# MultiSync LCD2190UXi
# SpectraView 2190

User's Manual

Empowered by Innovation

NEC

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## WARNING

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.

REFRAIN FROM OPENING THE CABINET AS THERE ARE HIGH VOLTAGE COMPONENTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

## CAUTION

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.

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.

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.

## Caution:

When operating the MultiSync LCD2190UXi or the SpectraView 2190 with a 220-240V AC power source in Europe, use the power cord provided with the monitor.

In the UK, a BS approved power cord with a moulded plug has a Black (five Amps) fuse installed for use with this equipment. If a power cord is not supplied with this equipment please contact your supplier.

When operating the MultiSync LCD2190UXi or the SpectraView 2190 with a 220-240V AC power source in Australia, use the power cord provided with the monitor. If a power cord is not supplied with this equipment please contact your supplier.

For all other cases, 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.

# Declaration

### Declaration of the Manufacturer

We hereby certify that the colour monitors MultiSync LCD2190UXi and SpectraView 2190 (L215GV) are in compliance with

Council Directive 73/23/EEC:
- EN 60950-1

Council Directive 89/336/EEC:
- EN 55022
- EN 61000-3-2
- EN 61000-3-3
- EN 55024

and marked with

NEC Display Solutions, Ltd.
4-13-23, Shibaura,
Minato-Ku
Tokyo 108-0023, Japan

TÜV Rheinland Product Safety | ISO 13406-2

Windows is a registered trademark of Microsoft Corporation. NEC is a registered trademark of NEC Corporation.
ENERGY STAR is a U.S. registered trademark.
OmniColor is a registered trademark of NEC Display Solutions Europe GmbH in the countries of EU and Switzerland.
ErgoDesign is a registered trademark of NEC Display Solutions, Ltd. in Austria, Benelux, Denmark, France, Germany, Italy, Norway, Spain, Sweden, U.K.
NaViSet is a registered trademark of NEC Display Solutions Europe GmbH in the countries of EU and Switzerland.
All other brands and product names are trademarks or registered trademarks of their respective owners.
As an ENERGY STAR® Partner, NEC Display Solutions of America, Inc. has determined that this product meets the ENERGY STAR guidelines for energy efficiency. The ENERGY STAR emblem does not represent EPA endorsement of any product or service.

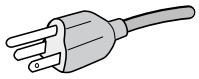
# Canadian Department of Communications Compliance Statement

**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. 60950-1.

## FCC Information

1. Use the attached specified cables with the MultiSync LCD2190UXi or the SpectraView 2190 colour monitor so as not to interfere with radio and television reception.
   (1) The power supply cord you use must have been approved by and comply with the safety standards of U.S.A., and meet the following condition.

| | |
|---|---|
| Power supply cord<br>Length<br>Plug shape | Non shield type, 3-conductor<br>2.0 m<br>  <br>U.S.A |

   (2) Please use the supplied shielded video signal cable, 15-pin mini D-SUB to DVI-A cable or 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 Conformity

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions. (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

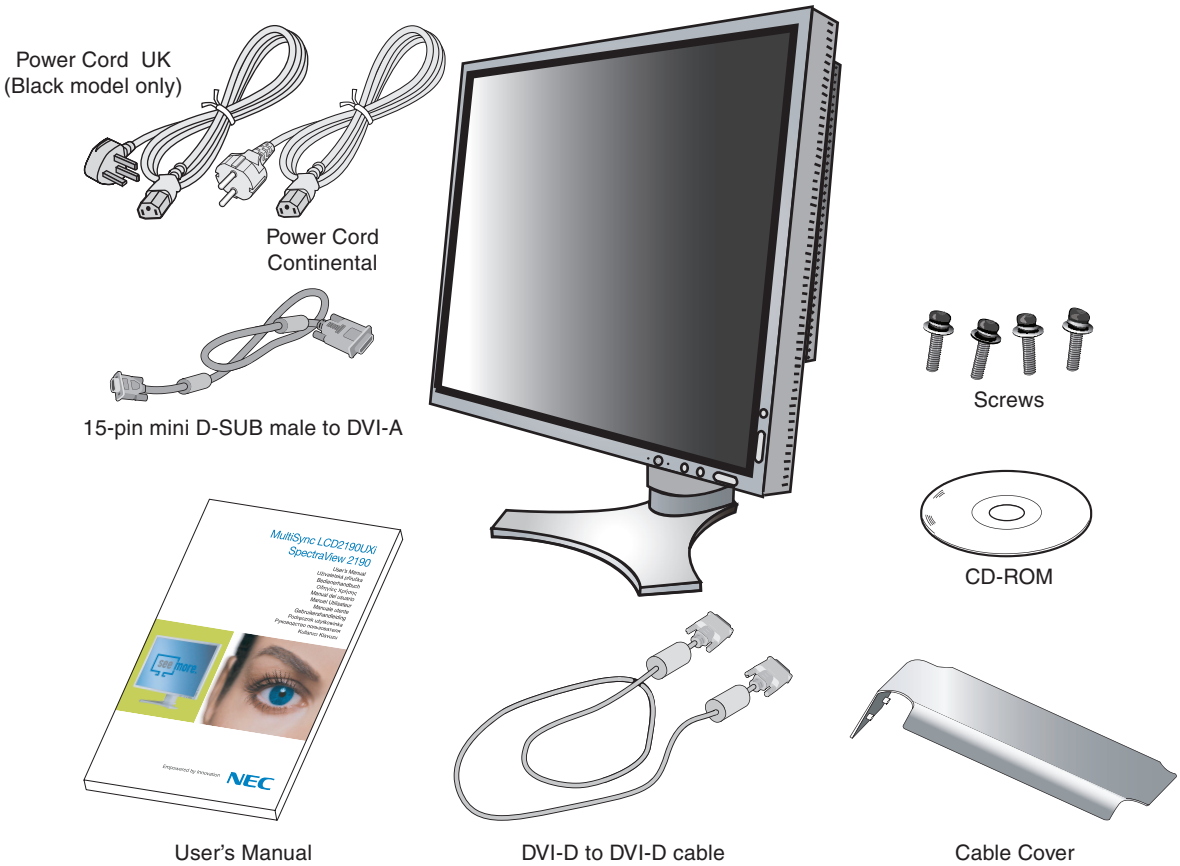
| | |
|---|---|
| **U.S. Responsible Party:** | **NEC Display Solutions of America, Inc.** |
| **Address:** | **500 Park Blvd, Suite 1100**<br>**Itasca, Illinois 60143** |
| **Tel. No.:** | **(630) 467-3000** |
| Type of Product: | Display Monitor |
| Equipment Classification: | Class B Peripheral |
| Models: | MultiSync LCD2190UXi and SpectraView 2190 (L215GV) |

*We hereby declare that the equipment specified above conforms to the technical standards as specified in the FCC Rules.*

# Contents

Your new NEC monitor box* should contain the following:

- MultiSync LCD2190UXi or SpectraView 2190 monitor with tilt/swivel/pivot/height adjust stand
- Power Cord (European Continental)
- Power Cord (UK: Black model only)
- Video Signal Cable (15-pin mini D-SUB male to DVI-A)
- Video Signal Cable (DVI-D to DVI-D cable)
- User's Manual
- CD-ROM
- Cable Cover
- Screw (x 4) (to mount the monitor to a flexible arm (page 7))




**NOTE:** This monitor can be equipped with optional loudspeakers: "MultiSync Sound bar". Please ask your dealer or check our website http://www.nec-display-solutions.com

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

# Quick Start

To attach the LCD monitor to your system, follow these instructions:

1. Turn off the power to your computer.
2. **For the PC or MAC with DVI digital output:** Connect the DVI signal cable to the connector of the display card in your system (**Figure A.1**). Tighten all screws.

   **For the PC with Analog output:** Connect the 15-pin mini D-SUB to DVI-A signal cable to the connector of the display card in your system (**Figure A.2**).

   **For the MAC:** Connect the Macintosh cable adapter to the computer, then attach the 15-pin mini D-SUB signal cable to the Macintosh cable adapter (**Figure B.1**).

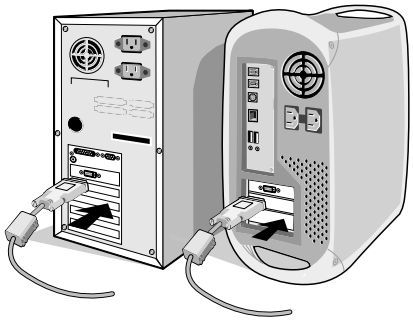


**Figure A.1**

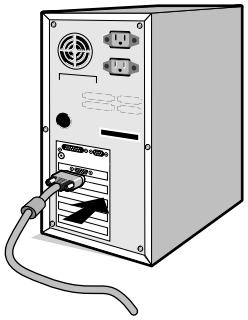


**Figure A.2**

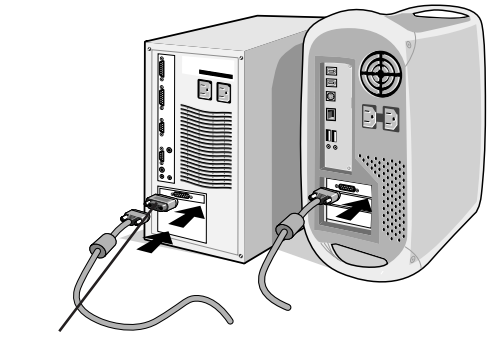



**Figure B.1**

**NOTE:** Some Macintosh systems do not require a Macintosh cable adapter.

3. Place hands on each side of the monitor to tilt the LCD panel 30-degree angle and lift up to the highest position (**Figure C.1**).
4. Connect all cables to the appropriate connectors (**Figure C.1**).

**NOTE:** Incorrect cable connections may result in irregular operation, damage display quality/components of LCD module and/or shorten the module's life.

5. To keep the cables neatly organized, place them into the cable management system that is built into the stand.

   Place the D-Sub cable (not included) and the power cable into the specific hooks as indicated (**Figure C.2**).

   Place the DVI cable and the 15-pin mini D-Sub to DVI-A cable into the hooks as indicated (**Figure C.3**).

   When using the monitor in Portrait mode, place the DVI cable and the 15-pin mini D-Sub to DVI-A cable into the hooks as indicated (**Figure C.4**).
6. Make sure all cables are resting flat against the stand (**Figure C.3**).

   Please check Tilt, Rise and Lower monitor screen and screen rotation when you manage cables.

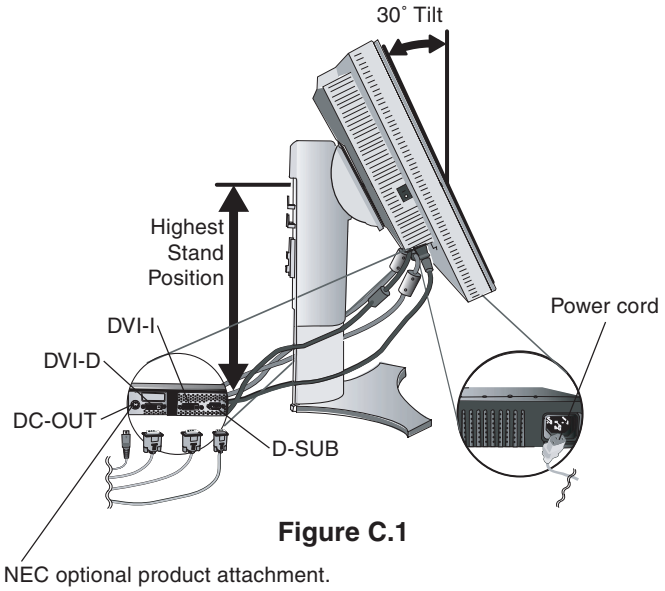



**Figure C.1**

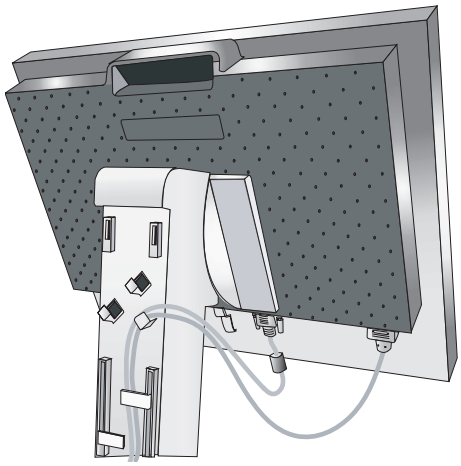


**Figure C.2**

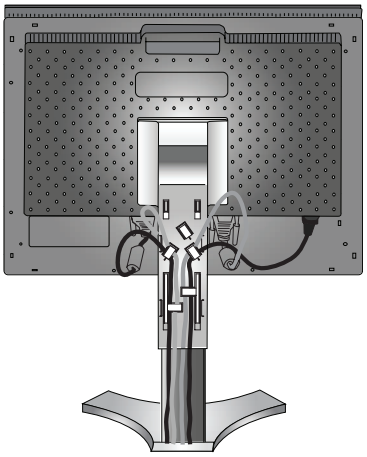


**Figure C.3**

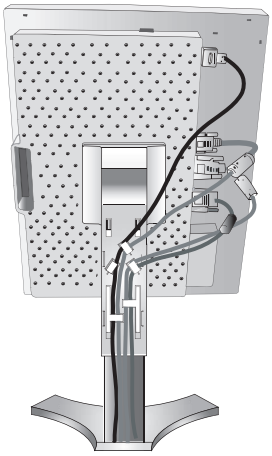


**Figure C.4**

7. Hold all cables firmly and place the cable cover onto the stand (**Figure D.1**). To remove the cable cover, lift the cover off as shown in **Figure D.2**.
8. 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.

**NOTE:** Please refer to Caution section of this manual for proper selection of AC power cord.

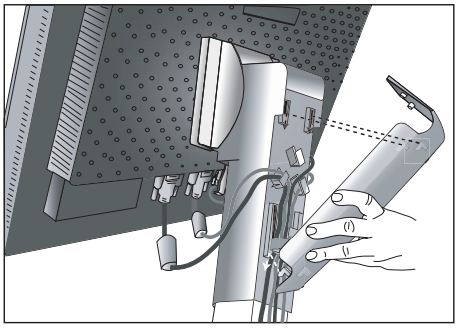


**Figure D.1**

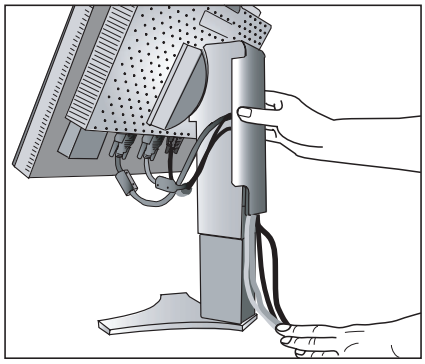


**Figure D.2**

9. The Vacation Switch on the left side of the monitor must be turned on. Turn on the monitor with the front power button (**Figure E.1**) and the computer.

**NOTE:** The Vacation Switch is a true on/off switch. If this switch is on the OFF position, the monitor cannot be turned on using the front button. DO NOT switch on/off repeatedly.

10. No-touch auto adjust automatically adjusts the monitor to optimal settings upon initial setup for most timings. For further adjustments, use the following OSM controls:
    - Auto Contrast (Analog input only)
    - Auto Adjust (Analog input only)

    Refer to the **Controls** section of this User's Manual for a full description of these OSM controls.

**NOTE:** If you have any problems, please refer to the **Troubleshooting** section of this User's Manual.

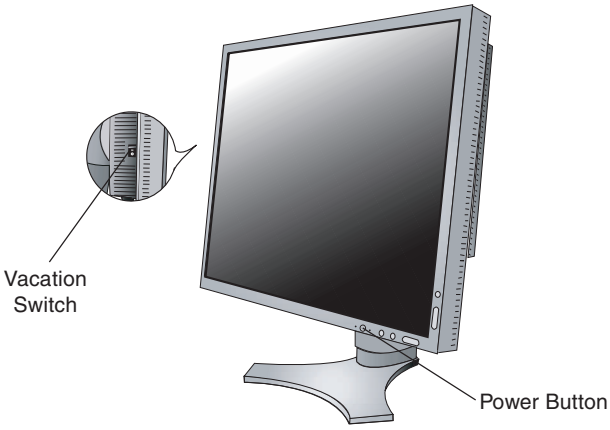



**Figure E.1**

## Raise and Lower Monitor Screen

The monitor may be raised or lowered in either Portrait or Landscape mode.
To raise or lower screen, place hands on each side of the monitor and lift or lower to the desired height (**Figure RL.1**).

**NOTE:** Handle with care when raising or lowering the monitor screen.

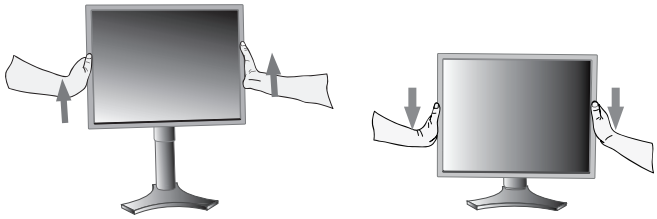


**Figure RL.1**

## Screen Rotation

Before rotating, the screen must be raised to the highest level to avoid knocking the screen on the desk or pinching with your fingers.
To raise the screen, place hands on each side of the monitor and lift up to the highest position (**Figure RL.1**).
To rotate screen, place hands on each side of the monitor screen and turn clockwise from Landscape to Portrait or counter-clockwise from Portrait to Landscape (**Figure R.1**).
To rotate OSM menu between landscape and portrait, refer to “Controls” section.

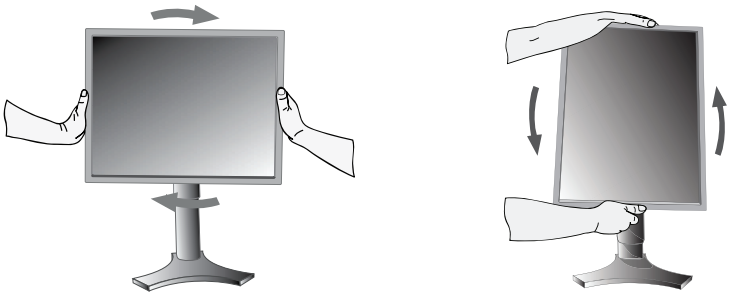


**Figure R.1**

## Tilt

Grasp top and bottom sides of the monitor screen with your hands and adjust the tilt as desired (**Figure TS.1**).

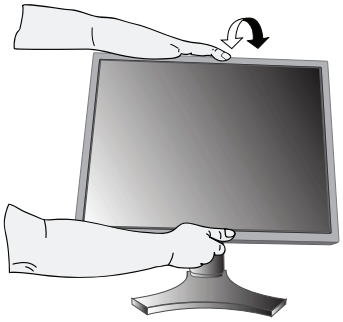


**Figure TS.1**

## Swivel

Grasp both sides of the monitor screen with your hands and adjust the swivel as desired (**Figure TS.2**).

**Figure TS.2**

**NOTE:** Handle with care when tilting the monitor screen.

## Remove Monitor Stand for Mounting

To prepare the monitor for alternate mounting purposes:

1. Disconnect all cables.
2. Place hands on each side of the monitor and lift up to the highest position.
3. Place monitor face down on a non-abrasive surface (**Figure S.1**).

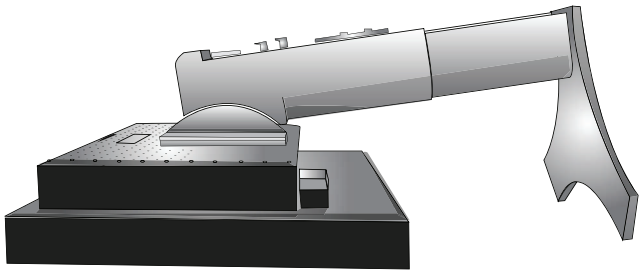


**Figure S.1**

4. Place one hand around the base and one hand on the Quick Release Lever. Move the Quick Release Lever in the direction indicated by the arrows (**Figure S.2**).
5. Lift up the bottom of the stand to unhook it from the monitor (**Figure S.3**). The monitor can now be mounted using and alternate method. Reverse process to reattach stand.

**NOTE:** Use only VESA-compatible alternative mounting method (100 mm pitch).

**NOTE:** Handle with care when removing monitor stand.

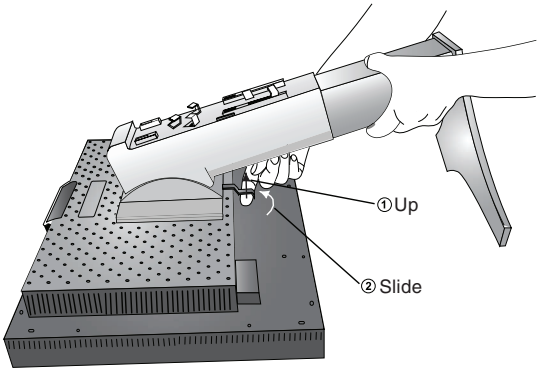



**Figure S.2**

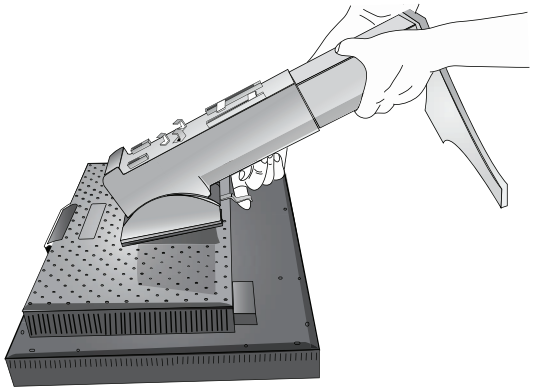


**Figure S.3**

## Flexible Arm Installation

This LCD monitor is designed for use with a flexible arm.

1. Follow the instructions on how Remove Monitor Stand for Mounting to remove the stand.
2. Using the 4 screws from the stand removal and attach the arm to the monitor (**Figure F.1**).

**Caution:** Use ONLY the screws (4 pcs) that are included when mounting to avoid damage to the monitor and stand. To fulfil the safety requirements the monitor must be mounted to an arm which guaranties the necessary stability under consideration of the weight of the monitor. The LCD monitor should only be used with an approved arm (e.g. GS mark).

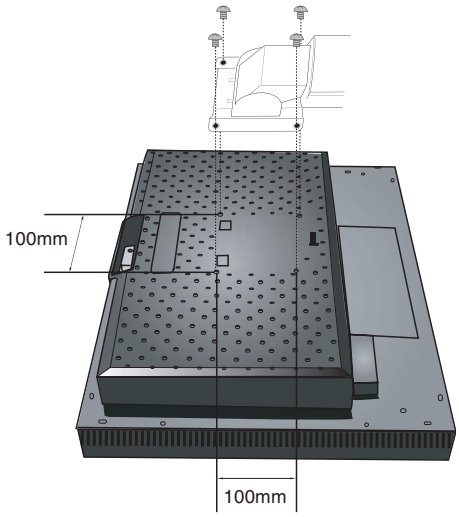


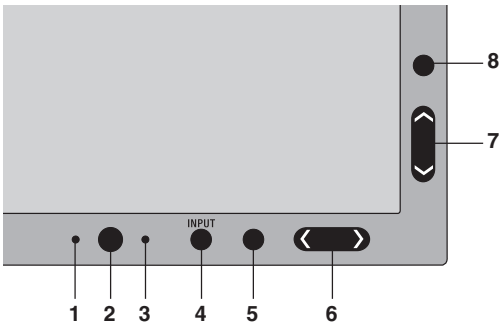

**Figure F.1**

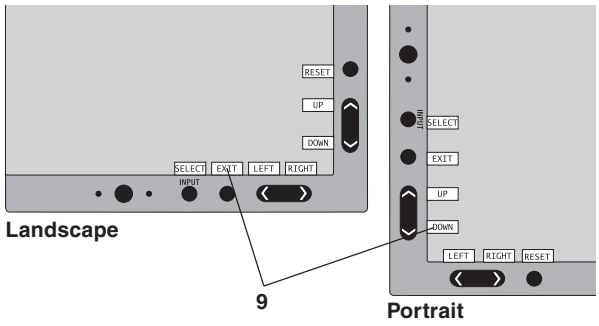
# Controls

## OSM (On-Screen Manager) control buttons on the front of the monitor function as follows:

To access OSM menu, press any of the control buttons (EXIT, LEFT, RIGHT, UP, DOWN).
To change signal input, press the SELECT button.

**NOTE:** OSM must be closed in order to change signal input.




| | |
|---|---|
| 1 AMBIBRIGHT SENSOR | Detects the level of ambient lighting allowing the monitor to make adjustments to various settings resulting in a more comfortable viewing experience. Do not cover this sensor. |
| 2 POWER | Turns the monitor on and off. |
| 3 LED | Indicates that the power is on.<br>Can be changed between blue and green in the Advanced OSM Control menu. |
| 4 INPUT/SELECT | Enters the OSM Control menu. Enters OSM sub menus.<br>Changes the input source when not in the OSM Control menu. |
| 5 EXIT | Exits the OSM sub menu. Exits OSM Control menu. |
| 6 LEFT/RIGHT | Navigates to the left or right through the OSM Control menu. |
| 7 UP/DOWN | Navigates up or down through the OSM Control menu. |
| 8 RESET/ROTATE OSM | Resets the OSM back to factory settings.<br>When pressed when the OSM is not showing, rotates the OSM Control menu between portrait and landscape mode (Page 22, Tag9 “OSM ROTATION”).* |
| 9 KEY GUIDE | The Key Guide appears on screen when the OSM control menu is accessed.<br>The Key Guide will rotate when the OSM control menu is rotated. |

* The “LEFT/RIGHT” and “UP/DOWN” buttons functionality is interchangeable depending on the orientation (landscape/portrait) of the OSM.

## Brightness/Contrast Controls

### BRIGHTNESS

Adjusts the overall image and background screen brightness.

### CONTRAST

Adjusts the image brightness in relation to the background.

### AUTO CONTRAST (Analog input only)

Adjusts the image displayed for non-standard video inputs.

### ECO MODE

Decreases the amount of power consumed by reducing the brightness level.

**1:** Decreases the brightness by 25%.

**2:** Decreases the brightness by 50%.

**CUSTOM:** Decreases the brightness level as determined by the user.
Refer to the Advanced OSM menu for custom setting instructions.

### AUTO BRIGHTNESS

There are three settings for Auto Brightness.

**OFF:** No function.

**1:** Adjusts the brightness automatically, by detecting the brightness level of your environment and adjusting the monitor with the best BRIGHTNESS setting*1.

**2:** Adjusts the brightness automatically for the best BRIGHTNESS setting based on the white display area. The environmental brightness sensor (Ambibright sensor) has no function.

**NOTE:** Do not cover environmental brightness sensor (Ambibright sensor).

*1: Please refer to Page 25 for full “Auto Brightness” information.

### BLACK LEVEL

Adjust the black level.

## Auto Adjust (Analog input only)

Automatically adjusts the Image Position and H. Size settings and Fine settings.

## Image Controls

### LEFT / RIGHT

Controls Horizontal Image Position within the display area of the LCD.

### DOWN / UP

Controls Vertical Image Position within the display area of the LCD.

### H.SIZE (V.SIZE) (Analog input only)

Adjusts the horizontal size by increasing or decreasing this setting.

If the “AUTO Adjust function” do not give you a satisfactory picture setting, a further tuning can be performed using the “H.Size (or V.Size)” function (dot clock). For this a Moiré test pattern could be used. This function may alter the width of the picture. Use Left/Right Menu to center the image on the screen. If the H.Size (or V.Size) is wrongly calibrated, the result would look like on the left drawing. The image should be homogeneous.

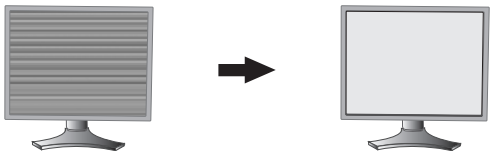
When H.SIZE value is wrong. | When H.SIZE value is improved. | When H.SIZE value is correct.

### FINE (Analog input only)

Improves focus, clarity and image stability by increasing or decreasing this setting.

If the “Auto Adjust function” and the “H.Size” function do not give you a satisfactory picture setting, a fine tuning can be performed using the “Fine” function.

For this a Moiré test pattern could be used. If the Fine value is wrongly calibrated, the result would look like on the left drawing. The image should be homogeneous.



When FINE value is wrong. | When FINE value is correct.

## AUTO FINE (Analog input only)

This function automatically and periodically adjusts the “FINE” setting for change in signal condition.
This function adjusts approximately every 33 minutes.

## EXPANSION

Sets the zoom method.

**FULL:** The image is expanded to 1600 x 1200, regardless of the resolution.

**ASPECT:** The image is expanded without changing the aspect ratio.

**OFF:** The image is not expanded.

**CUSTOM:** Refer to the ADVANCED OSM Controls menu section of the user’s manual for detailed instructions.

# Color Control Systems

**Colour Control Systems:** Seven preset colour settings.
For preset settings 1, 2, 3, and 5, the following levels can be adjusted:
**TEMPERATURE:** Adjust the white temperature by increasing or decreasing this setting. A lower colour temperature will make the screen reddish and a higher colour temperature will make the screen bluish.
**WHITE (White Balance)**: If TEMPERATURE needs further adjustment, the individual R/ G/ B/ levels of the white point can be adjusted. To adjust the R/G/B levels, CUSTOM must be showing as the TEMPERATURE selection.
**HUE:** Adjusts the hue of each colour*1. The change in colour will appear on screen and the menu colour bars will show the amount of adjustment.
**SATURATION:** Adjusts the colour depth of each colour*1. Press the “RIGHT” button and the colour vividness increases.
**OFFSET:** Adjusts the colour brightness of each colour*1. Press “RIGHT” button and the colour Brightness increases.
*1: RED, YELLOW, GREEN, CYAN, BLUE and MAGENTA.

**NATIVE, sRGB:** Original colour presented by the LCD panel that is unadjustable.

**PROGRAMMABLE:** The colour tone that was set up with the downloaded application software is reflected.

**NOTE:** To reset a poor image setting, turn on the monitor by using front power button while holding “RESET” and “SELECT” buttons at the same time.

# Tools 1

## SHARPNESS

This function is digitally capable to keep crisp image at any timings. It is continuously adjustable to get distinct image or soft one as you prefer, and set independently by different timings.

## DVI SELECTION

This function selects the DVI input mode (DVI-I). When the DVI selection has been changed, the computer has to be restarted.

**AUTO:** By using the DVI-D to DVI-D cable, the DVI SELECTION is DIGITAL.
By using the D-SUB to DVI-A cable, the DVI SELECTION is ANALOG.

**DIGITAL:** DVI digital input is available.

**ANALOG:** DVI analog input is available.

**NOTE:** For the MAC with digital output: Before turning on the MAC, the DVI Input mode must be set to DIGITAL in “DVI SELECTION” of OSM by pressing “SELECT” button then “CONTROL” button when the DVI signal cable is connected to the DVI-I connector (DVI-I) of the monitor. Otherwise the MAC may not turn on.

**NOTE:** Depending on the PC and Video card used, or when another Video signal cable is attached, this function may not operate.

## VIDEO DETECT

Selects the method of video detection when more than one computer is connected.

**FIRST:** The video input has to be switched to “FIRST” mode. When current video input signal is not present, then the monitor searches for a video signal from the other video input port. If the video signal is present in the other port, then the monitor switches the video source input port to the new found video source automatically. The monitor will not look for other video signals while the current video source is present.

**LAST:** The video input has to be switched to the “LAST” mode. When the monitor is displaying a signal from the current source and a new secondary source is supplied to the monitor, then the monitor will automatically switch to the new video source. When current video input signal is not present, then the monitor searches for a video signal from the other video input port. If the video signal is present in the other port, then the monitor switches the video source input port to the new found video source automatically.

**NONE:** The Monitor will not search the other video input port unless the monitor is turned on.

## OFF TIMER

Monitor will automatically power-down when the end user has selected a pre-determined amount of time. Before powering off, a message will appear on the screen asking the user if they want to delay the turn off time by 60 minutes. Press any OSM button to delay the turn off time.

## IPM

The Intelligent Power Manager allows the monitor to enter into a power saving mode after a period of inactivity.

The IPM has three settings.

**OFF:** Monitor does not go into power save mode when the input signal is lost.

**STANDARD:** Monitor enters power save mode automatically when the input signal is lost.

**OPTION:** Monitor enters power save mode automatically when the amount of surrounding light goes below the level that is determined by the user. The level can be adjusted in Tag 7 of the Advanced OSM Control menu.

When in power save mode, the LED on the front of the monitor blinks amber. While in power save mode, push any of the front buttons, except for POWER and SELECT to return to normal.

When the amount of surrounding light returns to normal levels, the monitor will automatically return to normal mode.

## COLORCOMP

This function electronically compensates for the slight variations in the white uniformity level, as well as for deviations in color that may occur throughout the display area of the screen. These variations are characteristic of LCD panel technology. This function improves the colour and evens out the luminance uniformity of the display.

**NOTE:** Using the COLORCOMP feature reduces the overall peak luminance of the display. If greater luminance is desired over the uniform performance of the display, then COLORCOMP should be turned off.

# MENU Tools

## LANGUAGE

OSM control menus are available in eight languages.

## OSM LEFT/RIGHT

You can choose where you would like the OSM control image to appear on your screen. Selecting OSM Location allows you to manually adjust the position of the OSM control menu left or right.

## OSM DOWN/UP

You can choose where you would like the OSM control image to appear on your screen. Selecting OSM Location allows you to manually adjust the position of the OSM control menu Up or Down.

## OSM TURN OFF

The OSM control menu will stay on as long as it is use. You can select how long the monitor waits after the last touch of a button to shut off the OSM control menu. The preset choices are 10-120 seconds by 5 seconds step.

## OSM LOCK OUT

This control completely locks out access to all OSM control functions. When attempting to activate OSM controls while in the Lock Out mode, a screen will appear indicating the OSM controls are locked out.

There are four types of OSM LOCK OUT:

OSM LOCK OUT with BRIGHTNESS and CONTRAST control: To activate the OSM Lock Out function, press SELECT, then “UP” button and hold down simultaneously. To deactivate the OSM Lock Out, press SELECT, then “UP” button and hold down simultaneously while in the OSM menu. BRIGHTNESS and CONTRAST can be adjusted while in the lock out mode.

OSM LOCK OUT with no control: To activate the OSM Lock Out function, press SELECT, then “Right” button and hold down simultaneously. To deactivate the OSM Lock Out, press SELECT, then “Right” button and hold down simultaneously while in the OSM menu. No controls can be adjusted while in the lock out mode.

OSM LOCK OUT with BRIGHTNESS (only) control: To activate the OSM Lock Out function, press SELECT, then “Down” and “Left” buttons and hold down simultaneously. To deactivate the OSM Lock Out, press SELECT, then “Down” and “Left” buttons and hold down simultaneously while in the OSM menu. BRIGHTNESS can be adjusted while in the lock out mode.

CUSTOM: Refer to the Advanced OSM Menu.

## OSM TRANSPARENCY

Adjusts the transparency of the OSM Menu.

## OSM COLOR

“Tag window frame color”, “Item select color” and “Adjust window frame color” can be changed to Red, Green, Blue, or Gray.

### RESOLUTION NOTIFIER

This optimal resolution is 1600 x 1200. If ON is selected, a message will appear on the screen after 30 seconds, notifying you that the resolution is not at 1600 x 1200.

### HOT KEY

You can adjust the brightness and contrast directly. When this function is set to ON, you can adjust the brightness with “Left” or “Right”, contrast with “Down” or “Up” buttons, while the OSM menu is off. The standard OSM can be accessed with the EXIT button.

### FACTORY PRESET

Selecting Factory Preset allows you to reset all OSM control settings (BRIGHTNESS, CONTRAST, ECOMODE, AUTO BRIGHTNESS, BLACK LEVEL, IMAGE CONTROL, COLOR CONTROL SYSTEM, SHARPNESS, OFF TIMER, IPM, OSM LEFT/RIGHT, OSM UP/DOWN, OSM TURN OFF, OSM TRANSPARENCY) back to the factory settings. Individual settings can be reset by highlighting the control to be reset and pressing the RESET button.

## Information

Provides information about the current resolution display and technical data including the preset timing being used and the horizontal and vertical frequencies. Indicates the model and serial numbers of your monitor.

## OSM Warning

OSM Warning menus disappear with Exit button.

**NO SIGNAL:** This function gives a warning when there is no Horizontal or Vertical Sync. After power is turned on or when there is a change of input signal, the **No Signal** window will appear.

**RESOLUTION NOTIFIER:** This function gives a warning of use with optimized resolution. After power is turned on or when there is a change of input signal or the video signal doesn’t have proper resolution, the **Resolution Notifier** window will open. This function can be disabled in the TOOL menu.

**OUT OF RANGE:** This function gives a recommendation of the optimized resolution and refresh rate. After the power is turned on or there is a change of input signal or the video signal doesn’t have proper timing, the **Out Of Range** menu will appear.

**NOTE:** It is possible to change the DVI SELECTION or to change the IPM settings while the “NO SIGNAL” or “OUT OF RANGE” messages are displayed.

For advanced user menu see “Appendix”.

# Recommended use

**Safety Precautions and Maintenance**

FOR OPTIMUM PERFORMANCE, PLEASE NOTE
THE FOLLOWING WHEN SETTING UP AND
USING THE LCD COLOUR MONITOR:

- **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 monitor 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 a sloping or unstable cart, stand or table, as the monitor may fall, causing serious damage to the monitor.
- Do not place any objects onto the monitor and do not use the monitor outdoors.
- The inside of the fluorescent tube located within the LCD monitor 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 temperatured, humid, dusty, or oily areas.
- Do not cover vent on monitor.
- If monitor or glass is broken, do not come in contact with the liquid crystal and handle with care.

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.

CAUTION

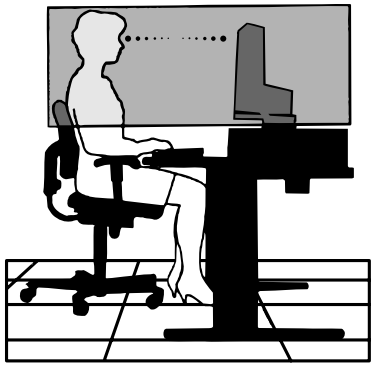
- Allow adequate ventilation around the monitor so that heat can properly dissipate. Do not block ventilated openings or place the monitor near a radiator or other heat sources. Do not put anything on top of monitor.
- The power cable connector is the primary means of detaching the system from the power supply. The monitor should be installed close to a power outlet which is easily accessible.
- Handle with care when transporting. Save packaging for transporting.

**Image Persistence:** Image persistence is when a residual or “ghost” image of a previous image remains visible on the screen. Unlike CRT monitors, LCD monitors’ 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 monitor for as long as the previous image was displayed. For example, if an image was on the monitor for one hour and a residual image remains, the monitor should be turned off for one hour to erase the image.

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

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



- For optimum performance, allow 20 minutes for warm-up.
- Adjust the monitor 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 monitor no closer than 40 cm and no further away than 70 cm from your eyes. The optimal distance is 50 cm.
- Rest your eyes periodically by focusing on an object at least 20 feet away. Blink often.
- Position the monitor 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.
- If reflected light makes it hard for you to see your screen, use an anti-glare filter.
- Clean the LCD monitor surface with a lint-free, non-abrasive cloth. Avoid using any cleaning solution or glass cleaner!
- Adjust the monitor's brightness and contrast controls to enhance readability.
- Use a document holder placed close to the screen.
- 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).
- Get regular eye checkups.

**Ergonomics**

To realize the maximum ergonomics benefits, we recommend the following:

- Adjust the Brightness until the background raster disappears.
- Do not position the Contrast control to its maximum setting.
- Use the preset Size and Position controls with standard signals.
- Use the preset Colour Setting.
- Use non-interlaced signals with a vertical refresh rate more than 60 Hz.
- Do not use primary colour blue on a dark background, as it is difficult to see and may produce eye fatigue to insufficient contrast.

**Cleaning the LCD Panel**

- When the liquid crystal panel is stained with dust or dirt, please wipe with soft cloth gently.
- Please do not rub the LCD panel with hard material.
- Please do not apply pressure to the LCD surface.
- Please do not use OA cleaner it will cause deterioration or discolor on the LCD surface.

**Cleaning the Cabinet**

- Unplug the power supply
- Gently wipe the cabinet with a soft cloth
- To clean the cabinet, dampen the cloth with a neutral detergent and water, wipe the cabinet and follow with a dry cloth.

**NOTE:** Many plastics are used on the surface of the cabinet. DO NOT clean with benzene, thinner, alkaline detergent, alcoholic system detergent, glass cleaner, wax, polish cleaner, soap powder, or insecticide. Do not touch rubber or vinyl to the cabinet for a long time. These types of fluids and fabrics can cause the paint to deteriorate, crack or peel.

# Specifications

| Monitor Specifications | MultiSync LCD2190UXi and SpectraView 2190 Monitor | Notes |
|---|---|---|
| LCD Module Diagonal:<br>Viewable Image Size:<br>Native Resolution (Pixel Count): | 54 cm/21.3 inches<br>54 cm/21.3 inches<br>1600 x 1200 | Active matrix; thin film transistor (TFT) liquid crystal display (LCD); 0.270 mm dot pitch; 250 cd/m$^2$ white luminence; 500:1 contrast ratio, typical. |
| Input Signal Video:<br>Sync: | ANALOG 0.7 Vp-p/75 Ohms<br>Separate sync.TTL Level<br>Horizontal sync. Positive/Negative<br>Vertical sync. Positive/Negative<br>Composite sync. Positive/Negative<br>Sync on Green (Video 0.7V p-p and | Digital Input: DVI<br><br><br><br><br>Sync Negative 0.3V p-p) |
| Display Colours | 16,777,216 | Depends on display card used. |
| Synchronization Range Horizontal:<br>Vertical: | 31.5 kHz to 91.1 kHz, 99.4 kHz*2<br>50 Hz to 85 Hz | Automatically<br>Automatically |
| Viewing Angle Left/Right:<br>Up/Down: | ±89° (CR > 10)<br>±89° (CR > 10) | |
| Image Formation Time | 20 ms (Typ.) | 10 ms (Gray to gray Typ) |
| Resolutions Supported | 720 x 400*1 at 70 Hz to 85 Hz<br>640 x 480*1 at 60 Hz to 85 Hz<br>800 x 600*1 at 56 Hz to 85 Hz<br>832 x 624*1 at 75 Hz<br>1024 x 768*1 at 60 Hz to 85 Hz<br>1152 x 864*1 at 70 Hz to 85 Hz<br>1152 x 870*1 at 75 Hz<br>1280 x 960*1 at 60 Hz<br>1280 x 1024*1 at 60 Hz to 85 Hz<br>1200 x 1600*1 at 60 Hz<br>1600 x 1200 at 60 Hz..... | Some systems may not support all modes listed.<br><br><br><br><br><br><br><br><br>NEC DISPLAY SOLUTIONS cites recommended resolution for optimal display performance. |
| Active Display Area Landscape: Horiz.:<br>Vert.:<br>Portrait: Horiz.:<br>Vert.: | 432 mm/17.0 inches<br>324 mm/12.8 inches<br>324 mm/12.8 inches<br>432 mm/17.0 inches | |
| Power Supply | AC 100-240 V ~ 50/60 Hz | |
| Current Rating | 0.68 - 0.29 A (with Option) | |
| Dimensions Landscape:<br><br>Portrait:<br><br>Height Adjustment: | 464.8 mm (W) x 424.8 - 574.8 mm (H) x 247.3 mm (D)<br>18.3 inches (W) x 16.7 - 22.6 inches (H) x 9.7 inches (D)<br>358.6 mm (W) x 477.9 - 627.9 mm (H) x 247.3 mm (D)<br>14.1 inches (W) x 18.8 - 24.7 inches (H) x 9.7 inches (D)<br>150 mm / 5.9 inches (Landscape) | |
| Weight | 10.9 kg (24.0 lbs) | |
| Environmental Considerations<br>Operating Temperature:<br>Humidity:<br>Altitude:<br>Storage Temperature:<br>Humidity:<br>Altitude: | <br>5°C to 35°C/41°F to 95°F<br>30% to 80%<br>0 to 10,000 Feet/0 to 3,048 m<br>-10°C to 60°C/14°F to 140°F<br>10% to 85%<br>0 to 40,000 Feet/0 to 12,192 m | |

*1 Interpolated Resolutions: When resolutions are shown that are lower than the pixel count of the LCD module, text may appear different. This is normal and necessary for all current flat panel technologies when displaying non-native resolutions full screen. In flat panel technologies, each dot on the screen is actually one pixel, so to expand resolutions to full screen, an interpolation of the resolution must be done.
*2 1200 x 1600 resolution only.

**NOTE:** Technical specifications are subject to change without notice.

# Features

**Ambix3 Technology:** Triple input technology allowing up to 3 input sources to be connected to a single monitor. The DVI-I connector supports both analog and digital input signals. Legacy analog input is supported using a traditional 15-pin VGA connector. Ambix3 provides traditional technology compatibility for analog as well as DVI-based digital compatibility for digital inputs. DVI-based digital interfaces include DVI-D, DFP and P&D.

**DVI-I:** The integrated interface ratified by the Digital Display Working Group (DDWG) that allows both digital and analog connectors off of one port. The "I" stands for integration for both digital and analog, The digital portion is DVI-based.

**DVI-D:** The digital-only subset of DVI ratified by the Digital Display Working Group (DDWG) for digital connections between computers and displays. As a digital-only connector, analog support is not provided off a DVI-D connector. As a DVI-based digital only connection, only a simple adapter is necessary for compatibility between DVI-D and other DVI-based digital connectors such as DFP and P&D.

**DFP (Digital Flat Panel):** An all-digital interface for flat panel monitors which is signal compatible with DVI. As a DVI-based digital only connection, only a simple adapter is necessary for compatibility between DFP and other DVI-based digital connectors such as DVI and P&D.

**P&D (Plug and Display):** The VESA standard for digital flat panel monitor interfaces. It is more robust than DFP since it allows for other options off a signal connector (options like USB, analog video and IEEE-1394-995). The VESA committe has recognized that DFP is a subset of P&D. As a DVI-based connector (for the digital input pins), only a simple adapter is necessary for compatibility between P&D and other DVI-based digital connector such as DVI and DFP.

**Pivoting Stand:** Allows users to adjust the monitor to the orientation that best fits their application, either Landscape orientation for wide documents, or portrait orientation for the ability to preview a full page on one screen at one time. The Portrait orientation is also perfect for full screen video conferencing.

**Reduced Footprint:** Provides the ideal solution for environments requiring superior image quality but with size and weight limitations. The monitor's small footprint and low weight allow it to be moved or transported easily from one location to another.

**Color Control Systems:** Allows you to adjust the colours on your screen and customize the colour accuracy of your monitor to a variety of standards.

**OmniColor:** Combines Six-axis colour control and the sRGB standard. Six-axis colour control permits colour adjustments via six axes (R, G, B, C, M and Y) rather than through the three axes (R, G and B) previously available. The sRGB standard provides the monitor with a uniform colour profile. This assures that the colours displayed on the monitor are exactly the same as on the colour printout (with sRGB supporting operating system and sRGB printer). This allows you to adjust the colours on your screen and customise the colour accuracy of your monitor to a variety of standards.

**OSM (On-Screen Manager) Controls:** Allow you to quickly and easily adjust all elements of your screen image via simple to use on-screen menus.

**ErgoDesign Features:** Enhance human ergonomics to improve the working environment, protect the health of the user and save money. Examples include OSM controls for quick and easy image adjustments, tilt base for preferred angle of vision, small footprint and compliance with MPRII and TCO guidelines for lower emissions.

**Plug and Play:** The Microsoft® solution with the Windows® 95/98/2000/Me/XP operating system facilitates setup and installation by allowing the monitor to send its capabilities (such as screen size and resolutions supported) directly to your computer, automatically optimizing display performance.

**IPM (Intelligent Power Manager) System:** Provides innovative power-saving methods that allow the monitor to shift to a lower power consumption level when on but not in use, saving two-thirds of your monitor energy costs, reducing emissions and lowering the air conditioning costs of the workplace.

**Multiple Frequency Technology:** Automatically adjusts monitor to the display card's scanning frequency, thus displaying the resolution required.

**FullScan Capability:** Allows you to use the entire screen area in most resolutions, significantly expanding image size.

**Wide Viewing Angle Technology:** Allows the user to be able to see the monitor from any angle (178 degrees) from any orientation — Portrait or Landscape. Provides full 178° viewing angles either up, down, left or right.

**VESA Standard Mounting Interface:** Allows users to connect their MultiSync monitor to any VESA standard third party mounting arm or bracket. Allows for the monitor to be mounted on a wall or an arm using any third party compliant device.

**NaViSet:** Is a ground-breaking software family, developed by NEC Display Solutions Europe GmbH, providing intuitive access to all monitor setting controls and remote diagnosis via the Windows interface, based upon the VESA standard, DDC/CI. Using a standard VGA or DVI signal cable, NaViSet can either benefit single users or, with NaViSet Administrator, can reduce the Total Cost of Ownership through remote network-wide maintenance, diagnosis and asset-reporting.

**CableComp** automatic long cable compensation prevents image quality degradation caused by long cable lengths.

**No-touch Auto Adjust (Analog input only):** No-touch auto adjust automatically adjusts the monitor to optimal settings upon initial setup.

**sRGB Color Control:** A new optimized colour management standard which allows for colour matching on computer displays and other peripherals. The sRGB, which is based on the calibrated colour space, allows for optimal colour representation and backward compatibility with other common colour standards.

**ColorComp:** This feature compensates for slight variations in the white uniformity level that may occur on the screen and improves the colour and evens out the luminance uniformity of the display.

**Over Drive:** Improved gray to gray response.

**Adjustable stand with pivot capability:** Adds flexibility to your viewing preferences.

**Quick Release stand:** Allows fast removal.

**AmbiBright technology:** Automatically adjusts the backlight level depending on the level of ambient lighting.

# Troubleshooting

**No picture**

- The signal cable should be completely connected to the display card/computer.
- The display card should be completely seated in its slot.
- Check the Vacation Switch should be in the ON position.
- Front Power Switch and computer power switch should be in the ON position.
- Check to make sure that a supported mode has been selected on the display card or system being used. (Please consult display card or system manual to change graphics mode.)
- Check the monitor and your display card with respect to compatibility and recommended settings.
- Check the signal cable connector for bent or pushed-in pins.
- Check the signal input, “DVI-D”, “DVI-I” or “D-Sub”.
- Ensure the DVI input mode is set to DIGITAL when the MAC digital output is connected to the DVI-I connector.
- If the front LED is blinking amber, check the status of the IPM mode (see page 11).

**Power Button does not respond**

- Unplug the power cord of the monitor from the AC outlet to turn off and reset the monitor.
- Check the Vacation Switch on the left side of the monitor.

**Image Persistence**

- Image persistence is when a residual or “ghost” image of a previous image remains visible on the screen. Unlike CRT monitors, LCD monitors’ 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 monitor for as long as the previous image was displayed. For example, if an image was on the monitor for one hour and a residual image remains, the monitor should be turned off for one hour to erase the image.

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

**Message “OUT OF RANGE” is displayed (screen is either blank or shows rough images only)**

- Image is displayed only roughly (pixels are missing) and OSM warning “OUT OF RANGE” is displayed: Either signal clock or resolution is too high. Choose one of the supported modes.
- OSM warning “OUT OF RANGE” is displayed on a blank screen: Signal frequency is out of range. Choose one of the supported modes.

**Image is unstable, unfocused or swimming is apparent**

- Signal cable should be completely attached to the computer.
- Use the OSM Image Adjust controls to focus and adjust display by increasing or decreasing the fine total. When the display mode is changed, the OSM Image Adjust settings may need to be readjusted.
- Check the monitor and your display card with respect to compatibility and recommended signal timings.
- If your text is garbled, change the video mode to non-interlace and use 60Hz refresh rate.

**LED on monitor is not lit (*no green, blue or amber colour can be seen*)**

- Power Switch should be in the ON position and power cord should be connected.

**Picture is not as bright**

- Make sure ECO MODE, AUTO BRIGHTNESS, and COLORCOMP is turned off.
- If the brightness fluctuates make sure AUTO BRIGHTNESS is turned off.

**Display image is not sized properly**

- Use the OSM Image Adjust controls to increase or decrease the Coarse total.
- Check to make sure that a supported mode has been selected on the display card or system being used. (Please consult display card or system manual to change graphics mode.)

**No Video**

- If no video is present on the screen, turn the Power button off and on again.
- Make certain the computer is not in a power-saving mode (touch the keyboard or mouse).

**Self Diagnosis**

- The LCD display is equipped with the ability to self diagnose abnormalities. When the LCD detects a problem, the LED on the front flashes in a pattern of long and short blinks, depending on the type of problem detected.
- If the LED detects a problem, please refer service to qualified personnel.

# Appendix

If you need detailed information about the controls, please use the advanced menu.

**<How to use the advanced menu>**

- Turn off your monitor.
- Turn on your monitor by pushing the “POWER” and “SELECT” button at the same time for at least one second simultaneously. Then press the control buttons (EXIT, LEFT, RIGHT, UP, DOWN).
- You will see the Advanced menu.
  This menu is larger than the normal OSM.

**<How to exit the advanced menu>**

- Turn off and restart your monitor in the normal way.

To make an adjustment, ensure that the tag is highlighted, then press “SELECT”.

To move to another tag, press “EXIT”, then press “Left” or “Right” to highlight another tag.

| | | |
|---|---|---|
| Tag1 | Brightness | Adjusts the overall image and screen background brightness.<br>Press “Left” or “Right” to adjust. |
| | Contrast | Adjusts the image brightness and contrast in relation to the background.<br>Press “Left” or “Right” to adjust. |
| | Auto Contrast<br>(Analog input only) | Adjusts the image displayed for non-standard video inputs. Press “SELECT” to adjust.<br>Any adjustment requires the image to have white portions. |
| | Auto Black Level<br>(Analog input only) | Automatically adjusts the black level. Any adjustment requires the image to have black portions. Press “SELECT” to activate Auto Adjust. |
| | ECO Mode | Decreases the amount of power consumed by reducing the brightness level.<br>1: Decreases the brightness by 25%.<br>2: Decreases the brightness by 50%.<br>CUSTOM: Decreases the brightness level as determined by the user. |
| | ECO Mode Custom | Allows the user to set a preferred brightness level when ECO Mode is in use. |
| | Auto Brightness | Auto Brightness has three settings.<br>OFF: No function.<br>1: Adjusts the brightness automatically, by detecting the brightness level of your environment and adjusting the monitor with your BRIGHTNESS setting.<br>2: Adjusts the brightness automatically for the best BRIGHTNESS setting based on the white display area. The environmental brightness sensor (Ambibright sensor) has no function.<br>Note: Do not cover environmental brightness sensor (Ambibright sensor). |
| | Black Level | Allows you to manually adjust the black level. Press “Left” or “Right” to adjust. |
| Tag2 | R-H.position<br>(Analog input only) | Adjusts the position of the red component of the image. Press “Left” or “Right” to adjust. |
| | G-H.position<br>(Analog input only) | Adjusts the position of the green component of the image. Press “Left” or “Right” to adjust. |
| | B-H.position<br>(Analog input only) | Adjusts the position of the blue component of the image. Press “Left” or “Right” to adjust. |
| | R-FINE<br>(Analog input only) | Adjusts the “FINE” setting of the RED component of the image.<br>Press “Left” or “Right” to adjust. |
| | G-FINE<br>(Analog input only) | Adjusts the “FINE” setting of the GREEN component of the image.<br>Press “Left” or “Right” to adjust. |
| | B-FINE<br>(Analog input only) | Adjusts the “FINE” setting of the BLUE component of the image.<br>Press “Left” or “Right” to adjust. |
| | R-SHARPNESS<br>(Analog input only) | Adjusts the sharpness of the red component of the image. Press “Left” or “Right” to adjust. |
| | G-SHARPNESS<br>(Analog input only) | Adjusts the sharpness of the green component of the image.<br>Press “Left” or “Right” to adjust. |
| | B-SHARPNESS<br>(Analog input only) | Adjusts the sharpness of the blue component of the image.<br>Press “Left” or “Right” to adjust. |
| | DVI Long Cable<br>(Digital input only) | Compensates for image degradation caused by using a long DVI cable.<br>There are 4 possible settings, with “0” being the lowest level of compensation and “3” being the highest level. The default setting is “1”. |

<table>
<tr><td rowspan="4">Tag3</td><td>Auto Adjust<br>(Analog input only)</td><td>Automatically adjusts the Image Position and H.Size settings and Fine settings.<br>Press “SELECT” to activate Auto Adjustment.</td></tr>
<tr><td>Signal Adjust<br>(Analog input only)</td><td>Determines when the auto adjustment is activated automatically.<br>The choices are “SIMPLE” and “FULL”. Press “Left” or “Right” to select.
<table>
<tr><td></td><td>H-size, Fine, H/V Position</td><td>Contrast</td></tr>
<tr><td>SIMPLE</td><td>O</td><td>X</td></tr>
<tr><td>FULL</td><td>O</td><td>O</td></tr>
</table>
O: Automatic Adjustment X: No Automatic Adjustment<br>NOTE: Automatic Adjustment does not work at resolutions less than 800x600 resolution.</td></tr>
<tr><td>Auto Adjust Level<br>(Analog input only)</td><td>Determines the automatic adjustment level for Auto Adjust. The choices are “SIMPLE”, “FULL” and “DETAIL”. Press “Left” or “Right” to select. Refer to the below table.
<table>
<tr><td></td><td>Size, Fine, Position</td><td>Contrast</td><td>Black Level,<br>Long cable capability**</td><td>Time</td></tr>
<tr><td>SIMPLE</td><td>O</td><td>X</td><td>X</td><td>1 second</td></tr>
<tr><td>FULL</td><td>O</td><td>O</td><td>X</td><td>1.5 seconds</td></tr>
<tr><td>DETAIL*</td><td>O</td><td>O</td><td>O</td><td>5 seconds</td></tr>
</table>
O: Automatic Adjustment X: No Automatic Adjustment<br>* “DETAIL” activates automatic long cable (skew, peaking) adjustment.<br>** Black level, RGB sharpness, RGB delay and RGB position are adjusted using “Long cable software” which is included in the attached CD-ROM.</td></tr>
<tr><td>A-NTAA SW<br>(Analog input only)</td><td>The Advanced No Touch Auto Adjust function is able to recognize new signals even when neither the resolution nor the refresh rate has changed. If several PCs are connected to the monitor, and each transmit very similar (or even the same) signals in terms of resolution and refresh rates, the monitor recognizes that there is a new signal and automatically optimizes the picture without the need for any action on the part of the user.<br>OFF: A-NTAA is disabled.<br>ON: If a change in signal is detected A-NTAA will adjust the monitor to the optimal settings for the new signal. If no change in the signal is detected then A-NTAA does not activate. The screen will be blank while the monitor optimizes the signal.<br>OPTION: Functions the same as ON, except that the screen does not go blank when the monitor makes adjustments for changes in signal, allowing the monitor to display the new signal faster. When using an external switching device to connect 2 or more PCs to the monitor, using the ON or OPTION settings is suitable.</td></tr>
<tr><td rowspan="8">Tag4</td><td>H. Position</td><td>Controls Horizontal Image Position within the display area of the LCD.<br>Press “Left” or “Right” to adjust.</td></tr>
<tr><td>V. Position</td><td>Controls Vertical Image Position within the display area of the LCD.<br>Press “Left” or “Right” to adjust.</td></tr>
<tr><td>H. Size<br>(Analog input only)</td><td>Adjusts the horizontal size of the screen.<br>If the “AUTO Adjust function” do not give you a satisfactory picture setting, a further tuning can be performed using the “H.Size (V.Size)” function (dot clock). For this a Moiré test pattern could be used. This function may alter the width of the picture. Use left/Right Menu to center the image on the screen. If the H.Size (V.Size) is wrongly calibrated, the result would look like on the left drawing. The image should be homogeneous.</td></tr>
<tr><td>Fine<br>(Analog input only)</td><td>Improve focus, clarity and image stability by increasing or decreasing this setting.<br>If the “Auto Adjust function” and the “H.Size” function do not give you a satisfactory picture setting, a fine tuning can be performed using the “Fine” function. For this a Moiré test pattern could be used. If the Fine value is wrongly calibrated, the result would look like on the left drawing. The image should be homogeneous.</td></tr>
<tr><td>Auto Fine<br>(Analog input only)</td><td>This function automatically and periodically adjusts the “FINE” setting for change in signal condition. This function adjusts approximately every 33 minutes.</td></tr>
<tr><td>H. Resolution</td><td>Adjusts the horizontal size by increasing or decreasing the setting.<br>Press “Right” button to expand the width of the image on the screen.<br>Press “Left” button to narrow the width of the image on the screen.</td></tr>
<tr><td>V. Resolution</td><td>Adjusts the vertical size by increasing or decreasing the setting.<br>Press “Right” button to expand the height of the image on the screen.<br>Press “Left” button to narrow the height of the image on the screen.</td></tr>
<tr><td>Expansion</td><td>Sets the zoom method.<br>FULL: The image is expanded to 1600 x 1200, regardless of the resolution.<br>ASPECT: The image is expanded without changing the aspect ratio.<br>OFF: The image is not expanded.<br>CUSTOM: When CUSTOM is selected as the Expansion mode, it becomes possible to adjust the H. ZOOM., V. ZOOM, and ZOOM POS.</td></tr>
</table>

| | | |
|---|---|---|
| | H.ZOOM<br>(Available in Custom Expansion mode only) | The image is expanded from 1 to 3 times in the horizontal (H. EXPANSION) direction by 0.01 increments. |
| | V.ZOOM<br>(Available in Custom Expansion mode only) | The image is expanded from 1 to 3 times in the vertical (V. EXPANSION) direction by 0.01 increments. |
| | ZOOM POS.<br>(Available in Custom Expansion mode only) | Sets the point from which the screen will be expanded when either H.ZOOM or V.ZOOM is selected as the expansion method. Options are CENTER and LEFT TOP.<br>CENTER: H.ZOOM expands the image from the centre outward to the sides of the screen. V.ZOOM expands the image from the centre towards the top and bottom of the screen.<br>LEFT TOP: Indicates the set point for image expansion (TOP in V. Zoom, LEFT in H.ZOOM). If the resolution does not fill out the screen, when expanding, the image will not expand past the TOP or the LEFT of the screen. The image can be expanded past the right and bottom edges of the screen. |
| Tag5 | Gamma Selection | Allows you to manually select the brightness level of grayscale. There are five selections: NO CORRECTION, 2.2, OPTION, PROGRAMMABLE and CUSTOM.<br>NO CORRECTION: No Correction possible.<br>2.2: The value is fixed at 2.2.<br>OPTION: There are two ways of OPTION selection.<br>1: This setting is recommended for Video source. Gray area looks much brighter than NO CORRECTION setting.<br>2: The value near DICOM gamma is set up in a factory and the luminosity difference between gradations is changing into the legible state.<br>PROGRAMMABLE: The brightness of grayscale can be changed to your preference by downloading the application software.<br>CUSTOM: Below items can be adjusted when CUSTOM is selected as the GAMMA SELECTION setting.<br>Custom Value: The gamma value is selected from the rate of 0.5 to 4.0 by 0.1 steps. When the COLOR CONTROL is sRGB, the value is fixed at 2.2 and NOT ADJUSTABLE.<br>Offset: The OFFSET digitally adjusts the black level after the signal is converted from analog to digital. |
| Tag6 | Color Control | Colour Control Systems: Seven preset colour settings.<br>For preset settings 1, 2, 3, and 5, the following levels can be adjusted:<br>TEMPERATURE: Adjust the white temperature by increasing or decreasing this setting. A lower colour temperature will make the screen reddish and a higher colour temperature will make the screen bluish.<br>WHITE (White Balance): If TEMPERATURE needs further adjustment; the individual R/ G/ B/ levels of the white point can be adjusted. To adjust the R/G/B levels, CUSTOM must be showing as the TEMPERATURE selection.<br>HUE: Adjusts the hue of each colour*1. The change in colour will appear on screen and the menu colour bars will show the amount of adjustment.<br>SATURATION: Adjusts the colour depth of each colour*1. Press the “RIGHT” button and the colour vividness increases.<br>OFFSET: Adjusts the colour brightness of each colour*1. Press “RIGHT” button and the colour Brightness increases.<br>*1: RED, YELLOW, GREEN, CYAN, BLUE and MAGENTA.<br>NATIVE, sRGB: Original colour presented by the LCD panel that is unadjustable.<br>PROGRAMMABLE: The colour tone that was set up with the downloaded application software is reflected. |
| Tag7 | Sharpness | This is a digital capability for keeping a crisp image at all signal timings. It continuously adjusts to maintain a distinct or soft image as you prefer, and is set independently according to different timings. Press “Left” or “Right” to adjust. |
| | DVI Selection | This function selects the DVI input mode. When the DVI selection has been changed, you must restart your computer. Press “Left” or “Right” to select.<br>AUTO: By using the DVI-D to DVI-D cable, the DVI SECTION is DIGITAL.<br>By using the D-SUB to DVI-A cable, the DVI SECTION is ANALOG.<br>DIGITAL: DVI digital input is available.<br>ANALOG: DVI analog input is available. |

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| | Video Detect | Selects the method of video detection when more than one computer is connected. Press “Left” or “Right” to select.<br>FIRST: The video input has to be switched to “FIRST” mode. When current video input signal is not present, then the monitor searches for a video signal from the other video input port. If the video signal is present in the other port, then the monitor switches the video source input port to the new found video source automatically. The monitor will not look for other video signals while the current video source is present.<br>LAST: The video input has to be switched to the “LAST” mode. When the monitor is displaying a signal from the current source and a new secondary source is supplied to the monitor, then the monitor will automatically switch to the new video source. When current video input signal is not present, then the monitor searches for a video signal from the other video input port. If the video signal is present in the other port, then the monitor switches the video source input port to the new found video source automatically.<br>NONE: The Monitor will not search the other video input port unless the monitor is turned on. |
| | Off Timer | Monitor will automatically turn off after the preset time period from power on with the ON/OFF function. When you select “ON”, press “SELECT” and “Left” or “Right” to adjust. Before powering off, a message will appear on the screen asking the user if they want to delay the turn off time by 60 minutes. Press any OSM button to delay the turn off time. |
| | IPM (Intelligent Power Manager) | The Intelligent Power Manager allows the monitor to enter into a power saving mode after a period of inactivity. The IPM has three settings.<br>OFF: Monitor does not go into power save mode when the input signal is lost.<br>STANDARD: Monitor enters power save mode automatically when the input signal is lost.<br>OPTION: Monitor enters power save mode automatically when the amount of surrounding light goes below the level that is determined by the user. |
| | IPM Setting | Adjusts the luminance value for IPM. |
| | Over Drive | Turns the OVER DRIVE function on or off. Over Drive may reduce blurring that occurs in some moving images. When Over Drive is on, response time is improved. When the IMAGE ROTATION function is used, the OVER DRIVE function will be turned off automatically. |
| | Side Border Color | Adjusts the side black bars colour between black and white. For wide aspect monitors. |
| | LED Brightness | Controls the brightness of the LED on the monitor. |
| | LED Color | The LED on the front can be blue or green. |
| | ColorComp | This function electronically compensates for the slight variations in the white uniformity level as well as for deviations in colour that may occur throughout the display area of the screen. These variations are characteristic of LCD panel technology. This function improves the colour and evens out the luminance uniformity of the display.<br>NOTE: Using the COLORCOMP feature does reduce the overall peak luminance of the display. If greater luminance is desired over the uniform performance of the display, then COLORCOMP should be turned off. |
| | ColorComp Level | Select the level for ColorComp adjustments. |
| Tag8 | Language | OSM control menus are available in eight languages. Press “Left” or “Right” to select. |
| | OSM H. Position | You can choose where you would like the OSM control image to appear on your screen. Selecting OSM Location allows you to manually adjust the position of the OSM control menu left or right. |
| | OSM V. Position | You can choose where you would like the OSM control image to appear on your screen. Selecting OSM Location allows you to manually adjust the position of the OSM control menu up or down. |
| | OSM Turn off | The OSM control menu will stay on as long as it is use. You can select how long the monitor waits after the last touch of a button to shut off the OSM control menu.<br>The preset choices are 10-120 seconds by 5 seconds step. |

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| | OSM Lock Out | This control completely locks out access to all OSM control functions. When attempting to activate OSM controls while in the Lock Out mode, a screen will appear indicating the OSM controls are locked out.<br>There are three types of OSM LOCK OUT:<br>OSM LOCK OUT with BRIGHTNESS and CONTRAST control: To activate the OSM Lock Out function, press SELECT, then “UP” button and hold down simultaneously. To deactivate the OSM Lock Out, press SELECT, then “UP” button and hold down simultaneously while in the OSM menu. BRIGHTNESS and CONTRAST can be adjusted while in the lock out mode.<br>OSM LOCK OUT with no control: To activate the OSM Lock Out function, press SELECT, then “Right” button and hold down simultaneously. To deactivate the OSM Lock Out, press SELECT, then “Right” button and hold down simultaneously while in the OSM menu.<br>No controls can be adjusted while in the lock out mode.<br>OSM LOCK OUT with BRIGHTNESS (only) control: To activate the OSM Lock Out function, press SELECT, then “Down” and “Left” buttons and hold down simultaneously. To deactivate the OSM Lock Out, press SELECT, then “Down” and “Left” buttons and hold down simultaneously while in the OSM menu. BRIGHTNESS can be adjusted while in the lock out mode.<br>CUSTOM: Press RESET and EXIT to enter the CUSTOM Menu. Select ENABLE or DISABLE for POWER KEY, INPUT SEL, HOT KEY (BRIGHTNESS/CONTRAST), ECO MODE, WARNING (RESOLUTION NOTIFIER/OSM LOCK OUT). To Deactivate the OSM Lock Out function, press RESET and EXIT to bring up the LOCK OUT warning.<br>Press SELECT, SELECT, <, >, <, >, EXIT. |
| | OSM Transparency | Adjusts the transparency of the OSM MENU. |
| | OSM Color | “Tag window frame color”, “Item select color” & ”Adjust Window frame color” can be changed. |
| | Signal Information | Signal information can be displayed in the corner of the screen.<br>Signal information is either “On/Off”. |
| | Resolution Notifier | The optimal resolution is 1600 x 1200. If ON is selected, a message will appear on the screen after 30 seconds, notifying you that the resolution is not set to 1600 x 1200.<br>Press “Left” or “Right” to select. |
| | Hot Key | When this function is activated; the brightness and contrast of the monitor can be adjusted without entering the OSM menu by using the front buttons.<br>The “Left” or “Right” buttons adjust the brightness level.<br>The “Down” or “Up” buttons adjust the contrast level. |
| | Factory Preset | Selecting Factory Preset allows you to reset all OSM control settings back to the factory settings. Highlighting the control to be reset and pressing the RESET button can reset individual settings. |
| Tag9 | Grayscale Mode | This function changes the display image to monochrome.<br>There are 3 types of settings.<br>OFF: The Display Image is COLOUR.<br>MODE1: Input is R/G/B Colour, but monitor uses only Green. The Display Image will become monochrome, because only green data passes the R/G/B LUT.<br>MODE2: Input is R/G/B Colour, but monitor changes the colour space to YUV. The Display Image will become monochrome, because only Y data passes the R/G/B LUT. |
| | OSM Rotation | AUTO: The OSM rotates automatically when the monitor is rotated. OSM ROTATION is set to AUTO by default.<br>MANUAL: To rotate the OSM, press the ROTATE OSM button when the OSM is not showing. |
| | Image Rotation | AUTO: The display image automatically rotates according to the orientation of the OSM. If “AUTO” is selected in the “OSM ROTATION” menu, the display image rotates according to the orientation of the monitor.<br>OFF: The display image is not rotated. IMAGE ROTATION is set to OFF by default.<br>ON: The display image always rotated. |

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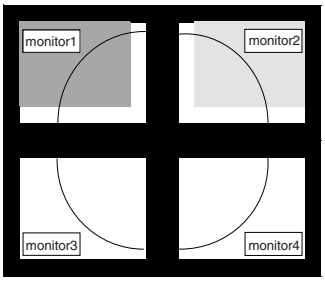
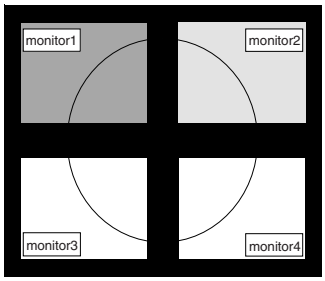
| | Screen Saver | Use the SCREEN SAVER to reduce the risk of image persistence.<br>MOTION (Default OFF): Screen image is reduced to 95% size and moves periodically in 4 directions in order to reduce the risk of image retention. Screen image can be set to move periodically in intervals from 10 to 900 seconds in 10 seconds increments.<br>GAMMA (Default OFF): When OFF, the GAMMA selection that is used by the display is the same as what is selected in Tag5 (page 20). When ON is selected, the GAMMA curve is narrow, reducing the contrast and cutting down the risk of image retention.<br>NOTE: SCREEN SAVER does not function when the TILE MATRIX function is enabled. When the SCREEN SAVER is on and the monitor is set to the recommended resolution, the screen image will be reduced to 95% and appear slightly less sharp than normal. Gamma screen saver is not available when using the PROGRAMMABLE mode for GAMMA curve. |
| | Input Setting | Video Band Width (Analog input only): It is used when the unnecessary noise from computer appears on a screen. It is strong ineffective, so that a number becomes small. Press “Left” or “Right” to select.<br>Sync Threshold (Analog input only): Adjusts the slice level of a synchronization signal. Press “SELECT” to move the adjustment menu. Adjusts the sensitivity of the separate or composite input signals.<br>Try this option if the FINE adjustment does not successfully eliminate the noise.<br>SOG Threshold (Analog input only): Adjusts the sensitivity of the Sync On Green input signals. Adjusts the slice level when separating synchronization from sync On Green signal input. Press “Left” or “Right” to select.<br>Edge Lock: Operating your monitor at a non-standard timing may cause images to appear darker than normal or have colour distortion. Use of the Edge Lock control will adjust images to their normal state. |
| TagA | Tile Matrix | Tile Matrix demonstrates multiple screens. This feature provides a single large screen using up to 25 monitors. It will be able to divide up to 5 each H and V.<br>This requires you to feed the PC output into each of the monitors through a distributor.<br>ENABLE: Select “ON”, the monitor will expand the selected position.<br>H MONITOR: Select number of horizontal divide.<br>V MONITOR: Select number of vertical divide.<br>MONITOR No: Select a position to expand the screen.<br>TILE COMP: Works in tandem with Tile Matrix to compensate for the width of the tile bezels in order to accurately display the image.<br>Tile Comp with 4 monitors (black area shows monitor frames):<br>  <br><br>Tile Comp OFF<br>  <br><br>Tile Comp ON |
| TagB | Date & Time | Adjusts the current date and time for internal clock. You should set this function when you use “SCHEDULE”.<br>Daylight Saving: For those timezones where Daylight Saving Time (Summertime) is observed. |

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| TagC | Schedule | Programs the monitor's working schedule. Schedule the power on and power off with hour and a day of the week. Also sets the input port. This OSM can't remove except EXIT.<br>Using the "SCHEDULE" function allows you to set up to seven different scheduled time intervals when the LCD Monitor will be activated.<br>You can select the time the monitor turns on and turns off, the day of week the monitor is activated, and which input source the monitor will use for each scheduled activation period. A check mark in the box next to the number of the schedule indicates that the selected schedule is in effect.<br>To select which schedule to set, use the up/down arrows to move the cursor vertically under the number (1 to 7) of the schedule.<br>Use the "Down" or "Up" buttons to move the cursor horizontally within the particular schedule. The "SELECT" button is used to make a selection.<br>If you create a schedule but do not want to use a power on time, select "--" in the "ON" time slot.<br>If you do not want to use a power off time select "--" in the OFF time slot.<br>If there is no input selected ("-----" showing in the input spot) the input from the previous schedule will be used.<br>The selection of EVERY DAY within a schedule takes priority over other schedules that are set up to operate weekly.<br>Schedules are numbered 1-7. If two schedules are programmed for the same time, then the highest numbered schedule has priority. For example schedule #7 will take priority over schedule #5.<br>When schedules are overlapping, scheduled Power ON time has priority over scheduled Power OFF time.<br>When the "OFF TIMER" is set, the "SCHEDULE" function is disabled.<br>Before powering off, a message will appear on the screen asking the user if they want to delay the turn off time by 60 minutes. Press any OSM button to delay the turn off time. |
| TagD | Eco Mode Information | Displays the estimated power saving information in watt-hours. |
| TagE | Information | Provides information about the current display resolution Technical data, including the preset timing currently being used and the horizontal and vertical frequencies is also displayed. |

# Using the Auto Brightness function

The brightness of the LCD screen can be set to increase or decrease depending on the amount of ambient light within the room. If the room is bright, the monitor becomes correspondingly bright. If the room is dim, then the monitor will dim accordingly. The purpose of this function is to make the viewing experience more comfortable to the eye in a variety of lighting conditions.

The Auto Brightness function is set to OFF by default.

## SETUP

Use the following procedure to select the Brightness Range that the monitor will use when the Auto Brightness function is activated.

1. Set the BRIGHT level. This is the brightness level that the monitor will go up to when the ambient light level is highest. Make sure the room is at its brightest when setting this level.

   Select “1” in the AUTO BRIGHTNESS menu (**Figure 1**). Then use the front buttons to move the cursor up to the BRIGHTNESS setting. Choose the desired brightness level (**Figure 2**).

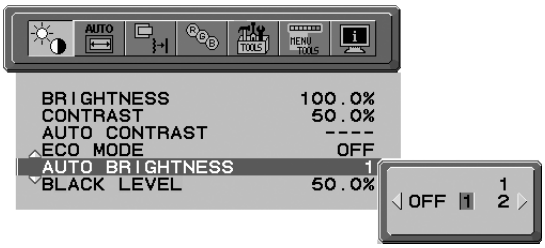



**Figure 1**

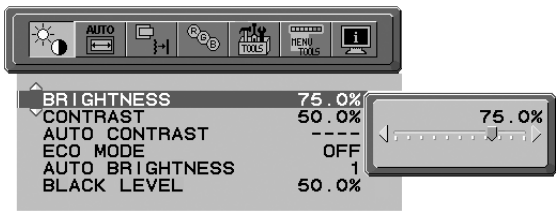



**Figure 2**

2. Set the DARK level. This is the level of brightness that the monitor will go down to when the ambient light level is low. Make sure the room is at its darkest when setting this level.

   Then use the front buttons to move the cursor up to the BRIGHTNESS setting. Choose the desired brightness level (**Figure 3**).

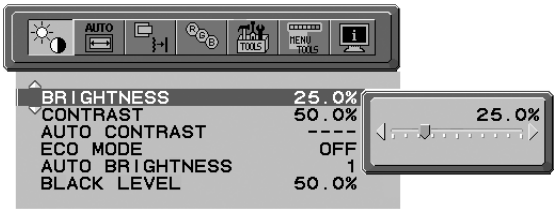



**Figure 3**

When the “Auto Brightness” function is enabled the Brightness level of the screen changes automatically according to the lighting conditions of the room (**Figure 4**).

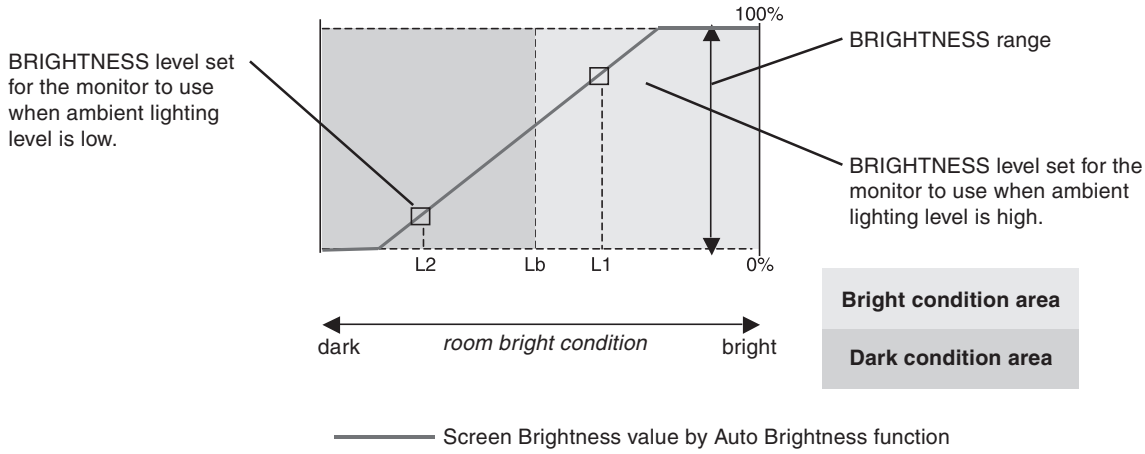



**Figure 4**

Lb: Border between bright and dim lighting conditions; set at factory
L1: BRIGHTNESS level set for the monitor to use when ambient lighting level is high (L1>Lb)
L2 : BRIGHTNESS level set for the monitor to use when ambient lighting level is low (L2<Lb)

L1 and L2 are the brightness levels set by the user to compensate for changes in ambient lighting.

TCO Development

## Congratulations!

The display you have just purchased carries the TCO’03 Displays label. This means that your display is designed, manufactured and tested according to some of the strictest quality and environmental requirements in the world. This makes for a high performance product, designed with the user in focus that also minimizes the impact on our natural environment.

Some of the features of the TCO’03 Display requirements:

**Ergonomics**

- Good visual ergonomics and image quality in order to improve the working environment for the user and to reduce sight and strain problems. Important parameters are luminance, contrast, resolution, reflectance, colour rendition and image stability.

**Energy**

- Energy-saving mode after a certain time – beneficial both for the user and the environment
- Electrical safety

**Emissions**

- Electromagnetic fields
- Noise emissions

**Ecology**

- The product must be prepared for recycling and the manufacturer must have a certified environmental management system such as EMAS or ISO 14 001
- Restrictions on:
  - chlorinated and brominated flame retardants and polymers
  - heavy metals such as cadmium, mercury and lead.

The requirements included in this label have been developed by TCO Development in co-operation with scientists, experts, users as well as manufacturers all over the world. Since the end of the 1980s TCO has been involved in influencing the development of IT equipment in a more user-friendly direction. Our labelling system started with displays in 1992 and is now requested by users and IT-manufacturers all over the world.

For more information, please visit
**www.tcodevelopment.com**

# Manufacturer's Recycling and Energy Information

NEC DISPLAY SOLUTIONS is strongly committed to environmental protection and sees recycling as one of the company's top priorities in trying to minimize the burden placed on the environment. We are engaged in developing environmentally-friendly products, and always strive to help define and comply with the latest independent standards from agencies such as ISO (International Organisation for Standardization) and TCO (Swedish Trades Union).

For more information, and for help in recycling your old NEC monitors, please visit our website at

http://www.nec-display-solutions.com (in Europe) or

http://www.nec-display.com (in Japan) or

http://www.necdisplay.com (in USA).

**Country-specific recycling programmes can also be found at:**

Sweden - http://www.el-retur.se

Germany - http://www.recyclingpartner.de/

Holland - http://www.mirec.nl/

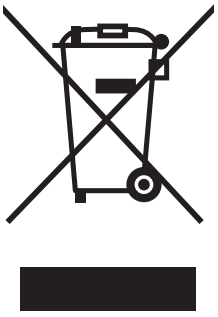
Japan - http://www.diarcs.com/

**Energy saving:**

This monitor features an advanced energy saving capability. When a VESA Display Power Management Signaling (DPMS) Standard signal is sent to the monitor, the Energy Saving mode is activated. The monitor enters a single Energy Saving mode.

| Mode | Power consumption | LED colour |
|---|---|---|
| Normal Operation | Approx. 50W | Green or Blue |
| Energy Saving Mode | Less than 1W | Amber |
| Off Mode | Less than 1W | Unlit |

## Disposing of your old NEC product



**Within the European Union**

EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your NEC display products, please follow the guidance of your local authority, or ask the shop where you purchased the product, or if applicable, follow any agreements made between yourself and NEC.

The mark on electrical and electronic products only applies to the current European Union Member States.

**Outside the European Union**

If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.