

Planar PS-Series RS232 protocol

(Applies to PS4200, PS4200TL, PS4250, PS4650, PS5550, PS5551, PS6500 models only)

Table of contents

1	Introduction	2
2	Description.....	2
2.1	Hardware specification	2
2.2	Communication Setting	2
2.3	Command Message Reference	2
3	Protocol 1 : with ID	3
3.1	Command Description	3
3.2	Set-Function Listing	3
3.3	Get-Function Listing.....	8
4	Protocol 2 : without ID	16
4.1	Set function listing.....	16
4.2	Remote Control Pass-through mode.....	20

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.

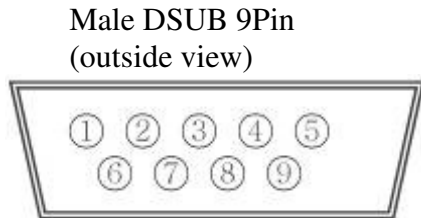
2 Description

2.1 Hardware specification

LCD communication port in the rear side

(1) Connector type: DSUB 9 Pin Male

(2) Pin Assignment



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 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 1: with ID

3.1 Command Description

Length: Total Byte of Message excluding “CR”
 TV ID Identification for each of TV
 Command Identify command type,
 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 Identify command type,
 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 order	1	2~3	4	5	6	7	8	9

Reply: (Command Type=“+” or “-”)

Name	Length	ID	Command Type	CR
Byte	1 Byte	2	1 Byte	1

Count		Byte		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	<u>0x38</u>	<u>0x30</u> <u>0x32</u>	<u>0x73</u>	<u>0x24</u>	<u>0x30</u>	<u>0x37</u>	<u>0x36</u>	<u>0x0D</u>

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	<u>0x34</u>	<u>0x30</u> <u>0x32</u>	<u>0x2B</u>	<u>0x0D</u>

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	<u>0x38</u>	<u>0x30</u> <u>0x32</u>	<u>0x73</u>	<u>0x24</u>	<u>0x31</u>	<u>0x37</u>	<u>0x36</u>	<u>0x0D</u>

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	<u>0x34</u>	<u>0x30</u> <u>0x32</u>	<u>0x2D</u>	<u>0x0D</u>

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	<u>0x38</u>	<u>0x30</u> <u>0x33</u>	<u>0x73</u>	<u>0x27</u>	<u>0x30</u>	<u>0x33</u>	<u>0x32</u>	<u>0x0D</u>

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	<u>0x34</u>	<u>0x30</u> <u>0x33</u>	<u>0x2B</u>	<u>0x0D</u>

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	<u>0x38</u>	<u>0x30</u> <u>0x33</u>	<u>0x73</u>	<u>0x27</u>	<u>0x30</u>	<u>0x37</u>	<u>0x35</u>	<u>0x0D</u>

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	<u>0x34</u>	<u>0x30</u> <u>0x33</u>	<u>0x2D</u>	<u>0x0D</u>

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	<u>0x38</u>	<u>0x39</u> <u>0x39</u>	<u>0x73</u>	<u>0x24</u>	<u>0x30</u>	<u>0x37</u>	<u>0x36</u>	<u>0x0D</u>

No Reply.

Set-function table

Set Function	Len	ID	Cmd Type	Command Code (ASCII)	Command Code (Hex)	Value Range (Three ASCII bytes)	Comments
Picture mode	8		s		81	000: STANDARD 001: VIVID 002: CINEMA 003: USER	
Contrast	8		s	#	23	000 ~ 100	
Brightness	8		s	\$	24	000 ~ 100	
Color	8		s		82	000 ~ 100	
Tint	8		s		83	000 ~ 100	
Sharpness	8		s	%	25	000 ~ 010	
Backlight	8		s		84	000 ~ 100	Step : 20 for OSD display range 0~5
DCR	8		s		85	000: OFF 001: ON	
Color Temp	8		S		86	000: 12000K 001: 9300K 002: 6500K 004: User	
Input Resolution	8		s		87	000: AUTO 001: 1024x768 002: 1280x768 003: 1360x768 004: 1366x768	
Volume	8		s	5	35	000 ~ 100	

Mute	8		s	6	36	000: OFF 001: ON	
Audio Source	8		s		88	000: Audio1 001: HDMI 002: Audio2 003: Audio3	
Speaker	8		s		89	000: Internal 001: External 002: Lineout	Only effected for models include internal speakers.
Aspect Ratio	8		s	1	31	000: Full 001: Original	
PIP Enable	8		s		8A	000: OFF 001: ON	
PIP Main Input	8		s		8B	000: VGA 001: YPbPr 002: DVI 003: HDMI	
PIP Sub Input	8		s		8C	000: VGA 001: YPbPr 002: DVI 003: HDMI	
PIP Size	8		s		8D	000: Small 001: Middle 002: Large	
PIP Position	8		s		8E	000: Move Down 001: Move Up 002: Move Left 003: Move Right	
Video Source	8		s	"	22	000 : VGA 001 : HDMI1 003 : CVBS1 004 : YPbPr 005 : S-Video 006 : DVI	
Auto adjustment	8		s		8F		

Clock frequency	8		s		90	000 ~ 32	
Phase	8		s		91	000 ~ 32	
H.Position	8		s		92	000 ~ 100	
V.Position	8		s		93	000 ~ 100	
Ambient Light Sensor	8		s		94	000: OFF 001: ON	
Blue Screen	8		s		95	000: OFF 001: ON	
Auto Detect	8		s		96	000: OFF 001: ON	
Touch Feature	8		s		9E	000: OFF	Only effected for Touch models.
						001: On	
Language	8		s	2	32	000: English 001: French 002: Spanish	
						003: Czech	Optional by different models.
						004: Danish	Optional by different models.
Over Scan	8		s		97	000: OFF 001: ON	
RTC Year	8		s		98	000 ~ 099	From 2000~2099
RTC Month	8		s		99	000 ~ 012	
RTC Day	8		s		9A	000 ~ 031	
RTC Hour	8		s		9B	000 ~ 023	
RTC Minute	8		s		9C	000 ~ 059	
Daylight saving time	8		s		9D	000: OFF 001: ON	
H Monitor	8		s		A4	001 ~ 010	
V Monitor	8		s		A5	001 ~ 010	
H Position	8		s		A6	001 ~ 010	
V Position	8		s		A7	001 ~ 010	
Frame Comp.	8		s		A8	000: OFF 001: ON	
Power save	8		s		A9	000: OFF 001: Eco	

						002: VGA Only 003: Standard	
Monitor ID	8		s	=	3D	001 ~ 098	
Image retention	8		s	G	47	000: OFF 001: ON	
Auto adjustment	8		s		AA	000: OFF 001: ON	
DDC/CI	8		s		AB	000: OFF 001: ON	
Reset User Default	8		s		AC		
OSD Info Box	8		s	[	5B	000: OFF 001: ON	
Store User Default	8		s		AD		
Factory Reset	8		s	~	7E		
Power	8		s	!	21	000: STBY 001: ON	
Key Pad	8		s	A	41	000 : POWER 001 : SOURCE 002 : MENU 003 : UP 004 : DOWN 005 : LEFT 006 : RIGHT 007 : MUTE	
Remote Control	8		s	B	42	000: Disable 001: Enable 002: Pass through	
Key Pad function	8		s	C	43	000: Disable 001: Enable	
Menu Key function	8		s	E	45	000: Disable 001: Enable	
Power Key function	8		s	F	46	000: Disable 001: Enable	

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 Identify command type,
 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 sensor, 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	<u>0x38</u>	<u>0x30</u> <u>0x35</u>	<u>0x72</u>	<u>0x62</u>	<u>0x30</u>	<u>0x36</u>	<u>0x37</u>	<u>0x0</u> <u>D</u>
-----	-------------	----------------------------	-------------	-------------	-------------	-------------	-------------	------------------------

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	<u>0x38</u>	<u>0x30</u> <u>0x35</u>	<u>0x67</u>	<u>0XD3</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x0</u> <u>D</u>

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	<u>0x34</u>	<u>0x30</u> <u>0x35</u>	<u>0x2D</u>	<u>0x0</u> <u>D</u>

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	<u>0x38</u>	<u>0x30</u> <u>0x37</u>	<u>0x67</u>	<u>0X65</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x0</u> <u>D</u>

Reply (Hex Format)

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

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	<u>0x38</u>	<u>0x30</u> <u>0x37</u>	<u>0x67</u>	<u>0XD7</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x0</u> <u>D</u>

Reply (Hex Format)

Name	Length	ID	Command Type	CR
Hex	<u>0x34</u>	<u>0x30</u> <u>0x37</u>	<u>0x2D</u>	<u>0x0</u> <u>D</u>

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	<u>0x39</u>	<u>0x30</u> <u>0x37</u>	<u>0x67</u>	<u>0X6F</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x0D</u>

Reply (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	Value 3	CR
Hex	<u>0x39</u>	<u>0x30</u> <u>0x37</u>	<u>0x72</u>	<u>0X6F</u>	<u>0x31</u>	<u>0x37</u>	<u>0x38</u>	<u>0x36</u>	<u>0x0D</u>

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	<u>0x39</u>	<u>0x30</u> <u>0x37</u>	<u>0x67</u>	<u>0X70</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x0D</u>

Reply (Hex Format)

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

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	<u>0x39</u>	<u>0x30</u> <u>0x37</u>	<u>0x67</u>	<u>0X71</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x0D</u>

Reply (Hex Format)

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

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	Command	Value	Value	Value	Value	Value	CR
------	--------	----	---------	---------	-------	-------	-------	-------	-------	----

	h		Type	d	1	2	3	4	5	
Hex	<u>0x3A</u>	<u>0x30</u> <u>0x37</u>	<u>0x67</u>	<u>0X76</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x30</u>	<u>0x0</u> <u>D</u>

Reply (Hex Format)

Name	Length	ID	Command Type	Command	Value 1	Value 2	Value 3	Value 4	Value 5	CR
Hex	<u>0x3A</u>	<u>0x30</u> <u>0x37</u>	<u>0x72</u>	<u>0X76</u>	<u>0x32</u>	<u>0x31</u>	<u>0x33</u>	<u>0x35</u>	<u>0x36</u>	<u>0x0</u> <u>D</u>

PC Get-function command to LCD Monitor

Get Function	Len	ID	Cmd Type	Command Code (ASCII)	Code (Hex)	Value Range (Three ASCII bytes)	Comments
Picture mode	8		g		B1	000: STANDARD 001: VIVID 002: CINEMA 003: USER	
Contrast	8		g		61	000 ~ 100	
Brightness	8		g		62	000 ~ 100	
Color	8		g		B2	000 ~ 100	
Tint	8		g		B3	000 ~ 100	
Sharpness	8		g		63	000 ~ 010	
Backlight	8		g		B4	000 ~ 100	Step : 20 for OSD display range 0~5
DCR	8		g		B5	000: OFF 001: ON	
Color Temp	8		g		B6	000: 12000K 001: 9300K 002: 6500K 004: User	
Input Resolution	8		g		B7	000: AUTO 001: 1024x768 002: 1280x768 003: 1360x768 004: 1366x768	
Volume	8		g		66	000 ~ 100	
Mute	8		g		67	000: OFF 001: ON	
Audio Source	8		g		B8	000: Audio1 001: HDMI 002: Audio2 003: Audio3	
Speaker	8		g		B9	000: Internal 001: External 002: Lineout	Only effected for models include internal speakers.

Aspect Ratio	8		g		77	000: Full 001: Original	
PIP Enable	8		g		BA	000: OFF 001: ON	
PIP Main Input	8		g		BB	000: VGA 001: YPbPr 002: DVI 003: HDMI	
PIP Sub Input	8		g		BC	000: VGA 001: YPbPr 002: DVI 003: HDMI	
PIP Size	8		g		BD	000: Small 001: Middle 002: Large	
Video Source	8		g		6A	000 : VGA 001 : HDMI1 003 : CVBS1 004 : YPbPr 005 : S-Video 006 : DVI	
Clock frequency	8		g		C0	000 ~ 32	
Phase	8		g		C1	000 ~ 32	
H.Position	8		g		C2	000 ~ 100	
V.Position	8		g		C3	000 ~ 100	
Ambient Light Sensor	8		g		C4	000: OFF 001: ON	
Blue Screen	8		g		C5	000: OFF 001: ON	
Auto Detect	8		g		C6	000: OFF 001: ON	
Touch Feature	8		g		CE	000: OFF	Only effected for Touch models.
						001: ON	
Language	8		g		78	000: English 001: French 002: Spanish	

						003: Czech,	Optional by different models.
						004: Danish	Optional by different models.
Over Scan	8		g		C7	000: OFF 001: ON	
RTC Year	8		g		C8	000 ~ 099	From 2000~2099
RTC Month	8		g		C9	000 ~ 012	
RTC Day	8		g		CA	000 ~ 031	
RTC Hour	8		g		CB	000 ~ 023	
RTC Minute	8		g		CC	000 ~ 059	
Daylight saving time	8		g		CD	000: OFF 001: ON	
H Monitor	8		g		D4	001 ~ 010	
V Monitor	8		g		D5	001 ~ 010	
H Position	8		g		D6	001 ~ 010	
V Position	8		g		D7	001 ~ 010	
Frame Comp.	8		g		D8	000: OFF 001: ON	
Power save	8		g		D9	000: OFF 001: Eco 002: VGA Only 003: Standard	
Monitor ID	8		g		75	001 ~ 098	
Image retention	8		g		72	000: OFF 001: ON	
Auto adjustment	8		g		DA	000: OFF 001: ON	
DDC/CI	8		g		DB	000: OFF 001: ON	
FW Version	16		g		DC	PS5550 p.xx	(ASCII), the return value will be different for different model
OSD Info Box	8		g		5D	000: OFF 001: ON	
Power	8		g		6C	000: STBY 001: ON	

Remote Control	8		g		68	000: Disable 001: Enable 002: Pass through	Lock
Key Pad function	8		g		69	000: Disable 001: Enable	Lock
Menu Key function	8		g		73	000: Disable 001: Enable	Lock
Power Key function	8		g		74	000: Disable 001: Enable	Lock
5V	8		g	m	6D	000~50	
12V	8		g	n	6E	000~120	
Ambient Sensor	9		g	p	70	0000 ~ 2000	
Thermal Sensor	9		g	q	71	-055 ~ +125	
Operating Time	A		g	v	76	0 ~ 65535	Hour

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 Function command code in ASCII
 Code:

set command table

Set Function	Len	Value Range		Comments
		Code (Hex)	(Three ASCII bytes)	
Picture mode	5	81	000: STANDARD 001: VIVID 002: CINEMA 003: USER	
Contrast	5	23	000 ~ 100	
Brightness	5	24	000 ~ 100	
Color	5	82	000 ~ 100	
Tint	5	83	000 ~ 100	
Sharpness	5	25	000 ~ 010	
Backlight	5	84	000 ~ 100	Step : 20 for OSD display range 0~5
DCR	5	85	000: OFF 001: ON	
Color Temp	5	86	000: 12000K 001: 9300K 002: 6500K 004: User	
Input Resolution	5	87	000: AUTO 001: 1024x768 002: 1280x768 003: 1360x768 004: 1366x768	VGA only
Volume	5	35	000 ~ 100	

Mute	5	36	000: OFF 001: ON	
Audio Source	5	88	000: Audio1 001: HDMI 002: Audio2 003: Audio3	
Speaker	5	89	000: Internal 001: External 002: Lineout	Only effected for models include internal speakers.
Aspect Ratio	5	31	000: Full 001: Original	
PIP Enable	5	8A	000: OFF 001: ON	
PIP Main Input	5	8B	000: VGA 001: YPbPr 002: DVI 003: HDMI	
PIP Sub Input	5	8C	000: VGA 001: YPbPr 002: DVI 003: HDMI	
PIP Size	5	8D	000: Small 001: Middle 002: Large	
PIP Position	5	8E	000: Move Down 001: Move Up 002: Move Left 003: Move Right	
Video Source	5	22	000 : VGA 001 : HDMI1 003 : CVBS1 004 : YPbPr 005 : S-Video 006 : DVI	
Auto adjustment	5	8F		

Clock frequency	5	90	000 ~ 32	
Phase	5	91	000 ~ 32	
H.Position	5	92	000 ~ 100	
V.Position	5	93	000 ~ 100	
Ambient Light Sensor	5	94	000: OFF 001: ON	
Blue Screen	5	95	000: OFF 001: ON	
Auto Detect	5	96	000: OFF 001: ON	
Touch Feature	5	9E	000: OFF	Only effected for Touch models.
			001: ON	
Language	5	32	000: English 001: Franch 002: Spanish	
			003: Czech,	Optional by different models.
			004: Danish	Optional by different models.
Over Scan	5	97	000: OFF 001: ON	
RTC Year	5	98	000 ~ 099	From 2000~2099
RTC Month	5	99	000 ~ 012	
RTC Day	5	9A	000 ~ 031	
RTC Hour	5	9B	000 ~ 023	
RTC Minute	5	9C	000 ~ 059	
Daylight saving time	5	9D	000: OFF 001: ON	
H Monitor	5	A4	001 ~ 010	
V Monitor	5	A5	001 ~ 010	
H Position	5	A6	001 ~ 010	
V Position	5	A7	001 ~ 010	
Frame Comp.	5	A8	000: OFF 001: ON	
Power save	5	A9	000: OFF 001: ECO 002: VGA Only	

			003: Standard	
Monitor ID	5	3D	001 ~ 098	
Image retention	5	47	000: OFF 001: ON	
Auto adjustment	5	AA	000: OFF 001: ON	
DDC/CI	5	AB	000: OFF 001: ON	
Reset User Default	5	AC		
OSD Info Box	5	5B	000: OFF 001: ON	
Store User Default	5	AD		
Factory Reset	5	7E		
Power	5	21	000: STBY 001: ON	
Key Pad	5	41	000 : POWER 001 : SOURCE 002 : MENU 003 : UP 004 : DOWN 005 : LEFT 006 : RIGHT 007 : MUTE	
Remote Control	5	42	000: Disable 001: Enable 002: Pass through	
Key Pad function	5	43	000: Disable 001: Enable	
Menu Key function	5	45	000: Disable 001: Enable	
Power Key function	5	46	000: Disable 001: Enable	

4.2 Remote Control Pass-through mode

When PC sets the LCD monitor to Remote Control Pass through mode, the LCD shall send a three bytes packet (followed by “CR”) in response to RCU button activation. Note, that in this mode the RCU shall have no effect on the monitor function. For example: “+Volume” will not change the volume in the LCD but only sends “+Volume” code to PC over the RS232 port.

Remote Control pass-through packet format from LCD monitor to PC(ASCII)

Name	Length	RCU-Code1	RCU-Code2	CR
Byte Count	3	MSB	LSB	00D
Bytes order	1	2	3	4

Example: Remote Control pass-through when “Menu” key is pressed (2E)

Name	Length	RCU-Code1	RCU-Code2	CR
Byte Count	3	2	E	00D

Bytes order	1	2	3	4
-------------	---	---	---	---

Example: Remote Control pass-through when key “DOWN” is pressed (21)

Name	Length	RCU-Code1	RCU-Code2	CR
Byte Count	3	2	1	00D
Bytes order	1	2	3	4

Example: Remote Control pass-through when “Power” key is pressed (0C)

Name	Length	RCU-Code1	RCU-Code2	CR
Byte Count	3	0	C	00D
Bytes order	1	2	3	4

RCU Key	Support	CODE (HEX)	Notes
PWR	Y	0C	
Exit	Y	0F	= MENU key
Vol +	Y	10	
Vol -	Y	11	
UP	Y	20	
DOWN	Y	21	
Mute	Y	0D	
Enter	Y	0A	= SOURCE key
Menu	Y	2E	
Information	Y	12	
Input	Y	28	= SOURCE key
DVI	Y	4B	
VGA	Y	39	
HDMI	Y	38	
AV	Y	37	
YPbPr	Y	70	