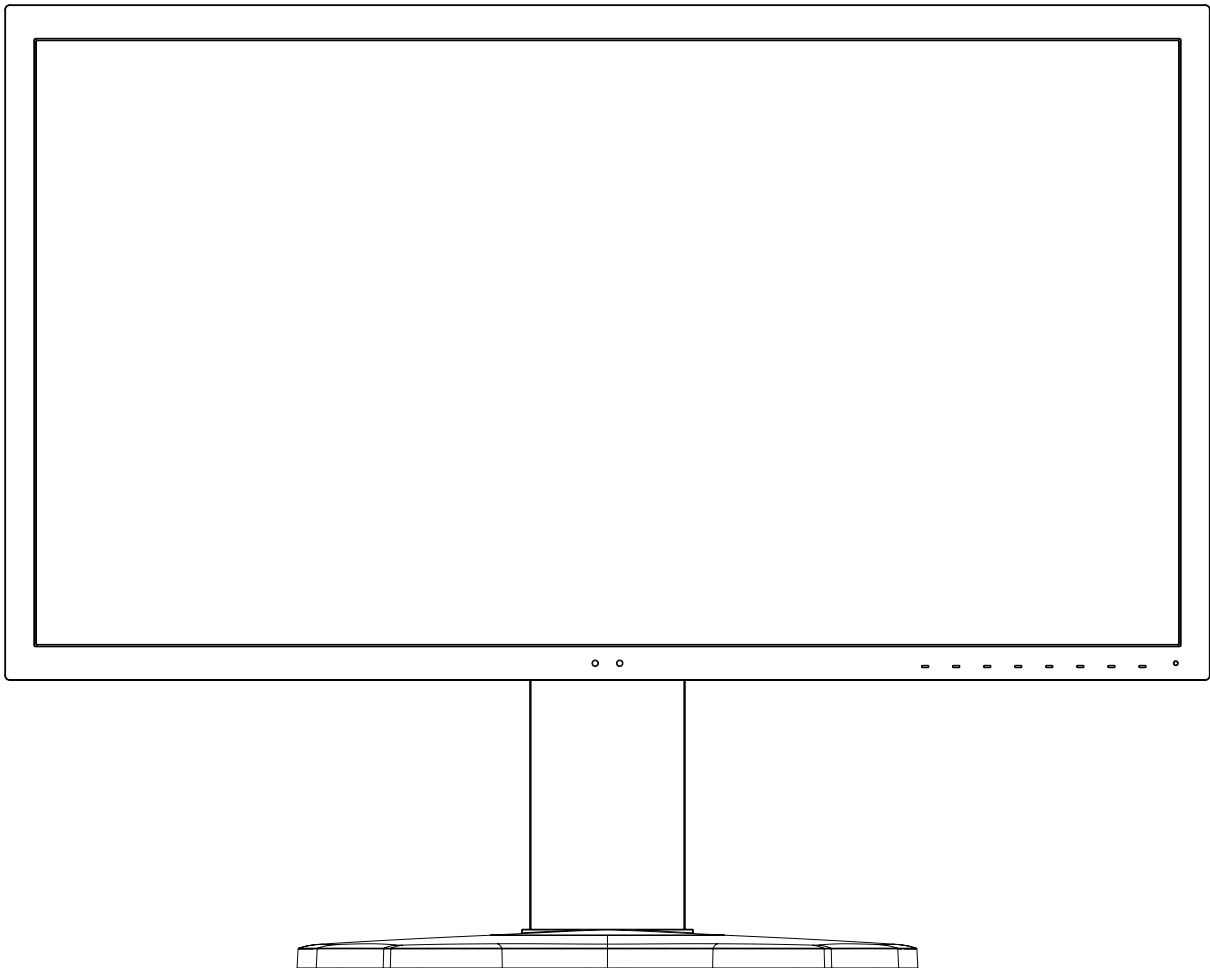


**NEC**

Desktop Monitor

# MultiSync PA311D

User's Manual



MODEL: PA311D-BK

The model name and serial number can be found in the label on the rear side of monitor.

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# Important Information



**⚠ WARNING:** To prevent fire or shock hazards, do not expose this unit to rain or moisture.

Do not connect or disconnect this product during an electrical storm.

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 personal.

**⚠ CAUTION:** To reduce the risk of electric shock, make sure the power cord is unplugged from the 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.

Please use the power cord provided with this display in accordance with the power cord table. If a power cord is not supplied with this equipment, please contact NEC. For all other cases, please use the power cord with the plug style that matches the power socket where the monitor is located. The compatible power cord corresponds to the AC voltage of the power outlet and has been approved by, and complies with, the safety standards in the country of purchase.

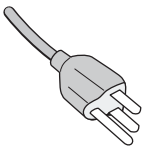
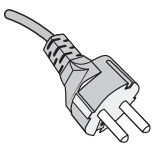
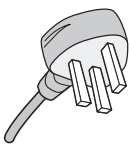
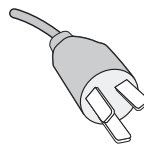
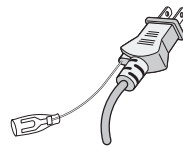
This equipment is designed to be used in the condition of the power cord connected to the earth. If the power cord is not connected to the earth, it may cause electric shock. Please make sure the power cord is earthed properly.



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.

Plug Type	North America	European Continental	U.K.	Chinese	Japanese
Plug Shape					
Region	U.S.A./Canada	EU	U.K.	China	Japan
Voltage	120*	230	230	220	100

\* When operating the MultiSync monitor with its AC 125-240V power supply, use a power supply cord that matches the power supply voltage of the AC power outlet being used.

**NOTE:** This product can only be serviced in the country where it was purchased.

- The intended primary use of this product is as an Information Technical Equipment in an office or domestic environment.
- The product is intended to be connected to a computer and is not intended for the display of television broadcast signals.



## Copyright Information

Windows is a registered trademark of Microsoft Corporation.

NEC is a registered trademark of NEC Corporation.

DisplayPort and DisplayPort Compliance Logo are trademarks owned by Video Electronics Standards Association in the United States and other countries.

MultiSync is a trademark or registered trademark of NEC Display Solutions, Ltd. in Japan and other countries.

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All other brands and product names are trademarks or registered trademarks of their respective owners.

- NOTE:**
- (1) The contents of this user's manual may not be reprinted in part or whole without permission.
  - (2) The contents of this user's manual are subject to change without notice.
  - (3) Great care has been taken in the preparation of this user's manual; however, should you notice any questionable points, errors or omissions, please contact us.
  - (4) The image shown in this user's manual is indicative only. If there is inconsistency between the image and the actual product, the actual product shall govern.
  - (5) Notwithstanding articles (3) and (4), NEC will not be responsible for any claims on loss of profit or other matters deemed to result from using this device.



# Registration Information

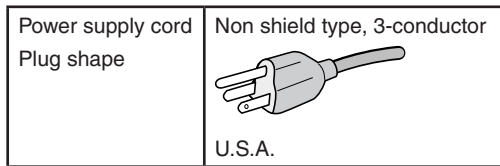
## Cable Information

**CAUTION:** Use the provided specified cables with this product so as not to interfere with radio and television reception. For DisplayPort, HDMI, USB, and USB-C, please use a shielded signal cable. Use of other cables and adapters may cause interference with radio and television reception.

## FCC Information

**⚠ WARNING:** The Federal Communications Commission does not allow any modifications or changes to the unit EXCEPT those specified by NEC Display Solutions of America, Inc. in this manual. Failure to comply with this government regulation could void your right to operate this equipment.

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.



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 the 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.

## SUPPLIER'S 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:** 3250 Lacey Rd, Ste 500  
Downers Grove, IL 60515  
**Tel. No.:** (630) 467-3000  
**Type of Product:** Display Monitor  
**Equipment Classification:** Class B Peripheral  
**Model:** MultiSync PA311D (PA311D-BK)



To see a list of our TCO certified monitors and their TCO Certification (in English only), visit our website at:  
[https://www.nec-display.com/global/about/legal\\_regulation/TCO\\_mn/index.html](https://www.nec-display.com/global/about/legal_regulation/TCO_mn/index.html)



# Recommended Use

## Safety Precautions and Maintenance







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








### About the Symbols

To ensure safe and proper use of the product, this manual uses a number of symbols to prevent injury to you and others as well as damage to property. The symbols and their meanings are described below. Be sure to understand them thoroughly before reading this manual.










 <b>WARNING</b>	Failing to heed this symbol and handling the product incorrectly could result in accidents leading to major injury or death.
 <b>CAUTION</b>	Failing to heed this symbol and handling the product incorrectly could result in personal injury or damage to surrounding property.









### Examples of symbols

	 Indicates a warning or caution. This symbol indicates you should be careful of electric shocks.
	 Indicates a prohibited action. This symbol indicates something that must be prohibited.
	 Indicates a mandatory action. This symbol indicates that the power cord should be unplugged from the power outlet.


















 <b>WARNING</b>	
 <b>UNPLUG THE POWER CORD</b>	Unplug the power cord if the monitor malfunctions.  Should the monitor emit smoke or strange odors or sounds, or if the monitor has been dropped or the cabinet broken, turn off the monitor's power, then unplug the power cord from the power outlet. Failure to do so could not only lead to fire or electric shock, it could also result in vision impairment. Contact your dealer for repairs.  Never try to repair the monitor on your own. Doing so is dangerous.
	To prevent damage to the monitor caused by tipping over due to earthquakes or other shocks, make sure to install the monitor in a stable location and take measures to prevent falling.
	Immediately turn off the power and unplug your monitor from the wall outlet, then refer servicing to qualified service personnel under the following conditions. If the monitor is used in this condition, the monitor may fall or cause a fire or electric shock. <ul style="list-style-type: none"> <li>• If the monitor stand has cracked or peeled.</li> <li>• If you notice any structural damage such as cracks or unnatural wobbling.</li> </ul>
 	Do not open the monitor.  There are high voltage areas in the monitor. Opening or removing covers may expose you to dangerous shock hazards or other risks. Refer all servicing to qualified service personnel.
	Handle the power cord with care. Damaging the cord could lead to fire or electric shock. <ul style="list-style-type: none"> <li>• Do not place heavy objects on the cord.</li> <li>• Do not place the cord under the monitor.</li> <li>• Do not cover the cord with a rug, etc.</li> <li>• Do not scratch or modify the cord.</li> <li>• Do not bend, twist or pull the cord with excessive force.</li> <li>• Do not apply heat to the cord.</li> </ul> Should the cord be damaged (exposed core wires, broken wires, etc.), ask your dealer to replace it.



 <b>WARNING</b>	
	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 use the monitor if the monitor was dropped or the cabinet is damaged.
 	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 spill any liquids into the cabinet or use your monitor near water. Immediately turn off the power and unplug your monitor from the wall outlet, then refer servicing to qualified service personnel under the following condition. If the monitor is used in this condition, the monitor may fall or cause an electric shock or start a fire: <ul style="list-style-type: none"> <li>• If liquid has spilled or objects have fallen into the monitor.</li> </ul>
	The power supply cord you use must have been approved by and comply with the safety standards of your country. (e.g. Type H05VV-F 3G 0.75 mm <sup>2</sup> should be used in Europe). In the UK use a BS-approved power cord with a molded plug having a black (5 A) fuse installed for use with this monitor.
	Do not disassemble the monitor. Do not remove or open the monitor's cabinet. Do not modify the monitor. There are high voltage areas in the monitor. Modifying the monitor could lead to a fire or electric shock.
	Do not play with the plastic bag which covers the monitor. Do not use this bag for any other purpose. To avoid the danger of suffocation, do not place this bag over your head, nose or mouth. Do not place this bag over another person's head, nose or mouth. Keep this bag away from children and babies.

 <b>CAUTION</b>	
Please install the monitor in accordance with the following information. Improper installation of the monitor may result in damage to the monitor, an electric shock or fire.	
	Allow adequate ventilation around the monitor, so that heat can properly dissipate.
	Do not cover the vent on the monitor.
	Do not mount the product in any configuration or position not described in the user's manual.
	Do not place this monitor near a radiator, other heat sources, or in direct sunshine.
	Do not install in areas where the monitor will be exposed to continual vibration.
	Do not use the monitor in high temperature, humid, dusty, or oily areas.
	Do not use the monitor outdoors.

 **CAUTION**

	Do not climb on the monitor or the table where the monitor is installed. Do not install the monitor on a wheeled table if the wheels on the table have not been properly locked. The monitor may fall causing damage to the monitor or personal injury.
	Do not touch LCD panel surface while transporting, mounting and setting. Applying pressure on the LCD panel can cause serious damage.
 	If the monitor or glass breaks, do not come into contact with the liquid crystal that is inside the screen. If the liquid crystal comes into contact with your eyes or mouth, rinse thoroughly and immediately contact your doctor for help.
  	<p>Handling the power cord</p> <ul style="list-style-type: none"> <li>• When connecting the power cord to the monitor's AC IN terminal, make sure the connector is fully and firmly inserted. Loose connection of the power cord could lead to fire or electric shock.</li> <li>• Do not connect or disconnect the power cord with wet hands. Doing so could result in electric shock.</li> <li>• When connecting or disconnecting the power cord, pull the power cord out by holding onto its plug. Do not pull the power cord out by holding onto its cable. Pulling the power cord out of the wall by holding onto the cable can damage the power cord, which could lead to fire or electric shock.</li> <li>• When cleaning the monitor, for safety purposes unplug the power cord from the power outlet beforehand.</li> <li>• Before moving the monitor, make sure the monitor power is off, then unplug the power cord from the power outlet and check that all cables connecting the monitor to other devices are disconnected.</li> <li>• When you are not planning to use the monitor for an extended period of time, always unplug the power cord from the power outlet.</li> </ul>
	<p>Handle with care when transporting.</p> <ul style="list-style-type: none"> <li>• To safely transport and securely install the monitor, please use as many people as necessary to be able to lift the monitor without causing personal injury or damage to the monitor.</li> </ul>
	To ensure the monitor's reliability, please clean the ventilation holes at the rear side of the cabinet at least once a year to remove dirt and dust.
	Regularly dust off the power cord by using a soft dry cloth. Dust build-up on the power cord's plugs and cable could cause an electric shock and result in a fire.
	Handle with care during installation and adjustment to prevent personal injury and damage to the monitor.
	<p>The monitor must be mounted to a flexible arm or stand that supports the weight of the monitor to prevent damage and personal injury that could result from the monitor tipping over or falling.</p> <ul style="list-style-type: none"> <li>• Please tighten all screws when installing the monitor to a flexible arm or stand. A loose screw may cause the monitor to fall, causing damage to the monitor or personal injury.</li> </ul>
 	<p>Clean the monitor's LCD screen surface with a lint-free, non-abrasive cloth.</p> <p>Avoid using any cleaning solutions! DO NOT clean with benzene thinner, alkaline detergent, alcoholic system detergent, glass cleaner, wax, polish cleaner, soap powder, or insecticide. Rubber or vinyl should not be in contact with the cabinet for an extended period of time. These types of fluids and materials can cause the paint to deteriorate, crack or peel.</p>
	When using a LAN cable, do not connect to a peripheral device with wiring that might have excessive voltage.
	Do not connect headphones to the monitor while you are wearing them. Depending on the volume level, it may damage your ears and cause loss of hearing.
	Do not bind the USB cable. It may trap heat and cause a fire.

**Image Persistence**

Image persistence occurs 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 a still image 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.

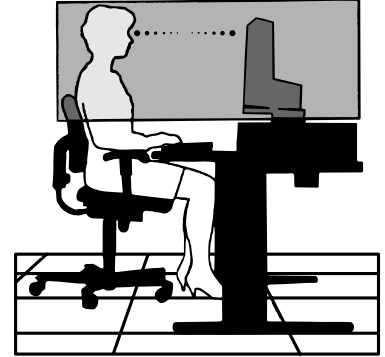
**NOTE:** As with all personal display devices, NEC DISPLAY SOLUTIONS recommends using a moving screen saver at regular intervals whenever the screen is idle, or turn off the monitor when not in use.

## Ergonomics

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

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

- For optimum performance of the monitor, allow 20 minutes for warming up. Avoid reproduction of still patterns on the monitor for long periods of time to avoid image persistence (after image effects).
- 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 (15.75 inches) and no further away than 70 cm (27.56 inches) from your eyes. The optimal distance is 50 cm (19.69 inches).
- Rest your eyes periodically for 5 to 10 minutes for every 1 hour by focusing on an object at least 20 feet away.
- 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.
- 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.
- Blink often. Eye exercise helps to reduce eye strain. Please contact your ophthalmologist. Get regular eye checkups.
- To avoid eye fatigue, adjust the brightness to a moderate setting. Place a sheet of white paper next to the LCD screen for luminance reference.
- Do not position the Contrast control to its maximum setting.
- Use the preset Size and Position controls with standard signals.
- Use the preset Color Setting.
- Use non-interlaced signals.
- Do not use primary color blue on a dark background, as it is difficult to see and may produce eye fatigue due to insufficient contrast.
- Suitable for entertainment purposes at controlled luminous environments, to avoid disturbing reflections from the screen.



For more detailed information on setting up a healthy work environment, write to the American National Standard for Human Factors Engineering of Computer Workstations - ANSI/HFES 100-2007 - The Human Factors Society, Inc. P.O. Box 1369, Santa Monica, California 90406.

## Cleaning the LCD Panel

- When the LCD is dusty, please gently wipe with a soft cloth.
- Please do not rub the LCD panel with hard or coarse material.
- Please do not apply pressure to the LCD surface.
- Please do not use OA cleaner as it will cause deterioration or discoloration on the LCD panel surface.

## Cleaning the Cabinet

- Unplug the power supply.
- Gently wipe the cabinet with a soft cloth.

Dampen the cloth with a neutral detergent and water, wipe the cabinet and follow with a dry cloth.

# Product Features

- **Accurate color reproduction**

- **SpectraView engine**

The sophisticated NEC exclusive color processing engine integrated into the display. It combines internal luminance, white point, ambient lighting, temperature and time monitoring, together with individual characterization and calibration of each display during production, to provide an unparalleled level of color control, uniformity, accuracy and stability.

The SpectraView engine provides the utmost in versatility; from faster and more advanced color calibration, to the ability to accurately emulate color spaces such as Adobe®RGB and sRGB, to performing printer output emulations using ICC Profiles and internal 3D Look-Up Tables.

- **Programmable picture mode profiles** (see [page 27](#))

Up to 10 programmable picture mode profiles for quick access to industry standard color spaces or user customized settings.

- **MultiProfiler supported**

Multiple color modes can be easily configured and selected using the MultiProfiler application, which can be downloaded from our website.

- **Uniformity** (see [page 47](#))

Provides a more consistent luminance and color across the screen by compensating for variations in luminance and color that are inherent to LCD panels.

- **Wide viewing angle technology**

Professional grade IPS (In-Plane Switching) panel for viewing the monitor with minimal color shift. Provides a 178° viewing angle of the screen from any direction for all orientations. Minimal light leakage on dark tones when viewing the screen from an angle in a dimly lit room.

- **10 bit color**

All signal inputs support 10-bit grayscale, over 1 billion colors. The display's internal processing extends it to more than 10-bits.

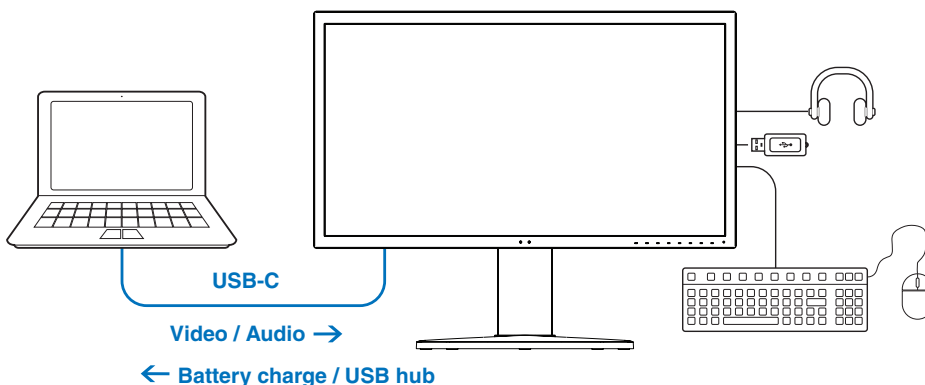
- **Stand-alone calibration** (see [page 29](#))

This function updates the display's internal color processor reference data with measurements taken using your color sensor. Those measurements will become the reference for all color settings in the display.

- **Multiple signal input**

- **USB type-C interface** (see [page 31](#))

Supports video and audio input, supplies power, and provides USB hub function with a single cable.



- **DisplayPort and HDMI interfaces** (see [page 13](#))

Designed to be future-ready scalable solutions for high performance digital display connectivity. Both interfaces enable the highest resolution, fastest refresh rates and deepest color depths.

- **PbP / PiP** (see [page 33](#))  
Increases productivity by displaying multiple input sources simultaneously, either next to each other (Picture-by-Picture) or a small inset screen on a large main screen (Picture-in-Picture). This function can also be used to display one input source in two different picture modes for a side by side comparison of different settings.
- **SuperSpeed USB (USB 3.1 Gen 1) hub with USB hub input select** (see [page 50](#))  
Allows you to switch between USB upstream ports (USB1/USB2/USB-C), so that connected devices are associated with the current video signal input computer.  
When you connect computers to each of the upstream ports, this function shares USB devices, such as keyboards, mice, and storage devices, with multiple computers.  
The SuperSpeed USB hub offers a 10x performance increase over the previous Hi-Speed USB generation, and it is backwards compatible with Hi-Speed USB (USB 2.0) devices.
- **Customizable functions**
  - **Hot key setting** (see [page 53](#))  
Picture modes or other functions can be assigned to the keys on the front bezel for easy access.
  - **LED indicator** (see [page 53](#))  
The color of the LED on the front bezel can be associated with different Picture Modes or video inputs for easy reference.
  - **Area marker function** (see [page 54](#))  
Shows a customizable on-screen marker used to indicate different aspect ratios and safe areas in video production.
- **Display management**
  - **LAN function** (see [page 34](#))  
Provides control of the monitor settings over the network, via a custom application or a web browser on a connected computer or smartphone.
  - **Import/Export** (see [page 36](#))  
Backup or copy the picture modes and monitor settings to a USB storage device connected to the SENS/MEM port.
- **Ergonomics**
  - **Human/Ambient Sensors** (see [page 12](#) and [page 52](#))  
Automatically detects your presence and work environment to determine and control the display brightness to conserve power.
  - **Fully adjustable quick-release stand** (see [page 19](#) and [page 19](#))  
Provides flexibility and comfort for individual viewer preferences, including height-adjustment, pivot, tilt and swivel capabilities, plus a quick release lever for fast removal of the stand for simplified installation.

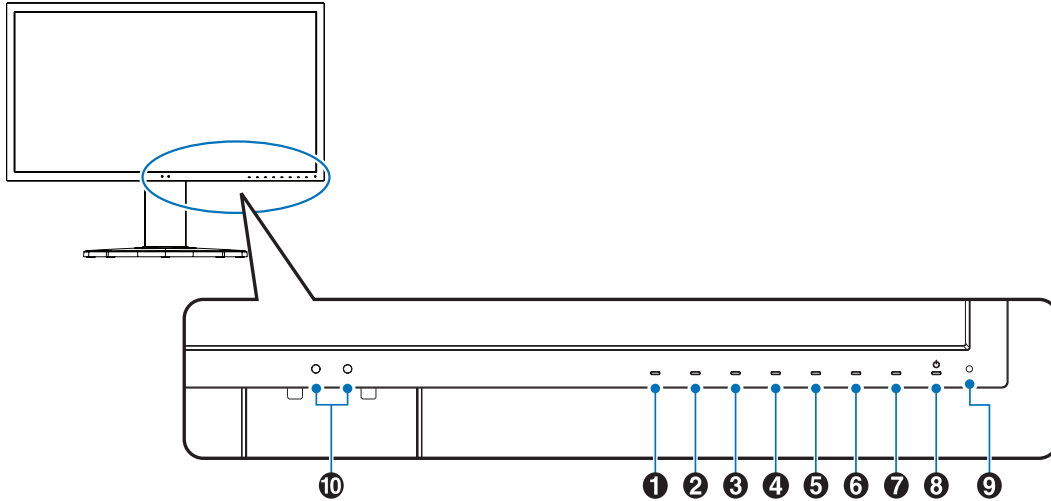
# Chapter 1 Installation

## This Chapter Includes:

- ⇒ “Parts Name and Functions” on page 12
- ⇒ “Connections” on page 14
- ⇒ “Setup” on page 16
- ⇒ “Flexible Arm Installation” on page 19

# Parts Name and Functions

## Control Panel

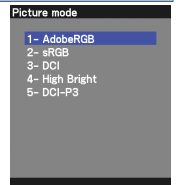


Key	Default assignment	Function
1 Key1	Menu	Accesses the OSD menu.
2 Key2*	Pic.L (Picture mode List)	Shows the [Picture mode] menu when not in the OSD control menu <sup>1</sup> .
3 Key3*	Lumi (Luminance)	Adjusts the luminance when the OSD menu is not open.
4 Key4*	Volume	Adjusts the volume when the OSD menu is not open.
5 Key5*	Mult.P (Multi Picture)	Sets the Multi picture [On] or [Off].
6 Key6*	Input	Changes the input source for the “Active picture” when not in the OSD control menu.
7 Key7*	USB (upstream select)	Temporarily change the USB upstream port <sup>2</sup> . This selection will reset when you change the input signal or turn off the monitor.
8 Key8*	Power	Turns the monitor on and off.

\*: The touch key on the screen can be customized.

1: [Picture mode] menu. Touch the **Up/Down** keys to select [Picture mode] in [Active picture].

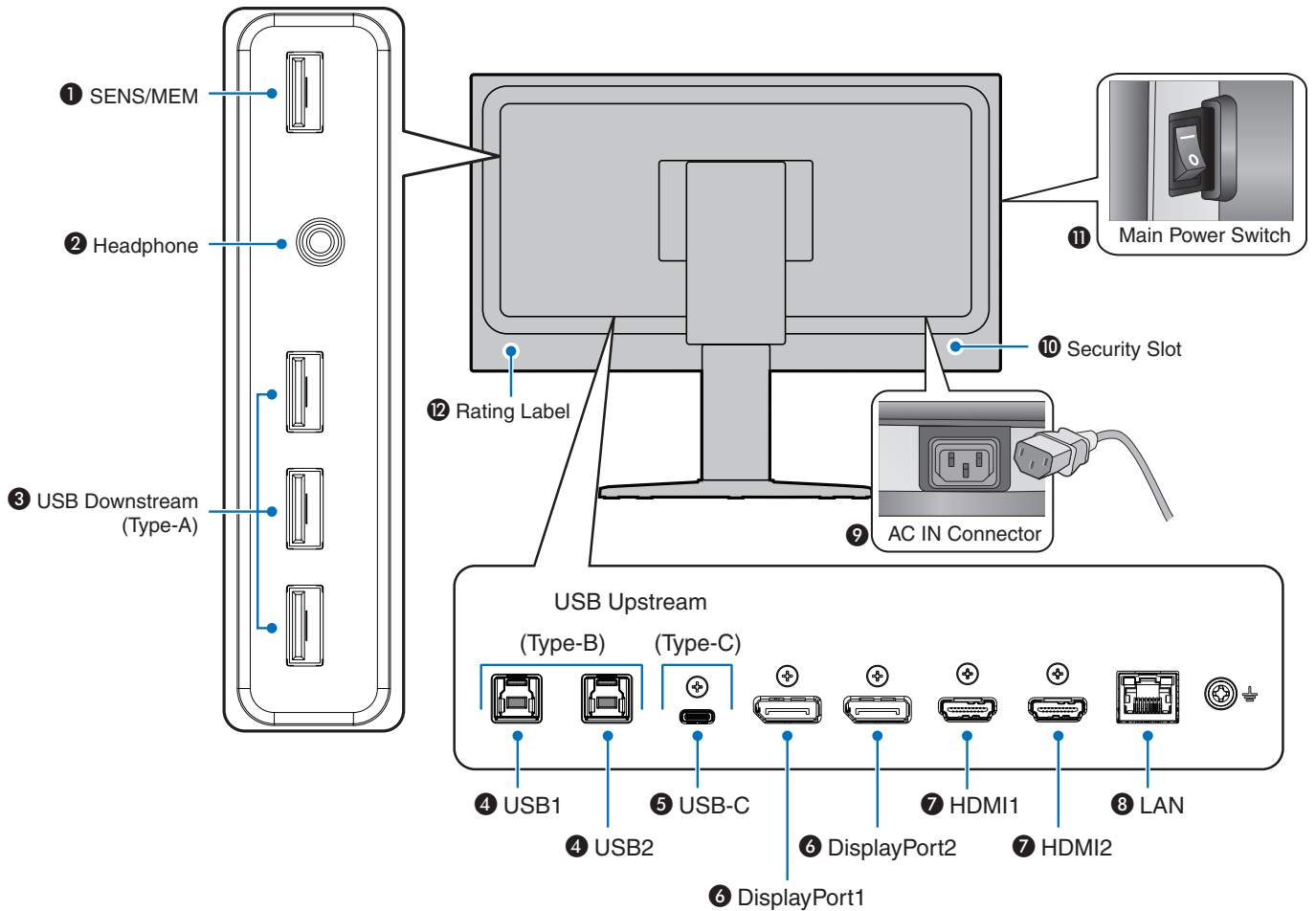
2: To avoid data loss, before changing the USB upstream ports, ensure that no USB storage devices are in use by the operating system of the computer attached to the USB upstream port



Item	Function
9 LED	Indicates that the power is on. The LED color can be changed in the OSD menu. See <a href="#">page 53</a> .
10 Sensor	Detects the ambient lighting and the presence of a user, allowing the monitor to make adjustments to various settings resulting in a more comfortable viewing experience. Do not cover this sensor.



# Terminal Panel



## 1 SENS/MEM Port

Connects with an external USB color sensor or USB storage device.

**NOTE:** This port is not for USB hub connection.

## 2 Headphone Jack

Connects with headphones.

## 3 USB Downstream Port (Type-A)

Connects with USB devices.

Connects with external equipment such as a computer compliant with USB.

## 4 USB Upstream Port (Type-B) (USB1/2)

Connects with external equipment such as a computer.

**NOTE:** Please use this port to control the monitor from connected external equipment.

## 5 USB-C IN (Type-C) (USB-C)

Connects with USB Type-C compliant external equipment such as a computer. Please refer to “Video Input Connections” on page 14 for more information.

## 6 DisplayPort IN (DisplayPort1/2)

DisplayPort signals input.

## 7 HDMI IN (HDMI1/2)

Digital HDMI signals input.

## 8 LAN Port IN (RJ-45) (LAN)

LAN connection.

## 9 AC IN Connector

Connects with the supplied power cord.

## 10 Security Slot

Security and theft protection lock slot compatible with Kensington security cables/equipment.

For products, visit Kensington’s website.

## 11 Main Power Switch

On/Off switch to turn main power ON/OFF. — : ON ○ : OFF

## 12 Rating Label

# Connections

## Connecting External Equipment

- NOTE:**
- Do not connect or disconnect cables when turning on the monitor's main power or other external equipment's power as this may result in loss of image.
  - Before making connections:
    - Turn off the device's power before connecting it to the monitor.
    - Refer to the device's user manual for available connection types and instructions for the device.
    - We recommend turning off the monitor's main power before connecting or disconnecting a USB storage device to avoid data corruption.

## Video Input Connections

- HDMI – High definition digital video and audio signal connection to a computer, streaming media player, Blu-ray player, game console, etc.
- DisplayPort (DP) – High definition digital video and audio signal connection to a computer.
- USB-C – Supports DisplayPort input of high definition digital video and audio signal (DisplayPort Alt Mode on USB Type-C only) connection to a computer. This display does not support other USB Type-C Alt Modes such as MHL and HDMI. This port is not for use with USB devices such as mice, keyboards, or storage media.

## Connecting Video

The type of video connections that can be used to connect to a computer depends on the computer's display adapter.

The following table shows the typical factory preset signal timing for each connection type. Some display cards may not be able to support the required resolution for proper image reproduction with the selected connection. The monitor will show the proper image by automatically adjusting the factory preset timing signal.

<Major supported timings>

Resolution		Vertical Frequency	Scan Type	Notes
H	V			
640	x 480	60 Hz	p	
720	x 400	70 Hz	p	
720	x 480	60 Hz	p	
720	x 480	60 Hz	i	HDMI only
720	x 576	50 Hz	p	
720	x 576	50 Hz	i	HDMI only
800	x 600	60 Hz	p	SVGA
1024	x 768	60 Hz	p	XGA
1280	x 720	24/25/30/50/60 Hz	p	720p
1280	x 1024	60/75 Hz	p	SXGA
1440	x 900	60 Hz	p	
1600	x 1200	60 Hz	p	UXGA
1920	x 1080	24/25/30/50/60 Hz	p	1080p
1920	x 1080	50/60 Hz	i	1080i, HDMI only
3840	x 2160	60/30 Hz	p	
4096	x 2160	60 Hz	p	Recommended

p: Progressive.

i: Interlace.

**NOTE:** When the selected monitor resolution is not a native panel resolution, the text contents appearance in the monitor screen is expanded in a horizontal or vertical direction to show the non-native resolution to full screen. This expansion is done by interpolated resolution technologies, which are normal and widely used in flat panel devices.

The maximum or recommended resolution may be set to 3840x2160 depending on the connected computer's video card.

## Connecting to a Computer with HDMI

- Please use Premium High Speed HDMI cable with the HDMI compliance logo. Standard / High speed HDMI cables doesn't support recommended video signal timing (4K60 Hz).

Cable type	Video signal timing		
	1080i/720p	1080p/4K30 Hz	4K60 Hz (recommended)
Standard HDMI	Yes	No	No
High Speed HDMI	Yes	Yes	No
Premium High Speed HDMI	Yes	Yes	Yes

- It may take a moment for the signal to appear after turning on the computer.
- Some display cards or drivers may not display an image correctly.
- When you use a computer with HDMI, please set [Overscan] to [Auto] or [Off] as display drivers may not be fully compatible and may not display an image correctly. See [page 48](#).
- If the monitor's main power is turned on after a connected computer is turned on, sometimes an image is not displayed. In this case, please turn off the computer then turn it on again.

## Connecting to a Computer with DisplayPort

- Please use a DisplayPort cable with the DisplayPort compliance logo.
- It may take a moment for the signal to appear after turning on the computer.
- When connecting a DisplayPort cable to a component with a signal conversion adapter, an image may not appear.
- Some DisplayPort cables feature a locking function. When removing this cable, hold down the top button to release the lock.
- If the monitor's main power is turned on after a connected computer is turned on, sometimes an image is not displayed. In this case, please turn off the computer then turn it on again.

## Connecting to a Computer with USB Type-C

- When using USB-C port for video / audio, please use SuperSpeed USB 10Gbps (USB 3.1 Gen 2) cable with USB compliance logo.
- Hi-Speed USB (USB 2.0) cable or charging cable doesn't support video / audio transmission.
- When using USB-C port for video / audio, please use computer port with DP Alt Mode compliance logo.
- HDMI Alt Mode or MHL is not supported.
- When using computer battery charging (Power delivery), please use computer and cable with USB Power Delivery compliance logo.
- It may take a few seconds for the monitor to recognize the USB signal.
- Please allow several seconds for the monitor to recognize the USB signal. Do not disconnect or reconnect the USB cable while the signal is being recognized.

Cable Type		Available Function				
		Computer Battery charging*1	USB Hub		Video / Audio	
			Hi-Speed USB (USB 2.0)	SuperSpeed USB (USB 3.1 Gen 1)	Lower Resolution	4K60Hz
USB Type-C Cable	Hi-Speed USB (USB 2.0)	Up to 65W	Yes	No	No	No
	SuperSpeed USB (USB 3.1 Gen 1)	Up to 65W	Yes	Yes*2	Yes	No
	<b>SuperSpeed USB 10Gbps (USB 3.1 Gen 2)</b>	<b>Up to 65W</b>	<b>Yes</b>	<b>Yes*2</b>	<b>Yes</b>	<b>Yes</b>
Thunderbolt 3 Cable	Passive	Up to 65W	Yes	Yes*2	Yes	Yes
	Active	Up to 65W	Yes	No	No	No

\*1: 65W charging is supported on Current rating 5A cable. When using Current rating 3A cable, charging will be limited to 60W. Optical cables do not support the Computer Battery charging function.

\*2: Default setting is [USB2.0]. To use [USB3.1], please see "USB data setting" on page 50.

## Connecting USB Devices

- It may take a few seconds for the monitor to recognize the USB input. Do not disconnect the USB cable or disconnect and reconnect the USB cable before the monitor recognizes the input.
- Before turning off the main power switch of the monitor or shutting down Windows®, please turn off the USB function and remove the USB device from the monitor. Data may be lost or corrupted if the USB device is not disconnected properly.

## Setup

For box contents, please refer to the printed contents sheet provided in the box.

The accessories included depends on the location where the monitor was shipped.

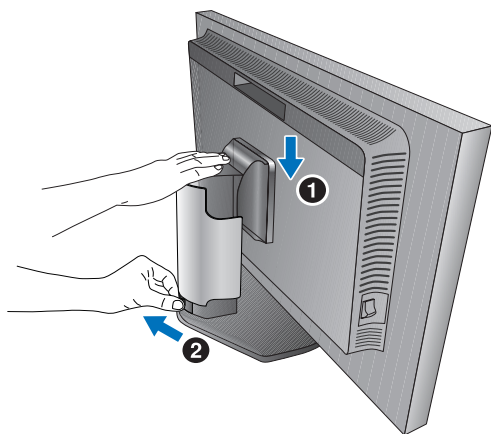
**To connect the monitor to your system, follow these instructions:**

**NOTE:** Make sure to read “Recommended Use” on page 4 before installation.

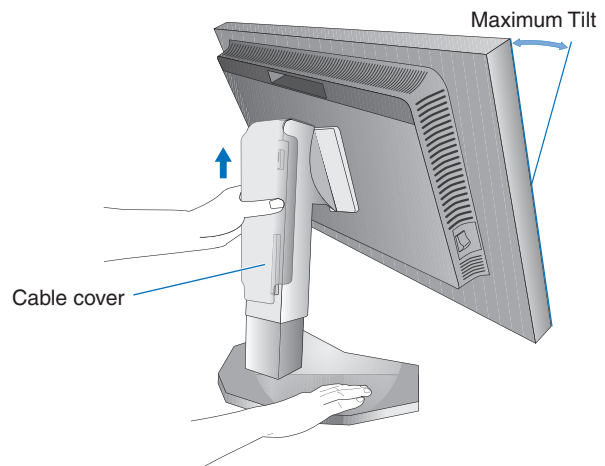
1. Turn off the power to your computer.
2. Height adjustment is locked by a lock switch. Place a hand on top of the stand to push down to the lowest position. Slide the lock switch to unlock the stand and raise the monitor screen (**Figure B.1**).

Place your hands on each side of the monitor to tilt the panel to a maximum tilt angle and lift up to the highest position (**Figure B.2**). Slide the cable cover up.

**NOTE:** Cable cover cannot be removed.

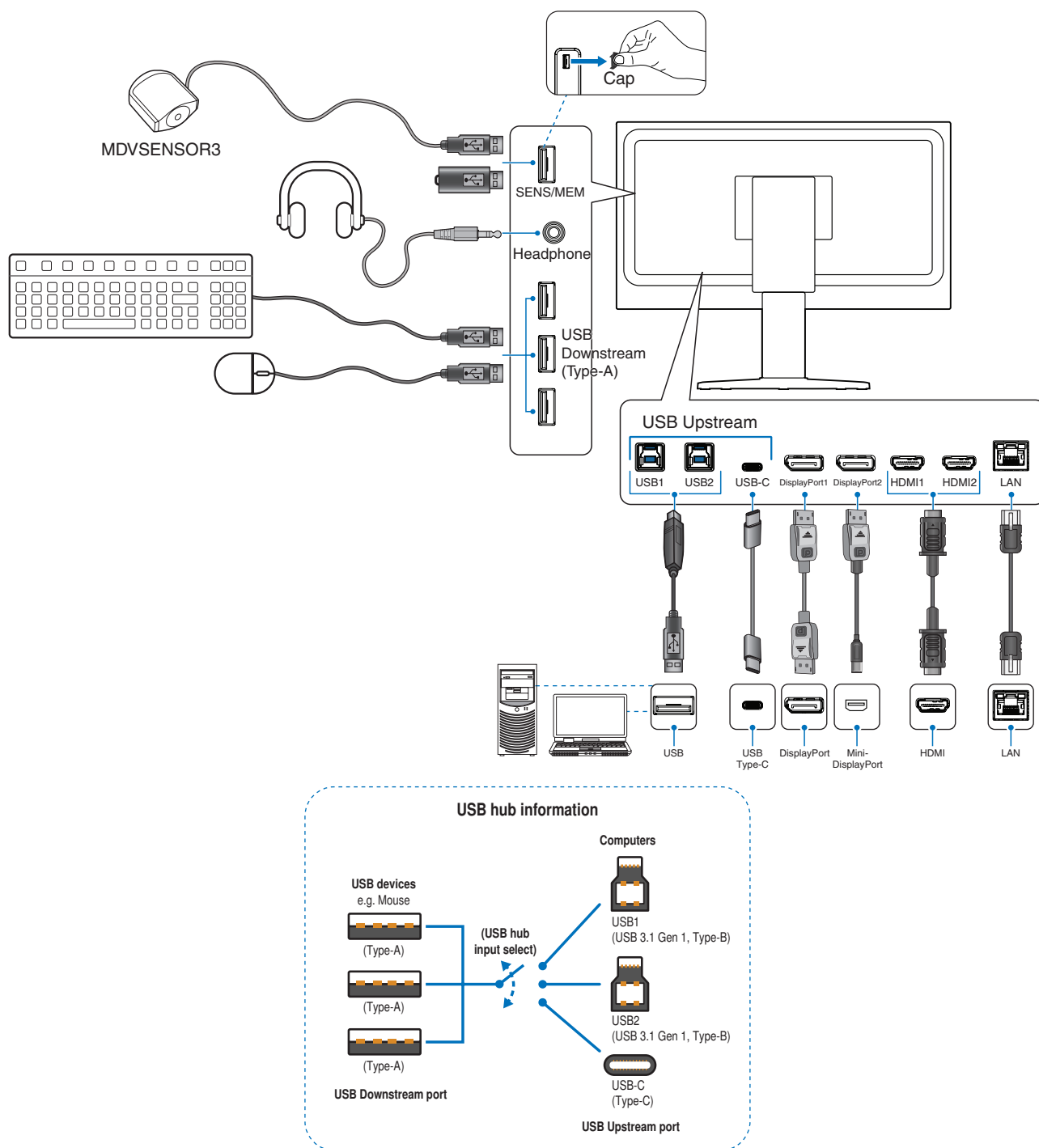


**Figure B.1**



**Figure B.2**

3. Connect devices to the monitor.



**CAUTION:** Use the provided specified cables with this product so as not to interfere with radio and television reception.

For DisplayPort, HDMI, USB, and USB-C, please use a shielded signal cable.

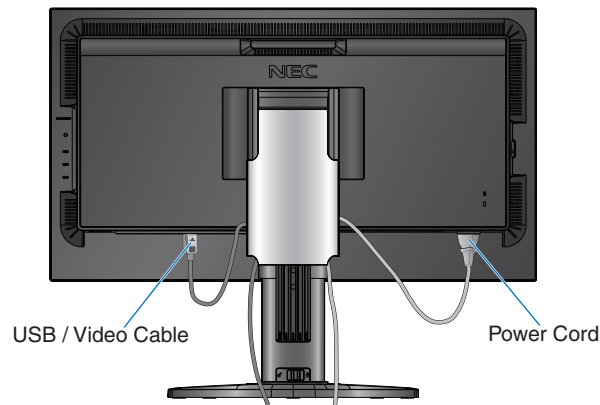
Use of other cables and adapters may cause interference with radio and television reception.

- CAUTION:**
- Do not bind the USB cable. It may trap heat and cause a fire.
  - Do not connect headphones to the monitor while you are wearing them. Depending on the volume level, it may damage your ears and cause loss of hearing.

- NOTE:**
- Adjustment of the volume control as well as the equalizer to other settings than the center position may increase the ear-/headphones output voltage and therefore the sound pressure level.
  - Use an audio cable without a built-in resistor. Using an audio cable with a built-in resistor lowers the sound.
  - Incorrect cable connections may result in irregular operation, damage display quality/components of the LCD module and/or shorten the module's life.

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

**NOTE:** Place the cables in the hooks firmly and evenly (**Figure C.2**).



**Figure C.2**

- Please check that you can still raise and lower the monitor screen after you have installed the cables, then slide the cable cover down.

- Connect the power cord to a power outlet.

**NOTE:**

- Please refer to the Caution section of this manual for proper selection of the AC power cord (see [page 1](#)).
- Please make sure that enough power is supplied to the monitor. Please refer to “[Power Supply](#)” in the “[Chapter 5 Specifications](#)” on [page 42](#).

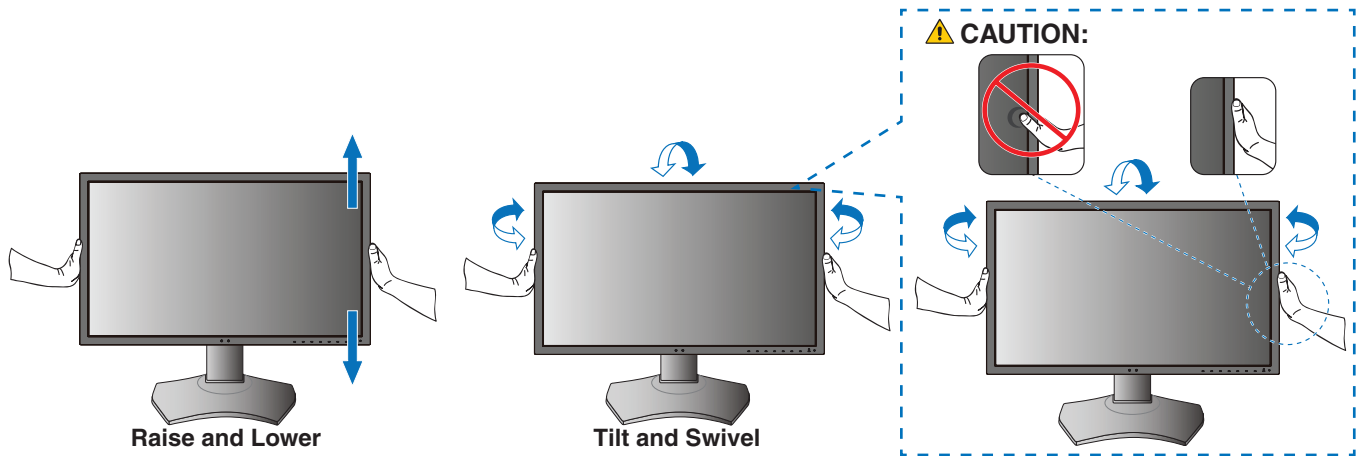
- Turn on the monitor by touching the  key and then turn on the computer.

**NOTE:** If you have any problems please refer to the Troubleshooting section of this User's Manual (see [page 38](#)).

## Adjustable Stand Capability

Hold the monitor on each side and adjust height, tilt, and swivel as desired.

To rotate the OSD menu between landscape and portrait, refer to the OSD (On-Screen-Display) Controls section (see [page 52](#)).



## Flexible Arm Installation

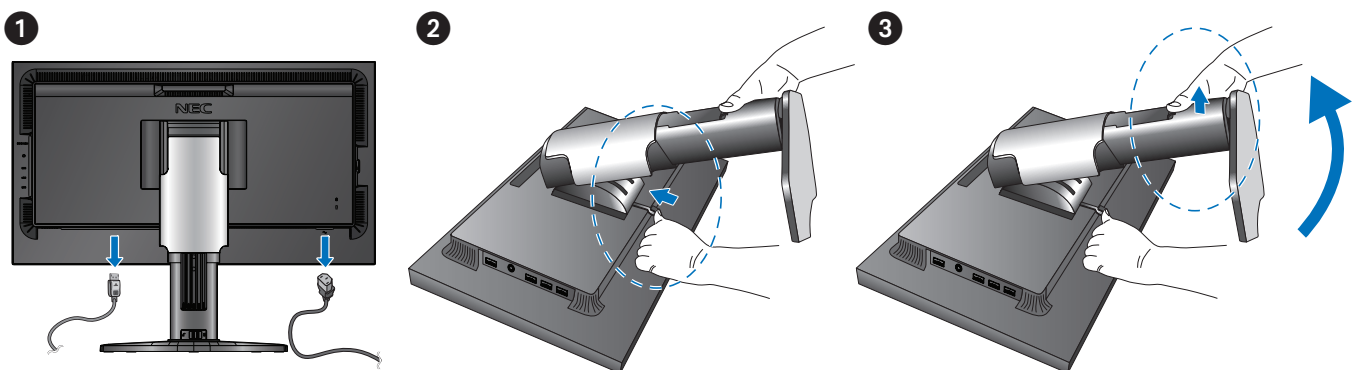
This monitor is designed for use with a flexible arm. Contact NEC for more information.

Follow the instructions provided by the manufacturer of the display mount. Remove the monitor stand before mounting.

**CAUTION:** To meet the safety requirements, the monitor must be mounted to an arm that supports the weight of the monitor. See [page 42](#) for details.

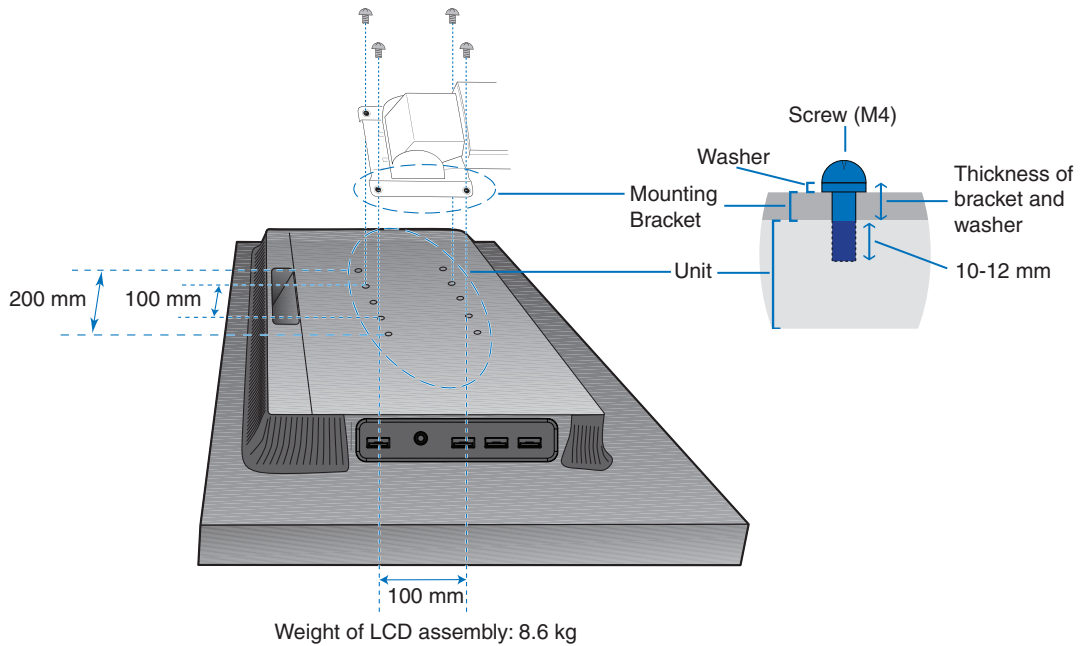
## Remove the Monitor Stand for Mounting

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



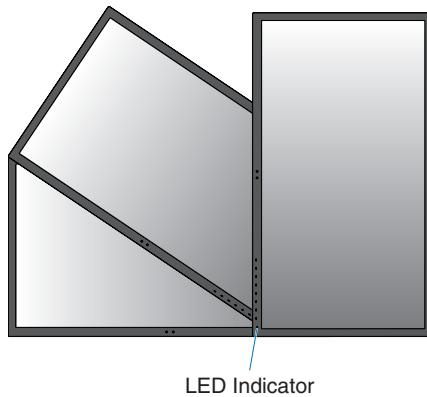
# Mount the Flexible Arm

Please use the 4 screws included with this monitor or the screw type specified below.



**Figure F.1**

- CAUTION:**
- The monitor should only be used with an approved arm (e.g. TUEV GS mark).
  - Tighten all screws (recommended fasten torque: 98 - 137 N•cm).
  - Attaching the flexible arm should be done by two or more people if the monitor cannot be placed face down on a flat surface for installation.
  - When using the monitor in the portrait position, it should be rotated clockwise so that the left side is moved to the top and the right side is moved to the bottom.
- This will allow for proper ventilation and will extend the lifetime of the monitor. Improper ventilation may shorten the lifetime of the monitor (**Figure F.2**).



**Figure F.2**



## Chapter 2 Basic Operation

### This Chapter Includes:

- ⇒ “Using the OSD (On-Screen Display) Controls” on page 22
- ⇒ “Changing the Input, Picture mode, Luminance, and Volume” on page 24
- ⇒ “Power management function LED indicator patterns” on page 25

# Using the OSD (On-Screen Display) Controls

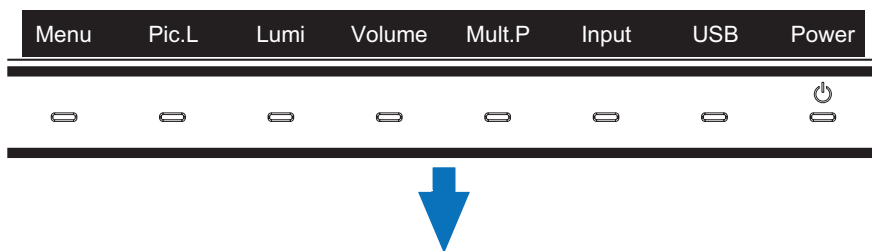
Many of the OSD controls are also available in the included MultiProfiler software, developed by NEC Display Solutions. The latest MultiProfiler software is available on the NEC Display Solutions website.

## OSD (On-Screen Display) control key on the front of the monitor function as follows:

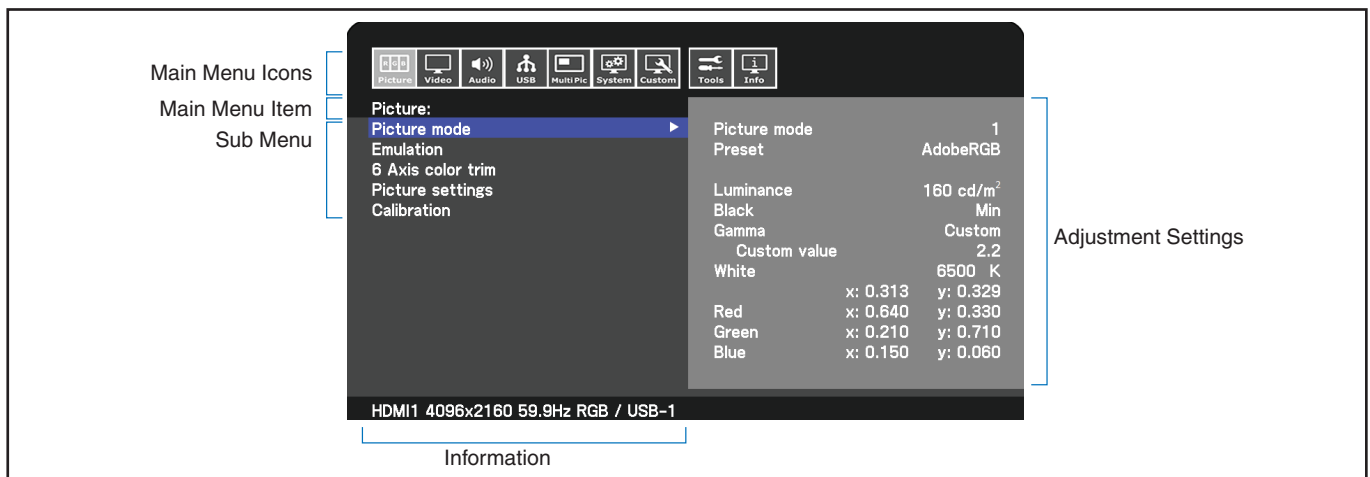
Touch the monitor keys to show the keys' guide.

**NOTE:** Touching a key will immediately open the menu for that key's function. The keys' functions and labels change based on which menu is opened.

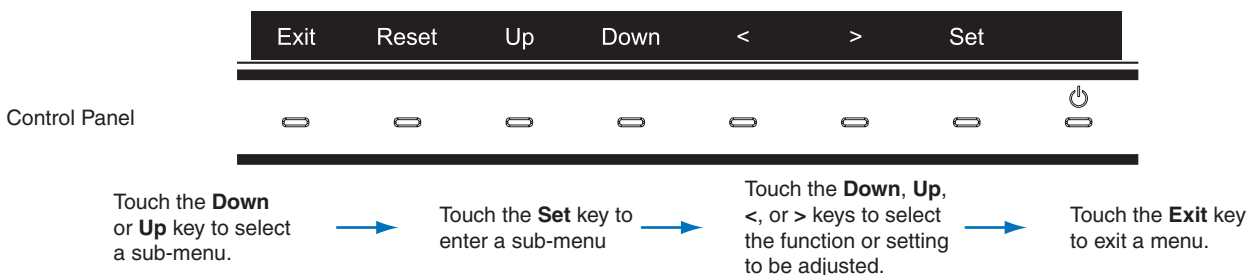
Some functions may not be available depending on the model or optional equipment.



- To access the OSD menu, touch the **Menu** key.



The keys' guide and their functions change when the OSD menu is open.



**NOTE:** Touch the **Reset** key to return the selected items to factory shipment state.

Below is a brief summary of where controls are under each menu item. Tables listing all options available in the OSD menu are located in [“Appendix B OSD Controls List” on page 44.](#)



**Picture:** Select one of the default picture modes, manually adjust the color settings, enable auto brightness and uniformity, view color vision emulation, and perform calibration.



**Video:** Select input signal source, configure auto input detection, and set image format, aspect, overscan, sharpness, and signal format.



**Audio:** Select source, adjust volume, and enable audio delay.



**USB:** Configure the USB hub and USB-C settings.



**Multi-Pic:** Enable and configure multi-picture viewing.



**System:** Set the OSD language, time, position, transparency, rotation, and configure power management, human sensing, network settings, and perform a factory reset.



**Customize:** Configure the hot-key functions and LED indicator color, choose the number of available picture modes, lockout access to the OSD, and rename the current input.



**Tools:** Show the area marker on-screen and import/export the display settings.

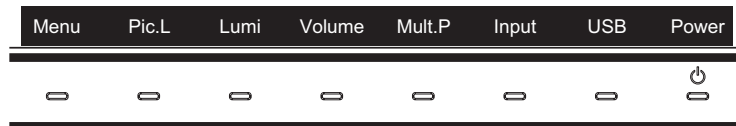


**Info:** Shows the monitors' information, SpectraView engine status, USB information, and system information.

# Changing the Input, Picture mode, Luminance, and Volume

Touch the monitor keys to show the keys' guide.

- NOTE:**
- Touching a key will immediately open the menu for that key's function. The keys' functions and labels change based on which menu is opened.
  - The functions described in this section are the default behavior for the hot-keys from default settings. Some of the hot-keys can be customized for quick access to different functions. See [page 53](#).



## Changing the Input

To change the signal input, touch the **Input** key.

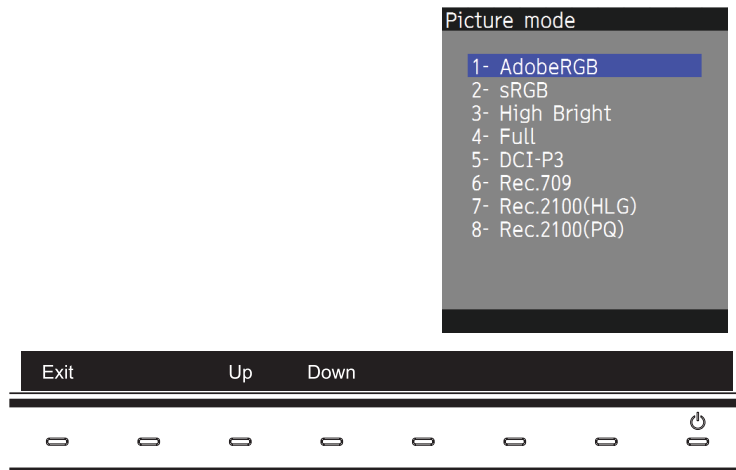
**NOTE:** If there is no active video signal on another input the monitor switches back to the current input.

### For HDCP Content

HDCP is a system for preventing illegal copying of video data sent over a digital signal. If you are unable to view material via the digital inputs, this does not necessarily mean that the monitor is not functioning properly. With the implementation of HDCP, there may be cases in which certain content is protected by HDCP and might not be displayed due to the decision/intention of the HDCP community (Digital Content Protection, LLC). HDCP video content is generally commercially produced Blu-rays and DVDs, television broadcast, and streaming media services.

## Changing the Picture mode

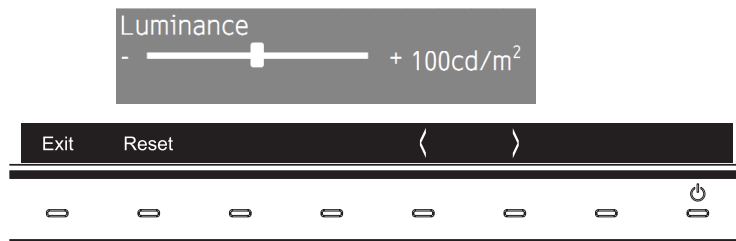
1. Touch the **Pic. L** key to open the [Picture mode] selection menu (See [page 45](#)). Note that the current picture mode is highlighted.
2. Touch the **Up** or **Down** key to select a different picture mode.



3. Touch the **Exit** key to save the change and close the [Picture mode] selection menu.

## Adjusting the Luminance

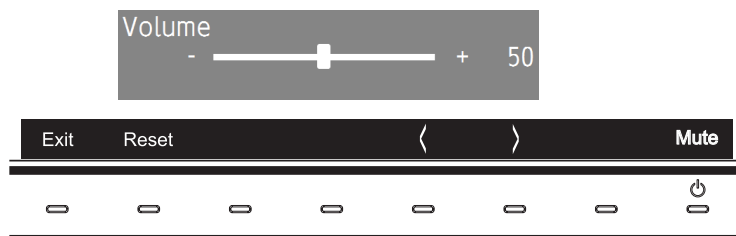
1. Touch the **Lumi** key to open the luminance adjustment slider.
2. Touch the < or > key to raise or lower the luminance level.



3. Touch the **Exit** key to save the change and close the [Luminance] slider.  
Touch the **Reset** key to discard the change.

## Adjusting the Volume and Mute

1. Touch the **Volume** key to open the volume adjustment slider.
2. Touch the < or > key to raise or lower the volume level.  
Touch the **Mute** key to mute or un-mute the audio.



3. Touch the **Exit** key to save the change and close the [Volume] slider.  
Touch the **Reset** key to discard the change.

## Power management function LED indicator patterns

The power management function is an energy saving feature that automatically reduces the power consumption of the monitor when the keyboard or the mouse has not been used for a fixed period.

Mode	LED indicator	Power consumption	Condition
Normal operation (Maximum brightness)	Blue	Approx. 84 W	Normal operation (Backlight is on)
Energy saving mode	Amber	Approx. 10 W	When meeting one of the conditions below, the monitor has passed a certain amount of time with no video signal input. <ul style="list-style-type: none"> <li>• A computer is connected to the USB upstream port.</li> <li>• [Quick recovery] is set to [On].</li> </ul>
	Dark amber	2 W	The monitor has passed a certain amount of time with no video signal input when there is an active network signal input.
	Slowly pulsating	0.5 W	The monitor has passed a certain amount of time with no video signal input and there is no network signal input.
Off mode	Off	0.5 - Approx. 10 W	Turn off the monitor by the $\phi$ key. Power consumption depends on the power saving mode status.
		0.3 W	Turn off the monitor by the main power switch.

- NOTE:**
- Power consumption depends on the setting of OSD or which devices are connected to the monitor.
  - This function works with computers that support VESA approved DPM (Display Power Management).
  - The LED indicator color for normal operation can be customized (see [page 53](#)).

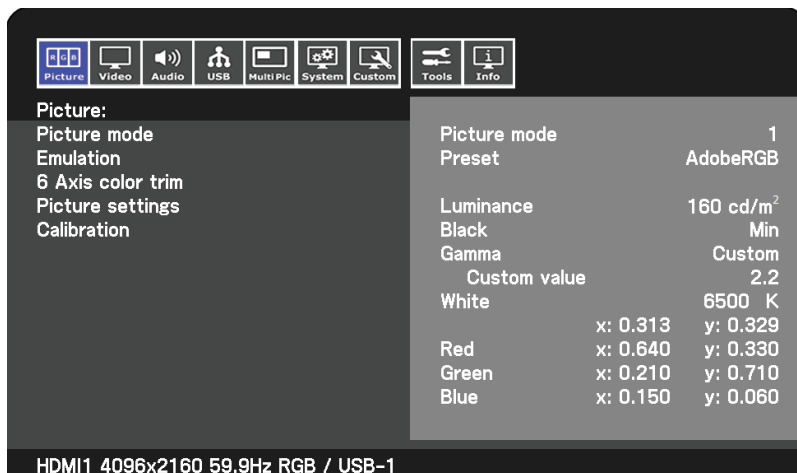
## Chapter 3 Advanced Operation

### This Chapter Includes:

- ⇒ “Changing the Picture Mode and Preset” on page 27
- ⇒ “Running Stand-alone calibration” on page 29
- ⇒ “Using the USB-C port functions” on page 31
- ⇒ “Configuring Multi-Picture Mode” on page 33
- ⇒ “Controlling the monitor via LAN” on page 34
- ⇒ “Import / export and firmware update with USB storage device” on page 36

## Changing the Picture Mode and Preset

Several picture modes are available for you to choose one that is most suitable for the type of content. Each picture mode includes [Luminance], [Black], [Gamma], [White], [Red], [Green], and [Blue] settings. You can change these settings in the [Picture mode] menu.



### To change the picture mode:

1. Touch the **Menu** key.
2. Navigate to the [Picture] menu then highlight the [Picture mode] function.
3. Touch the > key to cycle through the available picture modes.
4. Stop when you see the preset or screen colors that you want to use.

- NOTE:**
- Pause between each touch on the key to allow that picture mode's settings to refresh on the monitor screen.
  - There are five picture modes available by default. Up to ten can be made available by changing the [Number of Picture modes] in the [Custom] menu. (See [page 53](#)).
  - You can set the picture mode separately for each window when the [Multi picture] function is selected.
  - There are several types of color space configured as presets in each picture mode. You can change the detailed settings of these presets.

## About the SpectraView engine picture modes

The SpectraView engine (SVE) is a custom color processor engine integrated in the monitor. It combines individual characterization and calibration of the monitor during production together with temperature and time monitoring, to provide an unparalleled level of color control, accuracy and stability.

The SVE provides the utmost in versatility; from faster and more advanced color calibration to the ability to accurately emulate colorspace such as Adobe®RGB and sRGB, to performing printer output emulations using ICC Profiles and internal 3D Look Up Tables.

Each individual [Picture mode] can store fully customized color settings. This allows you to quickly switch between different settings by just changing between picture modes.

Using the SVE will also give access to other advanced functionality, such as the ability to emulate several modes of human color vision deficiency as well as the ability to select the monitor's output color gamut.

### To change picture mode preset:

Each [Picture mode] uses an SVE preset. Presets have been configured with settings for general use as described in the "Preset Types" table. When choosing a preset for the picture mode, all of the settings are immediately adjusted to match the preset. Each setting can be individually adjusted to customize as needed.

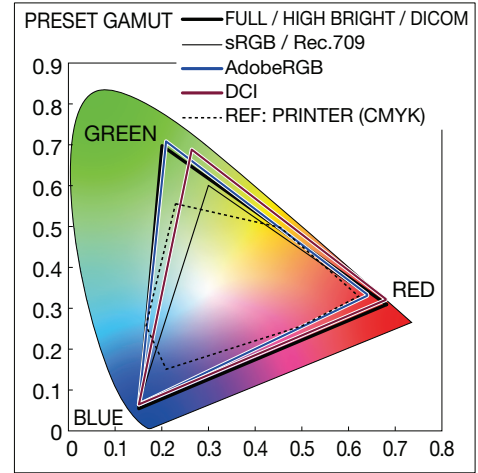
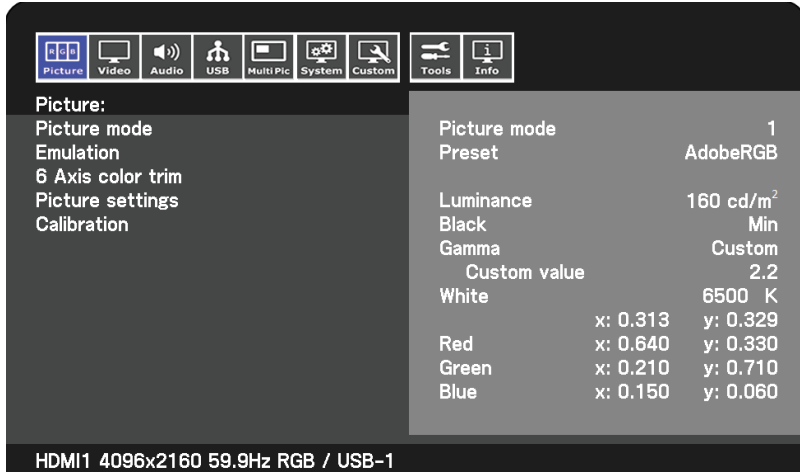
1. Touch the **Menu** key.
2. Navigate to the [Picture] menu then highlight the [Preset] function in the [Picture mode].

3. Touch the > key to cycle through the presets.

Choose the [Preset] that is most suitable for the type of content that is shown or application usage.

Each [Picture mode] includes [Luminance], [Black] (Black level), [Gamma], [White (K)](color temperature ), [White (x, y)] (White point CIE x, y), [Red] (Red Primary CIE x, y), [Green] (Green Primary CIE x, y), and [Blue] (Blue Primary CIE x, y), settings. You can change these settings in the [Picture mode] menu.

4. Touch the **Exit** key to return to the main [Picture] menu.



**NOTE:** Changing the settings in the [Picture mode] menu does not change the default settings for the [Preset].

- “\*” mark is shown if the picture mode settings have been changed from the default preset settings.

### Preset Types

Preset	Purpose
sRGB	The standard color setting of the Internet, Windows® operating systems, and many smart-phone and other digital cameras. Recommended setting for general color management.
AdobeRGB	Wider color gamut setting used in high-end graphics applications such as professional digital still cameras and printing.
eciRGB_v2	Color setting recommended by Europe printing group, ECI (The European Color Initiative).
DCI-P3	Color setting for digital cinema.
Rec.709	Color setting for High-definition television.
Rec.2100 (HLG)	Color setting for HDR (High Dynamic Range) broadcasting.
Rec.2100 (PQ)	Color setting for HDR (High Dynamic Range) digital cinema on disc and internet streaming.
High Bright	Highest brightness setting.
Low Blue	Reduces blue light emitted from the monitor. Paper-like color setting. (The Low Blue function substantially reduces blue light and helps to alleviate eye-strain.)
Full	Native LCD panel color gamut. Suitable for use with color managed applications.
DICOM	Color setting for medical imaging that conforms to DICOM GSDF (Grayscale Standard Display Function). <b>NOTE:</b> Do not use for diagnostic purposes.
Programmable	Programmable preset for MultiProfiler and other supported software. The preset name can be changed by software.

- NOTE:**
- Settings for [Emulation] and [6 Axis color trim] are also stored to each [Picture mode]. Please refer to the OSD controls table in Appendix B for full list and description of the Picture menu’s functions. See [page 45](#).
  - When the selected [Picture mode] does not match the color setting of your computer (ICC profile), the color reproduction of the displayed image is inaccurate.
  - For detailed color settings and to set the ICC profile on your computer automatically, MultiProfiler software is recommended. The latest version of the MultiProfiler software is available on the NEC Display Solutions website.



# Running Stand-alone calibration

This feature performs color calibration of the monitor without using an external computer or software. This is useful for color matching a small number of monitors quickly. It also updates the factory color measurement data used by the monitor's internal SpectraView engine (SVE) color processor.

Updating the factory color data with measurements taken from a color sensor results in color related settings, shown on the OSD, closely matching measurements from the color sensor. In effect, the color sensor's measurements become the new reference for all of the SVE's internal color calculations. All color presets in the monitor automatically update to use the new reference.

Requirements for Stand Alone Calibration:

- NEC MDSVSENSOR3 color sensor. This sensor connects directly to the SENS/MEM port on the monitor. The monitor automatically takes screen measurements directly from the color sensor. See [Appendix A](#) for purchase and availability information.

Or

- A near-range colorimeter with a measurement readout display in CIE Y/x, y format with Y in units of  $\text{cd/m}^2$ . Measurements are taken manually and each reading must be entered into the monitor via the OSD. [Validation] and [White copy] are not available.

**NOTE:** Other color sensor models and types are not supported.

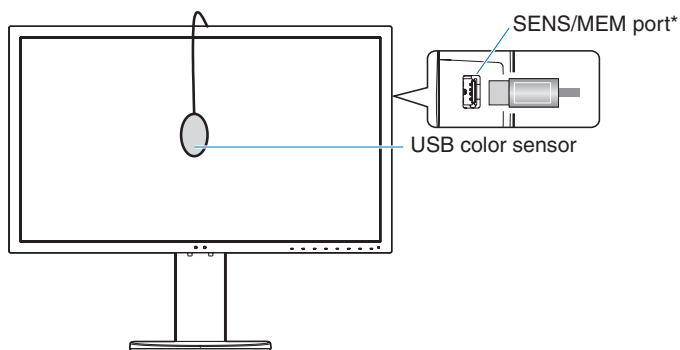
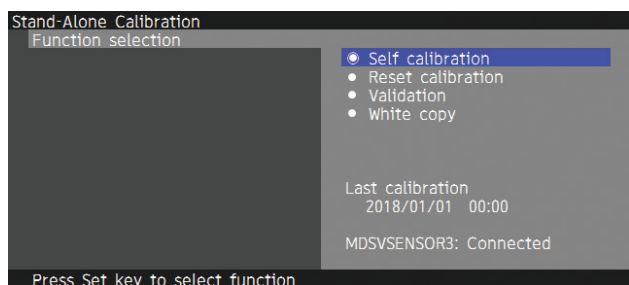
- NOTE:**
- For best calibration results, it is recommended the monitor be allowed to warm up for at least 30 minutes before starting the calibration or measurement process.
  - It is not necessary to recalibrate the other Picture modes in the monitor after performing the Self calibration. Updating the monitor's internal reference automatically updates all color settings.
  - The original factory measurements can be recalled at any time.
  - Differences between the factory color measurements and those taken with a color sensor are to be expected. Differences can be due to many factors, such as variations between color sensor measurement technologies and device calibration and drift, measurement position on the screen, and video signal differences.

## To open the Stand Alone Calibration OSD menu:

The stand-alone calibration menu automatically opens when connecting a supported USB color sensor to the SENS/MEM port. It can also be opened from the OSD picture menu as follows:

1. Touch the **Menu** key.
2. Navigate to the [Picture] menu then highlight the [Calibration] function.
3. Touch the > key to highlight [Calibration].
4. Touch the **Set** key to open the [Stand-Alone Calibration] menu.

Select a function on the menu and follow the instructions on the OSD message.



\*Remove the cap before inserting a cable in the SENS/MEM port.

## Self calibration

This function updates the monitor's internal SpectraView engine color processor to use measurements taken using a supported color sensor device. These measurements will become the reference for all color settings in the monitor.

When an NEC MDSVSENSOR3 color sensor is connected to the monitor's SENS/MEM port, the monitor takes measurements and is calibrated automatically. Place the color sensor at the center of the screen and follow the messages displayed.

Otherwise, if using a near-range colorimeter device, measurements must be taken manually with the device and the CIE Y/x/y values individually entered via the OSD. Y is in units of  $\text{cd/m}^2$ .

Depending on the monitor usage and other factors, performing a [Self calibration] at least once per year is recommended.

## Reset calibration

This deletes the color measurement data created by the [Self calibration] function and returns to the original factory internal reference color measurement data. All picture modes will automatically be updated.

## Validation\*

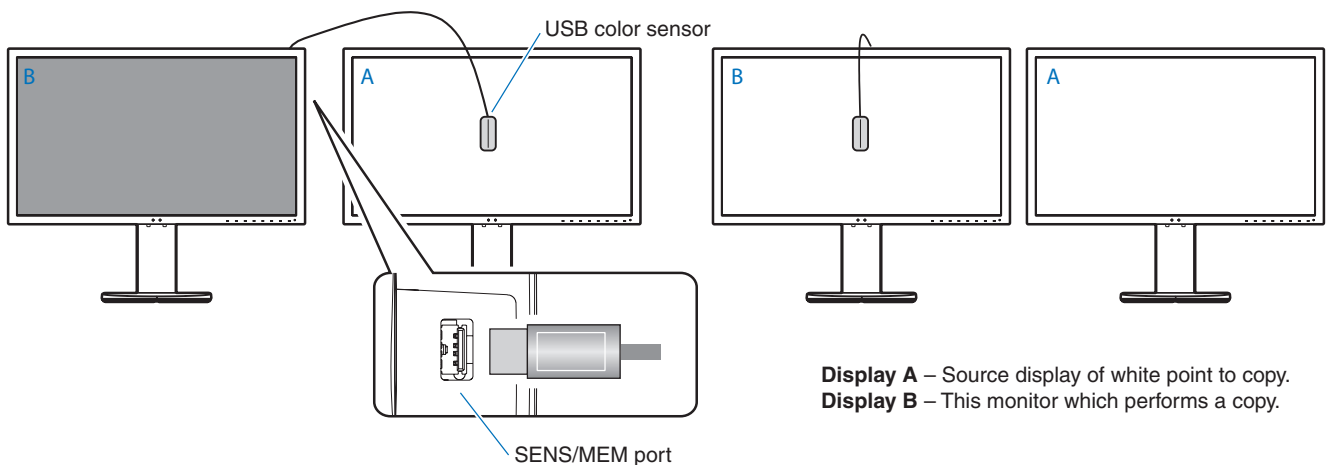
This can be used to determine if the Self Calibration operation should be performed.

It compares measurements taken of various color patches on the screen by the color sensor with the expected values calculated by the SVE, which uses the current internal reference color measurement data. The result of this comparison is indicated as an average color difference (dE) value. Larger values mean there is a larger difference between the measurements and the internal reference. If the dE value is higher than 3.0, Self Calibration is recommended to update the internal reference color data.

\*: The Self Calibration function must have been previously performed before this function is available on the OSD menu.

## White copy

This function measures the luminance and white point of the target monitor (A) and sets the values to the current picture mode of this monitor (B). Using this feature reduces the variation between different displays allowing them to match each other more closely.

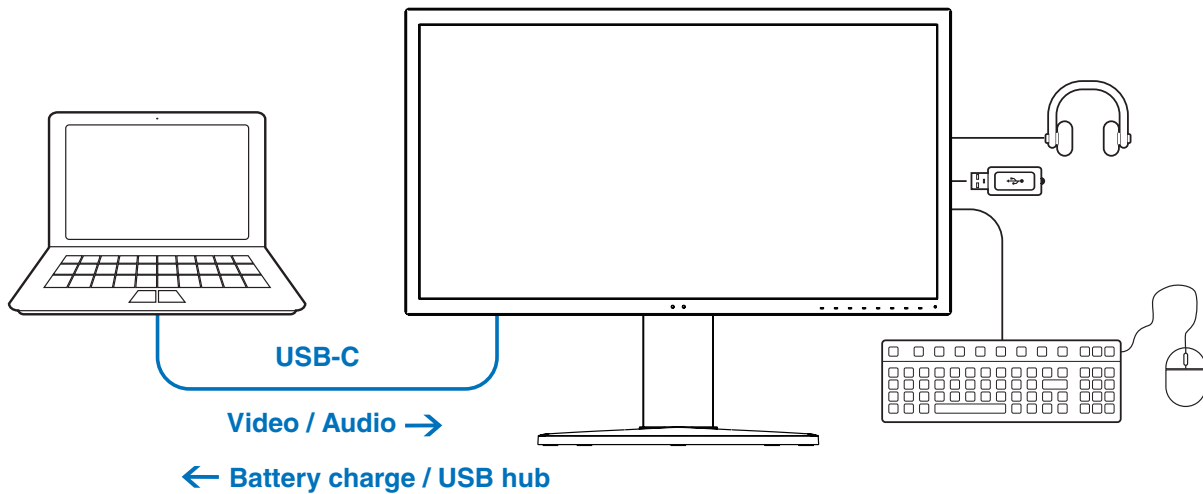


- NOTE:**
- The supported USB color sensor for SENS/MEM port is MDSVSENSOR3.
  - After the monitor is powered on, the "Color stabilizer" function is busy internally and must be warmed up. Calibrating during this period will affect the calibration quality.
  - The results of the [Self calibration] and [Validation] functions are stored in the monitor and can be read by software on your computer. Setting the monitor's time clock is required for this function. Follow the instructions on the OSD menu and set the time. After the time is set, the monitor counts automatically while the AC power is active.
  - [White copy] will adjust only luminance and white point. For more accurate color matching, please use the MultiProfiler software. See [Appendix A](#) for purchase and availability information.

# Using the USB-C port functions

The following features are simultaneously available via a single USB-C connection to a suitably equipped computer:

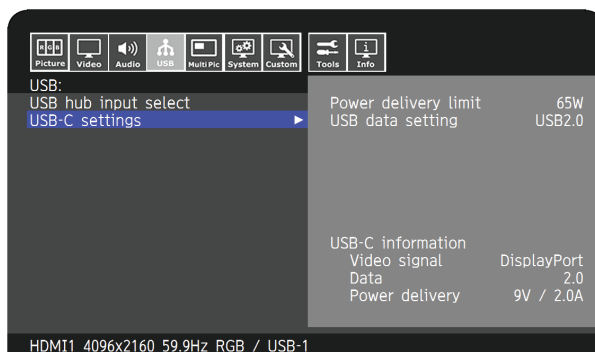
- Video and audio delivered by DisplayPort Alt Mode at up to 4K60Hz RGB10bit resolution.
- Connecting USB devices such as keyboards, mice and USB flash drives at speeds up to 5.0Gbps.
- USB power delivery to charge the connected computer's battery with/at up to 65W.



- NOTE:**
- These functions can be used concurrently; however, the actual behavior depends on the connected computer port or cable.
  - You can check the actual status from the [USB data setting].

## To open the USB-C settings menu:

1. Touch the **Menu** key.
2. Navigate to the USB menu then highlight the [USB-C settings] function.
3. Touch the > key to highlight [Power delivery] limit.
4. Touch the < or > keys to raise or lower the power limit.
5. Touch the **Exit** key to save the change and exit the setting.



## Video and audio function

- Please use a computer port with the DP Alt Mode compliance logo. HDMI Alt Mode or MHL is not supported.
- Please use a SuperSpeed USB 10Gbps (USB 3.1 Gen 2) cable with USB compliance logo. Hi-Speed USB (USB2.0) cable or charging cable doesn't support video transmission.

## USB Power delivery function

- Please use a computer and cable with USB Power Delivery compliance logo.
- If the connected device is not recognized, the information shows [---]. The power might be supplied.

## **USB hub Function**

- Default setting is [USB2.0]. To use [USB3.1], please see [USB data setting] on [page 50](#).

## **Compatibility**

- See the cable type comparison chart on [page 15](#).
- Information about the tested USB Type-C devices and cables are on the NEC Display Solutions website.

For safety and reliability purposes, it is highly recommended that only the tested cables be used.

# Configuring Multi-Picture Mode

Multi-Picture mode lets you see video input from multiple different sources at the same time. A secondary input can be viewed in an inset window on the main video (Picture-in-Picture), or the inputs can be viewed next to each other (Picture-by-Picture).

## To enable multi-picture mode:

1. Touch the **Menu** key.
2. Navigate to the [Multi Pic] menu then touch the **Down** key to highlight the [Multi picture settings] function.
3. Touch the > key to highlight [Multi picture].
4. Touch the < or > key to change the multi-picture function to [On].
5. Touch the **Down** key to highlight [Multi picture mode] then touch the < or > key to select either [PiP] or [PbP].
  - PiP (Picture-In-Picture) — select this option to have a second input viewed in a inset window.
  - PbP (Picture-By-Picture) — select this option to have the inputs viewed next to each other.
6. Touch the **Exit** key to save the change and exit the setting.

## PiP (Picture-in-Picture) settings:

1. Navigate to [Active Picture] on the OSD.
  - Change the [Active Picture] to [Picture2].  
The picture [Position] and [Size] functions are for configuring the settings of the sub-picture window [Picture2]. They will remain disabled as long as [Picture1] is the active picture.
2. You can now adjust the settings for the sub-picture window.
  - Picture Position — touch the **Up**, **Down**, < or > key to move the sub-picture window.
  - Picture Size — touch the < or > key to increase or reduce the size of the sub-picture.

## PbP (Picture-by-Picture) settings:

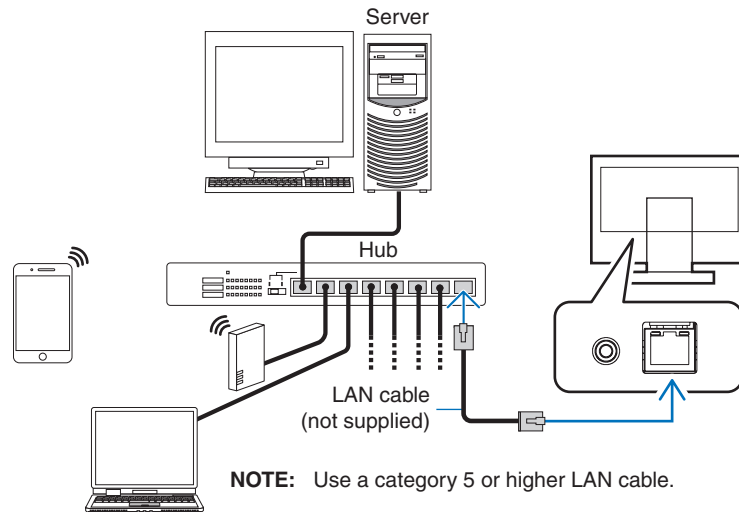
1. Navigate to [Active Picture] on the OSD.
  - Select either [Picture1] or [Picture2].  
The picture [Position] and [Size] functions are configured separately for each input.
2. You can now adjust the settings for each window.
  - Picture Position — touch the **Up** or **Down** key to move the active picture window.
  - Picture Size — touch the < or > key to increase or reduce the size of the active picture window.

# Controlling the monitor via LAN

## LAN Control Function

Provides control of the monitor settings over the network, via a custom application or a web browser on a connected computer or smartphone.

Example of a LAN connection:



## Preparation Before Use

Connect the monitor to the network by using a commercially available LAN cable. Set the IP address (see [page 52](#)).

## Using Control Software

Control software allows you to control the monitor settings and get the monitor status, including calibration information. Please download the software from our web page and install it on your computer.

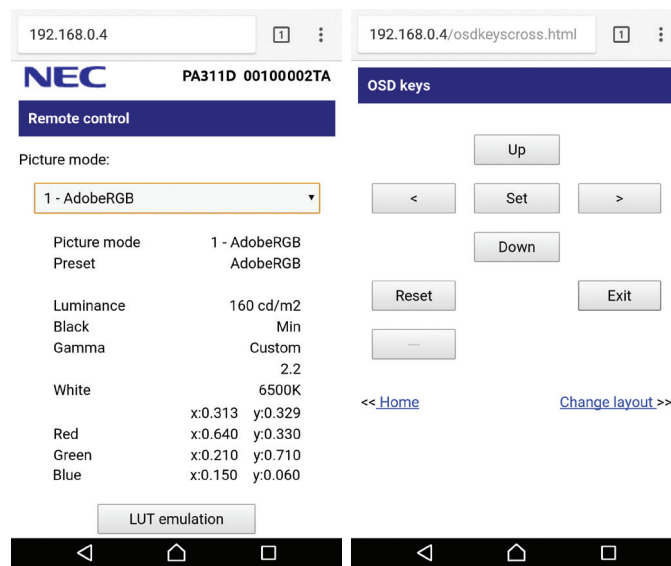
## OSD control via web browser (HTTP server function)

You can switch the picture modes and video inputs via a web browser.

To access this function, enter the monitor's URL in the web browser on a connected smartphone or computer.

`http://<the monitor's IP address>/index.html`

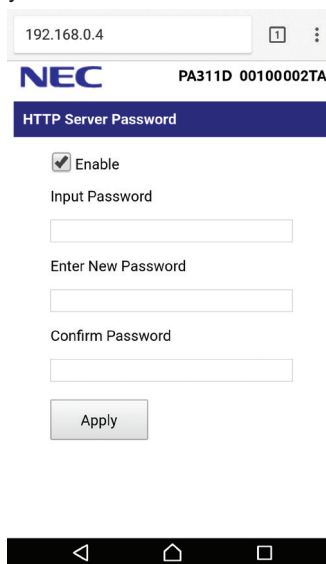
You can control the OSD menu using the web browser instead of the touch keys on the monitor. By using the [Hot key] setting in the OSD, you can customize the functions.



For security, you can set a password to access the HTTP server function. Please select [Enable] for HTTP Server Password function. A-Z, 0-9, and some symbols can be used for the password. The default setting is [0000]. The monitor name is displayed as the user name.

**NOTE:**

- The default setting for the IP address is [Auto]. When a LAN cable is connected, or after a monitor [Reset], the IP address will be assigned automatically.



- If the monitor appears to be slow in response to commands or clicks on buttons in the browser, or the general speed of operation is unacceptable, this may be due to network traffic or the settings on your network. Should this happen, consult your network administrator.
- The monitor may not respond if the buttons shown on the browser are repeatedly pressed in rapid intervals. Should this happen, wait a moment and repeat. If you still can't get a response, turn the monitor off and then back on.
- The HTTP server function is confirmed on some major web browsers; however, it is not guaranteed to work with all web browsers.
- If the HTTP server screen does not appear in the web browser, refresh your web browser (or clear the cache).
- Operation with a browser that uses a proxy server may not be possible depending on the type of proxy server and the setting method. Although the type of proxy server will be a factor, it is possible that items that have been set will not be shown depending on the effectiveness of the cache, and the contents set from the browser may not be reflected in operation. It is recommended that a proxy server is not used unless the network environment requires it.

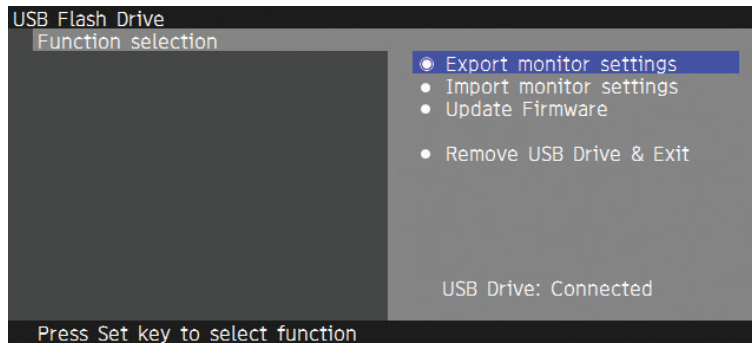
# Import / export and firmware update with USB storage device

Backup or copy the picture modes and monitor settings to a USB storage device connected to the SENS/MEM port.

You can also update the firmware of the monitor.

The [USB Flash Drive] OSD menu will be shown when you select [Import/Export] (see [page 54](#)) on the OSD menu or connect a USB storage device to the SENS/MEM port.

**NOTE:** This function is not available when using the USB ports from the USB hub. This function will only work with the SENS/MEM port.



Select a function on the menu and follow the instructions on the OSD message.

## Export monitor settings

Exports the monitor settings to the USB storage device for back-up and copy. Select a type of export items.

- Current Picture mode: Export the picture mode settings of the current active window.
- All Picture modes: Export all picture modes settings.
- All monitor settings: Export all OSD settings.

The export file name is automatically set to avoid duplication.

## Import monitor settings

Imports the exported setting file and overwrites the current OSD settings.

Only the OSD settings, which are contained in the exported file are overwritten.

Please put the exported files on the root folder of the USB storage device.

If you set the IP address of the monitor manually, please make sure not to duplicate the IP address.

**NOTE:** The monitor detects up to 15 files, so do not put more than 15 files on the drive.

## Update Firmware

Updates the firmware of the monitor. Please put the firmware updating file on the root folder of the USB storage device in advance.

The LED blinks green during firmware updating. When the update is complete, the monitor restarts automatically. After restart, turn off and on the main power switch.



## Remove USB Drive & Exit

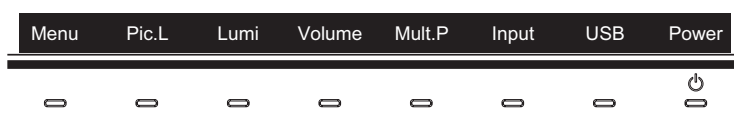
Prepares the USB storage device for disconnect and closes the OSD menu.

Please use this function before removing the USB storage device from the monitor.

- NOTE:**
- The supported file system format of the USB storage device is FAT32.
  - The monitor is not guaranteed to work with all USB storage devices sold commercially.
  - The [Import/Export] function does not export the dependent settings of each monitor, e.g. calibration status. The exported file can be imported within PA271Q monitors, or within PA311D monitors. The latest compatible models for [Import/Export] functions will be on the NEC Display Solutions website.
  - Setting the time clock is required to create an export file. Follow the instructions on the OSD menu and set the time. Once the time is set, the monitor counts automatically while the AC power is active.
  - Visit the NEC Display Solutions website for information on firmware releases.

## Customizing the Hot Key functions

You can configure the keys on the front bezel for quick access to your most used OSD settings. For example, you can configure a key to set a specific picture mode, change to a specific video input, open a specific menu, and so on.



1. Touch the monitor keys to show the keys' guide.
2. Touch the **Menu** key to open the OSD menu.
3. Navigate to the [Custom] menu.
4. Touch the **Down** key to highlight [Hot key].
5. Touch the > key to enter the hot-key list.
6. Touch the **Up** or **Down** keys to highlight the hot-key you want to configure.
7. Touch the **Set** key to open the [Hot key settings: Key#] configuration menu.
8. Use the **Exit**, **Up**, **Down**, and > keys to navigate the Hot key settings menu and select the option you want to assign to the selected hot-key.

The functions you can assign to the hot-keys include the following:

- **Picture mode:** This menu lets you assign a specific picture mode to the hot-key, such as [sRGB] or [Low Blue]. Note that the number of picture modes you can choose from in this list depends on how many are set in [Number of Picture modes] in the [Custom] OSD menu. (See [page 53](#))
  - **Video input:** This menu lets you assign a specific input to the hot-key, such as [DP1] or [HDMI1].
  - **OSD menu shortcut:** This menu lets you assign an OSD menu shortcut to the hot-key. For example, by default, the [Picture mode] menu is assigned to Key2.
  - **Function 1:** This menu lets you assign specific adjustment functions to the hot-key. For example, by default, the [Luminance] adjustment control is assigned to Key3, and the [Volume] adjustment control is assigned to Key4.
  - **Function 2:** This menu lets you assign specific features to the hot-key and tapping the hot-key cycles through that feature's options. For example, by default, [Multi picture] is assigned to Key5 and, when the OSD menu is closed, touching Key5 once turns on [Multi picture] and shows the inputs as PiP and touching Key5 again turns off [Multi picture].
9. After you highlight the function you want to assign to the hot-key, touch the **Set** key to save the change and return to the main OSD menu.

Now, when you touch the front bezel, label for the function you selected will appear above the hot-key.

- NOTE:**
- There are eight hot keys on the front bezel. Keys2-8 are configurable for easy access to OSD menu functions. Key1 **Menu** cannot be changed as its function is to open the OSD menu.
  - When an OSD menu is open, the hot-keys function as navigation keys for the menu.

# Chapter 4 Troubleshooting


## This Chapter Includes:

- ⇒ “Screen Image and Video Signal Issues” on page 39
- ⇒ “Hardware Issues” on page 40
- ⇒ “Image Persistence” on page 41

# Screen Image and Video Signal Issues

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## 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 main power switch, it should be in the ON position.
- Make sure both the computer and monitor are powered on.
- Make sure that a supported resolution has been selected on the display card or system being used. If in doubt, please refer to the user's manual of the display controller or system to change the resolution.
- Check the monitor and your display card with respect to compatibility and recommended signal timings.
- Check the signal cable connector for bent or pushed-in pins.
- The monitor automatically goes into standby at the preset time period after the video signal is lost. Touch the  key on the monitor.
- When using a USB Type-C cable for connecting a computer to the monitor, please check that the connected computer's port complies with DisplayPort Alt Mode.
- When using a USB Type-C cable for connecting a computer to the monitor, check that the USB Type-C cable complies with SuperSpeed USB 10Gbps (USB 3.1 Gen 2).
- Refer to the NEC Display Solutions website for information about tested computers and USB Type-C cables for connecting to the USB-C port on the monitor.

## The image is unstable, unfocused or swimming is apparent

- The signal cable should be completely attached to the computer.
- Check the monitor and your display card with respect to compatibility and recommended signal timings.
- If text looks garbled, change the video mode to non-interlaced and use a 60 Hz refresh rate.

## The image is not properly reproduced

- Use the OSD to enter the [Monitor information] menu and confirm that the appropriate resolution has been selected.

## Picture is discolored

- Make sure [3D LUT Emulation] and [Color vision emulation] are [Off].
- Make sure the [Picture mode] setting is the same as the ICC profile on the PC.

## Color irregularities on screen

- Reduce [Luminance].
- Set [Uniformity] to [5].

## Picture is not bright

- Make sure [ECO mode] is [Off].
- LCD brightness degradation occurs due to long-term usage or extreme cold conditions.
- When the display cannot achieve the desired brightness, the numerical brightness value on the OSD will be yellow.
- When using an HDMI input, please change the [Video range].

## Selected resolution is not displayed properly


- Check the Information OSD to verify the appropriate resolution has been selected.
- If the resolution you set is over or under a range, "OUT of RANGE" window will appear then warn you. Please set supported resolution at the connected computer.

### Brightness variations over time

- Change [Auto brightness] to [Off].

**NOTE:** When [Auto brightness] is set to [On], the monitor automatically adjusts brightness based on the environment. When the brightness of surrounding environment changes, the monitor will also change.

### No Video

- If no video is present on the screen, turn the  key off and on again.
- Make sure the computer is not in a power-saving mode by touching the connected keyboard or the connected mouse.
- Some video cards do not output video signal when the monitor is turned off/on or disconnect/connect from the AC power cord under low resolution with DisplayPort.

## Hardware Issues

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### Key does not respond

- Unplug the power cord of the monitor from the AC outlet to turn off and reset the monitor.
- Check the main power switch of the monitor.


### Message “Out of range” is displayed (screen is either blank or shows rough images only)

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

### LED on monitor is not lit

- Make sure the power cord is properly connected to the monitor and the wall, and make sure the monitor’s main power switch is on.
- Increase [LED brightness] adjustment.

### LED colors, except for blue, are blinking or glowing

- A certain failure might have occurred, please contact your supplier.
- If the monitor is powered off by the internal temperature being higher than the normal operating temperature, the LED will blink red for five or six times. Power on the monitor again after confirming the internal temperature has been reduced to normal operation temperature.
- The monitor could be in standby. Touch the  key on the monitor.
- If the LED blinks red during firmware updating, turn off and on the main power switch and update again.

### No Sound

- Check to see if [Mute] is activated.
- Check to see if [Volume] is set to a minimum.
- Check to see if the computer supports an audio signal through DisplayPort or HDMI.

### The USB hub does not operate

- Check to make sure that the USB cable is properly connected. Refer to your USB device user’s manual.
- Check the [USB hub input select] setting. If you changed the setting, please turn the main power switch off and on.
- Set [Quick recovery] to [On].
- Check if the USB upstream port on the monitor is connected to the USB downstream port on the computer. Please make sure the computer is on.
- Disconnect one upstream USB cable when using 2 upstream connections.
- Turn the main power switch off and on again.

### USB or LAN control is not available

- Check the LAN cable. A category 5 or higher LAN cable is required for connection.
- Check to see if the USB upstream port on the monitor is connected to the USB downstream port on the computer.

### USB Type-C function does not work

“Warning: Remove USB-C cable” OSD was shown.

- The monitor detected abnormal voltage or current on the USB-C port. Please remove USB Type-C cable from the monitor immediately or turn the main power switch off and on again.
- Refer to the NEC Display Solutions website for the information of tested computers and USB Type-C cables.

Charging is not started or unstable.

- Check if the connected computer's port complies with USB Power Delivery.
- Check if the USB Type-C cable complies with USB Power Delivery.
- Try replacing the USB Type-C cable.
- Refer to the NEC Display Solutions website for the information of tested computers and USB Type-C cables.
- Set [Power delivery limit] to [15W].

## Image Persistence

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Please be aware that LCD Technology may experience a phenomenon known as Image Persistence. Image Persistence occurs when a residual or “ghost” image of a previous image remains visible on the screen. Unlike CRT monitors, the image persistence on LCD monitors is not permanent, but single still image 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.

Monitor Specifications		MultiSync PA311D	Notes
LCD Module	Diagonal: Viewable Image Size: Native Resolution:	78.91 cm/31.1 inches 78.91 cm/31.1 inches 4096 x 2160 48-50, 60 Hz	Active matrix; thin film transistor (TFT) liquid crystal display (LCD); 0.1704 mm dot pitch; 350 cd/m <sup>2</sup> white luminance; 1400:1 contrast ratio (typical).
Input Signal			
DisplayPort:	DisplayPort Connector: USB-C Port:	Digital RGB Digital RGB	Up to 4096 x 2160 60 Hz, 8/10 bit, HDR, HDCP 1.3/2.2 Up to 4096 x 2160 60 Hz, 8/10 bit, HDR, HDCP 1.3/2.2
HDMI:	HDMI Connector:	Digital RGB, YCbCr	Up to 4096 x 2160 60 Hz, 8/10 bit, HDR, HDCP 1.4/2.2
Display Colors		1,073,741,824	Depends on display card used.
Synchronization Range	Horizontal: Vertical:	15 kHz to 135 kHz 24 Hz to 75 Hz	Automatically Automatically
Viewing Angle	Left/Right: Up/Down:	±89° (CR > 10) ±89° (CR > 10)	
Response Time		8 ms (Gray to Gray Typ.)	
Active Display Area	Landscape: Horiz.: Vert.: Portrait: Horiz.: Vert.:	698.0 mm/27.5 inches 368.1 mm/14.5 inches 368.1 mm/14.5 inches 698.0 mm/27.5 inches	
USB Hub	I/F: Port: Load Current:	SuperSpeed USB (USB 3.1 Gen 1) Upstream 3 (incl. 1 x USB-C Port) Downstream 3 Downstream Port: 5V/0.9A (Max.) USB-C Port: 65 W (Max.)	
AUDIO			
AUDIO Input:	DisplayPort Connector: HDMI Connector:	Digital Audio Digital Audio	PCM 2ch 32, 44.1, 48 kHz (16/20/24bit) PCM 2ch 32, 44.1, 48 kHz (16/20/24bit)
Headphone Output:	STEREO Mini Jack:		Headphone Impedance 32 Ohm
Speaker Output		Internal Speaker 1W + 1W (Stereo)	
Control	LAN: SENS/MEM Port:	RJ-45 10 BASE-T/100 BASE-TX MDSVSENSOR3, USB storage device (FAT32)	
Power Supply		AC 100-240 V, 50/60 Hz	
Current Rating		2.40 - 1.00 A	
Dimensions	Landscape:	737.9 mm (W) x 433.2 - 583.2 (H) x 301.6 mm (D) 29.1 inches (W) x 17.1 - 23.0 inches (H) x 11.9 inches (D)	
Stand adjustable range	Height Adjustment: Tilt / Swivel:	150 mm/5.9 inches (Landscape orientation) UP 30° Down 5° / 90°	
Weight		14.9 kg (32.8 lbs)	
Environmental Considerations			
	Operating Temperature: Humidity: Altitude:	5°C to 35°C/41°F to 95°F 20% to 80% 0 to 16,404 Feet/0 to 5,000 m	
	Storage Temperature: Humidity: Altitude:	-20°C to 60°C/-4°F to 140°F 10% to 85% 0 to 40,000 Feet/0 to 12,192 m	

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

# Appendix A External Resources

Accessories and optional software applications referenced in this product manual are listed below.

## NEC Display Solutions regional websites

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Global: <https://www.nec-display.com/global/>

Asia-Pacific: <https://www.nec-display.com/ap/contact/>

North America: <https://www.necdisplay.com>

Europe, Russia, Middle East and Africa: <https://www.nec-display-solutions.com>

## Software

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Software is available for download on the NEC Display Solutions global website.

[https://www.nec-display.com/dl/en/dp\\_soft/lineup.html](https://www.nec-display.com/dl/en/dp_soft/lineup.html)

### NEC MultiProfiler Software



This free software provides complete control of the SpectraView engine color settings in an easy-to-use application available for Microsoft Windows and macOS. The software can be used to emulate different color-spaces, perform printer output emulations using ICC Profiles and create 3D Look-Up Tables within the display. It requires a USB connection to the display.

The latest version of the MultiProfiler software is available on the NEC Display Solutions website.

### NaViSet Administrator software



This free software is an advanced and powerful network based control, monitoring and asset management system for NEC display monitors and projectors. The software is available for Microsoft Windows and macOS.

The latest version of the NaViSet Administrator software is available on the NEC Display Solutions website.

### SpectraView II Software

Designed for professionals with color-critical applications, SpectraView II combines award-winning NEC display technology with a color-measurement sensor and sophisticated calibration software. The result is highly accurate, reliable, repeatable, feature-rich solution for display calibration and profiling.

## Hardware / Color Sensor

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### MDSVSENSOR3 USB Color Sensor

This customized X-Rite color sensor is required when using the stand-alone Color Calibration functions of this monitor.

Please contact an authorized NEC dealer or see the NEC Display Solutions website in your region for purchase information and availability.

# Appendix B OSD Controls List

## This Chapter Includes

- ⇒ “Picture” on page 45
- ⇒ “Video” on page 48
- ⇒ “Audio” on page 49
- ⇒ “USB” on page 50
- ⇒ “Multi-Picture” on page 51
- ⇒ “System” on page 52
- ⇒ “Customize” on page 53
- ⇒ “Tools” on page 54
- ⇒ “Information” on page 54

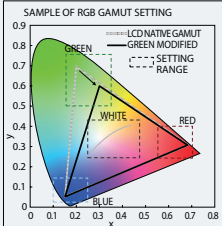
Default values can be provided on request.



# Picture

Picture Menu	
Picture mode	
Picture mode	Select [Picture mode] from 1 to 10.
Preset	Sets the preset settings to use for the current [Picture mode] (see <a href="#">page 27</a> ).
3D LUT Emu.	Shows the name that you set in supported software when [3D LUT Emulation] is available.
Luminance	Adjusts the overall image and screen background luminance. When the setting is too high to display, the OSD characters are changed to yellow.
Black	Adjusts the black luminance. When the setting is too low to display, the OSD characters are changed to yellow.
Gamma	<p>Allows you to manually select the brightness level of grayscale.</p> <p>sRGB: Gamma setting for sRGB.</p> <p>L Star: Gamma setting for the CIELAB color space Lab.</p> <p>Rec.1886: Gamma setting for HDTV broadcasting.</p> <p>HDR-Hybrid Log: Gamma setting for HDR, typically for UHD broadcasting. System gamma can be adjusted.  <div style="border: 1px solid black; padding: 2px; margin-top: 5px;">System Gamma: System gamma is adjustable in 0.5-2.0 range. When [Auto] is selected, the system gamma is automatically selected according to the [Luminance] setting.</div> </p> <p>HDR-ST2084 (PQ): Gamma setting for HDR, typically for UHD disk media and streaming videos. Peak luminance value is adjustable.  <div style="border: 1px solid black; padding: 2px; margin-top: 5px;">Peak Lumi.: Sets the peak luminance value to display HDR-ST2084 (PQ) luminance range. A larger value will improve white saturation but the picture become darker. When [Auto] is selected, [Luminance] is used as the peak luminance setting.</div> </p> <p>DICOM: DICOM GSDF (Grayscale Standard Display Function) is typically used for medical imaging.</p> <p>Programmable: A programmable gamma curve can be loaded using optional NEC software.</p> <p>Custom:  <div style="border: 1px solid black; padding: 2px; margin-top: 5px;">Custom Value: The gamma value is selected from a range from 0.5 to 4.0 in 0.1 steps. For general images 2.2 is used. Increasing the value will make the intermediate color darker, and lowering the value will make the intermediate color brighter.</div> </p> <div style="text-align: center; margin-top: 10px;"> <p>The graph shows the relationship between gray steps (0 to 255) and luminance (0 to 100 cd/m²) for different gamma curves. The curves represent: HDR-ST2084 (PQ) in blue, HDR-Hybrid Log in orange, Custom in green, Rec.1886 in yellow, L Star in light blue, DICOM in dark green, and sRGB in cyan.</p> </div>
White (K)	Adjusts the white color by temperature or x, y setting.
White (x,y)	<p>A lower color temperature will result in a reddish screen and a higher color temperature in a bluish screen.</p> <p>A larger x value will result in a reddish screen, a larger y value changes the screen to greenish, and smaller x,y values will change the screen to bluish white.</p> <div style="text-align: right; margin-top: 10px;"> <p>The graph shows the white range in color space with color temperature markers: 15000K, 5000K, 6500K, and 3000K. The x-axis ranges from 0.25 to 0.48, and the y-axis ranges from 0.25 to 0.43.</p> </div>

**Picture Menu**

<p>Red (x,y)</p> <p>Green (x,y)</p> <p>Blue (x,y)</p>	<p>Adjusts the color gamut. When the setting is outside of the color gamut of the LCD panel, the OSD characters are changed to yellow.</p>	
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Emulation <sup>*1</sup>		
3D LUT Emulation	<p>The 3D LUT (Look Up Table) is a three-dimensional table that maps colors into different color spaces. This function can apply your custom 3D LUT (Look Up Table) data to the video signal.</p> <p>For example, this allows print previews or cinematic or color grading effects to be performed within the monitor itself.</p> <p>This feature is used with supporting software, which also uploads the 3D LUTs to the monitor.</p> <p>ON: Applies the imported 3D LUT data to video signal.</p> <p>OFF: Does not apply the imported 3D LUT data.</p> <p>Compare: In this mode, colors that lie outside the boundaries of the 3D LUT are shown in gray. It is useful for determining out of gamut colors.</p>	
Color vision emulation	<p>Previews various typical human vision deficiencies and is useful for evaluating how people who have such deficiencies will perceive colors.</p> <p>This preview is available in types:</p> <ul style="list-style-type: none"> <li>• P (Protanopia)</li> <li>• D (Deuteranopia)</li> <li>• T (Tritanopia)</li> </ul> <p>Grayscale can be used for evaluating contrast legibility.</p> <p><b>NOTE:</b> Depending on the vision of the user, including those with color vision deficiency, there will be a variation in how the screen's color is seen and experienced. A simulation is used to illustrate the view of those with a color vision deficiency. It is not their actual view. The simulation is a reproduction of those with a strong color vision mode of type P, type D or type T. People with a slight color vision deficiency will experience little to no difference compared to those with normal color vision.</p>	

6 Axis color trim<sup>\*1</sup> With these controls, the standard color circle is divided into 6 separate ranges/areas: Reds, Yellows, Greens, Cyans, Blues, and Magentas. Each range can be individually adjusted in Hue, Saturation, and Offset (Brightness) for specific matching purposes. Neutral colors (grays) will not be impacted.

Red (Hue/Sat./Offset)	<p>Hue: Changes the actual color within its range on the color wheel without changing the saturation and offset. For example, the Red color range shifts reds towards Yellow or Magenta, the Yellow color range shifts yellows towards Red or Green, and so on.</p> <p>Sat. (Saturation): Changes the intensity of the color range without changing the hue and offset.</p> <p>Offset: Changes the brightness of the color range without changing the hue and saturation.</p> <p>e.g.: This is the color changes when Red color set to minimum value and maximum value at Hue/Sat./Offset.</p>	
Yellow (Hue/Sat./Offset)		
Green (Hue/Sat./Offset)		
Cyan (Hue/Sat./Offset)		
Blue (Hue/Sat./Offset)		
Magenta (Hue/Sat./Offset)		

	Minimum value	0	Maximum value
Default			
HUE			
SAT.			
OFFSET			

**Picture Menu**

Picture settings	
Auto brightness	<p>Adjusts the luminance automatically by detecting the brightness level of your environment.</p> <p><b>NOTE:</b> Do not cover the ambient light sensor. [Off] is recommended for best color reproduction. When the [Auto brightness] function is enabled, the luminance level of the screen changes automatically according to the lighting conditions of the room.</p> <p>Luminance level set for the monitor to use when ambient light level is low.</p> <p>Luminance range</p> <p>Luminance level set for the monitor to use when ambient light level is high.</p> <p>100%</p> <p>0%</p> <p>L2 Lb L1</p> <p>dark room bright condition bright</p> <p>Bright condition area</p> <p>Dark condition area</p> <p>Screen Brightness value by Auto Brightness function</p> <p>Lb: Border between bright and dim lighting conditions; set at factory  L1: Luminance level set for the monitor to use when ambient light level is high (<math>L1 &gt; Lb</math>)  L2: Luminance level set for the monitor to use when ambient light level is low (<math>L2 &lt; Lb</math>)</p> <p>L1 and L2 are the brightness levels set by the user to compensate for changes in ambient light.</p>
Uniformity	<p>This function improves color reproduction and evens out the non-uniformity in luminance and color of the monitor. Select between 1 and 5 uniformity options.</p> <p><b>NOTE:</b> A higher number produces a better effect but may also affect power consumption and lifetime of the monitor.</p>
ECO mode	<p>Decreases the amount of power consumed by reducing the brightness level.</p> <p>Off: The ECO mode function is disabled and the maximum brightness level is not reduced.</p> <p>On: Reduces the maximum possible brightness to about 100 cd/m<sup>2</sup>.</p>
UHD upscaling	<p>Controls how non-UHD signal is scaled up to achieve a high-definition effect.</p>
Calibration	
Calibration	<p>Opens the [Stand-Alone Calibration] OSD menu (see <a href="#">page 29</a>).</p>
Color stabilizer	<p>Uses the internal color sensor to compensate for a natural color shift that occurs with age.</p>
Metamerism	<p>Improves the white point color matching when using multiple displays that have SpectraView engine.</p> <p>This feature compensates for the way the human eye perceives colors slightly differently compared to the scientific instrument used to adjust the display during calibration.</p> <p>When using this function, all displays should be set to the same value.</p> <p>This function should be off in color-critical applications.</p>

# Video

Video Menu	
Input	
Input	Selects the video input.
Video settings	
Expansion	<p>Selects how to fit the video signal to the screen.</p> <p>Aspect: Fits the video signal to the screen while maintaining its aspect ratio.</p> <p>Full: Fills the entire screen regardless of the video signal's aspect ratio.</p> <p>1:1: Displays the video signal's original size without zoom.</p> <p>Zoom: Expands/reduces the image manually.</p> <p><b>NOTE:</b> The areas of an expanded image that are outside of the active screen area are not shown. A reduced image may have some image degradation.</p> <p>[Zoom] is unavailable if the input source is DisplayPort 3840 x 2160 60Hz 10-bit or 4096 x 2160 60Hz 10-bit.</p>
Zoom	Sets the Zoom level.
Overscan	<p>Some video formats may require different scanning modes in order to best display the image.</p> <p>On: This setting's display area is best suited for displaying broadcast content. Some images will have cropped edges. Approximately 95% of the image will be shown on the screen.</p> <p>Off: The whole image area is displayed within the screen area. This setting may distort the edges of the image. When you use a computer with HDMI out please set [Overscan] to [Off].</p> <p>Auto: This option attempts to detect the source's overscan setting and automatically set either On/Off.</p>
Sharpness	Adjusts the crispness of the image.
Video range	
White	<p>Auto: This option attempts to detect the source's video signal range and automatically set either [Full] or [Limited].</p> <p>Full: This option shows the input signal's gray levels at 0-255; this is the typical setting appropriate for use with most computers. Some AV equipment may also display content best with this setting.</p> <p>Limited: This option expands an input signal's range from 16-235 gray levels to use the monitor's full 0-255 range; this is the typical setting appropriate for use with most AV equipment, such as Blu-ray players, game consoles, video cameras, streaming media players, and some computers.</p> <p>Custom: This option allows you to manually set the individual levels for black and white.</p>
Black	
Signal format	<p>Selects the color format of the input video.</p> <p>AUTO: This function attempts to detect the source's color format and automatically set which format to use from the following options.</p> <p>RGB: Recommended and common color format for computers.</p> <p>YCbCr(Bt.601): SDTV(480i) color format mainly for AV equipment</p> <p>YCbCr(Bt.709): HDTV(720p or higher) color format mainly for AV equipment</p> <p>YCbCr(Bt.2020): HDR color format mainly for AV equipment</p>

Video Menu	
Input settings	
Input detect	<p>Selects the method of input detection the monitor uses when more than one signal source is connected.</p> <p>None: The monitor does not search for video signal on the other input connections. If video signal is lost on the current input, or if the monitor is manually switched to an input that does not have video signal, the screen will go black and the LED will flash.</p> <p>First: The monitor does not search for a video signal on the other input connections while the current input has a video signal. If the current input connection does not have video signal present, the monitor will search for video signal on the other video input connections. If a video signal is found, the monitor will switch from the current input to the input with the active video source automatically.</p> <p>Last: The monitor actively searches for a video signal on the other input connections, even while the current video signal is present. When a new video signal source is applied to another input connection, the monitor automatically switches to the new found video source. If the video signal is lost on the current input connection, the monitor will search for video signal on the other video input connections. If a video signal is found, the monitor will switch from the current input to the input with the active video source automatically.</p>
Blank signal skip	Skip no signal inputs when you change the input signal using the <b>Input</b> key.
DDC/CI	Turns on or off the two way communication and control of the monitor via the video cable.
Advanced signal settings	
DisplayPort version (DP1/DP2/USB-C)	<p>Selects the DisplayPort version [1.1a] or [1.2]. [1.2] is the recommended setting. If there are compatibility problems, please try using [1.1a].</p>
HDMI mode (HDMI1/HDMI2)	<p>Selects the HDMI mode from [Mode1] or [Mode2] [Mode2] is the recommended setting. If there are compatibility problems, please try using [Mode1].</p>
HDCP version	<p>Selects the digital copy protection version from [HDCP2.2] or [HDCP1.4]/[HDCP1.3]. <b>NOTE:</b> [HDCP2.2] is the recommended setting. If there are compatibility problems, please try using [HDCP1.4]/[HDCP1.3]. When [1.1a] is selected in [DisplayPort version], [HDCP1.3] is set automatically</p>
HDR	<p>Select whether to support HDR signal. [Enable] is the recommended setting. If there are compatibility problems, please try using [Disable]. <b>NOTE:</b> When [1.1a] is selected for the DisplayPort Version or [Mode1] for the HDMI mode, [HDR] is disabled automatically.</p>
Bit rate (DP1/DP2/USB-C)	<p>Selects the bitrate of the video signal from [HBR] or [HBR2]. [HBR2] is the recommended setting. If there are compatibility problems, please try using [HBR]. When [1.1a] is selected in [DisplayPort version], [HBR] is set automatically.</p>
Equalizer	<p>Compensates the video signal for better image stability. If the image flashes or picture noise occurs, please change the setting.</p>

## Audio

Audio Menu	
Audio settings	
Source	Selects the audio input source: [Active picture], [Picture1], [Picture2], [Picture3], [Picture4].
Volume	Increase or decrease output volume level.
Mute on	Switches the audio mute on/off.
Audio delay	Synchronizes sounds and pictures by delaying the audio signal to avoid lip-sync errors.

# USB

USB Menu	
USB hub input select	Switches the USB upstream port to sync with the video input selection. This function shares USB devices, such as a keyboard, mouse, and storage device, with multiple computers.
DP1	Sets the USB upstream port (USB1/USB2/USB-C) associated with the each display input.
DP2	<p>When you connect computers to each of the upstream ports and then change the video input, the USB downstream ports will be connected to the selected upstream port automatically. When connecting only one upstream port, the connected upstream port is selected automatically.</p> <p style="text-align: center;">USB hub information</p> <p>The diagram illustrates the USB hub information. On the left, three USB Type-A devices (e.g., Mouse) are connected to a central USB hub. The hub is labeled '(USB hub input select)'. On the right, three USB upstream ports are shown: USB1 (USB 3.1 Gen 1, Type-B), USB2 (USB 3.1 Gen 1, Type-B), and USB-C (Type-C). The hub is connected to all three upstream ports. The label 'USB Downstream port' is positioned below the hub, and 'Computers' is positioned above the upstream ports.</p>
USB-C	
HDMI1	
HDMI2	
USB-C settings	
Power delivery limit	<p>Selects the maximum supplied power for a connected computer. Normally, use the [65W] setting, but if power charging does not start or is unstable, try the [15W] settings.</p> <p>The selection of [15W] or [65W] sets the maximum power wattage that can be supplied to a connected computer. Depending on the type of connected USB-C device, the actual wattage is lower than the selected option.</p> <p>When [15W] is selected, output voltage is fixed to 5 V.</p>
USB data setting	<p>Select USB hub speed on USB-C input.</p> <p>USB2.0: Sets USB hub to Hi-Speed USB (USB 2.0).</p> <p>USB3.1: Sets USB hub to SuperSpeed USB (USB 3.1 Gen 1). Supported video resolution is up to 4096 x 2160 (30 Hz) when using USB Type-C video.</p> <p><b>NOTE:</b> The USB hub is disconnected temporarily when changing the setting. To avoid data loss, ensure that no USB storage devices are in use by the operating system.</p>

# Multi-Picture

Multi pic Menu	
Multi picture settings	Displays content from multiple inputs.
Multi picture	When this option is off, a single input is displayed. When this option is on, multiple inputs are displayed.
Picture number	Select the number of pictures to display (either 2 or 4). <b>NOTE:</b> If you set [2] or [4] when using a 10-bit DisplayPort signal input, the 10-bit signal will be decreased to 8-bit and then displayed in multi-picture. If [Multi picture] is set to [Off], a single picture will be displayed as a 10-bit image.
Multi picture mode	Select either PiP (Picture-In-Picture) or PbP (Picture-By-Picture). PiP: A second input is displayed in an inset picture on the screen. The size and position of the inset picture can be adjusted. <b>NOTE:</b> PiP is only available when [Picture number] is set to [2]. PbP: See different inputs are viewed next to each other. <b>NOTE:</b> DisplayPort input has a limitation when picture number is set to [4]. In the selection of [DP1], [DP2], [USB-C], you can set two inputs only. e.g. You can set [DP2], [USB-C], [HDMI1], [HDMI2]. You cannot set [DP1], [DP2], [USB-C], [HDMI].
Active picture	Selects a target picture for OSD operations. <b>NOTE:</b> Active frame is the white frame shown around the currently selected Active Picture area when the OSD menu is open. All OSD settings you set are applied to the active picture in PiP or PbP.
Side border color	Adjusts the side black bars color.
Position / Size	
Position	Sets the position of the Active Picture on the screen. In PiP mode, the inset picture window can be moved in all directions. In PbP mode, the Active Picture will only move either up or down. <b>NOTE:</b> This function is only available when [Picture number] is set to [2].
Size	Sets the size of the Active Picture. In PiP mode, only the inset picture [Picture2] can be adjusted. In PbP mode, as the Active Picture size is increased the other picture will automatically decrease and vice versa when the Active Picture size is decreased. <b>NOTE:</b> This function is only available when [Picture number] is set to [2].

# System

System Menu	
Language	
[Languages]	Selects the language used by the OSD.
OSD	
OSD time	Turns off the OSD after a period of inactivity.
OSD position	Determines the location where the OSD appears on the screen.
OSD transparency	Makes the OSD partially transparent.
OSD rotation	Determines the OSD orientation between landscape and portrait. Landscape: Shows the OSD in landscape orientation. Portrait: Shows the OSD in portrait orientation.
OSD last memory	Opens the OSD menu to the last item changed before it closed.
Information OSD	Selects whether the signal information OSD is displayed or not. The signal information OSD will appear when the input signal or input source changes.
Boot logo	The NEC logo is briefly displayed after the monitor is powered on.
Power management	
Quick recovery	Select the behavior of power saving mode. Off: Enables the most effective power saving mode. On: The monitor returns to On mode faster from power saving mode. <b>NOTE:</b> The power consumption is higher than [Off] setting (see <a href="#">page 25</a> ).
Human sensing	
Human sensing	The sensor detects the movement of a person by using the [Human sensing] function. The [Human sensing] function has three settings: Off: No human sensing. On: After no person has been detected for a period of time, the monitor shifts to power saving mode automatically to reduce the power consumption. When a person comes near the monitor again, the monitor will automatically return to normal mode. Custom: Allows you to choose what the [Backlight] and [Volume] conditions will be after no person has been detected for a period of time.
Sensor setting	Adjusts the threshold level of human sensing. The current threshold is shown to the right of the adjustment slider. To adjust the sensor's distance threshold, use the [</>] key to move the slider left or right. Detects a person within about 1.5 m from the monitor.
Start time	Adjusts the wait time before entering low brightness mode or power saving mode when the human sensor detects no person.
Backlight	Select the backlight setting when [Human sensing] is activated. This option is available when Human Sensing is set to [Custom].
Volume	Select the volume setting when [Human sensing] is activated. This option is available when Human Sensing is set to [Custom].
Network settings	
IP setting	Auto: The IP address is automatically obtained from the DHCP server. Manual: The network settings must be entered manually. Contact the Network Administrator for this information. <b>NOTE:</b> Consult your network administrator for the IP address when [Auto] is selected for [IP setting].
IP address	Set your IP address for the monitor connected to the network when [Manual] is selected for [IP setting].
Subnet mask	Set your subnet mask data for the monitor connected to the network when [Manual] is selected for [IP setting].
Default gateway	Set your default gateway for the monitor connected to the network when [Manual] is selected for [IP setting]. <b>NOTE:</b> Enter [0.0.0.0] to delete the setting.
Factory reset	
Factory reset	All settings are returned to factory shipment state.



# Customize

Custom Menu	
Hot key	
Key 1-8	<p>Customizes seven keys on the front bezel by assigning Picture modes or other functions to the keys for easy access. The following functions can be assigned:</p> <ul style="list-style-type: none"> <li>• Picture mode.</li> <li>• Video input.</li> <li>• OSD menu shortcut.</li> <li>• Function 1: USB hub upstream, Luminance, Volume setting OSD.</li> <li>• Function 2: Toggle functions like Emulation, Sound mute.</li> </ul> <p>Note: [Multi picture - Swap] is available when [Picture number] is [2].</p> <p><b>NOTE:</b> [Key1] is the Menu key and cannot be changed.</p>
Input name	
Input name	You can create a name for the input currently being used. Max: 14 characters, including space, A-Z, 0-9, and some symbols.
Number of Picture modes	
Number of Picture modes	Limits the number of selectable Picture modes. Select [1] if you want to prevent the picture mode from being changed.
LED indicator	
LED brightness	Controls the brightness of the LED on the front bezel of the monitor.
LED color	<p>Selects the color of the LED on the front bezel from Blue, Green, or Custom.</p> <p>Custom1: Change LED color along with the selected [Picture mode].</p> <p>Custom2: Change LED color along with the status of [Picture mode]. (Default or Emulation on or Edited.)</p> <p>Custom3: Change LED color by the selected video input.</p>
OSD lock out	
OSD lock out	<p>Prevents the monitor from being controlled by the OSD menu or the hot key. Touch the [Key1] and [Key3] simultaneously for a few seconds to unlock.</p> <p>Disable: All OSD menu and hot key actions are available for normal operation.</p> <p>Enable: Locks all OSD menu and hot key actions.</p> <p>Custom: Locks all OSD menu actions. Hot key actions are available for normal operation.</p>

# Tools

Tools Menu	
Area marker	
Area marker	Shows a marker by a frame or line. <b>NOTE:</b> When a line marker is displayed for a long time, LCD panel may have image sticking phenomena. To avoid it a frame marker is recommended.
Size	Adjusts the size of the marker.
Aspect	Adjusts the aspect ratio of the marker.
Color	Selects the color of a line marker or the brightness of a frame marker.
Import / Export	
Import / Export	Imports or exports the settings of your display to a USB storage device (see <a href="#">page 36</a> ). <b>NOTE:</b> <ul style="list-style-type: none"> <li>• The Import function will overwrite the current monitor settings. If needed, backup the current settings using the export function before importing new settings.</li> <li>• Some monitor specific settings, such as calibration records, are not exported.</li> <li>• If the IP address is set manually, make sure it is a unique address and there is no duplicate on the network.</li> </ul>

# Information

Info Menu	
Monitor information	Shows the model name, serial number, input signal and audio information for your monitor.
SpectraView engine status	Shows the status of internal sensors and the calibration information for your monitor.
USB information	Shows the USB hub and USB-C data setting.
System information	Shows the firmware version, SpectraView engine status, hours running, carbon savings, carbon usage and MAC address of your monitor. Hours running: Show total running time. Carbon savings: Shows the estimated carbon saving information in kg-CO2. The carbon footprint factor in the carbon saving calculation is based on the OECD (2008 Edition). Carbon usage: Shows the estimated carbon usage information in kg-CO2. This is an arithmetic estimation, not an actual measurement value. This estimation is based on the monitor settings only and does not account for any connected devices.

# Appendix C Manufacturer's Recycling and Energy Information

## This Chapter Includes:

- ⇒ “Disposing of your old NEC product” on page 56
- ⇒ “Energy Saving” on page 56
- ⇒ “WEEE Mark (European Directive 2012/19/EU and amendments)” on page 56

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).

# Disposing of your old NEC product

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The aim of recycling is to gain an environmental benefit by means of re-use, upgrading, reconditioning or reclamation of material. Dedicated recycling sites ensure that environmentally harmful components are properly handled and securely disposed. To ensure the best recycling of our products, NEC DISPLAY SOLUTIONS offers a variety of recycling procedures and gives advice on how to handle the product in an environmentally sensitive way, once it has reached the end of its life.

All required information concerning the disposal of the product and country-specific information on recycling facilities can be found on our following websites:

<https://www.nec-display-solutions.com/greencompany/> (in Europe),

<https://www.nec-display.com> (in Japan) or

<https://www.necdisplay.com> (in USA).

## Energy Saving

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

For additional information visit:

<https://www.necdisplay.com/> (in USA)

<https://www.nec-display-solutions.com/> (in Europe)

<https://www.nec-display.com/global/index.html> (Global)

For Energy Saving information: [Default setting: Quick recovery → Off]

For ErP requirement/For ErP (Network standby) requirement:

Setting: Quick recovery → Off

Power consumption: 2 W or less (Dark amber).

Time for power management function: Approx. 1 min.

(Except for a condition that the monitor has plural signal inputs.)

Power consumption: 0.5 W or less (slowly pulsating).

Time for power management function: Approx. 5 min.

(Except for a condition that the monitor has plural signal inputs.)

## WEEE Mark (European Directive 2012/19/EU and amendments)

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### Disposing of your used product: In the European Union

EU-wide legislation as implemented in each Member State requires that used 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 dispose of such products, please follow the guidance of your local authority or ask the shop where you purchased the product, or if applicable, follow applicable legislation or agreement you may have. The mark on electrical and electronic products may only apply 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 and ask for the correct method of disposal.