

RS232 & LAN Protocol Specification



RS232 & LAN Protocol

Outline the feed:

1.	Introduction.....	3
2.	Description.....	3
2.1	Hardware specification.....	3
2.2	Communication Setting.....	3
2.3	Command Message Reference.....	4
3.	Protocol.....	5
3.1	Set-Function Listing.....	5
3.2	Get-Function Listing.....	8

Version control:

Date	Reversion	Changes and additions
2018/06/29	1.0	Initial Defined release

1 Introduction

This document describes the hardware interface spec and software protocols of RS232 & LAN interface communication between Display and PC or other control unit with RS232 & LAN protocol.

The protocol contains two sections command:

- Set-Function
- Get-Function

※In the document below, "PC" represents all the control units that can sent or receive the RS232 & LAN protocol command.

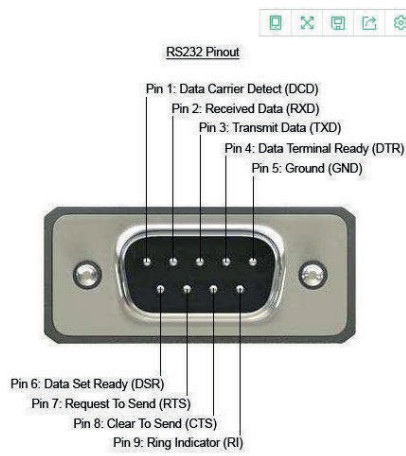
2 Description

2.1 Hardware specification

Display RS232 communication port on the rear side

- (1) Connector type: DSUB 9-Pin Male
- (2) Pin Assignment

Male DSUB 9-Pin
(outside view)



Pin #	Signal	Remark
1	NC	
2	RXD	Input to Display
3	TXD	Output from Display
4	NC	
5	GND	
6	NC	
7	NC	
8	NC	
9	+5V Out	Provide +5V/1A power for external specific dongle
frame	GND	

*Use of crossover (null modem) cable required for use with PC

Pin #	Signal	Remark
Tip	TXD	Output from Commercial Display
Ring	RXD	Input to Commercial Display
Sleeve	GND	

[Special case]

3.5mm barrel connector

Communication Setting:

- Baud Rate Select: 38400bps (fixed)
- Data bits: 8 bits (fixed)
- Parity: None (fixed)
- Stop Bits: 1(fixed)

2.2 Command Message Reference

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

1. If the message is received correctly it will send "y" (79h) followed by "CR" (0Dh)
2. If the message is received incorrectly it will send "n" (6Eh) followed by "CR" (0Dh)

3 Protocol (The same of RS232 and LAN)

3.1 Set-Function Listing

The PC can control the Display for specific actions. The Set-Function command allows you to control the Display behavior in a remote site through the RS232 and LAN port. The Set-Function packet format consists of 9 bytes.

Set-Function description:

Head Code "k"

Display ID Identification for each of Display (01~98; default is 01)
 ID "99" means to apply the set command for all connected displays. Under such circumstances, only ID#1 display has to reply.
 The Display ID can be set via the OSD menu for each Display set.

Command Type Identify command type,
 "s" (0x73h) : Set Command
 "y" (0x79h) : Valid command Reply
 "n" (0x6Eh) : 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 format

Send: (Command Type="s")

Name	Head	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="y" or "n")

Name	Head	ID	Command Type	CR
Byte Count	1 Byte	2 Byte	1 Byte	1 Byte
Bytes order	1	2~3	4	5

[NOTE]

When PC applies command to all displays (ID=99), only the #1 set needs to reply by the name of ID=1.

Example1: Set Brightness as 58 for Display and this command is valid

Send (Hex Format)

Name	Head	ID	Command Type	Command	Value1	Value2	Value3	CR
Hex	0x6B	0x31 0x33	0x73	0x44	0x30	0x35	0x38	0x0D

Reply (Hex Format)

Name	Head	ID	Command Type	CR
Hex	0x6B	0x31 0x33	0x79	0x0D

Example2: Set Brightness as 158 for Display and this command is NOT valid
Send (Hex Format)

Name	Head	ID	Command Type	Command	Value1	Value2	Value3	CR
Hex	0x6B	0x31 0x33	0x73	0x24	0x31	0x35	0x38	0x0D

Reply (Hex Format)

Name	Head	ID	Command Type	CR
Hex	0x6B	0x31 0x33	0x6E	0x0D

Set-function table

Set Function	Head	ID	Command Type (ASCII)	Command		Value Range (Three ASCII bytes)	Comments
				Code (ASCII)	Code (Hex)		
Power on/off(standby)	k		s	A	41	000: STBY 001: ON	
Input Select	k		s	B	42	000 : ATV 010 : DTV 001 : AV 002 : S-Video1 012 : S-Video2 003 : YPBPR 004 : HDMI 014: HDMI1 024: HDMI2 034: HDMI3 044: HDMI4 005 : DVI 006 : VGA 007: OPS1 017: OPS2 008: USB 009: DP 00A: Main(Android) 00B:SDI1 01B:SDI2	
Contrast	k		s	C	43	000 ~ 100	
Brightness	k		s	D	44	000 ~ 100	
Sharpness	k		s	E	45	000 ~ 100	
Saturation	k		s	F	46	000 ~ 100	
Hue	k		s	G	47	000 ~ 100	
Color mode	k		s	H	48	000: Normal 001: Warm 002: Cold 003: User	
Sound	k		s	I	49	000: SRS Off	

						001: SRS On	
Bass	k		s	J	4A	000 ~ 100	
Treble	k		s	K	4B	000 ~ 100	
Balance	k		s	L	4C	000 ~ 100	Sets Balance position
Picture Size	k		s	M	4D	000 : FULL 001 : NORMAL 002 : CUSTOM 003 : DYNAMIC 004 : REAL	
OSD language	k		s	N	4E	000: English 001: French 002: Spanish 003: Traditional Ch 004: Simple Ch	Extend the value for more supported languages
Power lock	k		s	O	4F	000 : Unlock 001 : Lock	
Volume	k		s	P	50	000 ~ 100 200:Volume down(-1) 201:Volume up(+1)	
Mute	k		s	Q	51	000: OFF 001: ON (mute)	
Button lock	k		s	R	52	000: Unlock 001: Lock	
Menu lock	k		s	S	53	000: Unlock 001: Lock	
Number	k		s	T	54	000~009	
Key Pad & IR Pad	k		s	U	55	000: UP 001: DOWN 002: LEFT 003: RIGHT 004: ENTER 005: INPUT 006: MENU 007: EXIT	
Remote Control	k		s	V	56	000: Disable 001: Enable	Disable: IR has no effect on Display. Enabled: IR controls the Display.
Setup wizard	k		s	W	57	000: Disable 001: Enable	Disable: to skip the initial setup wizard Enable:run the setup wizard
Date	k		s	X	58	Month:M+XX Day:D+XX (See example in List table)	
Time	k		s	Y	59	Hour:H+XX Min:M+XX Sec:S+XX (See example in List table)	
Restore default	8		s	Z	5A	000	Rests Display to factory setting

[NOTE]
1. Behavior at lock modes

Lock Mode	Behavior
Button Lock	1. Lock all buttons on the front panel and IR, except for "Power" 2. All the SET functions should be workable via RS232&LAN, even the ones with according hot key in IR like Mute,...etc.
MENU Lock	1. Lock "MENU" key of front panel and IR 2. The Factory and Hospitality modes should not be blocked for the model using MENU-combined key to enter these two modes. Alternative approach will be indicated separately if any limitation by model.
POWER Lock	1. Lock "POWER" key on the front and IR. 2. The SET_POWER on/off should be workable via RS232&LAN, but does not mean the POWER lock will be released under this case. 3. Can not be unlocked by reset in OSD setting 4. Will auto AC power-on in power-lock 5. Under power-lock, the set will not enter power saving when no PC signal and neither not turn off when no other video signals after 5min.
Remote control disable	Lock the IR keys, but keep the front panel buttons workable.

3.2 Get-Function Listing

The PC can interrogate the Display for specific information. The Get-Function packet format consists of 9 bytes which is similar to the Set-Function packet structure. Note that the "Value" byte is always = 000, be excepted for date&time.

Get-Function description:

Head Code: "k"

Display ID Identification for each of Display (01~98; default is 01)

Command Type Identify command type,
 "g" (0x67h) : Get Command
 "r" (0x72h) : Valid command Reply
 "n" (0x6Eh) : Invalid command Reply

Command: Function command code: One byte ASCII code

Value[1~3]: Three bytes ASCII that defines the value

CR 0x0D

Get-Function format
Send: (Command Type="g")

Name	Head	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 "n")

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

Name	Head	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

[NOTE] The reply for "Get-Operation time" and "Get-Device name" command is the exception.

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

Name	Head	ID	Command Type	CR
Byte Count	1 Byte	2 Byte	1 Byte	1 Byte
Bytes order	1	2~3	4	5

Example1: Get Sharpness from Display and this command is valid.

The Sharpness value is 38.

Send (Hex Format)

Name	Head	ID	Command Type	Command	Value1	Value2	Value3	CR
Hex	0x6B	0x39 0x31	0x67	0x63	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Head	ID	Command Type	Command	Value1	Value2	Value3	CR
Hex	0x6B	0x39 0x31	0x72	0x63	0x30	0x33	0x38	0x0D

Example2: Get Sharpness from Display , but the Sharpness command ID is error and it is NOT in the command table.

Send (Hex Format)

Name	Head	ID	Command Type	Command	Value1	Value2	Value3	CR
Hex	0x6B	0x39 0x31	0x67	0x63	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Head	ID	Command Type	CR
Hex	0x6B	0x39 0x31	0x6E	0x0D

Get-function table

Get Function	Head	ID	Command Type (ASCII)	Command		Response Range (Three ASCII bytes)	Comments
				Code (ASCII)	Code (Hex)		
Get-Contrast	k		g	a	61	000 ~ 100	
Get-Brightness	k		g	b	62	000 ~ 100	
Get-Sharpness	k		g	c	63	000 ~ 100	
Get-Saturation	k		g	d	64	000 ~ 100	
Get-Hue	k		g	e	65	000 ~ 100	

Get-Volume	k		g	f	66	000 ~ 100	
Get-Mute	k		g	g	67	000: Off 001: On (muted)	
Get-Input select	k		g	h	68	00~	See Set-function table
Get-Power status: ON/ STBY	k		g	i	69	001: ON	STBY is no back
Get-Remote control	k		g	j	6A	000: Disable 001: Enable	Gets IR mode status
Get-Power lock	k		g	k	6B	000: Unlock 001: Lock	
Get-Button lock	k		g	l	6C	000: Unlock 001: Lock	
Get-Menu lock	k		g	m	6D	000: Unlock 001: Lock	
Get-Temperature	k		g	n	6E	XXX:000~100	
Get-Operation time	k		g	o	6F	000 (See below note)	
Get-Date	k		g	p	70	000 (See the Set-Date command)	
Get-Time	k		g	q	71	000 (See the Set-Time command note)	
Get-Device name	k		g	r	72	000 (See below command note)	
Get-MAC address	k		g	s	73	000 (see below command note)	
Get RS232 & LAN Version	k		g	t	74		

[NOTE]
1. Get Operation-Time example

Assumed the Operation time record of display as below(.hour)
123456(hour)

Send: 0x 6B 30 31 67 6F 30 30 30 0D

Reply:

#1 0x 6B 30 31 6F 31 31 32 33 0D (123)

#2 0x 6B 30 31 6F 32 34 35 36 0D (456)

2. Get Device Name example

Assumed the device name is SYKJ-9800

Send: 0x 6B 30 31 67 72 30 30 30 0D (Get Device Name)

Reply:

```
#1 0x 6B 30 31 72 31 53 59 4B 0D ("S" "Y" "K")
#2 0x 6B 30 31 72 32 2D 4A 2D 0D ("J" "-" "9")
#3 0x 6B 30 31 72 33 38 30 00 0D ("8" "0" "0")
#4 0x 6B 30 31 72 34 00 00 00 0D ("(NULL)" "(NULL)" "(NULL)")
```

3. Get MAC address example

Assumed the MAC address is b0:c5:ca:70:1e:eb

Send: 0x 6B 30 31 67 73 30 30 30 0D(Get MAC address)

Reply:

```
#1 0x 6B 30 31 72 73 31 62 30 0D ("b0")
#2 0x 6B 30 31 72 73 32 63 35 0D ("c5")
#3 0x 6B 30 31 72 73 33 63 61 0D ("ca")
#4 0x 6B 30 31 72 73 34 37 30 0D ("70")
#5 0x 6B 30 31 72 73 35 31 65 0D ("1e")
#6 0x 6B 30 31 72 73 36 65 62 0D ("eb")
```

TKS!

:END