SONY

DATA PROJECTOR

VPL-ES3
VPL-EX3
VPL-ES4
VPL-EX4
VPL-EX5
VPL-EX50
VPL-EX5U
VPL-EW5

PROTOCOL MANUAL

1st Edition (Revised 3)

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠ WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠ WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠ AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

Table of Contents

1. Introduction

This protocol manual describes the basic configuration and basic operations of various commands used for projector. Projector can be controlled using the commands provided in “Appendix”. Using an external CONTROLLER , etc., inputs can be switched and the power can also be turned on and off. In the following paragraphs, “CONTROLLER” means an external device such as a PC which controls projector using these commands.

2. RS-232C

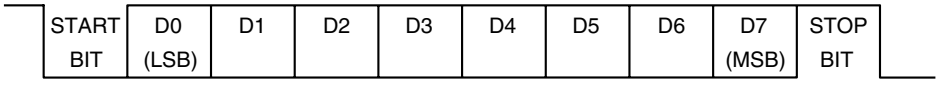
2-1. Communication Specifications

<RS-232C Communication Signal>

- Full duplex communication channels (Flow control not performed.)
- Start-stop synchronism system
- Baud rate: 38.4 kbps (bits per second)
- The bit configuration is defined as follows.

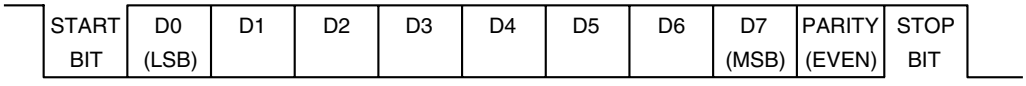
VPL-ES3/EX3

1 START Bit + 8 DATA Bits + 1 STOP Bit



Other than above

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



Even Parity ••• The sum of ones in D0 to D7 and parity is even.

2-2. Command Block Format

The code from B0 to B7 as described below are transmitted.

	Transmission from the Master side	Reception in the Master side	Reception in the Master side (With Data)
B0	START CODE : 0 × A9		
B1	ITEM NUMBER	ACK / NAK	ITEM NUMBER
B2			
B3	SET / GET	ACK	REPLY
B4	DATA	DUMMY DATA	DATA
B5			
B6	CHECK SUM		
B7	END CODE : 0 × 9A		

B0 START CORD
Common in the all FORMAT

B6 CHECK SUM
B1 to B5 are calculated by OR;

<Example of Calculation>

0 × A9	1010	1001	0 × A9	1010	1001
0 × A9	1010	1001	0 × 9A	1001	1010
Answer	1010	1001	Answer	1011	1011
		0 × A9			0 × BB

B7 END CODE
Common in the all FORMAT

2-3. Block Format

	Transmission from the Master side	Data transmission to the Projector
B0	START CODE	Start of Command
B1	ITEM NUMBER	Set the Data Category Value desired. Refer to the Appendix Table 1 for details.
B2		
B3	SET / GET	SET: 0 x 00 (Set data) GET: 0 x 01 (Get data)
B4	DATA	SET: Data to be set (Refer to the Appendix Table 2) GET: Unused. Set Dummy data [0 x 00, 0 x 00]
B5		
B6	CHECK SUM	Check Sum
B7	END CODE	End of Command

	Reception in the Master side	Receive results of the data transmission from the Projector.
B0	START CODE	Start of Command
B1	ACK / NAK	Results correspond with the data transmission Refer to the Appendix Table 3 for the data in detail.
B2		
B3	ACK	[0 x 03] Express Reply data either of ACK, or NAK
B4	DUMMY DATA	This data does not mean any senses. Dummy Data [0 x 00, 0 x 00] is stored.
B5		
B6	CHECK SUM	Check Sum
B7	END CODE	End of Command

	Reception in the Master side (With Data)	Receive data from the Projector
B0	START CODE	Start of Command
B1	ITEM NUMBER	Data to acquire Refer to the Appendix Table 1 in detail.
B2		
B3	REPLY	[0 x 02] Express data to be Reply data
B4	DATA	Received data Refer to the Appendix Table 2 in detail.
B5		
B6	CHECK SUM	Check Sum
B7	END CODE	End of Command

2-4. Connection

<RS-232C Connection>

Communication is enabled by the use of a D-Sub 9 Pin cross (reverse) cable.
The pin assignment of D-Sub 9 Pin and D-Sub 25 Pin is as follows.

D-Sub 9 Pin	D-Sub 25 Pin	Name	
Shell = FG	1	FG	Grounding for safety protection or cable shield
3	2	TxD	Transmission data
2	3	RxD	Reception data
7	4	RTS	Transmission request
8	5	CTS	Transmission permission
6	6	DSR	Data set ready
5	7	SG	GND for signal
1	8	DCD	Data channel signal carrier detection
4	20	DTR	Data terminal ready
9	22	RI	Calling display (Presence/absence of calling signal)

Pins indicated as D-Sub 25 Pin are not used.
Assured cable length: 15 m (However, assurance may not be applicable for some cables.)

The software for controlling the projector from a PC is intended for performing transmission and reception for only the TxD and RxD lines.
Therefore there is no handshake normally performed by RS-232C.

2-5. Communication Procedure

2-5-1. Outline of Communication

All communication between CONTROLLER (PC, etc.) and DEVICE (PROJECTOR) is performed by the command block format. Communication is started by the issue of a command at CONTROLLER and ended when the return Data is sent to CONTROLLER after DEVICE receives the command.
CONTROLLER is prohibited from sending several commands at one time. This means that after CONTROLLER sends one command, it cannot send other commands until DEVICE returns the return Data.
DEVICE sends the return Data after processing the command. The time from when CONTROLLER sends the command until the return Data is returned differs according to the contents of the command.

Note

When Sircs Direct Command is sent, return Data may not be returned in some cases.

2-6. Communication Rules

- When sending a command from CONTROLLER, the return Data from PROJECTOR should be received first before sending the next command. Even if the next command is sent before receiving the return Data, since PROJECTOR will not be able to receive that command, it does not return a response to CONTROLLER. Consequently, no error code is also sent.
  The following lists the approximate waiting times for PROJECTOR to return the return Data after CONTROLLER sends the command.
- When a communication error occurs, PROJECTOR ignores the Data received until now, and set into the reception standby state.
- For undefined commands or commends determined as invalid by PROJECTOR, PROJECTOR will send the “NAK” return Data to CONTROLLER .
- Take note that when Data is written when the input signal of PROJECTOR is unstable, that Data (value) will not be incorporated.
- When INDEX specified SIRCS direct command is transmitted, leave an interval of 45 msec until the next transmission. (Do not return the return Data (ACK, NAK) when the SIRCS direct command is received.)

2-7. Approximate Return Waiting Times

The await-return time is approx. 200 msec.

Note

This is the case, unless the communications are interfered anyway.

Appendix

VPL-ES3/EX3

<Table 1>			<Table 2>			Remarks
Item Number			Data			
Item	Upper byte	Lower byte	Data	Upper byte	Lower byte	
Input	00h	01h	Video	00h	00h	Set/Get
			S-Video	00h	01h	
			Input-A	00h	02h	
			Input-B*5	00h	03h	
Picture Mode	00h	02h	Dynamic	00h	00h	
			Standard	00h	01h	
			Game	00h	02h	
			Living	00h	03h	
			Cinema	00h	04h	
			Presentation	00h	05h	
Contrast	00h	10h	Setting value (0 - 100)	00h	00h-64h	
Brightness	00h	11h	Setting value (0 - 100)	00h	00h-64h	
Color	00h	12h	Setting value (0 - 100)	00h	00h-64h	
Hue	00h	13h	Setting value (0 - 100)	00h	00h-64h	
Sharpness	00h	14h	Setting value (0 - 100)	00h	00h-64h	
Volume	00h	16h	Setting value (0 - 100)	00h	00h-64h	
Color Temp	00h	17h	High	00h	00h	
			Low	00h	01h	
Wide Mode	00h	20h	Off	00h	00h	
			On	00h	01h	
Scan Converter	00h	21h	Off	00h	00h	
			On	00h	01h	
Picture Muting	00h	30h	Off	00h	00h	
			On	00h	01h	
Audio Muting	00h	31h	Off	00h	00h	
			On	00h	01h	
Input-A Signal Sel	00h	32h	Compornent	00h	00h	
			Video GBR	00h	01h	
Lamp Mode	00h	40h	High	00h	00h	
			Standard	00h	01h	

<Table 1>			<Table 2>			Remarks
Item Number			Data			
Item	Upper byte	Lower byte	Data	Upper byte	Lower byte	
Status Error	01h	01h	No Error	00h	00h	Get only
			Lamp Error	00h	01h	
			Fan Error	00h	02h	
			Cover Error	00h	04h	
			Temp Error	00h	08h	
Status Power	01h	02h	Stanby	00h	00h	
			Startup Lamp	00h	02h	
			Power On	00h	03h	
			Cooling1	00h	04h	
			Cooling2	00h	05h	
			Saving Cooling1	00h	06h	
			Saving Cooling2	00h	07h	
			Saving Stanby	00h	08h	
Lamp Timer	01h	13h	Lamp Use Time	0000h-FFFFh*1		
ROM Version	01h	1Dh	MAIN ROM Version	0000h-FFFFh*2		
Status Security*3	01h	1Fh	Disable	00h	00h	
			Enable	00h	01h	
Sircs (15 Bit Category)	17h	Refer to table 4	_	00h	00h	Set only*4
Sircs (20 Bit Category)	19h	Refer to table 5	_	00h	00h	

∗1 Example) In case the lamp timer indicates 1000H, return values are [03h] upper byte and [E8h] lowerbyte.
∗2 Example) In case the software version is 1.03, return values are [01h] upper byte and [03h] lowerbyte.
∗3 With the unit in which the security lock is set, whether the password input screen is displayed can be checked after the power turns on. When the password input screen is being displayed, return values are [00h] upper byte and [01h] lower byte.
∗4 It is corresponded to single command only.
∗5 Valid only for VPL-EX3.

<Table 3>			
Item Number		Data	
IItem	Data	Upper byte	Lower byt
ACK	–	00h	00h
NAK	Select Error	01h	05h

Approximate Return Waiting Times The await-return time is approx. 50 msec.

Note

This is the case, unless the communications are nterfered anyway.

Appendix

VPL-ES4/EX4

<Table 1>			<Table 2>			Remarks
Item Number			Data			
Item name	Upper byte	Lower byte	Item name	Upper byte	Lower byte	
Input	00h	01h	Video	00h	00h	Set/Get
			S-Video	00h	01h	
			Input-A	00h	02h	
			Input-B *5	00h	03h	
Picture Mode	00h	02h	Dynamic	00h	00h	
			Standard	00h	01h	
			Natural	00h	02h	
			Game	00h	03h	
			Living	00h	04h	
			Cinema	00h	05h	
			Presentation	00h	06h	
Contrast	00h	10h	Set Value	00h	00h - 64h (0 - 100)	
Brightness	00h	11h	Set Value	00h	00h - 64h (0 - 100)	
Color	00h	12h	Set Value	00h	00h - 64h (0 - 100)	
Hue	00h	13h	Set Value	00h	00h - 64h (0 - 100)	
Sharpness	00h	14h	Set Value	00h	00h - 64h (0 - 100)	
Volume	00h	16h	Set Value	00h	00h - 64h (0 - 100)	
Color Temp	00h	17h	High	00h	00h	
			Middle	00h	01h	
			Low	00h	02h	
DDE	00h	18h	Off	00h	00h	
			Progressive	00h	01h	
			Film	00h	02h	
Wide Mode	00h	20h	Off	00h	00h	
			On	00h	01h	
Scan Conv	00h	21h	Off	00h	00h	
			On	00h	01h	
PictureMuting	00h	30h	Off	00h	00h	
			On	00h	01h	
AudioMuting	00h	31h	Off	00h	00h	
			On	00h	01h	
Input-A Signal Sel	00h	32h	Auto	00h	00h	
			Computer	00h	01h	
			Component	00h	02h	
			Video GBR	00h	03h	
Lamp Mode	00h	40h	High	00h	00h	
			Standard	00h	01h	

<Table 1>			<Table 2>			Remarks
Item Number			Data			
Item name	Upper byte	Lower byte	Item name	Upper byte	Lower byte	
Status Error	01h	01h	No Error	00h	00h	Get
			Lamp Error	00h	01h	
			Fan Error	00h	02h	
			Cover Error	00h	04h	
			Temp Error	00h	08h	
Status Power	01h	02h	Stanby	00h	00h	
			Start Up Lamp	00h	02h	
			Power On	00h	03h	
			Cooling1	00h	04h	
			Cooling2	00h	05h	
			Saving Cooling1	00h	06h	
			Saving Cooling2	00h	07h	
			Saving Stanby	00h	08h	
Lamp Timer	01h	13h	Lamp Use Time	0000h - FFFFh ∗1		
ROM Version	01h	1Dh	MAIN ROM Version	0000h - FFFFh ∗2		
Status Security ∗3	01h	1Fh	Disable	00h	00h	
			Enable	00h	01h	
Sircs (15 Bit Category)	17h	Refer to table 4	–	00h	00h	Set only ∗4
Sircs (20 Bit Category)	19h	Refer to table 5	–	00h	00h	

∗1 Example) In case the lamp timer indicates 1000H, return values are [03h] upper byte and [E8h] lowerbyte.
∗2 Example) In case the software version is 1.03, return values are [01h] upper byte and [03h] lowerbyte.
∗3 With the unit in which the security lock is set, whether the password input screen is displayed can be checked after the power turns on. When the password input screen is being displayed, return values are [00h] upper byte and [01h] lower byte.
∗4 It is corresponded to single command only.
∗5 Valid only for VPL-EX4.

<Table 3>			
Item Number		Data	
IItem	Data	Upper byte	Lower byt
ACK	–	00h	00h
NAK	Select Error	01h	05h

When sending a command, wait for at least 50 ms after the reception of response.
No response may be returned when turning on the power.

Appendix

VPL-EX5/EX50/EX5U/EW5

<Table 1>			<Table 2>			Remarks
Item Number			Data			
Item name	Upper byte	Lower byte	Item name	Upper byte	Lower byte	
Input	00h	01h	Video	00h	00h	Set/Get
			S-Video	00h	01h	
			Input-A	00h	02h	
			Input-B *5	00h	03h	
Picture Mode	00h	02h	Dynamic	00h	00h	
			Standard	00h	01h	
			Game	00h	03h	
			Living	00h	04h	
			Cinema	00h	05h	
			Presentation	00h	06h	
Contrast	00h	10h	Set Value	00h	00h - 64h (0 - 100)	
Brightness	00h	11h	Set Value	00h	00h - 64h (0 - 100)	
Color	00h	12h	Set Value	00h	00h - 64h (0 - 100)	
Hue	00h	13h	Set Value	00h	00h - 64h (0 - 100)	
Sharpness	00h	14h	Set Value	00h	00h - 64h (0 - 100)	
Volume	00h	16h	Set Value	00h	00h - 64h (0 - 100)	
Color Temp	00h	17h	High	00h	00h	
			Middle	00h	01h	
			Low	00h	02h	
DDE	00h	18h	Off	00h	00h	
			Progressive	00h	01h	
			Film	00h	02h	
Aspect	00h	20h	Normal	00h	01h	
			Zoom	00h	03h	
			Full1	00h	07h	
			Full2	00h	08h	
			Wide zoom	00h	02h	
			4 : 3	00h	09h	
			16 : 9	00h	0Ah	
PictureMuting	00h	30h	Off	00h	00h	
			On	00h	01h	
AudioMuting	00h	31h	Off	00h	00h	
			On	00h	01h	
Input-A Signal Sel	00h	32h	Auto	00h	00h	
			Computer	00h	01h	
			Component	00h	02h	
			Video GBR	00h	03h	
Lamp Mode*5	00h	40h	High	00h	00h	
			Standard	00h	01h	

<Table 1>			<Table 2>			Remarks
Item Number			Data			
Item name	Upper byte	Lower byte	Item name	Upper byte	Lower byte	
Status Error	01h	01h	No Error	00h	00h	Get
			Lamp Error	00h	01h	
			Fan Error	00h	02h	
			Cover Error	00h	04h	
			Temp Error	00h	08h	
Status Power	01h	02h	Stanby	00h	00h	
			Start Up Lamp	00h	02h	
			Power On	00h	03h	
			Cooling1	00h	04h	
			Cooling2	00h	05h	
			Saving Cooling1	00h	06h	
			Saving Cooling2	00h	07h	
			Saving Stanby	00h	08h	
Lamp Timer	01h	13h	Lamp Use Time	0000h - FFFFh *1		
ROM Version	01h	1Dh	MAIN ROM Version	0000h - FFFFh *2		
Status Security *3	01h	1Fh	Disable	00h	00h	
			Enable	00h	01h	
Sircs (15 Bit Category)	17h	Refer to table 4	–	00h	00h	Set only *4
Sircs (20 Bit Category)	19h	Refer to table 5	–	00h	00h	

∗1 Example) In case the lamp timer indicates 1000H, return values are [03h] upper byte and [E8h] lowerbyte.
∗2 Example) In case the software version is 1.03, return values are [01h] upper byte and [03h] lowerbyte.
∗3 With the unit in which the security lock is set, whether the password input screen is displayed can be checked after the power turns on. When the password input screen is being displayed, return values are [00h] upper byte and [01h] lower byte.
∗4 It is corresponded to single command only.
∗5 Valid only for VPL-EX50/EW5.

<Table 3>			
Item Number		Data	
IItem	Data	Upper byte	Lower byt
ACK	–	00h	00h
NAK	Select Error	01h	05h

When sending a command, wait for at least 50 ms after the reception of response.
No response may be returned when turning on the power.

List of SIRCS CODE

(1) 15BIT Category

<Table 4>

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x																
1x			VOLUME + UP	VOLUME – DOWN	AUDIO MUTING	POWER*2 ON/OFF			CONTRAST + HIGH	CONTRAST – LOW	COLOR + HIGH	COLOR – LOW			BRITNESS + BRIGHT	BRITNESS – DARK
2x	HUE + PURPLISH	HUE – GREENISH	SHARPNESS + SHARP	SHARPNESS – SOFT	PICTURE MUTING	STATUS ON	STATUS OFF			MENU	VIDEO	INPUT A	INPUT B*1		POWER*2 ON	POWER*2 OFF
3x				CURSOR →	CURSOR ←	CURSOR ↑	CURSOR ↓									
4x								RGB SIZE	RGB SHIFT							
5x								INPUT SELECT			ENTER					S VIDEO
6x																
7x												RESET				

*1 Valid only for VPL-EX3/EX4/EX50/EW5

*2 During the normal Standby (Low Power Standby) state, commands other than Power On/Off and Power On of the service direct commands are not accepted. When the Power On/Off or Power On command is received, the Full Power Standby state is established, and other commands can also be accepted. (Only for Ver. 1.05 or previous versions of EX4 and ES4. This limitation does not apply to Ver. 1.06 or later versions.)

(2) 20BIT Category

<Table 5>

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x																
1x																
2x																
3x											V KEYSTONE					
4x																
5x																
6x	APA	DOT PHASE						FREEZE			DIGITAL ZOOM +	DIGITAL ZOOM –				
7x																

VPL-ES3 (SY)
VPL-EX3 (SY)
VPL-ES4 (SY)
VPL-EX4 (SY)
VPL-EX5 (SY)
VPL-EX5 (CH)
VPL-EX50 (SY)
VPL-EX50 (CH)
VPL-EX5U (SYY)
VPL-EW5 (SY)
VPL-EW5 (CH) E

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Ichinomiya Tec

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