IEI Medical Solutions



Celebrate Humanity with Technology

High-performing, cost-effective and reliable IEI medical products including diagnostic monitors, clinical reviewing monitors and all-in-one medical panel PC enable medical professionals to improve the quality of their patient care.All IEI medical products are ISO-9001, ISO-14000 and ISO-13485 certified quality manufacturing and are easily applied to diverse medical applications. For the best customer assurance, all IEI medical products are compliant with stringent safety standards, including UL 60601-1, CE(EN 60601-1-2), FCC Parts 18, VCCI, BSMI and CCC.

Best product innovation
- Revolutionary 12-bit GrayBoost® display technology
- 30-bit GrayEasy® deep color support

Innovation

Best support service
- Localized service and support
- Prompt logistic service

Service

Best product reliability
- Medical certified products
- ISO-9001, ISO-14000 and ISO-13485 certified quality manufacturing

Reliability

PACSmate®
www.pacsmate.com

IEI Product Family

UL60601-1 FCC Part 18 CE(EN 60601-1-2) BSMI VCCI CCC

PACS Diagnostic Application



High-Resolution Monochrome Monitor	MMD-5201M 12-bit 5MP	MMD-3213M 12-bit 3MP	MMD-2213M 12-bit 2MP
LCD Size	20.1"	21.3"	21.3"
Resolution	2560 x 2048	2048 x 1536	1600 x 1200
Max. Luminance	Original : 850cd/m² Calibrated: 600cd/m²	Original : 800cd/m² Calibrated: 600cd/m²	Original : 1000cd/m² Calibrated: 600cd/m²
High-Resolution Color Monitor	**MMD-4300C 30-bit 4MP**	**MMD-3213CH 30-bit 3MP**	**MMD-2213CH 30-bit 2MP**
LCD Size	30"	21.3" Super High Brightness	21.3" Super High Brightness
Resolution	2560 x 1600	2048 x 1536	1600 x 1200
Max. Luminance	Original : 370cd/m² Calibrated: 250cd/m²	Original : 800cd/m² Calibrated: 550cd/m²	Original : 950cd/m² Calibrated: 550cd/m²

Modality/Clinical Reviewing Application



Monochrome Monitor	MMC-2201M	Color Monitor	MMC-2201C	MMC-1190C	MMC-1170C	POCM-1170C
LCD Size	20.1"	LCD Size	20.1"	19"	17"	17"
Resolution	1600 x 1200	Resolution	1600 x 1200	1280 x 1024	1280 x 1024	1280 x 1024
Max.Luminance	Original : 700cd/m² Calibrated: 450cd/m²	Max.Luminance	300cd/m²	300cd/m²	300cd/m²	300cd/m²

Point-of-Care Application



	Fanless	High-Performance	Multi-Purpose	With UPS Function	
All-in-one Panel PC	POC-415A/417A/419A-915	POC-417B/419B-965	POC-3174A-A310	POC-3174B-A320	POC-3174B-A330
LCD Size	15"/ 17"/ 19"	17"/19"	17"	17"	17"
CPU	1.0 GHz Intel® Celeron® M with 512 KB L2 cache on-board (Celeron® M 373)	Intel® Core™ 2 Duo Socket P (T7500-2.2G / Celeron® M 550-2.0G)	2.0 GHz Intel® Pentium® M 760	Intel® Core™ 2 Duo Socket P(T7500-2.2G/ Celeron® M 550-2.0G)	2.0 GHz Intel® Pentium® M 760
Chipset	Intel® 910GMLE +ICH6M	Intel® GME965 + ICH8M	Intel® 915GM + ICH6M	Intel GME965 + ICH8M	Intel® 915GM + ICH6M
RAM	2 x 1.0 GB (max.) DDR2 SO-DIMM	2 x 2.0 GB (max.) DDR2 SO-DIMM	2 x 1.0 GB (max.) DDR2 SO-DIMM	2 x 2.0 GB (max.) DDR2 SO-DIMM	2 x 1.0 GB (max.) DDR2 SO-DIMM
Power In	DC 12V Input	DC 12V Input	AC 110V~240V Input	DC 12V Input	DC 12V Input



The IEI Innovation on Display Technology

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IEI GrayBoost® 12-bit Simultaneous Grayscale Technology

Conventional Topology of 10-bit Grayscale



12~16-bit raw image input

PC — 12-bit

DICOM Viewer
Graphic card dedicated viewer
Software library provided by medical graphic card vendor

Medical Graphic Card — 10-bit

Graphic Controller

LUT
10-bit to 10-bit LUT

DVI Output
Single-link DVI

Monitor — 10-bit

LUT
10-bit to 10-bit /12-bit LUT

10-bit



10-bit(1024) shades of grayscale image

Revolutionary GrayBoost® Topology of 12-bit Grayscale



12~16-bit raw image input

PC — 12-bit

DICOM Viewer
GrayBoost® dedicated viewer
12-bit data converted to 24-bit RGB
GrayBoost® software library provided by IEI

Commercial Dual-Link DVI Graphic Card — 12-bit

Graphic Controller
Dual-link 24-bit RGB

DVI Output
Dual-link 24-bit RGB

12-bit

Data Decoding
Built-in converter for 24-bit RGB decoding to 12-bit grayscale

LUT
12-bit to 12-bit LUT

Monitor — 12-bit



12-bit(4096) shades of grayscale image

Benefits of GrayBoost® Technology

- Precise 4096 tones of simultaneous grayscale by built-in 12-bit to 12-bit Look-Up-Table (LUT)
- DICOM calibrated with 12-bit precision to all selectable luminance levels
- Supports both commercial and medical dual-link DVI graphic cards
- Lowest total cost of ownership for practical 12-bit display solution
- DICOM viewer programming supported by IEI with GrayBoost® 12-bit dynamic link library*

* IEI GrayBoost® is supported with selected 12-bit DICOM viewer software. The GrayBoost® dynamic link library SDK is available for the DICOM viewer software developers.

True 30-bit Deep Color Ready with IEI GrayEasy® Technology

GrayEasy® 12-bit Grayscale Display System



12~16-bit raw image input

PC — 12-bit

Operating System
Windows® Vista™

DICOM Viewer
Windows® color system(WCS v1.0) based DICOM viewer

Graphic Card — 12-bit

Graphic Card
HDMI™ 1.3 compatible commercial dual-link graphic card supports xvYCC color space

Monitor — 12-bit

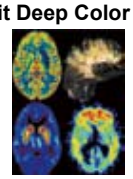
LUT
12-bit to 12-bit LUT

12-bit



12-bit(4096) shades of grayscale image

GrayEasy® 30-bit Deep Color Display System



30-bit color image input

PC — 30-bit

Operating System
Windows® Vista™

DICOM Viewer
Windows® color system(WCS v1.0) based DICOM viewer

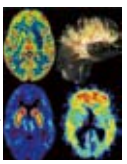
Graphic Card — 30-bit

Graphic Card
HDMI™ 1.3 compatible commercial dual-link graphic card supports xvYCC color space

Monitor — 30-bit

LUT
30-bit to 30-bit LUT

30-bit



30-bit deep color image

Benefits of GrayEasy® Technology

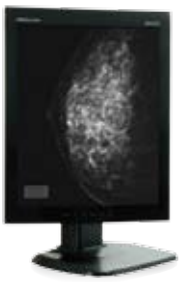
- Supports HDMI™ 1.3 commercial graphic cards for 12-bit grayscale and 30-bit color image processing
- Hardware supports deep color operating systems, such as Windows® Vista™
- Supports deep color compatible DICOM viewer software
- Built-in 12-bit input and 12-bit output Look-Up-Table (LUT) for DICOM calibration in grayscale images
- Built-in 30-bit color dithering for color images
- No extra software programming required
- Supports future Windows® Vista™ based deep color display system without additional upgrade cost



PACSmate® Diagnostic Monochrome Monitor

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12-bit 5MP MMD-5201M

- 20.1” grayscale TFT LCD
- 2560(H) x 2048(V) high-resolution
- Max. Original Luminance: 850cd/m²
  Max. Calibrated Luminance:600cd/m²
- 600:1 exceptional contrast ratio
- Out-of-box DICOM calibration utility
- GrayBoost® 12-bit simultaneous grayscale technology



12-bit 3MP MMD-3213M

- 21.3” grayscale TFT LCD
- 2048(H) x 1536(V) high-resolution
- Max. Original Luminance:800cd/m²
  Max. Calibrated Luminance:600cd/m²
- 700:1 exceptional contrast ratio
- Out-of-box DICOM calibration utility
- GrayBoost® 12-bit simultaneous grayscale technology

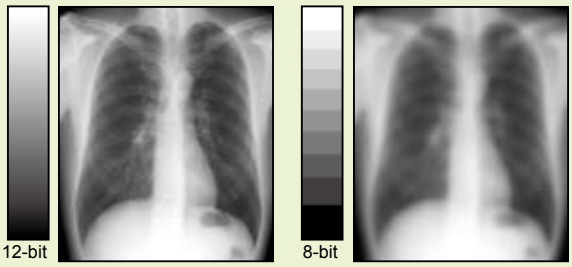


12-bit 2MP MMD-2213M

- 21.3” grayscale TFT LCD
- 1600(H) x 1200(V) high-resolution
- Max. Original Luminance:1000cd/m²
  Max. Calibrated Luminance:600cd/m²
- 700:1 exceptional contrast ratio
- Out-of-box DICOM calibration utility
- GrayBoost® 12-bit simultaneous grayscale technology

GrayBoost® 12-bit Simultaneous Grayscale

12-bit (4096 tones) image input can be all retained in 12-bit (4096 tones) image output via built-in 12-bit LUT. The IEI GrayBoost® technology successfully produces 12-bit image data flow through commercial dual-link graphic card, lowering total cost of ownership.



Backlight Stabilizer

The GeniGUARD® built-in backlight stabilizer integrated in PACSmate® monitors automatically calibrates the shift of LCD brightness caused by startup drift, ambient temperature and backlight aging.



GeniGUARD® Backlight Stabilizer

Uniform Luminance

Uniform luminance is especially critical for diagnostic applications and IEI therefore sets a high standard for the uniformity of every medical monitor. IEI's special testing equipment ensures every customer gets medical monitors with best uniformity for precise diagnostic results.



Original | IEI Factory Calibration | Meets AAPM TG18 & DIN 6868-57 standards

GeniSPOT® & GeniPASS® QC Solution

The GeniSPOT® 3-in-1 calibration system and GeniPASS® QC Utility ensure the display conforms with AAPM, DIN, JIS and IEC standards all the time.



GeniSPOT® DICOM Calibration



PACSmate® Diagnostic Color Monitor

PACSmate®
www.pacsmate.com

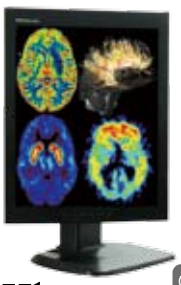
Single 4MP viewing mode & Dual 2MP viewing mode Available

TAIWAN EXCELLENCE 2008



30-bit
4MP **MMD-4300C**

- 30” color TFT LCD
- 2560(H) x 1600(V) high-resolution
- Max. Original Luminance: 370cd/m²
  Max. Calibrated Luminance:250cd/m²
- Built-in front sensor for conformance testing
- Selectable Gamma 1.8/2.0/2.2 & DICOM calibration
- Intelligent color-to-gray conversion technology



Super High Brightess

30-bit
3MP **MMD-3213CH**

- 21.3” grayscale TFT LCD
- 2048(H) x 1536(V) high-resolution
- Max. Original Luminance:800cd/m²
  Max. Calibrated Luminance:550cd/m²
- 750:1 exceptional contrast ratio
- GrayEasy® 30-bit deep color technology
- Intelligent color-to-gray conversion technology
- Selectable Gamma 1.8/2.0/2.2 & DICOM calibration



Super High Brightess

30-bit
2MP **MMD-2213CH**

- 21.3” grayscale TFT LCD
- 1600(H) x 1200(V) high-resolution
- Max. Original Luminance:950cd/m²
  Max. Calibrated Luminance:550cd/m²
- 900:1 exceptional contrast ratio
- GrayEasy® 30-bit deep color technology
- Intelligent color-to-gray conversion technology
- Selectable Gamma 1.8/2.0/2.2 & DICOM calibration

Backlight Stabilizer

The GeniGUARD® built-in backlight stabilizer integrated in PACSmate® monitors automatically calibrates the shift of LCD brightness caused by startup drift, ambient temperature and backlight aging.



GeniGUARD® Backlight Stabilizer

GrayEasy® 30-bit Deep Color

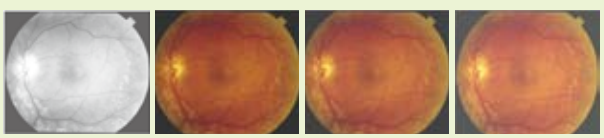
30-bit color image (10-bit for each RGB element) can be displayed on PACSmate® monitors without any image loss. Through IEI’s unique GrayEasy® technology, it's unnecessary to replace the monitors for future HDMI™ 1.3 supported deep color display capabilities.

Color To Grayscale Conversion

The built-in color-to-grayscale converter reproduces color images as pure grayscale images to achieve more precise grayscale presentation for diagnostic applications.

User Selectable Gamma Settings

IEI's color medical display can be adjusted with Gamma 1.8,2.0,2.2, DICOM and user settings for different brightness conditions to achieve the optimal display quality for images from different modalities.



DICOM | Gamma 2.2 | Gamma 2.0 | Gamma 1.8

Uniform Luminance

Uniform luminance is especially critical for diagnostic applications and IEI sets a high standard for the uniformity of every medical monitor. IEI's special testing equipment ensures every customer gets medical monitors with best uniformity for precise diagnostic results.



Original | IEI Factory Calibration | Meets AAPM TG18 & DIN 6868-57 standards



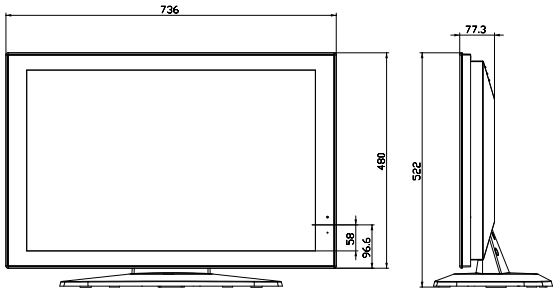
30" Color LCD Monitor for PACS Solutions

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4MP MMD-4300C



TAIWAN EXCELLENCE 2008



30-bit

Multiple Viewing Modes & Color-to-Grayscale Conversion Technology

Single 4MP viewing mode & Dual 2MP viewing mode Available

Single Viewing Mode

In single viewing mode, the MMD-4300C is a 4MP monitor in either the color mode or grayscale mode.

Single 4MP in color mode



Dual-link DVI-D
2560 x 1600

Single 4MP in grayscale mode

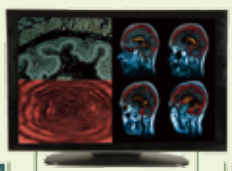


Dual-link DVI-D
2560 x 1600

Dual Viewing Mode

Through two DVI signal inputs, the MMD-4300C can be configured to display in a dual 2MP viewing mode. With color-to-grayscale conversion technology, the MMD-4300C can be viewed in multiple modes for side-by-side image comparison purpose. The independent Look-Up-Table for DICOM and Gamma calibration ensures the best display quality for diagnostic applications. The real-time adjustment of multiple display modes can be simply achieved through IEI SmartOSD software utility.

Dual portrait 2MP color mode



Single/ Dual-link DVI-D
1280 x 1600

Single-link DVI-D
1280 x 1600

Dual portrait 2MP grayscale mode



Single/ Dual-link DVI-D
1280 x 1600

Single-link DVI-D
1280 x 1600

Dual portrait 2MP grayscale/color mode



Single/ Dual-link DVI-D
1280 x 1600

Single-link DVI-D
1280 x 1600

Dual portrait 2MP color/grayscale mode



Single/ Dual-link DVI-D
1280 x 1600

Single-link DVI-D
1280 x 1600



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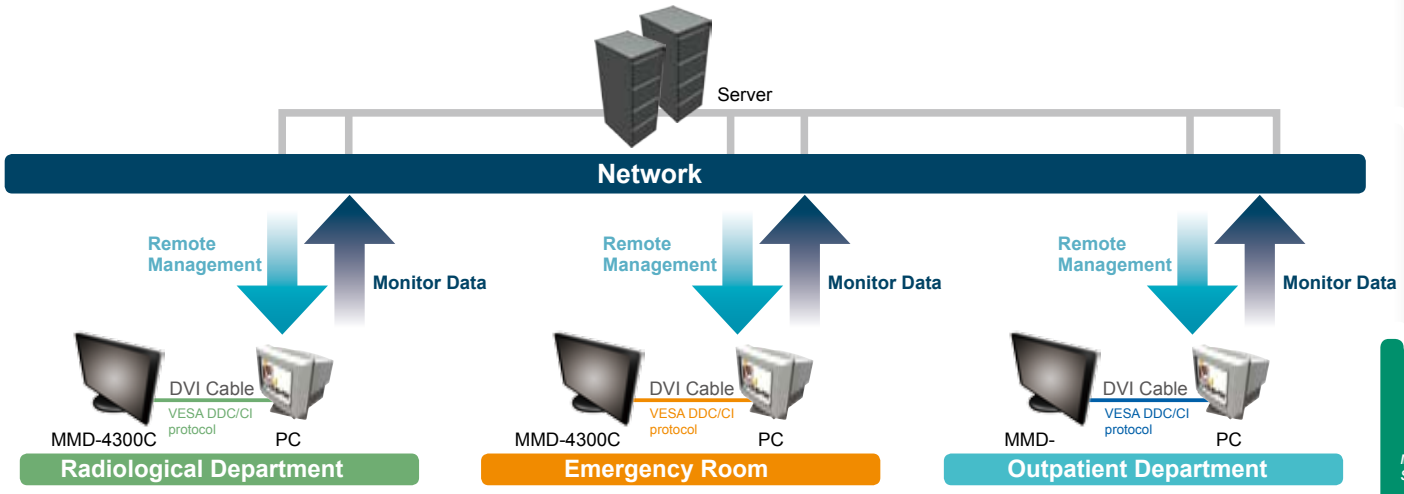
30" Color LCD Monitor for PACS Solutions

100% Compatible With VESA DDC/CI Protocol

MMD-4300C is implemented with the VESA DDC/CI protocol and the standard VESA Monitor Control Command Set (MCCS). The universal communication interface enables remote control management through a network. The MMD-4300C allows easier two-way communications with the host PC with only a DVI cable. Additional serial or USB cables are not necessary. Through DDC/CI protocol, the software OSD manages MMD-4300C remotely including power mode control, backlight luminance reading and front sensor luminance reading. This reduces the maintenance cost for the end user. IEI also provides software OSD customization services with a command library and customer defined MSSC command programming supports for easier software development.

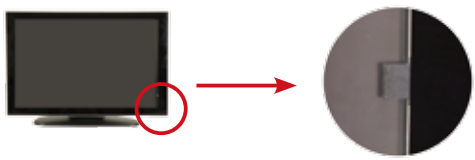
Various OSD functions:

- Power on/off
- Display mode selection: 4MP/2MP, color/monochrome
- Gamma and color temperature selection
- Luminance selection
- DICOM/ Gamma Look-Up-Table selection
- Monitor Information



Built-in Front Sensor for Continuous DICOM Conformance

IEI has designed a built-in, front-mounted sensor which continually monitors the luminance output to ensure consistent images over time.



Built-in Front Sensor

GrayEasy® 30-bit Deep Color

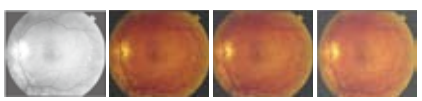
30-bit color image (10-bit for each RGB element) can be displayed on PACSmate® monitors without any image loss. Through IEI's unique GrayEasy® technology, it's unnecessary to replace the monitors for future HDMI™ 1.3 supported deep color display capabilities.

IPX2 Compliance

The whole enclosure of MMD-4300C is compliant with IPX2 waterproof standard. The special design for infection control enables MMD-4300C reliably used in critical care environment including the operating room.

User Selectable Gamma Settings and Color Temperature Settings

IEI provides you with flexible Gamma settings and color temperature settings for side-by-side image comparison in dual-viewing modes. The independent Gamma settings (for Gamma 1.8,2.0,2.2) and color temperature settings (6500K, 9300K) consist of multiple user-selectable settings, providing flexible display modes for images from different modalities.



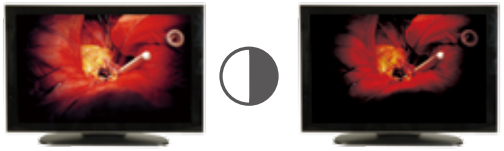
DICOM Gamma 2.2 Gamma 2.0 Gamma 1.8



Color Temperature Settings

Auto-Dimming for Ambient Light Adjustment

The auto-dimming function helps create better diagnostic experience under proper light condition and extend backlight lifetime



Well-Lit Room Dim-Lit Room



Total Quality Control Solutions

PACSmate®
www.pacsmate.com

Quality Control is critical to ensure reliability for diagnostic applications. To attain the best image consistency, IEI PACSmate® provides the healthcare and IT professionals with GeniSPOT® 3-in-1 calibration system and GeniPASS® QC Utility, which ensures the display conform with AAPM, DIN, JIS and IEC standards all the time.

GeniSPOT® Calibration System

The reliable USB 2.0 external GeniSPOT® 3-in-1 calibration system maintains display consistency. The GeniSPOT® also equips the photo sensor to provide precise luminance and DICOM calibration for your periodical QC process. The built-in luxmeter dynamically detects the ambient light of the reading environment and optimizes the monitor luminance. The intelligent self-diagnosis function ensures the GeniSPOT® photo sensor is functions perfectly and accurately all the time.



GeniSPOT® External Sensor

- Luminance testing
- DICOM calibration
- Luminance auto-dimming
- GeniSPOT® self-diagnosis
- Five-point testing of uniformity



Ambient light luxmeter for auto-dimming



GeniSPOT® Self-Diagnosis



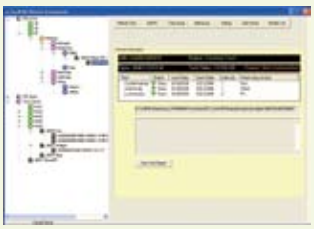
GeniSPOT® DICOM Calibration

GeniPASS® Remote Management Software

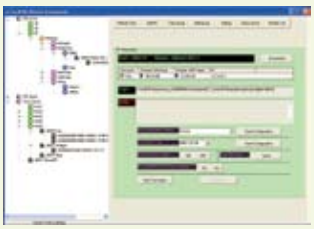
The IEI GeniPASS® software enables remote management through the GPRM (GeniPASS® Remote Management) server, including:

NEW

- Group Management
- Schedule Management
- Remote Management
- Monitor Control Management



Monitor Information



PC Information



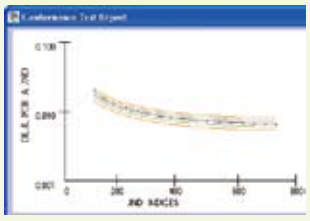
Test Record Management

GeniPASS® QC Utility

The GeniPASS® QC utility combines with the GeniSPOT® calibration system to provide easy luminance & DICOM calibration. Other GeniPASS® features include acceptance and constancy testing, calibration history management and user defined LUT programming.

GeniPASS® QC software

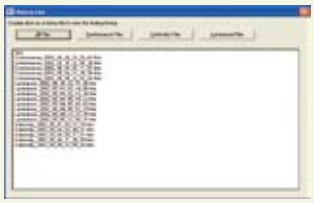
- Luminance testing
- DICOM calibration
- User-defined LUT programming
- Conformance testing
- Five-point testing of uniformity
- Calibration history management



Conformance Testing



Uniformity Testing



History Record Management



Specifications

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TAIWAN EXCELLENCE 2008





Model	MMD-5201M	MMD-3213M	MMD-2213M
Drive system	a-Si TFT active matrix		
Display area (H x V)	399.4 mm x 319.5mm	433.2 mm x 324.9 mm	
Diagnol size of display	51 cm (20.1 inches)	54 cm (21.3 inches)	
Resolution (H x V)	2560 x 2048	2048 x 1536	1600 x 1200
Pixel pitch (H x V)	0.156 mm x 0.156 mm	0.2115 mm x 0.2115 mm	0.270 mm x 0.270 mm
Sub-pixel pitch (H x V)	0.052mm x 0.156mm	0.0705 mm x 0.2115 mm	0.090 mm x 0.270 mm
Pixel format	1 pixel consists of 3 sub-pixels, LCR vertical stripe		
Luminance-max.	850 cd/m²	800 cd/m²	1000 cd/m²
Luminance calibrated-max.	600 cd/m²	600 cd/m²	600 cd/m²
White chromaticity	Wx, Wy=(0.280, 0.304) (typical)		
Contrast ratio	600:1 (typical)	700:1 (typical)	
Viewing angle	Right: 85°, Left: 85°, Up: 85°, Down: 85°(10:1 contrast)		
Response time (Ton+Toff)	30 ms (typical)	35 ms (typical)	
Polarizer surface/hardness	Antiglare/ 2H		
Backlight	12 CCFL	6 CCFL	
Default gamma	DICOM		
Grayscale	Simultaneous 12-bit		
LUT	12-bit input to 12-bit output		
Signal input	Dual link DVI-D (digital)		Single link DVI-D (digital)
USB 2.0 hub	1 upstream/ 2 downstream		
Membrane keypad	Yes		
Power adapter Input voltage range	100VAC - 240VAC		
Power adapter Input frequency range	47Hz-63Hz		
Power adapter Input AC current	1.25A-0.5A		
Power adapter Power output	12VDC, 8.33A, 100W (max)		
Physical dimensions (H x W x D)	With stand: 520 mm x 380 mm x 274 mm (portrait) Without stand: 485 mm x 380 mm x 100 mm (portrait)		
Adjustable height range (with stand)	Portrait: 520 mm~590 mm Landscape: 465 mm~535 mm		
Weight (with stand)	13 kg	13.2 kg	13.2 kg
Operating temperature	10°C~35°C		
Storage temperature	0°C~45°C		
Operation relative humidity	30% ~75% Non-condensing		
Storage/ Transportation relative humidity	10% ~95% Non-condensing		
Approvals	UL 60601-1, CE(EN 60601-1-2), FCC Part 18, TÜV GM, VCCI, BSMI and CCC		

Graphic Card Compatibility








	QUADRO FX1700	QUADRO FX1500	GeForce 9600GT	GeForce 8600GT	FireGL V7100	FireGL V3400
Bus Interface	PCI Express x 16	PCI Express x 16	PCI Express x 16	PCI Express x 16	PCI Express x 16	PCI Express x 16
Memory Size	512 MB	256 MB	512 MB	256 MB	256 MB	128 MB
Display Connectors (*DVI-DL: DVI-Dual link) (*DVI-SL: DVI-Single link)	2 x DVI-DL	2 x DVI-DL	2 x DVI-DL	2 x DVI-DL	1 x DVI-DL 1 x DVI-SL	1 x DVI-DL 1 x DVI-SL
Resolution	Up to 3840 x 2400	Up to 3840 x 2400	Up to 3840 x 2400	Up to 3840 x 2400	Up to 3840 x 2400	Up to 3840 x 2400

Ordering Information

5MP	MMD-5201M	5 megapixel, 20.1" monochrome LCD monitor includes GeniSPOT® and GeniPASS® calibration kit
3MP	MMD-3213M	3 megapixel, 21.3" monochrome LCD monitor includes GeniSPOT® and GeniPASS® calibration kit
2MP	MMD-2213M	2 megapixel, 21.3" monochrome LCD monitor includes GeniSPOT® and GeniPASS® calibration kit

Packing List

- PACSmate® Series medical LCD monitor
- Monitor stand
- Power Cord (US x 1, EU x 1)
- Power Adapter
- Dual-Link DVI-D Signal Cable
- USB Cable
- GeniSPOT® USB Calibration Kit
- Utility CD-ROM (for user's manual, software utility, and GeniPASS® QC software)