



**NEC**



QUICK REFERENCE GUIDE

**MD21GS-3MP**







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	<b>WARNING</b>	
<p>TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. ALSO, DO NOT USE THIS UNIT'S POLARIZED PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLETS UNLESS THE PRONGS CAN BE FULLY INSERTED.</p> <p>REFRAIN FROM OPENING THE CABINET AS THERE ARE HIGH VOLTAGE COMPONENTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p>		

	<b>CAUTION</b>	
<p>CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, MAKE SURE POWER CORD IS UNPLUGGED FROM WALL SOCKET. TO FULLY DISENGAGE THE POWER TO THE UNIT, PLEASE DISCONNECT THE POWER CORD FROM THE AC OUTLET. DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p>		
	<p>This symbol warns user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any part inside this unit.</p>	
	<p>This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included. Therefore, it should be read carefully in order to avoid any problems.</p>	

**Power Cord Important Information**

**CAUTION:** Please use the power cord provided with this display in accordance with the table below. If a power cord is not supplied with this equipment, please contact your supplier. For all other cases, please use a power cord that matches the AC voltage of the power outlet and has been approved by and complies with the safety standard of your particular country.

Plug Type	North America Hospital Grade	European Continental	Chinese	Japanese <i>(for Japanese Market only)</i>
Plug Shape				
Country	U.S.A./Canada	EU	China	Japan
Voltage	120	230	220	100

**Intended Use**

The MD21GS-3MP grayscale display is intended to be used for displaying and viewing of digital images for diagnosis by trained physicians. To guarantee the display performance as specified, it must only be used in conjunction with NEC recommended controller boards as specified in the Installation and Maintenance manual for this model.

**European Customers**

Unpacking, Installation and calibration of this display should only be done by authorized and trained personnel. Any installation done by a non-authorized person is done under his own risk and we accept no responsibility in any device malfunctioning.

**Medical Imaging**

The NEC MD21GS-3MP is designed for 3-megapixel (1536 x 2048) grayscale medical imaging. This display comes fully tuned with a setting for gamma correction that complies with the DICOM Part 14 Standard.

### Canadian Department of Communications Compliance Statement

DOC: This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

C-UL: Bears the C-UL Mark and is in compliance with Canadian Safety Regulations according to CAN/CSA C22.2 No. 601.1.

### FCC Information

1. Use the attached specified cables with the MD21GS-3MP grayscale display so as not to interfere with radio and television reception.
  - (A) Please use the supplied power cord or equivalent to ensure FCC compliance.
  - (B) Please use the supplied shielded video signal cable, DVI-D to DVI-D cable.Use of other cables and adapters may cause interference with radio and television reception.
2. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult your dealer or an experienced radio/TV technician for help.

If necessary, the user should contact the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet, prepared by the Federal Communications Commission, helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

### Declaration of the Manufacturer

We hereby certify that the grayscale monitor MD21GS-3MP is in compliance with Council Directive 93/42/EEC:

- EN 60601-1
- EN 60601-1-2
- EN 61000-3-2
- EN 61000-3-3

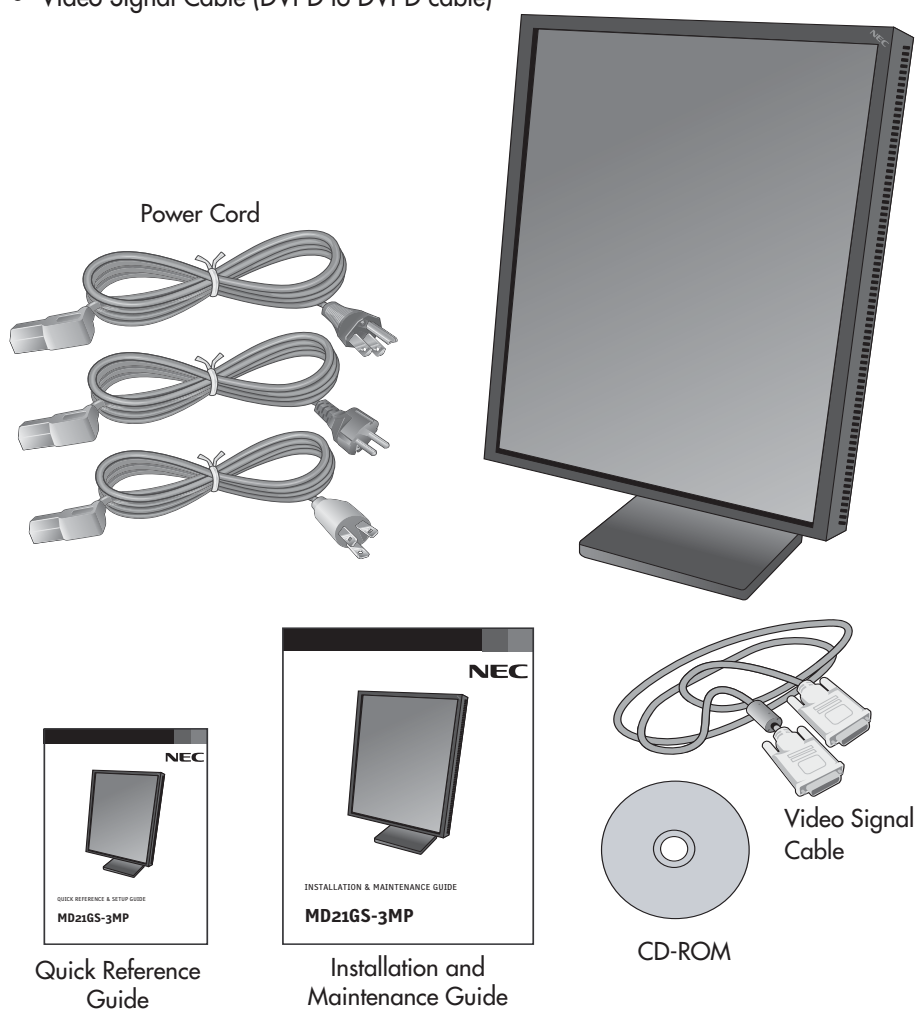
and marked with CE.

NEC-Mitsubishi Electric Visual, Systems Corporation, 4-13-23, Shibaura, Minato-Ku, Tokyo 108-0023, Japan

# Contents

Your new NEC Display monitor box\* should contain the following:

- MD21GS-3MP Display with tilt/swivel/pivot/height adjustable stand
- Power Cords (N.A. Hospital Grade, Europe Continental and Chinese<sup>2</sup>)
- Quick Reference & Setup Guide
- Installation and Maintenance Guide
- CD-ROM (GammaComp MD)
- Video Signal Cable (DVI-D to DVI-D cable)



\* Remember to save your original box and packing material to transport or ship the monitor.

<sup>2</sup> For Japanese market model, only power cord for Japan is provided with this monitor.

# Quick Start

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## Optional Display Card Installation

1. Following your PC manufacturer's guidelines, open your computer to access a PCI slot.
2. Place the display card into an available PCI slot and secure all screws.
3. Replace the computer cover.

**NOTE:** For installing driver information, display modes in multimonitor mode, the setting the dip switch, please reference the display card manufacturer's documentation.

## Connecting the LCD to Your PC

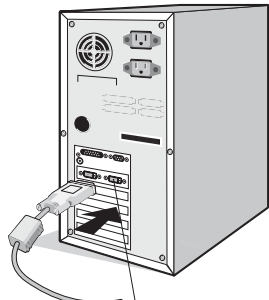
Once the display card is successfully installed, following these instructions to connect the display to your PC.

1. Shut down your computer and turn off the power.
2. Connect the DVI-D signal cable to the connector of the display card in your system (**Figure A.1**). **NOTE:** for dual displays, plug a DVI-D cable into Port 2 of the display card (**Figure A.1**). Tighten all screws.
3. Remove the cable cover by pressing the two tabs to unlock. Lift the cover to remove (**Figure B.1**).
4. Connect the DVI-D signal cable to the connector on the back of the display (**Figure C.1**). **NOTE:** Incorrect cable connections may result in irregular operation, damage display quality/components of LCD module, and/or shorten the module life.
5. Connect one end of the power cord to the AC inlet on the back of the monitor and the other end to the power outlet (**Figure C.1**). Replace the cable cover.  
**NOTE:** Refer to the Display Adjustment & Mounting section to check tilt, raise and lower monitor screen and screen rotation when you manage cables and power cord.  
**NOTE:** Please refer to the Caution section of this manual for proper selection of AC power cord.
6. Collect cables and power cord and place them under the cable clip (**Figure B.1**).  
**NOTE: Release the cables from the clip before removing the cable cover.**
7. Turn on the monitor with the power switch on the top (portrait) or left side (landscape) of the monitor (**Figure D1**). Turn on the computer. **NOTE: DO NOT switch on/off repeatedly.**
8. For further adjustments, please refer to the OSM section for a full description of OSM controls.

**NOTE:** If you have any problems, refer to the Troubleshooting section.

# Quick Start *-continued*

Figure A.1



Port 2 for Dual Monitor

Figure B.1

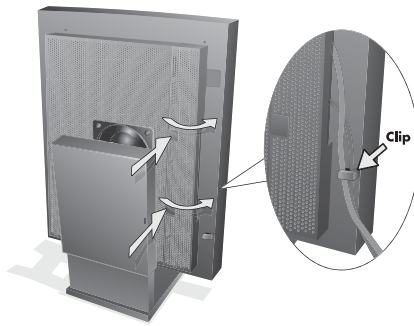


Figure C.1

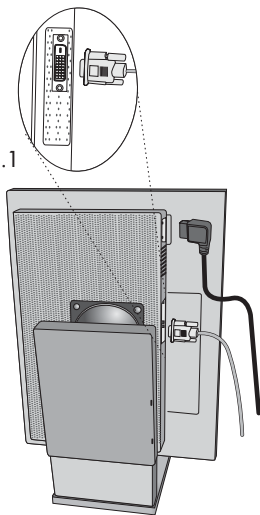
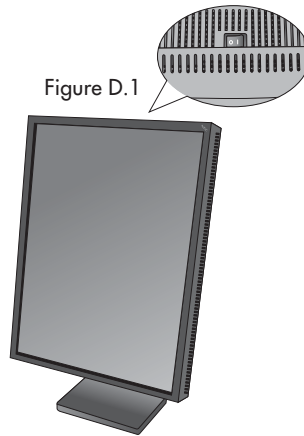
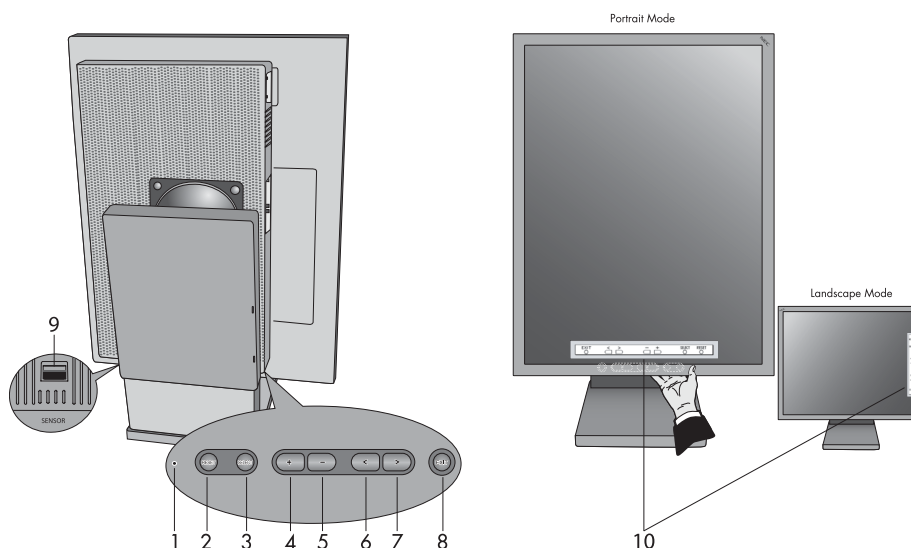


Figure D.1



# User Controls



- |                                |  |
|--------------------------------|--|
| <b>1. LED</b>                  | Indicates power on and signal condition. The LED can be turned on, off, or dimmed. Please refer to the Advanced OSM section/LED Brightness for further information.<br>Green – signal is present and power is on<br>Orange – no signal |
| <b>2. RESET</b>                | Resets the highlighted control menu to the factory setting.  |
| <b>3. SELECT</b>               | Enters the OSM controls and OSM sub menu.  |
| <b>4/5. ADJUST -/+</b>         | Moves the bar left/right to increase or decrease the adjustment.   |
| <b>6/7. CONTROL &lt;/&gt;</b>  | Moves the highlighted area left/right to select control menus.<br>Moves the highlighted area up/down to select one of the controls.  |
| <b>8. EXIT</b>                 | Exits the OSM Controls and OSM Main Menu.  |
| <b>9. Sensor Port</b>          | For optional external sensor used for self calibration and copy calibration.   |
| <b>10. On-Screen Key Guide</b> | The key guide will automatically appear on the screen when any control button on the back is pressed. The key guide will change orientation along with the OSM.  |

**NOTE:** When **RESET** is pressed in the main and sub-menu, a warning window will appear allowing you to cancel the **RESET** function by pressing the EXIT button.



# Recommended Use

## Safety Precautions and Maintenance




FOR OPTIMUM PERFORMANCE, PLEASE NOTE THE FOLLOWING WHEN SETTING UP AND USING THE NEC DISPLAY:



- **DO NOT OPEN THE MONITOR.** There are no user serviceable parts inside and opening or removing covers may expose you to dangerous shock hazards or other risks. Refer all servicing to qualified service personnel.
- Do not spill any liquids into the cabinet or use your display near water.
- Do not insert objects of any kind into the cabinet slots, as they may touch dangerous voltage points, which can be harmful or fatal or may cause electric shock, fire or equipment failure.
- Do not place any heavy objects on the power cord. Damage to the cord may cause shock or fire.
- Do not place this product on an unbalanced or unstable cart, stand or table because the monitor may fall, causing serious damage.
- Do not place any objects onto the display and do not use the display outdoors.
- The inside of the fluorescent tube located within the display contains mercury. Please follow the bylaws or rules of your municipality to dispose of the tube properly.
- Do not bend power cord.
- Do not use monitor in high temperature, humid, dusty, or oily areas.
- Do not cover vent on display.

Immediately unplug your monitor from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power supply cord or plug is damaged.
  - If liquid has been spilled, or objects have fallen into the monitor.
  - If the monitor has been exposed to rain or water.
  - If the monitor has been dropped or the cabinet damaged.
  - If the monitor does not operate normally by following operating instructions.
  - If glass is broken, handle with care.
  - If monitor or glass is broken, do not come in contact with the liquid crystal and handle with care.
- 
- Allow adequate ventilation around the monitor so that heat can properly dissipate. Do not block ventilated openings or place the monitor near a radiator or other heat sources. Do not put anything on top of monitor.
  - The power cable connector is the primary means of detaching the system from the power supply. The monitor should be installed close to a power outlet which is easily accessible.
  - Handle with care when transporting. Save packaging for transporting.

**CAUTION**

### Image Persistence

Image persistence is when a residual or "ghost" image of a previous image remains visible on the screen. Unlike CRT monitors, LCD displays' image persistence is not permanent, but constant images being displayed for a long period of time should be avoided.

To alleviate image persistence, turn off the display for as long as the previous image was displayed. For example, if an image was on the display for one hour and a residual image remains, the display should be turned off for one hour to erase the image.

**NOTE:** As with all personal display devices, NEC-Mitsubishi Electronics Display recommends using a moving screen saver at regular intervals whenever the screen is idle or turning off the display when not in use.

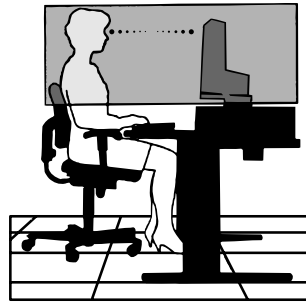
## Recommended Use *–continued*



CORRECT PLACEMENT AND ADJUSTMENT OF THE MONITOR CAN REDUCE EYE, SHOULDER AND NECK FATIGUE. CHECK THE FOLLOWING WHEN YOU POSITION THE DISPLAY:



- For optimum results during self and copy calibrations, allow 30 minutes for warm-up.
- Adjust the display height so that the top of the screen is at or slightly below eye level. Your eyes should look slightly downward when viewing the middle of the screen.
- Position your display no closer than 16 inches and no further away than 28 inches from your eyes. The optimal distance is 20 inches.
- Rest your eyes periodically by focusing on an object at least 20 feet away. Blink often.
- Position the display at a 90° angle to windows and other light sources to minimize glare and reflections. Adjust the monitor tilt so that ceiling lights do not reflect on your screen.
- Clean the display surface with a lint-free, non-abrasive cloth. In case of persistent dirt, wipe with cloth permeated by water, ethanol, isopropyl-alcohol completely. Avoid using any cleaning solution or glass cleaner (ex Acid, Alkali and Acetone).
- Adjust the display's brightness control to enhance readability.
- Position whatever you are looking at most of the time (the screen or reference material) directly in front of you to minimize turning your head while you are typing.
- Avoid displaying fixed patterns on the monitor for long periods of time to avoid image persistence (after-image effects).



### **Ergonomics**

To obtain the best possible ergonomics benefits, we recommend the following:

- Use the preset Size and Position controls with standard signals
- Use the DEFAULT White Point Selection

# Specifications

Display Specifications	MD21GS-3MP Monitor	Notes
LCD Module	Diagonal: 54 cm/21.3 inches Viewable Image Size: 54 cm/21.3 inches Native Resolution (Pixel Count): 1536 x 2048 (Portrait) 2048 x 1536 (Landscape)	Active matrix; thin film transistor (TFT) liquid crystal display (LCD); 0.2115 mm dot pitch; 400 cd/m <sup>2</sup> calibrated white luminance; 700:1 contrast ratio, typical.
Input Signal	Video: Digital Input: DVI	VideoDot Clock 162MHz Max
Grayscale Tones	10 Bit: 1024 (10bit) shades of gray from a pallet of 3061 (11.5bit) 256: 8bit shades of gray	When used with an NEC recommended 10 bit video card When used with an NEC recommended 8 bit video card
Synchronization Range	Horizontal: 31.5 kHz to 96.0 kHz Vertical: 30 Hz, 50Hz to 85 Hz	Automatically Automatically
Viewing Angle	Left/Right: ±88° (CR > 10) Up/Down: ±88° (CR > 10)	
Image Formation Time	35 ms (Typ.)	
Active Display Area	Landscape: Horiz.: 433 mm/171 inches Vert.: 325 mm/12.8 inches Portrait: Horiz.: 325 mm/12.8 inches Vert.: 433 mm/171 inches	
Power Supply	AC 100-240V ~ 50/60 Hz	
Current Rating	0.7 - 0.3 A	
Dimensions	Portrait: 358.7 mm (W) x 514 - 560 mm (H) x 200 mm (D) 14.1 inches (W) x 20.2 - 22.0 inches (H) x 7.9 inches (D) Landscape: 467 mm (W) x 460 - 506 mm (H) x 200 mm (D) 18.4 inches (W) x 18.1 - 19.9 inches (H) x 7.9 inches (D) Height Adjustment: 46 mm/1.8 inches (Landscape)	
Weight	11.7 kg/25.8 lbs	
Environmental Considerations	Operating Temperature: 5°C to 40°C/41°F to 104°F Humidity: 30% to 80% Feet: 0 to 10,000 Feet/0 to 3,048 m Storage Temperature: -20°C to 60°C/-4°F to 140°F Humidity: 10% to 85% Feet: 0 to 40,000 Feet/0 to 12,192 m	

# References

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## ***North America and Canada***

### **NEC-Mitsubishi Monitor Customer Service & Support**

Customer Service and Technical Support: (800) 632-4662  
Fax: (800) 695-3044  
Parts and Accessories/Macintosh  
Cable Adapter: (888) NEC-MITS [888-632-6487]  
Warranty Information: [www.necmitsubishi.com/warranty](http://www.necmitsubishi.com/warranty)

**Online Technical Support** [www.necmitsubishi.com/support](http://www.necmitsubishi.com/support)

### **Sales and Product Information**

Sales Information Line: (888) NEC-MITS [888-632-6487]  
Canadian Customers: (866) 771-0266, Ext#: 4037  
Government Sales: (800) 284-6320  
Government Sales email: [gov@necmitsubishi.com](mailto:gov@necmitsubishi.com)

### **Electronic Channels**

World Wide Web: [www.necmitsubishi.com](http://www.necmitsubishi.com)  
Product Registration: [www.necmitsubishi.com/productregistration](http://www.necmitsubishi.com/productregistration)

**Drivers and Downloads** [www.necmitsubishi.com/downloads](http://www.necmitsubishi.com/downloads)

## ***Europe***

NEC-Mitsubishi Electronics Display-Europe GmbH  
Landshuter Allee 12 -14  
D-80637 München  
Phone: +49(0)89 99699 - 0

### **Electronic Channels**

World Wide Web: [www.medical.nec-mitsubishi.com](http://www.medical.nec-mitsubishi.com)

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