



PL4901/PL5501/PL5502

RS232 & LAN Protocol Installation Guide



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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: 9600bps (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:

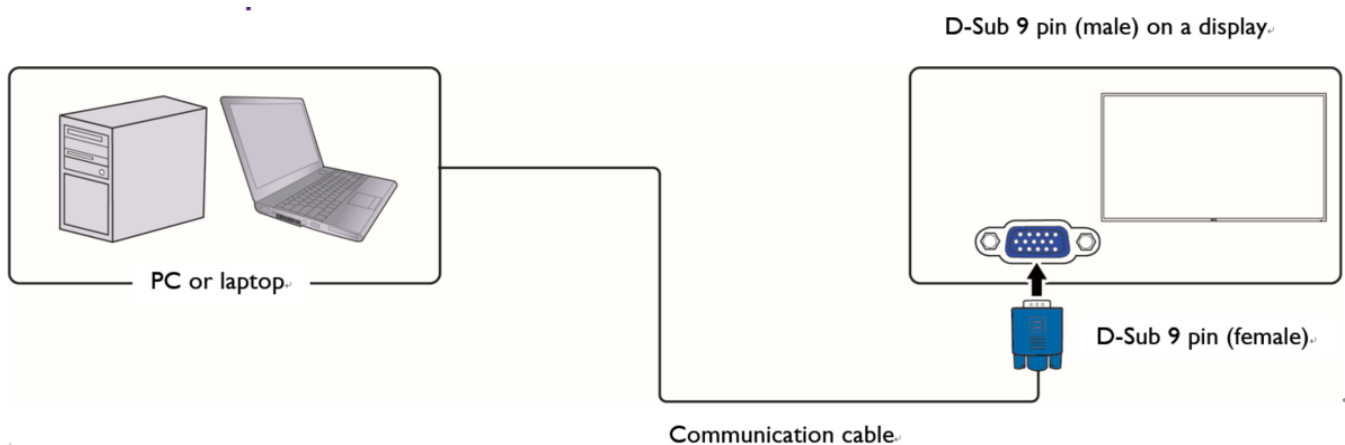
1. If the message is received correctly, it will send "+" (02Bh) followed by "CR" (00Dh).
2. If the message is received incorrectly, it will send "-" (02Dh) followed by "CR" (00Dh).

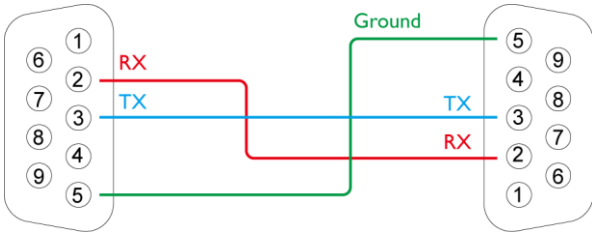
Connections and communication settings

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

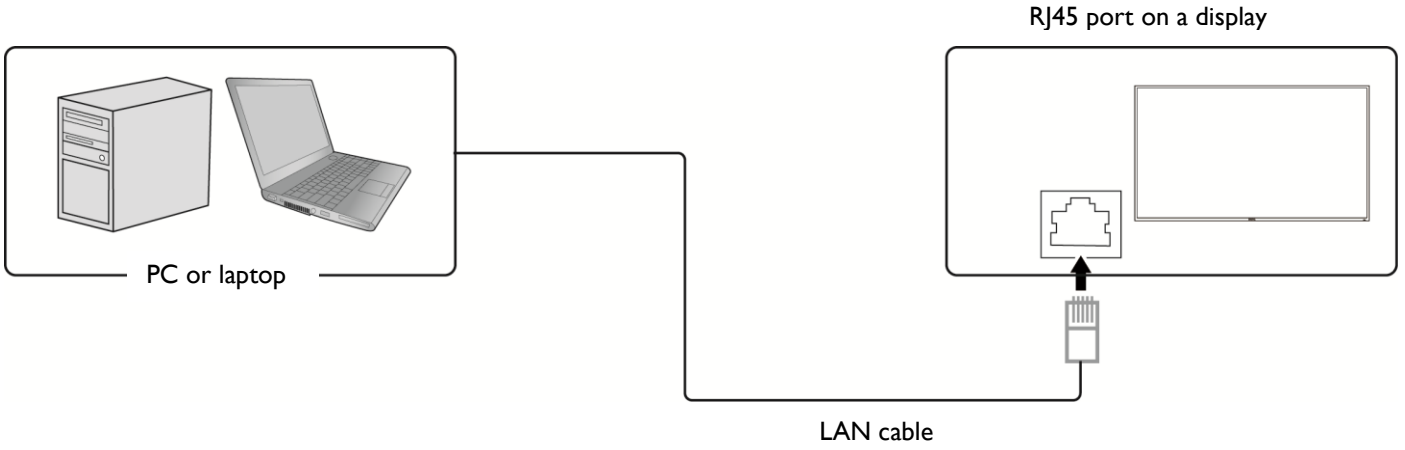
RS232 serial port connection

The image below is just for illustration purpose, PL4901/PL5501/PL5502 use RJ45 connector in display side for RS232 connection.





RS232 via LAN



Make sure the display and the computer are within the same network.

IP Protocol Port: 4660

Protocol Command Description

Item	Description
Length	Total Bytes of Message excluding "CR"
Display ID	Identification for each display Display ID is "01" for LAN control & RS232 control
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"
Display ID	Identification for each display Display ID is "01" for LAN control & RS232 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 and this command is valid.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x31	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 and this command is NOT valid.

Send (Hex Format)

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

Reply (Hex Format)

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

Example 3: Set Balance as 50 this command is valid.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x31	0x73	0x39	0x30	0x35	0x30	0x0D

Reply (Hex Format)

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

Example 4: Set Balance as 115 this command is Not valid.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x31	0x73	0x39	0x31	0x31	0x35	0x0D

Reply (Hex Format)

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

Set-function table

Set Function	Len	ID	Cmd Type	Cmd Code (Hex)	RS232/LAN	Remark
Power	8		s	21	000: Standby	
					001: On	
Video Source	8		s	22	000 : VGA	
					001 : HDMI1	
					002: HDMI2	
					006 : DVI	
					007 : DisplayPort	
Contrast	8		s	23	000 ~ 100	
Brightness	8		s	24	000 ~ 100	
Sharpness	8		s	25	000 ~ 020	
Aspect Ratio	8		s	31	001 : Movie expand 16:9	
					004 : 4:3	
Language	8		s	32	000: English	
					001: Français	
					002: Español	
					004: 簡中	
					005: Português	
					006: German	
					009: Russia	
					013: Italian	
Sound Mode	8		s	33	001:Standard	
					002:Music	
					003:Movie	
					004:Sports	
					005:Custom	
Volume	8		s	35	000 ~ 060	
Mute	8		s	36	000: Off	
					001: On	
Treble	8		s	37	000 ~ 100	
Bass	8		s	38	000 ~ 100	
Balance	8		s	39	000 ~ 100	
Remote control	8		s	40	000 : Vol+	
					001 : Vol-	
					010 : Remote up	

				011 : Remote down		
				012 : Remote left		
				013 : Remote right		
				014 : Remote OK		
				020 : Remote Menu		
				021 : Remote Source		
				022 : Remote Exit		
Picture Mode	8		s	81	000 : Standard	
					001 : Bright	
					002 : Soft	
					003 : Custom	
Chroma/Saturation	8		s	82	000 ~ 100	
Hue	8		s	83	000 ~ 100	
Backlight	8		s	84	000 ~ 100	
Tint	8		s	86	000: Cool	
					001: Standard	
					002: Warm	
Auto Adjustment Execute	8		s	8F	000	For VGA only, execute auto adjustment.
RTC Year	8		s	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		s	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		s	9A	001 ~ 031	If the setting is illegal (Ex: Day31 doesn't exist in April), return "Invalid Command Reply".
RTC Hour	8		s	9B	000 ~ 023	
RTC Minute	8		s	9C	000 ~ 059	
H Monitor	8		s	A4	001 ~ 009	
V Monitor	8		s	A5	001 ~ 009	
Tiling Position	8		s	A6	001 ~ 081	
Frame Comp.	8		s	A8	000: Off	
					001: On	
Power Save	8		s	A9	000: Off	
					001: Low	

				002: High		
Switch on status	8		s	AB	000: Power off	
					001:Force On	
					002: Last Status	

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"
Display ID	Identification for each of display Display ID is "01" for LAN control & RS232 control
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 sensor, 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 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 0x31	0x67	0x62	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x31	0x72	0x62	0x30	0x36	0x37	0x0D

Example 3: Get Balance from and this command is valid.

The Balance value is 32.

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x31	0x67	0x39	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	CR
Hex	0x38	0x30 0x31	0x72	0x39	0x30	0x33	0x32	0x0D

Example 4: Get Balance, but the Balance 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 0x31	0x67	0xD7	0x30	0x30	0x30	0x0D

Reply (Hex Format)

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

Example 5: Get Operation time from system and this command is valid.

The System Operation time value is 1786 (ASCII code).

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	Value5	CR
Hex	0x38	0x30 0x31	0x67	0x76	0x30	0x30	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	Value5	CR
Hex	0x38	0x30 0x31	0x72	0x76	0x30	0x31	0x37	0x38	0x36	0x0D

Example 6: Get CO2 Value from System and this command is valid.

The lux value is 786 (ASCII code).

Send (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	Value5	CR
Hex	0x38	0x30 0x31	0x67	0xAB	0x30	0x30	0x30	0x30	0x30	0x0D

Reply (Hex Format)

Name	Length	ID	Command type	Command	Value1	Value2	Value3	Value4	Value5	CR
Hex	0x38	0x30 0x31	0x72	0xAB	0x30	0x30	0x37	0x38	0x36	0x0D

PC Get-function command

Get Function	Len	ID	Cmd Type	Cmd Code (Hex)	RS232/LAN	Remark
Model Info	20		g	20	<p>(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</p> <p>(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.</p>	<p>MDA : Byte1=0x01: Get Customer Name -> BENQ Byte1=0x02: Get Customer Model Name -> by project Byte1=0x04: Get Scaler Firmware Version Byte1=0x05: Get LAN Firmware Version Byte1=0x06: Get Serial Number</p>
Signal Status	8		g	22	000: Signal unstable	

					001: Signal stable (Active Sync exists)	
Treble	8		g	37	000~100	
Bass	8		g	38	000~100	
Balance	8		g	39	000~100	
Contrast	8		g	61	000 ~ 100	
Brightness	8		g	62	000 ~ 100	
Sharpness	8		g	63	000 ~ 020	
Sound Mode	8		g	65	001: Standard	
					002: Music	
					003: Movie	
					004: Sports	
					005: Custom	
Volume	8		g	66	000 ~ 100	
Mute	8		g	67	000: Off	
					001: On	
Video Source	8		g	6A	000 : VGA	
					001 : HDMI1	
					002: HDMI2	
					006 : DVI	
					007 : DisplayPort	
Power	8		g	6C	000: Standby	
					001: On	
Thermal Sensor Value	10		g	71	<p>(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</p> <p>(2) Return value: Byte1-Byte2-...Byte5 (a) Byte1=0x01: The thermal sensor value is from main board 0x02: The thermal sensor value is rom keypad board (b) Byte2: If the thermal value is</p>	<p>Ex: If the temperature 5°C is from main board, the return value should be: Byte1=0x01, Byte2=0x2B, Byte3=0x30, Byte4=0x30, Byte5=0x35.</p> <p>Ex: If the temperature -15°C is from keypad board, the return value should be: Byte1=0x02, Byte2=0x2D, Byte3=0x30, Byte4=0x31, Byte5=0x35.</p>

					>=0, Byte2='+' (0x2B) If the thermal value is <0, Byte2='- ' (0x2D) (c) Byte3~Byte5: The absolute value of the temperature, in ASCII format.	
Monitor ID	8		g	75	001 ~ 098	
Operation Time	10		g	76	00000 ~ 99999	unit is in hour
Aspect Ratio	8		g	77	001 : 4:3	
					003 : 16:9	
Language	8		g	78	000: English	
					001: Français	
					002: Español	
					004: 简中	
					005: Português	
					006: German	
					009: Russia	
					013: Italian	
Picture Mode	8		g	B1	000: Standard	
					001: Bright	
					002: Soft	
					004: Custom	
Chroma/ Saturation	8		g	B2	000 ~ 100	
Hue	8		g	B3	000 ~ 100	
Backlight	8		g	B4	000 ~ 100	
Tint	8		g	B6	000: Cool	
					001: Standard	
					002: Warm	
RTC Year	8		g	C8	000 ~ 099	Ex: value=012 means Year 2012 If the RTC is not enable, return "Invalid Command Reply"
RTC Month	8		g	C9	001 ~ 012	Ex: value=001 means January If the RTC is not enable, return "Invalid Command Reply"
RTC Day	8		g	CA	001 ~ 031	If the RTC is not enable, return

						"Invalid Command Reply"
RTC Hour	8		g	CB	000 ~ 023	If the RTC is not enable, return "Invalid Command Reply"
RTC Minute	8		g	CC	000 ~ 059	If the RTC is not enable, return "Invalid Command Reply"
H Monitor	8		g	D4	001 ~ 009	
V Monitor	8		g	D5	001 ~ 009	
Tiling Position	8		g	D6	000 ~ 081	
Frame Comp.	8		g	D8	000: Off	
					001: On	
Power Save	8		g	D9	000: Off	
					001: Low	
					002: High	
Switch on Status	8		g	DA	000:Power off	
					001:Force On	
					002:Last Status	