



OWNER'S MANUAL

EXTERNAL CONTROL DEVICE SETUP

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

KEY CODES

- This feature is not available for all models.

Code (Hexa)	Function	Note	Code (Hexa)	Function	Note
00	CH +, PR +	R/C Button	53	List	R/C Button
01	CH -, PR -	R/C Button	5B	Exit	R/C Button
02	Volume +	R/C Button	60	PIP(AD)	R/C Button
03	Volume -	R/C Button	61	Blue	R/C Button
06	> (Arrow Key / Right Key)	R/C Button	63	Yellow	R/C Button
07	< (Arrow Key / Left Key)	R/C Button	71	Green	R/C Button
08	Power	R/C Button	72	Red	R/C Button
09	Mute	R/C Button	79	Ratio / Aspect Ratio	R/C Button
0B	Input	R/C Button	91	AD (Audio Description)	R/C Button
0E	SLEEP	R/C Button	9E	LIVE MENU	R/C Button
0F	TV, TV/RAD	R/C Button	7A	User Guide	R/C Button
10 - 19	* Number Key 0 - 9	R/C Button	7C	Smart / Home	R/C Button
1A	Q.View / Flashback	R/C Button	7E	SIMPLINK	R/C Button
1E	FAV (Favorite Channel)	R/C Button	8E	▶▶ (Forward)	R/C Button
20	Text (Teletext)	R/C Button	8F	◀◀ (Rewind)	R/C Button
21	T. Opt (Teletext Option)	R/C Button	AA	Info	R/C Button
28	Return (BACK)	R/C Button	AB	Program Guide	R/C Button
30	AV (Audio / Video) Mode	R/C Button	B0	▶ (Play)	R/C Button
39	Caption/Subtitle	R/C Button	B1	■ (Stop / File List)	R/C Button
40	∧ (Arrow Key / Cursor Up)	R/C Button	B5	RECENT	R/C Button
41	V (Arrow Key / Cursor Down)	R/C Button	BA	(Freeze / Slow Play / Pause)	R/C Button
42	My Apps	R/C Button	BB	Soccer	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	99	AutoConfig	R/C Button
4C	List, - (ATSC Only)	R/C Button	9F	App / *	R/C Button
4D	PICTURE	R/C Button	9B	TV / PC	R/C Button
52	SOUND	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.

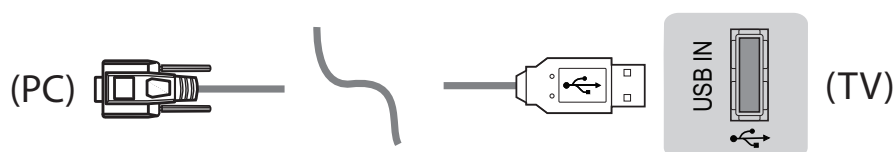
Connect the USB to Serial converter/RS-232C input jack to an external control device (such as a computer or an A/V control system) to control the product's functions externally.

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 RS232C Cable

DE9 (D-Sub 9pin) Type

- You need to purchase the RS-232C (DE9, D-Sub 9pin female-to-female type) to RS-232C cable required for the connection between the PC and the TV, which is specified in the manual.

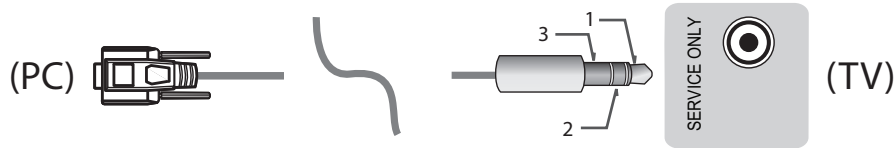


The connection interface may differ from your TV.

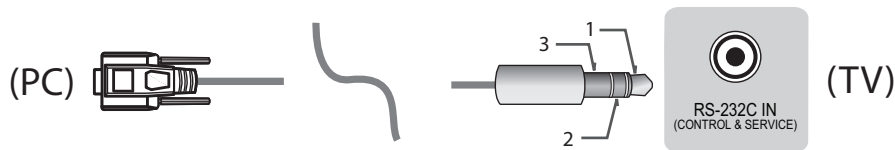
ENGLISH

Phone jack Type

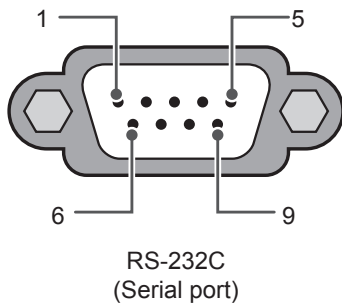
- You need to purchase the phone-jack to RS-232 cable required for the connection between the PC and the TV, which is specified in the manual.
- * For other models, connect to the USB port.
- * The connection interface may differ from your TV.



- or

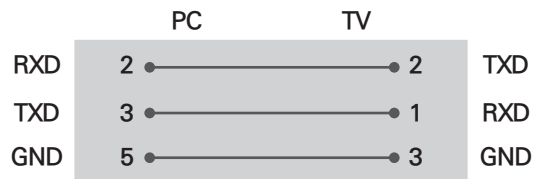


Customer Computer



RS-232C configurations

3-Wire Configurations(Not standard)



OR



D-Sub 9 Phone

Set ID

For Set ID number, see "Real Data Mapping" on p.6

1. Press **SETTINGS** to access the main menus.
2. Press the Navigation buttons to scroll to (***General** → **About this TV or OPTION**) and press **OK**.
3. Press the Navigation buttons to scroll to **SET ID** and press **OK**.
4. Scroll left or right to select a set ID number and select **CLOSE**. The adjustment range is 1-99.
5. When you are finished, press **EXIT**.
* (Depending on model)

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)		COMMAND1	COMMAND2	DATA (Hexadecimal)
01. Power*	k	a	00 to 01	15. Balance	k	t	00 to 64
02. Aspect Ratio	k	c	(p.7)	16. Color (Colour) Temperature	x	u	00 to 64
03. Screen Mute	k	d	(p.7)	17. ISM Method (Only Plasma TV)	j	p	(p.8)
04. Volume Mute	k	e	00 to 01	18. Equalizer	j	v	(p.8)
05. Volume Control	k	f	00 to 64	19. Energy Saving	j	q	00 to 05
06. Contrast	k	g	00 to 64	20. Tune Command	m	a	(p.9)
07. Brightness	k	h	00 to 64	21. Channel (Programme) Add/Del(Skip)	m	b	00 to 01
08. Color/ Colour	k	i	00 to 64	22. Key	m	c	Key Codes
09. Tint	k	j	00 to 64	23. Control Backlight, Control Panel Light	m	g	00 to 64
10. Sharpness	k	k	00 to 32	24. Input select (Main)	x	b	(p.11)
11. OSD Select	k	l	00 to 01	25. 3D (Only 3D models)	x	t	(p.11)
12. Remote Control Lock Mode	k	m	00 to 01	26. Extended 3D (Only 3D models)	x	v	(p.12)
13. Treble	k	r	00 to 64	27. Auto Configure	j	u	(p.12)
14. Bass	k	s	00 to 64				

* Note: During playing or recording media, all commands except Power (ka) and Key (mc) are not executed and treated as NG.
With RS232C cable, TV can communicate "ka command" in power-on or power-off status. but with USB-to-Serial converter cable, the command works only if TV is on.

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 to 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 *On or Off of the set.

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

Data 00 : Power Off 01 : *Power 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][Data][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 07 : 14:9
(4:3) (Europe, Colombia, Mid-East,
02 : Wide screen Asia except South Korea and
(16:9) Japan)
04 : Zoom 09 : * Just Scan
05 : Zoom 2 0B : Full Wide
(Latin America (Europe, Colombia, Mid-
except Colombia East, Asia except South
Only) Korea and Japan)
06 : Set by Program/ 10 to 1F : Cinema Zoom 1 to 16
Original 0c : 21:9 (Depending on model)

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]

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	1	20(decimal)

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

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

19. 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 (For LCD TV / LED TV) / Intelligent sensor (For PDP TV)
- 05 : Screen off

* (Depending on model)

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

20. 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]

* 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 Channel data

Data 01 : Low 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:

1. 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**

2. 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**

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][][0][][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.

* 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 Physical/Major Channel Number Only (One Part Channel)

- 66 : 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 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**

2. 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][][Data00][][Data01]

[][Data02][][Data03][][Data04][][Data05][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:

1. 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**

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]

21. 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.

22. Key (Command: m c)

- ▶ To send IR remote key code.

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

Data Key code - p.2.

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

23. Control Backlight (Command: m g)

- For LCD TV / LED TV

- ▶ 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]

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]

24. 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	10 : ATV
	ISDB-BS (Japan)
03 : ISDB-CS1 (Japan)	
04 : ISDB-CS2 (Japan)	
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.

25. 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]

* (Depending on model)

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)

* [Data 02], [Data 03] functions depend on model and signal.

* 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 00 (3D On) or 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	O
01	X	X	X
02	X	X	X
03	X	O	O

X : don't care

Ack [t][][Set ID][][OK][Data00][Data01][Data02]

[Data03][x]

[t][][Set ID][][NG][Data00][x]

26. 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)

* This option works when 3D Mode (Genre) is manual only.

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 2D 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 | 01 : Sport |
| 02 : Cinema | 03 : Extreme |
| 04 : Manual | 05 : Auto |

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

[v][][Set ID][][NG][Data00][x]

27. Auto Configure (Command: j u) (Depending on 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 Auto Configure

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

Network IP Control

(For USA only)

How to connect

1. Connect your TV to a wired or wireless network.
2. Press and hold the  (Settings) button on the remote control for at least 5 seconds on the Live TV screen. Once the Live TV channel banner appears at the top of the screen, enter 828 and press the OK button to enter the 'IP Control Setup' menu.
 - * The 3-digit password (default password: 828) can be changed using Password Change.
3. After entering the 'IP Control Setup' menu, set the 'Network IP Control' submenu to 'On'. The reboot popup window will appear. Select 'Yes' to reboot your TV.
 - * Set to 'Off' when the feature is not in use.

4. Open a terminal program (e.g. putty, teraterm) on a computer and connect to your TV with your TV's IP address through telnet service and the port number 9761 as shown below.

```
ex) username : ~$ telnet 10.186.119.107 9761
```

5. If the connection is successful, the following message will appear. Or if 'NG' appears when you press Enter, the connection has been established.

```
Trying 10.186.119.107...
```

```
Connected to 10.186.119.107.
```

```
Escape character is '^ ]'.
```

6. Enter a command like the example shown below and press Enter.

```
VOLUME_MUTE on
```

7. If the command has been successfully entered, 'OK' will appear. If not, 'NG' will appear.

8. To exit the program, enter 'quit' and press Enter. Then, the following message will appear.

```
quit
```

```
Connection closed by foreign host
```

- * Power ON through WOL(Wake On Lan)

You can turn on the TV, after setting the 'Mobile TV On' submenu(Setting > Mobile TV On) to 'On' and installing the app related with WOL(Wake On Lan) through iOS or Google Play on your mobile phone.

Command reference list

	COMMAND	NOTE
01. Power	POWER off	ex) POWER off
02. Aspect Ratio	ASPECT_RATIO [4by3 / 16by9 / setbyoriginal]	ex) ASPECT_RATIO 4by3
03. Screen Mute	SCREEN_MUTE [screenmuteon / videomuteon / allmuteoff]	ex) SCREEN_MUTE screenmuteon
04. Volume Mute	VOLUME_MUTE [on / off]	ex) VOLUME_MUTE on
05. Volume Control	VOLUME_CONTROL [0 to 100]	0 to 100 (Decimal) ex) VOLUME_CONTROL 15
06. Contrast	PICTURE_CONTRAST [0 to 100]	0 to 100 (Decimal) ex) PICTURE_CONTRAST 50
07. Brightness	PICTURE_BRIGHTNESS [0 to 100]	0 to 100 (Decimal) ex) PICTURE_BRIGHTNESS 50
08. Color/Colour	PICTURE_COLOUR [0 to 100]	0 to 100 (Decimal) ex) PICTURE_COLOUR 50
09. Tint	PICTURE_TINT [0 to 100]	0 to 100 (Decimal) ex) PICTURE_TINT 50
10. Sharpness	PICTURE_SHARPNESS [0 to 50]	0 to 50 (Decimal) ex) PICTURE_SHARPNESS 25
11. OSD Select	OSD_SELECT [on / off]	ex) OSD_SELECT on
12. Remote Control Lock Mode	REMOTECONTROLER_LOCK [on / off]	ex) REMOTECONTROLER_LOCK on
13. Balance	AUDIO_BALANCE [0 to 100]	0 to 100 (Decimal) ex) AUDIO_BALANCE 50
14. Color(Colour) Temperature	PICTURE_COLOUR_TEMPERATURE [0 to 100]	0 to 100 (Decimal) ex) PICTURE_COLOUR_TEMPERATURE 50
15. Equalizer	AUDIO_EQUALIZER [1 to 5] [0 to 20]	1 to 5(Frequency band) 0 to 20(Step decimal) * Precondition : All settings > sound > sound mode settings > Equalizer on ex) AUDIO_EQUALIZER 2 10
16. Energy Saving	ENERGY_SAVING [screenoff / maximum / medium / minimum / off]	ex) ENERGY_SAVING screenoff
17. Tune Command	CHANNEL_SETTING_ATSC_ATV [Channel Number] antenna CHANNEL_SETTING_ATSC_ATV [Channel Number] cable CHANNEL_SETTING_ATSC_DTV [Channel Number] cablemaj	ex) CHANNEL_SETTING_ATSC_ATV 11 antenna
	CHANNEL_SETTING_ATSC_DTV [Maj. Channel Number] [Min.Channel Number] antennanotphy CHANNEL_SETTING_ATSC_DTV [Maj. Channel Number] [Min.Channel Number] cablenotphy	ex) CHANNEL_SETTING_ATSC_DTV 10 2 antennanotphy
18. Channel(Programme) Add/Del	CHANNEL_ADD_DELETE [add / delete]	ex) CHANNEL_ADD_DELETE add

	COMMAND	NOTE
19. Key	KEY_ACTION [exit / channelup / channeldown / volumeup / volumedown / arrowright / arrowleft / volumemute / deviceinput / sleepreserve / livetv / previouschannel / favoritechannel / teletext / teletextoption / returnback / avmode / captionssubtitle / arrowup / arrowdown / myapp / settingmenu / ok / quickmenu / videomode / audiomode / channellist / bluebutton / yellowbutton / greenbutton / redbutton / aspectratio / audiodescription / programmorder / userguide / smarthome / simplelink / fastforward / rewind / programinfo / programguide / play / slowplay / soccerscreen / record / 3d / autoconfig / app / screenbright / number0 / number1 / number2 / number3 / number4 / number5 / number6 / number7 / number8 / number9]	ex) KEY_ACTION ok
20. Control Backlight	PICTURE_BACKLIGHT [0 to 100]	0 to 100 (Decimal) * Precondition : All settings > picture > Energy Saving off ex) PICTURE_BACKLIGHT 50
21. Input select	INPUT_SELECT [dtv / atv / cadtv / catv / avav1 / component1 / hdmi1 / hdmi2 / hdmi3]	ex) INPUT_SELECT dtv
22. 3D (only 3D models)	PICTURE_3D [off / 3dto2d]	ex) PICTURE_3D off
	PICTURE_3D 2dto3d [righttoleft / lefttoright] [0 to 20]	ex) PICTURE_3D 2dto3d righttoleft 10
	PICTURE_3D on [topandbottom / sidebyside / checkboard / framesequential / columninterleaving / rowinterleaving] [righttoleft / lefttoright] [0 to 20]	ex) PICTURE_3D on topandbottom righttoleft 0

	COMMAND	NOTE
23. Extended 3D (only 3D models)	PICTURE_3D_EXTENSION picturecorrection [0 / 1]	0 : Right to Left 1 : Left to Right * Precondition : 1) PICTURE_3D on X X X ex) PICTURE_3D_EXTENSION picturecorrection 0
	PICTURE_3D_EXTENSION [colorcorrection / sound] [0 / 1]	0 : off 1 : on * Colorcorrection, Sound Precondition : 1) PICTURE_3D on X X X Colorcorrection ex) PICTURE_3D on topandbottom righttoleft 0 PICTURE_3D_EXTENSION colorcorrection 1 Sound ex) PICTURE_3D on topandbottom righttoleft 0 PICTURE_3D_EXTENSION sound 1
	PICTURE_3D_EXTENSION normal [0 / 1]	0 : off 1 : on * Precondition : 1) PICTURE_3D on X X X ex) PICTURE_3D_EXTENSION normal 0
	PICTURE_3D_EXTENSION [depth / viewpoint] [0 to 20]	0 to 20 : Viewpoint range * Depth precondition : 1) PICTURE_3D 2dto3d X X 2) PICTURE_3D_EXTENSION genre 4 * Viewpoint precondition : 1) PICTURE_3D 2dto3d X X Depth ex) PICTURE_3D 2dto3d righttoleft 0 PICTURE_3D_EXTENSION genre 4 PICTURE_3D_EXTENSION depth 0 Viewpoint ex) PICTURE_3D 2dto3d righttoleft 0 PICTURE_3D_EXTENSION viewpoint 0
	PICTURE_3D_EXTENSION genre [0 to 5]	0 : Standard / 1 : Sport / 2 : Cinema / 3 : Extreme / 4 : Manual / 5 : Auto * Precondition : 1) PICTURE_3D 2dto3d X X ex) PICTURE_3D_EXTENSION genre 2

* This feature is varied based on the model.

* During playing or recording media, all commands except Power and Key commands are not executed and treated as NG.