room, wards and intensive care unit. Based on the basic foundation, the center conducts the usability tests with the real users of the medical devices. It has extensive experience in the world's top products, test facilities in various settings and a diverse field of experts who maintain a suitable test environment.



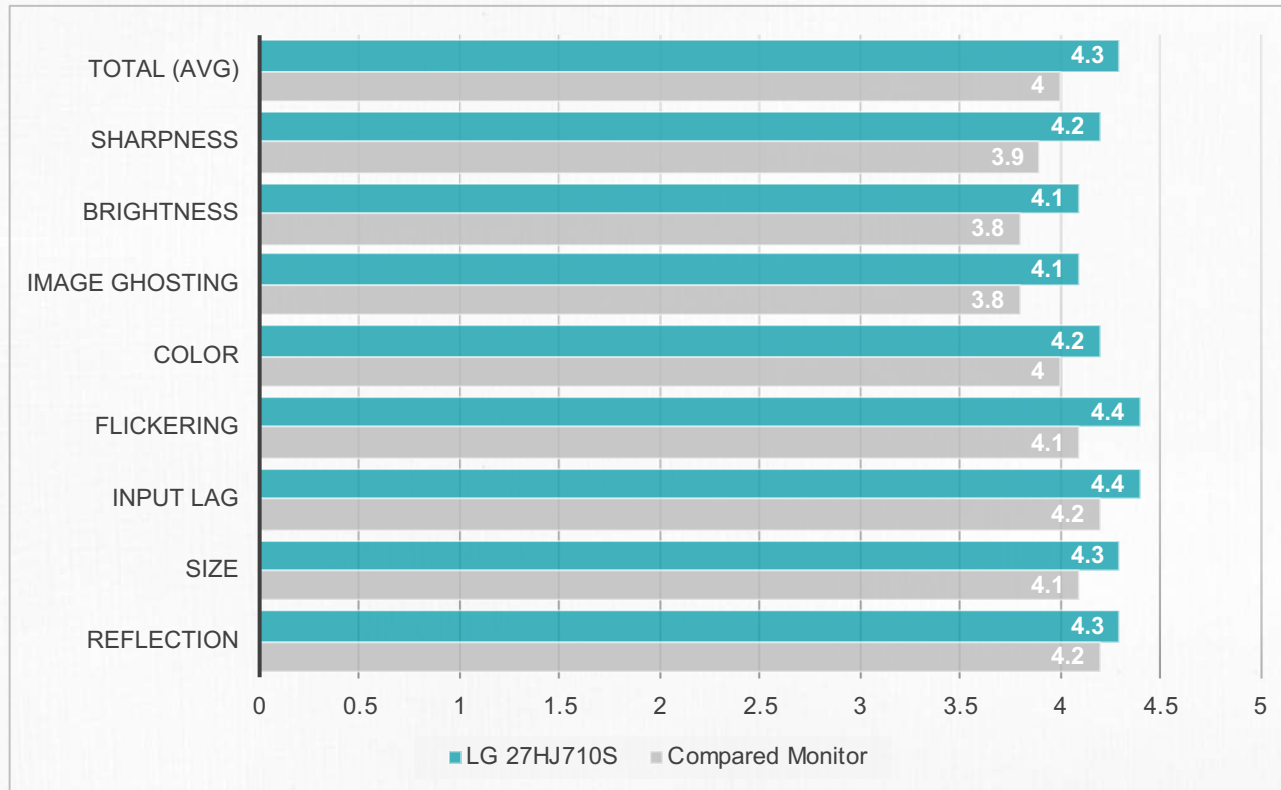


# Usability Evaluation Report

## 4K Surgical Monitor

4K Surgical Monitor : “The precise image in real-time”. Top-specialist scored LG surgical monitor exceeds existing monitor in every ways.  
No latency for perfect hand-eye sync, accurate color expression under any angle, higher Anti-reflection reducing eye fatigue.

### ■ Total Rating



### ■ Reason for evaluation

Sharpness	<ul style="list-style-type: none"><li>• Tissue fiber clearly visible</li><li>• Better sharpness compared to comparative products</li></ul>
Brightness	<ul style="list-style-type: none"><li>• Comfortable to eyes</li></ul>
Image Ghosting	<ul style="list-style-type: none"><li>• No afterimage (Image Ghosting) observed</li></ul>
Color	<ul style="list-style-type: none"><li>• After color setting, same as existing color</li><li>• Overall, good image and color quality</li></ul>
Flickering	<ul style="list-style-type: none"><li>• No blinking observed</li></ul>
Input Lag	<ul style="list-style-type: none"><li>• Bubble generation process during laser ablation is better than conventional model</li></ul>
Reflection	<ul style="list-style-type: none"><li>• There was no reflection against light in operation room</li></ul>

\* This is the average score evaluated by specialists and physician assistants.

\*\* It is a usability report provided by Seoul National University Hospital Medical Device Usability Testing Center.  
Tests are operated by 6 specialists and 14 physician assistants from Seoul National University Hospital.  
LG monitors were evaluated by comparing them to the existing ones during surgery.

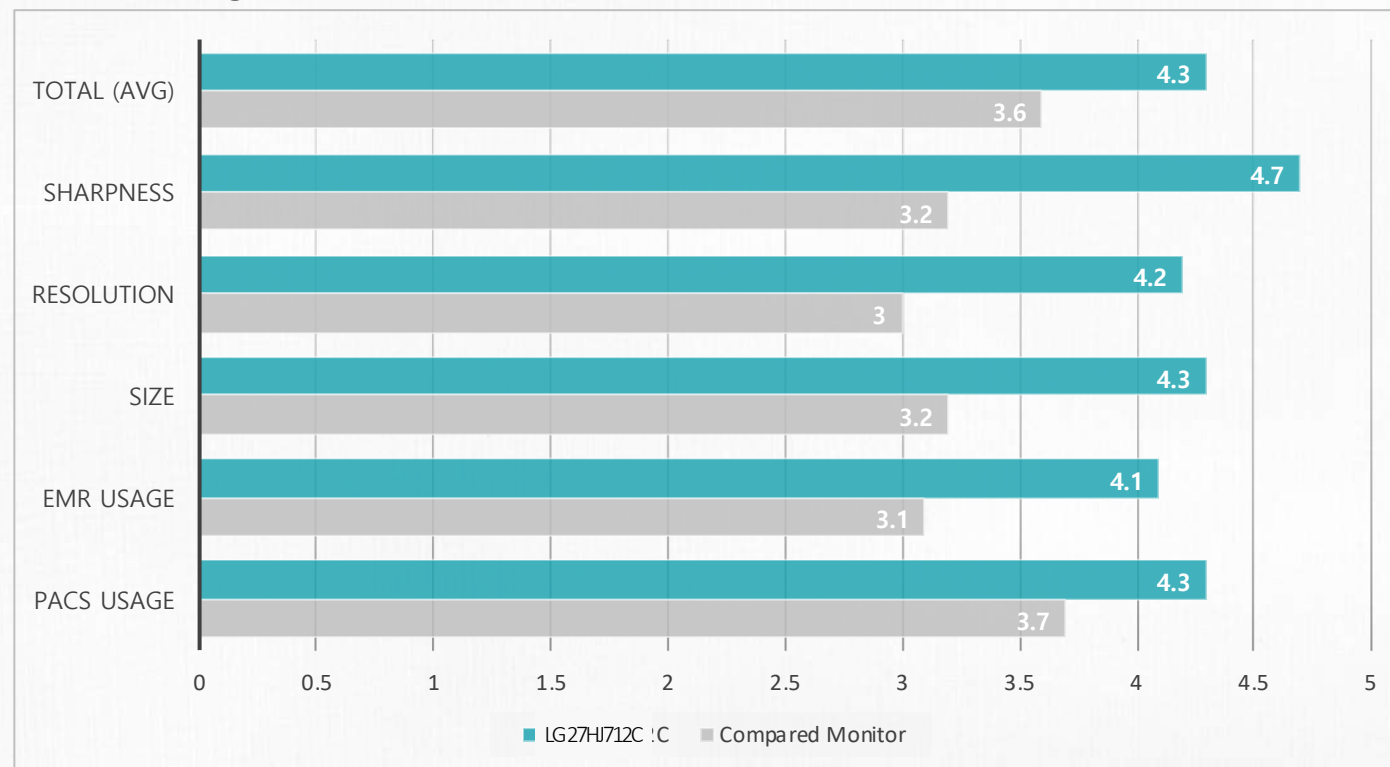
# Usability Evaluation Report

## 8MP Clinical Review Monitor

8MP Clinical Review Monitor :“32% more suitable than existing monitor”, according to Top-specialists.

With accurate image and color expression of LG monitor, clinical doctor can read more productively with less eye-fatigue, crucial for clinical doctor reading EMR and patient data. Accurate color expression and accurate image enables double-check and comparing modality image.

### ■ Total Rating



### ■ Reason for evaluation

<b>Sharpness</b>	• Excellent sharpness
<b>Resolution</b>	• More information can be displayed when using EMR
<b>Size</b>	• More information comes in at a glance with high resolution and wide screen
<b>EMR usage</b>	• Smaller fonts look better than conventional monitors • More information on one screen is good
<b>PACS usage</b>	• More information on one screen is good

\*The score is based on 1-5 scale system.

\*\* It is a usability report provided by Seoul National University Hospital Medical Device Usability Testing Center.

Tests are operated by 6 specialists from Seoul National University Hospital.

LG monitors were evaluated by comparing them to the existing ones during medical consultant.

## Usability Evaluation Report



■ Rating by departments

Full marks : 5	Urology			Obstetrics & Gynecology			Thoracic surgery			Surgery			Colorectal surgery		
	LG 27HJ710S	Compared Monitor	Gap	LG 27HJ710S	Compared Monitor	Gap	LG 27HJ710S	Compared Monitor	Gap	LG 27HJ710S	Compared Monitor	Gap	LG 27HJ710S	Compared Monitor	Gap
Total (Avg)	4.7	4.5	0.2	4.4	3.8	0.6	3.4	3.9	-0.5	4.8	4.6	0.2	3.9	3.4	0.5
Color	4.3	4.3	0.0	4.5	3.8	0.7	3.3	3.9	-0.6	4.9	4.6	0.3	3.6	3.7	-0.1
Sharpness	4.6	4.3	0.3	4.5	3.8	0.7	3.3	4.0	-0.7	4.9	4.7	0.2	3.9	3.2	0.7
Brightness	4.4	4.3	0.1	4.7	3.3	1.4	2.8	3.9	-1.1	4.9	4.6	0.3	3.8	3.2	0.6
Image Ghosting	4.8	4.4	0.4	4.3	3.5	0.8	3.6	3.9	-0.3	5.0	4.7	0.3	3.5	3.0	0.5
Flickering	4.9	4.5	0.4	4.7	3.9	0.8	4.0	4.0	0.0	4.9	4.7	0.2	3.9	3.4	0.5
Input Lag	4.8	4.6	0.2	4.3	4.2	0.1	3.9	3.9	0.0	4.9	4.7	0.2	4.2	3.8	0.4
Reflection	4.8	4.6	0.2	4.3	4.2	0.1	3.1	3.9	-0.8	5.0	4.6	0.4	4.0	3.5	0.5
Size	4.8	4.7	0.1	4.0	3.9	0.1	3.4	3.8	-0.4	4.3	4.3	0.0	4.0	3.5	0.5



# Test Environment – 4K Surgical Monitor

## Usability Evaluation Report

**CONFIDENTIAL**

**SNUH UTC** MEDICAL DEVICE USABILITY TESTING CENTER

		LG Monitor	Tester 1	Tester 2		Tester 3	Tester 4	Tester 5	Tester 6
			Urology	Urology		Obstetrics & Gynecology	Thoracic surgery	Surgery	Colorectal surgery
Operation Equipment	Manufacturer	-	Karl Storz	Karl Storz	Stryker	Stryker	Stryker	Karl Storz	Stryker
	Type	-	Cystoscope	Laparoscopy	Laparoscopy	Endoscopy	Pleuroscopy	Laparoscopy	Laparoscopy
	Model	-		Image1	1288HD	1288HD	1288HD		1288HD
	Resolution	-	1920x1080	1920x1080	1920x1080	1920x1080	1920x1080	4096x2160	1920x1080
Monitor	Manufacturer	LG	NDS	Panasonic	Stryker	Stryker	Stryker	Sony	Stryker
	Model	▲ 27HJ710S	RADIANCE G2 HB (SC-WU26-A1511)	EJ -MLA26EK1	Vision Elect HDTV 26" (Advan OEM)	Vision Elect HDTV 26" (Advan OEM)	Vision Elect HDTV 26" (Advan OEM)	LMD-X310S	Vision Elect HDTV 26" (Advan OEM)
	Size	▲ 27"	26"	26"	26"	26"	26"	31"	26"
	Resolution	▲ 3840x2160	1920x1080	1920x1080	1920x1080	1920x1080	1920x1080	4096x2160	1920x1080

- ❖ 27HJ710S Test Times : 30 times (5 tests per a doctor)
- ❖ Participated Doctors : 6 persons (Urology 2, Obstetrics & Gynecology 1, Thoracic surgery 1, Surgery 1, Colorectal surgery 1)
- ❖ Participated Assistant : 14 persons (Urology 3, Obstetrics & Gynecology 3, Thoracic surgery 1, Surgery 1, Colorectal surgery 6)

[↗ Back to Clinical Review Monitor](#)

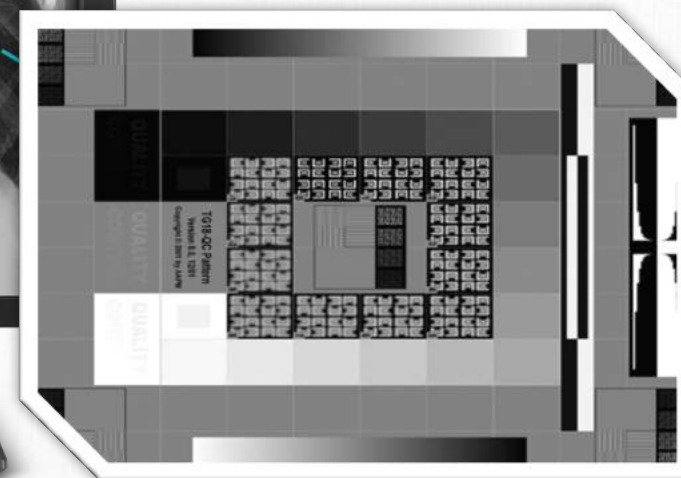
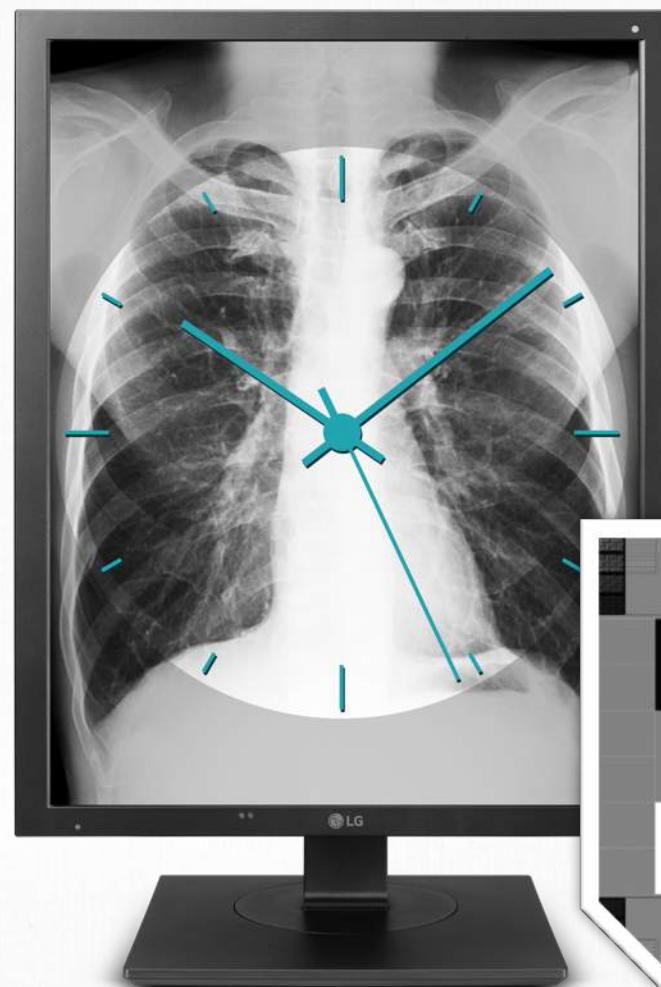
[↗ Back to Surgical Monitor](#)

For your information

# Front Sensor

## Contingent Image Quality

Built-in stabilization and patented front-of-screen sensors guarantee consistency and accuracy of medical images. It automatically keeps the medical images contingent and consistent to help exact diagnoses when you turn on the monitor as leaving the office.



# End of Sales Kit

8MP/1.3MP Clinical Review Monitor | 8MP/3MP Diagnostic Monitor | 4K/FHD Surgical Monitor | Digital X-ray Detector(DXD)