Planar PS-Series RS232 Protocol

(Applies to PS4652, PS5552, and PS6552 models only)

1 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.

1. Protocol 1, with ID

This set protocol allow user to assign the ID in the command to control the specify ID monitor

2. Protocol 2, without ID

The set protocol is best for single display control

Both sets protocol contain three sections command:

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

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

2 Description

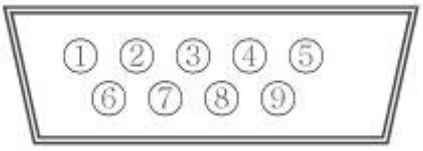
2.1 Hardware specification

LCD communication port in the rear side

(1) Connector type: DSUB 9 Pin Male

(2) Pin Assignment

Male DSUB 9Pin
(outside view)



Pin #	Signal	Remark
1	NC	
2	RXD	Input to LCD Monitor
3	TXD	Output from LCD Monitor
4	NC	
5	GND	
6	NC	
7	NC	
8	NC	
9	NC	
frame	GND	

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

2.2 Communication Setting

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

- Stop Bits: 1(fixed)

2.3 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 receives correctly it will send “+” (02Bh) followed by “CR” (00Dh)
2. If the message is receives incorrectly it will send “-” (02Dh) followed by “CR” (00Dh)

3 Protocol 1: with ID

3.1 Command Description

Length:	Total Byte 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 “p” (0x70h) : RCU Pass-through “+” (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

3.2 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:

Length:	Total Byte of Message excluding “CR”
TV ID	Identification for each of TV If we want to set all TV settings, TV ID can use “99” to achieve, and it will not have Reply command on this function.
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	Value 1	Value 2	Value 3	CR
Byte Count	1 Byte	2 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte
Bytes	1	2~3	4	5	6	7	8	9

order								

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

Example1: Set Brightness as 76 for TV-02 and this command is valid
Send (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	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 176 for TV-02 and this command is NOT valid
Send (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	CR
Hex	0x38	0x30 0x32	0x73	0x24	0x31	0x37	0x36	0x0D

Reply (Hex Format)

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

Example3: Set Tint as 32 for TV-03 and this command is valid
Send (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	CR
Hex	0x38	0x30 0x33	0x73	0x27	0x30	0x33	0x32	0x0D

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	0x34	0x30 0x33	0x2B	0x0D

Example4: Set Tint as 75 for TV-03 and this command is NOT valid

Send (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	CR
Hex	0x38	0x30 0x33	0x73	0x27	0x30	0x37	0x35	0x0D

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	0x34	0x30 0x33	0x2D	0x0D

Example5: Set Brightness as 76 for all TV and this command is valid

Send (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	CR
Hex	0x38	0x39 0x39	0x73	0x24	0x30	0x37	0x36	0x0D

No Reply.

Set-function table

Set Function	Len	Cmd Code (Hex)	Value Range (ASCII Bytes)	Remark
Power	8	21	000: Standby	
			001: On	
Video Source	8	22	000 : VGA	
			001 : HDMI1	
			004 : YPbPr	
			006 : DVI	
			007 : DisplayPort	
			009 : Multi-Media	
Contrast	8	23	000 ~ 100	
Brightness	8	24	000 ~ 100	
Sharpness	8	25	000 ~ 020	
Picture Reset	8	26		
Aspect Ratio	8	31	000: Full (Video) / Full 2 (PC)	
			001: 4:3 (Video) /Real (PC)	
			002: Wide Zoom (Video) / Full1 (PC)	
			003: Zoom (Video)	
Language	8	32	000: English	
			001: Français	

			002: Español	
			003: 繁中	
			004: 简中	
			005: Português	
			006: German	
			007: Dutch	
			008: Polish	
			009: Russia	
Sound Mode	8	33	000: Dynamic	
			001: Standard	
			002: Custom	
Volume	8	35	000 ~ 100	
Mute	8	36	000: Off	
			001: On	
Treble	8	37	000~100	OSD value=RS232 value-50
Bass	8	38	000~100	OSD value=RS232 value-50
Balance	8	39	000~100	OSD value=RS232 value-50
Surround	8	3A	000: Off	
			001: On	
Sound Reset	8	3B		
Monitor ID	8	3D	001 ~ 098	
IR Control	8	42	000: Disable	All the buttons at the remote controller have no function
			001: Enable	
			002: Passthrough Master Note: To set Pass through, the command must use the "With ID protocol", and the ID should between "01"~"98".	

			003: Passthrough Slave Note1: To set Pass through, the command must use the "With ID protocol", and the ID should between "01"~"98". Note2: The monitor will not response to any RS232 command if it is at Passthrough Slave mode	
Button&IR Control	8	43	000: Disable	All the buttons at both keypad board and remote controller have no function.
			001: Enable	
Button Control	8	45	000: Disable	All the buttons at the keypad board have no function
			001: Enable	
Image Retention	8	47	000: Off	
			001: On	
OSD Info Box	8	5B	000: Off	
			001: On	
All Reset	8	7E		
Picture Mode	8	81	000: Standard	
			001: Vivid	
			002: Cinema	
			003: Custom	
Chroma (Color)	8	82	000 ~ 050	
Phase (Tint)	8	83	000 ~ 050	
Backlight	8	84	000 ~ 100	
Adaptive Contrast	8	85	000: Off	
			001: On	
Color Temp	8	86	000: Cool	
			001: Neutral	
			002: Warm	
			003: Custom	
Audio Source	8	88	000: Audio1	
			002: HDMI or HDMI1	
			004: DisplayPort	
			006: Multi-Media	
Speaker	8	89	000: Internal	
			002: Lineout	

PAP Enable	8	8A	000: Off	
			001: PIP	
			002: PBP	
PAP Size	8	8D	When PAP=PIP 000: Small 001: Large	
			When PAP=PBP 000 ~ 014	
PIP Position	8	8E	000: Upper Left	
			001: Upper Right	
			002: Lower Left	
			003: Lower Right	
Auto Adjustment Execute	8	8F		For VGA only, execute auto adjustment.
VGA Clock frequency	8	90	000 ~ 100	
VGA Phase	8	91	000 ~ 031	
VGA H.Position	8	92	000 ~ 060	
VGA V.Position	8	93	000 ~ 060	
Ambient Light Sensor	8	94	000: Off	
			001: On	
Auto Search	8	96	000: Off	
			001: On	
Over Scan	8	97	000: Off	
			001: On	
			002: Auto	
RTC Year	8	98	000 ~ 099	Ex: value=012 means Year 2012 If the setting is illegal (Ex: Year 2013 doesn't have the date Feb/29), return "Invalid Command Reply".

RTC Month	8	99	001 ~ 012	Ex: value=001 means January If the setting is illegal (Ex: February doesn't have the date Feb/31), return "Invalid Command Reply".
RTC Day	8	9A	001 ~ 031	If the setting is illegal (Ex: Day31 doesn't exist in April), return "Invalid Command Reply".
RTC Hour	8	9B	000 ~ 023	
RTC Minute	8	9C	000 ~ 059	
OSD Rotation	8	9F	000: Landscape	
			001: Portrait	
H Monitor	8	A4	001 ~ 010	
V Monitor	8	A5	001 ~ 010	
H Position	8	A6	001 ~ 010	
V Position	8	A7	001 ~ 010	
Frame Comp.	8	A8	000: Off	
			001: On	
Power Save	8	A9	000: Off	
			001: Low	
			002: High	
Auto Adjustment	8	AA	000: Off	
			001: On	
Display Wall LED	8	AE	000: Off	
			001: On	
Display Wall Power On Delay	8	AF	000: Off	
			001: On	
PAP Active Picture	8	BE	000: Main(For PIP), Left(For PBP)	
			001: Sub(For PIP), Right(For PBP)	

On/Off Timer	14	E0	Byte1~Byte9 (1) Byte1: Decide which Timer is selected, and its enable/disable setting. Byte1[3:0]=0x1~0x07. There are totally 7 Timers, this value is used to decide which Timer is selected. Byte1[7]: Reserved, should be 0. Byte1[6]: The Timer is enable or not. Byte1[6]=1 means enable. Byte1[5]: The On Timer is enable or not. Byte1[5]=1 means enable. Byte1[4]: The Off Timer is enable or not. Byte1[4]=1 means enable. (2) Byte2: The Day of the On/Off Timer. bit0 for Sunday, bit1 for Monday, bit2 for Tuesday, bit3 for Wednesday, bit4 for Thursday, bit5 for Friday, bit6 for Saturday, bit7 for Everday. (3) Byte3: The Hour of the On Timer. Byte3=0x00~0x17. (4) Byte4: The Minute of the On Timer. Byte4=0x00~0x3B. (5) Byte5: The Hour of the Off Timer. Byte5=0x00~0x17. (6) Byte6: The Minute of the Off Timer. Byte6=0x00~0x3B. (7) Byte7: Select the Video Source. 0x00=VGA, 0x01=HDMI1, 0x02=HDMI2, 0x03=AV, 0x04=YPbPr, 0x05=S-Video, 0x06=DVI, 0x07=DisplayPort, 0x08=SDI, 0x09=Multi-Media. 0xFF=Default. Other values are reserved. (8) Byte8~9 are reserved, and should be 0x00.	Note: Some of the Video Sources are not supported if the model doesn't have this feature.. Ex: Byte1=0x01 means the Timer no.1 is selected and disable. Ex: Byte1=0x41 means the Timer no.1 is select and enable, and its both On and Off Timers are disable. Ex: Byte1=0x61 means the Timer no.1 is select and enable, and its On Timer is enable, Off Timer is disable. Ex: Byte1=0x71 means the Timer no.1 is select and enable, and its both On and Off Timers are enable. Ex: Byte1=0x53 means the Timer no.3 is select and enable, and its On Timer is disable, Off Timer is enable. Ex: Byte2=0x02 means the Timer is on Monday. Ex: Byte3=0x08, Byte4=0x1E means the On Timer is at 8:30. Ex: Byte5=0x17, Byte6=0x00 means the Off Timer is at 23:00. Ex: Byte7=0x00 means the selected Video Source is VGA.
Change Protocol	8	FF	001: Change protocol to Factory Protocol. 002: Change protocol to Gprobe Protocol. Other values are reserved.	

3.3 Get-Function Listing

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

Get-Function description:

Length:	Total Byte of Message 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

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	Value 1	Value 2	Value 3	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	Value 1	Value 2	Value 3	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 TV-05 and this command is valid.
The Brightness value is 67.

Send (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	CR
Hex	0x38	0x30 0x35	0x67	0x62	0x30	0x30	0x30	0x0D

Reply(Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	CR
Hex	0x38	0x30 0x35	0x72	0x62	0x30	0x36	0x37	0x0D

Example2: Get Brightness from TV-05 , but the Brightness command ID is error and it is NOT in the command table.

Send (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	CR

Hex	0x38	0x30 0x35	0x67	0XD3	0x30	0x30	0x30	0x0 D

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	0x34	0x30 0x35	0x2D	0x0 D

Example3: Get Tint from TV-0007 and this command is valid.
The Tint value is 32.
Send (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	CR
Hex	0x38	0x30 0x37	0x67	0X65	0x30	0x30	0x30	0x0 D

Reply (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	CR
Hex	0x38	0x30 0x37	0x72	0x65	0x30	0x33	0x32	0x0 D

Example4: 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	Value 1	Value 2	Value 3	CR
Hex	0x38	0x30 0x37	0x67	0XD7	0x30	0x30	0x30	0x0 D

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	0x34	0x30 0x37	0x2D	0x0 D

Example5 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	Value 1	Value 2	Value 3	Value 4	CR
Hex	0x39	0x30 0x37	0x67	0X6F	0x30	0x30	0x30	0x30	0x0 D

Reply (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	Value 3	CR
Hex	0x39	0x30	0x72	0X6F	0x31	0x37	0x38	0x36	0x0

		0x37							D

Example6 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	Value 1	Value 2	Value 3	Value 4	CR
Hex	0x39	0x30 0x37	0x67	0X70	0x30	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	Value 4	CR
Hex	0x39	0x30 0x37	0x72	0X70	0x31	0x35	0x36	0x38	0x0D

Example7 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	Value 1	Value 2	Value 3	Value 4	CR
Hex	0x39	0x30 0x37	0x67	0X71	0x30	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	Value 4	CR
Hex	0x39	0x30 0x37	0x72	0X71	0x2B	0x30	0x37	0x35	0x0D

Example8 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	Value 1	Value 2	Value 3	Value 4	Value 5	CR
Hex	0x3A	0x30 0x37	0x67	0X76	0x30	0x30	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	Value 4	Value 5	CR

Hex	0x3A	0x30 0x37	0x72	0X76	0x32	0x31	0x33	0x35	0x36	0x0D

PLANAR

PC Get-function command to LCD Monitor

Get Function	Len	Cmd Code (Hex)	Value Range (ASCII Bytes)	Remark
Model Info	20	20	(1) Input value: Byte1 - Byte2 - Byte3…Byte15 Byte2~Byte11=0x00 Byte1=0x01: Get Customer Name Byte1=0x02: Get Customer Model Name Byte1=0x03: Get Qisda Model Name Byte1=0x04: Get Scaler Firmware Version Byte1=0x05: Get LAN 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.	
Capability	8	21	Return value: Byte1 - Byte2 - Byte3 (1) Byte1 bit0 of Byte1=1: Support SDI bit1 of Byte1=1: Support Touch feature bit2 of Byte1=1: Support Internal speaker bit3 of Byte1=1: Support Multi-Media module (only STB supports Multi-Media module) bit4 of Byte1=1: Support HDMI2 (only STA supports HDMI2) Other bit are reserved, and should be 0. (2) Byte2~Byte3: Reserved, should be 0x00.	
Signal Status	8	22	000: Signal unstable	
			001: Signal stable (Active Sync exists)	
Signal Format	8	23	000: PC	
			001: Video	
AV Timing	8	24	000: NTSC	
			001: PAL	
Treble	8	37	000~100	OSD value=RS232 value-50
Bass	8	38	000~100	OSD value=RS232 value-50
Balance	8	39	000~100	OSD value=RS232 value-50
Surround	8	3A	000: Off	
			001: On	
OSD Info Box	8	5D	000: Off	
			001: On	
Contrast	8	61	000 ~ 100	
Brightness	8	62	000 ~ 100	
Sharpness	8	63	000 ~ 020	
Sound Mode	8	65	000: Dynamic	
			001: Standard	
			002: Custom	
Volume	8	66	000 ~ 100	

Mute	8	67	000: Off	
			001: On	
IR Control	8	68	000: Disable	All the buttons at the remote controller have no function
			001: Enable	
			002: Passthrough Master Note: To set Pass through, the command must use the "With ID protocal", and the ID should between "01"~"98".	
			003: Passthrough Slave Note1: To set Pass through, the command must use the "With ID protocal", and the ID should between "01"~"98". Note2: The monitor will not response to any RS232 command if it is at Passthrough Slave mode	
Button&IR Control	8	69	000: Disable	All the buttons at both keypad board and remote controller have no function.
			001: Enable	
Video Source	8	6A	000 : VGA	If PIP or PBP=On, the return value is the source at active window.
			001 : HDMI1	
			004 : YPbPr	
			006 : DVI	
			007 : DisplayPort	
			008 : SDI	Option, not support if the platform doesn't have this feature.
			009 : Multi-Media	Option, not support if the platform doesn't have this feature.
Power	8	6C	000: Standby	
			001: On	
5V	8	6D	~050	value=049 means 4.9V
12V	8	6E	~120	value=122 means 12.2V
Ambient Sensor Value	10	70	00000 ~ 2000	Ex: If the value is 500, the return value should be: Byte1=0x30, Byte2=0x35, Byte3=0x30, Byte4=0x30, Byte5=0x30.
Thermal Sensor Value	10	71	(1) Input value: Byte1-Byte2-...Byte5 (a) Byte1=0x01: Get the thermal sensor value from main board 0x02: Get the thermal sensor value from keypad board (b) Byte2~Byte5 are reserved, should b 0x00 (2) Return value: Byte1-Byte2-...Byte5 (a) Byte1=0x01: The thermal sensor value is from main board 0x02: The thermal sensor value is rom kaypad board (b) Byte2: If the thermal value is >=0, Byte2='+' (0x2B) If the thermal value is <0, Byte2='-' (0x2D) (c) Byte3~Byte5: The absolute value of the temperature, in ASCII format.	Ex: If the temperature 5℃ is from main board, the return value should be: Byte1=0x01, Byte2=0x2B, Byte3=0x30, Byte4=0x30, Byte5=0x35. Ex: If the temperature -15℃ is from keypad board, the return value should be: Byte1=0x02, Byte2=0x2D, Byte3=0x30, Byte4=0x31, Byte5=0x35.
Image Retention	8	72	000: Off	
			001: On	
Button Control	8	73	000: Disable	All the buttons at the keypad board have no function

			001: Enable	
Monitor ID	8	75	001 ~ 098	
Operation Time	10	76	00000 ~ 99999	unit is hour
Aspect Ratio	8	77	000: Full (Video) / Full 2 (PC)	
			001: 4:3 (Video) /Real (PC)	
			002: Wide Zoom (Video) / Full1 (PC)	
			003: Zoom (Video)	
Language	8	78	000: English	
			001: Français	
			002: Español	
			003: 繁中	
			004: 簡中	
			005: Português	
			006: German	
			007: Dutch	
			008: Polish	
			009: Russia	
Display Wall LED	8	AE	000: OFF	
			001: ON	
Display Wall Power On Delay	8	AF	000: OFF	
			001: ON	
Picture Mode	8	B1	000: Standard	
			001: Vivid	
			002: Cinema	
			003: Custom	
Chroma (Color)	8	B2	000 ~ 050	
Phase (Tint)	8	B3	000 ~ 050	
Backlight	8	B4	000 ~ 100	
Adaptive Contrast	8	B5	000: Off	
			001: On	
Color Temp	8	B6	000: Cool	
			001: Neutral	
			002: Warm	
			003: Custom	
Audio Source	8	88	000: Audio1	
			002: HDMI or HDMI1	
			004: DisplayPort	
			006: Multi-Media	
Speaker	8	B9	000: Internal	
			002: Lineout	
PAP Enable	8	BA	000: Off	

			001: PIP	
			002: PBP	
PAP Size	8	BD	When PAP=PIP 000: Small 001: Large	
			When PAP=PBP 000 ~ 014	
PAP Active Picture	8	BE	000: Main(For PIP), Left(For PBP)	
			001: Sub(For PIP), Right(For PBP)	
PIP Position	8	BF	000: Upper Left	
			001: Upper Right	
			002: Lower Left	
			003: Lower Right	
VGA Clock frequency	8	C0	000 ~ 100	For VGA only.
VGA Phase	8	C1	000 ~ 031	For VGA only.
VGA H.Position	8	C2	000 ~ 060	
VGA V.Position	8	C3	000 ~ 060	
Ambient Light Sensor	8	C4	000: Off	
			001: On	
Auto Search	8	C6	000: Off	
			001: On	
Over Scan	8	C7	000: Off	
			001: On	
			002: Auto	
RTC Year	8	C8	000 ~ 099	Ex: value=012 means Year 2012 If the RTC is not enable, return "Invalid Command Reply"
RTC Month	8	C9	001 ~ 012	Ex: value=001 means January If the RTC is not enable, return "Invalid Command Reply"
RTC Day	8	CA	001 ~ 031	If the RTC is not enable, return "Invalid Command Reply"
RTC Hour	8	CB	000 ~ 023	If the RTC is not enable, return "Invalid Command Reply"
RTC Minute	8	CC	000 ~ 059	If the RTC is not enable, return "Invalid Command Reply"
OSD Rotation	8	CF	000: Landscape	
			001: Portrait	
H Monitor	8	D4	001 ~ 010	
V Monitor	8	D5	001 ~ 010	
H Position	8	D6	001 ~ 010	
V Position	8	D7	001 ~ 010	
Frame Comp.	8	D8	000: Off	
			001: On	
Power Save	8	D9	000: Off	
			001: Low	

			002: High	
Auto Adjustment	8	DA	000: Off	
			001: On	
On/Off Timer	14	E0	Input value: Byte1 - Byte2 - Byte3…Byte9 (1) Byte1[3:0]: The Number of the On/Off Timer. There are totally 7 On/Off Timers, and this byte is used to selected which timer is going to be accessed. (2) Byte1[7:4] is reserved, should be 0. (3) Byte2~9 are reserverd, should be 0x00. Return value: Byte1 - Byte2 - Byte3…Byte9 (1) Byte1[3:0]: Should retuen the same value as Byte1 at Input value. Byte1[7]: Reserved, should be 0. Byte1[6]: The Timer is enable or not. Byte1[6]=1 means enable. Byte1[5]: The On Timer is enable or not. Byte1[5]=1 means enable. Byte1[4]: The Off Timer is enable or not. Byte1[4]=1 means enable. (2) Byte2: The Day of the On/Off Timer. bit0 for Sunday, bit1 for Monday, bit2 for Tuesday, bit3 for Wednesday, bit4 for Thursday, bit5 for Friday, bit6 for Saturday, bit7 for Everday. (3) Byte3: The Hour of the On Timer. Byte3=0x00~0x17. (4) Byte4: The Minute of the On Timer. Byte4=0x00~0x3B. (5) Byte5: The Hour of the Off Timer. Byte5=0x00~0x17. (6) Byte6: The Minute of the Off Timer. Byte6=0x00~0x3B. (7) Byte7: Select the Video Source. 0x00=VGA, 0x01=HDMI1, 0x02=HDMI2, 0x03=AV, 0x04=YPbPr, 0x05=S-Video, 0x06=DVI, 0x07=DisplayPort, 0x08=SDI, 0x09=Multi-Media. 0xFF=Default. Other values are reserved. (8) Byte8~9 are reserved, and should be 0x00.	See the return value examples below: Ex: Byte1=0x01 means the Timer no.1 is selected and disable. Ex: Byte1=0x41 means the Timer no.1 is select and enable, and its both On and Off Timers are disable. Ex: Byte1=0x61 means the Timer no.1 is select and enable, and its On Timer is enable, Off Timer is disable. Ex: Byte1=0x71 means the Timer no.1 is select and enable, and its both On and Off Timers are enable. Ex: Byte1=0x53 means the Timer no.3 is select and enable, and its On Timer is disable, Off Timer is enable. Ex: Byte2=0x02 means the Timer is on Monday. Ex: Byte3=0x08, Byte4=0x1E means the On Timer is at 8:30. Ex: Byte5=0x17, Byte6=0x00 means the Off Timer is at 23:00. Ex: Byte7=0x00 means the selected Video Source is VGA.

Network Setting	14	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.	Ex: Subnet Mask=255.255.255.0, the return value: Byte1=0x02, Byte2=0xFF, Byte3=0xFF, Byte4=0xFF, Byte5=0x00, Byte6~9=0x00.

4 Protocol 2 : without ID

4.1 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 5 bytes. Note that the “Value” byte is always = 00.

Set-Function description:

Length:	Total bytes of message = 5 ASCII (35H) excluding “CR”
Command:	Function command code: One byte ASCII code
Value[1~3]:	Three bytes ASCII that defines the value

Set-Function format:

Name	Length	Command	Value1	Value2	Value3	CR
Byte Count	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte
Bytes order	1	2	3	4	5	6

All Set-Function from PC to Monitor (ASCII)

Name	Length	Command	Value1	Value2	Value3	CR
Byte Count	5	1 Byte	1 Byte	1 Byte	1 Byte	00D
Bytes order	1	2	3	4	5	6

Example: Set Mute-ON command (ASCII)

Name	Length	Command	Value1	Value2	Value3	CR
Byte Count	5	6	0	0	0	00D
Bytes order	1	2	3	4	5	6

Example: Set Mute-OFF command (ASCII)

Name	Length	Command	Value1	Value2	Value3	CR
Byte Count	5	6	0	0	1	00D
Bytes order	1	2	3	4	5	6

LCD Monitor will send “+” (02Bh) and “CR” bytes to PC after receiving a valid command.
LCD Monitor will send “-” (02Dh) and “CR” bytes to PC if the command is not valid.

Value Range: Three bytes ASCII value range
Command Code: Function command code in ASCII

set command table

Get Function	Len	Cmd Code (Hex)	Value Range (ASCII Bytes)	Remark
Model Info	17	20	(1) Input value: Byte1 - Byte2 - Byte3…Byte15 Byte2~Byte11=0x00 Byte1=0x01: Get Customer Name Byte1=0x02: Get Customer Model Name Byte1=0x03: Get Qisda Model Name Byte1=0x04: Get Scaler Firmware Version Byte1=0x05: Get LAN 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.	

Capability	5	21	Return value: Byte1 - Byte2 - Byte3 (1) Byte1 bit0 of Byte1=1: Support SDI bit1 of Byte1=1: Support Touch feature bit2 of Byte1=1: Support Internal speaker bit3 of Byte1=1: Support Multi-Media module (only STB supports Multi-Media module) bit4 of Byte1=1: Support HDMI2 (only STA supports HDMI2) Other bit are reserved, and should be 0. (2) Byte2~Byte3: Reserved, should be 0x00.	
Signal Status	5	22	000: Signal unstable	
			001: Signal stable (Active Sync exists)	
Signal Format	5	23	000: PC	
			001: Video	
AV Timing	5	24	000: NTSC	
			001: PAL	
Treble	5	37	000~100	OSD value=RS232 value-50
Bass	5	38	000~100	OSD value=RS232 value-50
Balance	5	39	000~100	OSD value=RS232 value-50
Surround	5	3A	000: Off	
			001: On	
OSD Info Box	5	5D	000: Off	
			001: On	
Contrast	5	61	000 ~ 100	
Brightness	5	62	000 ~ 100	
Sharpness	5	63	000 ~ 020	
Sound Mode	5	65	000: Dynamic	
			001: Standard	
			002: Custom	
Volume	5	66	000 ~ 100	
Mute	5	67	000: Off	
			001: On	
IR Control	5	68	000: Disable	All the buttons at the remote controller have no function
			001: Enable	
			002: Passthrough Master Note: To set Pass through, the command must use the "With ID protocal", and the ID should between "01"~"98".	
			003: Passthrough Slave Note1: To set Pass through, the command must use the "With ID protocal", and the ID should between "01"~"98". Note2: The monitor will not response to any RS232 command if it is at Passthrough Slave mode	
Button&IR Control	5	69	000: Disable	All the buttons at both keypad board and remote controller have no function.
			001: Enable	

Video Source	5	6A	000 : VGA	If PIP or PBP=On, the return value is the source at active window.
			001 : HDMI1	
			004 : YPbPr	
			006 : DVI	
			007 : DisplayPort	
			009 : Multi-Media	
Power	5	6C	000: Standby	
			001: On	
5V	5	6D	~050	value=049 means 4.9V
12V	5	6E	~120	value=122 means 12.2V
Ambient Sensor Value	7	70	00000 ~ 2000	Ex: If the value is 500, the return value should be: Byte1=0x30, Byte2=0x35, Byte3=0x30, Byte4=0x30, Byte5=0x30.
Thermal Sensor Value	7	71	(1) Input value: Byte1-Byte2-...Byte5 (a) Byte1=0x01: Get the thermal sensor value from main board 0x02: Get the thermal sensor value from keypad board (b) Byte2~Byte5 are reserved, should b 0x00 (2) Return value: Byte1-Byte2-...Byte5 (a) Byte1=0x01: The thermal sensor value is from main board 0x02: The thermal sensor value is rom kaypad board (b) Byte2: If the thermal value is >=0, Byte2='+' (0x2B) If the thermal value is <0, Byte2='-' (0x2D) (c) Byte3~Byte5: The absolute value of the temperature, in ASCII format.	Ex: If the temperature 5℃ is from main board, the return value should be: Byte1=0x01, Byte2=0x2B, Byte3=0x30, Byte4=0x30, Byte5=0x35. Ex: If the temperature -15℃ is from keypad board, the return value should be: Byte1=0x02, Byte2=0x2D, Byte3=0x30, Byte4=0x31, Byte5=0x35.
Image Retention	5	72	000: Off	
			001: On	
Button Control	5	73	000: Disable	All the buttons at the keypad board have no function
			001: Enable	
Monitor ID	5	75	001 ~ 098	
Operation Time	7	76	00000 ~ 99999	unit is hour
Aspect Ratio	5	77	000: Full (Video) / Full 2 (PC)	
			001: 4:3 (Video) /Real (PC)	
			002: Wide Zoom (Video) / Full1 (PC)	
			003: Zoom (Video)	
Language	5	78	000: English	
			001: Français	
			002: Español	
			003: 繁中	
			004: 简中	
			005: Português	
			006: German	
			007: Dutch	

			008: Polish	
			009: Russia	
Display Wall LED	5	AE	000: OFF	
			001: ON	
Display Wall Power On Delay	5	AF	000: OFF	
			001: ON	
Picture Mode	5	B1	000: Standard	
			001: Vivid	
			002: Cinema	
			003: Custom	
Chroma (Color)	5	B2	000 ~ 050	
Phase (Tint)	5	B3	000 ~ 050	
Backlight	5	B4	000 ~ 100	
Adaptive Contrast	5	B5	000: Off	
			001: On	
Color Temp	5	B6	000: Cool	
			001: Neutral	
			002: Warm	
			003: Custom	
Audio Source	5	88	000: Audio1	
			002: HDMI or HDMI1	
			004: DisplayPort	
			006: Multi-Media	
Speaker	5	B9	000: Internal	
			002: Lineout	
PAP Enable	5	BA	000: Off	
			001: PIP	
			002: PBP	
PAP Size	5	BD	When PAP=PIP 000: Small 001: Large	
			When PAP=PBP 000 ~ 014	
PAP Active Picture	5	BE	000: Main(For PIP), Left(For PBP)	
			001: Sub(For PIP), Right(For PBP)	
PIP Position	5	BF	000: Upper Left	
			001: Upper Right	
			002: Lower Left	
			003: Lower Right	
VGA Clock frequency	5	C0	000 ~ 100	For VGA only.
VGA Phase	5	C1	000 ~ 031	For VGA only.

VGA H.Position	5	C2	000 ~ 060	
VGA V.Position	5	C3	000 ~ 060	
Ambient Light Sensor	5	C4	000: Off	
			001: On	
Auto Search	5	C6	000: Off	
			001: On	
Over Scan	5	C7	000: Off	
			001: On	
			002: Auto	
RTC Year	5	C8	000 ~ 099	Ex: value=012 means Year 2012 If the RTC is not enable, return "Invalid Command Reply"
RTC Month	5	C9	001 ~ 012	Ex: value=001 means January If the RTC is not enable, return "Invalid Command Reply"
RTC Day	5	CA	001 ~ 031	If the RTC is not enable, return "Invalid Command Reply"
RTC Hour	5	CB	000 ~ 023	If the RTC is not enable, return "Invalid Command Reply"
RTC Minute	5	CC	000 ~ 059	If the RTC is not enable, return "Invalid Command Reply"
OSD Rotation	5	CF	000: Landscape	
			001: Portrait	
H Monitor	5	D4	001 ~ 010	
V Monitor	5	D5	001 ~ 010	
H Position	5	D6	001 ~ 010	
V Position	5	D7	001 ~ 010	
Frame Comp.	5	D8	000: Off	
			001: On	
Power Save	5	D9	000: Off	
			001: Low	
			002: High	
Auto Adjustment	5	DA	000: Off	
			001: On	

On/Off Timer	11	E0	Input value: Byte1 - Byte2 - Byte3…Byte9 (1) Byte1[3:0]: The Number of the On/Off Timer. There are totally 7 On/Off Timers, and this byte is used to selected which timer is going to be accessed. (2) Byte1[7:4] is reserved, should be 0. (3) Byte2~9 are reserverd, should be 0x00. Return value: Byte1 - Byte2 - Byte3…Byte9 (1) Byte1[3:0]: Should retuen the same value as Byte1 at Input value. Byte1[7]: Reserved, should be 0. Byte1[6]: The Timer is enable or not. Byte1[6]=1 means enable. Byte1[5]: The On Timer is enable or not. Byte1[5]=1 means enable. Byte1[4]: The Off Timer is enable or not. Byte1[4]=1 means enable. (2) Byte2: The Day of the On/Off Timer. bit0 for Sunday, bit1 for Monday, bit2 for Tuesday, bit3 for Wednesday, bit4 for Thursday, bit5 for Friday, bit6 for Saturday, bit7 for Everday. (3) Byte3: The Hour of the On Timer. Byte3=0x00~0x17. (4) Byte4: The Minute of the On Timer. Byte4=0x00~0x3B. (5) Byte5: The Hour of the Off Timer. Byte5=0x00~0x17. (6) Byte6: The Minute of the Off Timer. Byte6=0x00~0x3B. (7) Byte7: Select the Video Source. 0x00=VGA, 0x01=HDMI1, 0x02=HDMI2, 0x03=AV, 0x04=YPbPr, 0x05=S-Video, 0x06=DVI, 0x07=DisplayPort, 0x08=SDI, 0x09=Multi-Media. 0xFF=Default. Other values are reserved. (8) Byte8~9 are reserved, and should be 0x00.	See the return value examples below: Ex: Byte1=0x01 means the Timer no.1 is selected and disable. Ex: Byte1=0x41 means the Timer no.1 is select and enable, and its both On and Off Timers are disable. Ex: Byte1=0x61 means the Timer no.1 is select and enable, and its On Timer is enable, Off Timer is disable. Ex: Byte1=0x71 means the Timer no.1 is select and enable, and its both On and Off Timers are enable. Ex: Byte1=0x53 means the Timer no.3 is select and enable, and its On Timer is disable, Off Timer is enable. Ex: Byte2=0x02 means the Timer is on Monday. Ex: Byte3=0x08, Byte4=0x1E means the On Timer is at 8:30. Ex: Byte5=0x17, Byte6=0x00 means the Off Timer is at 23:00. Ex: Byte7=0x00 means the selected Video Source is VGA.

Network Setting	11	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.	Ex: Subnet Mask=255.255.255.0, the return value: Byte1=0x02, Byte2=0xFF, Byte3=0xFF, Byte4=0xFF, Byte5=0x00, Byte6~9=0x00.