LG

Life's Good

OWNER'S MANUAL

IPS LED Monitor
(LED Monitor*)

* LG LED Monitor applies LCD screen with LED backlights.

Please read this manual carefully before operating your set and retain it for future reference.

21HK512D

CONTENTS

IMPORTANT PRECAUTIONS

This unit has been engineered and manufactured to ensure your personal safety, however improper use may result in potential electrical shock or fire hazards. In order to allow the proper operation of all safeguards incorporated in this display, observe the following basic rules for its installation, use, and servicing.

On Safety

- Use only the power cord supplied with the unit. In case you use another power cord, make sure that it is certified by the applicable national standards if not being provided by the supplier. If the power cable is faulty in any way, please contact the manufacturer or the nearest authorized repair service provider for a replacement.
- The appliance coupler is used as the disconnect device.
- Please make sure the device is installed near the wall outlet to which it is connected and that the outlet is easily accessible.
- Operate the display only from a power source indicated in the specifications of this manual or listed on the display. If you are not sure what type of power supply you have in your home, consult with your dealer.
- Overloaded AC outlets and extension cords are dangerous. So are frayed power cords and broken plugs. They may result in a shock or fire hazard. Call your service technician for replacement.
- As long as this unit is connected to the AC wall outlet, it is not disconnected from the AC power source even if the unit is turned off.

Do not Open the Display:

- There are no user serviceable components inside.
- There are Dangerous High Voltages inside, even when the power is OFF.
- Contact your dealer if the display is not operating properly.

To Avoid Personal Injury :

- Do not place the display on a sloping shelf unless properly secured.
- Use only a stand recommended by the manufacturer.
- Do not drop an object on or apply impact to the product. Do not throw any toys or objects on the product screen.
  - It can cause injury to human, problem to product and damage the display.

To Prevent Fire or Hazards:

- Always turn the display OFF if you leave the room for more than a short period of time. Never leave the display ON when leaving the house.
- Keep children from dropping or pushing objects into the display's cabinet openings. Some internal parts carry hazardous voltages.
- Do not add accessories that have not been designed for this display.
- When the display is to be left unattended for an extended period of time, unplug it from the wall outlet.
- In the presence of thunder and lightning, never touch the power cord and signal cable because it can be very dangerous. It can cause electric shock.

On Installation

- Do not allow anything to rest upon or roll over the power cord, and do not place the display where the power cord is subject to damage.
- Do not use this display near water such as near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.
- Displays are provided with ventilation openings in the cabinet to allow the release of heat generated during operation. If these openings are blocked, built-up heat can cause failures which may result in a fire hazard. Therefore, NEVER:
  - Block the bottom ventilation slots by placing the display on a bed, sofa, rug, etc.
  - Place the display in a built-in enclosure unless proper ventilation is provided.
  - Cover the openings with cloth or other material.
  - Place the display near or over a radiator or heat source.
- Do not rub or strike the Active Matrix LCD with anything hard as this may scratch, mar, or damage the Active Matrix LCD permanently.
- Do not press the LCD screen with your finger for a long time as this may cause some afterimages.
- Some dot defects may appear as Red, Green or Blue spots on the screen. However, this will have no impact or effect on the display performance.
- If possible, use the recommended resolution to obtain the best image quality for your LCD display. If used under any mode except the recommended resolution, some scaled or processed images may appear on the screen. However, this is characteristic of the fixed-resolution LCD panel.
- Displaying a still image for long time on the monitor may leave persistent image or stain on the monitor screen. To avoid this problem, use a screen saver and power off when this product is not used. Persistent image or stain caused by long time usage are not covered by the warranty on this product.
- Do not shock or scratch the front and sides of the screen with metallic objects.
  - Otherwise, it may cause damage to the screen.
- Make sure the panel faces forward and hold it with both hands to move. If you drop the product, the damaged product can cause electric shock or fire. Contact an authorized the service center for repair.
- Avoid high temperatures and humidity.
- Do not install this product on a wall if it could be exposed to oil or oil mist.
 - This may damage the product and cause it to fall.

- For displays with glossy bezels the user should consider the placement of the display as the bezel may cause disturbing reflections from surrounding light and bright surfaces.
- Do not use products using high voltage around the Monitor. (ex. Electrical Swatter)
  - Monitor may have malfunction as its electrical shock.

Precautions to the AC Adapter and Power

- If water or any foreign substance goes inside the product (TV, monitor, power cord, or AC adapter), disconnect the power cord immediately and contact the service center.
  - Otherwise, this may cause a fire or electric shock due to damage to the product.
- Do not touch the power plug or AC adapter with wet hands. If the pins of the plug are wet or dusty, wipe and dry them before use.
  - Otherwise, this may cause a fire or electric shock.
- Make sure to completely insert the power cord into the AC adapter.
  - If loosely connected, the poor connection may cause a fire or electric shock.
- Be sure to use power cords and AC adapters provided or approved by LG Electronics, Inc.
  - The use of non-approved products may cause a fire or electric shock.
- When unplugging the power cord, always pull it by the plug. Do not bend the power cord with excessive force.
  - The power line can be damaged, which may cause electric shock or fire.
- Be careful not to step or place heavy objects (electronic appliances, clothing, etc.) on the power cord or AC adapter. Be careful not to damage the power cord or AC adapter with sharp objects.
  - Damaged power cords may cause a fire or electric shock.
- Never disassemble, repair or modify the power cord or AC adapter.
  - This may cause a fire or electric shock.
- Be sure to keep the outlet, AC adapter, and pins of the power plug clean from dust and etc.
  - This may cause a fire.

On Cleaning

- Unplug the display before cleaning the face of the display screen.
- Use a slightly damp (not wet) cloth. Do not use an aerosol directly on the display screen because over-spraying may cause electrical shock.
- When cleaning the product, unplug the power cord and scrub gently with a soft cloth to prevent scratching. Do not clean with a wet cloth or spray water or other liquids directly onto the product. An electric shock may occur. (Do not use chemicals such as benzene, paint thinners or alcohol)
- Spray water onto a soft cloth 2 to 4 times, and use it to clean the front frame; wipe in one direction only. Too much moisture may cause staining.
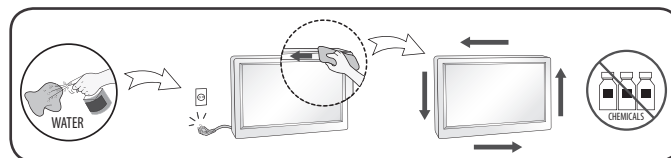
On Repacking

- Do not throw away the carton and packing materials. They make an ideal container in which to transport the unit. When shipping the unit to another location, repack it in its original material.

ON CLEANING

Recommended Cleaning Chemicals

- Isopropanol 70 %
- Ethanol 70 %
- Cidex® OPA
- 0.9 % NaCl solution

## How to Use Cleaner (When the screen has dust)

- Prior to cleaning, turn off the monitor and remove the power cable.
- Soak a soft cloth in a recommended cleaner, then lightly rub the screen with no more than 1 N of force.
- The cleaner could cause serious damage if it leaks inside the monitor while cleaning.
- The display could be damaged, so only clean the parts of the monitor other than the screen's LCD panel.
- Do not use benzene, thinner, acids or alkaline cleaners or other such solvents.
- Cleaning guidelines for displays must only be carried out by medical professionals (doctors or nurses) and must not be handled by patients.

ASSEMBLY AND PREPARING

Product Composition

Please check whether all the components are included in the box before using the product. If there are any missing components, contact the retailer where you purchased the product.

Note that the product and related components may look different from those shown here.
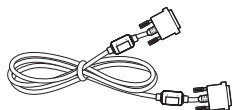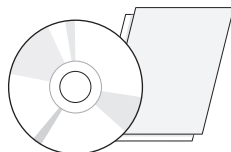
DVI-D Cable

DisplayPort Cable

Power Cord

CD/Owner's Manual/Regulatory Manual/Cards

Cable holder

⚠ CAUTION

- Always use genuine LG components to ensure safety and product performance.
- The product warranty will not cover damage or injury caused by the use of unauthorized components.
- It is recommended that use the supplied components.
- If you use generic cables not certified by LG, the screen may not display or there may be image noises.

🔔 NOTE

- The components may look different from those illustrated here.
- Without prior notice, all product information and specifications contained in this manual are subject to change to improve the performance of the product.
- To purchase optional accessories, visit an electronics store or an online shopping site, or contact the retailer from which you purchased the product.
- The power cord provided may differ depending upon the region.

Supported Software

Check the software supported by your product and refer to the manuals on the CD enclosed in the product package.

Software	Installation Priority
LG PerfectLum	Recommended

- Required and Recommended: You can download and install the latest version from the enclosed CD or from the LGE website (*www.lg.com*).

# Product and Button Description

Front View

Auto Luminance Stability Sensor

Calibration Sensor

APRX. Sensor

Power LED Indicator
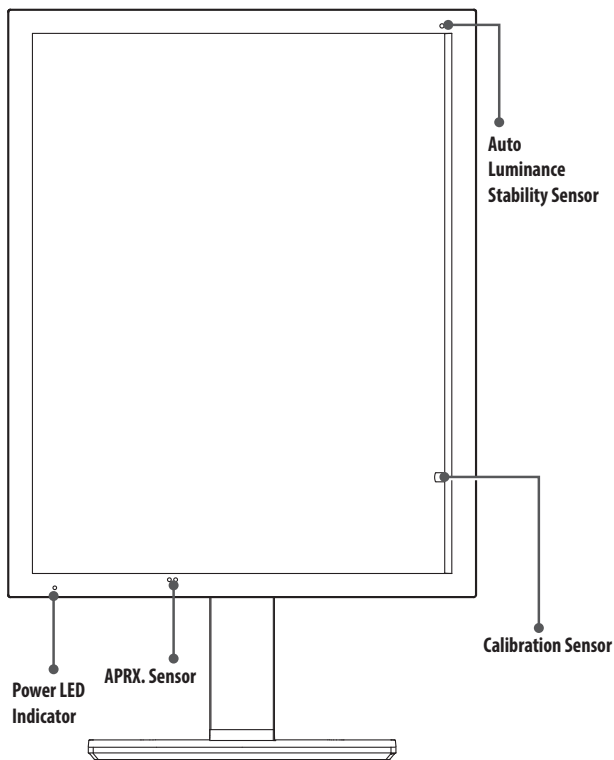
Power LED Indicator

LED Status	Operation Description
Green	Normal operation
Orange	No signal/Power saving
Light Orange	Power saving when people leave
LED off	Power off

⚠ NOTE

- Under normal operation, Power LED Indicator will be off after 20 seconds in order not to affect the image reading quality in dark room.
- To bring back the Power LED Indicator, press the OSD Control Knob or switch display condition.

Rear View

USB IN 1 USB IN 2 USB UP   USB (MSD)   LAN   DP IN   DVI-D IN   AC INPUT   ON / OFF
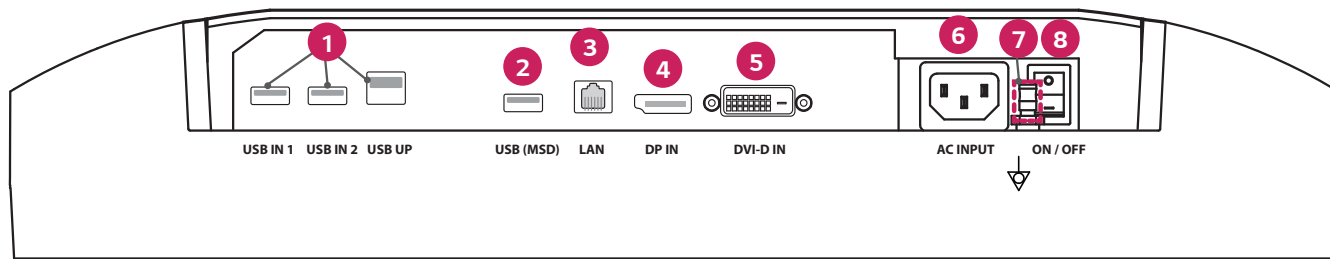
①	**USB IN 1 / USB IN 2 / USB UP**
	– One upstream two downstream ports.
	– Peripheral USB device connection.
②	**USB (MSD)** (Mass Storage Device)
	– USB A.
	– Save test or calibration report to an external storage device, it is compatible with FAT32 only. (For technician use only)
③	**LAN**
	– RJ45.
	– For sending calibration report to a target PC and synchronize with time server. (For technician use only)
④	**DP IN**
	– Display Port 20 pin.
	– Digital Connection.

⑤	**DVI-D IN**
	– Dual-Link DVI-D.
	– Digital Connection.
⑥	**AC INPUT**
	– AC power input.
	– For operation with AC power.
⑦	**Equipotential terminal**
	– Connect to other equipment's potential equalization conductor.
⑧	**ON/OFF** (AC switch)
	– For operation with AC power.

Stand View

Unit: mm

100

100

429.3

18

247.9
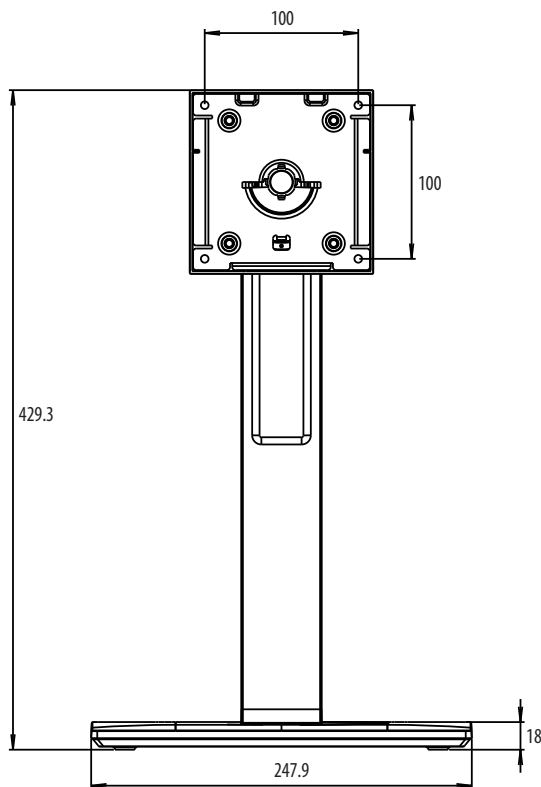
INITIAL INSTALLATION

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

1   Turn off the power of your computer.
2   For connecting the PC: Connect the DVI-D cables or DisplayPort cables to the connector of the display card in your system. Tighten all screws.
3   Connect the DVI-D cables or DisplayPort cables to the connector on the back of the monitor.
4   Connect one end of the power cord to the monitor and the other end to the power outlet.
5   The AC switch on the back of the monitor must be turned on. Then turn on the monitor with the OSD Control Knob.
6   For further adjustments, refer to the OSD section of this manual.

🔔 NOTE

- Incorrect cable connections may result in irregular operation, damage display quality / components of LCD module and/or shorten the module's life.
- Please refer to Caution of "Assembly And Preparing" section for proper selection of your Power cord.
- The AC switch is a real on/off switch. If this switch is on the Off position, the monitor cannot be turned on by using the OSD Control Knob.
- If you have any questions, please refer to the " Troubleshooting" section of this manual.

Moving and Lifting the Monitor

When moving or lifting the monitor, follow these instructions to prevent the monitor from being scratched or damaged and to ensure safe transportation, regardless of its shape or size.

- Place the monitor in the original box or packing material before attempting to move it.
- Before moving or lifting the monitor, disconnect the power cord and all other cables.
- Hold the bottom and side of the monitor frame firmly. Do not hold the panel itself.
- When holding the monitor, the screen should face away from you to prevent it from being scratched.
- When transporting the monitor, do not expose the monitor to shock or excessive vibration.
- When moving the monitor, keep it upright and never turn the monitor on its side or tilt it sideways.
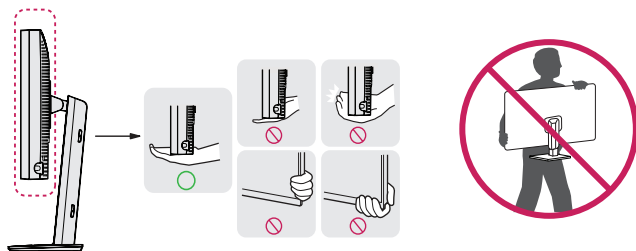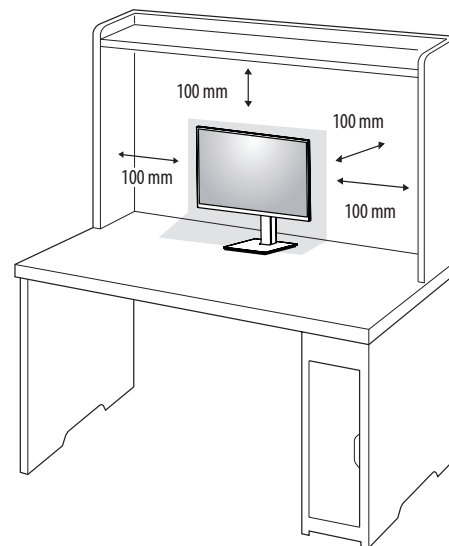

⚠ **CAUTION**

- Avoid touching the monitor screen as much as possible.
  - This may result in damage to the screen or some of the pixels used to create images.
- If you use the monitor panel without the stand base, its OSD Control Knob may cause the monitor to become unstable and fall, resulting in damage to the monitor or human injury. In addition, this may cause the OSD Control Knob to malfunction.

Installing on a Table

- Lift the monitor and place it on the table in an upright position. Place the monitor at least 100 mm away from the wall to ensure sufficient ventilation.


100 mm
100 mm
100 mm
100 mm

⚠ **CAUTION**

- Unplug the power cord before moving or installing the monitor. There is risk of electric shock.
- Make sure to use the power cord that is provided in the product package and connect it to a grounded power outlet.
- If you need another power cord, please contact your local dealer or the nearest retail store.

Adjusting the Stand Height

1   Place the monitor mounted on the stand base in an upright position.
2   Handle the monitor with both hands for safety.

Max. 150.0 mm
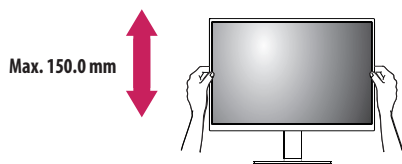
⚠ **WARNING**

• When adjusting the screen height, do not place your hand on the stand body to avoid injury to your fingers.

Adjusting the Angle

1   Place the monitor mounted on the stand base in an upright position.
2   Adjust the angle of the screen.
The angle of the screen can be adjusted forward or backward from -5 ° to 25 ° for a comfortable viewing experience.
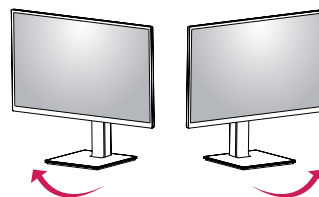
⚠ **WARNING**

• To avoid injury to the fingers when adjusting the screen, do not hold the lower part of the monitor's frame as illustrated below.
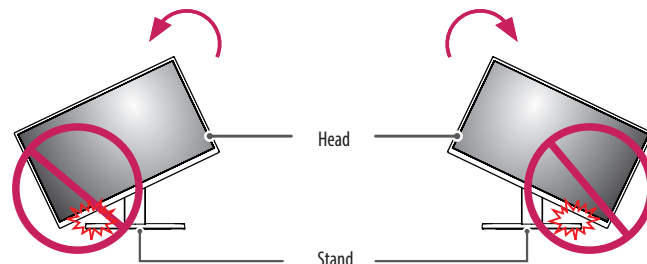• Be careful not to touch or press the screen area when adjusting the angle of the monitor.
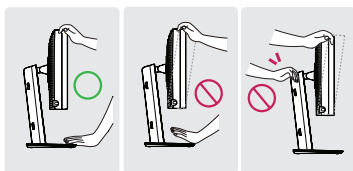
Swivel stand

Swivel 45 degrees and adjust the angle of the Monitor set to suit your view.
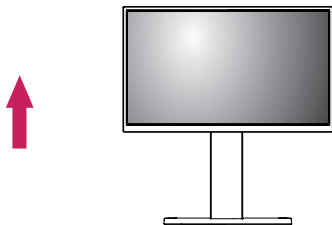
Pivot Feature

The pivot feature allows the monitor to rotate 90 degrees clockwise or counter-clockwise.
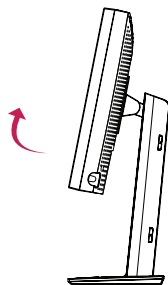
Head

Stand

⚠ **WARNING**

• To avoid scratching the stand base, do not use excessive force or speed when rotating the monitor using the pivot feature, and make sure that the stand does not make contact with the monitor.
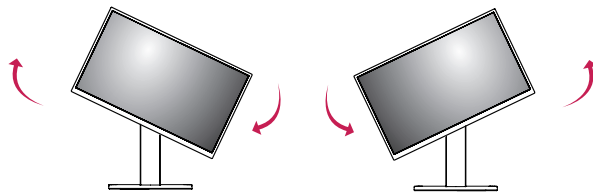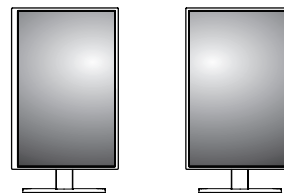
1 Raise the monitor up to the maximum height.

2 Adjust the angle of the monitor in the direction of the arrow as shown in the figure.

3 Rotate the monitor clockwise or counter-clockwise as shown in the figure.

4 Complete the installation by rotating the monitor 90 ° as shown in the figure.

🛈 NOTE

• Auto Pivot feature of the display is not supported.

• The screen can be rotated easily using the screen pivot shortcut key provided with your Windows operating system. Note that some Windows versions and some graphics card drivers may use different settings for the screen pivot key or may not support the pivot key at all.

• Windows operating system screen pivot shortcut key.
  – 0 °: Ctrl + Alt + keyboard up key (↑)
  – 90 °: Ctrl + Alt + keyboard left key (←)
  – 180 °: Ctrl + Alt + keyboard down key (↓)
  – 270 °: Ctrl + Alt + keyboard right key (→)

⚠ WARNING

• Take care when rotating the monitor if the cable is connected.

• To avoid injury to your fingers, do not put them between the screen and the stand base when turning the monitor's screen.
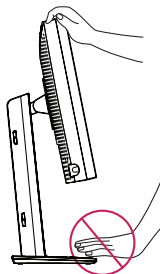
USER SETTINGS

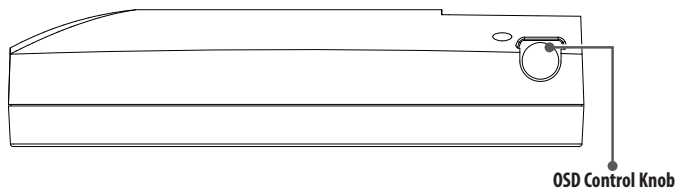## Menu Settings

OSD Control Knob

Your LCD monitor allows you to easily adjust the characteristics of the image being displayed. All of these adjustments are made using the OSD Control Knob on the monitor. While you use this OSD Control Knob, an OSD shows you their changes.

The applicable setting options are as shown below.

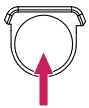[Input]   [Picture]   [Gamma]   [Info]

[OSD]   [General]   [Exit]

⚠ **NOTE**

• Your monitor's OSD (On Screen Display) may differ slightly from that shown in this manual.

OSD Control Knob

The OSD Control Knob is a multi-functional device located behind the Power LED Indicator on the right side of the front bezel. It has three movements-rotate upward, rotate downward and press inward as a button.

	Power On/Off	Press the OSD Control Knob to power the unit on from the off stage (the LED is off). To turn the power off, press the OSD Control Knob and hold for at least 3 second until the LED turns off.
	OSD Control	While the monitor is on (green LED and image on the screen), Pressing on the Control Knob activates the OSD. While the OSD menu is active, use the three way movements of the Control Knob.

Rotate Downward	Move Up/Right, Increase, Larger, More
Rotate Upward	Move Down/Left, Decrease, Smaller, Less
OSD Control Knob Press	Execute, Do, Save

[Input]

[Input]	Description
[DVI]	Set current input to DVI.
[DISPLAYPORT]	Set current input to Displayport.

[Picture]

[Picture]		Description
[ALS] (Auto Luminance Stability)	[Range]	User define the ALS value.
	[300]	Adjust brightness to 300 cd/m2 (±10%).
	[400]	Adjust brightness to 400 cd/m2 (±10%).
	[500]	Adjust brightness to 500 cd/m2 (±10%).
	[600]	Adjust brightness to 600 cd/m2 (±10%).
	[Off]	Stop [ALS] and enable [Brightness].
	[Auto]	Auto select [ALS] according ambient light detected by Ambient sensor.
[Brightness]	Adjust the backlight of the full screen by the range from 0 to 100.	
[Contrast]	Adjust the contrast for the display image by the range from 0 to 100.	
[Color Temp]	[6500K]	Set Color temp to 6500K.
	[7500K]	Set Color temp to 7500K.
	[9300K]	Set Color temp to 9300K.
	[Mono]	Set Color temp to monochrome.

[Gamma]

[Gamma]	Description
[Gamma 1.8]	Set Gamma curve to curve 1.8.
[Gamma 2.0]	Set Gamma curve to curve 2.0.
[Gamma 2.2]	Set Gamma curve to curve 2.2.
[Gamma DICOM]	Set Gamma curve for medical standard. (DIN6868-157)
[Gamma User]	Set Gamma curve for user mode.
[Light Box]	Full screen in white.

[Info]

[Info]	Description
System Information	Show Model name/Firmware Version/GPU Version/Monitor SN/H-Freq./V-Freq./Life Time/IP/ALS(LUX). **⊘ NOTE** • Information of LUX is only for reference. For quality assurance test, please use standard equipment.

[OSD]

[OSD]		Description
[Rotation]	[Landscape]	Set OSD Menu in landscape.
	[Portrait]	Set OSD Menu in portrait.
	[Auto]	Set OSD form by G-sensor.
[Language]	Sets the menu screen to the desired language.	
[OSD Position]	Set horizontal and vertical position of OSD Menu.	
[OSD Timer]	[10 sec.]	Set OSD display time around 10 seconds.
	[20 sec.]	Set OSD display time around 20 seconds.
	[30 sec.]	Set OSD display time around 30 seconds.
	[45 sec.]	Set OSD display time around 45 seconds.
	[60 sec.]	Set OSD display time around 60 seconds.
	[120 sec.]	Set OSD display time around 120 seconds.
[OSD Lock]	[Yes]	Select [Yes] to enable lock.
	[No]	Long press OSD Control Knob in lock.
[OSD Transparency]	Set transparency of OSD Menu.	

[General]

[General]		Description
[All Reset]	[Yes]	Reset all display and OSD setting to default value.
	[No]	Exit this page.
[APRX. Sensor]	[Off]	Disable [APRX. Sensor] function.
	[On]	Set [APRX. Sensor] close the panel power when user isn't in front of monitor.
	[Auto]	Save the P-distance and enable [APRX. Sensor] on. The arrow mark will point to [On].
[Zoom Up]	[Original]	Keep image in normal resolution.
	[Full]	Scale up the resolution to 2048 x 1536.
	[2X Scale]	Scale up the specific part of image.
[Self Calibration]	[Yes]	Enable monitor test luminance and calibrate DICOM with color temperature according to OSD setting.
	[No]	Exit this page.
[Cal. Date:]	**🛈 NOTE** • Show [Cal. Date:] in which [Self Calibration] is done. The [Cal. Date:] will be based on the date that is shown in the OSD menu, it can be synced to the real time/date via internet (RJ45). Please connect the monitor with internet before AC On if user want to get real time/date when doing [Self Calibration].	

TROUBLESHOOTING

Problem	Check to see
Nothing is displayed on the screen	• The signal cable should be completely connected to the display card/computer. • The display card should be completely seated in its slot. • Check the AC switch. Should be in the On position. • OSD Control Knob and computer power switch should be in the On position. • Check to make sure that a supported mode has been selected on the display card or system being used. (Please consult display card or system manual to change graphics mode) • Check the monitor and your display card with respect to compatibility and recommended settings. • Check the signal cable connector for bent or pushed-in pins.
Image persistence (Image Sticking)	• Image persistence is when a residual or ghost image of a previous image remains visible on the screen. To alleviate image persistence, turn off the monitor for as long as the previous image was displayed. • Try not to operate the LCD with a fixed image on the screen for more than thirty minutes.
The screen has defective pixels	• The screen has defective pixels (e.g. slightly light or dark). This is due to the characteristics of the panel itself and not the LCD product.
Image is unstable, unfocused or swimming is apparent	• 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 your text is garbled, change the video mode to non-interlace and use 50Hz refresh rate.
OSD is not sized properly	• Use the OSD Image Adjust controls to increase or decrease the coarse total. • Check to make sure that a supported mode has been selected on the display card or system being used.
Is the [No Signal] message displayed?	• Signal cable should be completely attached to the computer. • Make certain the computer is not in a power-saving mode. (Touch the keyboard or mouse) • If no video is present on the screen, turn the Power button off and on again.
LED on monitor is not lit (No Green or Light Orange can be seen)	• Power Switch should be in the On position and power cord should be connected. • Check the power cable should be connected surely. Press the OSD Control Knob or switch display condition with source or resolution.

PRODUCT SPECIFICATION

The product specifications are subject to change without prior notice for product improvements.
" ~ " refers to alternating current (AC), " ▭ " refers to direct current (DC).

LCD Screen	Type	TFT (Thin Film Transistor) LCD (Liquid Crystal Display) Screen	
	Pixel Pitch	0.2115 mm x 0.2115 mm	
Resolution	Max Resolution	2048 x 1536 @ 60 Hz	
	Recommended Resolution		
Video Signal	Horizontal Frequency	63 kHz - 96 kHz	
	Vertical Frequency	50 Hz - 75 Hz	
Input Connector	USB IN 1, USB IN 2, USB UP, USB (MSD), LAN, DP IN, DVI-D IN, AC INPUT, Equipotential terminal		
Power Source	Power Rating	100 - 240 V~ 50/60 Hz, 1.2 - 0.5 A	
	Power consumption	Max. 85 W *	
Environmental Conditions	Operating Conditions	Temperature	0 ℃ to 40 ℃
		Humidity	0 % to 80 %
		Pressure	540 hPa to 1060 hPa
	Storing Conditions	Temperature	-20 ℃ to 60 ℃
		Humidity	0 % to 80 %
		Pressure	500 hPa to 1060 hPa

Dimensions (mm)	Monitor Size (Width x Height x Depth)	
	With Stand	377 x 606 x 248.2
	Without Stand	377 x 473 x 89.6
Weight (kg)	With Stand	9.8
	Without Stand	7.0

* The Operating Mode of Power Consumption is measured with LGE test standard. (Full White pattern, Maximum resolution)

* The Power Consumption level can be different by operating condition and monitor setting.

Display Mode

Pixel Format	Pixel Frequency	Frequency		Standard	Input 1	Input 2
	CLK (MHz)	H (kHz)	V (Hz)	Type	DVI-D	DP
1280 x 1024	108	63.96	60.0	VESA	V	V
1600 x 1200	162	75.00	60.0	VESA	V	V
1920 x 1080	148.5	67.50	60.0	VESA	V	V
1920 x 1200	193.6	74.60	60.0	VESA	V	V
2048 x 1536	260	96.71	60.0	-	V	V

🛈 NOTE

• Modes not listed in the table may not be supported. For optimal resolution, we recommend you to choose a mode listed in the above table.

Supported Graphic Card List

Vendor	Graphic Card
NVDIA	Quadro K2000
	Quadro K2200
	Quadro M4000
	Quadro P1000
AMD	FirePro W4100
	FirePro W9000

LG

Life's Good

The model and serial number of the product are located on the back and on one side of the product. Record them below in case you ever need service.

Model
Serial No.

WARNING: This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.