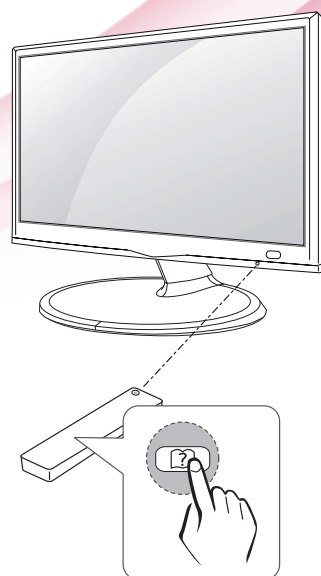


OWNER'S MANUAL

LED TV



LG LED TV applies LCD screen with LED backlights.
Please read this manual carefully before operating the your TV and retain it for future reference.

22MA53D

23MA53D

24MA53D

27MA53D

TABLE OF CONTENTS

3 LICENSES

4 INSTALLATION PROCEDURE

5 ASSEMBLING AND PREPARING

- 5 Unpacking
- 7 Parts and buttons
- 9 Lifting and moving the TV
- 10 Setting up the TV
 - 10 - Attaching the Stand
 - 12 - Mounting on a table
 - 13 - Tidying cables
 - 14 - Detaching the Stand
 - 15 - Mounting on a wall

17 WATCHING TV

- 17 Turning the TV on for the first time

19 MAKING CONNECTIONS

- 19 Connecting an antenna or cable
 - 19 - Connecting an antenna or basic cable
 - 20 - Connecting with a cable box
- 21 Connecting to a HD receiver, DVD, VCR player or Gaming device
 - 21 - HDMI connection
 - 22 - HDMI to DVI connection
 - 23 - Component connection
 - 24 - Composite connection
- 25 Headphone connection
- 26 Connecting to a USB
- 27 MHL connection
- 28 Connecting to a PC
 - 29 - HDMI connection
 - 30 - HDMI to DVI connection
 - 31 - RGB connection

32 REMOTE CONTROL

34 CUSTOMIZING SETTINGS

- 34 Accessing main menus

35 USING THE USER GUIDE

- 35 Accessing User Guide menu.
 - 35 - Using the TV menu
 - 35 - Using the Remote Control

36 MAINTENANCE

- 36 Cleaning Your TV
 - 36 Screen and frame
 - 36 Cabinet and stand
 - 36 Power cord
 - 37 Preventing "Image burn" or "Burn-in" on your TV screen

38 TROUBLESHOOTING

- 38 General

39 SPECIFICATIONS

45 KEY CODES

46 EXTERNAL CONTROL DEVICE SETUP

- 46 USB to Serial converter with USB Cable
- 47 RS-232C with RS-232C Cable (Legacy)
 - 47 - Customer Computer
 - 47 - RS-232C configurations
- 48 Communication Parameters
- 48 Command reference list
- 49 Transmission / Receiving Protocol

LICENSES

Supported licenses may differ by model. For more information of the licenses, visit www.lg.com.



Manufactured under license from Dolby Laboratories. Dolby and the double-D symbol are trademarks of Dolby Laboratories.



The terms HDMI and HDMI High-Definition Multimedia Interface, and the HDMI logo are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.



ABOUT DIVX VIDEO: DivX® is a digital video format created by DivX, LLC, a subsidiary of Rovi Corporation. This is an official DivX Certified® device that plays DivX video. Visit divx.com for more information and software tools to convert your files into DivX videos.

ABOUT DIVX VIDEO-ON-DEMAND: This DivX Certified® device must be registered in order to play purchased DivX Video-on-Demand (VOD) movies. To obtain your registration code, locate the DivX VOD section in your device setup menu. Go to vod.divx.com for more information on how to complete your registration.

DivX Certified® to play DivX® video up to HD 1080p, including premium content.

DivX®, DivX Certified® and associated logos are trademarks of Rovi Corporation or its subsidiaries and are used under license.

Covered by one or more of the following U.S. patents: 7,295,673; 7,460,668; 7,515,710; 7,519,274

INSTALLATION PROCEDURE

- 1 Open the package and make sure all the accessories are included.
- 2 Attach the stand to the TV.
- 3 Connect an external device to the TV.

**NOTE**

- Image shown may differ from your TV.
- Your TV's OSD (On Screen Display) may differ slightly from that shown in this manual.
- The available menus and options may differ from the input source or product model that you are using.
- New features may be added to this TV in the future.

ASSEMBLING AND PREPARING

Unpacking

Check your product box for the following items. If there are any missing accessories, contact the local dealer where you purchased your product. The illustrations in this manual may differ from the actual product and accessories.



NOTE

- The accessories supplied with your product may vary depending on the model.
- Product specifications or contents in this manual may be changed without prior notice due to upgrade of product functions.



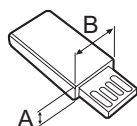
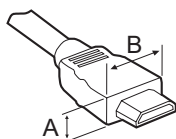
CAUTION

- Do not use any pirated items to ensure the safety and product life span.
- Any damages or injuries by using pirated items are not covered by the warranty.



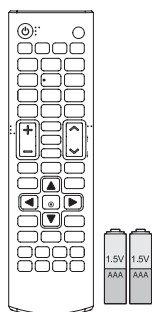
NOTE

- The items supplied with your product may vary depending on the model.
- Product specifications or contents of this manual may be changed without prior notice due to upgrade of product functions.
- For an optimal connection, HDMI cables and USB devices should have bezels less than 10 mm thick and 18 mm width. Use an extension cable that supports USB 2.0 if the USB cable or USB memory stick does not fit into your TV's USB port.



*A ≦ 10 mm

*B ≦ 18 mm



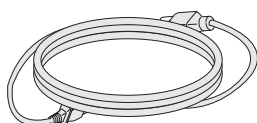
**Remote Control
and AAA Batteries**
(See p.32, See p.33)



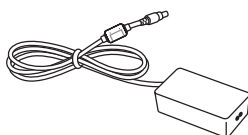
**Owner's Manual on CD and
Info Cards**



Stand Base
(See p.10, See p.14)



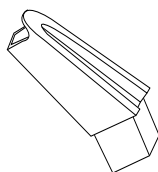
Power Cord
(See p.12)



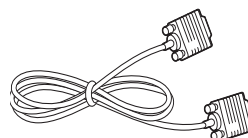
AC-DC Adapter
(See p.12)



Cable Tie
(See p.13)

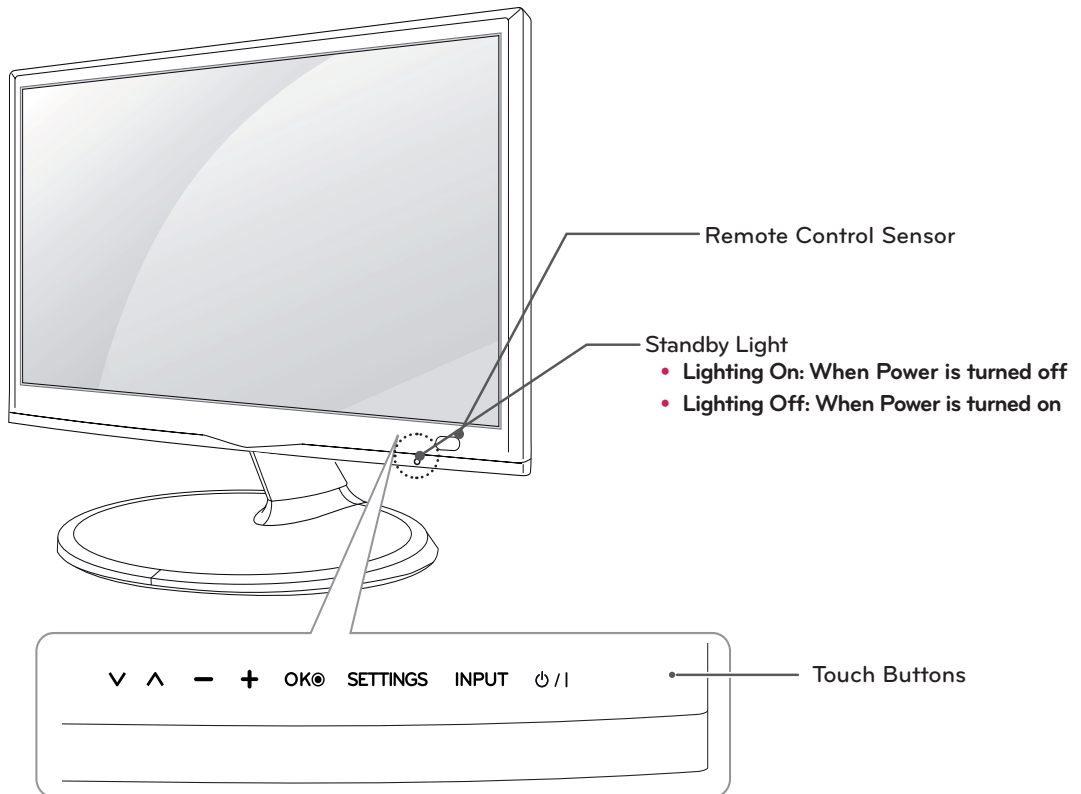


Stand Body
(See p.10, See p.14)



RGB Cable
(See p.31)

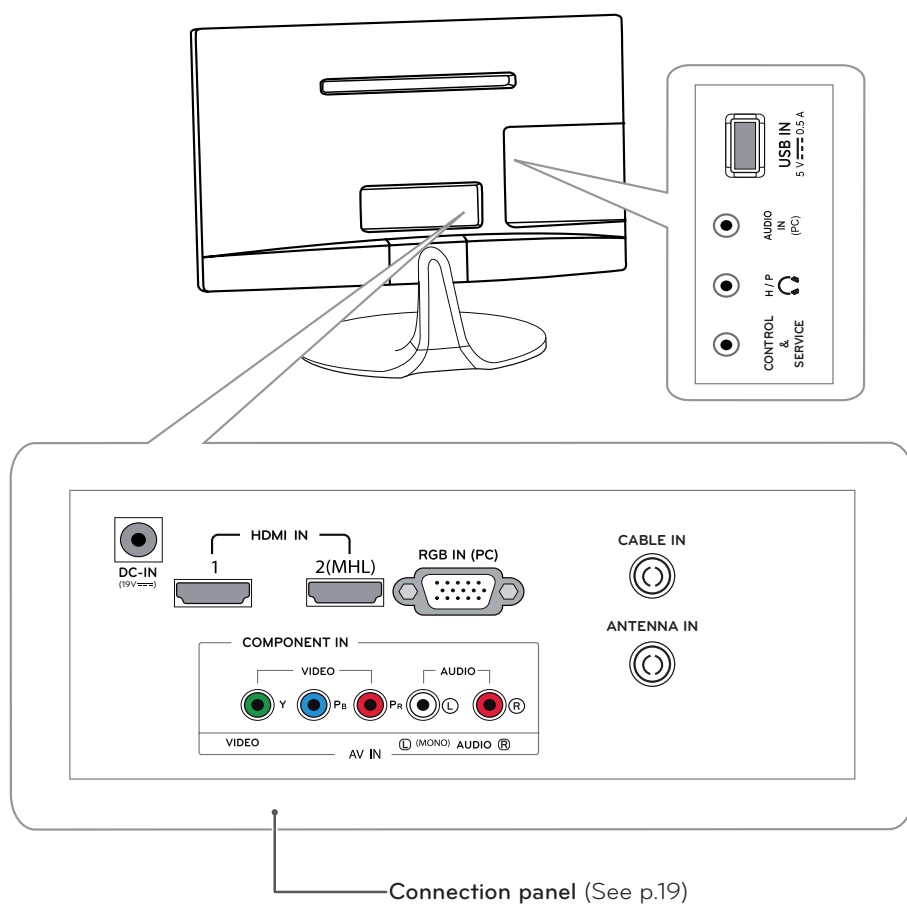
Parts and buttons



NOTE

All of the buttons are touch sensitive and can be operated through simple touch with your finger.

Touch button	Description
▼ ▲	Scrolls through the saved programmes.
- +	Adjusts the volume level.
OK	Selects the highlighted menu option or confirms an input.
SETTINGS	Accesses the main menus, or saves your input and exits the menus.
INPUT	Changes the input source.
⏻	Turns the power on or off.



Lifting and moving the TV

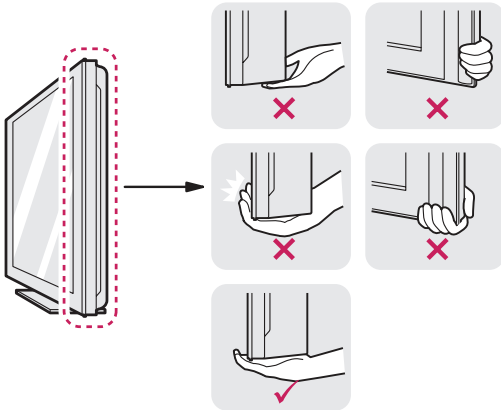
When moving or lifting the TV, read the following to prevent the TV from being scratched or damaged and for safe transportation regardless of its type and size.



CAUTION

Avoid touching the screen at all times, as this may result in damage to the screen or some of the pixels used to create images.

- It is recommended to move the TV in the box or packing material that the TV originally came in.
- Before moving or lifting the TV, disconnect the power cord and all cables.
- Hold the top and bottom of the TV frame firmly. Make sure not to hold the transparent part, speaker, or speaker grill area.



- When holding the TV, the screen should face away from you to prevent the screen from scratches.



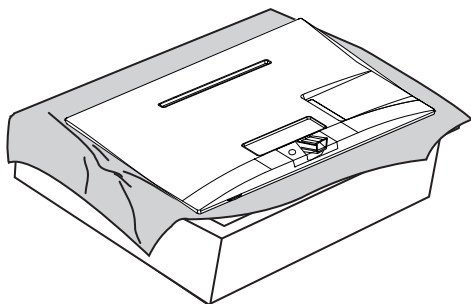
- When transporting the TV, do not expose the TV to jolts or excessive vibration.
- When transporting the TV, keep the TV upright, never turn the TV on its side, or tilt towards the left or right.

Setting up the TV

Attaching the Stand

If you are not mounting the TV to a wall, use the following instructions to attach the stand.

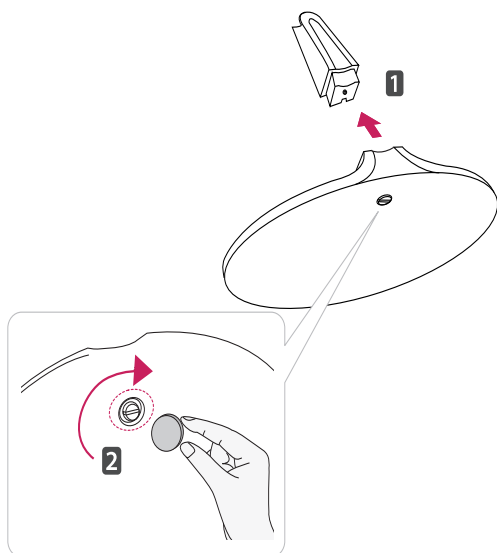
- 1 Place the TV with the screen side down on a flat and cushioned surface.



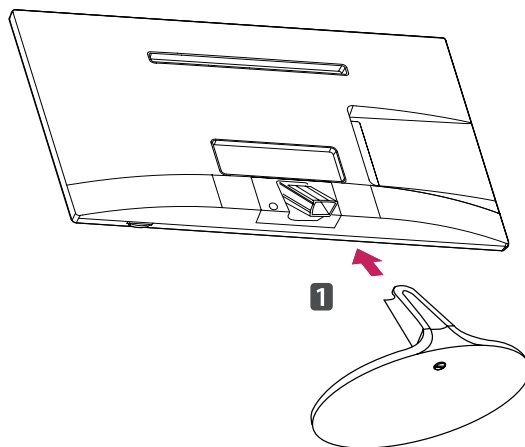
CAUTION

- Lay a foam mat or soft protective cloth on the surface to protect the screen from damage.
- When attaching the stand to the TV, place the screen facing down on a cushioned table or flat surface to protect the screen from scratches.

- 2 Attach the **Stand Base** from **Stand Body** by turning the screw to the right with a **Coin**.

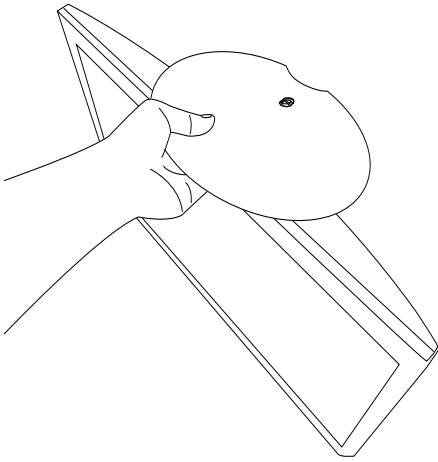


- 3 Attach the **Stand Base** from the TV.

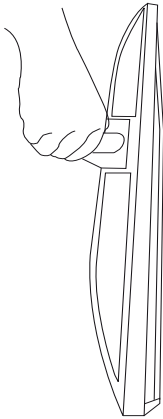


CAUTION

Tighten the screws firmly to prevent the TV from tilting forward. Do not over tighten.

**CAUTION**

- Do not carry the monitor upside-down as this may cause it to fall off its stand, resulting in damage or injury.
- The illustration shows a general example of installation and may look different from the actual product.

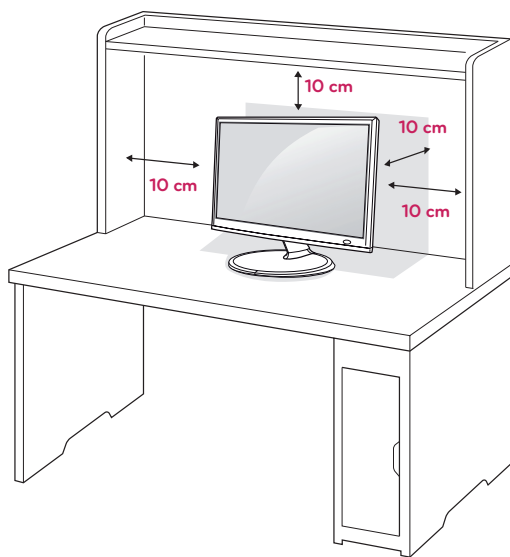


- Do not carry the monitor upside-down by holding the stand body as this may cause it to fall off, resulting in damage or injury.
- The illustration shows a general example of installation and may look different from the actual product.

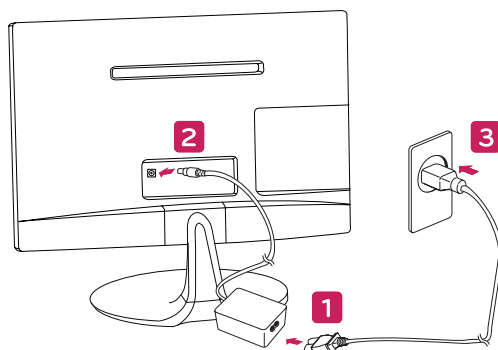
Mounting on a table

- 1 Lift and tilt the TV into its upright position on a table.

Leave a 10 cm (4 inches) (minimum) space from the wall for proper ventilation.



- 2 Connect the **AC-DC Adapter** and **Power Cord** to a wall outlet.



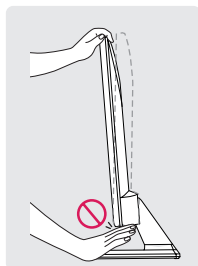
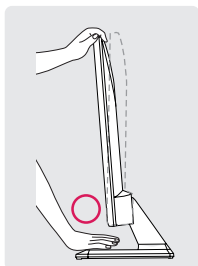
CAUTION

Do not place the TV near or on sources of heat, as this may result in fire or other damage.



WARNING

When you adjust the angle, do not hold the bottom of the TV frame as shown on the following illustration, as may injure your fingers.

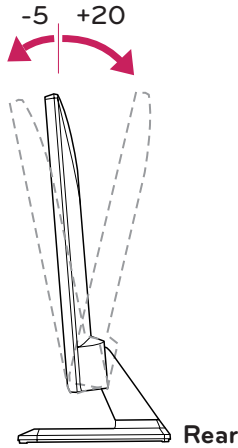


CAUTION

Disconnect the power cord first, and then move or install the TV. Otherwise electric shock may occur.

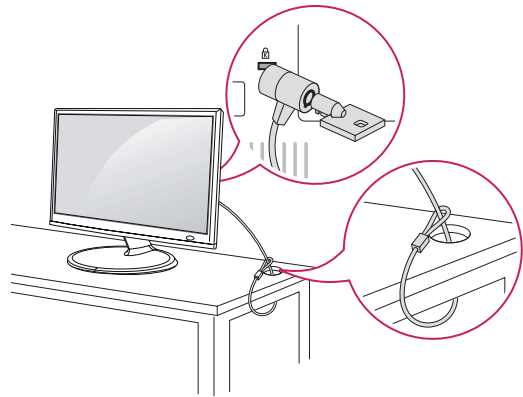
! NOTE

Tilt from +20 to -5 degrees up or down to adjust the angle of the TV to suit your view.

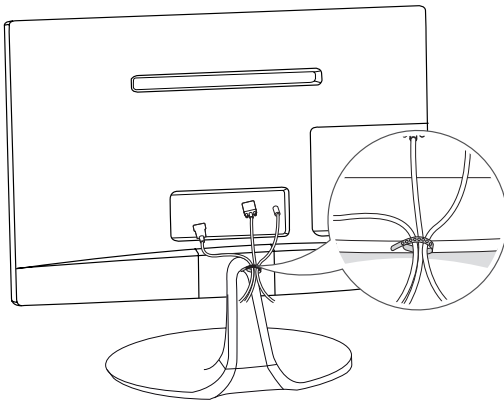
**Using the Kensington security system**

The Kensington security system connector is located at the back of the TV. For more information of installation and using, refer to the manual supplied with the Kensington security system or visit <http://www.kensington.com>.

Connect the Kensington security system cable between the TV and a table.

**Tidying cables**

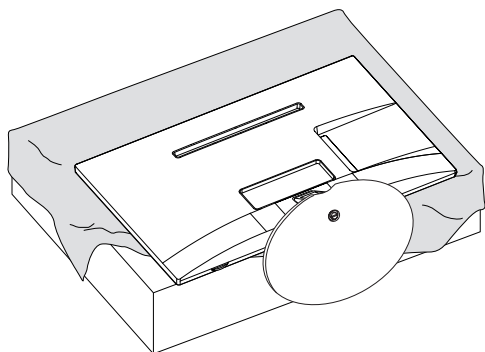
Gather and bind the cables with the supplied cable tie.

**! NOTE**

The Kensington security system is optional. You can obtain additional accessories from most electronics stores.

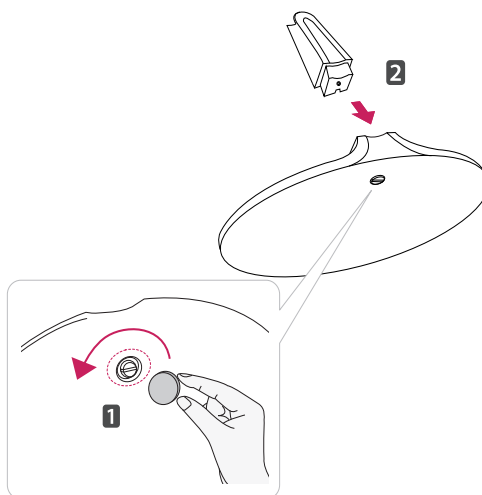
Detaching the Stand

- 1 Place the TV with the screen side down on a flat and cushioned surface.
- 3 Turn the screw to the left, and then pull out the **Stand Base** from the **Stand Body**.

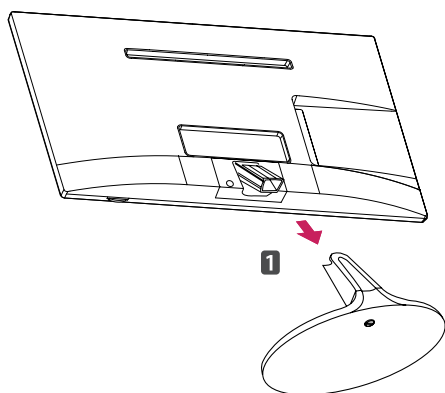


CAUTION

- Lay a foam mat or soft protective cloth on the surface to protect the screen from damage.
- When detaching the stand to the TV, place the screen facing down on a cushioned table or flat surface to protect the screen from scratches.

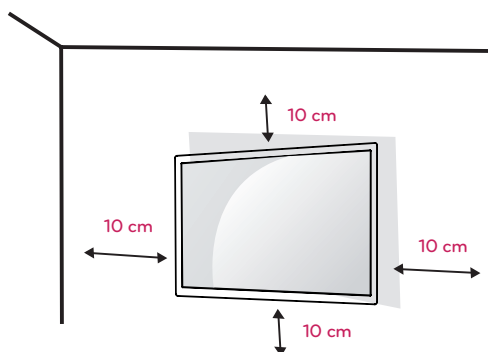


- 2 Pull out the **Stand Body** from the TV.



Mounting on a wall

For proper ventilation, allow a clearance of 10 cm on each side and from the wall. Detailed installation instructions are available from your dealer, see the optional Tilt Wall Mounting Bracket Installation and Setup Guide.



If you intend to mount the TV to a wall, attach Wall mounting interface (optional parts) to the back of the TV.

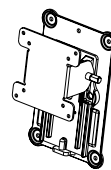
When you install the TV using the wall mounting interface (optional parts), attach it carefully so it will not drop.

- 1 Please, Use the screw and wall mount interface in accordance with VESA Standards.
- 2 If you use screw longer than standard, the TV might be damaged internally.
- 3 If you use improper screw, the product might be damaged and drop from mounted position. In this case, LG Electronics is not responsible for it.
- 4 VESA compatible only with respect to screw mounting interface dimensions and mounting screw specifications.

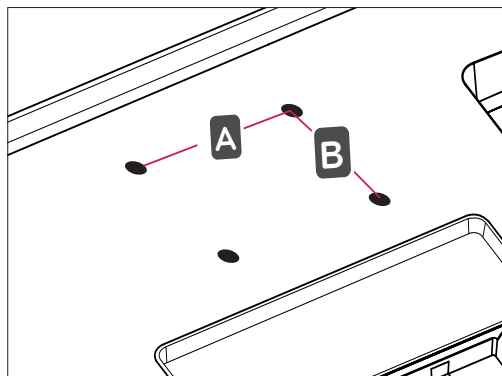
5 Please use VESA standard as below.

- 784.8 mm (30.9 inch) and under
 - * Wall Mount Pad Thickness : 2.6 mm
 - * Screw : Φ 4.0 mm x Pitch 0.7 mm x Length 10 mm
- 787.4 mm (31.0 inch) and above
 - * Please use VESA standard wall mount pad and screws.

VESA (A x B)	100 x 100
Standard screw	M4
Number of screws	4
Wall mount bracket (optional)	RW120



- VESA (A x B)



**CAUTION**

- Disconnect the power cord first, and then move or install the TV. Otherwise electric shock may occur.
- If you install the TV on a ceiling or slanted wall, it may fall and result in severe injury.
- Use an authorized LG wall mount and contact the local dealer or qualified personnel.
- Do not over tighten the screws as this may cause damage to the TV and void your warranty.
- Use the screws and wall mounts that meet the VESA standard. Any damages or injuries by misuse or using an improper accessory are not covered by the warranty.

**NOTE**

- Use the screws that are listed on the VESA standard screw specifications.
- The wall mount kit includes an installation manual and necessary parts.
- The wall mount bracket is optional. You can obtain additional accessories from your local dealer.
- The length of screws may differ depending on the wall mount. Be sure to use the proper length.
- For more information, refer to the instructions supplied with the wall mount.

WATCHING TV

Turning the TV on for the first time

When you access the TV for the first time, the initial setting screen appears. Select a language and customize the basic settings.

- 1 Connect the power cord to a power outlet.
- 2 Press  or  on the TV or power button on the remote control to turn the TV on.
The Standby Light is turned off.



NOTE

When the TV is in Power saving mode, the Standby Light turns amber.

- 3 The initial setting screen appears if you access the TV for the first time.



NOTE

If you do not operate the TV within 40 seconds when the setting menu screen appears, the setting menus will disappear.

- 4 Follow the on-screen instructions to customize your TV according to your preferences.

City (城市)

Select a city to display.



展示模式選項

Selects **Home Use(家用)** for the home environment.



電源顯示燈

Selects the **Standby Light(待機顯示燈)**. If you select **On(開啟)**, the TV turns on the Standby Light(待機顯示燈) in the front panel when the TV is off.



使用指南與 FAQ 使用提示

Shows how to use User Guide(使用指南) and FAQ.



自動搜尋頻道

Scans and saves available programmes automatically.

**NOTE**

- For those countries without confirmed DTV broadcasting standards, some DTV features might not work, depending on the DTV broadcasting environment.
- To display images in the best quality for your home environment, select **Home Use(家用)** mode.
- **Store Demo(商店展示)** mode is suitable for the retail environment.
- If you select **Store Demo(商店展示)** mode, the previously customized settings will switch to the default settings of **Store Demo(商店展示)** mode in 5 minutes.

- 5 When the basic settings are complete, press **OK**.

**NOTE**

If you do not complete the initial setting, it will appear whenever you access the TV.

- 6 To turn the TV off, press **⏻/I** on the TV.
The Standby Light is turned on.

**CAUTION**

Disconnect the power cord from the power outlet when you do not use the TV for a long period of time.

**NOTE**

- You can also switch the TV from PC mode to TV mode, press **TV/PC**.
- You can also access **Factory Reset** by accessing **OPTION** in the main menus.

MAKING CONNECTIONS

Connect various external devices to the TV and switch input modes to select an external device. For more information about an external device's connection, refer to the manual supplied with each device.

Available external devices are: HD receivers, DVD players, VCRs, audio systems, USB storage devices, PC, camcorders or cameras, gaming devices, and other external devices.



NOTE

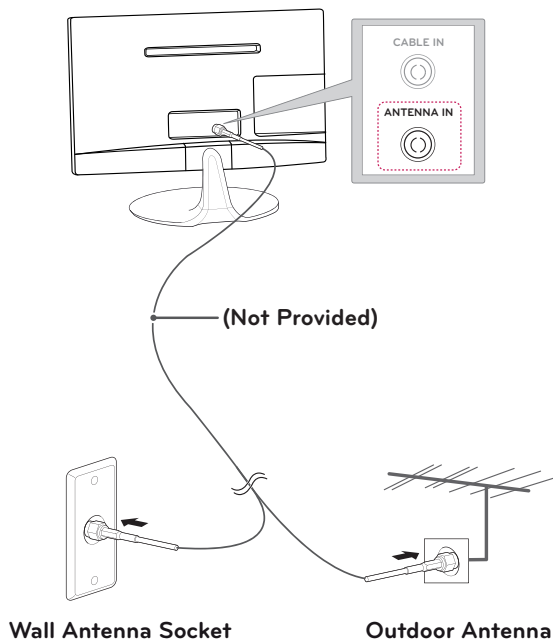
- If you record a TV program on a DVD recorder or VCR, make sure to connect the TV signal input cable to the TV through a DVD recorder or VCR. For more information about recording, refer to the manual supplied with the connected device.
- The external device connection may differ from the model.
- Connect external devices to the TV regardless of the order of the TV port.

Connecting an antenna or cable

Connect an antenna, cable, or cable box to watch TV referring to the following. The illustrations may differ from the actual accessories and an RF cable is optional.

Connecting an antenna or basic cable

Connect the TV to a wall antenna socket with an RF cable (75Ω).

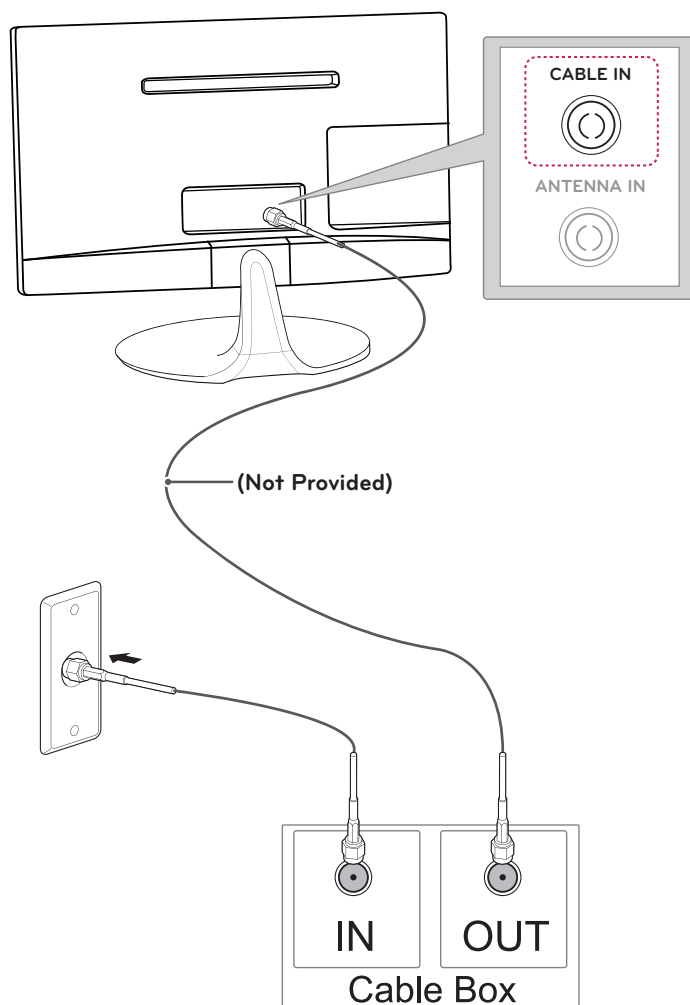


NOTE

- Use a signal splitter to use more than 2 TVs.
- If the image quality is poor, install a signal amplifier properly to improve the image quality.
- If the image quality is poor with an antenna connected, aim the antenna to the proper direction.
- Visit <http://AntennaWeb.org> for more information about the antenna and cable connection.

Connecting with a cable box

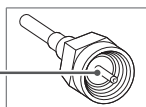
Connect the TV to a cable box and the cable box to a wall antenna socket with 2 RF cables (75Ω).



CAUTION

- Make sure not to bend the copper wire of the RF cable.

Copper wire



- Complete all connections instructions between devices, and then connect the power cord to the power outlet to prevent damages to your TV.

Connecting to a HD receiver, DVD, VCR player or Gaming device

Connect a HD receiver, DVD, VCR player or Gaming device to the TV and select an appropriate input mode.

HDMI connection

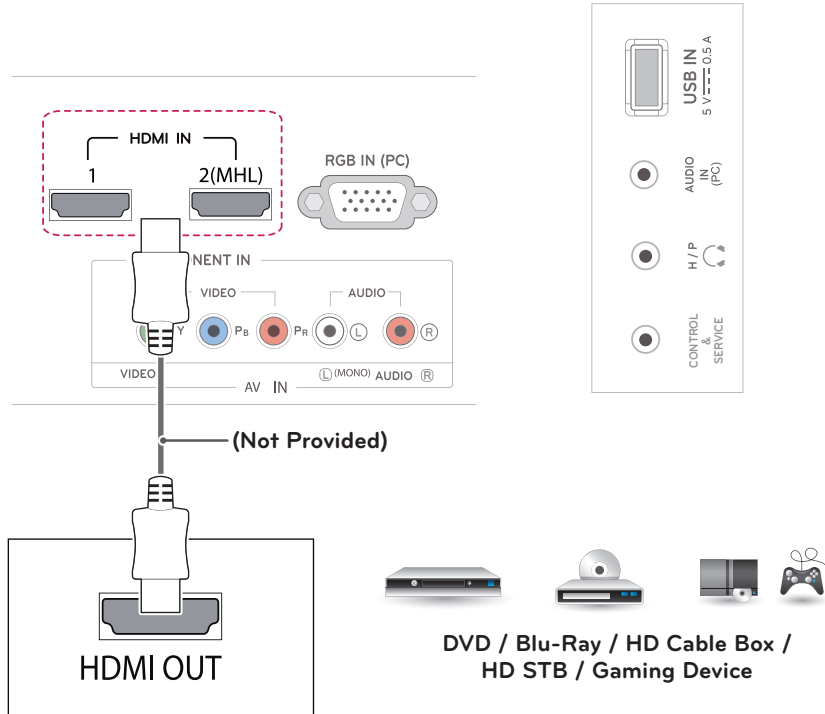
HDMI is the best way to connect a device.

Transmits the digital video and audio signals from an external device to the TV. Connect the external device and the TV with the HDMI cable as shown on the following illustration.

! NOTE

- Use a High Speed HDMI™ Cable.
- High Speed HDMI™ Cables are tested to carry an HD signal up to 1080p and higher.
- Supported HDMI Audio format: Dolby Digital, PCM (Up to 192 KHz, 32k/44.1k/48k/88k/96k/176k/192k, DTS Not supported.)

- Choose any HDMI input port to connect.
- It does not matter which port you use.

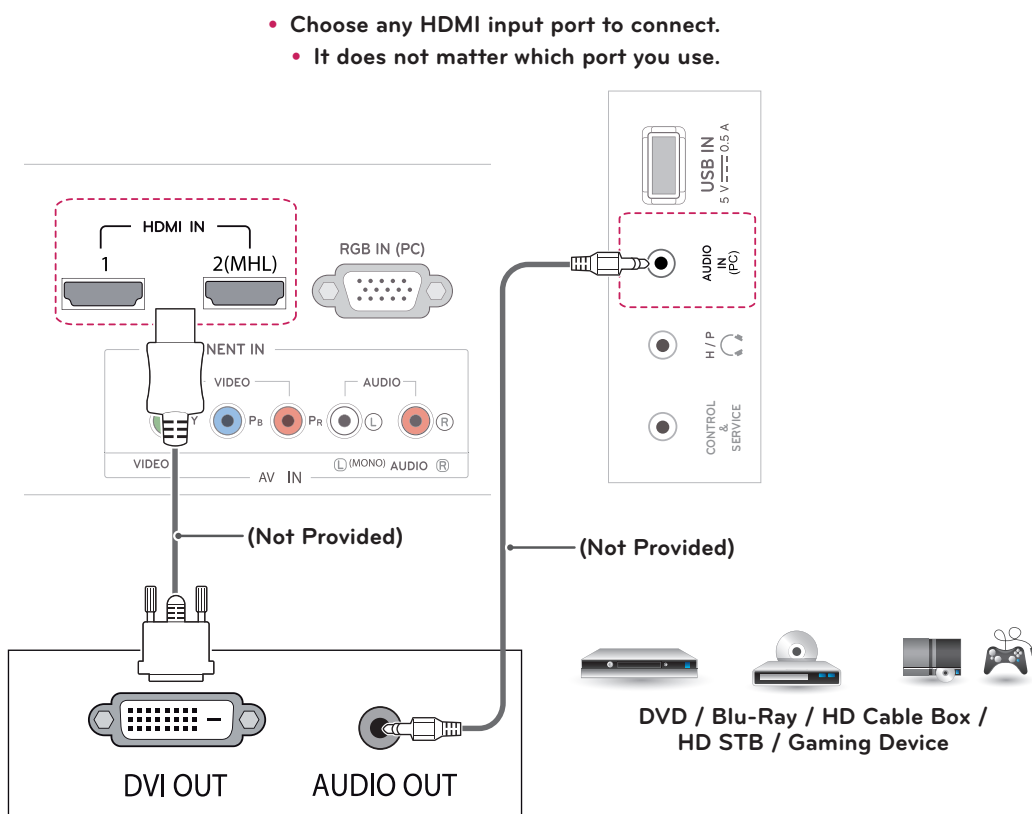


HDMI to DVI connection

Transmits the digital video signal from an external device to the TV. Connect the external device and the TV with the HDMI to DVI cable as shown in the following illustration. To transmit an audio signal, connect an optional audio cable.

! NOTE

- If you do not use an optional external speaker, connect the external device to the TV with the optional audio cable.
- When using the HDMI/DVI cable, only Single link is supported.

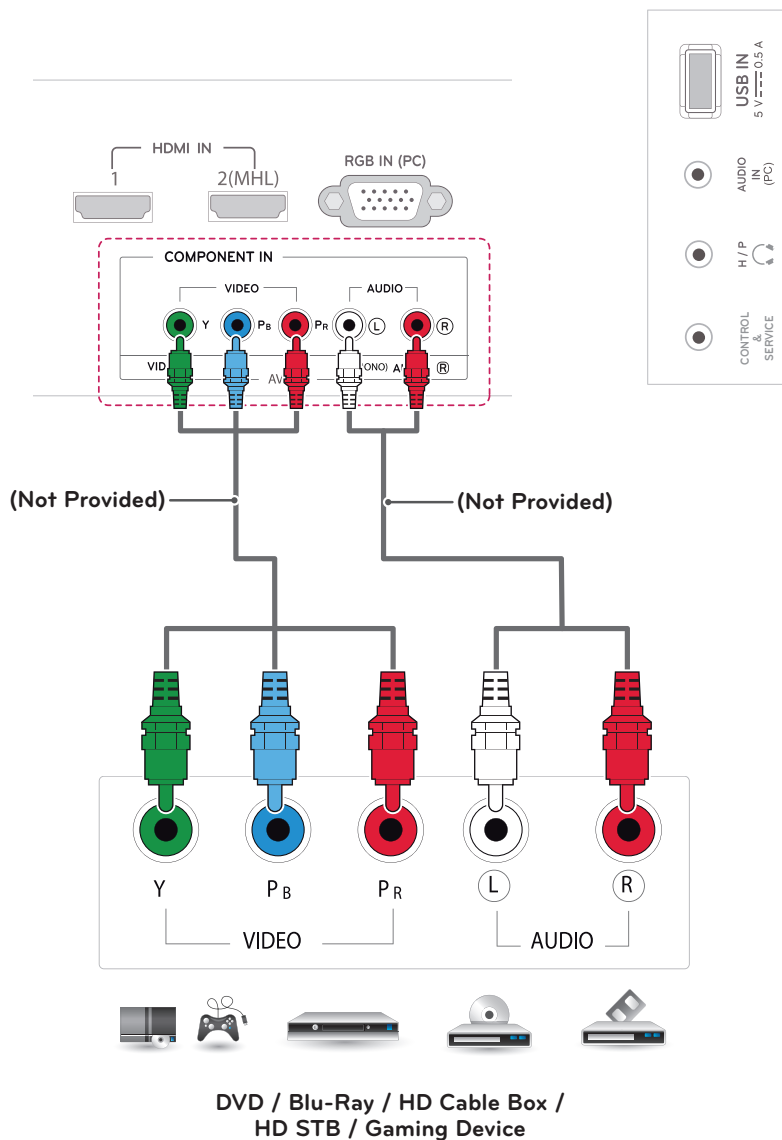


Component connection

Transmits the analog video and audio signals from an external device to the TV. Connect the external device and the TV with the component cable as shown on the following illustration. To display images by using progressive scan, make sure to use the component cable.

! NOTE

- If cables are installed incorrectly, it could cause the image to display in black and white or with distorted color.
- **Check to ensure the cable are matched with the corresponding color connection.**



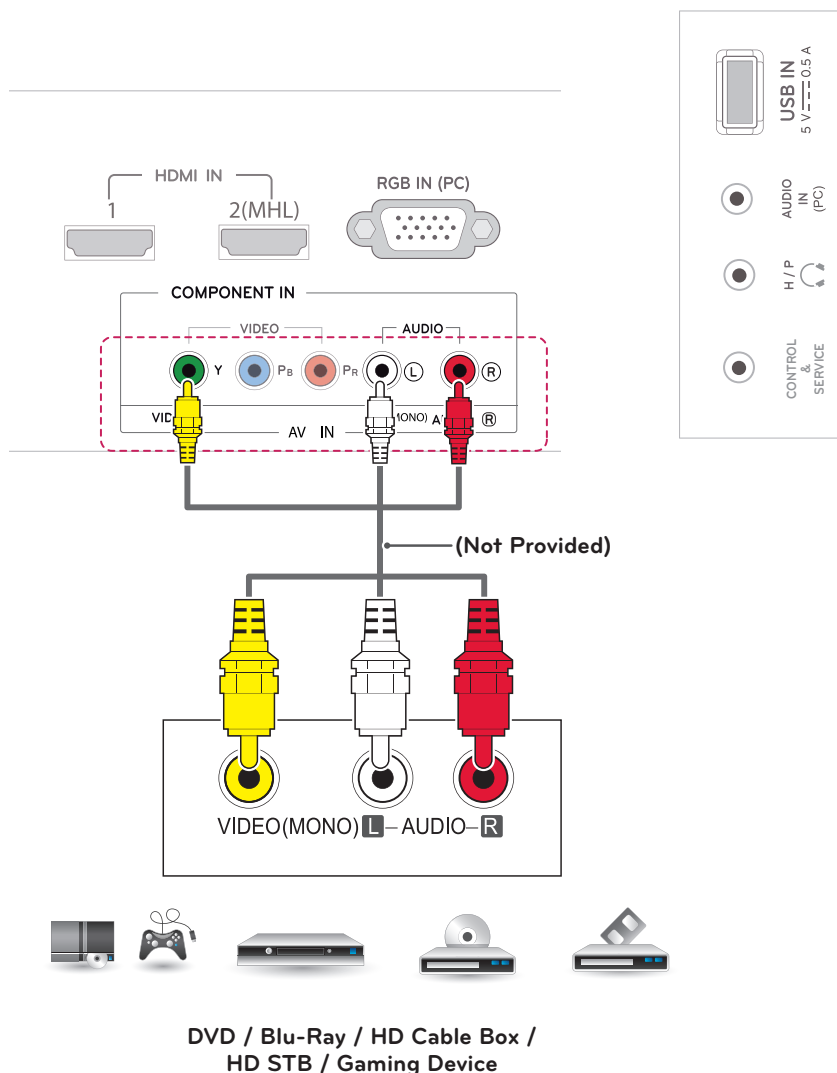
Composite connection

Transmits the analog video and audio signals from an external device to the TV. Connect the external device and the TV with the composite cable as shown on the following illustration.



NOTE

Check to ensure the cable are matched with the corresponding color connection.

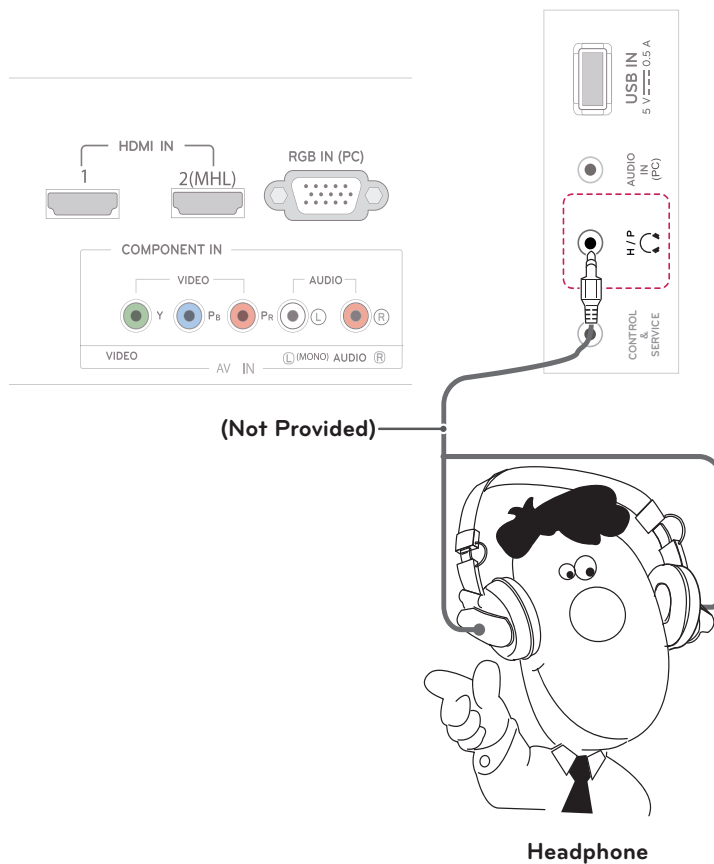


Headphone connection

Transmits the headphone signal from the TV to an external device. Connect the TV with the headphone as shown on the following illustration.

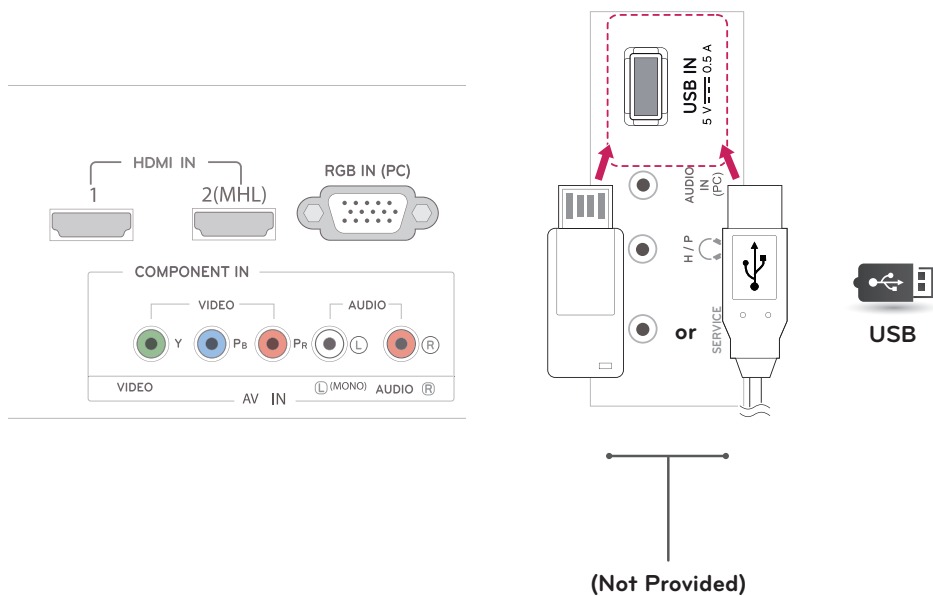
! NOTE

- AUDIO menu items are disabled when connecting a headphone.
- Headphone impedance: 16 Ω
- Max audio output of headphone: 9 mW to 15 mW
- Headphone jack size: 0.35 cm



Connecting to a USB

Connect a USB storage device such as a USB flash memory, external hard drive, MP3 player or a USB memory card reader to the TV and access the USB menu to use various multimedia files.

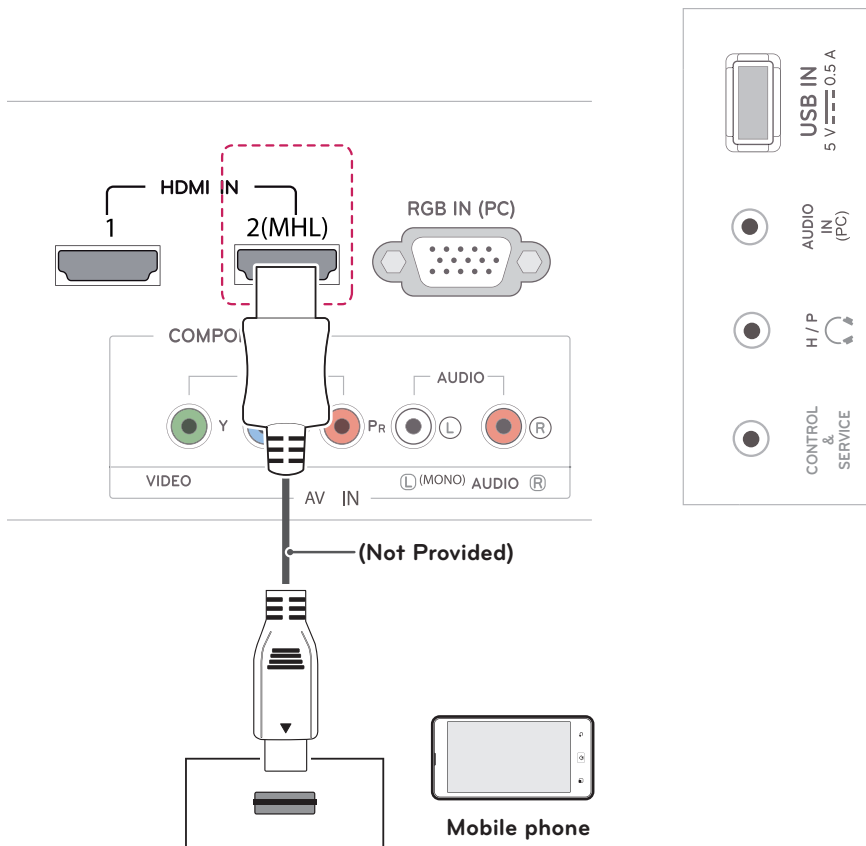


MHL connection

Mobile High-definition Link (MHL) is an interface for transmitting digital audiovisual signals from mobile phones to television sets.

! NOTE

- Connect the mobile phone to the HDMI IN2(MHL) port to view the phone screen on the TV.
- The MHL passive cable is needed to connect the TV and a mobile phone.
- This only works for the MHL-enabled phone.
- Some applications can be operated by the remote control.
- Remove the MHL passive cable from the TV when:
 - the MHL function is disabled
 - your mobile device is fully charged instandby mode



Connecting to a PC

Your TV supports the Plug & Play* feature and has the built-in speakers with Virtual Surround that reproduces sound clearly with a rich bass.

* Plug & Play: The function when a PC recognizes a connected device that users connect to a PC and turn on, without device configuration or user intervention.



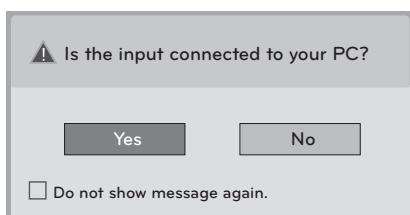
NOTE

- It is recommended to use the TV with the HDMI connection for the best image quality.
- If you do not use an optional external speaker, connect the PC to the TV with the optional audio cable.
- If you turn the TV on when the set becomes cold, the screen may flicker. This is normal.
- Some red, green, or blue spots may appear on the screen. This is normal.
- Connect the signal input cable and tighten it by turning the screws clockwise.
- Do not press the screen with your finger for a long time as this may result in temporary distortion on the screen.
- Avoid displaying a fixed image on the screen for a long period of time to prevent image burn. Use a screensaver if possible.
- When using the HDMI/DVI cable, only Single link is supported.



NOTE

- If you want to use HDMI-PC mode, you must set the input label to PC mode.
- The **OSD (On Screen Display)** is displayed on the screen as shown below.
 - » When turning the product on in **HDMI** input.
 - » When switching to **HDMI** input.



- If you select **"Yes"** the size and image quality are optimised for your PC.
- If you select **"No"** the size and image quality are optimised for the **AV device (DVD player, set-top box, gaming device)**.
- If you select **"Do not show message again"** this message does not appear until the TV is reset. You can change the set value in **SETTINGS ► INPUT ► Input Label**.
- The values set for HDMI1/HDMI2 are saved independently.

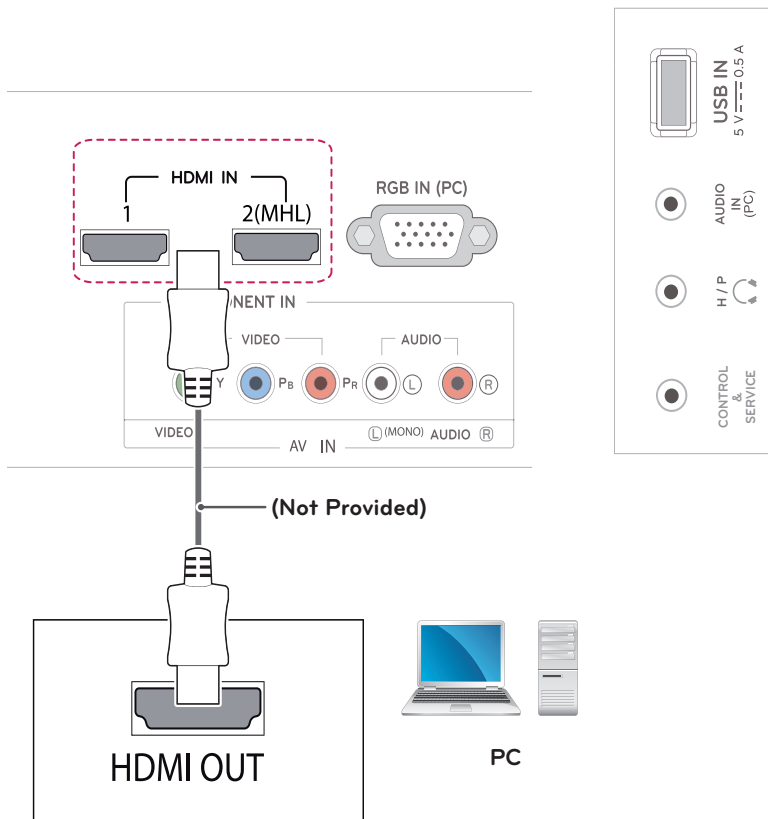
HDMI connection

Transmits the digital video and audio signals from your PC to the TV. Connect the PC and the TV with the HDMI cable as shown in the following illustrations. You should set PC as an input label to connect the PC to the TV with an HDMI connection.

! NOTE

- Use a High Speed HDMI™ Cable.
- High Speed HDMI™ Cables are tested to carry an HD signal up to 1080p and higher.
- If you want to use HDMI-PC mode, you must set the input label to PC or DVI mode.
- Supported HDMI Audio format: Dolby Digital, PCM (Up to 192 KHz, 32k/44.1k/48k/88k/96k/176k/192k, DTS Not supported.)

- Choose any HDMI input port to connect.
- It does not matter which port you use.



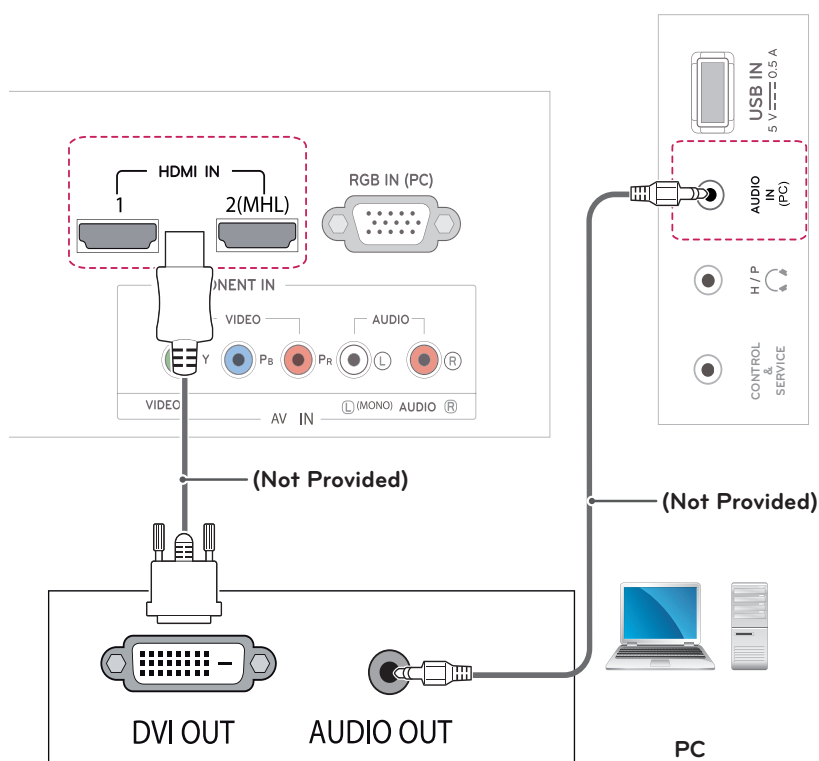
HDMI to DVI connection

Transmits the digital video signal from your PC to the TV. Connect the PC and the TV with the HDMI to DVI cable as shown the following illustrations. To transmit an audio signal, connect an optional audio cable.



NOTE

- If you want to use HDMI-PC mode, you must set the input label to DVI mode.
- If you do not use an optional external speaker, connect the PC to the TV with the optional audio cable.
- When using the HDMI/DVI cable, only Single link is supported.

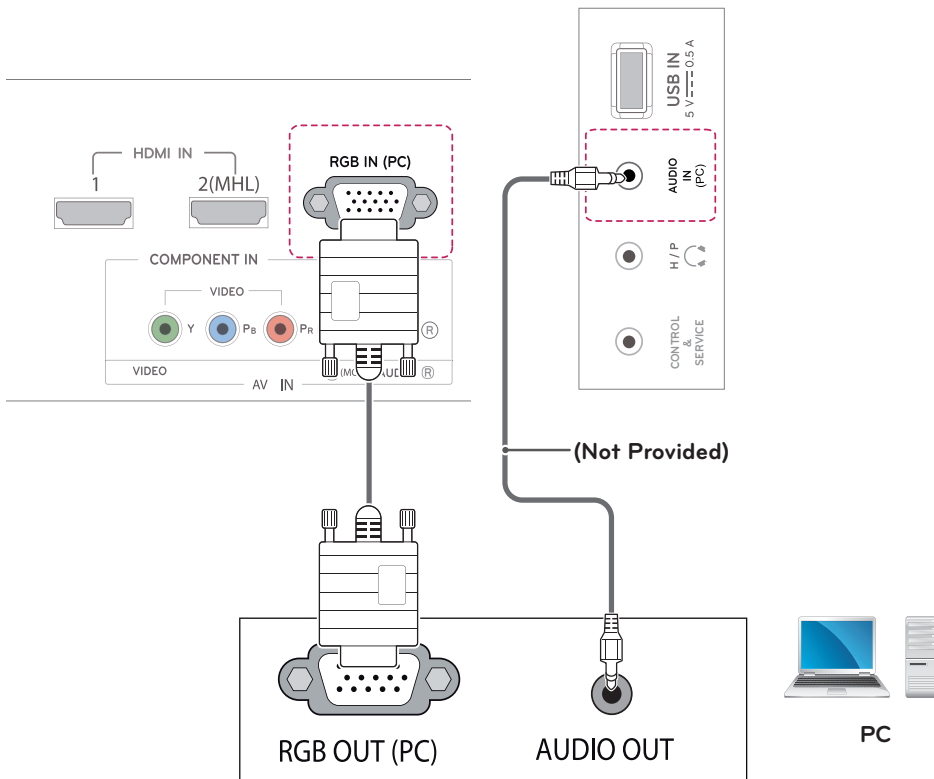


RGB connection

Transmits the analog video signal from your PC to the TV. Connect the PC and the TV with the D-sub 15 pin cable as shown the following illustrations. To transmit an audio signal, connect an optional audio cable.

! NOTE

If you do not use an optional external speaker, connect the PC to the TV with the optional audio cable.



REMOTE CONTROL

The descriptions in this manual are based on the buttons of the remote control. Please read this manual carefully and use the TV correctly.

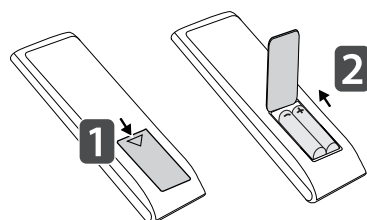
To replace batteries, open the battery cover, replace batteries (1.5 V AAA) matching $\oplus$ and $\ominus$ ends to the label inside the compartment, and close the battery cover.

To remove the batteries, perform the installation actions in reverse.



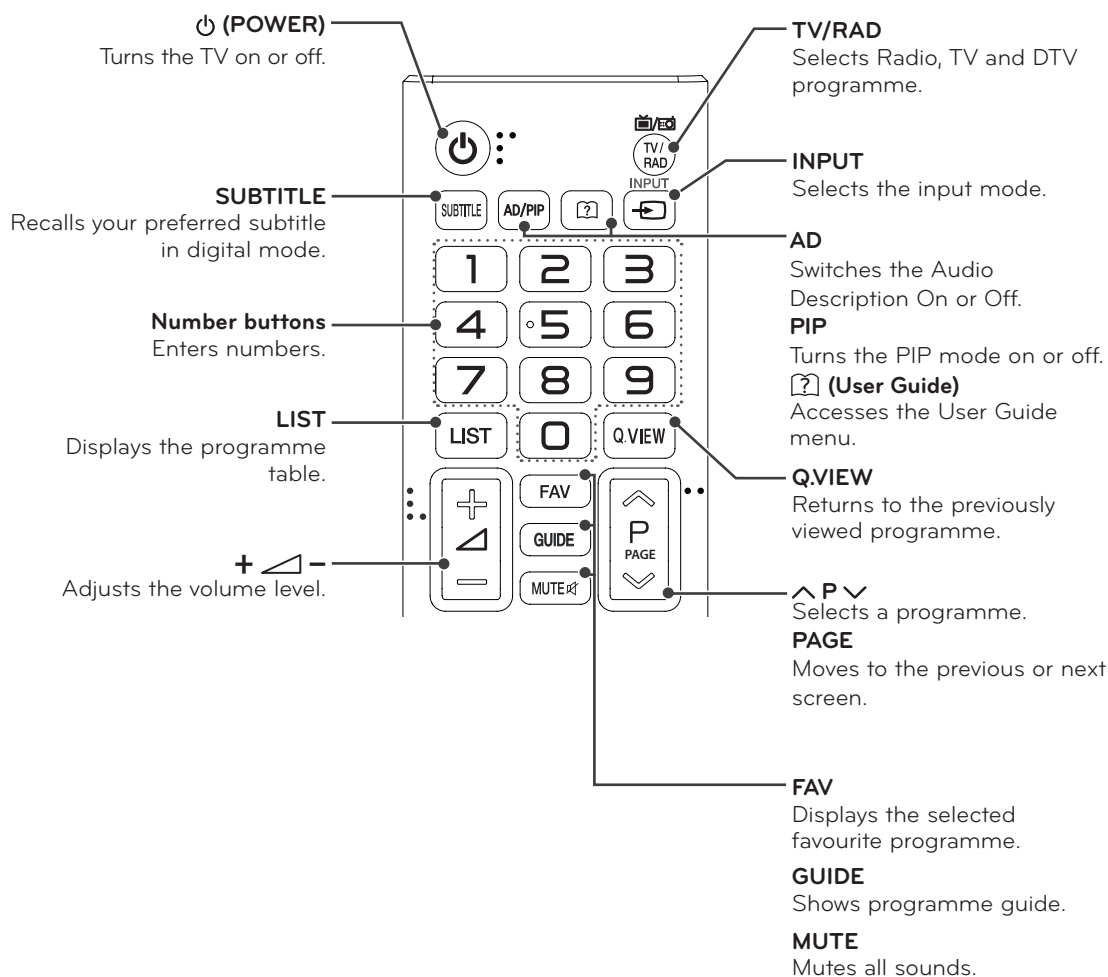
CAUTION

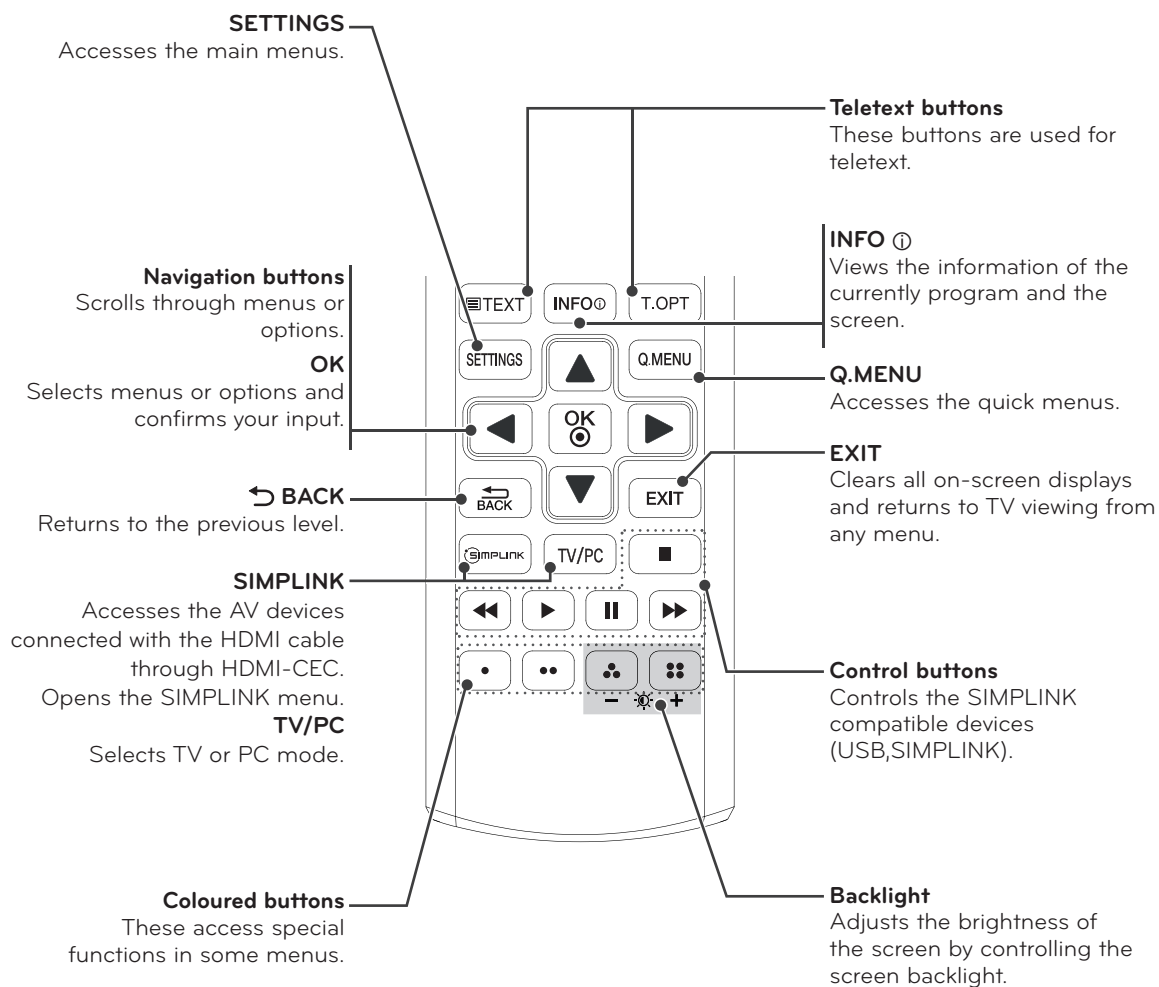
Do not mix old and new batteries, as this may damage the remote control.



Make sure to point the remote control to the remote control sensor on the TV.

Image shown may differ from your TV.





! NOTE

- On MHEG channel, you cannot adjust the backlight with the yellow or blue key. (To adjust backlight, press SETTINGS -> PICTURE -> Picture Mode -> Backlight.)

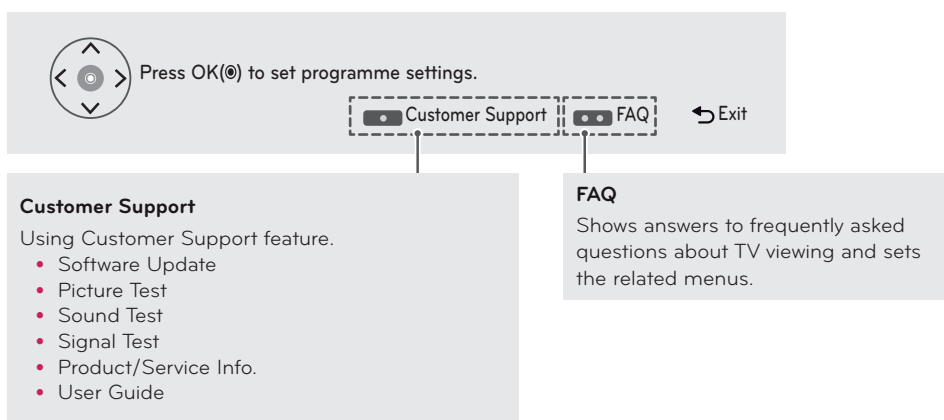
CUSTOMIZING SETTINGS

Accessing main menus

- 1 Press **SETTINGS** to access the main menus.
- 2 Press the Navigation buttons to scroll to one of the following menus and press **OK**.
- 3 Press the Navigation buttons to scroll to the setting or option you want and press **OK**.
- 4 When you are finished, press **EXIT**.
When you return to the previous menu, press **↶ BACK**.

PICTURE	Adjusts the image size, quality or effect.
AUDIO	Adjusts the sound quality, effect or volume level.
SETUP	Sets up and edit programmes.
TIME	Sets the time, date or Timer feature.
LOCK	Locks or unlocks channels and programs.
OPTION	Customizes the general settings.
INPUT	Views the input sources with their labels.
MY MEDIA	Using integrated media feature.

- Press **RED** button to access the **Customer Support** menus.
- Press **GREEN** Button to access the **FAQ** menus.



USING THE USER GUIDE

Accessing User Guide menu.

Using the TV menu

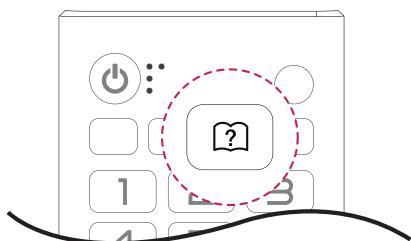
- 1 Press **SETTINGS** to access the main menus.
- 2 Press the **RED** button to access the **Customer Support** menus.
- 3 Press the Navigation button to scroll to **User Guide** and press **OK**.
- 4 Press the Navigation buttons to scroll to the option you want and press **OK**.
- 5 When you are finished, press **EXIT**.
When you return to the previous menu, press **BACK**.

- Image shown may differ from your TV.

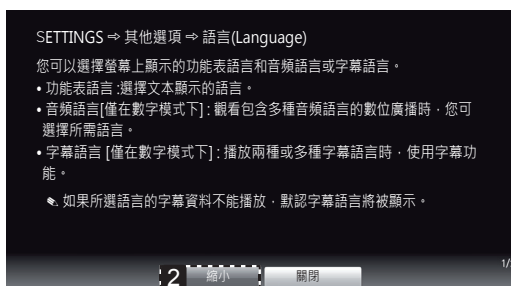
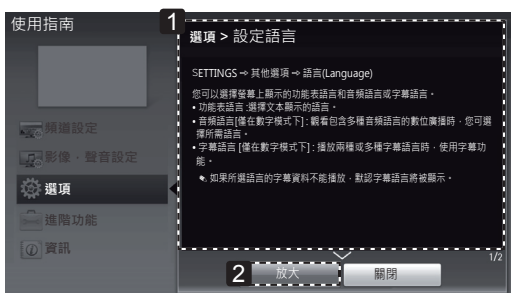


- 1 Allows to select the category you want.
- 2 Allows to select the item you want.
You can use **^**/**v** to move between pages.
- 3 Allows to browse the description of the function you want from the index.

Using the Remote Control



- 1 Press  (**User Guide**) to access the **User Guide**.
- 2 Press the Navigation buttons to scroll to the option you want and press **OK**.
- 3 When you are finished, press **EXIT**.
When you return to the previous menu, press **BACK**.



- 1 Shows the description of the selected menu.
You can use **^**/**v** to move between pages.
- 2 Zooms in or out the screen.

MAINTENANCE

Cleaning Your TV

Clean your TV regularly to keep the best performance and to extend the product lifespan.



CAUTION

- Make sure to turn the power off and disconnect the power cord and all other cables first.
- When the TV is left unattended and unused for a long time, disconnect the power cord from the wall outlet to prevent possible damage from lightning or power surges.

Screen and frame

To remove dust, wipe the surface with a dry and soft cloth.

To remove major dirt, wipe the surface with a soft cloth dampened in clean water or a diluted mild detergent. Then wipe immediately with a clean and dry cloth.



CAUTION

- Do not push, rub, or hit the surface with your fingernail or a sharp object, as this may result in scratches on the screen and image distortions.
- Do not use any chemicals, such as waxes, benzene, alcohol, thinners, insecticides, air fresheners, lubricants, as these may damage the screen's finish and cause discolorations.

Cabinet and stand

To remove dust, wipe the cabinet with a dry and soft cloth.

To remove major dirt, wipe the cabinet with a soft cloth dampened in a clean water or water containing a small amount of mild detergent.



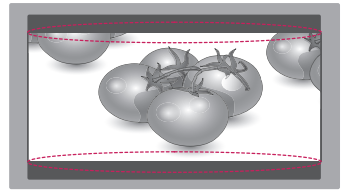
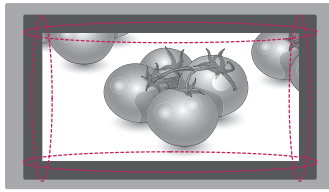
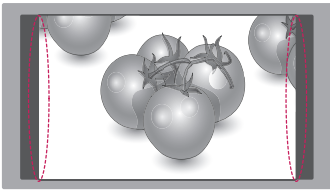
CAUTION

- Do not spray liquid onto the surface. If water enters the TV, it may result in fire, electric shock, or malfunction.
- Do not use any chemicals as this may deteriorate the surface.

Power cord

Remove the accumulated dust or dirt on the power cord regularly.

Preventing "Image burn" or "Burn-in" on your TV screen



- If a fixed image displays on the TV screen for a long period of time, it will be imprinted and become a permanent disfigurement on the screen. This is "image burn" or "burn-in" and not covered by the warranty.
- If the aspect ratio of the TV is set to 4:3 for a long period of time, image burn may occur on the letterboxed area of the screen.
- Avoid displaying a fixed image on the TV screen for a long period of time (2 or more hours for LCD) to prevent image burn.

TROUBLESHOOTING

General

Problem	Resolution
Cannot control the TV with the remote control.	• Check the remote control sensor on the product and try again. • Check if there is any obstacle between the product and the remote control. • Check if the batteries are still working and properly installed (+ to +, - to -).
No image display and no sound is produced.	• Check if the product is turned on. • Check if the power cord is connected to a wall outlet. • Check if there is a problem in the wall outlet by connecting other products.
The TV turns off suddenly.	• Check the power control settings. The power supply may be interrupted. • Check if the Auto sleep feature is activated in the Time settings. • If there is no signal while the TV is on, the TV will turn off automatically after 15 minutes of inactivity.

SPECIFICATIONS

	Digital TV	Analogue TV
Television system	DTMB	PAL D/K, PAL I, NTSC M
Programme coverage	DTMB: 1 to 62	PAL D/K: VHF/UHF 1 to 62, CATV 1 to 41 PAL I: VHF/UHF 1 to 69, CATV 1 to 47 NTSC M: VHF/UHF 2 to 78, CATV 1 to 71

22MA53D

Panel	Screen Type	550 mm Wide (22 inch) Visible diagonal size : 550 mm
	Pixel Pitch	0.248 mm (H) x 0.248 mm (V)
Video Signal	Max. Resolution	1920 × 1080 @ 60 Hz
	Recommended Resolution	1920 × 1080 @ 60 Hz
	Horizontal Frequency	30 kHz to 83 kHz
	Vertical Frequency	56 Hz to 75 Hz
	Synchronization Type	Separate Sync, Digital
Input Connector		TV, D-Sub Analog, PC Audio In, Component, AV(CVBS), HDMI*2, USB
Power	Rated Voltage	19 V --- 2.0 A
	Power Consumption	On Mode : 30 W (typ.) Off Mode ≤ 0.4 W
AC/DC Adapter		Manufacturer: Lien Chang, Model LCAP25B Manufacturer: LG Innotek, Model PSAB-L204B
Tilt	Tilt Range	-5 to 20°
Dimensions (Width x Depth x Height) Weight	With Stand	
	508.6 mm x 178.3 mm x 389.6 mm 3.3 kg	
	Without Stand	
	508.6 mm x 73 mm x 315.0 mm 3.1 kg	
Environmental conditions	Operating Temperature	10 °C to 35 °C
	Operating Humidity	20 % to 80 %
	Storage Temperature Storage Humidity	-10 °C to 60 °C 5 % to 90 %

Product specifications shown above may be changed without prior notice due to upgrade of product functions.

23MA53D

Panel	Screen Type	580 mm Wide (23 inch) Visible diagonal size : 580 mm
	Pixel Pitch	0.265 mm (H) x 0.265 mm (V)
Video Signal	Max. Resolution	1920 × 1080 @ 60 Hz
	Recommended Resolution	1920 × 1080 @ 60 Hz
	Horizontal Frequency	30 kHz to 83 kHz
	Vertical Frequency	56 Hz to 75 Hz
	Synchronization Type	Separate Sync, Digital
Input Connector		TV, D-Sub Analog, PC Audio In, Component, AV(CVBS), HDMI*2, USB
Power	Rated Voltage	19 V $\overline{\text{---}}$ 2.0 A
	Power Consumption	On Mode : 33 W (typ.) Off Mode ≤ 0.4 W
AC/DC Adapter		Manufacturer: Lien Chang, Model LCAP25B Manufacturer: LG Innotek, Model PSAB-L204B
Tilt	Tilt Range	-5 to 20°
Dimensions (Width x Depth x Height) Weight	With Stand	
	544.0 mm x 178.3 mm x 409.4 mm 3.6 kg	
	Without Stand	
	544.0 mm x 73 mm x 335.0 mm 3.36 kg	
Environmental conditions	Operating Temperature	10 °C to 35 °C
	Operating Humidity	20 % to 80 %
	Storage Temperature	-10 °C to 60 °C
	Storage Humidity	5 % to 90 %

Product specifications shown above may be changed without prior notice due to upgrade of product functions.

24MA53D

Panel	Screen Type	600 mm Wide (24 inch) Visible diagonal size : 600 mm
	Pixel Pitch	0.275 mm (H) x 0.275 mm (V)
Video Signal	Max. Resolution	1920 × 1080 @ 60 Hz
	Recommended Resolution	1920 × 1080 @ 60 Hz
	Horizontal Frequency	30 kHz to 83 kHz
	Vertical Frequency	56 Hz to 75 Hz
	Synchronization Type	Separate Sync, Digital
Input Connector		TV, D-Sub Analog, PC Audio In, Component, AV(CVBS), HDMI*2, USB
Power	Rated Voltage	19 V --- 2.0 A
	Power Consumption	On Mode : 33 W (typ.) Off Mode ≤ 0.4 W
AC/DC Adapter		Manufacturer: Lien Chang, Model LCAP25B Manufacturer: LG Innotek, Model PSAB-L204B
Tilt	Tilt Range	-5 to 20°
Dimensions (Width x Depth x Height) Weight	With Stand	
	566.8 mm x 178.3 mm x 420.8 mm 3.8 kg	
	Without Stand	
	566.8 mm x 73 mm x 346.1 mm 3.53 kg	
Environmental conditions	Operating Temperature	10 °C to 35 °C
	Operating Humidity	20 % to 80 %
	Storage Temperature	-10 °C to 60 °C
	Storage Humidity	5 % to 90 %

Product specifications shown above may be changed without prior notice due to upgrade of product functions.

27MA53D

Panel	Screen Type	690 mm Wide (27 inch) Visible diagonal size : 690 mm
	Pixel Pitch	0.311 mm (H) x 0.311 mm (V)
Video Signal	Max. Resolution	1920 × 1080 @ 60 Hz
	Recommended Resolution	1920 × 1080 @ 60 Hz
	Horizontal Frequency	30 kHz to 83 kHz
	Vertical Frequency	56 Hz to 75 Hz
	Synchronization Type	Separate Sync, Digital
Input Connector		TV, D-Sub Analog, PC Audio In, Component, AV(CVBS), HDMI*2, USB
Power	Rated Voltage	19 V $\overline{\text{---}}$ 2.4 A
	Power Consumption	On Mode : 35 W (typ.) Off Mode ≤ 0.4 W
AC/DC Adapter		Manufacturer: LG Innotek, Model PSAB-L101A Manufacturer: Lite-On, Model PA-1650-64
Tilt	Tilt Range	-5 to 20°
Dimensions (Width x Depth x Height) Weight	With Stand	
	641.2 mm x 193.0 mm x 462.2 mm 5.28 kg	
	Without Stand	
	641.2 mm x 83 mm x 391.0 mm 4.84 kg	
Environmental conditions	Operating Temperature	10 °C to 35 °C
	Operating Humidity	20 % to 80 %
	Storage Temperature	-10 °C to 60 °C
	Storage Humidity	5 % to 90 %

Product specifications shown above may be changed without prior notice due to upgrade of product functions.

RGB (PC) / HDMI (PC) supported mode

Resolution	Horizontal Frequency(kHz)	Vertical Frequency(Hz)
720 x 400	31.468	70.080
640 x 480	31.469	59.940
640 x 480	37.500	75.000
800 x 600	37.879	60.317
800 x 600	46.875	75.000
1024 x 768	48.363	60.004
1024 x 768 Only HDMI(PC)	56.476	70.069
1024 x 768	60.023	75.029
1152 x 864	67.500	75.000
1280 x 720	45.000	60.000
1280 x 800	49.702	59.810
1280 x 1024	63.981	60.020
1280 x 1024	79.976	75.025
1400 x 1050	65.317	59.978
1440 x 900	55.935	59.887
1600 x 900	60.000	60.000
1680 x 1050	64.674	59.883
1680 x 1050	65.290	59.954
1920 x 1080	67.500	60.000

NOTE

The optimal display resolution is 1920 x 1080 @ 60 Hz. The optimal timing is vertical frequency 60Hz in each mode.

Component supported mode

Resolution	Horizontal Frequency(kHz)	Vertical Frequency(Hz)
720 x 480	15.730	59.940
720 x 480	15.750	60.000
720 x 576	15.625	50.000
720 x 480	31.470	59.940
720 x 480	31.500	60.000
720 x 576	31.250	50.000
1280 x 720	44.960	59.940
1280 x 720	45.000	60.000
1280 x 720	37.500	50.000
1920 x 1080	33.720	59.940
1920 x 1080	33.750	60.000
1920 x 1080	28.125	50.000
1920 x 1080	56.250	50.000
1920 x 1080	67.432	59.940
1920 x 1080	67.500	60.000

Component port connecting information

Component ports on the TV	Y	P _B	P _R
---------------------------	---	----------------	----------------

Video output ports on DVD player	Y	P _B	P _R
	Y	B-Y	R-Y
	Y	Cb	Cr
	Y	Pb	Pr

HDMI (DTV) supported mode

Resolution	Horizontal Frequency(kHz)	Vertical Frequency(Hz)
720 x 480	31.469 31.500	59.940 60.000
720 x 576	31.250	50.000
1280 x 720	37.500	50.000
1280 x 720	44.960 45.000	59.940 60.000
1920 x 1080	33.720 33.750	59.940 60.000
1920 x 1080	28.125	50.000
1920 x 1080	27.000	24.000
1920 x 1080	33.750	30.000
1920 x 1080	56.250	50.000
1920 x 1080	67.430 67.500	59.940 60.000

**NOTE**

- Avoid keeping a fixed image on the set's screen for prolonged periods of time. The fixed image may become permanently imprinted on the screen. Use a screen saver when possible.
- There may be interference relating to resolution, vertical pattern, contrast or brightness in PC mode. Change the PC mode to another resolution or change the refresh rate to another rate or adjust the brightness and contrast on the menu until the picture is clear. If the refresh rate of the PC graphic card can not be changed, change the PC graphic card or consult the manufacturer of the PC graphic card.
- The synchronization input waveform for Horizontal and Vertical frequencies are separate.
- Connect the signal cable from the RGB output port of the PC to the RGB (PC) port of the TV or the signal cable from the HDMI output port of the PC to the HDMI IN port on the TV.
- Connect the audio cable from the PC to the Audio input on the TV. (Audio cables are not included with the TV).
- If using a sound card, adjust PC sound as required.
- If the graphic card on the PC does not output analogue and digital RGB simultaneously, connect only one of either RGB or HDMI IN to display the PC output on the TV.
- If the graphic card on the PC does output analogue and digital RGB simultaneously, set the TV to either RGB or HDMI. (The other mode is set to Plug and Play automatically by the TV.)
- DOS mode may not work depending on the video card if you use an HDMI to DVI cable.
- If you use too long an RGB-PC cable, there may be interference on the screen. We recommend using under 5 m of cable. This provides the best picture quality.

KEY CODES

- This feature is not available for all models.

Code (Hexa)	Function	Note	Code (Hexa)	Function	Note
00	CH +, PR +	R/C Button	4C	List, - (ATSC Only)	R/C Button
01	CH -, PR -	R/C Button	50	TV/PC	R/C Button
02	Volume +	R/C Button	53	List	R/C Button
03	Volume -	R/C Button	5B	Exit	R/C Button
06	> (Arrow Key / Right Key)	R/C Button	60	PIP(AD)	R/C Button
07	< (Arrow Key / Left Key)	R/C Button	61	Blue	R/C Button
08	Power	R/C Button	63	Yellow	R/C Button
09	Mute	R/C Button	71	Green	R/C Button
0B	Input	R/C Button	72	Red	R/C Button
0E	SLEEP	R/C Button	79	Ratio / Aspect Ratio	R/C Button
0F	TV, TV/RAD	R/C Button	91	AD (Audio Description)	R/C Button
10 - 19	Number Key 0 - 9	R/C Button	99	AutoConfig	R/C Button
1A	Q.View / Flashback	R/C Button	7A	User Guide	R/C Button
1E	FAV (Favorite Channel)	R/C Button	7C	Smart / Home	R/C Button
20	Text (Teletext)	R/C Button	7E	SIMPLINK	R/C Button
21	T. Opt (Teletext Option)	R/C Button	8E	▶▶ (Forward)	R/C Button
28	Return (BACK)	R/C Button	8F	◀◀ (Rewind)	R/C Button
30	AV (Audio / Video) Mode	R/C Button	AA	Info	R/C Button
39	Caption/Subtitle	R/C Button	AB	Program Guide	R/C Button
40	▲ (Arrow Key / Cursor Up)	R/C Button	B0	▶ (Play)	R/C Button
41	▼ (Arrow Key / Cursor Down)	R/C Button	B1	■ (Stop / Live TV)	R/C Button
42	My Apps	R/C Button	BA	⏸ (Freeze / Slow Play / Pause)	R/C Button
43	Menu / Settings	R/C Button	BD	● (REC)	R/C Button
44	OK / Enter	R/C Button	DC	3D	R/C Button
45	Q.Menu	R/C Button	9F	App / *	R/C Button

* Key code 4C (0x4C) is available on ATSC/ISDB models which use major/minor channel.
(For South Korea, Japan, North America, Latin America except Colombia models)

EXTERNAL CONTROL DEVICE SETUP

- Image shown may differ from your TV.

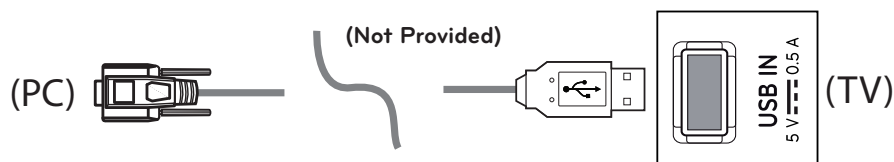
Connect the USB to Serial converter/RS-232C input jack to an external control device (such as a computer or an A/V control system) to control the product's functions externally.

Note: The type of control port on the TV can be different between model series.

- * Please be advised that not all models support this type of connectivity.
- * Cable is not provided.

USB to Serial converter with USB Cable

USB Type



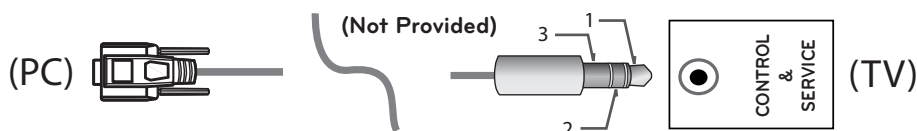
- LGTV supports PL2303 chip-based (Vendor ID : 0x0557, Product ID : 0x2008) USB to serial converter which is not made nor provided by LG.
- It can be purchased from computer stores that carry accessories for IT support professionals.

RS-232C with RS-232C Cable (Legacy)

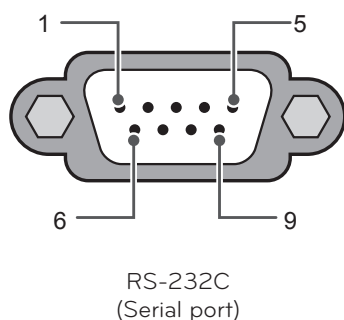
Phone jack Type

- You need to purchase the phone-jack to RS-232 cable required for the connection between the PC and the TV, which is specified in the manual.

* For other models, connect to the USB port.

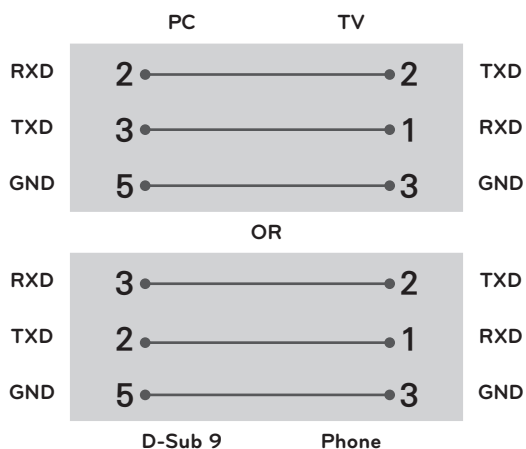


Customer Computer



RS-232C configurations

3-Wire Configurations(Not standard)



Set ID

For Set ID number, see "Real Data Mapping" on See p.49

- Press **SETTINGS** to access the main menus.
- Press the Navigation buttons to scroll to **OPTION** and press **OK**.
- Press the Navigation buttons to scroll to **SET ID** and press **OK**.
- Scroll left or right to select a set ID number and select **CLOSE**. The adjustment range is 1-99.
- When you are finished, press **EXIT**.

Communication Parameters

- Baud rate : 9600 bps (UART)
- Data length : 8 bits
- Parity : None
- Stop bit : 1 bit
- Communication code : ASCII code
- Use a crossed (reverse) cable.

Command reference list

(Depending on model)

	COMMAND1	COMMAND2	DATA (Hexadecimal)
01. Power off	k	a	00
02. Aspect Ratio	k	c	(See p.50)
03. Screen Mute	k	d	(See p.50)
04. Volume Mute	k	e	00 to 01
05. Volume Control	k	f	00 to 64
06. Contrast	k	g	00 to 64
07. Brightness	k	h	00 to 64
08. Color/Colour	k	i	00 to 64
09. Tint	k	j	00 to 64
10. Sharpness	k	k	00 to 32
11. OSD Select	k	l	00 to 01
12. Remote Control Lock Mode	k	m	00 to 01
13. Balance	k	t	00 to 64
14. Color (Colour) Temperature	x	u	00 to 64
15. ISM Method (Only Plasma TV)	j	p	(See p.51)
16. Energy Saving	j	q	00 to 05
17. Tune Command	m	a	(See p.52)
18. Channel (Programme) Add/Del(Skip)	m	b	00 to 01
19. Key	m	c	Key Codes
20. Control Back Light, Control Panel Light	m	g	00 to 64
21. Input select (Main)	x	b	(See p.54)
22. 3D (Only 3D models)	x	t	(See p.54)
23. Extended 3D (Only 3D models)	x	v	(See p.55)
24. Auto Configure	j	u	(See p.55)

* Note: During USB operations such as DivX or EMF, all commands except Power(ka) and Key(mc) are not executed and treated as NG.

Transmission / Receiving Protocol

Transmission

[Command1][Command2][][Set ID][][Data][Cr]

[Command 1] : First command to control the TV. (j, k, m or x)

[Command 2]: Second command to control the TV.

[Set ID] : You can adjust the [Set ID] to choose desired monitor ID number in option menu. Adjustment range in TV is 1 to 99. If [Set ID] value is selected to '0', every connected set can be controlled.

* [Set ID] is indicated as decimal (1 to 99) on menu and as Hexadecimal (0x00 to 0x63) on transmission/receiving protocol.

[DATA] : To transmit command data (hexadecimal). Transmit 'FF' data to read status of command.

[Cr] : Carriage Return - ASCII code '0x0D'

[] : Space - ASCII code '0x20'

OK Acknowledgement

[Command2][][Set ID][][OK][Data][x]

* The set transmits ACK (acknowledgement) based on this format when receiving normal data. At this time, if the data is data read mode, it indicates present status data. If the data is data write mode, it returns the data of the PC computer.

Error Acknowledgement

[Command2][][Set ID][][NG][Data][x]

* The set transmits ACK (acknowledgement) based on this format when receiving abnormal data from non-viable functions or communication errors.

Data 00: Illegal Code

Real data mapping (Hexadecimal → Decimal)

* When you enter the [data] in hexadecimal, refer to following conversion table.

* Channel Tune (ma) Command uses two-byte hexadecimal value([data]) to select channel number.

00 : Step 0	32 : Step 50 (Set ID 50)	FE : Step 254
01 : Step 1 (Set ID 1)	33 : Step 51 (Set ID 51)	FF : Step 255
...	...	...
0A : Step 10 (Set ID 10)	63 : Step 99 (Set ID 99)	01 00 : Step 256
...	...	...
0F : Step 15 (Set ID 15)	C7 : Step 199	27 0E : Step 9998
10 : Step 16 (Set ID 16)	C8 : Step 200	27 0F : Step 9999
...	...	...

* Commands may work differently depending on model and signal.

01. Power (Command: k a)

- To control Power Off of the set.

Transmission[k][a][][Set ID][][Data][Cr]

Data 00 : Power Off Data 01 : Power On

Ack [a][][Set ID][][OK/NG][Data][x]

- To Show Power On. (Works TV is On Only)

Transmission [k][a][][Set ID][][FF][Cr]

Ack [a][][Set ID][][OK][01][x]

* Similarly, if other functions transmit 'FF' data based on this format, Acknowledgement feedback presents status about each function.

02. Aspect Ratio (Command: k c) (Main Picture Size)

- To adjust the screen format. (Main picture format)

You can also adjust the screen format using the Aspect Ratio in the Q.MENU. or PICTURE menu.

Transmission [k][c][][Set ID][][Data][Cr]

Data 01 : Normal screen (4:3)

02 : Wide screen (16:9)

04 : Zoom

05 : Zoom 2 (Latin America except Colombia Only)

06 : Set by Program/Original

07 : 14:9 (Europe, Colombia, Mid-East, Asia except South Korea and Japan)

09 : * Just Scan

0B : Full Wide

(Europe, Colombia, Mid-East, Asia except South Korea and Japan)

10 to 1F : Cinema Zoom 1 to 16

Ack [c][][Set ID][][OK/NG][Data][x]

* Using the PC input, you select either 16:9 or 4:3 screen aspect ratio.

* In DTV/HDMI/Component mode (high-definition), Just Scan is available.

* Full wide mode may work differently based on model and is supported for DTV fully, and ATV, AV partially.

03. Screen Mute (Command: k d)

- To select screen mute on/off.

Transmission [k][d][][Set ID][][Data][Cr]

Data 00 : Screen mute off (Picture on)

Video mute off

01 : Screen mute on (Picture off)

10 : Video mute on

Ack [d][][Set ID][][OK/NG][Data][x]

* In case of video mute on only, TV will display On Screen Display(OSD). But, in case of Screen mute on, TV will not display OSD.

04. Volume Mute (Command: k e)

- To control volume mute on/off.

You can also adjust mute using the MUTE button on remote control.

Transmission [k][e][][Set ID][][Data][Cr]

Data 00 : Volume mute on (Volume off)

01 : Volume mute off (Volume on)

Ack [e][][Set ID][][OK/NG][Data][x]

05. Volume Control (Command: k f)

- To adjust volume.

You can also adjust volume with the volume buttons on remote control.

Transmission [k][f][][Set ID][][Data][Cr]

Data Min : 00 to Max : 64

Ack [f][][Set ID][][OK/NG][Data][x]

06. Contrast (Command: k g)

- To adjust screen contrast.

You can also adjust contrast in the PICTURE menu.

Transmission [k][g][][Set ID][][Data][Cr]

Data Min : 00 to Max : 64

Ack [g][][Set ID][][OK/NG][Data][x]

07. Brightness (Command: k h)

- To adjust screen brightness.

You can also adjust brightness in the PICTURE menu.

Transmission [k][h][][Set ID][][Data][Cr]

Data Min : 00 to Max : 64

Ack [h][][Set ID][][OK/NG][Data][x]

08. Color/Colour (Command: k i)

- To adjust the screen Color(Colour).

You can also adjust colour in the PICTURE menu.

Transmission [k][i][][Set ID][][Data][Cr]

Data Min : 00 to Max : 64

Ack [i][][Set ID][][OK/NG][Data][x]

09. Tint (Command: k j)

- To adjust the screen tint.

You can also adjust tint in the PICTURE menu.

Transmission [k][j][][Set ID][][Data][Cr]

Data Red : 00 to Green : 64

Ack [j][][Set ID][][OK/NG][Data][x]

10. Sharpness (Command: k k)

- To adjust the screen sharpness.

You can also adjust sharpness in the PICTURE menu.

Transmission [k][k][][Set ID][][Data][Cr]

Data Min : 00 to Max : 32

Ack [k][][Set ID][][OK/NG][Data][x]

11. OSD Select (Command: k l)

- To select OSD (On Screen Display) on/off when controlling remotely.

Transmission [k][l][][Set ID][][Data][Cr]

Data 00 : OSD off 01 : OSD on

Ack [l][][Set ID][][OK/NG][Data][x]

12. Remote control lock mode (Command: k m)

- To lock the front panel controls on the monitor and remote control.

Transmission [k][m][][Set ID][][Data][Cr]

Data 00 : Lock off 01 : Lock on

Ack [m][][Set ID][][OK/NG][Data][x]

* If you are not using the remote control, use this mode. When main power is off & on (plug-off and plug-in, after 20 - 30 seconds), external control lock is released.

* In the standby mode (DC off by off timer or 'ka', 'mc' command), and if key lock is on, TV will not turn on by power on key of IR & Local Key.

13. Balance (Command: k t)

- To adjust balance.

You can also adjust balance in the AUDIO menu.

Transmission [k][t][][Set ID][][Data][Cr]

Data Min : 00 to Max : 64

Ack [t][][Set ID][][OK/NG][Data][x]

14. Color(Colour) Temperature (Command: x u)

- To adjust colour temperature. You can also adjust Color(Colour) Temperature in the PICTURE menu.

Transmission [x][u][][Set ID][][Data][Cr]

Data Min : 00 to Max : 64

Ack [u][][Set ID][][OK/NG][Data][x]

15. ISM Method (Command: j p) (Only Plasma TV)

- To control the ISM method. You can also adjust ISM Method in OPTION menu.

Transmission [j][p][][Set ID][][Data][Cr]

Data Min : 02: Orbiter

08: Normal

20: Color(Colour) Wash

Ack [p][][Set ID][][OK/NG][Data][x]

16. Energy Saving (Command: j q)

- To reduce the power consumption of the TV. You can also adjust Energy Saving in PICTURE menu.

Transmission [j][q][][Set ID][][Data][Cr]

Data

00 : Off

01 : Minimum

02 : Medium

03 : Maximum

04 : Auto

05 : Screen off

* (Depending on model)

Ack [q][][Set ID][][OK/NG][Data][x]

17. Tune Command (Command: m a)

* This command may work differently depending on model and signal.

- For Europe, Mid-East, Colombia, Asia except South Korea and Japan Model

► Select channel to following physical number.

```
Transmission [m][a][ ][Set ID][ ][Data 00][ ][Data 01][ ][Data 02][Cr]
```

* Analogue Terrestrial/Cable

[Data 00][Data 01] Channel Data

Data 00 : High byte channel data

Data 01 : Low byte channel data

- 00 00 ~ 00 C7 (Decimal : 0 ~ 199)

Data 02 : Input Source (Analogue)

- 00 : Terrestrial TV (ATV)

- 80 : Cable TV (CATV)

* Digital Terrestrial/Cable/Satellite

[Data 00][Data 01]: Channel Data

Data 00 : High Channel data

Data 01 : Low Channel data

- 00 00 ~ 27 0F (Decimal: 0 ~ 9999)

Data 02 : Input Source (Digital)

- 10 : Terrestrial TV (DTV)

- 20 : Terrestrial Radio (Radio)

- 40 : Satellite TV (SDTV)

- 50 : Satellite Radio (S-Radio)

- 90 : Cable TV (CADTV)

- a0 : Cable Radio (CA-Radio)

* Tune Command Examples:

1. Tune to the analogue terrestrial (PAL) Channel 10.

Set ID = All = 00

Data 00 & 01 = Channel Data is 10 = 00 0a

Data 02 = Analogue Terrestrial TV = 00

Result = ma 00 00 0a 00

2. Tune to the digital terrestrial (DVB-T) Channel 01.

Set ID = All = 00

Data 00 & 01 = Channel Data is 1 = 00 01

Data 02 = Digital Terrestrial TV = 10

Result = ma 00 00 01 10

3. Tune to the satellite (DVB-S) Channel 1000.

Set ID = All = 00

Data 00 & 01 = Channel Data is 1000 = 03 E8

Data 02 = Digital Satellite TV = 40

Result = ma 00 03 E8 40

```
Ack [a][ ][Set ID][ ][OK][Data 00][Data 01]
```

```
[Data 02][x][a][ ][Set ID][ ][NG][Data 00][x]
```

- For South Korea, North/Latin America except Colombia Model

► To tune channel to following physical/major/minor number.

```
Transmission [m][a][ ][O][ ][Data00][ ][Data01][ ][Data02][ ][Data03][ ][Data04][ ][Data05][Cr]
```

Digital channels have a Physical, Major, and Minor channel number. The Physical number is the actual digital channel number, the Major is the number that the channel should be mapped to, and the Minor is the sub-channel. Since the ATSC tuner automatically maps the channel from the Major / Minor number, the Physical number is not required when sending a command in Digital.

* Analogue Terrestrial/Cable

Data 00 : Physical Channel Number

- Terrestrial (ATV) : 02~45 (Decimal: 2 ~ 69)

- Cable (CATV) : 01, 0E~7D (Decimal : 1, 14~125)

[Data 01 ~ 04]: Major/Minor Channel Number

Data 01 & 02: xx (Don't care)

Data 03 & 04: xx (Don't care)

Data 05: Input Source (Analogue)

- 00 : Terrestrial TV (ATV)

- 01 : Cable TV (CATV)

* Digital Terrestrial/Cable

Data 00 : xx (Don't care)

[Data 01][Data 02]: Major Channel Number

Data 01 : High byte Channel Data

Data 02 : Low byte Channel Data

- 00 01 ~ 27 0F (Decimal: 1 ~ 9999)

[Data 03][Data 04]: Minor Channel Number

Data 03 : High byte Channel Data

Data 04 : Low byte Channel Data

Data 05 : Input Source (Digital)

- 02 : Terrestrial TV (DTV) – Use Physical Channel Number
- 06 : Cable TV (CADTV) – Use Physical Channel Number
- 22 : Terrestrial TV (DTV) – Don't Use Physical Channel Number
- 26 : Cable TV (CADTV) - Don't Use Physical Channel Number
- 46 : Cable TV (CADTV) – Use Major Channel Number Only (One Part Channel)

Two bytes are available for each major and minor channel data, but usually the low byte is used alone (high byte is 0).

* Tune Command Examples:

1. Tune to the analogue cable (NTSC) channel 35.

Set ID = All = 00
 Data 00 = Channel Data is 35 = 23
 Data 01 & 02 = No Major = 00 00
 Data 03 & 04 = No Minor = 00 00
 Data 05 = Analogue Cable TV = 01
 Total = ma 00 23 00 00 00 01

2. Tune to the digital terrestrial (ATSC) channel 30-3.

Set ID = All = 00
 Data 00 = Don't know Physical = 00
 Data 01 & 02 = Major is 30 = 00 1E
 Data 03 & 04 = Minor is 3 = 00 03
 Data 05 = Digital Terrestrial TV = 22
 Total = ma 00 00 00 1E 00 03 22

Ack [a][][Set ID][][OK][Data 00][Data 01]
 [Data 02][Data 03][Data 04][Data 05]
 [x][a][][Set ID][][NG][Data 00][x]

• For Japan Model

► To tune channel to following physical/major/minor number.

Transmission [m][a][][0][][Data00][][Data01]
 [][Data02][][Data03][][Data04][][Data05][Cr]

* Digital Terrestrial/Satellite

Data 00: xx (Don't care)

[Data 01][Data 02]: Major Channel Number

Data 01: High byte Channel Data

Data 02: Low byte Channel Data

- 00 01 ~ 27 0F (Decimal: 1 ~ 9999)

[Data 03][Data 04]: Minor/Branch Channel Number
 (Don't care in Satellite)

Data 03: High byte Channel Data

Data 04: Low byte Channel Data

Data 05 : Input Source (Digital/Satellite for Japan)

- 02 : Terrestrial TV (DTV)
- 07 : BS (Broadcasting Satellite)
- 08 : CS1 (Communication Satellite 1)
- 09 : CS2 (Communication Satellite 2)

* Tune Command Examples:

1. Tune to the digital terrestrial (ISDB-T) channel 17-1.

Set ID = All = 00
 Data 00 = Don't know Physical = 00
 Data 01 & 02 = Major is 17 = 00 11
 Data 03 & 04 = Minor/Branch is 1 = 00 01
 Data 05 = Digital Terrestrial TV = 02
 Total = ma 00 00 00 11 00 01 02

2. Tune to the BS (ISDB-BS) channel 30.

Set ID = All = 00
 Data 00 = Don't know Physical = 00
 Data 01 & 02 = Major is 30 = 00 1E
 Data 03 & 04 = Don't Care = 00 00
 Data 05 = Digital BS TV = 07
 Total = ma 00 00 00 1E 00 00 07

* This feature is varied based on the model.

Ack [a][][Set ID][][OK][Data 00][Data 01]
 [Data 02][Data 03][Data 04][Data 05]
 [x][a][][Set ID][][NG][Data 00][x]

18. Channel(Programme) Add/Del(Skip) (Command: m b)

► To skip current channel(programme) for next time.

Transmission [m][b][][Set ID][][Data][Cr]

Data 00 : Del(ATSC,ISDB)/Skip(DVB) 01 : Add

Ack [b][][Set ID][][OK/NG][Data][x]

* Set the saved channel status to del(ATSC, ISDB)/skip(DVB) or add.

19. Key (Command: m c)

► To send IR remote key code.

Transmission [m][c][][Set ID][][Data][Cr]

Data Key code - See p.45.

Ack [c][][Set ID][][OK/NG][Data][x]

20. Control Back Light (Command: m g)

• For LCD TV / LED TV

► To control the back light.

Transmission [m][g][][Set ID][][Data][Cr]

Data Min : 00 to Max : 64

Ack [g][][Set ID][][OK/NG][Data][x]

Control Panel Light (Command: m g)

- For Plasma TV

- To control the panel light.

Transmission [m][g][][Set ID][][Data][Cr]

Data Min : 00 to Max : 64

Ack [g][][Set ID][][OK/NG][Data][x]

21. Input select (Command: x b)
(Main Picture Input)

- To select input source for main picture.

Transmission [x][b][][Set ID][][Data][Cr]

Data 00 : DTV

01 : CADTV

02 : Satellite DTV

ISDB-BS (Japan)

03 : ISDB-CS1 (Japan)

04 : ISDB-CS2 (Japan)

10 : ATV

11 : CATV

20 : AV or AV1

21 : AV2

40 : Component1

41 : Component2

60 : RGB

90 : HDMI1

91 : HDMI2

92 : HDMI3

93 : HDMI4

Ack [b][][Set ID][][OK/NG][Data][x]

* This function depends on model and signal.

22. 3D(Command: x t) (only 3D models)
(Depending on model)

- To change 3D mode for TV.

Transmission [x][t][][Set ID][][Data 00][][Data 01]
[][Data 02][][Data 03][Cr]

Data Structure

[Data 00] 00 : 3D On

01 : 3D Off

02 : 3D to 2D

03 : 2D to 3D

[Data 01] 00 : Top and Bottom

01 : Side by Side

02 : Check Board

03 : Frame Sequential

04 : Column interleaving

05 : Row interleaving

[Data 02] 00 : Right to Left

01 : Left to Right

[Data 03] 3D Effect(3D Depth): Min : 00 - Max : 14

(*transmit by Hexadecimal code)

* If [Data 00] is 00 (3D On), [Data 03] has no meaning.

* If [Data 00] is 01 (3D off) or 02 (3D to 2D), [Data 01], [Data 02] and [Data 03] have no meaning.

* If [Data 00] is 03(2D to 3D), [Data 01] and [Data 02] have no meaning.

* If [Data 00] is 03(2D to 3D), [Data 03] works when 3D Mode (Genre) is manual only.

* All 3D pattern options ([Data 01]) may not be available according to broadcasting/video signal.

[Data 00]	[Data 01]	[Data 02]	[Data 03]
00	O	O	X
01	X	X	X
02	X	X	X
03	X	X	O

X : don't care

Ack [t][][Set ID][][OK][Data00][Data01][Data02]
[Data03][x]
[t][][Set ID][][NG][Data00][x]

23. Extended 3D(Command: x v) (only 3D models) (Depending on model)

- To change 3D option for TV.

Transmission [x][v][][Set ID][][Data 00][][Data 01][Cr]

[Data 00] 3D option

- 00 : 3D Picture Correction
- 01 : 3D Depth (3D Mode is Manual Only)
- 02 : 3D Viewpoint
- 06 : 3D Color Correction
- 07 : 3D Sound Zooming
- 08 : Normal Image View
- 09 : 3D Mode (Genre)

[Data 01] It has own range for each 3D option determined by [Data 00].

1) When [Data 00] is 00

- 00 : Right to Left
- 01 : Left to Right

2) When [Data 00] is 01, 02

Data Min: 0 - Max: 14 (*transmit by Hexadecimal code)

Data value range(0 - 20) converts Viewpoint range (-10 - +10) automatically (Depending on model)

3) When [Data 00] is 06, 07

- 00 : Off
- 01 : On

4) When [Data 00] is 08

- 00 : Revert to 3D video from 3D-to-2D converted 3D video
- 01 : Change 3D video to 2D video, except 2D-to-3D video

* If conversion condition doesn't meet, command is treated as NG.

5) When [Data 00] is 09

- 00 : Standard
- 02 : Cinema
- 04 : Manual
- 01 : Sport
- 03 : Extreme

Ack [v][][Set ID][][OK][Data00][Data01][x]
[v][][Set ID][][NG][Data00][x]

24. Auto Configure (Command: j u)

- To adjust picture position and minimize image shaking automatically. It works only in RGB (PC) mode.

Transmission [j][u][][Set ID][][Data][Cr]

Data 01 : To set

Ack [u][][Set ID][][OK/NG][Data][x]



Make sure to read the Safety Precautions before using the product.
Keep the Owner's Manual (CD) in an accessible place for future reference.
The model and serial number of the TV is located on the back and one side of the TV. Record it below should you ever need service.

MODEL _____

SERIAL _____

To obtain the source code under GPL, LGPL, MPL and other open source licenses, that is contained in this product, please visit <http://opensource.lge.com>.

In addition to the source code, all referred license terms, warranty disclaimers and copyright notices are available for download. LG Electronics will also provide open source code to you on CD-ROM for a charge covering the cost of performing such distribution (such as the cost of media, shipping and handling) upon email request to opensource@lge.com. This offer is valid for three (3) years from the date on which you purchased the product.