EIZO

Digital Mammography Monitors

RadiForce® GS510

5MP

radiforce.com

Film Imaging to Digital Imaging for Mammography Diagnosis

As the incidence of breast cancer rises,
regular mammograms are recommended for early detection.

It is vital in the process of early breast cancer detection
to find subtle masses and calcifications.
Film imaging for mammography diagnosis has long been the primary methodology.

However, to meet the demand for a higher quality of images and
reduction of reading time and cost, digitizing and networking of medical images
in a filmless environment is spreading rapidly.

The transition from film to filmless mammography naturally requires
a monitor to display extremely precise images equal to or better than film mammography.

In the mammography field today
high-performance monitors featuring high resolutions and displaying high density images
contribute to the process of early breast cancer detection.

Digital Mammography Requires a High-Performance Monitor

Selecting the optimum digital mammography monitor:

Requirement 1

High-Resolution

High resolutions are required to display the correct "information volume" of a digital mammography image.

Requirement 2

High-Definition & High-Density

For the detection of mammary gland disorders which appear as "distortion," the monitor needs this required performance in order to display the subtle structures.

Requirement 3

Multi-Grayscale

For the detection of small tumors which appear as delicate "density" differences, the monitor needs the correct display of extremely subtle grayscale shadings.

Requirement 4

Brightness Uniformity

For correct luminance display of delicate "density" differences, the monitor needs uniformity in brightness across the entire screen.

Requirement 5

Image Sharpness

For detection of subtle masses and calcifications, the monitor needs to display the outlines of the images with a high degree of sharpness.

Requirement 6

DICOM Part14 Compliance with Quality Control Software

For unified image display between multiple monitors, the monitor is required to adjust the characteristics to the grayscale standard DICOM Part14 GSDF through calibration.

Requirement 7

Simple Quality Control Procedures

Quality characteristics gradually change over time and therefore in order to maintain a consistent display, the monitor needs to be quality-controllable.

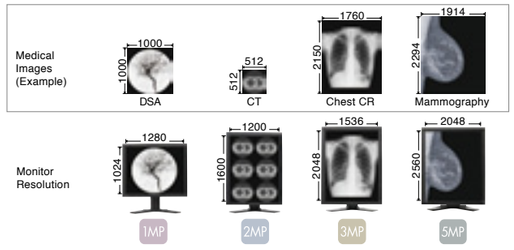
5MP RadiForce® GS510

54 cm 21.3" Monochrome LCD Monitor

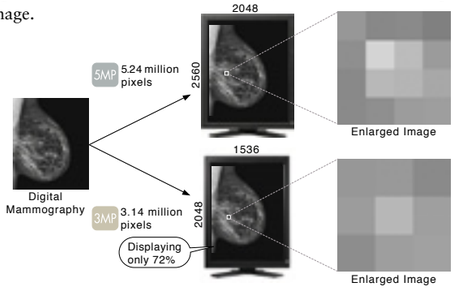
Featuring high-resolution, high-definition and multi-grayscale, the RadiForce GS510 is designed specifically for digital mammography with a choice of distinctive glare panel to meet diversified environment usage.

High-Resolution for Delicate Grayscale Shadings

When selecting a monitor, it's important to consider the "information volume" of the medical images to be displayed.

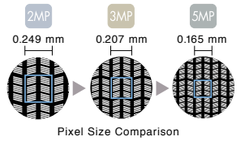


Requirement 1 "Information volume" of a digital mammography image should exceed 5 million pixels. When a lower resolution monitor displays this "information volume," the monitor stretches the information forcing the mosaic to appear as shadings. With a 2048 x 2560 resolution or 5.24 million pixels, the stretching effect is minimized and the mosaic becomes suitable for rendering subtle masses and calcifications, within the mammography image.



High-Definition and High-Density with Minute Pixels

Requirement 2 0.165mm pixel size is the smallest pixel size among current medical monitors providing high-definition and high-density display without shadings appearing granular.

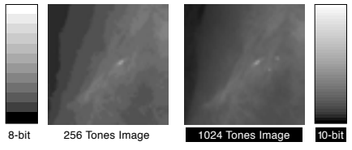


EIZO research as of June, 2006.

10-Bit Simultaneous Grayscale for Subtle Shadings

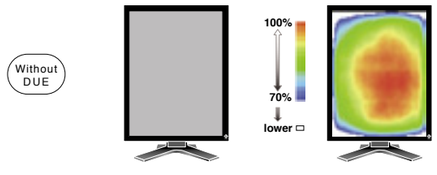
Requirement 3 A 13-bit look-up table produces a palette of 8,161 grayscale tones from which 1,024 (10-bit) tones can be displayed simultaneously, ensuring highly refined rendering of even extremely subtle grayscale shadings.

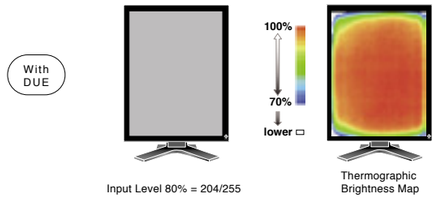
10-bit graphics board and 10-bit viewer software needed for 10-bit display.



DUE for Brightness Uniformity

Requirement 4 To sustain image consistency, brightness uniformity is required for medical imaging monitors. However, unified luminance of the backlight is difficult to attain due to the characteristics of LCD monitors. The Digital Uniformity Equalizer (DUE) function provides optimum backlight luminance uniformity.

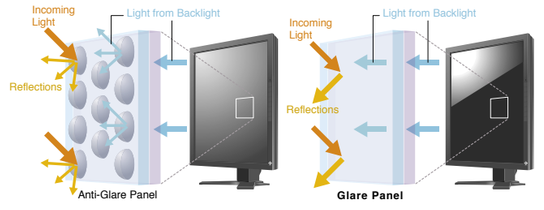




Easier Observation of Masses and Calcifications with Distinctive Glare Panel

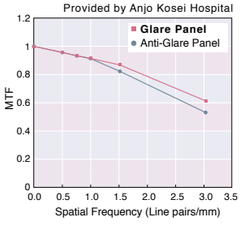
Many current monitors use anti-glare panels, which have a waffled surface to diffuse the reflection of surrounding light. However, this also diffuses the light from the monitor's backlight, which affects the outline of an image, causing a viewing strain on the observer. With a distinctive glare panel, there is no diffused reflection by the waffled surface, and the outline of the image is displayed more clearly. Therefore, the subtle images such as calcification and masses will be easier to observe reducing the strain on the observer.

Please note that the reflection of surrounding light may increase when used in a bright environment. Available with either a glare panel (GS510-BLG, GS510-CLG) or anti-glare panel (GS510-BL, GS510-CL).



Sharper Resolution for Clearer Image Outline

Requirement 5 MTF (Modulation Transfer Function) is a parameter to define the display sharpness and resolution of a monitor panel. The glare panel has better MTF characteristics than the anti-glare panel meaning the glare panel can be expected to display the outline of a detailed image more sharply.



Blue Base and Clear Base

Available with either a blue base (GS510-BLG, GS510-BL) or clear base (GS510-CLG, GS510-CL) backlight.

Brightness Stabilization

At startup or upon wakeup, the EIZO patented drift correction function quickly stabilizes the brightness level. In addition, a sensor measures the backlight brightness and compensates for brightness fluctuations caused by the ambient temperature and the passage of time.

This brightness stabilization function is EIZO patented technology (Japan patent numbers 3171808 and 3193315, US patent number 6188380).

Backlight Saver

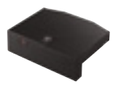
With ScreenManager Pro for Medical utility software installed, the Backlight Saver function allows for the monitor's backlight to turn off when the screen saver is activated and the monitor's backlight to turn on when the computer comes out of the screen saver mode. This function helps to reduce power consumption when the monitor is used for a prolonged period of time.

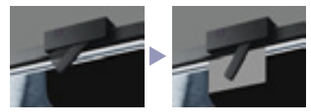
Calibration and Quality Control Made Easy

Requirement 6 EIZO's easy-to-use RadiCS quality control software performs calibration conforming to DICOM Part14 GSDF and enables precise quality control complying with AAPM, DIN, IEC and other standards with simple procedures.

Quick and Easy Quality Control

Requirement 7 Once attached to the top of the monitor the Clip-On Swing Sensor G1 can remain in place and is ready for use. This saves the time and trouble of attaching and removing it when performing quality control tasks.





Displaying the Optimum Digital Mammography Image.

EIZO offers all the necessary components for correct digital mammography image display.

Standard Configuration

Digital Mammography Monitor

GS510

An option of blue-base and clear-base backlights are available:
- GS510-BLG
- GS510-CLG

EIZO also offers paired monitors, which provides the same color between two monitors bundled as a pair in one box.

High-Performance Graphics Board

Two options are available:

	MED5mp-PPP	VREngine/SMD5-PCI
Bit	10-bit / 8-bit	10-bit / 8-bit
Compatible Operating System	Windows XP / 2000 Professional / NT4.0	Windows XP / 2000 Professional
Frame Buffer Memory	256 MB	128 MB
Bus Interface	PCI 32-bit (33 MHz) / 64-bit (66 MHz)	PCI 32-bit (33 MHz / 66 MHz)
Display Resolutions	Single Head : Up To 2048 x 2560 Dual Head : Up To 4096 x 2560	Single Head : Up To 2048 x 2560 Dual Head : Up To 4096 x 2560
Dot Clock	Up To 148 MHz	Up To 148 MHz
Scanning Frequency (H, V)	103.9 kHz, 50 Hz	103.9 kHz, 50 Hz (When displaying 5MP)
Maximum Power Consumption	40 W	16.8 W
Output Terminals	DVI-I x 2	DVI-I x 2

Quality Control Sensor

Clip-On Swing Sensor G1

Compatible OS	Windows XP / 2000 Professional
Dimensions (W x H x D)	112 x 89.9 x 32.2 mm
Weight	250 g

Quality Control Tool for Monochrome LCD Monitor

RadiCS™ GX2

Compatible OS	Windows XP / 2000 Professional
Display functions	DICOM Part 14 GSDF, CIE, Exponential (gamma value), LogLinear, Linear, User definition
Sensor Interface	USB
Languages	English, German, Japanese

The external sensor is used upon setup of RadiCS to perform calibration and constancy testing.

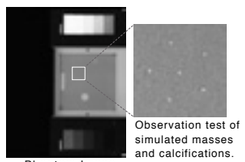
Full 3-Year Warranty

EIZO and its authorized distributors offer a three-year limited warranty for RadiForce GS510. The product shall be free from defects in material and workmanship for a period of three (3) years, but subject to the usage time being 20,000 hours or less from the date of purchase.

3 Year Warranty

Quality Control of Digital Mammography Monitor

As with the use of film mammography, image quality testing of the monitor at installation and regularly during use ensures that the monitor maintains a consistent display of quality digital mammography. In Europe, EUREF has already established a standard for the quality control of digital mammography monitors.



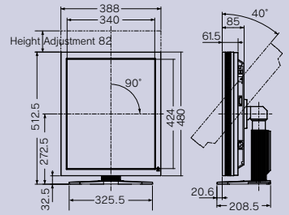
Phantom Image

Observation test of simulated masses and calcifications.

Specification

Model Variations	GS510-BLG: Blue Base with Glare Panel GS510-BLG-P: Pairing GS510-CLG: Clear Base with Glare Panel GS510-CLG-P: Pairing GS510-BL: Blue Base GS510-BL-P: Pairing GS510-CL: Clear Base GS510-CL-P: Pairing
Cabinet Color	Black
Panel	54 cm (21.3") TFT Monochrome LCD Panel (IPS)
Active Display Size (H x V)	337.9 x 422.4 mm
Viewable Image Size	Diagonal: 540 mm
Native Resolution	2048 x 2560
Pixel Pitch	0.165 x 0.165 mm
Grayscale Tones	1,024 from a palette of 8,161
Viewing Angles (H,V)	170° ／170°
Brightness	700 cd/m² (typical)
Recommended Brightness for Calibration	500 cd/m²
Contrast Ratio	800: 1
Response Time	100 ms (typical)
Scanning Frequency (H,V)	99.9 - 107.9 kHz, 47 - 53 Hz Frame synchronous mode with compatible graphics board
Dot Clock	142 - 152 MHz
Input Signals	DVI Standard 1.0
Input Terminal	DVI-D 24 pin
USB Ports / USB Standard	1 upstream, 2 downstream / Standard Rev. 1.1
Plug & Play	VESA DDC 2B
Power Requirements	AC100 - 120V, 200 - 240V: 50 / 60 Hz
Power Consumption	85 W
Power Save Mode	Less than 6 W
Sensor	Backlight Sensor
Power Management	DVI DMPM
OSD Languages	English, Japanese
Height Adjustment Range	82 mm
Pivot	90°
Tilt / Swivel	40° Up / 35° Right, 35° Left
Dimensions (W x H x D)	With Stand: 388 x 512.5 - 594.5 x 208.5 mm Without Stand: 388 x 480 x 85 mm
Net Weight	With Stand: 9.5 kg Without Stand: 6.3 kg
Hole Spacing	VESA standard (100 x 100)
Certifications and Standards	CE (Medical Device Directive), TÜV/GM (EN60601-1), cTÜVus (UL60601-1, CSA C22.2 No. 601-1), CB (IEC60601-1), VCCI-B, FCC-B, Canadian ICES-003-B, FDA 510(k) for Mammography and General Radiography
Supplied Accessories	AC power cord, user's manual, signal cable (DVI-D–DVI-D), USB cable, EIZO LCD Utility Disk (ScreenManager Pro for Medical software), warranty card, ScreenCleaner (GS510-BLG, GS510-CLG only)

■ Dimensions [Unit: mm]



Ergonomic Design

Narrow bezels on all four sides save space and require less eye movement in a multi-panel environment. The screen can be easily adjusted to the ideal viewing position with an 82 mm height adjustable stand with 40 ° tilt and 70° swivel.

Accessories +

Flexible Arm

LA-131-D

Flexible arms with forward/backward, side-to-side, and upward/downward movement for easy positioning.

Wall Mount Arm

LA-030-W

Mount your LCD monitor on a wall and change the screen position as necessary with tilt and swivel capability. It can also be extended more than 500 mm away from or placed against the wall when not in use.

Wall Mount Arm

LA-011-W

Mount your LCD monitor on a wall and change the screen position as necessary with tilt and swivel capability.

Dual Height Adjustable Stand

LS-HM1-D

Mount two panels in either portrait or landscape orientation.

Panel Protector

RP-901

Protect against scratches and dust with high light transmission panel.

Monitor Cleaning Kit

ScreenCleaner™

Keep your screen free from dust and fingerprints with this screen cleaner kit. Includes pump spray and cloth. (Bundled with GS510-BLG and GS510-CLG.)

EIZO NANAO CORPORATION supports Pink Ribbon activities.

Specifications are subject to change without notice.

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