

SyncMaster LD190/LD190G/LD220/LD220G

# LCD Monitor

## User Manual

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# Safety Instructions

## Notational



Note

These safety instructions must be followed to ensure your safety and prevent property damage.

Make sure to read the instructions carefully and use the product in the correct manner.

### Warning / Caution



Otherwise, it may result in death or personal injury.

Otherwise, it may result in personal injury or property damage.

### Notational Conventions



Prohibited



Important to read and understand at all times



Do not disassemble



Disconnect the plug from the outlet



Do not touch



Ground to prevent an electric shock

## Power



When not used for extended period of time, set your computer to DPM.

If using screen saver, set it to active screen mode.

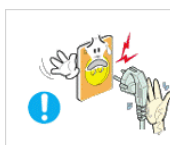
The images here are for reference only, and are not applicable in all cases (or countries).

Shortcut to Anti-Afterimage Instructions



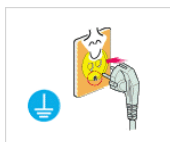
▶ Do not use a damaged power cord or plug or a damaged or loose power outlet.

- Otherwise, this may result in electric shock or fire.



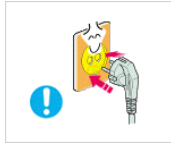
▶ Do not touch the power plug with wet hands when removing or plugging the plug into the outlet.

- Otherwise, this may result in electric shock.



▶ Make sure to connect the power cord to a grounded power outlet.

- Otherwise, it may result in electric shock or personal injury.
-



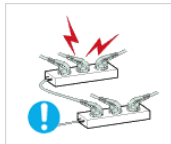
▶ Ensure that the power plug is plugged into the power outlet firmly and correctly.

- Otherwise, this may result in fire.



▶ Do not forcefully bend or pull the power plug and do not place any heavy material on it.

- Otherwise, this may result in fire.



▶ Do not connect multiple appliances to the same power outlet.

- Otherwise, this may cause fire due to overheating.



▶ Do not disconnect the power cord while using the product.

- Otherwise, this may result in damage to the product due to electric shock.



▶ To disconnect the apparatus from the mains, the plug must be pulled out from the mains socket, therefore the mains plug shall be readily operable.

- This may cause electric shock or fire.



▶ Use only the power cord provided by our company. Do not use the provided power cord of another product.

- Otherwise, this may result in fire or electric shock.

## Installation



Be sure to contact an authorized Service Center when installing your monitor in a location with heavy dust, high or low temperatures, high humidity, and exposed to chemical substances and where it operates for 24 hours such as at airports, train stations etc.

Failure to do so may cause serious damage to your monitor.



▶ Do not drop the monitor when moving it.

- This may cause damage to the product or the person carrying it.



▶ When installing the product in a cabinet or rack, make sure that the front end of the bottom of the product does not project out.

- Otherwise, it may fall or cause personal injury.

• Use a cabinet or rack of a size appropriate to the product.



▶ DO NOT PLACE CANDLES, MOSQUITO REPELLANT, CIGARETTES AND ANY HEATING APPLIANCES NEAR THE PRODUCT.

- Otherwise, this may result in fire.
-



▶ Keep heating appliances as far away from the power cord or the product as possible.

- Otherwise, this may result in electric shock or fire.



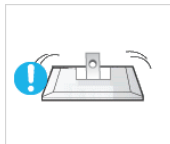
▶ Do not install it in a badly ventilated location such as a bookcase or closet.

- Otherwise, this may result in fire due to an increase in the internal temperature.



▶ Put down the monitor carefully.

- Failing to do so may damage the monitor.



▶ Do not place the front of the product on the floor.

- Otherwise, this may result in damage to the screen display.



▶ Install your product in a well ventilated location. Ensure that there is a clearance of more than 10 cm from the wall.

- Otherwise, it may result in fire due to an increase in the internal temperature.



▶ Ensure that the packaging vinyl is kept away from children.

- Otherwise, it may result in serious harm (suffocation) if children play with it.

## Clean

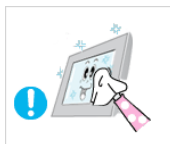


When cleaning the monitor case or the surface of the TFT-LCD screen, wipe with a slightly moistened, soft fabric.

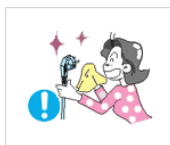


▶ Do not spray cleaner directly onto the surface of the product.

- Otherwise, this may result in the discoloration and distortion of the structure and the screen surface may peel off.

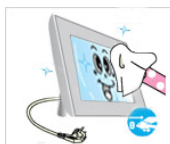


▶ Clean the product using a soft cloth with a monitor cleaner only. If you must use a cleaner other than the monitor cleaner, dilute it with water at a ratio of 1:10.



▶ When cleaning the power plug pins or dusting the power outlet, clean it with a dry cloth.

- Otherwise, it may result in fire.



▶ When cleaning the product, make sure to disconnect the power cord.

- Otherwise, it may result in electric shock or fire.
-



▶ When cleaning the product, disconnect the power cord and clean it softly with a dry cloth.

- (Do not use chemicals such as wax, benzene, alcohol, thinner, mosquito repellent, lubricant, or cleaner.) These may change the appearance of the product surface and peel off the indication labels on the product.



▶ Since the product housing is easily scratched, make sure to use the specified cloth only.

- Use the specified cloth adding only a little water. As the product may be scratched if there is any foreign material on the cloth, make sure to shake it thoroughly before using it.



▶ When cleaning the product, do not spray water directly onto the main body of the product.

- Ensure that water does not enter the product and that it is not wet.
- Otherwise, this may result in electric shock, fire or a malfunction.

## Others



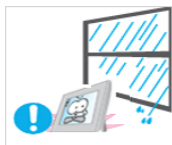
▶ The product is a high voltage product. Ensure that users do not disassemble, repair or modify the product themselves.

- Otherwise, this may result in electric shock or fire. If the product needs to be repaired, contact a Service Center.



▶ If there is a strange smell or a strange sound or smoke is coming from the product, disconnect the power plug immediately and contact a Service Center.

- Otherwise, this may result in electric shock or fire.



▶ Do not place this product in a location exposed to moisture, dust, smoke, water, or in a car.

- Otherwise, this may result in electric shock or fire.



▶ When you drop the product or the case is broken, turn the power off and disconnect the power cord. Contact a Service Center.

- Otherwise, this may result in electric shock or fire.



▶ If thunder or lightening is occurring, do not touch the power cord or antenna cable.

- Otherwise, this may result in electric shock or fire.



▶ Do not try to move the monitor by pulling only the wire or the signal cable.

- Otherwise, it may fall and result in electric shock, damage to the product or fire due to damage to the cable.



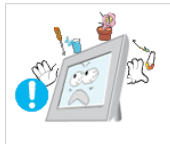
▶ Do not lift or move the product back and forwards or right and left while only holding the power cord or signal cables.

- Otherwise, it may fall and result in electric shock, damage to the product or fire due to damage to the cable.



▶ Make sure that the ventilating opening is not blocked by a table or curtain.

- Otherwise, it may result in fire due to an increase in the internal temperature.



▶ Do not place any containers containing water, vases, flower-pots, medicines as well as any metal on the product.

- If water or a foreign material enters the product, disconnect the power cord and contact a Service Center.

- This may result in a product malfunction, electric shock, or fire.



▶ Do not use or keep combustible spray or flammable material near the product.

- Otherwise, this may result in an explosion or fire.



▶ Do not insert any metal, such as chopsticks, coins, pins and steel, or flammable objects, such as matches or paper, inside the product (through the ventilating openings, input and output terminals, etc).

- If water or foreign material enters the product, disconnect the power cord and contact a Service Center.

- Otherwise, this may result in electric shock or fire.



▶ When using a fixed screen for a long time, an afterimage or stain may occur.

- If you are not using your product for a long period of time, put it into sleep mode or use a moving screen saver.



▶ Set a resolution and frequency appropriate to the product.

- Otherwise, your eyesight may be damaged.



▶ If you continually move closer to the product screen, your eyesight may be failing.



▶ To ease eye strain, take at least a five-minute break after every hour of using the monitor.



▶ Do not install it in an unstable location such as an unstable rack or uneven surface or a location exposed to vibrations.

- Otherwise, it may fall and cause personal injury and/or damage the product.
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- If you use the product in a location exposed to vibrations, it may damage the product and result in fire.

▶ When moving the product, turn the power off and disconnect the power plug, antenna cable, and all the cables connected to the product.

- Otherwise, it may result in electric shock or fire.



▶ Ensure that children do not hang onto the product or climb up onto the product.

- The product may fall and cause personal injury or death.



▶ If you do not use the product for a long period of time, disconnect the power cord from the power outlet.

- Otherwise, this may result in overheating or fire due to dust, and may result in fire due to electric shock or leakage.



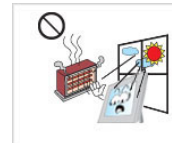
▶ Do not place any heavy items or toys or confectionery, such as cookies etc. that may attract the attention of children and to the product.

- Your children may hang onto the product causing it to fall and this may result in personal injury or death.



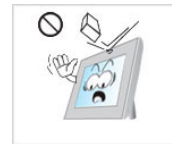
▶ Do not turn the product upside down or move it while holding only the stand.

- Otherwise, it may fall and result in personal injury and/or damage to the product.



▶ Do not place the product in a location exposed to direct sunlight or near any heat such as a fire or heater.

- This may reduce the lifetime of the product, and may result in fire.



▶ Do not drop any objects onto the product or cause any impact to the product.

- Otherwise, this may result in electric shock or fire.



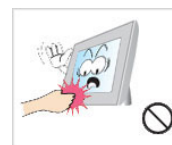
▶ Do not use a humidifier or kitchen table near the product.

- Otherwise, this may result in electric shock or fire.



▶ When there is a gas leak, do not touch the product or the power plug but ventilate immediately.

- If a spark occurs, it may cause an explosion or fire.



▶ If the product has been turned on for a long time, the display panel becomes hot. Do not touch it.

- Keep the small accessories in a location out of the reach of children.
-



▶ Do not install the product in a location low enough for children to reach.

- Otherwise, it may fall and result in personal injury.
- Since the front part of the product is heavy, install the product on a level and stable surface.



▶ Do not put any heavy objects on the product.

- This may result in personal injury and/or damage to the product.

▶ Good Postures When Using the Monitor



▶ When using the product, use it in the correct position.

- Keep your back straight while looking at the product.
  - The distance between your eyes and the screen should be between 45 to 50 cm. Look at the screen from a slightly higher location than the height of the screen.
  - When using the product, use it in the correct position.
  - Adjust the angle so that light is not reflected on the screen.
  - Place your arms perpendicular to your sides and allow your arms to be level with the back of the hand.
  - Keep your elbow at 90 degrees.
  - Keep your knees at greater than 90 degrees, and keep your heels firmly on the floor. Keep your arms lower than your heart.
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# Introduction

## {LD190,LD190G}Package Contents



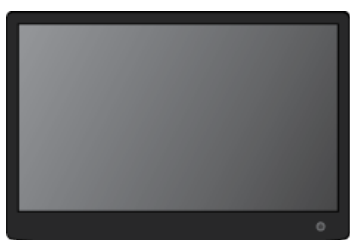
### Note

Please make sure the following items are included with your monitor.

If any items are missing, contact your dealer.

Contact a local dealer to buy optional items.

## Unpacking



Monitor

### Manuals



Quick Setup Guide



Warranty Card



User's Guide

(Not available in all locations)

(Not available in all locations)

### Cables



D-Sub Cable



Power Cord



USB Cable

### Others



Cleaning Cloth

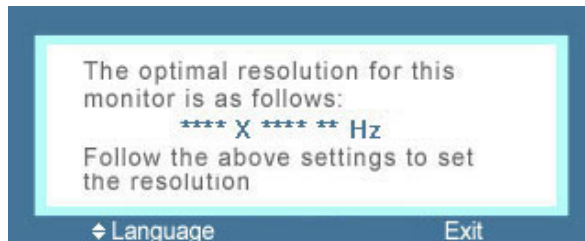


#### Note

Cleaning Cloth is only provided for highly polished black products as a product feature.

## Your Monitor

### Initial Settings



Select the language using the up or down key.

The displayed content will disappear after 40 seconds.

Turn the Power button off and on. It will be displayed again.

It can be displayed up to three (3) times. Make sure to adjust the resolution of your PC before reaching the maximum count.



#### Note

The resolution displayed on the screen is the optimal resolution for this product.

Adjust your PC resolution so that it is the same as the optimal resolution for this product.

## Front



#### Note

Touch them lightly with your fingers to use them.

#### 1 *MENU* button [MENU]

Opens the on-screen menu and exits from the menu. Also use to exit the OSD menu or return to the previous menu.

#### 2 *Brightness* button [☀]

When OSD is not on the screen, push the button to adjust brightness.

**3** *AUTO button*

When OSD is not on the screen, push the button for auto adjustment.

**2,3** *Adjust buttons [▼/▲]*

These buttons allow you to adjust items in the menu.

**4** *Power button [⏻]*

Use this button for turning the product on and off.



**Note**

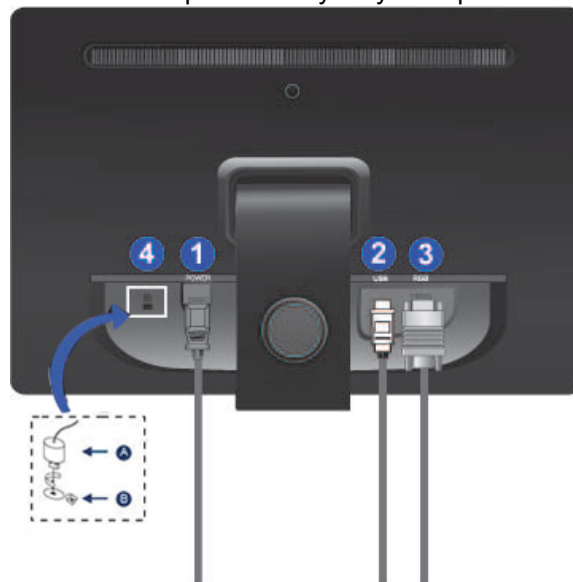
See PowerSaver described in the manual for further information regarding power saving functions. For energy conservation, turn your monitor OFF when it is not needed or when leaving it unattended for long periods.

## Rear



**Note**


The configuration at the back of the product may vary from product to product.



**1** *POWER port*

Connect the power cord for your monitor to the POWER port on the back of the product.

**2** *USB IN port*

Connect the  of the monitor and the USB of the computer with the USB cable.

**3** *RGB IN port*

Connect the D-sub cable to the 15-pin, RGB IN port on the back of your monitor.

**4** *Kensington Lock*

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The Kensington lock is a device used to physically fix the system when using it in a public place. (The locking device has to be purchased separately.) For using a locking device, contact where you purchase it.



**Note**

The location of the Kensington Lock may be different depending on its model.

## Using the Anti-Theft Kensington Lock

1. Insert the locking device into the Kensington slot on the Monitor **B** and turn it in the locking direction **A**.
2. Connect the Kensington Lock cable.
3. Fix the Kensington Lock to a desk or a heavy stationary object.



**Note**

See Connecting Cables for further information regarding cable connections.

## {LD220,LD220G}Package Contents



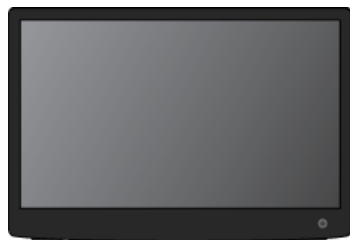
**Note**

Please make sure the following items are included with your monitor.

If any items are missing, contact your dealer.

Contact a local dealer to buy optional items.

## Unpacking



Monitor



### Manuals



Quick Setup Guide



Warranty Card

(Not available in all locations)



User's Guide

(Not available in all locations)

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### Cables



D-Sub Cable



Power Cord



USB Cable

### Others



Cleaning Cloth

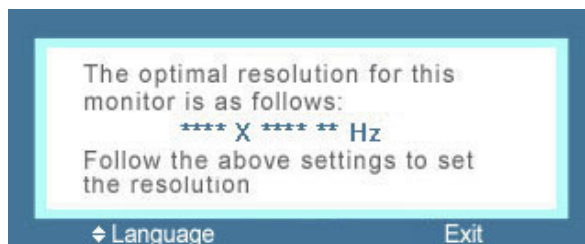


#### Note

Cleaning Cloth is only provided for highly polished black products as a product feature.

## Your Monitor

### Initial Settings



Select the language using the up or down key.

The displayed content will disappear after 40 seconds.

Turn the Power button off and on. It will be displayed again.

It can be displayed up to three (3) times. Make sure to adjust the resolution of your PC before reaching the maximum count.



#### Note

The resolution displayed on the screen is the optimal resolution for this product.

Adjust your PC resolution so that it is the same as the optimal resolution for this product.

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## Front



### **Note**

Touch them lightly with your fingers to use them.

#### **1** *MENU button [MENU]*

Opens the on-screen menu and exits from the menu. Also use to exit the OSD menu or return to the previous menu.

#### **2** *Brightness button [B/▲]*

When OSD is not on the screen, push the button to adjust brightness.

#### **3** *AUTO button*

When OSD is not on the screen, push the button for auto adjustment.

#### **2,3** *Adjust buttons [▼/▲]*

These buttons allow you to adjust items in the menu.

#### **4** *Power button [Power icon]*

Use this button for turning the product on and off.



### **Note**

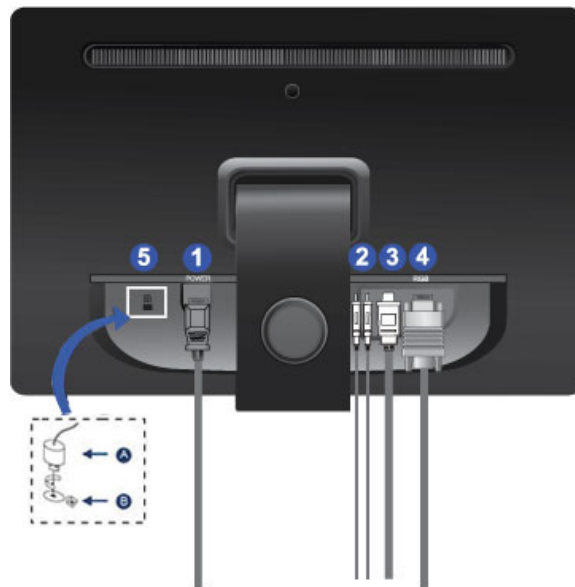
See PowerSaver described in the manual for further information regarding power saving functions. For energy conservation, turn your monitor OFF when it is not needed or when leaving it unattended for long periods.

## Rear

### **Note**

The configuration at the back of the product may vary from product to product.

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**1** *POWER port*

Connect the power cord for your monitor to the POWER port on the back of the product.

**2** *USB OUT port*


*DOWN(USB downstream port)*

Connect the  DOWN port of the USB monitor and a USB device with the USB cable.

*UP(USB upstream port)*

Connect the  UP port of the monitor and the USB port of the computer with the USB cable.

**3** *USB IN port*

Connect the  port of the monitor and the USB of the computer with the USB cable.

**4** *RGB IN port*

Connect the D-sub cable to the 15-pin, RGB IN port on the back of your monitor.

**5** *Kensington Lock*

The Kensington lock is a device used to physically fix the system when using it in a public place. (The locking device has to be purchased separately.) For using a locking device, contact where you purchase it.





**Note**

The location of the Kensington Lock may be different depending on its model.

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## Using the Anti-Theft Kensington Lock

1. Insert the locking device into the Kensington slot on the Monitor  and turn it in the locking direction .
2. Connect the Kensington Lock cable.
3. Fix the Kensington Lock to a desk or a heavy stationary object.



### Note

See Connecting Cables for further information regarding cable connections.

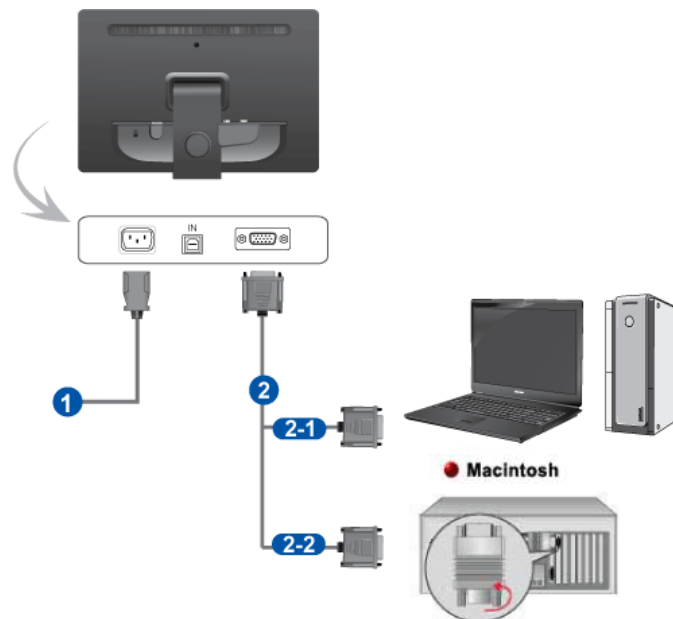
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# Connections

## Monitor connection with D-SUB cable



**1** Connect the power cord for your monitor to the power port on the back of the monitor.

Plug the power cord for the monitor into a nearby outlet.

**2** Use a connection appropriate for your computer.

**2-1** Using the D-sub (Analog) connector on the video card.

- Connect the signal cable to the 15-pin, D-sub port on the back of your monitor.



**2-2** Connected to a Macintosh.

- Connect the monitor to the Macintosh computer using the D-sub connection cable.



**Note**

If the monitor and the computer are connected, you can turn them on and use them.

## Use a general monitor in the following cases.

- When using a single display
- When playing a 3D game
- When watching a BluRay or HD video




**Note**

For laptop, "LCD+CRT Dual View" mode must be selected first before the multi-monitor configuration.

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Press the Fn + F4( ) key combination once.

Then the 'Easy Display Manager'screen appears in which you can select a display device.

Whenever you press the F4( ) key while holding down the Fn key, the selected option is changed.

## Monitor connection with USB cable



### Note

The monitor can be operated with USB cable connection only. The monitor can be operated with D-sub cable connection as well.

## Installation Requirements

Installation Requirements    1. When using a common office or web document

- CPU : 1.6 Ghz Atom or Celeron

- RAM : 1 GB

2. When watching a movie in full screen mode

- CPU : 1.8Ghz Core2

- RAM : 1 GB

Supported OS (Operating Systems) - Windows XP Service Pack 2 or later

- Windows 2000 Service Pack 4 or later

- Windows Vista



### Note


- To find out the PC operating system information, Right click 'My Computer' and choose 'Properties' and select 'General' tab.
- Movie scenes may not be played continuously and smoothly due to the PC specifications or movie player codec.
- When using a notebook PC, set the battery mode to Maximum Performance mode to play a movie at the best quality.

## Use a USB monitor in the following cases.


- When using more than one display
- When using multiple monitors in Plug & Play mode

## Connecting a USB Monitor

1. Connect the power cord (  ) to your monitor as shown above.

2. Connect the USB cable (  ) to monitor and PC as shown above.

3. More than 2 monitors connection with USB cable.

Connect the USB cable (  ) to two different monitors as shown above.

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(LD220/LD220G models only) Maximum of 4 monitors can be used at a same time with a serial USB connection.

Maximum of 6 monitors can be used at a same time with a parallel USB connection.

### When connecting serially

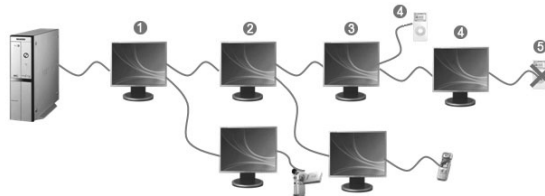
You can connect up to four (4) USB monitors serially.



### When connecting in parallel

You can connect up to six (6) USB monitors in parallel.

When connecting external devices to the USB monitor, you can only connect up to four (4) devices.



### USB Monitor Driver Installation

Make sure to begin the installation after your PC has booted completely.



#### Note

If you turn off the monitor or remove the USB cable during installation, it may cause some error to your PC and the installation will not be completed.

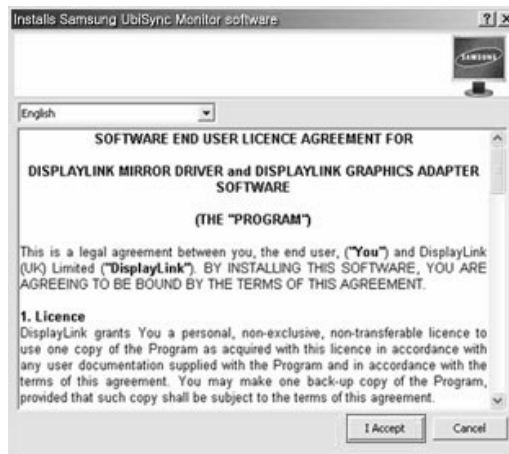
1. Insert the installation CD into your PC CD-ROM drive. Click the USB Monitor Driver icon and start installation.



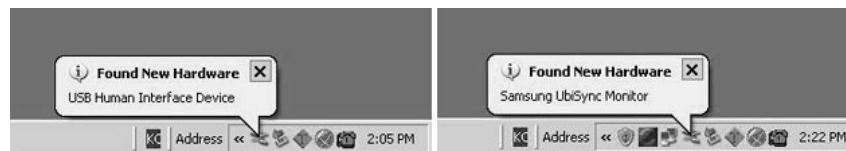
#### Note

USB Monitor Driver Icon : 

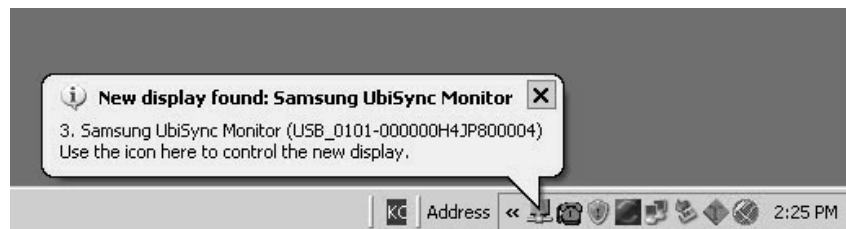
2. Click "I Accept" button and installation will progress.
-



- connecting the monitor to PC with USB cable, the following message (as shown picture) will appear on your PC window in a sequential manner.

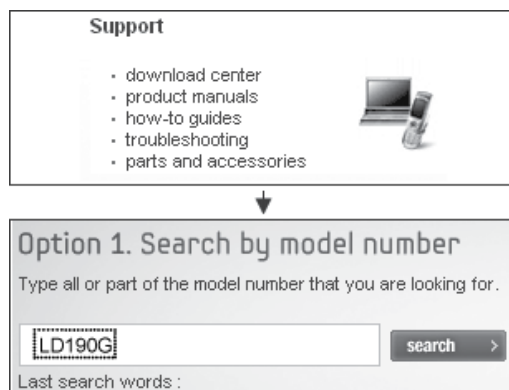


- When installation is completed, a monitor icon is created in the system tray at the bottom of window screen. The installed USB Monitor information is displayed as shown below.



- When the Driver installation is completed, please set the USB monitor to multi-monitor.
  - USB Driver online download

Please visit the Download Center (<http://www.samsung.com>) and download the USB Monitor Driver by searching the model name.



- Display settings after program installation

Applicable mode: Extend mode

Mode position: Right hand side of the Main Screen

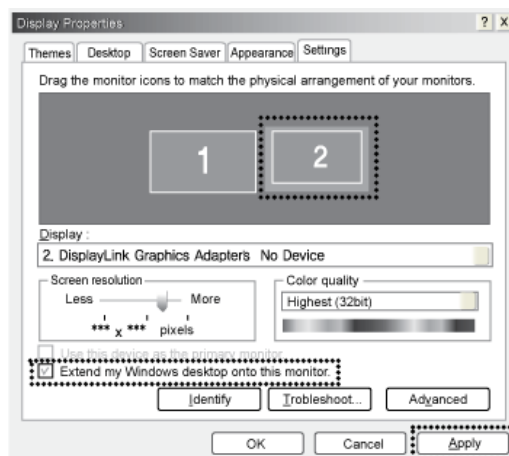
Mode rotation: 0 °

## Multi-monitor Configuration

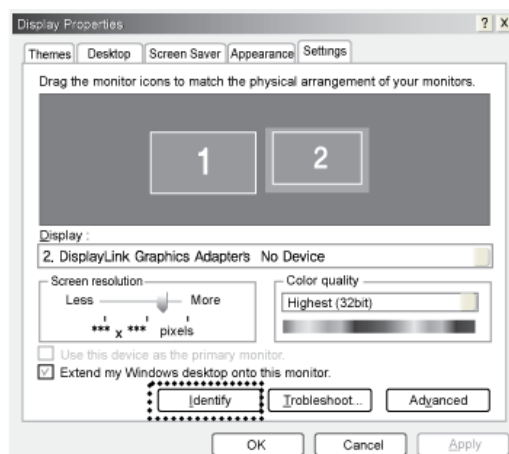


Both USB monitor (USB Cable connection) and general monitor (D-SUB connection) have same multi-monitor configuration.

1. Click 'Start >Control panel > Appearance and Themes >Display'.
2. Select 'Settings' tab.
3. Click second monitor icon and check 'Extend my windows desktop onto this monitor'. Then click 'Apply' button shown as below.



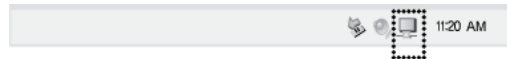
4. Click the 'Identify' button and check the given number for each monitor. Arrange the monitor in order.



5. Then click "OK" button.

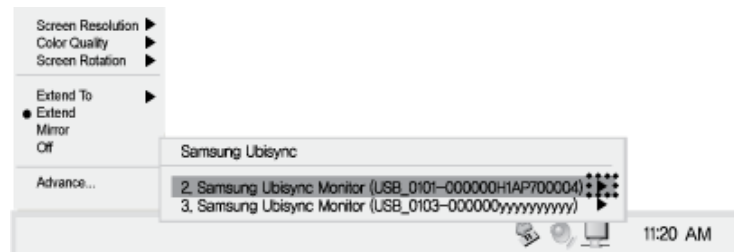
## Display Information Setup for USB Monitor

1. When USB Monitor Driver installation is completed, a monitor icon is created in the system tray at the bottom of the window screen.
-



2. Click the monitor icon to display a list of connected USB monitors.

e.g.,) The following figure shows when two USB monitors are connected. Select the monitor for which you want to configure the display settings. You can configure the "Screen Resolution", "Color Quality" and "Screen Rotation" settings for your monitor.



### Note

1. Because this USB monitor is recognized as a USB device, the DOS screen that appears for general monitors when a PC is booting up is not displayed.
  - In order to view booting information (DOS), use D-SUB cable (Analog Signal) connection.
2. USB monitor is not compatible to any software that requires 3D hardware acceleration.
  - Real Player (Expansion mode is not supported.)
  - Most 3D games
  - Programs based on DirectX
3. It is recommended using the following settings to play a movie at the best quality.
  - Set the battery mode of your notebook PC to Maximum Performance mode.
  - If a movie is not played smoothly in full screen mode, use a lower screen resolution.





Depending on PC interface or incompatible codec packs, it can cause serious playback issues, such as flickering or choppy video on the screen.

4. If you connect more than one USB monitor, a blank screen will appear until PC recognizes the USB device. Screen will be displayed after PC recognizes the USB device. (LD220/LD220G models only)

## Q & A

1. I cannot turn on the monitor.
    - Connect the power cable again.
  2. There is no image on the screen.
    - Unplug the power code and replug in.
    - Connect the USB cable again.
-

- Install the USB driver.
  - As USB port can be unstable, reboot your PC.
  - PC's USB port may be faulty. Please try to connect different port.
  - USB monitor may not work on USB 1.0.
  - Any input from mouse or keyboard will activate the display if it is under the power saving mode.
3. I can't install USB Driver with the supplied CD.
- Download USB driver at Samsung Electronics website and install it.[ <http://www.samsung.com> ]
4. After installing USB Driver, The computer performance is slow.
- As USB Driver takes more memory than the use of general graphic card, computer performance may be lower than before.
5. After booting the PC, screen order is changed.
- Update your graphic card to the latest version.
-  **Note**
- For graphic card driver, refer to graphic card manufacturer's home page.
6. Monitor resolution is changed.
- Please make a reference to [USB Monitor Installation guide]- 'Display Information Setup for USB Monitor' for best resolution
- [Best Resolution - LD190/LD190G: 1360X768, LD220/LD220G: 1920x1080]
7. While playing high quality video file, choppy video can be seen repeatedly.
- When you watch high quality video file in full screen mode, it may play properly due to limited USB bandwidth. It is strongly recommend to decrease the window size of the movie player. Depending on PC interface or incompatible codec packs, it can cause serious playback issues, such as flickering or choppy video on the screen.
8. I can use Clone mode, but can't set to extend mode.
- Update your graphic card to the latest version.
-  **Note**
- For graphic card driver, refer to graphic card manufacturer's home page.
- Right click 'Desktop' -'Property' - 'Settings' tab. Check 'Extend my windows desktop onto this monitor'.
  - If graphic card does not support WDDM, Extend mode can not be used in windows Vista. e.g.,) Some versions in Matrox Card.
9. How can I remove the 'USB Monitor Installation Program' completely?
- Click 'Add/Remove Programs' in the 'Control Panel'. A list of 'Currently Installed Programs' is displayed.
  - Select 'Samsung UbiSync Monitor' from the list and click 'Remove'.
-

10. I disconnected or turned off my USB monitor but my PC still displays the old monitor information in the Display Properties window.

- Deactivated USB monitor is due to either the power is off or there is no USB connection. In order to remove this information, 'Samsung Ubisync Monitor' program must be removed. This can be done by click 'Start' - 'Control Panel' - 'Add/Remove Programs' - 'Samsung Ubisync Monitor' - 'Remove'. All the connected USB monitors will not be able to use if the software program is removed. Installation software program must be installed again in order to use USB monitor.

11. The screen of USB monitor is frozen.

Check "Hardware Acceleration" on desktop property.

- 1. Click 'Start > Control Panel > Appearance and Themes > Display > Settings > Advanced'.
- 2. Select 'Troubleshoot' tab, when displayed. Set the 'Hardware acceleration(H)' value to 'Full'.

12. Icons and photos are broken or jagged in Clone mode (USB monitor).

- This occurs because Windows does not send the screen updating information to Clone mode if Extended mode is active on a single PC. We recommend using the monitor in Extend mode.

## Connecting USB{LD220/LD220G}

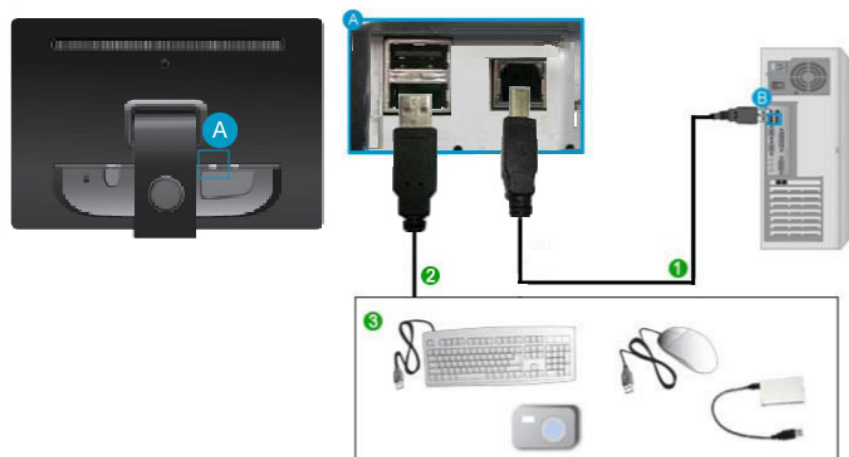


**Note**


You can use a USB device such as a mouse, keyboard, Memory Stick, or external hard disk drive by connecting them to the DOWN port of the monitor without connecting them to the PC.

The USB port of the monitor supports High-Speed Certified USB 2.0.


	High speed	Full speed	Low speed
Data Rate	480 Mbps	12 Mbps	1.5 Mbps
Power Consumption	2.5 W	2.5 W	2.5 W
	(Max., each port)	(Max., each port)	(Max., each port)




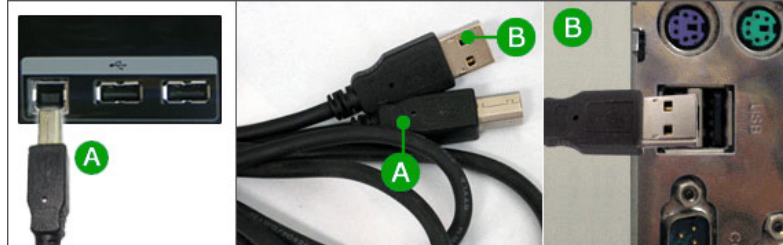



1. Connect the  *UP* port of the monitor and the USB port of the computer with the USB cable.



To use  *DOWN* port, you have to connect the *UP* (Upstream Cable) to the PC.

Make sure to use the USB cable supplied with this monitor to connect the monitor's  *UP* port and your computer's USB port.



2. Connect the  *DOWN* port of the USB monitor and a USB device with the USB cable.
3. The use procedures are as the same as those for using an external device connecting to the PC.
  - You can connect and use a keyboard and mouse.
  - You can play a file from a media device.  
(Examples of media devices: MP3, digital camera, etc.)
  - You can run, move, copy or delete the files on the storage device.  
(Examples of storage devices: external memory, memory card, memory reader, HDD-type MP3 player, etc.)
  - You can use other USB devices that can be connected to a computer.



When connecting a device to the  *DOWN* port of the monitor, connect the device using a cable appropriate to the device.

(For the purchase of the cable and external devices, ask the service center of the corresponding product.)

The company is not liable for problems or damages to an external device caused by using an unauthorized cable for the connection.

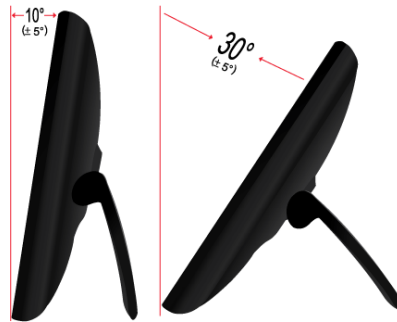
Some products do not follow the USB standard, and it may cause a malfunction of the device.

If the device malfunctions even if it is connected to the computer, contact the service center of the device/computer.

---

## Using the Stand

### Folding the base



#### Note

You can tilt the monitor backwards at an angle of 10 °~ 30 °(±5°) .

---

# Using the Software

## Monitor Driver



### Note

When prompted by the operating system for the monitor driver, insert the CD-ROM included with this monitor. Driver installation is slightly different from one operating system to another. Follow the directions appropriate for the operating system you have.

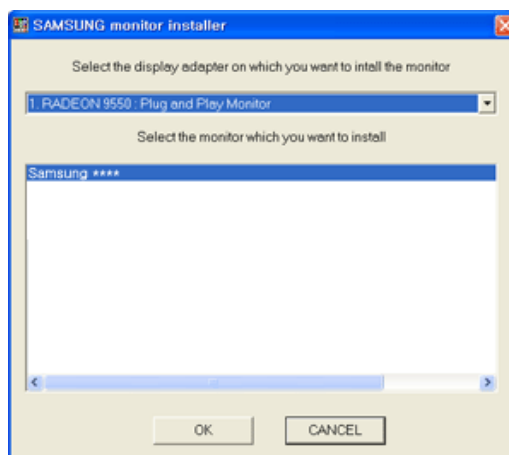
Prepare a blank disk and download the driver program file at the Internet web site shown here.

**Internet web site :**

<http://www.samsung.com/> (Worldwide)

## Installing the Monitor Driver (Automatic)

1. Insert CD into the CD-ROM drive.
2. Click "Windows".
3. Choose your monitor model in the model list, then click the "OK" button.



4. If you can see following message window, then click the "Continue Anyway" button. Then click "OK" button (Microsoft® Windows® XP/2000 Operating System).





### Note


This monitor driver is under certifying MS logo, and this installation doesn't damage your system.

The certified driver will be posted on Samsung Monitor homepage.

<http://www.samsung.com/>

## Installing the Monitor Driver (Manual)

Microsoft® Windows Vista™, Operating System

1. Insert your Manual CD into your CD-ROM drive.
2. Click  (Start) and "Control Panel". Then, double-click on "Appearance and Personalization".



3. Click "Personalization" and then "Display Settings".

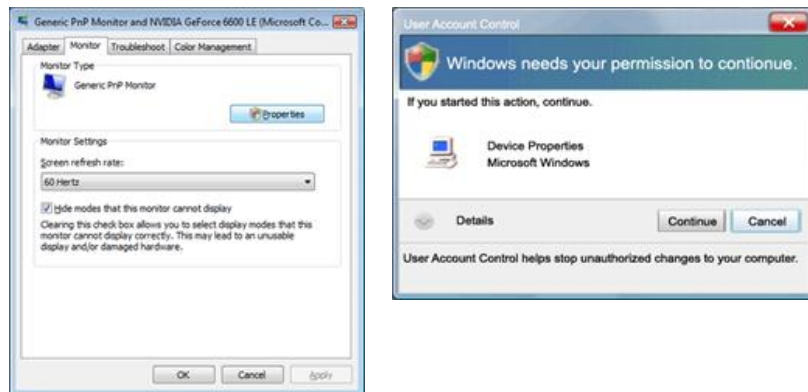


4. Click "Advanced Settings...".



5. Click "Properties" in the "Monitor" tab. If the "Properties" button is deactivated, it means the configuration for your monitor is completed. The monitor can be used as is.
-

If the message "Windows needs..." is displayed, as shown in the figure below, click "Continue".

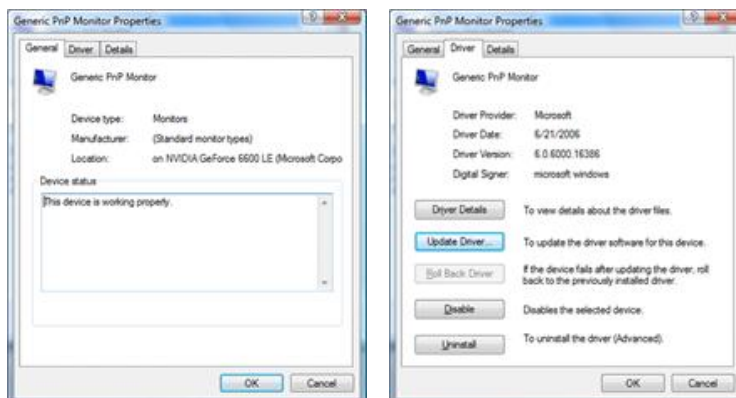


### Note

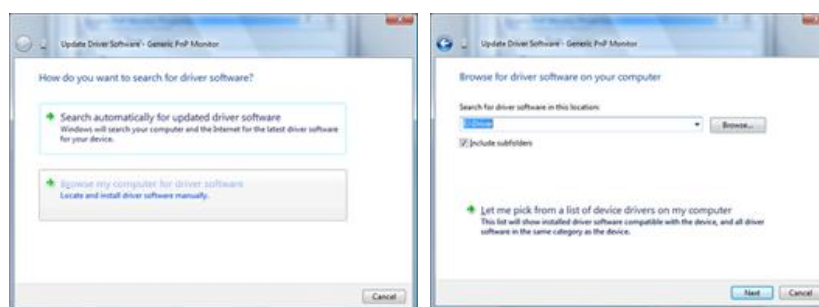
This monitor driver is under certifying MS logo, and this installation doesn't damage your system.

The certified driver will be posted on Samsung Monitor homepage.

- Click "Update Driver..." in the "Driver" tab.

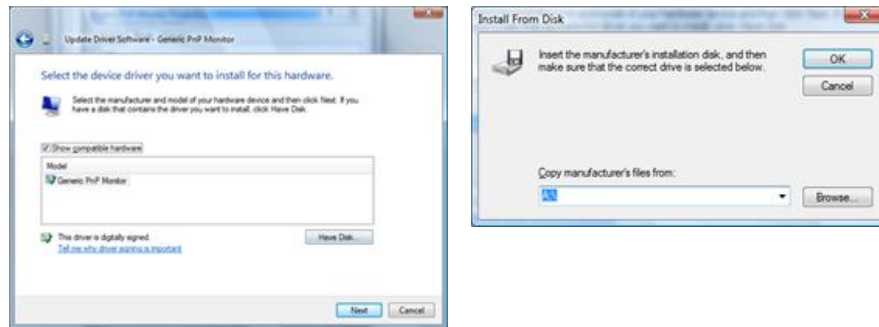


- Check the "Browse my computer for driver software" checkbox and click "Let me pick from a list of device drivers on my computer".

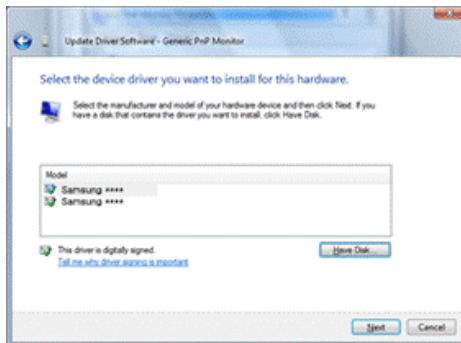


- Click "Have Disk..." and select the folder (for example, D:\Drive) where the driver setup file is located, and click "OK".
-

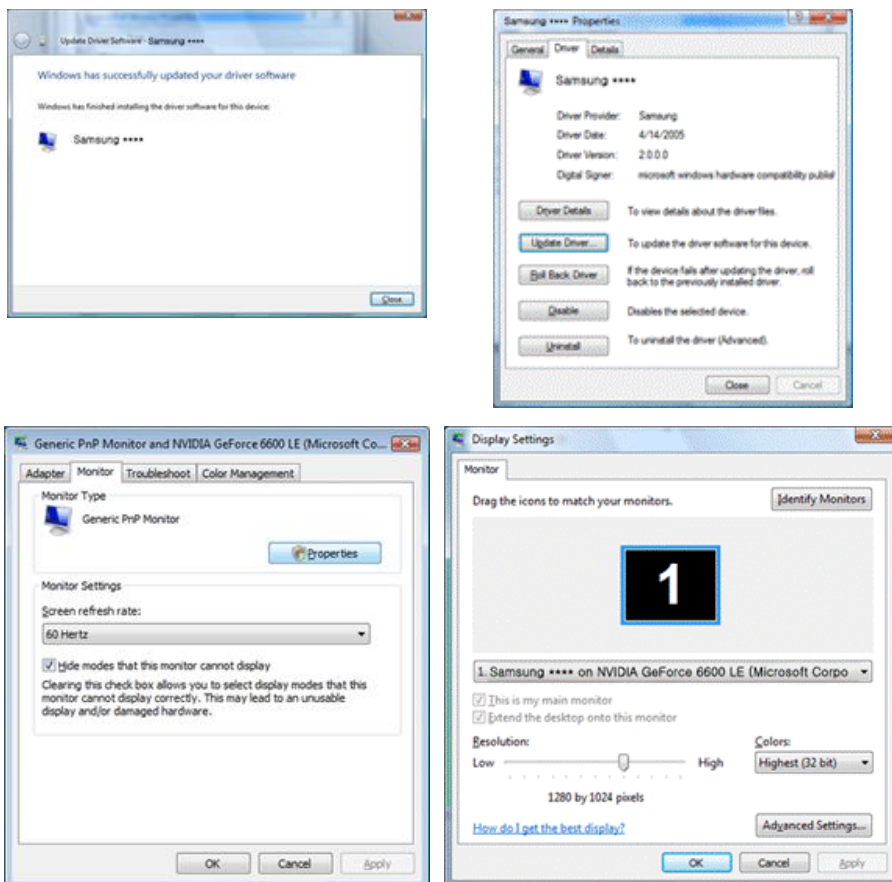
## Using the Software



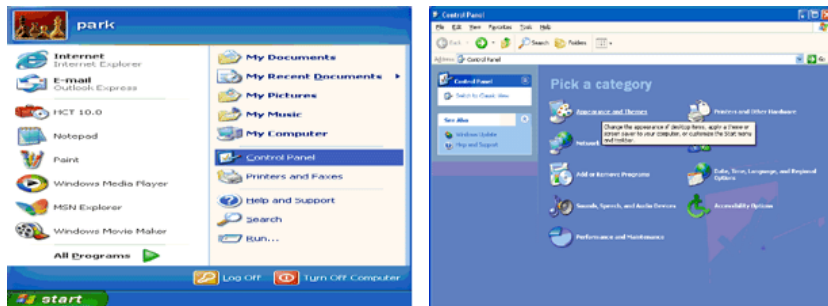
9. Select the model that matches your monitor from the list of monitor models on the screen, and click "Next".



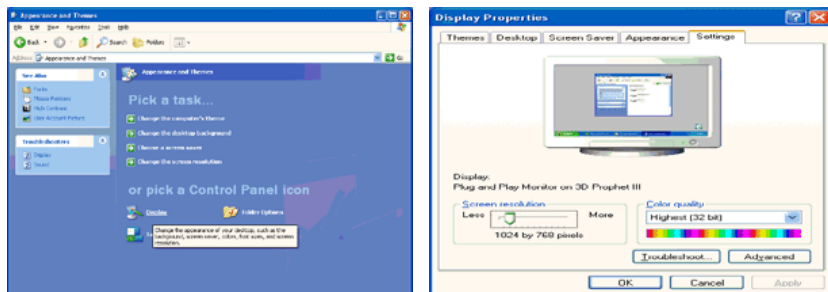
10. Click "Close" → "Close" → "OK" → "OK" on the following screens displayed in sequence.



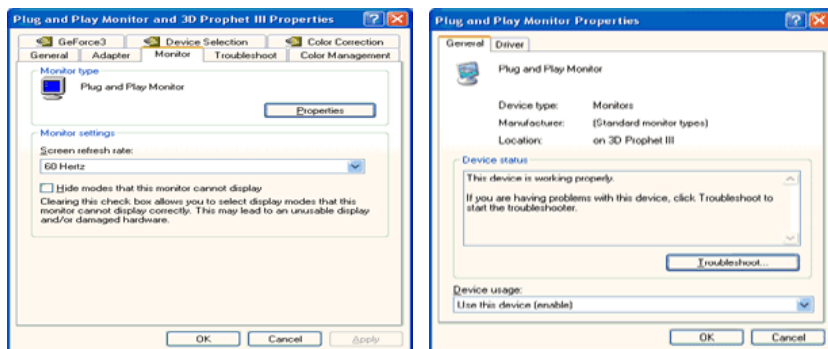
1. Insert CD into the CD-ROM drive.
2. Click "Start" → "Control Panel" then click the "Appearance and Themes" icon.



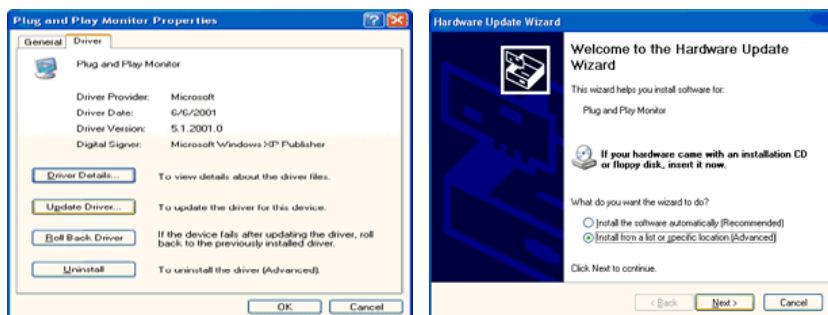
3. Click "Display" icon and choose the "Settings" tab then click "Advanced...".



4. Click the "Properties" button on the "Monitor" tab and select "Driver" tab.

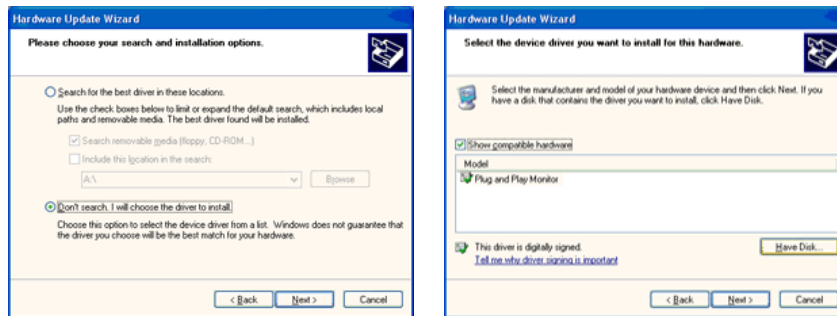


5. Click "Update Driver..." and select "Install from a list or..." then click "Next" button.

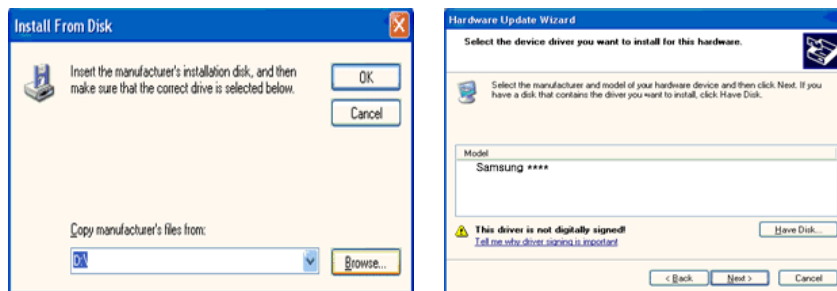


6. Select "Don't search, I will..." then click "Next" and then click "Have disk".
-





- Click the "Browse" button then choose A:(D:\Driver) and choose your monitor model in the model list and click the "Next" button.



- If you can see following message window, then click the "Continue Anyway" button. Then click "OK" button.



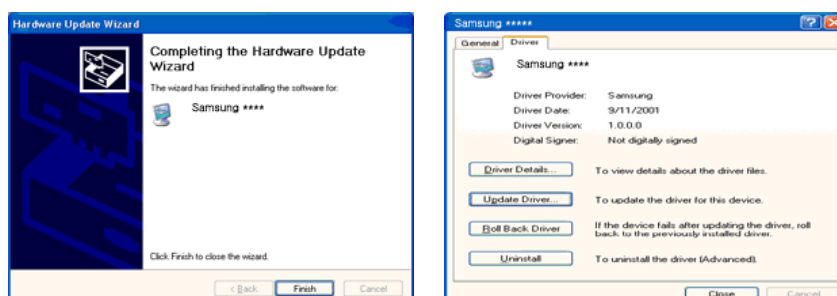
### Note

This monitor driver is under certifying MS logo, and this installation doesn't damage your system.

The certified driver will be posted on Samsung Monitor homepage.

<http://www.samsung.com/>

- Click the "Close" button then click "OK" button continually.







10. Monitor driver installation is completed.

#### Microsoft® Windows® 2000 Operating System

When you can see "Digital Signature Not Found" on your monitor, follow these steps.

1. Choose "OK" button on the "Insert disk" window.
2. Click the "Browse" button on the "File Needed" window.
3. Choose A:(D:\Driver) then click the "Open" button and then click "OK" button.

#### How to install

1. Click "Start", "Setting", "Control Panel".
2. Double click the "Display" icon.
3. Select the "Settings" tab and click "Advanced Properties" button.
4. Choose "Monitor".

Case1 : If the "Properties" button is inactive, it means your monitor is properly configured. Please stop installation

Case2 : If the "Properties" button is active, click the "Properties" button then follow next steps continually.

5. Click "Driver" and then click on "Update Driver..." then click on the "Next" button.
6. Choose "Display a list of the known drivers for this device so that I can choose a specific driver" then click "Next" and then click "Have disk".
7. Click the "Browse" button then choose A:(D:\Driver).
8. Click the "Open" button, then click "OK" button.
9. Choose your monitor model and click the "Next" button then click "Next" button.
10. Click the "Finish" button then the "Close" button.

If you can see the "Digital Signature Not Found" window then click the "Yes" button. And click the "Finish" button then the "Close" button.

#### Microsoft® Windows® Millennium Operating System

1. Click "Start", "Setting", "Control Panel".
  2. Double click the "Display" icon.
  3. Select the "Settings" tab and click "Advanced Properties" button.
-

4. Select the "Monitor" tab.
5. Click the "Change" button in the "Monitor Type" area.
6. Choose "Specify the location of the driver".
7. Choose "Display a list of all the driver in a specific location..." then click "Next" button.
8. Click the "Have Disk" button.
9. Specify A:\(D:\driver) then click "OK" button.
10. Select "Show all devices" and choose the monitor that corresponds to the one you connected to your computer and click "OK".
11. Continue choosing "Close" button and "OK" button until you close the Display Properties dialogue box.

#### Microsoft® Windows® NT Operating System

1. Click "Start", "Settings", "Control Panel", and then double-click "Display" icon.
2. In Display Registration Information window, click Settings Tab and then click "All Display Modes".
3. Select a mode that you wish to use (Resolution, Number of colors and Vertical frequency) and then click "OK".
4. Click "Apply" button if you see the screen working normally after clicking "Test". If the screen is not normal, change to a different mode (lower mode of resolution, colors or frequency).



#### Note

If there is no Mode at All Display Modes, select the level of resolution and vertical frequency by referring to the Preset Timing Modes in the user guide.

#### Linux Operating System

To execute X-Window, you need to make the X86Config file, which is a type of system setting file.

1. Press "Enter" at the first and the second screen after executing the X86Config file.
  2. The third screen is for setting your mouse.
  3. Set a mouse for your computer.
  4. The next screen is for selecting a keyboard.
  5. Set a Keyboard for your computer.
  6. The next screen is for setting your monitor.
  7. First of all, set a horizontal frequency for your monitor. (You can enter the frequency directly.)
  8. Set a vertical frequency for your monitor. (You can enter the frequency directly.)
  9. Enter the model name of your monitor. This information will not affect the actual execution of X-Window.
-

10. You have finished setting up your monitor. Execute X-Window after setting other requested hardware.

---

# Adjusting the Monitor

## Direct Functions



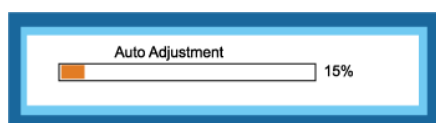
Note

- The monitor LED displays for 10 seconds
- Press the MENU button four times continuously to exit OSD

## AUTO(Available in Analog mode only)

When no OSD is displayed,press"▼" button to perform the AUTO function, the auto adjustment screen appears as shown in the animated screen on the center.

Auto adjustment allows the monitor to self-adjust to the incoming Analog signal.



- ▶ If auto adjustment does not work properly, press "▼" button again to adjust picture with more accuracy.
- ▶ If you change resolution in the control panel, auto function will be executed automatically.

## Brightness

When no OSD is displayed,press"▲" button to perform the Brightness function.



## Toggle the Source


In power saving mode, the power LED is blinking all the time, or in the Checksignal menu,press"▲/▼" buttons to perform the **Source** function.



## OSD Function

	Brightness					
	MagicBright	Custom	NotePC	Internet	Movie	Dynamic Contrast
	Source	Analog	USB			
	Image Size	Auto	Wide			

---

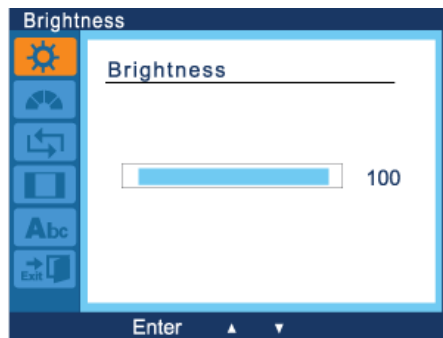
 **Language** • English, Deutsch, Español, Français, Italiano, Svenska, Русский, Português, Türkçe

 **Exit**

## **Brightness**

(Not available in **MagicBright** mode of **Dynamic Contrast**.)

You can use the on-screen menus to change the brightness according to personal preference.



MENU → MENU → ▲, ▼ →  
MENU

## **MagicBright**

**MagicBright** is a new feature providing optimum viewing environment depending on the contents of the image you are watching. Currently five different modes are available: **Custom**, **NotePC**, **Internet**, **Movie** and **Dynamic Contrast**. Each mode has its own pre-configured brightness value.



MENU → ▲, ▼ → MENU → ▲,  
▼ → MENU

- **Custom**

Although the values are carefully chosen by our engineers, the pre-configured values may not be comfortable to your eyes depending on your taste.

If this is the case, adjust the brightness by using the OSD menu.

- **NotePc**

Used for connecting to a notebook screen.

- **Internet**

For working with a mixture of images such as texts and graphics.

- **Movie**

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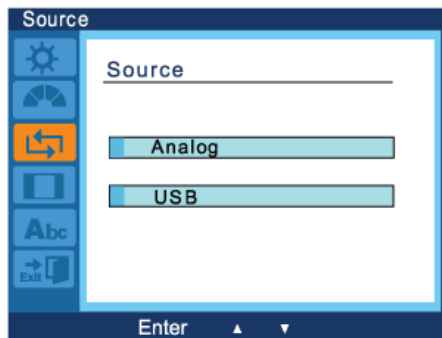
For watching motion pictures such as a DVD or Video CD.

- **Dynamic Contrast**

**Dynamic Contrast** automatically detects distribution of inputted visual signal and adjusts to create optimum contrast.

## Source

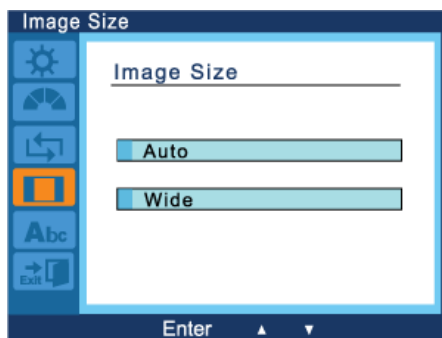
Choose the video signal between Analog and USB.



MENU → ▲, ▼ → MENU → ▲, ▼ → MENU

## Image Size

You can change the size of the screen displayed on your monitor.



### Note

- Signals not available in the standard mode table are not supported.
- If the wide screen which is the optimal resolution for the monitor is set on your PC, this function is not performed.

MENU → ▲, ▼ → MENU → ▲, ▼ → MENU

- **Auto**
- **Wide**

- **Auto** - The screen is displayed in accordance with the screen aspect ratio of the input signals.
- **Wide** - A full screen is displayed regardless of the screen aspect ratio of the input signals.

## Language

You can choose one of nine languages.

---



#### Note

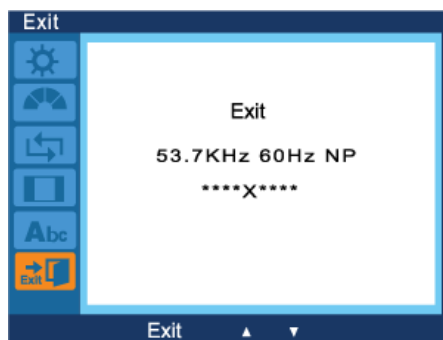
The language chosen affects only the language of the OSD. It has no effect on any software running on the computer.

MENU → ▲, ▼ → MENU → ▲, ▼ → MENU

- English, Deutsch, Español, Français, Italiano, Svenska, Русский, Português, Türkçe

#### Exit

Perform this function to close OSD.



MENU → ▲, ▼ → MENU

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# Troubleshooting

## Self-Test Feature Check

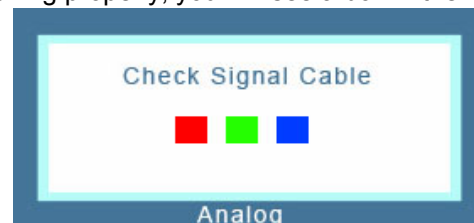


Your monitor provides a self test feature that allows you to check whether your monitor is functioning properly.

## Self-Test Feature Check

1. Turn off both your computer and the monitor.
2. Unplug the video cable from the back of the computer.
3. Turn on the monitor.

If the monitor is functioning properly, you will see a box in the illustration below.



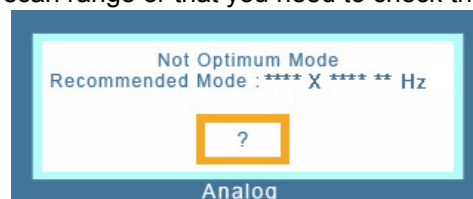
This box appears during normal operation if the video cable becomes disconnected or damaged.

4. Turn off your monitor and reconnect the video cable; then turn on both your computer and the monitor.

If your monitor screen remains blank after using the previous procedure, check your video controller and computer system; *your monitor is functioning properly.*

## Warning Messages

If there is something wrong with the input signal, a message appears on the screen or the screen goes blank although the power indicator LED is still on. The message may indicate that the monitor is out of scan range or that you need to check the signal cable.



## Environment

The location and the position of the monitor may influence the quality and other features of the monitor.

If there are any sub woofer speakers near the monitor, unplug and relocate the woofer to another room.

Remove all electronic devices such as radios, fans, clocks and telephones that are within 3 feet (one meter) of the monitor.

---



## Useful Tips

A monitor recreates visual signals received from the computer. Therefore, if there is a problem with the computer or the video card, this can cause the monitor to become blank, have poor coloring, become noisy, and video mode not supported, etc. In this case, first check the source of the problem, and then contact the Service Center or your dealer.

Judging the monitor's working condition

If there is no image on the screen or a **"Not Optimum Mode", "Recommended Mode 1360 x 768(1920 x 1080) 60 Hz"** message comes up, disconnect the cable from the computer while the monitor is still powered on.

If there is a message coming up on the screen or if the screen goes white, this means the monitor is in working condition.

In this case, check the computer for trouble.

## Check List



### Note

Before calling for assistance, check the information in this section to see if you can remedy any problems yourself. If you do need assistance, please call the phone number on the Information section or contact your dealer.

## No images on the screen. I cannot turn on the monitor.

Q: Is the power cord connected properly?

A: Check the power cord connection and supply.

Q: Can you see **"Check Signal Cable"** on the screen?

A: (Connected using the D-sub cable)

Check the signal cable connection.

Q: If the power is on, reboot the computer to see the initial screen (the login screen), which can be seen.

A: If the initial screen (the login screen) appears, boot the computer in the applicable mode (the safe mode for Windows ME/XP/2000) and then change the frequency of the video card.

(Refer to the Preset Timing Modes)

If the initial screen (the login screen) does not appear, contact the Service Center or your dealer.

Q: Can you see **"Not Optimum Mode", "Recommended Mode 1360 x 768(1920 x 1080) 60 Hz"** on the screen?

A: You can see this message when the signal from the video card exceeds the maximum resolution and frequency that the monitor can handle properly.

A: Adjust the maximum resolution and frequency that the monitor can handle properly.

A: If the display exceeds SXGA or 75 Hz, a **"Not Optimum Mode", "Recommended Mode 1360 x 768(1920 x 1080) 60 Hz"** message is displayed. If the display exceeds 85 Hz, the display will work properly but the **"Not Optimum Mode", "Recommended**

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**Mode** 1360 x 768(1920 x 1080) 60 Hz" message appears for one minute and then disappears.

Please change to the recommended mode during this one-minute period.

(The message is displayed again if the system is rebooted.)

Q: There is no image on the screen. Is the power indicator on the monitor blinking at 1 second intervals?

A: The monitor is in PowerSaver mode.

A: Press a key on the keyboard to activate the monitor and restore the image on the screen.

A: If a(n) (error) message is displayed on the screen when the monitor is properly connected, please check if the monitor is set to Analog/USB. Press the MENU button, when the menu appears, enter the **Source** option to toggle the **Source**. When no OSD is displayed, press" ▲/▼ to toggle the **Source**.

### **The screen shows strange colors or just black and white.**

Q: Is the screen displaying only one color as if looking at the screen through a cellophane paper?

A: Check the signal cable connection.

A: Make sure the video card is fully inserted in its slot.

Q: Have the screen colors become strange after running a program or due to a crash between applications?

A: Reboot the computer.

Q: Has the video card been set properly?

A: Set the video card by referring to the video card manual.

### **The screen suddenly has become unbalanced.**

Q: Have you adjusted the resolution or frequency to the monitor?

A: Adjust the resolution and frequency at the video card.

(Refer to the Preset Timing Modes).

Q: The screen can be unbalanced due to the cycle of the video card signals.

### **The screen is out of focus or OSD cannot be adjusted.**

Q: Have you adjusted the resolution or frequency on the monitor?

A: Adjust the resolution and frequency of the video card.

(Refer to the Preset Timing Modes).

### **LED is blinking but no images on the screen.**

Q: Is the frequency properly adjusted when checking the Display Timing on the menu?

A: Adjust the frequency properly by referring to the video card manual and the Preset Timing Modes.

---

(The maximum frequency per resolution may differ from product to product.)

**There are only 16 colors shown on the screen. The screen colors have changed after changing the video card.**

Q: Have the Windows colors been set properly?

A: Windows XP :

Set the resolution at the Control Panel → Appearance and Themes → Display → Settings.

A: Windows ME/2000 :

Set the resolution at the Control Panel → Display → Settings.

Q: Has the video card been set properly?

A: Set the video card by referring to the video card manual.

**There is a message that reads "Unrecognized monitor, Plug & Play (VESA DDC) monitor found".**

Q: Have you installed the monitor driver?

A: Install the monitor driver according to the Monitor Driver.

Q: See the video card manual to see if the Plug & Play (VESA DDC) function can be supported.

A: Install the monitor driver according to the Monitor Driver.

**Check the following items if there is trouble with the monitor.**

Check if the power cord and the video cables are properly connected to the computer.

Check if the computer beeps more than 3 times when booting.

(If it does, request an a service for the main board of the computer.)

If you installed a new video card or if you assembled the PC, check if the installed the adapter (video) driver and the monitor driver.

Check if the scanning ratio of the video screen is set to between 50 Hz ~ 75 Hz(LD190/LD190G)/56 Hz ~ 61 Hz(LD220/LD220G).

(Do not exceed 75 Hz(LD190/LD190G) /61 Hz(LD220/LD220G) when using the maximum resolution.)

If you have problems in installing the adapter (video) driver, boot the computer in Safe Mode, remove the Display Adapter in the "Control Panel → System → Device Administrator" and then reboot the computer to reinstall the adapter (video) driver.



**Note**

If problems repeatedly occur, contact an authorized service center.

**Q & A**

Q: How can I change the frequency?

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A: The frequency can be changed by reconfiguring the video card.

A: Note that video card support can vary, depending on the version of the driver used. (Refer to the computer or the video card manual for details.)

Q: How can I adjust the resolution?

A: Windows XP:

Set the resolution in the Control Panel → Appearance and Themes → Display → Settings.

A: Windows ME/2000:

Set the resolution in the Control Panel → Display → Settings.

\* Contact the video card manufacturer for details.

Q: How can I set the Power Saving function?

A: Windows XP:

Set the resolution in the Control Panel → Appearance and Themes → Display → Screen Saver.

Set the function in the BIOS-SETUP of the computer. (Refer to the Windows / Computer Manual).

A: Windows ME/2000:

Set the resolution at the Control Panel → Display → Screen Saver.

Set the function in the BIOS-SETUP of the computer. (Refer to the Windows / Computer Manual).

Q: How can I clean the outer case/LCD Panel?

A: Disconnect the power cord and then clean the monitor with a soft cloth, using either a cleaning solution or plain water.

Do not leave any detergent or scratches on the case. Do not let any water enter the monitor.

Q: How I can clone or extend screen mode?

A: Open the "Display Properties" window and select the "Settings" tab,

- For more information on how to configure the settings, click here.



**Note**

Before calling for assistance, check the information in this section to see if you can remedy any problems yourself. If you do need assistance, please call the phone number on the Information section or contact your dealer.

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# Specifications

## General

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### General

Model Name	SyncMaster LD190
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### LCD Panel

Size	18.5 inch (47 cm)
Display area	409.8 mm (H) x 230.4 mm (V)
Pixel Pitch	0.3 mm (H) x 0.3 mm (V)

---

### Synchronization

Horizontal	30 ~ 81 kHz
Vertical	50 ~ 75 Hz

---

### Display Color

16.7 M

---

### Resolution

Optimum resolution	1360 x 768@60 Hz
Maximum resolution	1360 x 768@60 Hz

---

### Input Signal, Terminated

RGB Analog, USB

0.7 Vp-p  $\pm$  5 %

Separate H/V sync, Composite, SOG

TTL level (V high  $\geq$  2.0 V, V low  $\leq$  0.8 V)

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### Maximum Pixel Clock

89 MHz (Analog, USB)

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### Power Supply

AC 100 - 240 V~ (+/- 10 %), 50/60 Hz  $\pm$  3 Hz

---

### Signal Cable

15pin - to - 15pin D-sub cable, Detachable  
USB Interface connector, Detachable

---

### Dimensions (W x H x D) / Weight (Simple Stand)

450.2 x 295.8 x 72.0 mm (17.7 x 11.6 x 2.8 inch) (With Stand) / 4.7 kg(10.4 lbs)

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### Environmental considerations

Operating	Temperature : 50°F ~ 104°F (10°C ~ 40°C)
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	Humidity : 10 % ~ 80 %, non-condensing
--	--

Storage	Temperature : -4°F ~ 113°F (-20°C ~ 45°C)
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## Environmental considerations

Humidity : 5 % ~ 95 %, non-condensing

## Plug and Play Capability

This monitor can be installed on any Plug & Play compatible system. The interaction of the monitor and the computer systems will provide the best operating conditions and monitor settings. In most cases, the monitor installation will proceed automatically, unless the user wishes to select alternate settings.

## Dot Acceptable

TFT-LCD panels manufactured by using advanced semiconductor technology with precision of 1ppm (one millionth) above are used for this product. But the pixels of RED, GREEN, BLUE and WHITE color appear to be bright sometimes or some black pixels may be seen. This is not from bad quality and you can use it without any problems.

For example, the number of TFT-LCD sub pixels contained in this product are 3,133,440.



### Note

Design and specifications are subject to change without prior notice.



### Class B Equipment (Information Communication equipment for residential use)

This product complies with the Electromagnetic Compatibility Directives for residential use and can be used in all areas including common residential areas. (Class B equipment emits less electromagnetic waves than Class A equipment.)

## PowerSaver

This monitor has a built-in power management system called PowerSaver. This system saves energy by switching your monitor to low-power mode when it has not been used for a certain amount of time. The monitor automatically returns to normal operation when you press a key on the keyboard. For energy conservation, turn your monitor OFF when it is not needed, or when leaving it unattended for long periods. The PowerSaver system operates with a VESA DPM compliant video card installed in your computer. Use the software utility installed on your computer to set up this feature.

State	Normal Operation	Power saving mode	Power off (Power button) EPA/ENERGY 2000
Power Indicator	On	Blinking	Off
Power Consumption	20 watts	Analog: Less than 1 watt  USB: Less than 1 watt	Less than 1 watts



This monitor is EPA ENERGY STAR® compliant and ENERGY 2000 compliant when used with a computer equipped with VESA DPM functionality.

As an ENERGY STAR® Partner, SAMSUNG has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

## Preset Timing Modes

If the signal transferred from the computer is the same as the following Preset Timing Modes, the screen will be adjusted automatically. However, if the signal differs, the screen may go blank while the power LED is on. Refer to the video card manual and adjusts the screen as follows.

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
IBM, 640 x 350	31.469	70.086	25.175	+/-
IBM, 640 x 480	31.469	59.940	25.175	-/-
IBM, 720 x 400	31.469	70.087	28.322	-/+
MAC, 640 x 480	35.000	66.667	30.240	-/-
MAC, 832 x 624	49.726	74.551	57.284	-/-
VESA, 640 x 480	37.861	72.809	31.500	-/-
VESA, 640 x 480	37.500	75.000	31.500	-/-
VESA, 800 x 600	35.156	56.250	36.000	+/+
VESA, 800 x 600	37.879	60.317	40.000	+/+
VESA, 800 x 600	48.077	72.188	50.000	+/+
VESA, 800 x 600	46.875	75.000	49.500	+/+
VESA, 1024 x 768	48.363	60.004	65.000	-/-
VESA, 1024 x 768	56.476	70.069	75.000	-/-
VESA, 1024 x 768	60.023	75.029	78.750	+/+
VESA, 1360 x 768	47.712	60.015	85.500	+/+



### Horizontal Frequency

The time to scan one line connecting the right edge to the left edge of the screen horizontally is called the Horizontal Cycle and the inverse number of the Horizontal Cycle is called the Horizontal Frequency. Unit: kHz

### Vertical Frequency

Like a fluorescent lamp, the screen has to repeat the same image many times per second to display an image to the user. The frequency of this repetition is called the Vertical Frequency or Refresh Rate. Unit: Hz

## General

### General

Model Name SyncMaster LD190G

### LCD Panel

Size 18.5 inch (47 cm)  
 Display area 409.8 mm (H) x 230.4 mm (V)  
 Pixel Pitch 0.3 mm (H) x 0.3 mm (V)

### Synchronization

---

Horizontal 30 ~ 81 kHz

Vertical 50 ~ 75 Hz

### Display Color

---

16.7 M

### Resolution

---

Optimum resolution 1360 x 768@60 Hz

Maximum resolution 1360 x 768@60 Hz

### Input Signal, Terminated

---

RGB Analog, USB

0.7 Vp-p  $\pm$  5 %

Separate H/V sync, Composite, SOG

TTL level (V high  $\geq$  2.0 V, V low  $\leq$  0.8 V)

### Maximum Pixel Clock

---

89 MHz (Analog, USB)

### Power Supply

---

AC 100 - 240 V~ (+/- 10 %), 50/60 Hz  $\pm$  3 Hz

### Signal Cable

---

15pin - to - 15pin D-sub cable, Detachable

USB Interface connector, Detachable

### Dimensions (W x H x D) / Weight (Simple Stand)

---

450.2 x 295.8 x 72.0 mm (17.7 x 11.6 x 2.8 inch) (With Stand) / 4.7 kg(10.4 lbs)

### Environmental considerations

---

Operating Temperature : 50°F ~ 104°F (10°C ~ 40°C)

Humidity : 10 % ~ 80 %, non-condensing

Storage Temperature : -4°F ~ 113°F (-20°C ~ 45°C)

Humidity : 5 % ~ 95 %, non-condensing

### Plug and Play Capability

---

This monitor can be installed on any Plug & Play compatible system. The interaction of the monitor and the computer systems will provide the best operating conditions and monitor settings. In most cases, the monitor installation will proceed automatically, unless the user wishes to select alternate settings.

### Dot Acceptable

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TFT-LCD panels manufactured by using advanced semiconductor technology with precision of 1ppm (one millionth) above are used for this product. But the pixels of RED, GREEN, BLUE and WHITE color appear to be bright sometimes or some

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**Dot Acceptable**

black pixels may be seen. This is not from bad quality and you can use it without any problems.

For example, the number of TFT-LCD sub pixels contained in this product are 3,133,440.

**Note**

Design and specifications are subject to change without prior notice.

**Class B Equipment (Information Communication equipment for residential use)**

This product complies with the Electromagnetic Compatibility Directives for residential use and can be used in all areas including common residential areas. (Class B equipment emits less electromagnetic waves than Class A equipment.)

**PowerSaver**

This monitor has a built-in power management system called PowerSaver. This system saves energy by switching your monitor to low-power mode when it has not been used for a certain amount of time. The monitor automatically returns to normal operation when you press a key on the keyboard. For energy conservation, turn your monitor OFF when it is not needed, or when leaving it unattended for long periods. The PowerSaver system operates with a VESA DPM compliant video card installed in your computer. Use the software utility installed on your computer to set up this feature.

State	Normal Operation	Power saving mode	Power off (Power button) EPA/ENERGY 2000
Power Indicator	On	Blinking	Off
Power Consumption	20 watts	Analog: Less than 1 watt  USB: Less than 1 watt	Less than 1 watts



This monitor is EPA ENERGY STAR® compliant and ENERGY 2000 compliant when used with a computer equipped with VESA DPM functionality.

As an ENERGY STAR® Partner, SAMSUNG has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

**Preset Timing Modes**

If the signal transferred from the computer is the same as the following Preset Timing Modes, the screen will be adjusted automatically. However, if the signal differs, the screen may go blank while the power LED is on. Refer to the video card manual and adjusts the screen as follows.

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
IBM, 640 x 350	31.469	70.086	25.175	+/-
IBM, 640 x 480	31.469	59.940	25.175	-/-

## Specifications

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
IBM, 720 x 400	31.469	70.087	28.322	-/+
MAC, 640 x 480	35.000	66.667	30.240	-/-
MAC, 832 x 624	49.726	74.551	57.284	-/-
VESA, 640 x 480	37.861	72.809	31.500	-/-
VESA, 640 x 480	37.500	75.000	31.500	-/-
VESA, 800 x 600	35.156	56.250	36.000	+/+
VESA, 800 x 600	37.879	60.317	40.000	+/+
VESA, 800 x 600	48.077	72.188	50.000	+/+
VESA, 800 x 600	46.875	75.000	49.500	+/+
VESA, 1024 x 768	48.363	60.004	65.000	-/-
VESA, 1024 x 768	56.476	70.069	75.000	-/-
VESA, 1024 x 768	60.023	75.029	78.750	+/+
VESA, 1360 x 768	47.712	60.015	85.500	+/+



### Horizontal Frequency

The time to scan one line connecting the right edge to the left edge of the screen horizontally is called the Horizontal Cycle and the inverse number of the Horizontal Cycle is called the Horizontal Frequency. Unit: kHz

### Vertical Frequency

Like a fluorescent lamp, the screen has to repeat the same image many times per second to display an image to the user. The frequency of this repetition is called the Vertical Frequency or Refresh Rate. Unit: Hz

## General

### General

Model Name SyncMaster LD220

### LCD Panel

Size 21.5 inch (54 cm)  
Display area 476.64 mm (H) x 268.11 mm (V)  
Pixel Pitch 0.248 mm (H) x 0.248 mm (V)

### Synchronization

Horizontal 30 ~ 75 kHz  
Vertical 56 ~ 61 Hz

### Display Color

16.7 M

### Resolution

---

Optimum resolution 1920 x 1080@60 Hz

---

Maximum resolution 1920 x 1080@60 Hz

---

### Input Signal, Terminated

---

RGB Analog, USB

0.7 Vp-p  $\pm$  5 %

Separate H/V sync, Composite, SOG

TTL level (V high  $\geq$  2.0 V, V low  $\leq$  0.8 V)

### Maximum Pixel Clock

---

164 MHz (Analog, USB)

---

### Power Supply

---

AC 100 - 240 V~ (+/- 10 %), 50/60 Hz  $\pm$  3 Hz

---

### Signal Cable

---

15pin - to - 15pin D-sub cable, Detachable

USB Interface connector, Detachable

### Dimensions (W x H x D) / Weight (Simple Stand)

---

594.0 x 405.0 x 123.0 mm (23.4 x 15.9 x 4.8 inch) (With Stand) / 5.7 kg(12.6 lbs)

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### Environmental considerations

---

Operating	Temperature : 50°F ~ 104°F (10°C ~ 40°C)
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	Humidity : 10 % ~ 80 %, non-condensing
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Storage	Temperature : -4°F ~ 113°F (-20°C ~ 45°C)
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	Humidity : 5 % ~ 95 %, non-condensing
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### Plug and Play Capability

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This monitor can be installed on any Plug & Play compatible system. The interaction of the monitor and the computer systems will provide the best operating conditions and monitor settings. In most cases, the monitor installation will proceed automatically, unless the user wishes to select alternate settings.

### Dot Acceptable

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TFT-LCD panels manufactured by using advanced semiconductor technology with precision of 1ppm (one millionth) above are used for this product. But the pixels of RED, GREEN, BLUE and WHITE color appear to be bright sometimes or some black pixels may be seen. This is not from bad quality and you can use it without any problems.

For example, the number of TFT-LCD sub pixels contained in this product are 6,220,800.

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Design and specifications are subject to change without prior notice.

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### Class B Equipment (Information Communication equipment for residential use)

This product complies with the Electromagnetic Compatibility Directives for residential use and can be used in all areas including common residential areas. (Class B equipment emits less electromagnetic waves than Class A equipment.)

## PowerSaver

This monitor has a built-in power management system called PowerSaver. This system saves energy by switching your monitor to low-power mode when it has not been used for a certain amount of time. The monitor automatically returns to normal operation when you press a key on the keyboard. For energy conservation, turn your monitor OFF when it is not needed, or when leaving it unattended for long periods. The PowerSaver system operates with a VESA DPM compliant video card installed in your computer. Use the software utility installed on your computer to set up this feature.

State	Normal Operation	Power saving mode	Power off (Power button) EPA/ENERGY 2000
Power Indicator	On	Blinking	Off
Power Consumption	40 watts	Analog: Less than 1.2 watt  USB: Less than 1.2 watt	Less than 1.2 watts



This monitor is EPA ENERGY STAR® compliant and ENERGY 2000 compliant when used with a computer equipped with VESA DPM functionality.

As an ENERGY STAR® Partner, SAMSUNG has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

## Preset Timing Modes

If the signal transferred from the computer is the same as the following Preset Timing Modes, the screen will be adjusted automatically. However, if the signal differs, the screen may go blank while the power LED is on. Refer to the video card manual and adjusts the screen as follows.

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
VESA, 640 x 480	31.469	59.940	25.175	-/-
VESA, 800 x 600	35.156	56.250	36.000	+/+
VESA, 800 x 600	37.879	60.317	40.000	+/+
VESA, 1024 x 768	48.363	60.004	65.000	-/-
VESA, 1280 X 800	49.702	59.810	83.500	-/+
VESA, 1280 X 960	60.000	60.000	108.000	+/+
VESA, 1280 X 1024	63.981	60.020	108.000	+/+
VESA, 1440 X 900	55.935	59.887	106.500	-/+
VESA, 1600 X 1200	75.000	60.000	162.000	+/+
VESA, 1680 X 1050	65.290	59.954	146.250	-/+

## Specifications

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
VESA, 1920 X 1080	66.587	59.934	138.500	+/-



### Horizontal Frequency

The time to scan one line connecting the right edge to the left edge of the screen horizontally is called the Horizontal Cycle and the inverse number of the Horizontal Cycle is called the Horizontal Frequency. Unit: kHz

### Vertical Frequency

Like a fluorescent lamp, the screen has to repeat the same image many times per second to display an image to the user. The frequency of this repetition is called the Vertical Frequency or Refresh Rate. Unit: Hz

## General

### General

Model Name SyncMaster LD220G

### LCD Panel

Size 21.5 inch (54 cm)  
Display area 476.64 mm (H) x 268.11 mm (V)  
Pixel Pitch 0.248 mm (H) x 0.248 mm (V)

### Synchronization

Horizontal 30 ~ 75 kHz  
Vertical 56 ~ 61 Hz

### Display Color

16.7 M

### Resolution

Optimum resolution 1920 x 1080@60 Hz  
Maximum resolution 1920 x 1080@60 Hz

### Input Signal, Terminated

RGB Analog, USB

0.7 Vp-p  $\pm$  5 %

Separate H/V sync, Composite, SOG

TTL level (V high  $\geq$  2.0 V, V low  $\leq$  0.8 V)

### Maximum Pixel Clock

164 MHz (Analog, USB)

### **Power Supply**

---

AC 100 - 240 V~ (+/- 10 %), 50/60 Hz  $\pm$  3 Hz

### **Signal Cable**

---

15pin - to - 15pin D-sub cable, Detachable

USB Interface connector, Detachable

### **Dimensions (W x H x D) / Weight (Simple Stand)**

---

594.0 x 405.0 x 123.0 mm (23.4 x 15.9 x 4.8 inch) (With Stand) / 5.7 kg(12.6 lbs)

### **Environmental considerations**

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Operating	Temperature : 50°F ~ 104°F (10°C ~ 40°C)
-----------	--

	Humidity : 10 % ~ 80 %, non-condensing
--	--

Storage	Temperature : -4°F ~ 113°F (-20°C ~ 45°C)
---------	---

	Humidity : 5 % ~ 95 %, non-condensing
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### **Plug and Play Capability**

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This monitor can be installed on any Plug & Play compatible system. The interaction of the monitor and the computer systems will provide the best operating conditions and monitor settings. In most cases, the monitor installation will proceed automatically, unless the user wishes to select alternate settings.

### **Dot Acceptable**

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TFT-LCD panels manufactured by using advanced semiconductor technology with precision of 1ppm (one millionth) above are used for this product. But the pixels of RED, GREEN, BLUE and WHITE color appear to be bright sometimes or some black pixels may be seen. This is not from bad quality and you can use it without any problems.

For example, the number of TFT-LCD sub pixels contained in this product are 6,220,800.



Design and specifications are subject to change without prior notice.



### **Class B Equipment (Information Communication equipment for residential use)**

This product complies with the Electromagnetic Compatibility Directives for residential use and can be used in all areas including common residential areas. (Class B equipment emits less electromagnetic waves than Class A equipment.)

## **PowerSaver**

This monitor has a built-in power management system called PowerSaver. This system saves energy by switching your monitor to low-power mode when it has not been used for a certain amount of time. The monitor automatically returns to normal operation when you press a key on the keyboard. For energy conservation, turn your monitor OFF when it is not needed, or when leaving it unattended for long periods. The PowerSaver system operates with a VESA DPM compliant video card installed in your computer. Use the software utility installed on your computer to set up this feature.

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State	Normal Operation	Power saving mode	Power off (Power button) EPA/ENERGY 2000
Power Indicator	On	Blinking	Off
Power Consumption	40 watts	Analog: Less than 1.2 watt  USB: Less than 1.2 watt	Less than 1.2 watts



This monitor is EPA ENERGY STAR® compliant and ENERGY 2000 compliant when used with a computer equipped with VESA DPM functionality.

As an ENERGY STAR® Partner, SAMSUNG has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

## Preset Timing Modes

If the signal transferred from the computer is the same as the following Preset Timing Modes, the screen will be adjusted automatically. However, if the signal differs, the screen may go blank while the power LED is on. Refer to the video card manual and adjusts the screen as follows.

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
VESA, 640 x 480	31.469	59.940	25.175	-/-
VESA, 800 x 600	35.156	56.250	36.000	+/+
VESA, 800 x 600	37.879	60.317	40.000	+/+
VESA, 1024 x 768	48.363	60.004	65.000	-/-
VESA, 1280 X 800	49.702	59.810	83.500	-/+
VESA, 1280 X 960	60.000	60.000	108.000	+/+
VESA, 1280 X 1024	63.981	60.020	108.000	+/+
VESA, 1440 X 900	55.935	59.887	106.500	-/+
VESA, 1600 X 1200	75.000	60.000	162.000	+/+
VESA, 1680 X 1050	65.290	59.954	146.250	-/+
VESA, 1920 X 1080	66.587	59.934	138.500	+/-

### Horizontal Frequency

The time to scan one line connecting the right edge to the left edge of the screen horizontally is called the Horizontal Cycle and the inverse number of the Horizontal Cycle is called the Horizontal Frequency. Unit: kHz



### Vertical Frequency

Like a fluorescent lamp, the screen has to repeat the same image many times per second to display an image to the user. The frequency of this repetition is called the Vertical Frequency or Refresh Rate. Unit: Hz

---

# Information

## For Better Display

➔ Adjust the computer resolution and screen injection rate (refresh rate) on the computer as described below to enjoy the best picture quality. You can have an uneven picture quality on screen if the best picture quality is not provided for TFT-LCD.

- Resolution: 1360 x 768(1920 x 1080)
- Vertical frequency (refresh rate): 60 Hz

➔ TFT-LCD panels manufactured by using advanced semiconductor technology with a precision of 1ppm (one millionth) and above is used for this product. But the pixels of RED, GREEN, BLUE and WHITE color seem to be bright sometimes or some of black pixels could be seen. This is not from bad quality and you can use it without any problems.

- For example, the number of TFT-LCD sub pixels contained in this product are 3,133,440(6,220,800).

➔ When cleaning the monitor and the panel outside, please apply the recommended small amount of cleaner by using a soft cloth to polish. Do not force the LCD area but rub softly.

If excessive force is applied, you may stain it.

➔ If you are not satisfied with the picture quality, you can get better quality of picture by performing the "**Auto Adjustment** function" in display screen that is appeared as window termination button is pressed.

➔ When viewing a fixed screen for an extended period of time, a residual image or blurriness may appear.

Change the mode to energy save or set a screensaver to move the picture when you need to be away from the monitor for an extended period of time.

## PRODUCT INFORMATION (Image Retention Free)

LCD Monitors and TVs may have image retention when switching from one image to another especially after displaying a stationary image for a long time.

This guide is to demonstrate correct usage of LCD products in order to protect them from Image retention.

### ➔ *Warranty*

Warranty does not cover any damage caused by image retention.

Burn-in is not covered by the warranty.

### ➔ *What is Image retention ?*

During normal operation of a LCD panel, pixel image retention doesn't occur. However, if the same image is displayed for a long time, a slight difference in electric charge accumulates between the two electrodes which encase the liquid crystal. This may cause the liquid crystal to build up in a certain areas of the display. Thus,

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the previous image is retained when switching to a new video image. All display products, including LCD, are subject to image retention. This is not a product defect.

Please follow the suggestions below to protect your LCD from image retention.

➤ *Power Off, Screen Saver, or Power Save Mode*

Ex)

- Turn the power off when using a stationary pattern.
  - Turn the power off for 4 hours after 20 hours in use
  - Turn the power off for 2 hours after 12 hours in use
- Use a Screen saver if possible
  - Screen saver in one color or a moving image is recommended.
- Set the Monitor to power off with the PC Display Properties Power Scheme.

➤ *Suggestions for specific applications*

Ex) Airports, Transit Stations, Stock Markets, Banks, and Controlling Systems We recommend that you follow set up of your display system program as below:

➤ *Display Information together with Logo or Moving image cycle.*

Ex) Cycle : Display Information for 1 hour followed by a Display Logo or moving image for 1 minute.

➤ *Change the Color Information periodically (Use 2 different colors).*

Ex) Rotate the Color Information with 2 colors every 30 minutes.



Avoid using a combination of characters and background color with large difference in luminance.

Avoid using Grey colors, which can cause Image retention easily.

- Avoid: Colors with big difference in luminance (Black & White, Grey)

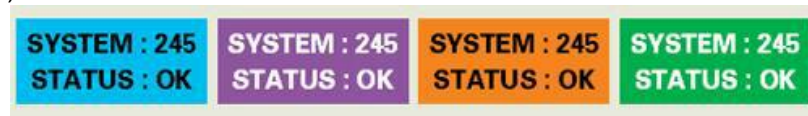
Ex)



- Recommended settings: Bright colors with little difference in luminance

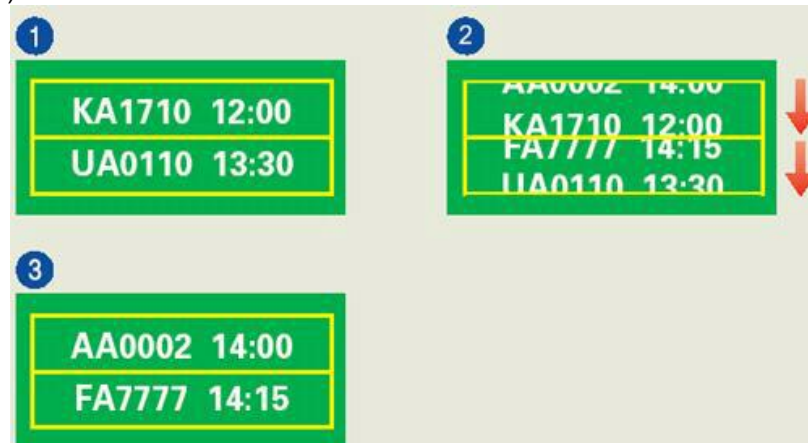
- Change the characters color and background color every 30 minutes

Ex)



- Every 30 minutes, change the characters with movement.

Ex)



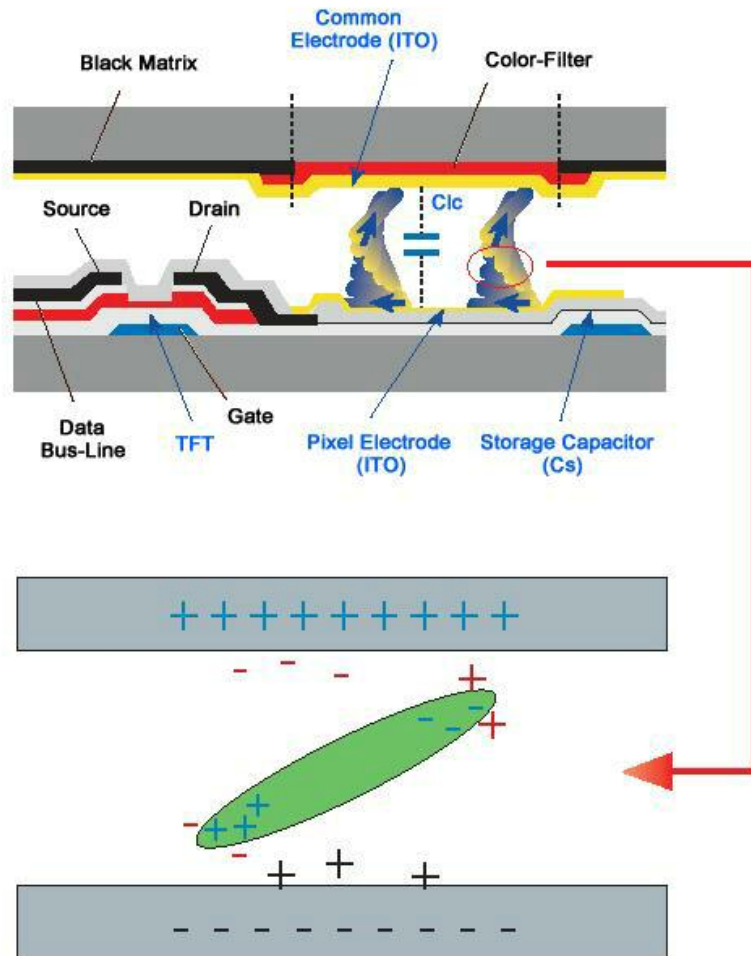
➤ *The best way to protect your monitor from Image retention is to set your PC or System to operate a Screen Saver program when you are not using it.*

Image retention may not occur when a LCD panel is operated under normal conditions.

Normal conditions are defined as continuously changing video patterns. When the LCD panel is operated for a long time with a fixed pattern (-over 12 hours-), there may be slight difference in voltage between electrodes that work the liquid crystal (LC) in a pixel. The voltage difference between electrodes increases with time, forcing the liquid crystal to lean. When this occurs, the previous image may be seen when the pattern is changed.

To prevent this, the accumulated voltage difference must be decreased.

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⊕ *Our LCD Monitor satisfies ISO13406-2 Pixel fault Class II*

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# Appendix

## Contact SAMSUNG WORLDWIDE



### Note

If you have any questions or comments relating to Samsung products, please contact the SAMSUNG customer care center.

#### North America

U.S.A	1-800-SAMSUNG(726-7864)	<a href="http://www.samsung.com/us">http://www.samsung.com/us</a>
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**Terms**

Dot Pitch	The image on a monitor is composed of red, green and blue dots. The closer the dots, the higher the resolution. The distance between two dots of the same color is called the 'Dot Pitch'. Unit: mm
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Vertical Frequency	<p>The screen must be redrawn several times per second in order to create and display an image for the user. The frequency of this repetition per second is called the Vertical Frequency or Refresh Rate. Unit: Hz</p> <p>Example: If the same light repeats itself 60 times per second, this is regarded as 60 Hz.</p>
Horizontal Frequency	<p>The time to scan one line connecting the right edge to the left edge of the screen horizontally is called the Horizontal Cycle. The inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz</p>
Interlace and Non-Interlace Methods	<p>Showing the horizontal lines of the screen from the top to the bottom sequentially is called the Non-Interlace method while showing odd lines and then even lines in turn is called the Interlace method. The Non-Interlace method is used for the majority of monitors to ensure a clear image. The Interlace method is the same as that used in TVs.</p>
Plug & Play	<p>This is a function that provides the best quality screen for the user by allowing the computer and the monitor to exchange information automatically. This monitor follows the international standard VESA DDC for the Plug &amp; Play function.</p>
Resolution	<p>The number of horizontal and vertical dots used to compose the screen image is called the 'resolution'. This number shows the accuracy of the display. A high resolution is good for performing multiple tasks as more image information can be shown on the screen.</p> <p>Example: If the resolution is 1360 x 768(1920 x 1080) , this means the screen is composed of 1360 (1920 )horizontal dots (horizontal resolution) and 768(1080) vertical lines (vertical resolution).</p>

## Correct Disposal

### Correct Disposal of This Product (Waste Electrical & Electronic Equipment)



(Applicable in the European Union and other European countries with separate collection systems)

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### **Correct Disposal of This Product (Waste Electrical & Electronic Equipment)**

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