Using RS-232C to SVC Port

	Command 1	Command 2	Data
01. Power	k	a	00H - 01H
02. Input Select	k	b	02H - 09H
03. Aspect Ratio	k	c	01H - 09H
04. Screen Mute	k	d	00H - 01H
05. Volume Mute	k	e	00H - 01H
06. Volume Control	k	f	00H - 64H
07. Contrast	k	g	00H - 64H
08. Brightness	k	h	00H - 64H
09. Color	k	i	00H - 64H
10. Tint	k	j	00H - 64H
11. Sharpness	k	k	00H - 64H
12. OSD Select	k	l	00H - 01H
13. Remote Lock/ key Lock	k	m	00H - 01H
14. Balance	k	t	00H - 64H
15. Color Temperature	k	u	00H - 03H
16. Abnomal state	k	z	FFH
17. ISM mode	j	p	00H - 08H
18. Auto configuration	j	u	01H
19. Key	m	c	Key Code
20. Tile Mode	d	d	00H - 44H
21. Tile H Size	d	g	00H - 64H
22. Tile V Size	d	h	00H - 64H
23. Tile ID Set	d	i	00H - 10H
24. Elapsed time return	d	l	FFH
25. Temperature value	d	n	FFH
26. Lamp fault check	d	p	FFH

- DB9 Pin 3 to 3.5mm Tip
- DB9 Pin 2 to 3.5mm Ring
- DB9 Pin 5 to 3.5mm Sleeve

LG TV Commands

Description	Command
Power ON	ka 01 01
Power OFF	ka 01 00
Energy Saving - OFF	jq 01 00
Energy Saving - Minimum	jq 01 01
Energy Saving - Medium	jq 01 02
Energy Saving - Maximum	jq 01 03

Energy Saving - Auto	jq 01 04
Energy Saving - Screen Off	jq 01 05
Input Select - DTV Antenna	xb 01 00
Input Select - DTV Cable	xb 01 01
Input Select - Analog Antenna	xb 01 10
Input Select - AV or AV1	xb 01 20
Input Select - AV2	xb 01 21
Input Select - Component or Component1	xb 01 40
Input Select - Component2	xb 01 41
Input Select - RGB-PC	xb 01 60
Input Select - HDMI1	xb 01 90
Input Select - HDMI2	xb 01 91
Input Select - HDMI3	xb 01 92
Input Select - HDMI4	xb 01 93
Aspect Ratio - 4:3	kc 01 01
Aspect Ratio - 16:9	kc 01 02
Aspect Ratio - Zoom	kc 01 04
Aspect Ratio - Set by Program	kc 01 06
Aspect Ratio - Just Scan	kc 01 09
Aspect Ratio - Cinema Zoom 1	kc 01 10
Screen Mute - OFF	kd 01 00
Screen Mute - ON	kd 01 01
Video Out Mute on	kd 01 10
Volume - Mute ON	ke 01 00
Volume - Mute OFF	ke 01 01
Volume Control [Adjust 00 - 64 Hex]	kf 01 00
Volume - Relative UP	mc 01 02
Volume - Relative DOWN	mc 01 03
Picture - Contrast [Adjust 00 - 64 Hex]	kg 01 00
Picture - Brightness [Adjust 00 - 64 Hex]	kh 01 00
Picture - Color [Adjust 00 - 64 Hex]	ki 01 00
Picture - Contrast [Adjust 00 - 64 Hex]	kk 01 00
Picture - Color Temperature [Adjust 00 - 64 Hex]	xu 01 00
OSD (On Screen Display) - OFF	kl 01 00
OSD (On Screen Display) - ON	kl 01 01
Remote Control Lock - OFF	km 01 01
Remote Control Lock - ON	km 01 00
Audio - Treble Adjust [Adjust 00 - 64 Hex]	kr 01 00
Audio - Bass Adjust [Adjust 00 - 64 Hex]	ks 01 00
Audio - Balance Adjust [Adjust 00 - 64 Hex]	kt 01 00

RS-232C DB9 Pins

1. No connection
2. RXD (Receive data) DCE/Modem — 3.5mm Ring
3. TXD (Transmit Data) DTE/PC — 3.5mm Tip
4. DTR (DTE side ready)
5. GND — 3.5mm Sleeve
6. DSR (DCE side ready)
7. RTS (Ready to send)
8. CTS (Clear to send)
9. No Connection

PuTTY Hexidecimal Settings

Baud Rate : 9600bps (UART)
Data Length : 8bits
Parity Bit : None
Stop Bit : 1bit
Flow Control : None
Communication Code : ASCII code

Do not use UTF-8 to send hexadecimal characters.

Character Translation needs to be CP437, ISO-8859-1, or Windows-1252, i.e. "ASCII".

Universal Asynchronous Receiver Transmitter (UART)

- "Start Bit" has a value of 0 (a Space)
- "Stop Bit" has value of 1 (a Mark).

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

[Cr]: Carriage Return ASCII code ‘0x0D’

[ ]: ASCII code Space (0x20)’

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

AV controllers

- AMX
- Crestron
- Extron
- Kramer
- Contemporary Research

ATS *ActivateTheSpace.freshdesk.com* Serial Control Command Strings for LG TVs

Samsung RS232 Users Guide

Voltage

Range from -25 (1 | true) to +25 (0 | false). Zero (0) volts is idle. Nominal is +-12 volts, however USB adapters only put out 0 to 5 volts.

As little as +- 3 volts will work depending on the distance and noise.

USB is limited to 5v x 500mA = 2.5. Watts

CommandFusion iViewer for Android github.com/CommandFusion/LG-TV-RS232

https://github.com/suan/libLGTV_serial Python

Null Modem Control Cable? Yes between laptops, but not between laptop & TV

ncpa.cpl Network Connection Panel Control Panel

appwiz.cpl Control Panel\Programs\Programs and Features

devmgmt.msc Device Management Microsoft Console

desk.cpl display

Windows Command Line COM Config

```
C:\Users\Jefe>mode com10

Status for device COM10:
------------------------
    Baud:            1200
    Parity:          None
    Data Bits:       7
    Stop Bits:       1
    Timeout:         OFF
    XON/XOFF:        OFF
    CTS handshaking: OFF
    DSR handshaking: OFF
    DSR sensitivity: OFF
    DTR circuit:     ON
    RTS circuit:     ON
```

Setting MODE using the command prompt `cmd` is an alternative to `devmgmt.msc` » Properties » Port Settings

MODE COM10:9600,N,8,1,P the P means XON/XOFF on

MODE COM10 BAUD=9600 PARITY=N DATA=8 STOP=1 ODSR=OFF OCTS=OFF TO=OFF DTR=OFF XON=OFF RTS=OFF

MODE COM9 BAUD=9600 PARITY=N DATA=8 STOP=1 ODSR=OFF OCTS=OFF TO=OFF DTR=OFF XON=OFF RTS=OFF

STOP = 1 | 1.5 | 2 *end of character bits*

Parity = none | even | odd | mark | space

Time Out (TO) = on | off

On Data Set Ready (ODSR) = on | off

Data Set Ready Sensitivity (IDSR) = on | off

On Clear To Send (OCTS) = on | off

Transmit ON (XON) = on | off

Data Terminal Ready (DTR) = on | off | hs *handshake*

Request To Send (RTS) = on | off | hs | tg *handshake | toggle*

Handshaking: XON/XOFF vs RTS/CTS

XON/XOFF is “In band” "software flow control”.
• Pause Transmission `Ctrl` `S` x13
• Resume Transmission `Ctrl` `Q` x11

Compare XON/XOFF to “out-of-band” hardware control using Pins 7 RTS request-to-send & 8 CTS clear-to-send.

a value of 1 is called a **Mark** and a value of 0 is called a **Space**. When a communication line is idle, the line is said to be “Marking”, or transmitting continuous 1 values.

When there is no electricity present on the data circuit, the line is considered to be sending Break.

RS-422 & RS-485

RS422 & RS485 also use the DB9 connector, but instead of a common reference ground they use differential balanced signaling. RS-232 uses a common ground for transmit and receive.

Command Line - not PuTTY

`echo "hello world" > com9` sends extra 3-characters: space, carriage return and new line.

`set /p x="hello" <nul >\\.\COM9` avoids the extra three characters. “/p” is a prompt to the user, but input is redirected by < which is redirected to skip getting more input “nul”. Output to Com9

Ctrl-Z
\x1a is end-of-file.

Hex \x0A is Line Feed (LF).
Hex \x0D is Carriage Return (CR).
\x00 = NUL.
\x01 = Start of Heading (SOH).
\x30 = 0.
\x31 = 1.

Create a Batch File
cd \Users\Jefe\Downloads
SerialSend.exe /baudrate 9600 /devnum 9 /hex "ka 0 \x01\x00\x0D"

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LG.com/us/tvs/lg-49LH570A-led-tv

SVC Settings 9600, 8,N,1

P-On

ka\x201\x201

P-Off

ka\x201\x200

Vol +

mc\x201\x202

Vol -

mc\x201\x203

Mute

mc\x201\x209

HDMI 1

kb\x201\x208

HDMI 2

kb\x201\x209

AV 1

kb\x201\x202

AV2

kb\x201\x203

Component 1

kb\x201\x204

Component 2

kb\x201\x205

PC

kb\x201\x207

RCA RCRPS04GR Universal Remote

4 Devices

TV
Audio/Aux Receiver
Satellite Cable Stream
DVD·VCR

Programming

1. Turn Device On.
2. Press and hold the remote's Device button and the Power button at the same time until the Power light in the power button stays lit.
3. Enter Vendor Code
4. Press red Guide button to cycle through vendor's set of codes. When device turns off that is a potential set of codes. Push Power button to see if device turns back on.
5. Verify all buttons work as expected for the Device (volume, channel, inputs). If not, then redo the above process, going to the next set of codes by pushing the Guide one more time than you did in step 4.

Vendor Code

TV — LG · 05
Audio·Aux Receiver — Pioneer · 06
Satellite Cable Stream — Dish Network · 04
DVD·VCR — Sony Blu-Ray · 12 | *does not work*