



INSTALLATION MANUAL LED TV*

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

43/49/55/65UU3***-U*

www.lg.com

Copyright © 2018 LG Electronics Inc. All Rights Reserved.

Table of contents

3 Location and Function of Controls

- 3 Parts and Button
- 3 Basic functions

4 First Use Wizard

- 4 Language & Location

5 Installation Menu

- 5 Introduction
- 6 PUBLIC DISPLAY SETTINGS
- 6 - Public Display Settings Operation
- 6 - Power On Status
- 7 - Volume
- 7 - Key Management
- 8 - Limited Mode
- 9 - DTV Channel Update
- 9 - Power On Default
- 9 - Aux Source Setting
- 9 - Power Management
- 9 - Factory Reset
- 10 Network
- 10 - MAC Address
- 10 - Network Setting
- 10 - Wake On LAN
- 10 - Server Settings
- 11 General
- 11 - Configuration Setup
- 13 - External Speaker
- 13 - Set ID Setup
- 13 - Power Saving
- 14 - HCEC Setup
- 15 - Clock Setup
- 15 - Password Change
- 15 - Lock Mode
- 15 - Crestron
- 16 - Welcome Video
- 17 TV Manager
- 22 - USB Download Menu

23 IR Codes

24 External control device Setup


- 24 RS-232C Setup
- 24 Phone jack Type
- 24 Type of Connector : D-Sub 9-Pin Male
- 25 RS-232C Configurations
- 25 Communication Parameters
- 25 IR OUT Using Guide
- 25 - Suitable / Not Recommend remote-controller data format
- 25 - IR Receiver specifications
- 26 Command Reference List
- 26 Transmission / Receiving Protocol

Location and Function of Controls

Parts and Button



Basic functions

	Power On (Press)
	Power Off ¹ (Press and Hold)
	Menu Control (Press ²)
	Menu Selection (Press and Hold ³)

- 1 All running apps will close.
- 2 You can access and adjust the menu by pressing the button when TV is on.
- 3 You can use the function when you access menu control.

First Use Wizard

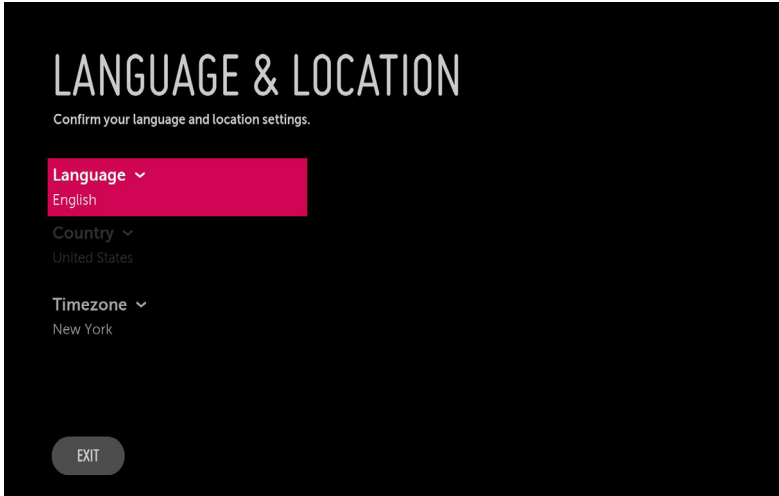
* Image shown may differ from your TV.

ENGLISH

Language & Location

(Depending on model)

- Select the **Language** and **Country**. Some countries need to select the Time Zone.



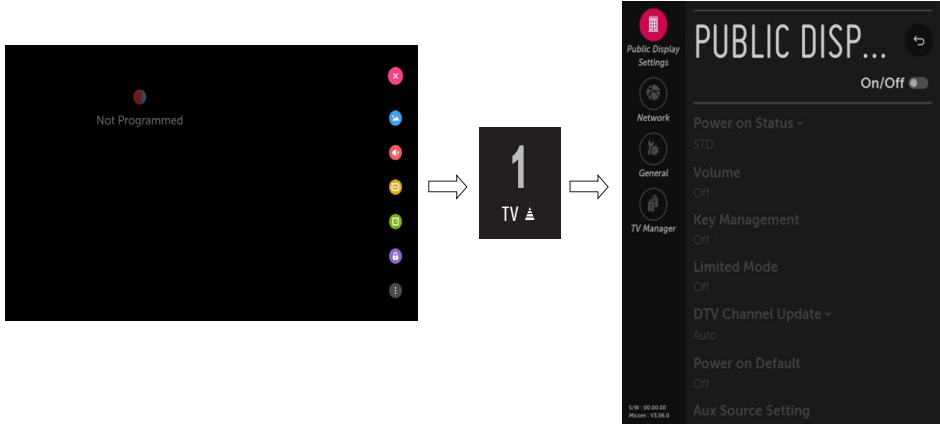
Installation Menu

* Image shown may differ from your TV.

Introduction

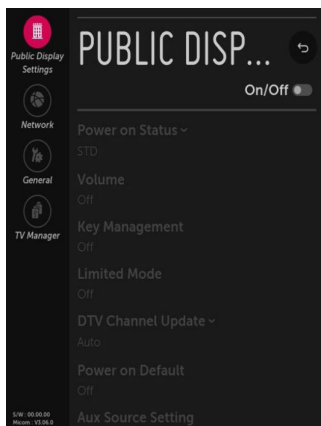
The abundant functions for Hotel TV linked with software installation can be projected on OSD as 'Installation Menu'.

The wide range of hotel features can be performed simply on additional window to enhance the LG hotel TV's easy installation and convenient operation for Hotelier and System Integrators.



- 1 Press the Setting button for more than 5 seconds using the user remote control, programme information will appear at top left on the screen.
- 2 Enter a four digit password and press **OK** button.
 - The TV is set with the initial password "1-1-0-5".

PUBLIC DISPLAY SETTINGS



- 1 Use the ∇ \wedge button to select the **PUBLIC DISPLAY SETTINGS**.
- 2 Use the 'OK' button and then ∇ \wedge button to select Public Display Mode.
 - When 'Public Display Mode' is set to On (Work), all functions of Public Display Mode apply.

Public Display Settings Operation

- Decide to work all functions of 'Public Display Mode' or not by setting 'Public Display Mode' as On(Work) or Off(Do Not Work) - When 'Public Display Mode' is set to On(Work), all functions of Public Display Mode apply.
- When 'Public Display Mode' is set to Off(Do Not Work), all functions of Public Display Mode Do Not apply.
- When it is set to 'On', 'Key Lock' item of the User menu is disabled and the OSD is displayed same to the Local Key Operation setting of the Public Display Mode.
- When it is set to 'On', all items reserved at the Schedule list are deleted and the reservation function is not supported. (applied for the model offering the reservation function) - The TV triggered by the external device (ex: SIMPLINK, TVLink-Tuner, etc.) operates separately from the Public Display Mode.
- When it is set to 'On', User Menu \Rightarrow General \Rightarrow 'Reset to Initial Settings and Demo Mode' are disabled.
- When 'Public Display Mode' is set to On(Work), all skipped programs are not tuned by number keys.
- When 'Public Display Mode' is set to On(Work), Detailed Information about the Channel is not available in the EPG.

Power On Status

- Decide to select working status of TV Set when turn on main power.
- You can set with PWR, STD, LST.
- PWR always make TV set On status when turn on main power .
- STD make Stand-by status when turn on main power.
- LST make TVSet work like previous power status. As same concept as Power Backup mode; If main power were turned off in Power On status, TVSet would work in On status. If main power were turned off in Stand-by status, TVSet would work in Stand-by status.
- If there Block All is both IR Operation and Local Key Operation from Key Management, In order to provide the Option that must be able to turn on the TV in the TV turned off situation, change the value of the PWR. (Reference the Key Management)

Volume

- Decide to apply volume policy of 'Start Volume', 'Maximum Volume' and 'Minimum Volume' as On(Work) or Off(Do Not Work).
- ($0 \leq \text{Min} \leq \text{Start} \leq \text{Max} \leq 100$)

Start Volume

- This entry sets the start volume level when is power on.
 - The level is specified as a number between minimum volume to maximum value. ($\text{Min} \leq \text{Start} \leq \text{Max}$)
 - The default setting is 'Off' (disabled).
 - When enabled, if the value is lower then the minimum specified in the minimum volume entry, the minimum volume entry must be used.
 - When enabled, if the value is larger then the maximum specified in the maximum volume entry, the maximum volume value must be used.
 - Access to a volume in 'On Timer' must be fixed to start volume when 'Public Display Settings Operation' (On) and 'Start Volume' (Off, 0 ~ 100) were set simultaneously.

Maximum Volume

- This entry sets the maximum volume level the set. The level is specified as a number between 'Minimum Volume' to 100. ($\text{Min} \leq \text{Max} \leq 100$).
 - If the command volume up to higher than maximum volume' is received, that should be ignored.
 - The default value is 100.

Minimum Volume

- This entry sets the minimum volume level the set will produce.
 - The level is specified as a number between 0 to 'Maximum Volume'. ($0 \leq \text{Min} \leq \text{Max}$)
 - If the command volume down to lower than minimum volume is received, that should be ignored.
 - The default value is 0.

Key Management

- Manage key usability of Local(Front) Key and Remote Control. When selected to 'On', following 'IR Operation' and 'Local Key Operation' will be worked by below.

IR Operation

- Decide whether work the LG remote control or not.
 - When 'IR Operation' is set to 'Normal', all remote keys are available.
 - 'Use PWR Only' makes block all remote keys except power key.
 - When 'IR Operation' is set to 'Block All', all normal remote keys don't work.

Local Key Operation

- Decide to operate 'Local/Front Key' working behavior by setting 'Local Key Operation' as 'Normal', 'Use PWR Only' and 'Block All'.
 - When 'Local Key Operation' is set to 'Normal', all local keys are available.
 - 'Use PWR Only' makes block all local keys except power key.
 - When 'Local Key Operation' is set to 'Block All', all local keys don't work.

Limited Mode

- Configure TV function's limitation. When selected to 'On', following sub-menus will be worked by below.

Setup Menu

- Permit to tune and manage Channels as 'On'(permitted) or 'Off'(not permitted).

Channel Change

- Decide to change channel or not by setting 'Program Change' as 'On'(Change Possible) or 'Off'(Change Impossible) when present source is TV.
 - When 'Channel Change' is set to Off (Change Impossible)
 - » Program Key, Numeral Key, List Key, Q.View Key don't work and entering 'Channel Menu' in the Main Menu OSD is impossible.
 - » 'Channel' item in 'On Time' menu will be fixed.
 - » Entering 'Channels' in the 'Main Menu' OSD is impossible regardless of 'Channels' item.
 - When 'Program Change' is set to On(Change Possible), 'Program Key', 'Numeric Key', 'List Key', 'Q.View' Key, 'TV/RAD Key', does work and entering 'Channel Menu' in the Main Menu OSD is possible.

Menu Display

- Function to decide whether work with menu (including relevant menus too) of control key (On – Enter possible) or not (Off – Enter impossible).
 - Although select Off(Enter impossible), the action that press a Menu button for 5 seconds to enter 'Installation Menu' is available.
 - When select On(Enter possible), Menu works.

OSD Display

- Decide to display OSD or not by setting 'OSD Display' as On(Display) or Off(Do not Display).
 - When 'OSD Display' is set to 'Off' (Do not Display), all OSD is not displayed except some exception.
 - Although select 'Off' (Do not Display), the action that press a Menu button for 5 seconds to enter 'Installation Menu' and entering service menu are available. (In-Start, Power-Only, Adjust, Installation Menu . . .)

System Provider Mode

- 'System Provider Mode' allows access to the menu system from the front panel or remote control but access is controlled as follows:
 - When value is 'On', Accessible Items on the menu system, others are not permissible. (Depending on model)
 - » Input select screens
 - » Sleep timer
 - » Aspect Ratio
 - » Caption
 - » Channels (Except for Channel Tuning & Settings and Channel Manager)
 - » 'Safety' / 'Photo & Video' / 'Music' / 'Network'
 - » Input Manager
 - If the channel map is empty, 'Auto-tuning' guide dialog should be blocked by pressing 'List', 'CH+', 'CH-' keys.

DTV Channel Update

- It is a mode to set whether to update dtv Channel automatically or not.
- When DTV Channel Update is set to 'Auto', the function to update TV's Channel map according to dtv Channel's stream information.
- DTV Channel Update is set to 'Manual', the function to keep TV's Channel map even though dtv Channel's information is changed.

Power On Default

- Set the channel to display and Volume Level, etc. when turn on power in AC Power On or Stand-by status.
- Set to On(Work) or Off(Do Not Work).
- When 'Power On Default' is set to Off, it is not applied to the subordinate Input, Channel, A/V Setting, Aspect Ratio menu.
- When Power On Default is set to On, it can set by entering the subordinate menu.

Input

- Set whether it is turned on by the set input source or by the last stored input source.

Channel

- Select start channel number if Input source's value is TV.

A/V Setting

- If 'A/V Setting' is changed from 'Off' to 'On', A/V parameters that are set before entering 'Installation Menu' are applied whenever turn on power.

Aspect Ratio

- The aspect ratio determines the default aspect ratio that the set returns to on power up.

Aux Source Setting

- Set to On(Work) or Off(Do Not Work).
- The Auxiliary (Input) Source Setting feature will enable or disable for each external input.
- User cannot disable the current input's 'Aux Source Setting'.

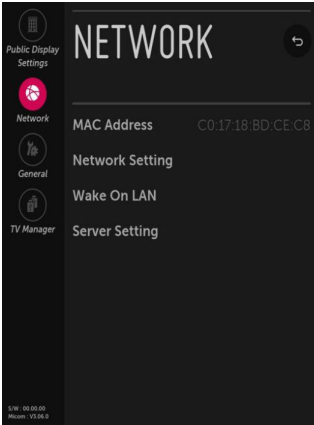
Power Management

- The Power Management feature will turn off the television receiver if no input control command is received from either the Local or IR Key within a selected hours.
 - Activity on either of these inputs shall reset the 'Power Management' timer and prevent interruption of TV viewing.
 - This entry can be set to a value which is corresponding to the desired hours (1Hour to 7Hours).
 - Default value is 'Off(disabled)'.

Factory Reset

- Change all settings to their default values.

Network



MAC Address

- Displays the MAC address (not customizable).

Network Setting

One-click network connection

- Connects easily to a wired network.
- This menu supports to connect to an available network.

To connect to a network through Set Expert

- For use in special circumstances such as in offices (in cases where a static IP is used).
When connecting via Wired, Configures the IP settings of the TV set. You can set the IP address, subnet mask, gateway and DNS server.

Wake On LAN

- Sets the Wake On LAN function to Enable or Disable.
 - The Wake On LAN feature enables the TV to receive software updates and/or be powered ON upon receipt of Wake Up Frame packets and/or Magic Packet data via the wired LAN. To facilitate use of this feature, note that the appropriate wired connection must be made. ('Wake up Frame' - Depending on model)

Server Settings

(Depending on model)

- Sets the information to connect to the external server.

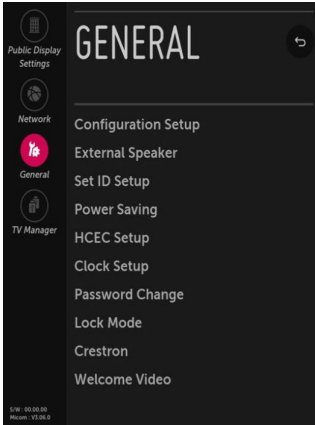
CMS Server

- Sets the network information to connect to SuperSign CMS. (or other compatible solutions)

Control Server

- Sets the network information to connect to SuperSign Control. (or other compatible solutions)

General



Configuration Setup

Select RCU

- It is a mode to set whether to use Select RCU or not. When 'Select RCU' is set to 'Enable', You can adjust 'Number of RCU' menu.

Number of RCU

- It is a mode to set Number of RCU.
- Number of RCU value range 1~9. (When 'Select RCU' is set to 'Enable')
- Number of RCU value range 0. (When 'Select RCU' is set to 'Disable')
 - RCU (Remote Control Unit) : It is special RCU that operates only setted number of RCU in TV.

DTV Channel Update

- It is a mode to set whether to update dtv Channel automatically or not.
- When DTV Channel Update is set to 'Auto', the function to update TV's Channel map according to dtv Channel's stream information.
- DTV Channel Update is set to 'Manual', the function to keep TV's Channel map even though dtv Channel's information is changed.

On Timer Operation

- It is a mode to select 'On Timer Operation' working one time or repeatedly.
- 'Once': 'On Time' in the user menu operates only one time when the **On Time** menu is set to **On**.
- 'Repeat': 'On Time' operates repeatedly when the **On Time** menu is set to **On**.

USB Auto Playback

(Depending on model)

- When 'USB Auto Playback' is set to 'Movie', TV finds and plays the USB's movie files located at the root(top) directory Movies if USB is plugged in.
- When 'USB Auto Playback' is set to 'Photo', TV finds and plays the USB's photo files located at the root(top) directory Photos if USB is plugged in.
- If it reaches the last file, it starts the first file again

15Min Auto Off

(Depending on model)

- When '15Min Auto Off' is set to 'Enable', TV will turn off if there is no signal in 15Min.

Auto Sensing

- If 'Auto Sensing' is set to 'On', the input is automatically switched when the input signal that you set to "ON" is received.
- If 'Auto Sensing' is set to 'Disable', the input is not switched when the input signal is received.
 - SIMPLINK and Auto Sensing cannot work simultaneously. If SIMPLINK is set to On, Auto Sensing is automatically set to Disable.
 - If the signal is removed while Auto Sensing (automatic input switch) is enabled, the input returns to the previous setting. If the several input are connected by enabling Auto Sensing and the automatic input returns to the previous setting. If the several inputs are connected by enabling Auto Sensing and the automatic input switch is performed several times, the input returns to the previous setting only for the last input and does not repeat the operation for the rest.

DPM

(Depending on model)

- You can configure the DPM (Display Power Management) function.
- If this option is not set to Off, the TV set enters the DPM mode when there is no input signal.
- If you set this option to Off, the DPM function is disabled.

Sustain Aspect Ratio

(Depending on model)

- Sustain Aspect Ratio sets the power mode of the HDMI Switching IC, which detects HDMI external input signals in the TV Standby state after DPM Power Off turns off the TV.
- If Sustain Aspect Ratio is set to ON, the HDMI Switching IC is supplied with power even in Standby state after DPM turns off the TV.
- If Sustain Aspect Ratio is set to OFF, the HDMI Switching IC maintains low power mode in Standby state after DPM turns off the TV.

External Speaker

(Depending on model)

Volume Control

- Selects the volume control method of an external speaker.
- You can select 'Off', 'Int Variable' Fixed.
- Int variable is linked to the main volume OSD and change the volume 0 - 1 Watts.
- Fixed produces a fixed output. The default is Off.

Output

- This item is enabled when Volume Control is set to Fixed. You can choose one of 7 steps. (0.01/0.03/0.05/0.1/0.2/0.5/1 Watts).
- The Default is 1 Watt.

Set ID Setup

Set ID Lock

- Set the 'Set ID' item in **GENERAL** Menu whether to activate or not.
- Set to On (Work) or Off (Do Not Work).

Set ID

- Set the 'Set ID' of TV Set with 1~99.

Power Saving

Static Saving

- It is the item for setting the level to reduce the backlight control from the items for saving the consuming power, which is increased or decreased by 10 steps from 0 to 100. 100 makes the consuming power set to the same one from the TV. 0 reduces the consuming power to the minimum. The default value is 100.
 - The value displayed at the OSD is not changed and only the actual setting value is converted to percentage based on the static saving value to set.
 - 0 ~ 30: HIGH, 40 ~ 60: MID, 70 ~ 90: LOW, 100: OFF.

Keyless Off Hours

- Automatically TV will be turned off if there is no key input for the preset time period.
- When it is set to 'Enable', User Menu ⇒ **Timers** ⇒ **Auto Power Off** is disabled. (Depending on model)
- When it is set to 'Enable', User Menu ⇒ **Timers** ⇒ **2Hour Auto Power Off** is disabled. (Depending on model)

HCEC Setup

(Depending on model)

CEC Mode

(Depending on model)

- You will have 2 modes to choose [Default], [HCEC].
- If [Default] is selected, you can use SIMPLINK which is provided in LG TV. Also you can enable and disable SIMPLINK through SIMPLINK MENU.
- If [HCEC] is selected, you can use TVLink-HCEC Protocol. (For more detailed information, please refer to TVLink-HCEC Protocol document)

IR Decoding

- When 'IR Decoding' is set to 'Enable', the TV decodes and changes it into a CEC Message and sends it to Command via the HDMI CEC Line. The default value is Disable.

Device ID

- Sets the ID of a device(Logical Address) connected to the CEC Line. You can choose 'All' and from '0 x 01' to '0 x 0E' (All, 0 x 01 ~ 0 x 0e).
- The default value is 'All'.

StandBy

- Set the sending and receiving scenario of OpStandBy(0 x 0c) command.
- This detailed scenario is described on the table below.

	Send	Receive
Send Only	0	X
Receive Only	X	0
All	0	0
Off	X	X

HTNG Public Display Mode

- If you use following functions via TVLink-HCEC, HTNG Public Display Mode will be set as "Yes" automatically.
 - Power On Default, Start Volume, Maximum Volume, Minimum Volume, or Start Volume.
- Even if 'Public Display Settings Operation' is set as No, above settings are still effective.

Clock Setup

(Depending on model)

Clock Source

- You can select 'Off', 'TV', 'NTP', 'Admin'.
- NTP : Clock is synchronized using Network Time Protocol. It's only enabled when network cable is connected.
- Admin : It's automatically set to Admin when clock is updated by commercial protocols like TVLink-HCEC, TVLink-Interactive, or HCAP API.
- Off : Clock is synchronized using any available clock source.
- TV : Clock is synchronized using particular TV programme.
 - **Input** (Depending on model)
 - » You can select 'Input' according to 'Clock Source'.
 - » You can select 'RF' or 'IP' when Clock Source is 'Pro:Centric'.
 - » You can select TV source when Clock Source is 'TV'.
 - » Input is set to 'None', 'HCAP', 'Protocol', 'HTNG' automatically when Clock Source is 'Admin'.
 - **Timezone (City) / Timezone (Custom) / Timezone (Offset)** (Depending on model)
 - » In the case when there is difference between the time information received from the Teletext and the time of the current area, it can be set up to correct this. The initial value is 0, and it can be changed in the range of -12 Hrs ~ +14 Hrs. (Timezone (Offset) range is -12 Hrs ~ +12 Hrs)

Password Change

- To ensure more security, Password can be changed by installers' own design.
 - 1 Change password by using virtual keyboard.
 - 2 Input the password again for confirmation.

Lock Mode

- If 'Lock Mode' is 'Yes', the following features will be unavailable.

USB

- If it is set to 'Enable', USB devices do not work in relative features. (Exclude S/W update)

Factory Reset

- If it is set to 'Enable', User Menu ⇨ **General** ⇨ **Reset to Initial Settings** is disabled.

Crestron

(Depending on model)

- This function enables synchronization with applications provided by Crestron.
- Server: This menu sets the server's IP address for the network connection with the server. (equipment provided by Crestron)
- Port (1024~65535): This menu sets the port for the network connection with the server. The default port number is 41794.
- IP ID (3-254): This menu sets a unique ID for synchronizing with the application.

Welcome Video

(Depending on model)

Welcome Video Mode

- You can set to Off, Once or Repeat.

Video Download

- You can download video file from USB.
- Video file locate LG_DTV folder.

Reset

- Delete Downloaded video file.

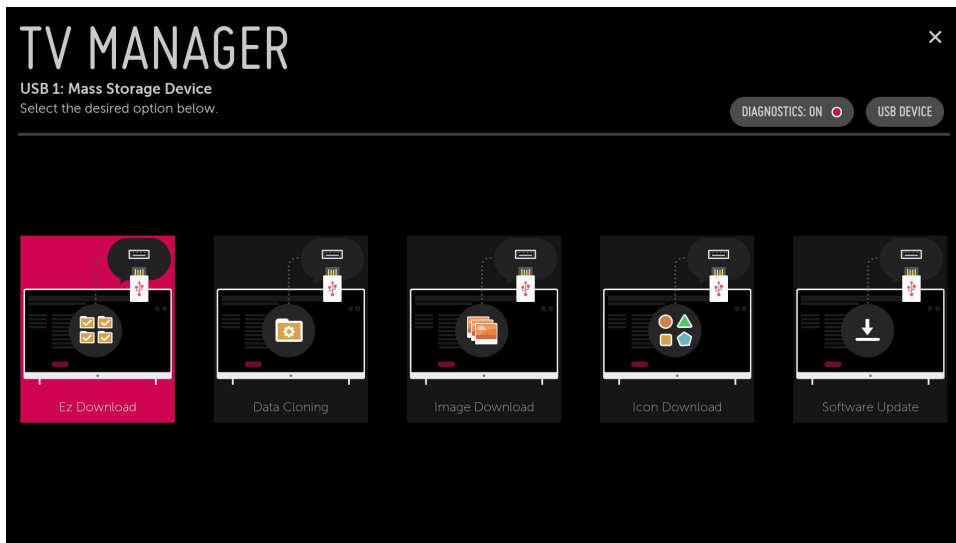
Operation

- The video displays after your TV is turned on and the boot logo appears.
- If Welcome Video is enabled and a video is downloaded on the TV, the video plays.
- The time it takes a video to be displayed may differ depending on the decoding time of the video.
- Controls for playing the video are not available. (Pause, stop, fast forward, etc.)
- Videos in any file format that the TV supports can be downloaded and displayed.

TV Manager

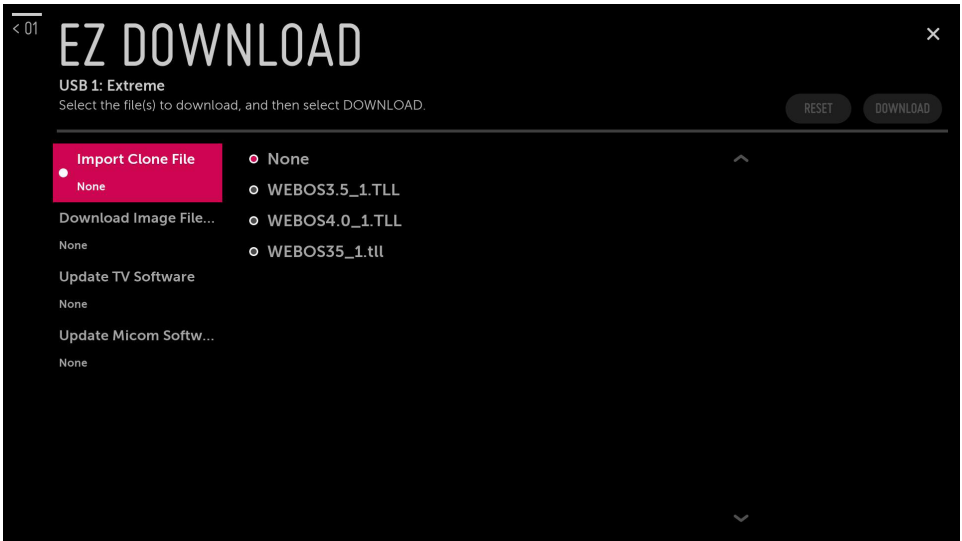
* Image shown may differ from your TV.

You can update files from USB to TV through the TV manager.



Ez Download

* Image shown may differ from your TV.

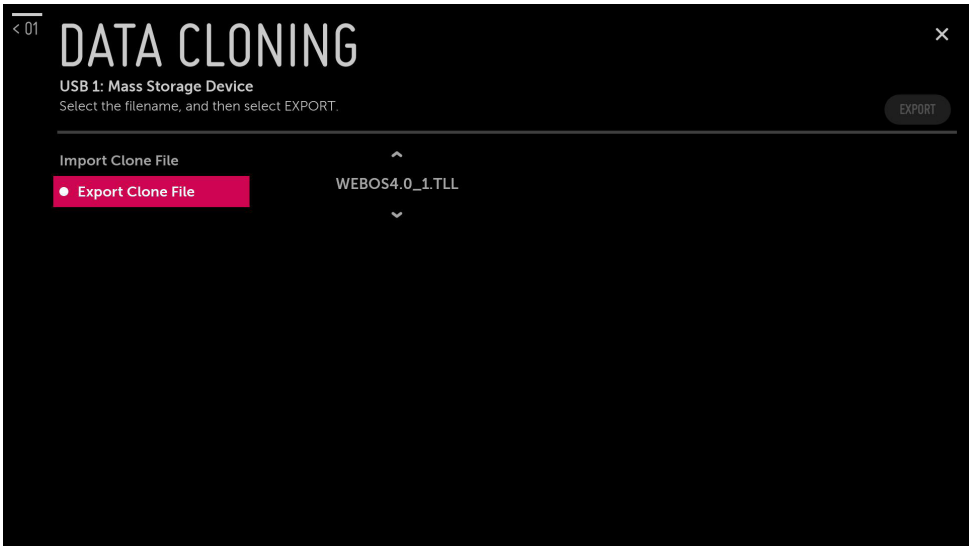


- Ez Download is a function that enables users to download the desired items all at once, such as EPK (software update file), TLL, Image, Micom.
 - Images and Software Update files should be copied into the folder named LG_DTV on the USB.
 - » TLL files should be copied to the root folder of the USB.
 - » If you press 'EZ Download' menu, EZ Download is launched.
 - » If .DZM file exist file will be selected previously download file.



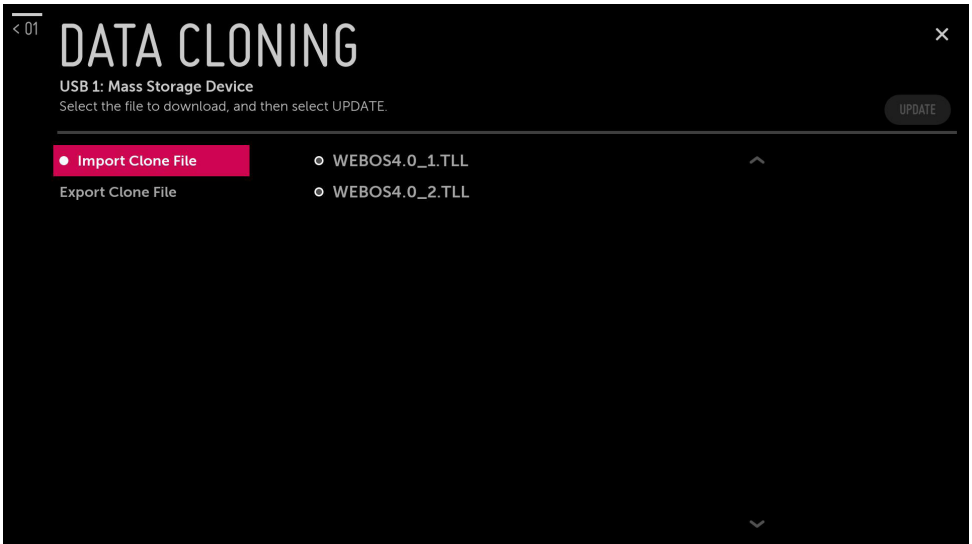
- If the DZM file is still in the USB after the download is complete:
An Ez Download pop-up window will appear and list the file types, such as EPK (software update file), TLL, Image, Micom with the previously downloaded lists checked automatically.

Export Clone File



- "Import Clone File" needs *.TLL file which is generated by "Export Clone File" process. While writing is in process, the user must not turn TV off nor unplug the USB memory card. The following reference images might be slightly different.

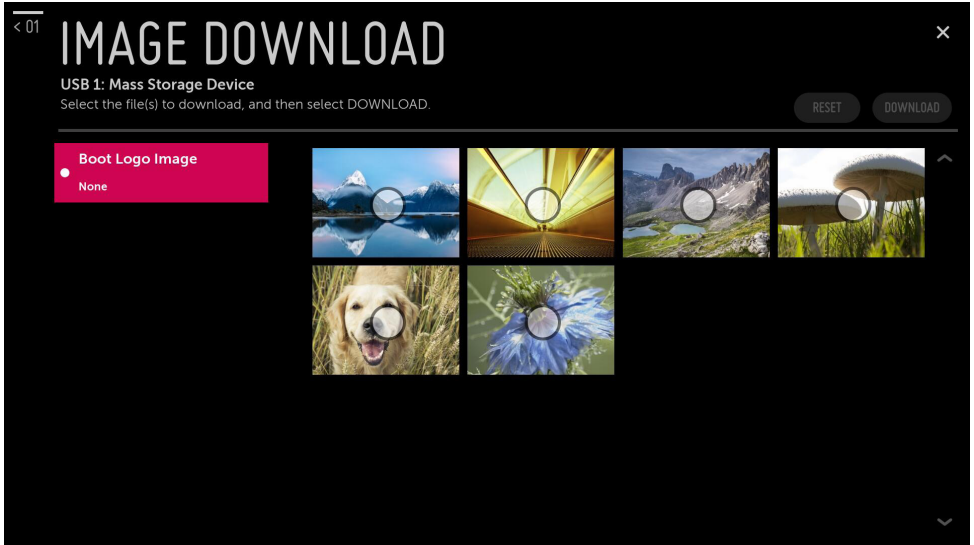
Import Clone File



- Once the internal TV data and its channel map information are written to the USB memory card, the user can start "Import Clone File" process with the data file generated and stored in USB memory card. The user should not turn TV off nor unplug the USB memory card while processing. The following reference images might be slightly different.

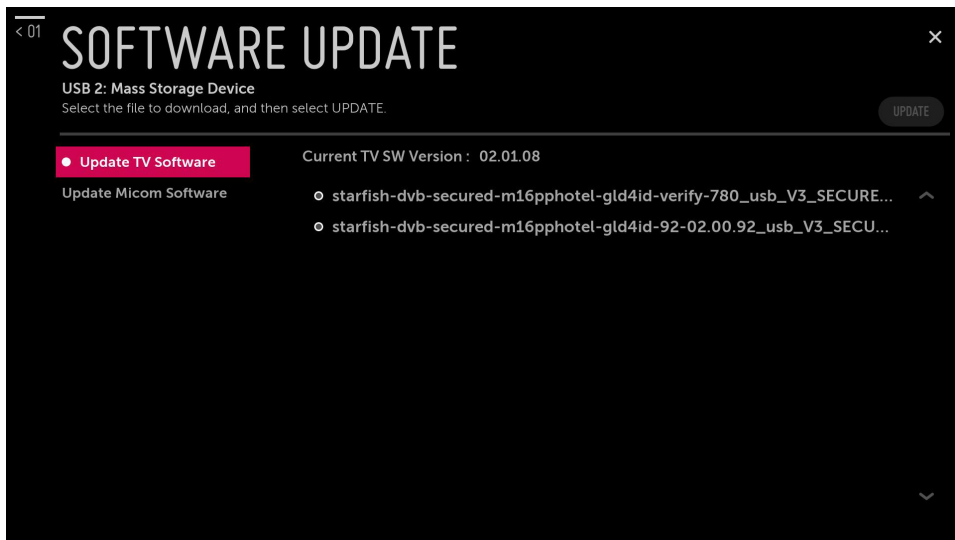
Image Download

* Image shown may differ from your TV.

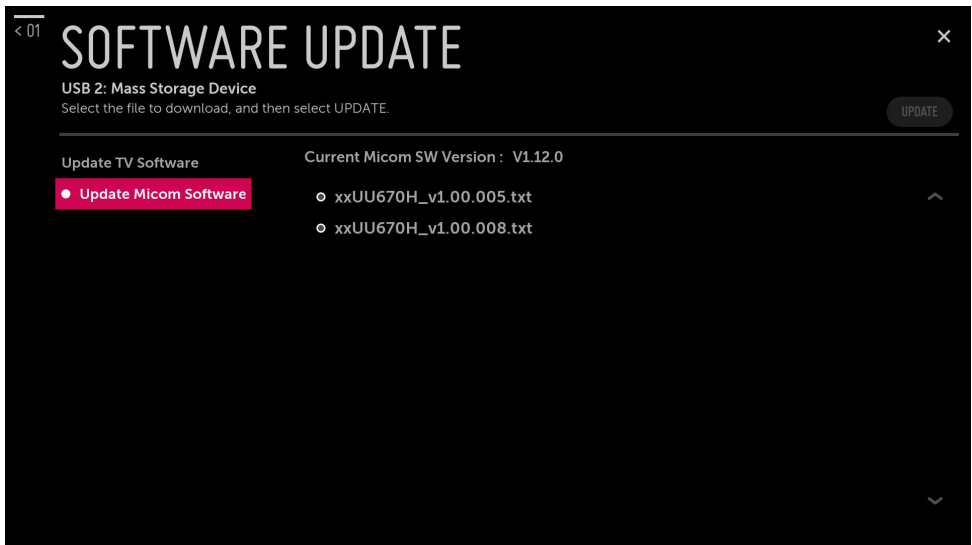


- If there are more than two USB Memory Device, It is possible to select the USB.
- The download sequence is Image Download ⇔ Select Image(s) ⇔ Download.
- The target files should be located in "LG_DTV" folder.
 - **Boot Logo Image**
 - » Boot Logo Image can download only one file.
 - » Boot Logo Image update function supports only JPG, JPEG, BMP format file of less than 8 MB filesize.
 - » We recommend you that splash image resolution match the TV's panel resolution.
 - » Max resolution of splash image : Full HD → 1920 x 1080, HD → 1360 x 768.
 - » Min resolution of splash image : 64 x 64.

► Update TV Software



- This feature updates TV software through the EPK file in USB.
- The target files should be located in "LG_DTV" folder.
- The download sequence is Software Update ⇒ Update TV Software ⇒ Select file(EPK) ⇒ UPDATE.



- This feature updates Micom software through the txt file in USB.
- The target files should be located in “LG_DTV” folder.
- The download sequence is Software Update ⇒ Update Micom Software ⇒ Select file(txt) ⇒ UPDATE.

USB Download Menu

USB Cloning

- An Installer can quickly set up and clone multiple TV sets at a property. These cloned TVs will all have the same Master TV Setup: Public Display Mode Installation Menu settings, User A/V settings and the Channel Map. This newer procedure significantly decreases the installation time that would be necessary if the standard RS-232C method were used instead.

1 Overview USB Cloning Procedure

: Commercial TVs have the capability to support cloning internal TV data and programme information with an external clone device called “USB Cloning”, in order to copy TV data accurately and quickly. The clone internal functions use slightly different internal processes for the two types of commercial TVs. However, the UI of cloning feature remains the same in both. Regarding the demands over the current cloning feature for quicker cloning, better portability and etc, we would like to announce the cloning process via USB port, named as USB Cloning. USB cloning process is divided into 2 main processes. One is writing the previously saved TV data into the TV, and one another is reading of current TV data into USB memory card. To avoid any confusion due to the words, it is clearly specified as “Import Clone File” and “Export Clone File” in the whole process.














2 Data To Be Cloned













: The data cloned are the same data cloned by previous USB Cloning. Details are explained in the following:

- TV data includes :
 - A. Installer Menu settings
 - B. Main menu settings (Audio, Picture etc)
- Analog / Digital Channel information includes:
 - A. Channel numbers
 - B. Channel label
 - C. Channel attributes including channel type, skipping status and etc.

IR Codes

- This feature is not available for all models.

Code (Hexa)	Function	Note
00	CH PAGE 	R/C Button
01	CH PAGE 	R/C Button
02	VOL 	R/C Button
03	VOL 	R/C Button
06		R/C Button
07		R/C Button
08	 (Power)	R/C Button
09	MUTE 	R/C Button
0B	INPUT 	R/C Button
1A	FLASHBK	R/C Button
0F	TV	R/C Button
10 - 19	Number Key 0 - 9	R/C Button
45	Q.MENU	R/C Button
28	 BACK	R/C Button
30	AV MODE	R/C Button
39	CAPTION	R/C Button
40		R/C Button
41		R/C Button
43	SETTINGS	R/C Button
44		R/C Button

Code (Hexa)	Function	Note
52	SOUND	R/C Button
61		R/C Button
63		R/C Button
71		R/C Button
72		R/C Button
79	RATIO 	R/C Button
4C	 LIST	R/C Button
5B	EXIT	R/C Button
0A	AUDIO	R/C Button
8E		R/C Button
8F		R/C Button
0E	SLEEP	R/C Button
AA	INFO 	R/C Button
B0		R/C Button
B1		R/C Button
BA		R/C Button
1E	FAV	R/C Button
4D	PICTURE	R/C Button
91	SAP/*	R/C Button

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

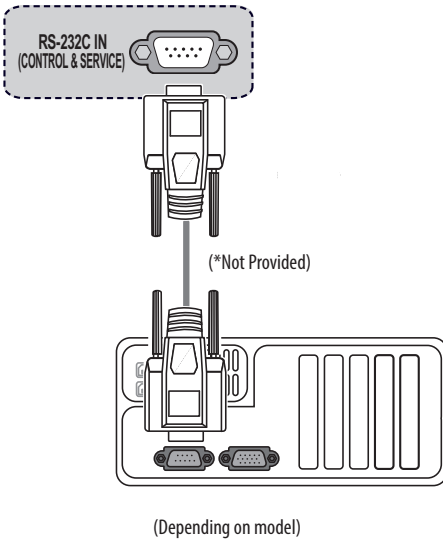
External control device Setup

RS-232C Setup

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

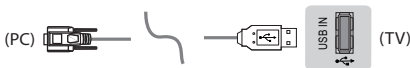
Connect the serial port of the control device to the RS-232C jack on the product back panel.

- RS-232C connection cables are not supplied with the product.



USB to Serial converter with USB Cable

USB Type



- LG TV supports PL2303 chip-based (Vendor ID : 0 x 0557, Product ID : 0 x 2008) 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.

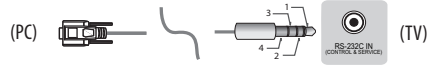
Phone jack Type

(Depending on model)

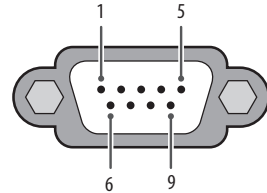
- You need to purchase the phone-jack to RS-232C cable required for the connection between the PC and the TV, which is specified in the manual.

* For other models, connect to the USB port.

* The connection interface may differ from your TV.



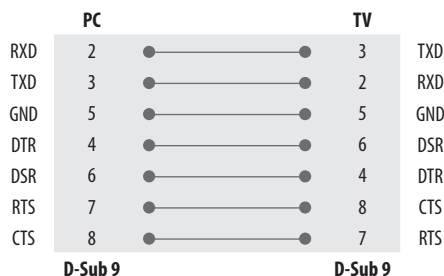
Type of Connector : D-Sub 9-Pin Male



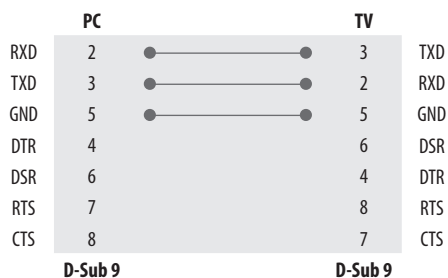
No.	Pin name
1	3.5 V
2	RXD (Receive data)
3	TXD (Transmit data)
4	IR OUT from TV
5	GND
6	No Connection
7	No Connection (5 V available in some models)
8	No Connection
9	No Connection (12 V available in some models)

RS-232C Configurations

7-Wire Configurations (Standard RS-232C cable)



3-Wire Configurations (Not standard)



IR OUT Using Guide

Suitable / Not Recommend remote-controller data format

Item	Formats
Suitable data format	NEC, RC5, Toshiba
Not recommend data format	Continuous data format (short burst/gap signal)

IR Receiver specifications

Carrier frequency	37.9 KHz
Peak Wavelength	940 nm
Minimum burst length	Min. 300 μ s
Minimum gap time is required of	Min. 350 μ s
Data word length	Max. 100 ms
Minimum gap time in the data stream is needed of	Min. 50 ms

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
High Level Out Pulse Width	T_{wh}	Burst Wave = 600 μ s	400	-	800	μ s
Low Level Out Pulse Width	T_{wl}	Period = 1.2 ms	400	-	800	μ s

Communication Parameters

- Baud rate: 9,600 bps (UART)
- Data length: 8 bits
- Parity : None
- Stop bit: 1 bit
- Communication code: ASCII text
- Use a crossed (reverse) cable.



- If not use the remote-controller with data formats recommended, IR output signals will be suppressed automatically by IR receiver.
- In this case, LG does not guarantee IR working function.
- To make sure of this matter, here are two methods as below.
 - Use the remote-controller with suitable data formats.
 - Use the IR dongle receiver of the set-top box.

Command Reference List

(Depending on model)

	COMMAND1	COMMAND2	DATA (Hexadecimal)
01. Power	k	a	00 to 01
02. Aspect Ratio	k	c	(page 27)
03. Screen Mute	k	d	(page 27)
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	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. Treble	k	r	00 to 64
14. Bass	k	s	00 to 64
15. Balance	k	t	00 to 64
16. Color Temperature	x	u	00 to 64
17. Equalizer	j	v	(page 29)
18. Energy Saving	j	q	00 to 05
19. Tune Command	m	a	(page 29)
20. Channel Skip/Add	m	b	00 to 01
21. Key	m	c	Key Codes
22. Control Backlight	m	g	00 to 64
23. Input select	x	b	(page 32)
24. Auto Configure	j	u	(page 32)

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

Transmission / Receiving Protocol

(Depending on Model)

Transmission

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

[Command1] : First command to control the TV. (j, k, m or x)

[Command2] : 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 is 1 to 99. When selecting Set ID '0', every connected set is controlled. Set ID is indicated as decimal (1 to 99) on menu and as Hexa decimal (0 x 0 to 0 x 63) on transmission/receiving protocol.

[Data] : To transmit command data. Transmit 'FF' data to read status of command.

[Cr] : Carriage Return

ASCII code '0 x 0D'

[] : ASCII code 'space (0 x 20)'

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
...

1 Power (Command: k a)

- ▶ To control power on or off of the set.

Transmission

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

Data 00 : Off

Data 01 : On

Ack

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

- ▶ To show TV is power on or *Off

Transmission

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

Ack

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

- * Similarly, if other functions transmit 'FF' data based on this format, Acknowledgement feedback presents status about each function.
- * OK Ack., Error Ack. and other message may display on the screen when TV is power on.

2 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 picture settings.

Transmission

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

Data 01 : 4:3 (Normal screen - Just Scan Off)

Data 02 : 16:9 (Wide screen - Just Scan Off)

Data 06 : Original (Just Scan Off)

Data 09 : Just Scan

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.

3 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

Data 01 : Screen mute on (Picture off)

Data 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.

4 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)

Data 01 : Volume mute off (Volume on)

Ack

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

5 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]

6 Contrast (Command: k g)

- ▶ To adjust screen contrast. You can also adjust contrast in the picture settings.

Transmission

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

Ack

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

7 Brightness (Command: k h)

- ▶ To adjust screen brightness. You can also adjust brightness in the picture settings.

Transmission

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

Data Min : 00 to Max : 64

Ack

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

8 Color (Command: k i)

- ▶ To adjust the screen color. You can also adjust colour in the picture settings.

Transmission

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

Data Min : 00 to Max : 64

Ack

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

9 Tint (Command: k j)

- ▶ To adjust the screen tint. You can also adjust colour in the picture settings.

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 settings.

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 : Off

Data 01 : 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 : Off

Data 01 : 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 operation is on, TV will not turn on by power on key of IR & Local Key.

13 Treble (Command: k r)

(Depending upon model)

- ▶ To adjust treble. You can also adjust Treble in the audio settings.

Transmission

```
[k][r][ ][Set ID][ ][Data][Cr]
```

Data Min : 00 to Max : 64

Ack

```
[r][ ][Set ID][ ][OK/NG][Data][x]
```

14 Bass (Command: k s)

(Depending upon model)

- ▶ To adjust bass. You can also adjust Bass in the audio settings.

Transmission

```
[k][s][ ][Set ID][ ][Data][Cr]
```

Data Min : 00 to Max : 64

Ack

```
[s][ ][Set ID][ ][OK/NG][Data][x]
```

15 Balance (Command: k t)

- ▶ To adjust balance. You can also adjust balance in the audio settings.

Transmission

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

Data Min : 00 to Max : 64

Ack

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

16 Color Temperature (Command: x u)

- ▶ To adjust colour temperature. You can also adjust color temperature in the picture settings.

Transmission

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

Data Min : 00 to Max : 64

Ack

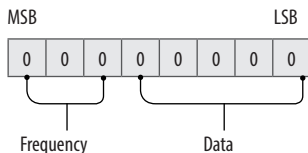
```
[u][ ][Set ID][ ][OK/NG][Data][x]
```

17 Equalizer (Command : j v)

- ▶ Adjust EQ of the set.

Transmission

```
[j][v][ ][Set ID][ ][Data][Cr]
```



7	6	5	Frequency	4	3	2	1	0	Step
0	0	0	1st Band	0	0	0	0	0	0(decimal)
0	0	1	2nd Band	0	0	0	0	1	1(decimal)
0	1	0	3rd Band
0	1	1	4th Band	1	0	0	1	1	19(decimal)
1	0	0	5th Band	1	0	1	0	0	20(decimal)

Ack

```
[v][ ][Set ID][ ][OK/NG][Data][x]
```

- * It depends on model, and can adjust when sound mode is EQ adjustable value.

18 Energy Saving (Command: j q)

(Depending upon model)

- ▶ To reduce the power consumption of the TV. You can also adjust energy saving in picture settings.

Transmission

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

Data 00 : Off

Data 01 : Minimum

Data 02 : Medium

Data 03 : Maximum

Data 04 : Auto

Data 05 : Screen off

Ack

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

19 Tune Command (Command: m a)

- * This command may work differently Depending upon 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]
```

- Analog Antenna/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 (Analog)

- 00 : Antenna TV (ATV)

- 80 : Cable TV (CATV)

- Digital Antenna/Cable/Satellite

[Data 00][Data 01] : Channel Data

Data 00 : High byte channel data

Data 01 : Low byte channel data

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

Data 02 : Input Source (Digital)

- 10 : Antenna TV (DTV)

- 20 : Antenna Radio (Radio)

- 40 : Satellite TV (SDTV)

- 50 : Satellite Radio (S-Radio)

- 90 : Cable TV (CADTV)

- a0 : Cable Radio (CA-Radio)

- Tune Command Examples:

01. Tune to the Analog antenna (PAL) Channel 10.

Set ID = All = 00
 Data 00 & 01 = Channel Data is 10 = 00 0a
 Data 02 = Analog Antenna TV = 00
 Result = ma 00 00 0a 00

02. Tune to the digital antenna (DVB-T) Channel 01.

Set ID = All = 00
 Data 00 & 01 = Channel Data is 1 = 00 01
 Data 02 = Digital Antenna TV = 10
 Result = ma 00 00 01 10

03. 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][][0][][Data 00][][Data 01][]

[Data 02][][Data 03][][Data 04][][Data 05][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.

- Analog Antenna/Cable

Data 00 : Physical Channel Number

- Antenna (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 (Analog)

- 00 : Antenna TV (ATV)

- 01 : Cable TV (CATV)

- Digital Antenna/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 : Antenna TV (DTV) – Use Physical Channel Number

- 06 : Cable TV (CADTV) – Use Physical Channel Number

- 22 : Antenna 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:

01. Tune to the Analog 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 = Analog Cable TV = 01
 Total = ma 00 23 00 00 00 00 01

02. Tune to the digital antenna (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 Antenna 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][][Data 00][][Data 01][][Data 02]

[][Data 03][][Data 04][][Data 05][Cr]

- Digital Antenna/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 : Antenna TV (DTV)

- 07 : BS (Broadcasting Satellite)

- 08 : CS1 (Communication Satellite 1)

- 09 : CS2 (Communication Satellite 2)

- Tune Command Examples:

01. Tune to the digital antenna (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 Antenna TV = 02
 Total = ma 00 00 00 11 00 01 02

02. 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]

20 Channel Skip/Add (Command: m b)

- ▶ To skip current channel for next time.

Transmission

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

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

Data 01 : Add

Ack

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

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

21 Key (Command: m c)

- ▶ To send IR remote key code.

Transmission

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

Data : Key code - page 23

Ack

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

22 Control Backlight (Command: m g)

- ▶ To control the backlight.

Transmission

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

Data Min : 00 to Max : 64

Ack

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

23 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

Data 01 : CADTV

Data 02 : Satellite DTV ISDB-BS (Japan)

Data 03 : ISDB-CS1 (Japan)

Data 04 : ISDB-CS2 (Japan)

Data 10 : ATV

Data 11 : CATV

Data 20 : AV or AV1

Data 21 : AV2

Data 40 : Component1

Data 41 : Component2

Data 60 : RGB

Data 90 : HDMI1

Data 91 : HDMI2

Data 92 : HDMI3

Data 93 : HDMI4

Ack

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

* This function depends on model and signal.

24 Auto Configure (Command: j u)

(Depending upon model)

- ▶ 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]
```

