

ViewSonic®



LFD RS-232 & LAN Protocol Specification

LFD RS232 & LAN Protocol

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Version control

Date	Reversion	Changes and additions	by
2008/10/1	1.0	Initial release	
2017/9/14	3.1.0	1. Remove the TV portion 2. Add the signal detection in GET-input select 3. Add GET-operation time (Changed from GET-power log) 4. Revise SET-picture size definition 5. Revise GET-MAC reply string definition 6. Revise GET-Device name reply string definition	Thomas Hung
2017/11/17	3.1.1	1. Define the configuration for LAN control 2. Move the set commands of Number and Key pad to Basic section 3. Add Brightness increase and decrease in SET-Brightness 4. Identify the necessity of IR-pass-thru keys as basic or optional 5. Add comment on SET-Power	Thomas Hung
2018/10/18	3.2.1	1. Female DSUB 9 connector is recommended 2. Define the UDP port for WOL by MAC 3. Add the alternative of Power-on by MAC address for LAN 4. Add SET/GET-Backlight (color calibration command originally) for the case of Brightness not working 5. Change the reply format of Operation hours, Device name, and MAC address 6. Add GET-IP address 7. Add GET-Serial number 8. Add GET-FW version 9. Remove GET-RS232 version 10. Add the auto-reply function	Thomas Hung
2018/10/31	3.2.2	1. Revise the comment on GET-operation hour for not allowing reset	Thomas Hung
2018/11/30	3.2.3	1. Add SET/GET-Backlight On_Off	Thomas Hung
2019/08/05	3.2.4	1. Revise the recommended RS232 type to be Male. 2. Add USB type-C into input source	Thomas Hung
2019/11/1	3.2.5	1. Add SET/GET-Freeze On_Off	Thomas Hung
2020/1/06	3.2.6	1. Add SET-Customized Hot Keys	Thomas Hung
2020/3/23	3.3.0	1. Add GET-Smart hub	Thomas Hung
2020/7/8	3.3.1	1. Add Cycle mode for SET-Input select	Thomas Hung
2020/12/21	3.3.2	1. Add SET/GET-Function On_Off (Backlight, Freeze, Touch) 2. Remark for input select when both DP and TypeC exist	Thomas Hung

[Note] Some product may not support full command set due to platform constrain. Please see the individual product spec or user manual for details.

1 Introduction

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

The protocol contains three sections command:

- Set-Function
- Get-Function
- Remote control pass-through mode

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

2 Description

2.1 RS232 Hardware Specification

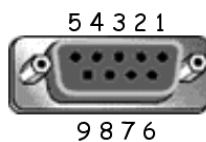
ViewSonic LFD communication port on the rear side

- (1) Connector type: DSUB 9-Pin **Male** (female or 3.5mm barrel connector)
- (2) Pin Assignment
- (3) Use of crossover (null modem) cable for connection

Male D9 (preferred)



Female D9



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	NC	Provide +5V/2A power for external-specific dongle
frame	GND	

3.5mm barrel connector
(alternative for limited space)

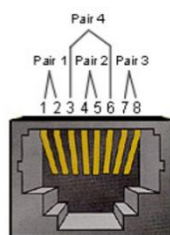


Pin #	Signal	Remark
Tip	TXD	Output from Display
Ring	RXD	Input to Display
Sleeve	GND	

2.2 LAN Hardware Specification

ViewSonic LFD communication port on the rear side

- (1) Connector type: 8P8C RJ45
- (2) Pin Assignment



Pin #	Signal	Remark
1	TX+	Output from Display
2	TX-	Output from Display
3	RX+	Input to Display
4	BI D3+	For 1G case
5	BI D3-	For 1G case
6	RX-	Input to Display
7	BI D4+	For 1G case
8	BI D4-	For 1G case
frame	GND	

2.3 RS232 Communication Setting

- Baud Rate Select: 9600bps (fixed)
- Data bits: 8 bits (fixed)
- Parity: None (fixed)
- Stop Bits: 1(fixed)

2.4 LAN Communication Setting

- Type: Ethernet
- Protocol: TCP/IP
- Port: 5000 (fixed)
- **WOL Port: 9 (fixed) for UDP *3.2.0**
- Cross subnet: No
- Logon Credentials: No

2.5 Command Message Reference

PC sends to LFD command packet followed by "CR". Every time PC sends control command to Display, the Display shall respond 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)

3 Protocol

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 port. The Set-Function packet format consists of 9 bytes.

Set-Function description:

Length:	Total Byte of Message excluding "CR"
LFD 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 LFD ID can be set via the OSD menu for each Display.
Command Type	Identify command type, "s" (0x73h) : Set 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 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

[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 76 for Display (#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 0x32	0x2B	0x0D

Example2: Set Brightness as 75 for Display (#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	0x30	0x37	0x35	0x0D

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	0x34	0x30 0x32	0x2D	0x0D

Set-function table

A. Basic function

Set Function	Length	ID	Command	Command		Value Range (Three ASCII bytes)	Comments
				Type (ASCII)	Code (ASCII)	Code (Hex)	
Power on*3.2.1 /off(standby)	8		s	!	21	000: STBY 001: ON	1. The Power-on via LAN control may works only under specific mode. To see display UG for details. *3.1.1 2. "WOL by MAC address" may available as alternative. *3.2.1
Input Select	8		s	"	22	000: TV 001: AV 002: S-Video 003: YPbPr 004: HDMI1 014: HDMI2 024: HDMI3 034: HDMI4 005: DVI 006: VGA1 016: VGA2 026: VGA3 007: Slot-in PC (OPS/SDM)/HDBT 008: Internal memory 009: DP1*3.2.4 029: DP2 019: Type-C 1*3.3.2 039: Type-C 2 00A: Embedded/Main (Android)	1. No need for USB 2. For the case of two more same sources, the 2 nd digital is used to indicate the extension. 3. The HEX of 00A is 30 30 41. 4. 00Z is reserved for cycle mode*3.3.1 5. Using 2nd digi to identify DP or TypeC. 0 and even numbers stand for DP; odd numbers stand for TypeC. *3.3.2
Brightness	8		s	\$	24	000 ~ 100 900: Bright down (-1) 901: Bright up (+1) *3.1.1	
Backlight*3.2.0	8		A	B	42	000 ~ 100	1. For Android platform whose main mode is controlled by backlight

							and the other sources are controlled by brightness. 2. Derived from Color calibration. *3.2.0
Power lock	8		s	4	34	000: Unlock 001: Lock	*See note in details
Volume	8		s	5	35	000 ~ 100 900: Volume down(-1) 901: Volume up(+1)	
Mute	8		s	6	36	000: OFF 001: ON (mute)	
Button lock	8		s	8	38	000: Unlock 001: Lock	*See note in details
Menu lock	8		s	>	3E	000: Unlock 001: Lock	*See note in details
Number *3.1.1	8		s	@	40	000~009	
Key Pad *3.1.1	8		s	A	41	000: UP 001: DOWN 002: LEFT 003: RIGHT 004: ENTER 005: INPUT 006: MENU/(EXIT) 007: EXIT	
Remote Control	8		s	B	42	000: Disable 001: Enable 002: Pass through	Disable: RCU will be no function Enabled: RCU controls normally Pass through: Display will bypass the RC code to connected device via the RS232 port, but not react itself.
Restore default	8		s	~	7E	000	Recover to factory setting

[NOTE]

1. Behavior at lock modes

Lock Mode	Behavior
Button Lock	1. Lock all buttons on the front panel and RCU, except for "Power" 2. All the SET functions should be workable via RS32, even the ones with according hot key in RCU like Mute,...etc.
MENU Lock	1. Lock "MENU" key of front panel and RCU 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 RCU. 2. The SET_POWER on/off should be workable via RS232, 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 15min.
Remote control disable	Lock the RCU keys, but keep the front panel buttons workable.

4. Wake-on-LAN by MAC address as alternative for SET Power on

Length= 126 Bytes

6 Bytes	6 Bytes (#1)	6 Bytes (#2)	...	6 Bytes (#16)	24 Bytes
0xFF FF ... FF	MAC address	MAC address	...	MAC address	0x00 00 ... 00

B. Optional function

Set Function	Length	ID	Command			Value Range (Three ASCII bytes)	Comments
			Type (ASCII)	Code (ASCII)	Code (Hex)		
Input Select: Cycle*3.3.1	8		s	"	22	00Z	Inputs in cycle loop depend on display itself
Contrast	8		s	#	23	000 ~ 100	
Sharpness	8		s	%	25	000 ~ 100	
Color	8		s	&	26	000 ~ 100	
Tint	8		s	`	27	000 ~ 100	
Backlight On_Off*3.2.3	8		s	(	28	000: Off 001: On	Keep both "Backlight On_Off" and "Function On_Off" for backward compatibility ^{3.3.2}
Color mode	8		s	)	29	000: Normal 001: Warm 002: Cold 003: Personal	
Freeze On_Off*3.2.5	8		s	*	2A	000: Off 001: On	Keep both "Freeze On_Off" and "Function On_Off" for backward compatibility ^{3.3.2}
Surround sound	8		s	-	2D	000: Off 001: On	
Bass	8		s	.	2E	000 ~ 100	
Treble	8		s	/	2F	000 ~ 100	
Balance	8		s	0	30	000 ~ 100	050 is central
Picture Size	8		s	1	31	000: FULL (16:9) 001: NORMAL (4:3) 002: REAL (1:1) *3.1.0	
OSD language	8		s	2	32	000: English 001: French 002: Spanish	Could be extended for more supported languages by model
PIP-Mode	8		s	9	39	000: OFF 001: PIP(POP)	

						002: PBP	
PIP-Sound select	8		s	:	3A	000: Main 001: Sub	
PIP-Position	8		s	;	3B	000: Up 001: Down 002: Left 003: Right	
PIP-Input	8		s	7	37 *2.9	000: TV 001: AV 002: S-Video 003: YPbPr 004: HDMI1 014: HDMI2 024: HDMI3 034: HDMI4 005: DVI 006: VGA1 016: VGA2 026: VGA3 007: Slot-in PC (OPS/SDM)/HDBT 008: Internal memory 009: DP/Type-C *3.2.4 00A: Embedded/Main (Android)	Value range is same as SET-Input select
Tiling-Mode	8		s	P	50	000: OFF 001: ON	(for video wall)
Tiling-Compensation	8		s	Q	51	000: OFF 001: ON	(for video wall) Bezel width compensation
Tiling-H by V Monitors	8		s	R	52	01x~09x: H 0x1~0x9: V	(for video wall) 1. 2 nd digital for H monitors 2. 3 rd digital for V monitors
Tiling-Position	8		s	S	53	001~025	(for Video wall) Copy the screen of Position# to identified display
Date: Year	8		s	V	56	Y17~Y99	Last 2 digits (20)17~(20)99
Date: Month	8		s	V	56	M01~M12	2 digits
Date: Day	8		s	V	56	D01~D31	2 digits
Time: Hour	8		s	W	57	H00~H23	24-hr format. 2 digits.
Time: Min	8		s	W	57	M00~M59	2 digits
Time: Sec	8		s	W	57	S00~S59	2 digits
Customized Hot Keys*3.2.6	8		s	X	58	001~999 001: Open MVBA app*3.2.6	
Function On_Off*3.3.2	8		s	=	3D	001: Backlight Off 101: Backlight On 002: Freeze Off 102: Freeze On	

						003: Touch Off 103: Touch On	
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[NOTE]

1. Tiling definition of H Monitors/ V Monitors/ and Position

H MONITORS					
V MONITORS	1	2	3	4	5
	6	7	8	9	10
	11	12	13	14	15
	16	17	18	19	20
	21	22	23	24	25

Position

2. Set Date example

Date: 2017-3/15

Send: 0x 38 30 31 73 56 59 31 37 0D ("Y17")

Send: 0x 38 30 31 73 56 4D 30 33 0D ("M03")

Send: 0x 38 30 31 73 56 44 31 35 0D ("D15")

3. Set Time example

Time: 16:27:59

Send: 0x 38 30 31 73 57 48 31 36 0D ("H16")

Send: 0x 38 30 31 73 57 4D 32 37 0D ("M27")

Send: 0x 38 30 31 73 57 53 35 39 0D ("S59")

3.2 Get-Function Listing

The PC can interrogate the LFD 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

Get-Function description:

Length: Total Byte of Message excluding "CR"
LFD 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
 "-" (0x2Dh) : 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	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

Example1: Get Brightness from Display (#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

Example2: Get Color from Display (#05) , but the Color command is not supported by this model.

Send (Hex Format)

Name	Length	ID	Command Type	Command	Value1	Value2	Value3	CR
------	--------	----	--------------	---------	--------	--------	--------	----

Hex	<u>0x38</u>	<u>0x30</u> <u>0x35</u>	<u>0x67</u>	<u>0x26</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x0D</u>
-----	-------------	----------------------------	-------------	-------------	-------------	-------------	-------------	-------------

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	<u>0x34</u>	<u>0x30</u> <u>0x35</u>	<u>0x2D</u>	<u>0x0D</u>

Get-function table
A. Basic function

Get Function	Length	ID	Command Type (ASCII)	Command		Response Range (Three ASCII bytes)	Comments
				Code (ASCII)	Code (Hex)		
Get-Brightness	8		g	b	62	000 ~ 100	
Get-Backlight*3.2.0	8		a	B	42	000 ~ 100	1. For Android platform whose main mode is controlled by backlight and the other sources are controlled by brightness. 2. Derived from Color calibration. *3.2.0
Get-Volume	8		g	f	66	000 ~ 100	
Get-Mute	8		g	g	67	000: Off 001: On (muted)	
Get-Input select	8		g	j	6A	000~ 100~	1. 1 st digit for signal detection: 0 means "no signal"; 1 means "signal detected" 2. 2 nd & 3 rd digit: See Set-function table
Get-Power status: ON/ STBY	8		g	l	6C	001: ON 000: STBY	
Get-Remote control	S		g	n	6E	000: Disable 001: Enable 002: Pass through	Get RCU mode status
Get-Power lock	8		g	o	6F	000: Unlock 001: Lock	
Get-Button lock	8		g	p	70	000: Unlock 001: Lock	
Get-Menu lock	8		g	q	71	000: Unlock 001: Lock	
Get-ACK	8		g	z	7A	000	This command is used to test the communication link
Get-Thermal	8		g	0	30	000~100: 0~+100 deg C -01~-99: -1~-99 deg C	
Get-Operation hour*3.2.0	8		g	1	31	000	1. Accumulated hours in 6-digit integer (000,001~999,999)*3.2.0

							2. Can not be reset when FW update and Factory initiation*3.2.2 3. Reply in new 32-byte format*3.2.0
Get-Device name	8		g	4	34	000	Reply in new 32-byte format*3.2.0
Get-MAC address	8		g	5	35	000	(for the model with LAN) Reply in new 32-byte format*3.2.0
Get-IP address *3.2.0	8		g	6	36	000	(for the model with LAN) Reply in new 32-byte format*3.2.0
Get-Serial number *3.2.0	8		g	7	37	000	Reply in new 32-byte format*3.2.0
Get-FW version *3.2.0	8		g	8	38	000	Reply in new 32-byte format*3.2.0

[NOTE]

1. Get Operation hour example

Assumed the accumulated operation hour is 123,456 hrs

Send: 0x 38 30 31 67 31 30 30 30 0D (Get Operation hour)

Reply: 0x 32 30 31 72 31 31 32 33 34 35 36 00 00 ... 00 00 0D

2. Get Device Name example

Assumed the device name is CDE-5500

Send: 0x 38 30 31 67 34 30 30 30 0D (Get Device Name)

Reply: 0x 32 30 31 72 34 43 44 45 2D 35 35 30 30 00 00 ... 00 00 0D

Assumed the device name is "NMP-302#1"

Send: 0x 38 30 31 67 34 30 30 30 0D (Get Device Name)

Reply: 0x 32 30 31 72 34 4E 4D 50 2D 33 30 32 23 31 00 00 ...00 00 0D

3. Get MAC address example

Assumed the MAC address is 00:11:22:aa:bb:cc

Send: 0x 38 30 31 67 35 30 30 30 0D (Get MAC add)

Reply: 0x 32 30 31 72 35 30 30 31 31 32 32 61 61 62 62 63 63 00 00 ...00 00 0D

4. Get IP address example

Assumed the IP address is 192.168.100.2

Send: 0x 38 30 31 67 36 30 30 30 0D (Get IP address)

Reply: 0x 32 30 31 72 36 31 39 32 2E 31 36 38 2E 31 30 30 2E 32 00 00 ...00 00 0D

5. Get Serial number example

Assumed the Serial number is ABC180212345

Send: 0x 38 30 31 67 37 30 30 30 0D (Get Serial number)

Reply: 0x 32 30 31 72 37 41 42 43 31 38 30 32 31 32 33 34 35 00 00 ...00 00 0D

6. Get FW version example

Assumed the FW version is 3.02.001

Send: 0x 38 30 31 67 38 30 30 0D (Get FW version)

Reply: 0x 32 30 31 72 38 33 2E 30 32 2E 30 30 31 00 00 ...00 00 0D

B. Optional function

Get Function	Length	ID	Command Type (ASCII)	Command		Response Range (Three ASCII bytes)	Comments
				Code (ASCII)	Code (Hex)		
Get-Contrast	8		g	a	61	000 ~ 100	
Get-Sharpness	8		g	c	63	000 ~ 100	
Get-Color	8		g	d	64	000 ~ 100	
Get-Tint	8		g	e	65	000 ~ 100	
Get-Backlight On_Off*3.2.3	8		g	h	68	000: Off 001: On	Keep both "Backlight On_Off" and "Function On_Off" for backward compatibility ^{3.3.2}
Get Freeze On_Off*3.2.5	8		g	i	69	000: Off 001: On	Keep both "Freeze On_Off" and "Function On_Off" for backward compatibility ^{3.3.2}
Get-PIP mode	8		g	t	74	000: OFF 001: PIP (POP) 002: PBP	
Get-PIP input	8		g	u	75	000 ~	See Set-input select
Get-Tiling Mode	8		g	v	76	000: OFF 001: ON	(for Video wall)
Get-Tiling Compensation	8		g	w	77	000: OFF 001: ON	(for Video wall) Bezel width compensation
Get-Tiling H by V monitors	8		g	x	78	01x~09x: H monitors 0x1~0x9: V monitors	(for Video wall) 1. 2 nd digital for H monitors 2. 3 rd digital for V monitors
Get-Tiling position	8		g	y	79	000: OFF 001~025	(for Video wall) Copy the screen of Position# to identified display
Get-Date: Year	8		g	2	32	Y00~Y00	Last 2 digits (20)17~(20)99
Get-Date: Month	8		g	2	32	M00~M00	2 digits
Get-Date: Day	8		g	2	32	D00~M00	2 digits

Get-Time: Hour	8		g	3	33	H00~H00	24-hr format. 2 digits
Get-Time: Min	8		g	3	33	M00~M00	2 digits
Get-Time: Sec	8		g	3	33	S00~S00	2 digits
Get-Smart hub *3.3.0	8		g	:	3A	000:all 00A:Amb_Temp 00B:Amb_Humidity 00C:Amb_Light 00D:Amb_PIR detection	1. Reply in new 32-byte format. Each sub-item length is fixed 6 bytes. *3.3.0 2. Allow get data separately or once for all *3.3.0
Get-Function On_Off*3.3.2	8		g	=	3D	001: Backlight Off 101: Backlight On 002: Freeze Off 102: Freeze On 003: Touch Off 103: Touch On	Send value 001: To get Backlight status 002: To get Freeze status 003: To get Touch status

[NOTE]

1. Get Date example

Assumed the current date of display#01 as below
Date: 2017-3/15

Send: 0x 38 30 31 67 32 59 30 30 0D (Get Date:Year)
Reply: 0x 38 30 31 72 32 59 31 37 0D ("Y17")

Send: 0x 38 30 31 67 32 4D 30 30 0D (Get Date:Month)
Reply: 0x 38 30 31 72 32 4D 30 33 0D ("M03")

Send: 0x 38 30 31 67 32 44 30 30 0D (Get Date:Day)
Reply: 0x 38 30 31 72 32 44 31 35 0D ("D15")

2. Get Time example

Assumed the current time of display#01 as below
Time: 16:27:59

Send: 0x 38 30 31 67 33 48 30 30 0D (Get Time:Hour)
Reply: 0x 38 30 31 72 33 48 31 36 0D ("H16")

Send: 0x 38 30 31 67 33 4D 30 30 0D (Get Time:Min)
Reply: 0x 38 30 31 72 33 4D 32 37 0D ("M27")

Send: 0x 38 30 31 67 33 53 30 30 0D (Get Time:Sec)
Reply: 0x 38 30 31 72 33 53 35 39 0D ("S59")

3. Get Smart hub example

Assumed Amb_Temp is -5 deg C, Amb_Humidity is 30%, Amb_Light is 80, Amb_PIR detection is 1

Send: 0x 38 30 31 67 3A 30 30 30 0D (Get all Smart hub info)
Reply: 0x 32 30 31 72 3A 41 2D 30 35 2E 30 42 30 33 30 2E 30 43 30 30 30 38 30 44 30 30 30 31 00 00 00 0D (A-05.0B030.0C00080D00001)

Send: 0x 38 30 31 67 3A 30 30 41 0D (Get Amb_Temp only)
Reply: 0x 32 30 31 72 3A 41 2D 30 35 2E 30 00 00 ...00 00 0D (A-05.0)

C. Auto Reply *3.2.1

Display will send out the updated data/ status automatically without GET query from host whenever the following data/status is changed by user through any available ways like remote control unit, front keys, or touch screen.

Power On/Off
Input Select
Brightness
Backlight
Volume
Mute On/Off

3.3 Remote Control Pass-through mode

When PC sets the Display to Remote Control Pass through mode, the Display shall send a 7-byte packet (followed by "CR") in response to RCU button activation. In this mode the RCU shall have no effect on the Display function. For example: "Volume+" will not change the volume in the Display but only sends "Volume+" code to PC over the RS232 port.

IR Pass Through-Function format

Reply: (Command Type="p")

Name	Length	ID	Command Type	RCU Code1 (MSB)	RCU Code2 (LSB)	CR
Byte Count	1 Byte	2 Byte	1 Byte	1 Byte	1 Byte	1 Byte
Bytes order	1	2~3	4	5	6	7

Example1: Remote Control pass-through when "VOL+" key is pressed for Display (#5)
Send (Hex Format)

Name	Length	ID	Command Type	RCU Code1 (MSB)	RCU Code2 (LSB)	CR
Hex	0x36	0x30 0x35	0x70	0x31	0x30	0x0D

Key	Code (HEX)	Basic *3.1.1	Optional *3.1.1
1	01	V	
2	02	V	
3	03	V	
4	04	V	
5	05	V	
6	06	V	
7	07	V	
8	08	V	
9	09	V	
0	0A	V	
-	0B		V
RECALL (LAST)	0C		V
INFO (DISPLAY)	0D		V
	0E		
ASPECT (ZOOM, SIZE)	0F		V
VOLUME UP (+)	10	V	
VOLUME DOWN (-)	11	V	
MUTE	12	V	
CHANNEL/PAGE UP (+)/ BRIGHTNESS+	13		V
CHANNEL/PAGE DOWN (-)/ BRIGHTNESS-	14		V
POWER	15	V	
SOURCES (INPUTS)	16	V	
	17		
	18		
SLEEP	19		V
MENU	1A	V	
UP	1B	V	
DOWN	1C	V	
LEFT (-)	1D	V	
RIGHT (+)	1E	V	

OK (ENTER, SET)	1F	V	
EXIT	20	V	
	21		
	22		
	23		
	24		
	25		
	26		
	27		
	28		
	29		
	2A		
	2B		
RED ■ (F1)	2C		V
GREEN ■ (F2)	2D		V
YELLOW ■ (F3)	2E		V
BLUE ■ (F4)	2F		V

[NOTE]

1. This IR-pass-through code is different from the RCU key code
2. Special control sequence for POWER key under IR-pass through mode..
 - 2-1. When Display is OFF and receives the IR POWER code: Display will turn itself on, then forward the POWER code to the host via RS232.
 - 2-2. When Display is ON and receives the IR POWER code: Display will forward the POWER code to the host via RS232, then turn off itself.
 - 2-3. When SET-POWER LOCK is enabled, the Display will not respond to POWER key pressing.
3. The VOLUME UP and VOLUME DOWN code will repeatedly output when you press and hold the keys.