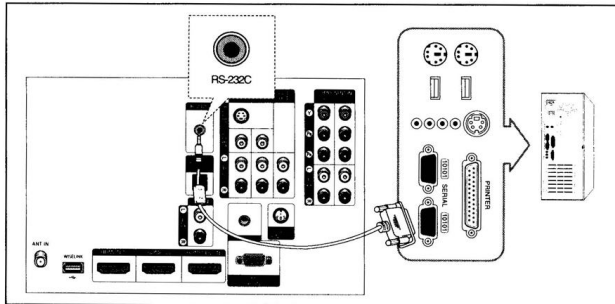


# Procedures for Controlling a DLP DTV using an RS-232C Connection

## Connect the DLP DTV using the serial port.



- ⚠ Do not disconnect or connect the RS-232C cable while the Computer or the DLP TV is operating. It may cause serious damage to the Computer or the DLP TV.
- ⚠ If the PC is not properly configured, the RS-232C connection may not work properly. For further details, refer to the Computer's product documentation.

## Serial Port Settings (Select Standard RS232)

<b>Specification</b>	RS-232C
<b>Bit Rate</b>	9600 bps
<b>Data Bits</b>	8 bits
<b>Parity</b>	None
<b>Stop Bits</b>	1 bit
<b>Flow Control</b>	None

## Serial Communication Protocol

### Command Packet Structure [7byte]

0x08	0x22	Cmd1	Cmd2	Cmd3	Value	CS
------	------	------	------	------	-------	----

- ◆ A command packet consists of 7 bytes in total.
- ◆ The two bytes **0x08** and **0x22** signify that the packet is for serial communication.
- ◆ The following 4 bytes represent a pre-defined command that can be defined by the user.
- ◆ The last byte is the checksum which checks the validity of the current packet.

**Header [2 Byte]:** Pre-defined values fixed to 0x08 and 0x22.

**Cmd1 [1 Byte]:** The first value of the code defined in the command list (Hexadecimal)

**Cmd2 [1 Byte]:** The second value of the code defined in the command list (Hexadecimal)

**Cmd3 [1 Byte]:** The third value of the code defined in the command list (Hexadecimal)

**Value [1 Byte]:** Input parameter for the command (Default: 0) (Hexadecimal)

**CS [1 Byte]:** Checksum (the 2's complement of the sum of all the values except for the CS value.)

### Response Packet Structure [3 Byte]

◆ Success			◆ Fail		
0x03	0x0C	0xF1	0x03	0x0C	0xFF

When the received packet from an external device has a valid value, a Success packet is sent. Otherwise, a Fail packet is sent.

#### A Fail packet is sent if:

- ◆ The received packet length is not equal to 7 bytes.
- ◆ The 2 byte packet header value is not equal to 0x08, 0x22.
- ◆ The check sum is incorrect.

#### Failure detection by an external device

An external device classifies the packet as Fail if it does not receive a Success packet within 100ms.

## Communication Sequence

- ◆ **PC**  
Creates a command packet and sends it through RS232C.
- ◆ **DLP DTV**  
Receives a packet and parses the packet.  
Determines whether it is a success or fail, and transmits the Ack packet to the PC.  
Controls the DLP DTV with the parsed command.
- ◆ **PC**  
Waits for the Ack packet.  
Prepares the next command, if a Success packet arrives immediately.

# Procedures for Controlling a DLP DTV using an RS-232C Connection

## Example

In this example, let's analyze the message of the communication protocol.

To change the Contrast of the screen mode to 90, you have to define a packet as follows.

First, find the Contrast command from the Command List.

Find 0x0B for PICTURE.

Find 0x02 for CONTRAST.

Find 0x00 for CONTRAST.

Finally, insert the desired value 90 into the 4-byte data.

Insert the header values 0x08 and 0x22, calculate and insert the check sum and send the packet to the DLP DTV.

e.g.) PICTURE / MODE / CONTRAST (90) CS= ~(08+22+0B+00+01+5A)+1

0x08	0x22	0x0B	0x02	0x00	0x5A	0x70
------	------	------	------	------	------	------

If the DLP DTV receives, analyzes and parses the packet successfully, it transmits a Success packet to the PC.

0x03	0x0C	0xF1
------	------	------

Control Item		Cmd1	Cmd2	Cmd3	Value										
General	Power	0x00	0x00	0x00	0x00										
					0x01										
					0x02										
	Volume	0x01	0x00	0x00	0x00	0x00 (0~100)									
						0x01									
						0x02									
	Mute	0x02	0x00	0x00	0x00	0x00									
						0x01									
	Ch.	Continuous	0x03	0x00	0x00	0x00									
						Up Down									
Input	Source List	0x0a	0x00	0x00	0x00										
					TV										
					AV										
					S-Video										
					Component										
					PC										
					HDMI										
					HDMI3/DVI										
					Dynamic										
					Standard										
Mode	0x00	0x00	0x00	0x01											
Movie	0x02	0x00	0x00	0x01											
Contrast	0~100	0x02	0x00	0x00											
Brightness	0~100	0x03	0x00	0x00											
Sharpness	0~100	0x04	0x00	0x00											
Color	0~10	0x05	0x00	0x00											
Tint	G/R	0x07	0x00	0x00											
Detailed Settings	Black Adjust	0x0b	0x09	0x00	0x00										
					Off										
					Low										
					Medium										
					High										
	Dynamic Contrast				Off										
					Low										
					Medium										
					High										
					Gamma										
Edge Enhancement	Off														
xvYCC	On														
xvYCC	On														
White Balance(DLP)	-10~10														
Picture Option	Color Tone	0x0a	0x0a	0x00	0x00										
					Cool1										
					Normal										
					Warm1										
					Warm2										
	Size				16:9										
					Zoom1										
					Zoom2										
					Wide Fit										
					4:3										
Picture Option	Just Scan														
	Wide TV(PC)														
	Wide PC(PC)														
	0x01														
	0x08														
PICTURE	Picture Option	0x0b	0x0a	0x0b	0x00										
					Cool2										
					Cool1										
					Normal										
					Warm1										
					Warm2										
					16:9										
					Zoom1										
					Zoom2										
					Wide Fit										
					4:3										
					Just Scan										
					Wide TV(PC)										
					Wide PC(PC)										
					Off										
					Low										
					Medium										
					High										
					Auto										
					DNie										
					Off										
					On										
					HDMI Black Level										
					Normal										
					low										
					Off										
					On										
					Film Mode										
					Off										
					On										
Color Gamut															
Normal															
sRGB															
Sound	Mode	0x0c	0x00	0x00	0x00										
					Standard										
					Music										
					Movie										
					Speech										
					Custom										
					Equalizer	Mode	0x01	0x00	0x00	0x00					
										Standard					
										Music					
										Movie					
										Speech					
										Custom					
										SRS TruSurround XT	Balance	0x01	0x00	0x00	0x01 (0~100)
															100hz
															300hz
															1khz
					3khz										
					10khz										
					Reset										
					Off										
					On										
					Preferred Language	English	0x03	0x00	0x00						0x00
										Spanish					
										French					
										Mono					
										Stereo					
					Multi-Track Sound	SAP	0x04	0x00	0x00	0x00					
										Off					
										On					
										Off					
On															
Auto Volume	Off	0x05	0x00	0x00	0x00										
					On										
					Off										
					On										
					Off										
TV Speaker	On	0x06	0x00	0x00	0x01										
					0x02										
					0x03										
					0x04										
					0x08										

