RM5501K/RM6501K/RM7501K/RM8601K
RS232/LAN Protocol Installation Guide

Table of Contents

Date: 2019/03/20

Introduction

This document describes the hardware interface spec and software protocols of RS232 interface communication between Commercial Display and PC or other control unit with RS232 protocol. This set protocol allow users to assign the ID in the command to control the specify ID monitor. The set protocol contains two sections command: Set-Function and Get-Function

In this document, "PC" represents all the control units that can send or receive the RS232 protocol command.

Wire arrangement

Wire Arrangement		
P1	Color	P2
1	Black	1
2	Brown	3
3	Red	2
4	Orange	4
5	Yellow	5
6	Green	6
7	Blue	7
8	Purple	8
9	Gray	9
Case	Drain wire	Case

RS232 pin assignment

Pin	Description	Pin	Description
1	NC	2	RXD
3	TXD	4	NC
5	GND	6	NC
7	RTS	8	CTS
9	NC		

Use of crossover (null modem) cable requires use with PC.

Communication setting

Baud rate select: **38400bps** (fixed)/ Data bits: 8 bits (fixed)

Parity: None (fixed)/ Stop Bits: 1(fixed)

Command message reference

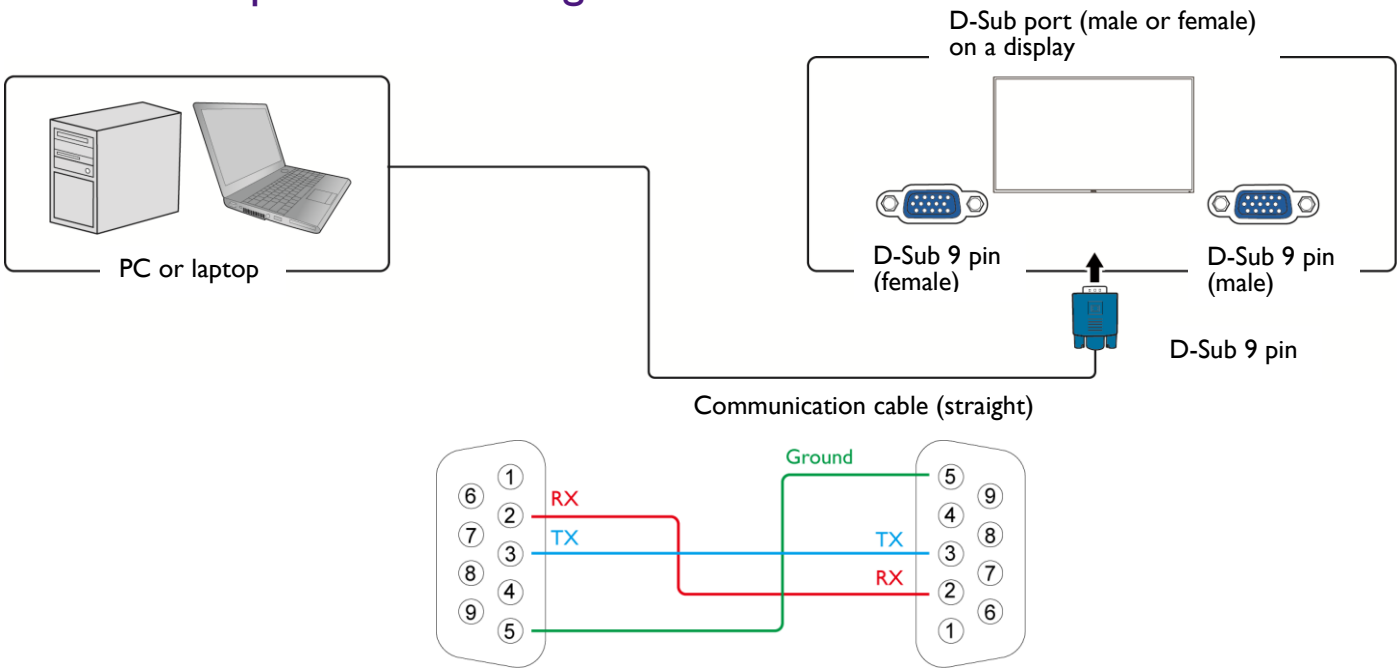
PC sends to Monitor command packet followed by "CR". Every time PC sends control command to the Monitor, the Monitor shall response as follows:

1. If the message is received correctly, it will send "+" (02Bh) followed by "CR" (00Dh).
2. If the message is received incorrectly, it will send "-" (02Dh) followed by "CR" (00Dh).

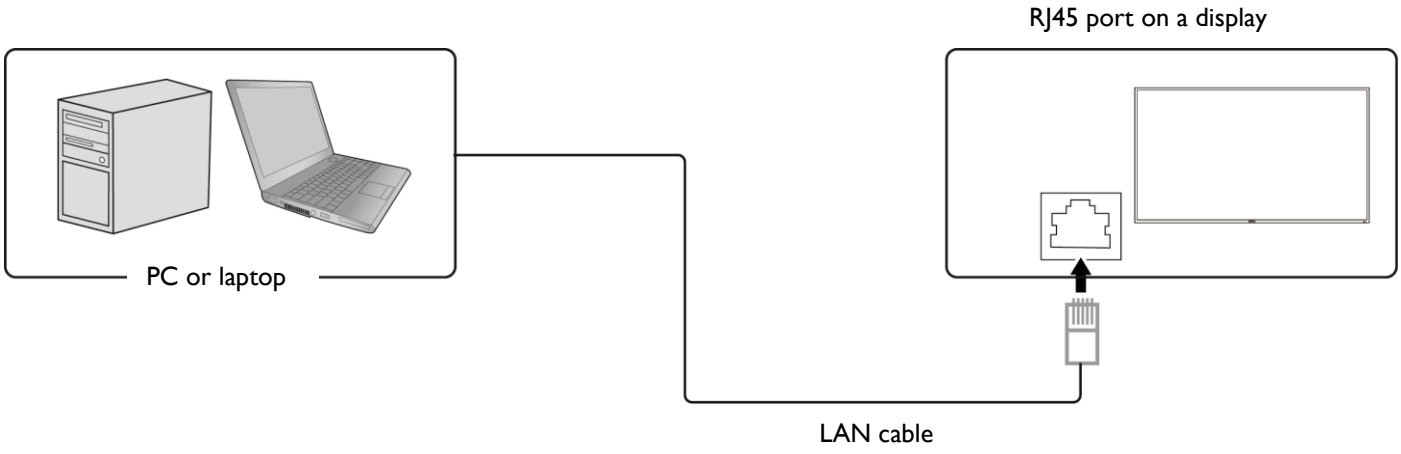
Connections and communication settings

Choose one of the connections and set up properly before RS232 control.

RS232 serial port with a straight cable



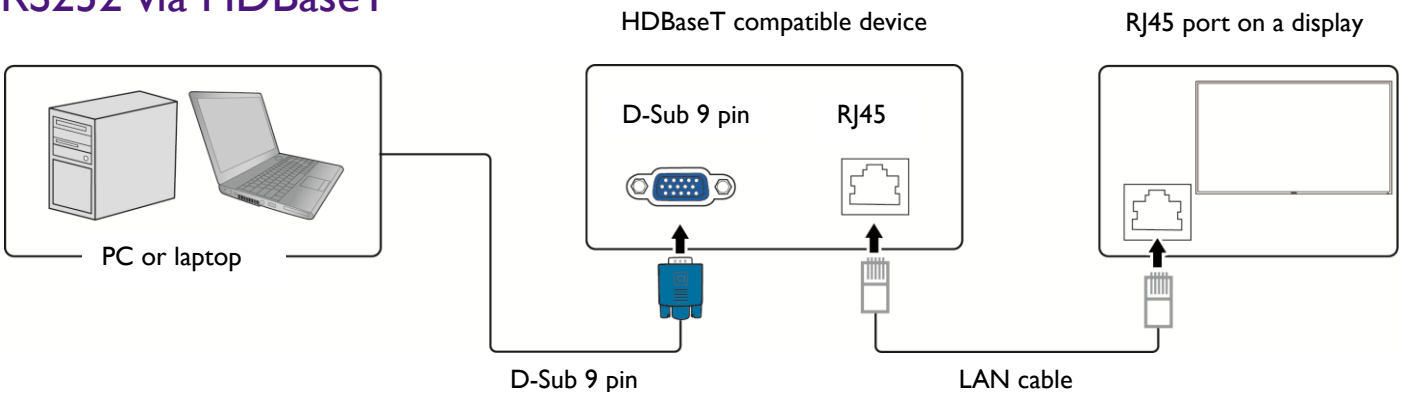
RS232 via LAN



Find the Wired LAN IP address of the connected display from the OSD menu and make sure the display and the computer are within the same network.

IP Procotol Port: 4660

RS232 via HDBaseT



Protocol Command Description

Item	Description
Length	Total Bytes of Message excluding "CR"
TV ID	Identification for each of TV
Command Type	Identify command type, "s" (0x73h): Set Command "g" (0x67h): Get Command "r" (0x72h): Reply Command "+" (0x2Bh): Valid command Reply "-" (0x2Dh): Invalid command Reply
Command	Function command code: One byte ASCII code
Value [1~3]	Three bytes ASCII that defines the value
CR	0x0D

Set-function listing

The PC can control the LCD Monitor for specific actions. The Set-Function command allows you to control the LCD monitor behavior in a remote sit through the RS232 port. The Set-Function packet format consists of 11 bytes.

Set-function description

Item	Description
Length	Total Bytes of Message excluding "CR"
TV ID	Identification for each of TV TV ID is "01" for LAN control
Command Type	Identify command type, "s" (0x73h): Set Command
Command	Function command code: One byte ASCII code
Value [1~3]	Three bytes ASCII that defines the value
CR	0x0D

Set-function format

Send: (Command Type="s")

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Byte count	1 Byte	2 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte
Bytes order	1	2~3	4	5	6	7	8	9

Reply: (Command Type="+" or "-")

Name	Length	ID	Command type	CR
Byte count	1 Byte	2 Byte	1 Byte	1 Byte
Bytes order	1	2~3	4	5

Example 1: Set Brightness as 76 for TV-02 and this command is valid.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR

Hex	0x38	0x30 0x32	0x73	0x24	0x30	0x37	0x36	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	CR
Hex	0x34	0x30 0x31	0x2B	0x0D

Example 2: Set Brightness as 176 for TV-02 and this command is NOT valid.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x32	0x73	0x24	0x31	0x37	0x36	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	CR
Hex	0x34	0x30 0x31	0x2D	0x0D

Example 3: Set Tint as 32 for TV-03 and this command is valid.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x33	0x73	0x27	0x30	0x33	0x32	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	CR

Hex	0x34	0x30 0x31	0x2B	0x0D

Example 4: Set Tint as 75 for TV-03 and this command is NOT valid.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x33	0x73	0x27	0x30	0x37	0x35	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	CR
Hex	0x34	0x30 0x31	0x2D	0x0D

Example 5: Set Brightness as 76 for all TV and this command is valid.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x39 0x39	0x73	0x24	0x30	0x37	0x36	0x0D

No Reply.

Set-function table

					Value Range (ASCII Bytes)	
Set Function	Len	ID	Cmd Type	Cmd Code (Hex)	**RS232 Control**	**LAN Control**
Power	8		s	21	000 : ------- / Monitor Off	000 : Monitor Off
					001 : Android On / Monitor On	001 : Monitor On
					002 : Android Off / -------	
Video Source	8		s	22	000 : VGA	000 : VGA
					001 : HDMI1	001 : HDMI1

					002: HDMI2	002: HDMI2
					021 : HDMI3	021 : HDMI3
					022 : HDMI4	022 : HDMI4
					101 : android	101 : android
					102 : OPS	102 : OPS
Aspect Ratio	8		s	31		000: Default
						001: 16:9
						002: 4:3
						003: Auto
						004 : Panorama Mode
						005 : Just Scan
						006 : 14:9
						007 : PC Mode
Language	8		s	32		000: English
						001: Français
						002: Español
						003: 繁中
						004: 简中
						005: Português
						006: German
						007: Dutch
						008: Polish
						009: Russia
						010:Czech
						011:Danish
						012:Swedish
						013:Italian
						014:Romanian
						015:Norwegian
						016:Finnish
						017:Greek
						019:Arabic
						020: Japanse
						021: Thailand
						023 : Hungarian
						024 : Persian
						025 : Vietnamese
Volume	8		s	35	200 Volume -	200 Volume -
					300 Volume +	300 Volume +

Mute	8		s	36	002: turn (State change)	002: turn (State change)
Remote control	8		s	40	010 : Remote Up	—
					011 : Remote Down	—
					012 : Remote Left	—
					013 : Remote Right	—
					014 : Remote OK	—
					020 : Remote OSD Menu	—
					021 : Remote Source	—
					023 : Remote Back (Android Back key)	—
					031 : Blank	—
					032 : Freeze	—
Button&IR Control	8		s	43		000: Disable
						001: Enable
All Reset	8		s	7E		000

Monitor ID default : 01 (30 31)

Get-function listing

The PC can interrogate the LCD Monitor for specific information. The Get-Function packet format consists of 5 bytes which are similar to the Set-Function packet structure. Note that the "Value" byte is always = 00.

Get-function description

Item	Description
Length	Total Bytes of messages excluding "CR"
TV ID	Identification for each of TV
Command Type	Identify command type, "g" (0x67h): Get Command
Command	Function command code: One byte ASCII code
Value [1~3]	Three bytes ASCII that defines the value NOTE: To get backlight senor, thermal sensor, and ambient sensor, you need four bytes ASCII that defines the value and the length is 9.
CR	0x0D

Get-function format

Send: (Command Type="g")

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Byte count	1 Byte	2 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte
Bytes order	1	2~3	4	5	6	7	8	9

Reply: (Command Type="r" or "-")

If the Command is valid, Command Type ="r"

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Byte count	1 Byte	2 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte
Bytes order	1	2~3	4	5	6	7	8	9

If the Command is Not valid, Command Type="-"

Name	Length	ID	Command type	CR
Byte count	1 Byte	2 Byte	1 Byte	1 Byte
Bytes order	1	2~3	4	5

Example 1: Get Brightness from TV-05 and this command is valid.

The Brightness value is 67.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x35	0x67	0x62	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR

Hex	0x38	0x30 0x35	0x72	0x62	0x30	0x36	0x37	0x0D

Example 3: Get Tint from TV-0007 and this command is valid.

The Tint value is 32.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x37	0x67	0X65	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x37	0x72	0x65	0x30	0x33	0x32	0x0D

Example 4: Get Tint from TV-07, but the Brightness command ID is error and it is NOT in the command table.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x37	0x67	0XD7	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	CR

Hex	0x34	0x30 0x31	0x2D	0x0D

Example 5: Get backlight sensor from TV-0007 and this command is valid.

The lux value is 1786 (ASCII code).

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	CR
Hex	0x39	0x30 0x37	0x67	0X6F	0x30	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	CR
Hex	0x39	0x30 0x37	0x72	0X6F	0x31	0x37	0x38	0x36	0x0D

Example 6: Get ambient sensor from TV-0007 and this command is valid.

The lux value is 1568 (ASCII code).

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	CR
Hex	0x39	0x30 0x37	0x67	0X70	0x30	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	CR
Hex	0x39	0x30 0x37	0x72	0X70	0x31	0x35	0x36	0x38	0x0D

Example 7: Get thermal sensor from TV-0007 and this command is valid.

The value is +075 degree (ASCII code).

NOTE: Positive degree is "+"ASCII code and negative degree is "-"ASCII code.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	CR
Hex	0x39	0x30 0x37	0x67	0X71	0x30	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	CR
Hex	0x39	0x30 0x37	0x72	0X71	0x2B	0x30	0x37	0x35	0x0D

Example 8: Get Running Hours from TV-0007 and this command is valid. The value is 21,356 hours (ASCII code).

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	Value5	CR
Hex	0x3A	0x30 0x37	0x67	0X76	0x30	0x30	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	Value5	CR
Hex	0x3A	0x30 0x37	0x72	0X76	0x32	0x31	0x33	0x35	0x36	0x0D

PC Get-function command to LCD Monitor

					Value Range (ASCII Bytes)	
Get Function	Len	ID	Cmd Type	Cmd Code (Hex)	**RS232**	**LAN**
Model Info	20		g	20		(1) Input value: Byte1 - Byte2 - Byte3…Byte15 Byte2~Byte11=0x00 Byte1=0x01: Get Customer Name Byte1=0x02: Get Customer Model Name Byte1=0x04: Get Scaler Firmware Version Byte1=0x06: Get Serial Number (2) Return value: Byte1 - Byte2 - Byte3…Byte15 The Byte1 value at the return value should be the same as the value of Byte1 at input value. Byte2~Byte15 should be ASCII format. Ex: If Customer=Generic, Byte1=0x01, Byte2='G', Byte3='e',...Byte8='c', Byte9~Byte11=0x00. Ex: If the Scaler Firmware Version=1.02, Byte1=0x03, Byte2='1', Byte3='.', Byte4='0', Byte5='2', Byte6~Byte11=0x00.
Signal Status	8		g	22		000: Signal unstable
						001: Signal stable (Active Sync exists)
Volume	8		g	66	000 ~ 100	000 ~ 100
Mute	8		g	67	000: Off	000: Off
					001: On	001: On
Button&IR Control	8		g	69		000: Disable
						001: Enable
Video Source	8		g	6A		000 : VGA
						001 : HDMI1
						002: HDMI2
						021 : HDMI3
						022 : HDMI4
						101 : android
						102 : OPS
Power	8		g	6C		000 : Monitor Off
					001 : Android On	001 : Monitor On
					002 : Android	

					Off	
Aspect Ratio	8		g	77		000: Default
						001: 16:9
						002: 4:3
						003: Auto
						004 : Panorama Mode
						005 : Just Scan
						006 : 14:9
						007 : PC Mode
Language	8		g	78		000: English
						001: Français
						002: Español
						003: 繁中
						004: 简中
						005: Português
						006: German
						007: Dutch
						008: Polish
						009: Russia
						010:Czech
						011:Danish
						012:Swedish
						013:Italian
						014:Romanian
						015:Norwegian
						016:Finnish
						017:Greek
						019:Arabic
						020:Japanse
						021: Thailand
						023 : Hungarian
						024 : Persian
						025 : Vietnamese
Network Setting	14		g	E1		Input Value: Byte1 - Byte2 - Byte3…Byte9 (1) Byte1=0x00: IP Setup Mode Byte1=0x01: IP Address Byte1=0x02: Get Subnet Mask Byte1=0x03: Default Gateway Byte1=0x04: Primary DNS

						Byte1=0x05: Secondary DNS Byte1=0x06: MAC Address (2) Byte2~9 are reserved, should be 0x00. Return value: Byte1 - Byte2 - Byte3…Byte9 The Byte1 at the return value should be the same as the value of Byte1 at Input value. Byte2~Byte15 should be hex value format (1) If Byte1=0x00(IP Setup Mode) at Input value, the return value should be Byte1=0x00 Byte2=0x00: Manual 0x01: DHCP Byte3~9 are reserved, should be 0x00. (2) If Byte1=0x01(IP Address) at Input value, the return value should be Ex: IP address=169.254.81.38 Byte1=0x01 (same as Byte1 at Input value) Byte2=0xA9 (=169), Byte3=0xFE (=254), Byte4=0x51(=81), Byte5=0x26 (=38) Byte6~9 are reserved, should be 0x00. (3) If Byte1=0x02~0x05 at Input value, refer to (2) (4) If Byte1=0x06(MAC Address) at Input value, the return value should be Ex: MAC address=00:22:64:7E:2C:82 Byte1=0x06 (same as Byte1 at Input value) Byte2=0x00, Byte3=0x22, Byte4=0x64, Byte5=0x7E, Byte6=0x2C, Byte7=0x82 Byte8~9 are reserved, should be 0x00.

Monitor ID default : 01 (30 31)