PROTOCOL MANUAL

ID CHASSIS

MODEL	DEST.
VPL-V800Q	US Canadian
VPL-V800QM	AEP

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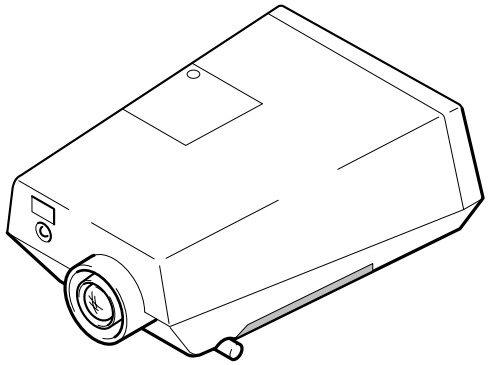


LCD DATA PROJECTOR

SONY

1. INTRODUCTION

This protocol manual describes various commands provided for projector VPL-V800/S800.

Using these commands, an external computer is able to control VPL-V800/S800. In the following paragraphs, CONTROLLER means an external device such as a PC which controls VPL-V800/S800 using these commands.

2. PROTOCOL SPECIFICATION

2-1. Communication Signal

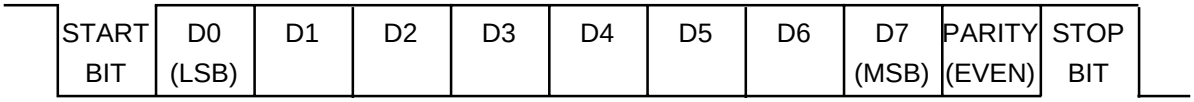
- Standard (4 Wire) communication channel
- Unsynchronous bit serial, word serial digital signal
- Baud rate : 38.4K, 19.2K, 9600, 4800 bits per second (bps)

  <Note>

  1: Baud rate of PROJECTOR is originally set to 38.4Kbps for the standard at the factory.

  2: Baud rate of PROJECTOR is able to be changed in the item of ‘Service Setting for RS422A’ of OSD Menu of PROJECTOR.
- Bit configuration is defined as follows

  1 START Bit + 8 DATA Bits + 1 PARITY Bit + 1 STOP Bit



EVEN Parity ... Total number of ‘1’s from D0 to D7 is even number

2-2. Command Block Format

Code from B0 up to Bn+2 as described bellow shall be transmitted.

< Note > n = 16 + the number of bytes of Data transmitted

①

B0
Start Code

②

B1	B2	B3	B4	B5
RECEIVER (To) Index				
Peripheral Index	Group Index		Device Index	

B6	B7	B8	B9	B10
SENDER (From) Index				
Peripheral Index	Group Index		Device Index	

B11	B12	B13
COMMAND		
CMD1	CMD2	CMD3

③ ④ ⑤ ⑥ ⑦

B14	B15	B16	B17	~	Bn	Bn+1
Data Size of ④~⑥	Sub Command	Data Size of ⑥	Data (TOP)		Data (END)	Check SUM

B1 ~ Bn XOR

⑧

Bn+2
End Code

2-3. Data of Code

① Start Condition

Bn	NAME	DATA	NOTE
B0	Start Code	A5	

② Index Header

/*-- RECEIVER INDEX --*/

B1	PERIPHERAL INDEX	01	Projector
B2	GROUP INDEX UPPER BYTE	00	
B3	GROUP INDEX LOWER BYTE	01	Group Index = 0001 hex
B4	DEVICE INDEX UPPER BYTE	00	
B5	DEVICE INDEX LOWER BYTE	01	Device Index = 0001 hex

/*-- SENDER INDEX --*/

B6	PERIPHERAL INDEX	03	CONTROLLER
B7	GROUP INDEX UPPER BYTE	00	
B8	GROUP INDEX LOWER BYTE	01	Group Index = 0001 hex
B9	DEVICE INDEX UPPER BYTE	00	
B10	DEVICE INDEX LOWER BYTE	01	Device Index = 0001 hex

/*-- Command --*/

B11	CMD1	Refer to attached	
B12	CMD2	Refer to attached	
B13	CMD3	10	CRT Projector
		80	LCD Projector
		D0	DMD Projector

③ Data Size

B14	Data Size	xx	Total Data Size of ④~⑥

④ Sub Command

B15	Sub Command	00	I am stationary in 00.

⑤ DataSize

B16	Data Size	xx	Data Size of ⑥

⑥ Data

B17~Bn	Data	xx	Bytes of Data depend on a COMMAND

⑦ Check SUM

Bn+1	Check Sum	xx	Check SUM of Data of ②~⑥ (XOR of Data of ②~⑥)

⑧ End Condition

Bn+2	END Code	5A	

Place Data for a Command Block as follows for VPL-V800/S800.

B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
A5	01	00	01	00	01	03	00	01	00	01	16	SIRCS CODE	80

B14	B15	B16	B17	~	Bn	Bn+1	Bn+2
SIZE of ④~⑥	00	SIZE of ⑥	DATA			Check SUM	5A

- Command Blocks from B0 up to Bn+2 shall be transmitted continuously. Transfer interval between bytes within a Command Block sent from CONTROLLER shall not exceed 4 ms.

<CMD1> CMD1 is the first part command represents the basic operation of COMMAND, and classified into as follows.

CMD1	FUNCTION	DIRECTION
10	RETURN DATA FROM PJ	CONTROLLER ← PROJECTOR
16	SIRCS CODE DIRECT	CONTROLLER → PROJECTOR

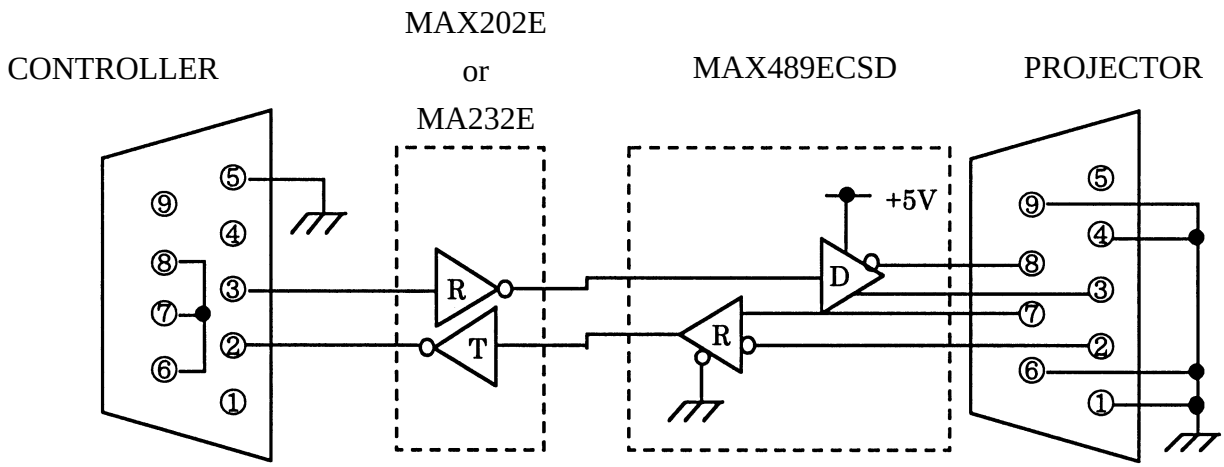
<CMD3> CMD3 is the third part command which clarifies a category of PROJECTOR.
This shall be set to ‘80 hex’ for VPL-V800/S800.

2-4. Connection

Connector : 9 Pin D-subminiature female(D-9S)

If CONTROLLER is wired with RS-232C and PROJECTOR is with RS-422A, the following connection is recommended.

signal / pin	CONTROLLER	PROJECTOR
1	NC	GND
2	RXDA	$\overline{TX}$
3	TXDA	RX
4	NC	GND
5	GND	NC
6	DSR	GND
7	RTS	TX
8	CTS	$\overline{RX}$
9	NC	GND



2-5. Communication Procedure

Communication between CONTROLLER (such as a PC) and DEVICE (such as a PROJECTOR) shall be performed with transmission of a Command Block format.

Communication starts with a Command transmitted by CONTROLLER, and ends with a Return Data from DEVICE to CONTROLLER, if DEVICE receives a Command and deal with it correctly.

CONTROLLER is prohibited to send plural Commands simultaneously, so that after transmission of a Command to DEVICE, CONTROLLER shall not transmit the next Command before receiving a Return Data from DEVICE.

Required time between transmission of a Command from CONTROLLER and that of Return Data from DEVICE depends on a Command transmitted, since DEVICE needs some time for dealing with it and then send back a Return Data.

2-6. Communication Rules

- INDEX NUMBER of PROJECTOR shall be set to '01'.
- After transmission of a Command to PROJECTOR, CONTROLLER shall not send the next Command before receiving Return Data (CMD1=10 hex) from PROJECTOR. If not, any Data is not transmitted from PROJECTOR, neither any Error Code.
- In case of a communication error, PROJECTOR ignores all Data sent so far, and transmits 'NAK' to CONTROLLER as a Return Data.
- If unidentified Command is transmitted or Data is not acknowledged by PROJECTOR, PROJECTOR transmits 'NAK' to CONTROLLER as a Return Data.
- After transmission of SIRCS DIRECT COMMAND (CMD1=16hex) and that of a Return Data (CMD1=10hex) from PROJECTOR , CONTROLLER shall not send the next SIRCS DIRECT COMMAND immediately. More than 180 ms is required for its interval.

3. Command Block Table

The following is one of examples about a Command Block, which intends to send the SIRCS DIRECT COMMAND of PICTURE MUTING.

B11	B12	B13	B14	B15	B16	B17	B18	B19
CMD1	CMD2	CMD3	Data Size	Sub Command	Data Size	Data1	Data2	Check SUM
16	24	80	04	00	02	00	00	B6

FUNCTION	COMMAND	DIRECTION			CMD1	CMD2	DATA	
RETURN DATA	ACK(ACKNOWLEDGE)	CONTROLLER	←	PROJECTOR	10	10	00	
FROM PJ								
<CMD1=10 HEX>	NAK(NOT ANKNOWLEDGE)	CONTROLLER	←	PROJECTOR	10	F0	ERROR DATA	
							COMMAND ERROR	
							01	UNDEFINED COMMAND
							COMMUNICATION ERROR	
							10	CHECK SUM ERROR
							20	FRAMING ERROR
							30	PARITY ERROR
							40	OVER RUN ERROR
							50	OTHER ERROR
SIRCS CODE	SIRCS CODE DIRECT SEND	CONTROLLER	→	PROJECTOR	16	*CMD2	REPEAT	REPEAT NUMBER
DIRECT							00 ONE SHOT	__ disregard
<CMD1=16HEX>							01 REPEAT	XX repeat frequency
							*CMD2	
							00~7F SIRCS CODE	

	CMD1 = 16 HEX							SIRCS CODE								
CMD2	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x											SWITCHER 1-1	SWITCHER 1-2	SWITCHER 1-3	SWITCHER 1-4	SWITCHER 1-5	SWITCHER 1-6
1x	SWITCHER 1-7	SWITCHER 1-8	VOLUME + UP	VOLUME - DOWN	AUDIO MUTING	POWER ON/OFF			CONTRAST + HIGH		COLOR + HIGH	COLOR - LOW			BRITNESS + BRIGHT	
2x	HUE + PURPLISH	HUE - GREENISH	SHARPNESS + SHARP	SHARPNESS - SOFT	PICTURE MUTING	STATUS ON	STATUS OFF			MENU	VIDEO	INPUT A	INPUT B		POWER ON	POWER OFF
3x				CURSOR →	CURSOR ←	CURSOR ↑	CURSOR ↓	SWITCHER 2-1	SWITCHER 2-2	SWITCHER 2-3	SWITCHER 2-4	SWITCHER 2-5	SWITCHER 2-6	SWITCHER 2-7	SWITCHER 2-8	
4x		ADJUSTMENT COLOR RED	ADJUSTMENT COLOR GREEN	ADJUSTMENT COLOR BLUE				RGB SIZE	RGB SHIFT							
5x			W/B GAIN	W/B BIAS				INPUT SELECT			ENTER				MEMORY	VIDEO / S VIDEO
6x	INDEX 0(ALL)	INDEX 1	INDEX 2	INDEX 3	INDEX 4	INDEX 5	INDEX 6	INDEX 7	INDEX 8	INDEX 9						
7x			LENS SHIFT +	LENS SHIFT -	FOCUS + F	FOCUS - N		ZOOM + L	ZOOM - S		SWITCHER OTHER	RESET		NORMAL	PATTERN	
8x																
9x																
Ax																
Bx																
Cx																
Dx																
Ex																
Fx																